Third Five-Year Review Report
for

Hastings Ground Water Contamination Site

Adams County

Hastings, Nebraska

July 2007

Prepared by

City of Hastings
Hastings, Nebraska

and

Region VII
United States Environmental Protection Agency
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Date:

7/17/07

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List of Abbreviations

AOC	Administrative Order on Consent
ARARs	Applicable or Relevant and Appropriate Requirements
BNSF	Burlington Northern Santa Fe Railroad
BTEX	Benzene, toluene, ethylbenzene, and xylene
CCl_4	Carbon Tetrachloride
CD	Consent Decree
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CMS	Community Municipal Services
COCs	Contaminant(s) of Concern
1,2-DCA	1,1-Dichloroethane
1,1-DCE	1,1-Dichloroethylene
Cis-1,2-DCE	Cis-1,2-Dichloroethane
Trans-1,2-DCE	Trans-1,2-Dichloroethane
DOD	Department of Defense
EDB	Ethylene Dibromide
EE/CA	Engineering Evaluation/Cost Analysis
EPA	United States Environmental Protection Agency
ESD	Explanation of Significant Differences
FS	Feasibility Study
HEIP	Hastings East Industrial Park
HGWCS	Hastings Ground Water Contamination Site
Risk Assessment	Human Health Baseline Risk Assessment
IC	Institutional Control
ICA	Institutional Control Area
ISCO	In Situ Chemical Oxidation
IWA	In-well Aeration
LUST	Leaking Underground Storage Tank
MCL	Maximum Contaminant Level established under the Safe Drinking Water Act
MW	Monitoring Well
NAD	Former Naval Ammunition Depot
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NDEQ	Nebraska Department of Environmental Quality
OSWER	Office of Solid Waste and Emergency Response
O&M	Operation and Maintenance
OU	Operable Unit(s)

List of Abbreviations

PAH	Polynuclear Aromatic Hydrocarbon
PCE	Tetrachloroethylene
PRP	Potentially Responsible Party
RA	Remedial Action
RD	Remedial Design
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
RPM	Remedial Project Manager
SD	Settling Defendant (a party who entered into a Consent Decree with EPA)
SOW	Statement of Work
SVE	Soil Vapor Extraction
TBCs	To Be Considered
1,1,1-TCA	1,1,1-Trichloroethane
TCE	Trichloroethylene
µg/l	Microgram/Liter
USACE	United States Army Corp of Engineers
VOCs	Volatile Organic Compounds

Executive Summary

This document presents the U.S. Environmental Protection Agency's (EPA) third Five-Year Review of the Hastings Ground Water Contamination Site (HGWCS), located in and adjacent to the city of Hastings, Nebraska. The results of this Five-Year Review indicate that some of the actions taken to date continue to provide protection to the public health and the environment. For the actions which have not yet been fully implemented, a protectiveness determination cannot be made at this time until further information is obtained. Several responsible parties continue to be active in the implementation of response actions at various locations across the site. For the most part, the ownership of involved properties and the list of responsible parties have not changed since the last Five-Year Review. These parties, EPA and the state of Nebraska, have conducted and continue to conduct actions at the site to address contamination in the site soils and ground water.

The HGWCS was divided into seven subsites for investigative and remediation purposes on the basis of geographic and contaminant source area characteristics. The subsites include Well No.3, Colorado Avenue, Second Street, North Landfill, FAR-MAR-CO, South Landfill, and the Former Naval Ammunition Depot (NAD). Most subsites consist of multiple operable units (OUs), designated as such to facilitate the identification and implementation of remedial actions. A non-subsite specific OU, the Area-Wide Ground Water Action OU19, was created to integrate information from the individual subsites, with the exception of the NAD, to protect potential receptors from unacceptable risks posed by the multiple contaminated ground water plumes emanating from the various subsites. EPA has worked closely with the state of Nebraska, the United States Army Corp of Engineers (USACE), and a number of potentially responsible parties (PRPs), including the city of Hastings, to address the issues that have affected the public health and environment at this site. These actions are briefly described below.

Area-Wide Ground Water Action - The Agency has taken an Area-Wide approach to protect the public from exposure to the contaminated ground water emanating from the six subsites located within or directly adjacent to the City limits of Hastings. This approach integrates information collected at each subsite and is intended to protect potential receptors from unacceptable risks posed by contaminated ground water. In 2001, EPA, in consultation with Nebraska Department of Environmental Quality (NDEQ), signed an Interim Action Record of Decision (ROD) that selected an interim action remedy. The Interim Action ROD provides for establishing an institutional control area (ICA), alternate water supply for affected users, well inventory and ground water monitoring program. EPA and the PRPs signed a Consent Decree (CD) which requires the PRPs to implement the selected interim action remedy. On behalf of the Area-Wide PRPs, the city prepared a Remedial Design/Remedial Action (RD/RA) Work Plan in August 2004 to satisfy the requirements of the CD and Statement of Work (SOW). The city had previously passed and implemented Ordinance No. 3754 in November 2000 that established the ICA identified in the 2001 ROD. The city initiated further work efforts in 2004, completed ground water quality sampling and other actions, and submitted annual ground water monitoring reports in early 2005, 2006 and 2007. Ground water monitoring and compliance monitoring of the ordinance continues. The NAD was not included in the Area-Wide Ground Water Action because it is located outside the City limits and the USACE is conducting a separate ground water action.

Well No.3 Subsite - EPA completed one interim action addressing the contamination present in the soils (OU07), one soil removal action (OU17), one interim action addressing the ground water contamination (OU 13) and one final action selected to address the downgradient Trichloroethylene (TCE) ground water contamination (OU18). EPA released its final ROD for the subsite on May 17, 2001, selecting no further action for OUs 07, 13, and 17. The remedial action for OU13 was completed in 2002 when ground water monitoring indicated that the carbon tetrachloride present in the aquifer had been remediated to the maximum contaminant level (MCL) established under the Safe Drinking Water Act. For OU18, the final ROD selected the continuation of the operation of the former municipal supply well M-3 with MCLs as the cleanup level for the TCE and related volatile contaminants. EPA and Dutton-Lainson Company (Dutton-Lainson) signed an agreement CD to continue performing the OU18 work. Dutton-Lainson began operating the system at M-3 in May 2003 and initiated ground water monitoring in June 2003; Dutton-Lainson samples the ground water twice yearly.

Colorado Avenue Subsite - The PRPs installed an intermediate/deep level (e.g., 60 to 100 feet below ground surface) soil vapor extraction (SVE) system for OU09 (source control) and continue to operate it on a periodic basis. Construction and implementation of a shallow level (generally less than 50 feet below ground surface) SVE system originally planned for the summer of 2002 is now expected to be installed in 2007. For OU01 (ground water), EPA completed an interim action ROD in 1991 and amended this ROD in 1998 to permit an expanded range of technologies including air sparging and in-well-aeration (IWA). Dravo Corporation (Dravo) installed the IWA ground water treatment systems for Phase II in 1999. In 2002, four additional IWA wells were installed one mile east of the contaminant source areas. These treatment wells are known as Phase III and began operation in November 2002. While ground water treatment activities continue, the remedy has not been fully implemented. Dravo has signed a Consent Order requiring a complete delineation of the downgradient Colorado Avenue contaminant plume. This work to sample areas beyond the Phase III treatment system is known as the Phase IV work.

Second Street Subsite - The EPA initiated a ground water and soils SVE removal action at the source area in 1996. These systems continue to operate with day-to-day operations performed by City employees. EPA initiated a second removal action for the Second Street Subsite downgradient ground water in September, 2000. Two in-well stripping wells located at Pine Avenue began operating in the summer of 2001. The remediation systems remove the benzene and other volatile contaminants from the soils and ground water. After completion of the Remedial Investigation/Feasibility Study (RI/FS) for OU20, EPA signed a ROD selecting in situ treatment combined with extraction and treatment of the ground water in July 2003. EPA implemented the OU20 remedy in 2005 with the installation of fourteen in situ treatment wells. These wells are needed to treat the remaining areas of ground water contamination identified to the east and south. Oxygen release chemicals are injected into the ground water to enhance naturally occurring biodegradation of the contaminants. The first two in situ bioremediation treatments were completed in November 2005 and November 2006. After completion of the RI/FS for the OU12 source area, on September 21, 2006, EPA signed a ROD selecting excavation and thermal treatment of readily-accessible contaminated soils and source materials; and treatment of contaminated areas below the surface throughout the subsite by using in situ chemical oxidation (ISCO). ISCO will be conducted in phases, with monitoring, as the work progresses.

North Landfill Subsite – The PRPs implemented the source control (OU10) remedial action consistent with the 1991 ROD and completed construction of a landfill cap in 1999. The PRPs monitored the levels of contamination present in the soil-gas for eight quarters (from 1999 to 2001) to determine if the landfill continued to be a source of volatile organic compounds (VOCs) to the aquifer. The results of this monitoring indicated that the landfill was not a major source of contamination.

In March 1995, the responsible parties requested that EPA delay the implementation of the ground water extraction and treatment remedy selected in the 1991 ROD in order to determine if the remediation system implemented at the FAR-MAR-CO Subsite would address the North Landfill plume. EPA agreed to a 5-year suspension for the implementation of the remedial action as long as quarterly ground water monitoring was performed to verify the performance of the FAR-MAR-CO system. The FAR-MAR-CO extraction system was implemented in 1997. The 5-year performance period ended in July 2002 and the report evaluating the FAR-MAR-CO remediation system (the Well D Report) was submitted to EPA in December 2002. The PRPs' report concluded that the North Landfill plume was contained. EPA has not accepted this conclusion. The PRPs completed a final FS for ground water remediation under EPA oversight in 2005. Additional ground water monitoring wells (MW) have been installed and monitored by the responsible parties; these monitoring results indicated that an upgradient source of ground water contamination is migrating into the subsite plume. After approval of the FS for OU02, EPA signed a final action ROD on August 25, 2006. This ROD is addresses the final response action for this subsite and includes monitoring to confirm the conclusion in the Well D Report that the North Landfill ground water contamination is contained. The remedy also consists of natural attenuation (NA), ground water use restrictions, hydraulic containment using vertical extraction wells, and use of the pumped water as non-contact cooling water.

FAR-MAR-CO Subsite – EPA issued the ROD for the FAR-MAR-CO OU03 (source control) in 1988, selecting SVE as the remedy. In August 1995, EPA amended the ROD by extending the SVE operation for two years beyond the time which the soils had reached their cleanup levels. This extension was implemented to remove the contamination present in the upper zone of the aquifer, thereby facilitating the restoration of the aquifer. The work was conducted by Farmland Industries, Inc. (Farmland) under a CD. The SVE system began its operation on November 19, 1997. The extended operation and maintenance (O&M) phase of the system began in May 2000 and was completed in May 2002. Farmland collected soil vapor samples in November 2002 and in May 2003 to determine if any rebounding of the contamination had occurred. After verifying that rebounding had not occurred, Farmland undertook restoration activities in mid-2003 and completed restoration of the subsite in December 2003.

EPA identified a threat from the FAR-MAR-CO Subsite to the drinking water supply provided by the Community Municipal Services (CMS) in 1995 and in response, issued an Action Memorandum in December 1995 which determined that a ground water removal action (OU06) was necessary. Morrison Enterprises (Morrison), a former owner and operator of the subsite, installed the extraction well, Well D, in the summer of 1997. Morrison submitted to EPA the Well D Report documenting the first five years of operation. EPA evaluated the performance of the system based upon the information presented in that report. EPA continues to receive ground water monitoring results from Morrison for the contaminants of concern (COCs) (carbon tetrachloride {CCl_4} and ethylene dibromide {EDB}) on a quarterly basis. System operation information is also included in the quarterly reports.

In 1999, the city extended a water line to CMS users, which removed the immediate threat of exposure to contaminated drinking water. To evaluate alternatives to address the long-term threat, EPA invited Morrison to perform an FS. Morrison agreed and performed the work under EPA oversight in 2005 and 2006. Final revisions were completed in June 2007. In July 2007, EPA issued a Proposed Plan which evaluated alternatives for remediating contaminated ground water at the subsite and choosing one as the proposed alternative, subject to public comment. All alternatives envision a 50 year period for the Performance Goals, which are MCLs for the COCs, to be attained.

South Landfill Subsite - EPA issued its final ROD for OU05 (source control and ground water) in September 2000. The selected remedy for the South Landfill includes upgrading the landfill cap and monitored natural attenuation to address ground water contamination. EPA negotiated a CD with the PRPs who then began work in late 2004. The landfill cap was installed in 2005, and a methane investigation was also conducted. Additional methane sampling is planned and ground water sampling activities are in progress. The RD for ground water will be prepared in 2007.

NAD Subsite - The USACE is performing the work for the following OUs: 04, 08, 14, 15, and 16. The USACE is in the process of performing its third Five-Year Review for OUs 04, 08, 14, 15 and 16 separately. The transmittal memorandum of a draft copy of the report is included as Appendix 1. The USACEs evaluation for OU04, OU08, and OU15 concluded the remedies to be protective in human health and the environment in the short and long term. The remedy for OU14 is expected to be protective upon completion, and in the interim, exposure pathways that could result in unacceptable risks are being controlled. The remedy for OU16 currently protects human health and the environment because exposure pathways that could result in unacceptable risks are being controlled. However, in order for the remedy to be protective in the long-term, institutional controls on future land use are necessary to ensure long-term protectiveness.

Five-Year Review Summary Form

SITE IDENTIFICATION		
Site name (from WasteLAN): Hastings Ground Water Contamination		
EPA ID (*from WasteLAN*): NED980862668		
Region: 7	**State:** NE	**City/County:** Hastings / Adams
SITE STATUS		
NPL status: ☒ Final ☐ Deleted ☐ Other (specify)		
Remediation status (choose all that apply): ☒ Under Construction ☒ Operating ☐ Completed		
Multiple OUs?* ☒ YES ☐ NO		**Construction completion date:** N/A
Has the site been put into reuse? ☒ YES ☐ NO		
REVIEW STATUS		
Lead agency: ☒ EPA ☐ State ☐ Tribe ☐ Other Federal Agency		
Author name: Brian Zurbuchen, Ph.D		
Review period:** 09 / 05 / 2006 to 07/16/07		
Date(s) of site inspection: 02 / 28 / 2006 – 02 / 29 / 2006		
Type of review: ☒ Post-SARA ☐ Pre-SARA ☐ NPL-Removal only ☐ Non-NPL Remedial Action Site ☐ NPL State/Tribe-lead ☐ Regional Discretion		
Review number: ☐ 1 (first) ☐ 2 (second) ☒ 3 (third) ☐ Other (specify)		
Triggering action: ☐ Actual RA On-site Construction at OU #__ ☐ Actual RA Start at OU #__ ☐ Construction Completion ☒ Previous Five-Year Review Report ☐ Other (specify)		
Triggering action date (*from WasteLAN*): 07 / 02 / 2002		
Due date (*five years after triggering action date*): 07 / 02 / 2007		

* ["OU" refers to operable unit.]
** [Review period should correspond to the actual start and end dates of the Five-Year Review in WasteLAN.]

Five-Year Review Summary Form, cont'd.

Issues:

Well 3 (OU18): the OU18 ground water contaminant plume is not well defined; EPA will discuss this matter with Settling Defendants (SDs).

Colorado Avenue: the OU09 remedy has not been fully implemented; the 2006 CD requires SDs to implement the OU01 SVE remedy. The OU01 remedy has not been fully implemented; the downgradient plume (known as Phase IV) is being investigated by Dravo under terms of the Administrative Order on Consent (AOC) signed in 2007; a ROD is planned for a final ground water RA.

Second Street: EPA will implement the OU12 RD/RA, remedy is for source control; OU12 ROD is final ROD for the subsite; OU12 RD began June 2007. EPA is implementing the OU20 remedy in phases; RA began in 2005.

North Landfill (OU02): Final Action ROD issued in August 2006; CD negotiations with PRPs still ongoing; employment of Well D for extraction of contaminated ground water will continue.

FAR-MAR-CO (OU06): EPA issued the Proposed Plan in July 2007; operation of Well D for extraction of contaminated ground water is ongoing.

Area-Wide Ground Water Action (OU19): Interim Action ROD issued in 2001; CD entered February 26, 2004; all components of remedy implemented; COCs have been consistently detected in industrial wells located near the eastern boundary of the institutional control area; 1,4-dioxane to be added to COC list.

Recommendations and Follow-up Actions:

Continue the actions as specified in the Interim RODs or Action Memoranda for the respective subsites and the Area-Wide Ground Water Action. Develop and implement a monitoring plan to ensure ICA is broad enough to encompass ground water contaminant plumes.

Protectiveness Statement(s):

The combination of the subsite and area-wide remedies currently protects human health. In addition to the remedies that established engineering controls at the subsites, a remedy identifying institutional controls (ICs) was selected for the Area-Wide Ground Water Action (OU19). The Area-Wide Ground Water Action is not a subsite, but was established to prevent the public from exposure to the contaminated ground water emanating from the six city subsites. The IC prohibits property owners from domestic use of ground water within the ICA unless it is demonstrated through sampling that the ground water is suitable for use. However, in order for the remedy to be protective in the long-term, the IC currently in place must continue to be implemented over the lateral extents of all migrating contaminant plumes.

Other Comments:

There are several parties involved with the cleanup of these 20 OUs. Some RAs are fund-lead and require a state match. Response actions at the NAD are being conducted by USACE. Other response actions are fully funded by the city and private responsible parties. Cooperation and coordination among all the entities is crucial for the successful cleanup of the source areas and restoration of the aquifer.

Third Five-Year Review Report
Hastings Ground Water Contamination
Hastings, Nebraska

The purpose of the Five-Year Review is to determine whether the remedy at a site is protective of human health and the environment. The method, findings, and conclusions of reviews are documented in Five-Year Review reports. In addition, Five-Year Review reports identify issues found during the review, if any, and identify recommendations to address them.

I. Introduction

EPA is preparing this Five-Year Review pursuant to Section 121 of the Comprehensive Environmental Response Compensation and Liability Act as amended (CERCLA), 42 U.S.C. §9621 and the National Oil and Hazardous Substances Contingency Plan (NCP). CERCLA § 121 states:

> *If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each five years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented. In addition, if upon such review it is the judgment of the President that action is appropriate at such site in accordance with Section 104 or 106, the President shall take or require such action. The President shall report to the Congress a list of facilities for which such review is required, the results of all such reviews, and any actions taken as a result of such reviews.*

EPA interpreted this requirement further in the NCP; 40 CFR §300.430(F)(4)(ii) states:

> *If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after the initiation of the selected remedial action.*

EPAs involvement in Hastings began in 1984, when high levels of VOCs were found in three municipal wells. EPA designated the contaminated area as HGWCS. The HGWCS covers the central industrial area of the city of Hastings, Adams County, Nebraska, and adjacent areas outside of the City limits.

The HGWCS was placed on the National Priorities List in 1986. The National Priorities List is a nationwide list of hazardous waste sites eligible for long-term RA financed under the Superfund program, in the event a viable responsible party cannot be identified.

The HGWCS was divided into seven subsites for investigative and remediation purposes on the basis of geographic and constituent source area characteristics. The subsites are Well No.3, Colorado Avenue, Second Street, North Landfill, South Landfill, and the NAD. Most subsites consist of multiple OUs, designated as such to facilitate the identification and implementation of RA. A non-subsite specific OU, the Area-Wide Ground Water Action OU19, was created to integrate information from the individual subsites, with the exception of the NAD, into a comprehensive strategy to protect potential receptors from unacceptable risks posed by the multiple contaminated groundwater plumes emanating from the various subsites.

EPA and the city of Hastings, in cooperation with the NDEQ, have conducted this Five-Year Review of the Superfund RA implemented at the HGWCS, with the exclusion of the NAD. The USACE, with oversight by EPA and NDEQ, conducted their Five-Year Review for the NAD subsite.

This Five-Year Review Report was completed pursuant to Section 121 (c) of CERCLA, Section 300.430(f)(4)(ii) of the NCP and pursuant to EPA/Office of Solid Waste and Emergency Response (OSWER), Comprehensive Five-Year Review Guidance (OSWER Directive 9355.7-03B-P, June 2001).

This is the third Five-Year Review for the HGWCS. The initial Five-Year Review was triggered by the initiation of the actual on-site construction at the Well No.3 Subsite, OU07 (October 1992). The first Five-Year Review was issued in May 1997. The second Five Year Review covered the period from May 1997 to May 2002 and was completed July 2, 2002.

This current Five-Year Review covers the period from May 2002 through April 2007. Review activities were conducted between September 2006 and June 2007. As the HGWCS is made up of 20 OUs, several informational sources contributed to this report. EPA and the city of Hastings collected and condensed this information to fit the format required for Five-Year Review Reports.

Information for the Well No.3 Subsite was provided by EPA (analytical data), the city of Hastings, and Hydro-Trace, Inc., the contractor for Dutton-Lainson (a responsible party at the subsite). At the Colorado Avenue Subsite, the analytical information was provided by Michael Baker, Jr., Inc. (Baker), the contractor for Dravo Corporation, (a responsible party at the subsite) and EPA's contractors. At the Second Street Subsite, analytical data was provided by EPA's contractor. At the North Landfill Subsite, the analytical information was provided by the city of Hastings and Hydro-Trace, Inc., the contractor for the North Landfill responsible parties. At the FAR-MAR-CO Subsite, analytical data was provided by Hydro-Trace, Inc., the contractor for Morrison (a responsible party at the subsite). At the South Landfill Subsite, analytical information was provided by EPA's contractor, the city of Hastings and its contractor, Hydro-Trace, Inc., and Olsson Associates (See Appendix 4). At the NAD, the information was provided by the USACE. The information for the Area-Wide portion of the site was provided by the city of Hastings.
This Five-Year Review Report documents the status of construction activities and the inspections of response actions conducted by EPA and the NDEQ. The NDEQ and EPA inspections determined that the contractors constructed the remedies in accordance with the RD plans and specifications. The inspections also clarified the status of additional construction work needed. The subsite updates below identify the activities which were initiated since the 2002 review and any additional activities necessary to achieve the RODs performance standards, protectiveness, and site completion.

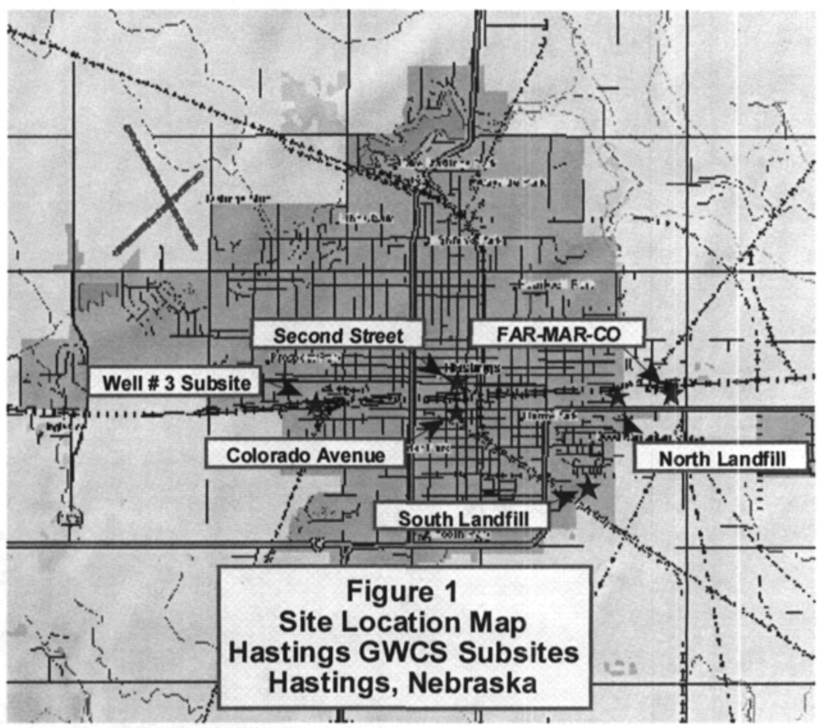

Figure 1
Site Location Map
Hastings GWCS Subsites
Hastings, Nebraska

The USACE is in the process of performing its third Five-Year Review for OUs 04, 08, 14, 15 and 16 separately. The transmittal memorandum of a draft copy of the report is included as Appendix 1.

EPA's third Five-Year Review will become part of the site file and will be included in the site Administrative Record located in the Hastings Public Library, Hastings, Nebraska, and in the EPA's Region VII site file.

II. Site Chronology

Table 1 summarizes the chronology of subsite activities.

III. Background

A. Physical Characteristics

The city of Hastings is located in the south-central part of Nebraska and the northeastern part of Adams County. Hastings is the largest city in the county and the county seat. The city is in the Central Loess Plains section of the Great Plains. Most of the area is nearly level to low rolling loess plains that are dissected by small drainageways. Nearly all soils are deep and are formed in calcareous loess, eolian sands, or mixed silty and sandy alluvium.

The city of Hastings, Nebraska, lies above the surface water divide between tributaries to the Little Blue River and tributaries to the West Fork Big Blue River. Several naturally occurring wetlands lie within 10 miles of Hastings. The climate is continental and marked by wide seasonal fluctuations in temperature and precipitation. Temperatures below 0°F in winter and above 100°F in summer are common. The mean annual temperature is 50.7°F, and the 30 year annual average rainfall is 27.94 inches. The average growing season is 163 days.

B. Land and Resource Use

The city of Hastings, Nebraska, is the center of agricultural, industrial, and commercial activities for Adams County. The population of approximately 24,000 has been stable in recent decades. Farming is important in the area and is based mostly on growing cash grain crops and raising livestock. More than 75 percent of the acreage in the county is cultivated, and 16 percent is in rangeland. Less than 1 percent of the county is in woodland and windbreaks. The lack of seasonal rainfall makes irrigation from deep wells important in the area. About 25 percent of the acreage in the county is irrigated.

Four of the six city subsites are located within the Hastings city limits. The FAR-MAR-CO Subsite and the South Landfill Subsite are located outside of, but adjacent to the east and southeast city boundary. Residential communities are located adjacent to the six subsites. The Colorado Avenue, Well No.3, and Second Street Subsites are located in the central-industrialized area of Hastings. The NAD is located approximately 1 mile east of the city.

Table 1
Chronology of Site Events

Subsite Operable Unit/Event		**Date**
Hastings Ground Water Contamination Site and Area Wide OU19		
	Initial Discovery of Problem	7/1/1984
	Special Notice Issued	9/23/1985
	Final listing on EPA National Priorities List	6/10/1986
	Area-Wide FS	4/2000
	Area-Wide Interim Action ROD	6/24/2001
	Special Notice to PRPs	12/28/2001
	Second Five-Year Review Public Availability Session & Site Inspection	3/20/2002
	Second Five Year Review Completed	7/2/2002
	Consent Decree	2/26/2004
	Interim RD/RA Work Plan received by EPA	8/3/2004
	EPA conditionally approves Interim RD/RA Work Plan	9/3/2004
	Revised Interim RD/RA Work Plan received by EPA	11/15/2004
	2004 Annual Report, Hastings Institutional Control Area, received by EPA	3/3/2005
	2005 Annual Report, Hastings Institutional Control Area, received by EPA	4/1/2006
	Third Five-Year Review Site Inspection	2/28 – 3/1/2007
	Fact Sheet: announces start of Third Five Year Review	4/2007
	2006 Annual Report, Hastings Institutional Control Area, received by EPA	4/2/2007
FAR-MAR-CO - OU03 and OU11		
	RI/FS Completion	9/30/1988
	ROD Signature - FAR-MAR-CO Soils	9/30/1988
	Removal Action OU11	10/26/1989 – 12/23/1989
	Explanation of Significant Differences (ESD) for FAR-MAR-CO (SVE Plus Phase)	8/22/1995
	Consent Decree, Farmland Ind.	5/7/1997
	SVE Construction, Inspection	11/19/1997
	RA Report	12/19/1997
	O&M Start	12/19/1997
	Certification of Completion	2003
FAR-MAR-CO - OU06		
	EE/CA	10/20/1995
	Action Memorandum	12/6/1995
	AOC for PRP Removal Action	9/16/1996
	Initiation of Removal Action	7/17/1997, Operational
	5 year report on Well D	12/5/2002
	Revised Feasibility Study submitted by PRP	7/2007

Colorado Avenue - OU09		
	ROD Signature	9/28/1988
	PRP RD, Phase I	1/17/1995
	PRP RA	9/27/1995, Ongoing
	Carbon canisters removed from SVE System	7/2004
	Soil-gas Investigation at Phase I Area	7/2004
	EPA approves OU09 Work Plan and Revised Phase II Design	9/29/2006
	Phase II SVE addition construction began	12/2006 and ongoing
Colorado Avenue - OU01		
	ROD Signature	9/30/1991
	ROD Amendment	5/25/1998
	PRP RD, Phase I and Phase II	3/12/1999
	PRP RA	3/12/1999
	IWA Phase III system placed into operation	11/2002
	IWA 1 and 2 were put into resting mode	4/2005
	CD signed between Dravo and EPA	5/2006
Well No.3 Soils - OU07		
	ROD	9/26/1989
	Fund-Lead RD	12/13/991
	Fund-Lead RA	12/10/1991 – 8/17/1993
	Final Inspection	4/21/1993
	RA Report	8/17/1993
	Certification of Completion	11/1994
	First Five-Year Review	5/27/1997
Well No.3 Plume 2 Soils - OU17		
	EE/CA	5/11/1995
	Action Memorandum	7/20/1995
	PRP Removal	3/25/1996 – 4/15/1997
	SVE Plus Phase	4/16/1997 – 6/10/1998
	Certification of Completion	12/8/1999
Well No.3 Ground water - OU13 and OU18		
	ROD	6/30/1993
	ESD, OU13	12/14/1994
	ESD Phase II, OU13	7/23/1996
	ROD Amendment, Select MCLs for CCl_4	11/19/1999
	RD, Fund-Lead, OU13	9/29/1994 – 7/25/1996
	RA, Fund-Lead, OU13	9/24/1994 – 7/30/1996
	Interim RA Report, Fund-Lead, OU13	12/11/1998

	Final ROD for *Well No.3* Subsite, All OUs	5/17/2001
	Certification of Completion OU13	5/2001
	Special Notice to PRPs, OU18	9/28/2001
	CD signed	10/11/2002
	Final Remediation Action Work Plan OU18	4/10/2003
North Landfill - OU02 and OU10		
	ROD	9/30/1991
	RD Complete, OU10	1/12/1996
	Consent Decree, Pilot Allocation	8/14/1998
	RA Start, OU10	2/6/1998 – 6/22/1998
	Inspection of Landfill Cap, OU10	9/1/1999
	RA Report, OU10	11/23/1999
	Vadose Zone Sampling (First of 8 Quarters)	12/1999
	Final Feasibility Study (FS) Report for groundwater completed OU02	5/20/2005
	Revised Final FS for groundwater completion OU02	5/1/2006
	Proposed Plan for Final groundwater remedy.	4/17/2006
	ROD final groundwater remedy OU20	8/25/2006
Second Street - OU12 and OU20		
	EE/CA released by EPA	8/10/1995
	Removal Action Memorandum	9/20/1995
	Fund-Lead Removal Action Start	9/18/1996
	Source Area System Startup	1/1997
	EE/CA Addendum for Downgradient Ground Water	6/1999
	Downgradient GW System Startup	5/2001
	Second Fund-Lead Removal, OU20	9/1999
	FS Completion Downgradient Plume, OU20	9/25/2002
	Proposed Plan, OU20	10/2002
	Record of Decision, OU20	7/18/2003
	Soil boring investigation in MGP gas holders, OU12	12/5 – 12/12/2003
	Catalytical Oxidizer discontinued	3/2004
	Field Investigation Ground Water Contamination	3/2004
	Replacement of Equalization Tank	8/2004
	Soil Boring investigation eastern perimeter OU12	4/2 – 4/19/2005
	Remedial Design Completed to Implement RA	5/2005
	Polymer Addition system (6 month trial) Installed	5/2005
	In Situ Bioremediation Treatment construction	5/2005 – 9/2005
	Bioremediation Activity Event, 1st Injection	11/2005
	Soil boring investigation east of City property	12/5 – 12/10/2005

	Polymer Addition System Removed	12/2005
	RI/FS Completion, OU12	7/2006
	O&F Inspection, OU20	10/18/2006
	Record Of Decision OU 12	9/21/2006
	Bioremediation Activity Event, 2nd Injection	11/2006
	RA components were deemed O&F by NDEQ	2/2007
	Interim Remedial Action Report approved, OU20	6/4/2007
South Landfill - OU05		
	ROD	9/2000
	Pre-design for Landfill Cap	2003
	RAWP and Construction Plans Completed	5/5/2004
	Landfill Cap Construction Began	7/26/2004
	Landfill Cap Construction Completed	2/28/2005
	Completion of Baseline Assessment	9/19/2005
	Methane Gas Investigation Completed	1/2006
	Ground Water Investigation Plan (GWIP) Approved	6/21/2006
	Land Access Agreement for GWIP	4/2007
	GWIP conducted	4/2007 – ongoing
Naval Ammunition Depot		
Soils, Operable Units 04, 15, 16		
	Final Remedial Action Report OU04	01/2000
	Final Proposed Plan PAH Contamination in Surface Soils, OU04, 15, 16	06/2000
	Field Investigation Report, Residential Sampling and OU15 Resampling	09/2002
	Record of Decision, Carcinogenic Polycyclic Aromatic Hydrocarbons in Surface Soils (Residential Properties OU03, 15, 16)	07/2002
	Final Remediation Report, cPAHs in Surface Soils (Residential Properties) OU04, 15, and 16	01/2004
	Explanation of Significant Differences (Mod of 2002 ROD) OU04, 15, 16 (Nonresidential Soils)	07/2004
	Final Remedial Action Completion Report, PAHs in Surface Soil (Nonresidential), OU04, 15, 16	10/2005
	Final Removal Action Report Explosives Disposal Area, OU16	01/2000
	Final Action Memorandum Bomb and Mine Complex, OU16	10/2000
	Final Removal Action Report Bomb and Mine Complex, OU16	
	Final Engineering Evaluation/ Cost Analysis Bomb and Mine Complex, OU16	02/2000
Vadose Zone, Operable Unit 8		
	Removal Action Report, OU08, Phase I	04/2002
	Final Removal Action Report, Phase II Soil Vapor Extraction, OU08	01/2003
Ground Water, Operable Unit 14		
	Draft final Field Investigation Report, OU14 and 15	07/2000
	Final Action Memorandum for Alternate Water Supply, OU14	11/2002
	Final Removal Action Report Alternate Water Supply, OU14	10/2004
	Final Groundwater Feasibility Study Report, OU14	03/2004

C. History of Contamination

The HGWCS was discovered in 1983 through investigations by the Nebraska Department of Health and the Nebraska Department of Environmental Control (subsequently known as the NDEQ). EPA began investigations of the ground water contamination in 1984. Releases of industrial chemicals traveled through the soils into the ground water resulting in a number of contaminant plumes traveling eastward with the natural movement of the ground water. Several city public water supply wells were taken out of service after ground water contamination was discovered.

Well No.3 Subsite - The Well No.3 Subsite is located in the central industrial area of Hastings between B Street and Second Street in the north-south direction and between Maple Avenue and Denver Avenue in the east-west direction. The subsite is named for the former municipal water supply well M-3 which was decommissioned due to the presence of CCl_4 in the well water.

Figure 2
Site Location Map
Well #3 Subsite

The source area was located in an area where a grain storage facility operated from 1959 to 1975. A second plume (Plume 2) was identified in 1993 and was found to contain TCE, 1,1,1-Trichloroethane (TCA), 1,1-dichloroethylene (1,1-DCE) and Tetrachloroethylene (PCE). One source for Plume 2 was found at the Dutton-Lainson Property located at 1601 West Second Street. Figure 2 is a location map of the Well No.3 Subsite.

Colorado Avenue Subsite - The source area is located south of the downtown Hastings business district between the Burlington Northern Santa Fe Railroad (BNSF) right-of-way and South Street in the north-south direction and between Kansas Avenue and Sixth Avenue in the east-west direction. EPAs soil-gas, soil, and ground water investigations indicated the presence of chlorinated VOCs in the soil and ground water. Ground water impacts were discovered in 1983 when the city of Hastings attempted to put municipal well M-18, located about ½ mile east of the source area, back into service. NDEQ analyzed the samples from M-18 in 1983 and 1984 and found elevated concentrations of chlorinated organics, including TCA, TCE, and PCE. The EPA's investigation revealed that a vapor degreasing process at 108 South Colorado Avenue operated for many years releasing solvent chemicals into the environment. Figure 3 is a location map of the Colorado Avenue Subsite.

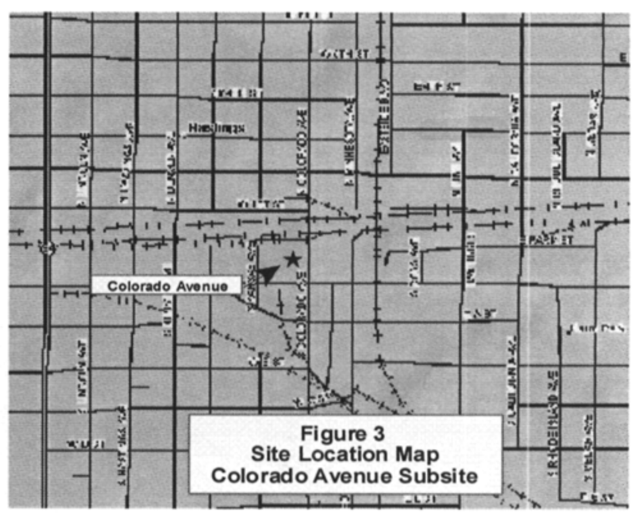

Figure 3
Site Location Map
Colorado Avenue Subsite

Second Street Subsite - The source area is located in the central business district of Hastings where a manufactured gas plant was in operation from 1894 to 1931. The source area is bounded by the BNSF to the south, the former Union Pacific right-of-way to the east, Second Street to the north, and Minnesota Ave to the west. The city is the current owner of the property. EPAs investigations identified benzene, toluene, ethylbenzene, xylene and polycyclic-aromatic hydrocarbons (PAH) in subsite soils and in the ground water beneath and to the east of the subsite. Figure 4 is a location map of the Second Street Subsite.

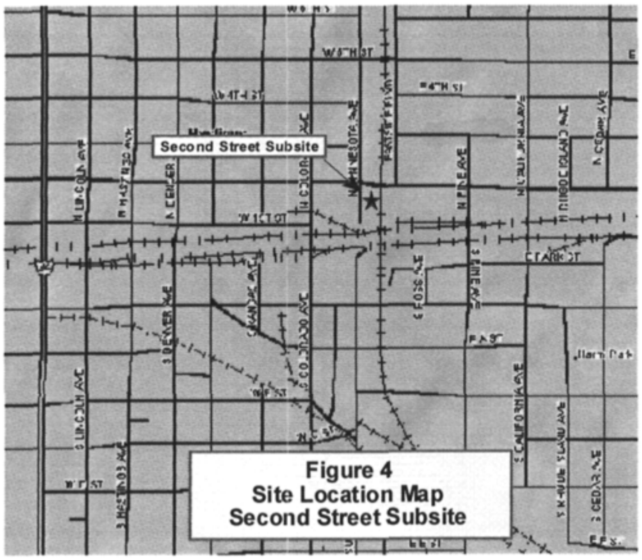

Figure 4
Site Location Map
Second Street Subsite

North Landfill Subsite - The source area is bounded by the BNSF right-of-way to the north and U. S. Highway 6 to the south. The landfill is situated on land that was formerly used as a clay source for local brick makers. From August 1961 to 1964 the city leased the land and operated a landfill at the subsite. The landfill received both municipal and industrial waste. The subsite is relatively flat and occupies 13.4 acres. Investigations at the North Landfill Subsite began in 1984. Soil-gas surveys were conducted by EPA in 1985 and 1986 which revealed VOCs in the vadose zone. There is a ground water plume migrating from the source area down gradient from the subsite. Figure 5 is a map of the North Landfill Subsite.

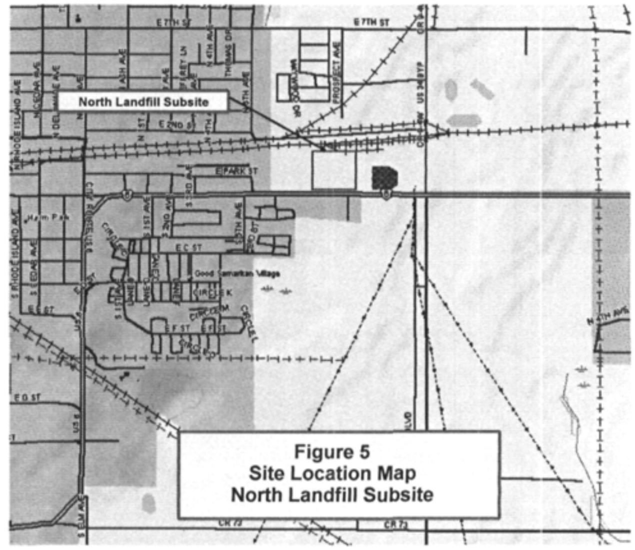

Figure 5
Site Location Map
North Landfill Subsite

FAR-MAR-CO Subsite - The subsite is located east of the Hastings city limits in an industrial enterprise zone served by the BNSF. In general, the area has been used for the storage and handling of agricultural products for over 50 years. Investigations performed at the subsite found VOCs related to grain fumigants in the soils and ground water. The subsite consists of industrial properties having several owners on about 70 acres. CCl_4 and EDB, ingredients of a liquid grain fumigant used during grain elevator operations, was found in the soils and ground water. In 1983, VOCs were first detected in the Community Municipal Services (CMS) water distribution system east of the subsite. Ground water data collected by EPA indicated that a ground water plume containing CCl_4 and EDB was migrating from the source area in the direction of a CMS well which had been providing drinking water to the Hastings East Industrial Park (HEIP) and the Hastings Community College (prior to a hook-up to the city water supply system). Soils surrounding a group of buildings converted from grain storage to manufacturing use were contaminated with TCA. The owner of the manufacturing facility cleaned up the soils under an Administrative Order on Consent.

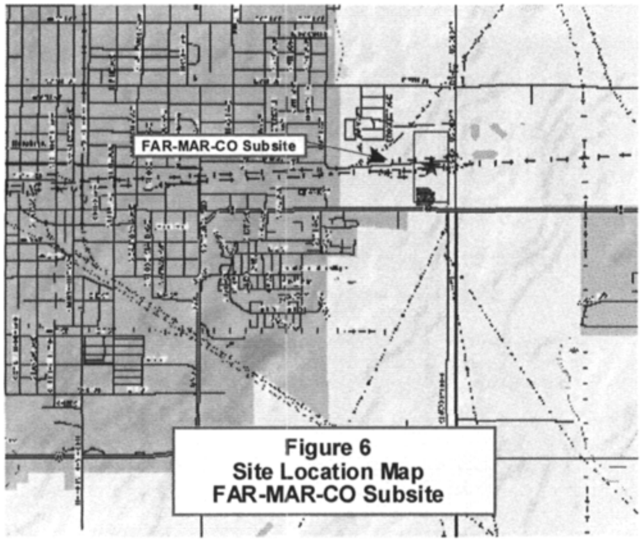

Figure 6
Site Location Map
FAR-MAR-CO Subsite

South Landfill Subsite - The subsite is located near the southeast border of Hastings. It is bounded by the abandoned Union Pacific Railroad right-of-way tracks on the south, the Good Samaritan Village retirement complex on the north, and U.S. Highway 6 on the west. The South Landfill was originally a clay pit. The landfill was constructed with two main disposal cells with a drainage ditch between the cells. The landfill was operated by the city from the mid-1960s to the early 1980s and received both municipal and industrial waste.

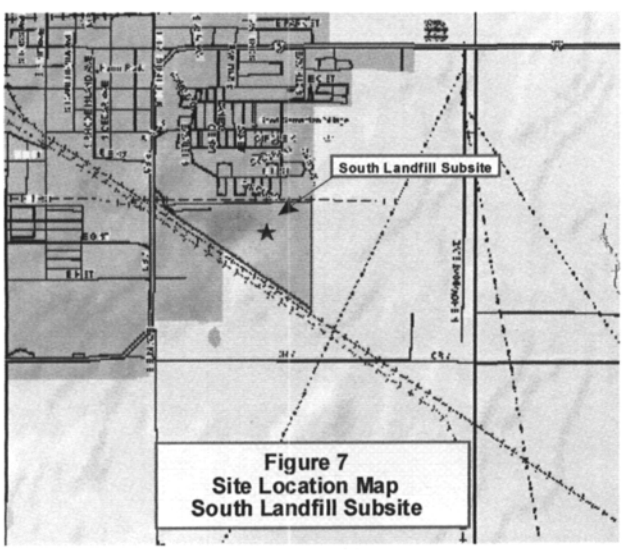

Figure 7
Site Location Map
South Landfill Subsite

Several chlorinated VOCs are present in the soils and ground water at the subsite. Figure 7 is a map of the South Landfill Subsite.

Area-Wide Ground Water Action - The ground water contamination associated with the HGWCS is known to extend west to east from the Well No.3 Subsite, through the central business district, and approaching the eastern boundary of Adams County. The Area-Wide Ground Water Action is not a subsite, but was established to integrate information collected at the subsites to protect potential receptors from unacceptable risks posed by the contaminated groundwater emanating from the six city subsites.

The interim RA selected by the June 24, 2001, ROD included a comprehensive survey of all existing ground water wells (domestic, irrigation, industrial, and monitoring) and collection of data such as well logs, well location, well depth, well use, and analytical results. The CD provides for the installation of additional MWs, as needed, and periodic monitoring of these wells to determine if VOC contamination is present above the MCLs. In the event that contaminant levels were found to exceed the MCLs in a drinking water well, an alternative water supply would be provided.

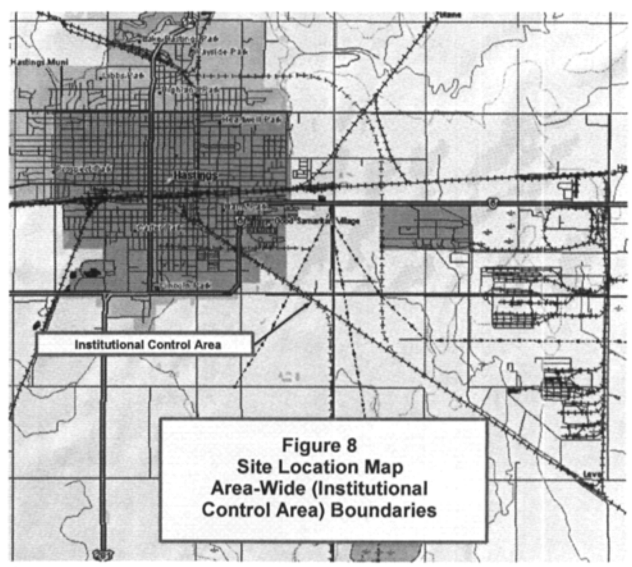

Figure 8
Site Location Map
Area-Wide (Institutional Control Area) Boundaries

The city has enacted an ordinance establishing an ICA. Under provisions of the ordinance, the city established a well registration process to assure new wells are not installed in areas of contamination and samples numerous existing private wells on a regular basis. Figure 8 is a map of the ICA of the HGWCS.

D. Initial Response

The HGWCS was discovered in 1983 when several municipal supply wells were discovered to be contaminated with VOCs. Subsite response actions will be discussed under the specific subsite.

E. Basis for Taking Action

A Human Health Baseline Risk Assessment (Risk Assessment) was prepared by the Nebraska Health and Human Services System for the HGWCS (NHHSS, 1997). Exposures to ground water are associated with significant human health risks, due to the exceedance of EPA's risk management criteria for the reasonable maximum exposure scenarios in both the noncarcinogenic and carcinogenic categories.

Table 2 presents the COCs and the maximum concentrations found in the ground water beneath and/or downgradient of each of the city subsites, as described in the Risk Assessment. These contaminants are also present in the soils at the specific subsites.

The Risk Assessment evaluated the potential area-wide risk associated with hypothetical human exposure to residual ground water concentrations after the interim remedial/removal actions have been completed at each of the subsites. The risk determinations are summarized in Table 3. The receptors were considered to be private well owners located downgradient of the respective subsite. For noncarcinogenic effects, a hazard index greater than 1.0 indicates the possibility that adverse health effects may occur. For carcinogenic effects, RA is generally required at a site when the excess cancer risk level exceeds 1 in 10,000 (1×10^{-4}).

The Nebraska regulations administered by NDEQ define the aquifer beneath the HGWCS as RAC-1. Ground water in the principal aquifer beneath Hastings is of drinkable quality and is extensively utilized as a source of drinking, irrigation, and industrial water. For these reasons, protecting ground water, especially for drinking water use, is important

IV. Remedial Actions

A. Well No.3 Subsite – OUs 07, 13, 17, and 18

The subsite was discovered in 1983 when the Nebraska Department Of Health detected CCl_4, an ingredient of a grain fumigant, in municipal supply well M-3. EPA has addressed two plumes and associated soils, and identified each as separate OUs.

<u>Remedy Selection</u>
Plume 1 and Associated Soil Contamination

EPA identified as OU13 the ground water contaminant plume related to a former grain elevator operation where CCl_4 was believed to have been used. In 1993, EPA issued an interim action ROD which selected extraction and treatment as the remedy for Plume 1.

EPA identified as OU07 the contaminated soils associated with Plume 1. In 1989, EPA issued a ROD for OU07. The selected remedy for the cleanup of the CCl_4 contaminated soils was SVE.

Plume 2 and Associated Soil Contamination

Further investigation at the subsite led to the discovery of an additional plume in 1993, identified as Plume 2 (OU18), characterized primarily by TCE and PCE. Soil-gas survey results indicated that Plume 2 was emanating from the north side of the BNSF tracks on the property of Dutton-Lainson.

EPA included a remedy selection for Plume 2 in the 1993 interim ground water ROD and selected ground water extraction and treatment as the remedy for OU18 as well as OU13.

EPA identified as OU17 the contaminated soils associated with the Plume 2. EPA issued an Action Memorandum in 1995 for OU17, selecting SVE as the response action. In

March 1996, Dutton-Lainson began implementing SVE, under EPA oversight.

In April 1997, EPA determined that the OU17 SVE system had attained the removal action goals for the cleanup of the soils. Dutton-Lainson requested to extend the operation of the SVE system in order to reduce the contamination present in the aquifer. Quarterly ground water monitoring was conducted during this period. The operation of the SVE system was terminated in June 1998.

EPA completed a final ROD for OU07, 13, 17, and 18 on May 17, 2001. For OU07, 13, and 17, no further actions were determined to be necessary. For OU18, Plume 2, EPA selected the continued operation of the OU13 extraction system installed at former municipal supply well M-3 at 200 Gallons Per Minute until MCLs for the COCs, TCE, TCA, 1-1, DCE, and PCE, would be achieved and verified with semi-annual monitoring at locations CW-7, CW-8, CW-9, CW-10, M-3 and the outfall from the street drain. EPA negotiated a CD with Dutton-Lainson to perform the final ground water remedial action in 2002.

Remedy Implementation

Plume 1 OU13

EPA implemented the ROD for Plume 1 in 1993. In 1995, a ground water treatment system to treat CCl_4 using air-stripping was installed. The system utilized reinjection wells to reuse the water after it was treated. A second extraction system was installed in October 1996 which released the extracted water into the storm sewer. In response to a request by the city to allow the reuse of the extracted ground water as irrigation water at Lincoln Park, in 1996, EPA issued an Explanation of Significant Differences for OU13. EPA installed an irrigation system at the park in 1997 for beneficial reuse of this extracted water, and in 1998, the city began utilizing the extracted ground water as irrigation water at Lincoln Park.

In November 1999, EPA amended the ground water interim action ROD by selecting the MCLs as the performance standard for Plume 1.

In September 2000, EPA initiated restoring the subsite with the abandonment of three MWs that were free of contamination based upon quarterly ground water monitoring.

In 2002, EPA abandoned three MWs, the reinjection wells and the extraction and treatment equipment at CW-05 (Phase I).

OU07:Plume 1 Associated Soil Contamination

In 1992, EPA implemented SVE, selected in the OU07 ROD, and in 1993, EPA and NDEQ determined that remediation of the OU07 soils was complete, allowing unlimited use and unrestricted access.

Plume 2 OU18

The interim remedial action for Plume 2 OU18, was not implemented. Instead, Dutton-Lainson implemented the final remedy for Plume 2, OU18, which EPA selected in the 2001 final ROD. Consistent with the ROD, Dutton-Lainson used the extraction and treatment system that was installed for OU13. Figure 9 is a picture of the extraction well at the Well No.3 Subsite taken during the third Five-Year Review site visit. The extracted water continued to be reused as irrigation water. The performance standard was to treat the Plume 2 COCs to MCLs. Dutton-Lainson began semi-annual ground water monitoring in June 2003. MW data reviewed by EPA for this Five Year Review indicates that OU18 may have migrated beyond the area originally believed. This matter requires further investigation.

Plume 2 OU17 Associated Soil Contamination

Dutton-Lainson implemented the soils cleanup for OU17 as a removal action and completed the work in June 1997. Dutton-Lainson extended operations after soil cleanup was complete in order to draw contaminant vapors off of the ground water and thereby facilitate ground water cleanup. The extended period of operation of the SVE lasted through 1998.

By September 1999, the EPA and NDEQ determined that no additional response action was needed for OU17. Dutton-Lainson proceeded to abandon the SVE extraction and monitoring probes. EPA determined that the removal action was complete in December 1999.

Table 2
COCs and Maximum Concentrations

COCs	South Landfill (µg/l)	Well No.3 (µg/l)	FAR-MAR-CO (µg/l)	North Landfill (µg/l)	Second Street (µg/l)	Colorado Avenue (µg/l)
Acenaphthylene	-	-	-	-	37	-
Benzene	-	-	-	-	25,000	-
CCl_4	-	1,400	2,800	8	-	1
Chloroform	-	120	19	1,900	52	3.6
1,2-Dibromoethane	-	0.088	220	8.8	-	-
1,2-DCA	26	110	-	27	1,700	-
1,1-DCE	29	150	13	60	-	1,400
cis-1,2-DCE	340	-	-	650	-	310
Trans-1,2-DCE	-	-	41	2,000	-	81
total-1,2-DCE	-	24	-	1,900	-	200
Ethyl Benzene	-	-	-	-	19,000	-
Methylene Chloride	-	23	90	150	-	2,200
Naphthalene	-	-	-	-	7,900	-
Phenanthrene	-	-	-	-	550	-
Styrene	-	-	-	-	12,000	-
Tetrachloroethylene	12	200	19	48	530	1,300
1,1,1-TCA	11	200	200	99	2,000	2,100
Trichloroethylene	300	990	1,200	2,400	16,000	55,000
Toluene	-	-	-	-	28,000	
1,3,5-Trimethylbenzene	-	-	-	300	-	
Vinyl Chloride	44	-	-	87	-	
Xylenes	-	-	-	-	11,000	

Table 3 Summary of Human Health Baseline Risk Assessment				
Health Risk	*Receptor #1* *Well No.3 Subsite*	*Receptor #2* *Colorado Avenue and Second Street Subsites*	*Receptor #3* *North Landfill and FAR-MAR-CO Subsites*	*Receptor #4* *South Landfill Subsite*
Noncarcinogenic Residential Risk (Hazard Index), Child	14.2	56.3	31.1	3.8
Noncarcinogenic Residential Risk (Hazard Index), Adult	5.7	22.5	12.9	1.6
Carcinogenic Residential Risk, Child	4.68×10^{-4}	4.31×10^{-4}	7.70×10^{-4}	9.08×10^{-5}
Carcinogenic Residential Risk, Adult	9.22×10^{-4}	8.50×10^{-4}	1.22×10^{-3}	1.74×10^{-4}

System Operations/Operation and Maintenance

The operation of the SVE systems for OU07 and OU17 were completed during the timeframes covered by the first and second Five-Year Reviews, respectively. The first Five-Year Review contained EPA's determination that the contamination was removed from the OU07 soils allowing unlimited use and unrestricted access. All required work for OU17 was completed prior to EPA's issuance of the second Five-Year Review. The OU07 and OU17 actions will not be discussed further in this review.

EPA installed the Phase II system to capture remnants of the OU13 plume downgradient from the area addressed by the Phase I system.

The Phase II system was installed in former municipal supply well M-3 and extracts ground water at a rate of approximately 200 gallons per minute. The extracted ground water is released into a storm sewer and, during the growing months, the water is used as park irrigation water at Lincoln Park.

The operation of the ground water extraction system for OU13 was completed prior to the second Five-Year Review and will not be discussed further in this review.

From May 2003 when operation of former municipal supply well M-3 by the PRP commenced for OU18 through 2006, the system extracted approximately 365,000,000 gallons of contaminated ground water estimated to contain approximately 3 pounds of TCE. It is important to note that TCE in the extraction well remained below the reporting limit of 1μg/l since 2003.

This finding may indicate dilution effects or incomplete capture of the OU18 plume.

MWs with contaminant concentrations at or below MCLs for a period of four successive semi-annual samplings were abandoned by agreement between Dutton-Lainson and EPA. Having met the above criteria, CW-7 was abandoned in August 2005, and CW-10 was abandoned in November 2006. TCE concentrations in CW-9 have been near or at the 5 μg/L MCL for the past year. TCE concentrations in CW-8 are well below the 10^{-5} health risk levels.

The Well No.3, OU18 costs are summarized in Table 4a. The PRP costs shown for 2002 include payment of EPA's past costs including the RI extraction system in connection with the Consent Decree plus O&M costs operating the extraction well, collection of the semi-annual ground water monitoring samples and O&M of the underground irrigation system at Lincoln Park.

The total costs paid by Dutton-Lainson are set forth in Table 4a below.

Table 4a
Annual System O&M Costs
Well No.3, OU18

Dates		Estimated Cost** ($1,000s)		Actual Cost ($1,000s)	
From	To	EPA	PRP	EPA	PRP
1-02	1-03	–	–	–	$343***
1-03	1-04	N/A	$16	*	$3
1-04	1-05	N/A	$32	*	$37
1-05	1-06	N/A	$32	*	$21
1-06	1-07	N/A	$32	*	$14

* EPA costs reimbursed by PRP
** OU18 O&M began in mid-year 2003
*** Includes October 2002 settlement of EPA past costs for RI/FS, etc.

<u>Progress Since the Last Five-Year Review</u>
EPA completed the final ROD for all the Well No.3 OUs in 2001. Work at OU17 and OU13 including site restoration was completed in 2002. The RA goals for OU07, OU13 and OU17 have been attained and verified. The RA goals for OU18 are projected to take 15 years to attain.

EPA negotiated with Dutton-Lainson to take over the operation of extraction well 3 for OU18. Semi-annual ground water monitoring will continue until the MCLs have been attained and verified for Plume 2. The CD for OU18, signed August 7, 2002, defined work that Dutton-Lainson would perform to meet the selected remedy goals of MCLs target cleanup levels for the OU18 COCs. Semi-annual ground water monitoring will continue until the contaminants are reduced to the levels defined by the ROD and verified.

This review determined that the remedies selected for the Well No.3 Subsite (OUs 07, 13, and 17) are complete and protective. At the time of this review, there is insufficient information to determine the fate of the OU18 plume.

B. Colorado Avenue Subsite – OUs 01 and 09

<u>Remedy Selection</u>
The Colorado Avenue Subsite is located just south of the BNSF tracks along Colorado Avenue. The COCs include TCE, DCE, PCE, and TCA, which have been found in the soils on the west side of Colorado Avenue and in the soil and ground water along and beneath a storm sewer at the subsite.

In 1988, EPA issued an Interim Action ROD (OU09) in which it selected SVE as the technology to clean up approximately 800,000 cubic yards of contaminated soil.

EPA completed a study into the nature and extent of ground water contamination at this subsite in 1991 for OU01. Also in 1991, an Interim Action ROD was signed selecting extraction and treatment as the ground water remedy.

In 1998, EPA amended the OU01 ROD by expanding the range of acceptable alternatives to include in situ water treatment technologies (i.e., air sparging and in-well stripping).

Remedy Implementation
Dravo performed RD/RA work for both OUs under Unilateral Administrative Orders issued by EPA until a CD was completed in 2006.

Construction of the SVE system for Phase I (i.e., deep and intermediate wells only) was initiated in 1995. The system began operating in 1996. The SVE system is operated and soil-gas samples are collected to verify progress of the soils cleanup. In 2007, the SVE system is resting pending completion of installation of the Phase II SVE wells. Construction of the shallow SVE wells Phase II began in December 2006. Installation of two extraction wells and four vent wells inside the former Marshalltown Instruments building was completed in December 2006. The construction work was interrupted while Dravo completes an agreement with BNSF for access. EPA estimates the SVE remediation will be completed by 2011.

In January 1996, Dravo, proposed a plan to install a small-scale air sparging pilot test. EPA agreed to allow this pilot to go forward before requiring implementation of the pump and treat system. After completion of this work, Dravo requested an amendment to the OU01 ROD.

The remedy for the ground water (OU01) is also being implemented in phases. Phase I, consisting of three air sparging wells, was installed at Minnesota Avenue. These wells would utilize the SVE system to capture VOCs released from the ground water. To date, this system has not operated.

The second phase of the interim action involved installation of treatment wells IWA-1 and IWA-2 located at Pine Street and IWA-3 located north of East Park Street at Cedar Avenue. The treatment wells began operation in December 1999. Phase I and Phase II treatment systems were designed to treat the most contaminated areas of the ground water contaminant plume.

Dravo installed four additional IWA treatment wells at Sixth Avenue immediately west of the North Landfill Subsite. These wells IWA – 4, -5, 6, and 7 began operation in November 2002.

Figures 9 and 10 are photographs of the buildings housing the Phase III in-well aeration water treatment systems installed at the Colorado Avenue Subsite.

Figure 9 – Colorado Avenue Subsite – Phase III, 6th Avenue IWA System.

Figure 10 – Colorado Avenue Subsite – Phase III, East Highway 6 IWA system.

The performance goal for the interim action remedy for the ground water is the containment of the 10^{-4} risk range for TCE which is the 290 μg/l concentration level. The available ground water monitoring results do not demonstrate that the capture of the 290 μg/l TCE plume is occurring. This indicates that the remedy is not yet protective. In addition, as noted in the

OU01 ROD, the ultimate goal for the Colorado Avenue plume is attainment of MCLs for the ground water.

System Operations/Operation and Maintenance
The Phase I SVE system for source control has been installed but is not currently operating, pending completion of construction for the Phase II SVE wells. One Phase II ground water treatment well IWA – 3 and the four IWA Phase III treatment wells continue to operate.

Total expenditure for the third Five Year review period, as provided by Dravo, is $9,590,000. The cost data provided by Dravo includes settlement for $7.3 million representing the EPA's past costs dating back to 1984 as defined in the Consent Decree. The EPA's costs include direct, indirect, state of Nebraska's oversight costs, and contractor support costs. Dravo's and EPA's costs are summarized in Table 4b.

Table 4b
Annual System O&M Costs
Colorado Avenue, OU01 & OU09

Dates		Estimated Cost** ($1,000s)		Actual Cost ($1,000s)	
From	To				
		EPA	PRP	EPA*	PRP***
1-02	1-03	N/A	–	$203	$1024
1-03	1-04	N/A	–	$105	$329
1-04	1-05	N/A	–	$72	$349
1-05	1-06	N/A	–	$79	$261
1-06	1-07	N/A	–	$193	$7,627

* EPA bills PRP for interim costs based on CD settlement and for O&M oversight costs
** OU09 and OU01 O&M began in 1996 and 2000, respectively
*** PRP costs include settlement costs for EPA RI/FS and past costs.

Progress Since the Last Five-Year Review
In 1999, EPA modified the interim action ROD for OU01. The ROD Amendment permitted implementation of the air sparging and in-well stripping technologies. Dravo installed three in-well aeration wells in 1999. These systems are known as Phase II; one well continues to operate. Dravo installed the Phase III system, consisting of four in-well aeration wells in 2002. All four Phase III IWA wells continue to operate.

Ground water monitoring conducted by the North Landfill and FAR-MAR-CO Subsite parties indicates that the contamination emanating from Colorado Avenue continues to migrate. Additional response actions are needed to control and contain this contaminant plume. EPA anticipates that the remedies, when fully implemented, will be protective. The issues remaining are the installation and operation the full scale SVE system to address contamination in the soils, continued operation of the ground water treatment systems and completion of the Phase IV ground water investigation. During conduct of the Phase IV investigations, EPA expects that continued operation of Well D will capture a significant part of the Colorado Avenue TCE contaminant plume.

C. Second Street Subsite – OUs 12 and 20

Remedy Selection
The Second Street Subsite is located on the southeast corner of Second Street and Minnesota Avenue, bounded on the south by the BNSF tracks and on the east by the former Union Pacific Railroad right-of-way. A coal gas plant operated on this property in the late 1800s until about 1931. Releases to the environment from this operation resulted in contamination of soils and ground water.

EPA completed a RI in 1994 and an Engineering Evaluation/Cost Analysis (EE/CA) in 1995. In 1995, EPA issued a Removal Action Memorandum. The EPA selected SVE to remove contamination from the vadose zone and ground water extraction and treatment to remove contaminants from ground water.

EPA found that oil was entering the ground water treatment system and installed an oil/water separator. The system has been operating continuously since July 1998. The treatment system processes approximately seven million gallons of water per year. Figure 11 is a picture of the ground water treatment and SVE systems at the Second Street Subsite taken during the second Five-Year Review site visit.

The city of Hastings, the current owner of the subsite (and the potentially responsible party), entered into an Administrative Order on Consent with EPA in 1996 in which it agreed, among other things to: provide hookups for electricity, gas, water, and sewer; assist EPA in obtaining necessary permits; and conduct O&M of the removal action systems.

In 1999, a second removal action (OU20) was initiated to address down gradient ground water contamination emanating from the source area. This second removal action consisting of an IWA and treatment system was installed at Pine Avenue located 700 feet east of the subsite source area. The IWA system includes two treatment wells; it began operation in 2001 and continues to operate. (see Figure 12).

During 2002, EPA completed an FS to analyze RA alternatives for the ground water contaminant plume. A ROD for OU20 was completed on July 18, 2003, to address the ground water contamination emanating from the subsite. The two earlier response actions initiated by EPA using its removal authority have been transitioned to components of the OU20 RA.

The Final Action ROD for OU12 was signed in September 2006. The selected RA for OU12 consists of limited excavation and treatment/disposal of accessible contaminated soils/materials from the Subsite, along with in situ chemical oxidation in those contaminated zones that are less accessible. An RD will be completed for OU12 in 2007 or 2008.

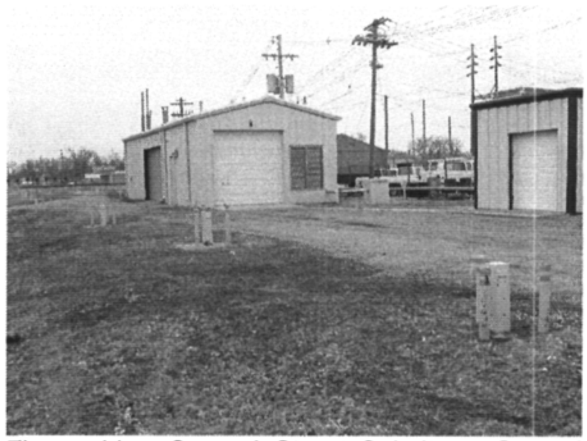

Figure 11 – Second Street Subsite – Ground water treatment and SVE system.

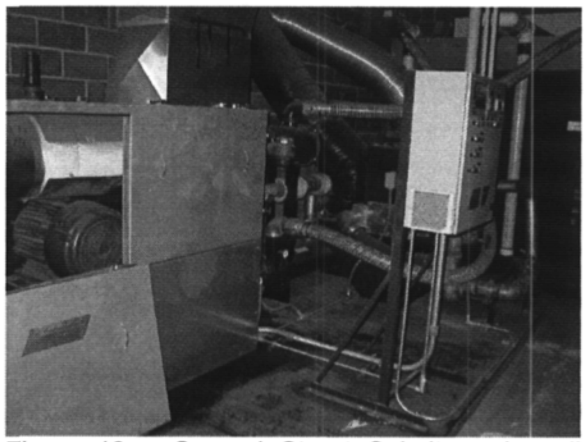

Figure 12 – Second Street Subsite – In-well stripping system.

Remedy Implementation

The first removal action, consisting of an SVE and ground water extraction and treatment system, has been in operation since 1997. In 1998, EPA installed an oil/water separator in the ground water treatment system. In an effort to reduce maintenance, a polymer system was added to the main system for a six month trial in May 2005 and was removed in December 2005 as it created too much mass and clogged the air stripper and pumps.

EPA completed the RD for in situ bioremediation in May 2005. The in situ bioremediation treatment and monitoring network consisting of fourteen injection points was completed in September 2005. EPA performed injection of oxygen release chemicals in November 2005 and November 2006 and continues to monitoring the effectiveness of treatment.

Because the OU12 remedy has not been implemented, O&M costs have not been incurred yet.

System Operations/Operation and Maintenance

EPAs annual O&M costs for the Second Street Subsite are shown in Table 4c. The costs shown include EPA's contractor and the state of Nebraska's cost share. In addition to providing in-kind services for the day-to-day operation of the source treatment systems, the city is also providing support for the second removal action by leasing the building which houses EPA's Pine Avenue IWA treatment system. Expenditures by the city of Hastings in the operation of these systems are also included in Table 4c.

Table 4c
Annual System O&M Costs
Second Street, OU20

Dates		**Estimated Cost* ($1,000s)**		**Actual Cost ** ($1,000s)**	
From	**To**				
		EPA	PRP	EPA	PRP**l
1-02	1-03	–	–	–	–
1-03	1-04	–	–	–	–
1-04	1-05	–	–	–	–
1-05	1-06	$548	N/A	$391	$48
1-06	1-07	$586	N/A	$570	$49

* Annual O&M costs are expected to decrease after year 3.
** EPA O&M costs began in early 2005. Prior costs were Removal Action costs.
*** City provides operator and related in-kind services.

Progress Since the Last Five-Year Review

The first removal action addressing the ground water continues to operate and has removed seven million gallons of contaminated ground water per year from the aquifer during the past five years of operation. More than 30,000 pounds of VOCs have been removed throughout the operation of the SVE system. A fourth extraction well has been installed and upgrades to the transfer pumps have been installed to increase the flow rate so that two extraction wells can pump simultaneously.

The Pine Avenue IWA ground water treatment system is removing more than one half pound of total volatiles per day.

After completing the ROD for the ground water (OU20) in 2003, EPA negotiated with NDEQ for a Superfund cost-sharing contract to allow implementation of a RA to proceed. The remedy selected by the ROD includes: (1) continuing to operate the source area SVE and water treatment systems; (2) continuing to operate the Pine Avenue IWA system; and (3) in situ bioremediation consisting of 14 injection wells, nine points at Pine Avenue and five points east of California Avenue. The 14 in situ bioremediation wells and associated MWs were installed in 2005. Implementation of the OU20 remedy includes ground water sampling conducted twice yearly to measure effectiveness of the remedy and to collect data used to direct future soils and water treatment activities for the subsite.

EPA completed a soil boring investigation on the eastern perimeter of the OU12 source area and the adjoining city property in April, 2005. EPA completed the FS for the OU12 source area in July 2006. EPA signed a ROD on September 21, 2006, selecting a two-part remedy: (1) excavation and thermal treatment of readily-accessible contaminated soils and source materials; and (2) treatment of contaminated areas below the surface throughout the subsite by using ISCO. EPA is preparing the RD.

D. North Landfill Subsite – OUs 02 and 10

<u>Remedy Selection</u>
The North Landfill Subsite is located north of Highway 6 just east of the city of Hastings. The city had operated a landfill at the subsite from 1962-1964. In 1991, EPA issued an Interim Action ROD which addressed both the source control (OU10) and the ground water (OU02). The RA for the source control consisted of improving the landfill cap and restricting public access and future land use. The selected RA for the ground water was extraction and treatment.

OU10 Source Control

The PRPs entered into an Administrative Order on Consent with EPA which required, among other things, that they design the landfill cap. EPA approved the design for the landfill cap in 1995.

OU02 Ground Water

In December 2002, the PRPs provided EPA a report of five years of well data associated to demonstrate the effect that pumping of Well D was having on the North Landfill plume, OU02. EPA concluded that Well D did affect the North Landfill plume, but more data was necessary to determine its extent and to evaluate remedial alternatives to address the plume. The PRPs agreed to perform an FS under EPA oversight. EPA issued a final ground water ROD for OU02 in August 2006. The North Landfill final ground water ROD requires the pumping of Well D, hydraulic containment, and monitored natural attenuation.

CD negotiations with the PRPs commenced in late 2006 and are near conclusion as of the date of this Five-Year Review Report.

<u>Remedy Implementation</u>
OU10 Source Control

Pursuant to the 1998 CD, the Settling Parties constructed the cap in 1999 and performed vadose zone monitoring. By December 2001, eight quarters of soil-gas sampling were completed. Quarterly ground water monitoring has been conducted since June 1995.

OU02 Ground Water

The pumping of Well D is a requirement of a response action at the adjacent FAR-MAR-CO Subsite and will be required in a final remedial action for the North Landfill Subsite. The remaining actions required by the OU02 ROD are the subject of the CD negotiations now underway.

Total expenditures for the North Landfill Subsite were $591,000 during this 5-year period. Table 4d summarizes subsite costs.

Table 4d
Annual System O&M Costs
North Landfill

Dates		Estimated Cost ($1,000s)		Actual Cost ($1,000s)	
From	To	EPA	PRP	EPA	PRP
1-02	1-03		$28		$343
1-03	1-04		$28		$3
1-04	1-05		$28		$37
1-05	1-06		$28		$21
1-06	1-07		$28		$14

<u>System Operations/Operation and Maintenance</u>
The city of Hastings performs the maintenance at the North Landfill. It monitors the condition of the landfill cap monthly and mows the subsite during the growing season. The third Five-Year Review inspection included the inspection of the condition of the landfill cap.

Figure 13 shows a photo of the landfill cap taken during the second Five-Year Review site visit.

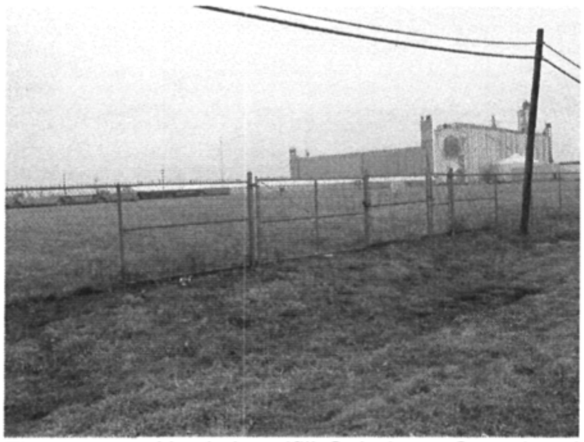

Figure 13 – North Landfill Subsite – Completed landfill cap and fence surrounding property. The FAR-MAR-CO Subsite grain elevators are in the background.

Progress Since the Last Five-Year Review
The North Landfill source control remedy is functioning as designed. Since the last report, EPA has issued a final ground water remedial action ROD that took into account five years of quarterly sampling results that were submitted as part of the Well D Report (1997 to 2002.) The Well D Report indicated that 1,213 million gallons of water were extracted from Well D and approximately 1,529 pounds of TCE were removed and treated at the Whelan Energy Center. The ground water results indicated that TCE concentrations were decreasing for a period of time and then began increasing, suggesting the presence of an upgradient source of TCE. These findings caused re-evaluation of the remedial alternatives proposed in the Feasibility Study. On April 17, 2006, Hydro-Trace, Inc., on behalf of the city of Hastings and Dutton-Lainson, presented data from downgradient shallow wells indicating the cause and effect of the TCE excursions. The EPA evaluated the data and ultimately agreed with Hydro-Trace's conclusion. In a Technical Memorandum for the final CD for Remedial Action, EPA (April 2007) agreed that a calculation could be performed which would indicate the time it would take the TCE originating from the North Landfill to reach Well D at the MCL level. This calculation, which indicated the North Landfill ground water plume would be cleaned by 2017, served as the basis for the agreement in principle.

E. FAR-MAR-CO Subsite – OUs 03, 06, and 11

Remedy Selection
The FAR-MAR-CO Subsite is located east of the North Landfill Subsite on the north side of Highway 6. EPA has concluded that the contamination found in the soils and ground water is the result of numerous spills of grain fumigants, including one which occurred as a result of a grain dust explosion in 1959. A second source of contamination TCA was identified at the Hastings Irrigation Pipe Company portion of the subsite. A removal action addressed this source in 1992 and the owner removed 43 cubic yards of soils contaminated with 1,1,1-TCA. No further action, other than ground water monitoring, was required by EPA to address any TCA contamination after the removal action was completed as subsequent monitoring indicated that 1,1,1-TCA was not present in the ground water at levels of concern.

A ROD was signed in 1988 for the source control (OU03) which selected SVE and included ground water monitoring. In August 1995, an Explanation of Significant Differences to the ROD was issued to extend the SVE operation beyond the time when cleanup levels for the soils were met in order to extract contamination beneath the source to address the contamination in the ground water. A CD was entered on May 6, 1997, which required the Settling Defendants to perform SVE.

An Action Memorandum was signed in December 1995 authorizing the performance of the ground water removal action (OU06). EPA determined that a removal action was necessary to protect the only remaining CMS well from contamination. The CMS wells had provided drinking water to HEIP and the Hastings Community College. All but one had been decommissioned due to contamination. After the system became operational, the city of Hastings extended a water main east of town to the HEIP and the Hastings Community College and both are now on city water. EPA determined the immediate threat to well users was removed by the new waterline but a long term threat remained due to the migration of the FAR-MAR-CO plume. Morrison Enterprises, the former owner and operator of the subsite, agreed to perform a ground water FS under EPA's oversight. In 2007, EPA approved the FS and its addendum, and issued a Proposed Plan for a Ground Water Remedial Action in July 2007.

Remedy Implementation

OU03 Source Control

The SVE system was installed for the source control (OU03) during the fall of 1997 with the startup in November 1997. The period of extended operation was initiated in May 2000 and was completed in 2003. Verification of attainment sampling was conducted and the SVE system was removed once sampling verified the attainment of the performance standards.

OU06 Ground Water

Installation of the ground water extraction system began in December 1996 and became operational in July 1997. This action includes related ground water monitoring. The ground water extraction and treatment system became operational in July 1997 for the ground water (OU06). The ground water system continues to operate as a removal action and is proposed by EPA as a component of the final ground water remedy. The PRPs continue to perform quarterly ground water monitoring.

System Operations/Operation and Maintenance

The ground water extraction and treatment system for the ground water (OU06) was installed by Morrison Enterprises in the summer of 1997. The system was online in August 1997 and continues to operate as designed. The system, Well D, extracts ground water at a rate of approximately 450 gallons per minute and has extracted over two billion gallons of ground water since startup. From 2002 through 2006, an additional 908 million gallons of water were extracted at Well D. The extracted ground water is used as non-contact cooling water at the Hastings Energy Center. Since 2002, this action removed approximately 240 pounds of CCl_4, 1529 pounds of TCE, and 15 pounds of EDB from the aquifer.

Costs were provided by the Hastings Utilities, the city of Hastings, Dutton-Lainson, and Morrison Enterprises who are part of this ground water removal action. Table 4e summarizes costs associated with ground water treatment actions.

Table 4e
Annual System O&M Costs
FAR-MAR-CO, OU06

Dates		Estimated Cost ($1,000s)		Actual Cost ($1,000s)	
From	To				
		EPA	PRP	EPA	PRP[1]
1-02	1-03	–	$109	$4	$72
1-03	1-04	–	$109	$6	$34
1-04	1-05	–	$109	$8	$39
1-05	1-06	–	$109	$7	$48
1-06	1-07	–	$109	$6	$45

Progress Since the Last Five-Year Review

OU03 Source Control

Performance levels for the source control remedial action, OU03, were achieved in May 2002. By removing contamination from the soils, this source control remedy, in conjunction with the ICs required by the Area-Wide CD, is protective of human health and the environment.

OU11 HIPCO

Performance levels for the source control remedial action, OU11, were achieved in 1992. By removing contamination from the soils, this source control remedy, in conjunction with the ICs required by the Area-Wide CD, is protective of human health and the environment.

OU06 Ground Water

The extraction well (Well D) for OU06 has been operating since 1997 and functioning as designed. Quarterly ground water monitoring and reporting continues. The document discussing the first Five-Years of operation of Well D was presented to EPA on December 5, 2002. This document evaluates the effectiveness of Well D in extracting contaminated ground water and whether additional extraction wells are needed to capture the plumes from both the North Landfill and FAR-MAR-CO Subsites.

EPA approved a FS which evaluates ground water remedies EPA's selection of a remedy will occur after the conclusion of the public comment period on EPA's Proposed Plan, which began in July 2007.

F. South Landfill Subsite – OU 05

Remedy Selection

The South Landfill Subsite is located in the southeast section of Hastings. During the 1960s and 1970s, industrial waste was disposed at the city operated landfill. Contamination at the subsite consists primarily of VOCs. EPA completed a soil-gas investigation of this subsite in 1994. The sampling results confirmed the presence of industrial solvents in the landfill. Seven MWs were installed during early 1995. Ground water sampling was conducted through 1996. EPA developed the RI report based on the findings of the remedial investigation and the PRPs wrote the FS. EPA released the Proposed Plan and issued the ROD for the South Landfill on September 29, 2000. The selected remedy is surface water controls and a landfill cap for soil and landfill contents, and ground water use restrictions and monitored natural attenuation for ground water remediation.

The major components of the selected remedy include:

- regrading of surface areas, installation of a geosynthetic clay liner or other cap.
- implementation of surface water management controls.
- installation of a fence.
- imposition of deed restrictions.
- ground water monitoring.
- bio-chemical evaluation of the ground water regime to determine the effectiveness and dynamics of natural-attenuation processes.

Remedy Implementation

The PRPs petitioned EPA and NDEQ to consider use of an evapotranspiration cap for the landfill in lieu of the infiltration control system described by the ROD. EPA and NDEQ agreed to the alternate design resulting in significant cost savings.

The landfill cap was completed in February 2005. Baseline assessment was completed September 15, 2005. The methane gas investigation was completed in January 2006. A groundwater investigation plan was approved June 21, 2006, and is currently being conducted to collect data needed for the RD and may be useful to determine if natural attenuation is occurring.

Preliminary indications suggest that natural attenuation may be reducing concentrations of chlorinated VOCs, which are the primary COCs, as ground water migrates away from the landfill. Chemical concentrations of the contaminants and their degradation byproducts will be measured to evaluate effectiveness of the selected remedy.

As discussed in the following section concerning Area-Wide OU19, the city enacted an ordinance which provides for ground water use restrictions including the registration of all existing wells and permits for new wells within the ICA. The area defined for the ICA includes the landfill and the property affected by the downgradient plume. The city monitors private wells and alternate drinking water is required to be provided whenever drinking water wells are contaminated above the MCLs by the plume.

Figure 14 is a photo of the South Landfill taken during the third Five-Year Review site inspection.

Figure 14 – South Landfill Subsite – completed landfill cap and fence surrounding subsite.

<u>System Operations/Operation and Maintenance</u>
As discussed in the following section concerning the Area-Wide OU19, the city ordinance restricting ground water use is in effect and the protective measures have been implemented. Costs for the South Landfill subsite are summarized in Table 4f below. Cost data provided by the PRPs reflects Consent Decree Settlement cost for EPAs past costs (2003) and capital costs for construction of the landfill cap and fencing the subsite to protect the cap (2005).

Table 4f
Annual System O&M Costs
South Landfill, OU05

Dates		Estimated Cost** ($1,000s)		Actual Cost*** ($1,000s)	
From	To	EPA	PRP	EPA	PRP
1-02	1-03	–	–	–	$48
1-03	1-04	–	–	–	$837
1-04	1-05	–	–	–	$65
1-05	1-06	N/A	$10	*	$679
1-06	1-07	N/A	$20	*	$56

* EPA costs reimbursed by PRPs
** O&M for source control began June 2005
*** PRP costs include capital costs and settlement costs for EPA past costs for RI/FS etc.

<u>Progress Since the Last Five-Year Review</u>
EPA released the South Landfill subsite Proposed Plan in June 2000 and completed the ROD September 2000.

The PRPs completed the FS and in 2003, a CD to implement the remedy was completed. The PRPs prepared the RD for the landfill cap and completed installation of an evapotranspiration cap in 2005. The PRPs are collecting off-site ground water data to enable preparation of the RD for ground water. A need for ground water MWs is anticipated to allow evaluation of the monitored natural attenuation remedy. EPA will evaluate the protectiveness after completion of the RD/RA for ground water and full implementation of the ground water remedy.

G. Area Wide Ground Water Action – OU 19

Remedy Selection

The selected interim remedy for the Area-Wide Ground Water Action, as set forth in the June 2001 Interim ROD, is intended to protect the public from exposure to the contaminated groundwater emanating from the six city subsites by integrating information from the subsites and implementing institutional controls. Specifically, these actions include:

- Implementing domestic ground water use restrictions through institutional controls to prevent the installation of drinking water wells in the contaminated area.
- Installing warning signs to advise the public that the water in the area may not meet public drinking water standards.
- Monitoring compliance with ground water use restrictions to prevent unacceptable exposures.
- Conducting an inventory of all existing ground water wells to identify all domestic, irrigation, industrial, and MWs in the ICA.
- Providing an alternate source of water for impacted private well users within the ICA. This may include hooking users up to the city's public water supply system, providing bottled water, and/or an in-house water treatment system.
- Implementing a ground water monitoring program for periodic sampling of domestic, irrigation, industrial and MWs.
- Submitting an annual report that summarizes activities conducted under the ordinance and evaluates effectiveness of the institutional controls.

Remedy Implementation

In August 2004, the PRPs submitted the Interim Remedial Action Remedial Design, Area-Wide Work Plan. EPA approved the work plan in September 2004. The city had previously enacted City Ordinance No.3754 in November 2001. The ordinance provides for ground water use restrictions, compliance monitoring, and well inventory and monitoring. The city began implementing the ICA in 2004 and completed the first Annual ICA Report in February 2005. The city submitted the second and third Annual ICA Reports in March 2006 and March 2007, respectively. Analytical results from the latest annual report are included in Appendix 2. The other components of the remedy have been implemented.

System Operations/Operation and Maintenance

The city ordinance restricting ground water use is in effect. EPA has confirmed that the other components of the interim ROD are operational through review of annual reports submitted by the PRPs. Expenditures by the PRPs in the preparation of the FS were provided to EPA during the third Five-Year Review process. The Area-Wide costs are summarized in Table 4g.

Table 4g
Annual System O&M Costs
Area-Wide Ground Water Action, OU19

Dates		Estimated Cost ($1,000s)**		Actual Cost ($1,000s)***	
From	To	EPA	PRP	EPA	PRP***
1-02	1-03	-	-	-	$33
1-03	1-04	-	-	-	$2,262
1-04	1-05	N/A	$267	*	$33
1-05	1-06	N/A	$35	$18*	$82
1-06	1-07	N/A	$35	$5*	$65

* EPA costs reimbursed by PRPs
** PRP estimated costs from June 2001 ROD
*** O&M for began September 2004
*** PRP costs include settlement of $2,250,000 for EPA past costs in 2003.

Progress Since the Last Five-Year Review

Since the last Five-Year Review was conducted, negotiations between EPA and the PRPs were completed for the Interim RD/RA CD which was entered by the court in February 2004. The RD/RA Work Plan was submitted and approved by EPA and was implemented by the PRPs. All of the components of the remedy, excluding the provisions for installation of additional MWs on an as-needed basis, have been implemented.

H. Naval Ammunition Depot Subsite – OUs 04, 08, 14, 15, and 16

The USACE is in the process of performing its third Five-Year Review for OUs 04, 08, 14, 15 and 16 separately. The transmittal memorandum of a draft copy of the report is included as Appendix 1.

V. Progress since the Last Five-Year Review

The Second Five-Year Review Report completed July 2002 identified eight recommendations and associated follow-up actions related to the protectiveness of the remedies at the various subsites of the HGCWS, excluding the NAD. The Table 6 presented below summarizes the issue and the recommended follow-up action and protectiveness assessment related to each issue. All eight recommendations were indicated to affect the future protectiveness and two of the eight affected the current (as of the date of the second five-year review) protectiveness. As of the time of this third five-year review, seven of the eight have been accomplished. The recommendation not yet accomplished is addressed below.

Implementation of the Phase II SVE remedy was expected to occur in 2002. Dravo challenged the OU09 remedy as part of the cost recovery litigation. The CD was signed in 2006. EPA expects Dravo to complete construction for the OU09 remedy in 2007.

Table 5
Actions Taken Since the Last Five-Year Review

Issues from Previous Review	Recommendations / Follow-up Actions	Party Responsible	Milestone Date	Action Taken and Outcome	Date of Action
Well No.3 – CD Negotiations	Sign CD	EPA and Dutton-Lainson	Summer 2002	CD entered by the court	10/11/2002
Colorado Avenue – Complete SVE System	Install Phase II equipment	Dravo	Summer 2002	EPA approved SVE Phase II Design	09/29/2004
				CD entered by the court	05/24/2006
Colorado Avenue – Ground Water System	Install Phase III and Phase IV	Dravo	Summer 2002	Phase III ~~and IV~~ IWA systems installed	Startup Date: 11/13/2002
Second Street – Complete FS	Publish Proposed Plan and ROD	EPA	Summer 2002	FS completed	09/2002
				ROD completed	07/18/2003
North Landfill – Ground Water Report	Complete Ground Water Report	City of Hastings, Dutton-Lainson, and Dravo	Summer 2003	Approved by EPA	12/2002
FAR-MAR-CO – Ground Water Report	Complete Ground Water Report	Morrison Enterprises	Summer 2003	Submitted to and approved by EPA	12/2002
South Landfill – Remedial Design	Complete the Remedial Design	City of Hastings	Summer 2003	RD for landfill cover completed	05/05/2004
				Landfill cover and fence installed	05/05/2005
Area-Wide – Complete CD Negotiations	Sign CD	Area-Wide PRPs	Fall 2002	CD entered by the court	02/26/2004

VI. Five-Year Review Process

A. Administrative Components

In January 2007, members of the HGWCS team began coordination and outreach activities for the third Five-Year Review in a manner consistent with EPA guidance. Efforts were coordinated through meetings and e-mail to all parties who serve as EPA Remedial Project Managers (RPMs) for the various subsites of the HGWCS. Those RPMs are Darrell Sommerhauser - Well No.3, Colorado Avenue, South Landfill, and Second Street OU20 Subsites; Bill Gresham - FAR-MAR-CO, North Landfill, and Second Street OU12 Subsites; Brian Zurbuchen - Area-Wide Ground Water Action OU19 Subsite and lead for the Five-Year Review.. The HGWCS team also includes EPA RPM Tom Lorenz – NAD (OU04, OU08, OU14, OU15, & OU16) Subsite. The following team members assisted in the HGWCS review:

- Audrey Asher, CNSL, EPA's Regional Counsel responsible for the legal review of the document (913-551-7255),
- Glenn Curtis, Branch Chief, Iowa/Nebraska Branch, Superfund Division, Region VII, EPA (913-551-7726),
- Rebecca Himes, EPA Community Involvement Coordinator (913-551-7253).

In addition, the following representatives from the NDEQ lead the states effort to assist in the process:

- Ed Southwick, Project Manager, NDEQ, (402-471-3388),
- Steve Kemp, Project Manager, NDEQ, State Technical Reviewer (402-471-3388).

In January 2007, a schedule was determined that included the following components:

- Community Involvement
- Document Review
- Data Review
- Site Inspections
- Five-Year Review Report Development and Review

The Five-Year Review for the NAD Subsite was conducted independently by USACE under the direction of Mr. Lorenz.

B. Community Notification and Involvement

Activities to involve the community in the Five-Year Review process were initiated with a conference call in early January 2007, between the site RPMs and the Community Involvement Coordinator for the HGWCS.

On February 19, 2007, the state, the city of Hastings, community members, responsible parties, and their contractors were notified of EPA's plans to conduct the Five-Year Review site inspection set for February 28, 2007. The attendees included the PRPs technical representatives, the city of Hastings, Hastings Utilities, NDEQ, and EPA. The subsite inspections were conducted at Well No.3, Colorado Avenue, Second Street, North Landfill, FAR-MAR-CO, and South Landfill. Well D and the secondary and tertiary containment wells that function as the remedy for multiple subsites was also inspected. During the inspections, EPA examined information concerning the current operational status and attempted to identify areas where operations could be improved. EPA inspection team also reviewed on-site information and activities related to the Area-Wide Ground Water Action (OU19) on March 1.

In April 2007, EPA mailed a Fact Sheet containing an announcement that the Third Five-Year Review was in progress. EPA announced in the Fact Sheet there would be a Public Availability session after the Five-

Year Review report has been completed and placed in the administrative record.

The completed Five-Year Review Report will be available in the information repository at the Hastings Public Library, Hastings, Nebraska. The notice of completion of this report will be placed in the local newspaper and local contacts will be notified by letter or phone. A brief summary of this report will also be included in EPA's website information.

C. Document Review

This Five-Year Review consisted of a review of relevant documents including O&M records and monitoring data (See Appendix 3). Applicable performance standards and ground water cleanup standards, as listed in the RODs and an Action Memorandum for the subsites were reviewed.

D. Data Review

Well No.3 – OU18, Ground Water

A review of the ground water data was presented in EPA's Final Well No.3 ROD (2001). The Final ROD addressed all four OUs at the subsite and was developed with concurrence by NDEQ. As stated in the Final ROD Declaration, no additional work is needed for OU07. OU13 and OU17. Information presented in the Final ROD indicates that MCL based performance levels have been attained and verified for ground water Plume 1 (CCl_4). The Final ROD listed five contaminants of concern for the Well No.3 Subsite; CCl_4, 1,1-DCE, 1,1,1-TCA, TCE and PCE. During the course of this Five-Year Review, no instances of CCl_4 exceeding the MCL (5 μg/l) were noted.

The Final ROD established MCLs as the cleanup standard for Plume 2 (TCE, TCA, PCE, and 1,1-DCE),. According to the Final ROD, three COCs, TCE, 1,1-DCE and PCE were found to exceed the MCL in 2001.

To update earlier reviews, EPA collected the reports provided by the Dutton-Lainson for OU18 and consulted available data for other MWs located downgradient from the source area of the OU18 plume. Reports with tabulated data showing concentrations of the COCs at the Well No.3 Subsite OU18 monitoring locations are presented in Appendix 4e of this Five-Year Review Report. The referenced reports present the concentration levels from the quarterly and semi-annual ground water sampling efforts from May 2002 through January 2007.

MWs CW-01, CW-06, and CW-03R were abandoned in June 2000. MWs CW-05, CW-04, CW-11, and CW-12 were abandoned in 2002. The last reported sampling of well CW-7 was December 2005. The last reported sampling of CW-10 was December 2006. As of 2007, from the data it appears that only two Well No.3 Subsite MWs are available to monitor progress of the RA. Results for the December 2006 sampling show TCE in well CW-8 at 13 μg/l. The reported value for TCE in CW-9 was 5 μg/l. Under terms of the Consent Decree, Dutton-Lainson will continue sampling of the two remaining Well No.3 monitoring locations semi-annually for the Well No.3 COCs.

Also contained in Appendix 4e are data tables from Annual RA Reports provided by Dravo for two MW nests identified as BW -17 and BW -18. For reference, well BW-17 is about 300 feet west of MW-1d. Dravo reported sampling wells MW-1 (129 ft.) and MW-1d (169 ft.) in April 2005. Well No.3 COCs were not found in well MW-1, but TCE was found in MW-1d at 0.6 μg/l.

The most recent results for the Well No.3 MWs show that concentrations of 1,1,1-TCA and 1,1-DCE are below their respective MCLs (cleanup levels). The MCL based cleanup level was exceeded for TCE and PCE. Review of Dravo's data for BW -17 and BW-18 show no results above the MCL for 1,1,1-TCA. Dravo's data show samples above the MCL for 1,1-DCE (2002), for TCE

(2002, 2004 & 2005), for PCE (2002 & 2004).

Data contained in the HTI reports include results for sampling the untreated water produced by extraction well 3 and show only one detection of TCE for the 2002 – 2006 period. TCE was reported for extraction well 3 in December 2003 at 1.3 μg/l. Based on existing ground water data (see Appendix 4e), there is some question about the ability of extraction well 3 to completely capture Plume 2 and remove the residual TCE contamination from the aquifer.

Colorado Avenue – OU09, Source Control
To date, SVE activities performed by the PRPs have removed more that 2000 pounds of volatile organic chemicals from the soils at the Colorado Avenue Subsite. Ground water samples collected from MWs in the vicinity of the contaminant source areas have shown significant reductions in the contaminant concentrations. These declines can be directly attributed to the activities performed by the PRPs. A May 1999 shallow soils investigation performed by EPA confirmed the need for the Phase II (shallow) SVE system. EPA approved Dravo's work plan and revised RD in September 2006 for the Phase II activities. Dravo initiated the Phase II SVE construction activities in December 2006.

EPA will evaluate the SVE data after the Phase II SVE wells are installed, operated and sampled.

Colorado Avenue – OU01, Ground Water
Dravo's Phase II, IWA systems began operation in December 1999. In addition, Dravo's Phase III IWA ground water treatment systems began operation in November 2002. Results from 2002 to January 2007 operations and ground water sampling are available and contained in Dravo's Annual RA Reports. To demonstrate mass removal from the ground water, Dravo collects influent and effluent vapor samples from the IWA systems.

Evaluation of the information contained in Dravo Annual RA Reports, when combined with EPA's sampling results, provides confirmation that Dravo's IWA treatment systems when properly maintained are removing significant amounts of contamination from the aquifer. Based on Dravo's most recent Annual RA Report (2007) provided to EPA, it appears that Dravo is monitoring the status of the granular activated carbon treatment systems and replacing the spent carbon to make the systems functional.

However, with respect to the ROD goal of plume containment, areas of the Colorado Avenue TCE plume located beyond the Phase III system are not being treated by Dravo's water treatment system. A Consent Order was completed in May 2007 requiring Dravo to perform the Phase IV ground water investigation work. Data from this investigation is expected to enable Dravo and EPA to define work needed to complete the OU01 Final RD/RA. The Phase IV work will include evaluating information related to the capture of Colorado Avenue plume contaminants by the Well D ground water extraction system installed by the PRP for the FAR-MAR-CO Subsite.

EPA will evaluate the potential need for additional ground water treatment actions to fully comply with the goals contained in the 1991 ROD, as amended.

Second Street – OU20, Ground Water
The first Second Street removal action consisted of source area SVE and extraction and treatment of the groundwater. These systems have operated for the past ten years (1997 – present). The second removal action involved operation of an IWA ground water treatment system. This system has operated from 2001 through the present. All three existing treatment systems were transitioned to be components of the OU20 remedial action. EPA initiated injection of oxygen release chemicals for the in situ treatment phase of the RA in November

2005. All components of the remedy are monitored to evaluate their effectiveness. Ground water, treated water and air samples are collected twice-yearly.

The SVE system continues to show removal of significant amounts of VOCs, benzene, toluene, ethylbenzene, and xylene (BTEX) compounds from the soils. Monitoring results for the ground water pump and treat system are also available. The recent results (Fall 2006) indicate that significant reduction of BTEX and PAH concentrations have been achieved at the source area and in the vicinity of the IWA treatment system. Data Evaluation Reports are prepared twice-yearly and reviewed by EPA and the NDEQ. Continued operation of the remediation systems will be needed to attain the cleanup levels established by the 2003 OU20 ROD. The ability to attain ground water based remediation goals is heavily dependent on successful implementation of the OU12 source area remedial action.

North Landfill
The final action ROD, which was signed in 2006, called for natural attenuation, extraction of contaminated ground water, and treatment at the Whalen Energy Center, as well as monitoring of the contaminant plume. Cleanup goals established for the COCs are the MCLs or 1 x 10^{-6} cancer risk level. Ground water monitoring data indicate that the source area contamination is being reduced by natural attenuation processes and that the levels of contamination migrating from the landfill have decreased. It was accepted by all parties that MCLs would have been reached immediately downgradient of the subsite, as measured in wells MW-6 and MW-7, by the year 2007, with an uncertainty of plus or minus 1 year. However, a plume having significantly higher concentrations of TCE, from an upgradient source, impacted the subsite. These higher concentrations overwhelmed the natural attenuation processes which were previously acting to reduce concentrations of the North Landfill plume.

The CD will require installation of additional MWs and continued monitoring of the ground water downgradient of the subsite. This continued monitoring will provide additional data with which to evaluate whether the remedy is operating successfully. The CD will also require continued operation of Well D for extraction of North Landfill-related contamination until September 30, 2017, or earlier if monitoring data indicate earlier termination is appropriate.

FAR-MAR-CO
The performance standards were attained in May 2000 for the source control OU. The extended period of operation concluded in May 2002. Periodic verification sampling was performed for the next year and subsite restoration activities were performed afterwards. The PRPs are performing quarterly ground water monitoring for the ground water OU. The results show some success in the capture of the plume migrating from the source area. The FS prepared by the PRPs reports that the plume migrating from the source area is being captured by the remediation system and will attain MCLs within 50 years.

Cleanup goals established for the COCs are the MCLs or 1 x 10^{-6} cancer risk level. Ground water monitoring data indicate that the source area contamination is being reduced by natural attenuation. However, based on residual contamination in the ground water, continued operation of Well D for extraction of subsite-related contamination will be required until cleanup goals are met.

South Landfill – OU05 Source Control
The ROD was completed in 2000. The SDs petitioned EPA and NDEQ to allow an alternative design for the landfill cap. A design for the envirotranspiration landfill cap was approved and the SDs completed installation of the landfill cap in 2004.

Subsite fencing was completed in 2005. The SDs have conducted some ground water sampling of on site MWs since the CD was signed in 2003. The SDs have performed sampling of landfill gas and have initiated work on ground water sampling needed to prepare the RD for ground water portion of the subsite. The new data is expected to define the extent of the off-site plume and help with evaluation of the selected remedy, monitored natural attenuation. Upon submittal and approval of the ground water RD, EPA expects the SDs to implement the RA.

Cleanup levels established for the COCs are the MCLs or 1 x 10^{-6} cancer risk level. Additional goals for the subsite action include prevention of further ground water quality degradation by eliminating further leaching of contaminants into the ground water via infiltration of surface water through the landfill contents.

EPA will evaluate the subsite data upon completion of the ground water RA.

<u>Area-Wide Ground Water Action – OU19</u>
EPA's Area Wide Interim Action ROD was released in 2001. The city implemented the ICA beginning in 2004.

As discussed above, the Colorado Avenue, FAR-MAR-CO and South Landfill plumes have traveled beyond their respective MW networks. Private wells are being sampled to assist with defining ground water quality in areas beyond the existing MWs.

Private parties are being notified if their wells are contaminated and will be offered options to consider in order to receive safe drinking water. EPA performs or oversees the monitoring of ongoing subsite actions to determine progress toward achieving MCLs in accordance with subsite-specific RODs.

Since the selected remedy does not achieve Applicable Relevant and Appropriate Requirements (ARARs), the Area-Wide remedy was implemented as an interim action, consistent with 40 CFR 300.430(f)(1)(ii)(C). The interim action will remain in place until MCLs are achieved at each subsite.

The city of Hastings passed a city ordinance establishing an ICA restricting the use of the ground water within the Area-Wide project area. The selected remedy is implemented with extensive monitoring and full implementation of the city ordinance. Annual ICA reports are submitted to the EPA.

E. Site Inspection

Inspections at the site were conducted on February 28, and March 1, 2007, by the EPA RPMs and representatives of NDEQ, the city of Hastings and several responsible parties. The purpose of the inspections was to visually confirm and document the conditions of the remedies, the site, and surrounding areas. Brief descriptions of the inspections and issues identified are presented below. The completed inspection checklists for each of the subsites, excluding the NAD, are included in Appendix 5. The EPA will follow up with the responsible parties to resolve the issues that were identified during the site inspection.

<u>Well No.3</u>
Two MWs, the extraction well No. 3, and the storm water outfall comprising the OU18 project were inspected on February 28, 2007. No deficiencies related to these items were noted.

<u>Colorado Avenue</u>
The Phase I SVE system consisting of equipment inside the treatment building and 5 shallow/deep SVE well pairs, one horizontal SVE well plus the associated monitoring probe protectors were inspected on February 28, 2007. Two items needing attention were noted. Monitoring Probe MP-7D is missing the identification tag and all monitoring probes should be checked to verify they can be correctly identified by the

field sampling team. All well head enclosures (6 each) were delivered in primer and were never painted. After 11 years weathering at the subsite, the enclosures are rusted and unsightly.

The Phase I ground water treatment system was not placed into operation and therefore was not inspected. The Phase II and Phase III ground water treatment systems were inspected on February 28, 2007.

Two MWs cap were not secured. This item was corrected by Dravo in March 2007. Two MWs, MW -1d and BW-12 do not have identification tags visible on the exterior. The air sample ports were not identified for the east Park Ave. IWA system (IWA-3).

Second Street
The SVE and ground water treatment systems at the former police station, the in-well aeration system at Uncle Neal's Car Wash, the bioremediation wells and subsite MWs were inspected on February 28, 2007. Two newly installed wells, EX -3 and SW - 16 did not have identification tags as of the date of the inspection.

North Landfill
The North Landfill Subsite was visually inspected to evaluate the condition of the landfill cap; a low spot was observed due to slight standing water. A walk around the perimeter revealed the fence to be in good condition, with signage present. MWs 5, 6 and 7 were observed. It appeared that the concrete pads at MWs 6 and 7 were either gone or had been buried in soil.

FAR-MAR-CO
The FAR-MAR-CO Subsite inspection occurred by visually inspecting the ground water contaminant plume capture network consisting of Well D; Wells A, B, and C at the Whelan Energy Center; and wells IN-05 and IN-11 at Chief Ethanol. All appeared to be operational. Also, MWs arrayed around the actual subsite were inspected. The manhole cover for MW-16 was damaged and in need of repair/replacement.

South Landfill
The landfill cap, the vegetation and the perimeter security fence with locked gate were inspected on February 23, 2007. Some minor observations related to routine maintenance items were noted during the inspections.

Area-Wide Ground Water Action – OU19
Institutional controls were evaluated by visiting the Hastings Utilities Power Plant building, 1228 North Denver Avenue, Hastings, Nebraska, to review water well registration records and sampling and analytical results for water wells in the ground water monitoring program. An inspection of the site boundaries was also conducted to confirm the presence of warning signs put in place to advise the public of the ground water institutional control area (see map in Appendix 2)

A partial examination of the water well registration records indicated water well registry was being maintained and appeared to be up-to-date. This information is necessary to implement the ground water monitoring program, monitor compliance with the city of Hastings Ordinance No.3754, and provide alternate water to impacted users, as documented in the ROD. The examination of the signage along the site boundaries revealed that signage had been damaged or removed at four of the six locations specified in the Area-Wide Work Plan (city of Hastings, 2004).

F. Interviews

The following city of Hastings officials were contacted by telephone or in person as part of the Five-Year Review:

- Jeremy Groves, city of Hastings 402-461-2339
- Jack Newlun, Solid Waste Superintendent for Hastings
- Marty Stange, Hastings Utilities, 402-463-1371, extension 251
- Mike Sullivan, City Attorney, 402-462-2119
- Jenny Sidlo, Engineer, Hastings Utilities, 402-461-3664

During the site inspection on March 1, 2007, EPA conducted an informal meeting with certain city staff at City Hall. Employees from the city had previously expressed concerns regarding the proposed remedy during the public meeting for the Proposed Plan and ROD for the Second Street source area (OU12). The city staff again expressed similar concern during our March 1, 2007 meeting. The EPA noted these concerns and determined that they were adequately addressed in EPA's Responsiveness Summary to the Second Street OU12 ROD.

Hastings Utilities presented information concerning its ground water monitoring efforts and a map showing the locations of private well samples, the location of the ICA, the extent of the well head protection area, and the locations where signs identifying the protection areas had been posted (See Appendix 2).

On April 6, 2007, a Fact Sheet was distributed to public officials, PRPs, community leaders and residents near the HGWCS. The Fact Sheet announced the start of the five-year review process and solicited public comment and concerns on the HGWCS. The community was also made aware of the start of the five-year review through publication of a display ad in the local newspaper on April 10, 2007. The EPA did not receive any public comments outside of the concerns or issues expressed by the local officials and/or PRPs for the subsites.

VII. Technical Assessment

A. *Question A*: Is the remedy functioning as intended by the decision documents?

<u>Remedial Action Performance</u>
Area-wide and subsite response actions have been implemented. Active remediation is underway at Well No.3, Colorado Avenue, Second Street, North Landfill, and FAR-MAR-CO Subsites. All ground water treatment systems remained operational and functional during the five year review period with one exception. Numerous treatment interruptions occurred at the Colorado Avenue Subsite. These were related to failure to change out the spent carbon for the IWA systems. Dravo's submittal contained in Appendix 4b addresses the intent to change out the spent carbon as needed to minimize this problem in the future. The source control and ground water remedies in place will continue to operate until they reach performance goals.

EPA anticipates additional remedial work to be implemented at the Colorado Avenue, Second Street, North Landfill, FAR-MAR-CO, and South Landfill Subsites.

A final Area-Wide ROD will be issued to establish final clean up levels, subsequent to issuance of the Final RODs for each of the subsites.

<u>System Operations / O&M</u>
System operations procedures are consistent with subsite specific requirements.

<u>Cost of System Operations / O&M</u>
Some PRP costs provided to EPA were aggregate numbers including settlement for

historical RI/FS costs, etc. Cost information available to EPA is shown in Section IV. In some cases, a direct comparison to earlier cost estimates was not possible. The review found actual costs to be generally in agreement with estimates.

Institutional Controls
The ICA has been established by the city of Hastings in cooperation with Adams County. The ground water monitoring of the private wells within the ICA is being performed by Hastings Utilities with the private parties being notified of the sampling results. Some former agricultural properties have converted to commercial use. Some parcels of land within the ICA are owned by responsible parties. There are no current or planned changes in land use at any of the Hastings OUs that could increase risks to human health.

Monitoring Activities
For Well No.3, Colorado Avenue and Second Street, ground water monitoring has been conducted twice yearly.

For South Landfill, the available monitoring data is limited. Additional data is currently being collected by the SDs. Results from ground water monitoring conducted to date are contained in Appendix 4d.

Ground water monitoring at the North Landfill and FAR-MAR-CO Subsites was conducted quarterly during the past five years. Summaries of the past quarterly monitoring results are included in Appendix 4c. For the Colorado Avenue Subsite, monitoring for both the source control efforts and the ground water efforts was presented to EPA during the Five-Year Review and are in Appendix 4a

For Area-Wide, three Annual ICA Reports have been completed and provided to EPA. The reports reflect actions taken to comply with requirements of the CD.

Opportunities for Optimization
Well No.3: No opportunities for optimization or improvement were identified.

Colorado Avenue: The Phase II and III ground water treatment systems are operating, however data is not conclusive and the Phase IV investigation is needed to determine the fate of the OU01 plume. Because the remedy has not been fully implemented, opportunities for improvement and optimization still remain. A final ROD is needed to fully comply with State ARARs.

Second Street: Implementation of the OU20 remedy began in 2005. Opportunities for optimization may exist at Second Street. The EPA and NDEQ are evaluating areas for improvement of the ground water remedy. While the SVE source control system continues to operate, additional source control measures are needed as reflected by the OU12 ROD.

North Landfill: The source control remedy remains protective and effective, no optimization opportunities were identified. The ground water remedy has not been implemented. Optimization opportunities will be employed as they are identified and deemed appropriate.

FAR-MAR-CO: Source control has been performed with no optimization opportunities identified. Work is being implemented on the ground water remedy. Optimization opportunities will be employed as they are identified and deemed appropriate.

South Landfill: The ground water remedy has not been fully implemented. Optimization opportunities will be discussed in the next Five-Year Review.

Area-Wide Ground Water. No opportunities for optimization were identified during the course of this Five-Year Review.

Early Indicators of Potential Remedy Failure
Although an expansion of the ICA may be needed in the near future, this is not viewed

as a remedy failure. The terms of the Consent Decree allow for the potential need to expand the ICA. O&M costs have deviated from early estimates, but are generally consistent with expectations. In some instances maintenance requirements have exceeded earlier expectations.

B. *Question B*: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives (RAOs) used at the time of the remedy selection still valid?

There have been no changes in the physical conditions of the site that would affect the protectiveness of the remedy.

<u>Changes in Standards and To Be Considereds (TBCs)</u>
Based on this review, EPA believes earlier assumptions, data inputs and RAOs are still appropriate for the HGWCS. As noted in this review, a number of actions remain to be implemented / completed.

<u>Changes in Exposure Pathways, Toxicity, and Other Contaminant Characteristics</u>
The exposure assumptions used to develop the Risk Assessment include both current exposures (adult and children residents)

Earlier risk assessments remain valid. Except as discussed under question C, no changes were noted during this review, EPA will consider the significance of 1,4-dioxane when the final OU01 ROD is prepared.

C. *Question C*: Has any other information come to light that could call into question the protectiveness of the remedy?

1,4-dioxane is known to be a chemical stabilizer used in the formulation of 1,1,1-TCA industrial vapor degreasing products. Low levels of 1,4-dioxane have been detected at the Hastings site. Historically, the standard VOC laboratory methods did not yield reliable data for low-level analysis of 1,4-dioxane. Laboratory methods recently developed require that the analysis for 1,4-dioxane be a separate request and require a larger sample of water. This matter will need to be addressed. Appropriate action will be taken to ensure that current and future remedial actions are protective.

VIII. Issues

Table 6 summarizes site issues identified during the Five-Year Review.

IX. Recommendations and Follow-up Actions

At the **Well No.3** Subsite, the intent of the Plume 2 (OU18) RA is to remediate the TCE contamination to MCLs using the extraction system installed by EPA at former municipal supply well M-3. This action was anticipated to last for 15 years. Based on available data, the fate of the OU18 ground water contaminant plume is uncertain. This matter will be taken up through discussions with the Settling Defendant.

At the **Colorado Avenue** Subsite, there is insufficient data to conclude that the ground water contaminant plume is being effectively captured and controlled by the existing treatment systems. Additional ground water remediation systems may be needed. The PRP is in the process of conducting Phase IV ground water investigations. EPA will consider amending the list of COCs to include 1,4-dioxane. Additional monitoring results are needed to evaluate the effectiveness of the Colorado Avenue RA.

Table 7
Recommendations and Follow-Up Actions

Subsite/ Issue	Recommendation/ Follow-Up Actions	Party Responsible	Oversight Agency (Lead / Support)	Milestone Date	Affects Protectiveness? (Y/N)	
					Current	Future
Well No.3 (OU18) - Plume Not Contained	Invoke additional work provisions of CD	Dutton-Lainson	EPA / NDEQ	2007	N	Y
Colorado Avenue (OU01) - Plume Not Contained	Perform Phase IV investigation	Dravo	EPA / NDEQ	2007 - 2009	N	Y
Colorado Avenue (OU01) – COC list incomplete	Amend list of COCs	EPA	EPA / NDEQ	2008	N	Y
Second Street (OU20)- COC list	Incorporate monitoring and treatment of EDB into remedy	EPA and NDEQ	EPA / NDEQ	2008	N	Y
Area-Wide Ground Water Action – ICA boundary	Continue to administer ICA	Area-Wide PRPs	EPA/NDEQ	Annually	Y	Y

Table 6
Summary of Issues

Issue	Currently Affects Protectiveness (Y/N)	Affects Future Protectiveness (Y/N)
Available data are insufficient to conclude that the **Well No.3** OU18 plume is being captured by the system now operating	N	Y
Monitoring results indicate plume continues to migrate from the **Colorado Avenue** Subsite beyond the Phase III treatment systems	N	Y
1,4-dioxane, a stabilizer of 1,1,1-TCA and a probable human carcinogen, has not been identified as a COC and therefore has never been included in the list of analytes for **Colorado Avenue**	N	Y
Releases of EDB from former Foote Oil [a Nebraska Leaking Underground Storage Tank (LUST) site] are complicating the cleanup of **Second Street** ground water plume (OU20)	N	Y
Available ground water data suggest that contamination may have migrated beyond the boundary for the ICA (**Area-Wide Ground Water Action**)	Y	Y

At the **Second Street** Subsite, since the last five-year review, EDB has been detected in MWs at more than 100 times the MCL. EDB is now included in water sample analyses, however, it is not currently recognized as COC at the subsite. Although EDB is a contaminant associated with the former Foote Oil (a Nebraska LUST site), EPA will take steps to include EDB in the cleanup of the Second Street Subsite contaminant plume.

The **Area-Wide Ground Water Action** interim remedy has been implemented. Hastings Utilities provided Annual ICA reports to EPA. Ground water monitoring at the eastern, or leading, edges of the contaminant plumes is insufficient to conclude that contamination remains within the ICA. The characterization of the extent of the contaminant plumes in question will be performed as part of future RD/RA for Colorado Avenue, North Landfill and FAR-MAR-CO.

Table 7 summarizes recommendations and follow-up actions for the six city subsites and associated OUs.

X. Protectiveness Statement(s)

A. Well No.3

OU07, OU13, and OU17- the remedies employed at these OUs are protective of human health and the environment. The remedy at OU18 is considered protective in the short-term because there is no evidence that there is current exposure. Institutional Controls are in place restricting well drilling. The ICs can potentially provide long-term protection.

B. Colorado Avenue

OU01 and OU09 - the remedies at these OUs are expected to be protective of human health and the environment upon completion. However, additional systems will be required to meet the goals of the OU01 and OU09 RODs. There is insufficient data to demonstrate protectiveness for the OU01 and OU09 RAs. The partially implemented remedies may be considered protective in the short-term because there is no evidence that there is current exposure.

Currently, there is good reason to question the location of the leading edge of the Colorado Avenue ground water contaminant plume. Because the plume may have traveled beyond the boundary originally identified for the ICA monitoring area, additional work will be needed to define the extent of the plume. Evaluation of data to be collected over the next two years may be sufficient to answer the remaining questions about protectiveness for the long term. A final ROD is needed for the Colorado Avenue Subsite.

C. Second Street

OU12 and OU20 - In 2006 EPA selected a final remedy. The OU12 remedy is expected to be protective of human health and the environment upon completion, and in the interim, exposure pathways that could result in unacceptable risks are being controlled. The remedy at OU20 is considered protective in the short-term because there is no evidence that there is current exposure. Institutional Controls are in place restricting well drilling and can potentially provide long-term protection.

D. North Landfill

The remedy for OU10 (source control) is protective of human health and the environment. The remedy selected for OU02 is expected to be protective of human health and the environment upon completion. In the interim, exposure pathways that could result in unacceptable risks are being controlled. EPA and the PRPs are negotiating a Consent Decree for implementation of the final remedy for OU02.

E. FAR-MAR-CO

The remedy for OU03 and OU11 (source control), is protective of human health and the environment. The remedy for OU06 is expected to be protective of human health and the environment upon completion. In the interim, exposure pathways that could result in unacceptable risks are being controlled. Currently, the Final Action FS is being reviewed by EPA. The remedy at OU06 currently protects human health and the environment because there are institutional controls limiting further installation of ground water supply wells and the monitoring of the water of private residences down gradient of the subsite.

F. South Landfill

OU05, a protectiveness determination of this remedy cannot be made at this time until further information is obtained. Further information will be obtained by taking the following actions: completion of the work defined by the SDs ground water investigation work plan, installation of additional MWs and periodic sampling of the down gradient areas affected by the OU05 contaminant plume.

It is expected that these actions will be conducted by the SDs. EPA expects to have sufficient information to make a protectiveness determination after about 2 years of monitoring.

G. Area-Wide Ground Water Action

OU19 - the interim remedy at OU19 currently protects human health because current and future property owners are prohibited from domestic use of ground water unless it is demonstrated through sampling that the ground water is suitable for use. However, in order for the remedy to be protective in the long-term, the institutional controls currently in place must continue to be implemented over the lateral extents of all migrating contaminant plumes.

XI. Next Review

The next Five-Year Review for the HGWCS is required by July 2012, five years from the date of this review.

XII. Other Comments

Work continues at the site under both federal and responsible party leads. Ground water monitoring will continue at most subsites and the institutional controls (ground water monitoring, deed restrictions and security fencing, posting of the site, and domestic groundwater use restrictions) will remain in effect. Interim response actions being performed at the subsites are believed to be consistent with the final remedy for the HGWCS.

List of Documents Reviewed

FAR-MAR-CO

Record of Decision Initial Source Control OU, Hastings Ground Water Contamination Site, FAR-MAR-C0 Subsite, OU No.03 dated September 30, 1988

Administrative Order on Consent - VII-90-F0038, Hastings Ground Water Contamination Site, FAR-MAR-CO Subsite, OU No.03 remedial design with Farmland Industries, Inc. dated September 27, 1990

Record of Decision, Hastings Ground Water Contamination Site, FAR-MAR-CO Subsite, OU No.11, dated September 28, 1990

Administrative Order on Consent - VII-90-F-0001, Hastings Ground Water Contamination Site, FAR-MAR-CO Subsite, OU No.11 with Hastings Irrigation Pipe Company dated October 26, 1989, amended December 12, 1990

Administrative Order on Consent, VII-92-F0005, Hastings Ground Water Contamination Site, FAR-MAR-CO Subsite, OU No.06, RI/FS, dated November 20, 1991

Consent Decree,, Civil Action No. CV88-L-720, United States of America vs. Morrison-Quirk Grain Corporation dated April 19, 1993

Consent Decree, Civil Action No. 4:CV93-3315, United States of America vs . Hastings Irrigation Pipe Company dated November 11, 1993

Explanation of Significant Differences, Hastings Ground Water Contamination Site, FAR-MAR-CO Subsite, OU No.03 dated August 22, 1995

Action Memorandum, Hastings Ground Water Contamination Site, FAR-MAR-CO Subsite, OU No.06 dated December 6, 1995

Administrative Order on Consent, VII-96-F-0020, Hastings Ground Water Contamination Site, FAR-MAR-CO Subsite, OU No.06 with Morrison Enterprises dated June 14, 1996

Consent Decree, Civil Action No. 4:96CV3037, United States of America v. Cooperative Producers, Inc. and Farmland Industries, Inc. dated May 7, 1997

Construction Completion Report and Remedial Action Report for the FAR-MAR-CO Subsite, Hastings, Nebraska dated OU No.-3, source control dated December 19, 1997

Colorado Avenue

Record of Decision Initial Source Control OU, Hastings Ground Water Contamination Site, Colorado Avenue Subsite, OU No.09 dated September 28, 1988

Administrative Order on Consent, VII-88-F-0021, Hastings Ground Water Contamination Site, Colorado Avenue Subsite, OU No.09, SVE Pilot Study dated December 14, 1988

Unilateral Administrative Order, Docket No. VII-90-F-0040, Hastings Ground Water Contamination Site, Colorado Avenue Subsite, OU No.09, RD/RA, dated September 28, 1990

Interim Action Record of Decision, Hastings Ground Water Contamination Site, Colorado

Avenue Subsite, OU No.01 dated September 30, 1991

Administrative Order on Consent, VII-90-F-0025, Hastings Ground Water Contamination Site, Colorado Avenue Subsite, OU No.09, De Minimis Settlement, dated June 12, 1992

Administrative Order on Consent, VII-92-F0001, Hastings Ground Water Contamination Site, Colorado Avenue Subsite, OU No.09, dated October 1, 1992

Unilateral Administrative Order, Docket No. VII-93-F-0019, Hastings Ground Water Contamination Site, Colorado Avenue Subsite, OU No.01, RD/RA, dated March 8, 1993

Interim Action Record of Decision Amendment, Hastings Ground Water Contamination Site, Colorado Avenue Subsite, OU No.01 dated May 25, 1998

Explanation of Significant Differences, Hastings Ground Water Contamination Site, Colorado Avenue Subsite, OU No.01 dated September, 26, 1999

Consent Decree, Civil Action No. 8:01CV500, Colorado Avenue Subsite OU 01 and 09, Hastings Ground Water Contamination Site, Entered May 24, 2006

Draft Annual Remedial Action Report, July 2005 – January 2007, Colorado Avenue Groundwater Contamination Subsite, February 2007.

Well No.3

Interim Action Record of Decision, Hastings Ground Water Contamination Site, Well No.3 Subsite, OU No.07 dated September 26, 1989

Interim Action Record of Decision, Hastings Ground Water Contamination Site, Well No.3 Subsite, OU No.13 and OU No.18 dated June 30, 1993

Remedial Action Report for the Hastings Ground Water Contamination Site, Well No.3 Subsite, OU No.07, dated August 17, 1993

Administrative Order on Consent, VII-93-F0001, Hastings Ground Water Contamination Site, Well No.3 Subsite, OU No.17, RI/FS, dated October 21, 1993

Administrative Order on Consent, VII-94-F005, Hastings Ground Water Contamination Site, Well No.3 Subsite, OU No.17, Removal Site Evaluation, dated January 21, 1994

Explanation of Significant Differences, cord of Decision, Hastings Ground Water Contamination Site, Well No.3 Subsite, OU No.13 dated December 14, 1994

Action Memorandum, Hastings Ground Water Contamination Site, Well No.3 Subsite, OU No.17, dated July 20, 1995

Administrative Order on Consent, VII-95-F0033, Hastings Ground Water Contamination Site, Well No.3 Subsite, OU No.17, Removal Action, dated September 28, 1995

Explanation of Significant Differences, cord of Decision, Hastings Ground Water Contamination Site, Well No.3 Subsite, OU No.13 dated July 23, 1996

Remedial Action Report for the Hastings Ground Water Contamination Site, Well No.3 Subsite, OU No.13, dated December 11, 1998

Interim Action Record of Decision Amendment, Hastings Ground Water Contamination Site, Well No.3 Subsite, OU No.13 dated November 19, 1999

Final Record of Decision, Hastings Ground Water Contamination Site, Well No.3 Subsite, OUs No.07, 13, 17 and 18, dated May 17, 2001

Consent Decree for Remedial Action, Civil Action No. 8:02CV366, Hastings Ground Water Contamination Site, Well No.3 Subsite, OU 18, entered October 11,2002.

North Landfill

Administrative Order on Consent, VII-89-F0018, Hastings Ground Water Contamination Site, North Landfill Subsite, OUs No.02 and 10, FS, dated September 27, 1989

Interim Action Record of Decision, Hastings Ground Water Contamination Site, North Landfill Subsite, OUs No.02 and 10 dated September 30, 1991

Administrative Order on Consent, VII-92-F0028, Hastings Ground Water Contamination Site, North Landfill Subsite, OU No.02 and 10, Remedial Design dated June 12, 1992

Consent Decree, Civil Action No. 8:98CV265, United States of America vs. City of Hastings, Dravo Corporation, Dutton-Lainson Company and Bernice Edwards dated August 14, 1998

Final Remedial Action Report for the North Landfill Subsite OU No.10, Hastings Ground Water Contamination Site, Hastings, Nebraska dated November 23, 1999

Second Street

Administrative Order on Consent, VII-96-F0019, Hastings Ground Water Contamination Site, Second Street Subsite, OU No.12, O&M for removal action, dated September 16, 1996

Action Memorandum, Hastings Ground Water Contamination Site, Second Street Subsite, OU No.12, dated June 5, 1997

Interim Remedial Action Report, Second Street subsite OU20, Hastings Ground Water Contamination Site, May 2007.

South Landfill

Administrative Order on Consent, VII-98-F0022, Hastings Ground Water Contamination Site, South Landfill Subsite, OU No.05, RI/FS, dated October 23, 1998

Record of Decision, Hastings Ground Water Contamination Site, South Landfill Subsite, OU No.05, dated September 2000

Consent Decree, Civil Action No. 8:03CV321, Hastings Ground Water Contamination Site, South Landfill Subsite, OU 05, entered November 12, 2003.

Final Remedial Action Report for the South Landfill Subsite Evapotranspiration Cap OU No.5, Hastings Ground Water Contamination Site, September 2005.

Area Wide

Human Health Baseline Risk Assessment, Hastings Area-Wide Groundwater Contamination Site, Hastings, Nebraska, Nebraska Health and Human Services System, November 1997.

Administrative Order on Consent, VII-98-F0022, Hastings Ground Water Contamination Site, Area Wide Subsite, OU No.19, RI/FS, dated October 23, 1998

Interim Action Record of Decision, Hasting Ground Water Contamination Site, Area-Wide Ground Water Action, OU No.19, June 25, 2001

Consent Decree, Civil Action No. 8:03CV531, United States of America versus City of Hastings, Concrete Industries, Inc., Cooperative Producers, Inc., Desco Corporation, Dravo Corporation, Dutton Lainson Company, and Morrison Enterprises, Entered February 26, 2004

Interim Remedial Action Design, Hastings Ground Water Contamination Site, Area Wide Work Plan, dated August 2004

Hastings Institutional Control Area, Annual Report, Reporting Year 2006, Hastings, Nebraska, March 29, 2007, Hastings Utilities.

Appendix 1

November 30, 2006

845839-SECHO-0209
MARKS No. 200-1f

U.S. Army Engineer District, Kansas City
ATTN: CENWK-EC-EC (Mr. Brian Roberts)
601 East 12th Street, Room 610
Kansas City, Missouri 64106-2896

Contract No.: DACW41-98-D-9006, Task Order 0010

Submittal: Draft Five-Year Review Report (Operable Units 4, 8, 14, 15, & 16)
Former Naval Ammunition Depot, Hastings, Nebraska

Dear Mr. Roberts:

Please find attached your copies of the Draft Five-Year Review Report. This report once finalized will supersede the initial 5-Year Review Report, submitted in April 2002. This document has been developed in accordance with the Task Order Scope of Work for WAD 101.

Please complete and return the ENG Form 4025 (attachment) in accordance with the "Hastings Project and Document Review & Approval Process Flowchart". This document is a *primary document* as defined by the *Interagency Agreement*; document reviewers should therefore provide comments within 60 days from the submittal date.

This document also has been distributed to other organizations in accordance with the attached distribution list.

If you have any questions regarding this submittal, please call us at (913) 451-1224.

Sincerely,

Shaw Environmental, Inc.

Justin Barker.
Deputy Project Manager

John C. Borthwick, P.E.
Project Manager

JCB:jlb
Attachments

cc: Central File (845839 A.01) letter only
Central File (845839 H.23.10) letter and document
Distribution List

Appendix 2

HASTINGS INSTITUTIONAL CONTROL AREA

Annual Report
Reporting Year 2006
RY 2006

Hastings, Nebraska

Submitted: March 29, 2007

Hastings Institutional Control Area

Ground water use restrictions.
Well permits required.

Please contact Hastings Utilities at PH (402) 463-1371.

HASTINGS UTILITIES

LETTER OF TRANSMITTAL

1228 North Denver Ave./PO Box 289
Hastings, NE 68902-0289

Phone 402-463-1371
FAX 402-463-3666

DATE: 3 /29 / 07

TO:

RECEIVED
APR 0 2 2007
SUPERFUND DIVISION

JOB No.
FAX No.
PHONE No.
EMAIL:
Cell Phone No.

RE: ICA Annual Report - 2007

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- [ ] ______

Remarks: Please find attached a copy of the 2007 ICA Annual Report

Please call or email if you have questions.

Copy To: File

Email: mstange@hastingsutilities.com

Signed: ______
Name: Marty Stange, P.E.
Title: Civil/Environmental Engineer

OFFICE USE ONLY
__X__MAIL _____FAX Date Faxed: ______

Report - VOC Testing Results

Latest Revision 3/26/07 by JES

Hastings Permit No.	Lab #	Date	Chem 1	Conc	Chem 2	Conc	Chem 3	Conc	Chem 4	Conc	Chem 5	Conc
ICA 005	P24688-32	1/12/2004										
ICA 005	P27040-29	1/17/2005										
ICA 005	P30089-15	9/11/2006										
ICA 009	P25681-8	7/7/2004										
ICA 009	P27409-7	4/11/2005	PCE	4.2								
ICA 009	P29613-6	5/24/2006	TCE	.87								
ICA 009	EPA	7/18/2006										
ICA 010	P23255-20	6/21/2003	1,1,1-TCA	0.53								
ICA 010	P26463-18	11/1/2004	1,2,3-TCA	0.82								
ICA 010	P27385-3	3/23/2005	1,1,1-TCA	.77								
ICA 010	P28663-17	10/10/2005										
ICA 010	P30808-16	10/30/2006										
ICA 011	P28115-14	8/25/2005										
ICA 013	P26311-40	3/17/2005	DCE	0.15								
ICA 013	P27385-8	3/17/2005	CCl4	10	TCE	15						
ICA 013	P27546-34	6/13/2005	CCl4	14	TCE	9.7						
ICA 013	P28708-1	10/5/2005	CCl4	12	TCE	6.1						
ICA 014	P24518-1	12/9/2003										
ICA 014	P27546-28	5/19/2005										
ICA 014	EPA	7/18/2006										

Hastings Permit No.	Lab #	Date	Chem 1	Conc	Chem 2	Conc	Chem 3	Conc	Chem 4	Conc	Chem 5	Conc
ICA 015	HA9-12-03WEC-A	9/12/2003	CCl4	9	TCE	45						
ICA 015	HA9-8-04WEC-A	9/8/2004	CCl4	6	TCE	63						
ICA 015	HA12-10-04WEC-A	12/10/2004	CCl4	6	TCE	69						
ICA 015	HTI	3/9/2005	CCl4	6	TCE	55						
ICA 015	P26311-38	3/17/2005	DCE	0.08								
ICA 015	P27385-7 cont'd	3/17/2005	PCE	.79								
ICA 015	P27385-7	3/17/2005	DCE	.57	Cis-DCE	.52	1,1,1-TCA	.61	CCl4	7.3	TCE	35
ICA 015	P27546-35	6/13/2005	DCE	.62	Cis-DCE	.59	1,1,1-TCA	.63	CCl4	7	TCE	51
ICA 015	P27546-35 (2)	6/13/2005	PCE	.95								
ICA 015	HTI	6/16/2005	CCl4	6	TCE	79						
ICA 015	HTI	9/13/2005	CCl4	7	TCE	55						
ICA 015	P28708-3	10/5/2005	DCE	.7	Cis-DCE	.7	1,1,1-TCA	.64	CCl4	6.6	TCE	50
ICA 015	Hastings Analytical	12/19/2005	TCE	75								
ICA 015	Hastings Analytical	3/7/2006	TCE	98								
ICA 015	Hastings Analytical	3/7/2006	CCl4	7	TCE	98						
ICA 015	Hastings Analytical	6/8/2006	TCE	64								
ICA 015	Hastings Analytical	9/7/2006	TCE	85								
ICA 015	Hastings Analytical	12/6/2006	TCE	97								
ICA 017	P22385-15	2/25/2003										
ICA 017	P29584-55	6/6/2006										

Hastings Permit No.	Lab #	Date	Chem 1	Conc	Chem 2	Conc	Chem 3	Conc	Chem 4	Conc	Chem 5	Conc
ICA 018	HA9-12-03WEC-C	9/12/2003	TCE	23								
ICA 018	HA9-8-04WEC-C	9/8/2004	TCE	21								
ICA 018	HA12-10-04WEC-C	12/10/2004	TCE	25								
ICA 018	Hastings Analytical	3/9/2005	TCE	23								
ICA 018	HTI	3/9/2005	TCE	23								
ICA 018	P26311-41	3/17/2005	DCE	0.05								
ICA 018	P27385-9	3/17/2005	CCl4	2.4	TCE	24						
ICA 018	P27546-33	6/13/2005	CCl4	2.6	TCE	30						
ICA 018	HTI	6/16/2005	TCE	24								
ICA 018	Hastings Analytical	6/16/2005	TCE	24								
ICA 018	HTI	9/12/2005	TCE	23								
ICA 018	P28708-2	10/5/2005	CCl4	2.1	TCE	25						
ICA 018	Hastings Analytical	12/19/2005	TCE	28								
ICA 018	Hastings Analytical	3/7/2006	TCE	26								
ICA 018	Hastings Analytical	3/7/2006	TCE	26								
ICA 018	Hastings Analytical	6/8/2006	TCE	24								
ICA 018	Hastings Analytical	9/7/2006	TCE	23								
ICA 018	Hastings Analytical	12/6/2006	TCE	24								
ICA 021	P17418-19	1/29/2001										
ICA 021	ENSR	7/25/2003										
ICA 021	P25855-18	8/25/2004										
ICA 021	Tetra Tech	11/15/2004										
ICA 021	ENSR	12/13/2004										
ICA 021	ENSR	2/24/2005										
ICA 022	P27897-30	7/6/2005										

Hastings Permit No.	Lab #	Date	Chem 1	Conc	Chem 2	Conc	Chem 3	Conc	Chem 4	Conc	Chem 5	Conc
ICA 023	P17504-10	1/10/2001	CCL4	.7	TCE	5.8						
ICA 023	P17418-5	2/12/2001	TCE	6.2								
ICA 023	P27897-29	7/6/2005	TCE	3.5								
ICA 024	P27897-36	7/6/2005	TCE	1.2								
ICA 025	P27897-37	7/6/2005	TCE	.97								
ICA 026	P17854-7	4/2/2001										
ICA 026	P25855-30	8/25/2004										
ICA 028	P28115-19	7/22/2005	CCl4	1	TCE	.88						
ICA 029	HA6-16-00 NP-001R(A	6/16/2000	DCE	21	DCA	13	Cis-DCE	29	1,1,1-TCA	37	TCE	2974
ICA 029	HA6-16-00 NP-001R(B	6/16/2000	PCE	43								
ICA 029	HA9-15-00 NP-001R(A	9/15/2000	DCE	24	DCA	13	Cis-DCE	28	1,1,1-TCA	39	TCE	2426
ICA 029	HA9-15-00	9/15/2000	PCE	46								
ICA 029	HA9-16-03 NP-001R	9/16/2003	DCE	18	DCA	9	Cis-DCE	17	1,1,1-TCA	27	TCE	1288
ICA 029	HA9-16-03 NP-001R (B	9/16/2003	PCE	36								
ICA 029	Hastings Analytical	6/23/2005	DCE	18	DCA	10	Cis-DCE	16	1,1,1-TCA	20	TCE	953
ICA 029	P27897-32	6/29/2005	DCE	16	DCA	7.5	Cis-DCE	11	1,1,1-TCA	21	TCE	1000
ICA 029	P27897-32 (2)	6/29/2005	PCE	28	DCA	1.8						
ICA 029	Hastings Analytical	6/8/2006	DCE	10	Cis-DCE	7	1,1,1-TCA	9	TCE	463	PCE	12

Hastings Permit No.	Lab #	Date	Chem 1	Conc	Chem 2	Conc	Chem 3	Conc	Chem 4	Conc	Chem 5	Conc
ICA 030	P17418-13	2/26/2001										
ICA 030	HA9-12-03IN-04	9/12/2003										
ICA 030	P25566-1	6/30/2004										
ICA 030	P25566-1	6/30/2004										
ICA 030	Hastings Analytical	3/10/2006										
ICA 030	Hastings Analytical	6/14/2006										
ICA 030	Hastings Analytical	8/23/2006										
ICA 030	Hastings Analytical	12/8/2006										
ICA 031	P17418-10	2/5/2001										
ICA 031	ENSR	1/8/2003	CCl4	6.7								
ICA 031	ENSR	1/8/2003	CCl4	6.7								
ICA 031	ENSR	7/16/2003	CCl4	4.6								
ICA 031	ENSR	8/17/2004	CCl4	4.7								
ICA 031	P26473-7	9/23/2004	CCl4	23								
ICA 031	ENSR	10/21/2004	CCl4	29								
ICA 031	Tetra Tech	11/15/2004	CCl4	2.1								
ICA 031	ENSR	12/13/2004										
ICA 032	P17418-20	1/29/2001	CCL4	15								
ICA 032	ENSR	1/29/2001	CCl4	15								
ICA 032	P17418-4	2/12/2001	CCL4	15								
ICA 032	P20644-1	7/1/2002	CCL4	34								
ICA 032	P25855-20	8/25/2004	CCL4	27								
ICA 032	ENSR	10/21/2004	CCl4	26								
ICA 032	ENSR	2/23/2005	CCl4	19								
ICA 032	P27385-5	3/23/2005	CCl4	14								

Hastings Permit No.	Lab #	Date	Chem 1	Conc	Chem 2	Conc	Chem 3	Conc	Chem 4	Conc	Chem 5	Conc
ICA 034	P17854-14	3/20/2001										
ICA 034	P25855-23	8/25/2004										
ICA 035	P17418-24	3/7/2001										
ICA 035	P25855-33	8/25/2004										
ICA 036	P17418-15	2/26/2001										
ICA 036	P26311-20	11/2/2004										
ICA 037	HA9-12-03IN-05	9/12/2003										
ICA 037	P25469-26	6/8/2004	CCL4	.52	TCE	1.4						
ICA 037	P30016-20	6/13/2006	CCl4	.67								
ICA 037	Hastings Analytical	9/7/2006										
ICA 038	HA9-12-03IN-11	9/12/2003	CCl4	7	TCE	7						
ICA 038	P25469-24	6/8/2004	CCL4	11	TCE	9.7						
ICA 038	P30016-28	6/13/2006	CCl4	12	TCE	11						
ICA 038	Hastings Analytical	9/7/2006	CCl4	8	TCE	9						
ICA 039	P28115-13	8/2/2005										
ICA 043	P17418-6	2/1/2001	Chloroform	.79	CCL4	220						
ICA 043	P20644-2	7/1/2002	CCL4	26	TCE	1.1						
ICA 043	HA9-12-03D-13	9/12/2003										
ICA 043	P25469-27	6/7/2004	TCE	.64								
ICA 043	P28115-9	8/25/2005										
ICA 043	Hastings Analytical	10/12/2006										
ICA 044	P28115-17	8/2/2005										
ICA 045	P21045-66	7/9/2002										

Hastings Permit No.	Lab #	Date	Chem 1	Conc	Chem 2	Conc	Chem 3	Conc	Chem 4	Conc	Chem 5	Conc
ICA 046	P21045-64	7/2/2002	TCE	3.4								
ICA 046	HA9-12-031-51	9/12/2003	CCl4	6	TCE	24						
ICA 046	P25087-35	5/6/2004	TCE	1.9								
ICA 046	P25087-37	5/6/2004	TCE	48	PCE	.8	DCE	1	1,1,1-TCA	0.73	CCl4	13
ICA 046	HA12-10-041-46	12/10/2004										
ICA 046	Hastings Analytical	6/17/2005	CCl4	9	TCE	79						
ICA 046	P27897-41	6/23/2005	CCl4	13	TCE	32	PCE	.67				
ICA 046	Hastings Analytical	6/8/2006	CCl4	7	TCE	16						
ICA 046	P30016-37	6/28/2006	CCl4	11	TCE	24						
ICA 046	Hastings Analytical	9/5/2006	CCl4	6	TCE	71						
ICA 047	HA9-12-031-46	9/12/2003										
ICA 047	HA3-12-041-46	3/12/2004										
ICA 047	Hastings Analytical	6/17/2005										
ICA 047	P27897-40	6/23/2005	TCE	2								
ICA 047	Hastings Analytical	3/10/2006										
ICA 047	Hastings Analytical	6/8/2006										
ICA 047	P30016-38	6/28/2006	TCE	2.1								
ICA 047	Hastings Analytical	9/5/2006										
ICA 047	Hastings Analytical	12/6/2006										
ICA 048	P21045-65	7/2/2002	DCFM	.92	DCE	1.7	1,1,1-TCA	1.3	TCE	5.1	PCE	.61
ICA 048	P25855-28	7/20/2004	DCE	1.6	1,1,1-TCA	1	TCE	5.8	PCE	.56		
ICA 048	P27897-39	7/11/2005	DCE	1.4	1,1,1-TCA	.9	TCE	5.1	PCE	.52		
ICA 051	P17418-23	3/7/2001										
ICA 051	P25855-29	8/25/2004										

Hastings Permit No.	Lab #	Date	Chem 1	Conc	Chem 2	Conc	Chem 3	Conc	Chem 4	Conc	Chem 5	Conc
ICA 053	P17418-21	1/29/2001										
ICA 053	ENSR	7/16/2003										
ICA 053	P25855-19	8/25/2004										
ICA 054	P17418-14	2/26/2001										
ICA 054	P25855-24	8/25/2004										
ICA 088	P30313-19	7/27/2006	DCE	4	1,1,1-TCA	1.5	CCl4	.81	TCE	71	PCE	.81
ICA 104	P27546-27	6/1/2005										
ICA 105	HA8-12-03CI-15	8/21/2003										
ICA 105	Hastings Analytical	7/1/2005										
ICA 105	Hastings Analytical	6/26/2006										
ICA 105	P30016-26	7/19/2006	CCl4	.75	TCE	.8						
ICA 105	Hastings Analytical	8/23/2006										
ICA 108	HA8-21-03I-49	8/21/2003	TCE	13								
ICA 108	Hastings Analytical	7/1/2005	DCE	6	Cis-DCE	9	TCE	331	PCE	6		
ICA 108	P28115-18	7/22/2005	DCE	6.7	DCA	1	Cis-DCE	9.6	1,1,1-TCA	5.9	CCl4	1
ICA 108	P28115-18 (2)	7/22/2005	DBE	.61	PCE	6.1	TCE	280				
ICA 108	Hastings Analytical	6/26/2006	DCE	9	Cis-DCE	12	1,1,1-TCA	6	TCE	330	PCE	7
ICA 108	P30016-23	7/19/2006	DCE	4.5	DBE	.92	Cis-DCE	5.8	1,1,1-TCA	3.9	CCl4	.55
ICA 108	P30016-23 cont'd	7/19/2006	DCA	.55	TCE	230	PCE	4.5				
ICA 108	Hastings Analytical	8/23/2006	DCE	9	Cis-DCE	13	1,1,1-TCA	7	TCE	264	PCE	6

Hastings . ermit No.	Lab #	Date	Chem 1	Conc	Chem 2	Conc	Chem 3	Conc	Chem 4	Conc	Chem 5	Conc
ICA 109	HA8-21-03I-58	8/21/2003										
ICA 109	Hastings Analytical	7/1/2005										
ICA 109	P28115-20	7/22/2005	CCl4	1.9	TCE	7.9						
ICA 109	Hastings Analytical	6/26/2006										
ICA 109	P30016-24	7/19/2006	CCl4	1.1	TCE	9.5						
ICA 109	Hastings Analytical	8/23/2006										
ICA 115	P17418-6#2	2/12/2001	TCE	.54								
ICA 128	P30016-35	6/15/2006										
ICA 137	P30313-17	8/4/2006										
ICA 147	P17418-3	3/6/2001	TCE	.66								
ICA 147	P25855-32	8/25/2004										
ICA 148	P17854-12	3/20/2001										
ICA 148	P21045-71	7/9/2002										
ICA 148	P25855-37	7/19/2004										
ICA 149	P17418-9	3/5/2001	Chloroform	.73	CCL4	240	TCE	0.52				
ICA 149	HA9-12-03D-7	9/12/2003	CCl4	114								
ICA 149	P25469-25	6/11/2004	Chloroform	.5	CCL4	140	TCE	1.3				
ICA 149	P27546-29	6/1/2005	TCE	.87								
ICA 149	P27546-29	6/1/2005	CCl4	120	TCE	.87						
ICA 149	P30016-34	6/20/2006	CCl4	96	TCE	.7						
ICA 149	Hastings Analytical	10/12/2006	CCl4	81								
ICA 150	P17418-7	3/5/2001										
ICA 151	P17418-1	3/6/2001										
ICA 151	P25855-31	8/25/2004										

Hastings Permit No.	Lab #	Date	Chem 1	Conc	Chem 2	Conc	Chem 3	Conc	Chem 4	Conc	Chem 5	Conc
ICA 152	Hydro Trace	12/7/2000										
ICA 152	P17854-6	4/2/2001										
ICA 152	P18807-7#2	8/23/2001	TCE	0.56	PCE	0.36						
ICA 152	ENSR	1/8/2003										
ICA 152	P25855-22	8/26/2004										
ICA 152	607648292	11/5/2004										
ICA 152	Tetra Tech	11/15/2004	CCl4	1.6								
ICA 152	ENSR	12/14/2004	CCl4	1.6								
ICA 152	ENSR	2/23/2005										
ICA 152	Hastings Analytical	4/5/2005										
ICA 152	P27897-31	7/15/2005										
ICA 153	P17854-8	4/2/2001										
ICA 153	P25855-21	8/25/2004										
ICA 154	P17418-22	3/7/2001										
ICA 155	P17418-8	3/5/2001	Chloroform	.77								
ICA 155	P25087-36	6/30/2004	DCM	0.64								
ICA 161	P21045-72#2	7/16/2002	PCE	.91								
ICA 161	P21045-72	7/16/2002	DCE	1.2	Cis-DCE	2.1	TCA	.87	CCL4	3.8	TCE	58
ICA 161	HA9-12-03I-50	9/12/2003	TCE	34								
ICA 161	P25566-2	6/15/2004	DCE	.96	Cis-DCE	1.2	TCA	.61	CCL4	3.7	TCE	47
ICA 161	P25566-2#2	6/15/2004	TCE	.58								
ICA 161	Hastings Analytical	6/23/2005	TCE	40								
ICA 161	Hastings Analytical	6/8/2006	TCE	42								
ICA 161	P30016-36	6/28/2006	DCE	.67	Cis-DCE	.63	CCl4	3.9	TCE	50		
ICA 161	Hastings Analytical	9/5/2006	TCE	40								

Hastings Permit No.	Lab #	Date	Chem 1	Conc	Chem 2	Conc	Chem 3	Conc	Chem 4	Conc	Chem 5	Conc
ICA 162	Hastings Analytical	4/5/2005										
ICA 172	P25087-33	4/2/2004	TCE	1.1								
ICA 172	HA12-10-04CD-06	12/10/2004										
ICA 172	Hastings Analytical	6/23/2005										
ICA 172	Hastings Analytical	6/14/2006										
ICA 172	Hastings Analytical	10/12/2006										
ICA 172	Hastings Analytical	12/8/2006										
ICA 174	P17418-2	3/6/2001	TCE	.83								
ICA 174	P27385-2	3/23/2005	TCE	.77								
ICA 176	P18807-7	8/23/2001	DCE	0.46	DCA	1.1	Cis-DCE	0.26	TCA	0.24	CCL4	1.5
ICA 176	P25855-25	8/26/2004	DCFM	.65	DCE	1.2	CCL4	1.3	TCE	.69		
ICA 176	P27897-38	7/15/2005	DCFM	.98	DCE	.61	DCA	1.9	TCE	.78	PCE	.5
ICA 188	P25855-41	7/19/2004										
ICA 189	P28115-16	7/21/2005										
ICA 195	P28115-10	7/20/2005										
ICA 196	P27897-28	7/11/2005										
ICA 206	Shaw Environmental	7/15/2006	TCE	.7								
ICA 216	Hastings Analytical	6/14/2005	TCE	53								
ICA 216	Hastings Analytical	6/8/2006	TCE	27								
ICA 216	Hastings Analytical	9/29/2006	TCE	19								
ICA 216	Hastings Analytical	12/5/2006	TCE	14								

Hastings Permit No.	Lab #	Date	Chem 1	Conc	Chem 2	Conc	Chem 3	Conc	Chem 4	Conc	Chem 5	Conc
ICA 217	Hastings Analytical	6/16/2005	VC	3	Cis-DCE	94	TCE	89				
ICA 217	Hastings Analytical	6/6/2006	DCE	7	DCE	10	Cis-DCE	66	CCl4	249		
ICA 217	Hastings Analytical	9/29/2006	VC	3	DCE	7	Cis-DCE	118	TCE	165		
ICA 217	Hastings Analytical	12/5/2006	VC	2	DCE	7	Cis-DCE	133	TCE	170		
ICA 218	Hastings Analytical	6/16/2005	Cis-DCE	30	TCE	58						
ICA 218	Hastings Analytical	6/6/2006	Cis-DCE	19	TCE	128						
ICA 218	Hastings Analytical	9/29/2006	Cis-DCE	21	TCE	179						
ICA 218	Hastings Analytical	12/5/2006	Cis-DCE	20	TCE	158						
ICA 219	Hastings Analytical	10/12/2006	TCE	39								
ICA 219	Hastings Analytical	12/4/2006	TCE	30								
ICA 221	Hastings Analytical	6/14/2005	DCE	13	DCA	5	Cis-DCE	10	1,1,1-TCA	16	TCE	621
ICA 221	Hastings Analytical	6/8/2006	DCE	15	Cis-DCE	8	1,1,1-TCA	14	TCE	436	PCE	11
ICA 221	Hastings Analytical	10/13/2006	Cis-DCE	10	TCE	21						
ICA 221	Hastings Analytical	12/5/2006	DCE	15	Cis-DCE	6	1,1,1-TCA	14	TCE	278	PCE	8
ICA 222	Hastings Analytical	6/17/2005	Cis-DCE	10	TCE	35						
ICA 222	Hastings Analytical	6/14/2006	Cis-DCE	7	TCE	19						
ICA 222	Hastings Analytical	10/13/2006	Cis-DCE	10	TCE	22						
ICA 222	Hastings Analytical	12/8/2006	Cis-DCE	10	TCE	19						
ICA 224	Hastings Analytical	6/17/2005	Cis-DCE	34	Chloroform	9	DCA	5	CCl4	220	TCE	71
ICA 224	Hastings Analytical	6/14/2006	Cis-DCE	25	CCl4	219	TCE	46				
ICA 224	Hastings Analytical	10/13/2006	Cis-DCE	20	Chloroform	7	CCl4	207	TCE	39		
ICA 224	Hastings Analytical	12/8/2006	Cis-DCE	19	CCl4	163	TCE	28				

Hastings Permit No.	Lab #	Date	Chem 1	Conc	Chem 2	Conc	Chem 3	Conc	Chem 4	Conc	Chem 5	Conc
ICA 225	Hastings Analytical	6/14/2005	VC	7	Cis-DCE	198	TCE	42				
ICA 225	Hastings Analytical	6/5/2006	VC	3	Cis-DCE	99	TCE	53				
ICA 225	Hastings Analytical	9/18/2006	VC	3	Cis-DCE	88	TCE	91				
ICA 225	Hastings Analytical	12/5/2006	VC	2	Cis-DCE	71	TCE	94				
ICA 227	Hastings Analytical	6/17/2005	Cis-DCE	12	TCE	7						
ICA 227	Hastings Analytical	6/14/2006	Cis-DCE	10								
ICA 227	Hastings Analytical	10/13/2006	Cis-DCE	12	TCE	5						
ICA 227	Hastings Analytical	12/8/2006	Cis-DCE	10								
ICA 229	Hastings Analytical	6/23/2005	TCE	31								
ICA 229	Hastings Analytical	10/12/2006	TCE	31								
ICA 229	Hastings Analytical	12/6/2006	TCE	30								
ICA 230	Hastings Analytical	6/6/2006	TCE	7								
ICA 230	Hastings Analytical	9/29/2006	TCE	8								
ICA 230	Hastings Analytical	12/8/2006	TCE	8								

Hastings Permit No.	Lab #	Date	Chem 1	Conc	Chem 2	Conc	Chem 3	Conc	Chem 4	Conc	Chem 5	Conc
ICA 307	HA9-16-03WellD	9/16/2003	CCl4	14	TCE	60						
ICA 307	HA3-19-04WellD	3/19/2004	CCl4	11	TCE	70						
ICA 307	HA12-9-04WellD	12/9/2004	CCl4	10	TCE	65						
ICA 307	Hastings Analytical	3/9/2005	CCl4	6	TCE	55						
ICA 307	P26311-39	3/17/2005	DCE	0.11								
ICA 307	P27385-4	3/17/2005	DCE	.92	Cis-DCE	.8	1,1,1-TCA	.98	CCl4	9.7	TCE	61
ICA 307	P27385-4 cont'd	3/17/2005	PCE	1.3								
ICA 307	P27546-30	6/13/2005	DCE	1.1	Cis-DCE	.95	1,1,1-TCA	.99	CCl4	9	TCE	77
ICA 307	P27546-30 (2)	6/13/2005	PCE	1.6								
ICA 307	Hastings Analytical	6/16/2005	CCl4	6	TCE	79						
ICA 307	Hastings Analytical	9/13/2005	CCl4	7	TCE	55						
ICA 307	P28708-4	10/5/2005	DCE	1.1	Cis-DCE	1.2	1,1,1-TCA	1.1	CCl4	8	TCE	74
ICA 307	Hastings Analytical	9/5/2006	CCl4	5	TCE	136						
ICA 354	P30016-33	6/20/2006	CCl4	82	TCE	.62						
ICA 397	P27385-6	3/17/2005										
ICA 397	P28115-12	10/12/2005										
ICA 397	NHHS	1/18/2006										
ICA 397	P30016-27	6/14/2006										
ICA 397	P30313-29	7/24/2006										
ICA 397	P30313-20	8/21/2006										
ICA 397	P31099-82	10/23/2006										
ICA 397	P31099-84	11/20/2006										
ICA 397	P31427-9	12/19/2006										

Hastings Permit No.	Lab #	Date	Chem 1	Conc	Chem 2	Conc	Chem 3	Conc	Chem 4	Conc	Chem 5	Conc
ICA 418	NHHS	1/18/2006	TCE	.54								
ICA 418	P30016-31	6/14/2006	TCE	.5								
ICA 418	P30313-26	7/24/2006										
ICA 418	P30313-21	8/21/2006	TCE	.56								
ICA 418	P30313-22	9/18/2006										
ICA 418	P31099-81	10/23/2006										
ICA 418	P31180-5	11/20/2006										
ICA 418	P31180-2	12/19/2006	TCE	.57								
ICA 419	NHHS	1/18/2006	TCE	.68								
ICA 419	P30016-30	6/14/2006	TCE	1.5								
ICA 419	P30313-25	7/24/2006	TCE	1.9								
ICA 419	P30313-18	8/21/2006										
ICA 419	P30313-24	9/18/2006										
ICA 419	P31099-83	10/23/2006										
ICA 419	P31180-3	11/20/2006										
ICA 419	P31180-1	12/19/2006										
ICA 420	NHHS	1/18/2006										
ICA 420	P30016-29	6/14/2006										
ICA 420	P30313-27	7/24/2006	TCE	.66								
ICA 420	P30313-15	8/21/2006										
ICA 420	P31099-86	10/23/2006										
ICA 420	P31180-4	11/20/2006										
ICA 420	P31427-5	12/19/2006										

Hastings Permit No.	Lab #	Date	Chem 1	Conc	Chem 2	Conc	Chem 3	Conc	Chem 4	Conc	Chem 5	Conc
ICA 421	P30016-32	6/14/2006										
ICA 421	P30313-28	7/24/2006										
ICA 421	P30313-16	8/21/2006										
ICA 421	P30313-23	9/18/2006										
ICA 421	P31099-85	10/23/2006										
ICA 421	P31180-6	11/20/2006										
ICA 421	P31427-8	12/19/2006										
ICA 442	607961398	3/8/2005	PCE	16								
ICA 443	607961406	3/9/2005										
ICA 447	P30016-25	6/28/2006	DCE	.65	TCE	1.9						

Report - SOC Testing Results

Latest Revision 3/26/07 by JES

Hastings Permit No	Lab #	Sample Date	Chem 1	Con	Chem 2	Con
ICA 005	P28584-5	10/3/2005				
ICA 009	P25059-6	4/19/2004				
ICA 009	P26311-31	4/11/2005				
ICA 010	P25059-5	4/19/2004				
ICA 013	P27897-58	6/14/2005	EDB	.24		
ICA 014	P26311-32	5/19/2005				
ICA 015	HA9-12-03WEC-A	9/12/2003	EDB	0.38		
ICA 015	HA9-8-04WEC-A	9/8/2004	EDB	0.24		
ICA 015	HA12-10-04WEC-A	12/10/2004	EDB	0.2		
ICA 015	HTI	3/9/2005	EDB	.11		
ICA 015	P27897-61	6/13/2005	EDB	.1		
ICA 015	HTI-1	6/16/2005	EDB	.25		
ICA 015	HTI-2	9/13/2005	EDB	0.09		
ICA 015	HA12-19-05 Well A	12/19/2005	EDB	.14		
ICA 015	HA3-7-06WEC-A	3/7/2006	EDB	.30		
ICA 015	HA6-8-06 Well A	6/8/2006	EDB	.23		
ICA 015	HA9-7-06 Well A	9/7/2006	EDB	.12		
ICA 015	HA12-6-06 Well A	12/6/2006	EDB	.11		
ICA 017	P26311-30	4/7/2005				
ICA 017	P30082-50	9/6/2006				
ICA 018	P27897-55	6/14/2005	EDB	.04		
ICA 018	HA12-19-05 Well C	12/9/2005	EDB	.05		
ICA 018	HA3-7-06WEC-C	3/7/2006				
ICA 021	P25855-45	8/25/2004				
ICA 022	P27897-48	7/6/2005				
ICA 023	P17500-4	1/10/2001	EDB	.07		
ICA 023	P17533-34	2/12/2001	EDB	.07		
ICA 023	P27897-43	7/6/2005				
ICA 024	P27897-47	7/6/2005				
ICA 025	P27897-44	7/6/2005				

Hastings Permit No	Lab #	Sample Date	Chem 1	Con	Chem 2	Con
ICA 026	P17916-12	4/2/2001				
ICA 026	P25855-55	8/25/2004				
ICA 028	P28115-23	7/22/2005				
ICA 029	P27897-60	6/29/2005	EDB	.086		
ICA 030	P17533-37	2/5/2001				
ICA 030	P17533-29	2/26/2001				
ICA 030	P25566-9	6/30/2004	EDB	.02		
ICA 030	HA3-10-06IN-04	3/10/2006				
ICA 031	P17533-36	2/5/2001				
ICA 031	P26473-6	9/23/2004				
ICA 032	P17533-35	2/12/2001				
ICA 032	P20644-4	7/1/2002				
ICA 032	P25855-43	8/25/2004				
ICA 034	P17916-15	3/20/2001				
ICA 034	P25855-52	8/25/2004				
ICA 035	P17533-49	3/7/2001				
ICA 035	P25855-57	8/25/2004				
ICA 036	P17533-28	2/26/2001				
ICA 036	P26311-26	11/2/2004				
ICA 037	P25566-3	6/8/2004	EDB	.04		
ICA 037	P26311-29	6/9/2005	EDB	.01		
ICA 037	P30016-17	6/13/2006	EDB	.02		
ICA 038	HA9-12-03IN-11	9/12/2003	EDB	0.19		
ICA 038	P25566-8	6/8/2004	EDB	.17		
ICA 038	P27897-53	6/9/2005	EDB	.15		
ICA 038	P30016-14	6/13/2006	EDB	.12		
ICA 038	HA9-7-06 IN-11	9/7/2006	EDB	.08		
ICA 039	P28115-21	8/2/2005				
ICA 043	P20644-3	7/1/2002				
ICA 043	P25566-5	6/7/2004				
ICA 044	P28115-22	8/2/2005				
ICA 045	P21045-84	7/9/2002				

Hastings Permit No	Lab #	Sample Date	Chem 1	Con	Chem 2	Con
ICA 046	P21045-86	7/2/2002				
ICA 046	HA9-12-03I-51	9/12/2003	EDB	0.92		
ICA 046	P25087-37	5/6/2004	EDB	1.5		
ICA 046	HA6-17-05 I-51	6/17/2005	EDB	.38		
ICA 046	P27897-45	6/23/2005	EDB	.403		
ICA 046	HA6-8-06 I-51	6/8/2006	EDB	.19		
ICA 046	HA9-5-06 I-51	9/5/2006	EDB	.21		
ICA 047	P25348-5	5/6/2004	EDB	1.2		
ICA 047	P27897-46	6/23/2005				
ICA 048	P21045-87	7/2/2002				
ICA 048	P25855-46	7/20/2004				
ICA 048	P27897-51	7/6/2005				
ICA 051	P25855-47	8/25/2004				
ICA 053	P25855-44	8/25/2004				
ICA 054	P17533-27	2/26/2001				
ICA 054	P25855-53	8/25/2004				
ICA 088	P30313-33	7/24/2006				
ICA 104	P26311-28	6/1/2005				
ICA 105	P30016-13	7/24/2006				
ICA 108	P27897-49	8/1/2005	EDB	.31		
ICA 108	HA8-23-06	8/23/2006	EDB	.58		
ICA 109	HA8-21-03I-58	8/21/2003	EDB	0.07		
ICA 109	P27897-56	8/1/2005	EDB	.03		
ICA 128	P30016-18	6/15/2006				
ICA 137	P30313-32	8/4/2006				
ICA 147	P17533-30	3/6/2001				
ICA 147	P25855-54	8/25/2004				
ICA 148	P17916-13	3/20/2001				
ICA 148	P21045-81	7/9/2002				
ICA 148	P25855-60	7/19/2004				
ICA 149	P17533-38	2/5/2001				

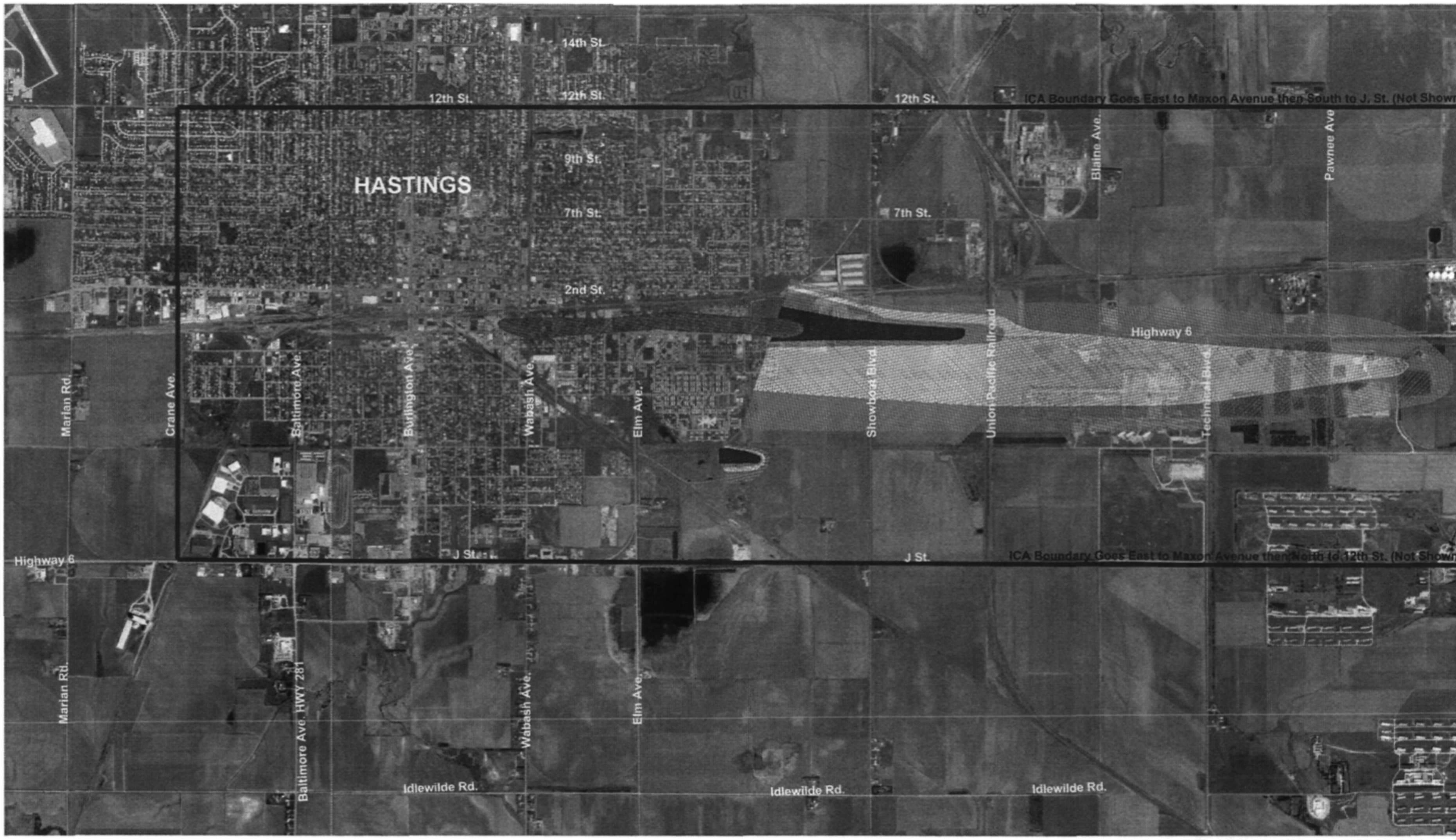
Hastings Permit No	Lab #	Sample Date	Chem 1 Con		Chem 2 Con	
ICA 149	P17533-44	3/5/2001				
ICA 149	P25566-6	6/11/2004				
ICA 149	P30016-5	6/20/2006				
ICA 150	P17533-43	3/5/2001				
ICA 151	P17533-32	3/6/2001				
ICA 151	P25855-56	8/25/2004				
ICA 152	P17916-10	4/2/2001				
ICA 152	P18807-13	8/23/2001				
ICA 152	P25855-50	8/26/2004				
ICA 153	P17916-11	4/2/2001				
ICA 153	P25855-42	8/25/2004				
ICA 154	P17533-50	3/7/2001				
ICA 154	P17533-45	3/7/2001				
ICA 155	P17533-42	3/5/2001				
ICA 155	P25566-4	6/30/2004				
ICA 161	P21045-77	7/16/2002	EDB	.036		
ICA 161	P25566-7	6/15/2004	EDB	.02		
ICA 172	P25348-8	5/7/2004	EDB	.02		
ICA 174	P17533-31	3/6/2001				
ICA 174	P26311-42	3/17/2005				
ICA 176	P25855-51	8/26/2004				
ICA 182	P25469-19	5/20/2004				
ICA 184	P25469-23	5/24/2004				
ICA 185	P25469-20	5/21/2004				
ICA 188	P25855-64	7/19/2004				
ICA 189	P27897-52	7/28/2005				
ICA 195	P21045-85	7/9/2002				
ICA 195	P27897-59	7/20/2005				
ICA 196	P21045-80	7/9/2002				
ICA 221	HA10-13-06	9/8/2006	EDB	.11		

Hastings Permit No	Lab #	Sample Date	Chem 1 Con		Chem 2 Con
ICA 222	HA6-17-05	6/17/2005	EDB	.26	
ICA 222	HA6-14-06	6/14/2006	EDB	.15	
ICA 222	HA10-13-06 2	9/8/2006	EDB	.12	
ICA 224	HA6-14-06 2	6/14/2006	EDB	2.3	
ICA 224	HA10-13-06 3	9/8/2006	EDB	1.2	
ICA 227	HA6-17-05 2	6/17/2005	EDB	.63	
ICA 227	HA6-14-06 3	6/14/2006	EDB	.45	
ICA 227	HA10-13-06 4	9/8/2006	EDB	.41	
ICA 227	HA12-8-06	12/8/2006	EDB	.44	
ICA 307	HA9-16-03WellD	9/16/2003	EDB	0.11	
ICA 307	HA3-19-04WellD	3/19/2004	EDB	0.14	
ICA 307	HA12-9-04WellD	12/9/2004	EDB	0.10	
ICA 307	HA3-9-05	3/9/2005	EDB	.11	
ICA 307	P27897-54	6/14/2005	EDB	.11	
ICA 307	HA6-16-05	6/16/2005	EDB	.25	
ICA 307	HA9-13-05	9/13/2005	EDB	.09	
ICA 307	HA9-5-06	9/5/2006	EDB	.08	
ICA 352	P25469-22	5/20/2004			
ICA 353	P25469-21	5/24/2004			
ICA 354	P30016-8	6/20/2006			
ICA 397	P26311-27	3/17/2005			
ICA 397	P27897-57	6/15/2005			
ICA 397	P29188-24	1/18/2006			
ICA 397	P30016-12	7/24/2006			
ICA 397	P30313-39	8/21/2006			
ICA 397	P30313-44	9/18/2006			
ICA 397	P31180-11	10/20/2006			
ICA 397	P31099-89	10/23/2006			
ICA 397	P31427-10	12/19/2006			
ICA 397	P31539-6	2/21/2007			
ICA 418	P29188-18	1/18/2006			
ICA 418	P30016-9	7/24/2006			
ICA 418	P30313-37	8/21/2006			
ICA 418	P30313-43	9/18/2006			

Hastings Permit No	Lab #	Sample Date	Chem 1 Con	Chem 2 Con
ICA 418	P31099-88	10/20/2006		
ICA 418	P30313-31	10/23/2006		
ICA 418	P31180-7	12/19/2006		
ICA 418	P31427-14	1/24/2007		
ICA 418	P31539-9	2/21/2007		
ICA 419	P29188-16	1/18/2006		
ICA 419	P30313-38	8/21/2006		
ICA 419	P30313-41	9/18/2006		
ICA 419	P31180-10	10/20/2006		
ICA 419	P30313-30	10/23/2006		
ICA 419	P31180-8	12/19/2006		
ICA 419	P31539-7	2/21/2007		
ICA 420	P29188-25	1/18/2006		
ICA 420	P30016-10	7/24/2006		
ICA 420	P30313-35	8/21/2006		
ICA 420	P30313-40	9/18/2006		
ICA 420	P31099-87	10/20/2006		
ICA 420	P30313-34	10/23/2006		
ICA 420	P31180-12	12/19/2006		
ICA 421	P30016-6	7/24/2006		
ICA 421	P30313-36	8/21/2006		
ICA 421	P30313-42	9/18/2006		
ICA 421	P31180-9	10/20/2006		
ICA 421	P31099-90	10/23/2006		
ICA 421	P31427-11	12/19/2006		
ICA 421	P31427-12	1/24/2007		
ICA 421	P31539-10	2/21/2007		
WP 003	P29557-6	4/3/2006		
WP 003	P30082-60	9/11/2006		
WP 012	P30849-1	10/18/2006		
WP 125	P17916-14	3/20/2001		
WP 125	P26473-16	11/17/2004		
WP 144	P17533-40	2/27/2001		
WP 145	P17533-41	2/27/2001		

Hastings Permit No	Lab #	Sample Date	Chem 1 Con	Chem 2 Con
WP 146	P17533-39	2/27/2001		
WP 160	P21045-76	7/16/2002		
WP 169	P25855-59	7/19/2004		
WP 170	P25855-65	7/19/2004		
WP 171	P25855-49	7/26/2004		
WP 177	P25855-63	7/19/2004		
WP 178	P25855-62	7/19/2004		
WP 183	P25469-18	5/20/2004		
WP 315	P25855-61	7/19/2004		
WP 316	P25855-58	7/19/2004		
WP 317	P25855-48	7/20/2004		
WP 346	P27897-50	7/21/2005		
WP 469	P28584-4	10/3/2005		
WP 470	P28584-3	10/3/2005		

AREAS OF GROUND WATER TCE CONTAMINATION - 2006



NOTE: Groundwater Plumes as noted on this sheet are APPROXIMATE and are to be used only to aid in the scheduling of VOC and SOC sampling in the ICA. Ground water plumes associated with the M3, Colorado Ave, NAD, and HEIP subsites are NOT SHOWN.

LEGEND

TCE 5 to 25ppb	TCE 26 to 100 ppb
TCE 101 to 200 ppb	TCE 201 to 1000 ppb
TCE >1001 ppb	
------ Approximate Plume Location (Unverified Location)	

Date: 3-27-07

North
Scale: 1"=1000'-0"±

\\Cad\Environmental\Area Wide\ICAPlumeAerialUpdate.dwg

Hastings Utilities
Hastings, Nebraska

Areas of Ground Water Contamination.

AREAS OF GROUND WATER CONTAMINATION - 2006

NOTE: Groundwater Plumes as noted on this sheet are APPROXIMATE and are to be used only to aid in the scheduling of VOC and SOC sampling in the ICA. Ground water plumes associated with the M3, Colorado Ave, NAD, and HEIP subsites are NOT SHOWN.

LEGEND

- TCE > 5ppb
- PCE > 5ppb
- 5 to 25 ppb CCL4
- >100 ppb CCL4
- 0.5 to 1.0 ppb EDB
- Approximate Plume Location (Unverified Location)
- PAH
- 25 to 100 ppb CCL4
- 0.05 to .5 ppb EDB
- 1.0 ppb EDB plus

Date: 3-27-07

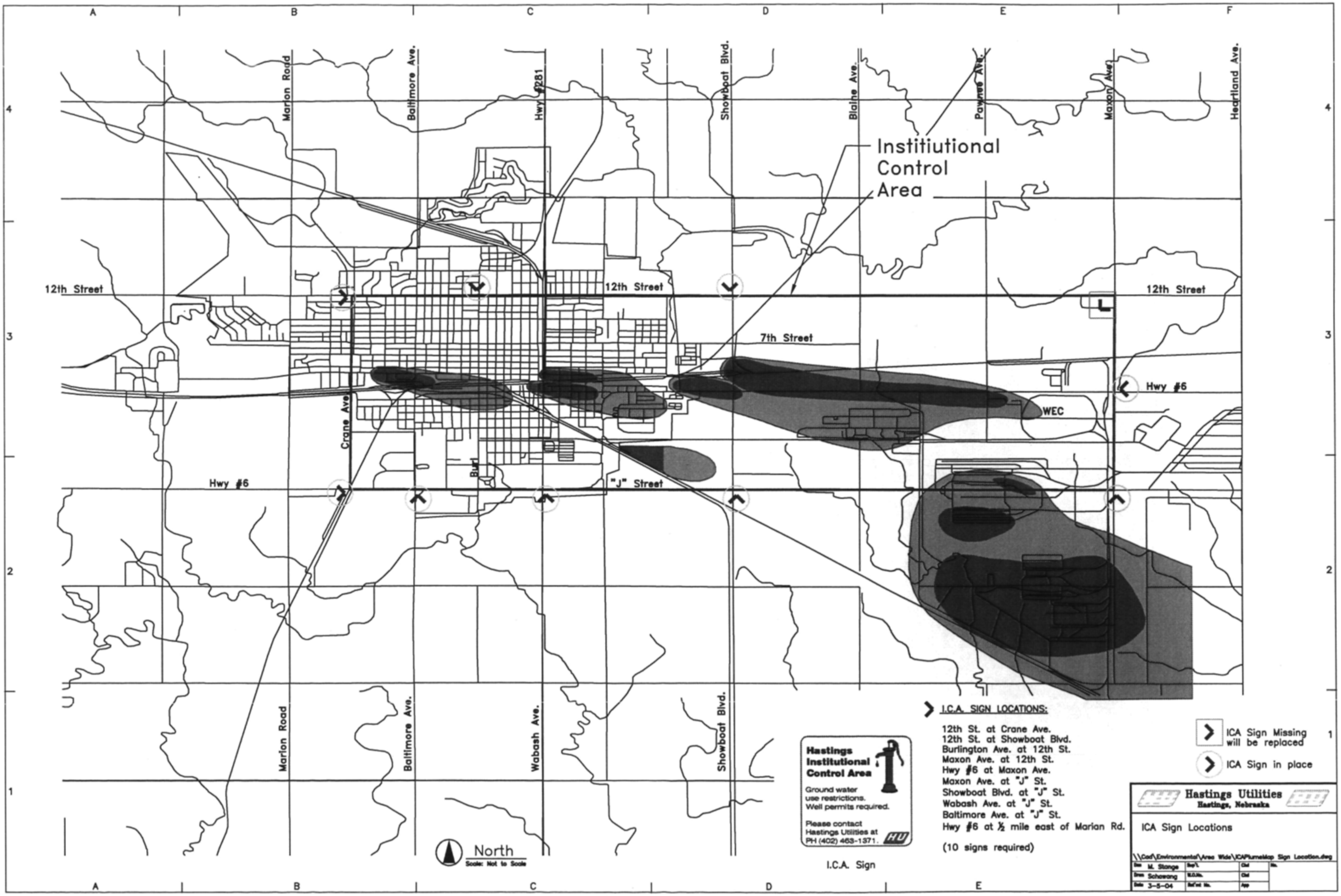
North
Scale: 1"=1000'-0"±

\\Cad\Environmental\Area Wide\ICAPlumeAerialUpdate.dwg

Hastings Utilities
Hastings, Nebraska

Description: Areas of Ground Water Contamination.

1 of 1


Institiutional Control Area
12th Street
7th Street
Hwy #6
"J" Street
WEC
Marion Road
Baltimore Ave.
Hwy #281
Showboat Blvd.
Blaine Ave.
Pawnee Ave.
Maxon Ave.
Heartland Ave.
Crane Ave.
Burl
Wabash Ave.
North
Scale: Not to Scale
Hastings Institutional Control Area
Ground water use restrictions. Well permits required.
Please contact Hastings Utilities at PH (402) 463-1371.
HU
I.C.A. Sign
I.C.A. SIGN LOCATIONS:
12th St. at Crane Ave.
12th St. at Showboat Blvd.
Burlington Ave. at 12th St.
Maxon Ave. at 12th St.
Hwy #6 at Maxon Ave.
Maxon Ave. at "J" St.
Showboat Blvd. at "J" St.
Wabash Ave. at "J" St.
Baltimore Ave. at "J" St.
Hwy #6 at ½ mile east of Marian Rd.
(10 signs required)
ICA Sign Missing will be replaced
ICA Sign in place
Hastings Utilities
Hastings, Nebraska
ICA Sign Locations
\\Cad\Environmental\Area Wide\ICAPlumeMap Sign Location.dwg
M. Stange
Schowang
3-5-04

Jeremy Groves

From: Gresham.Bill@epamail.epa.gov
Sent: Thursday, April 05, 2007 4:02 PM
To: Jeremy Groves
Cc: Zurbuchen.Brian@epamail.epa.gov; Sommerhauser.Darrell@epamail.epa.gov
Subject: EPA costs for OUs 2, 6, and 12

Hi Jeremy

Please see the following tables for costs associated with OUs at the various subsites. The costs shown are associated only with O & M activities at the subject OUs. Let me know if you have any questions or comments. *Thanks*

Bill

OU 2 (North Landfill)

YEAR	EPA COST	PRP COST
2002	$0	$
2003	$0	$
2004	$0	$
2005	$0	$
2006	$0	$

In 2002, after reviewing data collected during five years of operation of Well D, EPA concluded that the FAR-MAR-CO groundwater revoval action had successfully reduced risk associated with the North Landfill TCE plume to less than the interim action level. Therefore, implementation of the interim remedial action selected by EPA in the 1991 interim remedial action ROD for North Landfill was no longer necessary. As a consequence, during this 5-year period, until after adoption of the August 2006 final action ROD, no costs on OU 2 could be considered O & M.

OU 6 (FAR-MAR-CO)

YEAR	EPA COST	PRP COST
2002	$4,117.95	$
2003	$6,494.77	$
2004	$7,931.38	$
2005	$6,805.23	$
2006	$6,423.70	$

During years 2002 and 2003, all costs were considered O & M, associated with attainment of the interim remedial action. A 50 percent multiplier was applied to the 2004 through 2006 costs; half of the costs were considered O & M, half were considered associated with the final remedial action FS (not O & M). The costs shown in this table for the subject years reflect the application of that multiplier, so only half of the total costs for those years is shown.

OU 12 (Second Street)

YEAR	EPA COST	PRP COST
2002	$0	$
2003	$0	$
2004	$0	$
2005	$0	$
2006	$0	$

During the subject period, no costs associated with EPA work on this OU are considered to be related to O & M. EPA completed the final action ROD for OU 12 in September 2006. Work is currently in the RD phase, so no O & M costs have been incurred as of April 2007.

Jeremy Groves

From: Gayle McClure [g_mcclure@dutton-lainson.com]
Sent: Thursday, April 12, 2007 5:18 PM
To: Jeremy Groves; hydrotrace@inebraska.com
Subject: 2002 through 2006 Well #3 costs

Jeremy and Roy;

Following are the above reference costs you requested.

	Oversite Costs	O&M Costs	Monitoring Costs
2002	$333119.76	-0-	$9469.08
2003	-0-	$559.80	$2581.47
2004	$7408.51	$8212.52	$22062.27
2005	$424.62	$15202.97	$5259.13
2006	$1142.44	$6909.29	$5684.67

Please let me know if you need additioal information.

Gayle McClure

North Landfill (OU 2) Groundwater Costs

Year	Sampling	Util/Repairs	Engineering	Misc.	EPA Resp.	Total
2002	73,596.51	13,246.66	30,000.00	253.34	2,406.90	119,503.41
2003	47,171.86	16,159.60	0	214.68	4,545.10	68,091.24
2004	49,852.13	34,014.04	4,024.99	3,059.52	8,281.94	99,232.62
2005	52,160.30	21,362.52	21,326.86	394.32	9,572.34	104,816.34
2006	53,009.14	23,815.82	26,144.44	279.66	36,101.90	139,350.96

North Landfill (OU 10) Source Control Costs

Year	Sampling	Util/Repairs	Engineering	Misc.	EPA Resp.	Total
2002	0			5,903.70	2,694.67	8598.37
2003	0			5,903.70	Incl. Below	5903.70
2004	0			4,416.70	9,520.52	13937.22
2005	0			4,416.70	4,595.30	9012.00
2006	0			4,416.70	14,551.16	18967.8

For source control, Roy Spalding did some soil sampling during 2000 and 2001. There might be a small amount of this in the 2002 groundwater sampling invoices, but we will show this as a 0 in this table.

Also including an estimate in the Miscellaneous column for City and Dutton Lainson financial assurance costs for source control. City's costs were as follows, and am using double these figures:

NLF - Source Control - November 2002 $2,951.85

NLF - Source Control - November 2003 $2,951.85

NLF - Source Control - November 2004 $2,208.35

NLF - Source Control - November 2005 $2,208.35

NLF - Source Control - November 2006 $2,208.35

Farmarco (OU 6) Groundwater Costs

Year	Sampling	Util/Repairs	Engineering	Misc.	EPA Resp.	Total
2002	37,751.08	18,269.20	15,000.00	126.67	1,203.45	72,350.40
2003	20,049.11	11,950.45	0	107.34	2,272.55	34,379.45
2004	21,325.57	12,462.27	0	1,446.26	4,140.97	39,375.07
2005	30,109.03	13,040.06	0	113.66	4,786.16	48,048.91
2006	22,904.52	13,252.26	0	56.33	9,352.57	45,565.68

Notes:

1. The "Sampling" column consists of what was paid to Hydro-Trace. The Hydro-Trace charges were shared among Morrison Enterprises, the City of Hastings, and Dutton Lainson Company.

2. The "Util/Repairs" column consists of what was paid to Hastings Utilities for Well D operation. The Hastings Utility charges were shared among Morrison Enterprises, the City of Hastings, and Dutton Lainson Company.

3. The $15,000 shown in the "Engineering" column was the Morrison Enterprises share of what was paid to Hydro-Trace for preparation of the 5 Year Report submitted to EPA in 2002.

4. The "Misc." column would include such items as insurance costs.

5. The "EPA Resp." column shows response costs paid to EPA by Morrison Enterprises.

South Landfill (OU 5) Source Control and Groundwater Costs

Year	Sampling/ Consulting	Cap Construction	Misc.	EPA Resp.	Total
2002	48,313.87	0	0	0	48,313.87
2003	22,245.96	0	0	815,000.00	837,245.96
2004	4,556.25	0	5,000.00	54,927.92	64,484.17
2005	8,535.00	607,068.75	5,000.00	58,632.41	679,236.16
2006	18,163.76	0	5,000.00	32,925.95	56,089.71

Sampling/Consulting. See attached chart.

Cap Construction. Certified September 23, 2005, consists of capital costs of $474,068.75 (paid by Duttons and Dravo), and Engineering Costs of $133,000.00 (City in-kind).

Miscellaneous. The City began paying a fee for its Wells Fargo Letter of Credit in 2004, in the amount of $2,532.28 per year. Amount is estimated for 2004, 2005, and 2006 to cover what both the City and Dutton Lainson is paying for LOC costs.

EPA Response Costs. The $815,000 paid in 2003 represents the amount of Past Response Costs paid by Dravo, Dutton Lainson, and Concrete Industries pursuant to the November 12, 2003 Consent Decree. The payments in 2004, 2005, and 2006, are for Interim and Future Response Costs.

March 29, 2007

SLF GROUNDWATER SAMPLING/CONSULTING COSTS			
INV. DATE	VENDOR	ACTIVITY	TOTAL
2002	Arcadis	Cap Model	43,129.51
Dec 9, 2002	PWC	Costs Review	5,184.38
Total for 2002			**48,313.87**
2003	Arcadis	Cap Model	2,137.70
Jan 24, 2003	PWC	Costs Review	13,868.63
Nov 17, 2003	Hydro-Trace	Sampling	6,239.63
Total for 2003			**22,245.96**
Jan 8, 2004	Hydro-Trace	Sampling	**4,556.25**
Aug 11, 2005	Seagull	Methane Gas Testing	7,910.00
Oct 2, 2005	Hydro-Trace	Baseline Assessment	625.00
Total for 2005			**8,535.00**
Jan. 10, 2006	Olsson	Methane Gas Testing	8,385.00
2006	Olsson	Sampling Plan (Pd. by Duttons/Dravo)	9,308.62
2006	Hydro-Trace	Consulting (Pd. by Duttons)	470.14
Total for 2006			**18,163.76**

h\epa\awide\5 yr rpt 2007\slf sampl consult

Area Wide (OU 19) Costs

Year	Consulting	In-Kind	Misc.	EPA Resp.	Total
2002	21,496.72	12,00 0	0	0	21,496.72
2003	0	12,00 0	0	2,250,000.00	2,250,000.00
2004	0	12,00 0	1,500.00	20,442.91	21,942.91
2005	0	64,427.11 ~~52,427.11~~	1,500.00	18,016.99	71,944.10
2006	0	Not determined	1,500.00	0	1,500.00

Consulting. Four PRP's, including the City, paid PriceWaterhouseCoopers $21,496.72 in 2002 for Dale Jensen's review of Area Wide past costs.

Miscellaneous. The City began paying a fee for its Wells Fargo Letter of Credit in 2004, in the amount of $1,500.00 per year.

EPA Response Costs. Five parties paid Past Response Costs as follows:

CPI	150,000
Dutton	545,000
Morrison	500,000
Dravo (Cash out)	850,000
Navy	205,000
Total	2,250,000

On January 23, 2006, we provided EPA with a summary of City Engineering/Hastings Utilities staff time and expenses for the Area Wide work from April, 2004 through November 1, 2005.

Costs Summary - April, 2004 through November 1, 2005.	
Marty's December 2, 2005 email shows staff time and expenses of	$12,183.37
Marty's December 8, 2005 email shows staff time and expenses of	$30,166.26
Kim's January 20, 2006 email shows staff time of	$9,784.22
Kim's January 23, 2006 email shows expenses of	$293.26
Totals	$52,427.11

EPA SUB-SITE #5

South Landfill

Operations & Maintenance

Year	Inspections	Mow/Maint	Repairs	TOTAL
2005	75.96	0.00	0.00	75.96
2006	228.00	432.00	0.00	660.00
2007	57.00	0.00	0.00	57.00
TOTAL	360.96	432.00	0.00	792.96

Updated 3/26/07

EPA SUB-SITE #10

North Landfill/Edwards

Operations & Maintenance

Year	Inspections	Mow/Maint	Repairs	TOTAL
2000	159.00	1,556.80	159.00	1874.80
2001	159.00	778.40	0.00	937.40
2002	180.00	400.00	0.00	580.00
2003	193.56	492.12	0.00	685.68
2004	213.48	844.64	0.00	1,058.12
2005	227.88	863.00	0.00	1,090.88
2006	228.00	864.00	0.00	1,092.00
2007	57.00	0.00	0.00	57.00
TOTAL	1,417.92	5,798.96	159.00	7,375.88

Updated 3/26/07

EPA Fact Sheet

Region 7

Iowa
Kansas
Missouri
Nebraska

Fact Sheet

April 2007

Third Five-Year Review to Begin
Hastings Ground Water Contamination Superfund Site
Hastings Adams County Nebraska

Introduction

The U S Environmental Protection Agency (EPA) conducts regular checkups called five year reviews on Superfund sites where cleanups are in progress or have been completed These reviews are required by the Superfund law [42 U S C Section 9621 (c)] EPA Region 7 and the city of Hastings have initiated the third five year review of the Hastings Ground Water Contamination Superfund Site in Hastings Adams county Nebraska

Site Background

EPA began investigating sources of ground water contamination in the Hastings area in 1984 after high levels of contaminants were found in three municipal wells used to supply drinking water to the public The contamination occurred primarily as a result of releases of hazardous substances from a former coal gasification plant solvents from local industries and grain fumigants from grain storage facilities In 1986 the site was placed on the National Priorities List a list of sites in the nation eligible for investigation and remediation under the Superfund Program

The Hastings Ground Water Contamination site covers the central industrial area of the city of Hastings and areas outside the city limits For purposes of response actions the site has been divided into seven subsites The names of these sites identify their location within the Hastings area The subsites are known as

- Far Mar Co
- North Landfill
- Second Street
- Colorado Avenue
- Well Number 3
- South Landfill
- Naval Ammunition Depot (NAD)

The U S Army Corps of Engineers (USACE) is conducting the five year review for the NAD while EPA is conducting the five year review for the other six subsites

EPA is coordinating multiple response actions at the Hastings site The actions taken or planned serve to reduce contamination at each of the subsites so the ground water quality will meet the federal safe drinking water standards

Five Year Review

EPA and the city of Hastings will study site information during this third five year review and inspect the site to determine if the remedies continue to protect human health and the environment EPA and the state encourage members of the community to ask questions and report any concerns about the site

A final report will be prepared at the end of the five year review and will be placed in the site administrative record This is expected to be available to the public mid year 2007

Public Availability Session

EPA will hold an Availability Session for the public after the five year review report has been completed and placed in the site administrative record EPA project managers will be at the session to discuss the findings of the five year review the site response actions conducted to date and the next steps for the site cleanup The location and date of the meeting will be announced in the Hastings *Tribune*

Additional Information

The site administrative record is available at the following locations during normal business hours

EPA Records Center
901 N Fifth St
Kansas City Kan

Hastings Public Library
517 W Fourth St
Hastings Neb

Questions or requests for information about the five year review process can be submitted to

Fritz Hirter
Community Involvement Coordinator
EPA Region 7
901 N Fifth St
Kansas City KS 66101
Toll free (800) 223 0425
e mail hirter fritz@epa gov

Region 7

Iowa
Kansas
Missouri
Nebraska

Fact Sheet

July 2007

Third Five Year Review Completed
Hastings Ground Water Contamination Superfund Site
Hastings Adams County Nebraska

Introduction

The U S Environmental Protection Agency (EPA) conducts regular checkups called five year reviews on Superfund sites where cleanups are in progress or have been completed These reviews are required by the Superfund law [42 U S C Section 9621 (c)] to make sure the cleanups remain protective of human health and the environment EPA Region 7 and the city of Hastings have completed the third five year review of the Hastings Ground Water Contamination Superfund Site in Hastings Adams County Nebraska

Availability Session

Wednesday July 18 2007
Hastings Public Library
Auditorium
4 to 6 p m

EPA project managers will hold an informal availability session to discuss the findings of the five year review the site response actions conducted to date and the next steps for the site cleanup

Site Background

EPA began investigating sources of ground water contamination in the Hastings area in 1984 after high levels of contaminants were found in three municipal wells used to supply drinking water to the public The contamination occurred primarily as a result of releases of hazardous substances from a former coal gasification plant solvents from local industries and grain fumigants from grain storage facilities In 1986 the site was placed on the National Priorities List a list of sites in the nation eligible for investigation and remediation under the Superfund Program

The Hastings Ground Water Contamination site (HGWCS) covers the central industrial area of the city of Hastings and areas outside the city limits For purposes of investigation and remediation the site was divided into seven subsites The names of these subsites identify their location within the Hastings area and are known as

FAR MAR CO — Colorado Avenue
North Landfill — Well Number 3
Second Street — South Landfill
Former Naval Ammunition Depot (NAD)

The U S Army Corps of Engineers (USACE) is conducting the five year review for the former NAD while EPA conducted the five year review for the remainder of the HGWCS

EPA is coordinating multiple response actions at the subsites The actions taken or planned serve to prevent exposure to the contamination and to reduce contamination at each of the subsites so the ground water quality will meet the federal safe drinking water standards

Five Year Review Process

During this third five year review EPA and the city of Hastings reviewed site operations and maintenance records monitoring data and other reports and inspected each of the subsites of the HGWCS A technical assessment was done to determine if the remedies are performing as intended The assessment also compared actual costs with estimated remedy costs In addition the assessment sought to ensure targeted cleanup levels are protective of human health and the environment and that the remedy meets state and federal requirements EPA evaluated the progress made since the last five year review and identified potential issues and follow up actions EPA and the city of Hastings subsequently prepared a Five Year Review Report that documents this review

Results of the Five Year Review

EPA believes the combination of the subsite and area wide remedies continue to protect human health because current and future property owners are prohibited from domestic use of ground water unless it is demonstrated through sampling that the ground water is suitable for use However additional monitoring is necessary to confirm the protectiveness of these actions Target cleanup levels for several of the subsites are interim levels and are not considered protective over the long term

The long term effectiveness of the remedies cannot be ascertained because final remedies have not been selected or implemented at all of the subsites

There have been no changes to the physical condition of the site or the surrounding land use that would affect the remedy

Additional Information

The five year review report and the complete site administrative record can be reviewed at the following locations during normal business hours

EPA Records Center
901 N Fifth St
Kansas City Kan

Hastings Public Library
517 W Fourth St
Hastings Neb

Questions or requests for information about the five year review process can be submitted to

Fritz Hirter
Community Involvement Coordinator
EPA Region 7
901 N Fifth St
Kansas City KS 66101
Toll free (800) 223 0425
e mail hirter fritz@epa gov

Second Street

2.0 Operable Unit Background

2.1 ROD Requirements

As described in Section 1.1, the interim RA components for OU20 consist of the following three treatment systems: 1) the Source Area extraction and treatment systems (includes the groundwater extraction and treatment and the SVE systems); 2) Pine Avenue IWS and treatment system; and 3) downgradient groundwater plume in-situ bioremediation treatment. The first two systems were installed as part of removal actions and the third treatment system for the downgradient plume was installed following issuance of an interim ROD (EPA, 2003b). Subsections 2.1.1 and 2.1.2 address the removal action objectives and specific requirements defined for each of the treatment systems installed in 1996 and 2001. The remedial action objectives (RAOs) for the OU20 ROD are discussed in Sections 2.1.3 and 2.1.4.

2.1.1 Source Area Treatment System Requirements

The Source Area RA component was initially implemented as a removal action. As defined in the 1995 EE/CA, the removal action objectives were as follows (MK, 1995b):

- *To prevent the ingestion, inhalation, or direct contact with contaminants in the vadose zone of the source area; and to prevent the migration of vadose zone contaminants that would result in continued degradation of ground water quality.*
- *To control the migration of the Subsite ground water plume such that no additional municipal water supply wells will be jeopardized.*
- *To implement a response action that will stabilize the threats associated with contamination in a way that will contribute to the performance of future remedial actions for the Subsite.*

For the Source Area removal action, EPA adopted the interim groundwater goals of 100 ug/L for benzene and naphthalene.

The selected removal action remedies consisted of: groundwater extraction and treatment and SVE.

The discharge option of groundwater following treatment consisted of discharge to Heartwell Lake (a City lake) in accordance with a variance of National Pollutant Discharge Elimination System (NPDES) requirements. The original NPDES permit and associated requirements were issued by the NDEQ in February 1998 (NDEQ, 1998).

However, these original NPDES requirements were superseded by NDEQ in 2002 (NDEQ, 2002). Table 2-1, presented at the end of this section, provides a summary of the 2002 NPDES requirements.

2.1.2 Pine Avenue Treatment System Requirements

The Pine Avenue RA treatment system was also initially implemented as a removal action. As defined in the EE/CA Addendum, the removal action objectives for the downgradient groundwater plume were as follows (BVSPC, 1999a):

- *To minimize threats to the local aquifer, which serves as the only source of drinking water, by reducing the highest levels of contaminants in the groundwater.*
- *To control the migration of the Subsite downgradient groundwater plume so that no additional municipal water supply wells will be jeopardized.*
- *To implement a response action that will stabilize the threats associated with contamination in a way that will contribute to the performance of future remedial actions for the Subsite.*

In addition to the removal action objectives listed above, contaminant specific goals were established for the removal action and for cleanup goals (BVSPC, 1999a). A summary of these contaminant specific goals is presented in Table 2-2.

2.1.3 In-situ Bioremediation Treatment Requirements

The in-situ bioremediation RA component was implemented following the preparation of an FS, approval of the interim ROD, and preparation of the remedial design. The RAOs for the in-situ bioremediation treatment area (downgradient plume area to the east of the Pine Avenue system), as first defined in the in the FS, were as follows (BVSPC, 2002c):

- *Prevent further migration of the Downgradient Plume.*
- *For the portion of the Plume downgradient of Pine Avenue, remediate or contain the contaminated groundwater to reduce risk.*
- *Reduce the contaminant levels in the Plume to levels less than maximum contaminant levels (MCLs), to levels where the excess cancer risk is less than* $1x10^{-6}$*, or to levels where the Hazard Quotient is less than 1.0, whichever is less.*

- *Prevent further degradation of the aquifer's groundwater.*

These interim RA component requirements were incorporated into the overall requirements established in the interim ROD for the entire OU20 RA. A summary of these requirements is presented in Section 2.1.4.

2.1.4 Overall Scope of OU20 Remedial Action

The overall scope and requirements for the entire OU20 remedial action (remedy) were provided in the interim ROD (EPA, 2003b). The interim ROD goals included RAOs that are consistent with the goals for the Area-Wide HGWCS and long-term Subsite specific objectives.

The HGWCS common goals be addressed by the Subsite remedy include containing and removing contaminants in the groundwater and the reduction of cancer risk levels to no more than an estimated one additional cancer case in a population of 1,000,000 based on an assumed 30-year exposure period (EPA, 2003b). Specific RAOs defined in the Interim ROD for OU20, which support these HGWCS goals, are as follows (EPA, 2003b):

- T*o prevent further migration and further worsening of the downgradient plume.*
- *To remediate or contain the contaminated ground water in order to reduce risk.*
- *To provide a remedy which will achieve the long-term objectives listed below when combined with a suitable remedy for the source area (OU12). The EPA anticipates that the source area will be the subject of a separate ROD at a later date.*

In addition to these RAOs, the overall long-term objectives for this Subsite are:

- *To reduce the contaminant levels in the ground water to levels less than MCLs and the maximum contaminant level goals (MCLGs), if they are greater than zero, pursuant to the Safe Drinking Water Act and/or to state clean up levels derived from Nebraska Title 118 regulations, or to levels where the excess cancer risk is computed as being less than one additional cancer per million persons of population (1 x 10-6) or where the Hazard Index is less than 1.0, so that the aquifer can be restored to its beneficial use.*
- *To prevent further degradation of the ground water.*

The selected remedy defined in the interim ROD included the following components (EPA, 2003b):

- Continued operation of the Source Area pump-and-treat and soil vapor extraction systems;
- Continued operation of the Pine Avenue in-well aeration treatment system;
- In-situ bioremediation treatment, adding oxygen release compounds to the aquifer; and
- Extraction of groundwater combined with treatment by granular activated carbon;
- Long-term groundwater monitoring of the effectiveness of the above systems.

As discussed in Section 1.1, the top three treatment components and the last monitoring component have been implemented as part of this interim RA. The fourth treatment component listed (extracted groundwater combined with treatment by granular activated carbon) has been postponed and will only be implemented in the future if needed.

In addition to the RAOs defined above, overall contaminant specific groundwater cleanup criteria have also been established (EPA, 2003b). A tabular summary of contaminant specific groundwater cleanup criteria has been presented in Table 2-3 (end of this section).

2.2 Remedial Design

As discussed in Section 2.1, the design and implementation of the three RA components were done at different times and under different programs. The first two RA components (e.g., Source Area component and Pine Avenue IWS component) were implemented as removal actions presented and evaluated in EE/CAs. The third RA component (in-situ bioremediation treatment) was implemented in accordance to the interim ROD and the remedial design for the entire OU20. Because of this phased implementation approach, each of the three RA components was designed under separate efforts. The subsections that follow provide a brief synopsis of the design efforts for each RA component.

2.2.1 *Source Area Treatment System Design*

The initial design for the construction and implementation of the Source Area RA component was prepared and implemented by MK. This initial design (provided as a removal action) included a groundwater extraction and treatment system and a SVE system. Following is a summary of the documents prepared for this design:

- Removal Action Work Plan (MK, 1996b). This Work Plan contained an overall description and design analysis of the removal action systems. Several site-specific plans related to the design of this system were also provided in the Work Plan document including: the Site Safety and Health Plan (SSHP); the Construction Quality Assurance Plan (CQAP); the Waste Management Plan; the Operations and Maintenance Plan; and the Quality Assurance Project Plan (QAPP) Sampling and Analysis Plan (SAP).

- Technical Specification and Drawings. Three sets of technical specifications and drawings were issued for this initial design. The first set consisted of specifications and drawings for the installation of the soil gas and water wells used within the Source Area RA component (Appendix C of MK, 1996b). The second set consisted of specifications for the equipment required for the SVE and groundwater treatment systems (Appendix E of MK, 1996b). The third set consisted of specifications and drawings required for the construction of the treatment building and installation of equipment (MK, 1996f).

During the removal action start-up activities, and through subsequent operation of the groundwater system, the need for additions to both the treatment building and the groundwater treatment system was identified. Heavy oil/tar waste contamination was noted in groundwater pumped from extraction well MW09. As a result, BVSPC was tasked with the design of a treatment facility (building) addition and additions to the water treatment system, which included the procurement and installation of an oil water separator (OWS) and associated appurtenances. Following is a summary of the documents that were prepared for this design effort:

- Technical Specifications and Drawings. Technical specifications and drawings were issued for this design effort (BVSPC, 1998a). The specifications and drawings included design, procurement, and installation provisions for the building addition, OWS, and associated appurtenances.

- CQAP (BVSPC, 1998b). This plan provided construction QA and QC provisions for the treatment building and system addition work.

2.2.2 *Pine Avenue Treatment System Design*

The Pine Avenue treatment component design was prepared and implemented by BVSPC. This design (provided as a removal action) included provisions for an IWS and treatment system. Following is a summary of the documents prepared for this initial design:

- Basis of Design Report (BVSPC, 2000a). This report contained an overall description and design analysis of the removal action system. Several site-specific plans related to the design of this system were also provided in the design report including: the SSHP; the CQAP, the Waste Management Plan; the Operations and Maintenance Plan; and the QAPP/SAP.

- Technical Specifications and Drawings. Technical specifications and drawings were issued for the construction and installation of the IWS wells; procurement and installation of the equipment and associated appurtenances, and start-up testing and services (BVSPC, 2000h).

2.2.3 *In-situ Bioremediation Treatment Design*

The in-situ bioremediation treatment component design was prepared and implemented by BVSPC. The design of this treatment component included the installation of 14 in-situ treatment wells. Following is a summary of the documents prepared for this design effort:

- Design Analysis Documents. For this design effort, 30, 60, 90, and 95 Percent Design Analysis documents were prepared. The 95 Percent Design Analysis presents the final design of the in-situ bioremediation treatment component (BVSPC, 2005b).

- Design Analysis Supplement. Following preparation of the final design, a supplement to the final design (95 Percent Design Analysis Supplement) was prepared which addressed potential actions that could be implemented to address plume remnants located in the vicinity of Duncan Field and further east (i.e., to the east of the area of treatment known as the East Fence) (BVSPC, 2005f). However, at the time of implementation of the in-situ bioremediation RA treatment component (e.g., Spring and Summer of 2005) the work authorized by EPA was limited to installation of the 14 in-situ treatment wells.

- Site-Specific Design Plans. Several site-specific plans related to the design of this treatment component were developed including: the SSHP (BVSPC, 2005c); the QAPP/SAP (BVSPC, 2005h); and the Operation and Maintenance Plan (BVSPC, 2006e).

- Technical Specification and Drawings. Technical specifications and drawings were issued as part of the subcontract documents for the construction and installation of the injection points and several associated monitoring wells (BVSPC, 2005d). The technical specifications included not only construction and installation details and requirements, but also included procedures for waste management and quality control to be implemented during the construction activities.

2.3 Treatment System Descriptions

The following subsections provide brief descriptions of the three treatment components implemented for the OU20 RA.

2.3.1 Source Area Treatment System Description

The Source Area treatment system component consists of a groundwater extraction and treatment system and a SVE system.

The Source Area groundwater extraction and treatment system is comprised of the following major components:

- Groundwater extraction wells (four wells);
- An OWS (used primarily as pre-treatment for extraction well MW09);
- An equalization tank component (consisting of an equalization tank, a transfer pump, and a filter bag system);
- An air stripper component (consisting of an air stripping tank/tower, an air stripper blower, and a water transfer pump); and
- GAC units (two units operated in series).

A simplified flow diagram for the Source Area groundwater extraction and treatment system is shown in Figure 2-1. As indicated in this figure, the treated groundwater (or water effluent) is discharged to a City storm sewer which ultimately discharges to surface water (the City's Heartwell Lake). The vapor stream generated can be treated thermally (using the catalytic oxidizer) or discharged directly to the atmosphere.

The Source Area SVE extraction and treatment system is comprised of the following major components:

- SVE extraction wells (six shallow wells, two intermediate, and two deep wells);
- The SVE blower component (consisting of a vapor water separator, a vapor filter, a vacuum blower, and a silencer);

A simplified flow diagram for the Source Area SVE system is shown in Figure 2-2. As indicated in this figure, the condensate water generated from this system is directed to and treated within the Source Area water treatment system prior to discharge. The vapor stream generated can be treated thermally (using the catalytic oxidizer) or discharged directly to the atmosphere.

When operations began, the catalytic oxidizer provided thermal treatment of vapors generated from both the water and SVE treatment systems. However, after significant reductions in contaminants in the vapor streams generated from the SVE and air stripper, the need for this treatment was re-evaluated and thermal treatment was found to not be required (EPA, 2003b). As a result, operation of the catalytic oxidizer ceased in 2004 and the vapors generated were rerouted to allow for direct discharge to the atmosphere.

2.3.2 Pine Avenue Treatment System Description

The Pine Avenue IWA treatment system is comprised of the following major components:

- IWS wells (two wells);
- A carbon heat exchanger;
- GAC units (four units operated in two stages).
- A blower package (consisting the blower, a filter, a silencer, and blower enclosure);
- The primary heat exchanger (consisting of the exchanger and the exterior cooling air system); and
- A carbon dioxide addition (bio-fouling prevention) system.

A simplified process flow diagram for the Pine Avenue IWA treatment system is shown in Figure 2-3. As indicated in this figure, this is a closed loop system with contaminant removal being provided by vapor phase GAC units.

2.3.3 In-situ Bioremediation Treatment Description

The in-situ bioremediation treatment component design was prepared and implemented by BVSPC. This treatment component is primarily composed of two sets of injection wells (called injection points), nine points at Pine Avenue and five points east of California Avenue. These two groups of points are referred to as the Pine Avenue Fence and the East Fence. For reference the locations of these two treatment fences are shown in Figure 1-2. Based on groundwater monitoring results, each of the injection points was constructed with three screened intervals where treatment can be provided: from 156 feet to 164 feet below ground surface (bgs); 166 feet to 174 feet bgs; and 176 feet to 184 feet bgs. A diagram of a typical injection point is shown on Figure 2-4. To reach portions of the aquifer below the BNRR railroad tracks, five of the injection points were drilled at a slant (angles ranging from approximately 4 to 10 degrees).

The in-situ bioremediation treatment is conducted by the injecting a slurry of clean water and a slow oxygen release compound into the aquifer formation through each of the three screens at each of the injection points. Over time (approximately 1 year) the compound releases oxygen into the groundwater as the groundwater flows past the injection points. Figure 2-4 also shows how the oxygen diffuses into the aquifer after injection. Following injection, local microbes in the aquifer use the additional oxygen provided to biodegrade the Plume contaminants. The effectiveness and progress of the treatment is monitored through chemical analysis and field measurement of monitoring wells throughout the Plume, including upgradient monitoring wells. The levels of contaminants are also monitored to determine how much treatment chemical will be needed for the next injection at each Fence. The oxygen levels at the fences and in downgradient monitoring wells are tracked, to determine when the next injection of treatment chemical is necessary. A total of three injections were planned for this RA treatment component East fence with the first two being implemented in Fall 2005 and Fall 2006, and the third injection being projected for Fall of 2007. Injections at the Pine Avenue fence will continue after that, and as required may continue until the Source Area remediation is completed.

In addition to the injection treatment, based on the elevated levels of contaminants in the BW14 wells from the Fall 2006 groundwater sampling results, EPA made a decision to enhance the treatment in this area and the area directly downgradient of this area (known as the "tail" portion of the downgradient plume) by additional "passive" bioremediation treatment (see Section 5.3.4 for specific results for BW14 wells). The passive treatment involved the addition of oxygen to the aquifer from "socks" containing a slow oxygen release compound. These socks were installed in monitoring well BW01, which is located adjacent to the BW14 wells (see Figure 1-2). Well BW01 is a 4-inch diameter monitoring well that is fully screened over the entire aquifer from 120 feet bgs (typical groundwater elevation) to 215 feet bgs. Because of BW01's larger well diameter (4 inches instead of the more typical 2-inch diameter) and long screened interval, several "sock" canisters were suspended over the entire interval of groundwater contamination defined by well BW14 (e.g., 165 to 200 feet bgs). A diagram of this passive treatment approach and further details of the sock canister installation are provided for reference in Appendix C.

Discussion of Second Street OU 20 operating costs.

Operating costs presented in Table 1 reflect the EPA's costs for October 2004 through December 2006. The information shown is based on two contractor work assignments funded with "remedial action" dollars. This funding is distinguished from removal action dollars which were used during the Non Time Critical Removal Actions (NTCRA) for the Second Street OU 20 projects. Subsequent to completion of the Interim Action Record of Decision (2003) and the State Superfund Contract (2004), the project was being transitioned from removal to remedial. Therefore significant costs incurred by EPA prior to completion of the transition were paid with "removal" dollars, whereas after the transition was completed (mid 2005), all costs were paid with "remedial" dollars.

The EPA believes the total O & F costs for 2006 ($570,106.67) presented in Table 1 should be representative for projecting costs to be incurred in 2007. As explained above, the O & F costs for 2005 presented in Table 1 do not represent all of the EPA's costs for operating the treatment systems at the subsite. Looking beyond 2007 - 2008, the EPA expects project costs to decline somewhat. The EPA anticipates the need for optimizing the Second Street OU 20 remedy to reduce overall project costs.

Summary of O&F Costs (January 2004-December 2006)
OU20 Interim RA - Secound (Hastings) Subsite

(Data Source: Table D-2, Appendix D, Draft Interim RA Report; Prepared by

O&F Cost Summary

Reporting Month	Year	Source Area RA Component	Pine Avenue RA Component
October	2004	$526.39	$526.39
November	2004	$1,944.26	$1,944.26
December	2004	$711.33	$711.33
2004 Totals		**$3,181.98**	**$3,181.98**
January	2005	$3.71	$3.71
February	2005	$6,231.90	$0.00
March	2005	$3,079.08	$0.00
April	2005	$27,362.58	$0.00
May	2005	$8,358.91	$0.00
June	2005	$7,535.87	$0.00
July	2005	$21,547.11	$954.93
August	2005	$15,683.71	$3,080.28
September	2005	$22,545.31	$3,528.08
October	2005	$38,445.02	$3,512.56
November	2005	$19,966.20	$2,134.87
December	2005	$13,215.71	$4,256.77
2005 Totals		**$183,975.11**	**$17,471.20**
January	2006	$25,998.52	$23,747.54
February	2006	$25,288.08	$9,048.78
March	2006	$8,025.49	$5,339.76
April	2006	$6,438.34	$6,806.24
May	2006	$1,736.27	$3,045.34
June	2006	$4,456.48	$7,200.67
July	2006	$13,144.14	$10,712.16
August	2006	$8,727.00	$6,812.92
September	2006	$11,358.88	$13,589.03
October	2006	$16,773.90	$6,040.65
November	2006	$170.14	$4,871.67
December	2006	$3,832.00	$5,595.64
2006 Totals		**$125,949.24**	**$102,810.40**
O&F Totals		**$313,106.32**	**$123,463.57**
Cost Data from Invoices: RAC Contract 68-W5-004, Work Assignment 92 and AES Contrac			

BVSPC for EPA Reg VII, March 2007)

In Situ Treatment RA Component	Total All RA Components
$542.34	$1,595.11
$2,003.18	$5,891.70
$732.89	$2,155.55
$3,278.41	**$9,642.36**
$3.82	$11.24
$268.97	$6,500.87
$0.00	$3,079.08
$1,284.82	$28,647.40
$0.00	$8,358.91
$0.00	$7,535.87
$3,068.36	$25,570.40
$3,576.49	$22,340.48
$0.00	$26,073.39
$0.00	$41,957.58
$94,889.49	$116,990.55
$86,536.43	$104,008.91
$189,628.38	**$391,074.68**
$4,253.31	$53,999.37
$19,304.30	$53,641.16
$5,820.26	$19,185.51
$18,419.33	$31,663.91
$25,671.86	$30,453.47
$12,882.72	$24,539.87
$14,599.37	$38,455.67
$10,024.77	$25,564.69
$22,208.55	$47,156.46
$28,229.67	$51,044.22
$18,815.65	$23,857.46
$161,117.24	$170,544.88
$341,347.03	**$570,106.67**
$534,253.81	**$970,823.71**

:t EPS70506, Task Order 0092.

4.0 Chronology of Events

4.1 Chronology of OU20 Events

A chronology of the OU20 events associated with the three RA components is presented in Table 4-1 (located at the end of this section). This chronology includes a summary of the major events from the investigation activities; the remedial action evaluation, design and construction activities; the operation and maintenance activities through December 2006; and the O&F determinations. Although sampling events would be considered as a major events, due to the large number of sampling events that have occurred throughout the history of the implementation of the RA components, a separate summary of the OU20 sampling events has been presented in Table 4-2. In addition to this chronology, more detailed descriptions and chronologies of the construction activities performed for each of the RA components are presented in Section 3.

4.2 Chronology of OU20 Sampling Events

A chronology of OU20 sampling events is presented in Table 4-2 (located at the end of this section). As noted in Table 4-2, the results of several of the sampling events have been provided in Section 5.0.

4.3 References

All references cited throughout this section are listed under their section-specific designations and are further broken out by Table and component and alphabetically in Appendix A.

Tables

Table 4-1
Chronology of OU20 Events

Date	Activity
PRE-REMEDIAL ACTION	
1987-1989	Hastings area RI activities (soil gas surveys, soil sampling, and groundwater sampling) conducted near the Second Street Source Area identified VOCs and PAHs in soils and groundwater (PRC, 1990). The contaminants found were associated with the FMGP operations.
1992-1993	RI activities (soil and groundwater sampling) conducted further defined nature and extent of VOC and PAH contamination at the Source Area (MK, 1995a).
1991-1994	The Foote Oil UST Site RI activities were performed. During this investigation, BETXs from leaking USTs were found in soils and groundwater below the Foote Oil UST, which is immediately to east of Source Area (HWS, 1994).
SOURCE AREA RA COMPONENT	
August 1995	EE/CA Report issued and recommended Source Area removal actions via SVE for onsite vadose zone soils and pump and treatment for containment of groundwater contamination (MK, 1995b).
September 1995	The Removal Action Memorandum for the Source Area removal actions was issued by EPA on September 20, 1995. This Action Memorandum approved the implementation of the EE/CA recommended removal actions (SVE and groundwater pump and treatment) for the Source Area (EPA, 1995).
September 1996	Administrative Order on Consent for implementation of removal actions at Source Area signed between EPA Region VII and City of Hastings (EPA, 1996).
September 1996 – January 1997	Construction of the Source Area systems included three (3) groundwater extraction wells and treatment system and ten (10) SVE wells and treatment system (MK, 1997a). [Details of these construction activities are presented in Section 3.2.1.]
January 5-22, 1997	Start-up of the Source Area removal action systems performed during the week of January 5-12, 1997, and a checklist of outstanding items was developed from the inspection activities performed. From January 13-22, 1997, the checklist items were addressed (MK, 1997a). Transition from Morrison Knudsen construction activities to operations of systems by BVSPC began on January 20, 1997.
April 10, 1998-June 24, 1998	Construction of the Source Area system additions started 4/10/98 and continued through 6/24/98 (BVSPC, 1998e). Additions included the installation of an oil water separator (OWS) to the water treatment system and an addition to the treatment system building to house the OWS. From June 22-24, 1998, the final construction activities for the system additions were completed, testing was performed, and start-up activities performed (6/24/98). [Details of these construction activities are presented in Section 3.2.2.]
July, 1998	Pre-Final Inspection for Source Area system additions was performed on July 6, 1998 (EPA, 1998a).
October, 1998	An O&F Letter was issued to the City of Hastings on October 18, 1998. This letter triggered the start of a 6-month transition period for the operation of the Source Area systems to taken over by the City (EPA, 1998b).
May, 1999	Final inspection items completed. Letter issued on May 12, 1999 (BVSPC, 1999b).
July, 1999	As of July 1, 1999, daily operations and maintenance of the removal action systems taken over from BVSPC by City of Hastings (BVSPC, 1999c).
September 1999	Authorization was obtained from the NDEQ's air quality program division to send spent (and characterized as non-hazardous waste) GAC generated from the Source Area water treatment system to the Hastings Utility Whelan Energy Center (coal-fired electric generating plant) for disposal (NDEQ, 1999).
December 1999	Under the jurisdiction of the NDEQ, operation began for an SVE system installed at the Foote Oil Site (EPA, 2005b).

Table 4-1 (Continued)
Chronology of OU20 Events

Date	Activity
November 2000	NDEQ's Water Quality Division reduced the NPDES compliance sampling reporting from a quarterly to a bi-annual basis (NDEQ, 2000).
March 2004	Following the evaluation of reduced contaminants in the vapor streams (EPA, 2003a), operation of the catalytic oxidizer was discontinued and system vapors were re-vented for atmospheric discharge (BVSPC, 2004b).
August 2004	Water system modifications were performed including replacement of the original (flat bottom) equalization tank with a cone bottom tank. This modification and some integral configuration of piping reduced operator maintenance for this system component (EPA, 2005b).
May 11, 2005	Electrical and mechanical problems occurred in the Source Area SVE vacuum blower. As a result, the blower was replaced in July 2005. However, the SVE system was not restarted until September 2005, to allow for a 3-month rest/ rebound period evaluation (EPA, 2005b).
May through December 2005	A (6-month trial) pilot test of a leased polymer addition system installed upstream of the OWS of the Source Area water treatment system was performed. This test was performed to evaluate the use of this additional treatment component in efforts to reduce O&M efforts. However, the test indicated that increased O&M efforts would be required. Therefore, the leased pilot test equipment was removed and returned to its supplier. (EPA, 2005b).
February 2006	A multi-bag filter unit was installed within the Source Area water treatment system. This new multi-bag unit replaced a single bag unit as part of efforts to reduce maintenance efforts and shutdown time (BVSPC, 2006b).
August 2006	On August 17, 2006, the O&F inspection of the Source Area RA component (treatment systems) was performed in conjunction with the Pine Avenue and in-situ bioremediation RA components (EPA, 2007). A copy of the O&F Inspection Report (and findings) is provided in Appendix B.
December 2006	An additional groundwater extraction well was installed in efforts to enhance the Source Area groundwater extraction system (BVSPC, 2007c).
February 2007	Based on the results of the O&F inspection and meeting, NDEQ agreed with EPA's findings that the Source Area treatment RA component was O&F (NDEQ, 2007). A copy of the NDEQ's O&F approval letter is provided in Appendix B.
PINE AVENUE RA COMPONENT	
May 1999	EE/CA Addendum issued and recommended implementation of a removal action for contaminated downgradient groundwater plume (the Pine Avenue RA component) via in-well groundwater stripping wells (BVSPC, 1999a).
September 1999	The Removal Action Memorandum for Pine Avenue removal action was issued by EPA on September 28, 1999. This Action Memorandum approved the EE/CA recommended Pine Avenue removal action of in-well stripping and treatment for the downgradient groundwater plume (EPA, 1999a).
September–October 2000	Construction activities for the two IWS wells, associated monitoring wells, and associate underground piping were completed. Concrete slabs for drive ways, parking areas and foundations for the treatment bay (the private property owner's extra car wash bay) were completed in November/early December 2000. However, due to weather conditions, the construction of the building was not completed until March 2001 (BVSPC, 2000f). [Details of these construction activities are presented in Section 3.3.]
February/March 2001	Prior to operation of the Pine Avenue IWS well system, baseline groundwater sampling was performed during the week of February 26th, 2001 (BVSPC, 2001a).
April/May 2001	Following completion of the treatment (car wash) bay, construction activities for the interior equipment placement, piping, and electrical work for the Pine Avenue IWS system were completed (BVSPC, 2001b). [Details of these construction activities are presented in Section 3.3.]

Table 4-1 (Continued)
Chronology of OU20 Events

Date	Activity
May 31-June 4, 2001	A 5-day reliability test associated with the start-up of the Pine Avenue IWS system was performed. On June 4, 2001, the reliability test was successfully completed, and the system was considered operational with the stipulation of providing a replacement for the heat exchanger element (BVSPC, 2001b).
May/June 2001	During the initial start-up period (May 31-June 4, 2001) both groundwater and vapor samples were collected to evaluate the performance of the Pine Avenue IWS system. Review of the initial data indicated some discrepancy in the water samples, so water samples were re-collected on June 13, 2001. Review of this data indicated the water and vapor treatments had achieved the contaminant reduction goals of 70-90 percent for water and 99 percent for vapor (BVSPC, 2001c).
July 2001	Activities related to the replacement of the heat exchanger element for the Pine Avenue IWS system were completed (EPA, 2005c).
August 2001	The Pine Avenue IWS system was restarted following replacement of the heat exchanger. On August 14, 2001, a final inspection of the system was performed by EPA and a punch list of was developed (EPA, 2001b).
September 2001	Items listed on the final punch list from the Final Inspection were addressed by mid-September 2001 (BVSPC, 2001e).
September 2001	Problems with the Pine Avenue IWS well screens plugging were and evaluated. The problems were resolved with an O&M procedure to routinely add small quantities of hydrochloride (HCl) acid and bleach to wells (BVSPC, 2001f).
November 2002	The IWS wells were redeveloped due to continued decreasing performance of the wells from scaling and bio-fouling. The redevelopment efforts involved removal of the well internals, mechanical surging and pumping, and chemical (acid and bleach) redevelopment. Following redevelopment, significant improvement in the overall performance of the IWS wells was noted (BVSPC, 2002d).
January 2003	The carbon dioxide (CO_2) (well fouling prevention) addition system was retrofitted with a tank that could be refilled while the system remained running, thus eliminating the need for shut-downs during CO_2 recharging (EPA, 2005c).
July 2003	Authorization was obtained from the NDEQ's air quality permitting program to send spent (and characterized as non-hazardous waste) GAC generated from the Pine Avenue treatment system to the Hastings Utility Whelan Energy Center (coal-fired electric generating plant) for disposal (NDEQ, 2003).
July 2004	The blower motor was replaced (EPA, 2005c). This blower motor failure may have in part resulted from excessive wear and damage caused by extreme temperature conditions within the "car wash" treatment bay.
August/September 2004	To avoid potential adverse effects to operating equipment and electrical systems (especially during the Summer months, modifications were provided to the treatment bay (EPA, 2005c). The modifications included provisions to increase ventilation throughout the bay (addition of vents and a higher capacity ventilation fan) and a system cut-off to shutdown the blower during extreme temperatures (high ambient room temperature).
August 2006	On August 17, 2006, the O&F inspection of the Pine Avenue RA component was performed in conjunction with the Source Area and in-situ (downgradient groundwater plume) bioremediation treatment components (EPA, 2007). A copy of the O&F Inspection Report (and findings) is provided in Appendix B.
February 2007	Based on the results of the O&F inspection and meeting, NDEQ agreed with EPA's findings that the Pine Avenue treatment component was O&F (NDEQ, 2007). A copy of the NDEQ's O&F approval letter is provided in Appendix B.
IN-SITU BIOREMEDIATION TREATMENT	
November 2000	The RI Supplement was completed (BVSPC, 2000f). The RI Supplement provided a detailed evaluation of groundwater data collected for the downgradient plume from samples collected from October 1997 through April 2000.

Table 4-1 (Continued)
Chronology of OU20 Events

Date	Activity
September 2002	The FS Report for the downgradient plume was issued on September 25, 2002 (BVSPC, 2002c). This FS report presented remedial alternatives for the remediation of the entire groundwater plume, with a special focus on the plume downgradient (to the east and southeast) of the Pine Avenue IWS system.
July 2003	The Interim ROD was issued by EPA for OU20 (EPA, 2003b). The remedy defined in the ROD included the following components: continued operation of the Source Area extraction and treatment systems and Pine Avenue IWS system; groundwater extraction and carbon treatment of the groundwater plume directly downgradient (to the east) of the Pine Avenue system; in-situ bioremedial treatment of the contaminated remnants of the downgradient plume not addressed by the other actions; and long-term groundwater monitoring of the RA actions.
June 2004 through June 2005	Design efforts for the downgradient plume were completed. The design resulted of the preparation of a 95 Percent Design Analysis (BVSPC, 2005b) and 95 Percent Design Supplement (BVSPC, 2005f). Prior to the preparation of the design, a large scale direct push groundwater sampling effort was performed in April/May 2004. This direct push effort was used to define the plume and locations of the planned treatment. From 2002 through 2004, groundwater sampling activities for the downgradient groundwater plume also continued. The results of the direct push and 2002 through 2004 groundwater sampling efforts were documented in the 95 Percent Design Analysis (BVSPC, 2005b). The results of both of these sampling efforts defined the location of the Plume more to the southeast and documented significant declines in groundwater contamination directly to the east of the Pine Avenue IWS system. Based on these results, the planned ROD downgradient plume RA component(s) were modified as follows (BVSPC, 2005f): the entire downgradient plume to the east/southeast of the Pine Avenue IWS system would be treated by in-situ bioremediation treatment and the planned pump and treatment system would be postponed, and only added later as required. Based on this design, the RA treatment component to be constructed would only involve the installation of two injection well "fences" (total of 14 injection wells), that would be used to inject a slow oxygen release compound, and spot treatment of contaminant remnants in the plume "tail".
May 25 through September 2, 2005	Construction activities, including the installation of 14 injection points and 8 groundwater monitoring wells, were performed throughout this period. (BVSPC, 2005e). [Details of these construction activities are presented in Section 3.4.]
October/November 2005	As part of the Fall 2005 groundwater plume sampling effort, background (pre-injection treatment) sampling was performed from October 31 through November 8, 2005 (BVSPC, 2006c). Following the background sampling effort, the first round of oxygen release compound injections were performed from November 6 through November 15, 2005 (BVSPC, 2005m).
April 2006	As part of the Spring 2006 groundwater plume sampling effort, the first round of sampling following the Fall 2005 injection activities was performed from April 24 through 29, 2006 (BVSPC, 2006d).
July 2006	After review of the Fall 2005 groundwater results for the BW14 wells, additional treatment of the plume "tail" portion was instituted. The additional treatment (or "passive" in-situ treatment approach) used for the Plume tail included the installation of "socks" containing the oxygen release compound into an existing 4 inch monitoring well BW01on July 13, 2006 (GSI, 2006). [Further details are also provided in Section 2.3.3 and Appendix C.]
August 2006	On August 17, 2006, the O&F inspection of the in-situ bioremediation RA component was performed in conjunction with the Source Area and Pine Avenue IWS RA treatment components (EPA, 2007). A copy of the O&F Inspection Report (and findings) is provided in Appendix B.

Table 4-1 (Continued)
Chronology of OU20 Events

Date	Activity
November/December 2006	As part of the Fall 2006 groundwater plume sampling effort, the second round of sampling following the Fall 2005 injection activities was performed from of November 29 through December 13, 2006 (BVSPC, 2007e). Following this sampling effort, the second round of ORC injections were performed from December 4 though 16, 2006 (BVSPC, 2007b). Before the injection activities were begun, formation sand and treatment slurry that had accumulated in the injection point sump's was removed.
February 2007	Based on the results of the O&F inspection and meeting, NDEQ agreed with EPA's findings that the in-situ bioremediation treatment component was O&F (NDEQ, 2007). A copy of the NDEQ's O&F approval letter is provided in Appendix B.

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Table 4-2
Chronology of OU20 Sampling Events

Date	Activity
SOURCE AREA RA COMPONENT	
Sampling Activities Prior to Removal Action #1 (Source Area RA Component)	
1987-1989	Hastings area RI activities (soil gas surveys, soil sampling, and groundwater sampling) conducted near the Second Street Source Area identified VOCs and PAHs in soils and groundwater (PRC, 1990). The contaminants found were associated with the FMGP operations.
1992-1993	RI activities (soil and groundwater sampling) conducted further defined nature and extent of VOC and PAH contamination at the Source Area (MK, 1995a).
1991-1994	Foote Oil Site RI activities including groundwater sampling were performed. BETXs for leaking USTs were found in the soils and groundwater immediately to east of the Source Area (HWS, 1994).
1996-1997	RI activities (soil gas surveys, soil sampling, and groundwater sampling) were conducted during preconstruction and initial removal action activities (including system start-up data). These investigative activities further defined the nature and extent of VOC and PAH contamination present at the Source Area (MK, 1997b).
Sampling Activities Following Installation of Removal Action #1 (Source Area RA Component)	
Source Area Water Samples [Source Area water samples include the following: extraction wells, vent wells, and process water (including NPDES compliance/monitoring) points.]	
Groundwater Wells: 1996-2006	Throughout this period, groundwater well sampling efforts were typically performed during the NPDES sampling efforts (defined below). During these efforts, groundwater samples were typically collected from the three Source Area extraction wells (EXW01, EXW02, and MW09). The primary focus of these sampling efforts were on the MW09 results, because the other two wells were non-detect or contained very low contaminant concentrations. Although, individual data evaluation reports were prepared for these efforts, a summary of the most recent results for this evaluation was provided in the memorandum titled "Groundwater & Process Water Data Results – Sampling 10/26/06" (BVSPC, 2007d). [Note: For reference, graphical and tabular results from well MW09 has been provided in Section 5.]
Vent Well Water: 1997-2006	During the operational period from 1997 through 2006, several groundwater sampling events were performed at the six vent well locations. [Note: Although there are a total of ten vents wells present at the site, only six are screened below the water table.] For each sampling event, a separate data evaluation report was generated, which included a historic graphic summary of all previous events. The most recent data evaluation report (BVSPC, 2005a) indicates some contaminant (e.g., total VOCs and BETXs) reductions have been noted since the initial start-up of the water extraction and treatment system.). [Note: For reference, graphical and tabular groundwater results from the vent wells have been provided in Section 5.]
Process Water: 1996-2006	Throughout this period, process water sampling efforts were typically performed during the NPDES sampling efforts (defined below). Process water sampling points are locations in the water treatment system used to evaluate the effectiveness from individual process components (e.g., inlet and outlet of air stripper). Although individual data evaluation reports were prepared for these efforts, a summary of the most recent results for this evaluation was provided in the memorandum titled "Groundwater & Process Water Data Results – Sampling 10/26/06" (BVSPC, 2007d).
NPDES: 1997-February 2002	During this period, several process water sampling efforts were performed for NPDES compliance reporting in accordance with the October 1996 Order of Variance and 1998 NPDES Permit (NDEQ, 1996 and NDEQ, 1998). From 1997 through 2000, quarterly efforts were required, but in late 2000 the NDEQ reduced these requirements to semi-annual efforts (NDEQ, 2000). Although individual

Table 4-2 (Continued)
Chronology of OU20 Sampling Events

Date	Activity
	letter compliance reports were prepared for each effort, a comprehensive summary of the results for the entire period was provided in the report, titled "NDPES Permit Number 1320121 Winter Water Quality Report 2002" (BVSPC, 2002b). [Note: For reference, a copy of the tabular summary of the data has also been provided in Section 5.]
NPDES: May 2002 – October 26, 2006	During this period, several process water sampling efforts were performed for NPDES compliance reporting in accordance to the NPDES Permit issued in 2002 (NDEQ, 2002). Although individual letter compliance reports were prepared, a comprehensive summary of the results for this period was provided in the last report prepared for this period, titled "NDPES Permit Number 1320121 Summer 2006 Compliance Report" (BVSPC, 2006h). [Note: For reference, a copy of the tabular summary of the data has also been provided in Section 5.]
Source Area Soil Gas Samples [Soil gas samples include samples collected from SVE wells, process air points, vent wells, and monitoring probes. Process air points include samples collected from the vapor systems, including the combined inlet vapor into the SVE system, the air stripper outlet vapor, and from treated vapor (from the catalytic oxidizer), which are used to evaluation contaminant reduction performance.]	
January 1997	During the Source Area treatment component systems start-up period of January 6-9, 1997, soil gas samples were collected from the SVE wells, process air points, vent wells, and monitoring probes (MK, 1997a). Significant concentrations of total VOCs (specifically BETXs) were identified from this sampling effort.
SVE wells and process air :1997-2006	During the operational period from 1997 through 2006, a total of 25 soil gas sampling events have been performed at SVE wells and process air points. A separate data evaluation report was generated for each event, and a summary graph, including historic data was included in each report. The SVE results provided in the most recent data evaluation report (BVSPC, 2007a), show that a significant reduction of contaminants (e.g., total VOCs and BETXs) have occurred since the initial SVE system start-up. [Note: For reference, graphical and tabular results from the SVE wells have been provided in Section 5.]
Monitoring Probes: 1997-2006	During the operational period from 1997 through 2006, several soil gas sampling events were performed at the two monitoring probe locations. For each event, a separate data evaluation report was generated, which included a historic graphic summary from the most current event and all previous events. The most recent data evaluation report (BVSPC, 2005j) showed that a significant reduction of contaminants monitored for (e.g., total VOCs and BETXs) has occurred from the initial SVE system start-up in January 1997.
Vent Wells: 1997-2006	During the operational period from 1997 through 2006, several soil gas sampling events were performed at the ten vent well locations. For each event, a separate data evaluation report was generated, which included a historic graphic summary from the most current event and all previous events. The most recent data evaluation report (BVSPC, 2005k) showed that a significant reduction of contaminants monitored for (e.g., total VOCs and BETXs) has occurred from the initial SVE system start-up in January 1997.
PINE AVENUE RA COMPONENT	
Groundwater Sampling Prior to Implementation of Removal Action #2 (Pine Avenue RA Component)	
1997-2000	Throughout this period, several groundwater sampling efforts were performed as part of the RI/FS for the downgradient Plume. A comprehensive discussion of the results obtained for these sampling efforts is provided in the RI Supplement (BVSPC, 2000g).
February/March, 2001	Baseline (prior to IWS well system start-up and operation) groundwater sampling was performed during the week of February 26th, 2001 (BVSPC, 2001a).

Table 4-2 (Continued)
Chronology of OU20 Sampling Events

Date	Activity
Sampling Following Installation of Removal Action #2 (Pine Avenue RA Component)	
Pine Avenue-Groundwater	
May/June 2001	During the initial start-up period (May 31-June 4, 2001), groundwater samples were collected to evaluate the performance of the Pine Avenue IWS system. Review of the initial data indicated discrepancies, so the water samples were re-collected on June 13, 2001. Review of the 6/13/01 data indicated that the treatment goals of 70-90 percent contaminant reduction in water were achieved (BVSPC, 2001c).
2001 through Spring 2005	During this period, several rounds of groundwater sampling were performed within the vicinity of the Pine Avenue RA component. The results of these sampling efforts were used to evaluate the performance of the IWS treatment system as well as the effect of the IWS system on downgradient Plume wells. For each event, a separate data evaluation report was generated, which included a historic graphic summary from the most current event and all previous events. The most recent data evaluation report (BVSPC, 2005g), found some contaminant (e.g., total VOCs, BETXs, and PAHs) reductions had been noted since the start-up of the IWS system (May 2001). Following the Spring 2005 effort, this sampling effort was incorporated into the bi-annual downgradient groundwater sampling effort. [For reference, graphical and tabular groundwater results showing the effects of the operation of IWS system from several representative wells (SW10I, SW5I, SW6I, and SW7I) are presented in Section 5.]
Fall 2005 through 2006	During this period, groundwater sampling to evaluate the Pine Avenue RA component was performed in conjunction with the bi-annual downgradient groundwater Plume sampling effort. Although individual reports were prepared for each of these sampling efforts, a comprehensive summary of the results for this period was provided in most recent report prepared titled "Data Evaluation Report – Second Street Downgradient Plume November/December 2006 Groundwater Sampling" (BVSPC, 2007e). [For reference, graphical and tabular groundwater results showing the effects of the operation of IWS system from several representative wells (SW10I, SW5I, SW6I, and SW7I) are presented in Section 5.]
Pine Avenue-Vapor	
May/June 2001	During the initial start-up period (May 31-June 4, 2001) vapor samples were collected to evaluate the performance of the Pine Avenue IWS system. Review of the two initial rounds of vapor samples collected on 06/01/01 and 6/19/01 indicated that the contaminant reduction goal of 99 percent by the vapor carbon treatment system was achieved (BVSPC, 2001c).
2001-2006	Several vapor sampling efforts have been collected throughout the operations period of the IWS treatment system. Since the IWS system is a "closed –loop" treatment system, the results obtained from these sampling effort vary, and are primarily used to determine contaminant removal effectiveness and the need for carbon change-outs. The most recent event was performed in October 2006. [Representative reports of vapor sampling efforts include "Vapor Data Results Sampling 2/24/02" (BVSPC, 2002a) and emails to EPA (BVSPC, 2005i).]
IN-SITU BIOREMEDIATION RA COMPONENT	
Groundwater Sampling Prior to Implementation of the In-Situ Bioremediation RA Component	
1997-2000	During this period several downgradient sampling efforts were performed as part of the downgradient Plume RI/FS. A comprehensive discussion of the results obtained for these sampling efforts is provided in the RI Supplement (BVSPC, 2000g).
2000-2002	During this period, no specific groundwater sampling efforts were performed for this component. Some of the groundwater samples collected for the evaluation of the Pine Avenue RA component during this period did provide useful data for this component.

Table 4-2 (Continued)
Chronology of OU20 Sampling Events

Date	Activity
2002-2004	During this period, several groundwater sampling efforts were performed for the downgradient groundwater Plume in connection with pre-design and implementation of the in-situ bioremediation RA component. Specific groundwater monitoring sampling included efforts in late Summer (August) 2002, Spring and Fall 2003, and Spring and Fall 2004. In addition to these monitoring well sampling efforts, a one-time direct push sampling effort was also performed in the Spring of 2004. The results of these sampling efforts were presented in the 95 Percent Design Analysis Report (BVSPC 2005b).
2005	Downgradient groundwater Plume sampling efforts were performed in the Spring and Fall of 2005. The Fall 2005 effort was performed just before the first injection treatment effort of this RA component. The results of both the Spring and Fall 2005 efforts were provided in separate data evaluation reports. For reference, a summary of the historical results from 1997 through 2005 were presented in the Fall 2005 Data Evaluation Report (BVSPC 2006c).
Groundwater Sampling Following Implementation of the In-situ Bioremediation RA Component	
2006	Downgradient groundwater Plume sampling was performed in the Spring and Fall of 2006. The results of these efforts were reported in separate data evaluation reports and a summary of the historical results from 1997 through Fall 2006 and a detail evaluation of the most recent sampling effort (Fall 2006) is presented in the Fall 2006 Data Evaluation Report (BVSPC 2007e). [For reference, graphical and tabular groundwater results showing the effects of the in-situ bioremedial treatment injections from several representative wells (OW04D, SW03, BW14I, and BW14D) are presented in Section 5.] In addition to the groundwater sampling for contaminant analysis, groundwater operational monitoring of field parameters was preformed several times in 2006. These operation monitoring activities were performed to evaluate the effects of the injection in the downgradient Plume. The results of these efforts were documented in separate data evaluation reports. The 2006 September O&M Report (BVSPC, 2006g) provides a comprehensive summary of all the operational data collected in 2006.

Colorado Avenue

"Jeremy Groves" <jgroves@cityofhastings.org>

07/13/2007 10:03 AM

To Brian Zurbuchen/SUPR/R7/USEPA/US@EPA

cc

bcc

Subject FW: 5 yr review

Jeremy T. Groves
Environmental Engineering Assistant
City of Hastings
220 North Hastings Ave. I Hastings, Nebraska 68901
P 402.461.2339 I F 402.461.2323
jgroves@cityofhastings.org I www.cityofhastings.org

-----Original Message-----
From: Brian E Steffes [mailto:BSTEFFES@mbakercorp.com]
Sent: Friday, July 13, 2007 6:52 AM
To: Jeremy Groves
Subject: Fwd: 5 yr review

Jeremy,

Here is the original email and attachments. Pls forward to Brian Zurbruchen (I don't have his email).

Darrell had asked me to break out the costs on Table 2 by Operable Unit, and I am still awaiting some financial info from Dravo to do that, but haven't received it yet, so the table has not been revised. I will resend the table when I can.

Let me know if there is anything else I can do.

I plan on being in Hastings next week and will try to stop by and say Hi.
Brian

Brian E. Steffes, P.G.
Michael Baker Jr., Inc.
100 Airside Drive
Moon Twp., PA 15108
(412) 269-6013
Fax (412) 375-3996
bsteffes@mbakercorp.com

----- Message from "Brian E. Steffes" <BSTEFFES@mbakercorp.com> on Mon, 12 Mar 2007 09:22:03 -0500 -----

To: "Jeremy Groves" <jgroves@cityofhastings.org>

cc: <Lisa.Potts@carmeusena.com>, <Stephen.Smith@carmeusena.com>, "Christine Harwood" <CHARWOOD@mbakercorp.com>

Subject: 5 yr review

Jeremy,
Attached are items requested from Dravo Corp. for the Colorado Ave. Subsite for the 5 Year Review. I have supplied the following:

* Exhibit 4.1 (including four data summary tables in two Excel files)
* Table 2 - O&M Costs
* Constructor interview questions
* Performance, Operations and Maintenance interview questions
* Chronology of site events

Please let me know if there are other items you need, or if you have any questions.
Brian Steffes

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(412) 269-6013
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→ see Appendix ~~5~~ 4b

Table 2_Costs.xls Constructor Interview.doc Exhibit 4-1.doc Exhibit 4_1 IWA Vapor Table.xls Exhibit 4_1 SVE Tables.xls

Five Yr Review Chronology of Site Events.doc P,O&M Interview Questions.doc

→ see Appendix 2

FIVE YEAR REVIEW

Chronology of Site Events – January 2002 to January 2007
Colorado Avenue Subsite (including Phase I SVE system, Phase II IWA system, and Phase III IWA system)
Dravo Corporation
Hastings, Nebraska
February 2007

Note: The Colorado Avenue Subsite is comprised of two Operable Units (OUs). OU 1 is the groundwater operable unit and OU 9 is the soils operable unit. The following discussions are broken into OU 1 and OU 9 as applicable.

<u>January 2002 to January 2003</u>

OU 9 (Soils):

- Phase I SVE system continued to operate at wellheads 3M, 5M, 8D, 9M, 10D and 11M.

OU 1 (Groundwater):

- Phase II IWA systems (IWA-1 & IWA-2 at Pine Avenue and IWA-3 at Cedar Avenue) continued to operate (operational since 1999).
- November 2002 – Phase III IWA systems (IWA-4,5,6 at Sixth Avenue and IWA-7 at South Street) began operation.
- April 2002 – Dravo conducted annual performance sampling at the Phase II IWA wells.
- July 2002 – Dravo conducted baseline sampling at the Phase III IWA wells.
- September 2002 – Dravo conducted baseline sampling at Phase III performance monitoring wells.

<u>January 2003 to January 2004</u>

OU 9 (Soils):

- Phase I SVE system continued to operate at wellheads 3M, 5M, 8D, 9M, 10D and 11M.

OU 1 (Groundwater):

- Phase II IWA systems continued to operate.
- Phase III IWA systems continued to operate.

- March 2003 – Dravo redeveloped Phase II IWA wells.

- April 2003 – Dravo conducted annual performance sampling at Phase II IWA wells.

- May 2003 – Dravo conducted 1st operational cycle sampling at Phase III IWA systems.

<u>January 2004 to January 2005</u>

OU 9 (Soils):

- Phase I SVE system continued to operate at wellheads 3M, 5M, 8D, 9M, 10D and 11M.

- July 2004 – Dravo removed carbon canisters from SVE system.

- July 2004 – Dravo conducted Soil and Soil Gas Investigation at Phase I SVE area.

- August 2004 – Dravo submitted results of Soil and Soil Gas Investigation to EPA.

OU 1 (Groundwater):

- Phase II IWA systems continued to operate.

- Phase III IWA systems continued to operate.

- April 2004 – Dravo conducted annual performance monitoring at the Phase II and Phase III IWA wells.

- December 2004 – Dravo changed carbon at IWA-4,5&6 and IWA-7.

<u>January 2005 to January 2006</u>

OU 9 (Soils):

- January 2005 – Phase I SVE system shut down to allow for rebound.

- January 2005 – Dravo submitted intent to shut down Phase I SVE system to EPA.

- February 2005 – Dravo received EPA comments regarding Phase I SVE system.

- March 2005 – Dravo submitted Draft Post-Remedial Soil Investigation Work Plan to EPA.

- April 2005 – Dravo conducted Post-Remediation Soils Investigation at Phase I SVE System.

- June 2005 – Dravo submitted Post-Remediation Soils Investigation Report to EPA.

- July 2005 – Dravo restarted Phase I SVE system, operated wellheads 7M, 9M, 10D and 11M.

OU 1 (Groundwater):

- Phase II IWA systems continued to operate.

- Phase III IWA systems continued to operate.

- April 2005 – Dravo sampled SVE wells and monitoring probes.

- April 2005 – Dravo conducted annual performance monitoring at the Phase II and Phase III IWA wells.

- April 2005 – IWA 1 and IWA 2 were put into a resting mode

- June 2005 – Dravo changed carbon at IWA-4,5&6.

- July 2005 – Dravo changed carbon units at IWA-3.

- October 2005 – Dravo conducted performance sampling event.

- December 2005 – Dravo changed carbon at IWA-4,5&6 and IWA-7.

<u>January 2006 to January 2007</u>

OU 9 (Soils):

- SVE system continued to operate until December 2006, at which point it was rested pending completion of the Phase II SVE design.

- June 2006 – City of Hastings takes over O&M of Phase I SVE system.

- July 2006 – Dravo submitted OU 9 Work Plans to EPA.

- August 2006 – Dravo received EPA comments on the OU 9 Draft Work Plan.

- September & October 2006 – Dravo submitted responses to EPA comments on the OU 9 Work Plans.

- September & October 2006 – Dravo received EPA approval of OU 9 Work Plans.

- November 2006 – Dravo submitted Application for Access to BNSF railroad for Phase II SVE activities.

OU 1 (Groundwater):

- IWA-3 continued to operate. IWA-1 and IWA-2 in resting mode pending approval of formal shutdown process.
- Phase III IWA systems continued to operate.
- February 2006 – Dravo installed three monitoring wells (BW-22, -23 and -24) as part of the Phase III IWA program.
- April 2006 – Dravo changed carbon at IWA-4,5&6 and IWA-7.
- May 2006 – Consent Decree between Dravo and EPA was signed.
- May and November 2006 – Dravo conducted semiannual groundwater sampling.
- June 2006 – Dravo changed carbon at IWA-4,5&6 and IWA-7.
- August 2006 – Dravo submitted OU 1 Work Plans to EPA.
- August 2006 – Dravo changed carbon at IWA-4,5&6 and IWA-7.
- October 2006 – Dravo redeveloped Phase III IWA wells.
- December 2006 – Dravo changed carbon at IWA-4,5&6 and IWA-7.
- December 2006 – Dravo began construction of modified Phase II SVE design, drilling and installing two extraction wells and four vent wells inside the former Marshalltown Instruments building.
- December 2006 – Dravo and EPA held a pre-construction conference and selected borehole locations for the Phase II SVE wells and monitoring probes proposed for areas E and F.

FIVE YEAR REVIEW

PERFORMANCE, OPERATION AND MAINTENANCE INTERVIEW QUESTIONS
Colorado Avenue Subsite
Dravo Corporation
Hastings, Nebraska
February 2007

Note: The Colorado Avenue Subsite is comprised of two Operable Units (OUs). OU 1 is the groundwater operable unit and OU 9 is the soils operable unit. The following discussions are broken into OU 1 and OU 9 as applicable.

1. What is your overall impression of the project?

The remedies at both OU 1 and OU 9 appear to be reducing the amount of contaminants. It appears that portions of the project have completed their effectiveness and should be shut down.

2. Is the remedy functioning as expected? How well is the remedy performing?

OU 9 (Soils):

The Phase I SVE system appears to have reduced concentrations in the source area. However, the remaining low concentrations of residual contaminants in subsurface soil do not appear to be effectively reduced by continued operation of the Phase I SVE system, this is probably related to the low permeability of the fine grained soils in the shallow and intermediate zones and the extremely low concentration of remaining contamination.

OU 1 (Groundwater):

The Phase II IWA system appears to have completed its task, as contamination in the treatment area has been reduced below the performance criteria. The Phase II IWA system removed less than 5 pounds of COCs during the period of July 1, 2005 to January 31, 2007. Therefore, it is no longer efficient to continue to operate the Phase II IWA systems.

The Phase III IWA systems appear to be functioning as expected. The Phase III IWA systems removed 189 pounds of COCs and treated approximately 215 million gallons of groundwater during the period of July 1, 2005 to January 31, 2007. The carbon saturation issues that have impacted the Phase III system performance in the past have been addressed through increased performance monitoring and carbon replacement. Therefore, the remedy is performing well.

3. What does the monitoring data show? Are there any trends that show contaminant levels are decreasing?

OU 9 (Soils):

Historic and recent SVE wellhead samples demonstrate significant reductions in TCE concentrations since 1996. SVE wellhead samples collected during July 1996 in Areas 1 and 2 had TCE concentrations ranging from 33,000 parts per billion by volume (ppbv) to 642,000 ppbv. All eight SVE wellhead samples collected in July 1996 exceeded the clean up criteria for TCE. SVE wellhead samples collected during April 2005 in Areas 1 and 2 had TCE concentrations ranging from 82 ppbv to 4,200 ppbv. Only three of the eight SVE wellheads sampled in April 2005 in Areas 1 and 2 exceeded the cleanup criteria for TCE.

SVE wellhead samples collected during July 1997 in Area 3 showed a lesser degree of contamination, with TCE concentrations ranging from 170 ppbv to 1,800 ppbv. The two SVE wellheads sampled in April 2005 in Area 3 had TCE concentrations of 38 and 39 ppbv, which is well below the clean up criteria.

OU 1 (Groundwater):

The vapor influent sampling results at the Phase II IWA system indicate that asymptotic conditions have been reached or are decreasing dramatically. In addition, groundwater concentrations are well below performance standards.

The vapor influent sampling results at the Phase III IWA systems indicate that mass removal by the IWA systems is occurring, but also is decreasing with time and is now minimal. Influent vapor samples collected at IWA-4, 5 & 6 and IWA-7 in July 2003 had TCE concentrations of 13,000 ppbv and 3,500 ppbv, respectively. Influent vapor samples collected in October 2006 had TCE concentrations reduced to 370 ppbv and 1,600 ppbv, respectively.

4. **Is there a continuous on-site presence? If so, please describe staff and activities. If there is not a continuous on-site presence, describe staff and frequency of inspections and activities.**

OU 9 (Soils):

Dravo does not have a continuous on-site presence at either the SVE shed or the IWA sheds, as the treatment systems are not associated with any existing facility. The City of Hastings provides personnel (generally Ms. Jenny Sidlo) to visit the SVE shed every work day during operation. Ms. Sidlo records the operating parameters, and performs any routine maintenance within her abilities. Weekly reports are provided to Dravo. More significant O&M activities are conducted by appropriate personnel, primarily Busch technicians who service the pumps when necessary.

OU 1 (Groundwater):

Mr. Bob Dangler conducts daily inspections for the IWA systems during each workday. Mr. Dangler records the operating parameters and provides routine maintenance, such as adding oil, replacing bulbs and belts. Mr. Dangler also changes the carbon at the Phase III systems when required, and conducts performance vapor sampling. Larger technical issues are generally handled by Krieger Electric (for electrical service) and Layne Western (for periodic well redevelopment and repair). Linweld supplies carbon dioxide on a bi-weekly basis. Mr. Steve Wilhelm, designer of the IWA systems, is called for technical advice when issues arise with performance of the systems.

5. **Have there been significant changes in the O&M requirements, maintenance schedules, or sampling routines since start-up or in the last five years? If so, do they affect the protectiveness of the remedy? Please describe changes and impacts.**

OU 9 (Soils):

While there have been no significant changes to the requirements, maintenance or sampling at the SVE system, the former operator retired in 2006 and the O&M has been taken over by the City of Hastings.

OU 1 (Groundwater):

There have been significant changes to the sampling routines in the past three years. Most of these changes have been established as part of the recently signed Consent Decree between Dravo and EPA. The major change involves the change out schedule and performance monitoring of the Phase III IWA carbon units. Until 2004, effluent samples were not collected and the carbon units were not changed out at the Phase III IWA systems. This led to a period of time when the carbon became saturated and did not function as designed. The Phase III IWA carbon units are now changed out approximately on a two-month cycle, and influent, intermediate and effluent samples are collected on the off month. The Phase II IWA system at Pine Avenue is in the resting mode of its shutdown sequence. Since it will only be operated one week per year and the concentrations of COCs remaining in groundwater are so low, the existing carbon units will be removed in the near future, and, therefore, require no changing. The Phase II IWA system at Park Avenue had its twin 1,800-pound units changed in July of 2005. Based on the low concentrations of COCs remaining in groundwater in this area, it is unlikely the carbon will ever need to be changed again.

Another change involves the routine collection of operating and static water levels at the Phase III IWA systems and at the Phase II system at Cedar Avenue. Water levels are measured bi-monthly at the Phase III systems and monthly at the Cedar Avenue system.

The performance groundwater sampling event, previously conducted annually, is now conducted semi-annually. The wells and depth intervals sampled conform to the list in Attachment 5 of the Consent Decree.

6. **Have there been unexpected O&M difficulties or costs at the site since start-up or in the last five years? If so, please give details.**

OU 9 (Soils):

The Busch service technician maintenanced the pumps in 2006.

OU 1 (Groundwater):

There were repeated failures of the air line in IWA-5. The air line came apart in June 2004 and was repaired in September 2004. The air line came apart again in April 2005 and was repaired in May 2005. However, the repair did not work, and well IWA-5 experienced a significant pressure drop. The air flows at IWA-4 and IWA-6 were increased to make up for the difference. It was determined that the previous repair had used a too-short length of pipe, and this was corrected in August 2005. However, the air line failed again in July 2006. The failure was determined to be caused by vibrations in the pipe unthreading the joints, causing leakage. IWA-5 was finally repaired by adding set screws to each joint to hold them together. No further failure of this type is expected.

IWA-7 has developed an air leak in the blower system. The leak could allow air to enter the treatment stream, which could foul the well screen due to increased mineralization. This leak is being diagnosed and a repair will be made.

The manhole at IWA-6 was damaged by a snow plow, but this did not affect the operation of the well. The wellhead was repaired and protective bollards added in May 2006.

Bad storms in the region tore shingles off the roofs of the IWA treatment sheds. The sheds were re-shingled in May 2006.

7. Have there been opportunities to optimize O&M, or sampling efforts? Please describe changes and resultant or desired cost savings or improved efficiency.

The Consent Decree required development of project-specific work plans for both the SVE system (OU 9) and the IWA systems (OU 1). These work plans formalize the collection of samples to defined wells and depth intervals. Although some cost savings were realized by a reduction in the number of samples required per event, the performance monitoring events went from an annual event to a semi-annual event, thus overall program costs have increased. The value of the increased frequency is questionable.

The carbon at the Phase III systems (OU 1) is now changed on a two-month cycle. Although this has increased overall program costs, it has increased the efficiency of the remedy by eliminating the carbon saturation issue.

8. Do you have any comments, suggestions, or recommendations regarding the project?

OU 9 (Soil):

The Phase I system serves little purpose at this time and should be permanently shutdown.

The Phase II system in Areas A and E is likely to be ineffective and cause more environmental harm in electricity use than benefit.

OU 1 (Groundwater):

The treatment area for the Phase II IWA systems has no more significant residual groundwater contamination. As such, the Phase II IWA system at Pine Avenue has already entered the shutdown sequence. The Phase II IWA system at Cedar Avenue should also begin the shutdown sequence, as it is no longer efficient due to the low mass removal involved. In the past 16 months, less than 5 pounds of COCs were removed by this system. Therefore, it has become an inefficient system based on the utility and maintenance costs associated with continued operation.

5-YEAR REVIEW

TABLE 2: ANNUAL SYSTEM OPERATIONS/O&M COSTS
Colorado Avenue Subsite
Dravo Corporation
Hastings, Nebraska
March 2007

Dates		Total Cost Rounded to nearsest $1,000
From	To	
1-02	1-03	$1,024,000
1-03	1-04	$329,000
1-04	1-05	$341,000
1-05	1-06	$261,000
1-06	1-07	$7,627,000*

* Does not include 4th Quarter costs.

FIVE YEAR REVIEW

CONSTRUCTOR INTERVIEW QUESTIONS
Colorado Avenue Subsite
Dravo Corporation
Hastings, Nebraska
February 2007

Note: The Colorado Avenue Subsite is comprised of two Operable Units (OUs). OU 1 is the groundwater operable unit and OU 9 is the soils operable unit. The following discussions are broken into OU 1 and OU 9 as applicable.

1. **What is your overall impression of the project?**

   The remedies at both OU 1 and OU 9 appear to be reducing the amount of contaminants. It appears that portions of the project have completed their effectiveness and should be shut down. Continued operation is a waste of electrical power and effort that could be focused elsewhere.

2. **What effects have site operations had on the surrounding community?**

   Dravo is unaware of any significant positive or adverse effects site operations have had on the surrounding community. Operation has utilized power generated in a coal fired boiler increasing acid, fine particulate matter and ozone depleting emissions in the local community. Operations have provided part time employment to local personnel to provide daily O&M services and local suppliers of materials and specialized services, thus providing a small financial benefit.

3. **Are you aware of any community concerns regarding the site of its operation and administration? If so, please give details.**

   Dravo has been made aware of only one concern: a resident at the corner of Pine Avenue and Park Street expressed her displeasure with weeds that were growing between her property and the Pine Avenue treatment shed. Dravo identified the weeds as being on railroad property, but is looking into brush clearing if it becomes necessary. The resident solved the problem by building a fence to block the view of the treatment shed, and no further concerns have been expressed.

4. **Are you aware of any events, incidents, or activities at the site such as vandalism, trespassing, or emergency responses from local authorities? If so, please give details.**

   Initially, the VOC sensor on the SVE system had the fire department responding to the potential fòr fire as it was a dual hydrogen/VOC alarm. When it was determined that the VOCs were coming from inside the Marshalltown building, Dravo simultaneously stopped using hydrogen and disarmed the VOC alarm. Dravo is unaware of any of the above items at any of their operations.

   The fans at the Pine Street system were vandalized by having gravel thrown into the blade area from above. They were repaired and retrofitted with shields to prevent reoccurrence.

5. **Do you feel well informed about the site's activities and progress?**

Dravo provides the EPA with quarterly reports regarding the site activities and progress at OU 9 and quarterly and annual reports regarding the site activities and progress at OU 1.

6. **Do you have any comments, suggestions, or recommendations regarding the site's management or operation?**

The treatment area for the Phase II IWA systems (OU 1) has no more significant residual groundwater contamination. As such, the Phase II IWA system at Pine Avenue has already entered the shutdown sequence. The Phase II IWA system at Cedar Avenue should also begin the shutdown sequence, as it is no longer efficient due to the low mass removal involved. In the past 16 months, less than 5 pounds of COCs were removed by this system. Therefore, it has become an inefficient system based on the utility and maintenance costs associated with continued operation.

Appendix 3

List of Documents Reviewed

FAR-MAR-CO

Record of Decision Initial Source Control Operable Unit, Hastings Ground Water Contamination Site, FAR-MAR-C0 Subsite, Operable Unit #03 dated September 30, 1988

Administrative Order on Consent - VII-90-F0038, Hastings Ground Water Contamination Site, FAR-MAR-CO Subsite, Operable Unit #03 remedial design with Farmland Industries, Inc. dated September 27, 1990

Record of Decision, Hastings Ground Water Contamination Site, FAR-MAR-CO Subsite, Operable Unit #11, dated September 28, 1990

Administrative Order on Consent - VII-90-F-0001, Hastings Ground Water Contamination Site, FAR-MAR-CO Subsite, Operable Unit #11 with Hastings Irrigation Pipe Company dated October 26, 1989, amended December 12, 1990

Administrative Order on Consent, VII-92-F0005, Hastings Ground Water Contamination Site, FAR-MAR-CO Subsite, Operable Unit #06, RI/FS, dated November 20, 1991

Consent Decree,, Civil Action No. CV88-L-720, United States of America vs. Morrison-Quirk Grain Corporation dated April 19, 1993

Consent Decree, Civil Action No. 4:CV93-3315, United States of America vs . Hastings Irrigation Pipe Company dated November 11, 1993

Explanation of Significant Differences, Hastings Ground Water Contamination Site, FAR-MAR-CO Subsite, Operable Unit #03 dated August 22, 1995

Action Memorandum, Hastings Ground Water Contamination Site, FAR-MAR-CO Subsite, Operable Unit #06 dated December 6, 1995

Administrative Order on Consent, VII-96-F-0020, Hastings Ground Water Contamination Site, FAR-MAR-CO Subsite, Operable Unit #06 with Morrison Enterprises dated June 14, 1996

Consent Decree, Civil Action No. 4:96CV3037, United States of America v. Cooperative Producers, Inc. and Farmland Industries, Inc. dated May 7, 1997

Construction Completion Report and Remedial Action Report for the FAR-MAR-CO Subsite, Hastings, Nebraska dated Operable Unit #-3, source control dated December 19, 1997

Colorado Avenue

Record of Decision Initial Source Control Operable Unit, Hastings Ground Water Contamination Site, Colorado Avenue Subsite, Operable Unit #09 dated September 28, 1988

Administrative Order on Consent, VII-88-F-0021, Hastings Ground Water Contamination Site, Colorado Avenue Subsite, Operable Unit #09, SVE Pilot Study dated December 14, 1988

Unilateral Administrative Order, Docket No. VII-90-F-0040, Hastings Ground Water Contamination Site, Colorado Avenue Subsite, Operable Unit #09, RD/RA, dated September 28, 1990

Interim Action Record of Decision, Hastings Ground Water Contamination Site, Colorado

Avenue Subsite, Operable Unit #01 dated September 30, 1991

Administrative Order on Consent, VII-90-F-0025, Hastings Ground Water Contamination Site, Colorado Avenue Subsite, Operable Unit #09, De Minimis Settlement, dated June 12, 1992

Administrative Order on Consent, VII-92-F0001, Hastings Ground Water Contamination Site, Colorado Avenue Subsite, Operable Unit #09, dated October 1, 1992

Unilateral Administrative Order, Docket No. VII-93-F-0019, Hastings Ground Water Contamination Site, Colorado Avenue Subsite, Operable Unit #01, RD/RA, dated March 8, 1993

Interim Action Record of Decision Amendment, Hastings Ground Water Contamination Site, Colorado Avenue Subsite, Operable Unit #01 dated May 25, 1998

Explanation of Significant Differences, Hastings Ground Water Contamination Site, Colorado Avenue Subsite, Operable Unit #01 dated September, 26, 1999

Consent Decree, Civil Action No. 8:01CV500, Colorado Avenue Subsite Operable Unit 01 and 09, Hastings Ground Water Contamination Site, Entered May 24, 2006

Draft Annual Remedial Action Report, July 2005 – January 2007, Colorado Avenue Groundwater Contamination Subsite, February 2007.

Well #3

Interim Action Record of Decision, Hastings Ground Water Contamination Site, Well #3 Subsite, Operable Unit #07 dated September 26, 1989

Interim Action Record of Decision, Hastings Ground Water Contamination Site, Well #3 Subsite, Operable Unit #13 and Operable Unit #18 dated June 30, 1993

Remedial Action Report for the Hastings Ground Water Contamination Site, Well #3 Subsite, Operable Unit #07, dated August 17, 1993

Administrative Order on Consent, VII-93-F0001, Hastings Ground Water Contamination Site, Well #3 Subsite, Operable Unit #17, RI/FS, dated October 21, 1993

Administrative Order on Consent, VII-94-F005, Hastings Ground Water Contamination Site, Well #3 Subsite, Operable Unit #17, Removal Site Evaluation, dated January 21, 1994

Explanation of Significant Differences, cord of Decision, Hastings Ground Water Contamination Site, Well #3 Subsite, Operable Unit #13 dated December 14, 1994

Action Memorandum, Hastings Ground Water Contamination Site, Well #3 Subsite, Operable Unit #17, dated July 20, 1995

Administrative Order on Consent, VII-95-F0033, Hastings Ground Water Contamination Site, Well #3 Subsite, Operable Unit #17, Removal Action, dated September 28, 1995

Explanation of Significant Differences, cord of Decision, Hastings Ground Water Contamination Site, Well #3 Subsite, Operable Unit #13 dated July 23, 1996

Remedial Action Report for the Hastings Ground Water Contamination Site, Well #3 Subsite, Operable Unit #13, dated December 11, 1998

Interim Action Record of Decision Amendment, Hastings Ground Water Contamination Site, Well #3 Subsite, Operable Unit #13 dated November 19, 1999

Final Record of Decision, Hastings Ground Water Contamination Site, Well #3 Subsite, Operable Units #07, 13, 17 and 18, dated May 17, 2001

Consent Decree for Remedial Action, Civil Action No. 8:02CV366, Hastings Ground Water Contamination Site, Well #3 Subsite, Operable Unit 18, entered October 11,2002.

North Landfill

Administrative Order on Consent, VII-89-F0018, Hastings Ground Water Contamination Site, North Landfill Subsite, Operable Units #02 and 10, FS, dated September 27, 1989

Interim Action Record of Decision, Hastings Ground Water Contamination Site, North Landfill Subsite, Operable Units #02 and 10 dated September 30, 1991

Administrative Order on Consent, VII-92-F0028, Hastings Ground Water Contamination Site, North Landfill Subsite, Operable Unit #02 and 10, Remedial Design dated June 12, 1992

Consent Decree, Civil Action No. 8:98CV265, United States of America vs. City of Hastings, Dravo Corporation, Dutton-Lainson Company and Bernice Edwards dated August 14, 1998

Final Remedial Action Report for the North Landfill Subsite Operable Unit #10, Hastings Ground Water Contamination Site, Hastings, Nebraska dated November 23, 1999

Second Street

Administrative Order on Consent, VII-96-F0019, Hastings Ground Water Contamination Site, Second Street Subsite, Operable Unit #12, O&M for removal action, dated September 16, 1996

Action Memorandum, Hastings Ground Water Contamination Site, Second Street Subsite, Operable Unit #12, dated June 5, 1997

Interim Remedial Action Report, Second Street subsite OU 20, Hastings Ground Water Contamination Site, May 2007.

South Landfill

Administrative Order on Consent, VII-98-F0022, Hastings Ground Water Contamination Site, South Landfill Subsite, Operable Unit #05, RI/FS, dated October 23, 1998

Record of Decision, Hastings Ground Water Contamination Site, South Landfill Subsite, Operable Unit #05, dated September 2000

Consent Decree, Civil Action No. 8:03CV321, Hastings Ground Water Contamination Site, South Landfill Subsite, Operable Unit 05, entered November 12, 2003.

Final Remedial Action Report for the South Landfill Subsite Evapotranspiration Cap Operable Unit #5, Hastings Ground Water Contamination Site, September 2005.

Area Wide

Human Health Baseline Risk Assessment, Hastings Area-Wide Groundwater Contamination Site, Hastings, Nebraska, Nebraska Health and Human Services System, November 1997.

Administrative Order on Consent, VII-98-F0022, Hastings Ground Water Contamination Site, Area Wide Subsite, Operable Unit #19, RI/FS, dated October 23, 1998

Interim Action Record of Decision, Hasting Ground Water Contamination Site, Area-Wide Ground Water Action, Operable Unit #19, June 25, 2001

Consent Decree, Civil Action No. 8:03CV531, United States of America versus City of Hastings, Concrete Industries, Inc., Cooperative Producers, Inc., Desco Corporation, Dravo Corporation, Dutton Lainson Company, and Morrison Enterprises, Entered February 26, 2004

Interim Remedial Action Design, Hastings Ground Water Contamination Site, Area Wide Work Plan, dated August 2004

Hastings Institutional Control Area, Annual Report, Reporting Year 2006, Hastings, Nebraska, March 29, 2007, Hastings Utilities.

Appendix 4a

Chronology of OU12 Sampling Events
Second Street (Source Area) Subsite
Hastings, Nebraska

Date	Activity
December 5-12, 2003	A Geoprobe soil boring investigation was performed for the Second Street Source Area from December 5-12, 2003. During the investigation, a total of ten (10) soil borings were investigated from depths of 0 to 120 ft bgs and four (4) source materials borings (within two former MGP gas holders) were investigated from depths of 0 to 16 ft bgs (bottom of holders). The soil and source materials were sampled continuously and samples for analysis were sent in for analyses from every 10 to 20 ft. The analysis performed included volatile organic compounds (especially benzene, ethyl benzene, toluene, and xylenes) and semi-volatiles (especially polynuclear aromatic hydrocarbons). **A summary of the results obtained is presented in Figure A-1 (attached).**
April 2-19, 2005	An investigation of eight (8) soil borings was performed at the Second Street Source Area from April 2-19, 2005. During the investigation, the eight (8) borings were investigated via sonic drilling and continuous soil sampling from depths of 0 to 180 ft bgs. The overall depth range sampled included 0-120 ft in the vadose zone and 120-180 ft bgs within the saturated groundwater zone (e.g., 60 ft below the groundwater table elevation of 120 ft bgs). Six (6) soil borings of the eight (8) borings were located along the eastern perimeter of the Source Area, while the other two (2) borings were located within and below two former MGP gas holders. The soil within all the borings were sampled continuously and samples are sent in for analysis from every 10 ft interval. The analysis performed included volatile organic compounds (especially benzene, ethyl benzene, toluene, and xylenes) and semi-volatiles (especially polynuclear aromatic hydrocarbons). **A summary of the results obtained is presented in Figure A-2 (attached).**
December 5-10, 2005	An investigation of three (3) soil borings was performed at the Second Street Source Area from December 5-10, 2005. During the investigation, the three (3) borings were investigated via sonic drilling and continuous soil sampling from depths of 0 to 150 ft bgs. The overall depth range sampled included 0-120 ft in the vadose zone and 120-150 ft bgs within the saturated groundwater zone (e.g., 30 ft below the groundwater table elevation of 120 ft bgs). These three (3) soil borings were located to the east just beyond the City's property boundary for the Source Area. The soil within all the borings were sampled continuously and samples are sent in for analysis from every 10 ft interval. The analysis performed included volatile organic compounds (especially benzene, ethyl benzene, toluene, and xylenes) and semi-volatiles (especially polynuclear aromatic hydrocarbons). **A summary of the results obtained is presented in Figure A-2 (attached).**

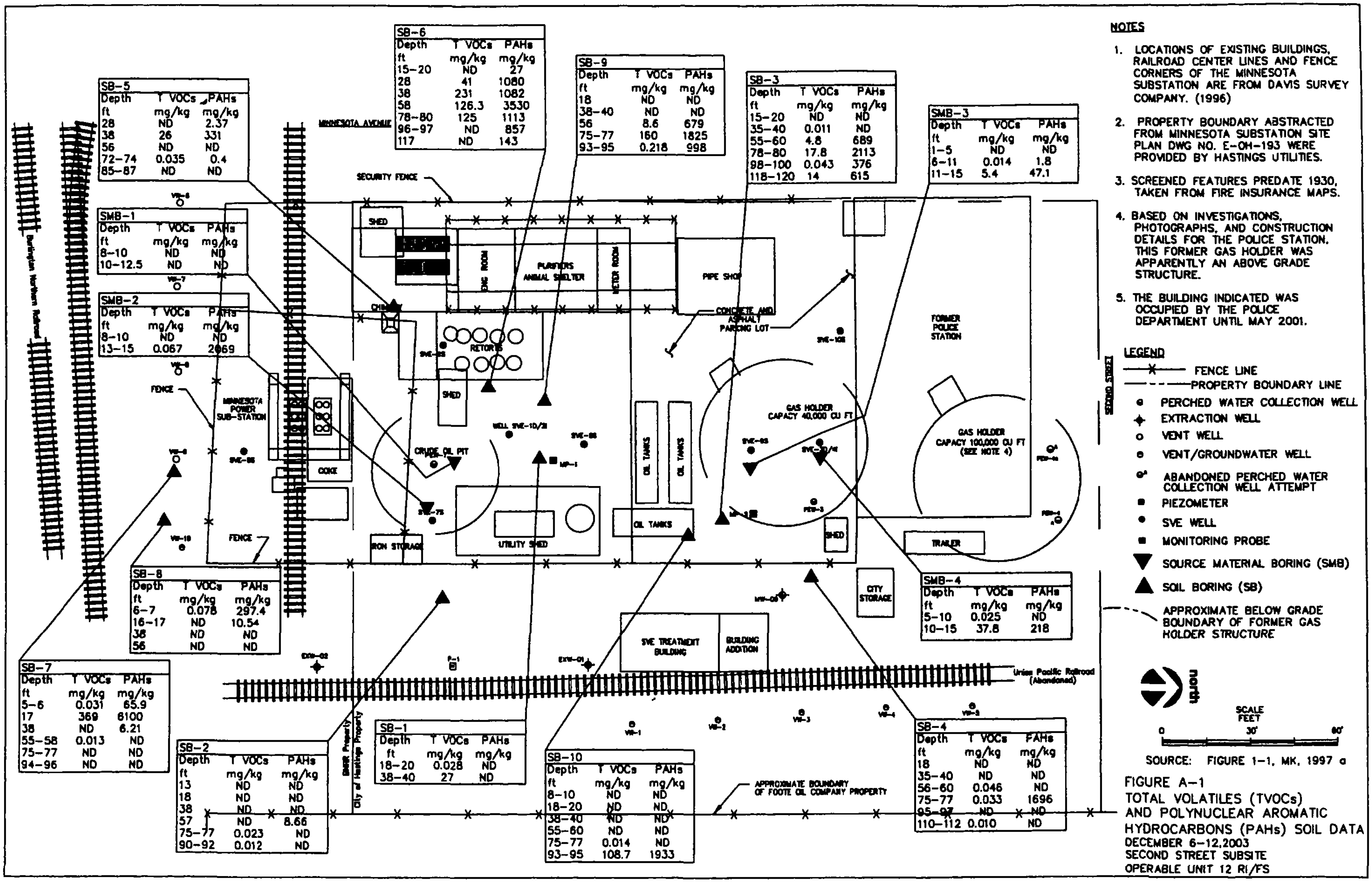
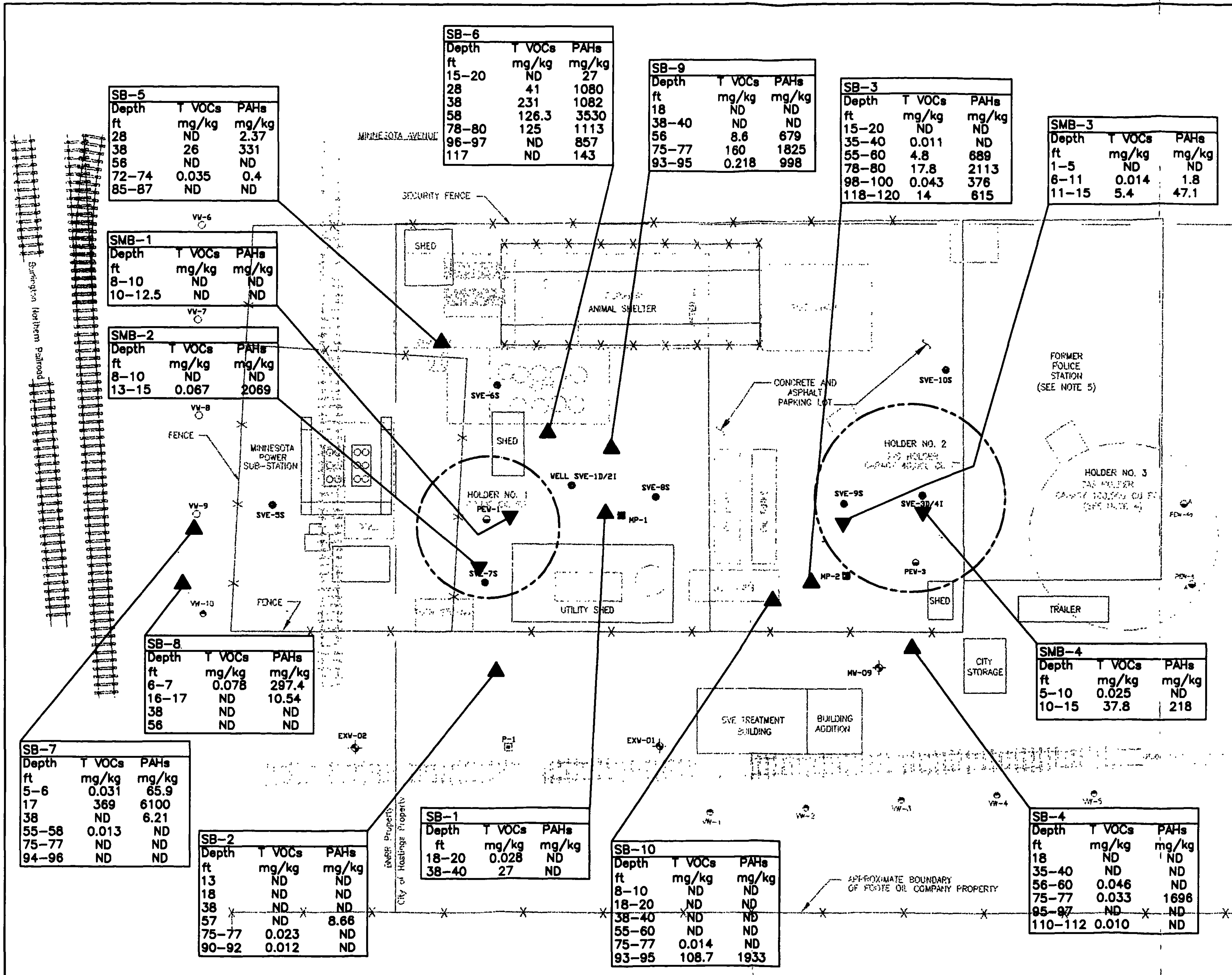


FIGURE A-1
TOTAL VOLATILES (TVOCs) AND POLYNUCLEAR AROMATIC HYDROCARBONS (PAHs) SOIL DATA
DECEMBER 6-12,2003
SECOND STREET SUBSITE
OPERABLE UNIT 12 RI/FS



SB-6

Depth ft	T VOCs mg/kg	PAHs mg/kg
15–20	ND	27
28	41	1080
38	231	1082
58	126.3	3530
78–80	125	1113
96–97	ND	857
117	ND	143

SB-5

Depth ft	T VOCs mg/kg	PAHs mg/kg
28	ND	2.37
38	26	331
56	ND	ND
72–74	0.035	0.4
85–87	ND	ND

SB-9

Depth ft	T VOCs mg/kg	PAHs mg/kg
18	ND	ND
38–40	ND	ND
56	8.6	679
75–77	160	1825
93–95	0.218	998

SB-3

Depth ft	T VOCs mg/kg	PAHs mg/kg
15–20	ND	ND
35–40	0.011	ND
55–60	4.8	689
78–80	17.8	2113
98–100	0.043	376
118–120	14	615

SMB-3

Depth ft	T VOCs mg/kg	PAHs mg/kg
1–5	ND	ND
6–11	0.014	1.8
11–15	5.4	47.1

SMB-1

Depth ft	T VOCs mg/kg	PAHs mg/kg
8–10	ND	ND
10–12.5	ND	ND

SMB-2

Depth ft	T VOCs mg/kg	PAHs mg/kg
8–10	ND	ND
13–15	0.067	2069

SB-8

Depth ft	T VOCs mg/kg	PAHs mg/kg
6–7	0.078	297.4
16–17	ND	10.54
38	ND	ND
56	ND	ND

SMB-4

Depth ft	T VOCs mg/kg	PAHs mg/kg
5–10	0.025	ND
10–15	37.8	218

SB-7

Depth ft	T VOCs mg/kg	PAHs mg/kg
5–6	0.031	65.9
17	369	6100
38	ND	6.21
55–58	0.013	ND
75–77	ND	ND
94–96	ND	ND

SB-2

Depth ft	T VOCs mg/kg	PAHs mg/kg
13	ND	ND
18	ND	ND
38	ND	ND
57	ND	8.66
75–77	0.023	ND
90–92	0.012	ND

SB-1

Depth ft	T VOCs mg/kg	PAHs mg/kg
18–20	0.028	ND
38–40	27	ND

SB-10

Depth ft	T VOCs mg/kg	PAHs mg/kg
8–10	ND	ND
18–20	ND	ND
38–40	ND	ND
55–60	ND	ND
75–77	0.014	ND
93–95	108.7	1933

SB-4

Depth ft	T VOCs mg/kg	PAHs mg/kg
18	ND	ND
35–40	ND	ND
56–60	0.046	ND
75–77	0.033	1696
95–97	ND	ND
110–112	0.010	ND

NOTES

1. LOCATIONS OF EXISTING BUILDINGS, RAILROAD CENTER LINES AND FENCE CORNERS OF THE MINNESOTA SUBSTATION ARE FROM DAVIS SURVEY COMPANY. (1996)
2. PROPERTY BOUNDARY ABSTRACTED FROM MINNESOTA SUBSTATION SITE PLAN DWG NO. E-OH-193 WERE PROVIDED BY HASTINGS UTILITIES.
3. SCREENED FEATURES PREDATE 1930, TAKEN FROM FIRE INSURANCE MAPS.
4. BASED ON INVESTIGATIONS, PHOTOGRAPHS, AND CONSTRUCTION DETAILS FOR THE POLICE STATION, THIS FORMER GAS HOLDER WAS APPARENTLY AN ABOVE GRADE STRUCTURE.
5. THE BUILDING INDICATED WAS OCCUPIED BY THE POLICE DEPARTMENT UNTIL MAY 2001.

LEGEND

- FENCE LINE
- PROPERTY BOUNDARY LINE
- PERCHED WATER COLLECTION WELL
- EXTRACTION WELL
- VENT WELL
- VENT/GROUNDWATER WELL
- ABANDONED PERCHED WATER COLLECTION WELL ATTEMPT
- PIEZOMETER
- SVE WELL
- MONITORING PROBE
- SOURCE MATERIAL BORING (SMB)
- SOIL BORING (SB)
- APPROXIMATE BELOW GRADE BOUNDARY OF FORMER GAS HOLDER STRUCTURE

SOURCE: FIGURE 1-1, MK, 1997 a

FIGURE 1
TOTAL VOLATILES (TVOCs) AND POLYNUCLEAR AROMATIC HYDROCARBONS (PAHs) SOIL DATA
SECOND STREET SUBSITE
SOURCE AREA SOILS RI/FS

PLOTTER: HP1055 PLOT SCALE: 1=1 Original dwg size 17 x 11 Revised By: ON Feb 11, 2004 @ 2:25pm
Drawing: Z:\48131\DWG\... ACAD 15.05 Plot By: kin07985 Feb 11, 2004, 02:25pm Attached Xref: Bas

Dec 2003

Geoprobe Data

Data Tables

The following data tables are attached for reference:
Table 1 – Summary of Volatile Compounds Identified (total of 12 pages)
Table 2 – Summary of Semi-Volatile Compounds Identified (total of 18 pages)
Table 3 – Summary of Waste Characteristics Testing (1 page)

For reference Tables 1 and 2 have been organized in the following order to correlate with the discussions presented:

Former gas holder #2 (north holder)
SMB-4 (within holder)
SMB-3 (within holder)
SB-3 (outside holder)
SB-4 (outside holder)
SB-10 (outside holder and adjacent to former oil tank area)

Former gas holder #1 (south holder)
SMB-1 (within holder)
SMB-2 (within holder)
SB-1 (outside holder)
SB-2 (outside holder)

Potential tar well (vicinity of SVE6S) area
SB-5
SB-6
SB-9

Potential spill area/vicinity of vent well VW9
SB-7
SB-8

Miscellaneous
Soil waste cuttings drum

QA/QC Samples
Soil trip blanks
Water rinsate blanks
Water trip blanks

TABLE 1
SUMMARY OF VOLATILE COMPOUNDS IDENTIFIED SOIL/SOURCE MATERIAL SAMPLING 12/2-6/03
2ND ST (HASTINGS) SOURCE AREA RI/FS

	Location	SMB-4	SMB-4	SMB-3	SMB-3	SMB-3
	Interval	5-10 ft bgs	10-15 ft bgs	1-6 ft bgs	6-11 ft bgs	11-15 ft bgs
	EPA No	2110-1	2110-1	2110-3	2110-4	2110-5
	Date	12/2/2003	12/2/2003	12/2/2003	12/2/2003	12/2/2003
	Time	8:45	9:00	9:30	9:50	9 45
Parameter	Units					
Volatile Organics		Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q
Acetone	ug/kg	25 J	1700 U	10 U	14 J	1800 U
Benzene	ug/kg	10 U	1700 U	10 U	10 U	1800 U
Bromodichloromethane	ug/kg	10 U	1700 U	10 U	10 U	1800 U
Bromoform	ug/kg	10 U	1700 U	10 U	10 U	1800 U
Bromomethane	ug/kg	10 U	1700 U	10 U	10 U	1800 U
2-Butanone (Methyl Ethyl Ketone)	ug/kg	10 U	1700 U	10 U	10 U	1800 U
Carbon Disulfide	ug/kg	10 U	1700 U	10 U	10 U	1800 U
Carbon Tetrachloride	ug/kg	10 U	1700 U	10 U	10 U	1800 U
Chlorobenzene	ug/kg	10 U	1700 U	10 U	10 U	1800 U
Chloroethane	ug/kg	10 U	1700 U	10 U	10 U	1800 U
Chloroform	ug/kg	10 U	1700 U	10 U	10 U	1800 U
Chloromethane	ug/kg	10 U	1700 U	10 U	10 U	1800 U
Cyclohexane	ug/kg	10 U	1700 U	10 U	10 U	1800 U
1,2 Dibromo 3-Chloropropane	ug/kg	10 U	1700 U	10 U	10 U	1800 U
Dibromochloromethane	ug/kg	10 U	1700 U	10 U	10 U	1800 U
1,2-Dibromoethane	ug/kg	10 U	1700 U	10 U	10 U	1800 U
1,2-Dichlorobenzene (Ortho)	ug/kg	10 U	1700 U	10 U	10 U	1800 U
1,3-Dichlorobenzene (Meta)	ug/kg	10 U	1700 U	10 U	10 U	1800 U
1,4-Dichlorobenzene (Para)	ug/kg	10 U	1700 U	10 U	10 U	1800 U
Dichlorodifluoromethane	ug/kg	10 U	1700 U	10 U	10 U	1800 U
1,1-Dichloroethane	ug/kg	10 U	1700 U	10 U	10 U	1800 U
1,2-Dichloroethane	ug/kg	10 U	1700 U	10 U	10 U	1800 U
1,1-Dichloroethene	ug/kg	10 U	1700 U	10 U	10 U	1800 U
cis-1,2-Dichloroethene	ug/kg	10 U	1700 U	10 U	10 U	1800 U
trans-1,2-Dichloroethene	ug/kg	10 U	1700 U	10 U	10 U	1800 U
1,2-Dichloropropane	ug/kg	10 U	1700 U	10 U	10 U	1800 U
cis-1,3,-Dichloropropene	ug/kg	10 U	1700 U	10 U	10 U	1800 U
trans-1,3,-Dichloropropene	ug/kg	10 U	1700 U	10 U	10 U	1800 U
Ethylbenzene	ug/kg	10 U	21000	10 U	10 U	5400
2-Hexanone	ug/kg	10 U	1700 U	10 U	10 U	1800 U
Isopropylbenzene	ug/kg	10 U	5800	10 U	10 U	1800 U
Methyl Acetate	ug/kg	10 U	1700 U	10 U	10 U	1800 U
Methyl tert-butyl ether	ug/kg	10 U	1700 U	10 U	10 U	1800 U
Methylcyclohexane	ug/kg	10 U	1700 U	10 U	10 U	1800 U
Methylene Chloride	ug/kg	10 U	1700 U	10 U	10 U	1800 U
4-Methyl-2-Pentanone (MIBK)	ug/kg	10 U	1700 U	10 U	10 U	1800 U
Styrene	ug/kg	10 U	1700 U	10 U	10 U	1800 U
1,1,2,2-Tetrachloroethane	ug/kg	10 U	1700 U	10 U	10 U	1800 U
Tetrachloroethene	ug/kg	10 U	1700 U	10 U	10 U	1800 U
Toluene	ug/kg	10 U	1700 U	10 U	10 U	1800 U
1,2,4-Trichlorobenzene	ug/kg	10 U	1700 U	10 U	10 U	1800 U
1,1,1-Trichloroethane	ug/kg	10 U	1700 U	10 U	10 U	1800 U
1,1,2-Trichloroethane	ug/kg	10 U	1700 U	10 U	10 U	1800 U
Trichloroethene	ug/kg	10 U	1700 U	10 U	10 U	1800 U
Trichlorofluoromethane	ug/kg	10 U	1700 U	10 U	10 U	1800 U
1,1,2-Trichlorofluoroethane	ug/kg	10 U	1700 U	10 U	10 U	1800 U
Vinyl Chloride	ug/kg	10 U	1700 U	10 U	10 U	1800 U
Total Xylenes	ug/kg	10 U	11000	10 U	10 U	1800 U
Total Volatiles	ug/kg	25	37,800	ND	14	5,400
Total BTETXs	ug/kg	ND	32,000	ND	ND	5,400

U : Compound was analyzed for but not detected. The value is the quantation limit.

J : Value estimated since not all QC criteria met.

ND : Not detected above quantation limits provided.

NA : Not applicable or not analyzed for.

TABLE 1
SUMMARY OF VOLATILE COMPOUNDS IDENTIFIED SOIL/SOURCE MATERIAL SAMPLING 12/2-6/03
2ND ST (HASTINGS) SOURCE AREA RI/FS

	Location	SB-3	SB-3	SB-3	SB-3	SB-3	SB-3
	Interval	10-15 ft bgs	35-40 ft bgs	55-60 ft bgs	78-80 ft bgs	98-100 ft bgs	118-120 ft bgs
	EPA No	2110-6	2110-7	2110-8	2110-9	2110-10	2110-11
	Date	12/2/2003	12/2/2003	12/2/2003	12/2/2003	12/2/2003	12/2/2003
	Time	10:45	11:00	11:30	12:15	13:30	15:54
Parameter	Units						
Volatile Organics		Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q
Acetone	ug/kg	10 U	11 J	2800 U	2700 U	11 U	1400 U
Benzene	ug/kg	10 U	10 U	2800 U	2700 U	10 U	1400 U
Bromodichloromethane	ug/kg	10 U	10 U	2800 U	2700 U	10 U	1400 U
Bromoform	ug/kg	10 U	10 U	2800 U	2700 U	10 U	1400 U
Bromomethane	ug/kg	10 U	10 U	2800 U	2700 U	10 U	1400 U
2-Butanone (Methyl Ethyl Ketone)	ug/kg	10 U	10 U	2800 U	2700 U	10 U	1400 U
Carbon Disulfide	ug/kg	10 U	10 U	2800 U	2700 U	10 U	1400 U
Carbon Tetrachloride	ug/kg	10 U	10 U	2800 U	2700 U	10 U	1400 U
Chlorobenzene	ug/kg	10 U	10 U	2800 U	2700 U	10 U	1400 U
Chloroethane	ug/kg	10 U	10 U	2800 U	2700 U	10 U	1400 U
Chloroform	ug/kg	10 U	10 U	2800 U	2700 U	10 U	1400 U
Chloromethane	ug/kg	10 U	10 U	2800 U	2700 U	10 U	1400 U
Cyclohexane	ug/kg	10 U	10 U	2800 U	2700 U	10 U	1400 U
1,2 Dibromo 3-Chloropropane	ug/kg	10 U	10 U	2800 U	2700 U	10 U	1400 U
Dibromochloromethane	ug/kg	10 U	10 U	2800 U	2700 U	10 U	1400 U
1,2-Dibromoethane	ug/kg	10 U	10 U	2800 U	2700 U	10 U	1400 U
1,2-Dichlorobenzene (Ortho)	ug/kg	10 U	10 U	2800 U	2700 U	10 U	1400 U
1,3-Dichlorobenzene (Meta)	ug/kg	10 U	10 U	2800 U	2700 U	10 U	1400 U
1,4-Dichlorobenzene (Para)	ug/kg	10 U	10 U	2800 U	2700 U	10 U	1400 U
Dichlorodifluoromethane	ug/kg	10 U	10 U	2800 U	2700 U	10 U	1400 U
1,1-Dichloroethane	ug/kg	10 U	10 U	2800 U	2700 U	10 U	1400 U
1,2-Dichloroethane	ug/kg	10 U	10 U	2800 U	2700 U	10 U	1400 U
1,1-Dichloroethene	ug/kg	10 U	10 U	2800 U	2700 U	10 U	1400 U
cis-1,2-Dichloroethene	ug/kg	10 U	10 U	2800 U	2700 U	10 U	1400 U
trans-1,2-Dichloroethene	ug/kg	10 U	10 U	2800 U	2700 U	10 U	1400 U
1,2-Dichloropropane	ug/kg	10 U	10 U	2800 U	2700 U	10 U	1400 U
cis-1,3,-Dichloropropene	ug/kg	10 U	10 U	2800 U	2700 U	10 U	1400 U
trans-1,3,-Dichloropropene	ug/kg	10 U	10 U	2800 U	2700 U	10 U	1400 U
Ethylbenzene	ug/kg	10 U	10 U	2800 U	2700 U	10 U	1400 U
2-Hexanone	ug/kg	10 U	10 U	2800 U	2700 U	10 U	1400 U
Isopropylbenzene	ug/kg	10 U	10 U	2800 U	2700 U	10 U	1400 U
Methyl Acetate	ug/kg	10 U	10 U	2800 U	2700 U	10 U	1400 U
Methyl tert-butyl ether	ug/kg	10 U	10 U	2800 U	2700 U	10 U	1400 U
Methylcyclohexane	ug/kg	10 U	10 U	2800 U	2700 U	10 U	1400 U
Methylene Chloride	ug/kg	10 U	10 U	2800 U	2700 U	10 U	1400 U
4-Methyl-2-Pentanone (MIBK)	ug/kg	10 U	10 U	2800 U	2700 U	10 U	1400 U
Styrene	ug/kg	10 U	10 U	4800 J	9800 J	18	1400 U
1,1,2,2-Tetrachloroethane	ug/kg	10 U	10 U	2800 U	2700 U	10 U	1400 U
Tetrachloroethene	ug/kg	10 U	10 U	2800 U	2700 U	10 U	1400 U
Toluene	ug/kg	10 U	10 U	2800 U	2700 U	10 U	1400 U
1,2,4-Trichlorobenzene	ug/kg	10 U	10 U	2800 U	2700 U	10 U	1400 U
1,1,1-Trichloroethane	ug/kg	10 U	10 U	2800 U	2700 U	10 U	1400 U
1,1,2-Trichloroethane	ug/kg	10 U	10 U	2800 U	2700 U	10 U	1400 U
Trichloroethene	ug/kg	10 U	10 U	2800 U	2700 U	10 U	1400 U
Trichlorofluoromethane	ug/kg	10 U	10 U	2800 U	2700 U	10 U	1400 U
1,1,2-Trichlorofluoroethane	ug/kg	10 U	10 U	2800 U	2700 U	10 U	1400 U
Vinyl Chloride	ug/kg	10 U	10 U	2800 U	2700 U	10 U	1400 U
Total Xylenes	ug/kg	10 U	10 U	2800 U	8000 J	25	14000
Total Volatiles	ug/kg	ND	11	4,800	17,800	43	14,000
Total BTETXs	ug/kg	ND	ND	ND	8,000	25	14,000

TABLE 1
SUMMARY OF VOLATILE COMPOUNDS IDENTIFIED SOIL/SOURCE MATERIAL SAMPLING 12/2-6/03
2ND ST (HASTINGS) SOURCE AREA RI/FS

	Location	SB-4	SB-4	SB-4	SB-4	SB-4	SB-4	SB-4
	Interval	18 ft bgs	35-40 ft bgs	55-60 ft bgs	55-60 ft bgs	75-77 ft bgs	95-97 ft bgs	110-112 ft bgs
	EPA No	2110-38	2110-39	2110-40	2110-40FD (Dup)	2110-56	2110-57	2110-58
	Date	12/4/2003	12/4/2003	12/4/2003	12/4/2003	12/6/2003	12/6/2003	12/6/2003
	Time	14:00	14:30	14:45	14:45	8:10	8:30	8:10
Parameter	Units							
Volatile Organics		Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q
Acetone	ug/kg	10 U	10 U	36 J	11 U	18	10 U	10 J
Benzene	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Bromodichloromethane	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Bromoform	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Bromomethane	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Butanone (Methyl Ethyl Ketone)	ug/kg	10 U	10 U	10 J	10 U	10 U	10 U	10 U
Carbon Disulfide	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Carbon Tetrachloride	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chlorobenzene	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chloroethane	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chloroform	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chloromethane	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Cyclohexane	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2 Dibromo 3-Chloropropane	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Dibromochloromethane	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dibromoethane	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichlorobenzene (Ortho)	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,3-Dichlorobenzene (Meta)	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,4-Dichlorobenzene (Para)	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Dichlorodifluoromethane	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethane	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloroethane	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethene	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U
cis-1,2-Dichloroethene	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U
trans-1,2-Dichloroethene	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloropropane	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U
cis-1,3,-Dichloropropene	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U
trans-1,3,-Dichloropropene	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Ethylbenzene	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Hexanone	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Isopropylbenzene	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methyl Acetate	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methyl tert-butyl ether	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methylcyclohexane	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methylene Chloride	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Methyl-2-Pentanone (MIBK)	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Styrene	ug/kg	10 U	10 U	10 U	10 U	15	10 U	10 U
1,1,2,2-Tetrachloroethane	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Tetrachloroethene	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Toluene	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2,4-Trichlorobenzene	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1,1-Trichloroethane	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1,2-Trichloroethane	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Trichloroethene	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Trichlorofluoromethane	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1,2-Trichlorofluoroethane	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Vinyl Chloride	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Total Xylenes	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Total Volatiles	ug/kg	ND	ND	46	ND	33	ND	10
Total BTETXs	ug/kg	ND	ND	ND	ND	ND	ND	ND

TABLE 1
SUMMARY OF VOLATILE COMPOUNDS IDENTIFIED SOIL/SOURCE MATERIAL SAMPLING 12/2-6/03
2ND ST (HASTINGS) SOURCE AREA RI/FS

	Location	SB-10		SB-10		SB-10		SB-10		SB-10		SB-10	
	Interval	8-10 ft bgs		18-20 ft bgs		38-40 ft bgs		55-56 ft bgs		75-77 ft bgs		93-95 ft bgs	
	EPA No	2110-46		2110-47		2110-48		2110-49		2110-50		2110-51	
	Date	12/5/2003		12/5/2003		12/5/2003		12/5/2003		12/5/2003		12/5/2003	
	Time	9:40		9:50		10:05		10:20		11:45		12.15	
Parameter	Units												
Volatile Organics		Conc.	Q	Conc.	Q	Conc.	Q	Conc.	Q	Conc.	Q	Conc.	Q
Acetone	ug/kg	10	U	10	U	10	U	10	U	14	J	2700	U
Benzene	ug/kg	10	U	10	U	10	U	10	U	10	U	2700	U
Bromodichloromethane	ug/kg	10	U	10	U	10	U	10	U	10	U	2700	U
Bromoform	ug/kg	10	U	10	U	10	U	10	U	10	U	2700	U
Bromomethane	ug/kg	10	U	10	U	10	U	10	U	10	U	2700	U
2-Butanone (Methyl Ethyl Ketone)	ug/kg	10	U	10	U	10	U	10	U	10	U	2700	U
Carbon Disulfide	ug/kg	10	U	10	U	10	U	10	U	10	U	2700	U
Carbon Tetrachloride	ug/kg	10	U	10	U	10	U	10	U	10	U	2700	U
Chlorobenzene	ug/kg	10	U	10	U	10	U	10	U	10	U	2700	U
Chloroethane	ug/kg	10	U	10	U	10	U	10	U	10	U	2700	U
Chloroform	ug/kg	10	U	10	U	10	U	10	U	10	U	2700	U
Chloromethane	ug/kg	10	U	10	U	10	U	10	U	10	U	2700	U
Cyclohexane	ug/kg	10	U	10	U	10	U	10	U	10	U	2700	U
1,2 Dibromo 3-Chloropropane	ug/kg	10	U	10	U	10	U	10	U	10	U	2700	U
Dibromochloromethane	ug/kg	10	U	10	U	10	U	10	U	10	U	2700	U
1,2-Dibromoethane	ug/kg	10	U	10	U	10	U	10	U	10	U	2700	U
1,2-Dichlorobenzene (Ortho)	ug/kg	10	U	10	U	10	U	10	U	10	U	2700	U
1,3-Dichlorobenzene (Meta)	ug/kg	10	U	10	U	10	U	10	U	10	U	2700	U
1,4-Dichlorobenzene (Para)	ug/kg	10	U	10	U	10	U	10	U	10	U	2700	U
Dichlorodifluoromethane	ug/kg	10	U	10	U	10	U	10	U	10	U	2700	U
1,1-Dichloroethane	ug/kg	10	U	10	U	10	U	10	U	10	U	2700	U
1,2-Dichloroethane	ug/kg	10	U	10	U	10	U	10	U	10	U	2700	U
1,1-Dichloroethene	ug/kg	10	U	10	U	10	U	10	U	10	U	2700	U
cis-1,2-Dichloroethene	ug/kg	10	U	10	U	10	U	10	U	10	U	2700	U
trans-1,2-Dichloroethene	ug/kg	10	U	10	U	10	U	10	U	10	U	2700	U
1,2-Dichloropropane	ug/kg	10	U	10	U	10	U	10	U	10	U	2700	U
cis-1,3,-Dichloropropene	ug/kg	10	U	10	U	10	U	10	U	10	U	2700	U
trans-1,3,-Dichloropropene	ug/kg	10	U	10	U	10	U	10	U	10	U	2700	U
Ethylbenzene	ug/kg	10	U	10	U	10	U	10	U	10	U	2700	U
2-Hexanone	ug/kg	10	U	10	U	10	U	10	U	10	U	2700	U
Isopropylbenzene	ug/kg	10	U	10	U	10	U	10	U	10	U	2700	U
Methyl Acetate	ug/kg	10	U	10	U	10	U	10	U	10	U	2700	U
Methyl tert-butyl ether	ug/kg	10	U	10	U	10	U	10	U	10	U	2700	U
Methylcyclohexane	ug/kg	10	U	10	U	10	U	10	U	10	U	2700	U
Methylene Chloride	ug/kg	10	U	10	U	10	U	10	U	10	U	2700	U
4-Methyl-2-Pentanone (MIBK)	ug/kg	10	U	10	U	10	U	10	U	10	U	2700	U
Styrene	ug/kg	10	U	10	U	10	U	10	U	10	U	50000	
1,1,2,2-Tetrachloroethane	ug/kg	10	U	10	U	10	U	10	U	10	U	2700	U
Tetrachloroethene	ug/kg	10	U	10	U	10	U	10	U	10	U	2700	U
Toluene	ug/kg	10	U	10	U	10	U	10	U	10	U	2700	
1,2,4-Trichlorobenzene	ug/kg	10	U	10	U	10	U	10	U	10	U	2700	U
1,1,1-Trichloroethane	ug/kg	10	U	10	U	10	U	10	U	10	U	2700	U
1,1,2-Trichloroethane	ug/kg	10	U	10	U	10	U	10	U	10	U	2700	U
Trichloroethene	ug/kg	10	U	10	U	10	U	10	U	10	U	2700	U
Trichlorofluoromethane	ug/kg	10	U	10	U	10	U	10	U	10	U	2700	U
1,1,2-Trichlorofluoroethane	ug/kg	10	U	10	U	10	U	10	U	10	U	2700	U
Vinyl Chloride	ug/kg	10	U	10	U	10	U	10	U	10	U	2700	U
Total Xylenes	ug/kg	10	U	10	U	10	U	10	U	10	U	56000	
Total Volatiles	ug/kg	ND		ND		ND		ND		14		108,700	
Total BTETXs	ug/kg	ND		ND		ND		ND		ND		58,700	

TABLE 1
SUMMARY OF VOLATILE COMPOUNDS IDENTIFIED SOIL/SOURCE MATERIAL SAMPLING 12/2-6/03
2ND ST (HASTINGS) SOURCE AREA RI/FS

	Location	SMB-1	SMB-1	SMB-2	SMB-2	SB-1	SB-1
	Interval	8-10 ft bgs	10-12.5 ft bgs	8-10 ft bgs	13-15 ft bgs	18-20 ft bgs	38 ft bgs
	EPA No	2110-12	2110-13	2110-14	2110-15	2110-41	2110-412
	Date	12/2/2003	12/2/2003	12/2/2003	12/2/2003	12/4/2003	12/4/2003
	Time	16:35	16:50	17:15	17:25	15:30	15:45
Parameter	Units						
Volatile Organics		Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q
Acetone	ug/kg	10 U	16 U	10 U	14 U	28 J	1600 U
Benzene	ug/kg	10 U	13 U	10 U	18	10 U	1600 U
Bromodichloromethane	ug/kg	10 U	13 U	10 U	14 U	10 U	1600 U
Bromoform	ug/kg	10 U	13 U	10 U	14 U	10 U	1600 U
Bromomethane	ug/kg	10 U	13 U	10 U	14 U	10 U	1600 U
2-Butanone (Methyl Ethyl Ketone)	ug/kg	10 U	13 U	10 U	14 U	10 U	1600 U
Carbon Disulfide	ug/kg	10 U	13 U	10 U	14 U	10 U	1600 U
Carbon Tetrachloride	ug/kg	10 U	13 U	10 U	14 U	10 U	1600 U
Chlorobenzene	ug/kg	10 U	13 U	10 U	14 U	10 U	1600 U
Chloroethane	ug/kg	10 U	13 U	10 U	14 U	10 U	1600 U
Chloroform	ug/kg	10 U	13 U	10 U	14 U	10 U	1600 U
Chloromethane	ug/kg	10 U	13 U	10 U	14 U	10 U	1600 U
Cyclohexane	ug/kg	10 U	13 U	10 U	14 U	10 U	1600 U
1,2 Dibromo 3-Chloropropane	ug/kg	10 U	13 U	10 U	14 U	10 U	1600 U
Dibromochloromethane	ug/kg	10 U	13 U	10 U	14 U	10 U	1600 U
1,2-Dibromoethane	ug/kg	10 U	13 U	10 U	14 U	10 U	1600 U
1,2-Dichlorobenzene (Ortho)	ug/kg	10 U	13 U	10 U	14 U	10 U	1600 U
1,3-Dichlorobenzene (Meta)	ug/kg	10 U	13 U	10 U	14 U	10 U	1600 U
1,4-Dichlorobenzene (Para)	ug/kg	10 U	13 U	10 U	14 U	10 U	1600 U
Dichlorodifluoromethane	ug/kg	10 U	13 U	10 U	14 U	10 U	1600 U
1,1-Dichloroethane	ug/kg	10 U	13 U	10 U	14 U	10 U	1600 U
1,2-Dichloroethane	ug/kg	10 U	13 U	10 U	14 U	10 U	1600 U
1,1-Dichloroethene	ug/kg	10 U	13 U	10 U	14 U	10 U	1600 U
cis-1,2-Dichloroethene	ug/kg	10 U	13 U	10 U	14 U	10 U	1600 U
trans-1,2-Dichloroethene	ug/kg	10 U	13 U	10 U	14 U	10 U	1600 U
1,2-Dichloropropane	ug/kg	10 U	13 U	10 U	14 U	10 U	1600 U
cis-1,3,-Dichloropropene	ug/kg	10 U	13 U	10 U	14 U	10 U	1600 U
trans-1,3,-Dichloropropene	ug/kg	10 U	13 U	10 U	14 U	10 U	1600 U
Ethylbenzene	ug/kg	10 U	13 U	10 U	19	10 U	6600 J
2-Hexanone	ug/kg	10 U	13 U	10 U	14 U	10 U	1600 U
Isopropylbenzene	ug/kg	10 U	13 U	10 U	14 U	10 U	1600 U
Methyl Acetate	ug/kg	10 U	13 U	10 U	14 U	10 U	1600 U
Methyl tert-butyl ether	ug/kg	10 U	13 U	10 U	14 U	10 U	1600 U
Methylcyclohexane	ug/kg	10 U	13 U	10 U	14 U	10 U	1600 U
Methylene Chloride	ug/kg	10 U	19 U	10 U	23 U	10 U	1600 U
4-Methyl-2-Pentanone (MIBK)	ug/kg	10 U	13 U	10 U	14 U	10 U	1600 U
Styrene	ug/kg	10 U	13 U	10 U	14 U	10 U	3700 J
1,1,2,2-Tetrachloroethane	ug/kg	10 U	13 U	10 U	14 U	10 U	1600 U
Tetrachloroethene	ug/kg	10 U	13 U	10 U	14 U	10 U	1600 U
Toluene	ug/kg	10 U	13 U	10 U	14 U	10 U	7100 J
1,2,4-Trichlorobenzene	ug/kg	10 U	13 U	10 U	14 U	10 U	1600 U
1,1,1-Trichloroethane	ug/kg	10 U	13 U	10 U	14 U	10 U	1600 U
1,1,2-Trichloroethane	ug/kg	10 U	13 U	10 U	14 U	10 U	1600 U
Trichloroethene	ug/kg	10 U	13 U	10 U	14 U	10 U	1600 U
Trichlorofluoromethane	ug/kg	10 U	13 U	10 U	14 U	10 U	1600 U
1,1,2-Trichlorofluoroethane	ug/kg	10 U	13 U	10 U	14 U	10 U	1600 U
Vinyl Chloride	ug/kg	10 U	13 U	10 U	14 U	10 U	1600 U
Total Xylenes	ug/kg	10 U	13 U	10 U	30	10 U	9600 J
Total Volatiles	ug/kg	ND	ND	ND	67	28	27,000
Total BTETXs	ug/kg	ND	ND	ND	67	ND	23,300

TABLE 1
SUMMARY OF VOLATILE COMPOUNDS IDENTIFIED SOIL/SOURCE MATERIAL SAMPLING 12/2-6/03
2ND ST (HASTINGS) SOURCE AREA RI/FS

	Location	SB-2	SB-2	SB-2	SB-2	SB-2	SB-2
	Interval	13 ft bgs	18 ft bgs	38 ft bgs	57 ft bgs	75-77 ft bgs	90-92 ft bgs
	EPA No	2110-34	2110-35	2110-36	2110-37	2110-59	2110-60
	Date	12/4/2003	12/4/2003	12/4/2003	12/4/2003	12/6/2003	12/6/2003
	Time	11:15	11:25	11:40	11:50	9:50	10:10
Parameter	Units						
Volatile Organics		Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q
Acetone	ug/kg	10 U	10 U	10 U	10 U	23	12
Benzene	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U
Bromodichloromethane	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U
Bromoform	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U
Bromomethane	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U
2-Butanone (Methyl Ethyl Ketone)	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U
Carbon Disulfide	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U
Carbon Tetrachloride	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U
Chlorobenzene	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U
Chloroethane	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U
Chloroform	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U
Chloromethane	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U
Cyclohexane	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U
1,2 Dibromo 3-Chloropropane	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U
Dibromochloromethane	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dibromoethane	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichlorobenzene (Ortho)	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U
1,3-Dichlorobenzene (Meta)	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U
1,4-Dichlorobenzene (Para)	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U
Dichlorodifluoromethane	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethane	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloroethane	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethene	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U
cis-1,2-Dichloroethene	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U
trans-1,2-Dichloroethene	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloropropane	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U
cis-1,3,-Dichloropropene	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U
trans-1,3,-Dichloropropene	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U
Ethylbenzene	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U
2-Hexanone	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U
Isopropylbenzene	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U
Methyl Acetate	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U
Methyl tert-butyl ether	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U
Methylcyclohexane	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U
Methylene Chloride	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U
4-Methyl-2-Pentanone (MIBK)	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U
Styrene	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U
1,1,2,2-Tetrachloroethane	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U
Tetrachloroethene	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U
Toluene	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U
1,2,4-Trichlorobenzene	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U
1,1,1-Trichloroethane	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U
1,1,2-Trichloroethane	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U
Trichloroethene	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U
Trichlorofluoromethane	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U
1,1,2-Trichlorofluoroethane	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U
Vinyl Chloride	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U
Total Xylenes	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U
Total Volatiles	ug/kg	ND	ND	ND	ND	23	12
Total BTETXs	ug/kg	ND	ND	ND	ND	ND	ND

TABLE 1
SUMMARY OF VOLATILE COMPOUNDS IDENTIFIED SOIL/SOURCE MATERIAL SAMPLING 12/2-6/03
2ND ST (HASTINGS) SOURCE AREA RI/FS

	Location	SB-5	SB-5	SB-5	SB-5	SB-5	SB-5
	Interval	28 ft bgs	38 ft bgs	58 ft bgs	72-74 ft bgs	72-74 ft bgs	85-87 ft bgs
	EPA No	2110-23	2110-24	2110-25	2110-54	2110-54FD (Dup)	2110-55
	Date	12/3/2003	12/3/2003	12/3/2003	12/5/2003	12/5/2003	12/5/2003
	Time	14:20	14:45	15:10	15:20	15:20	16:20
Parameter	Units						
Volatile Organics		Conc Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q
Acetone	ug/kg	10 U	1600 U	10 U	11 J	10 U	10 U
Benzene	ug/kg	10 U	1600 U	10 U	10 U	10 U	10 U
Bromodichloromethane	ug/kg	10 U	1600 U	10 U	10 U	10 U	10 U
Bromoform	ug/kg	10 U	1600 U	10 U	10 U	10 U	10 U
Bromomethane	ug/kg	10 U	1600 U	10 U	10 U	10 U	10 U
2-Butanone (Methyl Ethyl Ketone)	ug/kg	10 U	1600 U	10 U	10 U	10 U	10 U
Carbon Disulfide	ug/kg	10 U	1600 U	10 U	10 U	10 U	10 U
Carbon Tetrachloride	ug/kg	10 U	1600 U	10 U	10 U	10 U	10 U
Chlorobenzene	ug/kg	10 U	1600 U	10 U	10 U	10 U	10 U
Chloroethane	ug/kg	10 U	1600 U	10 U	10 U	10 U	10 U
Chloroform	ug/kg	10 U	1600 U	10 U	10 U	10 U	10 U
Chloromethane	ug/kg	10 U	1600 U	10 U	10 U	10 U	10 U
Cyclohexane	ug/kg	10 U	1600 U	10 U	10 U	10 U	10 U
1,2 Dibromo 3-Chloropropane	ug/kg	10 U	N/A R	10 U	10 U	10 U	10 U
Dibromochloromethane	ug/kg	10 U	1600 U	10 U	10 U	10 U	10 U
1,2-Dibromoethane	ug/kg	10 U	1600 U	10 U	10 U	10 U	10 U
1,2-Dichlorobenzene (Ortho)	ug/kg	10 U	1600 U	10 U	10 U	10 U	10 U
1,3-Dichlorobenzene (Meta)	ug/kg	10 U	1600 U	10 U	10 U	10 U	10 U
1,4-Dichlorobenzene (Para)	ug/kg	10 U	1600 U	10 U	10 U	10 U	10 U
Dichlorodifluoromethane	ug/kg	10 U	1600 U	10 U	10 U	10 U	10 U
1,1-Dichloroethane	ug/kg	10 U	1600 U	10 U	10 U	10 U	10 U
1,2-Dichloroethane	ug/kg	10 U	1600 U	10 U	10 U	10 U	10 U
1,1-Dichloroethene	ug/kg	10 U	1600 U	10 U	10 U	10 U	10 U
cis-1,2-Dichloroethene	ug/kg	10 U	1600 U	10 U	10 U	10 U	10 U
trans-1,2-Dichloroethene	ug/kg	10 U	1600 U	10 U	10 U	10 U	10 U
1,2-Dichloropropane	ug/kg	10 U	1600 U	10 U	10 U	10 U	10 U
cis-1,3,-Dichloropropene	ug/kg	10 U	1600 U	10 U	10 U	10 U	10 U
trans-1,3,-Dichloropropene	ug/kg	10 U	1600 U	10 U	10 U	10 U	10 U
Ethylbenzene	ug/kg	10 U	1600 U	10 U	10 U	10 U	10 U
2-Hexanone	ug/kg	10 U	1600 U	10 U	10 U	10 U	10 U
Isopropylbenzene	ug/kg	10 U	1600 U	10 U	10 U	10 U	10 U
Methyl Acetate	ug/kg	10 U	1600 U	10 U	10 U	10 U	10 U
Methyl tert-butyl ether	ug/kg	10 U	1600 U	10 U	10 U	10 U	10 U
Methylcyclohexane	ug/kg	10 U	1600 U	10 U	10 U	10 U	10 U
Methylene Chloride	ug/kg	10 U	1600 U	10 U	10 U	3	10 U
4-Methyl-2-Pentanone (MIBK)	ug/kg	10 U	1600 U	10 U	10 U	10 U	10 U
Styrene	ug/kg	10 U	3100	10 U	10 U	10 U	10 U
1,1,2,2-Tetrachloroethane	ug/kg	10 U	1600 U	10 U	10 U	10 U	10 U
Tetrachloroethene	ug/kg	10 U	1600 U	10 U	10 U	10 U	10 U
Toluene	ug/kg	10 U	2900	10 U	10 U	10 U	10 U
1,2,4-Trichlorobenzene	ug/kg	10 U	1600 U	10 U	10 U	10 U	10 U
1,1,1-Trichloroethane	ug/kg	10 U	1600 U	10 U	10 U	10 U	10 U
1,1,2-Trichloroethane	ug/kg	10 U	1600 U	10 U	10 U	10 U	10 U
Trichloroethene	ug/kg	10 U	1600 U	10 U	10 U	2	10 U
Trichlorofluoromethane	ug/kg	10 U	1600 U	10 U	10 U	10 U	10 U
1,1,2-Trichlorofluoroethane	ug/kg	10 U	1600 U	10 U	10 U	10 U	10 U
Vinyl Chloride	ug/kg	10 U	1600 U	10 U	10 U	10 U	10 U
Total Xylenes	ug/kg	10 U	20000	10 U	24	10 U	10 U
Total Volatiles	ug/kg	ND	26,000	ND	35	5	ND
Total BTETXs	ug/kg	ND	22,900	ND	24	ND	ND

TABLE 1
SUMMARY OF VOLATILE COMPOUNDS IDENTIFIED SOIL/SOURCE MATERIAL SAMPLING 12/2-6/03
2ND ST (HASTINGS) SOURCE AREA RI/FS

	Location	SB-6	SB-6	SB-6	SB-6	SB-6	SB-6	SB-6	SB-6
	Interval	15-20 ft bgs	28 ft bgs	38 ft bgs	58 ft bgs	78-80 ft bgs	78-80 ft bgs	96-97 ft bgs	117 ft bgs
	EPA No	2110-16	2110-17	2110-18	2110-19	2110-20	2110-20FD (Dup)	2110-21	2110-22
	Date	12/3/2003	12/3/2003	12/3/2003	12/3/2003	12/3/2003	12/3/2003	12/3/2003	12/3/2003
	Time	8:30	8:45	9:00	9:15	9:45	9:45	10:30	12:38
Parameter	Units								
Volatile Organics		Conc. Q	Conc Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q
Acetone	ug/kg	10 U	1800 U	16000 U	2800 U	6900 U	5500 U	10 U	10 U
Benzene	ug/kg	10 U	1500 U	21000	4600 J	6900 U	5500 U	10 U	10 U
Bromodichloromethane	ug/kg	10 U	1500 U	16000 U	2800 U	6900 U	5500 U	10 U	10 U
Bromoform	ug/kg	10 U	1500 U	16000 U	2800 U	6900 U	5500 U	10 U	10 U
Bromomethane	ug/kg	10 U	1500 U	16000 U	2800 U	6900 U	5500 U	10 U	10 U
2-Butanone (Methyl Ethyl Ketone)	ug/kg	10 U	1500 U	16000 U	2800 U	6900 U	5500 U	10 U	10 U
Carbon Disulfide	ug/kg	10 U	1500 U	16000 U	2800 U	6900 U	5500 U	10 U	10 U
Carbon Tetrachloride	ug/kg	10 U	1500 U	16000 U	2800 U	6900 U	5500 U	10 U	10 U
Chlorobenzene	ug/kg	10 U	1500 U	16000 U	2800 U	6900 U	5500 U	10 U	10 U
Chloroethane	ug/kg	10 U	1500 U	16000 U	2800 U	6900 U	5500 U	10 U	10 U
Chloroform	ug/kg	10 U	1500 U	16000 U	2800 U	6900 U	5500 U	10 U	10 U
Chloromethane	ug/kg	10 U	1500 U	16000 U	2800 U	6900 U	5500 U	10 U	10 U
Cyclohexane	ug/kg	10 U	1500 U	16000 U	2800 U	6900 U	5500 U	10 U	10 U
1,2 Dibromo 3-Chloropropane	ug/kg	10 U	N/A R	16000 U	2800 U	6900 U	5500 U	10 U	10 U
Dibromochloromethane	ug/kg	10 U	1500 U	16000 U	2800 U	6900 U	5500 U	10 U	10 U
1,2-Dibromoethane	ug/kg	10 U	1500 U	16000 U	2800 U	6900 U	5500 U	10 U	10 U
1,2-Dichlorobenzene (Ortho)	ug/kg	10 U	1500 U	16000 U	2800 U	6900 U	5500 U	10 U	10 U
1,3-Dichlorobenzene (Meta)	ug/kg	10 U	1500 U	16000 U	2800 U	6900 U	5500 U	10 U	10 U
1,4-Dichlorobenzene (Para)	ug/kg	10 U	1500 U	16000 U	2800 U	6900 U	5500 U	10 U	10 U
Dichlorodifluoromethane	ug/kg	10 U	1500 U	16000 U	2800 U	6900 U	5500 U	10 U	10 U
1,1-Dichloroethane	ug/kg	10 U	1500 U	16000 U	2800 U	6900 U	5500 U	10 U	10 U
1,2-Dichloroethane	ug/kg	10 U	1500 U	16000 U	2800 U	6900 U	5500 U	10 U	10 U
1,1-Dichloroethene	ug/kg	10 U	1500 U	16000 U	2800 U	6900 U	5500 U	10 U	10 U
cis-1,2-Dichloroethene	ug/kg	10 U	1500 U	16000 U	2800 U	6900 U	5500 U	10 U	10 U
trans-1,2-Dichloroethene	ug/kg	10 U	1500 U	16000 U	2800 U	6900 U	5500 U	10 U	10 U
1,2-Dichloropropane	ug/kg	10 U	1500 U	16000 U	2800 U	6900 U	5500 U	10 U	10 U
cis-1,3,-Dichloropropene	ug/kg	10 U	1500 U	16000 U	2800 U	6900 U	5500 U	10 U	10 U
trans-1,3,-Dichloropropene	ug/kg	10 U	1500 U	16000 U	2800 U	6900 U	5500 U	10 U	10 U
Ethylbenzene	ug/kg	10 U	1500 U	24000	15000 J	6900 U	5500 U	10 U	10 U
2-Hexanone	ug/kg	10 U	1500 U	16000 U	2800 U	6900 U	5500 U	10 U	10 U
Isopropylbenzene	ug/kg	10 U	1500 U	16000 U	2800 U	6900 U	5500 U	10 U	10 U
Methyl Acetate	ug/kg	10 U	1500 U	16000 U	2800 U	6900 U	5500 U	10 U	10 U
Methyl tert-butyl ether	ug/kg	10 U	1500 U	16000 U	2800 U	6900 U	5500 U	10 U	10 U
Methylcyclohexane	ug/kg	10 U	1500 U	16000 U	2800 U	6900 U	5500 U	10 U	10 U
Methylene Chloride	ug/kg	10 U	1500 U	16000 U	2800 U	6900 U	5500 U	10 U	10 U
4-Methyl-2-Pentanone (MIBK)	ug/kg	10 U	1500 U	16000 U	2800 U	6900 U	5500 U	10 U	10 U
Styrene	ug/kg	10 U	15000	22000	8700 J	29000	27000	10 U	10 U
1,1,2,2-Tetrachloroethane	ug/kg	10 U	1500 U	16000 U	2800 U	6900 U	5500 U	10 U	10 U
Tetrachloroethene	ug/kg	10 U	1500 U	16000 U	2800 U	6900 U	5500 U	10 U	10 U
Toluene	ug/kg	10 U	1500 U	100000	27000 J	6900 U	5500 U	10 U	10 U
1,2,4-Trichlorobenzene	ug/kg	10 U	1500 U	16000 U	2800 U	6900 U	5500 U	10 U	10 U
1,1,1-Trichloroethane	ug/kg	10 U	1500 U	16000 U	2800 U	6900 U	5500 U	10 U	10 U
1,1,2-Trichloroethane	ug/kg	10 U	1500 U	16000 U	2800 U	6900 U	5500 U	10 U	10 U
Trichloroethene	ug/kg	10 U	1500 U	16000 U	2800 U	6900 U	5500 U	10 U	10 U
Trichlorofluoromethane	ug/kg	10 U	1500 U	16000 U	2800 U	6900 U	5500 U	10 U	10 U
1,1,2-Trichlorofluoroethane	ug/kg	10 U	1500 U	16000 U	2800 U	6900 U	5500 U	10 U	10 U
Vinyl Chloride	ug/kg	10 U	1500 U	16000 U	2800 U	6900 U	5500 U	10 U	10 U
Total Xylenes	ug/kg	10 U	26000	64000	71000 J	96000	89000	10 U	10 U
Total Volatiles	ug/kg	ND	41,000	231,000	128,300	125,000	116,000	ND	ND
Total BTETXs	ug/kg	ND	26,000	209,000	117,600	96,000	89,000	ND	ND

TABLE 1
SUMMARY OF VOLATILE COMPOUNDS IDENTIFIED SOIL/SOURCE MATERIAL SAMPLING 12/2-6/03
2ND ST (HASTINGS) SOURCE AREA RI/FS

Parameter	Location	SB-9	SB-9	SB-9	SB-9	SB-9
	Interval	18 ft bgs	38-40 ft bgs	56 ft bgs	75-77 ft bgs	93-95 ft bgs
	EPA No	2110-43	2110-44	2110-45	2110-52	2110-53
	Date	12/5/2003	12/5/2003	12/5/2003	12/5/2003	12/5/2003
	Time	8:20	8:35	9:00	13:20	13:35
	Units					
Volatile Organics		Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q
Acetone	ug/kg	10 U	10 U	1400 U	1400 U	10 U
Benzene	ug/kg	10 U	10 U	1400 U	1400 U	10 U
Bromodichloromethane	ug/kg	10 U	10 U	1400 U	1400 U	10 U
Bromoform	ug/kg	10 U	10 U	1400 U	1400 U	10 U
Bromomethane	ug/kg	10 U	10 U	1400 U	1400 U	10 U
2-Butanone (Methyl Ethyl Ketone)	ug/kg	10 U	10 U	1400 U	1400 U	10 U
Carbon Disulfide	ug/kg	10 U	10 U	1400 U	1400 U	10 U
Carbon Tetrachloride	ug/kg	10 U	10 U	1400 U	1400 U	10 U
Chlorobenzene	ug/kg	10 U	10 U	1400 U	1400 U	10 U
Chloroethane	ug/kg	10 U	10 U	1400 U	1400 U	10 U
Chloroform	ug/kg	10 U	10 U	1400 U	1400 U	10 U
Chloromethane	ug/kg	10 U	10 U	1400 U	1400 U	10 U
Cyclohexane	ug/kg	10 U	10 U	1400 U	1400 U	10 U
1,2 Dibromo 3-Chloropropane	ug/kg	10 U	10 U	N/A R	1400 U	10 U
Dibromochloromethane	ug/kg	10 U	10 U	1400 U	1400 U	10 U
1,2-Dibromoethane	ug/kg	10 U	10 U	1400 U	1400 U	10 U
1,2-Dichlorobenzene (Ortho)	ug/kg	10 U	10 U	1400 U	1400 U	10 U
1,3-Dichlorobenzene (Meta)	ug/kg	10 U	10 U	1400 U	1400 U	10 U
1,4-Dichlorobenzene (Para)	ug/kg	10 U	10 U	1400 U	1400 U	10 U
Dichlorodifluoromethane	ug/kg	10 U	10 U	1400 U	1400 U	10 U
1,1-Dichloroethane	ug/kg	10 U	10 U	1400 U	1400 U	10 U
1,2-Dichloroethane	ug/kg	10 U	10 U	1400 U	1400 U	10 U
1,1-Dichloroethene	ug/kg	10 U	10 U	1400 U	1400 U	10 U
cis-1,2-Dichloroethene	ug/kg	10 U	10 U	1400 U	1400 U	10 U
trans-1,2-Dichloroethene	ug/kg	10 U	10 U	1400 U	1400 U	10 U
1,2-Dichloropropane	ug/kg	10 U	10 U	1400 U	1400 U	10 U
cis-1,3,-Dichloropropene	ug/kg	10 U	10 U	1400 U	1400 U	10 U
trans-1,3,-Dichloropropene	ug/kg	10 U	10 U	1400 U	1400 U	10 U
Ethylbenzene	ug/kg	10 U	10 U	1400 U	1400 U	10 U
2-Hexanone	ug/kg	10 U	10 U	1400 U	1400 U	10 U
Isopropylbenzene	ug/kg	10 U	10 U	1400 U	1400 U	10 U
Methyl Acetate	ug/kg	10 U	10 U	1400 U	1400 U	10 U
Methyl tert-butyl ether	ug/kg	10 U	10 U	1400 U	1400 U	10 U
Methylcyclohexane	ug/kg	10 U	10 U	1400 U	1400 U	10 U
Methylene Chloride	ug/kg	10 U	10 U	1400 U	1400 U	12 U
4-Methyl-2-Pentanone (MIBK)	ug/kg	10 U	10 U	1400 U	1400 U	10 U
Styrene	ug/kg	10 U	10 U	1400 U	40000	68
1,1,2,2-Tetrachloroethane	ug/kg	10 U	10 U	1400 U	1400 U	10 U
Tetrachloroethene	ug/kg	10 U	10 U	1400 U	1400 U	10 U
Toluene	ug/kg	10 U	10 U	1400 U	1400 U	10 U
1,2,4-Trichlorobenzene	ug/kg	10 U	10 U	1400 U	1400 U	10 U
1,1,1-Trichloroethane	ug/kg	10 U	10 U	1400 U	1400 U	10 U
1,1,2-Trichloroethane	ug/kg	10 U	10 U	1400 U	1400 U	10 U
Trichloroethene	ug/kg	10 U	10 U	1400 U	1400 U	10 U
Trichlorofluoromethane	ug/kg	10 U	10 U	1400 U	1400 U	10 U
1,1,2-Trichlorofluoroethane	ug/kg	10 U	10 U	1400 U	1400 U	10 U
Vinyl Chloride	ug/kg	10 U	10 U	1400 U	1400 U	10 U
Total Xylenes	ug/kg	10 U	10 U	8600	120000	150
Total Volatiles	ug/kg	ND	ND	8,600	160,000	218
Total BTETXs	ug/kg	ND	ND	8,600	120,000	150

TABLE 1
SUMMARY OF VOLATILE COMPOUNDS IDENTIFIED SOIL/SOURCE MATERIAL SAMPLING 12/2-6/03
2ND ST (HASTINGS) SOURCE AREA RI/FS

	Location	SB-7	SB-7	SB-7	SB-7	SB-7	SB-7
	Interval	5-6 ft bgs	17 ft bgs	38 ft bgs	55-58 ft bgs	75-77 ft bgs	94-96 ft bgs
	EPA No	2110-26	2110-27	2110-28	2110-29	2110-61	2110-62
	Date	12/4/2003	12/4/2003	12/4/2003	12/4/2003	12/6/2003	12/6/2003
	Time	7:45	8:00	8:35	9:00	11:20	11:45
Parameter	Units						
Volatile Organics		Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q
Acetone	ug/kg	13 U	16000 U	10 U	10 U	10 U	10 U
Benzene	ug/kg	13 U	16000 U	10 U	10 U	10 U	10 U
Bromodichloromethane	ug/kg	13 U	16000 U	10 U	10 U	10 U	10 U
Bromoform	ug/kg	13 U	16000 U	10 U	10 U	10 U	10 U
Bromomethane	ug/kg	13 U	16000 U	10 U	10 U	10 U	10 U
2-Butanone (Methyl Ethyl Ketone)	ug/kg	13 U	16000 U	10 U	10 U	10 U	10 U
Carbon Disulfide	ug/kg	13 U	16000 U	10 U	10 U	10 U	10 U
Carbon Tetrachloride	ug/kg	13 U	16000 U	10 U	10 U	10 U	10 U
Chlorobenzene	ug/kg	13 U	16000 U	10 U	10 U	10 U	10 U
Chloroethane	ug/kg	13 U	16000 U	10 U	10 U	10 U	10 U
Chloroform	ug/kg	13 U	16000 U	10 U	10 U	10 U	10 U
Chloromethane	ug/kg	13 U	16000 U	10 U	10 U	10 U	10 U
Cyclohexane	ug/kg	13 U	16000 U	10 U	10 U	10 U	10 U
1,2 Dibromo 3-Chloropropane	ug/kg	13 U	16000 U	10 U	10 U	10 U	10 U
Dibromochloromethane	ug/kg	13 U	16000 U	10 U	10 U	10 U	10 U
1,2-Dibromoethane	ug/kg	13 U	16000 U	10 U	10 U	10 U	10 U
1,2-Dichlorobenzene (Ortho)	ug/kg	13 U	16000 U	10 U	10 U	10 U	10 U
1,3-Dichlorobenzene (Meta)	ug/kg	13 U	16000 U	10 U	10 U	10 U	10 U
1,4-Dichlorobenzene (Para)	ug/kg	13 U	16000 U	10 U	10 U	10 U	10 U
Dichlorodifluoromethane	ug/kg	13 U	16000 U	10 U	10 U	10 U	10 U
1,1-Dichloroethane	ug/kg	13 U	16000 U	10 U	10 U	10 U	10 U
1,2-Dichloroethane	ug/kg	13 U	16000 U	10 U	10 U	10 U	10 U
1,1-Dichloroethene	ug/kg	13 U	16000 U	10 U	10 U	10 U	10 U
cis-1,2-Dichloroethene	ug/kg	13 U	16000 U	10 U	10 U	10 U	10 U
trans-1,2-Dichloroethene	ug/kg	13 U	16000 U	10 U	10 U	10 U	10 U
1,2-Dichloropropane	ug/kg	13 U	16000 U	10 U	10 U	10 U	10 U
cis-1,3,-Dichloropropene	ug/kg	13 U	16000 U	10 U	10 U	10 U	10 U
trans-1,3,-Dichloropropene	ug/kg	13 U	16000 U	10 U	10 U	10 U	10 U
Ethylbenzene	ug/kg	13 U	19000	10 U	10 U	10 U	10 U
2-Hexanone	ug/kg	13 U	16000 U	10 U	10 U	10 U	10 U
Isopropylbenzene	ug/kg	13 U	16000 U	10 U	10 U	10 U	10 U
Methyl Acetate	ug/kg	13 U	16000 U	10 U	10 U	10 U	10 U
Methyl tert-butyl ether	ug/kg	13 U	16000 U	10 U	10 U	10 U	10 U
Methylcyclohexane	ug/kg	13 U	16000 U	10 U	10 U	10 U	10 U
Methylene Chloride	ug/kg	14 U	16000 U	10 U	10 U	10 U	10 U
4-Methyl-2-Pentanone (MIBK)	ug/kg	13 U	16000 U	10 U	10 U	10 U	10 U
Styrene	ug/kg	13 U	110000	10 U	10 U	10 U	10 U
1,1,2,2-Tetrachloroethane	ug/kg	13 U	16000 U	10 U	10 U	10 U	10 U
Tetrachloroethene	ug/kg	13 U	16000 U	10 U	10 U	10 U	10 U
Toluene	ug/kg	13 U	16000 U	10 U	10 U	10 U	10 U
1,2,4-Trichlorobenzene	ug/kg	13 U	16000 U	10 U	10 U	10 U	10 U
1,1,1-Trichloroethane	ug/kg	13 U	16000 U	10 U	10 U	10 U	10 U
1,1,2-Trichloroethane	ug/kg	13 U	16000 U	10 U	10 U	10 U	10 U
Trichloroethene	ug/kg	13 U	16000 U	10 U	10 U	10 U	10 U
Trichlorofluoromethane	ug/kg	13 U	16000 U	10 U	10 U	10 U	10 U
1,1,2-Trichlorofluoroethane	ug/kg	13 U	16000 U	10 U	10 U	10 U	10 U
Vinyl Chloride	ug/kg	13 U	16000 U	10 U	10 U	10 U	10 U
Total Xylenes	ug/kg	31	240000	10 U	13	10 U	10 U
Total Volatiles	ug/kg	31	369,000	ND	13	ND	ND
Total BTETXs	ug/kg	31	259,000	ND	13	ND	ND

TABLE 1
SUMMARY OF VOLATILE COMPOUNDS IDENTIFIED SOIL/SOURCE MATERIAL SAMPLING 12/2-6/03
2ND ST (HASTINGS) SOURCE AREA RI/FS

	Location	SB-8	SB-8	SB-8	SB-8
	Interval	6-7 ft bgs	16-17 ft bgs	38 ft bgs	56 ft bgs
	EPA No	2110-30	2110-31	2110-32	2110-33
	Date	12/4/2003	12/4/2003	12/4/2003	12/4/2003
	Time	9:35	10:00	10:15	10:35
Parameter	Units				
Volatile Organics		Conc. Q	Conc. Q	Conc. Q	Conc. Q
Acetone	ug/kg	10 U	1600 U	10 U	10 U
Benzene	ug/kg	57	1600 U	10 U	10 U
Bromodichloromethane	ug/kg	10 U	1600 U	10 U	10 U
Bromoform	ug/kg	10 U	1600 U	10 U	10 U
Bromomethane	ug/kg	10 U	1600 U	10 U	10 U
2-Butanone (Methyl Ethyl Ketone)	ug/kg	10 U	1600 U	10 U	10 U
Carbon Disulfide	ug/kg	10 U	1600 U	10 U	10 U
Carbon Tetrachloride	ug/kg	10 U	1600 U	10 U	10 U
Chlorobenzene	ug/kg	10 U	1600 U	10 U	10 U
Chloroethane	ug/kg	10 U	1600 U	10 U	10 U
Chloroform	ug/kg	10 U	1600 U	10 U	10 U
Chloromethane	ug/kg	10 U	1600 U	10 U	10 U
Cyclohexane	ug/kg	10 U	1600 U	10 U	10 U
1,2 Dibromo 3-Chloropropane	ug/kg	10 U	N/A R	10 U	10 U
Dibromochloromethane	ug/kg	10 U	1600 U	10 U	10 U
1,2-Dibromoethane	ug/kg	10 U	1600 U	10 U	10 U
1,2-Dichlorobenzene (Ortho)	ug/kg	10 U	1600 U	10 U	10 U
1,3-Dichlorobenzene (Meta)	ug/kg	10 U	1600 U	10 U	10 U
1,4-Dichlorobenzene (Para)	ug/kg	10 U	1600 U	10 U	10 U
Dichlorodifluoromethane	ug/kg	10 U	1600 U	10 U	10 U
1,1-Dichloroethane	ug/kg	10 U	1600 U	10 U	10 U
1,2-Dichloroethane	ug/kg	10 U	1600 U	10 U	10 U
1,1-Dichloroethene	ug/kg	10 U	1600 U	10 U	10 U
cis-1,2-Dichloroethene	ug/kg	10 U	1600 U	10 U	10 U
trans-1,2-Dichloroethene	ug/kg	10 U	1600 U	10 U	10 U
1,2-Dichloropropane	ug/kg	10 U	1600 U	10 U	10 U
cis-1,3,-Dichloropropene	ug/kg	10 U	1600 U	10 U	10 U
trans-1,3,-Dichloropropene	ug/kg	10 U	1600 U	10 U	10 U
Ethylbenzene	ug/kg	10 U	1600 U	10 U	10 U
2-Hexanone	ug/kg	10 U	1600 U	10 U	10 U
Isopropylbenzene	ug/kg	10 U	1600 U	10 U	10 U
Methyl Acetate	ug/kg	10 U	1600 U	10 U	10 U
Methyl tert-butyl ether	ug/kg	10 U	1600 U	10 U	10 U
Methylcyclohexane	ug/kg	10 U	1600 U	10 U	10 U
Methylene Chloride	ug/kg	10 U	1600 U	10 U	10 U
4-Methyl-2-Pentanone (MIBK)	ug/kg	10 U	1600 U	10 U	10 U
Styrene	ug/kg	10 U	1600 U	10 U	10 U
1,1,2,2-Tetrachloroethane	ug/kg	10 U	1600 U	10 U	10 U
Tetrachloroethene	ug/kg	10 U	1600 U	10 U	10 U
Toluene	ug/kg	21	1600 U	10 U	10 U
1,2,4-Trichlorobenzene	ug/kg	10 U	1600 U	10 U	10 U
1,1,1-Trichloroethane	ug/kg	10 U	1600 U	10 U	10 U
1,1,2-Trichloroethane	ug/kg	10 U	1600 U	10 U	10 U
Trichloroethene	ug/kg	10 U	1600 U	10 U	10 U
Trichlorofluoromethane	ug/kg	10 U	1600 U	10 U	10 U
1,1,2-Trichlorofluoroethane	ug/kg	10 U	1600 U	10 U	10 U
Vinyl Chloride	ug/kg	10 U	1600 U	10 U	10 U
Total Xylenes	ug/kg	10 U	1600 U	10 U	10 U
Total Volatiles	ug/kg	78	ND	ND	ND
Total BTETXs	ug/kg	78	ND	ND	ND

TABLE 1
SUMMARY OF VOLATILE COMPOUNDS IDENTIFIED SOIL/SOURCE MATERIAL SAMPLING 12/2-6/03
2ND ST (HASTINGS) SOURCE AREA RI/FS

	Location	Waste Soil Comp.	Soil Trip Blank#1	Soil Trip Blank#2	Rinsate #1	Rinsate #2	Rinsate #3	Water Trip Blank #1	Water Trip Blank #2
	Interval	NA	NA	NA	NA	NA	NA	NA	NA
	EPA No	2110-63	2110-75FB	2110-76FB	2110-101	2110-102	2110-103	2110-105FB	2110-106FB
	Date	12/6/2003	12/2/2003	12/5/2003	12/4/2003	12/4/2003	12/6/2003	12/4/2003	12/6/2003
	Time	12:30	18:00	17:00	9:15	17:30	13:00	18:00	13:10
Parameter	Units								
Volatile Organics		Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q
Acetone	ug/kg	1500 U	150 J	1300 U	10 U	10 U	10 U	10 U	10 U
Benzene	ug/kg	1500 U	19 U	1300 U	10 U	10 U	10 U	10 U	10 U
Bromodichloromethane	ug/kg	1500 U	19 U	1300 U	10 U	10 U	10 U	10 U	10 U
Bromoform	ug/kg	1500 U	19 U	1300 U	10 U	10 U	10 U	10 U	10 U
Bromomethane	ug/kg	1500 U	19 U	1300 U	10 U	10 U	10 U	10 U	10 U
2-Butanone (Methyl Ethyl Ketone)	ug/kg	1500 U	19 U	1300 U	10 U	10 U	10 U	10 U	10 U
Carbon Disulfide	ug/kg	1500 U	19 U	1300 U	10 U	10 U	10 U	10 U	10 U
Carbon Tetrachloride	ug/kg	1500 U	19 U	1300 U	10 U	10 U	10 U	10 U	10 U
Chlorobenzene	ug/kg	1500 U	19 U	1300 U	10 U	10 U	10 U	10 U	10 U
Chloroethane	ug/kg	1500 U	19 U	1300 U	10 U	10 U	10 U	10 U	10 U
Chloroform	ug/kg	1500 U	19 U	1300 U	10 U	10 U	10 U	10 U	10 U
Chloromethane	ug/kg	1500 U	19 U	1300 U	10 U	10 U	10 U	10 U	10 U
Cyclohexane	ug/kg	1500 U	19 U	1300 U	10 U	10 U	10 U	10 U	10 U
1,2 Dibromo 3-Chloropropane	ug/kg	1500 U	19 U	1300 U	N/A R	N/A R	10 U	N/A R	10 U
Dibromochloromethane	ug/kg	1500 U	19 U	1300 U	10 U	10 U	10 U	10 U	10 U
1,2-Dibromoethane	ug/kg	1500 U	19 U	1300 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichlorobenzene (Ortho)	ug/kg	1500 U	19 U	1300 U	10 U	10 U	10 U	10 U	10 U
1,3-Dichlorobenzene (Meta)	ug/kg	1500 U	19 U	1300 U	10 U	10 U	10 U	10 U	10 U
1,4-Dichlorobenzene (Para)	ug/kg	1500 U	19 U	1300 U	10 U	10 U	10 U	10 U	10 U
Dichlorodifluoromethane	ug/kg	1500 U	19 U	1300 U	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethane	ug/kg	1500 U	19 U	1300 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloroethane	ug/kg	1500 U	19 U	1300 U	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethene	ug/kg	1500 U	19 U	1300 U	10 U	10 U	10 U	10 U	10 U
cis-1,2-Dichloroethene	ug/kg	1500 U	19 U	1300 U	10 U	10 U	10 U	10 U	10 U
trans-1,2-Dichloroethene	ug/kg	1500 U	19 U	1300 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloropropane	ug/kg	1500 U	19 U	1300 U	10 U	10 U	10 U	10 U	10 U
cis-1,3,-Dichloropropene	ug/kg	1500 U	19 U	1300 U	10 U	10 U	10 U	10 U	10 U
trans-1,3,-Dichloropropene	ug/kg	1500 U	19 U	1300 U	10 U	10 U	10 U	10 U	10 U
Ethylbenzene	ug/kg	1500 U	19 U	1300 U	10 U	10 U	10 U	10 U	10 U
2-Hexanone	ug/kg	1500 U	19 U	1300 U	10 U	10 U	10 U	10 U	10 U
Isopropylbenzene	ug/kg	1500 U	19 U	1300 U	10 U	10 U	10 U	10 U	10 U
Methyl Acetate	ug/kg	1500 U	19 U	1300 U	10 U	10 U	10 U	10 U	10 U
Methyl tert-butyl ether	ug/kg	1500 U	19 U	1300 U	10 U	10 U	10 U	10 U	10 U
Methylcyclohexane	ug/kg	1500 U	19 U	1300 U	10 U	10 U	10 U	10 U	10 U
Methylene Chloride	ug/kg	1500 U	19 U	1300 U	10 U	10 U	10 U	10 U	10 U
4-Methyl-2-Pentanone (MIBK)	ug/kg	1500 U	19 U	1300 U	10 U	10 U	10 U	10 U	10 U
Styrene	ug/kg	1500 U	19 U	1300 U	10 U	10 U	10 U	10 U	10 U
1,1,2,2-Tetrachloroethane	ug/kg	1500 U	19 U	1300 U	10 U	10 U	10 U	10 U	10 U
Tetrachloroethene	ug/kg	1500 U	19 U	1300 U	10 U	10 U	10 U	10 U	10 U
Toluene	ug/kg	1500 U	19 U	1300 U	10 U	10 U	10 U	10 U	10 U
1,2,4-Trichlorobenzene	ug/kg	1500 U	19 U	1300 U	10 U	10 U	10 U	10 U	10 U
1,1,1-Trichloroethane	ug/kg	1500 U	19 U	1300 U	10 U	10 U	10 U	10 U	10 U
1,1,2-Trichloroethane	ug/kg	1500 U	19 U	1300 U	10 U	10 U	10 U	10 U	10 U
Trichloroethene	ug/kg	1500 U	19 U	1300 U	10 U	10 U	10 U	10 U	10 U
Trichlorofluoromethane	ug/kg	1500 U	19 U	1300 U	10 U	10 U	10 U	10 U	10 U
1,1,2-Trichlorofluoroethane	ug/kg	1500 U	19 U	1300 U	10 U	10 U	10 U	10 U	10 U
Vinyl Chloride	ug/kg	1500 U	19 U	1300 U	10 U	10 U	10 U	10 U	10 U
Total Xylenes	ug/kg	1800	19 U	1300 U	10 U	10 U	10 U	10 U	10 U
Total Volatiles	ug/kg	1,800	150	ND	ND	ND	ND	ND	ND
Total BTETXs	ug/kg	1,800	ND	ND	ND	ND	ND	ND	ND

TABLE 2
SUMMARY OF SEMI-VOLATILE COMPOUNDS IDENTIFIED SOIL/SOURCE MATERIAL SAMPLING 12/2-6/03
2ND ST (HASTINGS) SOURCE AREA RI/FS

	Location	SMB-4	SMB-4	SMB-3	SMB-3	SMB-3	SB-3	SB-3	SB-3	SB-3	SB-3	SB-3
	Interval	5-10 ft bgs	10-15 ft bgs	1-6 ft bgs	6-11 ft bgs	11-15 ft bgs	10-15 ft bgs	35-40 ft bgs	55-60 ft bgs	78-80 ft bgs	98-100 ft bgs	118-120 ft bgs
	EPA No	2110-1	2110-1	2110-3	2110-4	2110-5	2110-6	2110-7	2110-8	2110-9	2110-10	2110-11
	Date	12/2/2003	12/2/2003	12/2/2003	12/2/2003	12/2/2003	12/2/2003	12/2/2003	12/2/2003	12/2/2003	12/2/2003	12/2/2003
	Time	8:45	9:00	9:30	9:50	9:45	10:45	11:00	11:30	12:15	13:30	15:54
Parameter	Units											
Semivolatile Organics		Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q
Acenaphthene (1)	ug/kg	3900 U	13000	340 U	1300 U	3000	430 U	380 U	28000 U	43000 U	24000 U	27000 U
Acenaphthylene (1)	ug/kg	3900 U	11000 U	340 U	1300 U	2100 U	430 U	380 U	57000	150000	48000	68000
Acetophenone	ug/kg	3900 U	11000 U	340 U	1300 U	2100 U	430 U	380 U	28000 U	43000 U	24000 U	27000 U
Anthracene (1)	ug/kg	3900 U	11000 U	340 U	1300 U	2100 U	430 U	380 U	28000 U	43000 U	24000 U	27000 U
Atrazine	ug/kg	3900 U	11000 U	340 U	1300 U	2100 U	430 U	380 U	28000 U	43000 U	24000 U	27000 U
Benzaldehyde	ug/kg	3900 U	11000 U	340 U	1300 U	2100 U	430 U	380 U	28000 U	43000 U	24000 U	27000 U
Benzo(a)anthracene(1,2)	ug/kg	3900 U	11000 U	340 U	1300 U	2100 U	430 U	380 U	28000 U	43000 U	24000 U	27000 U
Benzo(a)pyrene(1,2)	ug/kg	3900 U	11000 U	340 U	1300 U	2100 U	430 U	380 U	28000 U	43000 U	24000 U	27000 U
Benzo(b)fluoranthene(1,2)	ug/kg	3900 U	11000 U	340 U	1300 U	2100 U	430 U	380 U	28000 U	43000 U	24000 U	27000 U
Benzo(g,h,i)perylene (1)	ug/kg	3900 U	11000 U	340 U	1300 U	2100 U	430 U	380 U	28000 U	43000 U	24000 U	27000 U
Benzo(k)fluoranthene(1,2)	ug/kg	3900 U	11000 U	340 U	1300 U	2100 U	430 U	380 U	28000 U	43000 U	24000 U	27000 U
Biphenyl	ug/kg	3900 U	11000 U	340 U	1300 U	2100 U	430 U	380 U	28000 U	54000	24000 U	27000 U
bis(2-Chloroethoxy)methane	ug/kg	3900 U	11000 U	340 U	1300 U	2100 U	430 U	380 U	28000 U	43000 U	24000 U	27000 U
bis(2-Chloroethyl)ether	ug/kg	3900 U	11000 U	340 U	1300 U	2100 U	430 U	380 U	28000 U	43000 U	24000 U	27000 U
bis(2-Chloroisopropyl)ether	ug/kg	3900 U	11000 U	340 U	1300 U	2100 U	430 U	380 U	28000 U	43000 U	24000 U	27000 U
bis(2-Ethylhexyl)phthalate	ug/kg	3900 U	11000 U	340 U	1300 U	2100 U	430 U	380 U	28000 U	43000 U	24000 U	27000 U
4-Bromophenyl-phenylether	ug/kg	3900 U	11000 U	340 U	1300 U	2100 U	430 U	380 U	28000 U	43000 U	24000 U	27000 U
Butylbenzylphthalate	ug/kg	3900 U	11000 U	340 U	1300 U	2100 U	430 U	380 U	28000 U	43000 U	24000 U	27000 U
Caprolactam	ug/kg	3900 U	11000 U	340 U	1300 U	2100 U	430 U	380 U	28000 U	43000 U	24000 U	27000 U
Carbazole	ug/kg	3900 U	11000 U	340 U	1300 U	2100 U	430 U	380 U	28000 U	43000 U	24000 U	27000 U
4-Chloro-3-methyphenol	ug/kg	3900 U	11000 U	340 U	1300 U	2100 U	430 U	380 U	28000 U	43000 U	24000 U	27000 U
4-Chloroaniline	ug/kg	3900 U	11000 U	340 U	1300 U	2100 U	430 U	380 U	28000 U	43000 U	24000 U	27000 U
2-Chloronaphthalene (1)	ug/kg	3900 U	11000 U	340 U	1300 U	2100 U	430 U	380 U	28000 U	43000 U	24000 U	27000 U
2-Chlorophenol	ug/kg	3900 U	11000 U	340 U	1300 U	2100 U	430 U	380 U	28000 U	43000 U	24000 U	27000 U
4-Chlorophenyl-phenylether	ug/kg	3900 U	11000 U	340 U	1300 U	2100 U	430 U	380 U	28000 U	43000 U	24000 U	27000 U
Chrysene (1,2)	ug/kg	3900 U	11000 U	340 U	1300 U	2100 U	430 U	380 U	28000 U	43000 U	24000 U	27000 U
Di-n-butylphthalate	ug/kg	3900 U	11000 U	340 U	1300 U	2100 U	430 U	380 U	28000 U	43000 U	24000 U	27000 U
Di-n-octylphthalate	ug/kg	3900 U	11000 U	340 U	1300 U	2100 U	430 U	380 U	28000 U	43000 U	24000 U	27000 U
Dibenzo(a,h)anthracene (1,2)	ug/kg	3900 U	11000 U	340 U	1300 U	2100 U	430 U	380 U	28000 U	43000 U	24000 U	27000 U
Dibenzofuran	ug/kg	3900 U	11000 U	340 U	1300 U	2100 U	430 U	380 U	28000 U	43000 U	24000 U	27000 U
3,3'-Dichlorobenzidine	ug/kg	3900 U	11000 U	340 U	1300 U	2100 U	430 U	380 U	28000 U	43000 U	24000 U	27000 U
2,4-Dichlorophenol	ug/kg	3900 U	11000 U	340 U	1300 U	2100 U	430 U	380 U	28000 U	43000 U	24000 U	27000 U
Diethylphthalate	ug/kg	3900 U	11000 U	340 U	1300 U	2100 U	430 U	380 U	28000 U	43000 U	24000 U	27000 U
2,4-Dimethylphenol	ug/kg	3900 U	11000 U	340 U	1300 U	2100 U	430 U	380 U	28000 U	43000 U	24000 U	27000 U
Dimethylphthalate	ug/kg	3900 U	11000 U	340 U	1300 U	2100 U	430 U	380 U	28000 U	43000 U	24000 U	27000 U
4,6-Dinitro-2-methylphenol	ug/kg	9700 U	27000 U	850 U	3200 U	5300 U	1100 U	950 U	71000 U	110000 U	59000 U	66000 U
2,4-Dinitrophenol	ug/kg	9700 U	27000 U	850 U	3200 U	5300 U	1100 U	950 U	71000 U	110000 U	59000 U	66000 U

TABLE 2
SUMMARY OF SEMI-VOLATILE COMPOUNDS IDENTIFIED SOIL/SOURCE MATERIAL SAMPLING 12/2-6/03
2ND ST (HASTINGS) SOURCE AREA RI/FS

	Location	SMB-4	SMB-4	SMB-3	SMB-3	SMB-3	SB-3	SB-3	SB-3	SB-3	SB-3	SB-3
	Interval	5-10 ft bgs	10-15 ft bgs	1-6 ft bgs	6-11 ft bgs	11-15 ft bgs	10-15 ft bgs	35-40 ft bgs	55-60 ft bgs	78-80 ft bgs	98-100 ft bgs	118-120 ft bgs
	EPA No	2110-1	2110-1	2110-3	2110-4	2110-5	2110-6	2110-7	2110-8	2110-9	2110-10	2110-11
	Date	12/2/2003	12/2/2003	12/2/2003	12/2/2003	12/2/2003	12/2/2003	12/2/2003	12/2/2003	12/2/2003	12/2/2003	12/2/2003
	Time	8:45	9:00	9:30	9:50	9:45	10:45	11:00	11:30	12:15	13:30	15:54
Parameter	Units											
Semivolatile Organics		Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q
2,4-Dinitrotoluene	ug/kg	3900 U	11000 U	340 U	1300 U	2100 U	430 U	380 U	28000 U	43000 U	24000 U	27000 U
2,6-Dinitrotoluene	ug/kg	3900 U	11000 U	340 U	1300 U	2100 U	430 U	380 U	28000 U	43000 U	24000 U	27000 U
Fluoranthene (1)	ug/kg	3900 U	11000 U	340 U	1300 U	2100 U	430 U	380 U	28000 U	43000 U	24000 U	27000 U
Fluorene (1)	ug/kg	3900 U	14000	340 U	1300 U	2700	430 U	380 U	50000	130000	52000	67000
Hexachlorobenzene	ug/kg	3900 U	11000 U	340 U	1300 U	2100 U	430 U	380 U	28000 U	43000 U	24000 U	27000 U
Hexachlorobutadiene	ug/kg	3900 U	11000 U	340 U	1300 U	2100 U	430 U	380 U	28000 U	43000 U	24000 U	27000 U
Hexachlorocyclopentadiene	ug/kg	3900 U	N/A R	N/A R	1300 U	2100 U	N/A R	N/A R	N/A R	N/A R	N/A R	N/A R
Hexachloroethane	ug/kg	3900 U	11000 U	340 U	1300 U	2100 U	430 U	380 U	28000 U	43000 U	24000 U	27000 U
Indeno(1,2,3-cd)pyrene (1,2)	ug/kg	3900 U	11000 U	340 U	1300 U	2100 U	430 U	380 U	28000 U	43000 U	24000 U	27000 U
Isophorone	ug/kg	3900 U	11000 U	340 U	1300 U	2100 U	430 U	380 U	28000 U	43000 U	24000 U	27000 U
2-Methylnaphthalene (1)	ug/kg	3900 U	100000	340 U	1800	15000	430 U	380 U	260000	660000	110000	250000
2-Methylphenol	ug/kg	3900 U	11000 U	340 U	1300 U	2100 U	430 U	380 U	28000 U	43000 U	24000 U	27000 U
4-Methylphenol	ug/kg	3900 U	11000 U	340 U	1300 U	2100 U	430 U	380 U	28000 U	43000 U	24000 U	27000 U
Naphthalene (1)	ug/kg	3900 U	59000	340 U	1300 U	17000	430 U	380 U	160000	800000	24000 U	32000
2-Nitroaniline	ug/kg	9700 U	27000 U	850 U	3200 U	5300 U	1100 U	950 U	71000 U	110000 U	59000 U	66000 U
3-Nitroaniline	ug/kg	9700 U	27000 U	850 U	3200 U	5300 U	1100 U	950 U	71000 U	110000 U	59000 U	66000 U
4-Nitroaniline	ug/kg	9700 U	27000 U	850 U	3200 U	5300 U	1100 U	950 U	71000 U	110000 U	59000 U	66000 U
Nitrobenzene	ug/kg	3900 U	11000 U	340 U	1300 U	2100 U	430 U	380 U	28000 U	43000 U	24000 U	27000 U
2-Nitrophenol	ug/kg	3900 U	11000 U	340 U	1300 U	2100 U	430 U	380 U	28000 U	43000 U	24000 U	27000 U
4-Nitrophenol	ug/kg	3900 U	27000 U	850 U	3200 U	5300 U	1100 U	950 U	71000 U	110000 U	59000 U	66000 U
N-nitroso-di-n-propylamine	ug/kg	3900 U	11000 U	340 U	1300 U	2100 U	430 U	380 U	28000 U	43000 U	24000 U	27000 U
N-nitrosodiphenylamine	ug/kg	3900 U	11000 U	340 U	1300 U	2100 U	430 U	380 U	28000 U	43000 U	24000 U	27000 U
Pentachlorophenol	ug/kg	9700 U	27000 U	850 U	3200 U	5300 U	1100 U	950 U	71000 U	110000 U	59000 U	66000 U
Phenanthrene (1)	ug/kg	3900 U	32000	340 U	1300 U	5500	430 U	380 U	120000	290000	130000	150000
Phenol	ug/kg	3900 U	11000 U	340 U	1300 U	2100 U	430 U	380 U	28000 U	43000 U	24000 U	27000 U
Pyrene (1)	ug/kg	3900 U	11000 U	340 U	1300 U	3900	430 U	380 U	42000	83000	36000	48000
2,4,5-Trichlorophenol	ug/kg	9700 U	27000 U	850 U	3200 U	5300 U	1100 U	950 U	71000 U	110000 U	59000 U	66000 U
2,4,6-Trichlorophenol	ug/kg	3900 U	11000 U	340 U	1300 U	2100 U	430 U	380 U	28000 U	43000 U	24000 U	27000 U
Total Semivolatiles	ug/kg	ND	218,000	ND	1,800	47,100	ND	ND	689,000	2,167,000	376,000	615,000
Total PAHs (1)	ug/kg	ND	218,000	ND	1,800	47,100	ND	ND	689,000	2,113,000	376,000	615,000
Total Carcinogenic PAHs(2)	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

(1) Polynuclear Aromatic Hydrocarbon.

(2) Carcinogenic Polynuclear Aromatic Hydrocarbon.

U : Compound was analyzed for but not detected. The value is the quantation limit.

J : Value estimated since not all QC criteria met.

ND : Not detected above quantation limits provided.

NA : Not analyzed for.

TABLE 2
SUMMARY OF SEMI-VOLATILE COMPOUNDS IDENTIFIED SOIL/SOURCE MATERIAL SAMPLING 12/2-6/03
2ND ST (HASTINGS) SOURCE AREA RI/FS

	Location	SB-4	SB-4	SB-4	SB-4	SB-4	SB-4	SB-4
	Interval	18 ft bgs	35-40 ft bgs	55-60 ft bgs	55-60 ft bgs	75-77 ft bgs	95-97 ft bgs	110-112 ft bgs
	EPA No	2110-38	2110-39	2110-40	2110-40FD (Dup)	2110-56	2110-57	2110-58
	Date	12/4/2003	12/4/2003	12/4/2003	12/4/2003	12/6/2003	12/6/2003	12/6/2003
	Time	14:00	14:30	14:45	14:45	8:10	8:30	8:10
Parameter	Units							
Semivolatile Organics		Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q
Acenaphthene (1)	ug/kg	410 U	380 U	380 U	380 U	30000 U	330 U	360 U
Acenaphthylene (1)	ug/kg	410 U	380 U	380 U	380 U	87000	330 U	360 U
Acetophenone	ug/kg	410 U	380 U	380 U	380 U	30000 U	330 U	360 U
Anthracene (1)	ug/kg	410 U	380 U	380 U	380 U	31000	330 U	360 U
Atrazine	ug/kg	410 U	380 U	380 U	380 U	30000 U	330 U	360 U
Benzaldehyde	ug/kg	410 U	380 U	380 U	380 U	30000 U	330 U	360 U
Benzo(a)anthracene(1,2)	ug/kg	410 U	380 U	380 U	380 U	30000 U	330 U	360 U
Benzo(a)pyrene(1,2)	ug/kg	410 U	380 U	380 U	380 U	30000 U	330 U	360 U
Benzo(b)fluoranthene(1,2)	ug/kg	410 U	380 U	380 U	380 U	30000 U	330 U	360 U
Benzo(g,h,i)perylene (1)	ug/kg	410 U	380 U	380 U	380 U	30000 U	330 U	360 U
Benzo(k)fluoranthene(1,2)	ug/kg	410 U	380 U	380 U	380 U	30000 U	330 U	360 U
Biphenyl	ug/kg	410 U	380 U	380 U	380 U	34000	330 U	360 U
bis(2-Chloroethoxy)methane	ug/kg	410 U	380 U	380 U	380 U	30000 U	330 U	360 U
bis(2-Chloroethyl)ether	ug/kg	410 U	380 U	380 U	380 U	30000 U	330 U	360 U
bis(2-Chloroisopropyl)ether	ug/kg	410 U	380 U	380 U	380 U	30000 U	330 U	360 U
bis(2-Ethylhexyl)phthalate	ug/kg	410 U	380 U	380 U	380 U	30000 U	330 U	360 U
4-Bromophenyl-phenylether	ug/kg	410 U	380 U	380 U	380 U	30000 U	330 U	360 U
Butylbenzylphthalate	ug/kg	410 U	380 U	380 U	380 U	30000 U	330 U	360 U
Caprolactam	ug/kg	410 U	380 U	380 U	380 U	30000 U	330 U	360 U
Carbazole	ug/kg	410 U	380 U	380 U	380 U	30000 U	330 U	360 U
4-Chloro-3-methyphenol	ug/kg	410 U	380 U	380 U	380 U	30000 U	330 U	360 U
4-Chloroaniline	ug/kg	410 U	380 U	380 U	380 U	30000 U	330 U	360 U
2-Chloronaphthalene (1)	ug/kg	410 U	380 U	380 U	380 U	30000 U	330 U	360 U
2-Chlorophenol	ug/kg	410 U	380 U	380 U	380 U	30000 U	330 U	360 U
4-Chlorophenyl-phenylether	ug/kg	410 U	380 U	380 U	380 U	30000 U	330 U	360 U
Chrysene (1,2)	ug/kg	410 U	380 U	380 U	380 U	30000 U	330 U	360 U
Di-n-butylphthalate	ug/kg	410 U	380 U	380 U	380 U	30000 U	330 U	360 U
Di-n-octylphthalate	ug/kg	410 U	380 U	380 U	380 U	30000 U	330 U	360 U
Dibenzo(a,h)anthracene (1,2)	ug/kg	410 U	380 U	380 U	380 U	30000 U	330 U	360 U
Dibenzofuran	ug/kg	410 U	380 U	380 U	380 U	30000 U	330 U	360 U
3,3'-Dichlorobenzidine	ug/kg	410 U	380 U	380 U	380 U	30000 U	330 U	360 U
2,4-Dichlorophenol	ug/kg	410 U	380 U	380 U	380 U	30000 U	330 U	360 U
Diethylphthalate	ug/kg	410 U	380 U	380 U	380 U	30000 U	330 U	360 U
2,4-Dimethylphenol	ug/kg	410 U	380 U	380 U	380 U	30000 U	330 U	360 U
Dimethylphthalate	ug/kg	410 U	380 U	380 U	380 U	30000 U	330 U	360 U
4,6-Dinitro-2-methylphenol	ug/kg	1000 U	960 U	950 U	970 U	75000 U	830 U	920 U
2,4-Dinitrophenol	ug/kg	1000 U	960 U	950 U	970 U	75000 U	830 U	920 U

TABLE 2
SUMMARY OF SEMI-VOLATILE COMPOUNDS IDENTIFIED SOIL/SOURCE MATERIAL SAMPLING 12/2-6/03
2ND ST (HASTINGS) SOURCE AREA RI/FS

Parameter	Location	SB-4	SB-4	SB-4	SB-4	SB-4	SB-4	SB-4
	Interval	18 ft bgs	35-40 ft bgs	55-60 ft bgs	55-60 ft bgs	75-77 ft bgs	95-97 ft bgs	110-112 ft bgs
	EPA No	2110-38	2110-39	2110-40	2110-40FD (Dup)	2110-56	2110-57	2110-58
	Date	12/4/2003	12/4/2003	12/4/2003	12/4/2003	12/6/2003	12/6/2003	12/6/2003
	Time	14:00	14:30	14:45	14:45	8:10	8 30	8:10
	Units							
Semivolatile Organics		Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q
2,4-Dinitrotoluene	ug/kg	410 U	380 U	380 U	380 U	30000 U	330 U	360 U
2,6-Dinitrotoluene	ug/kg	410 U	380 U	380 U	380 U	30000 U	330 U	360 U
Fluoranthene (1)	ug/kg	410 U	380 U	380 U	380 U	33000	330 U	380 U
Fluorene (1)	ug/kg	410 U	380 U	380 U	380 U	87000	330 U	360 U
Hexachlorobenzene	ug/kg	410 U	380 U	380 U	380 U	30000 U	330 U	360 U
Hexachlorobutadiene	ug/kg	410 U	380 U	380 U	380 U	30000 U	330 U	360 U
Hexachlorocyclopentadiene	ug/kg	N/A R	N/A R	N/A R	380 U	30000 U	330 U	360 U
Hexachloroethane	ug/kg	410 U	380 U	380 U	380 U	30000 U	330 U	360 U
Indeno(1,2,3-cd)pyrene (1,2)	ug/kg	410 U	380 U	380 U	380 U	30000 U	330 U	360 U
Isophorone	ug/kg	410 U	380 U	380 U	380 U	30000 U	330 U	360 U
2-Methylnaphthalene (1)	ug/kg	410 U	380 U	380 U	380 U	590000	330 U	360 U
2-Methylphenol	ug/kg	410 U	380 U	380 U	380 U	30000 U	330 U	360 U
4-Methylphenol	ug/kg	410 U	380 U	380 U	380 U	30000 U	330 U	360 U
Naphthalene (1)	ug/kg	410 U	380 U	380 U	380 U	620000	330 U	360 U
2-Nitroaniline	ug/kg	1000 U	960 U	950 U	970 U	75000 U	830 U	920 U
3-Nitroaniline	ug/kg	1000 U	960 U	950 U	970 U	75000 U	830 U	920 U
4-Nitroaniline	ug/kg	1000 U	960 U	950 U	970 U	75000 U	830 U	920 U
Nitrobenzene	ug/kg	410 U	380 U	380 U	380 U	30000 U	330 U	360 U
2-Nitrophenol	ug/kg	410 U	380 U	380 U	380 U	30000 U	330 U	360 U
4-Nitrophenol	ug/kg	1000 U	960 U	950 U	970 U	75000 U	830 U	920 U
N-nitroso-di-n-propylamine	ug/kg	410 U	380 U	380 U	380 U	30000 U	330 U	360 U
N-nitrosodiphenylamine	ug/kg	410 U	380 U	380 U	380 U	30000 U	330 U	360 U
Pentachlorophenol	ug/kg	1000 U	960 U	950 U	970 U	75000 U	830 U	920 U
Phenanthrene (1)	ug/kg	410 U	380 U	380 U	380 U	200000	330 U	360 U
Phenol	ug/kg	410 U	380 U	380 U	380 U	30000 U	330 U	360 U
Pyrene (1)	ug/kg	410 U	380 U	380 U	380 U	48000	330 U	360 U
2,4,5-Trichlorophenol	ug/kg	1000 U	960 U	950 U	970 U	75000 U	830 U	920 U
2,4,6-Trichlorophenol	ug/kg	410 U	380 U	360 U	380 U	30000 U	330 U	360 U
Total Semivolatiles	ug/kg	ND	ND	ND	ND	1,730,000	ND	ND
Total PAHs (1)	ug/kg	ND	ND	ND	ND	1,696,000	ND	ND
Total Carcinogenic PAHs(2)	ug/kg	ND	ND	ND	ND	ND	ND	ND

TABLE 2
SUMMARY OF SEMI-VOLATILE COMPOUNDS IDENTIFIED SOIL/SOURCE MATERIAL SAMPLING 12/2-6/03
2ND ST (HASTINGS) SOURCE AREA RI/FS

	Location	SB-10	SB-10	SB-10	SB-10	SB-10	SB-10
	Interval	8-10 ft bgs	18-20 ft bgs	38-40 ft bgs	55-56 ft bgs	75-77 ft bgs	93-95 ft bgs
	EPA No	2110-46	2110-47	2110-48	2110-49	2110-50	2110-51
	Date	12/5/2003	12/5/2003	12/5/2003	12/5/2003	12/5/2003	12/5/2003
	Time	9.40	9:50	10:05	10:20	11:45	12.15
Parameter	Units						
Semivolatile Organics		Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q
Acenaphthene (1)	ug/kg	410 U	400 U	370 U	370 U	350 U	28000 U
Acenaphthylene (1)	ug/kg	410 U	400 U	370 U	370 U	350 U	110000
Acetophenone	ug/kg	410 U	400 U	370 U	370 U	350 U	28000 U
Anthracene (1)	ug/kg	410 U	400 U	370 U	370 U	350 U	28000
Atrazine	ug/kg	410 U	400 U	370 U	370 U	350 U	28000 U
Benzaldehyde	ug/kg	410 U	400 U	370 U	370 U	350 U	28000 U
Benzo(a)anthracene(1,2)	ug/kg	410 U	400 U	370 U	370 U	350 U	28000 U
Benzo(a)pyrene(1,2)	ug/kg	410 U	400 U	370 U	370 U	350 U	28000 U
Benzo(b)fluoranthene(1,2)	ug/kg	410 U	400 U	370 U	370 U	350 U	28000 U
Benzo(g,h,i)perylene (1)	ug/kg	410 U	400 U	370 U	370 U	350 U	28000 U
Benzo(k)fluoranthene(1,2)	ug/kg	410 U	400 U	370 U	370 U	350 U	28000 U
Biphenyl	ug/kg	410 U	400 U	370 U	370 U	350 U	34000
bis(2-Chloroethoxy)methane	ug/kg	410 U	400 U	370 U	370 U	350 U	28000 U
bis(2-Chloroethyl)ether	ug/kg	410 U	400 U	370 U	370 U	350 U	28000 U
bis(2-Chloroisopropyl)ether	ug/kg	410 U	400 U	370 U	370 U	350 U	28000 U
bis(2-Ethylhexyl)phthalate	ug/kg	410 U	400 U	370 U	370 U	350 U	28000 U
4-Bromophenyl-phenylether	ug/kg	410 U	400 U	370 U	370 U	350 U	28000 U
Butylbenzylphthalate	ug/kg	410 U	400 U	370 U	370 U	350 U	28000 U
Caprolactam	ug/kg	410 U	400 U	370 U	370 U	350 U	28000 U
Carbazole	ug/kg	410 U	400 U	370 U	370 U	350 U	28000 U
4-Chloro-3-methyphenol	ug/kg	410 U	400 U	370 U	370 U	350 U	28000 U
4-Chloroaniline	ug/kg	410 U	400 U	370 U	370 U	350 U	28000 U
2-Chloronaphthalene (1)	ug/kg	410 U	400 U	370 U	370 U	350 U	28000 U
2-Chlorophenol	ug/kg	410 U	400 U	370 U	370 U	350 U	28000 U
4-Chlorophenyl-phenylether	ug/kg	410 U	400 U	370 U	370 U	350 U	28000 U
Chrysene (1,2)	ug/kg	410 U	400 U	370 U	370 U	350 U	28000 U
Di-n-butylphthalate	ug/kg	410 U	400 U	370 U	370 U	350 U	28000 U
Di-n-octylphthalate	ug/kg	410 U	400 U	370 U	370 U	350 U	28000 U
Dibenzo(a,h)anthracene (1,2)	ug/kg	410 U	400 U	370 U	370 U	350 U	28000 U
Dibenzofuran	ug/kg	410 U	400 U	370 U	370 U	350 U	28000 U
3,3'-Dichlorobenzidine	ug/kg	410 U	400 U	370 U	370 U	350 U	28000 U
2,4-Dichlorophenol	ug/kg	410 U	400 U	370 U	370 U	350 U	28000 U
Diethylphthalate	ug/kg	410 U	400 U	370 U	370 U	350 U	28000 U
2,4-Dimethylphenol	ug/kg	410 U	400 U	370 U	370 U	350 U	28000 U
Dimethylphthalate	ug/kg	410 U	400 U	370 U	370 U	350 U	28000 U
4,6-Dinitro-2-methylphenol	ug/kg	1000 U	1000 U	940 U	920 U	870 U	71000 U
2,4-Dinitrophenol	ug/kg	1000 U	1000 U	940 U	920 U	870 U	71000 U

TABLE 2
SUMMARY OF SEMI-VOLATILE COMPOUNDS IDENTIFIED SOIL/SOURCE MATERIAL SAMPLING 12/2-6/03
2ND ST (HASTINGS) SOURCE AREA RI/FS

	Location	SB-10	SB-10	SB-10	SB-10	SB-10	SB-10
	Interval	8-10 ft bgs	18-20 ft bgs	38-40 ft bgs	55-58 ft bgs	75-77 ft bgs	93-95 ft bgs
	EPA No	2110-46	2110-47	2110-48	2110-49	2110-50	2110-51
	Date	12/5/2003	12/5/2003	12/5/2003	12/5/2003	12/5/2003	12/5/2003
	Time	9:40	9:50	10.05	10:20	11:45	12:15
Parameter	Units						
Semivolatile Organics		Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc Q
2,4-Dinitrotoluene	ug/kg	410 U	400 U	370 U	370 U	350 U	28000 U
2,6-Dinitrotoluene	ug/kg	410 U	400 U	370 U	370 U	350 U	28000 U
Fluoranthene (1)	ug/kg	410 U	400 U	370 U	370 U	350 U	33000
Fluorene (1)	ug/kg	410 U	400 U	370 U	370 U	350 U	69000
Hexachlorobenzene	ug/kg	410 U	400 U	370 U	370 U	350 U	28000 U
Hexachlorobutadiene	ug/kg	410 U	400 U	370 U	370 U	350 U	28000 U
Hexachlorocyclopentadiene	ug/kg	410 U	400 U	370 U	370 U	350 U	28000 U
Hexachloroethane	ug/kg	410 U	400 U	370 U	370 U	350 U	28000 U
Indeno(1,2,3-cd)pyrene (1,2)	ug/kg	410 U	400 U	370 U	370 U	350 U	28000 U
Isophorone	ug/kg	410 U	400 U	370 U	370 U	350 U	28000 U
2-Methylnaphthalene (1)	ug/kg	410 U	400 U	370 U	370 U	350 U	650000
2-Methylphenol	ug/kg	410 U	400 U	370 U	370 U	350 U	28000 U
4-Methylphenol	ug/kg	410 U	400 U	370 U	370 U	350 U	28000 U
Naphthalene (1)	ug/kg	410 U	400 U	370 U	370 U	350 U	790000
2-Nitroaniline	ug/kg	1000 U	1000 U	940 U	920 U	870 U	71000 U
3-Nitroaniline	ug/kg	1000 U	1000 U	940 U	920 U	870 U	71000 U
4-Nitroaniline	ug/kg	1000 U	1000 U	940 U	920 U	870 U	71000 U
Nitrobenzene	ug/kg	410 U	400 U	370 U	370 U	350 U	28000 U
2-Nitrophenol	ug/kg	410 U	400 U	370 U	370 U	350 U	28000 U
4-Nitrophenol	ug/kg	1000 U	1000 U	940 U	920 U	870 U	71000 U
N-nitroso-di-n-propylamine	ug/kg	410 U	400 U	370 U	370 U	350 U	28000 U
N-nitrosodiphenylamine	ug/kg	410 U	400 U	370 U	370 U	350 U	28000 U
Pentachlorophenol	ug/kg	1000 U	1000 U	940 U	920 U	870 U	71000 U
Phenanthrene (1)	ug/kg	410 U	400 U	370 U	370 U	350 U	200000
Phenol	ug/kg	410 U	400 U	370 U	370 U	350 U	28000 U
Pyrene (1)	ug/kg	410 U	400 U	370 U	370 U	350 U	53000
2,4,5-Trichlorophenol	ug/kg	1000 U	1000 U	940 U	920 U	870 U	71000 U
2,4,6-Trichlorophenol	ug/kg	410 U	400 U	370 U	370 U	350 U	28000 U
Total Semivolatiles	ug/kg	ND	ND	ND	ND	ND	1,967,000
Total PAHs (1)	ug/kg	ND	ND	ND	ND	ND	1,933,000
Total Carcinogenic PAHs(2)	ug/kg	ND	ND	ND	ND	ND	ND

TABLE 2
SUMMARY OF SEMI-VOLATILE COMPOUNDS IDENTIFIED SOIL/SOURCE MATERIAL SAMPLING 12/2-6/03
2ND ST (HASTINGS) SOURCE AREA RI/FS

	Location	SMB-1	SMB-1	SMB-2	SMB-2	SB-1	SB-1	SB-2	SB-2	SB-2	SB-2	SB-2	SB-2
	Interval	8-10 ft bgs	10-12.5 ft bgs	8-10 ft bgs	13-15 ft bgs	18-20 ft bgs	38 ft bgs	13 ft bgs	18 ft bgs	38 ft bgs	57 ft bgs	75-77 ft bgs	90-92 ft bgs
	EPA No	2110-12	2110-13	2110-14	2110-15	2110-41	2110-412	2110-34	2110-35	2110-36	2110-37	2110-59	2110-60
	Date	12/2/2003	12/2/2003	12/2/2003	12/2/2003	12/4/2003	12/4/2003	12/4/2003	12/4/2003	12/4/2003	12/4/2003	12/6/2003	12/6/2003
	Time	16.35	16.50	17:15	17:25	15:30	15:45	11:15	11:25	11:40	11:50	9:50	10:10
Parameter	Units												
Semivolatile Organics		Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q
Acenaphthene (1)	ug/kg	430 U	440 U	400 U	56000	400 U	11000 U	390 U	390 U	400 U	370 U	350 U	340 U
Acenaphthylene (1)	ug/kg	430 U	440 U	400 U	31000 U	400 U	11000 U	390 U	390 U	400 U	370 U	350 U	340 U
Acetophenone	ug/kg	430 U	440 U	400 U	31000 U	400 U	11000 U	390 U	390 U	400 U	370 U	350 U	340 U
Anthracene (1)	ug/kg	430 U	440 U	400 U	86000	400 U	11000 U	390 U	390 U	400 U	680	350 U	340 U
Atrazine	ug/kg	430 U	440 U	400 U	31000 U	400 U	11000 U	390 U	390 U	400 U	370 U	350 U	340 U
Benzaldehyde	ug/kg	430 U	440 U	400 U	31000 U	400 U	11000 U	390 U	390 U	400 U	370 U	350 U	340 U
Benzo(a)anthracene(1,2)	ug/kg	430 U	440 U	400 U	120000	400 U	11000 U	390 U	390 U	400 U	620	350 U	340 U
Benzo(a)pyrene(1,2)	ug/kg	430 U	440 U	400 U	98000	400 U	11000 U	390 U	390 U	400 U	500	350 U	340 U
Benzo(b)fluoranthene(1,2)	ug/kg	430 U	440 U	400 U	67000	400 U	11000 U	390 U	390 U	400 U	370 U	350 U	340 U
Benzo(g,h,i)perylene (1)	ug/kg	430 U	440 U	400 U	44000	400 U	11000 U	390 U	390 U	400 U	370 U	350 U	340 U
Benzo(k)fluoranthene(1,2)	ug/kg	430 U	440 U	400 U	100000	400 U	11000 U	390 U	390 U	400 U	420	350 U	340 U
Biphenyl	ug/kg	430 U	440 U	400 U	31000 U	400 U	11000 U	390 U	390 U	400 U	370 U	350 U	340 U
bis(2-Chloroethoxy)methane	ug/kg	430 U	440 U	400 U	31000 U	400 U	11000 U	390 U	390 U	400 U	370 U	350 U	340 U
bis(2-Chloroethyl)ether	ug/kg	430 U	440 U	400 U	31000 U	400 U	11000 U	390 U	390 U	400 U	370 U	350 U	340 U
bis(2-Chloroisopropyl)ether	ug/kg	430 U	440 U	400 U	31000 U	400 U	11000 U	390 U	390 U	400 U	370 U	350 U	340 U
bis(2-Ethylhexyl)phthalate	ug/kg	430 U	440 U	400 U	31000 U	400 U	11000 U	390 U	390 U	400 U	370 U	350 U	340 U
4-Bromophenyl-phenylether	ug/kg	430 U	440 U	400 U	31000 U	400 U	11000 U	390 U	390 U	400 U	370 U	350 U	340 U
Butylbenzylphthalate	ug/kg	430 U	440 U	400 U	31000 U	400 U	11000 U	390 U	390 U	400 U	370 U	350 U	340 U
Caprolactam	ug/kg	430 U	440 U	400 U	31000 U	400 U	11000 U	390 U	390 U	400 U	370 U	350 U	340 U
Carbazole	ug/kg	430 U	440 U	400 U	45000	400 U	11000 U	390 U	390 U	400 U	370 U	350 U	340 U
4-Chloro-3-methyphenol	ug/kg	430 U	440 U	400 U	31000 U	400 U	11000 U	390 U	390 U	400 U	370 U	350 U	340 U
4-Chloroaniline	ug/kg	430 U	440 U	400 U	31000 U	400 U	11000 U	390 U	390 U	400 U	370 U	350 U	340 U
2-Chloronaphthalene (1)	ug/kg	430 U	440 U	400 U	31000 U	400 U	11000 U	390 U	390 U	400 U	370 U	350 U	340 U
2-Chlorophenol	ug/kg	430 U	440 U	400 U	31000 U	400 U	11000 U	390 U	390 U	400 U	370 U	350 U	340 U
4-Chlorophenyl-phenylether	ug/kg	430 U	440 U	400 U	31000 U	400 U	11000 U	390 U	390 U	400 U	370 U	350 U	340 U
Chrysene (1,2)	ug/kg	430 U	440 U	400 U	130000	400 U	11000 U	390 U	390 U	400 U	550	350 U	340 U
Di-n-butylphthalate	ug/kg	430 U	440 U	400 U	31000 U	400 U	11000 U	390 U	390 U	400 U	370 U	350 U	340 U
Di-n-octylphthalate	ug/kg	430 U	440 U	400 U	31000 U	400 U	11000 U	390 U	390 U	400 U	370 U	350 U	340 U
Dibenzo(a,h)anthracene (1,2)	ug/kg	430 U	440 U	400 U	31000 U	400 U	11000 U	390 U	390 U	400 U	370 U	350 U	340 U
Dibenzofuran	ug/kg	430 U	440 U	400 U	35000	400 U	11000 U	390 U	390 U	400 U	370 U	350 U	340 U
3,3'-Dichlorobenzidine	ug/kg	430 U	440 U	400 U	31000 U	400 U	11000 U	390 U	390 U	400 U	370 U	350 U	340 U
2,4-Dichlorophenol	ug/kg	430 U	440 U	400 U	31000 U	400 U	11000 U	390 U	390 U	400 U	370 U	350 U	340 U
Diethylphthalate	ug/kg	430 U	440 U	400 U	31000 U	400 U	11000 U	390 U	390 U	400 U	370 U	350 U	340 U
2,4-Dimethylphenol	ug/kg	430 U	440 U	400 U	31000 U	400 U	11000 U	390 U	390 U	400 U	370 U	350 U	340 U
Dimethylphthalate	ug/kg	430 U	440 U	400 U	31000 U	400 U	11000 U	390 U	390 U	400 U	370 U	350 U	340 U
4,6-Dinitro-2-methylphenol	ug/kg	1100 U	1100 U	1000 U	78000 U	1000 U	28000 U	980 U	990 U	1000 U	920 U	880 U	860 U
2,4-Dinitrophenol	ug/kg	1100 U	1100 U	1000 U	78000 U	1000 U	28000 U	980 U	990 U	1000 U	920 U	880 U	860 U

TABLE 2
SUMMARY OF SEMI-VOLATILE COMPOUNDS IDENTIFIED SOIL/SOURCE MATERIAL SAMPLING 12/2-6/03
2ND ST (HASTINGS) SOURCE AREA RI/FS

	Location	SMB-1	SMB-1	SMB-2	SMB-2	SB-1	SB-1	SB-2	SB-2	SB-2	SB-2	SB-2	SB-2
	Interval	8-10 ft bgs	10-12.5 ft bgs	8-10 ft bgs	13-15 ft bgs	18-20 ft bgs	38 ft bgs	13 ft bgs	18 ft bgs	38 ft bgs	57 ft bgs	75-77 ft bgs	90-92 ft bgs
	EPA No	2110-12	2110-13	2110-14	2110-15	2110-41	2110-412	2110-34	2110-35	2110-36	2110-37	2110-59	2110-60
	Date	12/2/2003	12/2/2003	12/2/2003	12/2/2003	12/4/2003	12/4/2003	12/4/2003	12/4/2003	12/4/2003	12/4/2003	12/6/2003	12/6/2003 ·
	Time	16:35	16:50	17:15	17:25	15:30	15:45	11:15	11:25	11:40	11:50	9.50	10 10
Parameter	Units												
Semivolatile Organics		Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q
2,4-Dinitrotoluene	ug/kg	430 U	440 U	400 U	31000 U	400 U	11000 U	390 U	390 U	400 U	370 U	350 U	340 U
2,6-Dinitrotoluene	ug/kg	430 U	440 U	400 U	31000 U	400 U	11000 U	390 U	390 U	400 U	370 U	350 U	340 U
Fluoranthene (1)	ug/kg	430 U	440 U	400 U	330000	400 U	11000 U	390 U	390 U	400 U	970	350 U	340 U
Fluorene (1)	ug/kg	430 U	440 U	400 U	89000	400 U	11000 U	390 U	390 U	400 U	460	350 U	340 U
Hexachlorobenzene	ug/kg	430 U	440 U	400 U	31000 U	400 U	11000 U	390 U	390 U	400 U	370 U	350 U	340 U
Hexachlorobutadiene	ug/kg	430 U	440 U	400 U	31000 U	400 U	11000 U	390 U	390 U	400 U	370 U	350 U	340 U
Hexachlorocyclopentadiene	ug/kg	N/A R	N/A R	N/A R	N/A R	400 U	11000 U	390 U	390 U	400 U	370 U	350 U	340 U
Hexachloroethane	ug/kg	430 U	440 U	400 U	31000 U	400 U	11000 U	390 U	390 U	400 U	370 U	350 U	340 U
Indeno(1,2,3-cd)pyrene (1,2)	ug/kg	430 U	440 U	400 U	60000	400 U	11000 U	390 U	390 U	400 U	370 U	350 U	340 U
Isophorone	ug/kg	430 U	440 U	400 U	31000 U	400 U	11000 U	390 U	390 U	400 U	370 U	350 U	340 U
2-Methylnaphthalene (1)	ug/kg	430 U	440 U	400 U	51000	400 U	11000 U	390 U	390 U	400 U	610	350 U	340 U
2-Methylphenol	ug/kg	430 U	440 U	400 U	31000 U	400 U	11000 U	390 U	390 U	400 U	370 U	350 U	340 U
4-Methylphenol	ug/kg	430 U	440 U	400 U	31000 U	400 U	11000 U	390 U	390 U	400 U	370 U	350 U	340 U
Naphthalene (1)	ug/kg	430 U	440 U	400 U	48000	400 U	11000 U	390 U	390 U	400 U	650	350 U	340 U
2-Nitroaniline	ug/kg	1100 U	1100 U	1000 U	78000 U	1000 U	28000 U	980 U	990 U	1000 U	920 U	880 U	860 U
3-Nitroaniline	ug/kg	1100 U	1100 U	1000 U	78000 U	1000 U	28000 U	980 U	990 U	1000 U	920 U	880 U	860 U
4-Nitroaniline	ug/kg	1100 U	1100 U	1000 U	78000 U	1000 U	28000 U	980 U	990 U	1000 U	920 U	880 U	860 U
Nitrobenzene	ug/kg	430 U	440 U	400 U	31000 U	400 U	11000 U	390 U	390 U	400 U	370 U	350 U	340 U
2-Nitrophenol	ug/kg	430 U	440 U	400 U	31000 U	400 U	11000 U	390 U	390 U	400 U	370 U	350 U	340 U
4-Nitrophenol	ug/kg	1100 U	1100 U	1000 U	78000 U	1000 U	28000 U	980 U	990 U	1000 U	920 U	880 U	860 U
N-nitroso-di-n-propylamine	ug/kg	430 U	440 U	400 U	31000 U	400 U	11000 U	390 U	390 U	400 U	370 U	350 U	340 U
N-nitrosodiphenylamine	ug/kg	430 U	440 U	400 U	31000 U	400 U	11000 U	390 U	390 U	400 U	370 U	350 U	340 U
Pentachlorophenol	ug/kg	1100 U	1100 U	1000 U	78000 U	1000 U	28000 U	980 U	990 U	1000 U	920 U	880 U	860 U
Phenanthrene (1)	ug/kg	430 U	440 U	400 U	460000	400 U	11000 U	390 U	390 U	400 U	1800	350 U	340 U
Phenol	ug/kg	430 U	440 U	400 U	31000 U	400 U	11000 U	390 U	390 U	400 U	370 U	350 U	340 U
Pyrene (1)	ug/kg	430 U	440 U	400 U	330000	400 U	11000 U	390 U	390 U	400 U	1400	350 U	340 U
2,4,5-Trichlorophenol	ug/kg	1100 U	1100 U	1000 U	78000 U	1000 U	28000 U	980 U	990 U	1000 U	920 U	880 U	880 U
2,4,6-Trichlorophenol	ug/kg	430 U	440 U	400 U	31000 U	400 U	11000 U	390 U	390 U	400 U	370 U	350 U	340 U
Total Semivolatiles	ug/kg	ND	ND	ND	2,149,000	ND	ND	ND	ND	ND	8,660	ND	ND
Total PAHs (1)	ug/kg	ND	ND	ND	2,069,000	ND	ND	ND	ND	ND	8,660	ND	ND
Total Carcinogenic PAHs(2)	ug/kg	ND	ND	ND	575,000	ND	ND	ND	ND	ND	2,090	ND	ND

TABLE 2
SUMMARY OF SEMI-VOLATILE COMPOUNDS IDENTIFIED SOIL/SOURCE MATERIAL SAMPLING 12/2-6/03
2ND ST (HASTINGS) SOURCE AREA RI/FS

	Location	SB-5	SB-5	SB-5	SB-5	SB-5	SB-5
	Interval	28 ft bgs	38 ft bgs	56 ft bgs	72-74 ft bgs	72-74 ft bgs	85-87 ft bgs
	EPA No	2110-23	2110-24	2110-25	2110-54	2110-54FD (Dup)	2110-55
	Date	12/3/2003	12/3/2003	12/3/2003	12/5/2003	12/5/2003	12/5/2003
	Time	14:20	14:45	15:10	15:20	15:20	16:20
Parameter	Units						
Semivolatile Organics		Conc Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q
Acenaphthene (1)	ug/kg	400 U	27000 U	350 U	360 U	340 U	340 U
Acenaphthylene (1)	ug/kg	400 U	31000	350 U	350 U	340 U	340 U
Acetophenone	ug/kg	400 U	27000 U	350 U	350 U	340 U	340 U
Anthracene (1)	ug/kg	400 U	31000	350 U	350 U	340 U	340 U
Atrazine	ug/kg	400 U	27000 U	350 U	350 U	340 U	340 U
Benzaldehyde	ug/kg	400 U	27000 U	350 U	350 U	340 U	340 U
Benzo(a)anthracene(1,2)	ug/kg	400 U	27000 U	350 U	350 U	340 U	340 U
Benzo(a)pyrene(1,2)	ug/kg	400 U	27000 U	350 U	350 U	340 U	340 U
Benzo(b)fluoranthene(1,2)	ug/kg	400 U	27000 U	350 U	350 U	340 U	340 U
Benzo(g,h,i)perylene (1)	ug/kg	400 U	27000 U	350 U	350 U	340 U	340 U
Benzo(k)fluoranthene(1,2)	ug/kg	400 U	27000 U	350 U	350 U	340 U	340 U
Biphenyl	ug/kg	400 U	27000 U	350 U	350 U	340 U	340 U
bis(2-Chloroethoxy)methane	ug/kg	400 U	27000 U	350 U	350 U	340 U	340 U
bis(2-Chloroethyl)ether	ug/kg	400 U	27000 U	350 U	350 U	340 U	340 U
bis(2-Chloroisopropyl)ether	ug/kg	400 U	27000 U	350 U	350 U	340 U	340 U
bis(2-Ethylhexyl)phthalate	ug/kg	400 U	27000 U	350 U	350 U	340 U	340 U
4-Bromophenyl-phenylether	ug/kg	400 U	27000 U	350 U	350 U	340 U	340 U
Butylbenzylphthalate	ug/kg	400 U	27000 U	350 U	350 U	340 U	340 U
Caprolactam	ug/kg	400 U	27000 U	350 U	350 U	340 U	340 U
Carbazole	ug/kg	400 U	27000 U	350 U	350 U	340 U	340 U
4-Chloro-3-methyphenol	ug/kg	400 U	27000 U	350 U	350 U	340 U	340 U
4-Chloroaniline	ug/kg	400 U	27000 U	350 U	350 U	340 U	340 U
2-Chloronaphthalene (1)	ug/kg	400 U	27000 U	350 U	350 U	340 U	340 U
2-Chlorophenol	ug/kg	400 U	27000 U	350 U	350 U	340 U	340 U
4-Chlorophenyl-phenylether	ug/kg	400 U	27000 U	350 U	350 U	340 U	340 U
Chrysene (1,2)	ug/kg	400 U	27000 U	350 U	350 U	340 U	340 U
Di-n-butylphthalate	ug/kg	400 U	27000 U	350 U	350 U	340 U	340 U
Di-n-octylphthalate	ug/kg	400 U	27000 U	350 U	350 U	340 U	340 U
Dibenzo(a,h)anthracene (1,2)	ug/kg	400 U	27000 U	350 U	350 U	340 U	340 U
Dibenzofuran	ug/kg	400 U	27000 U	350 U	350 U	340 U	340 U
3,3'-Dichlorobenzidine	ug/kg	400 U	27000 U	350 U	350 U	340 U	340 U
2,4-Dichlorophenol	ug/kg	400 U	27000 U	350 U	350 U	340 U	340 U
Diethylphthalate	ug/kg	400 U	27000 U	350 U	350 U	340 U	340 U
2,4-Dimethylphenol	ug/kg	400 U	27000 U	350 U	350 U	340 U	340 U
Dimethylphthalate	ug/kg	400 U	27000 U	350 U	350 U	340 U	340 U
4,6-Dinitro-2-methylphenol	ug/kg	1000 U	68000 U	890 U	870 U	860 U	870 U
2,4-Dinitrophenol	ug/kg	1000 U	68000 U	890 U	870 U	860 U	870 U

TABLE 2
SUMMARY OF SEMI-VOLATILE COMPOUNDS IDENTIFIED SOIL/SOURCE MATERIAL SAMPLING 12/2-6/03
2ND ST (HASTINGS) SOURCE AREA RI/FS

Parameter	Location	SB-5		SB-5		SB-5		SB-5		SB-5		SB-5	
	Interval	28	ft bgs	38	ft bgs	56	ft bgs	72-74	ft bgs	72-74	ft bgs	85-87	ft bgs
	EPA No	2110-23		2110-24		2110-25		2110-54		2110-54FD (Dup)		2110-55	
	Date	12/3/2003		12/3/2003		12/3/2003		12/5/2003		12/5/2003		12/5/2003	
	Time	14.20		14:45		15:10		15:20		15:20		16:20	
	Units												
Semivolatile Organics		Conc.	Q	Conc.	Q	Conc.	Q	Conc.	Q	Conc.	Q	Conc.	Q
2,4-Dinitrotoluene	ug/kg	400	U	27000	U	350	U	350	U	340	U	340	U
2,6-Dinitrotoluene	ug/kg	400	U	27000	U	350	U	350	U	340	U	340	U
Fluoranthene (1)	ug/kg	400	U	43000		350	U	350	U	340	U	340	U
Fluorene (1)	ug/kg	400	U	47000		350	U	350	U	340	U	340	U
Hexachlorobenzene	ug/kg	400	U	27000	U	350	U	350	U	340	U	340	U
Hexachlorobutadiene	ug/kg	400	U	27000	U	350	U	350	U	340	U	340	U
Hexachlorocyclopentadiene	ug/kg	400	U	N/A	R	350	U	350	U	340	U	340	U
Hexachloroethane	ug/kg	400	U	27000	U	350	U	350	U	340	U	340	U
Indeno(1,2,3-cd)pyrene (1,2)	ug/kg	400	U	27000	U	350	U	350	U	340	U	340	U
Isophorone	ug/kg	400	U	27000	U	350	U	350	U	340	U	340	U
2-Methylnaphthalene (1)	ug/kg	870		27000	U	350	U	350	U	340	U	340	U
2-Methylphenol	ug/kg	400	U	27000	U	350	U	350	U	340	U	340	U
4-Methylphenol	ug/kg	400	U	27000	U	350	U	350	U	340	U	340	U
Naphthalene (1)	ug/kg	1500		27000	U	350	U	350	U	340	U	340	U
2-Nitroaniline	ug/kg	1000	U	68000	U	890	U	870	U	860	U	870	U
3-Nitroaniline	ug/kg	1000	U	68000	U	890	U	870	U	860	U	870	U
4-Nitroaniline	ug/kg	1000	U	68000	U	890	U	870	U	860	U	870	U
Nitrobenzene	ug/kg	400	U	27000	U	350	U	350	U	340	U	340	U
2-Nitrophenol	ug/kg	400	U	27000	U	350	U	350	U	340	U	340	U
4-Nitrophenol	ug/kg	1000	U	68000	U	890	U	870	U	860	U	870	U
N-nitroso-di-n-propylamine	ug/kg	400	U	27000	U	350	U	350	U	340	U	340	U
N-nitrosodiphenylamine	ug/kg	400	U	27000	U	350	U	350	U	340	U	340	U
Pentachlorophenol	ug/kg	1000	U	68000	U	890	U	870	U	860	U	870	U
Phenanthrene (1)	ug/kg	400	U	130000		350	U	400		340	U	340	U
Phenol	ug/kg	400	U	27000	U	350	U	350	U	340	U	340	U
Pyrene (1)	ug/kg	400	U	49000		350	U	350	U	340	U	340	U
2,4,5-Trichlorophenol	ug/kg	1000	U	68000	U	890	U	870	U	860	U	870	U
2,4,6-Trichlorophenol	ug/kg	400	U	27000	U	350	U	350	U	340	U	340	U
Total Semivolatiles	ug/kg	2,370		331,000		ND		400		ND		ND	
Total PAHs (1)	ug/kg	2,370		331,000		ND		400		ND		ND	
Total Carcinogenic PAHs(2)	ug/kg	ND		ND		ND		ND		ND		ND	

TABLE 2
SUMMARY OF SEMI-VOLATILE COMPOUNDS IDENTIFIED SOIL/SOURCE MATERIAL SAMPLING 12/2-6/03
2ND ST (HASTINGS) SOURCE AREA RI/FS

Parameter	Location	SB-6	SB-6	SB-6	SB-6	SB-6	SB-6	SB-6	SB-6
	Interval	15-20 ft bgs	28 ft bgs	38 ft bgs	58 ft bgs	78-80	78-80 ft bgs	96-97	117 ft bgs
	EPA No	2110-16	2110-17	2110-18	2110-19	2110-20	2110-20FD (Dup)	2110-21	2110-22
	Date	12/3/2003	12/3/2003	12/3/2003	12/3/2003	12/3/2003	12/3/2003	12/3/2003	12/3/2003
	Time	8:30	8:45	9:00	9:15	9:45	9 45	10.30	12:36
	Units								
Semivolatile Organics		Conc Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q
Acenaphthene (1)	ug/kg	10000 U	49000 U	50000 U	88000 U	38000 U	28000 U	45000 U	1200 U
Acenaphthylene (1)	ug/kg	10000 U	80000	79000	300000	120000	84000	120000	6100
Acetophenone	ug/kg	10000 U	49000 U	50000 U	88000 U	38000 U	28000 U	45000 U	1200 U
Anthracene (1)	ug/kg	10000 U	49000 U	50000 U	120000	39000	28000	45000	3800
Atrazine	ug/kg	10000 U	49000 U	50000 U	88000 U	38000 U	28000 U	45000 U	1200 U
Benzaldehyde	ug/kg	10000 U	49000 U	50000 U	88000 U	38000 U	28000 U	45000 U	1200 U
Benzo(a)anthracene(1,2)	ug/kg	10000 U	49000 U	50000 U	88000 U	38000 U	28000 U	53000	15000
Benzo(a)pyrene(1,2)	ug/kg	10000 U	49000 U	50000 U	88000 U	38000 U	28000 U	45000 U	16000
Benzo(b)fluoranthene(1,2)	ug/kg	10000 U	49000 U	50000 U	88000 U	38000 U	28000 U	45000 U	10000 J
Benzo(g,h,i)perylene (1)	ug/kg	10000 U	49000 U	50000 U	88000 U	38000 U	28000 U	45000 U	3800
Benzo(k)fluoranthene(1,2)	ug/kg	10000 U	49000 U	50000 U	88000 U	38000 U	28000 U	45000 U	5200
Biphenyl	ug/kg	10000 U	49000 U	50000 U	110000	39000	29000	45000 U	1200 U
bis(2-Chloroethoxy)methane	ug/kg	10000 U	49000 U	50000 U	88000 U	38000 U	28000 U	45000 U	1200 U
bis(2-Chloroethyl)ether	ug/kg	10000 U	49000 U	50000 U	88000 U	38000 U	28000 U	45000 U	1200 U
bis(2-Chloroisopropyl)ether	ug/kg	10000 U	49000 U	50000 U	88000 U	38000 U	28000 U	45000 U	1200 U
bis(2-Ethylhexyl)phthalate	ug/kg	10000 U	49000 U	50000 U	88000 U	38000 U	28000 U	45000 U	1200 U
4-Bromophenyl-phenylether	ug/kg	10000 U	49000 U	50000 U	88000 U	38000 U	28000 U	45000 U	1200 U
Butylbenzylphthalate	ug/kg	10000 U	49000 U	50000 U	88000 U	38000 U	28000 U	45000 U	1200 U
Caprolactam	ug/kg	10000 U	49000 U	50000 U	88000 U	38000 U	28000 U	45000 U	1200 U
Carbazole	ug/kg	10000 U	49000 U	50000 U	88000 U	38000 U	28000 U	45000 U	1200 U
4-Chloro-3-methyphenol	ug/kg	10000 U	49000 U	50000 U	88000 U	38000 U	28000 U	45000 U	1200 U
4-Chloroaniline	ug/kg	10000 U	49000 U	50000 U	88000 U	38000 U	28000 U	45000 U	1200 U
2-Chloronaphthalene (1)	ug/kg	10000 U	49000 U	50000 U	88000 U	38000 U	28000 U	45000 U	1200 U
2-Chlorophenol	ug/kg	10000 U	49000 U	50000 U	88000 U	38000 U	28000 U	45000 U	1200 U
4-Chlorophenyl-phenylether	ug/kg	10000 U	49000 U	50000 U	88000 U	38000 U	28000 U	45000 U	1200 U
Chrysene (1,2)	ug/kg	10000 U	49000 U	50000 U	88000 U	38000 U	28000 U	51000	15000
Di-n-butylphthalate	ug/kg	10000 U	49000 U	50000 U	88000 U	38000 U	28000 U	45000 U	1200 U
Di-n-octylphthalate	ug/kg	10000 U	49000 U	50000 U	88000 U	38000 U	28000 U	45000 U	1200 U
Dibenzo(a,h)anthracene (1,2)	ug/kg	10000 U	49000 U	50000 U	88000 U	38000 U	28000 U	45000 U	1200 U
Dibenzofuran	ug/kg	10000 U	49000 U	50000 U	88000 U	38000 U	28000 U	45000 U	1200 U
3,3'-Dichlorobenzidine	ug/kg	10000 U	49000 U	50000 U	88000 U	38000 U	28000 U	45000 U	1200 U
2,4-Dichlorophenol	ug/kg	10000 U	49000 U	50000 U	88000 U	38000 U	28000 U	45000 U	1200 U
Diethylphthalate	ug/kg	10000 U	49000 U	50000 U	88000 U	38000 U	28000 U	45000 U	1200 U
2,4-Dimethylphenol	ug/kg	10000 U	49000 U	50000 U	88000 U	38000 U	28000 U	45000 U	1200 U
Dimethylphthalate	ug/kg	10000 U	49000 U	50000 U	88000 U	38000 U	28000 U	45000 U	1200 U
4,6-Dinitro-2-methylphenol	ug/kg	25000 U	120000 U	120000 U	220000 U	96000 U	70000 U	110000 U	3000 U
2,4-Dinitrophenol	ug/kg	25000 U	120000 U	120000 U	220000 U	96000 U	70000 U	110000 U	3000 U

TABLE 2
SUMMARY OF SEMI-VOLATILE COMPOUNDS IDENTIFIED SOIL/SOURCE MATERIAL SAMPLING 12/2-6/03
2ND ST (HASTINGS) SOURCE AREA RI/FS

	Location	SB-6	SB-6	SB-6	SB-6	SB-6	SB-6	SB-6	SB-6
	Interval	15-20 ft bgs	28 ft bgs	38 ft bgs	58 ft bgs	78-80	78-80 ft bgs	96-97	117 ft bgs
	EPA No	2110-16	2110-17	2110-18	2110-19	2110-20	2110-20FD (Dup)	2110-21	2110-22
	Date	12/3/2003	12/3/2003	12/3/2003	12/3/2003	12/3/2003	12/3/2003	12/3/2003	12/3/2003
	Time	8:30	8:45	9:00	9:15	9:45	9:45	10:30	12:38
Parameter	Units								
Semivolatile Organics		Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q
2,4-Dinitrotoluene	ug/kg	10000 U	49000 U	50000 U	88000 U	38000 U	28000 U	45000 U	1200 U
2,6-Dinitrotoluene	ug/kg	10000 U	49000 U	50000 U	88000 U	38000 U	28000 U	45000 U	1200 U
Fluoranthene (1)	ug/kg	10000 U	49000 U	50000 U	100000	74000	50000	98000	20000
Fluorene (1)	ug/kg	10000 U	100000	83000	300000	110000	72000	100000	1200 U
Hexachlorobenzene	ug/kg	10000 U	49000 U	50000 U	88000 U	38000 U	28000 U	45000 U	1200 U
Hexachlorobutadiene	ug/kg	10000 U	49000 U	50000 U	88000 U	38000 U	28000 U	45000 U	1200 U
Hexachlorocyclopentadiene	ug/kg	N/A R	N/A R	N/A R	N/A R	N/A R	N/A R	N/A R	1200 U
Hexachloroethane	ug/kg	10000 U	49000 U	50000 U	88000 U	38000 U	28000 U	45000 U	1200 U
Indeno(1,2,3-cd)pyrene (1,2)	ug/kg	10000 U	49000 U	50000 U	88000 U	38000 U	28000 U	45000 U	4200
Isophorone	ug/kg	10000 U	49000 U	50000 U	88000 U	38000 U	28000 U	45000 U	1200 U
2-Methylnaphthalene (1)	ug/kg	10000 U	520000	490000	1500000	280000	220000	45000 U	1200 U
2-Methylphenol	ug/kg	10000 U	49000 U	50000 U	88000 U	38000 U	28000 U	45000 U	1200 U
4-Methylphenol	ug/kg	10000 U	49000 U	50000 U	88000 U	38000 U	28000 U	45000 U	1200 U
Naphthalene (1)	ug/kg	10000 U	140000	260000	460000	120000	85000	45000 U	1200 U
2-Nitroaniline	ug/kg	25000 U	120000 U	120000 U	220000 U	96000 U	70000 U	110000 U	3000 U
3-Nitroaniline	ug/kg	25000 U	120000 U	120000 U	220000 U	96000 U	70000 U	110000 U	3000 U
4-Nitroaniline	ug/kg	25000 U	120000 U	120000 U	220000 U	96000 U	70000 U	110000 U	3000 U
Nitrobenzene	ug/kg	10000 U	49000 U	50000 U	88000 U	38000 U	28000 U	45000 U	1200 U
2-Nitrophenol	ug/kg	10000 U	49000 U	50000 U	88000 U	38000 U	28000 U	45000 U	1200 U
4-Nitrophenol	ug/kg	25000 U	120000 U	120000 U	220000 U	96000 U	70000 U	110000 U	3000 U
N-nitroso-di-n-propylamine	ug/kg	10000 U	49000 U	50000 U	88000 U	38000 U	28000 U	45000 U	1200 U
N-nitrosodiphenylamine	ug/kg	10000 U	49000 U	50000 U	88000 U	38000 U	28000 U	45000 U	1200 U
Pentachlorophenol	ug/kg	25000 U	120000 U	120000 U	220000 U	96000 U	70000 U	110000 U	3000 U
Phenanthrene (1)	ug/kg	13000	240000	170000	580000	260000	190000	230000	7900
Phenol	ug/kg	10000 U	49000 U	50000 U	88000 U	38000 U	28000 U	45000 U	1200 U
Pyrene (1)	ug/kg	14000	49000 U	50000 U	170000	110000	76000	160000	36000
2,4,5-Trichlorophenol	ug/kg	25000 U	120000 U	120000 U	220000 U	96000 U	70000 U	110000 U	3000 U
2,4,6-Trichlorophenol	ug/kg	10000 U	49000 U	50000 U	88000 U	38000 U	28000 U	45000 U	1200 U
Total Semivolatiles	ug/kg	27,000	1,080,000	1,082,000	3,640,000	1,152,000	834,000	857,000	143,000
Total PAHs (1)	ug/kg	27,000	1,080,000	1,082,000	3,530,000	1,113,000	805,000	857,000	143,000
Total Carcinogenic PAHs(2)	ug/kg	ND	ND	ND	ND	ND	ND	104,000	65,400

TABLE 2
SUMMARY OF SEMI-VOLATILE COMPOUNDS IDENTIFIED SOIL/SOURCE MATERIAL SAMPLING 12/2-6/03
2ND ST (HASTINGS) SOURCE AREA RI/FS

	Location	SB-9		SB-9		SB-9		SB-9		SB-9	
	Interval	18	ft bgs	38-40	ft bgs	56	ft bgs	75-77	ft bgs	93-95	ft bgs
	EPA No	2110-43		2110-44		2110-45		2110-52		2110-53	
	Date	12/5/2003		12/5/2003		12/5/2003		12/5/2003		12/5/2003	
	Time	8:20		8:35		9:00		13:20		13:35	
Parameter	Units										
Semivolatile Organics		Conc.	Q	Conc.	Q	Conc.	Q	Conc.	Q	Conc.	Q
Acenaphthene (1)	ug/kg	400	U	390	U	91000		49000	U	32000	U
Acenaphthylene (1)	ug/kg	400	U	390	U	33000	U	180000		110000	
Acetophenone	ug/kg	400	U	390	U	33000	U	49000	U	32000	U
Anthracene (1)	ug/kg	400	U	390	U	33000	U	59000		36000	
Atrazine	ug/kg	400	U	390	U	33000	U	49000	U	32000	U
Benzaldehyde	ug/kg	400	U	390	U	33000	U	49000	U	32000	U
Benzo(a)anthracene(1,2)	ug/kg	400	U	390	U	33000	U	65000		42000	
Benzo(a)pyrene(1,2)	ug/kg	400	U	390	U	33000	U	49000	U	39000	
Benzo(b)fluoranthene(1,2)	ug/kg	400	U	390	U	33000	U	49000	U	37000	
Benzo(g,h,i)perylene (1)	ug/kg	400	U	390	U	33000	U	49000	U	32000	U
Benzo(k)fluoranthene(1,2)	ug/kg	400	U	390	U	33000	U	49000	U	32000	U
Biphenyl	ug/kg	400	U	390	U	33000	U	54000		36000	
bis(2-Chloroethoxy)methane	ug/kg	400	U	390	U	33000	U	49000	U	32000	U
bis(2-Chloroethyl)ether	ug/kg	400	U	390	U	33000	U	49000	U	32000	U
bis(2-Chloroisopropyl)ether	ug/kg	400	U	390	U	33000	U	49000	U	32000	U
bis(2-Ethylhexyl)phthalate	ug/kg	400	U	390	U	33000	U	49000	U	32000	U
4-Bromophenyl-phenylether	ug/kg	400	U	390	U	33000	U	49000	U	32000	U
Butylbenzylphthalate	ug/kg	400	U	390	U	33000	U	49000	U	32000	U
Caprolactam	ug/kg	400	U	390	U	33000	U	49000	U	32000	U
Carbazole	ug/kg	400	U	390	U	33000	U	49000	U	32000	U
4-Chloro-3-methyphenol	ug/kg	400	U	390	U	33000	U	49000	U	32000	U
4-Chloroaniline	ug/kg	400	U	390	U	33000	U	49000	U	32000	U
2-Chloronaphthalene (1)	ug/kg	400	U	390	U	33000	U	49000	U	32000	U
2-Chlorophenol	ug/kg	400	U	390	U	33000	U	49000	U	32000	U
4-Chlorophenyl-phenylether	ug/kg	400	U	390	U	33000	U	49000	U	32000	U
Chrysene (1,2)	ug/kg	400	U	390	U	33000	U	61000		39000	
Di-n-butylphthalate	ug/kg	400	U	390	U	33000	U	49000	U	32000	U
Di-n-octylphthalate	ug/kg	400	U	390	U	33000	U	49000	U	32000	U
Dibenzo(a,h)anthracene (1,2)	ug/kg	400	U	390	U	33000	U	49000	U	32000	U
Dibenzofuran	ug/kg	400	U	390	U	33000	U	49000	U	32000	U
3,3'-Dichlorobenzidine	ug/kg	400	U	390	U	33000	U	49000	U	32000	U
2,4-Dichlorophenol	ug/kg	400	U	390	U	33000	U	49000	U	32000	U
Diethylphthalate	ug/kg	400	U	390	U	33000	U	49000	U	32000	U
2,4-Dimethylphenol	ug/kg	400	U	390	U	33000	U	49000	U	32000	U
Dimethylphthalate	ug/kg	400	U	390	U	33000	U	49000	U	32000	U
4,6-Dinitro-2-methylphenol	ug/kg	1000	U	980	U	83000	U	120000	U	81000	U
2,4-Dinitrophenol	ug/kg	1000	U	980	U	83000	U	120000	U	81000	U

TABLE 2
SUMMARY OF SEMI-VOLATILE COMPOUNDS IDENTIFIED SOIL/SOURCE MATERIAL SAMPLING 12/2-6/03
2ND ST (HASTINGS) SOURCE AREA RI/FS

	Location	SB-9	SB-9	SB-9	SB-9	SB-9
	Interval	18 ft bgs	38-40 ft bgs	56 ft bgs	75-77 ft bgs	93-95 ft bgs
	EPA No	2110-43	2110-44	2110-45	2110-52	2110-53
	Date	12/5/2003	12/5/2003	12/5/2003	12/5/2003	12/5/2003
	Time	8:20	8:35	9:00	13:20	13:35
Parameter	Units					
Semivolatile Organics		Conc Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q
2,4-Dinitrotoluene	ug/kg	400 U	390 U	33000 U	49000 U	32000 U
2,6-Dinitrotoluene	ug/kg	400 U	390 U	33000 U	49000 U	32000 U
Fluoranthene (1)	ug/kg	400 U	390 U	55000	130000	62000
Fluorene (1)	ug/kg	400 U	390 U	63000	100000	83000
Hexachlorobenzene	ug/kg	400 U	390 U	33000 U	49000 U	32000 U
Hexachlorobutadiene	ug/kg	400 U	390 U	33000 U	49000 U	32000 U
Hexachlorocyclopentadiene	ug/kg	400 U	390 U	33000 U	49000 U	32000 U
Hexachloroethane	ug/kg	400 U	390 U	33000 U	49000 U	32000 U
Indeno(1,2,3-cd)pyrene (1,2)	ug/kg	400 U	390 U	33000 U	49000 U	32000 U
Isophorone	ug/kg	400 U	390 U	33000 U	49000 U	32000 U
2-Methylnaphthalene (1)	ug/kg	400 U	390 U	150000	350000	200000
2-Methylphenol	ug/kg	400 U	390 U	33000 U	49000 U	32000 U
4-Methylphenol	ug/kg	400 U	390 U	33000 U	49000 U	32000 U
Naphthalene (1)	ug/kg	400 U	390 U	76000	330000	32000 U
2-Nitroaniline	ug/kg	1000 U	980 U	83000 U	120000 U	81000 U
3-Nitroaniline	ug/kg	1000 U	980 U	83000 U	120000 U	81000 U
4-Nitroaniline	ug/kg	1000 U	980 U	83000 U	120000 U	81000 U
Nitrobenzene	ug/kg	400 U	390 U	33000 U	49000 U	32000 U
2-Nitrophenol	ug/kg	400 U	390 U	33000 U	49000 U	32000 U
4-Nitrophenol	ug/kg	1000 U	980 U	83000 U	120000 U	81000 U
N-nitroso-di-n-propylamine	ug/kg	400 U	390 U	33000 U	49000 U	32000 U
N-nitrosodiphenylamine	ug/kg	400 U	390 U	33000 U	49000 U	32000 U
Pentachlorophenol	ug/kg	1000 U	980 U	83000 U	120000 U	81000 U
Phenanthrene (1)	ug/kg	400 U	390 U	170000	380000	230000
Phenol	ug/kg	400 U	390 U	33000 U	49000 U	32000 U
Pyrene (1)	ug/kg	400 U	390 U	74000	170000	100000
2,4,5-Trichlorophenol	ug/kg	1000 U	980 U	83000 U	120000 U	81000 U
2,4,6-Trichlorophenol	ug/kg	400 U	390 U	33000 U	49000 U	32000 U
Total Semivolatiles	ug/kg	ND	ND	679,000	1,879,000	1,034,000
Total PAHs (1)	ug/kg	ND	ND	679,000	1,825,000	998,000
Total Carcinogenic PAHs(2)	ug/kg	ND	ND	ND	126,000	157,000

TABLE 2
SUMMARY OF SEMI-VOLATILE COMPOUNDS IDENTIFIED SOIL/SOURCE MATERIAL SAMPLING 12/2-6/03
2ND ST (HASTINGS) SOURCE AREA RI/FS

	Location	SB-7	SB-7	SB-7	SB-7	SB-7	SB-7	SB-8	SB-8	SB-8	SB-8
	Interval	5-6 ft bgs	17 ft bgs	38 ft bgs	55-58 ft bgs	75-77 ft bgs	94-96 ft bgs	6-7 ft bgs	16-17 ft bgs	38 ft bgs	56 ft bgs
	EPA No	2110-26	2110-27	2110-28	2110-29	2110-61	2110-62	2110-30	2110-31	2110-32	2110-33
	Date	12/4/2003	12/4/2003	12/4/2003	12/4/2003	12/6/2003	12/6/2003	12/4/2003	12/4/2003	12/4/2003	12/4/2003
	Time	7:45	8:00	8:35	9:00	11:20	11:45	9:35	10:00	10·15	10:35
Parameter	Units										
Semivolatile Organics		Conc Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q
Acenaphthene (1)	ug/kg	1300 U	180000 U	420 U	380 U	390 U	400 U	4800 U	420 U	400 U	390 U
Acenaphthylene (1)	ug/kg	4500	270000	420 U	380 U	390 U	400 U	23000	420 U	400 U	390 U
Acetophenone	ug/kg	1300 U	180000 U	420 U	380 U	390 U	400 U	4800 U	420 U	400 U	390 U
Anthracene (1)	ug/kg	1400	230000	420 U	380 U	390 U	400 U	5300	420 U	400 U	390 U
Atrazine	ug/kg	1300 U	180000 U	420 U	380 U	390 U	400 U	4800 U	420 U	400 U	390 U
Benzaldehyde	ug/kg	1300 U	180000 U	420 U	380 U	390 U	400 U	4800 U	420 U	400 U	390 U
Benzo(a)anthracene(1,2)	ug/kg	4700	180000 U	420 U	380 U	390 U	400 U	16000	420 U	400 U	390 U
Benzo(a)pyrene(1,2)	ug/kg	10000	180000 U	420 U	380 U	390 U	400 U	56000	420 U	400 U	390 U
Benzo(b)fluoranthene(1,2)	ug/kg	7800	180000 U	420 U	380 U	390 U	400 U	31000	420 U	400 U	390 U
Benzo(g,h,i)perylene (1)	ug/kg	5100	180000 U	1200	380 U	390 U	400 U	18000	860	400 U	390 U
Benzo(k)fluoranthene(1,2)	ug/kg	3700	180000 U	420 U	380 U	390 U	400 U	29000	420 U	400 U	390 U
Biphenyl	ug/kg	1300 U	180000 U	420 U	380 U	390 U	400 U	4800 U	420 U	400 U	390 U
bis(2-Chloroethoxy)methane	ug/kg	1300 U	180000 U	420 U	380 U	390 U	400 U	4800 U	420 U	400 U	390 U
bis(2-Chloroethyl)ether	ug/kg	1300 U	180000 U	420 U	380 U	390 U	400 U	4800 U	420 U	400 U	390 U
bis(2-Chloroisopropyl)ether	ug/kg	1300 U	180000 U	420 U	380 U	390 U	400 U	4800 U	420 U	400 U	390 U
bis(2-Ethylhexyl)phthalate	ug/kg	1300 U	180000 U	420 U	380 U	390 U	400 U	4800 U	420 U	400 U	390 U
4-Bromophenyl-phenylether	ug/kg	1300 U	180000 U	420 U	380 U	390 U	400 U	4800 U	420 U	400 U	390 U
Butylbenzylphthalate	ug/kg	1300 U	180000 U	420 U	380 U	390 U	400 U	4800 U	420 U	400 U	390 U
Caprolactam	ug/kg	1300 U	180000 U	420 U	380 U	390 U	400 U	4800 U	420 U	400 U	390 U
Carbazole	ug/kg	1300 U	180000 U	420 U	380 U	390 U	400 U	4800 U	420 U	400 U	390 U
4-Chloro-3-methyphenol	ug/kg	1300 U	180000 U	420 U	380 U	390 U	400 U	4800 U	420 U	400 U	390 U
4-Chloroaniline	ug/kg	1300 U	180000 U	420 U	380 U	390 U	400 U	4800 U	420 U	400 U	390 U
2-Chloronaphthalene (1)	ug/kg	1300 U	180000 U	420 U	380 U	390 U	400 U	4800 U	420 U	400 U	390 U
2-Chlorophenol	ug/kg	1300 U	180000 U	420 U	380 U	390 U	400 U	4800 U	420 U	400 U	390 U
4-Chlorophenyl-phenylether	ug/kg	1300 U	180000 U	420 U	380 U	390 U	400 U	4800 U	420 U	400 U	390 U
Chrysene (1,2)	ug/kg	5300	180000 U	420 U	380 U	390 U	400 U	20000	420 U	400 U	390 U
Di-n-butylphthalate	ug/kg	1300 U	180000 U	420 U	380 U	390 U	400 U	4800 U	420 U	400 U	390 U
Di-n-octylphthalate	ug/kg	1300 U	180000 U	420 U	380 U	390 U	400 U	4800 U	420 U	400 U	390 U
Dibenzo(a,h)anthracene (1,2)	ug/kg	1300 U	180000 U	420 U	380 U	390 U	400 U	11000	420 U	400 U	390 U
Dibenzofuran	ug/kg	1300 U	180000 U	420 U	380 U	390 U	400 U	4800 U	420 U	400 U	390 U
3,3'-Dichlorobenzidine	ug/kg	1300 U	180000 U	420 U	380 U	390 U	400 U	4800 U	420 U	400 U	390 U
2,4-Dichlorophenol	ug/kg	1300 U	180000 U	420 U	380 U	390 U	400 U	4800 U	420 U	400 U	390 U
Diethylphthalate	ug/kg	1300 U	180000 U	420 U	380 U	390 U	400 U	4800 U	420 U	400 U	390 U
2,4-Dimethylphenol	ug/kg	1300 U	180000 U	420 U	380 U	390 U	400 U	4800 U	420 U	400 U	390 U
Dimethylphthalate	ug/kg	1300 U	180000 U	420 U	380 U	390 U	400 U	4800 U	420 U	400 U	390 U
4,6-Dinitro-2-methylphenol	ug/kg	3300 U	440000 U	1100 U	960 U	980 U	1000 U	12000 U	1100 U	1000 U	980 U
2,4-Dinitrophenol	ug/kg	3300 U	440000 U	1100 U	960 U	980 U	1000 U	12000 U	1100 U	1000 U	980 U

TABLE 2
SUMMARY OF SEMI-VOLATILE COMPOUNDS IDENTIFIED SOIL/SOURCE MATERIAL SAMPLING 12/2-6/03
2ND ST (HASTINGS) SOURCE AREA RI/FS

	Location	SB-7	SB-7	SB-7	SB-7	SB-7	SB-7	SB-8	SB-8	SB-8	SB-8
	Interval	5-6 ft bgs	17 ft bgs	38 ft bgs	55-58 ft bgs	75-77 ft bgs	94-96 ft bgs	6-7 ft bgs	16-17 ft bgs	38 ft bgs	58 ft bgs
	EPA No	2110-26	2110-27	2110-28	2110-29	2110-61	2110-62	2110-30	2110-31	2110-32	2110-33
	Date	12/4/2003	12/4/2003	12/4/2003	12/4/2003	12/6/2003	12/6/2003	12/4/2003	12/4/2003	12/4/2003	12/4/2003
	Time	7:45	8.00	8:35	9:00	11:20	11:45	9:35	10 00	10:15	10:35
Parameter	Units										
Semivolatile Organics		Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q
2,4-Dinitrotoluene	ug/kg	1300 U	180000 U	420 U	380 U	390 U	400 U	4800 U	420 U	400 U	390 U
2,6-Dinitrotoluene	ug/kg	1300 U	180000 U	420 U	380 U	390 U	400 U	4800 U	420 U	400 U	390 U
Fluoranthene (1)	ug/kg	3300	320000	420 U	380 U	390 U	400 U	9300	420 U	400 U	390 U
Fluorene (1)	ug/kg	1300 U	390000	420 U	380 U	390 U	400 U	4800 U	580	400 U	390 U
Hexachlorobenzene	ug/kg	1300 U	180000 U	420 U	380 U	390 U	400 U	4800 U	420 U	400 U	390 U
Hexachlorobutadiene	ug/kg	1300 U	180000 U	420 U	380 U	390 U	400 U	4800 U	420 U	400 U	390 U
Hexachlorocyclopentadiene	ug/kg	1300 U	N/A R	420 U	380 U	390 U	400 U	4800 U	420 U	400 U	390 U
Hexachloroethane	ug/kg	1300 U	180000 U	420 U	380 U	390 U	400 U	4800 U	420 U	400 U	390 U
Indeno(1,2,3-cd)pyrene (1,2)	ug/kg	5200	180000 U	420 U	380 U	390 U	400 U	26000	420 U	400 U	390 U
Isophorone	ug/kg	1300 U	180000 U	420 U	380 U	390 U	400 U	4800 U	420 U	400 U	390 U
2-Methylnaphthalene (1)	ug/kg	1500	1200000	1100	380 U	390 U	400 U	11000	3800	400 U	390 U
2-Methylphenol	ug/kg	1300 U	180000 U	420 U	380 U	390 U	400 U	4800 U	420 U	400 U	390 U
4-Methylphenol	ug/kg	1300 U	180000 U	420 U	380 U	390 U	400 U	4800 U	420 U	400 U	390 U
Naphthalene (1)	ug/kg	1300	2200000	2300	380 U	390 U	400 U	8800	3900	400 U	390 U
2-Nitroaniline	ug/kg	3300 U	440000 U	1100 U	960 U	980 U	1000 U	12000 U	1100 U	1000 U	980 U
3-Nitroaniline	ug/kg	3300 U	440000 U	1100 U	960 U	980 U	1000 U	12000 U	1100 U	1000 U	980 U
4-Nitroaniline	ug/kg	3300 U	440000 U	1100 U	960 U	980 U	1000 U	12000 U	1100 U	1000 U	980 U
Nitrobenzene	ug/kg	1300 U	180000 U	420 U	380 U	390 U	400 U	4800 U	420 U	400 U	390 U
2-Nitrophenol	ug/kg	1300 U	180000 U	420 U	380 U	390 U	400 U	4800 U	420 U	400 U	390 U
4-Nitrophenol	ug/kg	3300 U	440000 U	1100 U	960 U	980 U	1000 U	12000 U	1100 U	1000 U	980 U
N-nitroso-di-n-propylamine	ug/kg	1300 U	180000 U	420 U	380 U	390 U	400 U	4800 U	420 U	400 U	390 U
N-nitrosodiphenylamine	ug/kg	1300 U	180000 U	420 U	380 U	390 U	400 U	4800 U	420 U	400 U	390 U
Pentachlorophenol	ug/kg	3300 U	440000 U	1100 U	960 U	980 U	1000 U	12000 U	1100 U	1000 U	980 U
Phenanthrene (1)	ug/kg	2700	1000000	1000	380 U	390 U	400 U	12000	1400	400 U	390 U
Phenol	ug/kg	1300 U	180000 U	420 U	380 U	390 U	400 U	4800 U	420 U	400 U	390 U
Pyrene (1)	ug/kg	9400	490000	610	380 U	390 U	400 U	21000	420 U	400 U	390 U
2,4,5-Trichlorophenol	ug/kg	3300 U	440000 U	1100 U	960 U	980 U	1000 U	12000 U	1100 U	1000 U	980 U
2,4,6-Trichlorophenol	ug/kg	1300 U	180000 U	420 U	380 U	390 U	400 U	4800 U	420 U	400 U	390 U
Total Semivolatiles	ug/kg	65,900	6,100,000	6,210	ND	ND	ND	297,400	10,540	ND	ND
Total PAHs (1)	ug/kg	65,900	6,100,000	6,210	ND	ND	ND	297,400	10,540	ND	ND
Total Carcinogenic PAHs(2)	ug/kg	36,700	ND	ND	ND	ND	ND	189,000	ND	ND	ND

TABLE 2
SUMMARY OF SEMI-VOLATILE COMPOUNDS IDENTIFIED SOIL/SOURCE MATERIAL SAMPLING 12/2-6/03
2ND ST (HASTINGS) SOURCE AREA RI/FS

Parameter	Location	Waste Soil Comp.	Soil Trip Blank#1	Soil Trip Blank#2	Rinsate #1	Rinsate #2	Rinsate #3	Water Trip Blank #1	Water Trip Blank #2
	Interval	NA	NA	NA	NA	NA	NA	NA	NA
	EPA No	2110-63	2110-75FB	2110-76FB	2110-101	2110-102	2110-103	2110-105FB	2110-106FB
	Date	12/6/2003	12/2/2003	12/5/2003	12/4/2003	12/4/2003	12/6/2003	12/4/2003	12/6/2003
	Time	12:30	18:00	17:00	9:15	17:30	13:00	18:00	13:10
	Units								
Semivolatile Organics		Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q
Acenaphthene (1)	ug/kg	10000 U	NA	NA	10 U	10 U	10 U	NA	NA
Acenaphthylene (1)	ug/kg	26000	NA	NA	10 U	10 U	10 U	NA	NA
Acetophenone	ug/kg	10000 U	NA	NA	10 U	10 U	10 U	NA	NA
Anthracene (1)	ug/kg	10000	NA	NA	10 U	10 U	10 U	NA	NA
Atrazine	ug/kg	10000 U	NA	NA	10 U	10 U	10 U	NA	NA
Benzaldehyde	ug/kg	10000 U	NA	NA	10 U	10 U	10 U	NA	NA
Benzo(a)anthracene(1,2)	ug/kg	11000	NA	NA	10 U	10 U	10 U	NA	NA
Benzo(a)pyrene(1,2)	ug/kg	10000 U	NA	NA	10 U	10 U	10 U	NA	NA
Benzo(b)fluoranthene(1,2)	ug/kg	10000 U	NA	NA	10 U	10 U	10 U	NA	NA
Benzo(g,h,i)perylene (1)	ug/kg	10000 U	NA	NA	10 U	10 U	10 U	NA	NA
Benzo(k)fluoranthene(1,2)	ug/kg	10000 U	NA	NA	10 U	10 U	10 U	NA	NA
Biphenyl	ug/kg	10000 U	NA	NA	10 U	10 U	10 U	NA	NA
bis(2-Chloroethoxy)methane	ug/kg	10000 U	NA	NA	10 U	10 U	10 U	NA	NA
bis(2-Chloroethyl)ether	ug/kg	10000 U	NA	NA	10 U	10 U	10 U	NA	NA
bis(2-Chloroisopropyl)ether	ug/kg	10000 U	NA	NA	10 U	10 U	10 U	NA	NA
bis(2-Ethylhexyl)phthalate	ug/kg	10000 U	NA	NA	79	10 U	10 U	NA	NA
4-Bromophenyl-phenylether	ug/kg	10000 U	NA	NA	10 U	10 U	10 U	NA	NA
Butylbenzylphthalate	ug/kg	10000 U	NA	NA	10 U	10 U	10 U	NA	NA
Caprolactam	ug/kg	10000 U	NA	NA	10 U	10 U	10 U	NA	NA
Carbazole	ug/kg	10000 U	NA	NA	10 U	10 U	10 U	NA	NA
4-Chloro-3-methyphenol	ug/kg	10000 U	NA	NA	10 U	10 U	10 U	NA	NA
4-Chloroaniline	ug/kg	10000 U	NA	NA	10 U	10 U	10 U	NA	NA
2-Chloronaphthalene (1)	ug/kg	10000 U	NA	NA	10 U	10 U	10 U	NA	NA
2-Chlorophenol	ug/kg	10000 U	NA	NA	10 U	10 U	10 U	NA	NA
4-Chlorophenyl-phenylether	ug/kg	10000 U	NA	NA	10 U	10 U	10 U	NA	NA
Chrysene (1,2)	ug/kg	11000	NA	NA	10 U	10 U	10 U	NA	NA
Di-n-butylphthalate	ug/kg	10000 U	NA	NA	10 U	10 U	10 U	NA	NA
Di-n-octylphthalate	ug/kg	10000 U	NA	NA	10 U	10 U	10 U	NA	NA
Dibenzo(a,h)anthracene (1,2)	ug/kg	10000 U	NA	NA	10 U	10 U	10 U	NA	NA
Dibenzofuran	ug/kg	10000 U	NA	NA	10 U	10 U	10 U	NA	NA
3,3'-Dichlorobenzidine	ug/kg	10000 U	NA	NA	10 U	10 U	10 U	NA	NA
2,4-Dichlorophenol	ug/kg	10000 U	NA	NA	10 U	10 U	10 U	NA	NA
Diethylphthalate	ug/kg	10000 U	NA	NA	10 U	10 U	10 U	NA	NA
2,4-Dimethylphenol	ug/kg	10000 U	NA	NA	10 U	10 U	10 U	NA	NA
Dimethylphthalate	ug/kg	10000 U	NA	NA	10 U	10 U	10 U	NA	NA
4,6-Dinitro-2-methylphenol	ug/kg	26000 U	NA	NA	25 U	25 U	25 U	NA	NA
2,4-Dinitrophenol	ug/kg	26000 U	NA	NA	25 U	25 U	25 U	NA	NA

TABLE 2
SUMMARY OF SEMI-VOLATILE COMPOUNDS IDENTIFIED SOIL/SOURCE MATERIAL SAMPLING 12/2-6/03
2ND ST (HASTINGS) SOURCE AREA RI/FS

	Location	Waste Soil Comp.	Soil Trip Blank#1	Soil Trip Blank#2	Rinsate #1	Rinsate #2	Rinsate #3	Water Trip Blank #1	Water Trip Blank #2
	Interval	NA	NA	NA	NA	NA	NA	NA	NA
	EPA No	2110-63	2110-75FB	2110-76FB	2110-101	2110-102	2110-103	2110-105FB	2110-106FB
	Date	12/6/2003	12/2/2003	12/5/2003	12/4/2003	12/4/2003	12/6/2003	12/4/2003	12/6/2003
	Time	12:30	18.00	17:00	9:15	17:30	13:00	18:00	13:10
Parameter	Units								
Semivolatile Organics		Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q
2,4-Dinitrotoluene	ug/kg	10000 U	NA	NA	10 U	10 U	10 U	NA	NA
2,6-Dinitrotoluene	ug/kg	10000 U	NA	NA	10 U	10 U	10 U	NA	NA
Fluoranthene (1)	ug/kg	20000	NA	NA	10 U	10 U	10 U	NA	NA
Fluorene (1)	ug/kg	24000	NA	NA	10 U	10 U	10 U	NA	NA
Hexachlorobenzene	ug/kg	10000 U	NA	NA	10 U	10 U	10 U	NA	NA
Hexachlorobutadiene	ug/kg	10000 U	NA	NA	10 U	10 U	10 U	NA	NA
Hexachlorocyclopentadiene	ug/kg	10000 U	NA	NA	10 U	10 U	10 U	NA	NA
Hexachloroethane	ug/kg	10000 U	NA	NA	10 U	10 U	10 U	NA	NA
Indeno(1,2,3-cd)pyrene (1,2)	ug/kg	10000 U	NA	NA	10 U	10 U	10 U	NA	NA
Isophorone	ug/kg	10000 U	NA	NA	10 U	10 U	10 U	NA	NA
2-Methylnaphthalene (1)	ug/kg	70000	NA	NA	10 U	10 U	10 U	NA	NA
2-Methylphenol	ug/kg	10000 U	NA	NA	10 U	10 U	10 U	NA	NA
4-Methylphenol	ug/kg	10000 U	NA	NA	10 U	10 U	10 U	NA	NA
Naphthalene (1)	ug/kg	36000	NA	NA	10 U	10 U	10 U	NA	NA
2-Nitroaniline	ug/kg	26000 U	NA	NA	25 U	25 U	25 U	NA	NA
3-Nitroaniline	ug/kg	26000 U	NA	NA	25 U	25 U	25 U	NA	NA
4-Nitroaniline	ug/kg	26000 U	NA	NA	25 U	25 U	25 U	NA	NA
Nitrobenzene	ug/kg	10000 U	NA	NA	10 U	10 U	10 U	NA	NA
2-Nitrophenol	ug/kg	10000 U	NA	NA	10 U	10 U	10 U	NA	NA
4-Nitrophenol	ug/kg	26000 U	NA	NA	25 U	25 U	25 U	NA	NA
N-nitroso-di-n-propylamine	ug/kg	10000 U	NA	NA	10 U	10 U	10 U	NA	NA
N-nitrosodiphenylamine	ug/kg	10000 U	NA	NA	10 U	10 U	10 U	NA	NA
Pentachlorophenol	ug/kg	26000 U	NA	NA	25 U	25 U	25 U	NA	NA
Phenanthrene (1)	ug/kg	63000	NA	NA	10 U	10 U	10 U	NA	NA
Phenol	ug/kg	10000 U	NA	NA	10 U	10 U	10 U	NA	NA
Pyrene (1)	ug/kg	28000	NA	NA	10 U	10 U	10 U	NA	NA
2,4,5-Trichlorophenol	ug/kg	26000 U	NA	NA	25 U	25 U	25 U	NA	NA
2,4,6-Trichlorophenol	ug/kg	10000 U	NA	NA	10 U	10 U	10 U	NA	NA
Total Semivolatiles	ug/kg	299,000	NA	NA	79	ND	ND	NA	NA
Total PAHs (1)	ug/kg	299,000	NA	NA	ND	ND	ND	NA	NA
Total Carcinogenic PAHs(2)	ug/kg	22,000	NA	NA	ND	ND	ND	NA	NA

TABLE 3
SUMMARY OF WASTE CHARACTERISTICS TESTING
SOURCE MATERIAL AND WASTE SOIL
SECOND STREET SOURCE AREA RI – HASTINGS, NTCRA

	Description	Regulatory Limit	Source Material		Source Material		Waste Soil Cuttings	
	Sample Location	RCRA-TCLP	SMB-4		SMB-1		Waste Soil Cuttings	
	Sample Number		2110-2		2110-13		2110-63	
	Sample Interval		10-15 ft		12.5-15 ft		Drum Composite	
	Sample Date		12/2/2003		12/2/2003		12/6/2003	
	Sample Time		9:00		16:50		12:30	
Parameter	Units	Conc.	Conc.	Q	Conc.	Q	Conc.	Q
Btu (ASTM D240)	Btu/lb	NA	NIL		NIL		NIL	
Moisture Content	Percent Moisture	NA	24		28		17	
pH (SW846 9045C)	s.u.	NA	8		9		7.22	
Ignitability (SW846 1010)	deg F	< 140	> 140		> 140		> 140	
Reactive Cyanide (SW846 9014)	mg/kg	NA	164	U	173	U	146	U
Reactive Sulfur (SW846 9034)	mg/kg	NA	329	U	345	U	302	U
TCLP Metals (SW846-6010/7471)								
Arsenic	mg/L	5	0.1		0.0641		0.0086	
Barium	mg/L	100	1.43		1.42		0.331	
Cadmium	mg/L	1	0.0085	U	0.0002	U	0.00086	
Chromium	mg/L	5	0.0072		0.0124		0.0006	U
Lead	mg/L	5	0.755		0.0839		0.0149	
Mercury	mg/L	0.2	0.00018		0.00019		0.0001	U
Selenium	mg/L	1	0.0083		0.0086		0.0095	
Silver	mg/L	5	0.0007	U	0.0007	U	0.0007	U
TCLP Volatile Organics (SW846-8240)								
Benzene	mg/L	0.5	0.070	U	0.025	U	0.025	U
Carbon Tetrachloride	mg/L	0.5	0.025	U	0.025	U	0.025	U
Chlorobenzene	mg/L	100	0.025	U	0.025	U	0.025	U
2-Butanone (MEK)	mg/L	200	0.063	U	0.063	U	0.063	U
Tetrachloroethene	mg/L	0.7	0.025	U	0.025	U	0.025	U
Trichloroethene	mg/L	0.5	0.025	U	0.025	U	0.025	U
Chloroform	mg/L	6.0	0.025	U	0.025	U	0.025	U
1,2 Dichloroethane	mg/L	0.5	0.025	U	0.025	U	0.025	U
1,1 Dichloroethene	mg/L	0.7	0.025	U	0.025	U	0.025	U
Vinyl Chloride	mg/L	0.2	0.025	U	0.025	U	0.025	U
TCLP Semi-volatile Organics (SW846-8270)								
o-Cresol (2-Methyl Phenol)	mg/L	200	0.05	U	0.05	U	0.05	U
m-Cresol (3-Methyl Phenol)	mg/L	200	0.05	U	0.05	U	0.05	U
p-Cresol (4-Methyl Phenol)	mg/L	200	0.05	U	0.05	U	0.05	U
1, 4-Dichlorobezene	mg/L	7.5	0.05	U	0.05	U	0.05	U
2, 4-Dinitrotoluene	mg/L	0.13	0.05	U	0.05	U	0.05	U
Hexachlorobenzene	mg/L	0.13	0.05	U	0.05	U	0.05	U
Hexachloro 1,3 butadiene	mg/L	0.50	0.05	U	0.05	U	0.05	U
Hexachloroethane	mg/L	3	0.05	U	0.05	U	0.05	U
Nitrobenzene	mg/L	2	0.05	U	0.05	U	0.05	U
Pentachlorophenol	mg/L	100	0.10	U	0.10	U	0.10	U
Pyridine	mg/L	5	0.05	U	0.05	U	0.05	U
2,4,5 Trichlorophenol	mg/L	400	0.05	U	0.05	U	0.05	U
2,4,6 Trichlorophenol	mg/L	2	0.05	U	0.05	U	0.05	U
TCLP Pesticides/Herbicides								
Endrin	mg/L	0.02	0.002	U	0.002	U	0.002	U
Lindane (gamma-BHC)	mg/L	0.4	0.0011		0.00064	U	0.0005	U
Methoxychlor	mg/L	10.0	0.00500	U	0.00064		0.00500	U
Toxaphene	mg/L	0.5	0.050	U	0.050	U	0.050	U
2,4-D	mg/L	10.0	0.0062	J	0.012	U	0.012	U
2,4,5-TP (Silvex)	mg/L	1.0	0.0025	U	0.0025	U	0.0025	U
Chlordane	mg/L	0.03	0.016	U	0.016	U	0.016	U
Heptachlor	mg/L	0.008	0.0005	U	0.0005	U	0.0005	U
Heptachlor Epoxide	mg/L	0.008	0.0005	U	0.0005	U	0.0005	U

NIL: Material would not burn, so no Btu value reported.
U: The compound was analyzed for but not detected. The associated numerical value is the sample quantitation limit.
ASTM- American Standard Testing Method.
Btu- British Thermal Unit (Heating Valve).
NA-Not applicable.
RCRA - Resource Conservation and Recovery Act.
TCLP- Toxicity Characteristics Leaching Procedure.
Regulatory limits from 40 CFR 261.24.

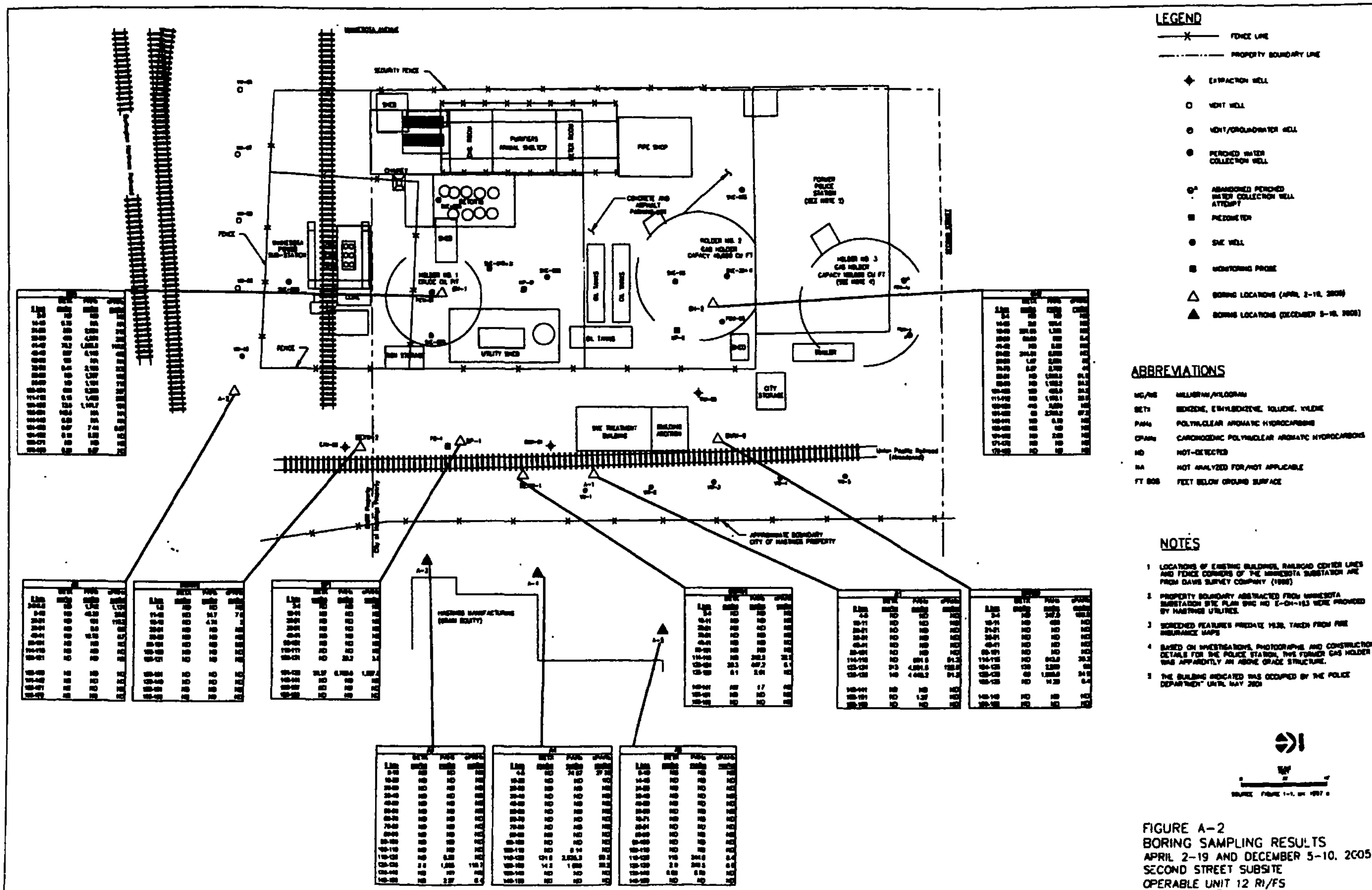
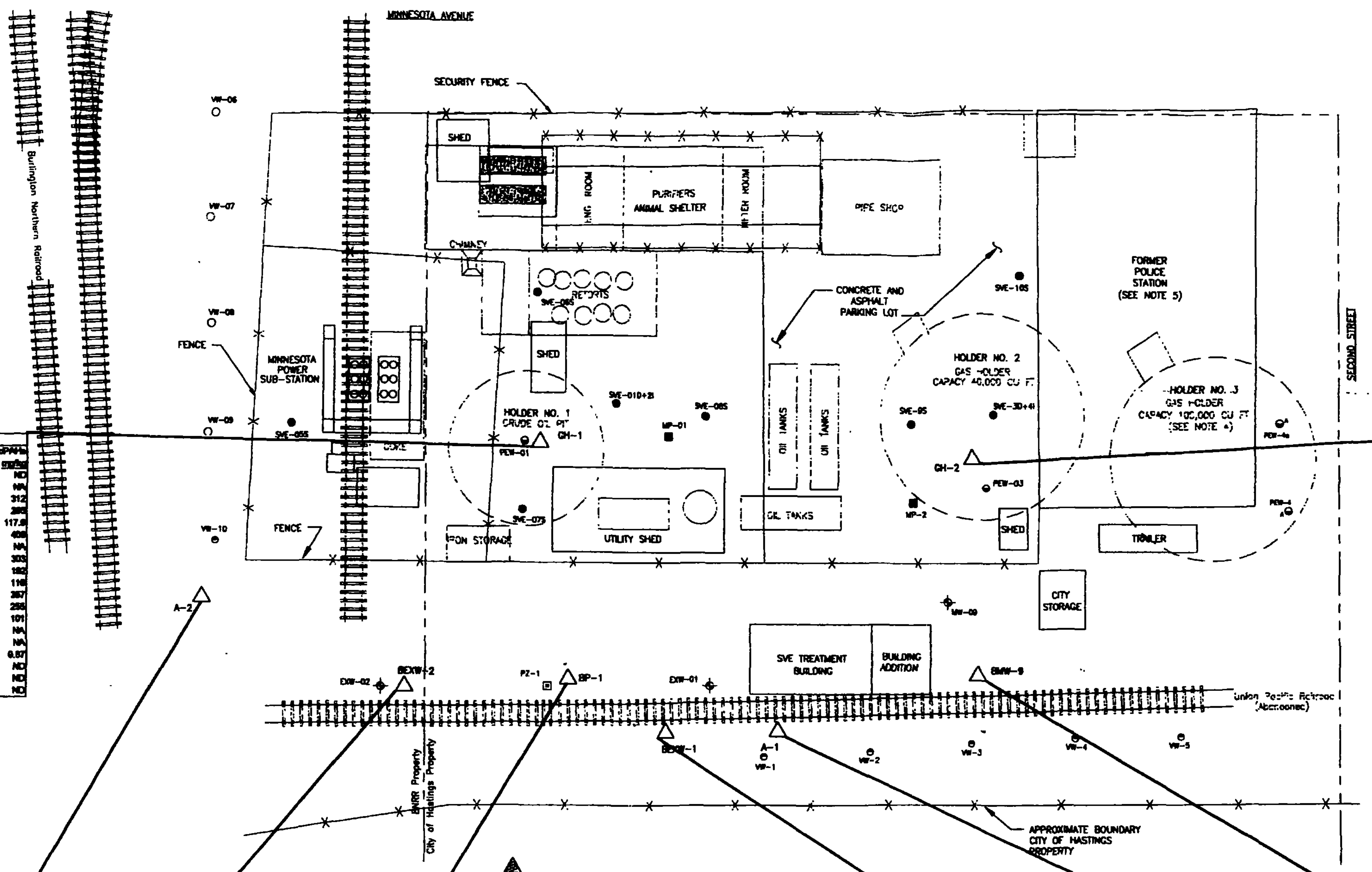


FIGURE A-2
BORING SAMPLING RESULTS
APRIL 2-19 AND DECEMBER 5-10, 2005
SECOND STREET SUBSITE
OPERABLE UNIT 12 RI/FS



GH1

ft bgs	BETX mg/kg	PAHs mg/kg	cPAHs mg/kg
2-3	ND	ND	ND
14-15	6.75	NA	NA
24-25	379	3,624	312
29-30	476	4,354	395
41-42	73.2	1,855.9	117.8
48-49	997	5,146	406
62-63	151	NA	NA
72-73	0.44	2,166	303
82-83	ND	1,707	182
89-90	ND	1,134	116
103-104	680	9,223	357
111-112	0.15	1,408	256
124-125	72.5	1,141.7	101
130-131	142.5	NA	NA
144-145	0.53	NA	NA
151-152	0.07	7.44	0.67
161-162	0.16	5.82	ND
170-171	ND	ND	ND
179-180	0.09	0.57	ND

GH2

ft bgs	BETX mg/kg	PAHs mg/kg	cPAHs mg/kg
3-4	ND	ND	ND
14-16	2.6	154.4	ND
18-19	291.65	1,733	ND
32-33	58.09	592	5.4
41-42	ND	0.58	ND
61-62	244.84	6,898	ND
58-59	1.67	2,881	66
74-75	0.87	2,782	41
80-81	ND	1,863.8	81.6
92-93	ND	1,182.2	54.2
104-105	160	425.9	34.2
111-112	ND	1,178.1	28.5
122-123	415	3,280	ND
131-132	65	2,706.2	67.2
140-141	ND	0.76	ND
152-153	ND	ND	ND
161-162	ND	2.66	ND
171-172	ND	ND	ND
179-180	ND	ND	ND

A2

ft bgs	BETX mg/kg	PAHs mg/kg	cPAHs mg/kg
2.5-3.5	ND	1,742	1,121
9-10	ND	40.35	25.3
20-21	ND	191	115.2
30-31	ND	0.6	0.6
40-41	ND	10.76	6.7
50-101	ND	ND	ND
114-115	ND	ND	ND
120-121	ND	ND	ND
132-133	ND	ND	ND
141-142	ND	ND	ND
150-151	ND	ND	ND
160-179	ND	ND	ND

BEXW2

ft bgs	BETX ug/kg	PAHs mg/kg	cPAHs mg/kg
1-2	ND	ND	ND
11-12	ND	14.7	7.6
18-19	ND	4.74	3
30-31	ND	ND	ND
38-39	ND	ND	ND
50-101	ND	ND	ND
108-109	ND	ND	ND
120-121	ND	ND	ND
130-131	ND	ND	ND
139-140	ND	ND	ND
150-151	ND	ND	ND
160-180	ND	ND	ND

BP1

ft bgs	BETX mg/kg	PAHs mg/kg	cPAHs mg/kg
3-4	ND	ND	ND
10-11	ND	ND	ND
20-21	ND	ND	ND
30-31	ND	ND	ND
40-41	ND	ND	ND
50-101	ND	ND	ND
110-111	ND	ND	ND
120-121	ND	20.2	3.6
131-132	39.37	6,760.6	1,507.8
140-141	ND	ND	ND
150-151	ND	ND	ND
160-180	ND	ND	ND

BEXW1

ft bgs	BETX mg/kg	PAHs mg/kg	cPAHs mg/kg
3-4	ND	ND	ND
10-11	ND	ND	ND
20-21	ND	ND	ND
30-31	ND	ND	ND
40-41	ND	ND	ND
50-101	ND	ND	ND
114-115	ND	342.3	22.3
123-124	30.3	447.2	8.1
125-126	0.1	2.91	ND
140-141	ND	1.7	ND
150-151	ND	ND	ND
160-180	ND	ND	ND

A1

ft bgs	BETX mg/kg	PAHs mg/kg	cPAHs mg/kg
4-5	ND	ND	ND
10-11	ND	ND	ND
20-21	ND	ND	ND
30-31	ND	ND	ND
40-41	ND	ND	ND
50-101	ND	ND	ND
114-115	ND	801.5	51.2
123-124	313	4,831.5	122.5
125-126	140	4,449.2	91.2
140-141	ND	ND	ND
150-151	ND	1.27	ND
160-180	ND	ND	ND

BMW9

ft bgs	BETX mg/kg	PAHs mg/kg	cPAHs mg/kg
3-4	ND	347.0	100.0
10-11	ND	450	ND
21-21	ND	ND	ND
30-31	ND	ND	ND
40-41	ND	ND	ND
50-101	ND	ND	ND
114-115	ND	945.8	30.3
124-125	130	2,269	60
125-126	69	1,096.6	24.5
135-136	ND	14.29	0.4
148-149	ND	ND	ND
160-180	ND	ND	ND

A3

ft bgs	BETX mg/kg	PAHs mg/kg	cPAHs mg/kg
9-10	ND	ND	ND
19-20	ND	ND	ND
29-30	ND	ND	ND
39-40	ND	ND	ND
49-50	ND	ND	ND
59-60	ND	ND	ND
69-70	ND	ND	ND
79-80	ND	ND	ND
89-90	ND	ND	ND
99-100	ND	ND	ND
109-110	ND	ND	ND
119-120	ND	0.38	ND
129-130	3.6	1,665	118.7
139-140	ND	ND	ND
149-150	ND	2.37	0.4

A4

ft bgs	BETX mg/kg	PAHs mg/kg	cPAHs mg/kg
4-6	ND	74.57	27.36
19-20	ND	ND	ND
29-30	ND	ND	ND
39-40	ND	ND	ND
49-50	ND	ND	ND
59-60	ND	ND	ND
69-70	ND	ND	ND
79-80	ND	ND	ND
89-90	ND	ND	ND
99-100	ND	ND	ND
109-110	ND	0.14	ND
119-120	131.6	2,535.3	58.3
129-130	14.3	ND	ND
139-140	ND	ND	ND
149-150	ND	ND	ND

A5

ft bgs	BETX mg/kg	PAHs mg/kg	cPAHs mg/kg
9-10	ND	ND	ND
14-15	ND	ND	ND
24-25	ND	ND	ND
39-40	ND	ND	ND
49-50	ND	ND	ND
59-60	ND	ND	ND
70-71	ND	ND	ND
80-81	ND	ND	ND
89-90	ND	ND	ND
99-100	ND	ND	ND
109-110	ND	ND	ND
119-120	115	344.9	8.4
129-130	2.0	249.3	8.0
139-140	0.05	0.09	ND
149-150	ND	ND	ND

LEGEND

- FENCE LINE
- PROPERTY BOUNDARY LINE
- EXTRACTION WELL
- VENT WELL
- VENT/GROUNDWATER WELL
- PERCHED WATER COLLECTION WELL
- ABANDONED PERCHED WATER COLLECTION WELL ATTEMPT
- PIEZOMETER
- SVE WELL
- MONITORING PROBE
- BORING LOCATIONS (APRIL 2-19, 2005)
- BORING LOCATIONS (DECEMBER 5-10, 2005)

ABBREVIATIONS

MG/KG	MILLIGRAM/KILOGRAM
BETX	BENZENE, ETHYLBENZENE, TOLUENE, XYLENE
PAHs	POLYNUCLEAR AROMATIC HYDROCARBONS
CPAHs	CARCINOGENIC POLYNUCLEAR AROMATIC HYDROCARBONS
ND	NOT-DETECTED
NA	NOT ANALYZED FOR/NOT APPLICABLE
FT BGS	FEET BELOW GROUND SURFACE

NOTES

1. LOCATIONS OF EXISTING BUILDINGS, RAILROAD CENTER LINES AND FENCE CORNERS OF THE MINNESOTA SUBSTATION ARE FROM DAVIS SURVEY COMPANY. (1996)
2. PROPERTY BOUNDARY ABSTRACTED FROM MINNESOTA SUBSTATION SITE PLAN DWG NO. E-OH-193 WERE PROVIDED BY HASTINGS UTILITIES.
3. SCREENED FEATURES PREDATE 1930, TAKEN FROM FIRE INSURANCE MAPS.
4. BASED ON INVESTIGATIONS, PHOTOGRAPHS, AND CONSTRUCTION DETAILS FOR THE POLICE STATION, THIS FORMER GAS HOLDER WAS APPARENTLY AN ABOVE GRADE STRUCTURE.
5. THE BUILDING INDICATED WAS OCCUPIED BY THE POLICE DEPARTMENT UNTIL MAY 2001.

north

SCALE FEET 0 40

SOURCE: FIGURE 1- , MK, 1997 a

FIGURE 1
BORING SAMPLING RESULTS
APRIL 2-19 AND DECEMBER 5-10, 2005
SECOND STREET SUBSITE
SOURCE AREA SOILS RI/FS

Dec 2005

Boring Data

TABLE KEY

Table #	Description
Table A3-1	Summary of Volatile Compounds Identified (Boring A3)
Table A3-2	Summary of Semi-Volatile Compounds Identified (Boring A3)
Table A4-1	Summary of Volatile Compounds Identified (Boring A4)
Table A4-2	Summary of Semi-Volatile Compounds Identified (Boring A4)
Table A5-1	Summary of Volatile Compounds Identified (Boring A5)
Table A5-2	Summary of Semi-Volatile Compounds Identified (Boring A5)
Table IDW-1	Summary of Volatile Compounds Identified (Investigation Derived Waste [IDW])
Table IDW-2	Summary of Semi-Volatile Compounds Identified (Investigation Derived Waste [IDW])
Table TCLP	Summary of TCLP Results
Table QA/QC-1	Summary of Volatile Compounds Identified (Soil, Rinsate, Water Trip Blanks)
Table QA/QC-2	Summary of Semi-Volatile Compounds Identified (Rinsate Blanks)

TABLE A3-1
SUMMARY OF VOLATILE COMPOUNDS IDENTIFIED (BORING A3)
SOIL BORING SAMPLING 12/05-10/2005
SECOND STREET (HASTINGS) SOURCE AREA RI/FS

Parameter	Location	A-3	A-3	A-3	A-3	A-3	A-3	A-3	A-3	A-3	A-3	A-3
	Interval	9-10 ft bgs	19-20 ft bgs	29-30 ft bgs	39-40 ft bgs	49-50 ft bgs	59-60 ft bgs	69-70 ft bgs	79-80 ft bgs	89-90 ft bgs	99-100 ft bgs	109-110 ft bgs
	EPA No	2824-34	2824-35	2824-36	2824-37	2824-38	2824-39	2824-40	2824-41	2824-42	2824-43	2824-44
	Date	12/09/2005	12/09/2005	12/09/2005	12/09/2005	12/09/2005	12/09/2005	12/09/2005	12/09/2005	12/09/2005	12/09/2005	12/09/2005
	Time	9:15	10:30	10:55	11:30	11:35	13:20	13:40	14:30	15:05	15:40	16:10
	Units											
Volatile Organics		Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q
Acetone	ug/kg	13 J	24 J	18 J	18 J	14 J	21 J	23 J	18 J	34 J	22 J	38 J
Benzene	ug/kg	5 U	5 U	5 U	5 U	4 U	5 U	5 U	5 U	5 U	5 U	2.9 U
Bromodichloromethane	ug/kg	5 U	5 U	5 U	5 U	4 U	5 U	5 U	5 U	5 U	5 U	2.9 U
Bromoform	ug/kg	5 U	5 U	5 U	5 U	4 U	5 U	5 U	5 U	5 U	5 U	2.9 U
Bromomethane	ug/kg	5 U	5 U	5 U	5 U	4 U	5 U	5 U	5 U	5 U	5 U	2.9 U
2-Butanone (Methyl Ethyl Ketone)	ug/kg	5 U	5 U	5 U	5 U	4 UJ	5 U	5 U	5 U	5 U	5 U	4.2 UJ
Carbon Disulfide	ug/kg	5 U	5 U	5 U	5 U	4 U	5 U	5 U	5 U	5 U	5 U	2.9 U
Carbon Tetrachloride	ug/kg	5 U	5 U	5 U	5 U	4 U	5 U	5 U	5 U	5 U	5 U	2.9 U
Chlorobenzene	ug/kg	5 U	5 U	5 U	5 U	4 U	5 U	5 U	5 U	5 U	5 U	2.9 U
Chloroethane	ug/kg	5 U	5 U	5 U	5 U	4 U	5 U	5 U	5 U	5 U	5 U	2.9 U
Chloroform	ug/kg	5 U	5 U	5 U	5 U	4 U	5 U	5 U	5 U	5 U	5 U	2.9 U
Chloromethane	ug/kg	5 U	5 U	5 U	5 U	4 U	5 U	5 U	5 U	5 U	5 U	2.9 U
Cyclohexane	ug/kg	5 U	5 U	5 U	5 U	4 U	5 U	5 U	5 U	5 U	5 U	2.9 U
1,2 Dibromo 3-Chloropropane	ug/kg	5 U	5 U	5 U	5 U	4 U	5 U	5 U	5 U	5 U	5 U	2.9 U
Dibromochloromethane	ug/kg	5 U	5 U	5 U	5 U	4 U	5 U	5 U	5 U	5 U	5 U	2.9 U
1,2-Dibromoethane	ug/kg	5 U	5 U	5 U	5 U	4 U	5 U	5 U	5 U	5 U	5 U	2.9 U
1,2-Dichlorobenzene (Ortho)	ug/kg	5 U	5 U	5 U	5 U	4 U	5 U	5 U	5 U	5 U	5 U	2.9 U
1,3-Dichlorobenzene (Meta)	ug/kg	5 U	5 U	5 U	5 U	4 U	5 U	5 U	5 U	5 U	5 U	2.9 U
1,4-Dichlorobenzene (Para)	ug/kg	5 U	5 U	5 U	5 U	4 U	5 U	5 U	5 U	5 U	5 U	2.9 U
Dichlorodifluoromethane	ug/kg	5 U	5 U	5 U	5 U	4 U	5 U	5 U	5 U	5 U	5 U	2.9 U
1,1-Dichloroethane	ug/kg	5 U	5 U	5 U	5 U	4 U	5 U	5 U	5 U	5 U	5 U	2.9 U
1,2-Dichloroethane	ug/kg	5 U	5 U	5 U	5 U	4 U	5 U	5 U	5 U	5 U	5 U	2.9 U
1,1-Dichloroethene	ug/kg	5 U	5 U	5 U	5 U	4 U	5 U	5 U	5 U	5 U	5 U	2.9 U
cis-1,2-Dichloroethene	ug/kg	5 U	5 U	5 U	5 U	4 U	5 U	5 U	5 U	5 U	5 U	2.9 U
trans-1,2-Dichloroethene	ug/kg	5 U	5 U	5 U	5 U	4 U	5 U	5 U	5 U	5 U	5 U	2.9 U
1,2-Dichloropropane	ug/kg	5 U	5 U	5 U	5 U	4 U	5 U	5 U	5 U	5 U	5 U	2.9 U
cis-1,3,-Dichloropropene	ug/kg	5 U	5 U	5 U	5 U	4 U	5 U	5 U	5 U	5 U	5 U	2.9 U
trans-1,3,-Dichloropropene	ug/kg	5 U	5 U	5 U	5 U	4 U	5 U	5 U	5 U	5 U	5 U	2.9 U
Ethylbenzene	ug/kg	5 U	5 U	5 U	5 U	4 U	5 U	5 U	5 U	5 U	5 U	2.9 U
2-Hexanone	ug/kg	5 U	5 U	5 U	5 U	4 U	5 U	5 U	5 U	5 U	5 U	2.9 U
Isopropylbenzene	ug/kg	5 U	5 U	5 U	5 U	4 U	5 U	5 U	5 U	5 U	5 U	2.9 U
Methyl Acetate	ug/kg	5 U	5 U	5 U	5 U	4 U	5 U	5 U	5 U	5 U	5 U	2.9 U
Methyl tert-butyl ether	ug/kg	10 U	10 U	10 U	10 U	8 U	10 U	10 U	10 U	10 U	10 U	5.8 U
Methylcyclohexane	ug/kg	5 U	5 U	5 U	5 U	4 U	5 U	5 U	5 U	5 U	5 U	2.9 U
Methylene Chloride	ug/kg	5 U	5 U	5 U	5 U	4 U	5 U	5 U	5 U	5 U	5 U	2.9 U
4-Methyl-2-Pentanone (MIBK)	ug/kg	5 U	5 U	5 U	5 U	4 U	5 U	5 U	5 U	5 U	5 U	2.9 U
Naphthalene	ug/kg	10 U	10 U	10 U	10 U	8 U	10 U	10 U	10 U	10 U	10 U	5.8 U
Styrene	ug/kg	5 U	5 U	5 U	5 U	4 U	5 U	5 U	5 U	5 U	5 U	2.9 U

Parameter	Location	A-3	A-3	A-3	A-3	A-3	A-3	A-3	A-3	A-3	A-3	A-3
	Interval	9-10 ft bgs	19-20 ft bgs	29-30 ft bgs	39-40 ft bgs	49-50 ft bgs	59-60 ft bgs	69-70 ft bgs	79-80 ft bgs	89-90 ft bgs	99-100 ft bgs	109-110 ft bgs
	EPA No	2824-34	2824-35	2824-36	2824-37	2824-38	2824-39	2824-40	2824-41	2824-42	2824-43	2824-44
	Date	12/09/2005	12/09/2005	12/09/2005	12/09/2005	12/09/2005	12/09/2005	12/09/2005	12/09/2005	12/09/2005	12/09/2005	12/09/2005
	Time	9:15	10:30	10:56	11:30	11:36	13:20	13:40	14:30	15:06	15:40	16:10
	Units											
Volatile Organics (Cont)		Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc Q	Conc. Q	Conc. Q
1,1,2,2-Tetrachloroethane	ug/kg	5 U	5 U	5 U	5 U	4 U	5 U	5 U	5 U	5 U	5 U	2.9 U
Tetrachloroethene	ug/kg	5 U	5 U	5 U	5 U	4 U	5 U	5 U	5 U	5 U	5 U	2.9 U
Toluene	ug/kg	5 U	5 U	5 U	5 U	4 U	5 U	5 U	5 U	5 U	5 U	2.9 U
1,2,3-Trichlorobenzene	ug/kg	5 UJ	5 UJ	5 UJ	5 UJ	4 U	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ	2.9 U
1,2,4-Trichlorobenzene	ug/kg	5 UJ	5 UJ	5 UJ	5 UJ	4 U	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ	2.9 U
1,1,1-Trichloroethane	ug/kg	5 U	5 U	5 U	5 U	4 U	5 U	5 U	5 U	5 U	5 U	2.9 U
1,1,2-Trichloroethane	ug/kg	5 U	5 U	5 U	5 U	4 U	5 U	5 U	5 U	5 U	5 U	2.9 U
Trichloroethene	ug/kg	5 U	5 U	5 U	5 U	4 U	5 U	5 U	5 U	5 U	5 U	2.9 U
Trichlorofluoromethane	ug/kg	5 U	5 U	5 U	5 U	4 U	5 U	5 U	5 U	5 U	5 U	2.9 U
1,1,2-Trichlorofluoroethane	ug/kg	5 U	5 U	5 U	5 U	4 U	5 U	5 U	5 U	5 U	5 U	2.9 U
Vinyl Chloride	ug/kg	5 UJ	5 UJ	5 UJ	5 UJ	4 U	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ	2.9 U
m and/or p-Xylene	ug/kg	5 U	5 U	5 U	5 U	4 U	5 U	5 U	5 U	5 U	5 U	2.9 U
o-Xylene	ug/kg	5 U	5 U	5 U	5 U	4 U	5 U	5 U	5 U	5 U	5 U	2.9 U
Total Volatiles	ug/kg	13	24	19	16	14	21	23	18	34	22	36
Total Volatiles w/o Naphthalene	ug/kg	13	24	19	16	14	21	23	18	34	22	36
Total BETXs	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

U : Compound was analyzed for but not detected. The value is the quantation limit.

UJ - The analyte was not detected at or above the reporting limit. The reporting limit is an estimate.

J : Value estimated since not all QC criteria met.

ND : Not detected above quantation limits provided.

TABLE A3-1

SUMMARY OF VOLATILE COMPOUNDS IDENTIFIED (BORING A3)

SOIL BORING SAMPLING 12/05-10/2005

SECOND STREET (HASTINGS) SOURCE AREA RI/FS

	Location	A-3	A-3	A-3	A-3
	Interval	119-120 ft bgs	129-130 ft bgs	139-140 ft bgs	149-150 ft bgs
	EPA No	2824-45	2824-46	2824-47	2824-48
	Date	12/09/2005	12/09/2005	12/09/2005	12/09/2005
	Time	16:30	17:00	17:30	18:00
Parameter	Units				
Volatile Organics		Conc. Q	Conc. Q	Conc. Q	Conc. Q
Acetone	ug/kg	68 J	730 UJ	7.7 J	600 UJ
Benzene	ug/kg	3.7 U	330 U	2.6 U	460 U
Bromodichloromethane	ug/kg	3.7 U	330 U	2.6 U	460 U
Bromoform	ug/kg	3.7 U	330 U	2.6 U	460 U
Bromomethane	ug/kg	3.7 U	330 U	2.6 U	460 U
2-Butanone (Methyl Ethyl Ketone)	ug/kg	12 J	2800 J	2.6 UJ	2200 J
Carbon Disulfide	ug/kg	3.7 U	330 U	2.6 U	460 U
Carbon Tetrachloride	ug/kg	3.7 U	330 U	2.6 U	460 U
Chlorobenzene	ug/kg	3.7 U	330 U	2.6 U	460 U
Chloroethane	ug/kg	3.7 U	330 U	2.6 U	460 U
Chloroform	ug/kg	3.7 U	330 U	2.6 U	460 U
Chloromethane	ug/kg	3.7 U	330 U	2.6 U	460 U
Cyclohexane	ug/kg	3.7 U	330 U	2.6 U	460 U
1,2 Dibromo 3-Chloropropane	ug/kg	3.7 U	330 U	2.6 U	460 U
Dibromochloromethane	ug/kg	3.7 U	330 U	2.6 U	460 U
1,2-Dibromoethane	ug/kg	3.7 U	330 U	2.6 U	460 U
1,2-Dichlorobenzene (Ortho)	ug/kg	3.7 U	330 U	2.6 U	460 U
1,3-Dichlorobenzene (Meta)	ug/kg	3.7 U	330 U	2.6 U	460 U
1,4-Dichlorobenzene (Para)	ug/kg	3.7 U	330 U	2.6 U	460 U
Dichlorodifluoromethane	ug/kg	3.7 U	330 U	2.6 U	460 U
1,1-Dichloroethane	ug/kg	3.7 U	330 U	2.6 U	460 U
1,2-Dichloroethane	ug/kg	3.7 U	330 U	2.6 U	460 U
1,1-Dichloroethene	ug/kg	3.7 U	330 U	2.6 U	460 U
cis-1,2-Dichloroethene	ug/kg	3.7 U	330 U	2.6 U	460 U
trans-1,2-Dichloroethene	ug/kg	3.7 U	330 U	2.6 U	460 U
1,2-Dichloropropane	ug/kg	3.7 U	330 U	2.6 U	460 U
cis-1,3,-Dichloropropene	ug/kg	3.7 U	330 U	2.6 U	460 U
trans-1,3,-Dichloropropene	ug/kg	3.7 U	330 U	2.6 U	460 U
Ethylbenzene	ug/kg	3.7 U	1300	2.6 U	460 U
2-Hexanone	ug/kg	3.7 U	330 U	2.6 U	460 U
Isopropylbenzene	ug/kg	3.7 U	740	2.6 U	460 U
Methyl Acetate	ug/kg	3.7 U	330 U	2.6 U	460 U
Methyl tert-butyl ether	ug/kg	7.3 U	670 U	5.2 U	930 U
Methylcyclohexane	ug/kg	3.7 U	330 U	2.6 U	460 U
Methylene Chloride	ug/kg	3.7 U	330 U	2.6 U	460 U
4-Methyl-2-Pentanone (MIBK)	ug/kg	4.3	330 U	2.6 U	460 U
Naphthalene	ug/kg	41	370000	5.2 U	930 U
Styrene	ug/kg	3.7 U	330 U	2.6 U	460 U

Parameter	Location	A-3	A-3	A-3	A-3
	Interval	119-120 ft bgs	129-130 ft bgs	139-140 ft bgs	149-150 ft bgs
	EPA No	2824-45	2824-46	2824-47	2824-48
	Date	12/09/2005	12/09/2005	12/09/2005	12/09/2005
	Time	16:30	17:00	17:30	18:00
	Units				
Volatile Organics (Cont)		Conc. Q	Conc. Q	Conc. Q	Conc. Q
1,1,2,2-Tetrachloroethane	ug/kg	3.7 U	330 U	2.6 U	460 U
Tetrachloroethene	ug/kg	3.7 U	330 U	2.6 U	460 U
Toluene	ug/kg	3.7 U	330 U	2.6 U	460 U
1,2,3-Trichlorobenzene	ug/kg	3.7 U	330 U	2.6 U	460 U
1,2,4-Trichlorobenzene	ug/kg	3.7 U	330 U	2.6 U	460 U
1,1,1-Trichloroethane	ug/kg	3.7 U	330 U	2.6 U	460 U
1,1,2-Trichloroethane	ug/kg	3.7 U	330 U	2.6 U	460 U
Trichloroethene	ug/kg	3.7 U	330 U	2.6 U	460 U
Trichlorofluoromethane	ug/kg	3.7 U	330 U	2.6 U	460 U
1,1,2-Trichlorofluoroethane	ug/kg	3.7 U	330 U	2.6 U	460 U
Vinyl Chloride	ug/kg	3.7 U	330 U	2.6 U	460 U
m and/or p-Xylene	ug/kg	3.7 U	[illegible]	2.6 U	460 U
o-Xylene	ug/kg	3.7 U	1800	2.6 U	460 U
Total Volatiles	ug/kg	122	377,130	8	2,200
Total Volatiles w/o Naphthalene	ug/kg	81	7,130	8	2,200
Total BETXs	ug/kg	ND	3,780	ND	ND

U : Compound was analyzed for but not detected. The value is the quantation limit.

UJ - The analyte was not detected at or above the reporting limit. The reporting limit is an estimate.

J : Value estimated since not all QC criteria met.

ND : Not detected above quantation limits provided.

TABLE A3-2
SUMMARY OF SEMI-VOLATILE COMPOUNDS IDENTIFIED (BORING A3)
SOIL BORING SAMPLING 12/06-10/2005
SECOND STREET (HASTINGS) SOURCE AREA RI/FS

	Location	A-3	A-3	A-3	A-3	A-3	A-3	A-3	A-3	A-3	A-3	A-3
	Interval	9-10 ft bgs	19-20 ft bgs	29-30 ft bgs	39-40 ft bgs	49-50 ft bgs	59-60 ft bgs	69-70 ft bgs	79-80 ft bgs	89-90 ft bgs	99-100 ft bgs	109-110 ft bgs
	EPA No	2824-34	2824-35	2824-36	2824-37	2824-38	2824-39	2824-40	2824-41	2824-42	2824-43	2824-44
	Date	12/09/2005	12/09/2005	12/09/2005	12/09/2005	12/09/2005	12/09/2005	12/09/2005	12/09/2005	12/09/2005	12/09/2005	12/09/2005
	Time	9:15	10:30	10:56	11:30	11:36	13:20	13:40	14:30	15:05	15:40	16:10
Parameter	Units											
Semivolatile Organics		Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q
Acenaphthene (1)	ug/kg	100 U	100 U	90 U	92 U	98 U	84 U	85 U	87 U	83 U	85 U	86 U
Acenaphthylene (1)	ug/kg	100 U	100 U	90 U	92 U	98 U	84 U	85 U	87 U	83 U	85 U	86 U
Anthracene (1)	ug/kg	100 U	100 U	90 U	92 U	98 U	84 U	85 U	87 U	83 U	85 U	86 U
Benzo(a)anthracene(1,2)	ug/kg	100 U	100 U	90 U	92 U	98 U	84 U	85 U	87 U	83 U	85 U	86 U
Benzo(a)pyrene(1,2)	ug/kg	100 U	100 U	90 U	92 U	98 U	84 U	85 U	87 U	83 U	85 U	86 U
Benzo(b)fluoranthene(1,2)	ug/kg	100 U	100 U	90 U	92 U	98 U	84 U	85 U	87 U	83 U	85 U	86 U
Benzo(g,h,i)perylene (1)	ug/kg	100 UJ	100 UJ	90 UJ	92 UJ	98 UJ	84 UJ	85 UJ	87 UJ	83 UJ	85 UJ	86 UJ
Benzo(k)fluoranthene(1,2)	ug/kg	100 U	100 U	90 U	92 U	98 U	84 U	85 U	87 U	83 U	85 U	86 U
Benzoic acid	ug/kg	500 U	510 U	450 U	460 U	480 U	420 U	420 U	440 U	420 U	420 U	430 U
Benzyl alcohol	ug/kg	250 U	250 U	220 U	230 U	240 U	210 U	210 U	220 U	210 U	210 U	210 U
bis(2-Chloroethoxy)methane	ug/kg	100 U	100 U	90 U	92 U	98 U	84 U	85 U	87 U	83 U	85 U	86 U
bis(2-Chloroethyl)ether	ug/kg	100 U	100 U	90 U	92 U	98 U	84 U	85 U	87 U	83 U	85 U	86 U
bis(2-Chloroisopropyl)ether	ug/kg	100 U	100 U	90 U	92 U	98 U	84 U	85 U	87 U	83 U	85 U	86 U
bis(2-Ethylhexyl)phthalate	ug/kg	250 U	250 U	220 U	230 U	240 U	210 U	210 U	220 U	210 U	210 U	210 U
4-Bromophenyl-phenylether	ug/kg	100 U	100 U	90 U	92 U	98 U	84 U	85 U	87 U	83 U	85 U	86 U
Butylbenzylphthalate	ug/kg	250 U	250 U	220 U	230 U	240 U	210 U	210 U	220 U	210 U	210 U	210 U
Carbazole	ug/kg	250 U	250 U	220 U	230 U	240 U	210 U	210 U	220 U	210 U	210 U	210 U
4-Chloro-3-methyphenol	ug/kg	250 U	250 U	220 U	230 U	240 U	210 U	210 U	220 U	210 U	210 U	210 U
4-Chloroaniline	ug/kg	500 UJ	510 UJ	450 UJ	460 UJ	480 UJ	420 UJ	420 UJ	440 UJ	420 UJ	420 UJ	430 UJ
2-Chloronaphthalene (1)	ug/kg	100 U	100 U	90 U	92 U	98 U	84 U	85 U	87 U	83 U	85 U	86 U
2-Chlorophenol	ug/kg	250 U	250 U	220 U	230 U	240 U	210 U	210 U	220 U	210 U	210 U	210 U
4-Chlorophenyl-phenylether	ug/kg	100 U	100 U	90 U	92 U	98 U	84 U	85 U	87 U	83 U	85 U	86 U
Chrysene (1,2)	ug/kg	100 U	100 U	90 U	92 U	98 U	84 U	85 U	87 U	83 U	85 U	86 U
Di-n-butylphthalate	ug/kg	250 U	250 U	220 U	230 U	240 U	210 U	210 U	220 U	210 U	210 U	210 U
Di-n-octylphthalate	ug/kg	250 U	250 U	220 U	230 U	240 U	210 U	210 U	220 U	210 U	210 U	210 U
Dibenzo(a,h)anthracene (1,2)	ug/kg	100 UJ	100 UJ	90 UJ	92 UJ	98 UJ	84 UJ	85 UJ	87 UJ	83 UJ	85 UJ	86 UJ
Dibenzofuran	ug/kg	100 U	100 U	90 U	92 U	98 U	84 U	85 U	87 U	83 U	85 U	86 U
1,2-Dichlorobenzene	ug/kg	100 U	100 U	90 U	92 U	98 U	84 U	85 U	87 U	83 U	85 U	86 U
1,3-Dichlorobenzene	ug/kg	100 U	100 U	90 U	92 U	98 U	84 U	85 U	87 U	83 U	85 U	86 U
1,4-Dichlorobenzene	ug/kg	100 U	100 U	90 U	92 U	98 U	84 U	85 U	87 U	83 U	85 U	86 U
3,3'-Dichlorobenzidine	ug/kg	500 U	510 U	450 U	460 U	480 U	420 U	420 U	440 U	420 U	420 U	430 U
2,4-Dichlorophenol	ug/kg	250 U	250 U	220 U	230 U	240 U	210 U	210 U	220 U	210 U	210 U	210 U
Diethylphthalate	ug/kg	100 U	100 U	90 U	92 U	98 U	84 U	85 U	87 U	83 U	85 U	86 U
2,4-Dimethylphenol	ug/kg	250 U	250 U	220 U	230 U	240 U	210 U	210 U	220 U	210 U	210 U	210 U
Dimethylphthalate	ug/kg	100 U	100 U	90 U	92 U	98 U	84 U	85 U	87 U	83 U	85 U	86 U
4,6-Dinitro-2-methylphenol	ug/kg	500 U	510 U	450 U	460 U	480 U	420 U	420 U	440 U	420 U	420 U	430 U
2,4-Dinitrophenol	ug/kg	500 U	510 U	450 U	460 U	480 U	420 U	420 U	440 U	420 U	420 U	430 U

Parameter	Location	A-3	A-3	A-3	A-3	A-3	A-3	A-3	A-3	A-3	A-3	A-3
	Interval	9-10 ft bgs	19-20 ft bgs	29-30 ft bgs	39-40 ft bgs	49-50 ft bgs	59-60 ft bgs	69-70 ft bgs	79-80 ft bgs	89-90 ft bgs	99-100 ft bgs	109-110 ft bgs
	EPA No	2824-34	2824-35	2824-36	2824-37	2824-38	2824-39	2824-40	2824-41	2824-42	2824-43	2824-44
	Date	12/09/2005	12/09/2005	12/09/2005	12/09/2005	12/09/2005	12/09/2005	12/09/2005	12/09/2005	12/09/2005	12/09/2005	12/09/2005
	Time	9:15	10:30	10:55	11:30	11:35	13:20	13:40	14:30	15:05	15:40	16:10
	Units											
Semivolatile Organics (Cont)		Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q
2,4-Dinitrotoluene	ug/kg	100 U	100 U	90 U	92 U	96 U	84 U	85 U	87 U	83 U	85 U	86 U
2,6-Dinitrotoluene	ug/kg	100 U	100 U	90 U	92 U	96 U	84 U	85 U	87 U	83 U	85 U	86 U
Fluoranthene (1)	ug/kg	100 U	100 U	90 U	92 U	96 U	84 U	85 U	87 U	83 U	85 U	86 U
Fluorene (1)	ug/kg	100 U	100 U	90 U	92 U	96 U	84 U	85 U	87 U	83 U	85 U	86 U
Hexachlorobenzene	ug/kg	100 U	100 U	90 U	92 U	96 U	84 U	85 U	87 U	83 U	85 U	86 U
Hexachlorobutadiene	ug/kg	100 U	100 U	90 U	92 U	96 U	84 U	85 U	87 U	83 U	85 U	86 U
Hexachlorocyclopentadiene	ug/kg	100 U	100 U	90 U	92 U	96 U	84 U	85 U	87 U	83 U	85 U	86 U
Hexachloroethane	ug/kg	100 U	100 U	90 U	92 U	96 U	84 U	85 U	87 U	83 U	85 U	86 U
Indeno(1,2,3-cd)pyrene (1,2)	ug/kg	100 UJ	100 UJ	90 UJ	92 UJ	96 UJ	84 UJ	85 UJ	87 UJ	83 UJ	85 UJ	86 UJ
Isophorone	ug/kg	100 U	100 U	90 U	92 U	96 U	84 U	85 U	87 U	83 U	85 U	86 U
2-Methylnaphthalene (1)	ug/kg	100 U	100 U	90 U	92 U	96 U	84 U	85 U	87 U	83 U	85 U	86 U
2-Methylphenol	ug/kg	250 U	250 U	220 U	230 U	240 U	210 U	210 U	220 U	210 U	210 U	210 U
4-Methylphenol	ug/kg	250 U	250 U	220 U	230 U	240 U	210 U	210 U	220 U	210 U	210 U	210 U
Naphthalene (1)	ug/kg	100 U	100 U	90 U	92 U	96 U	84 U	85 U	87 U	83 U	85 U	86 U
2-Nitroaniline	ug/kg	250 U	250 U	220 U	230 U	240 U	210 U	210 U	220 U	210 U	210 U	210 U
3-Nitroaniline	ug/kg	250 UJ	250 UJ	220 UJ	230 UJ	240 UJ	210 UJ	210 UJ	220 UJ	210 UJ	210 UJ	210 UJ
4-Nitroaniline	ug/kg	500 U	510 U	450 U	460 U	480 U	420 U	420 U	440 U	420 U	420 U	430 U
Nitrobenzene	ug/kg	100 U	100 U	90 U	92 U	96 U	84 U	85 U	87 U	83 U	85 U	86 U
2-Nitrophenol	ug/kg	250 U	250 U	220 U	230 U	240 U	210 U	210 U	220 U	210 U	210 U	210 U
4-Nitrophenol	ug/kg	500 U	510 U	450 U	460 U	480 U	420 U	420 U	440 U	420 U	420 U	430 U
N-nitroso-di-n-propylamine	ug/kg	250 U	250 U	220 U	230 U	240 U	210 U	210 U	220 U	210 U	210 U	210 U
N-nitrosodiphenylamine	ug/kg	100 U	100 U	90 U	92 U	96 U	84 U	85 U	87 U	83 U	85 U	86 U
Pentachlorophenol	ug/kg	250 U	250 U	220 U	230 U	240 U	210 U	210 U	220 U	210 U	210 U	210 U
Phenanthrene (1)	ug/kg	100 U	100 U	90 U	92 U	96 U	84 U	85 U	87 U	83 U	85 U	86 U
Phenol	ug/kg	100 U	100 U	90 U	92 U	96 U	84 U	85 U	87 U	83 U	85 U	86 U
Pyrene (1)	ug/kg	100 U	100 U	90 U	92 U	96 U	84 U	85 U	87 U	83 U	85 U	86 U
1,2,4-Trichlorobenzene	ug/kg	100 U	100 U	90 U	92 U	96 U	84 U	85 U	87 U	83 U	85 U	86 U
2,4,5-Trichlorophenol	ug/kg	250 U	250 U	220 U	230 U	240 U	210 U	210 U	220 U	210 U	210 U	210 U
2,4,6-Trichlorophenol	ug/kg	250 U	250 U	220 U	230 U	240 U	210 U	210 U	220 U	210 U	210 U	210 U
Total Semivolatiles	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total PAHs (1)	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Carcinogenic PAHs(2)	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

(1) Polynuclear Aromatic Hydrocarbon.

(2) Carcinogenic Polynuclear Aromatic Hydrocarbon.

U : Compound was analyzed for but not detected. The value is the quantation limit.

J : Value estimated since not all QC criteria met.

ND : Not detected above quantation limits provided.

N/A - Not applicable.

R - The presence or absence of the analyte can not be determined from the data due to severe quality control problems. The data are rejected and considered unusable.

TABLE A3-2
SUMMARY OF SEMI-VOLATILE COMPOUNDS IDENTIFIED (BORING A3)
SOIL BORING SAMPLING 12/05-10/2005
SECOND STREET (HASTINGS) SOURCE AREA RI/FS

	Location	A-3	A-3	A-3	A-3
	Interval	119-120 ft bgs	129-130 ft bgs	139-140 ft bgs	149-150 ft bgs
	EPA No	2824-45	2824-46	2824-47	2824-48
	Date	12/08/2005	12/09/2005	12/09/2005	12/09/2005
	Time	16:30	17:00	17:30	18:00
Parameter	Units				
Semivolatile Organics		Conc. Q	Conc. Q	Conc. Q	Conc. Q
Acenaphthene (1)	ug/kg	91 U	11000	86 U	91 U
Acenaphthylene (1)	ug/kg	91 U	97000	86 U	170
Anthracene (1)	ug/kg	91 U	58000	86 U	280
Benzo(a)anthracene(1,2)	ug/kg	91 U	31000	86 U	140
Benzo(a)pyrene(1,2)	ug/kg	91 U	29000	86 U	120
Benzo(b)fluoranthene(1,2)	ug/kg	91 U	18000	86 U	91 U
Benzo(g,h,i)perylene (1)	ug/kg	91 UJ	9100 J	86 UJ	91 UJ
Benzo(k)fluoranthene(1,2)	ug/kg	91 U	8000	86 U	91 U
Benzoic acid	ug/kg	460 U	11000 U	430 U	460 U
Benzyl alcohol	ug/kg	230 U	5400 U	220 U	230 U
bis(2-Chloroethoxy)methane	ug/kg	91 U	2200 U	86 U	91 U
bis(2-Chloroethyl)ether	ug/kg	91 U	2200 U	86 U	91 U
bis(2-Chloroisopropyl)ether	ug/kg	91 U	2200 U	86 U	91 U
bis(2-Ethylhexyl)phthalate	ug/kg	230 U	5400 U	220 U	230 U
4-Bromophenyl-phenylether	ug/kg	91 U	2200 U	86 U	91 U
Butylbenzylphthalate	ug/kg	230 U	5400 U	220 U	230 U
Carbazole	ug/kg	230 U	5400 U	220 U	230 U
4-Chloro-3-methyphenol	ug/kg	230 U	5400 U	220 U	230 U
4-Chloroaniline	ug/kg	460 UJ	11000 UJ	430 UJ	460 UJ
2-Chloronaphthalene (1)	ug/kg	91 U	2200 U	86 U	91 U
2-Chlorophenol	ug/kg	230 U	5400 U	220 U	230 U
4-Chlorophenyl-phenylether	ug/kg	91 U	2200 U	86 U	91 U
Chrysene (1,2)	ug/kg	91 U	38000	86 U	140
Di-n-butylphthalate	ug/kg	230 U	5400 U	220 U	230 U
Di-n-octylphthalate	ug/kg	230 U	5400 U	220 U	230 U
Dibenzo(a,h)anthracene (1,2)	ug/kg	91 UJ	2700 J	86 UJ	91 UJ
Dibenzofuran	ug/kg	91 U	7700	86 U	91 U
1,2-Dichlorobenzene	ug/kg	91 U	2200 U	86 U	91 U
1,3-Dichlorobenzene	ug/kg	91 U	2200 U	86 U	91 U
1,4-Dichlorobenzene	ug/kg	91 U	2200 U	86 U	91 U
3,3'-Dichlorobenzidine	ug/kg	460 U	11000 U	430 U	460 U
2,4-Dichlorophenol	ug/kg	230 U	5400 U	220 U	230 U
Diethylphthalate	ug/kg	91 U	2200 U	86 U	91 U
2,4-Dimethylphenol	ug/kg	230 U	5400 U	220 U	230 U
Dimethylphthalate	ug/kg	91 U	2200 U	86 U	91 U
4,6-Dinitro-2-methylphenol	ug/kg	460 U	11000 U	430 U	460 U
2,4-Dinitrophenol	ug/kg	460 U	11000 U	430 U	460 U

Parameter	Location	A-3	A-3	A-3	A-3
	Interval	119-120 ft bgs	129-130 ft bgs	139-140 ft bgs	149-150 ft bgs
	EPA No	2824-45	2824-46	2824-47	2824-48
	Date	12/09/2005	12/09/2005	12/09/2005	12/09/2005
	Time	16:30	17:00	17:30	18:00
	Units				
Semivolatile Organics (Cont)		Conc. Q	Conc. Q	Conc. Q	Conc. Q
2,4-Dinitrotoluene	ug/kg	91 U	2200 U	86 U	91 U
2,6-Dinitrotoluene	ug/kg	91 U	2200 U	86 U	91 U
Fluoranthene (1)	ug/kg	91 U	68000	86 U	290
Fluorene (1)	ug/kg	91 U	27000	86 U	91 U
Hexachlorobenzene	ug/kg	91 U	2200 U	86 U	91 U
Hexachlorobutadiene	ug/kg	91 U	2200 U	86 U	91 U
Hexachlorocyclopentadiene	ug/kg	91 U	2200 U	86 U	91 U
Hexachloroethane	ug/kg	91 U	2200 U	86 U	91 U
Indeno(1,2,3-cd)pyrene (1,2)	ug/kg	91 UJ	2200 UJ	86 UJ	91 UJ
Isophorone	ug/kg	91 U	2200 U	86 U	91 U
2-Methylnaphthalene (1)	ug/kg	160	2300	86 U	91 U
2-Methylphenol	ug/kg	230 U	5400 U	220 U	230 U
4-Methylphenol	ug/kg	230 U	5400 U	220 U	230 U
Naphthalene (1)	ug/kg	91 U	380000	86 U	91 U
2-Nitroaniline	ug/kg	230 U	5400 U	220 U	230 U
3-Nitroaniline	ug/kg	230 UJ	5400 UJ	220 UJ	230 UJ
4-Nitroaniline	ug/kg	460 U	11000 U	430 U	460 U
Nitrobenzene	ug/kg	91 U	2200 U	86 U	91 U
2-Nitrophenol	ug/kg	230 U	5400 U	220 U	230 U
4-Nitrophenol	ug/kg	460 U	11000 U	430 U	460 U
N-nitroso-di-n-propylamine	ug/kg	230 U	5400 U	220 U	230 U
N-nitrosodiphenylamine	ug/kg	91 U	2200 U	86 U	91 U
Pentachlorophenol	ug/kg	230 U	5400 U	220 U	230 U
Phenanthrene (1)	ug/kg	230	210000	86 U	840
Phenol	ug/kg	91 U	2200 U	86 U	91 U
Pyrene (1)	ug/kg	91 U	87000	86 U	410
1,2,4-Trichlorobenzene	ug/kg	91 U	2200 U	86 U	91 U
2,4,5-Trichlorophenol	ug/kg	230 U	5400 U	220 U	230 U
2,4,6-Trichlorophenol	ug/kg	230 U	5400 U	220 U	230 U
Total Semivolatiles	ug/kg	390	1,872,700	ND	2,370
Total PAHs (1)	ug/kg	390	1,066,000	ND	2,370
Total Carcinogenic PAHs(2)	ug/kg	ND	118,700	ND	400

(1) Polynuclear Aromatic Hydrocarbon.
(2) Carcinogenic Polynuclear Aromatic Hydrocarbon.
U : Compound was analyzed for but not detected. The value is the quantation limit.
J : Value estimated since not all QC criteria met.
ND : Not detected above quantation limits provided.
N/A - Not applicable.
R - The presence or absence of the analyte can not be determined from the data due to severe quality control problems. The data are rejected and considered unusable.

TABLE A4-1
SUMMARY OF VOLATILE COMPOUNDS IDENTIFIED (BORING A4)
SOIL BORING SAMPLING 12/05-10/2005
SECOND STREET (HASTINGS) SOURCE AREA RI/FS

	Location	A-4	A-4	A-4	A-4	A-4	A-4	A-4	A-4	A-4	A-4	A-4
	Interval	4-5 ft bgs	19-20 ft bgs	29-30 ft bgs	39-40 ft bgs	49-50 ft bgs	59-60 ft bgs	69-70 ft bgs	79-80 ft bgs	89-90 ft bgs	99-100 ft bgs	109-110 ft bgs
	EPA No	2824-18	2824-19	2824-20	2824-21	2824-22	2824-23	2824-24	2824-25	2824-26	2824-27	2824-28
	Date	12/07/2005	12/07/2005	12/08/2005	12/08/2005	12/08/2005	12/08/2005	12/08/2005	12/08/2005	12/08/2005	12/08/2005	12/08/2005
	Time	18:30	17:15	8:50	9:40	10:15	10:35	11:35	11:40	12:20	13:45	14:20
Parameter	Units											
Volatile Organics		Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q
Acetone	ug/kg	13 J	40 J	36 J	37 J	23 J	28 J	36 J	21 J	20 J	22 J	13 J
Benzene	ug/kg	3.3 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	3.6 U	5 U	3.9 U
Bromodichloromethane	ug/kg	3.3 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	3.6 U	5 U	3.9 U
Bromoform	ug/kg	3.3 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	3.6 U	5 U	3.9 U
Bromomethane	ug/kg	3.3 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	3.6 U	5 U	3.9 U
2-Butanone (Methyl Ethyl Ketone)	ug/kg	3.3 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	3.6 UJ	5 U	3.9 UJ
Carbon Disulfide	ug/kg	3.3 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	3.6 U	5 U	3.9 U
Carbon Tetrachloride	ug/kg	3.3 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	3.6 U	5 U	3.9 U
Chlorobenzene	ug/kg	3.3 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	3.6 U	5 U	3.9 U
Chloroethane	ug/kg	3.3 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	3.6 U	5 U	3.9 U
Chloroform	ug/kg	3.3 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	3.6 U	5 U	3.9 U
Chloromethane	ug/kg	3.3 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	3.6 U	5 U	3.9 U
Cyclohexane	ug/kg	3.3 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	3.6 U	5 U	3.9 U
1,2 Dibromo 3-Chloropropane	ug/kg	3.3 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	3.6 U	5 U	3.9 U
Dibromochloromethane	ug/kg	3.3 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	3.6 U	5 U	3.9 U
1,2-Dibromoethane	ug/kg	3.3 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	3.6 U	5 U	3.9 U
1,2-Dichlorobenzene (Ortho)	ug/kg	3.3 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	3.6 U	5 U	3.9 U
1,3-Dichlorobenzene (Meta)	ug/kg	3.3 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	3.6 U	5 U	3.9 U
1,4-Dichlorobenzene (Para)	ug/kg	3.3 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	3.6 U	5 U	3.9 U
Dichlorodifluoromethane	ug/kg	3.3 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	3.6 U	5 U	3.9 U
1,1-Dichloroethane	ug/kg	3.3 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	3.6 U	5 U	3.9 U
1,2-Dichloroethane	ug/kg	3.3 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	3.6 U	5 U	3.9 U
1,1-Dichloroethene	ug/kg	3.3 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	3.6 U	5 U	3.9 U
cis-1,2-Dichloroethene	ug/kg	3.3 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	3.6 U	5 U	3.9 U
trans-1,2-Dichloroethene	ug/kg	3.3 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	3.6 U	5 U	3.9 U
1,2-Dichloropropane	ug/kg	3.3 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	3.6 U	5 U	3.9 U
cis-1,3,-Dichloropropene	ug/kg	3.3 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	3.6 U	5 U	3.9 U
trans-1,3,-Dichloropropene	ug/kg	3.3 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	3.6 U	5 U	3.9 U
Ethylbenzene	ug/kg	3.3 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	3.6 U	5 U	3.9 U
2-Hexanone	ug/kg	3.3 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	3.6 U	5 U	3.9 U
Isopropylbenzene	ug/kg	3.3 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	3.6 U	5 U	3.9 U
Methyl Acetate	ug/kg	3.3 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	3.6 U	5 U	3.9 U
Methyl tert-butyl ether	ug/kg	6.6 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	7.1 U	10 U	7.7 U
Methylcyclohexane	ug/kg	3.3 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	3.6 U	5 U	3.9 U
Methylene Chloride	ug/kg	3.3 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	3.6 U	5 U	3.9 U
4-Methyl-2-Pentanone (MIBK)	ug/kg	3.3 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	3.6 U	5 U	3.9 U
Naphthalene	ug/kg	6.6 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	7.1 U	10 U	7.7 U
Styrene	ug/kg	3.3 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	3.6 U	5 U	3.9 U

Parameter	Location	A-4	A-4	A-4	A-4	A-4	A-4	A-4	A-4	A-4	A-4	A-4
	Interval	4-5 ft bgs	19-20 ft bgs	29-30 ft bgs	39-40 ft bgs	49-50 ft bgs	59-60 ft bgs	69-70 ft bgs	79-80 ft bgs	89-90 ft bgs	99-100 ft bgs	109-110 ft bgs
	EPA No	2824-18	2824-19	2824-20	2824-21	2824-22	2824-23	2824-24	2824-25	2824-26	2824-27	2824-28
	Date	12/07/2005	12/07/2005	12/08/2005	12/08/2005	12/08/2005	12/08/2005	12/08/2005	12/08/2005	12/08/2005	12/08/2005	12/08/2005
	Time	16:30	17:15	8:50	9:40	10:15	10:35	11:35	11:40	12:20	13:45	14:20
	Units											
Volatile Organics (Cont)		Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc Q
1,1,2,2-Tetrachloroethane	ug/kg	3.3 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	3.6 U	5 U	3.9 U
Tetrachloroethene	ug/kg	3.3 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	3.6 U	5 U	3.9 U
Toluene	ug/kg	3.3 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	3.6 U	5 U	3.9 U
1,2,3-Trichlorobenzene	ug/kg	3.3 UJ	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ	3.6 U	5 UJ	3.9 U
1,2,4-Trichlorobenzene	ug/kg	3.3 UJ	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ	3.6 U	5 UJ	3.9 U
1,1,1-Trichloroethane	ug/kg	3.3 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	3.6 U	5 U	3.9 U
1,1,2-Trichloroethane	ug/kg	3.3 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	3.6 U	5 U	3.9 U
Trichloroethene	ug/kg	3.3 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	3.6 U	5 U	3.9 U
Trichlorofluoromethane	ug/kg	3.3 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	3.6 U	5 U	3.9 U
1,1,2-Trichlorofluoroethane	ug/kg	3.3 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	3.6 U	5 U	3.9 U
Vinyl Chloride	ug/kg	3.3 UJ	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ	3.6 U	5 UJ	3.9 U
m and/or p-Xylene	ug/kg	3.3 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	3.6 U	5 U	3.9 U
o-Xylene	ug/kg	3.3 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	3.6 U	5 U	3.9 U
Total Volatiles	ug/kg	13	40	35	37	23	28	35	21	28	22	13
Total Volatiles w/o Naphthalene	ug/kg	13	40	35	37	23	28	35	21	28	22	13
Total BETXs	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

U : Compound was analyzed for but not detected. The value is the quantation limit.

UJ - The analyte was not detected at or above the reporting limit. The reporting limit is an estimate.

J : Value estimated since not all QC criteria met.

ND : Not detected above quantation limits provided.

TABLE A4-1
SUMMARY OF VOLATILE COMPOUNDS IDENTIFIED (BORING A4)
SOIL BORING SAMPLING 12/05-10/2005
SECOND STREET (HASTINGS) SOURCE AREA RI/FS

	Location	A-4	A-4	A-4	A-4	A-4
	Interval	119-120 ft bgs	119-120 ft bgs	129-130 ft bgs	139-140 ft bgs	149-150 ft bgs
	EPA No	2824-29	2824-29FD	2824-31	2824-32	2824-33
	Date	12/08/2005	12/08/2005	12/08/2005	12/08/2005	12/08/2005
	Time	14:45	14:45	15:30	16:10	16:20
Parameter	Units					
Volatile Organics		Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q
Acetone	ug/kg	1200 UJ	630 UJ	890 UJ	14 UJ	690 UJ
Benzene	ug/kg	4100	4900	340 U	3.1 U	360 U
Bromodichloromethane	ug/kg	470 U	380 U	340 U	3.1 U	360 U
Bromoform	ug/kg	470 U	380 U	340 U	3.1 U	360 U
Bromomethane	ug/kg	470 U	380 U	340 U	3.1 U	360 U
2-Butanone (Methyl Ethyl Ketone)	ug/kg	4300 J	2300 J	340 UJ	3.1 UJ	2400 J
Carbon Disulfide	ug/kg	470 U	380 U	340 U	3.1 U	360 U
Carbon Tetrachloride	ug/kg	470 U	380 U	340 U	3.1 U	360 U
Chlorobenzene	ug/kg	470 U	380 U	340 U	3.1 U	360 U
Chloroethane	ug/kg	470 U	380 U	340 U	3.1 U	360 U
Chloroform	ug/kg	470 U	380 U	340 U	3.1 U	360 U
Chloromethane	ug/kg	470 U	380 U	340 U	3.1 U	360 U
Cyclohexane	ug/kg	470 U	380 U	340 U	3.1 U	360 U
1,2 Dibromo 3-Chloropropane	ug/kg	470 U	380 U	340 U	3.1 U	360 U
Dibromochloromethane	ug/kg	470 U	380 U	340 U	3.1 U	360 U
1,2-Dibromoethane	ug/kg	470 U	380 U	340 U	3.1 U	360 U
1,2-Dichlorobenzene (Ortho)	ug/kg	470 U	380 U	340 U	3.1 U	360 U
1,3-Dichlorobenzene (Meta)	ug/kg	470 U	380 U	340 U	3.1 U	360 U
1,4-Dichlorobenzene (Para)	ug/kg	470 U	380 U	340 U	3.1 U	360 U
Dichlorodifluoromethane	ug/kg	470 U	380 U	340 U	3.1 U	360 U
1,1-Dichloroethane	ug/kg	470 U	380 U	340 U	3.1 U	360 U
1,2-Dichloroethane	ug/kg	470 U	380 U	340 U	3.1 U	360 U
1,1-Dichloroethene	ug/kg	470 U	380 U	340 U	3.1 U	360 U
cis-1,2-Dichloroethene	ug/kg	470 U	380 U	340 U	3.1 U	360 U
trans-1,2-Dichloroethene	ug/kg	470 U	380 U	340 U	3.1 U	360 U
1,2-Dichloropropane	ug/kg	470 U	380 U	340 U	3.1 U	360 U
cis-1,3,-Dichloropropene	ug/kg	470 U	380 U	340 U	3.1 U	360 U
trans-1,3,-Dichloropropene	ug/kg	470 U	380 U	340 U	3.1 U	360 U
Ethylbenzene	ug/kg	6800	7400	370	3.1 U	360 U
2-Hexanone	ug/kg	470 U	380 U	340 U	3.1 U	360 U
Isopropylbenzene	ug/kg	470 U	380	690	3.1 U	360 U
Methyl Acetate	ug/kg	470 U	380 U	340 U	3.1 U	360 U
Methyl tert-butyl ether	ug/kg	940 U	750 U	670 U	6.2 U	730 U
Methylcyclohexane	ug/kg	630	580	340 U	3.1 U	360 U
Methylene Chloride	ug/kg	470 U	380 U	340 U	3.1 U	360 U
4-Methyl-2-Pentanone (MIBK)	ug/kg	470 U	380 U	340 U	4.2 U	360 U
Naphthalene	ug/kg	980000	880000	58000	6.2 U	6800
Styrene	ug/kg	64000	69000	2800	3.1 U	360 U

Parameter	Location	A-4	A-4	A-4	A-4	A-4
	Interval	119-120 ft bgs	119-120 ft bgs	129-130 ft bgs	139-140 ft bgs	149-150 ft bgs
	EPA No	2824-29	2824-29FD	2824-31	2824-32	2824-33
	Date	12/08/2005	12/08/2005	12/08/2006	12/08/2006	12/08/2006
	Time	14:45	14:45	15:30	16:10	16:20
	Units					
Volatile Organics (Cont)		Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q
1,1,2,2-Tetrachloroethane	ug/kg	470 U	380 U	340 U	3.1 U	380 U
Tetrachloroethene	ug/kg	470 U	380 U	340 U	3.1 U	360 U
Toluene	ug/kg	18000	28000	380	3.1 U	380 U
1,2,3-Trichlorobenzene	ug/kg	470 U	380 U	340 U	3.1 U	360 U
1,2,4-Trichlorobenzene	ug/kg	470 U	380 U	340 U	3.1 U	380 U
1,1,1-Trichloroethane	ug/kg	470 U	380 U	340 U	3.1 U	380 U
1,1,2-Trichloroethane	ug/kg	470 U	380 U	340 U	3.1 U	380 U
Trichloroethene	ug/kg	470 U	380 U	340 U	3.1 U	380 U
Trichlorofluoromethane	ug/kg	470 U	380 U	340 U	3.1 U	380 U
1,1,2-Trichlorofluoroethane	ug/kg	470 U	380 U	340 U	3.1 U	380 U
Vinyl Chloride	ug/kg	470 U	380 U	340 U	3.1 U	380 U
m and/or p-Xylene	ug/kg	73000	78000	8800	3.1 U	380 U
o-Xylene	ug/kg	32000	38000	4700	3.1 U	380 U
Total Volatiles	ug/kg	1,180,530	1,883,880	73,580	ND	9,300
Total Volatiles w/o Naphthalene	ug/kg	208,530	223,880	17,880	ND	2,400
Total BETXs	ug/kg	131,800	181,380	14,380	ND	ND

U : Compound was analyzed for but not detected. The value is the quantation limit.

UJ - The analyte was not detected at or above the reporting limit. The reporting limit is an estimate.

J : Value estimated since not all QC criteria met.

ND : Not detected above quantation limits provided.

TABLE A4-2
SUMMARY OF SEMI-VOLATILE COMPOUNDS IDENTIFIED (BORING A4)
SOIL BORING SAMPLING 12/06-10/2005
SECOND STREET (HASTINGS) SOURCE AREA RI/FS

	Location	A-4	A-4	A-4	A-4	A-4	A-4	A-4	A-4	A-4	A-4	A-4
	Interval	4-6 ft bgs	19-20 ft bgs	29-30 ft bgs	39-40 ft bgs	49-50 ft bgs	59-60 ft bgs	69-70 ft bgs	79-80 ft bgs	89-90 ft bgs	99-100 ft bgs	109-110 ft bgs
	EPA No	2824-18	2824-19	2824-20	2824-21	2824-22	2824-23	2824-24	2824-25	2824-26	2824-27	2824-28
	Date	12/07/2005	12/07/2005	12/08/2005	12/08/2005	12/08/2005	12/08/2005	12/08/2005	12/08/2005	12/08/2005	12/08/2005	12/08/2005
	Time	16:30	17:15	8:50	9:40	10:16	10:35	11:35	11:40	12:20	13:46	14:20
Parameter	Units											
Semivolatile Organics		Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q
Acenaphthene (1)	ug/kg	810	98 U	93 U	94 U	94 U	87 U	85 U	86 U	86 U	86 U	86 U
Acenaphthylene (1)	ug/kg	1400	98 U	93 U	94 U	94 U	87 U	86 U	86 U	86 U	86 U	86 U
Anthracene (1)	ug/kg	3800	98 U	93 U	94 U	94 U	87 U	85 U	86 U	86 U	86 U	86 U
Benzo(a)anthracene(1,2)	ug/kg	5200	98 U	93 U	94 U	94 U	87 U	85 U	86 U	86 U	86 U	86 U
Benzo(a)pyrene(1,2)	ug/kg	5400	98 U	93 U	94 U	94 U	87 U	85 U	86 U	86 U	86 U	86 U
Benzo(b)fluoranthene(1,2)	ug/kg	5000	98 U	93 U	94 U	94 U	87 U	85 U	86 U	86 U	86 U	86 U
Benzo(g,h,i)perylene (1)	ug/kg	3300	98 UJ	93 UJ	94 UJ	94 UJ	87 UJ	85 UJ	86 UJ	86 U	86 U	86 U
Benzo(k)fluoranthene(1,2)	ug/kg	2100	98 U	93 U	94 U	94 U	87 U	85 U	86 U	86 U	86 U	86 U
Benzoic acid	ug/kg	1300 U	480 U	460 U	470 U	470 U	440 U	420 U	430 U	430 U	430 U	430 U
Benzyl alcohol	ug/kg	630 U	250 U	230 U	240 U	240 U	220 U	210 U	220 U	210 U	210 U	210 U
bis(2-Chloroethoxy)methane	ug/kg	250 U	98 U	93 U	94 U	94 U	87 U	85 U	86 U	86 U	86 U	86 U
bis(2-Chloroethyl)ether	ug/kg	250 U	98 U	93 U	94 U	94 U	87 U	85 U	86 U	86 U	86 U	86 U
bis(2-Chloroisopropyl)ether	ug/kg	250 U	98 U	93 U	94 U	94 U	87 U	85 U	86 U	86 U	86 U	86 U
bis(2-Ethylhexyl)phthalate	ug/kg	630 U	250 U	230 U	240 U	240 U	220 U	210 U	220 U	210 U	210 U	210 U
4-Bromophenyl-phenylether	ug/kg	250 U	98 U	93 U	94 U	94 U	87 U	85 U	86 U	86 U	86 U	86 U
Butylbenzylphthalate	ug/kg	630 U	250 U	230 U	240 U	240 U	220 U	210 U	220 U	210 U	210 U	210 U
Carbazole	ug/kg	630 U	250 U	230 U	240 U	240 U	220 U	210 U	220 U	210 U	210 U	210 U
4-Chloro-3-methyphenol	ug/kg	630 U	250 U	230 U	240 U	240 U	220 U	210 U	220 U	210 U	210 U	210 U
4-Chloroaniline	ug/kg	1300 UJ	480 UJ	460 UJ	470 UJ	470 UJ	440 UJ	420 UJ	430 UJ	430 UJ	430 UJ	430 UJ
2-Chloronaphthalene (1)	ug/kg	250 U	98 U	93 U	94 U	94 U	87 U	85 U	86 U	86 U	86 U	86 U
2-Chlorophenol	ug/kg	630 U	250 U	230 U	240 U	240 U	220 U	210 U	220 U	210 U	210 U	210 U
4-Chlorophenyl-phenylether	ug/kg	250 U	98 U	93 U	94 U	94 U	87 U	85 U	86 U	86 U	86 U	86 U
Chrysene (1,2)	ug/kg	5500	98 U	93 U	94 U	94 U	87 U	85 U	86 U	86 U	86 U	86 U
Di-n-butylphthalate	ug/kg	630 U	250 U	230 U	240 U	240 U	220 U	210 U	220 U	210 U	210 U	210 U
Di-n-octylphthalate	ug/kg	630 U	250 U	230 U	240 U	240 U	220 U	210 U	220 U	210 U	210 U	210 U
Dibenzo(a,h)anthracene (1,2)	ug/kg	780	98 UJ	93 UJ	94 UJ	94 UJ	87 UJ	85 UJ	86 UJ	86 U	86 U	86 U
Dibenzofuran	ug/kg	1200	98 U	93 U	94 U	94 U	87 U	85 U	86 U	86 U	86 U	86 U
1,2-Dichlorobenzene	ug/kg	250 U	98 U	93 U	94 U	94 U	87 U	85 U	86 U	86 U	86 U	86 U
1,3-Dichlorobenzene	ug/kg	250 U	98 U	93 U	94 U	94 U	87 U	85 U	86 U	86 U	86 U	86 U
1,4-Dichlorobenzene	ug/kg	250 U	98 U	93 U	94 U	94 U	87 U	85 U	86 U	86 U	86 U	86 U
3,3'-Dichlorobenzidine	ug/kg	1300 U	480 U	460 U	470 U	470 U	440 U	420 U	430 U	430 U	430 U	430 U
2,4-Dichlorophenol	ug/kg	630 U	250 U	230 U	240 U	240 U	220 U	210 U	220 U	210 U	210 U	210 U
Diethylphthalate	ug/kg	250 U	98 U	93 U	94 U	94 U	87 U	93	110	86 U	86 U	86 U
2,4-Dimethylphenol	ug/kg	630 U	250 U	230 U	240 U	240 U	220 U	210 U	220 U	210 U	210 U	210 U
Dimethylphthalate	ug/kg	250 U	98 U	93 U	94 U	94 U	87 U	85 U	86 U	86 U	86 U	86 U
4,6-Dinitro-2-methylphenol	ug/kg	1300 U	480 U	460 U	470 U	470 U	440 U	420 U	430 U	430 U	430 U	430 U
2,4-Dinitrophenol	ug/kg	1300 U	480 U	460 U	470 U	470 U	440 U	420 U	430 U	430 U	430 U	430 U

Parameter	Location	A-4	A-4	A-4	A-4	A-4	A-4	A-4	A-4	A-4	A-4	A-4
	Interval	4-5 ft bgs	19-20 ft bgs	29-30 ft bgs	39-40 ft bgs	49-50 ft bgs	59-60 ft bgs	69-70 ft bgs	79-80 ft bgs	89-90 ft bgs	99-100 ft bgs	109-110 ft bgs
	EPA No	2824-18	2824-19	2824-20	2824-21	2824-22	2824-23	2824-24	2824-25	2824-26	2824-27	2824-28
	Date	12/07/2005	12/07/2005	12/08/2005	12/08/2005	12/08/2005	12/08/2005	12/08/2005	12/08/2005	12/08/2005	12/08/2005	12/08/2005
	Time	16:30	17:15	8:50	9:40	10:15	10:35	11:35	11:40	12:20	13:45	14:20
	Units											
Semivolatile Organics (Cont)		Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q
2,4-Dinitrotoluene	ug/kg	250 U	98 U	93 U	94 U	94 U	87 U	86 U	86 U	86 U	86 U	86 U
2,6-Dinitrotoluene	ug/kg	250 U	98 U	93 U	94 U	94 U	87 U	85 U	86 U	86 U	86 U	86 U
Fluoranthene (1)	ug/kg	12000	98 U	93 U	94 U	94 U	87 U	85 U	86 U	86 U	86 U	86 U
Fluorene (1)	ug/kg	2300	98 U	93 U	94 U	94 U	87 U	85 U	86 U	86 U	86 U	86 U
Hexachlorobenzene	ug/kg	250 U	98 U	93 U	94 U	94 U	87 U	86 U	86 U	86 U	86 U	86 U
Hexachlorobutadiene	ug/kg	250 U	98 U	93 U	94 U	94 U	87 U	86 U	86 U	86 U	86 U	86 U
Hexachlorocyclopentadiene	ug/kg	250 U	98 U	93 U	94 U	94 U	87 U	85 U	86 U	86 U	86 U	86 U
Hexachloroethane	ug/kg	250 U	98 U	93 U	94 U	94 U	87 U	86 U	86 U	86 U	86 U	86 U
Indeno(1,2,3-cd)pyrene (1,2)	ug/kg	3400	98 U	93 U	94 U	94 U	87 U	86 U	86 U	86 U	86 U	86 U
Isophorone	ug/kg	250 U	98 U	93 U	94 U	94 U	87 U	85 U	86 U	86 U	86 U	86 U
2-Methylnaphthalene (1)	ug/kg	250 U	98 U	93 U	94 U	94 U	87 U	86 U	86 U	86 U	86 U	86 U
2-Methylphenol	ug/kg	630 U	250 U	230 U	240 U	240 U	220 U	210 U	220 U	210 U	210 U	210 U
4-Methylphenol	ug/kg	630 U	250 U	230 U	240 U	240 U	220 U	210 U	220 U	210 U	210 U	210 U
Naphthalene (1)	ug/kg	250 U	98 U	93 U	94 U	94 U	87 U	85 U	86 U	86 U	86 U	86 U
2-Nitroaniline	ug/kg	630 U	250 U	230 U	240 U	240 U	220 U	210 U	220 U	210 U	210 U	210 U
3-Nitroaniline	ug/kg	630 UJ	250 UJ	230 UJ	240 UJ	240 UJ	220 UJ	210 UJ	220 UJ	210 UJ	210 UJ	210 UJ
4-Nitroaniline	ug/kg	1300 U	490 U	460 U	470 U	470 U	440 U	420 U	430 U	430 U	430 U	430 U
Nitrobenzene	ug/kg	250 U	98 U	93 U	94 U	94 U	87 U	85 U	86 U	86 U	86 U	86 U
2-Nitrophenol	ug/kg	630 U	250 U	230 U	240 U	240 U	220 U	210 U	220 U	210 U	210 U	210 U
4-Nitrophenol	ug/kg	1300 U	490 U	460 U	470 U	470 U	440 U	420 U	430 U	430 U	430 U	430 U
N-nitroso-di-n-propylamine	ug/kg	630 U	250 U	230 U	240 U	240 U	220 U	210 U	220 U	210 U	210 U	210 U
N-nitrosodiphenylamine	ug/kg	250 U	98 U	93 U	94 U	94 U	87 U	85 U	86 U	86 U	86 U	86 U
Pentachlorophenol	ug/kg	630 U	250 U	230 U	240 U	240 U	220 U	210 U	220 U	210 U	210 U	210 U
Phenanthrene (1)	ug/kg	12000	98 U	93 U	94 U	94 U	87 U	86 U	86 U	86 U	86 U	86 U
Phenol	ug/kg	250 U	98 U	93 U	94 U	94 U	87 U	86 U	86 U	86 U	86 U	86 U
Pyrene (1)	ug/kg	12000	98 U	93 U	94 U	94 U	87 U	85 U	86 U	86 U	86 U	140
1,2,4-Trichlorobenzene	ug/kg	250 U	98 U	93 U	94 U	94 U	87 U	86 U	86 U	86 U	86 U	86 U
2,4,5-Trichlorophenol	ug/kg	630 U	250 U	230 U	240 U	240 U	220 U	210 U	220 U	210 U	210 U	210 U
2,4,6-Trichlorophenol	ug/kg	630 U	250 U	230 U	240 U	240 U	220 U	210 U	220 U	210 U	210 U	210 U
Total Semivolatiles	ug/kg	75,770	ND	ND	ND	ND	ND	93	110	ND	ND	140
Total PAHs (1)	ug/kg	74,570	ND	ND	ND	ND	ND	ND	ND	ND	ND	140
Total Carcinogenic PAHs(2)	ug/kg	27,360	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

(1) Polynuclear Aromatic Hydrocarbon.

(2) Carcinogenic Polynuclear Aromatic Hydrocarbon.

U : Compound was analyzed for but not detected. The value is the quantation limit.

J : Value estimated since not all QC criteria met.

ND : Not detected above quantation limits provided.

N/A - Not applicable.

TABLE A4-2
SUMMARY OF SEMI-VOLATILE COMPOUNDS IDENTIFIED (BORING A4)
SOIL BORING SAMPLING 12/05-16/2005
SECOND STREET (HASTINGS) SOURCE AREA RI/FS

	Location	A-4	A-4	A-4	A-4	A-4
	Interval	119-120 ft bgs	119-120 ft bgs	129-130 ft bgs	139-140 ft bgs	149-150 ft bgs
	EPA No	2824-29	2824-29FD	2824-31	2824-32	2824-33
	Date	12/08/2005	12/08/2005	12/08/2005	12/08/2005	12/08/2005
	Time	14:45	14:45	15:30	16:10	16:20
Parameter	Units					
Semivolatile Organics		Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q
Acenaphthene (1)	ug/kg	17000	16000	9400	86 U	88 U
Acenaphthylene (1)	ug/kg	130000	140000	60000	86 U	88 U
Anthracene (1)	ug/kg	46000	44000	24000	86 U	88 U
Benzo(a)anthracene(1,2)	ug/kg	17000	17000	6900	86 U	88 U
Benzo(a)pyrene(1,2)	ug/kg	12000	12000	5900	86 U	88 U
Benzo(b)fluoranthene(1,2)	ug/kg	6800	6800	3700	86 U	88 U
Benzo(g,h,i)perylene (1)	ug/kg	3000	2800	1400	86 U	88 UJ
Benzo(k)fluoranthene(1,2)	ug/kg	3300	3400	1900	86 U	88 U
Benzoic acid	ug/kg	5500 U	5600 U	5400 U	430 U	440 U
Benzyl alcohol	ug/kg	2800 U	2800 U	2700 U	220 U	220 U
bis(2-Chloroethoxy)methane	ug/kg	1100 U	1100 U	1100 U	86 U	88 U
bis(2-Chloroethyl)ether	ug/kg	1100 U	1100 U	1100 U	86 U	88 U
bis(2-Chloroisopropyl)ether	ug/kg	1100 U	1100 U	1100 U	86 U	88 U
bis(2-Ethylhexyl)phthalate	ug/kg	2800 U	2800 U	2700 U	220 U	220 U
4-Bromophenyl-phenylether	ug/kg	1100 U	1100 U	1100 U	86 U	88 U
Butylbenzylphthalate	ug/kg	2800 U	2800 U	2700 U	220 U	220 U
Carbazole	ug/kg	2800 U	2800 U	2700 U	220 U	220 U
4-Chloro-3-methyphenol	ug/kg	2800 U	2800 U	2700 U	220 U	220 U
4-Chloroaniline	ug/kg	5500 UJ	5600 UJ	5400 UJ	430 UJ	440 UJ
2-Chloronaphthalene (1)	ug/kg	1100 U	1100 U	1100 U	86 U	88 U
2-Chlorophenol	ug/kg	2800 U	2800 U	2700 U	220 U	220 U
4-Chlorophenyl-phenylether	ug/kg	1100 U	1100 U	1100 U	86 U	88 U
Chrysene (1,2)	ug/kg	16000	16000	8300	86 U	88 U
Di-n-butylphthalate	ug/kg	2800 U	2800 U	2700 U	220 U	220 U
Di-n-octylphthalate	ug/kg	2800 U	2800 U	2700 U	220 U	220 U
Dibenzo(a,h)anthracene (1,2)	ug/kg	1100 U	1300	1100 U	86 U	88 UJ
Dibenzofuran	ug/kg	1100 U	1100 U	7600	86 U	88 U
1,2-Dichlorobenzene	ug/kg	1100 U	1100 U	1100 U	86 U	88 U
1,3-Dichlorobenzene	ug/kg	1100 U	1100 U	1100 U	86 U	88 U
1,4-Dichlorobenzene	ug/kg	1100 U	1100 U	1100 U	86 U	88 U
3,3'-Dichlorobenzidine	ug/kg	5600 U	5600 U	5400 U	430 U	440 U
2,4-Dichlorophenol	ug/kg	2800 U	2800 U	2700 U	220 U	220 U
Diethylphthalate	ug/kg	1100 U	1100 U	1100 U	86 U	88 U
2,4-Dimethylphenol	ug/kg	2800 U	2800 U	2700 U	220 U	220 U
Dimethylphthalate	ug/kg	1100 U	1100 U	1100 U	86 U	88 U
4,6-Dinitro-2-methylphenol	ug/kg	5600 U	5600 U	5400 U	430 U	440 U
2,4-Dinitrophenol	ug/kg	5500 U	5600 U	5400 U	430 U	440 U

Parameter	Location	A-4	A-4	A-4	A-4	A-4
	Interval	119-120 ft bgs	119-120 ft bgs	129-130 ft bgs	139-140 ft bgs	149-150 ft bgs
	EPA No	2824-29	2824-29FD	2824-31	2824-32	2824-33
	Date	12/08/2005	12/08/2005	12/08/2005	12/08/2005	12/08/2005
	Time	14:45	14:45	15:30	18:10	18:20
	Units					
Semivolatile Organics (Cont)		Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q
2,4-Dinitrotoluene	ug/kg	1100 U	1100 U	2800	86 U	88 U
2,6-Dinitrotoluene	ug/kg	1100 U	1100 U	1100 U	86 U	88 U
Fluoranthene (1)	ug/kg	34000	34000	17000	86 U	88 U
Fluorene (1)	ug/kg	62000	61000	37000	86 U	88 U
Hexachlorobenzene	ug/kg	1100 U	1100 U	1100 U	86 U	88 U
Hexachlorobutadiene	ug/kg	1100 U	1100 U	1100 U	86 U	88 U
Hexachlorocyclopentadiene	ug/kg	1100 U	1100 U	1100 U	86 U	88 U
Hexachloroethane	ug/kg	1100 U	1100 U	1100 U	86 U	88 U
Indeno(1,2,3-cd)pyrene (1,2)	ug/kg	3100	3200	1600	86 U	88 UJ
Isophorone	ug/kg	1100 U	1100 U	1100 U	86 U	88 U
2-Methylnaphthalene (1)	ug/kg	840000	850000	380000	86 U	88 U
2-Methylphenol	ug/kg	2800 U	2800 U	2700 U	220 U	220 U
4-Methylphenol	ug/kg	2800 U	2800 U	2700 U	220 U	220 U
Naphthalene (1)	ug/kg	1100000	1100000	410000	86 U	88 U
2-Nitroaniline	ug/kg	2800 U	2800 U	2700 U	220 U	220 U
3-Nitroaniline	ug/kg	2800 UJ	2800 UJ	2700 UJ	220 UJ	220 UJ
4-Nitroaniline	ug/kg	5500 U	5600 U	5400 U	430 U	440 U
Nitrobenzene	ug/kg	1100 U	1100 U	1100 U	86 U	88 U
2-Nitrophenol	ug/kg	2800 U	2800 U	2700 U	220 U	220 U
4-Nitrophenol	ug/kg	5500 U	5600 U	5400 U	430 U	440 U
N-nitroso-di-n-propylamine	ug/kg	2800 U	2800 U	2700 U	220 U	220 U
N-nitrosodiphenylamine	ug/kg	1600	1700	1100 U	86 U	88 U
Pentachlorophenol	ug/kg	2800 U	2800 U	2700 U	220 U	220 U
Phenanthrene (1)	ug/kg	200000	220000	120000	86 U	88 U
Phenol	ug/kg	1100 U	1100 U	1100 U	86 U	88 U
Pyrene (1)	ug/kg	46000	46000	28000	86 U	88 U
1,2,4-Trichlorobenzene	ug/kg	1100 U	1100 U	1100 U	86 U	88 U
2,4,5-Trichlorophenol	ug/kg	2800 U	2800 U	2700 U	220 U	220 U
2,4,6-Trichlorophenol	ug/kg	2800 U	2800 U	2700 U	220 U	220 U
Total Semivolatiles	ug/kg	2,636,900	2,575,200	1,105,400	ND	ND
Total PAHs (1)	ug/kg	2,636,300	2,573,800	1,086,600	ND	ND
Total Carcinogenic PAHs(2)	ug/kg	88,300	86,700	38,200	ND	ND

(1) Polynuclear Aromatic Hydrocarbon.

(2) Carcinogenic Polynuclear Aromatic Hydrocarbon.

U : Compound was analyzed for but not detected. The value is the quantation limit.

J : Value estimated since not all QC criteria met.

ND : Not detected above quantation limits provided.

N/A - Not applicable.

TABLE A5-1
SUMMARY OF VOLATILE COMPOUNDS IDENTIFIED (BORING A5)
SOIL BORING SAMPLING 12/05-10/2005
SECOND STREET (HASTINGS) SOURCE AREA RI/FS

	Location	A-5	A-5	A-5	A-5	A-5	A-5	A-5	A-5	A-5	A-5	A-5
	Interval	9-10 ft bgs	14-15 ft bgs	24-25 ft bgs	39-40 ft bgs	49-50 ft bgs	59-60 ft bgs	70-71 ft bgs	80-81 ft bgs	89-90 ft bgs	99-100 ft bgs	109-110 ft bgs
	EPA No	2824-2	2824-3	2824-4	2824-5	2824-6	2824-7	2824-8	2824-9	2824-10	2824-11	2824-12
	Date	12/05/2005	12/06/2005	12/06/2005	12/06/2005	12/06/2005	12/06/2005	12/06/2005	12/06/2005	12/06/2005	12/06/2005	12/07/2005
	Time	16:46	11:00	11:17	13:10	13:42	14:00	14:57	15:26	16:20	16:50	8:40
Parameter	Units											
Volatile Organics		Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q
Acetone	ug/kg	33 U	23 J	13 U	26 U	33 U	20 U	20 U	23 U	27 U	52 U	26 U
Benzene	ug/kg	5.3 U	6.1 U	3.4 U	3.2 U	3.2 U	3.4 U	3.3 U	3.4 U	3.1 U	4.7 U	3.7 U
Bromodichloromethane	ug/kg	5.3 U	6.1 U	3.4 U	3.2 U	3.2 U	3.4 U	3.3 U	3.4 U	3.1 U	4.7 U	3.7 U
Bromoform	ug/kg	5.3 U	6.1 U	3.4 U	3.2 U	3.2 U	3.4 U	3.3 U	3.4 U	3.1 U	4.7 U	3.7 U
Bromomethane	ug/kg	5.3 U	6.1 U	3.4 U	3.2 U	3.2 U	3.4 U	3.3 U	3.4 U	3.1 U	4.7 U	3.7 U
2-Butanone (Methyl Ethyl Ketone)	ug/kg	5.3 U	6.1 UJ	3.4 U	3.2 U	3.2 U	3.4 U	3.3 U	3.4 U	3.1 U	4.7 U	3.7 U
Carbon Disulfide	ug/kg	5.3 U	6.1 U	3.4 U	3.2 U	3.2 U	3.4 U	3.3 U	3.4 U	4	4.7 U	3.7 U
Carbon Tetrachloride	ug/kg	5.3 U	6.1 U	3.4 U	3.2 U	3.2 U	3.4 U	3.3 U	3.4 U	3.1 U	4.7 U	3.7 U
Chlorobenzene	ug/kg	5.3 U	6.1 U	3.4 U	3.2 U	3.2 U	3.4 U	3.3 U	3.4 U	3.1 U	4.7 U	3.7 U
Chloroethane	ug/kg	5.3 U	6.1 U	3.4 U	3.2 U	3.2 U	3.4 U	3.3 U	3.4 U	3.1 U	4.7 U	3.7 U
Chloroform	ug/kg	5.3 U	6.1 U	3.4 U	3.2 U	3.2 U	3.4 U	3.3 U	3.4 U	3.1 U	4.7 U	3.7 U
Chloromethane	ug/kg	5.3 U	6.1 U	3.4 U	3.2 U	3.2 U	3.4 U	3.3 U	3.4 U	3.1 U	4.7 U	3.7 U
Cyclohexane	ug/kg	5.3 U	6.1 U	3.4 U	3.2 U	3.2 U	3.4 U	3.3 U	3.4 U	3.1 U	4.7 U	3.7 U
1,2 Dibromo 3-Chloropropane	ug/kg	5.3 U	6.1 U	3.4 U	3.2 U	3.2 U	3.4 U	3.3 U	3.4 U	3.1 U	4.7 U	3.7 U
Dibromochloromethane	ug/kg	5.3 U	6.1 U	3.4 U	3.2 U	3.2 U	3.4 U	3.3 U	3.4 U	3.1 U	4.7 U	3.7 U
1,2-Dibromoethane	ug/kg	5.3 U	6.1 U	3.4 U	3.2 U	3.2 U	3.4 U	3.3 U	3.4 U	3.1 U	4.7 U	3.7 U
1,2-Dichlorobenzene (Ortho)	ug/kg	5.3 U	6.1 U	3.4 U	3.2 U	3.2 U	3.4 U	3.3 U	3.4 U	3.1 U	4.7 U	3.7 U
1,3-Dichlorobenzene (Meta)	ug/kg	5.3 U	6.1 U	3.4 U	3.2 U	3.2 U	3.4 U	3.3 U	3.4 U	3.1 U	4.7 U	3.7 U
1,4-Dichlorobenzene (Para)	ug/kg	5.3 U	6.1 U	3.4 U	3.2 U	3.2 U	3.4 U	3.3 U	3.4 U	3.1 U	4.7 U	3.7 U
Dichlorodifluoromethane	ug/kg	5.3 U	6.1 U	3.4 U	3.2 U	3.2 U	3.4 U	3.3 U	3.4 U	3.1 U	4.7 U	3.7 U
1,1-Dichloroethane	ug/kg	5.3 U	6.1 U	3.4 U	3.2 U	3.2 U	3.4 U	3.3 U	3.4 U	3.1 U	4.7 U	3.7 U
1,2-Dichloroethane	ug/kg	5.3 U	6.1 U	3.4 U	3.2 U	3.2 U	3.4 U	3.3 U	3.4 U	3.1 U	4.7 U	3.7 U
1,1-Dichloroethene	ug/kg	5.3 U	6.1 U	3.4 U	3.2 U	3.2 U	3.4 U	3.3 U	3.4 U	3.1 U	4.7 U	3.7 U
cis-1,2-Dichloroethene	ug/kg	5.3 U	6.1 U	3.4 U	3.2 U	3.2 U	3.4 U	3.3 U	3.4 U	3.1 U	4.7 U	3.7 U
trans-1,2-Dichloroethene	ug/kg	5.3 U	6.1 U	3.4 U	3.2 U	3.2 U	3.4 U	3.3 U	3.4 U	3.1 U	4.7 U	3.7 U
1,2-Dichloropropane	ug/kg	5.3 U	6.1 U	3.4 U	3.2 U	3.2 U	3.4 U	3.3 U	3.4 U	3.1 U	4.7 U	3.7 U
cis-1,3,-Dichloropropene	ug/kg	5.3 U	6.1 U	3.4 U	3.2 U	3.2 U	3.4 U	3.3 U	3.4 U	3.1 U	4.7 U	3.7 U
trans-1,3,-Dichloropropene	ug/kg	5.3 U	6.1 U	3.4 U	3.2 U	3.2 U	3.4 U	3.3 U	3.4 U	3.1 U	4.7 U	3.7 U
Ethylbenzene	ug/kg	5.3 U	6.1 U	3.4 U	3.2 U	3.2 U	3.4 U	3.3 U	3.4 U	3.1 U	4.7 U	3.7 U
2-Hexanone	ug/kg	5.3 U	6.1 U	3.4 U	3.2 U	3.2 U	3.4 U	3.3 U	3.4 U	3.1 U	4.7 U	3.7 U
Isopropylbenzene	ug/kg	5.3 U	6.1 U	3.4 U	3.2 U	3.2 U	3.4 U	3.3 U	3.4 U	3.1 U	4.7 U	3.7 U
Methyl Acetate	ug/kg	5.3 U	6.1 U	3.4 U	3.2 U	3.2 U	3.4 U	3.3 U	3.4 U	3.1 U	4.7 U	3.7 U
Methyl tert-butyl ether	ug/kg	11 U	12 U	6.7 U	6.4 U	6.3 U	6.8 U	6.5 U	6.7 U	6.2 U	9.4 U	7.3 U
Methylcyclohexane	ug/kg	5.3 U	6.1 U	3.4 U	3.2 U	3.2 U	3.4 U	3.3 U	3.4 U	3.1 U	4.7 U	3.7 U
Methylene Chloride	ug/kg	5.3 U	6.1 U	3.4 U	3.2 U	3.2 U	3.4 U	3.3 U	3.4 U	3.1 U	4.7 U	3.7 U
4-Methyl-2-Pentanone (MIBK)	ug/kg	5.3 U	6.1 U	3.4 U	3.2 U	3.2 U	3.4 U	3.3 U	3.4 U	3.1 U	4.7 U	3.7 U
Naphthalene	ug/kg	11 U	12 U	6.7 U	6.4 U	6.3 U	6.8 U	6.5 U	6.7 U	6.2 U	9.4 U	7.3 U
Styrene	ug/kg	5.3 U	6.1 U	3.4 U	3.2 U	3.2 U	3.4 U	3.3 U	3.4 U	3.1 U	4.7 U	3.7 U

Parameter	Location	A-5	A-5	A-5	A-5	A-5	A-5	A-5	A-5	A-5	A-5	A-5
	Interval	9-10 ft bgs	14-15 ft bgs	24-25 ft bgs	39-40 ft bgs	49-50 ft bgs	59-60 ft bgs	70-71 ft bgs	80-81 ft bgs	89-90 ft bgs	99-100 ft bgs	109-110 ft bgs
	EPA No	2824-2	2824-3	2824-4	2824-5	2824-6	2824-7	2824-8	2824-9	2824-10	2824-11	2824-12
	Date	12/05/2005	12/06/2005	12/06/2005	12/06/2005	12/06/2005	12/06/2005	12/06/2005	12/06/2005	12/06/2005	12/06/2005	12/07/2005
	Time	16:45	11:00	11:17	13:10	13:42	14:00	14:57	15:20	16:20	16:50	8:40
	Units											
Volatile Organics (Cont)		Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q
1,1,2,2-Tetrachloroethane	ug/kg	6.3 U	6.1 U	3.4 U	3.2 U	3.2 U	3.4 U	3.3 U	3.4 U	3.1 U	4.7 U	3.7 U
Tetrachloroethene	ug/kg	5.3 U	6.1 U	3.4 U	3.2 U	3.2 U	3.4 U	3.3 U	3.4 U	3.1 U	4.7 U	3.7 U
Toluene	ug/kg	5.3 U	6.1 U	3.4 U	3.2 U	3.2 U	3.4 U	3.3 U	3.4 U	3.1 U	4.7 U	3.7 U
1,2,3-Trichlorobenzene	ug/kg	5.3 U	6.1 U	3.4 U	3.2 U	3.2 U	3.4 U	3.3 U	3.4 U	3.1 U	4.7 U	3.7 U
1,2,4-Trichlorobenzene	ug/kg	5.3 U	6.1 U	3.4 U	3.2 U	3.2 U	3.4 U	3.3 U	3.4 U	3.1 U	4.7 U	3.7 U
1,1,1-Trichloroethane	ug/kg	5.3 U	6.1 U	3.4 U	3.2 U	3.2 U	3.4 U	3.3 U	3.4 U	3.1 U	4.7 U	3.7 U
1,1,2-Trichloroethane	ug/kg	5.3 U	6.1 U	3.4 U	3.2 U	3.2 U	3.4 U	3.3 U	3.4 U	3.1 U	4.7 U	3.7 U
Trichloroethene	ug/kg	5.3 U	6.1 U	3.4 U	3.2 U	3.2 U	3.4 U	3.3 U	3.4 U	3.1 U	4.7 U	3.7 U
Trichlorofluoromethane	ug/kg	5.3 U	6.1 U	3.4 U	3.2 U	3.2 U	3.4 U	3.3 U	3.4 U	3.1 U	4.7 U	3.7 U
1,1,2-Trichlorofluoroethane	ug/kg	5.3 U	6.1 U	3.4 U	3.2 U	3.2 U	3.4 U	3.3 U	3.4 U	3.1 U	4.7 U	3.7 U
Vinyl Chloride	ug/kg	5.3 U	6.1 U	3.4 U	3.2 U	3.2 U	3.4 U	3.3 U	3.4 U	3.1 U	4.7 U	3.7 U
m and/or p-Xylene	ug/kg	5.3 U	6.1 U	3.4 U	3.2 U	3.2 U	3.4 U	3.3 U	3.4 U	3.1 U	4.7 U	3.7 U
o-Xylene	ug/kg	5.3 U	6.1 U	3.4 U	3.2 U	3.2 U	3.4 U	3.3 U	3.4 U	3.1 U	4.7 U	3.7 U
Total Volatiles	ug/kg	ND	23	ND	ND	ND	ND	ND	ND	4	ND	ND
Total Volatiles w/o Naphthalene	ug/kg	ND	23	ND	ND	ND	ND	ND	ND	4	ND	ND
Total BETXs	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

U : Compound was analyzed for but not detected. The value is the quantation limit.

UJ - The analyte was not detected at or above the reporting limit. The reporting limit is an estimate.

J : Value estimated since not all QC criteria met.

ND : Not detected above quantation limits provided.

TABLE A5-1
SUMMARY OF VOLATILE COMPOUNDS IDENTIFIED (BORING A5)
SOIL BORING SAMPLING 12/05-10/2005
SECOND STREET (HASTINGS) SOURCE AREA RI/FS

	Location	A-5	A-5	A-5	A-5	A-5
	Interval	119-120 ft bgs	119-120 ft bgs	129-130 ft bgs	139-140 ft bgs	149-150 ft bgs
	EPA No	2824-13	2824-13FD	2824-15	2824-16	2824-17
	Date	12/07/2005	12/07/2005	12/07/2005	12/07/2005	12/07/2005
	Time	9:20	9:20	10:20	11:00	11:35
Parameter	Units					
Volatile Organics		Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q
Acetone	ug/kg	5100 UJ	4700 UJ	1300 UJ	10 UJ	9.8 UJ
Benzene	ug/kg	5100 U	4700 U	530 U	2.9 U	4.1 U
Bromodichloromethane	ug/kg	5100 U	4700 U	530 U	2.9 U	4.1 U
Bromoform	ug/kg	5100 U	4700 U	530 U	2.9 U	4.1 U
Bromomethane	ug/kg	5100 U	4700 U	530 U	2.9 U	4.1 U
2-Butanone (Methyl Ethyl Ketone)	ug/kg	5100 UJ	4700 UJ	4800 J	2.9 UJ	4.1 UJ
Carbon Disulfide	ug/kg	5100 U	4700 U	530 U	2.9 U	4.1 U
Carbon Tetrachloride	ug/kg	5100 U	4700 U	530 U	2.9 U	4.1 U
Chlorobenzene	ug/kg	5100 U	4700 U	530 U	2.9 U	4.1 U
Chloroethane	ug/kg	5100 U	4700 U	530 U	2.9 U	4.1 U
Chloroform	ug/kg	5100 U	4700 U	530 U	2.9 U	4.1 U
Chloromethane	ug/kg	5100 U	4700 U	530 U	2.9 U	4.1 U
Cyclohexane	ug/kg	5100 U	4700 U	530 U	2.9 U	4.1 U
1,2 Dibromo 3-Chloropropane	ug/kg	5100 U	4700 U	530 U	2.9 U	4.1 U
Dibromochloromethane	ug/kg	5100 U	4700 U	530 U	2.9 U	4.1 U
1,2-Dibromoethane	ug/kg	5100 U	4700 U	530 U	2.9 U	4.1 U
1,2-Dichlorobenzene (Ortho)	ug/kg	5100 U	4700 U	530 U	2.9 U	4.1 U
1,3-Dichlorobenzene (Meta)	ug/kg	5100 U	4700 U	530 U	2.9 U	4.1 U
1,4-Dichlorobenzene (Para)	ug/kg	5100 U	4700 U	530 U	2.9 U	4.1 U
Dichlorodifluoromethane	ug/kg	5100 U	4700 U	530 U	2.9 U	4.1 U
1,1-Dichloroethane	ug/kg	5100 U	4700 U	530 U	2.9 U	4.1 U
1,2-Dichloroethane	ug/kg	5100 U	4700 U	530 U	2.9 U	4.1 U
1,1-Dichloroethene	ug/kg	5100 U	4700 U	530 U	2.9 U	4.1 U
cis-1,2-Dichloroethene	ug/kg	5100 U	4700 U	530 U	2.9 U	4.1 U
trans-1,2-Dichloroethene	ug/kg	5100 U	4700 U	530 U	2.9 U	4.1 U
1,2-Dichloropropane	ug/kg	5100 U	4700 U	530 U	2.9 U	4.1 U
cis-1,3,-Dichloropropene	ug/kg	5100 U	4700 U	530 U	2.9 U	4.1 U
trans-1,3,-Dichloropropene	ug/kg	5100 U	4700 U	530 U	2.9 U	4.1 U
Ethylbenzene	ug/kg	11000	18000	530 U	4.4	4.1 U
2-Hexanone	ug/kg	5100 U	4700 U	530 U	2.9 U	4.1 U
Isopropylbenzene	ug/kg	5100 U	4700 U	530 U	2.9 U	4.1 U
Methyl Acetate	ug/kg	5100 U	4700 U	530 U	2.9 U	4.1 U
Methyl tert-butyl ether	ug/kg	10000 U	9400 U	1100 U	5.9 U	8.2 U
Methylcyclohexane	ug/kg	18000	17000	530 U	30	4.1 U
Methylene Chloride	ug/kg	5100 U	4700 U	530 U	2.9 U	4.1 U
4-Methyl-2-Pentanone (MIBK)	ug/kg	5100 U	4700 U	530 U	2.9 U	4.1 U
Naphthalene	ug/kg	280000	240000	18000	380 J	16 U
Styrene	ug/kg	24000	23000	880	8.2	4.1 U

Parameter	Location	A-5		A-5		A-5		A-5		A-5	
	Interval	119-120 ft bgs		119-120 ft bgs		129-130 ft bgs		139-140 ft bgs		149-150 ft bgs	
	EPA No	2824-13		2824-13FD		2824-15		2824-16		2824-17	
	Date	12/07/2005		12/07/2005		12/07/2005		12/07/2005		12/07/2005	
	Time	9:20		9:20		10:20		11:00		11:35	
	Units										
Volatile Organics (Cont)		Conc.	Q	Conc.	Q	Conc.	Q	Conc.	Q	Conc.	Q
1,1,2,2-Tetrachloroethane	ug/kg	5100	U	4700	U	530	U	2.9	U	4.1	U
Tetrachloroethene	ug/kg	5100	U	4700	U	530	U	2.9	U	4.1	U
Toluene	ug/kg	28000		38000		530	U	8.3		4.1	U
1,2,3-Trichlorobenzene	ug/kg	5100	U	4700	U	530	U	2.9	U	4.1	U
1,2,4-Trichlorobenzene	ug/kg	5100	U	4700	U	530	U	2.9	U	4.1	U
1,1,1-Trichloroethane	ug/kg	5100	U	4700	U	530	U	2.9	U	4.1	U
1,1,2-Trichloroethane	ug/kg	5100	U	4700	U	530	U	2.9	U	4.1	U
Trichloroethene	ug/kg	5100	U	4700	U	530	U	2.9	U	4.1	U
Trichlorofluoromethane	ug/kg	5100	U	4700	U	530	U	2.9	U	4.1	U
1,1,2-Trichlorofluoroethane	ug/kg	5100	U	4700	U	530	U	2.9	U	4.1	U
Vinyl Chloride	ug/kg	5100	U	4700	U	530	U	2.9	U	4.1	U
m and/or p-Xylene	ug/kg	54000		53000		1400		33		4.1	U
o-Xylene	ug/kg	22000		21000		810		16		4.1	U
Total Volatiles	ug/kg	434,000		393,000		28,170		479		ND	
Total Volatiles w/o Naphthalene	ug/kg	164,000		153,000		7,170		99		ND	
Total BETXs	ug/kg	116,000		113,000		2,810		61		ND	

U : Compound was analyzed for but not detected. The value is the quantation limit.

UJ - The analyte was not detected at or above the reporting limit. The reporting limit is an estimate.

J : Value estimated since not all QC criteria met.

ND : Not detected above quantation limits provided.

TABLE A5-2
SUMMARY OF SEMI-VOLATILE COMPOUNDS IDENTIFIED (BORING A5)
SOIL BORING SAMPLING 12/05-10/2005
SECOND STREET (HASTINGS) SOURCE AREA RI/FS

	Location	A-5	A-5	A-5	A-5	A-5	A-5	A-5	A-5	A-5	A-5	A-5
	Interval	9-10 ft bgs	14-15 ft bgs	24-25 ft bgs	39-40 ft bgs	49-50 ft bgs	59-60 ft bgs	70-71 ft bgs	80-81 ft bgs	89-90 ft bgs	99-100 ft bgs	109-110 ft bgs
	EPA No	2824-2	2824-3	2824-4	2824-5	2824-6	2824-7	2824-8	2824-9	2824-10	2824-11	2824-12
	Date	12/06/2005	12/06/2005	12/06/2005	12/06/2005	12/06/2005	12/06/2005	12/06/2005	12/06/2005	12/06/2005	12/06/2005	12/07/2005
	Time	16:48	11:00	11:17	13:10	13:42	14:00	14:57	15:20	16:20	16:50	8:40
Parameter	Units											
Semivolatile Organics		Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q
Acenaphthene (1)	ug/kg	100 U	100 U	100 U	94 U	87 U	93 U	90 U	86 U	86 U	87 U	86 U
Acenaphthylene (1)	ug/kg	100 U	100 U	100 U	94 U	87 U	93 U	90 U	86 U	86 U	87 U	86 U
Anthracene (1)	ug/kg	100 U	100 U	100 U	94 U	87 U	93 U	90 U	86 U	86 U	87 U	86 U
Benzo(a)anthracene(1,2)	ug/kg	100 U	100 U	100 U	94 U	87 U	93 U	90 U	86 U	86 U	87 U	86 U
Benzo(a)pyrene(1,2)	ug/kg	100 U	100 U	100 U	94 U	87 U	93 U	90 U	86 U	86 U	87 U	86 U
Benzo(b)fluoranthene(1,2)	ug/kg	100 U	100 U	100 U	94 U	87 U	93 U	90 U	86 U	86 U	87 U	86 U
Benzo(g,h,i)perylene (1)	ug/kg	100 U	100 U	100 U	94 U	87 U	93 U	90 U	86 U	86 U	87 U	86 U
Benzo(k)fluoranthene(1,2)	ug/kg	100 U	100 U	100 U	94 U	87 U	93 U	90 U	86 U	86 U	87 U	86 U
Benzoic acid	ug/kg	500 U	510 U	500 U	470 U	440 U	460 U	450 U	430 U	430 U	440 U	430 U
Benzyl alcohol	ug/kg	250 U	250 U	250 U	230 U	220 U	230 U	220 U	220 U	210 U	220 U	220 U
bis(2-Chloroethoxy)methane	ug/kg	100 U	100 U	100 U	94 U	87 U	93 U	90 U	86 U	86 U	87 U	86 U
bis(2-Chloroethyl)ether	ug/kg	100 U	100 U	100 U	94 U	87 U	93 U	90 U	86 U	86 U	87 U	86 U
bis(2-Chloroisopropyl)ether	ug/kg	100 U	100 U	100 U	94 U	87 U	93 U	90 U	86 U	86 U	87 U	86 U
bis(2-Ethylhexyl)phthalate	ug/kg	250 U	250 U	250 U	230 U	220 U	230 U	220 U	220 U	210 U	220 U	400
4-Bromophenyl-phenylether	ug/kg	100 U	100 U	100 U	94 U	87 U	93 U	90 U	86 U	86 U	87 U	86 U
Butylbenzylphthalate	ug/kg	250 U	250 U	250 U	230 U	220 U	230 U	220 U	220 U	210 U	220 U	220 U
Carbazole	ug/kg	250 U	250 U	250 U	230 U	220 U	230 U	220 U	220 U	210 U	220 U	220 U
4-Chloro-3-methylphenol	ug/kg	250 U	250 U	250 U	230 U	220 U	230 U	220 U	220 U	210 U	220 U	220 U
4-Chloroaniline	ug/kg	500 UJ	510 UJ	500 UJ	470 UJ	440 UJ	460 UJ	450 UJ	430 UJ	430 UJ	440 UJ	430 UJ
2-Chloronaphthalene (1)	ug/kg	100 U	100 U	100 U	94 U	87 U	93 U	90 U	86 U	86 U	87 U	86 U
2-Chlorophenol	ug/kg	250 U	250 U	250 U	230 U	220 U	230 U	220 U	220 U	210 U	220 U	220 U
4-Chlorophenyl-phenylether	ug/kg	100 U	100 U	100 U	94 U	87 U	93 U	90 U	86 U	86 U	87 U	86 U
Chrysene (1,2)	ug/kg	100 U	100 U	100 U	94 U	87 U	93 U	90 U	86 U	86 U	87 U	86 U
Di-n-butylphthalate	ug/kg	250 U	250 U	250 U	230 U	220 U	230 U	220 U	220 U	210 U	220 U	220 U
Di-n-octylphthalate	ug/kg	250 U	250 U	250 U	230 U	220 U	230 U	220 U	220 U	210 U	220 U	220 U
Dibenzo(a,h)anthracene (1,2)	ug/kg	100 U	100 U	100 U	94 U	87 U	93 U	90 U	86 U	86 U	87 U	86 U
Dibenzofuran	ug/kg	100 U	100 U	100 U	94 U	87 U	93 U	90 U	86 U	86 U	87 U	86 U
1,2-Dichlorobenzene	ug/kg	100 U	100 U	100 U	94 U	87 U	93 U	90 U	86 U	86 U	87 U	86 U
1,3-Dichlorobenzene	ug/kg	100 U	100 U	100 U	94 U	87 U	93 U	90 U	86 U	86 U	87 U	86 U
1,4-Dichlorobenzene	ug/kg	100 U	100 U	100 U	94 U	87 U	93 U	90 U	86 U	86 U	87 U	86 U
3,3'-Dichlorobenzidine	ug/kg	500 U	510 U	500 U	470 U	440 U	460 U	450 U	430 U	430 U	440 U	430 U
2,4-Dichlorophenol	ug/kg	250 U	250 U	250 U	230 U	220 U	230 U	220 U	220 U	210 U	220 U	220 U
Diethylphthalate	ug/kg	100 U	100 U	100 U	94 U	87 U	93 U	90 U	86 U	180	87 U	86 U
2,4-Dimethylphenol	ug/kg	250 U	250 U	250 U	230 U	220 U	230 U	220 U	220 U	210 U	220 U	220 U
Dimethylphthalate	ug/kg	100 U	100 U	100 U	94 U	87 U	93 U	90 U	86 U	86 U	87 U	86 U
4,6-Dinitro-2-methylphenol	ug/kg	500 U	510 U	500 U	470 U	440 U	460 U	450 U	430 U	430 U	440 U	430 U
2,4-Dinitrophenol	ug/kg	500 U	510 U	500 U	470 U	440 U	460 U	450 U	430 U	430 U	440 U	430 U

Parameter	Location	A-5	A-5	A-5	A-5	A-5	A-5	A-5	A-5	A-5	A-5	A-5
	Interval	9-10 ft bgs	14-15 ft bgs	24-25 ft bgs	39-40 ft bgs	49-50 ft bgs	59-60 ft bgs	70-71 ft bgs	80-81 ft bgs	89-90 ft bgs	99-100 ft bgs	109-110 ft bgs
	EPA No	2824-2	2824-3	2824-4	2824-5	2824-6	2824-7	2824-8	2824-9	2824-10	2824-11	2824-12
	Date	12/05/2005	12/06/2005	12/06/2005	12/06/2005	12/06/2005	12/06/2005	12/06/2005	12/06/2005	12/06/2005	12/06/2005	12/07/2005
	Time	16:45	11:00	11:17	13:10	13:42	14:00	14:57	15:20	16:20	16:50	8:40
	Units											
Semivolatile Organics (Cont)		Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q
2,4-Dinitrotoluene	ug/kg	100 U	100 U	100 U	94 U	87 U	93 U	90 U	86 U	86 U	87 U	86 U
2,6-Dinitrotoluene	ug/kg	100 U	100 U	100 U	94 U	87 U	93 U	90 U	86 U	86 U	87 U	86 U
Fluoranthene (1)	ug/kg	100 U	100 U	100 U	94 U	87 U	93 U	90 U	86 U	86 U	87 U	86 U
Fluorene (1)	ug/kg	100 U	100 U	100 U	94 U	87 U	93 U	90 U	86 U	86 U	87 U	86 U
Hexachlorobenzene	ug/kg	100 U	100 U	100 U	94 U	87 U	93 U	90 U	86 U	86 U	87 U	86 U
Hexachlorobutadiene	ug/kg	100 U	100 U	100 U	94 U	87 U	93 U	90 U	86 U	86 U	87 U	86 U
Hexachlorocyclopentadiene	ug/kg	100 U	100 U	100 U	94 U	87 U	93 U	90 U	86 U	86 U	87 U	86 U
Hexachloroethane	ug/kg	100 U	100 U	100 U	94 U	87 U	93 U	90 U	86 U	86 U	87 U	86 U
Indeno(1,2,3-cd)pyrene (1,2)	ug/kg	100 U	100 U	100 U	94 U	87 U	93 U	90 U	86 U	86 U	87 U	86 U
Isophorone	ug/kg	100 U	100 U	100 U	94 U	87 U	93 U	90 U	86 U	86 U	87 U	86 U
2-Methylnaphthalene (1)	ug/kg	100 U	100 U	100 U	94 U	87 U	93 U	90 U	86 U	86 U	87 U	86 U
2-Methylphenol	ug/kg	250 U	250 U	250 U	230 U	220 U	230 U	220 U	220 U	210 U	220 U	220 U
4-Methylphenol	ug/kg	250 U	250 U	250 U	230 U	220 U	230 U	220 U	220 U	210 U	220 U	220 U
Naphthalene (1)	ug/kg	100 U	100 U	100 U	94 U	87 U	93 U	90 U	86 U	86 U	87 U	86 U
2-Nitroaniline	ug/kg	250 U	250 U	250 U	230 U	220 U	230 U	220 U	220 U	210 U	220 U	220 U
3-Nitroaniline	ug/kg	250 UJ	250 UJ	250 UJ	230 UJ	220 UJ	230 UJ	220 UJ	220 UJ	210 UJ	220 UJ	220 UJ
4-Nitroaniline	ug/kg	500 U	500 U	510 U	470 U	440 U	460 U	450 U	430 U	430 U	440 U	430 U
Nitrobenzene	ug/kg	100 U	100 U	100 U	94 U	87 U	93 U	90 U	86 U	86 U	87 U	86 U
2-Nitrophenol	ug/kg	250 U	250 U	250 U	230 U	220 U	230 U	220 U	220 U	210 U	220 U	220 U
4-Nitrophenol	ug/kg	500 U	510 U	500 U	470 U	440 U	460 U	450 U	430 U	430 U	440 U	430 U
N-nitroso-di-n-propylamine	ug/kg	250 U	250 U	250 U	230 U	220 U	230 U	220 U	220 U	210 U	220 U	220 U
N-nitrosodiphenylamine	ug/kg	100 U	100 U	100 U	94 U	87 U	93 U	90 U	86 U	86 U	87 U	86 U
Pentachlorophenol	ug/kg	250 U	250 U	250 U	230 U	220 U	230 U	220 U	220 U	210 U	220 U	220 U
Phenanthrene (1)	ug/kg	100 U	100 U	100 U	94 U	87 U	93 U	90 U	86 U	86 U	87 U	86 U
Phenol	ug/kg	100 U	100 U	100 U	94 U	87 U	93 U	90 U	86 U	86 U	87 U	86 U
Pyrene (1)	ug/kg	100 U	100 U	100 U	94 U	87 U	93 U	90 U	86 U	86 U	87 U	86 U
1,2,4-Trichlorobenzene	ug/kg	100 U	100 U	100 U	94 U	87 U	93 U	90 U	86 U	86 U	87 U	86 U
2,4,5-Trichlorophenol	ug/kg	250 U	250 U	250 U	230 U	220 U	230 U	220 U	220 U	210 U	220 U	220 U
2,4,6-Trichlorophenol	ug/kg	250 U	250 U	250 U	230 U	220 U	230 U	220 U	220 U	210 U	220 U	220 U
Total Semivolatiles	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	180	ND	400
Total PAHs (1)	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Carcinogenic PAHs(2)	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

(1) Polynuclear Aromatic Hydrocarbon.

(2) Carcinogenic Polynuclear Aromatic Hydrocarbon.

U : Compound was analyzed for but not detected. The value is the quantation limit.

J : Value estimated since not all QC criteria met.

ND : Not detected above quantation limits provided.

N/A - Not applicable.

TABLE A5-2
SUMMARY OF SEMI-VOLATILE COMPOUNDS IDENTIFIED (BORING A5)
SOIL BORING SAMPLING 12/05-10/2005
SECOND STREET (HASTINGS) SOURCE AREA RI/FS

	Location	A-5	A-5	A-5	A-5	A-5
	Interval	119-120 ft bgs	119-120 ft bgs	129-130 ft bgs	139-140 ft bgs	149-150 ft bgs
	EPA No	2824-13	2824-13FD	2824-15	2824-16	2824-17
	Date	12/07/2005	12/07/2005	12/07/2005	12/07/2005	12/07/2005
	Time	9:20	9:20	10:20	11:00	11:35
Parameter	Units					
Semivolatile Organics		Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q
Acenaphthene (1)	ug/kg	900 U	890 U	2100	87 U	88 U
Acenaphthylene (1)	ug/kg	34000	28000	12000	87 U	88 U
Anthracene (1)	ug/kg	7900	8900	6200	87 U	86 U
Benzo(a)anthracene(1,2)	ug/kg	2800	3300	2300	87 U	88 U
Benzo(a)pyrene(1,2)	ug/kg	1900	2100	1600	87 U	88 U
Benzo(b)fluoranthene(1,2)	ug/kg	1100	1300	920	87 U	88 U
Benzo(g,h,i)perylene (1)	ug/kg	900 U	890 U	480	87 UJ	88 UJ
Benzo(k)fluoranthene(1,2)	ug/kg	900 U	890 U	460	87 U	86 U
Benzoic acid	ug/kg	4500 U	4400 U	1100 U	440 U	440 U
Benzyl alcohol	ug/kg	2200 U	2200 U	540 U	220 U	220 U
bis(2-Chloroethoxy)methane	ug/kg	900 U	890 U	220 U	87 U	88 U
bis(2-Chloroethyl)ether	ug/kg	900 U	890 U	220 U	87 U	88 U
bis(2-Chloroisopropyl)ether	ug/kg	900 U	890 U	220 U	87 U	88 U
bis(2-Ethylhexyl)phthalate	ug/kg	2200 U	2200 U	540 U	220 U	220 U
4-Bromophenyl-phenylether	ug/kg	900 U	890 U	220 U	87 U	88 U
Butylbenzylphthalate	ug/kg	2200 U	2200 U	540 U	220 U	220 U
Carbazole	ug/kg	2200 U	2200 U	540 U	220 U	220 U
4-Chloro-3-methyphenol	ug/kg	2200 U	2200 U	540 U	220 U	220 U
4-Chloroaniline	ug/kg	4500 UJ	4400 UJ	1100 UJ	440 UJ	440 UJ
2-Chloronaphthalene (1)	ug/kg	900 U	890 U	220 U	87 U	88 U
2-Chlorophenol	ug/kg	2200 U	2200 U	540 U	220 U	220 U
4-Chlorophenyl-phenylether	ug/kg	900 U	890 U	220 U	87 U	88 U
Chrysene (1,2)	ug/kg	2800	3600	2200	87 U	88 U
Di-n-butylphthalate	ug/kg	2200 U	2200 U	540 U	220 U	220 U
Di-n-octylphthalate	ug/kg	2200 U	2200 U	540 U	220 U	220 U
Dibenzo(a,h)anthracene (1,2)	ug/kg	900 U	890 U	220 U	87 UJ	88 UJ
Dibenzofuran	ug/kg	1700	1900	1800	87 U	88 U
1,2-Dichlorobenzene	ug/kg	900 U	890 U	220 U	87 U	88 U
1,3-Dichlorobenzene	ug/kg	900 U	890 U	220 U	87 U	88 U
1,4-Dichlorobenzene	ug/kg	900 U	890 U	220 U	87 U	88 U
3,3'-Dichlorobenzidine	ug/kg	4500 U	4400 U	1100 U	440 U	440 U
2,4-Dichlorophenol	ug/kg	2200 U	2200 U	540 U	220 U	220 U
Diethylphthalate	ug/kg	900 U	890 U	220 U	87 U	88 U
2,4-Dimethylphenol	ug/kg	2200 U	2200 U	540 U	220 U	220 U
Dimethylphthalate	ug/kg	900 U	890 U	220 U	87 U	88 U
4,6-Dinitro-2-methylphenol	ug/kg	4500 U	4400 U	1100 U	440 U	440 U
2,4-Dinitrophenol	ug/kg	4500 U	4400 U	1100 U	440 U	440 U

Parameter	Location	A-5	A-5	A-5	A-5	A-5
	Interval	119-120 ft bgs	119-120 ft bgs	129-130 ft bgs	139-140 ft bgs	149-150 ft bgs
	EPA No	2824-13	2824-13FD	2824-15	2824-16	2824-17
	Date	12/07/2005	12/07/2005	12/07/2005	12/07/2005	12/07/2005
	Time	9:20	9:20	10:20	11:00	11:35
	Units					
Semivolatile Organics (Cont)		Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q
2,4-Dinitrotoluene	ug/kg	900 U	890 U	220 U	87 U	88 U
2,6-Dinitrotoluene	ug/kg	900 U	890 U	220 U	87 U	88 U
Fluoranthene (1)	ug/kg	6100	5800	4500	87 U	88 U
Fluorene (1)	ug/kg	13000	14000	8400	87 U	88 U
Hexachlorobenzene	ug/kg	900 U	890 U	220 U	87 U	88 U
Hexachlorobutadiene	ug/kg	900 U	890 U	220 U	87 U	88 U
Hexachlorocyclopentadiene	ug/kg	900 U	890 U	220 U	87 U	88 U
Hexachloroethane	ug/kg	900 U	890 U	220 U	87 U	88 U
Indeno(1,2,3-cd)pyrene (1,2)	ug/kg	900 U	890 U	540	87 U	88 U
Isophorone	ug/kg	900 U	890 U	220 U	87 U	88 U
2-Methylnaphthalene (1)	ug/kg	110000	120000	78000	87 U	88 U
2-Methylphenol	ug/kg	2200 U	2200 U	540 U	220 U	220 U
4-Methylphenol	ug/kg	2200 U	2200 U	540 U	220 U	220 U
Naphthalene (1)	ug/kg	130000	140000	93000	87 U	88 U
2-Nitroaniline	ug/kg	2200 U	2200 U	540 U	220 U	220 U
3-Nitroaniline	ug/kg	2200 UJ	2200 UJ	540 UJ	220 UJ	220 UJ
4-Nitroaniline	ug/kg	4500 U	4400 U	1100 U	440 U	440 U
Nitrobenzene	ug/kg	900 U	890 U	220 U	87 U	88 U
2-Nitrophenol	ug/kg	2200 U	2200 U	540 U	220 U	220 U
4-Nitrophenol	ug/kg	4500 U	4400 U	1100 U	440 U	440 U
N-nitroso-di-n-propylamine	ug/kg	2200 U	2200 U	540 U	220 U	220 U
N-nitrosodiphenylamine	ug/kg	900 U	890 U	300	87 U	88 U
Pentachlorophenol	ug/kg	2200 U	2200 U	540 U	220 U	220 U
Phenanthrene (1)	ug/kg	38000	41000	30000	93	88 U
Phenol	ug/kg	900 U	880 U	220 U	87 U	88 U
Pyrene (1)	ug/kg	8800	9400	6800	87 U	88 U
1,2,4-Trichlorobenzene	ug/kg	900 U	890 U	220 U	87 U	88 U
2,4,5-Trichlorophenol	ug/kg	2200 U	2200 U	540 U	220 U	220 U
2,4,6-Trichlorophenol	ug/kg	2200 U	2200 U	540 U	220 U	220 U
Total Semivolatiles	ug/kg	346,800	378,800	281,390	93	ND
Total PAHs (1)	ug/kg	344,960	374,700	249,290	93	ND
Total Carcinogenic PAHs(2)	ug/kg	9,460	9,800	8,610	ND	ND

(1) Polynuclear Aromatic Hydrocarbon.

(2) Carcinogenic Polynuclear Aromatic Hydrocarbon.

U : Compound was analyzed for but not detected. The value is the quantation limit.

J : Value estimated since not all QC criteria met.

ND : Not detected above quantation limits provided.

N/A - Not applicable.

TABLE IDW-1
SUMMARY OF VOLATILE COMPOUNDS IDENTIFIED (INVESTIGATION DERIVED WASTE)
SOIL BORING SAMPLING 12/05-10/2005
SECOND STREET (HASTINGS) SOURCE AREA RI/FS

Parameter	Location	IDW
	Interval	Composite
	EPA No	2824-1
	Date	12/10/2005
	Time	9:15
	Units	
Volatile Organics	.	Conc. Q
Acetone	ug/kg	570 J
Benzene	ug/kg	440 U
Bromodichloromethane	ug/kg	440 U
Bromoform	ug/kg	440 U
Bromomethane	ug/kg	440 U
2-Butanone (Methyl Ethyl Ketone)	ug/kg	3800 J
Carbon Disulfide	ug/kg	440 U
Carbon Tetrachloride	ug/kg	440 U
Chlorobenzene	ug/kg	440 U
Chloroethane	ug/kg	440 U
Chloroform	ug/kg	440 U
Chloromethane	ug/kg	440 U
Cyclohexane	ug/kg	440 U
1,2 Dibromo 3-Chloropropane	ug/kg	440 U
Dibromochloromethane	ug/kg	440 U
1,2-Dibromoethane	ug/kg	440 U
1,2-Dichlorobenzene (Ortho)	ug/kg	440 U
1,3-Dichlorobenzene (Meta)	ug/kg	440 U
1,4-Dichlorobenzene (Para)	ug/kg	440 U
Dichlorodifluoromethane	ug/kg	440 U
1,1-Dichloroethane	ug/kg	440 U
1,2-Dichloroethane	ug/kg	440 U
1,1-Dichloroethene	ug/kg	440 U
cis-1,2-Dichloroethene	ug/kg	440 U
trans-1,2-Dichloroethene	ug/kg	440 U
1,2-Dichloropropane	ug/kg	440 U
cis-1,3,-Dichloropropene	ug/kg	440 U
trans-1,3,-Dichloropropene	ug/kg	440 U
Ethylbenzene	ug/kg	440 U
2-Hexanone	ug/kg	440 U
Isopropylbenzene	ug/kg	440 U
Methyl Acetate	ug/kg	880
Methyl tert-butyl ether	ug/kg	880 U
Methylcyclohexane	ug/kg	440 U
Methylene Chloride	ug/kg	440 U
4-Methyl-2-Pentanone (MIBK)	ug/kg	440 U
Naphthalene	ug/kg	45000
Styrene	ug/kg	440 U
1,1,2,2-Tetrachloroethane	ug/kg	440 U
Tetrachloroethene	ug/kg	440 U
Toluene	ug/kg	440 U
1,2,3-Trichlorobenzene	ug/kg	440 U
1,2,4-Trichlorobenzene	ug/kg	440 U
1,1,1-Trichloroethane	ug/kg	440 U
1,1,2-Trichloroethane	ug/kg	440 U
Trichloroethene	ug/kg	440 U
Trichlorofluoromethane	ug/kg	440 U
1,1,2-Trichlorofluoroethane	ug/kg	440 U
Vinyl Chloride	ug/kg	440 U
m and/or p-Xylene	ug/kg	440 U
o-Xylene	ug/kg	440 U
Total Volatiles	ug/kg	50,250
Total Volatiles w/o Naphthalene	ug/kg	5,250
Total BETXs	ug/kg	ND

U : Compound was analyzed for but not detected. The value is the quantation limit.

UJ - The analyte was not detected at or above the reporting limit The reporting limit is an estimate.

J : Value estimated since not all QC criteria met

ND : Not detected above quantation limits provided.

TABLE IDW-2

SUMMARY OF SEMI-VOLATILE COMPOUNDS IDENTIFIED (INVESTIGATION DERIVED WASTE)

SOIL BORING SAMPLING 12/05-10/2005

SECOND STREET (HASTINGS) SOURCE AREA RI/FS

	Location	IDW
	Interval	Composite
	EPA No	2824-1
	Date	12/10/2005
	Time	9.15
Parameter	Units	
Semivolatile Organics		Conc. Q
Acenaphthene (1)	ug/kg	730
Acenaphthylene (1)	ug/kg	4800
Anthracene (1)	ug/kg	2300
Benzo(a)anthracene(1,2)	ug/kg	940
Benzo(a)pyrene(1,2)	ug/kg	670
Benzo(b)fluoranthene(1,2)	ug/kg	400
Benzo(g,h,i)perylene (1)	ug/kg	170 J
Benzo(k)fluoranthene(1,2)	ug/kg	210
Benzoic acid	ug/kg	440 U
Benzyl alcohol	ug/kg	220 U
bis(2-Chloroethoxy)methane	ug/kg	87 U
bis(2-Chloroethyl)ether	ug/kg	87 U
bis(2-Chloroisopropyl)ether	ug/kg	87 U
bis(2-Ethylhexyl)phthalate	ug/kg	220 U
4-Bromophenyl-phenylether	ug/kg	87 U
Butylbenzylphthalate	ug/kg	220 U
Carbazole	ug/kg	220 U
4-Chloro-3-methyphenol	ug/kg	220 U
4-Chloroaniline	ug/kg	440 UJ
2-Chloronaphthalene (1)	ug/kg	87 U
2-Chlorophenol	ug/kg	220 U
4-Chlorophenyl-phenylether	ug/kg	87 U
Chrysene (1,2)	ug/kg	930
Di-n-butylphthalate	ug/kg	220 U
Di-n-octylphthalate	ug/kg	220 U
Dibenzo(a,h)anthracene (1,2)	ug/kg	87 UJ
Dibenzofuran	ug/kg	610
1,2-Dichlorobenzene	ug/kg	87 U
1,3-Dichlorobenzene	ug/kg	87 U
1,4-Dichlorobenzene	ug/kg	87 U
3,3'-Dichlorobenzidine	ug/kg	440 U
2,4-Dichlorophenol	ug/kg	220 U
Diethylphthalate	ug/kg	87 U
2,4-Dimethylphenol	ug/kg	220 U
Dimethylphthalate	ug/kg	87 U
4,6-Dinitro-2-methylphenol	ug/kg	440 U
2,4-Dinitrophenol	ug/kg	440 U
2,4-Dinitrotoluene	ug/kg	87 U
2,6-Dinitrotoluene	ug/kg	87 U
Fluoranthene (1)	ug/kg	1800
Fluorene (1)	ug/kg	3800
Hexachlorobenzene	ug/kg	87 U
Hexachlorobutadiene	ug/kg	87 U
Hexachlorocyclopentadiene	ug/kg	87 U
Hexachloroethane	ug/kg	87 U
Indeno(1,2,3-cd)pyrene (1,2)	ug/kg	87 UJ
Isophorone	ug/kg	87 U
2-Methylnaphthalene (1)	ug/kg	22000
2-Methylphenol	ug/kg	220 U
4-Methylphenol	ug/kg	220 U
Naphthalene (1)	ug/kg	19000
2-Nitroaniline	ug/kg	220 U
3-Nitroaniline	ug/kg	220 UJ
4-Nitroaniline	ug/kg	440 U
Nitrobenzene	ug/kg	87 U
2-Nitrophenol	ug/kg	220 U
4-Nitrophenol	ug/kg	440 U
N-nitroso-di-n-propylamine	ug/kg	220 U
N-nitrosodiphenylamine	ug/kg	87 U
Pentachlorophenol	ug/kg	220 U
Phenanthrene (1)	ug/kg	11000
Phenol	ug/kg	87 U
Pyrene (1)	ug/kg	2700
1,2,4-Trichlorobenzene	ug/kg	87 U
2,4,5-Trichlorophenol	ug/kg	220 U
2,4,6-Trichlorophenol	ug/kg	220 U
Total Semivolatiles	ug/kg	70,980
Total PAHs (1)	ug/kg	70,150
Total Carcinogenic PAHs(2)	ug/kg	3,150

(1) Polynuclear Aromatic Hydrocarbon

(2) Carcinogenic Polynuclear Aromatic Hydrocarbon

U Compound was analyzed for but not detected. The value is the quantation limit

J Value estimated since not all QC criteria met

ND Not detected above quantation limits provided

N/A - Not applicable

TABLE TCLP-1
SUMMARY OF TCLP RESULTS
SOIL BORING SAMPLING 12/05-10/2005
SECOND STREET (HASTINGS) SOURCE AREA RI/FS

	Location	Regulatory Limit	TCLP	
	Interval	RCRA TCLP	Composite	
	EPA No		2824-1	
	Date		12/10/2005	
	Time		9:15	
Parameter	Units			
Semivolatile Organics		Conc	Conc.	Q
1,4-Dichlorobenzene	mg/L	7.5	0.005	U
2,4-Dinitrotoluene	mg/L	0.13	0.005	U
Hexachlorobenzene	mg/L	0.13	0.005	U
Hexachlorobutadiene	mg/L	0.5	0.005	U
Hexachloroethane	mg/L	3	0.005	U
2-Methylphenol	mg/L	200	0.01	U
3 and/or 4-Methylphenol	mg/L	200	0.01	U
Nitrobenzene	mg/L	2	0.005	U
Pentachlorophenol	mg/L	100	0.01	U
Pyridine	mg/L	5	N/A	O
2,4,5-Trichlorophenol	mg/L	400	0.01	U
2,4,6-Trichlorophenol	mg/L	2	0.01	U
Volatile Organics			Conc.	Q
Benzene	mg/L	0.5	0.5	K
2-Butanone	mg/L	200	200	K
Carbon Tetrachloride	mg/L	0.5	0.5	K
Chlorobenzene	mg/L	100	100	K
Chloroform	mg/L	6	6	K
1,2-Dichloroethane	mg/L	0.5	0.5	K
1,1-Dichloroethene	mg/L	0.7	0.7	K
Tetrachloroethene	mg/L	0.7	0.7	K
Trichloroethene	mg/L	0.5	0.5	K
Vinyl Chloride	mg/L	0.2	0.2	K

U: The compound was analyzed for but not detected. The associated numerical value is the sample quantitiation limit.

UJ - The analyte was not detected at or above the reporting limit. The reporting limit is an estimate.

N/A - Not applicable.

O - Parameter no analyzed for.

K - The identification of the analyte is acceptable; the reported value maybe biased high. The actual value is expected to be less than the reported

RCRA - Resource Conservation and Recovery Act.

TCLP - Toxicity Characteristics Leaching Procedure.

Regulatory limits from 40 CFR 261.24.

TABLE QA/QC-1
SUMMARY OF VOLATILE COMPOUNDS IDENTIFIED QA/QC SAMPLES (SOIL, RINSATE, WATER TRIP BLANKS)
SOIL BORING SAMPLING 12/05-10/2005
SECOND STREET (HASTINGS) SOURCE AREA RI/FS

Parameter	Location	Soil Trip Blank	Location	Rinsate Blank	Rinsate Blank	Water Trip Blank
	Interval	NA	Interval	NA	NA	NA
	EPA No	2824-49FB	EPA No	2824-101	2824-102	2824-104B
	Date	12/05/2005	Date	12/07/2005	12/10/2005	12/05/2005
	Time	16:50	Time	15:00	8:35	16:55
	Units		Units			
Volatile Organics		Conc. Q		Conc. Q	Conc. Q	Conc. Q
Acetone	ug/kg	27 J	ug/L	13	14	5 U
Benzene	ug/kg	6 U	ug/L	5 U	5 U	5 U
Bromodichloromethane	ug/kg	6 U	ug/L	5 U	5 U	5 U
Bromoform	ug/kg	6 U	ug/L	5 U	5 U	5 U
Bromomethane	ug/kg	6 U	ug/L	5 U	5 U	5 U
2-Butanone (Methyl Ethyl Ketone)	ug/kg	6 UJ	ug/L	5 U	5 U	5 U
Carbon Disulfide	ug/kg	6 U	ug/L	5 U	5 U	5 U
Carbon Tetrachloride	ug/kg	6 U	ug/L	5 U	5 U	5 U
Chlorobenzene	ug/kg	6 U	ug/L	5 U	5 U	5 U
Chloroethane	ug/kg	6 U	ug/L	5 U	5 U	5 U
Chloroform	ug/kg	6 U	ug/L	5 U	5 U	5 U
Chloromethane	ug/kg	6 U	ug/L	5 U	5 U	5 U
Cyclohexane	ug/kg	6 U	ug/L	5 U	5 U	5 U
1,2 Dibromo 3-Chloropropane	ug/kg	6 U	ug/L	5 U	5 U	5 U
Dibromochloromethane	ug/kg	6 U	ug/L	5 U	5 U	5 U
1,2-Dibromoethane	ug/kg	6 U	ug/L	5 U	5 U	5 U
1,2-Dichlorobenzene (Ortho)	ug/kg	6 U	ug/L	5 U	5 U	5 U
1,3-Dichlorobenzene (Meta)	ug/kg	6 U	ug/L	5 U	5 U	5 U
1,4-Dichlorobenzene (Para)	ug/kg	6 U	ug/L	5 U	5 U	5 U
Dichlorodifluoromethane	ug/kg	6 U	ug/L	5 U	5 U	5 U
1,1-Dichloroethane	ug/kg	6 U	ug/L	5 U	5 U	5 U
1,2-Dichloroethane	ug/kg	6 U	ug/L	5 U	5 U	5 U
1,1-Dichloroethene	ug/kg	6 U	ug/L	5 U	5 U	5 U
cis-1,2-Dichloroethene	ug/kg	6 U	ug/L	5 U	5 U	5 U
trans-1,2-Dichloroethene	ug/kg	6 U	ug/L	5 U	5 U	5 U
1,2-Dichloropropane	ug/kg	6 U	ug/L	5 U	5 U	5 U
cis-1,3,-Dichloropropene	ug/kg	6 U	ug/L	5 U	5 U	5 U
trans-1,3,-Dichloropropene	ug/kg	6 U	ug/L	5 U	5 U	5 U
Ethylbenzene	ug/kg	6 U	ug/L	5 U	5 U	5 U
2-Hexanone	ug/kg	6 U	ug/L	5 U	5 U	5 U
Isopropylbenzene	ug/kg	6 U	ug/L	5 U	5 U	5 U
Methyl Acetate	ug/kg	6 U	ug/L	5 U	5 U	5 U
Methyl tert-butyl ether	ug/kg	12 U	ug/L	10 U	10 U	10 U
Methylcyclohexane	ug/kg	6 U	ug/L	5 U	5 U	5 U
Methylene Chloride	ug/kg	6 U	ug/L	5 U	5 U	5 U
4-Methyl-2-Pentanone (MIBK)	ug/kg	6 U	ug/L	5 U	5 U	5 U
Naphthalene	ug/kg	12 U	ug/L	10 U	10 U	10 U
Styrene	ug/kg	6 U	ug/L	5 U	5 U	5 U
1,1,2,2-Tetrachloroethane	ug/kg	6 U	ug/L	5 U	5 U	5 U
Tetrachloroethene	ug/kg	6 U	ug/L	5 U	5 U	5 U
Toluene	ug/kg	6 U	ug/L	5 U	5 U	5 U
1,2,3-Trichlorobenzene	ug/kg	6 U	ug/L	5 U	5 U	5 U
1,2,4-Trichlorobenzene	ug/kg	6 U	ug/L	5 U	5 U	5 U
1,1,1-Trichloroethane	ug/kg	6 U	ug/L	5 U	5 U	5 U
1,1,2-Trichloroethane	ug/kg	6 U	ug/L	5 U	5 U	5 U
Trichloroethene	ug/kg	6 U	ug/L	5 U	5 U	5 U
Trichlorofluoromethane	ug/kg	6 U	ug/L	5 U	5 U	5 U
1,1,2-Trichlorofluoroethane	ug/kg	6 U	ug/L	5 U	5 U	5 U
Vinyl Chloride	ug/kg	6 U	ug/L	5 U	5 U	5 U
m and/or p-Xylene	ug/kg	6 U	ug/L	5 U	5 U	5 U
o-Xylene	ug/kg	6 U	ug/L	5 U	5 U	5 U
Total Volatiles	ug/kg	27	ug/L	13	14	ND
Total Volatiles w/o Naphthalene	ug/kg	27	ug/L	13	14	ND
Total BETXs	ug/kg	ND	ug/L	ND	ND	ND

U : Compound was analyzed for but not detected. The value is the quantation limit.

J : Value estimated since not all QC criteria met.

ND : Not detected above quantation limits provided

TABLE QA/QC-2
SUMMARY OF SEMI-VOLATILE COMPOUNDS IDENTIFIED QA/QC SAMPLES (RINSATE BLANKS)
SOIL/SOURCE MATERIAL SAMPLING 05/02-19/2005
SECOND STREET (HASTINGS) SOURCE AREA RI/FS

	Location	Rinsate Blank	Rinsate Blank
	Interval	NA	NA
	EPA No	2810-301	2810-302
	Date	5/3/2005	5/4/2005
	Time	8.00	10:30
Parameter	Units		
Semivolatile Organics		Conc. Q	Conc. Q
Acenaphthene (1)	ug/L	2 U	2 U
Acenaphthylene (1)	ug/L	2 U	2 U
Anthracene (1)	ug/L	2 U	2 U
Benzo(a)anthracene(1,2)	ug/L	2 U	2 U
Benzo(a)pyrene(1,2)	ug/L	2 U	2 U
Benzo(b)fluoranthene(1,2)	ug/L	2 U	2 U
Benzo(g,h,i)perylene (1)	ug/L	2 U	2 U
Benzo(k)fluoranthene(1,2)	ug/L	2 U	2 U
Benzoic acid	ug/L	5 UJ	5 UJ
Benzyl alcohol	ug/L	2 U	2 U
bis(2-Chloroethoxy)methane	ug/L	2 U	2 U
bis(2-Chloroethyl)ether	ug/L	2 U	2 U
bis(2-Chloroisopropyl)ether	ug/L	2 U	2 U
bis(2-Ethylhexyl)phthalate	ug/L	2 U	2 U
4-Bromophenyl-phenylether	ug/L	2 U	2 U
Butylbenzylphthalate	ug/L	2 U	2 U
Carbazole	ug/L	2 U	2 U
4-Chloro-3-methylphenol	ug/L	2 U	2 U
4-Chloroaniline	ug/L	2 U	2 U
2-Chloronaphthalene (1)	ug/L	2 U	2 U
2-Chlorophenol	ug/L	2 U	2 U
4-Chlorophenyl-phenylether	ug/L	2 U	2 U
Chrysene (1,2)	ug/L	2 U	2 U
Di-n-butylphthalate	ug/L	2 U	2 U
Di-n-octylphthalate	ug/L	2 U	2 U
Dibenzo(a,h)anthracene (1,2)	ug/L	2 U	2 U
Dibenzofuran	ug/L	2 U	2 U
1,2-Dichlorobenzene	ug/L	2 U	2 U
1,3-Dichlorobenzene	ug/L	2 U	2 U
1,4-Dichlorobenzene	ug/L	2 U	2 U
3,3'-Dichlorobenzidine	ug/L	5 UJ	5 UJ
2,4-Dichlorophenol	ug/L	2 U	2 U
Diethylphthalate	ug/L	2 U	2 U
2,4-Dimethylphenol	ug/L	2 U	2 U
Dimethylphthalate	ug/L	2 U	2 U
4,6-Dinitro-2-methylphenol	ug/L	5 UJ	5 UJ
2,4-Dinitrophenol	ug/L	10 UJ	10 UJ
2,4-Dinitrotoluene	ug/L	2 U	2 U
2,6-Dinitrotoluene	ug/L	2 U	2 U
Fluoranthene (1)	ug/L	2 U	2 U
Fluorene (1)	ug/L	2 U	2 U
Hexachlorobenzene	ug/L	2 U	2 U
Hexachlorobutadiene	ug/L	2 U	2 U
Hexachlorocyclopentadiene	ug/L	2 U	2 U
Hexachloroethane	ug/L	2 U	2 U
Indeno(1,2,3-cd)pyrene (1,2)	ug/L	2 U	2 U
Isophorone	ug/L	2 U	2 U
2-Methylnaphthalene (1)	ug/L	2 U	2 U
2-Methylphenol	ug/L	2 U	2 U
4-Methylphenol	ug/L	2 U	2 U
Naphthalene (1)	ug/L	2 U	2 U
2-Nitroaniline	ug/L	2 U	2 U
3-Nitroaniline	ug/L	2 U	2 U
4-Nitroaniline	ug/L	5 UJ	5 UJ
Nitrobenzene	ug/L	2 U	2 U
2-Nitrophenol	ug/L	2 U	2 U
4-Nitrophenol	ug/L	5 UJ	5 UJ
N-nitroso-di-n-propylamine	ug/L	2 U	2 U
N-nitrosodiphenylamine	ug/L	2 U	2 U
Pentachlorophenol	ug/L	5 U	5 U
Phenanthrene (1)	ug/L	2 U	2 U
Phenol	ug/L	2 U	2 U
Pyrene (1)	ug/L	2 U	2 U
1,2,4-Trichlorobenzene	ug/L	2 U	2 U
2,4,5-Trichlorophenol	ug/L	2 U	2 U
2,4,6-Trichlorophenol	ug/L	2 U	2 U
Total Semivolatiles	ug/L	ND	ND
Total PAHs (1)	ug/L	ND	ND
Total Carcinogenic PAHs(2)	ug/L	ND	ND

(1) Polynuclear Aromatic Hydrocarbon.

(2) Carcinogenic Polynuclear Aromatic Hydrocarbon.

U Compound was analyzed for but not detected. The value is the quantitation limit

J Value estimated since not all QC criteria met

ND Not detected above quantitation limits provided N/A - Not applicable

April 2005

Boring Data

TABLE KEY

Table #	Description
Table A2-1	Summary of Volatile Compounds Identified (Boring A2)
Table A2-2	Summary of Semi-Volatile Compounds Identified (Boring A2)
Table BEXW2-1	Summary of Volatile Compounds Identified (Boring BEXW2)
Table BEXW2-2	Summary of Semi-Volatile Compounds Identified (Boring BEXW2)
Table BP1-1	Summary of Volatile Compounds Identified (Boring BP1)
Table BP1-2	Summary of Semi-Volatile Compounds Identified (Boring BP1)
Table BEXW1-1	Summary of Volatile Compounds Identified (Boring BEXW1)
Table BEXW1-2	Summary of Semi-Volatile Compounds Identified (Boring BEXW1)
Table A1-1	Summary of Volatile Compounds Identified (Boring A1)
Table A1-2	Summary of Semi-Volatile Compounds Identified (Boring A1)
Table BMW9-1	Summary of Volatile Compounds Identified (Boring BMW9)
Table BMW9-2	Summary of Semi-Volatile Compounds Identified (Boring BMW9)
Table GH1-1	Summary of Volatile Compounds Identified (Boring GH1)
Table GH1-2	Summary of Semi-Volatile Compounds Identified (Boring GH1)
Table GH2-1	Summary of Volatile Compounds Identified (Boring GH2)
Table GH2-2	Summary of Semi-Volatile Compounds Identified (Boring GH2)
Table SB-1	Summary of Volatile Compounds Identified (Soil Blanks)
Table RB-1	Summary of Volatile Compounds Identified (Rinsate Blanks)
Table RB-2	Summary of Semi-Volatile Compounds Identified (Rinsate Blanks)
Table WB-1	Summary of Volatile Compounds Identified (Water Trip Blanks)
Table TCLP	Summary of TCLP Results

TABLE A2-1
SUMMARY OF VOLATILE COMPOUNDS IDENTIFIED (BORING A2)
SOIL/SOURCE MATERIAL SAMPLING 12/2-6/2003
SECOND STREET (HASTINGS) SOURCE AREA RI/FS

	Location	A-2	A-2	A-2	A-2	A-2	A-2	A-2	A-2	A-2	A-2	A-2
	Interval	2.5-3.5 ft bgs	9.0-10.0 ft bgs	20-21 ft bgs	30-31 ft bgs	40-41 ft bgs	50-51 ft bgs	60-61 ft bgs	70-71 ft bgs	80-81 ft bgs	90-91 ft bgs	100-101 ft bgs
	EPA No	2610-1	2610-2	2610-3	2610-4	2610-5	2610-6	2610-7	2610-8	2610-9	2610-10	2610-11
	Date	05/02/2005	38474	38474	38474	38474	38474	38474	38474	38474	38474	38474
	Time	13:45	14:20	14:35	15:00	15:15	16:15	16:40	17:40	18:25	8:10	9:15
Parameter	Units											
Volatile Organics		Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q
Acetone	ug/kg	15 UJ	60 J	29 J	18 J	27 J	18 J	14 J	18 J	10 U	10 U	10 U
Benzene	ug/kg	15 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Bromodichloromethane	ug/kg	15 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Bromoform	ug/kg	15 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Bromomethane	ug/kg	15 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Butanone (Methyl Ethyl Ketone)	ug/kg	15 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Carbon Disulfide	ug/kg	15 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Carbon Tetrachloride	ug/kg	15 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chlorobenzene	ug/kg	15 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chloroethane	ug/kg	15 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chloroform	ug/kg	15 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chloromethane	ug/kg	15 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Cyclohexane	ug/kg	15 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2 Dibromo 3-Chloropropane	ug/kg	15 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Dibromochloromethane	ug/kg	15 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dibromoethane	ug/kg	15 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichlorobenzene (Ortho)	ug/kg	15 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,3-Dichlorobenzene (Meta)	ug/kg	15 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,4-Dichlorobenzene (Para)	ug/kg	15 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Dichlorodifluoromethane	ug/kg	15 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethane	ug/kg	15 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloroethane	ug/kg	15 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethene	ug/kg	15 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
cis-1,2-Dichloroethene	ug/kg	15 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
trans-1,2-Dichloroethene	ug/kg	15 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloropropane	ug/kg	15 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
cis-1,3,-Dichloropropene	ug/kg	15 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
trans-1,3,-Dichloropropene	ug/kg	15 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Ethylbenzene	ug/kg	15 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Hexanone	ug/kg	15 UJ	10 U	10 U	10 U	67	10 U	10 U	10 U	10 U	10 U	10 U
Isopropylbenzene	ug/kg	15 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methyl Acetate	ug/kg	15 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methyl tert-butyl ether	ug/kg	15 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methylcyclohexane	ug/kg	15 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methylene Chloride	ug/kg	15 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Methyl-2-Pentanone (MIBK)	ug/kg	15 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Styrene	ug/kg	15 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1,2,2-Tetrachloroethane	ug/kg	15 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U

Parameter	Location	A-2	A-2	A-2	A-2	A-2	A-2	A-2	A-2	A-2	A-2	A-2
	Interval	2.5-3.5 ft bgs	9.0-10.0 ft bgs	20-21 ft bgs	30-31 ft bgs	40-41 ft bgs	50-51 ft bgs	60-61 ft bgs	70-71 ft bgs	80-81 ft bgs	90-91 ft bgs	100-101 ft bgs
	EPA No	2610-1	2610-2	2610-3	2610-4	2610-5	2610-6	2610-7	2610-8	2610-9	2610-10	2610-11
	Date	05/02/2005	38474	38474	38474	38474	38474	38474	38474	38474	38474	38474
	Time	13:45	14:20	14:35	15.00	15:15	16.15	16:40	17:40	18:25	8:10	9:15
	Units											
Volatile Organics (Cont)		Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q
Tetrachloroethene	ug/kg	15 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Toluene	ug/kg	15 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2,4-Trichlorobenzene	ug/kg	15 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1,1-Trichloroethane	ug/kg	15 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1,2-Trichloroethane	ug/kg	15 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Trichloroethene	ug/kg	15 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Trichlorofluoromethane	ug/kg	15 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1,2-Trichlorofluoroethane	ug/kg	15 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Vinyl Chloride	ug/kg	15 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Total Xylenes	ug/kg	15 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Total Volatiles	ug/kg	ND	60	29	16	94	18	14	16	ND	ND	ND
Total BETXs	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

U : Compound was analyzed for but not detected. The value is the quantation limit.

UJ - The analyte was not detected at or above the reporting limit. The reporting limit is an estimate.

J : Value estimated since not all QC criteria met.

ND : Not detected above quantation limits provided.

TABLE A2-1
SUMMARY OF VOLATILE COMPOUNDS IDENTIFIED (BORING A2)
SOIL/SOURCE MATERIAL SAMPLING 12/2-6/2003
SECOND STREET (HASTINGS) SOURCE AREA RI/FS

Parameter	Location	A-2	A-2	A-2	A-2	A-2	A-2	A-2	A-2
	Interval	114-115 ft bgs	120-121 ft bgs	132-133 ft bgs	141-142 ft bgs	150-151 ft bgs	160-161 ft bgs	171-172 ft bgs	178-179 ft bgs
	EPA No	2610-12	2610-13	2610-14	2610-15	2610-16	2610-17	2610-18	2610-19
	Date	38474	38474	38474	38474	38474	38474	38474	38474
	Time	10:10	11.05	12:20	14:00	14:15	16.16	18:30	15:45
	Units								
Volatile Organics		Conc Q	Conc Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q
Acetone	ug/kg	14 J	15 J	14 J	12 U	11 J	10 U	18 J	10 U
Benzene	ug/kg	10 U	10 U	10 U	12 U	10 U	10 U	10 U	10 U
Bromodichloromethane	ug/kg	10 U	10 U	10 U	12 U	10 U	10 U	10 U	10 U
Bromoform	ug/kg	10 U	10 U	10 U	12 U	10 U	10 U	10 U	10 U
Bromomethane	ug/kg	10 U	10 U	10 U	12 U	10 U	10 U	10 U	10 U
2-Butanone (Methyl Ethyl Ketone)	ug/kg	10 U	10 U	10 U	12 U	10 U	10 U	10 U	10 U
Carbon Disulfide	ug/kg	10 U	10 U	10 U	12 U	10 U	10 U	10 U	10 U
Carbon Tetrachloride	ug/kg	10 U	10 U	10 U	12 U	10 U	10 U	10 U	10 U
Chlorobenzene	ug/kg	10 U	10 U	10 U	12 U	10 U	10 U	10 U	10 U
Chloroethane	ug/kg	10 U	10 U	10 U	12 U	10 U	10 U	10 U	10 U
Chloroform	ug/kg	10 U	10 U	10 U	12 U	10 U	10 U	10 U	10 U
Chloromethane	ug/kg	10 U	10 U	10 U	12 U	10 U	10 U	10 U	10 U
Cyclohexane	ug/kg	10 U	10 U	10 U	12 U	10 U	10 U	10 U	10 U
1,2 Dibromo 3-Chloropropane	ug/kg	10 U	10 U	10 U	12 U	10 U	10 U	10 U	10 U
Dibromochloromethane	ug/kg	10 U	10 U	10 U	12 U	10 U	10 U	10 U	10 U
1,2-Dibromoethane	ug/kg	10 U	10 U	10 U	12 U	10 U	10 U	10 U	10 U
1,2-Dichlorobenzene (Ortho)	ug/kg	10 U	10 U	10 U	12 U	10 U	10 U	10 U	10 U
1,3-Dichlorobenzene (Meta)	ug/kg	10 U	10 U	10 U	12 U	10 U	10 U	10 U	10 U
1,4-Dichlorobenzene (Para)	ug/kg	10 U	10 U	10 U	12 U	10 U	10 U	10 U	10 U
Dichlorodifluoromethane	ug/kg	10 U	10 U	10 U	12 U	10 U	10 U	10 U	10 U
1,1-Dichloroethane	ug/kg	10 U	10 U	10 U	12 U	10 U	10 U	10 U	10 U
1,2-Dichloroethane	ug/kg	10 U	10 U	10 U	12 U	10 U	10 U	10 U	10 U
1,1-Dichloroethene	ug/kg	10 U	10 U	10 U	12 U	10 U	10 U	10 U	10 U
cis-1,2-Dichloroethene	ug/kg	10 U	10 U	10 U	12 U	10 U	10 U	10 U	10 U
trans-1,2-Dichloroethene	ug/kg	10 U	10 U	10 U	12 U	10 U	10 U	10 U	10 U
1,2-Dichloropropane	ug/kg	10 U	10 U	10 U	12 U	10 U	10 U	10 U	10 U
cis-1,3,-Dichloropropene	ug/kg	10 U	10 U	10 U	12 U	10 U	10 U	10 U	10 U
trans-1,3,-Dichloropropene	ug/kg	10 U	10 U	10 U	12 U	10 U	10 U	10 U	10 U
Ethylbenzene	ug/kg	10 U	10 U	10 U	12 U	10 U	10 U	10 U	10 U
2-Hexanone	ug/kg	10 U	10 U	10 U	12 U	10 U	10 U	10 U	10 U
Isopropylbenzene	ug/kg	10 U	10 U	10 U	12 U	10 U	10 U	10 U	10 U
Methyl Acetate	ug/kg	10 U	10 U	10 U	12 U	10 U	10 U	10 U	10 U
Methyl tert-butyl ether	ug/kg	10 U	10 U	10 U	12 U	10 U	10 U	10 U	10 U
Methylcyclohexane	ug/kg	10 U	10 U	10 U	12 U	10 U	10 U	10 U	10 U
Methylene Chloride	ug/kg	10 U	10 U	10 U	12 U	10 U	10 U	10 U	10 U
4-Methyl-2-Pentanone (MIBK)	ug/kg	10 U	10 U	10 U	12 U	10 U	10 U	10 U	10 U
Styrene	ug/kg	10 U	10 U	10 U	12 U	10 U	10 U	10 U	10 U
1,1,2,2-Tetrachloroethane	ug/kg	10 U	10 U	10 U	12 U	10 U	10 U	10 U	10 U

Parameter									
	Location	A-2	A-2	A-2	A-2	A-2	A-2	A-2	A-2
	Interval	114-115 ft bgs	120-121 ft bgs	132-133 ft bgs	141-142 ft bgs	150-151 ft bgs	160-161 ft bgs	171-172 ft bgs	178-179 ft bgs
	EPA No	2610-12	2610-13	2610-14	2610-15	2610-16	2610-17	2610-18	2610-19
	Date	38474	38474	38474	38474	38474	38474	38474	38474
	Time	10.10	11:05	12:20	14:00	14:16	15:15	15:30	15:45
	Units								
Volatile Organics (Cont)		Conc Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q
Tetrachloroethane	ug/kg	10 U	10 U	10 U	12 U	10 U	10 U	10 U	10 U
Toluene	ug/kg	10 U	10 U	10 U	12 U	10 U	10 U	10 U	10 U
1,2,4-Trichlorobenzene	ug/kg	10 U	10 U	10 U	12 U	10 U	10 U	10 U	10 U
1,1,1-Trichloroethane	ug/kg	10 U	10 U	10 U	12 U	10 U	10 U	10 U	10 U
1,1,2-Trichloroethane	ug/kg	10 U	10 U	10 U	12 U	10 U	10 U	10 U	10 U
Trichloroethene	ug/kg	10 U	10 U	10 U	12 U	10 U	10 U	10 U	10 U
Trichlorofluoromethane	ug/kg	10 U	10 U	10 U	12 U	10 U	10 U	10 U	10 U
1,1,2-Trichlorofluoroethane	ug/kg	10 U	10 U	10 U	12 U	10 U	10 U	10 U	10 U
Vinyl Chloride	ug/kg	10 U	10 U	10 U	12 U	10 U	10 U	10 U	10 U
Total Xylenes	ug/kg	10 U	10 U	10 U	12 U	10 U	10 U	10 U	10 U
Total Volatiles	ug/kg	14	15	14	ND	11	ND	18	ND
Total BETXs	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND

U : Compound was analyzed for but not detected. The value is the quantiation limit.

UJ - The analyte was not detected at or above the reporting limit. The reporting limit is an estimate.

J : Value estimated since not all QC criteria met.

ND : Not detected above quantation limits provided.

TABLE A2-2
SUMMARY OF SEMI-VOLATILE COMPOUNDS IDENTIFIED (BORING A2)
SOIL/SOURCE MATERIAL SAMPLING 05/2-19/2005
SECOND STREET (HASTINGS) SOURCE AREA RI/FS

Parameter	Location	A-2	A-2	A-2	A-2	A-2	A-2	A-2	A-2	A-2	A-2	A-2
	Interval	2.5-3.5 ft bgs	9.0-10.0 ft bgs	20-21 ft bgs	30-31 ft bgs	40-41 ft bgs	50-51 ft bgs	60-61 ft bgs	70-71 ft bgs	80-81 ft bgs	90-91 ft bgs	100-101 ft bgs
	EPA No	2610-1	2610-2	2610-3	2610-4	2610-5	2610-6	2610-7	2610-8	2610-9	2610-10	2610-11
	Date	05/02/2005	5/2/2005	5/2/2005	5/2/2005	5/2/2005	5/2/2005	5/2/2005	5/2/2005	5/2/2005	5/2/2005	5/2/2005
	Time	13:45	14:20	14:36	16:00	16:15	16:16	16:40	17:40	18:25	8:10	9:15
	Units											
Semivolatile Organics		Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q
Acenaphthene (1)	ug/kg	23,000 U	410 U	2,100 U	390 U	410 U	390 U	390 U	350 U	340 U	350 U	340 U
Acenaphthylene (1)	ug/kg	80,000	1,600	9,800	390 U	560	390 U	390 U	350 U	340 U	350 U	340 U
Acetophenone	ug/kg	23,000 U	410 U	2,100 U	390 U	410 U	390 U	390 U	350 U	340 U	350 U	340 U
Anthracene (1)	ug/kg	43,000	460	3,300	390 U	410 U	390 U	390 U	350 U	340 U	350 U	340 U
Atrazine	ug/kg	23,000 U	410 U	2,100 U	390 U	410 U	390 U	390 U	350 U	340 U	350 U	340 U
Benzaldehyde	ug/kg	23,000 U	410 U	2,100 U	390 U	410 U	390 U	390 U	350 U	340 U	350 U	340 U
Benzo(a)anthracene(1,2)	ug/kg	180,000	4,400	20,000	390 U	1,300	390 U	390 U	350 U	340 U	350 U	340 U
Benzo(a)pyrene(1,2)	ug/kg	250,000	6,700	31,000	600	1,500	390 U	390 U	350 U	340 U	350 U	340 U
Benzo(b)fluoranthene(1,2)	ug/kg	180,000	3,000	15,000	390 U	1,200	390 U	390 U	350 U	340 U	350 U	340 U
Benzo(g,h,i)perylene (1)	ug/kg	56,000	2,900	2,800	390 U	410 U	390 U	390 U	350 U	340 U	350 U	340 U
Benzo(k)fluoranthene(1,2)	ug/kg	150,000	3,000	14,000	390 U	900	390 U	390 U	350 U	340 U	350 U	340 U
Biphenyl	ug/kg	23,000 U	410 U	2,100 U	390 U	410 U	390 U	390 U	350 U	340 U	350 U	340 U
bis(2-Chloroethoxy)methane	ug/kg	23,000 U	410 U	2,100 U	390 U	410 U	390 U	390 U	350 U	340 U	350 U	340 U
bis(2-Chloroethyl)ether	ug/kg	23,000 U	410 U	2,100 U	390 U	410 U	390 U	390 U	350 U	340 U	350 U	340 U
bis(2-Chloroisopropyl)ether	ug/kg	23,000 U	410 U	2,100 U	390 U	410 U	390 U	390 U	350 U	340 U	350 U	340 U
bis(2-Ethylhexyl)phthalate	ug/kg	23,000 U	410 U	2,100 U	390 U	410 U	390 U	390 U	350 U	340 U	350 U	340 U
4-Bromophenyl-phenylether	ug/kg	23,000 U	410 U	2,100 U	390 U	410 U	390 U	390 U	350 U	340 U	350 U	340 U
Butylbenzylphthalate	ug/kg	23,000 U	410 U	2,100 U	390 U	410 U	390 U	390 U	350 U	340 U	350 U	340 U
Caprolactam	ug/kg	23,000 U	410 U	2,100 U	390 U	410 U	390 U	390 U	350 U	340 U	350 U	340 U
Carbazole	ug/kg	23,000 U	410 U	2,100 U	390 U	410 U	390 U	390 U	350 U	340 U	350 U	340 U
4-Chloro-3-methyphenol	ug/kg	23,000 U	410 U	2,100 U	390 U	410 U	390 U	390 U	350 U	340 U	350 U	340 U
4-Chloroaniline	ug/kg	23,000 U	410 U	2,100 U	390 U	410 U	390 U	390 U	350 U	340 U	350 U	340 U
2-Chloronaphthalene (1)	ug/kg	23,000 U	410 U	2,100 U	390 U	410 U	390 U	390 U	350 U	340 U	350 U	340 U
2-Chlorophenol	ug/kg	23,000 U	410 U	2,100 U	390 U	410 U	390 U	390 U	350 U	340 U	350 U	340 U
4-Chlorophenyl-phenylether	ug/kg	23,000 U	410 U	2,100 U	390 U	410 U	390 U	390 U	350 U	340 U	350 U	340 U
Chrysene (1,2)	ug/kg	180,000	4,400	21,000	390 U	1,200	390 U	390 U	350 U	340 U	350 U	340 U
Di-n-butylphthalate	ug/kg	23,000 U	410 U	2,100 U	390 U	410 U	390 U	390 U	350 U	340 U	350 U	340 U
Di-n-octylphthalate	ug/kg	23,000 U	410 U	2,100 U	390 U	410 U	390 U	390 U	350 U	340 U	350 U	340 U
Dibenzo(a,h)anthracene (1,2)	ug/kg	61,000	1,100	5,100	390 U	410 U	390 U	390 U	350 U	340 U	350 U	340 U
Dibenzofuran	ug/kg	23,000 U	410 U	2,100 U	390 U	410 U	390 U	390 U	350 U	340 U	350 U	340 U
3,3'-Dichlorobenzidine	ug/kg	23,000 U	410 U	2,100 U	390 U	410 U	390 U	390 U	350 U	340 U	350 U	340 U
2,4-Dichlorophenol	ug/kg	23,000 U	410 U	2,100 U	390 U	410 U	390 U	390 U	350 U	340 U	350 U	340 U
Diethylphthalate	ug/kg	23,000 U	410 U	2,100 U	390 U	410 U	390 U	390 U	350 U	340 U	350 U	340 U
2,4-Dimethylphenol	ug/kg	23,000 U	410 U	2,100 U	390 U	410 U	390 U	390 U	350 U	340 U	350 U	340 U
Dimethylphthalate	ug/kg	23,000 U	410 U	2,100 U	390 U	410 U	390 U	390 U	350 U	340 U	350 U	340 U
4,6-Dinitro-2-methylphenol	ug/kg	57,000 U	1,000 U	5,300 U	980 U	1,000 U	990 U	980 U	870 U	860 U	870 U	860 U
2,4-Dinitrophenol	ug/kg	57,000 U	1,000 U	5,300 U	980 U	1,000 U	990 U	980 U	870 U	860 U	870 U	860 U

Parameter	Location	A-2	A-2	A-2	A-2	A-2	A-2	A-2	A-2	A-2	A-2	A-2
	Interval	2.5-3 5 ft bgs	9.0-10.0 ft bgs	20-21 ft bgs	30-31 ft bgs	40-41 ft bgs	50-51 ft bgs	60-61 ft bgs	70-71 ft bgs	80-81 ft bgs	90-91 ft bgs	100-101 ft bgs
	EPA No	2610-1	2610-2	2610-3	2610-4	2610-5	2610-6	2610-7	2610-8	2610-9	2610-10	2610-11
	Date	05/02/2005	38474	38474	38474	38474	38474	38474	38474	38474	38474	38474
	Time	13:45	14:20	14:35	15:00	15:15	16:15	16:40	17:40	18:25	8.10	9.15
	Units											
Semivolatile Organics (Cont)		Conc Q	Conc Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc Q	Conc. Q
2,4-Dinitrotoluene	ug/kg	23,000 U	410 U	2,100 U	390 U	410 U	390 U	390 U	350 U	340 U	350 U	340 U
2 6-Dinitrotoluene	ug/kg	23,000 U	410 U	2,100 U	390 U	410 U	390 U	380 U	350 U	340 U	350 U	340 U
Fluoranthene (1)	ug/kg	160,000	2,900	16,000	390 U	1,000	390 U	380 U	360 U	340 U	350 U	340 U
Fluorene (1)	ug/kg	23,000 U	410 U	2,100 U	390 U	410 U	390 U	390 U	350 U	340 U	350 U	340 U
Hexachlorobenzene	ug/kg	23,000 U	410 U	2,100 U	390 U	410 U	380 U	390 U	360 U	340 U	350 U	340 U
Hexachlorobutadiene	ug/kg	23,000 U	410 U	2,100 U	390 U	410 U	390 U	380 U	360 U	340 U	350 U	340 U
Hexachlorocyclopentadiene	ug/kg	23,000 U	410 U	2,100 U	390 U	410 U	390 U	390 U	350 U	340 U	350 U	340 U
Hexachloroethane	ug/kg	23,000 U	410 U	2,100 U	390 U	410 U	390 U	390 U	350 U	340 U	350 U	340 U
Indeno(1,2,3-cd)pyrene (1,2)	ug/kg	120,000	2,700	9,100	390 U	600	390 U	390 U	350 U	340 U	350 U	340 U
Isophorone	ug/kg	23,000 U	410 U	2,100 U	390 U	410 U	380 U	380 U	350 U	340 U	350 U	340 U
2-Methylnaphthalene (1)	ug/kg	23,000 U	410 U	2,100 U	350 U	410 U	390 U	390 U	350 U	340 U	360 U	340 U
2-Methylphenol	ug/kg	23,000 U	410 U	2,100 U	380 U	410 U	380 U	390 U	360 U	340 U	350 U	340 U
4-Methylphenol	ug/kg	23,000 U	410 U	2,100 U	390 U	410 U	390 U	390 U	350 U	340 U	350 U	340 U
Naphthalene (1)	ug/kg	23,000 U	410 U	2,100 U	390 U	410 U	380 U	390 U	360 U	340 U	350 U	340 U
2-Nitroaniline	ug/kg	57,000 U	1,000 U	5,300 U	980 U	1,000 U	990 U	980 U	870 U	860 U	870 U	860 U
3-Nitroaniline	ug/kg	57,000 U	1,000 U	5,300 U	980 U	1,000 U	990 U	980 U	870 U	860 U	870 U	860 U
4-Nitroaniline	ug/kg	57,000 U	1,000 U	5,300 U	980 U	1,000 U	990 U	980 U	870 U	860 U	870 U	860 U
Nitrobenzene	ug/kg	23,000 U	410 U	2,100 U	390 U	410 U	390 U	380 U	380 U	340 U	350 U	340 U
2-Nitrophenol	ug/kg	23,000 U	410 U	2,100 U	390 U	410 U	390 U	390 U	360 U	340 U	350 U	340 U
4-Nitrophenol	ug/kg	57,000 U	1,000 U	5,300 U	980 U	1,000 U	990 U	980 U	870 U	860 U	870 U	860 U
N-nitroso-di-n-propylamine	ug/kg	23,000 U	410 U	2,100 U	390 U	410 U	390 U	390 U	350 U	340 U	350 U	340 U
N-nitrosodiphenylamine	ug/kg	23,000 U	410 U	2,100 U	390 U	410 U	390 U	390 U	350 U	340 U	350 U	340 U
Pentachlorophenol	ug/kg	57,000 U	1,000 U	5,300 U	980 U	1,000 U	990 U	980 U	870 U	860 U	870 U	860 U
Phenanthrene (1)	ug/kg	32,000	700	2,100 U	390 U	410 U	390 U	390 U	350 U	340 U	350 U	340 U
Phenol	ug/kg	23,000 U	410 U	2,100 U	390 U	410 U	380 U	380 U	380 U	340 U	350 U	340 U
Pyrene (1)	ug/kg	250,000	6,500	44,000	390 U	2,500	390 U	390 U	360 U	340 U	360 U	340 U
2,4,5-Trichlorophenol	ug/kg	57,000 U	1,000 U	5,300 U	980 U	1,000 U	990 U	980 U	870 U	860 U	870 U	860 U
2,4,6-Trichlorophenol	ug/kg	23,000 U	410 U	2,100 U	390 U	410 U	390 U	380 U	350 U	340 U	350 U	340 U
Total Semivolatiles	ug/kg	1,742,000	40,380	191,000	600	10,780	ND	ND	ND	ND	ND	ND
Total PAHs (1)	ug/kg	1,742,000	40,380	191,000	600	10,780	ND	ND	ND	ND	ND	ND
Total Carcinogenic PAHs(2)	ug/kg	1,121,000	25,300	115,200	600	6,700	ND	ND	ND	ND	ND	ND

(1) Polynuclear Aromatic Hydrocarbon.

(2) Carcinogenic Polynuclear Aromatic Hydrocarbon.

U : Compound was analyzed for but not detected. The value is the quantation limit.

J : Value estimated since not all QC criteria met.

ND : Not detected above quantation limits provided.

N/A - Not applicable.

TABLE A2-2
SUMMARY OF SEMI-VOLATILE COMPOUNDS IDENTIFIED (BORING A2)
SOIL/SOURCE MATERIAL SAMPLING 05/2-19/2005
SECOND STREET (HASTINGS) SOURCE AREA RI/FS

	Location	A-2	A-2	A-2	A-2	A-2	A-2	A-2	A-2
	Interval	114-115 ft bgs	120-121 ft bgs	132-133 ft bgs	141-142 ft bgs	150-151 ft bgs	160-161 ft bgs	171-172 ft bgs	178-179 ft bgs
	EPA No	2610-12	2610-13	2610-14	2610-15	2610-16	2610-17	2610-18	2610-19
	Date	5/2/2005	5/2/2005	5/2/2005	5/2/2005	5/2/2005	5/2/2005	5/2/2005	5/2/2005
	Time	10:10	11:05	12:20	14:00	14:15	15:15	15:30	15:45
Parameter	Units								
Semivolatile Organics		Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q
Acenaphthene (1)	ug/kg	350 U	340 U	370 U	380 U	360 U	380 U	360 U	370 U
Acenaphthylene (1)	ug/kg	350 U	340 U	370 U	380 U	360 U	380 U	360 U	370 U
Acetophenone	ug/kg	350 U	340 U	370 U	380 U	360 U	380 U	360 U	370 U
Anthracene (1)	ug/kg	350 U	340 U	370 U	380 U	360 U	380 U	360 U	370 U
Atrazine	ug/kg	350 U	340 U	370 U	380 U	360 U	380 U	360 U	370 U
Benzaldehyde	ug/kg	350 U	340 U	370 U	380 U	360 U	380 U	360 U	370 U
Benzo(a)anthracene(1,2)	ug/kg	350 U	340 U	370 U	380 U	360 U	380 U	360 U	370 U
Benzo(a)pyrene(1,2)	ug/kg	350 U	340 U	370 U	380 U	360 U	380 U	360 U	370 U
Benzo(b)fluoranthene(1,2)	ug/kg	350 U	340 U	370 U	380 U	360 U	380 U	360 U	370 U
Benzo(g,h,i)perylene (1)	ug/kg	350 U	340 U	370 U	380 U	360 U	380 U	360 U	370 U
Benzo(k)fluoranthene(1,2)	ug/kg	350 U	340 U	370 U	380 U	360 U	380 U	360 U	370 U
Biphenyl	ug/kg	350 U	340 U	370 U	380 U	360 U	380 U	360 U	370 U
bis(2-Chloroethoxy)methane	ug/kg	350 U	340 U	370 U	380 U	360 U	380 U	360 U	370 U
bis(2-Chloroethyl)ether	ug/kg	350 U	340 U	370 U	380 U	360 U	380 U	360 U	370 U
bis(2-Chloroisopropyl)ether	ug/kg	350 U	340 U	370 U	380 U	360 U	380 U	360 U	370 U
bis(2-Ethylhexyl)phthalate	ug/kg	350 U	340 U	370 U	700	360 U	560	360 U	370 U
4-Bromophenyl-phenylether	ug/kg	350 U	340 U	370 U	380 U	360 U	380 U	360 U	370 U
Butylbenzylphthalate	ug/kg	350 U	340 U	370 U	380 U	360 U	380 U	360 U	370 U
Caprolactam	ug/kg	350 U	340 U	370 U	380 U	360 U	380 U	360 U	370 U
Carbazole	ug/kg	350 U	340 U	370 U	380 U	360 U	380 U	360 U	370 U
4-Chloro-3-methylphenol	ug/kg	350 U	340 U	370 U	380 U	360 U	380 U	360 U	370 U
4-Chloroaniline	ug/kg	350 U	340 U	370 U	380 U	360 U	380 U	360 U	370 U
2-Chloronaphthalene (1)	ug/kg	350 U	340 U	370 U	380 U	360 U	380 U	360 U	370 U
2-Chlorophenol	ug/kg	350 U	340 U	370 U	380 U	360 U	380 U	360 U	370 U
4-Chlorophenyl-phenylether	ug/kg	350 U	340 U	370 U	380 U	360 U	380 U	360 U	370 U
Chrysene (1,2)	ug/kg	350 U	340 U	370 U	380 U	360 U	380 U	360 U	370 U
Di-n-butylphthalate	ug/kg	350 U	340 U	370 U	380 U	360 U	380 U	360 U	370 U
Di-n-octylphthalate	ug/kg	350 U	340 U	370 U	380 U	360 U	380 U	360 U	370 U
Dibenzo(a,h)anthracene (1,2)	ug/kg	350 U	340 U	370 U	380 U	360 U	380 U	360 U	370 U
Dibenzofuran	ug/kg	350 U	340 U	370 U	380 U	360 U	380 U	360 U	370 U
3,3'-Dichlorobenzidine	ug/kg	350 U	340 U	370 U	380 U	360 U	380 U	360 U	370 U
2,4-Dichlorophenol	ug/kg	350 U	340 U	370 U	380 U	360 U	380 U	360 U	370 U
Diethylphthalate	ug/kg	350 U	340 U	370 U	380 U	360 U	380 U	360 U	370 U
2,4-Dimethylphenol	ug/kg	350 U	340 U	370 U	380 U	360 U	380 U	360 U	370 U
Dimethylphthalate	ug/kg	350 U	340 U	370 U	380 U	360 U	380 U	360 U	370 U
4,6-Dinitro-2-methylphenol	ug/kg	870 U	850 U	930 U	970 U	900 U	940 U	900 U	920 U
2,4-Dinitrophenol	ug/kg	870 U	850 U	930 U	970 U	900 U	940 U	900 U	920 U

Parameter	Location	A-2	A-2	A-2	A-2	A-2	A-2	A-2	A-2
	Interval	114-115 ft bgs	120-121 ft bgs	132-133 ft bgs	141-142 ft bgs	150-151 ft bgs	160-161 ft bgs	171-172 ft bgs	178-179 ft bgs
	EPA No	2610-12	2610-13	2610-14	2610-15	2610-16	2610-17	2610-18	2610-19
	Date	38474	38474	38474	38474	38474	38474	38474	38474
	Time	10:10	11:05	12:20	14:00	14:15	15:15	15:30	15:45
	Units								
Semivolatile Organics (Cont)		Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc Q	Conc. Q
2,4-Dinitrotoluene	ug/kg	360 U	340 U	370 U	380 U	360 U	380 U	360 U	370 U
2,6-Dinitrotoluene	ug/kg	350 U	340 U	370 U	380 U	360 U	380 U	360 U	370 U
Fluoranthene (1)	ug/kg	350 U	340 U	370 U	380 U	360 U	380 U	360 U	370 U
Fluorene (1)	ug/kg	350 U	340 U	370 U	380 U	360 U	380 U	360 U	370 U
Hexachlorobenzene	ug/kg	350 U	340 U	370 U	380 U	360 U	380 U	360 U	370 U
Hexachlorobutadiene	ug/kg	350 U	340 U	370 U	380 U	360 U	380 U	380 U	370 U
Hexachlorocyclopentadiene	ug/kg	350 U	340 U	370 U	380 U	360 U	380 U	380 U	370 U
Hexachloroethane	ug/kg	350 U	340 U	370 U	380 U	360 U	380 U	360 U	370 U
Indeno(1,2,3-cd)pyrene (1,2)	ug/kg	350 U	340 U	370 U	380 U	380 U	380 U	360 U	370 U
Isophorone	ug/kg	360 U	340 U	370 U	380 U	380 U	380 U	360 U	370 U
2-Methylnaphthalene (1)	ug/kg	350 U	340 U	370 U	380 U	380 U	380 U	360 U	370 U
2-Methylphenol	ug/kg	350 U	340 U	370 U	380 U	380 U	380 U	380 U	370 U
4-Methylphenol	ug/kg	350 U	340 U	370 U	380 U	360 U	380 U	360 U	370 U
Naphthalene (1)	ug/kg	350 U	340 U	370 U	380 U	360 U	380 U	360 U	370 U
2-Nitroaniline	ug/kg	870 U	850 U	930 U	970 U	900 U	940 U	900 U	920 U
3-Nitroaniline	ug/kg	870 U	850 U	930 U	970 U	900 U	940 U	800 U	920 U
4-Nitroaniline	ug/kg	870 U	850 U	930 U	970 U	800 U	940 U	900 U	920 U
Nitrobenzene	ug/kg	350 U	340 U	370 U	380 U	380 U	380 U	360 U	370 U
2-Nitrophenol	ug/kg	350 U	340 U	370 U	380 U	380 U	380 U	360 U	370 U
4-Nitrophenol	ug/kg	870 U	850 U	930 U	970 U	900 U	940 U	900 U	920 U
N-nitroso-di-n-propylamine	ug/kg	350 U	340 U	370 U	380 U	360 U	380 U	360 U	370 U
N-nitrosodiphenylamine	ug/kg	360 U	340 U	370 U	380 U	360 U	380 U	380 U	370 U
Pentachlorophenol	ug/kg	870 U	850 U	930 U	970 U	900 U	940 U	900 U	920 U
Phenanthrene (1)	ug/kg	350 U	340 U	370 U	380 U	360 U	380 U	360 U	370 U
Phenol	ug/kg	350 U	340 U	370 U	380 U	360 U	380 U	380 U	370 U
Pyrene (1)	ug/kg	350 U	340 U	370 U	380 U	360 U	380 U	380 U	370 U
2,4,5-Trichlorophenol	ug/kg	870 U	850 U	930 U	970 U	900 U	940 U	900 U	920 U
2,4,6-Trichlorophenol	ug/kg	350 U	340 U	370 U	380 U	380 U	380 U	360 U	370 U
Total Semivolatiles	ug/kg	ND	ND	ND	700	ND	660	ND	ND
Total PAHs (1)	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Total Carcinogenic PAHs(2)	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND

(1) Polynuclear Aromatic Hydrocarbon.

(2) Carcinogenic Polynuclear Aromatic Hydrocarbon.

U : Compound was analyzed for but not detected. The value is the quantation limit.

J : Value estimated since not all QC criteria met.

ND : Not detected above quantation limits provided.

N/A - Not applicable.

TABLE BEXW2-1
SUMMARY OF VOLATILE COMPOUNDS IDENTIFIED (BORING BEXW2)
SOIL/SOURCE MATERIAL SAMPLING 05/02-19/2005
SECOND STREET (HASTINGS) SOURCE AREA RI/FS

	Location	BEXW-2	BEXW-2	BEXW-2	BEXW-2	BEXW-2	BEXW-2	BEXW-2	BEXW-2	BEXW-2	BEXW-2	BEXW-2
	Interval	1-2 ft bgs	11-12 ft bgs	18-19 ft bgs	30-31 ft bgs	38-39 ft bgs	50-51 ft bgs	58-59 ft bgs	70-71 ft bgs	70-71* ft bgs	79-81 ft bgs	80-81 ft bgs
	EPA No	2810-20	2810-21	2810-22	2810-23	2810-24	2810-25	2810-38	2810-26	2810-26FD	2810-27	2810-28
	Date	5/4/2005	5/4/2005	5/4/2005	5/4/2005	5/4/2005	5/4/2005	5/4/2005	5/4/2005	5/4/2005	5/4/2005	5/4/2005
	Time	8:55	10:15	10:35	11:00	11:15	11:40	12:20	14:05	14:05	14:35	15:10
Parameter	Units											
Volatile Organics		Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q
Acetone	ug/kg	34 J	70 J	28 J	14 J	10 J	10 U	15 J	10 U	10 U	12 J	14 J
Benzene	ug/kg	10 U	13 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Bromodichloromethane	ug/kg	10 U	13 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Bromoform	ug/kg	10 U	13 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Bromomethane	ug/kg	10 U	13 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Butanone (Methyl Ethyl Ketone)	ug/kg	10 U	13 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Carbon Disulfide	ug/kg	10 U	13 UJ	15	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Carbon Tetrachloride	ug/kg	10 U	13 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chlorobenzene	ug/kg	10 U	13 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chloroethane	ug/kg	10 U	13 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chloroform	ug/kg	10 U	13 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chloromethane	ug/kg	10 U	13 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Cyclohexane	ug/kg	10 U	13 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2 Dibromo 3-Chloropropane	ug/kg	10 U	13 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Dibromochloromethane	ug/kg	10 U	13 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dibromoethane	ug/kg	10 U	13 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichlorobenzene (Ortho)	ug/kg	10 U	13 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,3-Dichlorobenzene (Meta)	ug/kg	10 U	13 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,4-Dichlorobenzene (Para)	ug/kg	10 U	13 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Dichlorodifluoromethane	ug/kg	10 U	13 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethane	ug/kg	10 U	13 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloroethane	ug/kg	10 U	13 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethene	ug/kg	10 U	13 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
cis-1,2-Dichloroethene	ug/kg	10 U	13 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
trans-1,2-Dichloroethene	ug/kg	10 U	13 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloropropane	ug/kg	10 U	13 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
cis-1,3,-Dichloropropene	ug/kg	10 U	13 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
trans-1,3,-Dichloropropene	ug/kg	10 U	13 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Ethylbenzene	ug/kg	10 U	13 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Hexanone	ug/kg	10 U	13 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Isopropylbenzene	ug/kg	10 U	13 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methyl Acetate	ug/kg	10 U	13 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methyl tert-butyl ether	ug/kg	10 U	13 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methylcyclohexane	ug/kg	10 U	13 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methylene Chloride	ug/kg	10 U	13 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Methyl-2-Pentanone (MIBK)	ug/kg	10 U	13 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Styrene	ug/kg	10 U	13 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1,2,2-Tetrachloroethane	ug/kg	10 U	13 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U

Parameter	Location	BEXW-2	BEXW-2	BEXW-2	BEXW-2	BEXW-2	BEXW-2	BEXW-2	BEXW-2	BEXW-2	BEXW-2	BEXW-2
	Interval	1-2 ft bgs	11-12 ft bgs	18-19 ft bgs	30-31 ft bgs	38-39 ft bgs	50-51 ft bgs	58-59 ft bgs	70-71 ft bgs	70-71* ft bgs	79-81 ft bgs	90-91 ft bgs
	EPA No	2610-20	2610-21	2610-22	2610-23	2610-24	2610-25	2610-38	2610-28	2610-28FD	2610-27	2610-28
	Date	5/4/2005	5/4/2005	5/4/2005	5/4/2005	5/4/2005	5/4/2005	5/4/2005	5/4/2005	5/4/2005	5/4/2005	5/4/2005
	Time	9:56	10.15	10:35	11:00	11:15	11:40	12:20	14:05	14:05	14:35	15:10
	Units											
Volatile Organics (Cont)		Conc. Q	Conc Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc Q	Conc. Q
Tetrachloroethene	ug/kg	10 U	13 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Toluene	ug/kg	10 U	13 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2,4-Trichlorobenzene	ug/kg	10 U	13 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1,1-Trichloroethane	ug/kg	10 U	13 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1,2-Trichloroethane	ug/kg	10 U	13 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Trichloroethene	ug/kg	10 U	13 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Trichlorofluoromethane	ug/kg	10 U	13 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1,2-Trichlorofluoroethane	ug/kg	10 U	13 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Vinyl Chloride	ug/kg	10 U	13 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Total Xylenes	ug/kg	10 U	13 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Total Volatiles	ug/kg	34	70	41	14	10	ND	18	ND	ND	12	14
Total BETXs	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

U : Compound was analyzed for but not detected. The value is the quantation limit.

UJ - The analyte was not detected at or above the reporting limit. The reporting limit is an estimate.

J : Value estimated since not all QC criteria met.

ND : Not detected above quantation limits provided.

TABLE BEXW2-1
SUMMARY OF VOLATILE COMPOUNDS IDENTIFIED (BORING BEXW2)
SOIL/SOURCE MATERIAL SAMPLING 05/02-19/2005
SECOND STREET (HASTINGS) SOURCE AREA RI/FS

	Location	BEXW-2	BEXW-2	BEXW-2	BEXW-2	BEXW-2	BEXW-2	BEXW-2	BEXW-2	BEXW-2
	Interval	101-102 ft bgs	108-109 ft bgs	120-121 ft bgs	130-131 ft bgs	139-140 ft bgs	150-151 ft bgs	160-161 ft bgs	168-169 ft bgs	179-180 ft bgs
	EPA No	2810-29	2810-30	2810-31	2810-32	2810-33	2810-34	2810-35	2810-36	2810-37
	Date	5/4/2005	5/4/2005	5/4/2005	5/4/2005	5/4/2005	5/4/2005	5/4/2005	5/4/2005	5/4/2005
	Time	15:40	16:15	16:45	17:20	17:50	18:00	18:30	18:45	19:00
Parameter	Units									
Volatile Organics		Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q
Acetone	ug/kg	10 U	21 J	16 J	10 J	10 U	12 J	10 U	10 U	10 J
Benzene	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Bromodichloromethane	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Bromoform	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Bromomethane	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Butanone (Methyl Ethyl Ketone)	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Carbon Disulfide	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Carbon Tetrachloride	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chlorobenzene	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chloroethane	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chloroform	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chloromethane	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Cyclohexane	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2 Dibromo 3-Chloropropene	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Dibromochloromethane	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dibromoethane	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichlorobenzene (Ortho)	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,3-Dichlorobenzene (Meta)	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,4-Dichlorobenzene (Para)	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Dichlorodifluoromethane	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethane	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloroethane	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethene	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
cis-1,2-Dichloroethene	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
trans-1,2-Dichloroethene	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloropropane	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	21	10 U
cis-1,3,-Dichloropropene	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
trans-1,3,-Dichloropropene	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Ethylbenzene	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Hexanone	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Isopropylbenzene	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methyl Acetate	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methyl tert-butyl ether	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methylcyclohexane	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methylene Chloride	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Methyl-2-Pentanone (MIBK)	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Styrene	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1,2 2-Tetrachloroethane	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U

Parameter	Location	BEXW-2	BEXW-2	BEXW-2	BEXW-2	BEXW-2	BEXW-2	BEXW-2	BEXW-2	BEXW-2
	Interval	101-102 ft bgs	108-109 ft bgs	120-121 ft bgs	130-131 ft bgs	139-140 ft bgs	150-151 ft bgs	160-161 ft bgs	168-169 ft bgs	179-180 ft bgs
	EPA No	2610-29	2610-30	2610-31	2610-32	2610-33	2610-34	2610-35	2610-36	2610-37
	Date	5/4/2005	5/4/2005	5/4/2005	5/4/2005	5/4/2005	5/4/2005	5/4/2005	5/4/2005	5/4/2005
	Time	15:40	16:15	16:45	17:20	17:50	18:00	18:30	18:45	19:00
	Units									
Volatile Organics (Cont)		Conc Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q
Tetrachloroethene	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Toluene	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2,4-Trichlorobenzene	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1,1-Trichloroethane	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1,2-Trichloroethane	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Trichloroethene	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Trichlorofluoromethane	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1,2-Trichlorotrifluoroethane	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Vinyl Chloride	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Total Xylenes	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Total Volatiles	ug/kg	ND	21	16	10	ND	12	ND	21	10
Total BETXs	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND

U : Compound was analyzed for but not detected. The value is the quantitation limit.

UJ - The analyte was not detected at or above the reporting limit. The reporting limit is an estimate.

J : Value estimated since not all QC criteria met.

ND : Not detected above quantitation limits provided.

TABLE BEXW2-2
SUMMARY OF SEMI-VOLATILE COMPOUNDS IDENTIFIED (BORING BEXW2)
SOIL/SOURCE MATERIAL SAMPLING 05/2-19/2005
SECOND STREET (HASTINGS) SOURCE AREA RI/FS

	Location	BEXW-2	BEXW-2	BEXW-2	BEXW-2	BEXW-2	BEXW-2	BEXW-2	BEXW-2	BEXW-2	BEXW-2	BEXW-2
	Interval	1-2 ft bgs	11-12 ft bgs	18-19 ft bgs	30-31 ft bgs	38-39 ft bgs	50-51 ft bgs	58-59 ft bgs	70-71 ft bgs	70-71* ft bgs	79-81 ft bgs	90-91 ft bgs
	EPA No	2810-20	2810-21	2810-22	2810-23	2810-24	2810-25	2810-38	2810-26	2810-26FD	2810-27	2810-28
	Date	5/4/2005	5/4/2005	5/4/2005	5/4/2005	5/4/2005	5/4/2005	5/4/2005	5/4/2005	5/4/2005	5/4/2005	5/4/2005
	Time	9.55	10:15	10:35	11.00	11:15	11:40	12:20	14:05	14:05	14:35	15:10
Parameter	Units											
Semivolatile Organics		Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q
Acenaphthene (1)	ug/kg	400 U	2,200 U	410 U	380 U	390 U	380 U	380 U	350 U	350 U	390 U	420 U
Acenaphthylene (1)	ug/kg	400 U	2,200 U	410 U	380 U	390 U	380 U	360 U	350 U	350 U	390 U	420 U
Acetophenone	ug/kg	400 U	2,200 U	410 U	380 U	390 U	380 U	360 U	350 U	350 U	390 U	420 U
Anthracene (1)	ug/kg	400 U	2,200 U	410 U	380 U	390 U	380 U	360 U	350 U	350 U	390 U	420 U
Atrazine	ug/kg	400 U	2,200 U	410 U	380 U	390 U	380 U	380 U	360 U	360 U	380 U	420 U
Benzaldehyde	ug/kg	400 U	2,200 U	410 U	380 U	390 U	380 U	380 U	360 U	360 U	390 U	420 U
Benzo(a)anthracene(1,2)	ug/kg	400 U	2,700	650	380 U	390 U	380 U	360 U	350 U	350 U	390 U	420 U
Benzo(a)pyrene(1,2)	ug/kg	400 U	2,200 U	560	380 U	390 U	380 U	360 U	350 U	360 U	390 U	420 U
Benzo(b)fluoranthene(1,2)	ug/kg	400 U	2,300	630	380 U	390 U	380 U	360 U	350 U	360 U	390 U	420 U
Benzo(g,h,i)perylene (1)	ug/kg	400 U	2,200 U	410 U	380 U	390 U	380 U	360 U	360 U	350 U	390 U	420 U
Benzo(k)fluoranthene(1,2)	ug/kg	400 U	2,200 U	530	380 U	390 U	380 U	360 U	350 U	360 U	380 U	420 U
Biphenyl	ug/kg	400 U	2,200 U	410 U	380 U	390 U	380 U	360 U	350 U	360 U	390 U	420 U
bis(2-Chloroethoxy)methane	ug/kg	400 U	2,200 U	410 U	380 U	390 U	380 U	380 U	350 U	360 U	390 U	420 U
bis(2-Chloroethyl)ether	ug/kg	400 U	2,200 U	410 U	380 U	390 U	380 U	360 U	360 U	360 U	390 U	420 U
bis(2-Chloroisopropyl)ether	ug/kg	400 U	2,200 U	410 U	380 U	390 U	380 U	360 U	360 U	360 U	390 U	420 U
bis(2-Ethylhexyl)phthalate	ug/kg	400 U	2,200 U	410 U	380 U	380 U	380 U	360 U	350 U	360 U	390 U	420 U
4-Bromophenyl-phenylether	ug/kg	400 U	2,200 U	410 U	380 U	390 U	380 U	360 U	350 U	360 U	390 U	420 U
Butylbenzylphthalate	ug/kg	400 U	2,200 U	410 U	380 U	390 U	380 U	360 U	350 U	360 U	380 U	420 U
Caprolactam	ug/kg	400 U	2,200 U	410 U	380 U	380 U	380 U	360 U	360 U	360 U	390 U	420 U
Carbazole	ug/kg	400 U	2,200 U	410 U	380 U	390 U	380 U	360 U	360 U	350 U	390 U	420 U
4-Chloro-3-methylphenol	ug/kg	400 U	2,200 U	410 U	380 U	390 U	380 U	360 U	350 U	350 U	390 U	420 U
4-Chloroaniline	ug/kg	400 U	2,200 U	410 U	380 U	390 U	380 U	360 U	350 U	360 U	390 U	420 U
2-Chloronaphthalene (1)	ug/kg	400 U	2,200 U	410 U	380 U	380 U	380 U	360 U	360 U	360 U	390 U	420 U
2-Chlorophenol	ug/kg	400 U	2,200 U	410 U	380 U	390 U	380 U	360 U	360 U	360 U	390 U	420 U
4-Chlorophenyl-phenylether	ug/kg	400 U	2,200 U	410 U	380 U	390 U	380 U	360 U	360 U	360 U	380 U	420 U
Chrysene (1,2)	ug/kg	400 U	2,600	630	380 U	380 U	380 U	360 U	350 U	360 U	390 U	420 U
Di-n-butylphthalate	ug/kg	400 U	2,200 U	410 U	380 U	380 U	380 U	380 U	350 U	350 U	390 U	420 U
Di-n-octylphthalate	ug/kg	400 U	2,200 U	410 U	380 U	390 U	380 U	380 U	350 U	350 U	390 U	420 U
Dibenzo(a,h)anthracene (1,2)	ug/kg	400 U	2,200 U	410 U	380 U	390 U	380 U	360 U	350 U	360 U	380 U	420 U
Dibenzofuran	ug/kg	400 U	2,200 U	410 U	380 U	380 U	380 U	360 U	360 U	360 U	390 U	420 U
3,3'-Dichlorobenzidine	ug/kg	400 U	2,200 U	410 U	380 U	390 U	380 U	380 U	350 U	350 U	390 U	420 U
2,4-Dichlorophenol	ug/kg	400 U	2,200 U	410 U	380 U	390 U	380 U	360 U	350 U	350 U	390 U	420 U
Diethylphthalate	ug/kg	400 U	2,200 U	410 U	380 U	380 U	380 U	360 U	350 U	360 U	390 U	420 U
2,4-Dimethylphenol	ug/kg	400 U	2,200 U	410 U	380 U	390 U	380 U	360 U	350 U	350 U	390 U	420 U
Dimethylphthalate	ug/kg	400 U	2,200 U	410 U	380 U	380 U	380 U	360 U	350 U	350 U	390 U	420 U
4,6-Dinitro-2-methylphenol	ug/kg	1,000 U	5,600 U	1,000 U	970 U	990 U	970 U	910 U	870 U	870 U	980 U	1,100 U
2,4-Dinitrophenol	ug/kg	1,000 U	5,600 U	1,000 U	970 U	990 U	970 U	910 U	870 U	870 U	980 U	1,100 U

Parameter	Location	BEXW-2	BEXW-2	BEXW-2	BEXW-2	BEXW-2	BEXW-2	BEXW-2	BEXW-2	BEXW-2	BEXW-2	BEXW-2
	Interval	1-2 ft bgs	11-12 ft bgs	18-19 ft bgs	30-31 ft bgs	38-39 ft bgs	50-51 ft bgs	58-59 ft bgs	70-71 ft bgs	70-71* ft bgs	79-81 ft bgs	90-91 ft bgs
	EPA No	2610-20	2610-21	2610-22	2610-23	2610-24	2610-25	2610-38	2610-26	2610-26FD	2610-27	2610-28
	Date	5/4/2005	5/4/2005	5/4/2005	5/4/2005	5/4/2005	5/4/2005	5/4/2005	5/4/2005	5/4/2005	5/4/2005	5/4/2005
	Time	9:55	10:15	10:35	11:00	11:15	11:40	12:20	14:05	14:05	14:35	15:10
	Units											
Semivolatile Organics (Cont)		Conc Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q
2,4-Dinitrotoluene	ug/kg	400 U	2,200 U	410 U	380 U	390 U	380 U	380 U	350 U	350 U	390 U	420 U
2,6-Dinitrotoluene	ug/kg	400 U	2,200 U	410 U	380 U	390 U	380 U	380 U	350 U	350 U	390 U	420 U
Fluoranthene (1)	ug/kg	400 U	3,500	920	380 U	390 U	380 U	380 U	360 U	350 U	380 U	420 U
Fluorene (1)	ug/kg	400 U	2,200 U	410 U	380 U	390 U	380 U	380 U	360 U	350 U	380 U	420 U
Hexachlorobenzene	ug/kg	400 U	2,200 U	410 U	380 U	390 U	380 U	380 U	350 U	350 U	390 U	420 U
Hexachlorobutadiene	ug/kg	400 U	2,200 U	410 U	380 U	390 U	380 U	380 U	350 U	350 U	390 U	420 U
Hexachlorocyclopentadiene	ug/kg	400 U	2,200 U	410 U	380 U	390 U	380 U	360 U	350 U	350 U	390 U	420 U
Hexachloroethane	ug/kg	400 U	2,200 U	410 U	380 U	390 U	380 U	380 U	360 U	350 U	390 U	420 U
Indeno(1,2,3-cd)pyrene (1,2)	ug/kg	400 U	2,200 U	410 U	380 U	390 U	380 U	380 U	350 U	360 U	380 U	420 U
Isophorone	ug/kg	400 U	2,200 U	410 U	380 U	390 U	380 U	380 U	360 U	350 U	390 U	420 U
2-Methylnaphthalene (1)	ug/kg	400 U	2,200 U	410 U	380 U	390 U	380 U	380 U	350 U	350 U	390 U	420 U
2-Methylphenol	ug/kg	400 U	2,200 U	410 U	380 U	390 U	380 U	380 U	360 U	360 U	390 U	420 U
4-Methylphenol	ug/kg	400 U	2,200 U	410 U	380 U	390 U	380 U	380 U	350 U	350 U	390 U	420 U
Naphthalene (1)	ug/kg	400 U	2,200 U	410 U	380 U	390 U	380 U	380 U	360 U	350 U	390 U	420 U
2-Nitroaniline	ug/kg	1,000 U	5,600 U	1,000 U	970 U	980 U	970 U	910 U	870 U	870 U	980 U	1,100 U
3-Nitroaniline	ug/kg	1,000 U	5,600 U	1,000 U	970 U	980 U	970 U	910 U	870 U	870 U	980 U	1,100 U
4-Nitroaniline	ug/kg	1,000 U	5,600 U	1,000 U	970 U	980 U	970 U	910 U	870 U	870 U	980 U	1,100 U
Nitrobenzene	ug/kg	400 U	2,200 U	410 U	380 U	390 U	380 U	360 U	360 U	350 U	390 U	420 U
2-Nitrophenol	ug/kg	400 U	2,200 U	410 U	380 U	390 U	380 U	380 U	350 U	360 U	380 U	420 U
4-Nitrophenol	ug/kg	1,000 U	5,600 U	1,000 U	970 U	980 U	970 U	910 U	870 U	870 U	980 U	1,100 U
N-nitroso-di-n-propylamine	ug/kg	400 U	2,200 U	410 U	380 U	390 U	380 U	380 U	350 U	360 U	390 U	420 U
N-nitrosodiphenylamine	ug/kg	400 U	2,200 U	410 U	380 U	380 U	380 U	380 U	350 U	360 U	380 U	420 U
Pentachlorophenol	ug/kg	1,000 U	5,600 U	1,000 U	970 U	980 U	970 U	910 U	870 U	870 U	980 U	1,100 U
Phenanthrene (1)	ug/kg	400 U	2,200 U	410 U	380 U	390 U	380 U	380 U	380 U	360 U	380 U	420 U
Phenol	ug/kg	400 U	2,200 U	410 U	380 U	390 U	380 U	380 U	350 U	360 U	380 U	420 U
Pyrene (1)	ug/kg	400 U	3,600	820	380 U	390 U	380 U	380 U	350 U	360 U	390 U	420 U
2,4,5-Trichlorophenol	ug/kg	1,000 U	5,600 U	1,000 U	970 U	980 U	970 U	910 U	870 U	870 U	980 U	1,100 U
2,4,6-Trichlorophenol	ug/kg	400 U	2,200 U	410 U	380 U	390 U	380 U	380 U	350 U	360 U	380 U	420 U
Total Semivolatiles	ug/kg	ND	14,700	4,740	ND	ND	ND	ND	ND	ND	ND	ND
Total PAHs (1)	ug/kg	ND	14,700	4,740	ND	ND	ND	ND	ND	ND	ND	ND
Total Carcinogenic PAHs(2)	ug/kg	ND	7,800	3,000	ND	ND	ND	ND	ND	ND	ND	ND

(1) Polynuclear Aromatic Hydrocarbon.

(2) Carcinogenic Polynuclear Aromatic Hydrocarbon.

U : Compound was analyzed for but not detected. The value is the quantation limit.

J : Value estimated since not all QC criteria met.

ND : Not detected above quantation limits provided.

N/A - Not applicable.

TABLE BEXW2-2
SUMMARY OF SEMI-VOLATILE COMPOUNDS IDENTIFIED (BORING BEXW2)
SOIL/SOURCE MATERIAL SAMPLING 05/2-19/2005
SECOND STREET (HASTINGS) SOURCE AREA RI/FS

	Location	BEXW-2	BEXW-2	BEXW-2	BEXW-2	BEXW-2	BEXW-2	BEXW-2	BEXW-2	BEXW-2
	Interval	101-102 ft bgs	108-109 ft bgs	120-121 ft bgs	130-131 ft bgs	139-140 ft bgs	150-151 ft bgs	160-161 ft bgs	168-169 ft bgs	179-180 ft bgs
	EPA No	2610-29	2610-30	2610-31	2610-32	2610-33	2610-34	2610-35	2610-36	2610-37
	Date	5/4/2005	5/4/2005	5/4/2005	5/4/2005	5/4/2005	5/4/2005	5/4/2005	5/4/2005	5/4/2005
	Time	15:40	16:15	16:45	17:20	17:50	18:00	18:30	18:45	19:00
Parameter	Units									
Semivolatile Organics		Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q
Acenaphthene (1)	ug/kg	380 U	450 U	330 U	370 U	370 U	350 U	370 U	360 U	380 U
Acenaphthylene (1)	ug/kg	380 U	450 U	330 U	370 U	370 U	350 U	370 U	360 U	380 U
Acetophenone	ug/kg	380 U	450 U	330 U	370 U	370 U	350 U	370 U	360 U	380 U
Anthracene (1)	ug/kg	380 U	450 U	330 U	370 U	370 U	350 U	370 U	360 U	380 U
Atrazine	ug/kg	380 U	450 U	330 U	370 U	370 U	350 U	370 U	360 U	380 U
Benzaldehyde	ug/kg	380 U	450 U	330 U	370 U	370 U	350 U	370 U	360 U	380 U
Benzo(a)anthracene(1,2)	ug/kg	380 U	450 U	330 U	370 U	370 U	350 U	370 U	360 U	380 U
Benzo(a)pyrene(1,2)	ug/kg	380 U	450 U	330 U	370 U	370 U	350 U	370 U	360 U	380 U
Benzo(b)fluoranthene(1,2)	ug/kg	380 U	450 U	330 U	370 U	370 U	350 U	370 U	360 U	380 U
Benzo(g,h,i)perylene (1)	ug/kg	380 U	450 U	330 U	370 U	370 U	350 U	370 U	360 U	380 U
Benzo(k)fluoranthene(1,2)	ug/kg	380 U	450 U	330 U	370 U	370 U	350 U	370 U	360 U	380 U
Biphenyl	ug/kg	380 U	450 U	330 U	370 U	370 U	350 U	370 U	360 U	380 U
bis(2-Chloroethoxy)methane	ug/kg	380 U	450 U	330 U	370 U	370 U	350 U	370 U	360 U	380 U
bis(2-Chloroethyl)ether	ug/kg	380 U	450 U	330 U	370 U	370 U	350 U	370 U	360 U	380 U
bis(2-Chloroisopropyl)ether	ug/kg	380 U	450 U	330 U	370 U	370 U	350 U	370 U	360 U	380 U
bis(2-Ethylhexyl)phthalate	ug/kg	380 U	450 U	330 U	370 U	370 U	350 U	370 U	360 U	380 U
4-Bromophenyl-phenylether	ug/kg	380 U	450 U	330 U	370 U	370 U	350 U	370 U	360 U	380 U
Butylbenzylphthalate	ug/kg	380 U	450 U	330 U	370 U	370 U	350 U	370 U	360 U	380 U
Caprolactam	ug/kg	380 U	450 U	330 U	370 U	370 U	350 U	370 U	360 U	380 U
Carbazole	ug/kg	380 U	450 U	330 U	370 U	370 U	350 U	370 U	360 U	380 U
4-Chloro-3-methyphenol	ug/kg	380 U	450 U	330 U	370 U	370 U	350 U	370 U	360 U	380 U
4-Chloroaniline	ug/kg	380 U	450 U	330 U	370 U	370 U	350 U	370 U	360 U	380 U
2-Chloronaphthalene (1)	ug/kg	380 U	450 U	330 U	370 U	370 U	350 U	370 U	360 U	380 U
2-Chlorophenol	ug/kg	380 U	450 U	330 U	370 U	370 U	350 U	370 U	360 U	380 U
4-Chlorophenyl-phenylether	ug/kg	380 U	450 U	330 U	370 U	370 U	350 U	370 U	360 U	380 U
Chrysene (1,2)	ug/kg	380 U	450 U	330 U	370 U	370 U	350 U	370 U	360 U	380 U
Di-n-butylphthalate	ug/kg	380 U	450 U	330 U	370 U	370 U	350 U	370 U	360 U	380 U
Di-n-octylphthalate	ug/kg	380 U	450 U	330 U	370 U	370 U	350 U	370 U	360 U	380 U
Dibenzo(a,h)anthracene (1,2)	ug/kg	380 U	450 U	330 U	370 U	370 U	350 U	370 U	360 U	380 U
Dibenzofuran	ug/kg	380 U	450 U	330 U	370 U	370 U	350 U	370 U	360 U	380 U
3,3'-Dichlorobenzidine	ug/kg	380 U	450 U	330 U	370 U	370 U	350 U	370 U	360 U	380 U
2,4-Dichlorophenol	ug/kg	380 U	450 U	330 U	370 U	370 U	350 U	370 U	360 U	380 U
Diethylphthalate	ug/kg	380 U	450 U	330 U	370 U	370 U	350 U	370 U	360 U	380 U
2,4-Dimethylphenol	ug/kg	380 U	450 U	330 U	370 U	370 U	350 U	370 U	360 U	380 U
Dimethylphthalate	ug/kg	380 U	450 U	330 U	370 U	370 U	350 U	370 U	360 U	380 U
4,6-Dinitro-2-methylphenol	ug/kg	950 U	1,100 U	830 U	920 U	930 U	880 U	920 U	880 U	940 U
2,4-Dinitrophenol	ug/kg	950 U	1,100 U	830 U	920 U	930 U	880 U	920 U	880 U	940 U

Parameter	Location	BEXW-2	BEXW-2	BEXW-2	BEXW-2	BEXW-2	BEXW-2	BEXW-2	BEXW-2	BEXW-2
	Interval	101-102 ft bgs	108-109 ft bgs	120-121 ft bgs	130-131 ft bgs	139-140 ft bgs	150-151 ft bgs	160-161 ft bgs	168-169 ft bgs	179-180 ft bgs
	EPA No	2610-29	2610-30	2610-31	2610-32	2610-33	2610-34	2610-35	2610-36	2610-37
	Date	5/4/2005	5/4/2005	5/4/2005	5/4/2005	5/4/2005	5/4/2005	5/4/2005	5/4/2005	5/4/2005
	Time	15.40	16:15	16:45	17:20	17:50	18:00	18:30	18:45	19:00
	Units									
Semivolatile Organics (Cont)		Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q
2,4-Dinitrotoluene	ug/kg	380 U	450 U	330 U	370 U	370 U	350 U	370 U	360 U	380 U
2,6-Dinitrotoluene	ug/kg	380 U	450 U	330 U	370 U	370 U	350 U	370 U	350 U	380 U
Fluoranthene (1)	ug/kg	380 U	450 U	330 U	370 U	370 U	360 U	370 U	350 U	380 U
Fluorene (1)	ug/kg	380 U	450 U	330 U	370 U	370 U	350 U	370 U	350 U	380 U
Hexachlorobenzene	ug/kg	380 U	450 U	330 U	370 U	370 U	350 U	370 U	350 U	380 U
Hexachlorobutadiene	ug/kg	380 U	450 U	330 U	370 U	370 U	350 U	370 U	350 U	380 U
Hexachlorocyclopentadiene	ug/kg	380 U	450 U	330 U	370 U	370 U	350 U	370 U	350 U	380 U
Hexachloroethane	ug/kg	380 U	450 U	330 U	370 U	370 U	350 U	370 U	350 U	380 U
Indeno(1,2,3-cd)pyrene (1,2)	ug/kg	380 U	450 U	330 U	370 U	370 U	350 U	370 U	350 U	380 U
Isophorone	ug/kg	380 U	450 U	330 U	370 U	370 U	360 U	370 U	350 U	380 U
2-Methylnaphthalene (1)	ug/kg	380 U	450 U	330 U	370 U	370 U	350 U	370 U	350 U	380 U
2-Methylphenol	ug/kg	380 U	450 U	330 U	370 U	370 U	360 U	370 U	350 U	380 U
4-Methylphenol	ug/kg	380 U	450 U	330 U	370 U	370 U	360 U	370 U	360 U	380 U
Naphthalene (1)	ug/kg	380 U	450 U	330 U	370 U	370 U	350 U	370 U	350 U	380 U
2-Nitroaniline	ug/kg	950 U	1,100 U	830 U	920 U	930 U	890 U	920 U	890 U	940 U
3-Nitroaniline	ug/kg	950 U	1,100 U	830 U	920 U	930 U	890 U	920 U	890 U	940 U
4-Nitroaniline	ug/kg	950 U	1,100 U	830 U	920 U	930 U	890 U	920 U	890 U	940 U
Nitrobenzene	ug/kg	380 U	450 U	330 U	370 U	370 U	350 U	370 U	360 U	380 U
2-Nitrophenol	ug/kg	380 U	450 U	330 U	370 U	370 U	350 U	370 U	360 U	380 U
4-Nitrophenol	ug/kg	950 U	1,100 U	830 U	920 U	930 U	890 U	920 U	890 U	940 U
N-nitroso-di-n-propylamine	ug/kg	380 U	450 U	330 U	370 U	370 U	350 U	370 U	350 U	380 U
N-nitrosodiphenylamine	ug/kg	380 U	450 U	330 U	370 U	370 U	350 U	370 U	360 U	380 U
Pentachlorophenol	ug/kg	950 U	1,100 U	830 U	920 U	930 U	890 U	920 U	890 U	940 U
Phenanthrene (1)	ug/kg	380 U	450 U	330 U	370 U	370 U	350 U	370 U	350 U	380 U
Phenol	ug/kg	380 U	450 U	330 U	370 U	370 U	360 U	370 U	360 U	380 U
Pyrene (1)	ug/kg	380 U	450 U	330 U	370 U	370 U	350 U	370 U	360 U	380 U
2,4,5-Trichlorophenol	ug/kg	950 U	1,100 U	830 U	920 U	930 U	890 U	920 U	890 U	940 U
2,4,6-Trichlorophenol	ug/kg	380 U	450 U	330 U	370 U	370 U	360 U	370 U	360 U	380 U
Total Semivolatiles	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total PAHs (1)	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Carcinogenic PAHs(2)	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND

(1) Polynuclear Aromatic Hydrocarbon.
(2) Carcinogenic Polynuclear Aromatic Hydrocarbon.
U : Compound was analyzed for but not detected. The value is the quantation limit.
J : Value estimated since not all QC criteria met.
ND : Not detected above quantation limits provided.
N/A - Not applicable

TABLE BP1-1
SUMMARY OF VOLATILE COMPOUNDS IDENTIFIED (BORING BP1)
SOIL/SOURCE MATERIAL SAMPLING 05/2-19/2005
SECOND STREET (HASTINGS) SOURCE AREA RI/FS

	Location	BP-1	BP-1	BP-1	BP-1	BP-1	BP-1	BP-1	BP-1	BP-1	BP-1	BP-1
	Interval	3-4 ft bgs	10-11 ft bgs	20-21 ft bgs	30-31 ft bgs	40-41	50-51 ft bgs	60-61	70-71 ft bgs	80-81 ft bgs	90-91 ft bgs	100-101 ft bgs
	EPA No	2610-39	2610-40	2610-41	2610-42	2610-43	2610-44	2610-48	2610-45	2610-46	2610-47	2610-49
	Date	5/5/2005	5/5/2005	5/5/2005	5/5/2005	5/5/2005	5/5/2005	5/5/2005	5/5/2005	5/5/2005	5/5/2005	5/6/2005
	Time	15:30	14:45	15:10	15:30	16:00	16:15	16:30	16:45	17:00	17:15	8:04
Parameter	Units											
Volatile Organics		Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q
Acetone	ug/kg	130 J	54 J	50 J	10 U	16 U	47 U	17 U	12 U	11 U	10 U	10 U
Benzene	ug/kg	15 UJ	10 U	10 UJ	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U
Bromodichloromethane	ug/kg	15 UJ	10 U	10 UJ	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U
Bromoform	ug/kg	15 UJ	10 U	10 UJ	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U
Bromomethane	ug/kg	15 UJ	10 U	10 UJ	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U
2-Butanone (Methyl Ethyl Ketone)	ug/kg	15 UJ	10 U	10 UJ	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U
Carbon Disulfide	ug/kg	15 UJ	10 U	10 UJ	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U
Carbon Tetrachloride	ug/kg	15 UJ	10 U	10 UJ	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U
Chlorobenzene	ug/kg	15 UJ	10 U	10 UJ	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U
Chloroethane	ug/kg	15 UJ	10 U	10 UJ	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U
Chloroform	ug/kg	15 UJ	10 U	10 UJ	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U
Chloromethane	ug/kg	15 UJ	10 U	10 UJ	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U
Cyclohexane	ug/kg	15 UJ	10 U	10 UJ	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U
1,2 Dibromo 3-Chloropropane	ug/kg	15 UJ	10 U	10 UJ	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U
Dibromochloromethane	ug/kg	15 UJ	10 U	10 UJ	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U
1,2-Dibromoethane	ug/kg	15 UJ	10 U.	10 UJ	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichlorobenzene (Ortho)	ug/kg	15 UJ	10 U	10 UJ	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U
1,3-Dichlorobenzene (Meta)	ug/kg	15 UJ	10 U	10 UJ	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U
1,4-Dichlorobenzene (Para)	ug/kg	15 UJ	10 U	10 UJ	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U
Dichlorodifluoromethane	ug/kg	15 UJ	10 U	10 UJ	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethane	ug/kg	15 UJ	10 U	10 UJ	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloroethane	ug/kg	15 UJ	10 U	10 UJ	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethene	ug/kg	15 UJ	10 U	10 UJ	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U
cis-1,2-Dichloroethene	ug/kg	15 UJ	10 U	10 UJ	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U
trans-1,2-Dichloroethene	ug/kg	15 UJ	10 U	10 UJ	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloropropane	ug/kg	15 UJ	10 U	10 UJ	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U
cis-1,3,-Dichloropropene	ug/kg	15 UJ	10 U	10 UJ	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U
trans-1,3,-Dichloropropene	ug/kg	15 UJ	10 U	10 UJ	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U
Ethylbenzene	ug/kg	15 UJ	10 U	10 UJ	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U
2-Hexanone	ug/kg	15 UJ	10 U	10 UJ	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U
Isopropylbenzene	ug/kg	15 UJ	10 U	10 UJ	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U
Methyl Acetate	ug/kg	15 UJ	10 U	10 UJ	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U
Methyl tert-butyl ether	ug/kg	15 UJ	10 U	10 UJ	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U
Methylcyclohexane	ug/kg	15 UJ	10 U	10 UJ	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U
Methylene Chloride	ug/kg	15 UJ	10 U	10 UJ	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U
4-Methyl-2-Pentanone (MIBK)	ug/kg	15 UJ	10 U	10 UJ	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U
Styrene	ug/kg	15 UJ	10 U	10 UJ	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U
1,1,2,2-Tetrachloroethane	ug/kg	15 UJ	10 U	10 UJ	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U

Parameter	Location	BP-1	BP-1	BP-1	BP-1	BP-1	BP-1	BP-1	BP-1	BP-1	BP-1	BP-1
	Interval	3-4 ft bgs	10-11 ft bgs	20-21 ft bgs	30-31 ft bgs	40-41	50-51 ft bgs	60-61	70-71 ft bgs	80-81 ft bgs	90-91 ft bgs	100-101 ft bgs
	EPA No	2610-39	2610-40	2610-41	2610-42	2610-43	2610-44	2610-46	2610-45	2610-48	2610-47	2610-49
	Date	5/5/2005	5/5/2005	5/5/2005	5/5/2005	5/5/2005	5/5/2005	5/5/2005	5/5/2005	5/5/2005	5/5/2005	5/6/2005
	Time	15:30	14:45	15:10	15:30	16:00	16:15	16:30	16:45	17:00	17.15	8.04
	Units											
Volatile Organics (Cont)		Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc Q	Conc Q	Conc Q	Conc. Q
Tetrachloroethene	ug/kg	15 UJ	10 U	10 UJ	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U
Toluene	ug/kg	15 UJ	10 U	10 UJ	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U
1,2,4-Trichlorobenzene	ug/kg	15 UJ	10 U	10 UJ	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U
1,1,1-Trichloroethane	ug/kg	15 UJ	10 U	10 UJ	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U
1,1,2-Trichloroethane	ug/kg	15 UJ	10 U	10 UJ	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U
Trichloroethene	ug/kg	15 UJ	10 U	10 UJ	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U
Trichlorofluoromethane	ug/kg	15 UJ	10 U	10 UJ	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U
1,1,2-Trichlorofluoroethane	ug/kg	15 UJ	10 U	10 UJ	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U
Vinyl Chloride	ug/kg	15 UJ	10 U	10 UJ	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U
Total Xylenes	ug/kg	15 UJ	10 U	10 UJ	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U
Total Volatiles	ug/kg	130	54	50	ND	ND	ND	ND	ND	ND	ND	ND
Total BETXs	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

U : Compound was analyzed for but not detected. The value is the quantation limit.

UJ : The analyte was not detected at or above the reporting limit. The reporting limit is an estimate.

J : Value estimated since not all QC criteria met.

ND : Not detected above quantation limits provided.

TABLE BP1-1
SUMMARY OF VOLATILE COMPOUNDS IDENTIFIED (BORING BP1)
SOIL/SOURCE MATERIAL SAMPLING 12/2-6/2003
SECOND STREET (HASTINGS) SOURCE AREA RI/FS

	Location	BP-1	BP-1	BP-1	BP-1	BP-1	BP-1	BP-1	BP-1	BP-1
	Interval	110-111 ft bgs	110-111 ft bgs	120-121 ft bgs	131-132 ft bgs	140-141 ft bgs	150-151 ft bgs	160-161 ft bgs	170-171 ft bgs	179-180 ft bgs
	EPA No	2610-50	2610-50-FD	2610-52	2610-53	2610-54	2610-55	2610-56	2610-57	2610-60
	Date	5/6/2005	5/6/2005	5/6/2005	5/6/2005	5/6/2005	5/6/2005	5/6/2005	5/6/2005	5/6/2005
	Time	8:35	8:35	9:15	9:35	10:15	10:20	11:28	11:38	12:00
Parameter	Units									
Volatile Organics		Conc. Q	Conc Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q
Acetone	ug/kg	13 U	12 U	39 U	10 U	10 U	13 J	11 U	10 U	10 U
Benzene	ug/kg	10 U	10 U	10 U	250 J	10 U	10 U	10 U	10 U	10 U
Bromodichloromethane	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Bromoform	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Bromomethane	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Butanone (Methyl Ethyl Ketone)	ug/kg	10 U	10 U	12	10 U	10 U	10 U	10 U	10 U	10 U
Carbon Disulfide	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Carbon Tetrachloride	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chlorobenzene	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chloroethane	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chloroform	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chloromethane	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Cyclohexane	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2 Dibromo 3-Chloropropane	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Dibromochloromethane	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dibromoethane	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichlorobenzene (Ortho)	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,3-Dichlorobenzene (Meta)	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,4-Dichlorobenzene (Para)	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Dichlorodifluoromethane	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethane	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloroethane	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethene	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
cis-1,2-Dichloroethene	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
trans-1,2-Dichloroethene	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloropropane	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
cis-1,3,-Dichloropropene	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
trans-1,3,-Dichloropropene	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Ethylbenzene	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Hexanone	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Isopropylbenzene	ug/kg	10 U	10 U	10 U	7,900 J	10 U	10 U	10 U	10 U	10 U
Methyl Acetate	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methyl tert-butyl ether	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methylcyclohexane	ug/kg	10 U	10 U	10 U	87 J	10 U	10 U	10 U	10 U	10 U
Methylene Chloride	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Methyl-2-Pentanone (MIBK)	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Styrene	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1,2,2-Tetrachloroethane	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U

Parameter	Location	BP-1	BP-1	BP-1	BP-1	BP-1	BP-1	BP-1	BP-1	BP-1
	Interval	110-111 ft bgs	110-111 ft bgs	120-121 ft bgs	131-132 ft bgs	140-141 ft bgs	150-151 ft bgs	160-161 ft bgs	170-171 ft bgs	179-180 ft bgs
	EPA No	2610-50	2610-50-FD	2610-52	2610-53	2610-54	2610-55	2610-56	2610-57	2610-60
	Date	5/6/2005	5/6/2005	5/6/2005	5/6/2005	5/6/2005	5/6/2005	5/6/2005	5/6/2005	5/6/2005
	Time	8:35	8.35	9:15	9.35	10:15	10:20	11:25	11:35	12:00
	Units									
Volatile Organics (Cont)		Conc Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q
Tetrachloroethene	ug/kg	10 U	10 U	10 U	300 J	10 U	10 U	10 U	10 U	10 U
Toluene	ug/kg	10 U	10 U	10 U	120 J	10 U	10 U	10 U	10 U	10 U
1,2,4-Trichlorobenzene	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1,1-Trichloroethane	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1,2-Trichloroethane	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Trichloroethene	ug/kg	10 U	10 U	10 U	1,300 J	10 U	10 U	10 U	10 U	10 U
Trichlorofluoromethane	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1,2-Trichlorofluoroethane	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Vinyl Chloride	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Total Xylenes	ug/kg	10 U	10 U	10 U	39,000	10 U	10 U	10 U	10 U	10 U
Total Volatiles	ug/kg	ND	ND	12	48,957	ND	13	ND	ND	ND
Total BETXs	ug/kg	ND	ND	ND	39,370	ND	ND	ND	ND	ND

U : Compound was analyzed for but not detected. The value is the quantation limit.

UJ - The analyte was not detected at or above the reporting limit. The reporting limit is an estimate.

J : Value estimated since not all QC criteria met.

ND : Not detected above quantation limits provided.

TABLE BP1-2
SUMMARY OF SEMI-VOLATILE COMPOUNDS IDENTIFIED (BORING BP1)
SOIL/SOURCE MATERIAL SAMPLING 05/2-19/2005
SECOND STREET (HASTINGS) SOURCE AREA RI/FS

	Location	BP-1	BP-1	BP-1	BP-1	BP-1	BP-1	BP-1	BP-1	BP-1	BP-1	BP-1
	Interval	3-4 ft bgs	10-11 ft bgs	20-21 ft bgs	30-31 ft bgs	40-41 ft bgs	50-51 ft bgs	60-61 ft bgs	70-71 ft bgs	80-81 ft bgs	90-91 ft bgs	100-101 ft bgs
	EPA No	2610-39	2610-40	2610-41	2610-42	2610-43	2610-44	2610-46	2610-45	2610-48	2610-47	2610-49
	Date	5/5/2005	5/6/2005	5/6/2005	5/6/2005	5/5/2005	5/5/2005	5/6/2005	5/5/2005	5/5/2005	5/5/2005	5/6/2005
	Time	15:30	14:46	15:10	15:30	16:00	16:15	16:30	16:45	17:00	17:15	8:04
Parameter	Units											
Semivolatile Organics		Conc Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q
Acenaphthene (1)	ug/kg	440 U	430 U	400 U	390 U	380 U	380 U	350 U	350 U	360 U	340 U	350 U
Acenaphthylene (1)	ug/kg	440 U	430 U	400 U	390 U	380 U	380 U	350 U	350 U	380 U	340 U	360 U
Acetophenone	ug/kg	440 U	430 U	400 U	390 U	380 U	380 U	350 U	350 U	360 U	340 U	360 U
Anthracene (1)	ug/kg	440 U	430 U	400 U	380 U	380 U	380 U	350 U	360 U	380 U	340 U	350 U
Atrazine	ug/kg	440 U	430 U	400 U	380 U	380 U	380 U	360 U	350 U	360 U	340 U	350 U
Benzaldehyde	ug/kg	440 U	430 U	400 U	380 U	380 U	380 U	350 U	380 U	360 U	340 U	350 U
Benzo(a)anthracene(1,2)	ug/kg	440 U	430 U	400 U	390 U	380 U	380 U	360 U	350 U	360 U	340 U	350 U
Benzo(a)pyrene(1,2)	ug/kg	440 U	430 U	400 U	390 U	380 U	380 U	350 U	350 U	380 U	340 U	350 U
Benzo(b)fluoranthene(1,2)	ug/kg	440 U	430 U	400 U	390 U	380 U	380 U	350 U	360 U	380 U	340 U	350 U
Benzo(g,h,i)perylene (1)	ug/kg	440 U	430 U	400 U	390 U	380 U	380 U	350 U	350 U	380 U	340 U	350 U
Benzo(k)fluoranthene(1,2)	ug/kg	440 U	430 U	400 U	390 U	380 U	380 U	350 U	360 U	360 U	340 U	350 U
Biphenyl	ug/kg	440 U	430 U	400 U	380 U	380 U	380 U	350 U	360 U	360 U	340 U	350 U
bis(2-Chloroethoxy)methane	ug/kg	440 U	430 U	400 U	390 U	380 U	380 U	380 U	360 U	360 U	340 U	350 U
bis(2-Chloroethyl)ether	ug/kg	440 U	430 U	400 U	380 U	380 U	380 U	360 U	350 U	380 U	340 U	350 U
bis(2-Chloroisopropyl)ether	ug/kg	440 U	430 U	400 U	390 U	380 U	380 U	350 U	360 U	380 U	340 U	350 U
bis(2-Ethylhexyl)phthalate	ug/kg	480	430 U	400 U	390 U	380 U	380 U	360 U	350 U	380 U	340 U	350 U
4-Bromophenyl-phenylether	ug/kg	440 U	430 U	400 U	380 U	380 U	380 U	350 U	380 U	380 U	340 U	350 U
Butylbenzylphthalate	ug/kg	440 U	430 U	400 U	380 U	380 U	380 U	350 U	380 U	360 U	340 U	350 U
Caprolactam	ug/kg	440 U	430 U	400 U	390 U	380 U	380 U	350 U	360 U	380 U	340 U	350 U
Carbazole	ug/kg	440 U	430 U	400 U	390 U	380 U	380 U	380 U	360 U	360 U	340 U	350 U
4-Chloro-3-methylphenol	ug/kg	440 U	430 U	400 U	390 U	380 U	380 U	350 U	350 U	380 U	340 U	360 U
4-Chloroaniline	ug/kg	440 U	430 U	400 U	390 U	380 U	380 U	350 U	360 U	380 U	340 U	350 U
2-Chloronaphthalene (1)	ug/kg	440 U	430 U	400 U	380 U	380 U	380 U	350 U	360 U	380 U	340 U	350 U
2-Chlorophenol	ug/kg	440 U	430 U	400 U	390 U	380 U	380 U	350 U	350 U	380 U	340 U	360 U
4-Chlorophenyl-phenylether	ug/kg	440 U	430 U	400 U	380 U	380 U	380 U	350 U	360 U	380 U	340 U	350 U
Chrysene (1,2)	ug/kg	440 U	430 U	400 U	390 U	380 U	380 U	360 U	360 U	380 U	340 U	350 U
Di-n-butylphthalate	ug/kg	440 U	430 U	400 U	390 U	380 U	380 U	350 U	360 U	360 U	340 U	350 U
Di-n-octylphthalate	ug/kg	440 U	430 U	400 U	380 U	380 U	380 U	350 U	360 U	360 U	340 U	350 U
Dibenzo(a,h)anthracene (1,2)	ug/kg	440 U	430 U	400 U	390 U	380 U	380 U	350 U	360 U	360 U	340 U	350 U
Dibenzofuran	ug/kg	440 U	430 U	400 U	380 U	380 U	380 U	350 U	360 U	380 U	340 U	350 U
3,3'-Dichlorobenzidine	ug/kg	440 U	430 U	400 U	390 U	380 U	380 U	350 U	360 U	380 U	340 U	350 U
2,4-Dichlorophenol	ug/kg	440 U	430 U	400 U	390 U	380 U	380 U	350 U	350 U	360 U	340 U	350 U
Diethylphthalate	ug/kg	1,000	430 U	400 U	380 U	380 U	380 U	360 U	360 U	380 U	340 U	350 U
2,4-Dimethylphenol	ug/kg	440 U	430 U	400 U	390 U	380 U	380 U	350 U	360 U	380 U	340 U	350 U
Dimethylphthalate	ug/kg	440 U	430 U	400 U	390 U	380 U	380 U	350 U	360 U	360 U	340 U	350 U
4,6-Dinitro-2-methylphenol	ug/kg	1,100 U	1,100 U	1,000 U	980 U	940 U	970 U	880 U	870 U	910 U	850 U	870 U
2,4-Dinitrophenol	ug/kg	N/A R	N/A R	N/A R	N/A R	940 U	970 U	880 U	870 U	N/A R	N/A R	N/A R

Parameter	Location	BP-1	BP-1	BP-1	BP-1	BP-1	BP-1	BP-1	BP-1	BP-1	BP-1	BP-1
	Interval	3-4 ft bgs	10-11 ft bgs	20-21 ft bgs	30-31 ft bgs	40-41	50-51 ft bgs	60-61	70-71 ft bgs	80-81 ft bgs	90-91 ft bgs	100-101 ft bgs
	EPA No	2610-39	2610-40	2610-41	2610-42	2610-43	2610-44	2610-46	2610-45	2610-48	2610-47	2610-49
	Date	5/5/2005	5/5/2005	5/5/2005	5/5/2005	5/5/2005	5/5/2005	5/5/2005	5/5/2005	5/5/2005	5/6/2005	5/6/2005
	Time	15:30	14:45	15:10	15:30	16:00	16:15	16:30	16:45	17:00	17:15	8:04
	Units											
Semivolatile Organics (Cont)		Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q
2,4-Dinitrotoluene	ug/kg	440 U	430 U	400 U	390 U	380 U	380 U	360 U	350 U	360 U	340 U	350 U
2,6-Dinitrotoluene	ug/kg	440 U	430 U	400 U	390 U	380 U	380 U	360 U	350 U	360 U	340 U	350 U
Fluoranthene (1)	ug/kg	440 U	430 U	400 U	390 U	380 U	380 U	350 U	350 U	360 U	340 U	350 U
Fluorene (1)	ug/kg	440 U	430 U	400 U	390 U	380 U	380 U	350 U	350 U	360 U	340 U	350 U
Hexachlorobenzene	ug/kg	440 U	430 U	400 U	390 U	380 U	380 U	350 U	350 U	360 U	340 U	350 U
Hexachlorobutadiene	ug/kg	440 U	430 U	400 U	390 U	380 U	380 U	350 U	350 U	360 U	340 U	350 U
Hexachlorocyclopentadiene	ug/kg	440 U	430 U	400 U	390 U	380 U	380 U	350 U	350 U	360 U	340 U	350 U
Hexachloroethane	ug/kg	440 U	430 U	400 U	390 U	380 U	380 U	350 U	350 U	360 U	340 U	350 U
Indeno(1,2,3-cd)pyrene (1,2)	ug/kg	440 U	430 U	400 U	390 U	380 U	380 U	350 U	350 U	360 U	340 U	350 U
Isophorone	ug/kg	440 U	430 U	400 U	390 U	380 U	380 U	350 U	350 U	360 U	340 U	350 U
2-Methylnaphthalene (1)	ug/kg	440 U	430 U	400 U	390 U	380 U	380 U	350 U	350 U	360 U	340 U	350 U
2-Methylphenol	ug/kg	440 U	430 U	400 U	390 U	380 U	380 U	350 U	350 U	360 U	340 U	350 U
4-Methylphenol	ug/kg	440 U	430 U	400 U	390 U	380 U	380 U	350 U	350 U	360 U	340 U	350 U
Naphthalene (1)	ug/kg	440 U	430 U	400 U	390 U	380 U	380 U	350 U	350 U	360 U	340 U	350 U
2-Nitroaniline	ug/kg	1,100 U	1,100 U	1,000 U	980 U	940 U	970 U	880 U	870 U	910 U	850 U	870 U
3-Nitroaniline	ug/kg	1,100 U	1,100 U	1,000 U	980 U	940 U	970 U	880 U	870 U	910 U	850 U	870 U
4-Nitroaniline	ug/kg	1,100 U	1,100 U	1,000 U	980 U	940 U	970 U	880 U	870 U	910 U	850 U	870 U
Nitrobenzene	ug/kg	440 U	430 U	400 U	390 U	380 U	380 U	350 U	350 U	360 U	340 U	350 U
2-Nitrophenol	ug/kg	440 U	430 U	400 U	390 U	380 U	380 U	350 U	350 U	360 U	340 U	350 U
4-Nitrophenol	ug/kg	1,100 U	1,100 U	1,000 U	980 U	940 U	970 U	880 U	870 U	910 U	850 U	870 U
N-nitroso-di-n-propylamine	ug/kg	440 U	430 U	400 U	390 U	380 U	380 U	350 U	350 U	360 U	340 U	350 U
N-nitrosodiphenylamine	ug/kg	440 U	430 U	400 U	390 U	380 U	380 U	350 U	350 U	360 U	340 U	350 U
Pentachlorophenol	ug/kg	1,100 U	1,100 U	1,000 U	980 U	940 U	970 U	880 U	870 U	910 U	850 U	870 U
Phenanthrene (1)	ug/kg	440 U	430 U	400 U	390 U	380 U	380 U	350 U	350 U	360 U	340 U	350 U
Phenol	ug/kg	440 U	430 U	400 U	390 U	380 U	380 U	350 U	350 U	360 U	340 U	350 U
Pyrene (1)	ug/kg	440 U	430 U	400 U	390 U	380 U	380 U	350 U	350 U	360 U	340 U	350 U
2,4,5-Trichlorophenol	ug/kg	1,100 U	1,100 U	1,000 U	980 U	940 U	970 U	880 U	870 U	910 U	850 U	870 U
2,4,6-Trichlorophenol	ug/kg	440 U	430 U	400 U	390 U	380 U	380 U	350 U	350 U	360 U	340 U	350 U
Total Semivolatiles	ug/kg	1,480 I	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total PAHs (1)	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Carcinogenic PAHs(2)	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

(1) Polynuclear Aromatic Hydrocarbon.

(2) Carcinogenic Polynuclear Aromatic Hydrocarbon.

U : Compound was analyzed for but not detected. The value is the quantation limit.

J : Value estimated since not all QC criteria met.

ND : Not detected above quantation limits provided.

N/A - Not applicable.

R - The presence or absence of the analyte can not be determined from the data due to severe quality control problems. The data are rejected and considered unusable.

TABLE BP1-2
SUMMARY OF SEMI-VOLATILE COMPOUNDS IDENTIFIED (BORING BP1)
SOIL/SOURCE MATERIAL SAMPLING 05/2-19/2005
SECOND STREET (HASTINGS) SOURCE AREA RI/FS

	Location	BP-1	BP-1	BP-1	BP-1	BP-1	BP-1	BP-1	BP-1	BP-1
	Interval	110-111 ft bgs	110-111 ft bgs	120-121 ft bgs	131-132 ft bgs	140-141 ft bgs	150-151 ft bgs	160-161 ft bgs	170-171 ft bgs	179-180 ft bgs
	EPA No	2610-50	2610-60-FD	2610-52	2610-53	2610-54	2610-55	2610-66	2610-57	2610-60
	Date	5/6/2005	5/6/2005	5/6/2005	5/6/2005	5/6/2005	5/6/2005	5/6/2005	5/6/2005	5/6/2005
	Time	8:35	8:35	9:15	9:35	10:15	10:20	11:28	11:35	12:00
Parameter	Units									
Semivolatile Organics		Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q
Acenaphthene (1)	ug/kg	340 U	340 U	1,700 U	33,000	360 U	360 U	380 U	370 U	350 U
Acenaphthylene (1)	ug/kg	340 U	340 U	1,900	480,000	360 U	360 U	380 U	370 U	350 U
Acetophenone	ug/kg	340 U	340 U	1,700 U	7,000 U	360 U	360 U	380 U	370 U	350 U
Anthracene (1)	ug/kg	340 U	340 U	1,700 U	200,000 J	360 U	360 U	380 U	370 U	350 U
Atrazine	ug/kg	340 U	340 U	1,700 U	7,000 U	360 U	360 U	380 U	370 U	350 U
Benzaldehyde	ug/kg	340 U	340 U	1,700 U	7,000 U	360 U	360 U	380 U	370 U	350 U
Benzo(a)anthracene(1,2)	ug/kg	340 U	340 U	1,700	130,000 J	360 U	360 U	380 U	370 U	350 U
Benzo(a)pyrene(1,2)	ug/kg	340 U	340 U	1,700 U	64,000 J	360 U	360 U	380 U	370 U	350 U
Benzo(b)fluoranthene(1,2)	ug/kg	340 U	340 U	1,700 U	38,000	360 U	360 U	380 U	370 U	350 U
Benzo(g,h,i)perylene (1)	ug/kg	340 U	340 U	1,700 U	7,000 U	360 U	360 U	380 U	370 U	350 U
Benzo(k)fluoranthene(1,2)	ug/kg	340 U	340 U	1,700 U	42,000	360 U	360 U	380 U	370 U	350 U
Biphenyl	ug/kg	340 U	340 U	1,700 U	87,000 J	360 U	360 U	380 U	370 U	360 U
bis(2-Chloroethoxy)methane	ug/kg	340 U	340 U	1,700 U	7,000 U	360 U	360 U	380 U	370 U	360 U
bis(2-Chloroethyl)ether	ug/kg	340 U	340 U	1,700 U	7,000 U	360 U	360 U	380 U	370 U	350 U
bis(2-Chloroisopropyl)ether	ug/kg	340 U	340 U	1,700 U	7,000 U	360 U	360 U	380 U	370 U	350 U
bis(2-Ethylhexyl)phthalate	ug/kg	340 U	340 U	1,700 U	7,000 U	360 U	360 U	380 U	370 U	350 U
4-Bromophenyl-phenylether	ug/kg	340 U	340 U	1,700 U	7,000 U	360 U	360 U	380 U	370 U	350 U
Butylbenzylphthalate	ug/kg	340 U	340 U	1,700 U	7,000 U	360 U	360 U	380 U	370 U	360 U
Caprolactam	ug/kg	340 U	340 U	1,700 U	7,000 U	360 U	360 U	380 U	370 U	350 U
Carbazole	ug/kg	340 U	340 U	1,700 U	7,000 U	360 U	360 U	380 U	370 U	350 U
4-Chloro-3-methylphenol	ug/kg	340 U	340 U	1,700 U	7,000 U	360 U	360 U	380 U	370 U	350 U
4-Chloroaniline	ug/kg	340 U	340 U	1,700 U	7,000 U	360 U	360 U	380 U	370 U	350 U
2-Chloronaphthalene (1)	ug/kg	340 U	340 U	1,700 U	7,000 U	360 U	360 U	380 U	370 U	350 U
2-Chlorophenol	ug/kg	340 U	340 U	1,700 U	7,000 U	360 U	360 U	380 U	370 U	350 U
4-Chlorophenyl-phenylether	ug/kg	340 U	340 U	1,700 U	7,000 U	360 U	360 U	380 U	370 U	350 U
Chrysene (1,2)	ug/kg	340 U	340 U	2,100	1,200,000 J	360 U	360 U	380 U	370 U	350 U
Di-n-butylphthalate	ug/kg	340 U	340 U	1,700 U	7,000 U	360 U	360 U	380 U	370 U	350 U
Di-n-octylphthalate	ug/kg	340 U	340 U	1,700 U	7,000 U	360 U	360 U	380 U	370 U	360 U
Dibenzo(a,h)anthracene (1,2)	ug/kg	340 U	340 U	1,700 U	9,800	360 U	360 U	380 U	370 U	350 U
Dibenzofuran	ug/kg	340 U	340 U	1,700 U	30,000	360 U	360 U	380 U	370 U	350 U
3,3'-Dichlorobenzidine	ug/kg	340 U	340 U	1,700 U	7,000 U	360 U	360 U	380 U	370 U	350 U
2,4-Dichlorophenol	ug/kg	340 U	340 U	1,700 U	7,000 U	360 U	360 U	380 U	370 U	360 U
Diethylphthalate	ug/kg	340 U	340 U	1,700 U	7,000 U	360 U	360 U	380 U	370 U	350 U
2,4-Dimethylphenol	ug/kg	340 U	340 U	1,700 U	7,000 U	360 U	360 U	380 U	370 U	350 U
Dimethylphthalate	ug/kg	340 U	340 U	1,700 U	7,000 U	360 U	360 U	380 U	370 U	350 U
4,6-Dintro-2-methylphenol	ug/kg	860 U	860 U	4,400 U	18,000 U	900 U	910 U	940 U	920 U	880 U
2,4-Dintrophenol	ug/kg	N/A R	N/A R	N/A R	N/A R	N/A R	N/A R	N/A R	N/A R	N/A R

Parameter	Location	BP-1	BP-1	BP-1	BP-1	BP-1	BP-1	BP-1	BP-1	BP-1
	Interval	110-111 ft bgs	110-111 ft bgs	120-121 ft bgs	131-132 ft bgs	140-141 ft bgs	150-151 ft bgs	160-161 ft bgs	170-171 ft bgs	179-180 ft bgs
	EPA No	2610-50	2610-50-FD	2610-52	2610-53	2610-54	2610-55	2610-56	2610-57	2610-60
	Date	5/6/2005	5/6/2005	5/6/2005	5/6/2005	5/6/2005	5/6/2005	5/6/2005	5/6/2005	5/6/2005
	Time	8:35	8.35	9.15	9:35	10:15	10:20	11:25	11:35	12:00
	Units									
Semivolatile Organics (Cont)		Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q
2,4-Dinitrotoluene	ug/kg	340 U	340 U	1,700 U	7,000 U	380 U	360 U	380 U	370 U	350 U
2,6-Dinitrotoluene	ug/kg	340 U	340 U	1,700 U	7,000 U	380 U	360 U	380 U	370 U	350 U
Fluoranthene (1)	ug/kg	340 U	340 U	3,600	270,000 J	380 U	360 U	380 U	370 U	350 U
Fluorene (1)	ug/kg	340 U	340 U	1,700 U	280,000 J	380 U	360 U	380 U	370 U	350 U
Hexachlorobenzene	ug/kg	340 U	340 U	1,700 U	7,000 U	380 U	360 U	380 U	370 U	350 U
Hexachlorobutadiene	ug/kg	340 U	340 U	1,700 U	7,000 U	380 U	360 U	380 U	370 U	350 U
Hexachlorocyclopentadiene	ug/kg	340 U	340 U	1,700 U	7,000 U	380 U	360 U	380 U	370 U	350 U
Hexachloroethane	ug/kg	340 U	340 U	1,700 U	7,000 U	380 U	360 U	380 U	370 U	350 U
Indeno(1,2,3-cd)pyrene (1,2)	ug/kg	340 U	340 U	1,700 U	24,000	380 U	360 U	380 U	370 U	350 U
Isophorone	ug/kg	340 U	340 U	1,700 U	7,000 U	380 U	360 U	380 U	370 U	350 U
2-Methylnaphthalene (1)	ug/kg	340 U	340 U	1,700 U	790,000	380 U	360 U	380 U	370 U	350 U
2-Methylphenol	ug/kg	340 U	340 U	1,700 U	7,000 U	380 U	360 U	380 U	370 U	350 U
4-Methylphenol	ug/kg	340 U	340 U	1,700 U	7,000 U	380 U	360 U	380 U	370 U	350 U
Naphthalene (1)	ug/kg	340 U	340 U	1,700 U	2,100,000	380 U	360 U	380 U	370 U	350 U
2-Nitroaniline	ug/kg	860 U	860 U	4,400 U	18,000 U	900 U	910 U	940 U	920 U	890 U
3-Nitroaniline	ug/kg	860 U	860 U	4,400 U	18,000 U	900 U	910 U	940 U	920 U	890 U
4-Nitroaniline	ug/kg	860 U	860 U	4,400 U	18,000 U	900 U	910 U	940 U	920 U	890 U
Nitrobenzene	ug/kg	340 U	340 U	1,700 U	7,000 U	380 U	360 U	380 U	370 U	350 U
2-Nitrophenol	ug/kg	340 U	340 U	1,700 U	7,000 U	380 U	360 U	380 U	370 U	350 U
4-Nitrophenol	ug/kg	860 U	860 U	4,400 U	18,000 U	900 U	910 U	940 U	920 U	890 U
N-nitroso-di-n-propylamine	ug/kg	340 U	340 U	1,700 U	7,000 U	380 U	360 U	380 U	370 U	350 U
N-nitrosodiphenylamine	ug/kg	340 U	340 U	1,700 U	7,000 U	380 U	360 U	380 U	370 U	350 U
Pentachlorophenol	ug/kg	860 U	860 U	4,400 U	18,000 U	900 U	910 U	940 U	920 U	890 U
Phenanthrene (1)	ug/kg	340 U	340 U	3,500	880,000	380 U	360 U	380 U	370 U	350 U
Phenol	ug/kg	340 U	340 U	1,700 U	7,000 U	380 U	360 U	380 U	370 U	350 U
Pyrene (1)	ug/kg	340 U	340 U	7,400	280,000 J	380 U	360 U	380 U	370 U	350 U
2,4,5-Trichlorophenol	ug/kg	860 U	860 U	4,400 U	18,000 U	900 U	910 U	940 U	920 U	890 U
2,4,6-Trichlorophenol	ug/kg	340 U	340 U	1,700 U	7,000 U	380 U	360 U	380 U	370 U	350 U
Total Semivolatiles	ug/kg	ND	ND	20,200	6,887,800	ND	ND	ND	ND	ND
Total PAHs (1)	ug/kg	ND	ND	20,200	6,780,800	ND	ND	ND	ND	ND
Total Carcinogenic PAHs(2)	ug/kg	ND	ND	3,800	1,507,800	ND	ND	ND	ND	ND

(1) Polynuclear Aromatic Hydrocarbon.

(2) Carcinogenic Polynuclear Aromatic Hydrocarbon.

U : Compound was analyzed for but not detected. The value is the quantation limit.

J : Value estimated since not all QC criteria met.

ND : Not detected above quantation limits provided.

N/A - Not applicable.

R - The presence or absence of the analyte can not be determined from the data due to severe quality control problems. The data are rejected and considered unusable.

TABLE BEXW1-1
SUMMARY OF VOLATILE COMPOUNDS INDENTIFIED (BORING BEXW1)
SOIL/SOURCE MATERIAL SAMPLING 05/2-19/2005
SECOND STREET (HASTINGS) SOURCE AREA RI/FS

	Location	BEXW-1	BEXW-1	BEXW-1	BEXW-1	BEXW-1	BEXW-1	BEXW-1	BEXW-1	BEXW-1	BEXW-1	BEXW-1
	Interval	3-4 ft bgs	10-11 ft bgs	20-21 ft bgs	30-31 ft bgs	40-41 ft bgs	50-51 ft bgs	60-61 ft bgs	70-71 ft bgs	80-81 ft bgs	90-91 ft bgs	100-101 ft bgs
	EPA No	2610-61	2610-62	2610-63	2610-64	2610-65	2610-66	2610-67	2610-68	2610-69	2610-72	2610-73
	Date	5/6/2005	5/6/2005	5/6/2005	5/6/2005	5/6/2005	5/6/2005	5/6/2005	5/7/2005	5/7/2005	5/7/2005	5/7/2005
	Time	16:35	16:48	17:00	17:15	17:30	17:50	18:10	7:30	7:55	8:30	9:00
Parameter	Units											
Volatile Organics		Conc Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q		Conc. Q	Conc. Q	Conc. Q
Acetone	ug/kg	71 J	21 U	32 U	20 U	21 U	23 U	31 U	38 U	18	10 U	20 J
Benzene	ug/kg	13 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	11 U
Bromodichloromethane	ug/kg	13 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	11 U
Bromoform	ug/kg	13 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	11 U
Bromomethane	ug/kg	13 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	11 U
2-Butanone (Methyl Ethyl Ketone)	ug/kg	13 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	11 U
Carbon Disulfide	ug/kg	13 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	11 U
Carbon Tetrachloride	ug/kg	13 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	11 U
Chlorobenzene	ug/kg	13 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	11 U
Chloroethane	ug/kg	13 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	11 U
Chloroform	ug/kg	13 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	11 U
Chloromethane	ug/kg	13 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	11 U
Cyclohexane	ug/kg	13 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	11 U
1,2 Dibromo 3-Chloropropane	ug/kg	13 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	11 U
Dibromochloromethane	ug/kg	13 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	11 U
1,2-Dibromoethane	ug/kg	13 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	11 U
1,2-Dichlorobenzene (Ortho)	ug/kg	13 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	11 U
1,3-Dichlorobenzene (Meta)	ug/kg	13 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	11 U
1,4-Dichlorobenzene (Para)	ug/kg	13 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	11 U
Dichlorodifluoromethane	ug/kg	13 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	11 U
1,1-Dichloroethane	ug/kg	13 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	11 U
1,2-Dichloroethane	ug/kg	13 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	11 U
1,1-Dichloroethene	ug/kg	13 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	11 U
cis-1,2-Dichloroethene	ug/kg	13 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	11 U
trans-1,2-Dichloroethene	ug/kg	13 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	11 U
1,2-Dichloropropane	ug/kg	13 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	11 U
cis-1,3,-Dichloropropene	ug/kg	13 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	11 U
trans-1,3,-Dichloropropene	ug/kg	13 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	11 U
Ethylbenzene	ug/kg	13 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	11 U
2-Hexanone	ug/kg	13 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	11 U
Isopropylbenzene	ug/kg	13 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	11 U
Methyl Acetate	ug/kg	13 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	11 U
Methyl tert-butyl ether	ug/kg	13 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	11 U
Methylcyclohexane	ug/kg	13 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	11 U
Methylene Chloride	ug/kg	13 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	11 U
4-Methyl-2-Pentanone (MIBK)	ug/kg	13 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	11 U
Styrene	ug/kg	13 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	11 U
1,1,2,2-Tetrachloroethane	ug/kg	13 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	11 U

Parameter												
	Location	BEXW-1	BEXW-1	BEXW-1	BEXW-1	BEXW-1	BEXW-1	BEXW-1	BEXW-1	BEXW-1	BEXW-1	BEXW-1
	Interval	3-4 ft bgs	10-11 ft bgs	20-21 ft bgs	30-31 ft bgs	40-41 ft bgs	50-51 ft bgs	60-61 ft bgs	70-71 ft bgs	80-81 ft bgs	90-91 ft bgs	100-101 ft bgs
	EPA No	2610-61	2610-62	2610-63	2610-64	2610-65	2610-66	2610-67	2610-68	2610-69	2610-72	2610-73
	Date	5/6/2005	5/6/2005	5/6/2005	5/6/2005	5/6/2005	5/6/2005	5/6/2005	5/7/2005	5/7/2005	5/7/2005	5/7/2005
	Time	16:35	16:48	17:00	17:15	17:30	17:50	18:10	7:30	7:55	8:30	9:00
	Units											
Volatile Organics (Cont)		Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q		Conc. Q	Conc. Q	Conc. Q
Tetrachloroethene	ug/kg	13 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	11 U
Toluene	ug/kg	13 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	11 U
1,2,4-Trichlorobenzene	ug/kg	13 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	11 U
1,1,1-Trichloroethane	ug/kg	13 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	11 U
1,1,2-Trichloroethane	ug/kg	13 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	11 U
Trichloroethene	ug/kg	13 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	11 U
Trichlorofluoromethane	ug/kg	13 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	11 U
1,1,2-Trichlorofluoroethane	ug/kg	13 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	11 U
Vinyl Chloride	ug/kg	13 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	11 U
Total Xylenes	ug/kg	13 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	11 U
Total Volatiles	ug/kg	71	ND	ND	ND	ND	ND	ND	ND	18	ND	20
Total BETXs	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

U : Compound was analyzed for but not detected. The value is the quantation limit.

UJ - The analyte was not detected at or above the reporting limit. The reporting limit is an estimate.

J : Value estimated since not all QC criteria met.

ND : Not detected above quantation limits provided.

TABLE BEXW1-1
SUMMARY OF VOLATILE COMPOUNDS INDENTIFIED (BORING BEXW1)
SOIL/SOURCE MATERIAL SAMPLING 05/2-19/2005
SECOND STREET (HASTINGS) SOURCE AREA RI/FS

	Location	BEXW-1	BEXW-1	BEXW-1	BEXW-1	BEXW-1	BEXW-1	BEXW-1	BEXW-1	BEXW-1
	Interval	114-115 ft bgs	123-124 ft bgs	125-126 ft bgs	125-126 ft bgs	140-141 ft bgs	150-151 ft bgs	160-161 ft bgs	170-171 ft bgs	179-180 ft bgs
	EPA No	2610-74	2610-75	2610-76	2610-76-FD	2610-78	2610-79	2610-80	2610-81	2610-82
	Date	5/7/2005	5/7/2005	5/7/2005	5/7/2005	5/7/2005	5/7/2005	5/7/2005	5/7/2005	5/7/2005
	Time	9:35	10:15	10:45	10:45	11:15	11:30	12:05	12:10	12:40
Parameter	Units									
Volatile Organics		Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	
Acetone	ug/kg	27 J	10 UJ	20 J	10 UJ	10 J	10 J	17 J	23 J	10 J
Benzene	ug/kg	10 U	800 J	11 J	11 J	10 U	10 U	10 U	10 U	10 U
Bromodichloromethane	ug/kg	10 U	10 UJ	10 U	10 UJ	10 U	10 U	10 U	10 U	10 U
Bromoform	ug/kg	10 U	10 UJ	10 U	10 UJ	10 U	10 U	10 U	10 U	10 U
Bromomethane	ug/kg	10 U	10 UJ	10 U	10 UJ	10 U	10 U	10 U	10 U	10 U
2-Butanone (Methyl Ethyl Ketone)	ug/kg	10 U	10 UJ	10 U	10 UJ	10 U	10 U	10 U	10 U	10 U
Carbon Disulfide	ug/kg	10 U	10 UJ	10 U	10 UJ	10 U	10 U	10 U	10 U	10 U
Carbon Tetrachloride	ug/kg	10 U	10 UJ	10 U	10 UJ	10 U	10 U	10 U	10 U	10 U
Chlorobenzene	ug/kg	10 U	10 UJ	10 U	10 UJ	10 U	10 U	10 U	10 U	10 U
Chloroethane	ug/kg	10 U	10 UJ	10 U	10 UJ	10 U	10 U	10 U	10 U	10 U
Chloroform	ug/kg	10 U	10 UJ	10 U	10 UJ	10 U	10 U	10 U	10 U	10 U
Chloromethane	ug/kg	10 U	10 UJ	10 U	10 UJ	10 U	10 U	10 U	10 U	10 U
Cyclohexane	ug/kg	10 U	350 J	10 U	10 UJ	10 U	10 U	10 U	10 U	10 U
1,2 Dibromo 3-Chloropropane	ug/kg	10 U	10 UJ	10 U	10 UJ	10 U	10 U	10 U	10 U	10 U
Dibromochloromethane	ug/kg	10 U	10 UJ	10 U	10 UJ	10 U	10 U	10 U	10 U	10 U
1,2-Dibromoethane	ug/kg	10 U	10 UJ	10 U	10 UJ	10 U	10 U	10 U	10 U	10 U
1,2-Dichlorobenzene (Ortho)	ug/kg	10 U	10 UJ	10 U	10 UJ	10 U	10 U	10 U	10 U	10 U
1,3-Dichlorobenzene (Meta)	ug/kg	10 U	10 UJ	10 U	10 UJ	10 U	10 U	10 U	10 U	10 U
1,4-Dichlorobenzene (Para)	ug/kg	10 U	10 UJ	10 U	10 UJ	10 U	10 U	10 U	10 U	10 U
Dichlorodifluoromethane	ug/kg	10 U	10 UJ	10 U	10 UJ	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethane	ug/kg	10 U	10 UJ	10 U	10 UJ	10 U	10 U	10 U	10 U	10 U
1,2-Dichloroethane	ug/kg	10 U	10 UJ	10 U	10 UJ	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethene	ug/kg	10 U	10 UJ	10 U	10 UJ	10 U	10 U	10 U	10 U	10 U
cis-1,2-Dichloroethene	ug/kg	10 U	10 UJ	10 U	10 UJ	10 U	10 U	10 U	10 U	10 U
trans-1,2-Dichloroethene	ug/kg	10 U	10 UJ	10 U	10 UJ	10 U	10 U	10 U	10 U	10 U
1,2-Dichloropropane	ug/kg	10 U	10 UJ	10 U	10 UJ	10 U	10 U	10 U	10 U	10 U
cis-1,3,-Dichloropropene	ug/kg	10 U	10 UJ	10 U	10 UJ	10 U	10 U	10 U	10 U	10 U
trans-1,3,-Dichloropropene	ug/kg	10 U	10 UJ	10 U	10 UJ	10 U	10 U	10 U	10 U	10 U
Ethylbenzene	ug/kg	10 U	1,500	10 U	10 UJ	10 U	10 U	10 U	10 U	10 U
2-Hexanone	ug/kg	10 U	10 UJ	10 U	10 UJ	10 U	10 U	10 U	10 U	10 U
Isopropylbenzene	ug/kg	10 U	100 J	10 U	10 UJ	10 U	10 U	10 U	10 U	10 U
Methyl Acetate	ug/kg	10 U	10 UJ	10 U	10 UJ	10 U	10 U	10 U	10 U	10 U
Methyl tert-butyl ether	ug/kg	10 U	10 UJ	10 U	10 UJ	10 U	10 U	10 U	10 U	10 U
Methylcyclohexane	ug/kg	10 U	180 J	10 U	10 UJ	10 U	10 U	10 U	10 U	10 U
Methylene Chloride	ug/kg	10 U	10 UJ	10 U	10 UJ	10 U	10 U	10 U	10 U	10 U
4-Methyl-2-Pentanone (MIBK)	ug/kg	10 U	10 UJ	10 U	10 UJ	10 U	10 U	10 U	10 U	10 U
Styrene	ug/kg	10 U	14,000	10 U	10 UJ	10 U	10 U	10 U	10 U	10 U
1,1,2,2-Tetrachloroethane	ug/kg	10 U	10 UJ	10 U	10 UJ	10 U	10 U	10 U	10 U	10 U

Parameter	Location	BEXW-1	BEXW-1	BEXW-1	BEXW-1	BEXW-1	BEXW-1	BEXW-1	BEXW-1	BEXW-1
	Interval	114-115 ft bgs	123-124 ft bgs	125-126 ft bgs	125-126 ft bgs	140-141 ft bgs	150-151 ft bgs	160-161 ft bgs	170-171 ft bgs	179-180 ft bgs
	EPA No	2610-74	2610-75	2610-76	2610-76-FD	2610-78	2610-79	2610-80	2610-81	2610-82
	Date	5/7/2005	5/7/2005	5/7/2005	5/7/2005	5/7/2005	5/7/2005	5/7/2005	5/7/2005	5/7/2005
	Time	9 35	10:15	10:45	10:45	11:15	11:30	12:05	12:10	12.40
	Units									
Volatile Organics (Cont)		Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	
Tetrachloroethene	ug/kg	10 U	10 UJ	10 U	10 UJ	10 U	10 U	10 U	10 U	10 U
Toluene	ug/kg	10 U	4,000	10 U	10 UJ	10 U	10 U	10 U	10 U	10 U
1,2,4-Trichlorobenzene	ug/kg	10 U	10 UJ	10 U	10 UJ	10 U	10 U	10 U	10 U	10 U
1,1,1-Trichloroethane	ug/kg	10 U	10 UJ	10 U	10 UJ	10 U	10 U	10 U	10 U	10 U
1,1,2-Trichloroethane	ug/kg	10 U	10 UJ	10 U	10 UJ	10 U	10 U	10 U	10 U	10 U
Trichloroethene	ug/kg	10 U	10 UJ	10 U	10 UJ	10 U	10 U	10 U	10 U	10 U
Trichlorofluoromethane	ug/kg	10 U	10 UJ	10 U	10 UJ	10 U	10 U	10 U	10 U	10 U
1,1,2-Trichlorofluoroethane	ug/kg	10 U	10 UJ	10 U	10 UJ	10 U	10 U	10 U	10 U	10 U
Vinyl Chloride	ug/kg	10 U	10 UJ	10 U	10 UJ	10 U	10 U	10 U	10 U	10 U
Total Xylenes	ug/kg	10 U	24,000	86	170 J	10 U	10 U	10 U	10 U	10 U
Total Volatiles	ug/kg	27	44,930	119	181	10	10	17	23	10
Total BETXs	ug/kg	ND	30,300	99	181	ND	ND	ND	ND	ND

U : Compound was analyzed for but not detected. The value is the quantation limit.

UJ - The analyte was not detected at or above the reporting limit. The reporting limit is an estimate.

J : Value estimated since not all QC criteria met.

ND : Not detected above quantation limits provided.

TABLE BEXW1-2
SUMMARY OF SEMI-VOLATILE COMPOUNDS IDENTIFIED (BORING BEXW1)
SOIL/SOURCE MATERIAL SAMPLING 05/2-19/2005
SECOND STREET (HASTINGS) SOURCE AREA RI/FS

	Location	BEXW-1	BEXW-1	BEXW-1	BEXW-1	BEXW-1	BEXW-1	BEXW-1	BEXW-1	BEXW-1	BEXW-1	BEXW-1
	Interval	3-4 ft bgs	10-11 ft bgs	20-21 ft bgs	30-31 ft bgs	40-41 ft bgs	50-51 ft bgs	60-61 ft bgs	70-71 ft bgs	80-81 ft bgs	90-91 ft bgs	100-101 ft bgs
	EPA No	2610-61	2610-62	2610-63	2610-64	2610-65	2610-66	2610-67	2610-68	2610-69	2610-72	2610-73
	Date	5/6/2005	5/6/2005	5/6/2005	5/6/2005	5/6/2005	5/6/2005	5/6/2005	5/7/2005	5/7/2005	5/7/2005	5/7/2005
	Time	16:35	16:48	17:00	17.15	17:30	17:50	18:10	7:30	7:55	8:30	9.00
Parameter	Units											
Semivolatile Organics		Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc Q	Conc. Q
Acenaphthene (1)	ug/kg	2,000 U	410 U	420 U	370 U	390 U	370 U	360 U	340 U	340 U	340 U	350 U
Acenaphthylene (1)	ug/kg	2,000 U	410 U	420 U	370 U	390 U	370 U	360 U	340 U	340 U	340 U	350 U
Acetophenone	ug/kg	2,000 U	410 U	420 U	370 U	390 U	370 U	360 U	340 U	340 U	340 U	350 U
Anthracene (1)	ug/kg	2,000 U	410 U	420 U	370 U	390 U	370 U	360 U	340 U	340 U	340 U	350 U
Atrazine	ug/kg	2,000 U	410 U	420 U	370 U	390 U	370 U	360 U	340 U	340 U	340 U	350 U
Benzaldehyde	ug/kg	2,000 U	410 U	420 U	370 U	390 U	370 U	360 U	340 U	340 U	340 U	350 U
Benzo(a)anthracene(1,2)	ug/kg	2,000 U	410 U	420 U	370 U	390 U	370 U	360 U	340 U	340 U	340 U	350 U
Benzo(a)pyrene(1,2)	ug/kg	2,000 U	410 U	420 U	370 U	390 U	370 U	360 U	340 U	340 U	340 U	350 U
Benzo(b)fluoranthene(1,2)	ug/kg	2,000 U	410 U	420 U	370 U	390 U	370 U	360 U	340 U	340 U	340 U	350 U
Benzo(g,h,i)perylene (1)	ug/kg	2,000 U	410 U	420 U	370 U	390 U	370 U	360 U	340 U	340 U	340 U	350 U
Benzo(k)fluoranthene(1,2)	ug/kg	2,000 U	410 U	420 U	370 U	390 U	370 U	360 U	340 U	340 U	340 U	350 U
Biphenyl	ug/kg	2,000 U	410 U	420 U	370 U	390 U	370 U	360 U	340 U	340 U	340 U	350 U
bis(2-Chloroethoxy)methane	ug/kg	2,000 U	410 U	420 U	370 U	390 U	370 U	360 U	340 U	340 U	340 U	350 U
bis(2-Chloroethyl)ether	ug/kg	2,000 U	410 U	420 U	370 U	390 U	370 U	360 U	340 U	340 U	340 U	350 U
bis(2-Chloroisopropyl)ether	ug/kg	2,000 U	410 U	420 U	370 U	390 U	370 U	360 U	340 U	340 U	340 U	350 U
bis(2-Ethylhexyl)phthalate	ug/kg	2,000 U	410 U	420 U	370 U	390 U	370 U	360 U	340 U	340 U	340 U	350 U
4-Bromophenyl-phenylether	ug/kg	2,000 U	410 U	420 U	370 U	390 U	370 U	360 U	340 U	340 U	340 U	350 U
Butylbenzylphthalate	ug/kg	2,000 U	410 U	420 U	370 U	390 U	370 U	360 U	340 U	340 U	340 U	350 U
Caprolactam	ug/kg	2,000 U	410 U	420 U	370 U	390 U	370 U	360 U	340 U	340 U	340 U	350 U
Carbazole	ug/kg	2,000 U	410 U	420 U	370 U	390 U	370 U	360 U	340 U	340 U	340 U	350 U
4-Chloro-3-methylphenol	ug/kg	2,000 U	410 U	420 U	370 U	390 U	370 U	360 U	340 U	340 U	340 U	350 U
4-Chloroaniline	ug/kg	2,000 U	410 U	420 U	370 U	390 U	370 U	360 U	340 U	340 U	340 U	350 U
2-Chloronaphthalene (1)	ug/kg	2,000 U	410 U	420 U	370 U	390 U	370 U	360 U	340 U	340 U	340 U	350 U
2-Chlorophenol	ug/kg	2,000 U	410 U	420 U	370 U	390 U	370 U	360 U	340 U	340 U	340 U	350 U
4-Chlorophenyl-phenylether	ug/kg	2,000 U	410 U	420 U	370 U	390 U	370 U	360 U	340 U	340 U	340 U	350 U
Chrysene (1,2)	ug/kg	2,000 U	410 U	420 U	370 U	390 U	370 U	360 U	340 U	340 U	340 U	350 U
Di-n-butylphthalate	ug/kg	2,000 U	410 U	420 U	370 U	390 U	370 U	360 U	340 U	340 U	340 U	350 U
Di-n-octylphthalate	ug/kg	2,000 U	410 U	420 U	370 U	390 U	370 U	360 U	340 U	340 U	340 U	350 U
Dibenzo(a,h)anthracene (1,2)	ug/kg	2,000 U	410 U	420 U	370 U	390 U	370 U	360 U	340 U	340 U	340 U	350 U
Dibenzofuran	ug/kg	2,000 U	410 U	420 U	370 U	390 U	370 U	360 U	340 U	340 U	340 U	350 U
3,3'-Dichlorobenzidine	ug/kg	2,000 U	410 U	420 U	370 U	390 U	370 U	360 U	340 U	340 U	340 U	350 U
2,4-Dichlorophenol	ug/kg	2,000 U	410 U	420 U	370 U	390 U	370 U	360 U	340 U	340 U	340 U	350 U
Diethylphthalate	ug/kg	2,000 U	410 U	420 U	370 U	390 U	370 U	360 U	340 U	340 U	340 U	350 U
2,4-Dimethylphenol	ug/kg	2,000 U	410 U	420 U	370 U	390 U	370 U	360 U	340 U	340 U	340 U	350 U
Dimethylphthalate	ug/kg	2,000 U	410 U	420 U	370 U	390 U	370 U	360 U	340 U	340 U	340 U	350 U
4,6-Dinitro-2-methylphenol	ug/kg	5,100 U	1,000 U	1,100 U	930 U	990 U	930 U	910 U	860 U	860 U	860 U	890 U
2,4-Dinitrophenol	ug/kg	N/A R	N/A R	N/A R	930 U	990 U	930 U	910 U	860 U	N/A R	860 U	N/A R

Parameter	Location	BEXW-1	BEXW-1	BEXW-1	BEXW-1	BEXW-1	BEXW-1	BEXW-1	BEXW-1	BEXW-1	BEXW-1	BEXW-1
	Interval	3-4 ft bgs	10-11 ft bgs	20-21 ft bgs	30-31 ft bgs	40-41 ft bgs	50-51 ft bgs	60-61 ft bgs	70-71 ft bgs	80-81 ft bgs	90-91 ft bgs	100-101 ft bgs
	EPA No	2610-61	2610-62	2610-63	2610-64	2610-65	2610-66	2610-67	2610-68	2610-69	2610-72	2610-73
	Date	5/6/2005	5/6/2005	5/6/2005	5/6/2005	5/6/2005	5/6/2005	5/6/2005	5/7/2005	5/7/2005	5/7/2005	5/7/2005
	Time	16:35	16:48	17:00	17:15	17:30	17 50	18:10	7:30	7:55	8.30	9 00
	Units											
Semivolatile Organics (Cont)		Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc Q	Conc. Q	Conc. Q		Conc. Q	Conc. Q	Conc. Q
2,4-Dinitrotoluene	ug/kg	2,000 U	410 U	420 U	370 U	390 U	370 U	360 U	340 U	340 U	340 U	350 U
2,6-Dinitrotoluene	ug/kg	2,000 U	410 U	420 U	370 U	390 U	370 U	360 U	340 U	340 U	340 U	350 U
Fluoranthene (1)	ug/kg	2,000 U	410 U	420 U	370 U	390 U	370 U	360 U	340 U	340 U	340 U	350 U
Fluorene (1)	ug/kg	2,000 U	410 U	420 U	370 U	390 U	370 U	360 U	340 U	340 U	340 U	350 U
Hexachlorobenzene	ug/kg	2,000 U	410 U	420 U	370 U	390 U	370 U	360 U	340 U	340 U	340 U	350 U
Hexachlorobutadiene	ug/kg	2,000 U	410 U	420 U	370 U	390 U	370 U	360 U	340 U	340 U	340 U	350 U
Hexachlorocyclopentadiene	ug/kg	2,000 U	410 U	420 U	370 U	390 U	370 U	360 U	340 U	340 U	340 U	350 U
Hexachloroethane	ug/kg	2,000 U	410 U	420 U	370 U	390 U	370 U	360 U	340 U	340 U	340 U	350 U
Indeno(1,2,3-cd)pyrene (1,2)	ug/kg	2,000 U	410 U	420 U	370 U	390 U	370 U	360 U	340 U	340 U	340 U	350 U
Isophorone	ug/kg	2,000 U	410 U	420 U	370 U	390 U	370 U	360 U	340 U	340 U	340 U	350 U
2-Methylnaphthalene (1)	ug/kg	2,000 U	410 U	420 U	370 U	390 U	370 U	360 U	340 U	340 U	340 U	350 U
2-Methylphenol	ug/kg	2,000 U	410 U	420 U	370 U	390 U	370 U	360 U	340 U	340 U	340 U	350 U
4-Methylphenol	ug/kg	2,000 U	410 U	420 U	370 U	390 U	370 U	360 U	340 U	340 U	340 U	350 U
Naphthalene (1)	ug/kg	2,000 U	410 U	420 U	370 U	390 U	370 U	360 U	340 U	340 U	340 U	350 U
2-Nitroaniline	ug/kg	5,100 U	1,000 U	1,100 U	930 U	990 U	930 U	910 U	860 U	860 U	860 U	890 U
3-Nitroaniline	ug/kg	5,100 U	1,000 U	1,100 U	930 U	990 U	930 U	910 U	860 U	860 U	860 U	890 U
4-Nitroaniline	ug/kg	5,100 U	1,000 U	1,100 U	930 U	990 U	930 U	910 U	860 U	860 U	860 U	890 U
Nitrobenzene	ug/kg	2,000 U	410 U	420 U	370 U	390 U	370 U	360 U	340 U	340 U	340 U	350 U
2-Nitrophenol	ug/kg	2,000 U	410 U	420 U	370 U	390 U	370 U	360 U	340 U	340 U	340 U	350 U
4-Nitrophenol	ug/kg	5,100 U	1,000 U	1,100 U	930 U	990 U	930 U	910 U	860 U	860 U	860 U	890 U
N-nitroso-di-n-propylamine	ug/kg	2,000 U	410 U	420 U	370 U	390 U	370 U	360 U	340 U	340 U	340 U	350 U
N-nitrosodiphenylamine	ug/kg	2,000 U	410 U	420 U	370 U	390 U	370 U	360 U	340 U	340 U	340 U	350 U
Pentachlorophenol	ug/kg	5,100 U	1,000 U	1,100 U	930 U	990 U	930 U	910 U	860 U	860 U	860 U	890 U
Phenanthrene (1)	ug/kg	2,000 U	410 U	420 U	370 U	390 U	370 U	360 U	340 U	340 U	340 U	350 U
Phenol	ug/kg	2,000 U	410 U	420 U	370 U	390 U	370 U	360 U	340 U	340 U	340 U	350 U
Pyrene (1)	ug/kg	2,000 U	410 U	420 U	370 U	390 U	370 U	360 U	340 U	340 U	340 U	350 U
2,4,5-Trichlorophenol	ug/kg	5,100 U	1,000 U	1,100 U	930 U	990 U	930 U	910 U	860 U	860 U	860 U	890 U
2,4,6-Trichlorophenol	ug/kg	2,000 U	410 U	420 U	370 U	390 U	370 U	360 U	340 U	340 U	340 U	350 U
Total Semivolatiles	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total PAHs (1)	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Carcinogenic PAHs(2)	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

(1) Polynuclear Aromatic Hydrocarbon.

(2) Carcinogenic Polynuclear Aromatic Hydrocarbon.

U : Compound was analyzed for but not detected. The value is the quantation limit.

J : Value estimated since not all QC criteria met.

ND : Not detected above quantation limits provided.

N/A - Not applicable.

R - The presence or absence of the analyte can not be determined from the data due to severe quality control problems. The data are rejected and considered *unusable*.

TABLE BEXW1-2

SUMMARY OF SEMI-VOLATILE COMPOUNDS IDENTIFIED (BORING BEXW1)

SOIL/SOURCE MATERIAL SAMPLING 05/2-19/2005

SECOND STREET (HASTINGS) SOURCE AREA RI/FS

	Location	BEXW-1	BEXW-1	BEXW-1	BEXW-1	BEXW-1	BEXW-1	BEXW-1	BEXW-1	BEXW-1
	Interval	114-115 ft bgs	123-124 ft bgs	125-126 ft bgs	125-126 ft bgs	140-141 ft bgs	150-151 ft bgs	160-161 ft bgs	170-171 ft bgs	179-180 ft bgs
	EPA No	2610-74	2610-75	2610-76	2610-76-FD	2610-78	2610-79	2610-80	2610-81	2610-82
	Date	5/7/2005	5/7/2005	5/7/2005	5/7/2005	5/7/2005	5/7/2005	5/7/2005	5/7/2005	5/7/2005
	Time	9:35	10:15	10:46	10:45	11:15	11:30	12:05	12:10	12:40
Parameter	Units									
Semivolatile Organics		Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc Q	Conc. Q	Conc. Q
Acenaphthene (1)	ug/kg	5,200	2,300	350 U	380 U	360 U	390 U	370 U	350 U	380 U
Acenaphthylene (1)	ug/kg	34,000	23,000 J	300	380 U	360 U	390 U	370 U	350 U	380 U
Acetophenone	ug/kg	1,800 U	1,800 U	350 U	380 U	360 U	390 U	370 U	350 U	380 U
Anthracene (1)	ug/kg	15,000 J	10,000	350 U	380 U	360 U	390 U	370 U	350 U	380 U
Atrazine	ug/kg	1,800 U	1,800 U	350 U	380 U	360 U	390 U	370 U	350 U	380 U
Benzaldehyde	ug/kg	1,800 U	1,800 U	350 U	380 U	360 U	390 U	370 U	350 U	380 U
Benzo(a)anthracene(1,2)	ug/kg	7,200	3,100	350 U	380 U	360 U	390 U	370 U	350 U	380 U
Benzo(a)pyrene(1,2)	ug/kg	4,500	2,000	350 U	380 U	360 U	390 U	370 U	350 U	380 U
Benzo(b)fluoranthene(1,2)	ug/kg	1,800 U	1,800 U	350 U	380 U	360 U	390 U	370 U	350 U	380 U
Benzo(g,h,i)perylene (1)	ug/kg	1,800 U	1,800 U	350 U	380 U	360 U	390 U	370 U	350 U	380 U
Benzo(k)fluoranthene(1,2)	ug/kg	3,200	1,800 U	350 U	380 U	360 U	390 U	370 U	350 U	380 U
Biphenyl	ug/kg	2,300	5,900	350 U	380 U	360 U	390 U	370 U	350 U	380 U
bis(2-Chloroethoxy)methane	ug/kg	1,800 U	1,800 U	350 U	380 U	360 U	390 U	370 U	350 U	380 U
bis(2-Chloroethyl)ether	ug/kg	1,800 U	1,800 U	350 U	380 U	360 U	390 U	370 U	350 U	380 U
bis(2-Chloroisopropyl)ether	ug/kg	1,800 U	1,800 U	350 U	380 U	360 U	390 U	370 U	350 U	380 U
bis(2-Ethylhexyl)phthalate	ug/kg	1,800 U	1,800 U	350 U	380 U	360 U	390 U	370 U	350 U	380 U
4-Bromophenyl-phenylether	ug/kg	1,800 U	1,800 U	350 U	380 U	360 U	390 U	370 U	350 U	380 U
Butylbenzylphthalate	ug/kg	1,800 U	1,800 U	350 U	380 U	360 U	390 U	370 U	350 U	380 U
Caprolactam	ug/kg	1,800 U	1,800 U	350 U	380 U	360 U	390 U	370 U	350 U	380 U
Carbazole	ug/kg	1,800 U	1,800 U	350 U	380 U	360 U	390 U	370 U	350 U	380 U
4-Chloro-3-methyphenol	ug/kg	1,800 U	1,800 U	350 U	380 U	360 U	390 U	370 U	350 U	380 U
4-Chloroaniline	ug/kg	1,800 U	1,800 U	350 U	380 U	360 U	390 U	370 U	350 U	380 U
2-Chloronaphthalene (1)	ug/kg	1,800 U	1,800 U	350 U	380 U	360 U	390 U	370 U	350 U	380 U
2-Chlorophenol	ug/kg	1,800 U	1,800 U	350 U	380 U	360 U	390 U	370 U	350 U	380 U
4-Chlorophenyl-phenylether	ug/kg	1,800 U	1,800 U	350 U	380 U	360 U	390 U	370 U	350 U	380 U
Chrysene (1,2)	ug/kg	7,400	3,000	350 U	380 U	360 U	390 U	370 U	350 U	380 U
Di-n-butylphthalate	ug/kg	1,800 U	1,800 U	350 U	380 U	360 U	390 U	370 U	350 U	380 U
Di-n-octylphthalate	ug/kg	1,800 U	1,800 U	350 U	380 U	360 U	390 U	370 U	350 U	380 U
Dibenzo(a,h)anthracene (1,2)	ug/kg	1,800 U	1,800 U	350 U	380 U	360 U	390 U	370 U	350 U	380 U
Dibenzofuran	ug/kg	4,200	2,600	350 U	380 U	360 U	390 U	370 U	350 U	380 U
3,3'-Dichlorobenzidine	ug/kg	1,800 U	1,800 U	350 U	380 U	360 U	390 U	370 U	350 U	380 U
2,4-Dichlorophenol	ug/kg	1,800 U	1,800 U	350 U	380 U	360 U	390 U	370 U	350 U	380 U
Diethylphthalate	ug/kg	1,800 U	1,800 U	350 U	380 U	360 U	390 U	370 U	350 U	380 U
2,4-Dimethylphenol	ug/kg	1,800 U	1,800 U	350 U	380 U	360 U	390 U	370 U	350 U	380 U
Dimethylphthalate	ug/kg	1,800 U	1,800 U	350 U	380 U	360 U	390 U	370 U	350 U	380 U
4,6-Dinitro-2-methylphenol	ug/kg	4,600 U	4,400 U	890 U	970 U	900 U	980 U	920 U	890 U	950 U
2,4-Dinitrophenol	ug/kg	N/A R	N/A R	N/A R	N/A R	N/A R	N/A R	N/A R	N/A R	N/A R

Parameter	Location	BEXW-1	BEXW-1	BEXW-1	BEXW-1	BEXW-1	BEXW-1	BEXW-1	BEXW-1	BEXW-1
	Interval	114-115 ft bgs	123-124 ft bgs	125-126 ft bgs	125-126 ft bgs	140-141 ft bgs	150-151 ft bgs	160-161 ft bgs	170-171 ft bgs	179-180 ft bgs
	EPA No	2610-74	2610-75	2610-76	2610-76-FD	2610-78	2610-79	2610-80	2610-81	2610-82
	Date	5/7/2005	5/7/2005	5/7/2005	5/7/2005	5/7/2005	5/7/2005	5/7/2005	5/7/2005	5/7/2005
	Time	9:35	10:15	10:45	10:45	11:15	11.30	12:05	12:10	12:40
	Units									
Semivolatile Organics (Cont)		Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	
2,4-Dinitrotoluene	ug/kg	1,800 U	1,800 U	350 U	380 U	360 U	390 U	370 U	350 U	380 U
2,6-Dinitrotoluene	ug/kg	1,800 U	1,800 U	350 U	380 U	360 U	390 U	370 U	350 U	380 U
Fluoranthene (1)	ug/kg	16,000 J	8,000	350 U	380 U	360 U	390 U	370 U	350 U	380 U
Fluorene (1)	ug/kg	27,000	11,000	360 U	380 U	360 U	390 U	370 U	350 U	380 U
Hexachlorobenzene	ug/kg	1,800 U	1,800 U	350 U	380 U	360 U	390 U	370 U	350 U	380 U
Hexachlorobutadiene	ug/kg	1,800 U	1,800 U	350 U	380 U	360 U	390 U	370 U	350 U	380 U
Hexachlorocyclopentadiene	ug/kg	1,800 U	1,800 U	350 U	380 U	360 U	390 U	370 U	350 U	380 U
Hexachloroethane	ug/kg	1,800 U	1,800 U	350 U	380 U	360 U	390 U	370 U	350 U	380 U
Indeno(1,2,3-cd)pyrene (1,2)	ug/kg	1,800 U	1,800 U	350 U	380 U	360 U	390 U	370 U	350 U	380 U
Isophorone	ug/kg	1,800 U	1,800 U	350 U	380 U	360 U	390 U	370 U	350 U	380 U
2-Methylnaphthalene (1)	ug/kg	100,000	150,000	1,200	380 U	970	390 U	370 U	350 U	380 U
2-Methylphenol	ug/kg	1,800 U	1,800 U	350 U	380 U	360 U	390 U	370 U	350 U	380 U
4-Methylphenol	ug/kg	1,800 U	1,800 U	350 U	380 U	360 U	390 U	370 U	360 U	380 U
Naphthalene (1)	ug/kg	3,800	160,000	690	380 U	730	390 U	370 U	350 U	380 U
2-Nitroaniline	ug/kg	4,600 U	4,400 U	890 U	970 U	900 U	980 U	920 U	890 U	950 U
3-Nitroaniline	ug/kg	4,600 U	4,400 U	890 U	970 U	900 U	980 U	920 U	890 U	950 U
4-Nitroaniline	ug/kg	4,600 U	4,400 U	890 U	970 U	900 U	980 U	920 U	890 U	950 U
Nitrobenzene	ug/kg	1,800 U	1,800 U	350 U	380 U	360 U	390 U	370 U	350 U	380 U
2-Nitrophenol	ug/kg	1,800 U	1,800 U	350 U	380 U	360 U	390 U	370 U	350 U	380 U
4-Nitrophenol	ug/kg	4,600 U	4,400 U	890 U	970 U	900 U	980 U	920 U	890 U	950 U
N-nitroso-di-n-propylamine	ug/kg	1,800 U	1,800 U	350 U	380 U	360 U	390 U	370 U	350 U	380 U
N-nitrosodiphenylamine	ug/kg	1,800 U	1,800 U	350 U	380 U	360 U	390 U	370 U	350 U	380 U
Pentachlorophenol	ug/kg	4,600 U	4,400 U	890 U	970 U	900 U	980 U	920 U	890 U	960 U
Phenanthrene (1)	ug/kg	100,000	47,000	720	380 U	360 U	390 U	370 U	350 U	380 U
Phenol	ug/kg	1,800 U	1,800 U	350 U	380 U	360 U	390 U	370 U	350 U	380 U
Pyrene (1)	ug/kg	19,000 J	7,800	350 U	380 U	360 U	380 U	370 U	350 U	380 U
2,4,5-Trichlorophenol	ug/kg	4,600 U	4,400 U	890 U	970 U	900 U	980 U	920 U	890 U	950 U
2,4,6-Trichlorophenol	ug/kg	1,800 U	1,800 U	350 U	380 U	360 U	390 U	370 U	350 U	380 U
Total Semivolatiles	ug/kg	348,800	455,700	2,910	ND	1,700	ND	ND	ND	ND
Total PAHs (1)	ug/kg	342,300	447,200	2,910	ND	1,700	ND	ND	ND	ND
Total Carcinogenic PAHs(2)	ug/kg	22,300	8,100	ND	ND	ND	ND	ND	ND	ND

(1) Polynuclear Aromatic Hydrocarbon.

(2) Carcinogenic Polynuclear Aromatic Hydrocarbon.

U : Compound was analyzed for but not detected. The value is the quantation limit.

J : Value estimated since not all QC criteria met.

ND : Not detected above quantation limits provided.

N/A - Not applicable.

R - The presence or absence of the analyte can not be determined from the data due to severe quality control problems. The data are rejected and considered unusable.

TABLE A1-1
SUMMARY OF VOLATILE COMPOUNDS IDENTIFIED (BORING A1)
SOIL/SOURCE MATERIAL SAMPLING 05/02-19/2005
SECOND STREET (HASTINGS) SOURCE AREA RI/FS

	Location	A-1	A-1	A-1	A-1	A-1	A-1	A-1	A-1	A-1	A-1	A-1
	Interval	4-5 ft bgs	10-11 ft bgs	20-21 ft bgs	30-31 ft bgs	40-41 ft bgs	50-51 ft bgs	60-61 ft bgs	70-71 ft bgs	80-81 ft bgs	90-91 ft bgs	100-101 ft bgs
	EPA No	2610-83	2610-84	2610-85	2610-86	2610-87	2610-88	2610-89	2610-90	2610-91	2610-92	2610-95
	Date	5/2/2005	5/2/2005	5/2/2005	5/2/2005	5/2/2005	5/2/2005	5/2/2005	5/2/2005	5/2/2005	5/2/2005	5/2/2005
	Time	17:20	17:20	17:20	17:20	17:20	17:20	17:20	17:20	17:20	17:20	17:20
Parameter	Units											
Volatile Organics		Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q
Acetone	ug/kg	60 J	69 J	30 J	18 J	19 J	22 J	28 J	13 J	11 J	11 U	15 U
Benzene	ug/kg	10 UJ	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 U
Bromodichloromethane	ug/kg	10 UJ	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 U
Bromoform	ug/kg	10 UJ	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 U
Bromomethane	ug/kg	10 UJ	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 U
2-Butanone (Methyl Ethyl Ketone)	ug/kg	10 UJ	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 U
Carbon Disulfide	ug/kg	10 UJ	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 U
Carbon Tetrachloride	ug/kg	10 UJ	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 U
Chlorobenzene	ug/kg	10 UJ	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 U
Chloroethane	ug/kg	10 UJ	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 U
Chloroform	ug/kg	10 UJ	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 U
Chloromethane	ug/kg	10 UJ	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 U
Cyclohexane	ug/kg	10 UJ	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 U
1,2 Dibromo 3-Chloropropane	ug/kg	10 UJ	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 U
Dibromochloromethane	ug/kg	10 UJ	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 U
1,2-Dibromoethane	ug/kg	10 UJ	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 U
1,2-Dichlorobenzene (Ortho)	ug/kg	10 UJ	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 U
1,3-Dichlorobenzene (Meta)	ug/kg	10 UJ	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 U
1,4-Dichlorobenzene (Para)	ug/kg	10 UJ	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 U
Dichlorodifluoromethane	ug/kg	10 UJ	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 U
1,1-Dichloroethane	ug/kg	10 UJ	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 U
1,2-Dichloroethane	ug/kg	10 UJ	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 U
1,1-Dichloroethene	ug/kg	10 UJ	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 U
cis-1,2-Dichloroethene	ug/kg	10 UJ	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 U
trans-1,2-Dichloroethene	ug/kg	10 UJ	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 U
1,2-Dichloropropane	ug/kg	10 UJ	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 U
cis-1,3,-Dichloropropene	ug/kg	10 UJ	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 U
trans-1,3,-Dichloropropene	ug/kg	10 UJ	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 U
Ethylbenzene	ug/kg	10 UJ	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 U
2-Hexanone	ug/kg	10 UJ	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 U
Isopropylbenzene	ug/kg	10 UJ	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 U
Methyl Acetate	ug/kg	10 UJ	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 U
Methyl tert-butyl ether	ug/kg	10 UJ	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 U
Methylcyclohexane	ug/kg	10 UJ	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 U
Methylene Chloride	ug/kg	10 UJ	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 U
4-Methyl-2-Pentanone (MIBK)	ug/kg	10 UJ	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 U
Styrene	ug/kg	10 UJ	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 U
1,1,2,2-Tetrachloroethane	ug/kg	10 UJ	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 U

Parameter	Location	A-1	A-1	A-1	A-1	A-1	A-1	A-1	A-1	A-1	A-1	A-1
	Interval	4-5 ft bgs	10-11 ft bgs	20-21 ft bgs	30-31 ft bgs	40-41 ft bgs	50-51 ft bgs	60-61 ft bgs	70-71 ft bgs	80-81 ft bgs	90-91 ft bgs	100-101 ft bgs
	EPA No	2610-83	2610-84	2610-85	2610-86	2610-87	2610-88	2610-89	2610-90	2610-91	2610-92	2610-95
	Date	5/2/2005	5/2/2005	5/2/2005	5/2/2005	5/2/2005	5/2/2005	5/2/2005	5/2/2005	5/2/2005	5/2/2005	5/2/2005
	Time	17:20	17:20	17:20	17:20	17:20	17:20	17:20	17:20	17:20	17:20	17:20
	Units											
Volatile Organics (Cont)		Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q
Tetrachloroethene	ug/kg	10 UJ	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 U
Toluene	ug/kg	10 UJ	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 U
1 2,4-Trichlorobenzene	ug/kg	10 UJ	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 U
1,1,1-Trichloroethane	ug/kg	10 UJ	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 U
1,1,2-Trichloroethane	ug/kg	10 UJ	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 U
Trichloroethene	ug/kg	10 UJ	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 U
Trichlorofluoromethane	ug/kg	10 UJ	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 U
1,1,2-Trichlorofluoroethane	ug/kg	10 UJ	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 U
Vinyl Chloride	ug/kg	10 UJ	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 U
Total Xylenes	ug/kg	10 UJ	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 U
Total Volatiles	ug/kg	60	69	30	19	19	22	29	13	11	ND	ND
Total BTEXs	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

U : Compound was analyzed for but not detected. The value is the quantation limit.

UJ - The analyte was not detected at or above the reporting limit. The reporting limit is an estimate.

J : Value estimated since not all QC criteria met.

ND : Not detected above quantation limits provided.

TABLE A1-1
SUMMARY OF VOLATILE COMPOUNDS IDENTIFIED (BORING A1)
SOIL/SOURCE MATERIAL SAMPLING 05/02-19/2005
SECOND STREET (HASTINGS) SOURCE AREA RI/FS

Parameter	Location	A-1	A-1	A-1	A-1	A-1	A-1	A-1	A-1	A-1
	Interval	114-115 ft bgs	123-124 ft bgs	123-124 ft bgs	125-126 ft bgs	140-141 ft bgs	150-151 ft bgs	160-161 ft bgs	170-171 ft bgs	179-180 ft bgs
	EPA No	2810-96	2810-97	2810-97-FD	2810-98	2810-100	2810-101	2810-102	2810-103	2810-104
	Date	5/2/2005	5/2/2005	5/2/2005	5/2/2005	5/2/2005	5/2/2005	5/2/2005	5/2/2005	5/7/2005
	Time	17:20	17:20	17:20	17:20	17:20	17:20	17:20	17:20	14:30
	Units									
Volatile Organics		Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q
Acetone	ug/kg	1,500 UJ	16,000 UJ	14,000 U	5,700 U	17 U	15 U	15 U	18 J	10 U
Benzene	ug/kg	1,500 UJ	16,000 UJ	14,000 U	5,700 U	10 U	10 U	10 U	10 U	10 U
Bromodichloromethane	ug/kg	1,500 UJ	16,000 UJ	14,000 U	5,700 U	10 U	10 U	10 U	10 U	10 U
Bromoform	ug/kg	1,500 UJ	16,000 UJ	14,000 U	5,700 U	10 U	10 U	10 U	10 U	10 U
Bromomethane	ug/kg	1,500 UJ	16,000 UJ	14,000 U	5,700 U	10 U	10 U	10 U	10 U	10 U
2-Butanone (Methyl Ethyl Ketone)	ug/kg	1,500 UJ	16,000 UJ	14,000 U	5,700 U	10 U	10 U	10 U	10 U	10 U
Carbon Disulfide	ug/kg	1,500 UJ	16,000 UJ	14,000 U	5,700 U	10 U	10 U	10 U	10 U	10 U
Carbon Tetrachloride	ug/kg	1,500 UJ	16,000 UJ	14,000 U	5,700 U	10 U	10 U	10 U	10 U	10 U
Chlorobenzene	ug/kg	1,500 UJ	16,000 UJ	14,000 U	5,700 U	10 U	10 U	10 U	10 U	10 U
Chloroethane	ug/kg	1,500 UJ	16,000 UJ	14,000 U	5,700 U	10 U	10 U	10 U	10 U	10 U
Chloroform	ug/kg	1,500 UJ	16,000 UJ	14,000 U	5,700 U	10 U	10 U	10 U	10 U	10 U
Chloromethane	ug/kg	1,500 UJ	16,000 UJ	14,000 U	5,700 U	10 U	10 U	10 U	10 U	10 U
Cyclohexane	ug/kg	1,500 UJ	16,000 UJ	14,000 U	5,700 U	10 U	10 U	10 U	10 U	10 U
1,2 Dibromo 3-Chloropropane	ug/kg	1,500 UJ	16,000 UJ	14,000 U	5,700 U	10 U	10 U	10 U	10 U	10 U
Dibromochloromethane	ug/kg	1,500 UJ	16,000 UJ	14,000 U	5,700 U	10 U	10 U	10 U	10 U	10 U
1,2-Dibromoethane	ug/kg	1,500 UJ	16,000 UJ	14,000 U	5,700 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichlorobenzene (Ortho)	ug/kg	1,500 UJ	16,000 UJ	14,000 U	5,700 U	10 U	10 U	10 U	10 U	10 U
1,3-Dichlorobenzene (Meta)	ug/kg	1,500 UJ	16,000 UJ	14,000 U	5,700 U	10 U	10 U	10 U	10 U	10 U
1,4-Dichlorobenzene (Para)	ug/kg	1,500 UJ	16,000 UJ	14,000 U	5,700 U	10 U	10 U	10 U	10 U	10 U
Dichlorodifluoromethane	ug/kg	1,500 UJ	16,000 UJ	14,000 U	5,700 U	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethane	ug/kg	1,500 UJ	16,000 UJ	14,000 U	5,700 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloroethane	ug/kg	1,500 UJ	16,000 UJ	14,000 U	5,700 U	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethene	ug/kg	1,500 UJ	16,000 UJ	14,000 U	5,700 U	10 U	10 U	10 U	10 U	10 U
cis-1,2-Dichloroethene	ug/kg	1,500 UJ	16,000 UJ	14,000 U	5,700 U	10 U	10 U	10 U	10 U	10 U
trans-1,2-Dichloroethene	ug/kg	1,500 UJ	16,000 UJ	14,000 U	5,700 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloropropane	ug/kg	1,500 UJ	16,000 UJ	14,000 U	5,700 U	10 U	10 U	10 U	10 U	10 U
cis-1,3,-Dichloropropene	ug/kg	1,500 UJ	16,000 UJ	14,000 U	5,700 U	10 U	10 U	10 U	10 U	10 U
trans-1,3,-Dichloropropene	ug/kg	1,500 UJ	16,000 UJ	14,000 U	5,700 U	10 U	10 U	10 U	10 U	10 U
Ethylbenzene	ug/kg	1,500 UJ	18,000 J	20,000	5,700 U	10 U	10 U	10 U	10 U	10 U
2-Hexanone	ug/kg	1,500 UJ	16,000 UJ	14,000 U	5,700 U	10 U	10 U	10 U	10 U	10 U
Isopropylbenzene	ug/kg	1,500 UJ	16,000 UJ	14,000 U	57,000 U	10 U	10 U	10 U	10 U	10 U
Methyl Acetate	ug/kg	1,500 UJ	16,000 UJ	14,000 U	5,700 U	10 U	10 U	10 U	10 U	10 U
Methyl tert-butyl ether	ug/kg	1,500 UJ	16,000 UJ	14,000 U	5,700 U	10 U	10 U	10 U	10 U	10 U
Methylcyclohexane	ug/kg	1,500 UJ	16,000 UJ	14,000 U	5,700 U	10 U	10 U	10 U	10 U	10 U
Methylene Chloride	ug/kg	1,500 UJ	16,000 UJ	14,000 U	5,700 U	10 U	10 U	10 U	10 U	10 U
4-Methyl-2-Pentanone (MIBK)	ug/kg	1,500 UJ	16,000 UJ	14,000 U	5,700 U	10 U	10 U	10 U	10 U	10 U
Styrene	ug/kg	1,500 UJ	140,000 J	150,000	23,000	10 U	10 U	10 U	10 U	10 U
1,1,2,2-Tetrachloroethane	ug/kg	1,500 UJ	16,000 UJ	14,000 U	5,700 U	10 U	10 U	10 U	10 U	10 U

Parameter	Location	A-1	A-1	A-1	A-1	A-1	A-1	A-1	A-1	A-1
	Interval	114-115 ft bgs	123-124 ft bgs	123-124 ft bgs	125-126 ft bgs	140-141 ft bgs	150-151 ft bgs	160-161 ft bgs	170-171 ft bgs	179-180 ft bgs
	EPA No	2610-96	2610-97	2610-97-FD	2610-99	2610-100	2610-101	2610-102	2610-103	2610-104
	Date	5/2/2005	5/2/2005	5/2/2005	5/2/2005	5/2/2005	5/2/2005	5/2/2005	5/2/2005	6/7/2005
	Time	17:20	17:20	17:20	17:20	17:20	17:20	17:20	17:20	14:30
	Units									
Volatile Organics (Cont)		Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q
Tetrachloroethene	ug/kg	1,500 UJ	16,000 UJ	14,000 U	5,700 U	10 U	10 U	10 U	10 U	10 U
Toluene	ug/kg	1,500 UJ	65,000 J	73,000	5,700 U	10 U	10 U	10 U	10 U	10 U
1,2,4-Trichlorobenzene	ug/kg	1,500 UJ	16,000 UJ	14,000 U	5,700 U	10 U	10 U	10 U	10 U	10 U
1,1,1-Trichloroethane	ug/kg	1,500 UJ	16,000 UJ	14,000 U	5,700 U	10 U	10 U	10 U	10 U	10 U
1,1,2-Trichloroethane	ug/kg	1,500 UJ	16,000 UJ	14,000 U	5,700 U	10 U	10 U	10 U	10 U	10 U
Trichloroethene	ug/kg	1,500 UJ	16,000 UJ	14,000 U	5,700 U	10 U	10 U	10 U	10 U	10 U
Trichlorofluoromethane	ug/kg	1,500 UJ	16,000 UJ	14,000 U	5,700 U	10 U	10 U	10 U	10 U	10 U
1,1,2-Trichlorofluoroethane	ug/kg	1,500 UJ	16,000 UJ	14,000 U	5,700 U	10 U	10 U	10 U	10 U	10 U
Vinyl Chloride	ug/kg	1,500 UJ	16,000 UJ	14,000 U	5,700 U	10 U	10 U	10 U	10 U	10 U
Total Xylenes	ug/kg	1,500 UJ	230,000 J	260,000	140,000	10 U	10 U	10 U	10 U	10 U
Total Volatiles	ug/kg	ND	453,000	483,000	163,000	ND	ND	ND	18	ND
Total BETXs	ug/kg	ND	313,000	343,000	140,000	ND	ND	ND	ND	ND

U : Compound was analyzed for but not detected. The value is the quantation limit.

UJ - The analyte was not detected at or above the reporting limit. The reporting limit is an estimate.

J : Value estimated since not all QC criteria met.

ND : Not detected above quantation limits provided.

TABLE A1-2
SUMMARY OF SEMI-VOLATILE COMPOUNDS IDENTIFIED (BORING A1)
SOIL/SOURCE MATERIAL SAMPLING 05/2-19/2005
SECOND STREET (HASTINGS) SOURCE AREA RI/FS

	Location	A-1	A-1	A-1	A-1	A-1	A-1	A-1	A-1	A-1	A-1	A-1
	Interval	4-5 ft bgs	10-11 ft bgs	20-21 ft bgs	30-31 ft bgs	40-41 ft bgs	50-51 ft bgs	60-61 ft bgs	70-71 ft bgs	80-81 ft bgs	90-91 ft bgs	100-101 ft bgs
	EPA No	2610-83	2610-84	2610-85	2610-86	2610-87	2610-88	2610-89	2610-90	2610-91	2610-92	2610-95
	Date	5/2/2005	5/2/2005	5/2/2005	5/2/2005	5/2/2005	5/2/2005	5/2/2005	5/2/2005	5/2/2005	5/2/2005	5/2/2005
	Time	17:20	17:20	17:20	17:20	17:20	17:20	17:20	17:20	17:20	17.20	17:20
Parameter	Units											
Semivolatile Organics		Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q
Acenaphthene (1)	ug/kg	1,900 U	430 U	430 U	400 U	390 U	380 U	370 U	350 U	360 U	350 U	410 U
Acenaphthylene (1)	ug/kg	1,900 U	430 U	430 U	400 U	390 U	380 U	370 U	350 U	360 U	350 U	410 U
Acetophenone	ug/kg	1,900 U	430 U	430 U	400 U	380 U	380 U	370 U	360 U	360 U	350 U	410 U
Anthracene (1)	ug/kg	1,900 U	430 U	430 U	400 U	390 U	380 U	370 U	350 U	360 U	350 U	410 U
Atrazine	ug/kg	1,900 U	430 U	430 U	400 U	390 U	380 U	370 U	350 U	360 U	350 U	410 U
Benzaldehyde	ug/kg	1,900 U	430 U	430 U	400 U	390 U	380 U	370 U	350 U	360 U	350 U	410 U
Benzo(a)anthracene(1,2)	ug/kg	1,900 U	430 U	430 U	400 U	390 U	360 U	370 U	350 U	360 U	380 U	410 U
Benzo(a)pyrene(1,2)	ug/kg	1,900 U	430 U	430 U	400 U	390 U	380 U	370 U	350 U	360 U	350 U	410 U
Benzo(b)fluoranthene(1,2)	ug/kg	1,900 U	430 U	430 U	400 U	390 U	380 U	370 U	350 U	360 U	350 U	410 U
Benzo(g,h,i)perylene (1)	ug/kg	1,900 U	430 U	430 U	400 U	390 U	380 U	370 U	350 U	380 U	350 U	410 U
Benzo(k)fluoranthene(1,2)	ug/kg	1,800 U	430 U	430 U	400 U	390 U	380 U	370 U	350 U	360 U	350 U	410 U
Biphenyl	ug/kg	1,900 U	430 U	430 U	400 U	390 U	380 U	370 U	360 U	360 U	350 U	410 U
bis(2-Chloroethoxy)methane	ug/kg	1,900 U	430 U	430 U	400 U	390 U	380 U	370 U	360 U	360 U	350 U	410 U
bis(2-Chloroethyl)ether	ug/kg	1,900 U	430 U	430 U	400 U	390 U	380 U	370 U	350 U	360 U	360 U	410 U
bis(2-Chloroisopropyl)ether	ug/kg	1,900 U	430 U	430 U	400 U	380 U	380 U	370 U	350 U	360 U	350 U	410 U
bis(2-Ethylhexyl)phthalate	ug/kg	1,900 U	430 U	430 U	400 U	390 U	380 U	370 U	350 U	380 U	360 U	410 U
4-Bromophenyl-phenylether	ug/kg	1,900 U	430 U	430 U	400 U	390 U	380 U	370 U	360 U	360 U	360 U	410 U
Butylbenzylphthalate	ug/kg	1,900 U	430 U	430 U	400 U	380 U	380 U	370 U	350 U	360 U	360 U	410 U
Caprolactam	ug/kg	1,900 U	430 U	430 U	400 U	380 U	380 U	370 U	350 U	360 U	350 U	410 U
Carbazole	ug/kg	1,900 U	430 U	430 U	400 U	390 U	380 U	370 U	350 U	360 U	350 U	410 U
4-Chloro-3-methyphenol	ug/kg	1,900 U	430 U	430 U	400 U	390 U	380 U	370 U	350 U	360 U	350 U	410 U
4-Chloroaniline	ug/kg	1,900 U	430 U	430 U	400 U	390 U	380 U	370 U	350 U	360 U	350 U	410 U
2-Chloronaphthalene (1)	ug/kg	1,900 U	430 U	430 U	400 U	390 U	380 U	370 U	350 U	380 U	350 U	410 U
2-Chlorophenol	ug/kg	1,900 U	430 U	430 U	400 U	390 U	380 U	370 U	350 U	360 U	360 U	410 U
4-Chlorophenyl-phenylether	ug/kg	1,900 U	430 U	430 U	400 U	390 U	380 U	370 U	350 U	360 U	360 U	410 U
Chrysene (1,2)	ug/kg	1,900 U	430 U	430 U	400 U	380 U	380 U	370 U	350 U	360 U	350 U	410 U
Di-n-butylphthalate	ug/kg	1,900 U	430 U	430 U	400 U	390 U	380 U	370 U	350 U	360 U	350 U	410 U
Di-n-octylphthalate	ug/kg	1,900 U	430 U	430 U	400 U	390 U	380 U	370 U	360 U	380 U	350 U	410 U
Dibenzo(a,h)anthracene (1,2)	ug/kg	1,900 U	430 U	430 U	400 U	390 U	380 U	370 U	350 U	360 U	360 U	410 U
Dibenzofuran	ug/kg	1,900 U	430 U	430 U	400 U	390 U	380 U	370 U	350 U	360 U	350 U	410 U
3,3'-Dichlorobenzidine	ug/kg	1,900 U	430 U	430 U	400 U	380 U	380 U	370 U	360 U	360 U	350 U	410 U
2,4-Dichlorophenol	ug/kg	1,900 U	430 U	430 U	400 U	390 U	380 U	370 U	350 U	360 U	350 U	410 U
Diethylphthalate	ug/kg	1,900 U	430 U	430 U	400 U	390 U	380 U	370 U	350 U	360 U	350 U	410 U
2,4-Dimethylphenol	ug/kg	1,900 U	430 U	430 U	400 U	390 U	380 U	370 U	350 U	360 U	350 U	410 U
Dimethylphthalate	ug/kg	1,900 U	430 U	430 U	400 U	380 U	380 U	370 U	360 U	360 U	350 U	410 U
4,6-Dinitro-2-methylphenol	ug/kg	4,900 U	1,100 U	1,100 U	1,000 U	980 U	940 U	920 U	870 U	910 U	890 U	1,000 U
2,4-Dinitrophenol	ug/kg	N/A R	N/A R	N/A R	N/A R	N/A R	N/A R	N/A R	N/A R	N/A R	N/A R	N/A R

Parameter	Location	A-1	A-1	A-1	A-1	A-1	A-1	A-1	A-1	A-1	A-1	A-1
	Interval	4-5 ft bgs	10-11 ft bgs	20-21 ft bgs	30-31 ft bgs	40-41 ft bgs	50-51 ft bgs	60-61 ft bgs	70-71 ft bgs	80-81 ft bgs	90-91 ft bgs	100-101 ft bgs
	EPA No	2610-83	2610-84	2610-85	2610-86	2610-87	2610-88	2610-89	2610-90	2610-91	2610-92	2610-95
	Date	5/2/2005	5/2/2005	5/2/2005	5/2/2005	5/2/2005	5/2/2005	5/2/2005	5/2/2005	5/2/2005	5/2/2005	5/2/2005
	Time	17:20	17.20	17:20	17:20	17:20	17:20	17:20	17:20	17:20	17.20	17:20
	Units											
Semivolatile Organics (Cont)		Conc Q	Conc. Q	Conc. Q	Conc. Q	Conc Q	Conc. Q	Conc. Q	Conc. Q	Conc Q	Conc. Q	Conc. Q
2,4-Dinitrotoluene	ug/kg	1,900 U	430 U	430 U	400 U	390 U	380 U	370 U	350 U	360 U	360 U	410 U
2,6-Dinitrotoluene	ug/kg	1,900 U	430 U	430 U	400 U	380 U	380 U	370 U	350 U	360 U	350 U	410 U
Fluoranthene (1)	ug/kg	1,900 U	430 U	430 U	400 U	390 U	380 U	370 U	350 U	360 U	350 U	410 U
Fluorene (1)	ug/kg	1,900 U	430 U	430 U	400 U	390 U	380 U	370 U	360 U	380 U	360 U	410 U
Hexachlorobenzene	ug/kg	1,900 U	430 U	430 U	400 U	390 U	380 U	370 U	350 U	360 U	350 U	410 U
Hexachlorobutadiene	ug/kg	1,900 U	430 U	430 U	400 U	390 U	380 U	370 U	350 U	360 U	350 U	410 U
Hexachlorocyclopentadiene	ug/kg	1,900 U	430 U	430 U	400 U	390 U	380 U	370 U	360 U	360 U	350 U	410 U
Hexachloroethane	ug/kg	1,900 U	430 U	430 U	400 U	380 U	380 U	370 U	350 U	360 U	350 U	410 U
Indeno(1,2,3-cd)pyrene (1,2)	ug/kg	1,900 U	430 U	430 U	400 U	390 U	380 U	370 U	360 U	360 U	360 U	410 U
Isophorone	ug/kg	1,900 U	430 U	430 U	400 U	390 U	380 U	370 U	360 U	360 U	350 U	410 U
2-Methylnaphthalene (1)	ug/kg	1,900 U	430 U	430 U	400 U	390 U	380 U	370 U	350 U	360 U	350 U	410 U
2-Methylphenol	ug/kg	1,900 U	430 U	430 U	400 U	390 U	380 U	370 U	350 U	360 U	350 U	410 U
4-Methylphenol	ug/kg	1,900 U	430 U	430 U	400 U	390 U	380 U	370 U	350 U	360 U	350 U	410 U
Naphthalene (1)	ug/kg	1,900 U	430 U	430 U	400 U	390 U	380 U	370 U	350 U	360 U	350 U	410 U
2-Nitroaniline	ug/kg	4,900 U	1,100 U	1,100 U	1,000 U	980 U	940 U	920 U	870 U	910 U	890 U	1,000 U
3-Nitroaniline	ug/kg	4,900 U	1,100 U	1,100 U	1,000 U	980 U	940 U	820 U	870 U	910 U	880 U	1,000 U
4-Nitroaniline	ug/kg	4,900 U	1,100 U	1,100 U	1,000 U	980 U	940 U	920 U	870 U	910 U	890 U	1,000 U
Nitrobenzene	ug/kg	1,900 U	430 U	430 U	400 U	380 U	380 U	370 U	350 U	360 U	350 U	410 U
2-Nitrophenol	ug/kg	1,900 U	430 U	430 U	400 U	390 U	380 U	370 U	350 U	360 U	350 U	410 U
4-Nitrophenol	ug/kg	4,900 U	1,100 U	1,100 U	1,000 U	980 U	940 U	920 U	870 U	910 U	890 U	1,000 U
N-nitroso-di-n-propylamine	ug/kg	1,900 U	430 U	430 U	400 U	390 U	380 U	370 U	350 U	360 U	350 U	410 U
N-nitrosodiphenylamine	ug/kg	1,900 U	430 U	430 U	400 U	390 U	380 U	370 U	360 U	360 U	360 U	410 U
Pentachlorophenol	ug/kg	4,900 U	1,100 U	1,100 U	1,000 U	980 U	940 U	920 U	870 U	910 U	890 U	1,000 U
Phenanthrene (1)	ug/kg	1,900 U	430 U	430 U	400 U	390 U	380 U	370 U	350 U	360 U	350 U	410 U
Phenol	ug/kg	1,900 U	430 U	430 U	400 U	390 U	380 U	370 U	360 U	360 U	350 U	410 U
Pyrene (1)	ug/kg	1,900 U	430 U	430 U	400 U	390 U	380 U	370 U	350 U	360 U	350 U	410 U
2,4,5-Trichlorophenol	ug/kg	4,900 U	1,100 U	1,100 U	1,000 U	980 U	940 U	920 U	870 U	910 U	890 U	1,000 U
2,4,6-Trichlorophenol	ug/kg	1,900 U	430 U	430 U	400 U	390 U	380 U	370 U	350 U	360 U	350 U	410 U
Total Semivolatiles	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total PAHs (1)	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Carcinogenic PAHs(2)	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

(1) Polynuclear Aromatic Hydrocarbon.

(2) Carcinogenic Polynuclear Aromatic Hydrocarbon.

U : Compound was analyzed for but not detected. The value is the quantation limit.

J : Value estimated since not all QC criteria met.

ND : Not detected above quantation limits provided.

N/A - Not applicable.

R - The presence or absence of the analyte can not be determined from the data due to severe quality control problems. The data are rejected and considered unusable.

TABLE A1-2
SUMMARY OF SEMI-VOLATILE COMPOUNDS IDENTIFIED (BORING A1)
SOIL/SOURCE MATERIAL SAMPLING 05/2-19/2005
SECOND STREET (HASTINGS) SOURCE AREA RI/FS

	Location	A-1	A-1	A-1	A-1	A-1	A-1	A-1	A-1	A-1
	Interval	114-115 ft bgs	123-124 ft bgs	123-124 ft bgs	125-126 ft bgs	140-141 ft bgs	150-151 ft bgs	160-161 ft bgs	170-171 ft bgs	179-180 ft bgs
	EPA No	2610-95	2610-97	2610-97-FD	2610-99	2610-100	2610-101	2610-102	2610-103	2610-104
	Date	5/2/2005	5/2/2005	5/2/2005	5/2/2005	5/2/2005	5/2/2005	5/2/2005	5/2/2005	5/7/2005
	Time	17:20	17:20	17:20	17:20	17:20	17:20	17:20	17:20	14.30
Parameter	Units									
Semivolatile Organics		Conc Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q
Acenaphthene (1)	ug/kg	9,300	27,000	25,000	29,000	360 U	380 U	380 U	360 U	380 U
Acenaphthylene (1)	ug/kg	66,000 J	230,000 J	170,000 J	240,000 J	350 U	380 U	380 U	360 U	380 U
Acetophenone	ug/kg	4,000 U	8,600 U	7,300 U	18,000 U	350 U	360 U	380 U	360 U	380 U
Anthracene (1)	ug/kg	29,000	92,000 J	66,000 J	80,000	350 U	380 U	380 U	360 U	380 U
Atrazine	ug/kg	4,000 U	8,600 U	7,300 U	18,000 U	350 U	380 U	380 U	360 U	380 U
Benzaldehyde	ug/kg	4,000 U	8,600 U	7,300 U	18,000 U	350 U	380 U	380 U	360 U	380 U
Benzo(a)anthracene(1,2)	ug/kg	19,000	46,000	30,000	38,000	350 U	380 U	380 U	360 U	380 U
Benzo(a)pyrene(1,2)	ug/kg	8,100	21,000	14,000	18,000	350 U	380 U	380 U	360 U	380 U
Benzo(b)fluoranthene(1,2)	ug/kg	4,900	10,000	7,300 U	18,000 U	350 U	360 U	380 U	360 U	380 U
Benzo(g,h,i)perylene (1)	ug/kg	4,000 U	4,000 U	7,300 U	18,000 U	350 U	380 U	380 U	380 U	380 U
Benzo(k)fluoranthene(1,2)	ug/kg	5,200	9,500	8,200	18,000 U	350 U	380 U	380 U	380 U	380 U
Biphenyl	ug/kg	4,000	71,000 J	47,000	69,000	350 U	380 U	380 U	380 U	380 U
bis(2-Chloroethoxy)methane	ug/kg	4,000 U	8,600 U	7,300 U	18,000 U	350 U	380 U	380 U	380 U	380 U
bis(2-Chloroethyl)ether	ug/kg	4,000 U	8,600 U	7,300 U	18,000 U	350 U	380 U	380 U	380 U	380 U
bis(2-Chloroisopropyl)ether	ug/kg	4,000 U	8,600 U	7,300 U	18,000 U	350 U	380 U	380 U	360 U	380 U
bis(2-Ethylhexyl)phthalate	ug/kg	4,000 U	8,600 U	7,300 U	18,000 U	350 U	380 U	380 U	360 U	380 U
4-Bromophenyl-phenylether	ug/kg	4,000 U	8,600 U	7,300 U	18,000 U	350 U	380 U	380 U	360 U	380 U
Butylbenzylphthalate	ug/kg	4,000 U	8,600 U	7,300 U	18,000 U	350 U	380 U	380 U	360 U	380 U
Caprolactam	ug/kg	4,000 U	8,600 U	7,300 U	18,000 U	350 U	380 U	380 U	360 U	380 U
Carbazole	ug/kg	4,000 U	4,000 U	7,300 U	18,000 U	350 U	380 U	380 U	360 U	380 U
4-Chloro-3-methylphenol	ug/kg	4,000 U	8,600 U	7,300 U	18,000 U	350 U	380 U	380 U	360 U	380 U
4-Chloroaniline	ug/kg	4,000 U	8,600 U	7,300 U	18,000 U	350 U	380 U	380 U	360 U	380 U
2-Chloronaphthalene (1)	ug/kg	4,000 U	8,600 U	7,300 U	18,000 U	350 U	380 U	380 U	380 U	380 U
2-Chlorophenol	ug/kg	4,000 U	8,600 U	7,300 U	18,000 U	350 U	380 U	380 U	380 U	380 U
4-Chlorophenyl-phenylether	ug/kg	4,000 U	8,600 U	7,300 U	18,000 U	350 U	380 U	380 U	360 U	380 U
Chrysene (1,2)	ug/kg	14,000	36,000	22,000	31,000	350 U	380 U	380 U	360 U	380 U
Di-n-butylphthalate	ug/kg	4,000 U	8,600 U	7,300 U	18,000 U	350 U	380 U	380 U	360 U	380 U
Di-n-octylphthalate	ug/kg	4,000 U	8,600 U	7,300 U	18,000 U	350 U	380 U	380 U	380 U	380 U
Dibenzo(a,h)anthracene (1,2)	ug/kg	4,000 U	4,000 U	7,300 U	18,000 U	350 U	380 U	380 U	360 U	380 U
Dibenzofuran	ug/kg	9,100	29,000	24,000	29,000	350 U	380 U	380 U	360 U	380 U
3,3'-Dichlorobenzidine	ug/kg	4,000 U	8,600 U	7,300 U	18,000 U	350 U	380 U	380 U	360 U	380 U
2,4-Dichlorophenol	ug/kg	4,000 U	8,600 U	7,300 U	18,000 U	350 U	360 U	380 U	360 U	380 U
Diethylphthalate	ug/kg	4,000 U	8,600 U	7,300 U	18,000 U	350 U	380 U	380 U	360 U	380 U
2,4-Dimethylphenol	ug/kg	4,000 U	8,600 U	7,300 U	18,000 U	350 U	380 U	380 U	380 U	380 U
Dimethylphthalate	ug/kg	4,000 U	8,600 U	7,300 U	18,000 U	350 U	380 U	380 U	380 U	380 U
4,6-Dinitro-2-methylphenol	ug/kg	10,000 U	22,000 U	18,000 U	45,000 U	890 U	900 U	950 U	910 U	970 U
2,4-Dinitrophenol	ug/kg	N/A R	N/A R	N/A R	N/A R	N/A R	N/A R	N/A R	N/A R	N/A R

Parameter	Location	A-1	A-1	A-1	A-1	A-1	A-1	A-1	A-1	A-1
	Interval	114-115 ft bgs	123-124 ft bgs	123-124 ft bgs	125-126 ft bgs	140-141 ft bgs	150-151 ft bgs	160-161 ft bgs	170-171 ft bgs	179-180 ft bgs
	EPA No	2610-96	2610-97	2610-97-FD	2610-99	2610-100	2610-101	2610-102	2610-103	2610-104
	Date	5/2/2005	5/2/2005	5/2/2005	5/2/2005	5/2/2005	5/2/2005	5/2/2005	5/2/2005	5/7/2005
	Time	17 20	17 20	17:20	17:20	17:20	17:20	17:20	17:20	14:30
	Units									
Semivolatile Organics (Cont)		Conc Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc Q	Conc. Q	Conc. Q	Conc Q
2,4-Dinitrotoluene	ug/kg	4,000 U	8,600 U	7,300 U	18,000 U	350 U	360 U	380 U	360 U	380 U
2,6-Dinitrotoluene	ug/kg	4,000 U	8,600 U	7,300 U	18,000 U	350 U	360 U	380 U	360 U	380 U
Fluoranthene (1)	ug/kg	25,000	70,000 J	47,000	55,000	350 U	360 U	380 U	360 U	380 U
Fluorene (1)	ug/kg	58,000 J	140,000 J	93,000 J	150,000 J	350 U	360 U	380 U	360 U	380 U
Hexachlorobenzene	ug/kg	4,000 U	8,600 U	7,300 U	18,000 U	350 U	360 U	380 U	360 U	380 U
Hexachlorobutadiene	ug/kg	4,000 U	8,600 U	7,300 U	18,000 U	350 U	360 U	380 U	360 U	380 U
Hexachlorocyclopentadiene	ug/kg	4,000 U	8,600 U	7,300 U	18,000 U	350 U	360 U	380 U	360 U	380 U
Hexachloroethane	ug/kg	4,000 U	8,600 U	7,300 U	18,000 U	350 U	360 U	380 U	360 U	380 U
Indeno(1,2,3-cd)pyrene (1,2)	ug/kg	4,000 U	8,600 U	7,300 U	4,200	350 U	360 U	380 U	360 U	380 U
Isophorone	ug/kg	4,000 U	8,600 U	7,300 U	18,000 U	350 U	360 U	380 U	360 U	380 U
2-Methylnaphthalene (1)	ug/kg	300,000	1,600,000	1,100,000	1,400,000	350 U	360 U	380 U	360 U	380 U
2-Methylphenol	ug/kg	4,000 U	8,600 U	7,300 U	18,000 U	350 U	360 U	380 U	360 U	380 U
4-Methylphenol	ug/kg	4,000 U	8,600 U	7,300 U	18,000 U	350 U	360 U	380 U	360 U	380 U
Naphthalene (1)	ug/kg	32,000	2,000,000	1,300,000	1,900,000	350 U	370	380 U	360 U	380 U
2-Nitroaniline	ug/kg	10,000 U	22,000 U	18,000 U	45,000 U	890 U	900 U	950 U	910 U	970 U
3-Nitroaniline	ug/kg	10,000 U	22,000 U	18,000 U	46,000 U	890 U	900 U	950 U	910 U	970 U
4-Nitroaniline	ug/kg	10,000 U	22,000 U	18,000 U	46,000 U	890 U	900 U	950 U	910 U	970 U
Nitrobenzene	ug/kg	4,000 U	8,600 U	7,300 U	18,000 U	350 U	360 U	380 U	360 U	380 U
2-Nitrophenol	ug/kg	4,000 U	8,600 U	7,300 U	18,000 U	350 U	360 U	380 U	360 U	380 U
4-Nitrophenol	ug/kg	10,000 U	22,000 U	18,000 U	45,000 U	890 U	900 U	950 U	910 U	970 U
N-nitroso-di-n-propylamine	ug/kg	4,000 U	8,600 U	7,300 U	18,000 U	350 U	360 U	380 U	360 U	380 U
N-nitrosodiphenylamine	ug/kg	4,000 U	8,600 U	7,300 U	18,000 U	350 U	360 U	380 U	360 U	380 U
Pentachlorophenol	ug/kg	10,000 U	22,000 U	18,000 U	45,000 U	890 U	900 U	950 U	910 U	970 U
Phenanthrene (1)	ug/kg	190,000	460,000	330,000 J	410,000	350 U	360 U	380 U	360 U	380 U
Phenol	ug/kg	4,000 U	8,600 U	7,300 U	18,000 U	350 U	360 U	380 U	360 U	380 U
Pyrene (1)	ug/kg	42,000 J	100,000 J	72,000 J	84,000	350 U	900	380 U	360 U	380 U
2,4,5-Trichlorophenol	ug/kg	10,000 U	22,000 U	18,000 U	45,000 U	890 U	900 U	950 U	910 U	970 U
2,4,6-Trichlorophenol	ug/kg	4,000 U	8,600 U	7,300 U	18,000 U	350 U	360 U	380 U	360 U	380 U
Total Semivolatiles	ug/kg	814,600	4,931,500	3,348,200	4,847,200	ND	1,270	ND	ND	ND
Total PAHs (1)	ug/kg	801,500	4,831,500	3,277,200	4,449,200	ND	1,270	ND	ND	ND
Total Carcinogenic PAHs(2)	ug/kg	61,200	122,600	74,200	91,200	ND	ND	ND	ND	ND

(1) Polynuclear Aromatic Hydrocarbon.

(2) Carcinogenic Polynuclear Aromatic Hydrocarbon.

U : Compound was analyzed for but not detected. The value is the quantation limit.

J : Value estimated since not all QC criteria met.

ND : Not detected above quantation limits provided.

N/A - Not applicable.

R - The presence or absence of the analyte can not be determined from the data due to severe quality control problems. The data are rejected and considered unusable.

TABLE BMW9-1
SUMMARY OF VOLATILE COMPOUNDS IDENTIFIED (BORING BMW9)
SOIL/SOURCE MATERIAL SAMPLING 05/2-19/2005
SECOND STREET (HASTINGS) SOURCE AREA RI/FS

	Location	BMW-9	BMW-9	BMW-9	BMW-9	BMW-9	BMW-9	BMW-9	BMW-9	BMW-9	BMW-9	BMW-9
	Interval	3-4 ft bgs	10-11 ft bgs	20-21 ft bgs	30-31 ft bgs	40-41 ft bgs	50-51 ft bgs	60-61 ft bgs	70-71 ft bgs	79-80 ft bgs	90-91 ft bgs	100-101 ft bgs
	EPA No	2610-105	2610-106	2610-107	2610-108	2610-109	2610-110	2610-111	2610-112	2610-113	2610-116	2610-117
	Date	5/9/2005	5/9/2005	5/9/2005	5/9/2005	5/9/2005	5/9/2005	5/9/2005	5/9/2005	5/9/2005	5/9/2005	5/9/2005
	Time	7:25	7:40	8:05	8:30	8:45	9 00	9 35	10.05	10:50	11:45	13:15
Parameter	Units											
Volatile Organics		Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc Q	Conc. Q	Conc. Q
Acetone	ug/kg	31 J	25 J	43 J	18 J	63 J	20 J	13 J	28 J	12 J	15 J	23 J
Benzene	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Bromodichloromethane	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Bromoform	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Bromomethane	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Butanone (Methyl Ethyl Ketone)	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Carbon Disulfide	ug/kg	17 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Carbon Tetrachloride	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chlorobenzene	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chloroethane	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chloroform	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chloromethane	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Cyclohexane	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2 Dibromo 3-Chloropropane	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Dibromochloromethane	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dibromoethane	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichlorobenzene (Ortho)	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,3-Dichlorobenzene (Meta)	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,4-Dichlorobenzene (Para)	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Dichlorodifluoromethane	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethane	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloroethane	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethene	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
cis-1,2-Dichloroethene	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
trans-1,2-Dichloroethene	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloropropane	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
cis-1,3,-Dichloropropene	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
trans-1,3,-Dichloropropene	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Ethylbenzene	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Hexanone	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Isopropylbenzene	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methyl Acetate	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methyl tert-butyl ether	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methylcyclohexane	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methylene Chloride	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Methyl-2-Pentanone (MIBK)	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Styrene	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1,2,2-Tetrachloroethane	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U

Parameter	Location	BMW-9	BMW-9	BMW-9	BMW-9	BMW-9	BMW-9	BMW-9	BMW-9	BMW-9	BMW-9	BMW-9
	Interval	3-4 ft bgs	10-11 ft bgs	20-21 ft bgs	30-31 ft bgs	40-41 ft bgs	50-51 ft bgs	60-61 ft bgs	70-71 ft bgs	79-80 ft bgs	90-91 ft bgs	100-101 ft bgs
	EPA No	2610-105	2610-106	2610-107	2610-108	2610-109	2610-110	2610-111	2610-112	2610-113	2610-116	2610-117
	Date	5/9/2005	5/9/2005	5/9/2005	5/9/2005	5/9/2005	5/9/2005	5/9/2005	5/9/2005	5/9/2005	5/9/2005	5/9/2005
	Time	7:25	7:40	8:05	8:30	8 45	9.00	9:35	10:05	10 50	11:45	13:15
	Units											
Volatile Organics (Cont)		Conc. Q	Conc. Q	Conc. Q	Conc Q	Conc Q	Conc. Q	Conc Q	Conc. Q	Conc. Q	Conc. Q	Conc Q
Tetrachloroethane	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Toluene	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2,4-Trichlorobenzene	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1,1-Trichloroethane	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1,2-Trichloroethane	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Trichloroethane	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Trichlorofluoromethane	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1,2-Trichlorofluoroethane	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Vinyl Chloride	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Total Xylenes	ug/kg	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Total Volatiles	ug/kg	31	25	43	18	63	20	13	28	12	15	23
Total BETXs	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

U : Compound was analyzed for but not detected. The value is the quantation limit.

UJ - The analyte was not detected at or above the reporting limit. The reporting limit is an estimate.

J : Value estimated since not all QC criteria met.

ND : Not detected above quantation limits provided.

TABLE BMW9-1
SUMMARY OF VOLATILE COMPOUNDS IDENTIFIED (BORING BMW9)
SOIL/SOURCE MATERIAL SAMPLING 05/2-19/2005
SECOND STREET (HASTINGS) SOURCE AREA RI/FS

Parameter	Location	BMW-9	BMW-9	BMW-9	BMW-9	BMW-9	BMW-9	BMW-9	BMW-9	BMW-9
	Interval	114-115 ft bgs	124-125 ft bgs	124-125 ft bgs	125-126 ft bgs	135-136 ft bgs	148-149 ft bgs	160-161 ft bgs	170-171 ft bgs	179-180 ft bgs
	EPA No	2810-118	2810-119	2810-119-FD	2810-121	2810-122	2810-123	2810-124	2810-125	2810-126
	Date	5/9/2005	5/9/2005	5/9/2005	5/9/2005	5/9/2005	5/9/2005	5/9/2005	5/9/2005	5/9/2005
	Time	13:55	14:35	14:35	15:15	11:00	16:15	16:50	17:00	17 35
	Units									
Volatile Organics		Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q
Acetone	ug/kg	1,300 U	5,700 U	5,800 U	5,500 U	1,300 U	14 J	10 U	18 J	12 J
Benzene	ug/kg	1,300 U	5,700 U	5,800 U	5,500 U	1,300 U	10 U	10 U	10 U	10 U
Bromodichloromethane	ug/kg	1,300 U	5,700 U	5,800 U	5,500 U	1,300 U	10 U	10 U	10 U	10 U
Bromoform	ug/kg	1,300 U	5,700 U	5,800 U	5,500 U	1,300 U	10 U	10 U	10 U	10 U
Bromomethane	ug/kg	1,300 U	5,700 U	5,800 U	5,500 U	1,300 U	10 U	10 U	10 U	10 U
2-Butanone (Methyl Ethyl Ketone)	ug/kg	1,300 U	5,700 U	5,800 U	5,500 U	1,300 U	10 U	10 U	10 U	10 U
Carbon Disulfide	ug/kg	1,300 U	5,700 U	5,800 U	5,500 U	1,300 U	10 U	10 U	10 U	10 U
Carbon Tetrachloride	ug/kg	1,300 U	5,700 U	5,800 U	5,500 U	1,300 U	10 U	10 U	10 U	10 U
Chlorobenzene	ug/kg	1,300 U	5,700 U	5,800 U	5,500 U	1,300 U	10 U	10 U	10 U	10 U
Chloroethane	ug/kg	1,300 U	5,700 U	5,800 U	5,500 U	1,300 U	10 U	10 U	10 U	10 U
Chloroform	ug/kg	1,300 U	5,700 U	5,800 U	5,500 U	1,300 U	10 U	10 U	10 U	10 U
Chloromethane	ug/kg	1,300 U	5,700 U	5,800 U	5,500 U	1,300 U	10 U	10 U	10 U	10 U
Cyclohexane	ug/kg	1,300 U	14,000	5,800 U	5,500 U	1,300 U	10 U	10 U	10 U	10 U
1,2 Dibromo 3-Chloropropane	ug/kg	1,300 U	5,700 U	5,800 U	5,500 U	1,300 U	10 U	10 U	10 U	10 U
Dibromochloromethane	ug/kg	1,300 U	5,700 U	5,800 U	5,500 U	1,300 U	10 U	10 U	10 U	10 U
1,2-Dibromoethane	ug/kg	1,300 U	5,700 U	5,800 U	5,500 U	1,300 U	10 U	10 U	10 U	10 U
1,2-Dichlorobenzene (Ortho)	ug/kg	1,300 U	5,700 U	5,800 U	5,500 U	1,300 U	10 U	10 U	10 U	10 U
1,3-Dichlorobenzene (Meta)	ug/kg	1,300 U	5,700 U	5,800 U	5,500 U	1,300 U	10 U	10 U	10 U	10 U
1,4-Dichlorobenzene (Para)	ug/kg	1,300 U	5,700 U	5,800 U	5,500 U	1,300 U	10 U	10 U	10 U	10 U
Dichlorodifluoromethane	ug/kg	1,300 U	5,700 U	5,800 U	5,500 U	1,300 U	10 U	10 U	10 U	10 U
1,1-Dichloroethane	ug/kg	1,300 U	5,700 U	5,800 U	5,500 U	1,300 U	10 U	10 U	10 U	10 U
1,2-Dichloroethane	ug/kg	1,300 U	5,700 U	5,800 U	5,500 U	1,300 U	10 U	10 U	10 U	10 U
1,1-Dichloroethene	ug/kg	1,300 U	5,700 U	5,800 U	5,500 U	1,300 U	10 U	10 U	10 U	10 U
cis-1,2-Dichloroethene	ug/kg	1,300 U	5,700 U	5,800 U	5,500 U	1,300 U	10 U	10 U	10 U	10 U
trans-1,2-Dichloroethene	ug/kg	1,300 U	5,700 U	5,800 U	5,500 U	1,300 U	10 U	10 U	10 U	10 U
1,2-Dichloropropane	ug/kg	1,300 U	5,700 U	5,800 U	5,500 U	1,300 U	10 U	10 U	10 U	10 U
cis-1,3,-Dichloropropene	ug/kg	1,300 U	5,700 U	5,800 U	5,500 U	1,300 U	10 U	10 U	10 U	10 U
trans-1,3,-Dichloropropene	ug/kg	1,300 U	5,700 U	5,800 U	5,500 U	1,300 U	10 U	10 U	10 U	10 U
Ethylbenzene	ug/kg	1,300 U	5,700 U	5,800 U	5,500 U	1,300 U	10 U	10 U	10 U	10 U
2-Hexanone	ug/kg	1,300 U	5,700 U	5,800 U	5,500 U	1,300 U	10 U	10 U	10 U	10 U
Isopropylbenzene	ug/kg	1,300 U	5,700 U	5,800 U	5,500 U	1,300 U	10 U	10 U	10 U	10 U
Methyl Acetate	ug/kg	1,300 U	5,700 U	5,800 U	5,500 U	1,300 U	10 U	10 U	10 U	10 U
Methyl tert-butyl ether	ug/kg	1,300 U	5,700 U	5,800 U	5,500 U	1,300 U	10 U	10 U	10 U	10 U
Methylcyclohexane	ug/kg	1,300 U	9,900	5,800 U	5,500 U	1,300 U	10 U	10 U	10 U	10 U
Methylene Chloride	ug/kg	1,300 U	5,700 U	5,800 U	5,500 U	1,300 U	10 U	10 U	10 U	10 U
4-Methyl-2-Pentanone (MIBK)	ug/kg	1,300 U	5,700 U	5,800 U	5,500 U	1,300 U	10 U	10 U	10 U	10 U
Styrene	ug/kg	1,300 U	63,000	19,000	41,000	1,300 U	10 U	10 U	10 U	10 U
1,1,2,2-Tetrachloroethane	ug/kg	1,300 U	5,700 U	5,800 U	5,500 U	1,300 U	10 U	10 U	10 U	10 U

Parameter										
	Location	BMW-9	BMW-9	BMW-9	BMW-9	BMW-9	BMW-9	BMW-9	BMW-9	BMW-9
	Interval	114-115 ft bgs	124-125 ft bgs	124-125 ft bgs	125-126 ft bgs	135-136 ft bgs	148-149 ft bgs	160-161 ft bgs	170-171 ft bgs	179-180 ft bgs
	EPA No	2610-118	2610-119	2610-119-FD	2610-121	2610-122	2610-123	2610-124	2610-125	2610-126
	Date	5/9/2005	5/9/2005	5/9/2005	5/9/2005	5/9/2005	5/9/2005	5/9/2005	5/9/2005	5/9/2005
	Time	13:55	14:35	14.35	15:15	11:00	16.15	16:50	17:00	17:35
Parameter	Units									
Volatile Organics (Cont)		Conc Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc Q	Conc Q
Tetrachloroethene	ug/kg	1,300 U	5,700 U	5,800 U	5,500 U	1,300 U	10 U	10 U	10 U	10 U
Toluene	ug/kg	1,300 U	5,700 U	5,800 U	5,500 U	1,300 U	10 U	10 U	10 U	10 U
1,2,4-Trichlorobenzene	ug/kg	1,300 U	5,700 U	5,800 U	5,500 U	1,300 U	10 U	10 U	10 U	10 U
1,1,1-Trichloroethane	ug/kg	1,300 U	5,700 U	5,800 U	5,500 U	1,300 U	10 U	10 U	10 U	10 U
1,1,2-Trichloroethane	ug/kg	1,300 U	5,700 U	5,800 U	5,500 U	1,300 U	10 U	10 U	10 U	10 U
Trichloroethene	ug/kg	1,300 U	5,700 U	5,800 U	5,500 U	1,300 U	10 U	10 U	10 U	10 U
Trichlorofluoromethane	ug/kg	1,300 U	5,700 U	5,800 U	5,500 U	1,300 U	10 U	10 U	10 U	10 U
1,1,2-Trichlorofluoroethane	ug/kg	1,300 U	5,700 U	5,800 U	5,500 U	1,300 U	10 U	10 U	10 U	10 U
Vinyl Chloride	ug/kg	1,300 U	5,700 U	5,800 U	5,500 U	1,300 U	10 U	10 U	10 U	10 U
Total Xylenes	ug/kg	1,300 U	130,000	40,000	69,000	1,300 U	10 U	10 U	10 U	10 U
Total Volatiles	ug/kg	ND	216,900	59,000	110,000	ND	14	ND	18	12
Total BETXs	ug/kg	ND	130,000	40,000	69,000	ND	ND	ND	ND	ND

U : Compound was analyzed for but not detected. The value is the quantation limit.

UJ - The analyte was not detected at or above the reporting limit. The reporting limit is an estimate.

J : Value estimated since not all QC criteria met.

ND : Not detected above quantation limits provided.

TABLE BMW9-2
SUMMARY OF SEMI-VOLATILE COMPOUNDS IDENTIFIED (BORING BMW9)
SOIL/SOURCE MATERIAL SAMPLING 05/2-19/2005
SECOND STREET (HASTINGS) SOURCE AREA RI/FS

	Location	BMW-9	BMW-9	BMW-9	BMW-9	BMW-9	BMW-9	BMW-9	BMW-9	BMW-9	BMW-9	BMW-9
	Interval	3-4 ft bgs	10-11, ft bgs	20-21 ft bgs	30-31 ft bgs	40-41 ft bgs	50-51 ft bgs	60-61 ft bgs	70-71 ft bgs	79-80 ft bgs	90-91 ft bgs	100-101 ft bgs
	EPA No	2610-105	2610-106	2610-107	2610-108	2610-109	2610-110	2610-111	2610-112	2610-113	2610-116	2610-117
	Date	5/9/2005	5/9/2005	5/9/2005	5/9/2005	5/9/2005	5/9/2005	5/9/2005	5/9/2005	5/9/2005	5/9/2005	5/9/2005
	Time	7:25	7:40	8:05	8:30	8:45	9:00	9.35	10:05	10:50	11:45	13:15
Parameter	Units											
Semivolatile Organics		Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc Q	Conc Q	Conc. Q
Acenaphthene (1)	ug/kg	22,000 U	390 U	400 U	380 U	380 U	370 U	350 U	350 U	340 U	340 U	350 U
Acenaphthylene (1)	ug/kg	22,000 U	390 U	400 U	380 U	380 U	370 U	350 U	350 U	340 U	340 U	350 U
Acetophenone	ug/kg	22,000 U	390 U	400 U	380 U	380 U	370 U	350 U	350 U	340 U	340 U	350 U
Anthracene (1)	ug/kg	22,000 U	390 U	400 U	380 U	380 U	370 U	350 U	350 U	340 U	340 U	350 U
Atrazine	ug/kg	22,000 U	390 U	400 U	380 U	380 U	370 U	350 U	350 U	340 U	340 U	350 U
Benzaldehyde	ug/kg	22,000 U	390 U	400 U	380 U	380 U	370 U	350 U	350 U	340 U	340 U	350 U
Benzo(a)anthracene(1,2)	ug/kg	51,000	390 U	400 U	380 U	380 U	370 U	350 U	350 U	340 U	340 U	350 U
Benzo(a)pyrene(1,2)	ug/kg	22,000 U	390 U	400 U	380 U	380 U	370 U	350 U	350 U	340 U	340 U	350 U
Benzo(b)fluoranthene(1,2)	ug/kg	22,000 U	390 U	400 U	380 U	380 U	370 U	350 U	350 U	340 U	340 U	350 U
Benzo(g,h,i)perylene (1)	ug/kg	22,000 U	390 U	400 U	380 U	380 U	370 U	350 U	350 U	340 U	340 U	350 U
Benzo(k)fluoranthene(1,2)	ug/kg	22,000 U	390 U	400 U	380 U	380 U	370 U	350 U	350 U	340 U	340 U	350 U
Biphenyl	ug/kg	22,000 U	390 U	400 U	380 U	380 U	370 U	350 U	350 U	340 U	340 U	350 U
bis(2-Chloroethoxy)methane	ug/kg	22,000 U	390 U	400 U	380 U	380 U	370 U	350 U	350 U	340 U	340 U	350 U
bis(2-Chloroethyl)ether	ug/kg	22,000 U	390 U	400 U	380 U	380 U	370 U	350 U	350 U	340 U	340 U	350 U
bis(2-Chloroisopropyl)ether	ug/kg	22,000 U	390 U	400 U	380 U	380 U	370 U	350 U	350 U	340 U	340 U	350 U
bis(2-Ethylhexyl)phthalate	ug/kg	22,000 U	390 U	400 U	380 U	380 U	370 U	350 U	350 U	340 U	340 U	350 U
4-Bromophenyl-phenylether	ug/kg	22,000 U	390 U	400 U	380 U	380 U	370 U	350 U	350 U	340 U	340 U	350 U
Butylbenzylphthalate	ug/kg	22,000 U	390 U	400 U	380 U	380 U	370 U	350 U	350 U	340 U	340 U	350 U
Caprolactam	ug/kg	22,000 U	390 U	400 U	380 U	380 U	370 U	350 U	350 U	340 U	340 U	350 U
Carbazole	ug/kg	22,000 U	390 U	400 U	380 U	380 U	370 U	350 U	350 U	340 U	340 U	350 U
4-Chloro-3-methyphenol	ug/kg	22,000 U	390 U	400 U	380 U	380 U	370 U	350 U	350 U	340 U	340 U	350 U
4-Chloroaniline	ug/kg	22,000 U	390 U	400 U	380 U	380 U	370 U	350 U	350 U	340 U	340 U	350 U
2-Chloronaphthalene (1)	ug/kg	22,000 U	390 U	400 U	380 U	380 U	370 U	350 U	350 U	340 U	340 U	350 U
2-Chlorophenol	ug/kg	22,000 U	390 U	400 U	380 U	380 U	370 U	350 U	350 U	340 U	340 U	350 U
4-Chlorophenyl-phenylether	ug/kg	22,000 U	390 U	400 U	380 U	380 U	370 U	350 U	350 U	340 U	340 U	350 U
Chrysene (1,2)	ug/kg	49,000	390 U	400 U	380 U	380 U	370 U	350 U	350 U	340 U	340 U	350 U
Di-n-butylphthalate	ug/kg	22,000 U	390 U	400 U	380 U	380 U	370 U	350 U	350 U	340 U	340 U	350 U
Di-n-octylphthalate	ug/kg	22,000 U	390 U	400 U	380 U	380 U	370 U	350 U	350 U	340 U	340 U	350 U
Dibenzo(a,h)anthracene (1,2)	ug/kg	22,000 U	390 U	400 U	380 U	380 U	370 U	350 U	350 U	340 U	340 U	350 U
Dibenzofuran	ug/kg	22,000 U	390 U	400 U	380 U	380 U	370 U	350 U	350 U	340 U	340 U	350 U
3,3'-Dichlorobenzidine	ug/kg	22,000 U	390 U	400 U	380 U	380 U	370 U	350 U	350 U	340 U	340 U	350 U
2,4-Dichlorophenol	ug/kg	22,000 U	390 U	400 U	380 U	380 U	370 U	350 U	350 U	340 U	340 U	350 U
Diethylphthalate	ug/kg	22,000 U	390 U	400 U	380 U	380 U	370 U	350 U	350 U	340 U	340 U	350 U
2,4-Dimethylphenol	ug/kg	22,000 U	390 U	400 U	380 U	380 U	370 U	350 U	350 U	340 U	340 U	350 U
Dimethylphthalate	ug/kg	22,000 U	390 U	400 U	380 U	380 U	370 U	350 U	350 U	340 U	340 U	350 U
4,6-Dinitro-2-methylphenol	ug/kg	55,000 U	990 U	1,000 U	970 U	970 U	930 U	890 U	880 U	860 U	860 U	870 U
2,4-Dinitrophenol	ug/kg	N/A R	N/A R	N/A R	N/A R	N/A R	N/A R	N/A R	N/A R	N/A R	N/A R	N/A R

Parameter	Location	BMW-9	BMW-9	BMW-9	BMW-9	BMW-9	BMW-9	BMW-9	BMW-9	BMW-9	BMW-9	BMW-9
	Interval	3-4 ft bgs	10-11 ft bgs	20-21 ft bgs	30-31 ft bgs	40-41 ft bgs	50-51 ft bgs	60-61 ft bgs	70-71 ft bgs	79-80 ft bgs	90-91 ft bgs	100-101 ft bgs
	EPA No	2610-105	2610-106	2610-107	2610-108	2610-109	2610-110	2610-111	2610-112	2610-113	2610-116	2610-117
	Date	5/9/2005	5/9/2005	5/9/2005	5/9/2005	5/9/2005	5/9/2005	5/9/2005	5/9/2005	5/9/2005	5/9/2005	5/9/2005
	Time	7:25	7:40	8:05	8:30	8:45	9:00	9:35	10:05	10:50	11 45	13:15
	Units											
Semivolatile Organics (Cont)		Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc Q	Conc Q
2,4-Dinitrotoluene	ug/kg	22,000 U	390 U	400 U	380 U	380 U	370 U	350 U	350 U	340 U	340 U	350 U
2,6-Dinitrotoluene	ug/kg	22,000 U	390 U	400 U	380 U	380 U	370 U	350 U	350 U	340 U	340 U	350 U
Fluoranthene (1)	ug/kg	80,000	390 U	400 U	380 U	380 U	370 U	350 U	350 U	340 U	340 U	350 U
Fluorene (1)	ug/kg	22,000 U	390 U	400 U	380 U	380 U	370 U	350 U	350 U	340 U	340 U	350 U
Hexachlorobenzene	ug/kg	22,000 U	390 U	400 U	380 U	380 U	370 U	350 U	350 U	340 U	340 U	350 U
Hexachlorobutadiene	ug/kg	22,000 U	390 U	400 U	380 U	380 U	370 U	350 U	350 U	340 U	340 U	350 U
Hexachlorocyclopentadiene	ug/kg	22,000 U	390 U	400 U	380 U	380 U	370 U	350 U	350 U	340 U	340 U	350 U
Hexachloroethane	ug/kg	22,000 U	390 U	400 U	380 U	380 U	370 U	350 U	350 U	340 U	340 U	350 U
Indeno(1,2,3-cd)pyrene (1,2)	ug/kg	22,000 U	390 U	400 U	380 U	380 U	370 U	350 U	350 U	340 U	340 U	350 U
Isophorone	ug/kg	22,000 U	390 U	400 U	380 U	380 U	370 U	350 U	350 U	340 U	340 U	350 U
2-Methylnaphthalene (1)	ug/kg	22,000 U	390 U	400 U	380 U	380 U	370 U	350 U	350 U	340 U	340 U	350 U
2-Methylphenol	ug/kg	22,000 U	390 U	400 U	380 U	380 U	370 U	350 U	350 U	340 U	340 U	350 U
4-Methylphenol	ug/kg	22,000 U	390 U	400 U	380 U	380 U	370 U	350 U	350 U	340 U	340 U	350 U
Naphthalene (1)	ug/kg	22,000 U	390 U	400 U	380 U	380 U	370 U	350 U	350 U	340 U	340 U	350 U
2-Nitroaniline	ug/kg	55,000 U	990 U	1,000 U	970 U	970 U	930 U	890 U	880 U	860 U	860 U	870 U
3-Nitroaniline	ug/kg	55,000 U	990 U	1,000 U	970 U	970 U	930 U	890 U	880 U	860 U	860 U	870 U
4-Nitroaniline	ug/kg	55,000 U	990 U	1,000 U	970 U	970 U	930 U	890 U	880 U	860 U	860 U	870 U
Nitrobenzene	ug/kg	22,000 U	390 U	400 U	380 U	380 U	370 U	350 U	350 U	340 U	340 U	350 U
2-Nitrophenol	ug/kg	22,000 U	390 U	400 U	380 U	380 U	370 U	350 U	350 U	340 U	340 U	350 U
4-Nitrophenol	ug/kg	55,000 U	990 U	1,000 U	970 U	970 U	930 U	890 U	880 U	860 U	860 U	870 U
N-nitroso-di-n-propylamine	ug/kg	22,000 U	390 U	400 U	380 U	380 U	370 U	350 U	350 U	340 U	340 U	350 U
N-nitrosodiphenylamine	ug/kg	22,000 U	390 U	400 U	380 U	380 U	370 U	350 U	350 U	340 U	340 U	350 U
Pentachlorophenol	ug/kg	55,000 U	990 U	1,000 U	970 U	970 U	930 U	890 U	880 U	860 U	860 U	870 U
Phenanthrene (1)	ug/kg	90,000	390 U	400 U	380 U	380 U	370 U	350 U	350 U	340 U	340 U	350 U
Phenol	ug/kg	22,000 U	390 U	400 U	380 U	380 U	370 U	350 U	350 U	340 U	340 U	350 U
Pyrene (1)	ug/kg	77,000	450	400 U	380 U	380 U	370 U	350 U	350 U	340 U.	340 U	350 U
2,4,5-Trichlorophenol	ug/kg	55,000 U	990 U	1,000 U	970 U	970 U	930 U	890 U	880 U	860 U	860 U	870 U
2,4,6-Trichlorophenol	ug/kg	22,000 U	390 U	400 U	380 U	380 U	370 U	350 U	350 U	340 U	340 U	350 U
Total Semivolatiles	ug/kg	347,000	450	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total PAHs (1)	ug/kg	347,000	450	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Carcinogenic PAHs(2)	ug/kg	100,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

(1) Polynuclear Aromatic Hydrocarbon.

(2) Carcinogenic Polynuclear Aromatic Hydrocarbon.

U : Compound was analyzed for but not detected. The value is the quantation limit.

J . Value estimated since not all QC criteria met.

ND : Not detected above quantation limits provided.

N/A - Not applicable.

R - The presence or absence of the analyte can not be determined from the data due to severe quality control problems. The data are rejected and considered unusable.

TABLE BMW9-2
SUMMARY OF SEMI-VOLATILE COMPOUNDS IDENTIFIED (BORING BMW9)
SOIL/SOURCE MATERIAL SAMPLING 05/2-19/2005
SECOND STREET (HASTINGS) SOURCE AREA RI/FS

	Location	BMW-9	BMW-9	BMW-9	BMW-9	BMW-9	BMW-9	BMW-9	BMW-9	BMW-9
	Interval	114-115 ft bgs	124-125 ft bgs	124-125 ft bgs	125-126 ft bgs	135-136 ft bgs	148-149 ft bgs	160-161 ft bgs	170-171 ft bgs	179-180 ft bgs
	EPA No	2610-118	2610-119	2610-119-FD	2610-121	2610-122	2610-123	2610-124	2610-125	2610-126
	Date	5/9/2005	5/9/2005	5/9/2005	5/9/2005	5/9/2005	5/9/2005	5/9/2005	5/9/2005	5/9/2005
	Time	13:55	14:35	14:35	15.15	11:00	16:15	16:50	17.00	17:35
Parameter	Units									
Semivolatile Organics		Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc Q	Conc. Q	Conc. Q	Conc. Q
Acenaphthene (1)	ug/kg	6,500	13,000	14,000	7,100	350 U	370 U	360 U	350 U	350 U
Acenaphthylene (1)	ug/kg	59,000 J	150,000	130,000 J	74,000	1,100	370 U	360 U	350 U	350 U
Acetophenone	ug/kg	1,700 U	7,200 U	7,300 U	3,500 U	350 U	370 U	360 U	350 U	350 U
Anthracene (1)	ug/kg	17,000 J	57,000	41,000	24,000	900	370 U	360 U	350 U	350 U
Atrazine	ug/kg	1,700 U	7,200 U	7,300 U	3,500 U	350 U	370 U	360 U	350 U	350 U
Benzaldehyde	ug/kg	1,700 U	7,200 U	7,300 U	3,500 U	350 U	370 U	360 U	350 U	350 U
Benzo(a)anthracene(1,2)	ug/kg	9,600	26,000	17,000	10,000	400	370 U	360 U	350 U	350 U
Benzo(a)pyrene(1,2)	ug/kg	5,100	13,000	11,000	5,400	350 U	370 U	360 U	350 U	350 U
Benzo(b)fluoranthene(1,2)	ug/kg	3,100	7,200 U	7,300 U	3,500 U	350 U	370 U	360 U	350 U	350 U
Benzo(g,h,i)perylene (1)	ug/kg	1,700 U	7,200 U	7,300 U	3,500 U	350 U	370 U	360 U	350 U	350 U
Benzo(k)fluoranthene(1,2)	ug/kg	3,400	7,200 U	7,300 U	3,500 U	350 U	370 U	360 U	350 U	350 U
Biphenyl	ug/kg	1,700	35,000	31,000	17,000	420	370 U	360 U	350 U	350 U
bis(2-Chloroethoxy)methane	ug/kg	1,700 U	7,200 U	7,300 U	3,500 U	350 U	370 U	360 U	350 U	350 U
bis(2-Chloroethyl)ether	ug/kg	1,700 U	7,200 U	7,300 U	3,500 U	350 U	370 U	360 U	350 U	350 U
bis(2-Chloroisopropyl)ether	ug/kg	1,700 U	7,200 U	7,300 U	3,500 U	350 U	370 U	360 U	350 U	350 U
bis(2-Ethylhexyl)phthalate	ug/kg	1,700 U	7,200 U	7,300 U	3,500 U	350 U	370 U	360 U	350 U	350 U
4-Bromophenyl-phenylether	ug/kg	1,700 U	7,200 U	7,300 U	3,500 U	350 U	370 U	360 U	350 U	350 U
Butylbenzylphthalate	ug/kg	1,700 U	7,200 U	7,300 U	3,500 U	350 U	370 U	360 U	350 U	350 U
Caprolactam	ug/kg	1,700 U	7,200 U	7,300 U	3,500 U	350 U	370 U	360 U	350 U	350 U
Carbazole	ug/kg	1,700 U	7,200 U	7,300 U	3,500 U	350 U	370 U	360 U	350 U	350 U
4-Chloro-3-methyphenol	ug/kg	1,700 U	7,200 U	7,300 U	3,500 U	350 U	370 U	360 U	350 U	350 U
4-Chloroaniline	ug/kg	1,700 U	7,200 U	7,300 U	3,500 U	350 U	370 U	360 U	350 U	350 U
2-Chloronaphthalene (1)	ug/kg	1,700 U	7,200 U	7,300 U	3,500 U	350 U	370 U	360 U	350 U	350 U
2-Chlorophenol	ug/kg	1,700 U	7,200 U	7,300 U	3,500 U	350 U	370 U	360 U	350 U	350 U
4-Chlorophenyl-phenylether	ug/kg	1,700 U	7,200 U	7,300 U	3,500 U	350 U	370 U	360 U	350 U	350 U
Chrysene (1,2)	ug/kg	9,100	21,000	15,000	9,100	350 U	370 U	360 U	350 U	350 U
Di-n-butylphthalate	ug/kg	1,700 U	7,200 U	7,300 U	3,500 U	350 U	370 U	360 U	350 U	350 U
Di-n-octylphthalate	ug/kg	1,700 U	7,200 U	7,300 U	3,500 U	350 U	370 U	360 U	350 U	350 U
Dibenzo(a,h)anthracene (1,2)	ug/kg	1,700 U	7,200 U	7,300 U	3,500 U	350 U	370 U	360 U	350 U	350 U
Dibenzofuran	ug/kg	5,700	13,000	10,000	6,600	350 U	370 U	360 U	350 U	350 U
3,3'-Dichlorobenzidine	ug/kg	1,700 U	7,200 U	7,300 U	3,500 U	350 U	370 U	360 U	350 U	350 U
2,4-Dichlorophenol	ug/kg	1,700 U	7,200 U	7,300 U	3,500 U	350 U	370 U	360 U	350 U	350 U
Diethylphthalate	ug/kg	1,700 U	7,200 U	7,300 U	3,500 U	350 U	370 U	360 U	350 U	350 U
2,4-Dimethylphenol	ug/kg	1,700 U	7,200 U	7,300 U	3,500 U	350 U	370 U	360 U	350 U	350 U
Dimethylphthalate	ug/kg	1,700 U	7,200 U	7,300 U	3,500 U	350 U	370 U	360 U	350 U	350 U
4,6-Dinitro-2-methylphenol	ug/kg	4,300 U	18,000 U	18,000 U	8,800 U	880 U	920 U	910 U	870 U	890 U
2,4-Dinitrophenol	ug/kg	N/A R	N/A R	N/A R	N/A R	N/A R	N/A R	N/A R	N/A R	N/A R

Parameter	Location	BMW-9	BMW-9	BMW-9	BMW-9	BMW-9	BMW-9	BMW-9	BMW-9	BMW-9
	Interval	114-115 ft bgs	124-125 ft bgs	124-125 ft bgs	125-126 ft bgs	135-136 ft bgs	148-149 ft bgs	160-161 ft bgs	170-171 ft bgs	179-180 ft bgs
	EPA No	2610-118	2610-119	2610-119-FD	2610-121	2610-122	2610-123	2610-124	2610-125	2610-126
	Date	5/9/2005	5/9/2005	5/9/2005	5/9/2005	5/9/2005	5/9/2005	5/9/2005	5/9/2005	5/9/2005
	Time	13:55	14:35	14:35	15.15	11:00	16:15	16:50	17:00	17:35
	Units									
Semivolatile Organics (Cont)		Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc Q
2,4-Dinitrotoluene	ug/kg	1,700 U	7,200 U	7,300 U	3,500 U	350 U	370 U	360 U	350 U	350 U
2,6-Dinitrotoluene	ug/kg	1,700 U	7,200 U	7,300 U	3,500 U	350 U	370 U	360 U	350 U	350 U
Fluoranthene (1)	ug/kg	18,000 J	47,000	33,000	22,000	790	370 U	360 U	350 U	350 U
Fluorene (1)	ug/kg	37,000 J	82,000 J	62,000 J	39,000 J	1,200	370 U	360 U	350 U	350 U
Hexachlorobenzene	ug/kg	1,700 U	7,200 U	7,300 U	3,500 U	350 U	370 U	360 U	350 U	350 U
Hexachlorobutadiene	ug/kg	1,700 U	7,200 U	7,300 U	3,500 U	350 U	370 U	360 U	350 U	350 U
Hexachlorocyclopentadiene	ug/kg	1,700 U	7,200 U	7,300 U	3,500 U	350 U	370 U	360 U	350 U	350 U
Hexachloroethane	ug/kg	1,700 U	7,200 U	7,300 U	3,500 U	350 U	370 U	360 U	350 U	350 U
Indeno(1,2,3-cd)pyrene (1,2)	ug/kg	1,700 U	7,200 U	7,300 U	3,500 U	350 U	370 U	360 U	350 U	350 U
Isophorone	ug/kg	1,700 U	7,200 U	7,300 U	3,500 U	350 U	370 U	360 U	350 U	350 U
2-Methylnaphthalene (1)	ug/kg	360,000	710,000	720,000	340,000	3,600	370 U	360 U	350 U	350 U
2-Methylphenol	ug/kg	1,700 U	7,200 U	7,300 U	3,500 U	350 U	370 U	360 U	350 U	350 U
4-Methylphenol	ug/kg	1,700 U	7,200 U	7,300 U	3,500 U	350 U	370 U	360 U	350 U	350 U
Naphthalene (1)	ug/kg	260,000	820,000	870,000	430,000	350 U	370 U	360 U	350 U	350 U
2-Nitroaniline	ug/kg	4,300 U	18,000 U	18,000 U	8,800 U	880 U	920 U	910 U	870 U	890 U
3-Nitroaniline	ug/kg	4,300 U	18,000 U	18,000 U	8,800 U	880 U	920 U	910 U	870 U	890 U
4-Nitroaniline	ug/kg	4,300 U	18,000 U	18,000 U	8,800 U	880 U	920 U	910 U	870 U	890 U
Nitrobenzene	ug/kg	1,700 U	7,200 U	7,300 U	3,500 U	350 U	370 U	360 U	350 U	350 U
2-Nitrophenol	ug/kg	1,700 U	7,200 U	7,300 U	3,500 U	350 U	370 U	360 U	350 U	350 U
4-Nitrophenol	ug/kg	4,300 U	18,000 U	18,000 U	8,800 U	880 U	920 U	910 U	870 U	890 U
N-nitroso-di-n-propylamine	ug/kg	1,700 U	7,200 U	7,300 U	3,500 U	350 U	370 U	360 U	350 U	350 UJ
N-nitrosodiphenylamine	ug/kg	1,700 U	7,200 U	7,300 U	3,500 U	350 U	370 U	360 U	350 U	350 U
Pentachlorophenol	ug/kg	4,300 U	18,000 U	18,000 U	8,800 U	880 U	920 U	910 U	870 U	890 U
Phenanthrene (1)	ug/kg	130,000	260,000	220,000	110,000	5,200	370 U	360 U	350 U	350 U
Phenol	ug/kg	1,700 U	7,200 U	7,300 U	3,500 U	350 U	370 U	360 U	350 U	350 U
Pyrene (1)	ug/kg	26,000 J	70,000 J	48,000	28,000	1,100	370 U	360 U	350 U	350 U
2,4,5-Trichlorophenol	ug/kg	4,300 U	18,000 U	18,000 U	8,800 U	880 U	920 U	910 U	870 U	890 U
2,4,6-Trichlorophenol	ug/kg	1,700 U	7,200 U	7,300 U	3,500 U	350 U	370 U	360 U	350 U	350 U
Total Semivolatiles	ug/kg	951,200	2,317,000	2,222,000	1,122,200	14,710	ND	ND	ND	ND
Total PAHs (1)	ug/kg	943,800	2,269,000	2,181,000	1,096,800	14,290	ND	ND	ND	ND
Total Carcinogenic PAHs(2)	ug/kg	30,300	60,000	43,000	24,500	400	ND	ND	ND	ND

(1) Polynuclear Aromatic Hydrocarbon.

(2) Carcinogenic Polynuclear Aromatic Hydrocarbon.

U : Compound was analyzed for but not detected. The value is the quantation limit.

J : Value estimated since not all QC criteria met.

ND : Not detected above quantation limits provided.

N/A - Not applicable.

R - The presence or absence of the analyte can not be determined from the data due to severe quality control problems. The data are rejected and considered unusable

TABLE GH1-1
SUMMARY OF VOLATILE COMPOUNDS IDENTIFIED (BORING GH1)
SOIL/SOURCE MATERIAL SAMPLING 05/2-19/2005
SECOND STREET (HASTINGS) SOURCE AREA RI/FS

	Location	GH-1	GH-1	GH-1	GH-1	GH-1	GH-1	GH-1	GH-1	GH-1	GH-1	GH-1
	Interval	2-3 ft bgs	14-15 ft bgs	24-25 ft bgs	29-30 ft bgs	41-42 ft bgs	48-49 ft bgs	62-63 ft bgs	72-73 ft bgs	82-83 ft bgs	82-83 ft bgs	89-90 ft bgs
	EPA No	2610-127	2610-128	2610-129	2610-130	2610-131	2610-132	2610-133	2610-134	2610-135	2610-135-FD	2610-137
	Date	5/17/2005	5/17/2005	5/17/2005	5/17/2005	5/17/2005	5/17/2005	5/17/2005	5/17/2005	5/17/2005	5/17/2005	5/17/2005
	Time	10:55	11:20	11:45	13:15	14:05	14:25	14:50	15:20	15:50	15:50	16:25
Parameter	Units											
Volatile Organics		Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q
Acetone	ug/kg	85 J	68 J	14,000 U	14,000 U	1,400 U	27,000 U	14,000 U	53 U	57 U	52 U	56 U
Benzene	ug/kg	10 U	260	14,000 U	14,000 U	1,400	240,000	14,000 U	53 U	57 U	52 U	56 U
Bromodichloromethane	ug/kg	10 U	55 U	14,000 U	14,000 U	1,400 U	27,000 U	14,000 U	53 U	57 U	52 U	56 U
Bromoform	ug/kg	10 U	55 U	14,000 U	14,000 U	1,400 U	27,000 U	14,000 U	53 U	57 U	52 U	56 U
Bromomethane	ug/kg	10 U	55 U	14,000 U	14,000 U	1,400 U	27,000 U	14,000 U	53 U	57 U	52 U	56 U
2-Butanone (Methyl Ethyl Ketone)	ug/kg	10 U	55 U	14,000 U	14,000 U	1,400 U	27,000 U	14,000 U	53 U	57 U	52 U	56 U
Carbon Disulfide	ug/kg	10 U	80	14,000 U	14,000 U	1,400 U	27,000 U	14,000 U	53 U	57 U	52 U	56 U
Carbon Tetrachloride	ug/kg	10 U	55 U	14,000 U	14,000 U	1,400 U	27,000 U	14,000 U	53 U	57 U	52 U	56 U
Chlorobenzene	ug/kg	10 U	55 U	14,000 U	14,000 U	1,400 U	27,000 U	14,000 U	53 U	57 U	52 U	56 U
Chloroethane	ug/kg	10 U	55 U	14,000 U	14,000 U	1,400 U	27,000 U	14,000 U	53 U	57 U	52 U	56 U
Chloroform	ug/kg	10 U	55 U	14,000 U	14,000 U	1,400 U	27,000 U	14,000 U	53 U	57 U	52 U	56 U
Chloromethane	ug/kg	10 U	55 U	14,000 U	14,000 U	1,400 U	27,000 U	14,000 U	53 U	57 U	52 U	56 U
Cyclohexane	ug/kg	10 U	55 U	14,000 U	14,000 U	1,400 U	27,000 U	14,000 U	53 U	57 U	52 U	56 U
1,2 Dibromo 3-Chloropropane	ug/kg	10 U	55 U	14,000 U	14,000 U	1,400 U	27,000 U	14,000 U	53 U	57 U	52 U	56 U
Dibromochloromethane	ug/kg	10 U	55 U	14,000 U	14,000 U	1,400 U	27,000 U	14,000 U	53 U	57 U	52 U	56 U
1,2-Dibromoethane	ug/kg	10 U	55 U	14,000 U	14,000 U	1,400 U	27,000 U	14,000 U	53 U	57 U	52 U	56 U
1,2-Dichlorobenzene (Ortho)	ug/kg	10 U	55 U	14,000 U	14,000 U	1,400 U	27,000 U	14,000 U	53 U	57 U	52 U	56 U
1,3-Dichlorobenzene (Meta)	ug/kg	10 U	55 U	14,000 U	14,000 U	1,400 U	27,000 U	14,000 U	53 U	57 U	52 U	56 U
1,4-Dichlorobenzene (Para)	ug/kg	10 U	55 U	14,000 U	14,000 U	1,400 U	27,000 U	14,000 U	53 U	57 U	52 U	56 U
Dichlorodifluoromethane	ug/kg	10 U	55 U	14,000 U	14,000 U	1,400 U	27,000 U	14,000 U	53 U	57 U	52 U	56 U
1,1-Dichloroethane	ug/kg	10 U	55 U	14,000 U	14,000 U	1,400 U	27,000 U	14,000 U	53 U	57 U	52 U	56 U
1,2-Dichloroethane	ug/kg	10 U	55 U	14,000 U	14,000 U	1,400 U	27,000 U	14,000 U	53 U	57 U	52 U	56 U
1,1-Dichloroethene	ug/kg	10 U	55 U	14,000 U	14,000 U	1,400 U	27,000 U	14,000 U	53 U	57 U	52 U	56 U
cis-1,2-Dichloroethene	ug/kg	10 U	55 U	14,000 U	14,000 U	1,400 U	27,000 U	14,000 U	53 U	57 U	52 U	56 U
trans-1,2-Dichloroethene	ug/kg	10 U	55 U	14,000 U	14,000 U	1,400 U	27,000 U	14,000 U	53 U	57 U	52 U	56 U
1,2-Dichloropropane	ug/kg	10 U	55 U	14,000 U	14,000 U	1,400 U	27,000 U	14,000 U	53 U	57 U	52 U	56 U
cis-1,3,-Dichloropropene	ug/kg	10 U	55 U	14,000 U	14,000 U	1,400 U	27,000 U	14,000 U	53 U	57 U	52 U	56 U
trans-1,3,-Dichloropropene	ug/kg	10 U	55 U	14,000 U	14,000 U	1,400 U	27,000 U	14,000 U	53 U	57 U	52 U	56 U
Ethylbenzene	ug/kg	10 U	890	19,000	28,000	3,800	27,000	65,000	53 U	57 U	52 U	56 U
2-Hexanone	ug/kg	10 U	55 U	14,000 U	14,000 U	1,400 U	27,000 U	14,000 U	53 U	57 U	52 U	56 U
Isopropylbenzene	ug/kg	10 U	68	14,000 U	14,000 U	1,400 U	27,000 U	14,000 U	53 U	57 U	52 U	56 U
Methyl Acetate	ug/kg	10 U	55 U	14,000 U	14,000 U	1,400 U	27,000 U	14,000 U	53 U	57 U	52 U	56 U
Methyl tert-butyl ether	ug/kg	10 U	55 U	14,000 U	14,000 U	1,400 U	27,000 U	14,000 U	53 U	57 U	52 U	56 U
Methylcyclohexane	ug/kg	10 U	55 U	14,000 U	14,000 U	1,400 U	27,000 U	14,000 U	53 U	57 U	52 U	56 U
Methylene Chloride	ug/kg	10 U	55 U	14,000 U	14,000 U	1,400 U	27,000 U	14,000 U	53 U	57 U	52 U	56 U
4-Methyl-2-Pentanone (MIBK)	ug/kg	10 U	55 U	14,000 U	14,000 U	1,400 U	27,000 U	14,000 U	53 U	57 U	52 U	56 U
Styrene	ug/kg	10 U	2,000	130,000	220,000	28,000	300,000	56,000	270	150	220	56 U
1,1,2,2-Tetrachloroethane	ug/kg	10 U	55 U	14,000 U	14,000 U	1,400 U	27,000 U	14,000 U	53 U	57 U	52 U	56 U

Parameter	Location	GH-1	GH-1	GH-1	GH-1	GH-1	GH-1	GH-1	GH-1	GH-1	GH-1	GH-1
	Interval	2-3 ft bgs	14-15 ft bgs	24-25 ft bgs	29-30 ft bgs	41-42 ft bgs	48-49 ft bgs	62-63 ft bgs	72-73 ft bgs	82-83 ft bgs	82-83 ft bgs	89-90 ft bgs
	EPA No.	2610-127	2610-128	2610-129	2610-130	2610-131	2610-132	2610-133	2610-134	2610-135	2610-136-FD	2610-137
	Date	5/17/2005	5/17/2005	5/17/2005	5/17/2005	5/17/2005	5/17/2005	5/17/2005	5/17/2005	5/17/2005	5/17/2005	5/17/2005
	Time	10:55	11:20	11:45	13:15	14:05	14:25	14.50	15:20	15:50	15.50	16:25
	Units											
Volatile Organics (Cont)		Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q
Tetrachloroethene	ug/kg	10 U	55 U	14,000 U	14,000 U	1,400 U	27,000 U	14,000 U	53 U	57 U	52 U	56 U
Toluene	ug/kg	10 U	2,600 J	14,000 U	130,000	26,000	380,000	14,000 U	53 U	57 U	52 U	56 U
1,2,4-Trichlorobenzene	ug/kg	10 U	55 U	14,000 U	14,000 U	1,400 U	27,000 U	14,000 U	53 U	57 U	52 U	56 U
1,1,1-Trichloroethane	ug/kg	10 U	55 U	14,000 U	14,000 U	1,400 U	27,000 U	14,000 U	53 U	57 U	52 U	56 U
1,1,2-Trichloroethane	ug/kg	10 U	55 U	14,000 U	14,000 U	1,400 U	27,000 U	14,000 U	53 U	57 U	52 U	56 U
Trichloroethene	ug/kg	10 U	55 U	14,000 U	14,000 U	1,400 U	27,000 U	14,000 U	53 U	57 U	52 U	56 U
Trichlorofluoromethane	ug/kg	10 U	55 U	14,000 U	14,000 U	1,400 U	27,000 U	14,000 U	53 U	57 U	52 U	56 U
1,1,2-Trichlorofluoroethane	ug/kg	10 U	55 U	14,000 U	14,000 U	1,400 U	27,000 U	14,000 U	53 U	57 U	52 U	56 U
Vinyl Chloride	ug/kg	10 U	55 U	14,000 U	14,000 U	1,400 U	27,000 U	14,000 U	53 U	57 U	52 U	56 U
Total Xylenes	ug/kg	10 U	3,000	360,000	320,000	42,000	320,000	86,000	440	57 U	52 U	56 U
Total Volatiles	ug/kg	85	6,986	509,000	686,000	101,200	1,267,000	207,000	710	150	220	ND
Total BETXs	ug/kg	ND	6,750	379,000	478,000	73,200	987,000	161,000	440	ND	ND	ND

U : Compound was analyzed for but not detected. The value is the quantation limit.

UJ - The analyte was not detected at or above the reporting limit. The reporting limit is an estimate.

J : Value estimated since not all QC criteria met.

ND : Not detected above quantation limits provided.

TABLE GH1-1
SUMMARY OF VOLATILE COMPOUNDS IDENTIFIED (BORING GH1)
SOIL/SOURCE MATERIAL SAMPLING 05/2-18/2005
SECOND STREET (HASTINGS) SOURCE AREA RI/FS

	Location	GH-1	GH-1	GH-1	GH-1	GH-1	GH-1	GH-1	GH-1	GH-1
	Interval	103-104 ft bgs	111-112 ft bgs	124-125 ft bgs	130-131 ft bgs	144-145 ft bgs	151-152 ft bgs	161-162 ft bgs	170-171 ft bgs	179-180 ft bgs
	EPA No	2810-138	2810-139	2810-140	2810-141	2810-142	2810-143	2810-144	2810-145	2810-146
	Date	5/17/2005	5/17/2005	5/17/2005	5/18/2005	5/18/2005	5/18/2005	5/18/2005	5/18/2005	5/18/2005
	Time	17:05	17:50	12:30	8:10	8:50	9:20	9:30	9:40	10:05
Parameter	Units									
Volatile Organics		Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Q
Acetone	ug/kg	15,000 U	52 U	2,700 U	5,700 U	13 U	10 J	11 J	10 UJ	13
Benzene	ug/kg	110,000	52 U	4,200	8,500	15 J	10 U	10 U	10 UJ	10 U
Bromodichloromethane	ug/kg	15,000 U	52 U	2,700 U	5,700 U	10 U	10 U	10 U	10 UJ	10 U
Bromoform	ug/kg	15,000 U	52 U	2,700 U	5,700 U	10 U	10 U	10 U	10 UJ	10 U
Bromomethane	ug/kg	15,000 U	52 U	2,700 U	5,700 U	10 U	10 U	10 U	10 UJ	10 U
2-Butanone (Methyl Ethyl Ketone)	ug/kg	15,000 U	52 U	2,700 U	5,700 U	10 U	10 U	10 U	10 UJ	10 U
Carbon Disulfide	ug/kg	15,000 U	52 U	2,700 U	5,700 U	10 U	10 U	10 U	10 UJ	10 U
Carbon Tetrachloride	ug/kg	15,000 U	52 U	2,700 U	5,700 U	10 U	10 U	10 U	10 UJ	10 U
Chlorobenzene	ug/kg	15,000 U	52 U	2,700 U	5,700 U	10 U	10 U	10 U	10 UJ	10 U
Chloroethane	ug/kg	15,000 U	52 U	2,700 U	5,700 U	10 U	10 U	10 U	10 UJ	10 U
Chloroform	ug/kg	15,000 U	52 U	2,700 U	5,700 U	10 U	10 U	10 U	10 UJ	10 U
Chloromethane	ug/kg	15,000 U	52 U	2,700 U	5,700 U	10 U	10 U	10 U	10 UJ	10 U
Cyclohexane	ug/kg	15,000 U	52 U	2,700 U	5,700 U	10 U	10 U	10 U	10 UJ	10 U
1,2 Dibromo 3-Chloropropane	ug/kg	15,000 U	52 U	2,700 U	5,700 U	10 U	10 U	10 U	10 UJ	10 U
Dibromochloromethane	ug/kg	15,000 U	52 U	2,700 U	5,700 U	10 U	10 U	10 U	10 UJ	10 U
1,2-Dibromoethane	ug/kg	15,000 U	52 U	2,700 U	5,700 U	10 U	10 U	10 U	10 UJ	10 U
1,2-Dichlorobenzene (Ortho)	ug/kg	15,000 U	52 U	2,700 U	5,700 U	10 U	10 U	10 U	10 UJ	10 U
1,3-Dichlorobenzene (Meta)	ug/kg	15,000 U	52 U	2,700 U	5,700 U	10 U	10 U	10 U	10 UJ	10 U
1,4-Dichlorobenzene (Para)	ug/kg	15,000 U	52 U	2,700 U	5,700 U	10 U	10 U	10 U	10 UJ	10 U
Dichlorodifluoromethane	ug/kg	15,000 U	52 U	2,700 U	5,700 U	10 U	10 U	10 U	10 UJ	10 U
1,1-Dichloroethane	ug/kg	15,000 U	52 U	2,700 U	5,700 U	10 U	10 U	10 U	10 UJ	10 U
1,2-Dichloroethane	ug/kg	15,000 U	52 U	2,700 U	5,700 U	10 U	10 U	10 U	10 UJ	10 U
1,1-Dichloroethene	ug/kg	15,000 U	52 U	2,700 U	5,700 U	10 U	10 U	10 U	10 UJ	10 U
cis-1,2-Dichloroethene	ug/kg	15,000 U	52 U	2,700 U	5,700 U	10 U	10 U	10 U	10 UJ	10 U
trans-1,2-Dichloroethene	ug/kg	15,000 U	52 U	2,700 U	5,700 U	10 U	10 U	10 U	10 UJ	10 U
1,2-Dichloropropane	ug/kg	15,000 U	52 U	2,700 U	5,700 U	10 U	10 U	10 U	10 UJ	10 U
cis-1,3,-Dichloropropene	ug/kg	15,000 U	52 U	2,700 U	5,700 U	10 U	10 U	10 U	10 UJ	10 U
trans-1,3,-Dichloropropene	ug/kg	15,000 U	52 U	2,700 U	5,700 U	10 U	10 U	10 U	10 UJ	10 U
Ethylbenzene	ug/kg	30,000	52 U	3,300	7,000	22 J	10 U	10 U	10 UJ	10 U
2-Hexanone	ug/kg	15,000 U	52 U	2,700 U	5,700 U	10 U	10 U	10 U	10 UJ	10 U
Isopropylbenzene	ug/kg	15,000 U	53	2,700 U	5,700 U	10 U	10 U	10 U	10 UJ	10 U
Methyl Acetate	ug/kg	15,000 U	52 U	2,700 U	5,700 U	10 U	10 U	10 U	10 UJ	10 U
Methyl tert-butyl ether	ug/kg	15,000 U	52 U	2,700 U	5,700 U	10 U	10 U	10 U	10 UJ	10 U
Methylcyclohexane	ug/kg	15,000 U	52 U	2,700 U	5,700 U	10 U	10 U	10 U	10 UJ	10 U
Methylene Chloride	ug/kg	15,000 U	52 U	2,700 U	5,700 U	10 U	10 U	10 U	10 UJ	10 U
4-Methyl-2-Pentanone (MIBK)	ug/kg	15,000 U	52 U	2,700 U	5,700 U	10 U	10 U	10 U	10 UJ	10 U
Styrene	ug/kg	210,000	120	30,000	77,000	84 J	16	42	10 UJ	11
1,1,2,2-Tetrachloroethane	ug/kg	15,000 U	52 U	2,700 U	5,700 U	10 U	10 U	10 U	10 UJ	10 U

Parameter	Location	GH-1	GH-1	GH-1	GH-1	GH-1	GH-1	GH-1	GH-1	GH-1
	Interval	103-104 ft bgs	111-112 ft bgs	124-125 ft bgs	130-131 ft bgs	144-145 ft bgs	151-152 ft bgs	161-162 ft bgs	170-171 ft bgs	179-180 ft bgs
	EPA No	2610-138	2610-139	2610-140	2610-141	2610-142	2610-143	2610-144	2610-145	2610-146
	Date	5/17/2005	5/17/2005	5/17/2005	5/18/2005	5/18/2005	5/18/2005	5/18/2005	5/18/2005	5/18/2005
	Time	17:05	17:50	12:30	8:10	8:50	9:20	9:30	9:40	10.05
	Units									
Volatile Organics (Cont)		Conc Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Q
Tetrachloroethene	ug/kg	15,000 U	52 U	2,700 U	5,700 U	10 U	10 U	10 U	10 UJ	10 U
Toluene	ug/kg	240,000	52 U	22,000	17,000	130 J	24	38	10 UJ	11
1,2,4-Trichlorobenzene	ug/kg	15,000 U	52 U	2,700 U	5,700 U	10 U	10 U	10 U	10 UJ	10 U
1,1,1-Trichloroethane	ug/kg	15,000 U	52 U	2,700 U	5,700 U	10 U	10 U	10 U	10 UJ	10 U
1,1,2-Trichloroethane	ug/kg	15,000 U	52 U	2,700 U	5,700 U	10 U	10 U	10 U	10 UJ	10 U
Trichloroethene	ug/kg	15,000 U	52 U	2,700 U	5,700 U	10 U	10 U	10 U	10 UJ	10 U
Trichlorofluoromethane	ug/kg	15,000 U	52 U	2,700 U	5,700 U	10 U	10 U	10 U	10 UJ	10 U
1,1,2-Trichlorofluoroethane	ug/kg	15,000 U	52 U	2,700 U	5,700 U	10 U	10 U	10 U	10 UJ	10 U
Vinyl Chloride	ug/kg	15,000 U	52 U	2,700 U	5,700 U	10 U	10 U	10 U	10 UJ	10 U
Total Xylenes	ug/kg	310,000	160	43,000	110,000	360 J	50	120	10 UJ	20
Total Volatiles	ug/kg	900,000	323	102,500	219,500	611	100	211	ND	56
Total BETXs	ug/kg	690,000	150	72,500	142,500	527	74	158	ND	31

U : Compound was analyzed for but not detected. The value is the quantation limit.

UJ - The analyte was not detected at or above the reporting limit. The reporting limit is an estimate.

J : Value estimated since not all QC criteria met.

ND : Not detected above quantation limits provided.

TABLE GH1-2

SUMMARY OF SEMI-VOLATILE COMPOUNDS IDENTIFIED (BORING GH1)

SOIL/SOURCE MATERIAL SAMPLING 05/2-19/2005

SECOND STREET (HASTINGS) SOURCE AREA RI/FS

	Location	GH-1	GH-1	GH-1	GH-1	GH-1	GH-1	GH-1	GH-1	GH-1	GH-1	GH-1
	Interval	2-3 ft bgs	14-15 ft bgs	24-25 ft bgs	29-30 ft bgs	41-42 ft bgs	48-49 ft bgs	62-63 ft bgs	72-73 ft bgs	82-83 ft bgs	82-83 ft bgs	89-90 ft bgs
	EPA No	2810-127	2810-128	2810-129	2810-130	2810-131	2810-132	2810-133	2810-134	2810-135	2810-135-FD	2810-137
	Date	5/17/2005	5/17/2005	5/17/2005	5/17/2005	5/17/2005	5/17/2005	5/17/2005	5/17/2005	5/17/2005	5/17/2005	5/17/2005
	Time	10:55	11:20	11:45	13:15	14:05	14:25	14:50	15:20	15:50	15:50	16:25
Parameter	Units											
Semivolatile Organics		Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q
Acenaphthene (1)	ug/kg	410 U	N/A O	32,000	30,000	10,000	32,000	N/A O	20,000	38,000 U	34,000 U	19,000 U
Acenaphthylene (1)	ug/kg	410 U	N/A O	290,000	320,000	120,000 J	340,000	N/A O	200,000	180,000	190,000	130,000
Acetophenone	ug/kg	410 U	N/A O	15,000 U	15,000 U	7,500 U	14,000 U	N/A O	17,000 U	38,000 U	34,000 U	19,000 U
Anthracene (1)	ug/kg	410 U	N/A O	110,000	89,000	43,000	150,000 J	N/A O	58,000	45,000	46,000	41,000
Atrazine	ug/kg	410 U	N/A O	15,000 U	15,000 U	7,500 U	14,000 U	N/A O	17,000 U	38,000 U	34,000 U	19,000 U
Benzaldehyde	ug/kg	410 U	N/A O	15,000 U	15,000 U	7,500 U	14,000 U	N/A O	17,000 U	38,000 U	34,000 U	19,000 U
Benzo(a)anthracene(1,2)	ug/kg	410 U	N/A O	84,000	77,000	33,000	110,000	N/A O	83,000	75,000	66,000	45,000
Benzo(a)pyrene(1,2)	ug/kg	410 U	N/A O	59,000	56,000	24,000	80,000	N/A O	46,000	40,000	34,000	19,000 U
Benzo(b)fluoranthene(1,2)	ug/kg	410 U	N/A O	24,000	26,000	9,400	32,000	N/A O	25,000	38,000 U	34,000 U	19,000
Benzo(g,h,i)perylene (1)	ug/kg	410 U	N/A O	15,000 U	15,000 U	7,500 U	14,000 U	N/A O	17,000 U	38,000 U	34,000 U	19,000 U
Benzo(k)fluoranthene(1,2)	ug/kg	410 U	N/A O	40,000	39,000	15,000	48,000	N/A O	41,000	38,000 U	38,000	19,000 U
Biphenyl	ug/kg	410 U	N/A O	78,000	81,000	28,000	76,000	N/A O	56,000	51,000	54,000	31,000
bis(2-Chloroethoxy)methane	ug/kg	410 U	N/A O	15,000 U	15,000 U	7,500 U	14,000 U	N/A O	17,000 U	38,000 U	34,000 U	19,000 U
bis(2-Chloroethyl)ether	ug/kg	410 U	N/A O	15,000 U	15,000 U	7,500 U	14,000 U	N/A O	17,000 U	38,000 U	34,000 U	19,000 U
bis(2-Chloroisopropyl)ether	ug/kg	410 U	N/A O	15,000 U	15,000 U	7,500 U	14,000 U	N/A O	17,000 U	38,000 U	34,000 U	19,000 U
bis(2-Ethylhexyl)phthalate	ug/kg	410 U	N/A O	15,000 U	15,000 U	7,500 U	14,000 U	N/A O	17,000 U	38,000 U	34,000 U	19,000 U
4-Bromophenyl-phenylether	ug/kg	410 U	N/A O	15,000 U	15,000 U	7,500 U	14,000 U	N/A O	17,000 U	38,000 U	34,000 U	19,000 U
Butylbenzylphthalate	ug/kg	410 U	N/A O	15,000 U	15,000 U	7,500 U	14,000 U	N/A O	17,000 U	38,000 U	34,000 U	19,000 U
Caprolactam	ug/kg	410 U	N/A O	15,000 U	15,000 U	7,500 U	14,000 U	N/A O	17,000 U	38,000 U	34,000 U	19,000 U
Carbazole	ug/kg	410 U	N/A O	15,000 U	15,000 U	7,500 U	14,000 U	N/A O	17,000 U	38,000 U	34,000 U	19,000 U
4-Chloro-3-methyphenol	ug/kg	410 U	N/A O	15,000 U	15,000 U	7,500 U	14,000 U	N/A O	17,000 U	38,000 U	34,000 U	19,000 U
4-Chloroaniline	ug/kg	410 U	N/A O	15,000 U	15,000 U	7,500 U	14,000 U	N/A O	17,000 U	38,000 U	34,000 U	19,000 U
2-Chloronaphthalene (1)	ug/kg	410 U	N/A O	15,000 U	15,000 U	7,500 U	14,000 U	N/A O	17,000 U	38,000 U	34,000 U	19,000 U
2-Chlorophenol	ug/kg	410 U	N/A O	15,000 U	15,000 U	7,500 U	14,000 U	N/A O	17,000 U	38,000 U	34,000 U	19,000 U
4-Chlorophenyl-phenylether	ug/kg	410 U	N/A O	15,000 U	15,000 U	7,500 U	14,000 U	N/A O	17,000 U	38,000 U	34,000 U	19,000 U
Chrysene (1,2)	ug/kg	410 U	N/A O	87,000	79,000	29,000	110,000	N/A O	86,000	77,000	74,000	52,000
Di-n-butylphthalate	ug/kg	410 U	N/A O	15,000 U	15,000 U	7,500 U	14,000 U	N/A O	17,000 U	38,000 U	34,000 U	19,000 U
Di-n-octylphthalate	ug/kg	410 U	N/A O	15,000 U	15,000 U	7,500 U	14,000 U	N/A O	17,000 U	38,000 U	34,000 U	19,000 U
Dibenzo(a,h)anthracene (1,2)	ug/kg	410 U	N/A O	15,000 U	15,000 U	7,500 U	14,000 U	N/A O	17,000 U	38,000 U	34,000 U	19,000 U
Dibenzofuran	ug/kg	410 U	N/A O	26,000	25,000	8,900	28,000	N/A O	21,000	38,000 U	34,000 U	19,000 U
3,3'-Dichlorobenzidine	ug/kg	410 U	N/A O	15,000 U	15,000 U	7,500 U	14,000 U	N/A O	17,000 U	38,000 U	34,000 U	19,000 U
2,4-Dichlorophenol	ug/kg	410 U	N/A O	15,000 U	15,000 U	7,500 U	14,000 U	N/A O	17,000 U	38,000 U	34,000 U	19,000 U
Diethylphthalate	ug/kg	410 U	N/A O	15,000 U	15,000 U	7,500 U	14,000 U	N/A O	17,000 U	38,000 U	34,000 U	19,000 U
2,4-Dimethylphenol	ug/kg	410 U	N/A O	15,000 U	15,000 U	7,500 U	14,000 U	N/A O	17,000 U	38,000 U	34,000 U	19,000 U
Dimethylphthalate	ug/kg	410 U	N/A O	15,000 U	15,000 U	7,500 U	14,000 U	N/A O	17,000 U	38,000 U	34,000 U	19,000 U
4,6-Dinitro-2-methylphenol	ug/kg	1,000 U	N/A O	36,000 U	37,000 U	19,000 U	35,000 U	N/A O	44,000 U	94,000 U	86,000 U	47,000 U
2,4-Dinitrophenol	ug/kg	1,000 U	N/A O	36,000 U	37,000 U	19,000 U	35,000 U	N/A O	44,000 U	94,000 U	86,000 U	47,000 U

Parameter	Location	GH-1	GH-1	GH-1	GH-1	GH-1	GH-1	GH-1	GH-1	GH-1	GH-1	GH-1
	Interval	2-3 ft bgs	14-15 ft bgs	24-25 ft bgs	29-30 ft bgs	41-42 ft bgs	48-49 ft bgs	62-63 ft bgs	72-73 ft bgs	82-83 ft bgs	82-83 ft bgs	89-90 ft bgs
	EPA No	2610-127	2610-128	2610-129	2610-130	2610-131	2610-132	2610-133	2610-134	2610-135	2610-135-FD	2610-137
	Date	5/17/2005	5/17/2005	5/17/2005	5/17/2005	5/17/2005	5/17/2005	5/17/2005	5/17/2005	5/17/2005	5/17/2005	5/17/2005
	Time	10:55	11:20	11:45	13:15	14:06	14:25	14:50	15:20	15:50	15.50	16:25
Parameter	Units											
Semivolatile Organics (Cont)		Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc Q
2,4-Dinitrotoluene	ug/kg	410 U	N/A O	15,000 U	15,000 U	7,500 U	14,000 U	N/A O	17,000 U	38,000 U	34,000 U	19,000 U
2,6-Dinitrotoluene	ug/kg	410 U	N/A O	15,000 U	15,000 U	7,500 U	14,000 U	N/A O	17,000 U	38,000 U	34,000 U	19,000 U
Fluoranthene (1)	ug/kg	410 U	N/A O	160,000	150,000 J	64,000 J	220,000 J	N/A O	190,000	140,000	140,000	120,000
Fluorene (1)	ug/kg	410 U	N/A O	200,000	180,000 J	72,000 J	180,000 J	N/A O	140,000	120,000	130,000	84,000
Hexachlorobenzene	ug/kg	410 U	N/A O	15,000 U	15,000 U	7,500 U	14,000 U	N/A O	17,000 U	38,000 U	34,000 U	19,000 U
Hexachlorobutadiene	ug/kg	410 U	N/A O	15,000 U	15,000 U	7,500 U	14,000 U	N/A O	17,000 U	38,000 U	34,000 U	19,000 U
Hexachlorocyclopentadiene	ug/kg	410 U	N/A O	15,000 U	15,000 U	7,500 U	14,000 U	N/A O	17,000 U	38,000 U	34,000 U	19,000 U
Hexachloroethane	ug/kg	410 U	N/A O	15,000 U	15,000 U	7,500 U	14,000 U	N/A O	17,000 U	38,000 U	34,000 U	19,000 U
Indeno(1,2,3-cd)pyrene (1,2)	ug/kg	410 U	N/A O	18,000	18,000	7,500	26,000	N/A O	20,000	38,000 U	34,000 U	19,000 U
Isophorone	ug/kg	410 U	N/A O	15,000 U	15,000 U	7,500 U	14,000 U	N/A O	17,000 U	38,000 U	34,000 U	19,000 U
2-Methylnaphthalene (1)	ug/kg	410 U	N/A O	1,000,000 J	850,000 J	240,000 J	790,000 J	N/A O	480,000 J	290,000 J	390,000 J	190,000
2-Methylphenol	ug/kg	410 U	N/A O	15,000 U	15,000 U	7,500 U	14,000 U	N/A O	17,000 U	38,000 U	34,000 U	19,000 U
4-Methylphenol	ug/kg	410 U	N/A O	15,000 U	15,000 U	7,500 U	14,000 U	N/A O	17,000 U	38,000 U	34,000 U	19,000 U
Naphthalene (1)	ug/kg	410 U	N/A O	760,000	1,700,000	600,000	2,200,000	N/A O	37,000	140,000	140,000	23,000
2-Nitroaniline	ug/kg	1,000 U	N/A O	38,000 U	37,000 U	19,000 U	35,000 U	N/A O	44,000 U	94,000 U	86,000 U	47,000 U
3-Nitroaniline	ug/kg	1,000 U	N/A O	36,000 U	37,000 U	19,000 U	36,000 U	N/A O	44,000 U	94,000 U	86,000 U	47,000 U
4-Nitroaniline	ug/kg	1,000 U	N/A O	38,000 U	37,000 U	19,000 U	35,000 U	N/A O	44,000 U	94,000 U	86,000 U	47,000 U
Nitrobenzene	ug/kg	410 U	N/A O	15,000 U	15,000 U	7,500 U	14,000 U	N/A O	17,000 U	38,000 U	34,000 U	19,000 U
2-Nitrophenol	ug/kg	410 U	N/A O	15,000 U	15,000 U	7,500 U	14,000 U	N/A O	17,000 U	38,000 U	34,000 U	19,000 U
4-Nitrophenol	ug/kg	1,000 U	N/A O	38,000 U	37,000 U	19,000 U	35,000 U	N/A O	44,000 U	94,000 U	86,000 U	47,000 U
N-nitroso-di-n-propylamine	ug/kg	410 U	N/A O	15,000 U	15,000 U	7,500 U	14,000 U	N/A O	17,000 U	38,000 U	34,000 U	19,000 U
N-nitrosodiphenylamine	ug/kg	410 U	N/A O	15,000 U	15,000 U	7,500 U	14,000 U	N/A O	17,000 U	38,000 U	34,000 U	19,000 U
Pentachlorophenol	ug/kg	1,000 U	N/A O	38,000 U	37,000 U	19,000 U	35,000 U	N/A O	44,000 U	94,000 U	86,000 U	47,000 U
Phenanthrene (1)	ug/kg	410 U	N/A O	510,000	520,000	200,000	540,000	N/A O	520,000	390,000	440,000	310,000
Phenol	ug/kg	410 U	N/A O	15,000 U	15,000 U	7,500 U	14,000 U	N/A O	17,000 U	38,000 U	34,000 U	19,000 U
Pyrene (1)	ug/kg	410 U	N/A O	250,000	220,000 J	89,000 J	290,000	N/A O	280,000	210,000	200,000	120,000
2,4,5-Trichlorophenol	ug/kg	1,000 U	N/A O	38,000 U	37,000 U	19,000 U	35,000 U	N/A O	44,000 U	94,000 U	86,000 U	47,000 U
2,4,6-Trichlorophenol	ug/kg	410 U	N/A O	15,000 U	15,000 U	7,500 U	14,000 U	N/A O	17,000 U	38,000 U	34,000 U	19,000 U
Total Semivolatiles	ug/kg	ND	N/A	3,728,000	4,460,000	1,582,800	5,262,000	N/A	2,284,000	1,758,000	1,941,000	1,165,000
Total PAHs (1)	ug/kg	ND	N/A	3,624,000	4,354,000	1,555,800	5,148,000	N/A	2,188,000	1,707,000	1,887,000	1,134,000
Total Carcinogenic PAHs(2)	ug/kg	ND	N/A	312,000	286,000	117,900	408,000	N/A	303,000	182,000	212,000	116,000

(1) Polynuclear Aromatic Hydrocarbon.

(2) Carcinogenic Polynuclear Aromatic Hydrocarbon.

U : Compound was analyzed for but not detected. The value is the quantation limit.

J : Value estimated since not all QC criteria met.

ND : Not detected above quantation limits provided.

N/A - Not applicable.

O - Parameter not analyzed for.

TABLE GH1-2
SUMMARY OF SEMI-VOLATILE COMPOUNDS IDENTIFIED (BORING GH1)
SOIL/SOURCE MATERIAL SAMPLING 05/2-19/2005
SECOND STREET (HASTINGS) SOURCE AREA RI/FS

Parameter	Location	GH-1	GH-1	GH-1	GH-1	GH-1	GH-1	GH-1	GH-1	GH-1
	Interval	103-104 ft bgs	111-112 ft bgs	124-125 ft bgs	130-131 ft bgs	144-145 ft bgs	151-152 ft bgs	161-162 ft bgs	170-171 ft bgs	179-180 ft bgs
	EPA No	2810-138	2810-139	2810-140	2810-141	2810-142	2810-143	2810-144	2810-145	2810-146
	Date	5/17/2005	5/17/2005	5/17/2005	5/18/2005	5/18/2005	5/18/2005	5/18/2005	5/18/2005	5/18/2005
	Time	17:05	17:50	12:30	8:10	8:50	9:20	9:30	9:40	10:05
	Units									
Semivolatile Organics		Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Q
Acenaphthene (1)	ug/kg	36,000	16,000	6,100	N/A O	N/A O	350 U	400 U	350 U	360 U
Acenaphthylene (1)	ug/kg	4,350,000	220,000	100,000	N/A O	N/A O	710	450	350 U	360 U
Acetophenone	ug/kg	16,000 U	14,000 U	3,500 U	N/A O	N/A O	360 U	400 U	350 U	360 U
Anthracene (1)	ug/kg	180,000 J	81,000	38,000 J	N/A O	N/A O	380	400 U	350 U	360 U
Atrazine	ug/kg	16,000 U	14,000 U	3,500 U	N/A O	N/A O	350 U	400 U	350 U	360 U
Benzaldehyde	ug/kg	16,000 U	14,000 U	3,500 U	N/A O	N/A O	360 U	400 U	350 U	360 U
Benzo(a)anthracene(1,2)	ug/kg	110,000	62,000	29,000 J	N/A O	N/A O	410	400 U	350 U	360 U
Benzo(a)pyrene(1,2)	ug/kg	71,000	49,000	21,000	N/A O	N/A O	350 U	400 U	350 U	360 U
Benzo(b)fluoranthene(1,2)	ug/kg	29,000	25,000	6,800	N/A O	N/A O	350 U	400 U	350 U	360 U
Benzo(g,h,i)perylene (1)	ug/kg	16,000 U	14,000 U	3,600	N/A O	N/A O	360 U	400 U	350 U	360 U
Benzo(k)fluoranthene(1,2)	ug/kg	39,000	35,000	13,000	N/A O	N/A O	350 U	400 U	350 U	360 U
Biphenyl	ug/kg	78,000	50,000	19,000	N/A O	N/A O	350 U	400 U	350 U	360 U
bis(2-Chloroethoxy)methane	ug/kg	16,000 U	14,000 U	3,500 U	N/A O	N/A O	350 U	400 U	350 U	360 U
bis(2-Chloroethyl)ether	ug/kg	16,000 U	14,000 U	3,500 U	N/A O	N/A O	350 U	400 U	350 U	360 U
bis(2-Chloroisopropyl)ether	ug/kg	16,000 U	14,000 U	3,500 U	N/A O	N/A O	350 U	400 U	350 U	360 U
bis(2-Ethylhexyl)phthalate	ug/kg	16,000 U	14,000 U	3,500 U	N/A O	N/A O	360 U	400 U	350 U	360 U
4-Bromophenyl-phenylether	ug/kg	16,000 U	14,000 U	3,500 U	N/A O	N/A O	360 U	400 U	350 U	360 U
Butylbenzylphthalate	ug/kg	16,000 U	14,000 U	3,500 U	N/A O	N/A O	350 U	400 U	350 U	360 U
Caprolactam	ug/kg	16,000 U	14,000 U	3,500 U	N/A O	N/A O	350 U	400 U	350 U	360 U
Carbazole	ug/kg	16,000 U	14,000 U	3,500 U	N/A O	N/A O	350 U	400 U	350 U	360 U
4-Chloro-3-methyphenol	ug/kg	16,000 U	14,000 U	3,500 U	N/A O	N/A O	360 U	400 U	350 U	360 U
4-Chloroaniline	ug/kg	16,000 U	14,000 U	3,500 U	N/A O	N/A O	360 U	400 U	350 U	360 U
2-Chloronaphthalene (1)	ug/kg	16,000 U	14,000 U	3,500 U	N/A O	N/A O	350 U	400 U	350 U	360 U
2-Chlorophenol	ug/kg	16,000 U	14,000 U	3,500 U	N/A O	N/A O	360 U	400 U	350 U	360 U
4-Chlorophenyl-phenylether	ug/kg	16,000 U	14,000 U	3,500 U	N/A O	N/A O	350 U	400 U	350 U	360 U
Chrysene (1,2)	ug/kg	88,000	67,000	25,000	N/A O	N/A O	480	400 U	350 U	360 U
Di-n-butylphthalate	ug/kg	16,000 U	14,000 U	3,500 U	N/A O	N/A O	350 U	400 U	350 U	360 U
Di-n-octylphthalate	ug/kg	16,000 U	14,000 U	3,500 U	N/A O	N/A O	350 U	400 U	350 U	360 U
Dibenzo(a,h)anthracene (1,2)	ug/kg	16,000 U	14,000 U	3,500 U	N/A O	N/A O	350 U	400 U	350 U	360 U
Dibenzofuran	ug/kg	36,000	15,000	6,000	N/A O	N/A O	350 U	400 U	350 U	360 U
3,3'-Dichlorobenzidine	ug/kg	16,000 U	14,000 U	3,500 U	N/A O	N/A O	360 U	400 U	350 U	360 U
2,4-Dichlorophenol	ug/kg	16,000 U	14,000 U	3,500 U	N/A O	N/A O	350 U	400 U	350 U	360 U
Diethylphthalate	ug/kg	16,000 U	14,000 U	3,500 U	N/A O	N/A O	350 U	400 U	350 U	360 U
2,4-Dimethylphenol	ug/kg	16,000 U	14,000 U	3,500 U	N/A O	N/A O	350 U	400 U	350 U	360 U
Dimethylphthalate	ug/kg	16,000 U	14,000 U	3,500 U	N/A O	N/A O	350 U	400 U	350 U	360 U
4,6-Dinitro-2-methylphenol	ug/kg	41,000 U	35,000 U	8,900 U	N/A O	N/A O	890 U	1,000 U	880 U	900 U
2,4-Dinitrophenol	ug/kg	41,000 U	35,000 U	8,900 U	N/A O	N/A O	890 U	1,000 U	880 U	900 U

Parameter	Location	GH-1	GH-1	GH-1	GH-1	GH-1	GH-1	GH-1	GH-1	GH-1
	Interval	103-104 ft bgs	111-112 ft bgs	124-125 ft bgs	130-131 ft bgs	144-145 ft bgs	151-152 ft bgs	161-162 ft bgs	170-171 ft bgs	179-180 ft bgs
	EPA No	2610-138	2610-139	2610-140	2610-141	2610-142	2610-143	2610-144	2610-145	2610-146
	Date	5/17/2005	5/17/2005	5/17/2005	5/18/2005	5/18/2005	5/18/2005	5/18/2005	5/18/2005	5/18/2005
	Time	17 05	17 50	12:30	8:10	8:50	9:20	9:30	9:40	10:05
	Units									
Semivolatile Organics (Cont)		Conc Q	Conc Q	Conc. Q	Conc Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Q
2,4-Dinitrotoluene	ug/kg	16,000 U	14,000 U	3,500 U	N/A O	N/A O	350 U	400 U	350 U	360 U
2,6-Dinitrotoluene	ug/kg	16,000 U	14,000 U	3,500 U	N/A O	N/A O	350 U	400 U	350 U	360 U
Fluoranthene (1)	ug/kg	200,000 J	130,000	53,000 J	N/A O	N/A O	840	490	350 U	360 U
Fluorene (1)	ug/kg	220,000 J	120,000	49,000 J	N/A O	N/A O	640	450	350 U	360 U
Hexachlorobenzene	ug/kg	16,000 U	14,000 U	3,500 U	N/A O	N/A O	350 U	400 U	360 U	360 U
Hexachlorobutadiene	ug/kg	16,000 U	14,000 U	3,500 U	N/A O	N/A O	350 U	400 U	350 U	360 U
Hexachlorocyclopentadiene	ug/kg	16,000 U	14,000 U	3,500 U	N/A O	N/A O	350 U	400 U	350 U	360 U
Hexachloroethane	ug/kg	16,000 U	14,000 U	3,500 U	N/A O	N/A O	350 U	400 U	360 U	360 U
Indeno(1,2,3-cd)pyrene (1,2)	ug/kg	20,000	17,000	6,200	N/A O	N/A O	350 U	400 U	350 U	360 U
Isophorone	ug/kg	16,000 U	14,000 U	3,500 U	N/A O	N/A O	350 U	400 U	360 U	360 U
2-Methylnaphthalene (1)	ug/kg	1,200,000	26,000	180,000 J	N/A O	N/A O	530 J	950 J	350 U	360 U
2-Methylphenol	ug/kg	16,000 U	14,000 U	3,500 U	N/A O	N/A O	350 U	400 U	350 U	360 U
4-Methylphenol	ug/kg	16,000 U	14,000 U	3,500 U	N/A O	N/A O	350 U	400 U	350 U	360 U
Naphthalene (1)	ug/kg	1,800,000	14,000 U	370,000	N/A O	N/A O	350 U	1,200	360 U	350 U
2-Nitroaniline	ug/kg	41,000 U	35,000 U	8,800 U	N/A O	N/A O	880 U	1,000 U	880 U	900 U
3-Nitroaniline	ug/kg	41,000 U	35,000 U	8,800 U	N/A O	N/A O	890 U	1,000 U	880 U	900 U
4-Nitroaniline	ug/kg	41,000 U	35,000 U	8,900 U	N/A O	N/A O	880 U	1,000 U	880 U	900 U
Nitrobenzene	ug/kg	16,000 U	14,000 U	3,500 U	N/A O	N/A O	350 U	400 U	350 U	360 U
2-Nitrophenol	ug/kg	16,000 U	14,000 U	3,500 U	N/A O	N/A O	350 U	400 U	360 U	360 U
4-Nitrophenol	ug/kg	41,000 U	36,000 U	8,900 U	N/A O	N/A O	890 U	1,000 U	880 U	900 U
N-nitroso-di-n-propylamine	ug/kg	16,000 U	14,000 U	3,500 U	N/A O	N/A O	350 U	400 U	350 U	360 U
N-nitrosodiphenylamine	ug/kg	16,000 U	14,000 U	3,500 U	N/A O	N/A O	350 U	400 U	360 U	360 U
Pentachlorophenol	ug/kg	41,000 U	36,000 U	8,900 U	N/A O	N/A O	890 U	1,000 U	880 U	900 U
Phenanthrene (1)	ug/kg	610,000	350,000	160,000	N/A O	N/A O	2,500	1,400	350 U	570
Phenol	ug/kg	16,000 U	14,000 U	3,500 U	N/A O	N/A O	350 U	400 U	350 U	360 U
Pyrene (1)	ug/kg	290,000 J	210,000	81,000	N/A O	N/A O	970	980	350 U	360 U
2,4,5-Trichlorophenol	ug/kg	41,000 U	36,000 U	8,800 U	N/A O	N/A O	890 U	1,000 U	880 U	900 U
2,4,6-Trichlorophenol	ug/kg	16,000 U	14,000 U	3,500 U	N/A O	N/A O	350 U	400 U	360 U	360 U
Total Semivolatiles	ug/kg	9,337,000	1,473,000	1,188,700	N/A	N/A	7,440	5,920	ND	570
Total PAHs (1)	ug/kg	9,223,000	1,408,000	1,141,700	N/A	N/A	7,440	5,920	ND	570
Total Carcinogenic PAHs(2)	ug/kg	367,000	255,000	101,000	N/A	N/A	870	ND	ND	ND

(1) Polynuclear Aromatic Hydrocarbon.

(2) Carcinogenic Polynuclear Aromatic Hydrocarbon.

U : Compound was analyzed for but not detected. The value is the quantitation limit.

J Value estimated since not all QC criteria met

ND : Not detected above quantation limits provided.

N/A - Not applicable.

O - Parameter not analyzed for.

TABLE GH2-1
SUMMARY OF VOLATILE COMPOUNDS IDENTIFIED (BORING GH2)
SOIL/SOURCE MATERIAL SAMPLING 05/2-19/2005
SECOND STREET (HASTINGS) SOURCE AREA RI/FS

Parameter	Location	GH-2	GH-2	GH-2	GH-2	GH-2	GH-2	GH-2	GH-2	GH-2	GH-2	GH-2
	Interval	3-4 ft bgs	14-15 ft bgs	18-19 ft bgs	32-33 ft bgs	41-42 ft bgs	51-52 ft bgs	56-58 ft bgs	74-75 ft bgs	80-81 ft bgs	80-81 ft bgs	92-93 ft bgs
	EPA No	2610-150	2610-151	2610-152	2610-153	2610-154	2610-155	2610-156	2610-157	2610-158	2610-158-FD	2610-159
	Date	5/18/2005	5/18/2005	5/18/2005	5/18/2005	5/18/2005	5/18/2005	5/18/2005	5/18/2005	5/19/2005	5/19/2005	5/19/2005
	Time	15:45	16:00	16:15	16:45	17:36	18:00	18:15	18:35	7:55	7:56	8:30
	Units											
Volatile Organics		Conc Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q
Acetone	ug/kg	11 U	140 J	50 UJ	55 UJ	17 U	54 UJ	53 UJ	57 UJ	52 UJ	52 UJ	11 UJ
Benzene	ug/kg	11 U	71 UJ	550 J	280 J	11 U	54 UJ	53 UJ	57 UJ	52 UJ	52 UJ	11 UJ
Bromodichloromethane	ug/kg	11 U	71 UJ	50 UJ	55 UJ	11 U	54 UJ	53 UJ	57 UJ	52 UJ	52 UJ	11 UJ
Bromoform	ug/kg	11 U	71 UJ	50 UJ	55 UJ	11 U	54 UJ	53 UJ	57 UJ	52 UJ	52 UJ	11 UJ
Bromomethane	ug/kg	11 U	71 UJ	50 UJ	55 UJ	11 U	54 UJ	53 UJ	57 UJ	52 UJ	52 UJ	11 UJ
2-Butanone (Methyl Ethyl Ketone)	ug/kg	11 U	71 UJ	50 UJ	55 UJ	11 U	54 UJ	53 UJ	57 UJ	52 UJ	52 UJ	11 UJ
Carbon Disulfide	ug/kg	11 U	71 UJ	50 UJ	55 UJ	11 U	54 UJ	53 UJ	57 UJ	52 UJ	52 UJ	11 UJ
Carbon Tetrachloride	ug/kg	11 U	71 UJ	50 UJ	55 UJ	11 U	54 UJ	53 UJ	57 UJ	52 UJ	52 UJ	11 UJ
Chlorobenzene	ug/kg	11 U	71 UJ	50 UJ	55 UJ	11 U	54 UJ	53 UJ	57 UJ	52 UJ	52 UJ	11 UJ
Chloroethane	ug/kg	11 U	71 UJ	50 UJ	55 UJ	11 U	54 UJ	53 UJ	57 UJ	52 UJ	52 UJ	11 UJ
Chloroform	ug/kg	11 U	71 UJ	50 UJ	55 UJ	11 U	54 UJ	53 UJ	57 UJ	52 UJ	52 UJ	11 UJ
Chloromethane	ug/kg	11 U	71 UJ	50 UJ	55 UJ	11 U	54 UJ	53 UJ	57 UJ	52 UJ	52 UJ	11 UJ
Cyclohexane	ug/kg	11 U	71 UJ	50 UJ	55 UJ	11 U	54 UJ	53 UJ	57 UJ	52 UJ	52 UJ	11 UJ
1,2 Dibromo 3-Chloropropane	ug/kg	11 U	71 UJ	50 UJ	55 UJ	11 U	54 UJ	53 UJ	57 UJ	52 UJ	52 UJ	11 UJ
Dibromochloromethane	ug/kg	11 U	71 UJ	50 UJ	55 UJ	11 U	54 UJ	53 UJ	57 UJ	52 UJ	52 UJ	11 UJ
1,2-Dibromoethane	ug/kg	11 U	71 UJ	50 UJ	55 UJ	11 U	54 UJ	53 UJ	57 UJ	52 UJ	52 UJ	11 UJ
1,2-Dichlorobenzene (Ortho)	ug/kg	11 U	71 UJ	50 UJ	55 UJ	11 U	54 UJ	53 UJ	57 UJ	52 UJ	52 UJ	11 UJ
1,3-Dichlorobenzene (Meta)	ug/kg	11 U	71 UJ	50 UJ	55 UJ	11 U	54 UJ	53 UJ	57 UJ	52 UJ	52 UJ	11 UJ
1,4-Dichlorobenzene (Para)	ug/kg	11 U	71 UJ	50 UJ	55 UJ	11 U	54 UJ	53 UJ	57 UJ	52 UJ	52 UJ	11 UJ
Dichlorodifluoromethane	ug/kg	11 U	71 UJ	50 UJ	55 UJ	11 U	54 UJ	53 UJ	57 UJ	52 UJ	52 UJ	11 UJ
1,1-Dichloroethane	ug/kg	11 U	71 UJ	50 UJ	55 UJ	11 U	54 UJ	53 UJ	57 UJ	52 UJ	52 UJ	11 UJ
1,2-Dichloroethane	ug/kg	11 U	71 UJ	50 UJ	55 UJ	11 U	54 UJ	53 UJ	57 UJ	52 UJ	52 UJ	11 UJ
1,1-Dichloroethene	ug/kg	11 U	71 UJ	50 UJ	55 UJ	11 U	54 UJ	53 UJ	57 UJ	52 UJ	52 UJ	11 UJ
cis-1,2-Dichloroethene	ug/kg	11 U	71 UJ	50 UJ	55 UJ	11 U	54 UJ	53 UJ	57 UJ	52 UJ	52 UJ	11 UJ
trans-1,2-Dichloroethene	ug/kg	11 U	71 UJ	50 UJ	55 UJ	11 U	54 UJ	53 UJ	57 UJ	52 UJ	52 UJ	11 UJ
1,2-Dichloropropane	ug/kg	11 U	71 UJ	50 UJ	55 UJ	11 U	54 UJ	53 UJ	57 UJ	52 UJ	52 UJ	11 UJ
cis-1,3,-Dichloropropene	ug/kg	11 U	71 UJ	50 UJ	55 UJ	11 U	54 UJ	53 UJ	57 UJ	52 UJ	52 UJ	11 UJ
trans-1,3,-Dichloropropene	ug/kg	11 U	71 UJ	50 UJ	55 UJ	11 U	54 UJ	53 UJ	57 UJ	52 UJ	52 UJ	11 UJ
Ethylbenzene	ug/kg	11 U	1,200 J	110,000	21,000	11 U	4,000 J	73 J	57 UJ	52 UJ	52 UJ	11 UJ
2-Hexanone	ug/kg	11 U	71 UJ	50 UJ	55 UJ	11 U	54 UJ	53 UJ	57 UJ	52 UJ	52 UJ	11 UJ
Isopropylbenzene	ug/kg	11 U	670 J	17,000	3,800	11 U	210 J	53 UJ	57 UJ	52 UJ	52 UJ	11 UJ
Methyl Acetate	ug/kg	11 U	71 UJ	50 UJ	55 UJ	11 U	54 UJ	53 UJ	57 UJ	52 UJ	52 UJ	11 UJ
Methyl tert-butyl ether	ug/kg	11 U	71 UJ	50 UJ	55 UJ	11 U	54 UJ	53 UJ	57 UJ	52 UJ	52 UJ	11 UJ
Methylcyclohexane	ug/kg	11 U	71 UJ	50 UJ	55 UJ	11 U	54 UJ	53 UJ	57 U	52 UJ	52 UJ	11 UJ
Methylene Chloride	ug/kg	11 U	71 UJ	50 UJ	55 UJ	11 U	54 UJ	53 UJ	57 UJ	52 UJ	52 UJ	11 UJ
4-Methyl-2-Pentanone (MIBK)	ug/kg	11 U	71 UJ	50 UJ	55 UJ	11 U	54 UJ	53 UJ	57 UJ	52 UJ	52 U	11 UJ
Styrene	ug/kg	11 U	71 UJ	230 J	110 J	11 U	170,000	1,400 J	1,800	86 J	57 J	18 J
1 1,2,2-Tetrachloroethane	ug/kg	11 U	71 UJ	50 UJ	55 UJ	11 U	54 UJ	53 UJ	57 UJ	52 UJ	52 UJ	11 UJ

Parameter	Location	GH-2	GH-2	GH-2	GH-2	GH-2	GH-2	GH-2	GH-2	GH-2	GH-2	GH-2
	Interval	3-4 ft bgs	14-15 ft bgs	18-19 ft bgs	32-33 ft bgs	41-42 ft bgs	51-52 ft bgs	58-59 ft bgs	74-75 ft bgs	80-81 ft bgs	80-81 ft bgs	92-93 ft bgs
	EPA No	2610-150	2610-151	2610-152	2610-153	2610-154	2610-155	2610-156	2610-157	2610-158	2610-158-FD	2610-159
	Date	5/18/2005	5/18/2005	5/18/2005	5/18/2005	5/18/2005	5/18/2005	5/18/2005	5/18/2005	5/19/2005	5/19/2005	5/19/2005
	Time	15:45	16:00	18:15	16:45	17:35	18:00	18:15	18:35	7:55	7:55	8:30
	Units											
Volatile Organics (Cont)		Conc. Q	Conc. Q	Conc Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q
Tetrachloroethene	ug/kg	11 U	71 UJ	50 UJ	55 UJ	11 U	54 UJ	53 UJ	57 UJ	52 UJ	52 UJ	11 UJ
Toluene	ug/kg	11 U	71 UJ	1,100 J	410 J	11 U	810 J	53 UJ	57 UJ	52 UJ	52 UJ	11 UJ
1,2,4-Trichlorobenzene	ug/kg	11 U	71 UJ	50 UJ	55 UJ	11 U	54 UJ	53 UJ	57 UJ	52 UJ	52 UJ	11 UJ
1,1,1-Trichloroethane	ug/kg	11 U	71 UJ	50 UJ	55 UJ	11 U	54 UJ	53 UJ	57 UJ	52 UJ	52 UJ	11 UJ
1,1,2-Trichloroethane	ug/kg	11 U	71 UJ	50 UJ	55 UJ	11 U	54 UJ	53 UJ	57 UJ	52 UJ	52 UJ	11 UJ
Trichloroethene	ug/kg	11 U	71 UJ	50 UJ	55 UJ	11 U	54 UJ	53 UJ	57 UJ	52 UJ	52 UJ	11 UJ
Trichlorofluoromethane	ug/kg	11 U	71 UJ	50 UJ	55 UJ	11 U	54 UJ	53 UJ	57 UJ	52 UJ	52 UJ	11 UJ
1,1,2-Trichlorofluoroethane	ug/kg	11 U	71 UJ	50 UJ	55 UJ	11 U	54 UJ	53 UJ	57 UJ	52 UJ	52 UJ	11 UJ
Vinyl Chloride	ug/kg	11 U	71 UJ	50 UJ	55 UJ	11 U	54 UJ	53 UJ	57 UJ	52 UJ	52 UJ	11 UJ
Total Xylenes	ug/kg	11 U	1,400 J	180,000	35,000	11 U	240,000	1,800 J	870 J	52 UJ	52 UJ	11 UJ
Total Volatiles	ug/kg	ND	3,410	308,880	80,600	ND	415,020	3,073	2,670	98	57	18
Total BETXs	ug/kg	ND	2,800	291,650	58,680	ND	244,810	1,873	870	ND	ND	ND

U : Compound was analyzed for but not detected. The value is the quantation limit.

UJ - The analyte was not detected at or above the reporting limit. The reporting limit is an estimate.

J : Value estimated since not all QC criteria met.

ND : Not detected above quantation limits provided.

TABLE GH2-1

SUMMARY OF VOLATILE COMPOUNDS IDENTIFIED (BORING GH2)

SOIL/SOURCE MATERIAL SAMPLING 05/2-19/2005

SECOND STREET (HASTINGS) SOURCE AREA RI/FS

Parameter	Location	GH-2	GH-2	GH-2	GH-2	GH-2	GH-2	GH-2	GH-2	GH-2
	Interval	104-105 ft bgs	111-112 ft bgs	122-123 ft bgs	131-132 ft bgs	140-141 ft bgs	152-153 ft bgs	161-162 ft bgs	171-172 ft bgs	179-180 ft bgs
	EPA No	2610-160	2610-161	2610-162	2610-163	2610-164	2610-165	2610-166	2610-167	2610-168
	Date	5/19/2005	5/19/2005	5/19/2005	5/19/2005	5/19/2005	5/19/2005	5/19/2005	5/19/2005	5/19/2005
	Time	9:15	9:50	10:20	11:00	11:40	11:50	13:15	13:40	14:00
	Units									
Volatile Organics		Conc. Q	Conc Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q
Acetone	ug/kg	10 U	1,300 U	14,000 U	2,700 U	11	11 U	13 U	11 U	14 U
Benzene	ug/kg	10 U	1,300 U	14,000	2,700 U	11 U	11 U	11 U	11 U	11 U
Bromodichloromethane	ug/kg	10 U	1,300 U	14,000 U	2,700 U	11 U	11 U	11 U	11 U	11 U
Bromoform	ug/kg	10 U	1,300 U	14,000 U	2,700 U	11 U	11 U	11 U	11 U	11 U
Bromomethane	ug/kg	10 U	1,300 U	14,000 U	2,700 U	11 U	11 U	11 U	11 U	11 U
2-Butanone (Methyl Ethyl Ketone)	ug/kg	10 U	1,400 U	14,000 U	2,700 U	11 U	11 U	11 U	11 U	11 U
Carbon Disulfide	ug/kg	10 U	1,300 U	14,000 U	2,700 U	11 U	11 U	11 U	11 U	11 U
Carbon Tetrachloride	ug/kg	10 U	1,300 U	14,000 U	2,700 U	11 U	11 U	11 U	11 U	11 U
Chlorobenzene	ug/kg	10 U	1,300 U	14,000 U	2,700 U	11 U	11 U	11 U	11 U	11 U
Chloroethane	ug/kg	10 U	1,300 U	14,000 U	2,700 U	11 U	11 U	11 U	11 U	11 U
Chloroform	ug/kg	10 U	1,300 U	14,000 U	2,700 U	11 U	11 U	11 U	11 U	11 U
Chloromethane	ug/kg	10 U	1,300 U	14,000 U	2,700 U	11 U	11 U	11 U	11 U	11 U
Cyclohexane	ug/kg	10 U	1,300 U	14,000 U	2,700 U	11 U	11 U	11 U	11 U	11 U
1,2 Dibromo 3-Chloropropane	ug/kg	10 U	1,300 U	14,000 U	2,700 U	11 U	11 U	11 U	11 U	11 U
Dibromochloromethane	ug/kg	10 U	1,300 U	14,000 U	2,700 U	11 U	11 U	11 U	11 U	11 U
1,2-Dibromoethane	ug/kg	10 U	1,300 U	14,000 U	2,700 U	11 U	11 U	11 U	11 U	11 U
1,2-Dichlorobenzene (Ortho)	ug/kg	10 U	1,300 U	14,000 U	2,700 U	11 U	11 U	11 U	11 U	11 U
1,3-Dichlorobenzene (Meta)	ug/kg	10 U	1,300 U	14,000 U	2,700 U	11 U	11 U	11 U	11 U	11 U
1,4-Dichlorobenzene (Para)	ug/kg	10 U	1,300 U	14,000 U	2,700 U	11 U	11 U	11 U	11 U	11 U
Dichlorodifluoromethane	ug/kg	10 U	1,300 U	14,000 U	2,700 U	11 U	11 U	11 U	11 U	11 U
1,1-Dichloroethane	ug/kg	10 U	1,300 U	14,000 U	2,700 U	11 U	11 U	11 U	11 U	11 U
1,2-Dichloroethane	ug/kg	10 U	1,300 U	14,000 U	2,700 U	11 U	11 U	11 U	11 U	11 U
1,1-Dichloroethene	ug/kg	10 U	1,300 U	14,000 U	2,700 U	11 U	11 U	11 U	11 U	11 U
cis-1,2-Dichloroethene	ug/kg	10 U	1,300 U	14,000 U	2,700 U	11 U	11 U	11 U	11 U	11 U
trans-1,2-Dichloroethene	ug/kg	10 U	1,300 U	14,000 U	2,700 U	11 U	11 U	11 U	11 U	11 U
1,2-Dichloropropane	ug/kg	10 U	1,300 U	14,000 U	2,700 U	11 U	11 U	11 U	11 U	11 U
cis-1,3,-Dichloropropene	ug/kg	10 U	1,300 U	14,000 U	2,700 U	11 U	11 U	11 U	11 U	11 U
trans-1,3,-Dichloropropene	ug/kg	10 U	1,300 U	14,000 U	2,700 U	11 U	11 U	11 U	11 U	11 U
Ethylbenzene	ug/kg	10 U	1,300 U	21,000	2,700 U	11 U	11 U	11 U	11 U	11 U
2-Hexanone	ug/kg	10 U	1,300 U	14,000 U	2,700 U	11 U	11 U	11 U	11 U	11 U
Isopropylbenzene	ug/kg	10 U	1,300 U	14,000 U	2,700 U	11 U	11 U	11 U	11 U	11 U
Methyl Acetate	ug/kg	10 U	1,300 U	14,000 U	2,700 U	11 U	11 U	11 U	11 U	11 U
Methyl tert-butyl ether	ug/kg	10 U	1,300 U	14,000 U	2,700 U	11 U	11 U	11 U	11 U	11 U
Methylcyclohexane	ug/kg	10 U	1,300 U	14,000 U	2,700 U	11 U	11 U	11 U	11 U	11 U
Methylene Chloride	ug/kg	10 U	1,300 U	14,000 U	2,700 U	11 U	11 U	11 U	11	11 U
4-Methyl-2-Pentanone (MIBK)	ug/kg	10 U	1,300 U	14,000 U	2,700 U	11 U	11 U	11 U	11 U	11 U
Styrene	ug/kg	27	1,300 U	160,000	2,700 U	11 U	11 U	11 U	11 U	11 U
1,1,2,2-Tetrachloroethane	ug/kg	10 U	1,300 U	14,000 U	2,700 U	11 U	11 U	11 U	11 U	11 U

Parameter	Location	GH-2	GH-2	GH-2	GH-2	GH-2	GH-2	GH-2	GH-2	GH-2
	Interval	104-105 ft bgs	111-112 ft bgs	122-123 ft bgs	131-132 ft bgs	140-141 ft bgs	152-153 ft bgs	161-162 ft bgs	171-172 ft bgs	179-180 ft bgs
	EPA No	2610-160	2610-161	2610-162	2610-163	2610-164	2610-165	2610-166	2610-167	2610-168
	Date	5/19/2005	5/19/2005	5/19/2005	5/19/2005	5/19/2005	5/19/2005	5/19/2005	5/19/2005	5/19/2005
	Time	9:15	9:50	10:20	11:00	11:40	11:50	13:15	13:40	14:00
	Units									
Volatile Organics (Cont)		Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q
Tetrachloroethene	ug/kg	10 U	1,300 U	14,000 U	2,700 U	11 U	11 U	11 U	11 U	11 U
Toluene	ug/kg	10 U	1,300 U	130,000	2,700 U	11 U	11 U	11 U	11 U	11 U
1,2,4-Trichlorobenzene	ug/kg	10 U	1,300 U	14,000 U	2,700 U	11 U	11 U	11 U	11 U	11 U
1,1,1-Trichloroethane	ug/kg	10 U	1,300 U	14,000 U	2,700 U	11 U	11 U	11 U	11 U	11 U
1,1,2-Trichloroethane	ug/kg	10 U	1,300 U	14,000 U	2,700 U	11 U	11 U	11 U	11 U	11 U
Trichloroethene	ug/kg	10 U	1,300 U	14,000 U	2,700 U	11 U	11 U	11 U	11 U	11 U
Trichlorofluoromethane	ug/kg	10 U	1,300 U	14,000 U	2,700 U	11 U	11 U	11 U	11 U	11 U
1,1,2-Trichlorofluoroethane	ug/kg	10 U	1,300 U	14,000 U	2,700 U	11 U	11 U	11 U	11 U	11 U
Vinyl Chloride	ug/kg	10 U	1,300 U	14,000 U	2,700 U	11 U	11 U	11 U	11 U	11 U
Total Xylenes	ug/kg	100	1,300 U	250,000	65,000	11 U	11 U	11 U	11 U	11 U
Total Volatiles	ug/kg	127	ND	585,000	65,000	11	ND	ND	11	ND
Total BETXs	ug/kg	100	ND	415,000	65,000	ND	ND	ND	ND	ND

U : Compound was analyzed for but not detected. The value is the quantation limit.

UJ - The analyte was not detected at or above the reporting limit. The reporting limit is an estimate.

J : Value estimated since not all QC criteria met.

ND : Not detected above quantation limits provided.

TABLE GH2-2
SUMMARY OF SEMI-VOLATILE COMPOUNDS IDENTIFIED (BORING GH2)
SOIL/SOURCE MATERIAL SAMPLING 05/2-19/2005
SECOND STREET (HASTINGS) SOURCE AREA RI/FS

	Location	GH-2	GH-2	GH-2	GH-2	GH-2	GH-2	GH-2	GH-2	GH-2	GH-2	GH-2
	Interval	3-4 ft bgs	14-15 ft bgs	18-19 ft bgs	32-33 ft bgs	41-42 ft bgs	51-52 ft bgs	58-59 ft bgs	74-75 ft bgs	80-81 ft bgs	80-81 ft bgs	92-93 ft bgs
	EPA No	2610-150	2610-151	2610-152	2610-153	2610-154	2610-155	2610-156	2610-157	2610-158	2610-158-FD	2610-159
	Date	5/18/2005	5/18/2005	5/18/2005	5/18/2005	5/18/2005	5/18/2005	5/18/2005	5/18/2005	5/19/2005	5/19/2005	5/19/2005
	Time	15:45	16:00	16:15	16:45	17:35	18:00	18:15	18:35	7:55	7:55	8:30
Parameter	Units											
Semivolatile Organics		Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q
Acenaphthene (1)	ug/kg	3,500 U	7,200	59,000	23,000 J	380 U	71,000 U	13,000	13,000	12,000	14,000	16,000
Acenaphthylene (1)	ug/kg	3,500 U	4,700 U	18,000 U	3,400	380 U	500,000	120,000 J	120,000 J	91,000 J	50,000	50,000
Acetophenone	ug/kg	3,500 U	4,700 U	18,000 U	2,000 U	380 U	71,000 U	6,900 U	7,600 U	6,800 U	6,800 U	7,600 U
Anthracene (1)	ug/kg	3,500 U	4,700 U	22,000	8,000	380 U	71,000 U	30,000	33,000	31,000	35,000	25,000
Atrazine	ug/kg	3,500 U	4,700 U	18,000 U	2,000 U	380 U	71,000 U	6,900 U	7,600 U	6,800 U	6,800 U	7,600 U
Benzaldehyde	ug/kg	3,500 U	4,700 U	18,000 U	2,000 U	380 U	71,000 U	6,900 U	7,600 U	6,800 U	6,800 U	7,600 U
Benzo(a)anthracene(1,2)	ug/kg	3,500 U	4,700 U	18,000 U	2,900	380 U	71,000 U	29,000	21,000	23,000	24,000	22,000
Benzo(a)pyrene(1,2)	ug/kg	3,500 U	4,700 U	18,000 U	2,000 U	380 U	71,000 U	7,600	7,600 U	7,000	8,200	7,600 U
Benzo(b)fluoranthene(1,2)	ug/kg	3,500 U	4,700 U	18,000 U	2,000 U	380 U	71,000 U	12,000	7,600 U	6,800 U	6,800 U	7,600 U
Benzo(g,h,i)perylene (1)	ug/kg	3,500 U	4,700 U	18,000 U	2,000 U	380 U	71,000 U	6,900 U	7,600 U	6,800 U	6,800 U	7,600 U
Benzo(k)fluoranthene(1,2)	ug/kg	3,500 U	4,700 U	18,000 U	2,000 U	380 U	71,000 U	8,400	7,600 U	7,800	8,600	9,200
Biphenyl	ug/kg	3,500 U	4,700 U	28,000	9,800	380 U	100,000	44,000	44,000	35,000	34,000	34,000
bis(2-Chloroethoxy)methane	ug/kg	3,500 U	4,700 U	18,000 U	2,000 U	380 U	71,000 U	6,900 U	7,600 U	6,800 U	6,800 U	7,600 U
bis(2-Chloroethyl)ether	ug/kg	3,500 U	4,700 U	18,000 U	2,000 U	380 U	71,000 U	6,900 U	7,600 U	6,800 U	6,800 U	7,600 U
bis(2-Chloroisopropyl)ether	ug/kg	3,500 U	4,700 U	18,000 U	2,000 U	380 U	71,000 U	6,900 U	7,600 U	6,800 U	6,800 U	7,600 U
bis(2-Ethylhexyl)phthalate	ug/kg	3,500 U	4,700 U	18,000 U	2,000 U	380 U	71,000 U	6,900 U	7,600 U	6,800 U	6,800 U	7,600 U
4-Bromophenyl-phenylether	ug/kg	3,500 U	4,700 U	18,000 U	2,000 U	380 U	71,000 U	6,900 U	7,600 U	6,800 U	6,800 U	7,600 U
Butylbenzylphthalate	ug/kg	3,500 U	4,700 U	18,000 U	2,000 U	380 U	71,000 U	6,900 U	7,600 U	6,800 U	6,800 U	7,600 U
Caprolactam	ug/kg	3,500 U	4,700 U	18,000 U	2,000 U	380 U	71,000 U	6,900 U	7,600 U	6,800 U	6,800 U	7,600 U
Carbazole	ug/kg	3,500 U	4,700 U	18,000 U	2,000 U	380 U	71,000 U	6,900 U	7,600 U	6,800 U	6,800 U	7,600 U
4-Chloro-3-methylphenol	ug/kg	3,500 U	4,700 U	18,000 U	2,000 U	380 U	71,000 U	6,900 U	7,600 U	6,800 U	6,800 U	7,600 U
4-Chloroaniline	ug/kg	3,500 U	4,700 U	18,000 U	2,000 U	380 U	71,000 U	6,900 U	7,600 U	6,800 U	6,800 U	7,600 U
2-Chloronaphthalene (1)	ug/kg	3,500 U	4,700 U	18,000 U	2,000 U	380 U	71,000 U	6,900 U	7,600 U	6,800 U	6,800 U	7,600 U
2-Chlorophenol	ug/kg	3,500 U	4,700 U	18,000 U	2,000 U	380 U	71,000 U	6,900 U	7,600 U	6,800 U	6,800 U	7,600 U
4-Chlorophenyl-phenylether	ug/kg	3,500 U	4,700 U	18,000 U	2,000 U	380 U	71,000 U	6,900 U	7,600 U	6,800 U	6,800 U	7,600 U
Chrysene (1,2)	ug/kg	3,500 U	4,700 U	18,000 U	2,500	380 U	71,000 U	28,000	20,000	24,000	24,000	23,000
Di-n-butylphthalate	ug/kg	3,500 U	4,700 U	18,000 U	2,000 U	380 U	71,000 U	6,900 U	7,600 U	6,800 U	6,800 U	7,600 U
Di-n-octylphthalate	ug/kg	3,500 U	4,700 U	18,000 U	2,000 U	380 U	71,000 U	6,900 U	7,600 U	6,800 U	6,800 U	7,600 U
Dibenzo(a,h)anthracene (1,2)	ug/kg	3,500 U	4,700 U	18,000 U	2,000 U	380 U	71,000 U	6,900 U	7,600 U	6,800 U	6,800 U	7,600 U
Dibenzofuran	ug/kg	3,500 U	4,700 U	18,000 U	3,700	380 U	71,000 U	14,000	17,000	12,000	12,000	13,000
3,3'-Dichlorobenzidine	ug/kg	3,500 U	4,700 U	18,000 U	2,000 U	380 U	71,000 U	6,900 U	7,600 U	6,800 U	6,800 U	7,600 U
2,4-Dichlorophenol	ug/kg	3,500 U	4,700 U	18,000 U	2,000 U	380 U	71,000 U	6,900 U	7,600 U	6,800 U	6,800 U	7,600 U
Diethylphthalate	ug/kg	3,500 U	4,700 U	18,000 U	2,000 U	380 U	71,000 U	6,900 U	7,600 U	6,800 U	6,800 U	7,600 U
2,4-Dimethylphenol	ug/kg	3,500 U	4,700 U	18,000 U	2,000 U	380 U	71,000 U	6,900 U	7,600 U	6,800 U	6,800 U	7,600 U
Dimethylphthalate	ug/kg	3,500 U	4,700 U	18,000 U	2,000 U	380 U	71,000 U	6,900 U	7,600 U	6,800 U	6,800 U	7,600 U
4,6-Dinitro-2-methylphenol	ug/kg	8,800 U	12,000 U	46,000 U	5,100 U	950 U	180,000 U	17,000 U	19,000 U	17,000 U	17,000 U	19,000 U
2,4-Dinitrophenol	ug/kg	8,800 U	12,000 U	46,000 U	5,100 U	950 U	180,000 U	17,000 U	19,000 U	17,000 U	17,000 U	19,000 U

Parameter	Location	GH-2	GH-2	GH-2	GH-2	GH-2	GH-2	GH-2	GH-2	GH-2	GH-2	GH-2
	Interval	3-4 ft bgs	14-15 ft bgs	18-19 ft bgs	32-33 ft bgs	41-42 ft bgs	51-52 ft bgs	58-60 ft bgs	74-75 ft bgs	80-81 ft bgs	80-81 ft bgs	92-93 ft bgs
	EPA No	2610-150	2610-151	2610-152	2610-153	2610-154	2610-155	2610-156	2610-157	2610-158	2610-158-FD	2610-159
	Date	5/18/2005	5/18/2005	5/18/2005	5/18/2005	5/18/2005	5/18/2005	5/18/2005	5/18/2005	5/19/2005	5/19/2005	5/19/2005
	Time	15:45	16:00	16:15	16:45	17:35	18:00	18:15	18:35	7:56	7:56	8:30
	Units											
Semivolatile Organics (Cont)		Conc Q	Conc Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc Q	Conc. Q	Conc. Q
2,4-Dinitrotoluene	ug/kg	3,500 U	4,700 U	18,000 U	2,000 U	380 U	71,000 U	6,900 U	7,600 U	6,800 U	6,800 U	7,600 U
2,6-Dinitrotoluene	ug/kg	3,500 U	4,700 U	18,000 U	2,000 U	380 U	71,000 U	6,900 U	7,600 U	6,800 U	6,800 U	7,600 U
Fluoranthene (1)	ug/kg	3,500 U	4,700 U	18,000 U	5,300	380 U	170,000	64,000 J	48,000	46,000	50,000	53,000
Fluorene (1)	ug/kg	3,500 U	7,400	47,000	14,000	380 U	210,000	86,000 J	81,000 J	76,000 J	78,000 J	78,000 J
Hexachlorobenzene	ug/kg	3,500 U	4,700 U	18,000 U	2,000 U	380 U	71,000 U	6,900 U	7,600 U	6,800 U	6,800 U	7,600 U
Hexachlorobutadiene	ug/kg	3,500 U	4,700 U	18,000 U	2,000 U	380 U	71,000 U	6,900 U	7,600 U	6,800 U	6,800 U	7,600 U
Hexachlorocyclopentadiene	ug/kg	3,500 U	4,700 U	18,000 U	2,000 U	380 U	71,000 U	6,900 U	7,600 U	6,800 U	6,800 U	7,600 U
Hexachloroethane	ug/kg	3,500 U	4,700 U	18,000 U	2,000 U	380 U	71,000 U	6,900 U	7,600 U	6,800 U	6,800 U	7,600 U
Indeno(1,2,3-cd)pyrene (1,2)	ug/kg	3,500 U	4,700 U	18,000 U	2,000 U	380 U	71,000 U	6,900 U	7,600 U	6,800 U	6,800 U	7,600 U
Isophorone	ug/kg	3,500 U	4,700 U	18,000 U	2,000 U	380 U	71,000 U	6,900 U	7,600 U	6,800 U	6,800 U	7,600 U
2-Methylnaphthalene (1)	ug/kg	3,500 U	80,000	880,000	270,000	560	1,800,000	1,000,000	1,100,000	880,000	670,000	670,000
2-Methylphenol	ug/kg	3,500 U	4,700 U	18,000 U	2,000 U	380 U	71,000 U	6,900 U	7,600 U	6,800 U	6,800 U	7,600 U
4-Methylphenol	ug/kg	3,500 U	4,700 U	18,000 U	2,000 U	380 U	71,000 U	6,900 U	7,600 U	6,800 U	6,800 U	7,600 U
Naphthalene (1)	ug/kg	3,500 U	35,000	560,000	170,000	380 U	3,900,000	1,200,000	1,000,000	740,000	670,000	7,600 U
2-Nitroaniline	ug/kg	8,800 U	12,000 U	46,000 U	5,100 U	960 U	180,000 U	17,000 U	19,000 U	17,000 U	17,000 U	19,000 U
3-Nitroaniline	ug/kg	8,800 U	12,000 U	46,000 U	5,100 U	960 U	180,000 U	17,000 U	19,000 U	17,000 U	17,000 U	19,000 U
4-Nitroaniline	ug/kg	8,800 U	12,000 U	46,000 U	5,100 U	960 U	180,000 U	17,000 U	19,000 U	17,000 U	17,000 U	19,000 U
Nitrobenzene	ug/kg	3,500 U	4,700 U	18,000 U	2,000 U	380 U	71,000 U	6,900 U	7,600 U	6,800 U	6,800 U	7,600 U
2-Nitrophenol	ug/kg	3,500 U	4,700 U	18,000 U	2,000 U	380 U	71,000 U	6,900 U	7,600 U	6,800 U	6,800 U	7,600 U
4-Nitrophenol	ug/kg	8,800 U	12,000 U	46,000 U	5,100 U	960 U	180,000 U	17,000 U	19,000 U	17,000 U	17,000 U	19,000 U
N-nitroso-di-n-propylamine	ug/kg	3,500 U	4,700 U	18,000 U	2,000 U	380 U	71,000 U	6,900 U	7,600 U	6,800 U	6,800 U	7,600 U
N-nitrosodiphenylamine	ug/kg	3,500 U	4,700 U	18,000 U	2,000 U	380 U	71,000 U	6,900 U	7,600 U	6,800 U	6,800 U	7,600 U
Pentachlorophenol	ug/kg	8,800 U	12,000 U	46,000 U	5,100 U	960 U	180,000 U	17,000 U	19,000 U	17,000 U	17,000 U	19,000 U
Phenanthrene (1)	ug/kg	3,500 U	27,000	140,000	44,000	380 U	520,000	310,000 J	300,000 J	210,000	220,000	200,000
Phenol	ug/kg	3,500 U	4,700 U	18,000 U	2,000 U	380 U	71,000 U	6,900 U	7,600 U	6,800 U	6,800 U	7,600 U
Pyrene (1)	ug/kg	3,500 U	5,200	25,000	8,900	380 U	260,000	73,000 J	66,000	56,000 J	66,000 J	46,000
2,4,5-Trichlorophenol	ug/kg	8,800 U	12,000 U	46,000 U	5,100 U	960 U	180,000 U	17,000 U	19,000 U	17,000 U	17,000 U	19,000 U
2,4,6-Trichlorophenol	ug/kg	3,500 U	4,700 U	18,000 U	2,000 U	380 U	71,000 U	6,900 U	7,600 U	6,800 U	6,800 U	7,600 U
Total Semivolatiles	ug/kg	ND	161,800	1,761,000	585,500	560	7,080,000	3,039,000	2,853,000	2,030,800	1,964,000	1,239,200
Total PAHs (1)	ug/kg	ND	154,400	1,733,000	582,000	560	6,980,000	2,981,000	2,792,000	1,983,800	1,918,000	1,192,200
Total Carcinogenic PAHs(2)	ug/kg	ND	ND	ND	5,400	ND	ND	86,000	41,000	61,800	66,000	54,200

(1) Polynuclear Aromatic Hydrocarbon.

(2) Carcinogenic Polynuclear Aromatic Hydrocarbon.

U : Compound was analyzed for but not detected. The value is the quantation limit.

J : Value estimated since not all QC criteria met.

ND : Not detected above quantation limits provided.

N/A - Not applicable.

O - Parameter not analyzed for.

TABLE GH2-2
SUMMARY OF SEMI-VOLATILE COMPOUNDS IDENTIFIED (BORING GH2)
SOIL/SOURCE MATERIAL SAMPLING 05/2-19/2005
SECOND STREET (HASTINGS) SOURCE AREA RI/FS

	Location	GH-2	GH-2	GH-2	GH-2	GH-2	GH-2	GH-2	GH-2	GH-2
	Interval	104-105 ft bgs	111-112 ft bgs	122-123 ft bgs	131-132 ft bgs	140-141 ft bgs	152-153 ft bgs	161-162 ft bgs	171-172 ft bgs	179-180 ft bgs
	EPA No.	2610-160	2610-161	2610-162	2610-163	2610-164	2610-165	2610-166	2610-167	2610-168
	Date	5/19/2005	5/19/2005	5/19/2005	5/19/2005	5/19/2005	5/19/2005	5/19/2005	5/19/2005	5/19/2005
	Time	9:15	9:50	10:20	11:00	11:40	11:50	13:15	13:40	14:00
Parameter	Units									
Semivolatile Organics		Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q
Acenaphthene (1)	ug/kg	10,000	8,800	36,000 U	16,000	370 U	360 U	360 U	380 U	380 U
Acenaphthylene (1)	ug/kg	46,000	65,000 J	190,000	120,000 J	370 U	360 U	360 U	350 U	380 U
Acetophenone	ug/kg	3,400 U	3,500 U	36,000 U	3,600 U	370 U	360 U	360 U	350 U	380 U
Anthracene (1)	ug/kg	21,000	22,000	53,000	55,000 J	370 U	360 U	360 U	350 U	380 U
Atrazine	ug/kg	3,400 U	3,500 U	36,000 U	3,600 U	370 U	360 U	360 U	350 U	380 U
Benzaldehyde	ug/kg	3,400 U	3,500 U	36,000 U	3,600 U	370 U	360 U	360 U	360 U	380 U
Benzo(a)anthracene(1,2)	ug/kg	13,000	11,000	36,000 U	23,000	370 U	360 U	360 U	350 U	380 U
Benzo(a)pyrene(1,2)	ug/kg	5,300	5,800	36,000 U	12,000	370 U	360 U	360 U	350 U	380 U
Benzo(b)fluoranthene(1,2)	ug/kg	3,400 U	3,500 U	36,000 U	4,100	370 U	360 U	360 U	350 U	380 U
Benzo(g,h,i)perylene (1)	ug/kg	3,400 U	3,500 U	36,000 U	3,600 U	370 U	360 U	360 U	350 U	380 U
Benzo(k)fluoranthene(1,2)	ug/kg	3,800	3,500 U	36,000 U	7,100	370 U	360 U	360 U	360 U	380 U
Biphenyl	ug/kg	8,200	22,000	54,000	38,000 J	370 U	360 U	360 U	350 U	380 U
bis(2-Chloroethoxy)methane	ug/kg	3,400 U	3,500 U	36,000 U	3,600 U	370 U	360 U	360 U	350 U	380 U
bis(2-Chloroethyl)ether	ug/kg	3,400 U	3,500 U	36,000 U	3,600 U	370 U	360 U	360 U	350 U	380 U
bis(2-Chloroisopropyl)ether	ug/kg	3,400 U	3,500 U	36,000 U	3,600 U	370 U	360 U	360 U	350 U	380 U
bis(2-Ethylhexyl)phthalate	ug/kg	3,400 U	3,500 U	36,000 U	3,600 U	370 U	360 U	360 U	350 U	380 U
4-Bromophenyl-phenylether	ug/kg	3,400 U	3,500 U	36,000 U	3,600 U	370 U	360 U	360 U	360 U	380 U
Butylbenzylphthalate	ug/kg	3,400 U	3,500 U	36,000 U	3,600 U	370 U	360 U	360 U	350 U	380 U
Caprolactam	ug/kg	3,400 U	3,500 U	36,000 U	3,600 U	370 U	360 U	360 U	360 U	380 U
Carbazole	ug/kg	3,400 U	3,500 U	36,000 U	3,600 U	370 U	360 U	360 U	350 U	380 U
4-Chloro-3-methylphenol	ug/kg	3,400 U	3,500 U	36,000 U	3,600 U	370 U	360 U	360 U	350 U	380 U
4-Chloroaniline	ug/kg	3,400 U	3,600 U	36,000 U	3,600 U	370 U	360 U	360 U	360 U	380 U
2-Chloronaphthalene (1)	ug/kg	3,400 U	3,500 U	36,000 U	3,600 U	370 U	360 U	360 U	350 U	380 U
2-Chlorophenol	ug/kg	3,400 U	3,500 U	36,000 U	3,600 U	370 U	360 U	360 U	360 U	380 U
4-Chlorophenyl-phenylether	ug/kg	3,400 U	3,500 U	36,000 U	3,600 U	370 U	360 U	360 U	360 U	380 U
Chrysene (1,2)	ug/kg	12,000	8,900	36,000 U	21,000	370 U	360 U	360 U	360 U	380 U
Di-n-butylphthalate	ug/kg	3,400 U	3,500 U	36,000 U	3,600 U	370 U	360 U	360 U	350 U	380 U
Di-n-octylphthalate	ug/kg	3,400 U	3,500 U	36,000 U	3,600 U	370 U	360 U	360 U	350 U	380 U
Dibenzo(a,h)anthracene (1,2)	ug/kg	3,400 U	3,500 U	36,000 U	3,600 U	370 U	360 U	360 U	360 U	380 U
Dibenzofuran	ug/kg	7,800	7,300	36,000 U	16,000	370 U	360 U	360 U	360 U	380 U
3,3'-Dichlorobenzidine	ug/kg	3,400 U	3,600 U	36,000 U	3,600 U	370 U	360 U	360 U	360 U	380 U
2,4-Dichlorophenol	ug/kg	3,400 U	3,500 U	36,000 U	3,600 U	370 U	360 U	360 U	360 U	380 U
Diethylphthalate	ug/kg	3,400 U	3,500 U	36,000 U	3,600 U	370 U	360 U	360 U	360 U	380 U
2,4-Dimethylphenol	ug/kg	3,400 U	3,500 U	36,000 U	3,600 U	370 U	360 U	360 U	350 U	380 U
Dimethylphthalate	ug/kg	3,400 U	3,500 U	36,000 U	3,600 U	370 U	360 U	360 U	350 U	380 U
4,6-Dinitro-2-methylphenol	ug/kg	8,600 U	8,800 U	91,000 U	9,000 U	920 U	900 U	910 U	880 U	950 U
2,4-Dinitrophenol	ug/kg	8,600 U	8,800 U	91,000 U	9,000 U	920 U	900 U	910 U	880 U	950 U

Parameter	Location	GH-2	GH-2	GH-2	GH-2	GH-2	GH-2	GH-2	GH-2	GH-2
	Interval	104-105 ft bgs	111-112 ft bgs	122-123 ft bgs	131-132 ft bgs	140-141 ft bgs	152-153 ft bgs	161-162 ft bgs	171-172 ft bgs	179-180 ft bgs
	EPA No	2610-160	2610-161	2610-162	2610-163	2610-164	2610-165	2610-166	2610-167	2610-168
	Date	5/19/2005	5/19/2005	5/19/2005	5/19/2005	5/19/2005	5/19/2005	5/19/2005	5/19/2005	5/19/2005
	Time	9:15	9.50	10:20	11:00	11:40	11:50	13:15	13:40	14:00
	Units									
Semivolatile Organics (Cont)		Conc Q	Conc Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc Q	Conc. Q	Q
2,4-Dinitrotoluene	ug/kg	3,400 U	3,500 U	36,000 U	3,600 U	370 U	360 U	360 U	350 U	380 U
2 6-Dinitrotoluene	ug/kg	3,400 U	3,500 U	36,000 U	3,600 U	370 U	360 U	360 U	350 U	380 U
Fluoranthene (1)	ug/kg	23,000	21,000	47,000	39,000 J	370 U	360 U	360 U	360 U	380 U
Fluorene (1)	ug/kg	48,000	44,000 J	120,000	88,000 J	370 U	360 U	380 U	350 U	380 U
Hexachlorobenzene	ug/kg	3,400 U	3,500 U	36,000 U	3,600 U	370 U	360 U	360 U	350 U	380 U
Hexachlorobutadiene	ug/kg	3,400 U	3,600 U	36,000 U	3,600 U	370 U	360 U	360 U	360 U	380 U
Hexachlorocyclopentadiene	ug/kg	3,400 U	3,600 U	36,000 U	3,600 U	370 U	360 U	360 U	350 U	380 U
Hexachloroethane	ug/kg	3,400 U	3,600 U	36,000 U	3,600 U	370 U	360 U	360 U	350 U	380 U
Indeno(1,2,3-cd)pyrene (1,2)	ug/kg	3,400 U	3,500 U	36,000 U	3,600 U	370 U	360 U	360 U	360 U	380 U
Isophorone	ug/kg	3,400 U	3,500 U	36,000 U	3,600 U	370 U	360 U	360 U	350 U	380 U
2-Methylnaphthalene (1)	ug/kg	41,000	440,000	1,200,000	980,000	410	360 U	600	350 U	380 U
2-Methylphenol	ug/kg	3,400 U	3,500 U	36,000 U	3,600 U	370 U	360 U	360 U	350 U	380 U
4-Methylphenol	ug/kg	3,400 U	3,500 U	36,000 U	3,600 U	370 U	360 U	360 U	350 U	380 U
Naphthalene (1)	ug/kg	3,700	390,000	1,300,000	1,000,000	370 U	360 U	360 U	350 U	380 U
2-Nitroaniline	ug/kg	8,600 U	8,800 U	91,000 U	9,000 U	920 U	900 U	910 U	880 U	950 U
3-Nitroaniline	ug/kg	8,600 U	8,800 U	91,000 U	9,000 U	920 U	900 U	910 U	880 U	950 U
4-Nitroaniline	ug/kg	8,600 U	8,800 U	91,000 U	9,000 U	920 U	900 U	910 U	880 U	950 U
Nitrobenzene	ug/kg	3,400 U	3,500 U	36,000 U	3,600 U	370 U	360 U	360 U	350 U	380 U
2-Nitrophenol	ug/kg	3,400 U	3,500 U	36,000 U	3,600 U	370 U	360 U	360 U	350 U	380 U
4-Nitrophenol	ug/kg	8,600 U	8,800 U	91,000 U	9,000 U	920 U	900 U	910 U	880 U	950 U
N-nitroso-di-n-propylamine	ug/kg	3,400 U	3,500 U	36,000 U	3,600 U	370 U	360 U	360 U	350 U	380 U
N-nitrosodiphenylamine	ug/kg	3,400 U	3,500 U	36,000 U	3,600 U	370 U	360 U	360 U	350 U	380 U
Pentachlorophenol	ug/kg	8,600 U	8,800 U	91,000 U	9,000 U	920 U	900 U	910 U	880 U	950 U
Phenanthrene (1)	ug/kg	160,000	130,000	290,000	270,000	370	360 U	580	360 U	380 U
Phenol	ug/kg	3,400 U	3,500 U	36,000 U	3,600 U	370 U	360 U	360 U	350 U	380 U
Pyrene (1)	ug/kg	40,000 J	31,000 J	90,000	69,000 J	370 U	360 U	1,500	350 U	380 U
2,4,5-Trichlorophenol	ug/kg	8,800 U	8,800 U	91,000 U	9,000 U	920 U	900 U	910 U	880 U	950 U
2,4,6-Trichlorophenol	ug/kg	3,400 U	3,500 U	36,000 U	3,600 U	370 U	360 U	360 U	350 U	380 U
Total Semivolatiles	ug/kg	441,900	1,207,400	3,344,000	2,761,200	780	ND	2,680	ND	ND
Total PAHs (1)	ug/kg	425,900	1,178,100	3,290,000	2,708,200	780	ND	2,680	ND	ND
Total Carcinogenic PAHs(2)	ug/kg	34,200	28,500	ND	87,200	ND	ND	ND	ND	ND

(1) Polynuclear Aromatic Hydrocarbon.
(2) Carcinogenic Polynuclear Aromatic Hydrocarbon.
U : Compound was analyzed for but not detected. The value is the quantation limit.
J : Value estimated since not all QC criteria met.
ND : Not detected above quantation limits provided.
N/A - Not applicable.
O - Parameter not analyzed for.

TABLE SB-1
SUMMARY OF VOLATILE COMPOUNDS INDENTIFIED (SOIL BLANKS)
SOIL/SOURCE MATERIAL SAMPLING 05/02-19/2005
SECOND STREET (HASTINGS) SOURCE AREA RI/FS

	Location	Soil Trip Blank	Soil Trip Blank	Soil Trip Blank
	Interval	NA	NA	NA
	EPA No	2610-148-FB	2610-149-FB	2610-150-FB
	Date	5/5/2005	5/18/2005	5/7/2005
	Time	11:45	10:50	7:45
Parameter	Units			
Volatile Organics		Conc. Q	Conc. Q	Conc. Q
Acetone	ug/kg	180 J	10 U	120 J
Benzene	ug/kg	11 U	10 U	11 U
Bromodichloromethane	ug/kg	11 U	10 U	11 U
Bromoform	ug/kg	11 U	10 U	11 U
Bromomethane	ug/kg	11 U	10 U	11 U
2-Butanone (Methyl Ethyl Ketone	ug/kg	11 U	10 U	11 U
Carbon Disulfide	ug/kg	11 U	10 U	11 U
Carbon Tetrachloride	ug/kg	11 U	10 U	11 U
Chlorobenzene	ug/kg	11 U	10 U	11 U
Chloroethane	ug/kg	11 U	10 U	11 U
Chloroform	ug/kg	11 U	10 U	11 U
Chloromethane	ug/kg	11 U	10 U	11 U
Cyclohexane	ug/kg	11 U	10 U	11 U
1,2 Dibromo 3-Chloropropane	ug/kg	11 U	10 U	11 U
Dibromochloromethane	ug/kg	11 U	10 U	11 U
1,2-Dibromoethane	ug/kg	11 U	10 U	11 U
1,2-Dichlorobenzene (Ortho)	ug/kg	11 U	10 U	11 U
1,3-Dichlorobenzene (Meta)	ug/kg	11 U	10 U	11 U
1,4-Dichlorobenzene (Para)	ug/kg	11 U	10 U	11 U
Dichlorodifluoromethane	ug/kg	11 U	10 U	11 U
1,1-Dichloroethane	ug/kg	11 U	10 U	11 U
1,2-Dichloroethane	ug/kg	11 U	10 U	11 U
1,1-Dichloroethene	ug/kg	11 U	10 U	11 U
cis-1,2-Dichloroethene	ug/kg	11 U	10 U	11 U
trans-1,2-Dichloroethene	ug/kg	11 U	10 U	11 U
1,2-Dichloropropane	ug/kg	11 U	10 U	11 U
cis-1,3,-Dichloropropene	ug/kg	11 U	10 U	11 U
trans-1,3,-Dichloropropene	ug/kg	11 U	10 U	11 U
Ethylbenzene	ug/kg	11 U	10 U	11 U
2-Hexanone	ug/kg	11 U	10 U	11 U
Isopropylbenzene	ug/kg	11 U	10 U	11 U
Methyl Acetate	ug/kg	20	10 U	11 U
Methyl tert-butyl ether	ug/kg	11 U	10 U	11 U
Methylcyclohexane	ug/kg	11 U	10 U	11 U
Methylene Chloride	ug/kg	3	10 U	3
4-Methyl-2-Pentanone (MIBK)	ug/kg	11 U	10 U	11 U
Styrene	ug/kg	11 U	10 U	11 U
1,1,2,2-Tetrachloroethane	ug/kg	11 U	10 U	11 U
Tetrachloroethene	ug/kg	11 U	10 U	11 U
Toluene	ug/kg	11 U	10 U	11 U
1,2,4-Trichlorobenzene	ug/kg	11 U	10 U	11 U
1,1,1-Trichloroethane	ug/kg	11 U	10 U	11 U
1,1,2-Trichloroethane	ug/kg	11 U	10 U	11 U
Trichloroethene	ug/kg	11 U	10 U	11 U
Trichlorofluoromethane	ug/kg	11 U	10 U	11 U
1,1,2-Trichlorofluoroethane	ug/kg	11 U	10 U	11 U
Vinyl Chloride	ug/kg	11 U	10 U	11 U
Total Xylenes	ug/kg	11 U	10 U	11 U
Total Volatiles	ug/kg	203	ND	123
Total BETXs	ug/kg	ND	ND	ND

U : Compound was analyzed for but not detected. The value is the quantation limit.

J : Value estimated since not all QC criteria met.

ND . Not detected above quantation limits provided.

TABLE RB-1
SUMMARY OF VOLATILE COMPOUNDS IDENTIFIED
SOIL/SOURCE MATERIAL SAMPLING 05/02-19/2005
SECOND STREET (HASTINGS) SOURCE AREA RI/FS

	Location	Rinsate Blank	Rinsate Blank	Rinsate Blank	Rinsate Blank	Rinsate Blank	Rinsate Blank	Rinsate Blank	Rinsate Blank
	Interval	NA	NA	NA	NA	NA	NA	NA	NA
	EPA No	2610-301	2610-302	2610-303	2610-304	2610-305	2610-306	2610-340	2610-341
	Date	5/3/2005	5/4/2005	5/6/2005	5/7/2005	5/9/2005	5/10/2005	5/19/2005	5/18/2005
	Time	8:00	10:30	15:10	16:00	17:00	9:15	16:30	13:30
Parameter	Units								
Volatile Organics		Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q
Acetone	ug/L	19 J	23 J	17 J	18 J	22 J	24 J	12 J	67 J
Benzene	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 UJ
Bromodichloromethane	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 UJ
Bromoform	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 UJ
Bromomethane	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 UJ
2-Butanone (Methyl Ethyl Ketone)	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 UJ
Carbon Disulfide	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 UJ
Carbon Tetrachloride	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 UJ
Chlorobenzene	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 UJ
Chloroethane	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 UJ
Chloroform	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 UJ
Chloromethane	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 UJ
Cyclohexane	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 UJ
1,2 Dibromo 3-Chloropropane	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 UJ
Dibromochloromethane	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 UJ
1,2-Dibromoethane	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 UJ
1,2-Dichlorobenzene (Ortho)	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 UJ
1,3-Dichlorobenzene (Meta)	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 UJ
1,4-Dichlorobenzene (Para)	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 UJ
Dichlorodifluoromethane	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 UJ
1,1-Dichloroethane	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 UJ
1,2-Dichloroethane	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 UJ
1,1-Dichloroethene	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 UJ
cis-1,2-Dichloroethene	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 UJ
trans-1,2-Dichloroethene	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 UJ
1,2-Dichloropropane	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 UJ
cis-1,3,-Dichloropropene	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 UJ
trans-1,3,-Dichloropropene	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 UJ
Ethylbenzene	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 UJ
2-Hexanone	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 UJ
Isopropylbenzene	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 UJ
Methyl Acetate	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 UJ
Methyl tert-butyl ether	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 UJ
Methylcyclohexane	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 UJ
Methylene Chloride	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 UJ
4-Methyl-2-Pentanone (MIBK)	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 UJ
Styrene	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 UJ
1,1,2,2-Tetrachloroethane	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 UJ
Tetrachloroethene	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 UJ
Toluene	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 UJ
1,2,4-Trichlorobenzene	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 UJ
1,1,1-Trichloroethane	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 UJ
1,1,2-Trichloroethane	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 UJ
Trichloroethene	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 UJ
Trichlorofluoromethane	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 UJ
1,1,2-Trichlorofluoroethane	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 UJ
Vinyl Chloride	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 UJ
Total Xylenes	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 UJ
Total Volatiles	ug/L	19	23	17	18	22	24	12	67
Total BTETXs	ug/L	ND	ND	ND	ND	ND	ND	ND	ND

U : Compound was analyzed for but not detected. The value is the quantation limit.

UJ - The analyte was not detected at or above the reporting limit. The reporting limit is an estimate.

J Value estimated since not all QC criteria met.

ND Not detected above quantation limits provided.

TABLE RB-2
SUMMARY OF SEMI-VOLATILE COMPOUNDS IDENTIFIED
SOIL/SOURCE MATERIAL SAMPLING 05/02-19/2005
SECOND STREET (HASTINGS) SOURCE AREA RI/FS

	Location	Rinsate Blank	Rinsate Blank	Rinsate Blank	Rinsate Blank	Rinsate Blank	Rinsate Blank	Rinsate Blank	Rinsate Blank
	Interval	NA	NA	NA	NA	NA	NA	NA	NA
	EPA No	2810-301	2810-302	2810-303	2810-304	2810-305	2810-306	2810-340	2810-341
	Date	5/3/2005	5/4/2005	5/6/2005	5/7/2005	5/8/2005	5/10/2005	5/19/2005	5/18/2005
	Time	8:00	10:30	15:10	16:00	17.00	9:15	16:30	13:30
Parameter	Units								
Semivolatile Organics		Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q	Conc. Q
Acenaphthene (1)	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Acenaphthylene (1)	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Acetophenone	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Anthracene (1)	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Atrazine	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Benzaldehyde	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Benzo(a)anthracene(1,2)	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Benzo(a)pyrene(1,2)	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Benzo(b)fluoranthene(1,2)	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Benzo(g,h,i)perylene (1)	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Benzo(k)fluoranthene(1,2)	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Biphenyl	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
bis(2-Chloroethoxy)methane	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
bis(2-Chloroethyl)ether	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
bis(2-Chloroisopropyl)ether	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
bis(2-Ethylhexyl)phthalate	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Bromophenyl-phenylether	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Butylbenzylphthalate	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Caprolactam	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Carbazole	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Chloro-3-methylphenol	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Chloroaniline	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Chloronaphthalene (1)	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Chlorophenol	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Chlorophenyl-phenylether	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chrysene (1,2)	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Di-n-butylphthalate	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Di-n-octylphthalate	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Dibenzo(a,h)anthracene (1,2)	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Dibenzofuran	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
3,3'-Dichlorobenzidine	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2,4-Dichlorophenol	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Diethylphthalate	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2,4-Dimethylphenol	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Dimethylphthalate	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4,6-Dinitro-2-methylphenol	ug/L	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U
2,4-Dinitrophenol	ug/L	25 U	25 U	25 U	25 U	25 U	25 U	N/A R	N/A R
2,4-Dinitrotoluene	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2,6-Dinitrotoluene	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Fluoranthene (1)	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Fluorene (1)	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Hexachlorobenzene	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Hexachlorobutadiene	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Hexachlorocyclopentadiene	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Hexachloroethane	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Indeno(1,2,3-cd)pyrene (1,2)	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Isophorone	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Methylnaphthalene (1)	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Methylphenol	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Methylphenol	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Naphthalene (1)	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Nitroaniline	ug/L	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U
3-Nitroaniline	ug/L	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U
4-Nitroaniline	ug/L	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U
Nitrobenzene	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Nitrophenol	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Nitrophenol	ug/L	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U
N-nitroso-di-n-propylamine	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
N-nitrosodiphenylamine	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Pentachlorophenol	ug/L	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U
Phenanthrene (1)	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Phenol	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Pyrene (1)	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2,4,5-Trichlorophenol	ug/L	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U
2,4,6-Trichlorophenol	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Total Semivolatiles	ug/L	ND	ND	ND	ND	ND	ND	ND	ND
Total PAHs (1)	ug/L	ND	ND	ND	ND	ND	ND	ND	ND
Total Carcinogenic PAHs(2)	ug/L	ND	ND	ND	ND	ND	ND	ND	ND

(1) Polynuclear Aromatic Hydrocarbon. (2) Carcinogenic Polynuclear Aromatic Hydrocarbon.

U Compound was analyzed for but not detected. The value is the quantation limit. J : Value estimated since not all QC criteria met.

R - The presence or absence of the analyte can not be determined from the data due to severe quality control problems. The data are rejected and considered unusable.

ND Not detected above quantation limits provided. N/A - Not applicable.

TABLE WB-1
SUMMARY OF VOLATILE COMPOUNDS IDENTIFIED
SOIL/SOURCE MATERIAL SAMPLING 05/02-19/2005
SECOND STREET (HASTINGS) SOURCE AREA RI/FS

	Location	Water Trip Blank	Water Trip Blank	Water Trip Blank	Water Trip Blank
	Interval	NA	NA	NA	NA
	EPA No	2810-345-FB	2810-347-FB	2810-348-FB	2810-349-FB
	Date	5/18/2005	5/19/2005	5/5/2005	5/7/2005
	Time	11:00	15:00	11:50	7:25
Parameter	Units				
Volatile Organics		Conc. Q	Conc. Q	Conc. Q	Conc. Q
Acetone	ug/L	10 U	10 U	10 U	10 U
Benzene	ug/L	10 U	10 U	10 U	10 U
Bromodichloromethane	ug/L	10 U	10 U	10 U	10 U
Bromoform	ug/L	10 U	10 U	10 U	10 U
Bromomethane	ug/L	10 U	10 U	10 U	10 U
2-Butanone (Methyl Ethyl Ketone)	ug/L	10 U	10 U	10 U	10 U
Carbon Disulfide	ug/L	10 U	10 U	10 U	10 U
Carbon Tetrachloride	ug/L	10 U	10 U	10 U	10 U
Chlorobenzene	ug/L	10 U	10 U	10 U	10 U
Chloroethane	ug/L	10 U	10 U	10 U	10 U
Chloroform	ug/L	10 U	10 U	10 U	10 U
Chloromethane	ug/L	10 U	10 U	10 U	10 U
Cyclohexane	ug/L	10 U	10 U	10 U	10 U
1,2 Dibromo 3-Chloropropane	ug/L	10 U	10 U	10 U	10 U
Dibromochloromethane	ug/L	10 U	10 U	10 U	10 U
1,2-Dibromoethane	ug/L	10 U	10 U	10 U	10 U
1,2-Dichlorobenzene (Ortho)	ug/L	10 U	10 U	10 U	10 U
1,3-Dichlorobenzene (Meta)	ug/L	10 U	10 U	10 U	10 U
1,4-Dichlorobenzene (Para)	ug/L	10 U	10 U	10 U	10 U
Dichlorodifluoromethane	ug/L	10 U	10 U	10 U	10 U
1,1-Dichloroethane	ug/L	10 U	10 U	10 U	10 U
1,2-Dichloroethane	ug/L	10 U	10 U	10 U	10 U
1,1-Dichloroethene	ug/L	10 U	10 U	10 U	10 U
cis-1,2-Dichloroethene	ug/L	10 U	10 U	10 U	10 U
trans-1,2-Dichloroethene	ug/L	10 U	10 U	10 U	10 U
1,2-Dichloropropane	ug/L	10 U	10 U	10 U	10 U
cis-1,3,-Dichloropropene	ug/L	10 U	10 U	10 U	10 U
trans-1,3,-Dichloropropene	ug/L	10 U	10 U	10 U	10 U
Ethylbenzene	ug/L	10 U	10 U	10 U	10 U
2-Hexanone	ug/L	10 U	10 U	10 U	10 U
Isopropylbenzene	ug/L	10 U	10 U	10 U	10 U
Methyl Acetate	ug/L	10 U	10 U	10 U	10 U
Methyl tert-butyl ether	ug/L	10 U	10 U	10 U	10 U
Methylcyclohexane	ug/L	10 U	10 U	10 U	10 U
Methylene Chloride	ug/L	10 U	10 U	10 U	10 U
4-Methyl-2-Pentanone (MIBK)	ug/L	10 U	10 U	10 U	10 U
Styrene	ug/L	10 U	10 U	10 U	10 U
1,1,2,2-Tetrachloroethane	ug/L	10 U	10 U	10 U	10 U
Tetrachloroethene	ug/L	10 U	10 U	10 U	10 U
Toluene	ug/L	10 U	10 U	10 U	10 U
1,2,4-Trichlorobenzene	ug/L	10 U	10 U	10 U	10 U
1,1,1-Trichloroethane	ug/L	10 U	10 U	10 U	10 U
1,1,2-Trichloroethane	ug/L	10 U	10 U	10 U	10 U
Trichloroethene	ug/L	10 U	10 U	10 U	10 U
Trichlorofluoromethane	ug/L	10 U	10 U	10 U	10 U
1,1,2-Trichlorofluoroethane	ug/L	10 U	10 U	10 U	10 U
Vinyl Chloride	ug/L	10 U	10 U	10 U	10 U
Total Xylenes	ug/L	10 U	10 U	10 U	10 U
Total Volatiles	ug/L	ND	ND	ND	ND
Total BTETXs	ug/L	ND	ND	ND	ND

U Compound was analyzed for but not detected. The value is the quantation limit.

J Value estimated since not all QC criteria met.

ND Not detected above quantation limits provided

TABLE TCLP-1
SUMMARY OF TCLP RESULTS
SOIL/SOURCE MATERIAL SAMPLING 05/02-19/2005
SECOND STREET (HASTINGS) SOURCE AREA RI/FS

	Location	Regulatory Limit	TCLP		TCLP		TCLP		TCLP	
	Interval	RCRA TCLP	Composite		Composite		Composite		Composite	
	EPA No		2610-201		2610-202		2610-204		2610-206	
	Date		5/5/2005		5/7/2005		5/17/2005		5/19/2005	
	Time		12:15		12:45		9:40		14:30	
Parameter	Units									
Semivolatile Organics		Conc	Conc.	Q	Conc.	Q	Conc.	Q	Conc.	Q
1,4-Dichlorobenzene	mg/L	7.5	0.01	U	0.01	U	0.01	U	0.1	U
2,4-Dinitrotoluene	mg/L	0.13	0.01	U	0.01	U	0.01	U	0.1	U
Hexachlorobenzene	mg/L	0.13	0.01	U	0.01	U	0.01	U	0.1	U
Hexachlorobutadiene	mg/L	0.5	0.01	U	0.01	U	0.01	U	0.1	U
Hexachloroethane	mg/L	3	0.01	U	0.01	U	0.01	U	0.1	U
2-Methylphenol	mg/L	200	0.01	U	0.01	U	0.01	U	0.1	U
3 and/or 4-Methylphenol	mg/L	200	0.01	U	0.01	U	0.01	U	0.1	U
Nitrobenzene	mg/L	2	0.01	U	0.01	U	0.01	U	0.1	U
Pentachlorophenol	mg/L	100	0.01	U	0.01	U	0.01	U	0.1	U
Pyridine	mg/L	5	N/A	O	N/A	O	N/A	O	N/A	O
2,4,5-Trichlorophenol	mg/L	400	0.01	U	0.01	U	0.01	U	0.1	U
2,4,6-Trichlorophenol	mg/L	2	0.01	UJ	0.01	U	0.01	U	0.1	U
Volatile Organics			Conc.	Q	Conc.	Q	Conc.	Q	Conc.	Q
Benzene	mg/L	0.5	0.5	K	0.5	K	0.5	K	0.5	K
2-Butanone	mg/L	200	200	K	200	K	200	K	200	K
Carbon Tetrachloride	mg/L	0.5	0.5	K	0.5	K	0.5	K	0.5	K
Chlorobenzene	mg/L	100	100	K	100	K	100	K	100	K
Chloroform	mg/L	6	6	K	6	K	6	K	6	K
1,2-Dichloroethane	mg/L	0.5	0.5	K	0.5	K	0.5	K	0.5	K
1,1-Dichloroethene	mg/L	0.7	0.7	K	0.7	K	0.7	K	0.7	K
Tetrachloroethene	mg/L	0.7	0.7	K	0.7	K	0.7	K	0.7	K
Trichloroethene	mg/L	0.5	0.5	K	0.5	K	0.5	K	0.5	K
Vinyl Chloride	mg/L	0.2	0.2	K	0.2	K	0.2	K	0.2	K

U: The compound was analyzed for but not detected. The associated numerical value is the sample quantitation limit.

UJ - The analyte was not detected at or above the reporting limit. The reporting limit is an estimate.

N/A - Not applicable.

O - Parameter no analyzed for.

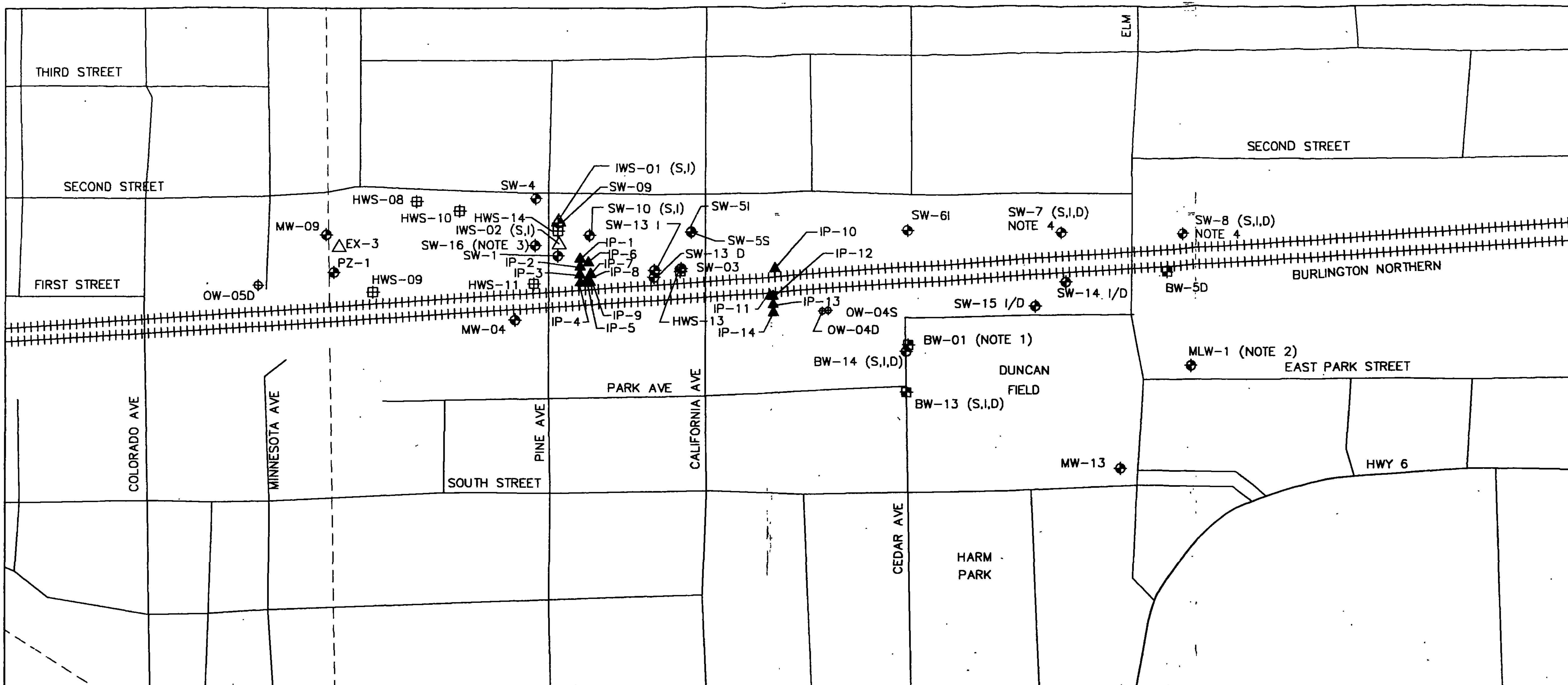
K - The identification of the analyte is acceptable; the reported value maybe biased high. The actual value is expected to be less than the reported value.

RCRA - Resource Conservation and Recovery Act.

TCLP - Toxicity Characteristics Leaching Procedure.

Regulatory limits from 40 CFR 261.24.

Second Street
(0420)



EPA WELLS		
WELL	NORTH	EAST
BW-1	277546.59	2091242.70
BW-5D	277790.10	2092036.70
EX-3	277874.20	2090108.56
IWS-01	277947.58	2090179.79
IWS-02	277878.27	2090180.26
MW-04	277646.00	2090047.60
MW-09	277907.30	2089469.20
MW-12	278542.70	2087795.40
MW-13	277465.66	2091244.22
PZ-1	277792.24	2089492.53
SW-01	277842.70	2090177.70
SW-02	278155.37	2090093.16
SW-03	277803:30	2090552.36
SW-4S	278016.38	2090110.19
SW-5I	277916.06	2090582.07
SW-5S	277913.54	2090582.47
SW-6I	277915.58	2091247.30
SW-7D	277908.13	2091709.67
SW-7S	277908.51	2091713.78
SW-7I	277908.60	2091717.87
SW-8D	277917.16	2092087.31
SW-8S	277917.49	2092091.36
SW-8I	277917.71	2092095.19
SW-9	277942.31	2090178.89
SW-10S	277904.59	2090272.85
SW-10I	277904.73	2090273.43
SW-11	277796.32	2090370.37
SW-12	277781.60	2090280.01
SW-13D	277776.93	2090469.47
SW-13I	277798.35	2090469.60
SW-14I	277786.40	2091723.66
SW-14D	277787.40	2091734.16
SW-15I	277683.78	2091627.14
SW-15D	277683.50	2091637.22

STATE/MUNICIPAL WELLS		
WELL	NORTH	EAST
OW-04D	277670.00	2090989.60
OW-04S	277672.40	2091007.30
OW-05D	277753.30	2089262.00
OW-05S	277780.40	2089266.60
MLW-1	277522.21	2092114.99
MLW-2	277493.00	2093234.28

PRP (UST) WELLS		
WELL	NORTH	EAST
HWS-06	278092.95	2089609.60
HWS-07	278111.00	2089758.00
HWS-08	278008.40	2089746.30
HWS-09	277731 00	2089612.00
HWS-10	277979.10	2089878.00
HWS-11	277757.40	2090104.30
HWS-13	277794.21	2090549.87
HWS-14	277916.71	2090180.04

INJECTION POINTS		
WELL	NORTH	EAST
IP-1	277832.70	2090244.80
IP-2	277808.70	2090244.90
IP-3	277784.60	2090244.20
IP-4	277760.20	2090245.40
IP-5	277759.90	2090261.70
IP-6	277821.60	2090270.10
IP-7	277787.00	2090277.20
IP-8	277771.10	2090270.10
IP-9	277763.00	2090274.80
IP-10	277802.70	2090839.70
IP-11	277719.90	2090824 00
IP-12	277717.80	2090833.70
IP-13	277692.20	2090835:10
IP-14	277668.10	2090835.70

PRP (COL. AVE) WELLS		
WELL	NORTH	EAST
BW-13	277465.66	2091244.22
BW-14	277566.97	2091250.04

N

300' 150 0 300' 600'

1"=300'

NOTES:

1. WELL BW-1 NOT SAMPLED. IT IS SHOWN FOR CLARITY, BECAUSE IT IS A SLOW OXYGEN RELEASE TREATMENT WELL.
2. FOUR DEPTHS OF WELL MLW-1 SAMPLED: 155, 175, 192 AND 200 FEET BGS.
3. WELL SW-16 NOT SAMPLED. IT IS SHOWN FOR CLARITY, BECAUSE IT IS RECOMMENDED FOR SAMPLING IN THE SPRING OF 2007.
4. ONLY THE INTERMEDIATE (I) DEPTH SAMPLED IN FALL 2006.

LEGEND:

- EPA MONITORING WELL
- STATE MONITORING WELL
- FOOTE OIL MONITORING WELL
- COLORADO AVENUE MONITORING WELL
- TREATMENT WELL OR POINT

FIGURE 1
WELLS SAMPLED IN NOVEMBER/DECEMBER 2006 TO MONITOR THE SECOND STREET DOWNGRADIENT PLUME
SECOND STREET SUBSITE

PLOTTER: HP1055 TABLE HALF PLOT SCALE: 1=1 ACAD 16 is (LMS Tech) Original dwg size 17 x 11 Plot By: new02908 Jun 10, 2007, 02:13pm Attached Xref: XSITE Revised By: ON Mar 13, 2007 @ 9:26am
Drawing: Z:\Projects\44718-Hastings, NE\Dwg\C0008151.DWG

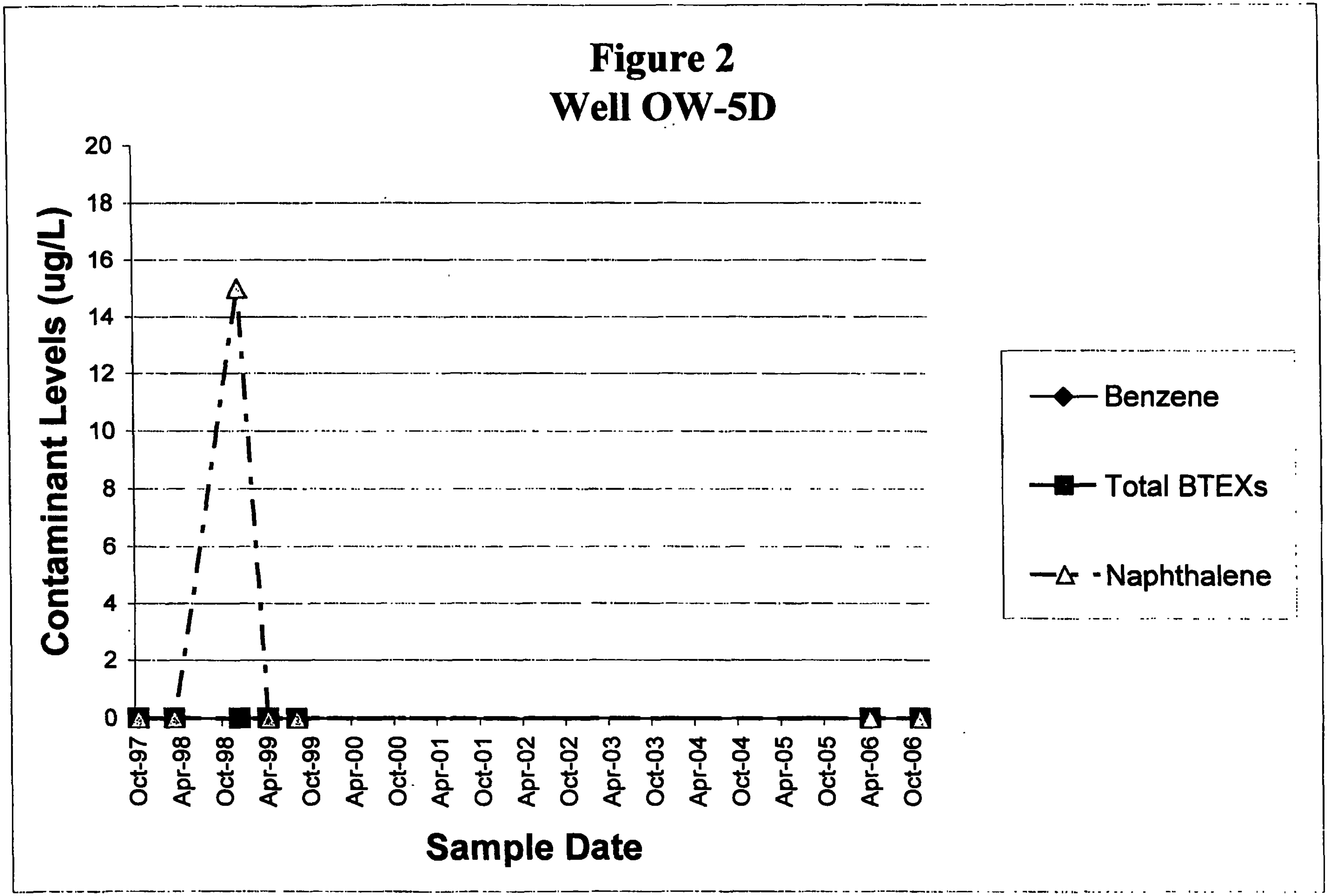


Figure 2
Well OW-5D
Contaminant Levels (ug/L)
0
2
4
6
8
10
12
14
16
18
20
Oct-97
Apr-98
Oct-98
Apr-99
Oct-99
Apr-00
Oct-00
Apr-01
Oct-01
Apr-02
Oct-02
Apr-03
Oct-03
Apr-04
Oct-04
Apr-05
Oct-05
Apr-06
Oct-06
Sample Date
Benzene
Total BTEXs
Naphthalene

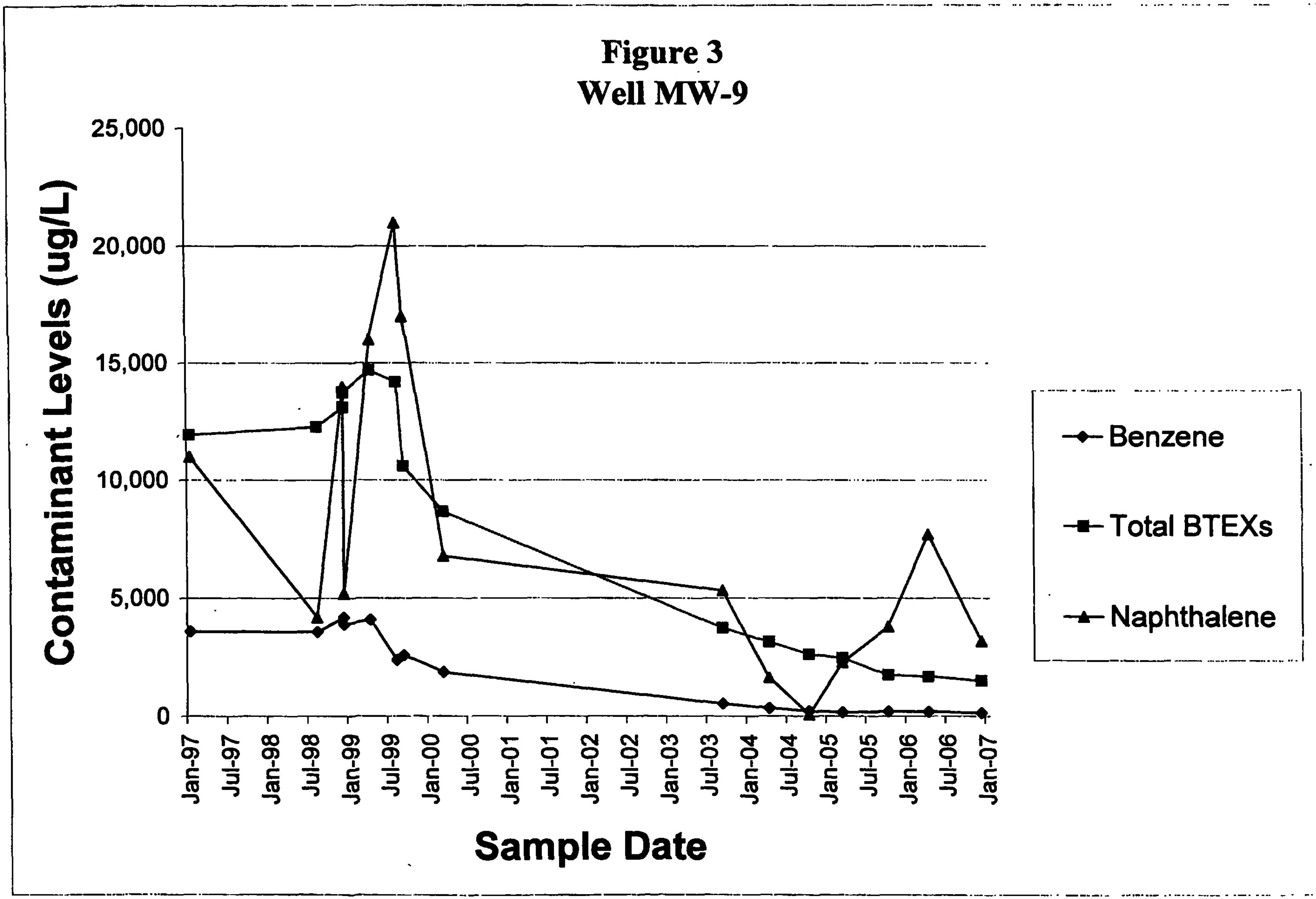


Figure 3
Well MW-9
Contaminant Levels (ug/L)
25,000
20,000
15,000
10,000
5,000
0
Jan-97
Jul-97
Jan-98
Jul-98
Jan-99
Jul-99
Jan-00
Jul-00
Jan-01
Jul-01
Jan-02
Jul-02
Jan-03
Jul-03
Jan-04
Jul-04
Jan-05
Jul-05
Jan-06
Jul-06
Jan-07
Sample Date
Benzene
Total BTEXs
Naphthalene

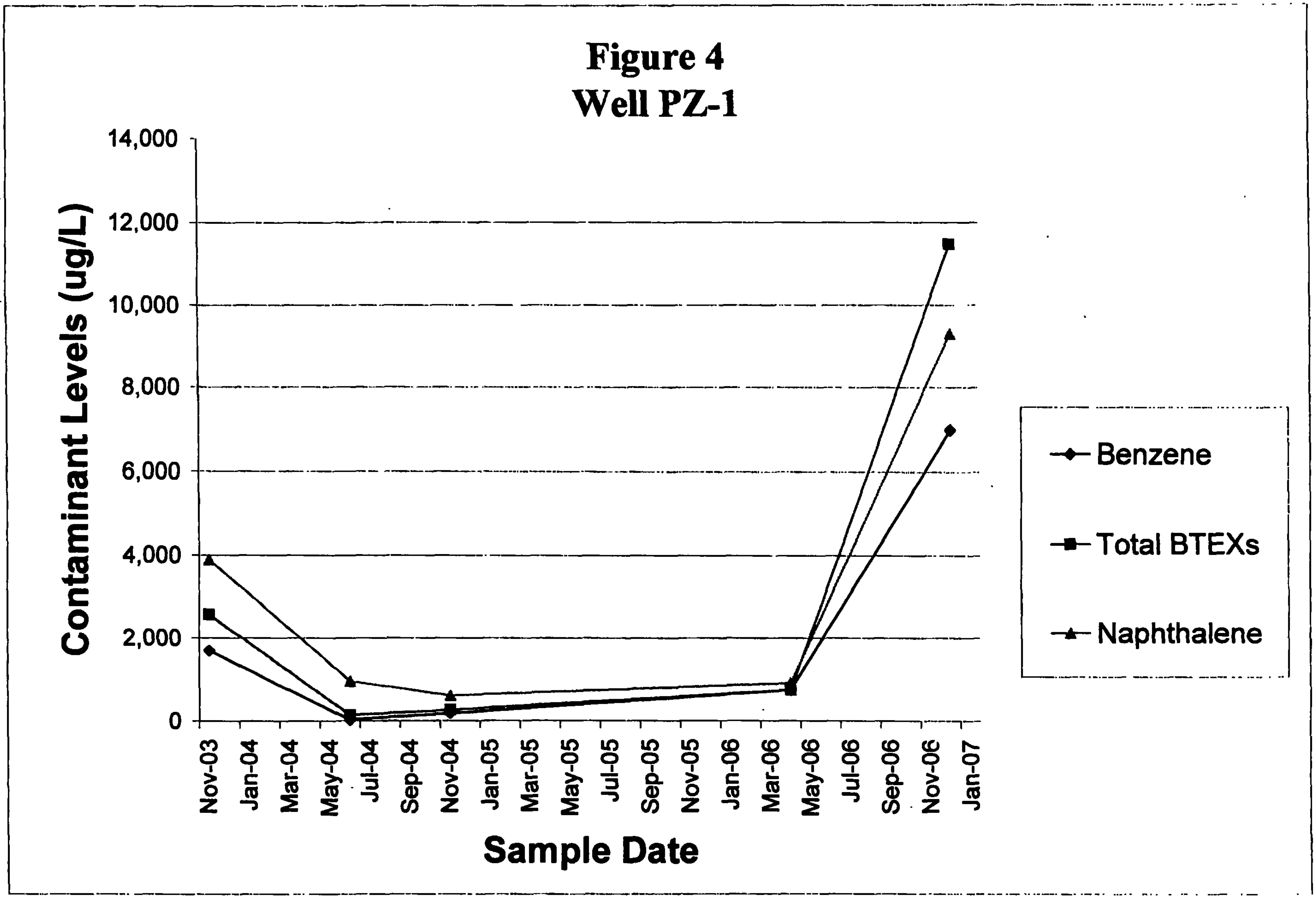
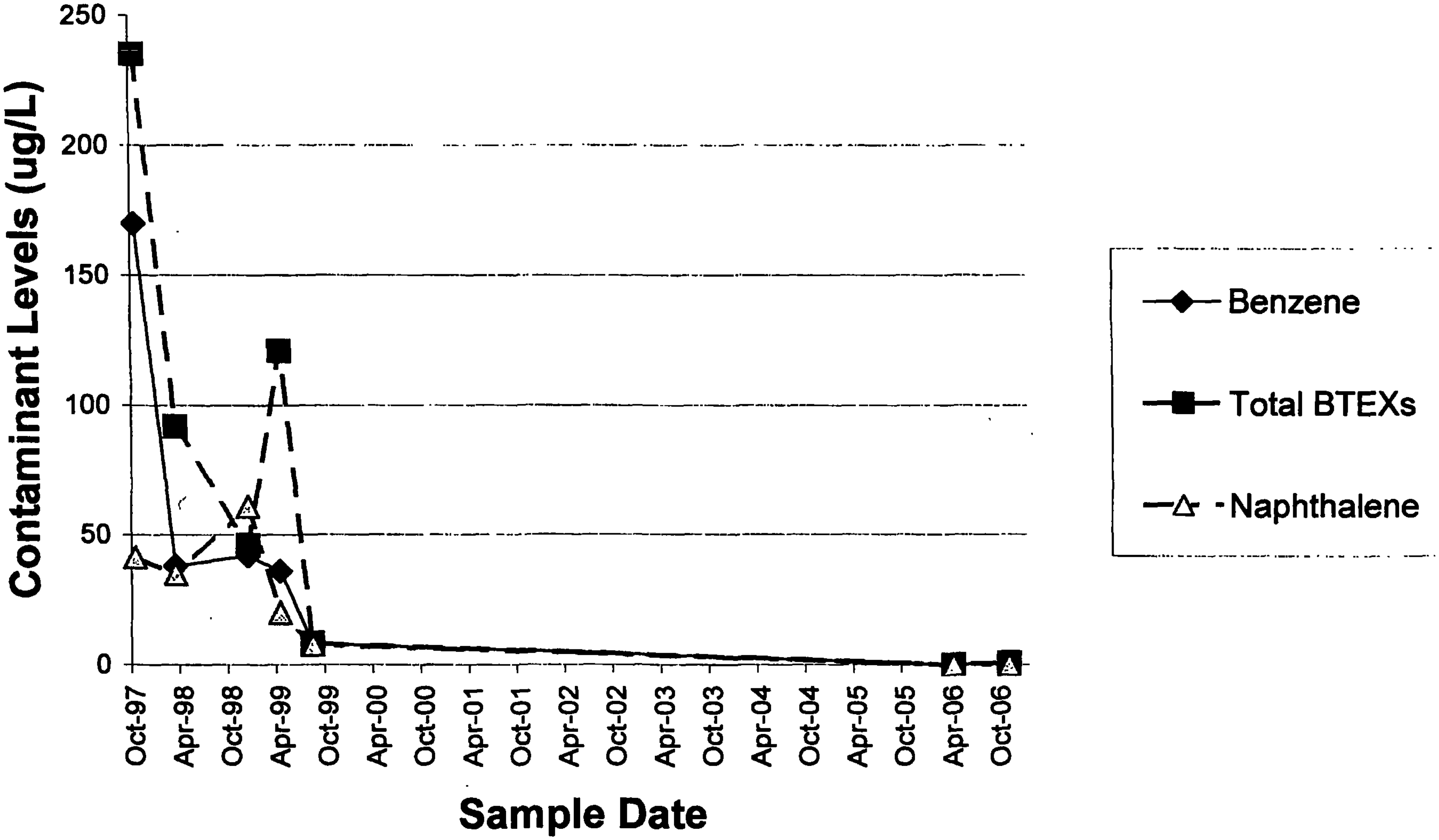


Figure 4
Well PZ-1
14,000
12,000
10,000
8,000
6,000
4,000
2,000
0
Contaminant Levels (ug/L)
Nov-03
Jan-04
Mar-04
May-04
Jul-04
Sep-04
Nov-04
Jan-05
Mar-05
May-05
Jul-05
Sep-05
Nov-05
Jan-06
Mar-06
May-06
Jul-06
Sep-06
Nov-06
Jan-07
Sample Date
Benzene
Total BTEXs
Naphthalene

Figure 5
Well HWS-09



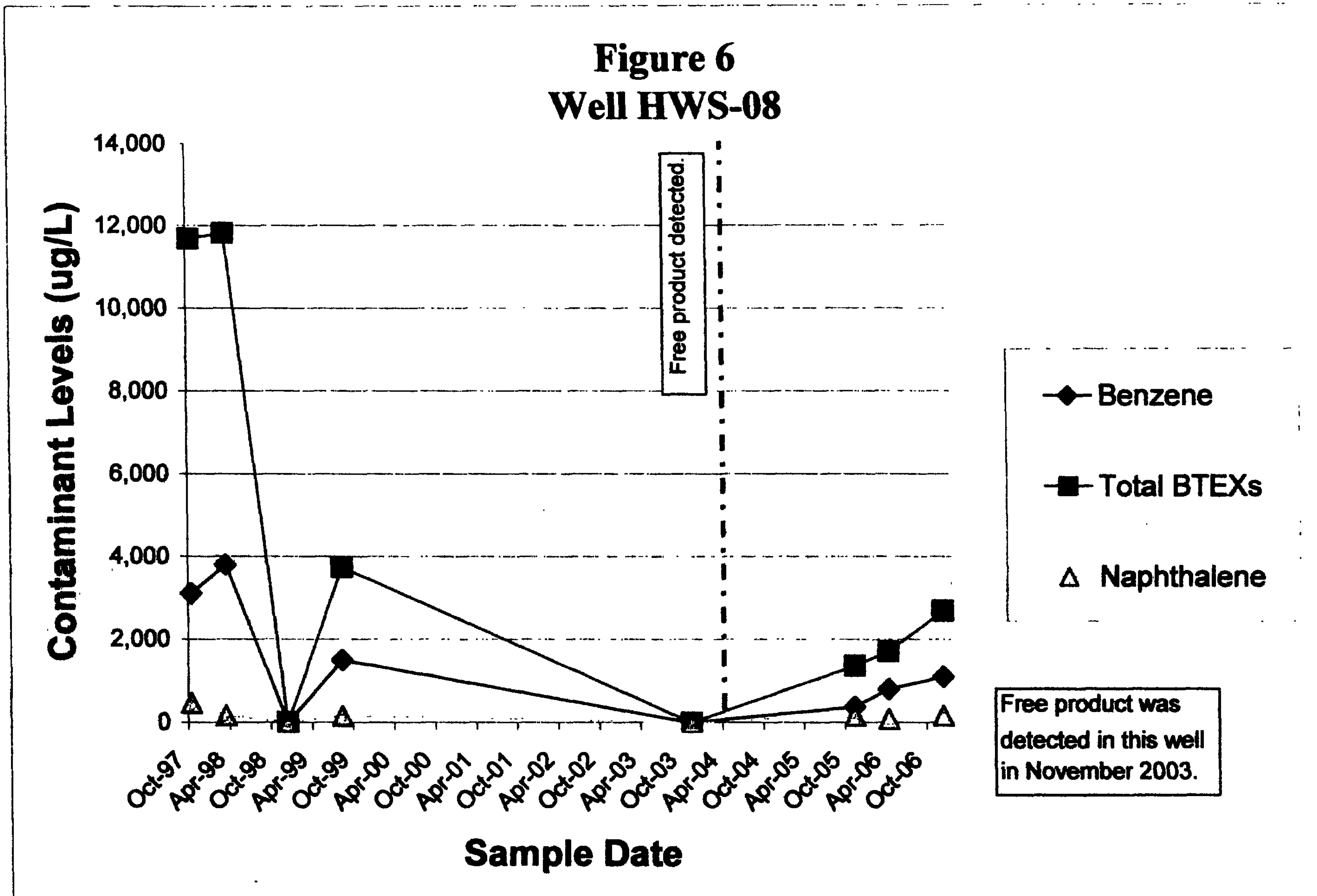


Figure 6
Well HWS-08
14,000
12,000
10,000
8,000
6,000
4,000
2,000
0
Contaminant Levels (ug/L)
Free product detected.
Oct-97
Apr-98
Oct-98
Apr-99
Oct-99
Apr-00
Oct-00
Apr-01
Oct-01
Apr-02
Oct-02
Apr-03
Oct-03
Apr-04
Oct-04
Apr-05
Oct-05
Apr-06
Oct-06
Sample Date
Benzene
Total BTEXs
Naphthalene
Free product was detected in this well in November 2003.

Figure 7
Well HWS-10

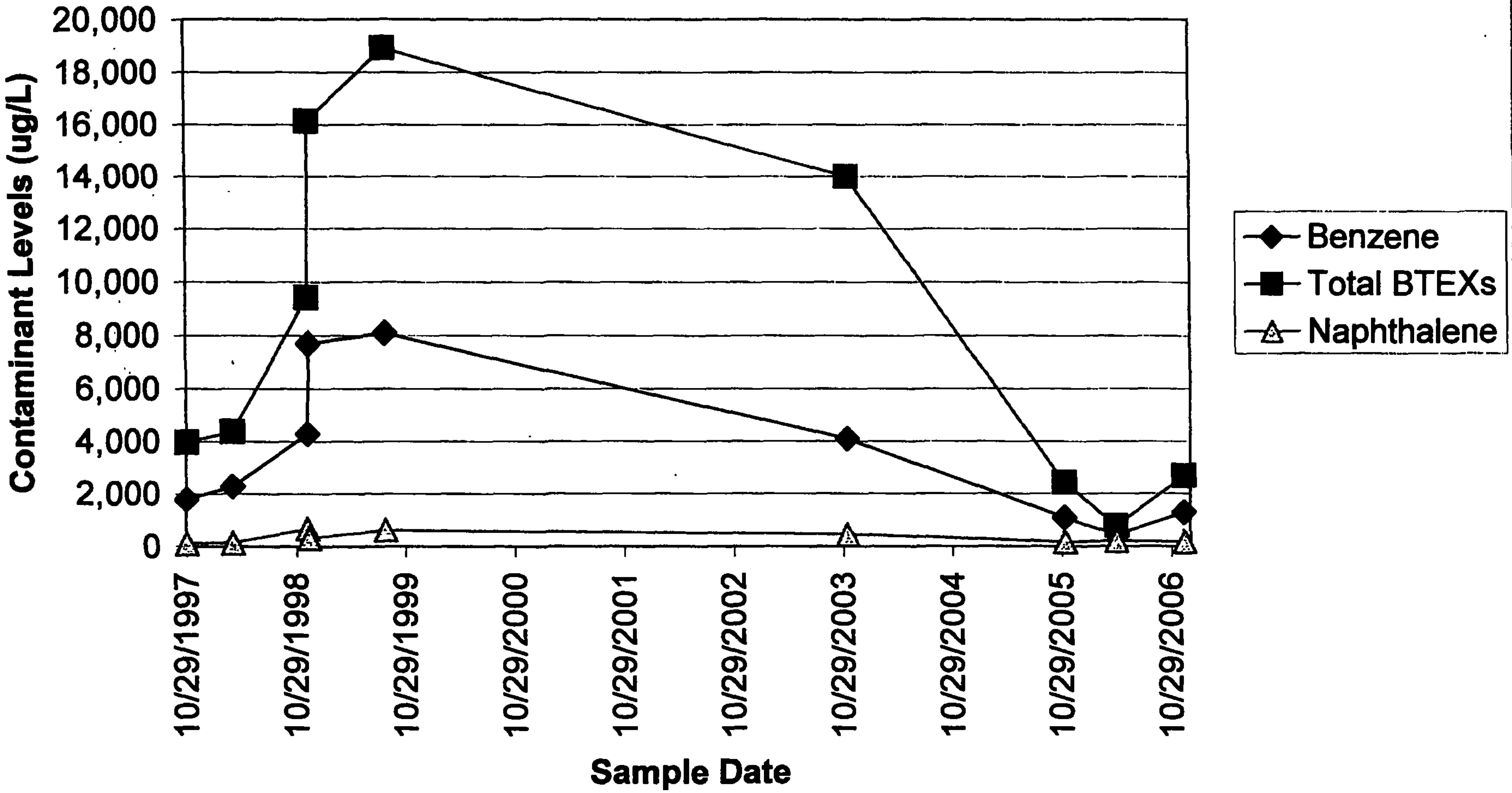
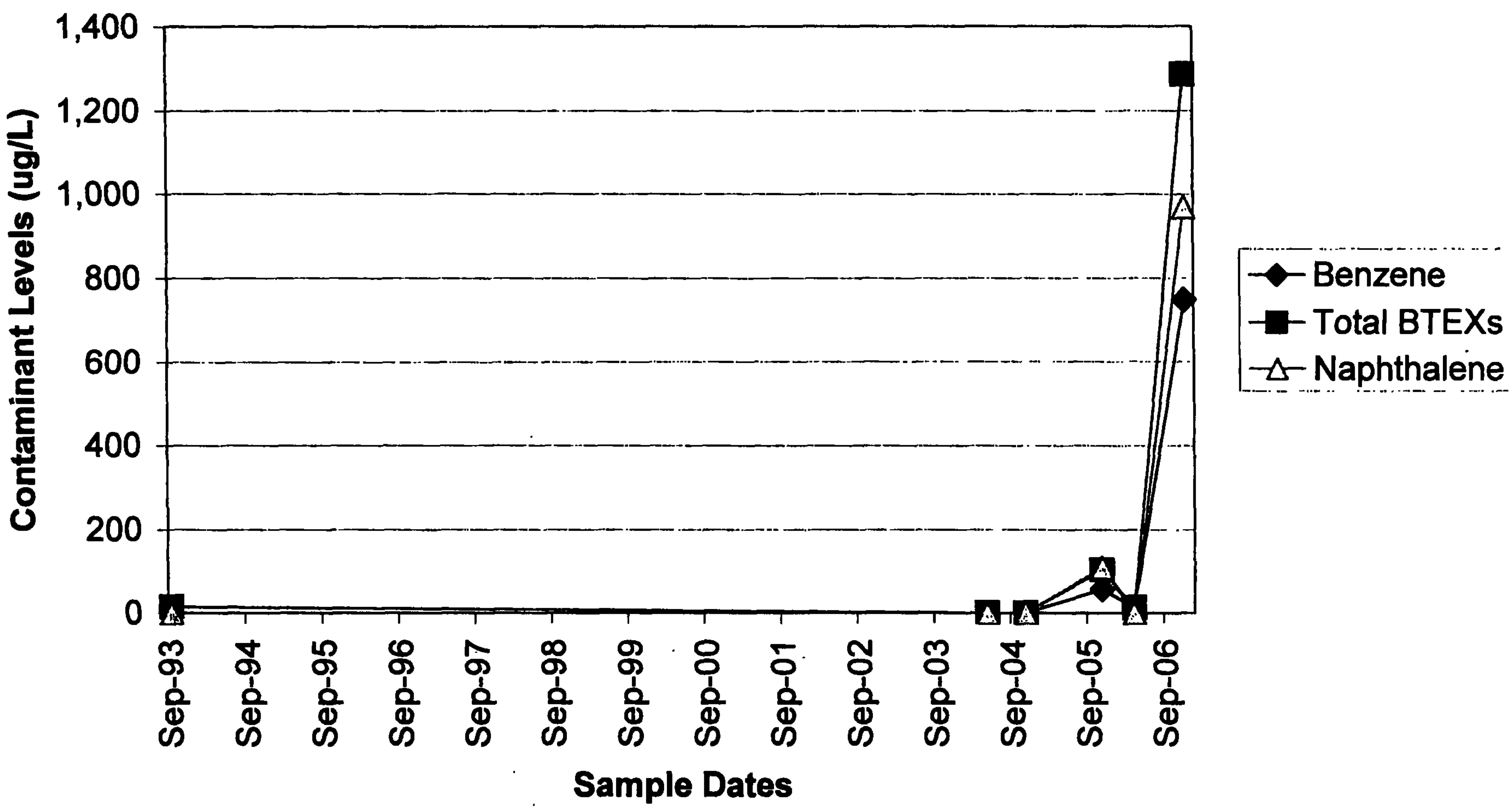


Figure 8
Well HWS-11



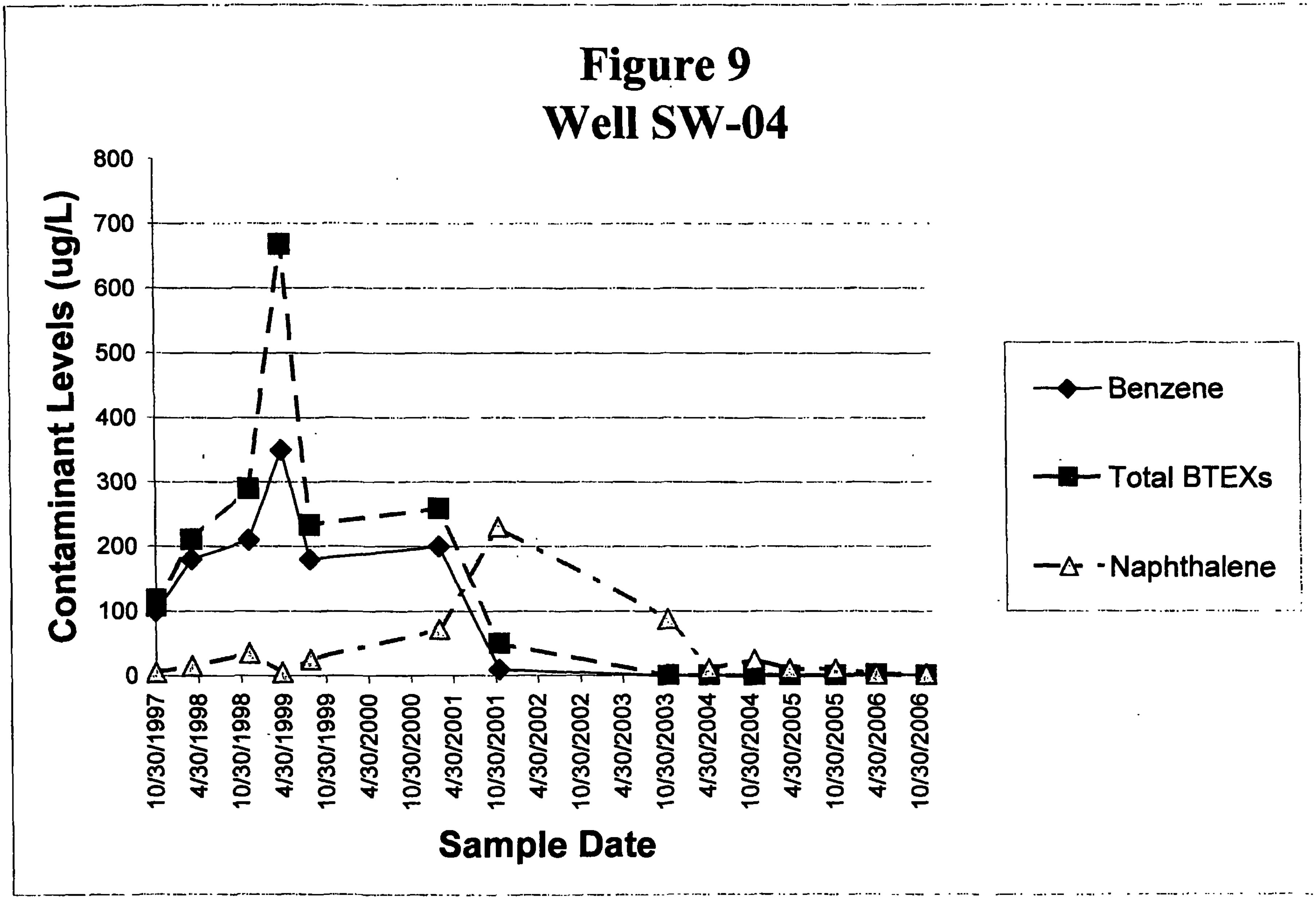


Figure 9
Well SW-04
Contaminant Levels (ug/L)
800
700
600
500
400
300
200
100
0
10/30/1997
4/30/1998
10/30/1998
4/30/1999
10/30/1999
4/30/2000
10/30/2000
4/30/2001
10/30/2001
4/30/2002
10/30/2002
4/30/2003
10/30/2003
4/30/2004
10/30/2004
4/30/2005
10/30/2005
4/30/2006
10/30/2006
Sample Date
Benzene
Total BTEXs
Naphthalene

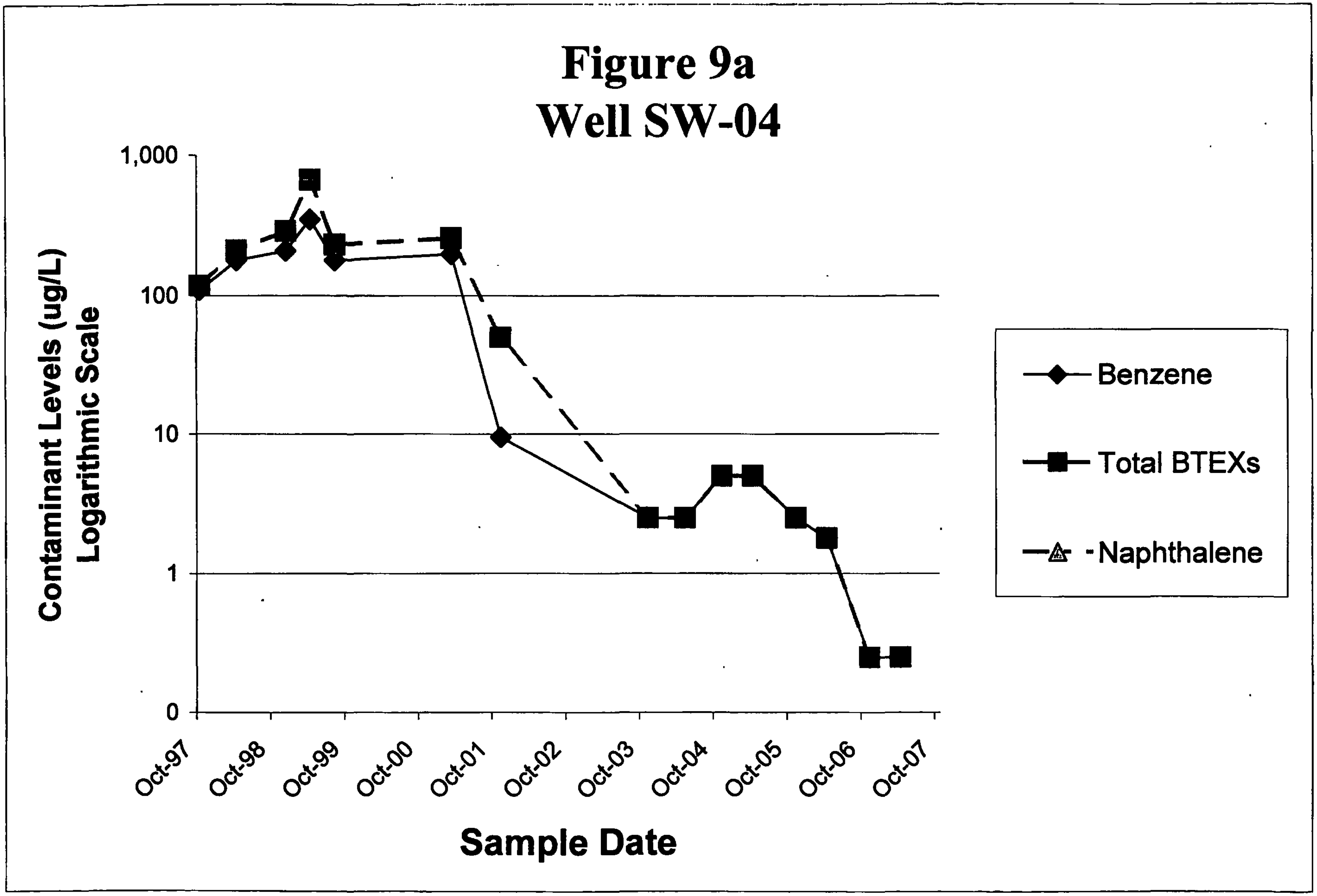
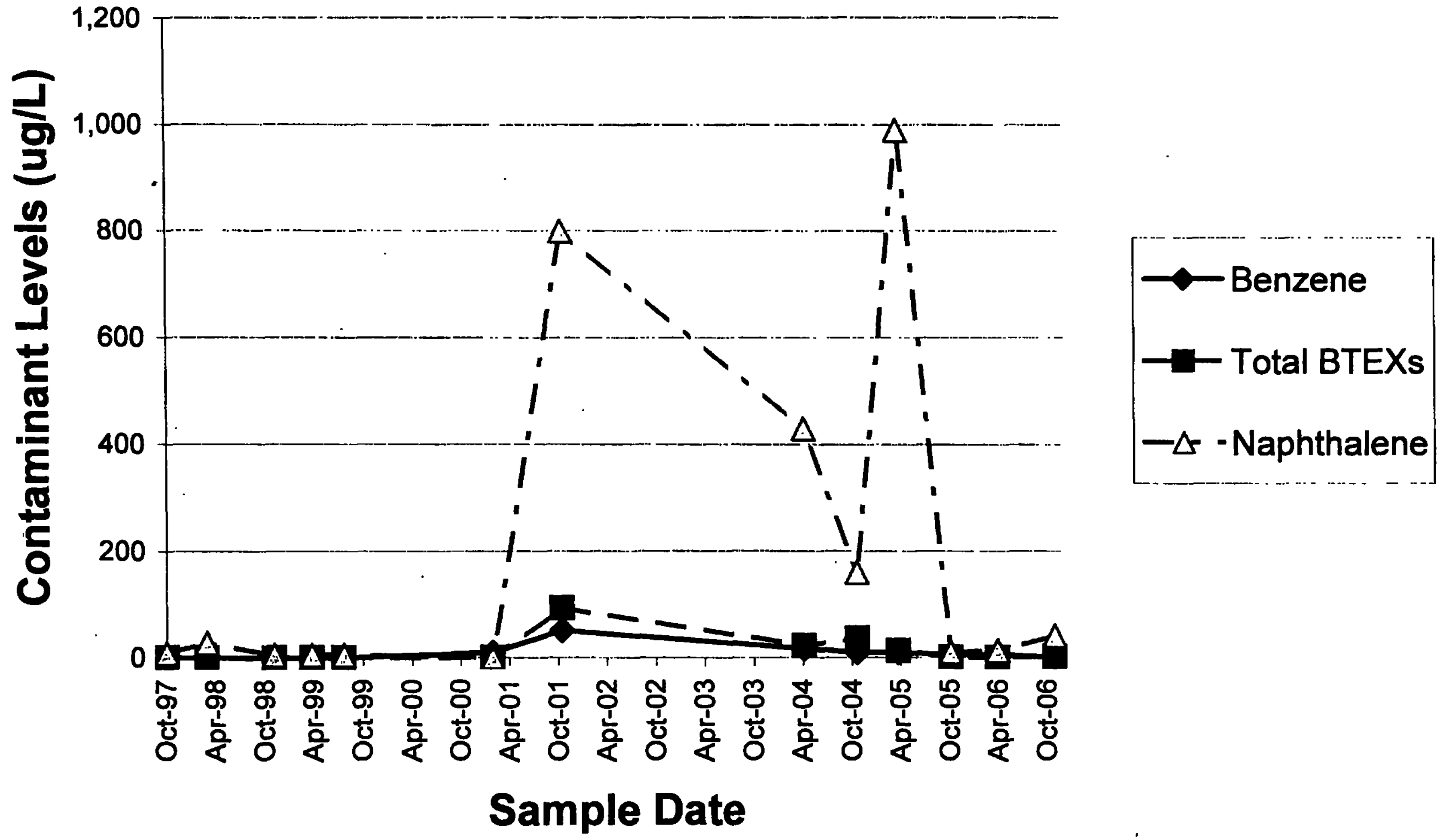


Figure 9a
Well SW-04
1,000
100
10
1
0
Contaminant Levels (ug/L) Logarithmic Scale
Oct-97
Oct-98
Oct-99
Oct-00
Oct-01
Oct-02
Oct-03
Oct-04
Oct-05
Oct-06
Oct-07
Sample Date
Benzene
Total BTEXs
Naphthalene

Figure 10
Well SW-01



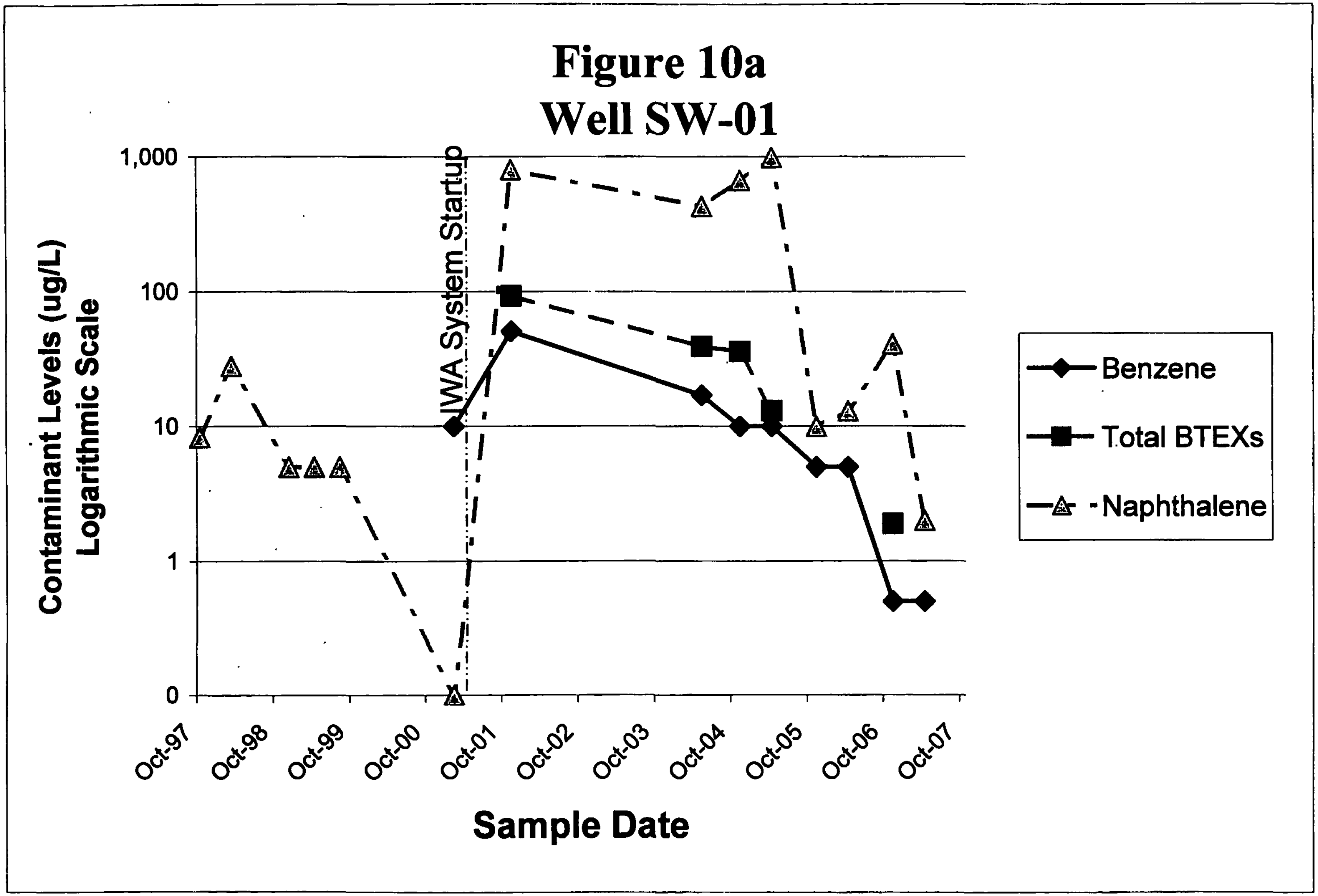


Figure 10a
Well SW-01
Contaminant Levels (ug/L)
Logarithmic Scale
1,000
100
10
1
0
IWA System Startup
Oct-97
Oct-98
Oct-99
Oct-00
Oct-01
Oct-02
Oct-03
Oct-04
Oct-05
Oct-06
Oct-07
Sample Date
Benzene
Total BTEXs
Naphthalene

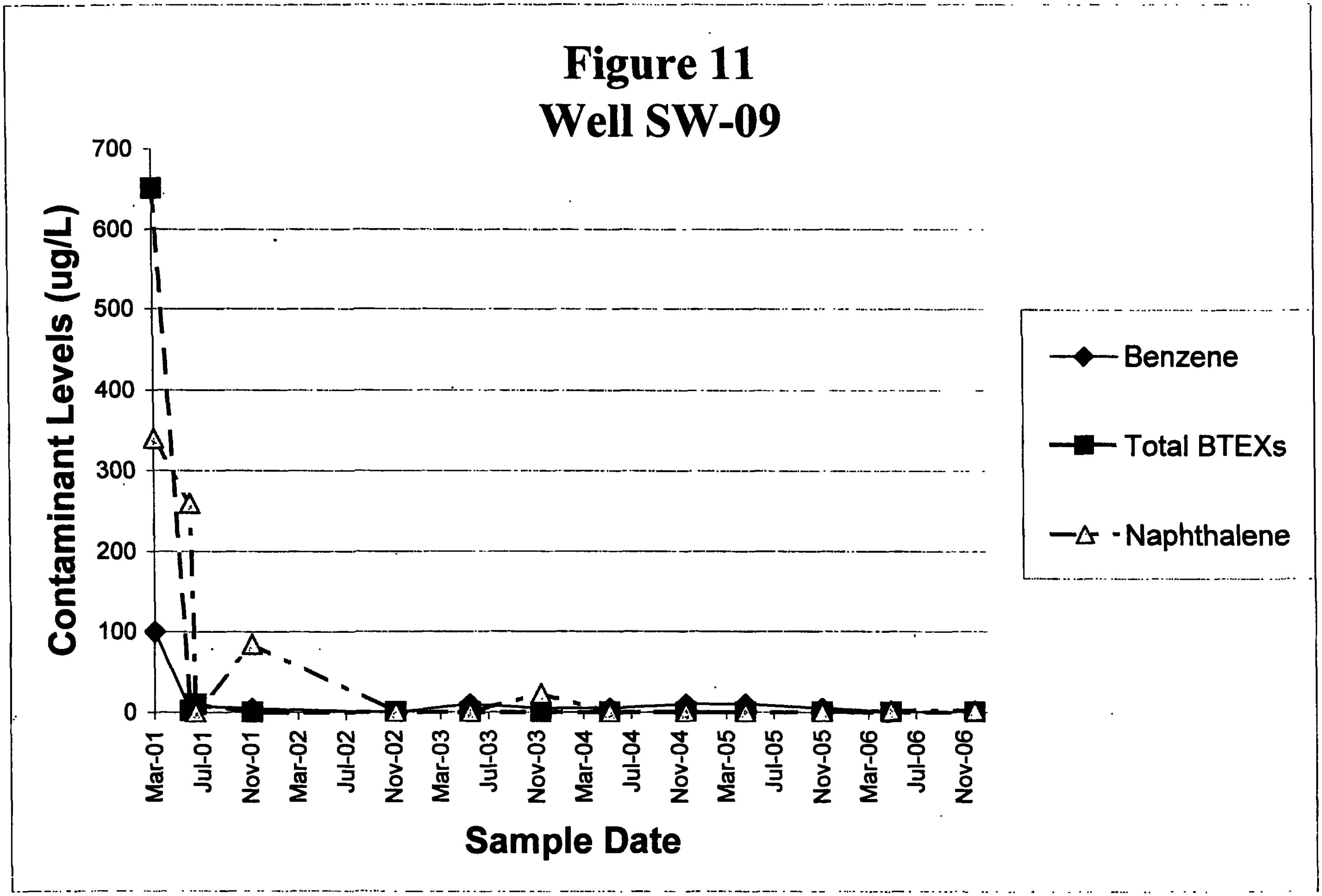


Figure 11
Well SW-09
700
600
500
400
300
200
100
0
Contaminant Levels (ug/L)
Mar-01
Jul-01
Nov-01
Mar-02
Jul-02
Nov-02
Mar-03
Jul-03
Nov-03
Mar-04
Jul-04
Nov-04
Mar-05
Jul-05
Nov-05
Mar-06
Jul-06
Nov-06
Sample Date
Benzene
Total BTEXs
Naphthalene

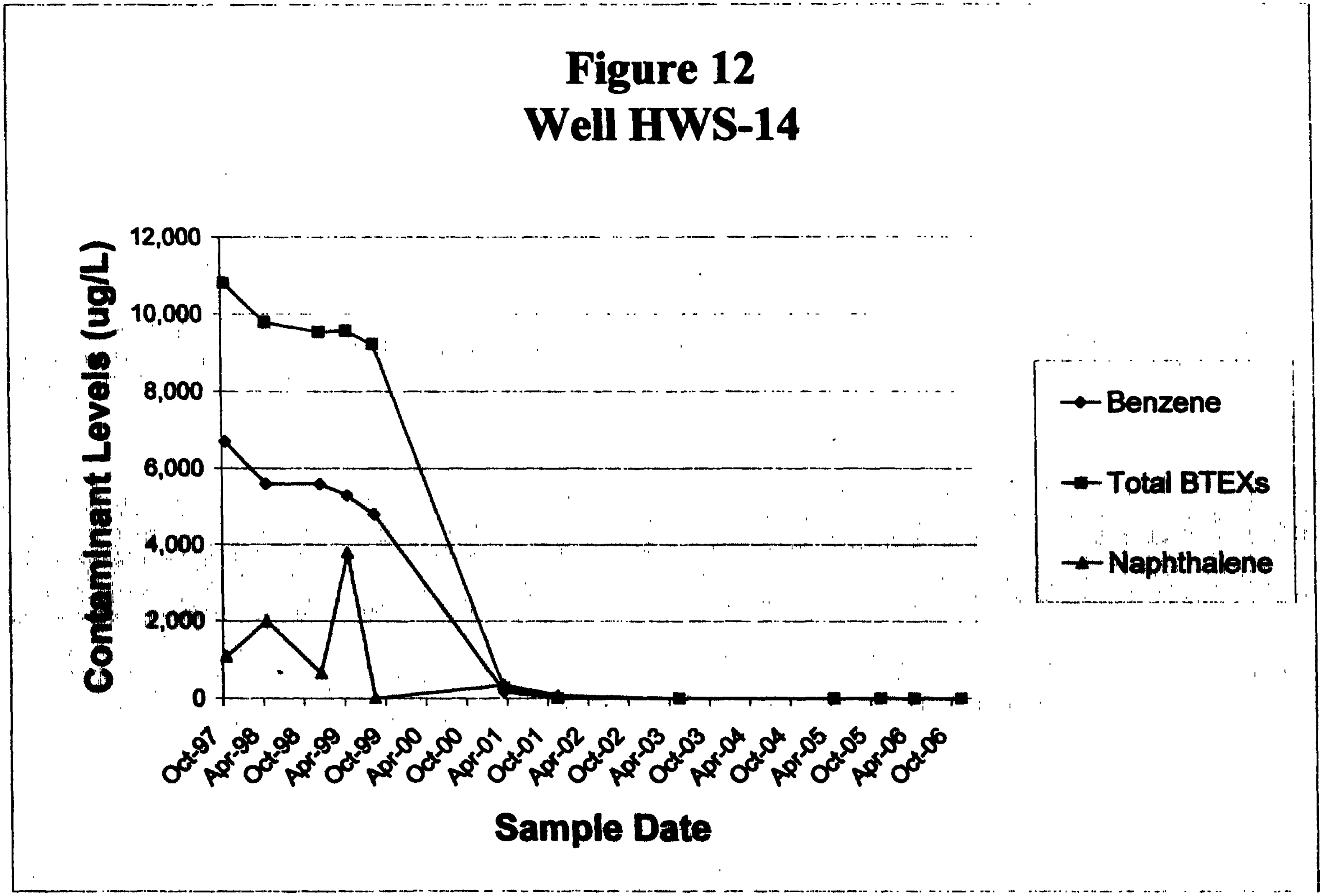


Figure 12
Well HWS-14
Contaminant Levels (ug/L)
12,000
10,000
8,000
6,000
4,000
2,000
0
Oct-97
Apr-98
Oct-98
Apr-99
Oct-99
Apr-00
Oct-00
Apr-01
Oct-01
Apr-02
Oct-02
Apr-03
Oct-03
Apr-04
Oct-04
Apr-05
Oct-05
Apr-06
Oct-06
Sample Date
Benzene
Total BTEXs
Naphthalene

Figure 13
Well IWS-1S

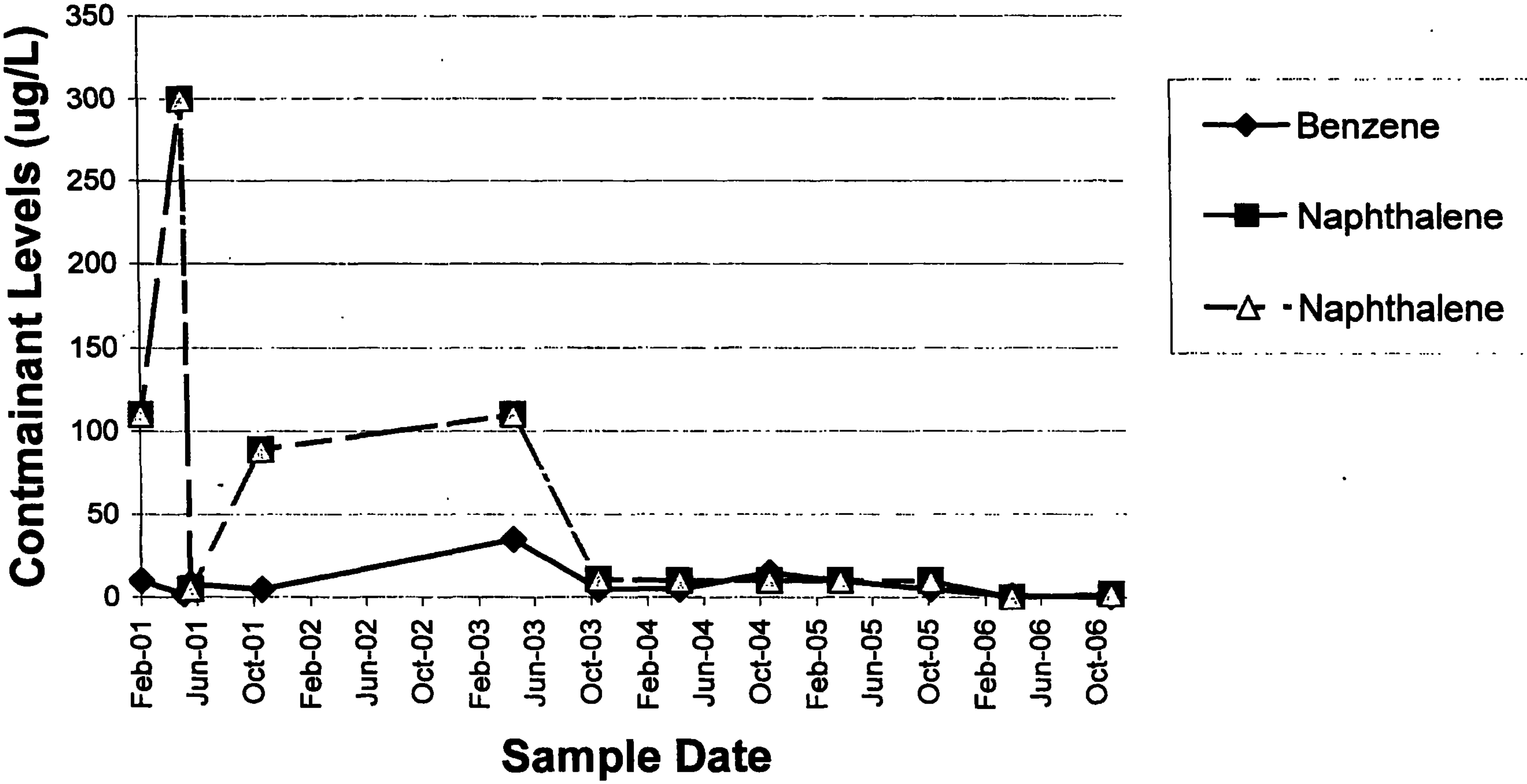


Figure 14
Well IWS-1I

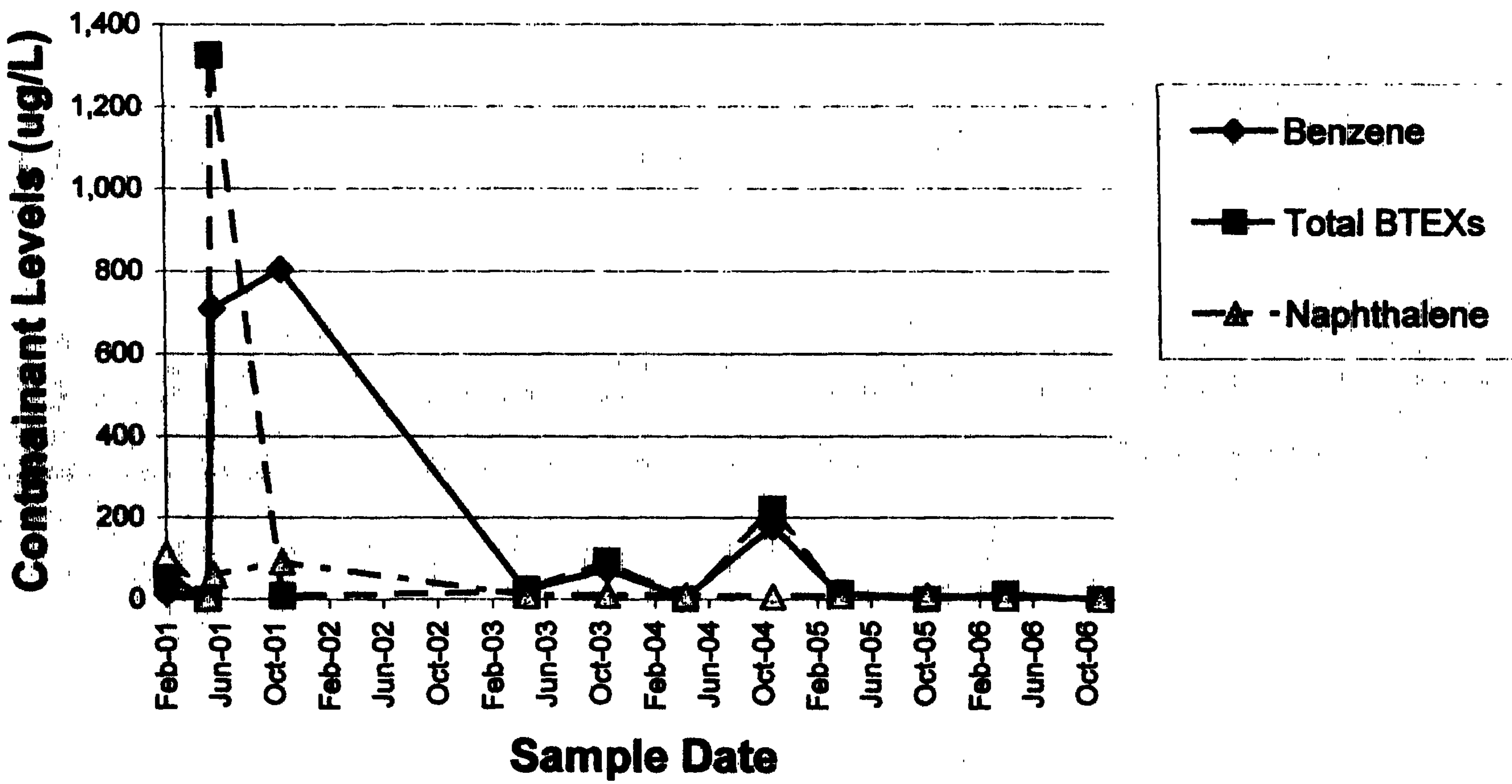


Figure 15
Well IWS-2S

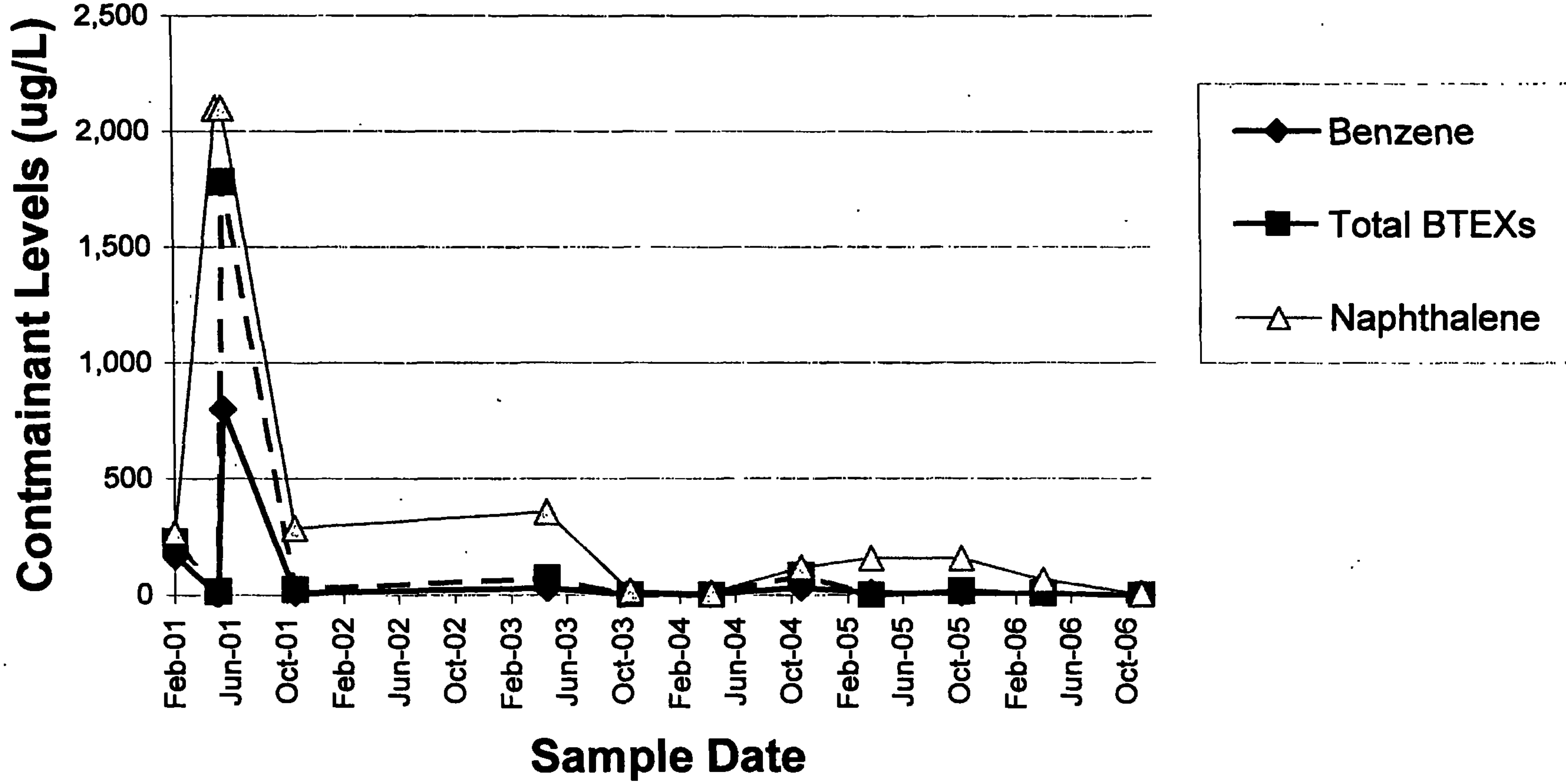


Figure 16
Well IWS-2I

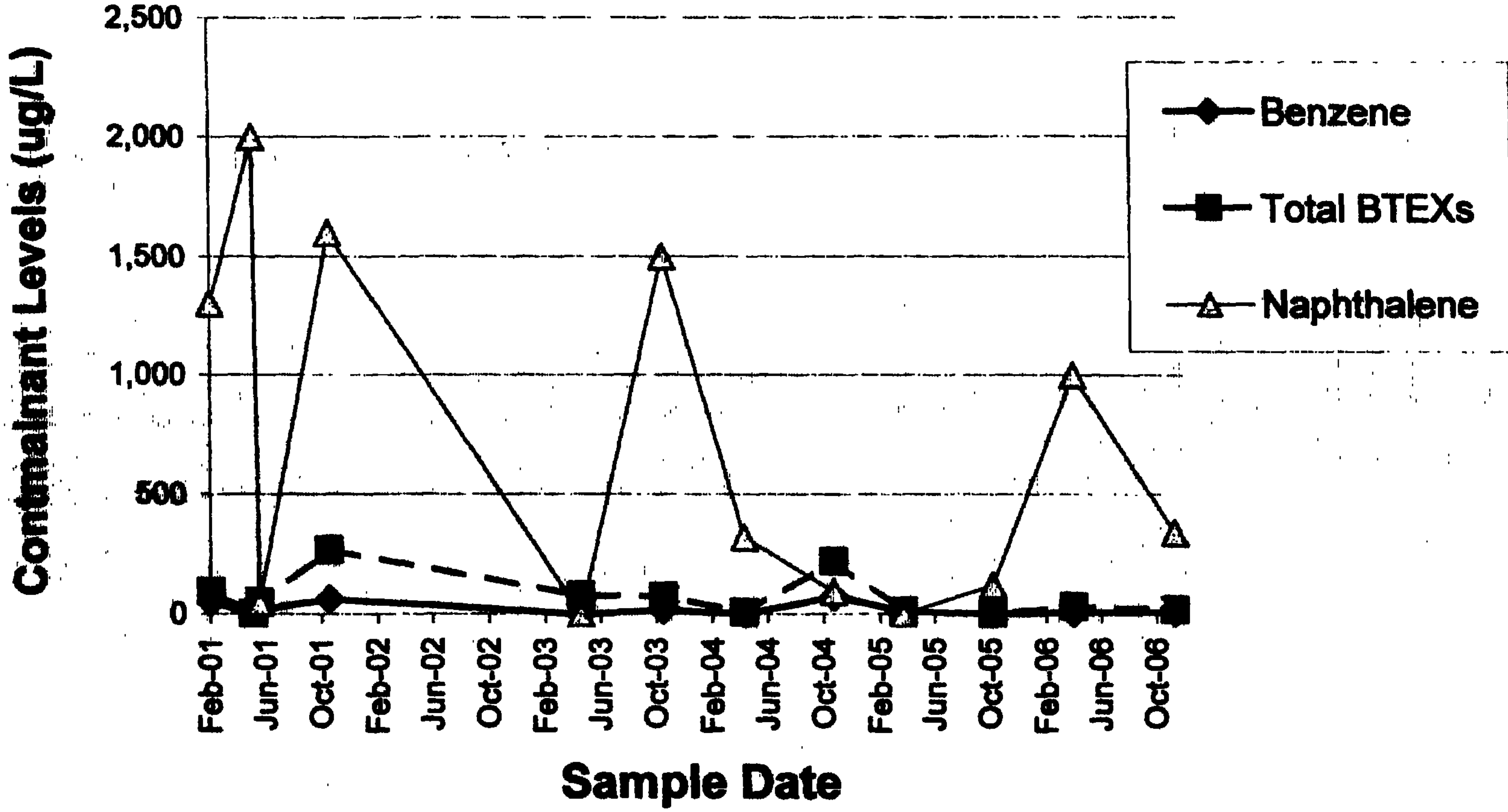


Figure 17
Well SW-13I

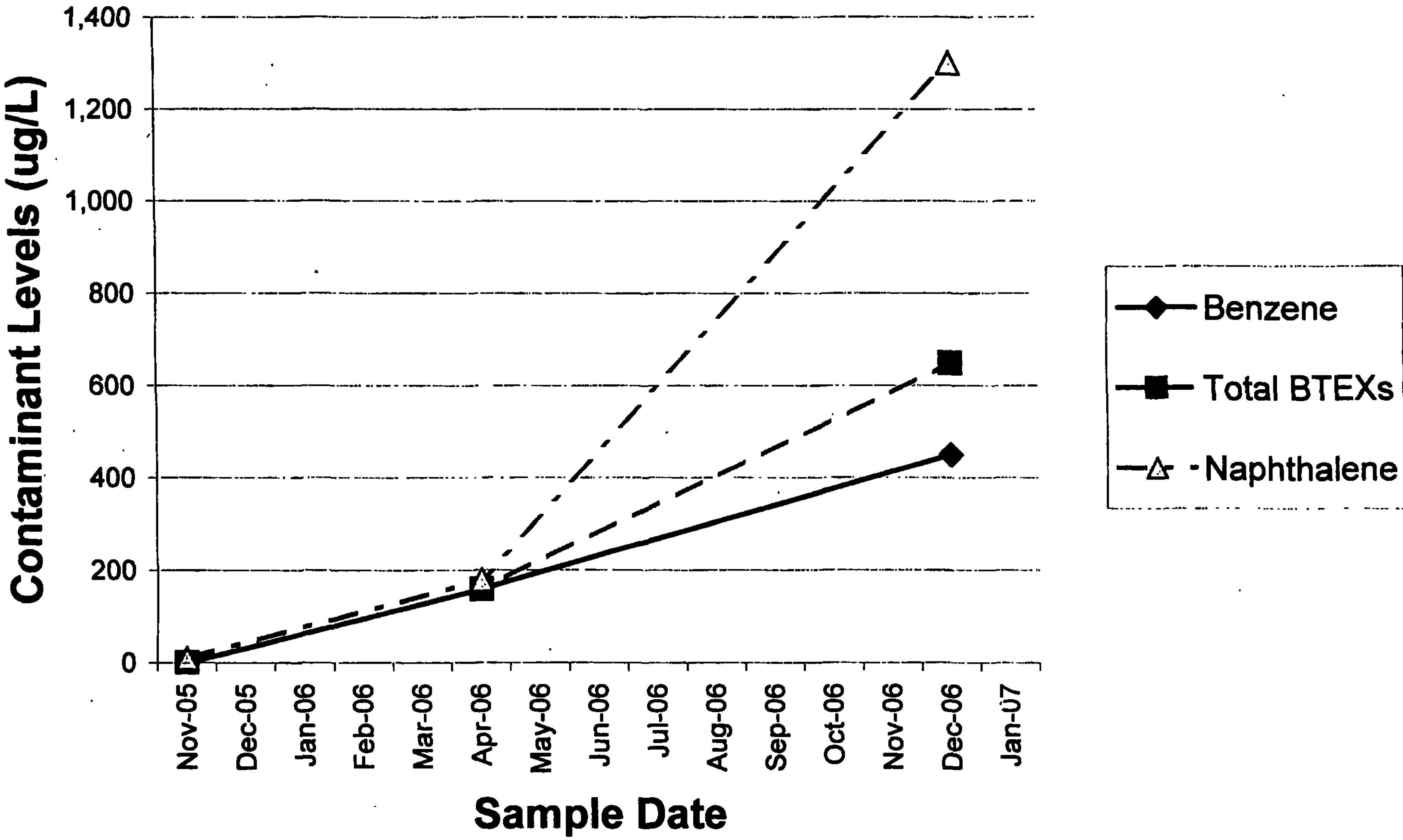


Figure 18
Well SW-13D

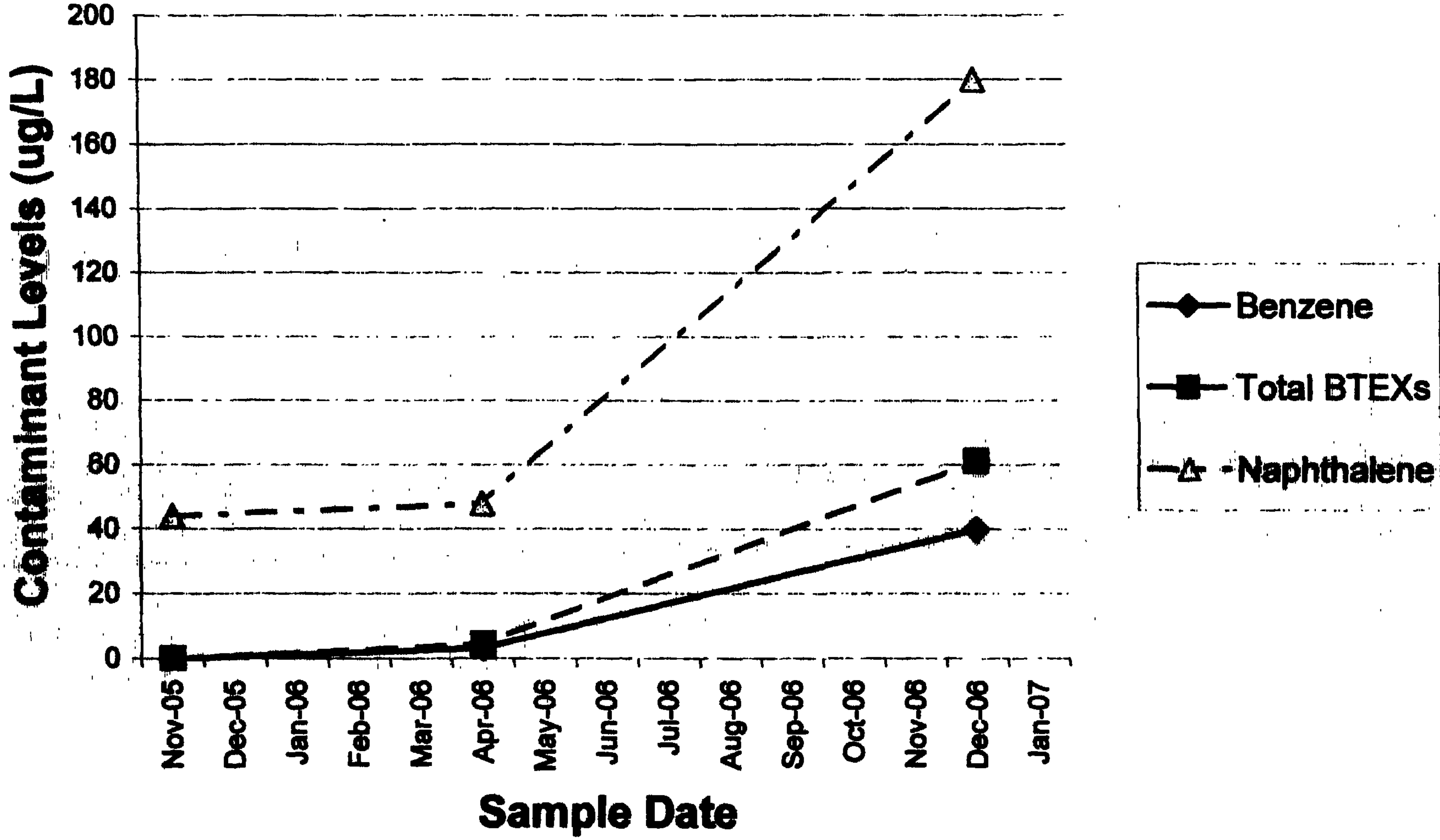


Figure 19
Well SW-03

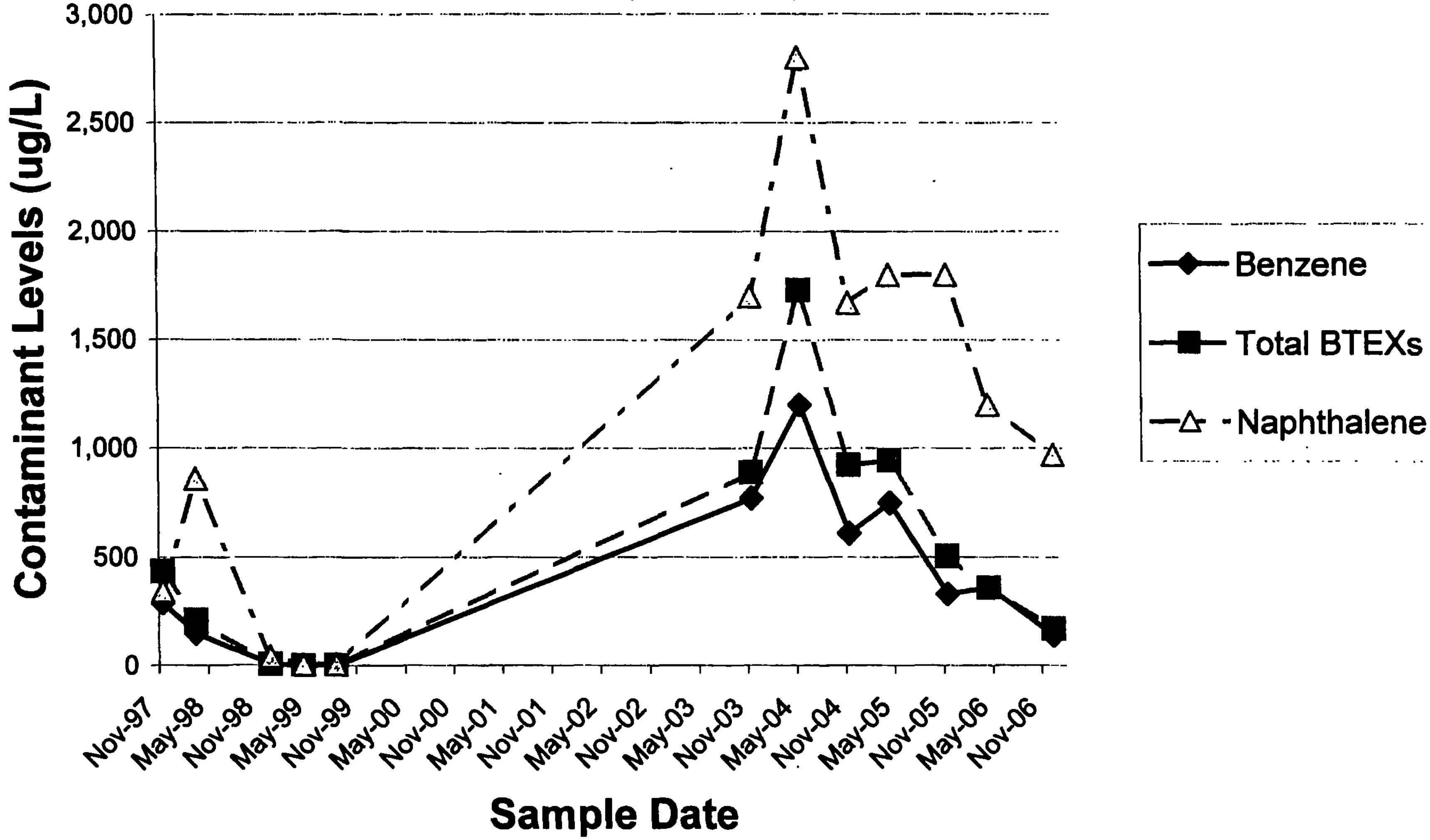


Figure 20
Well HWS-13

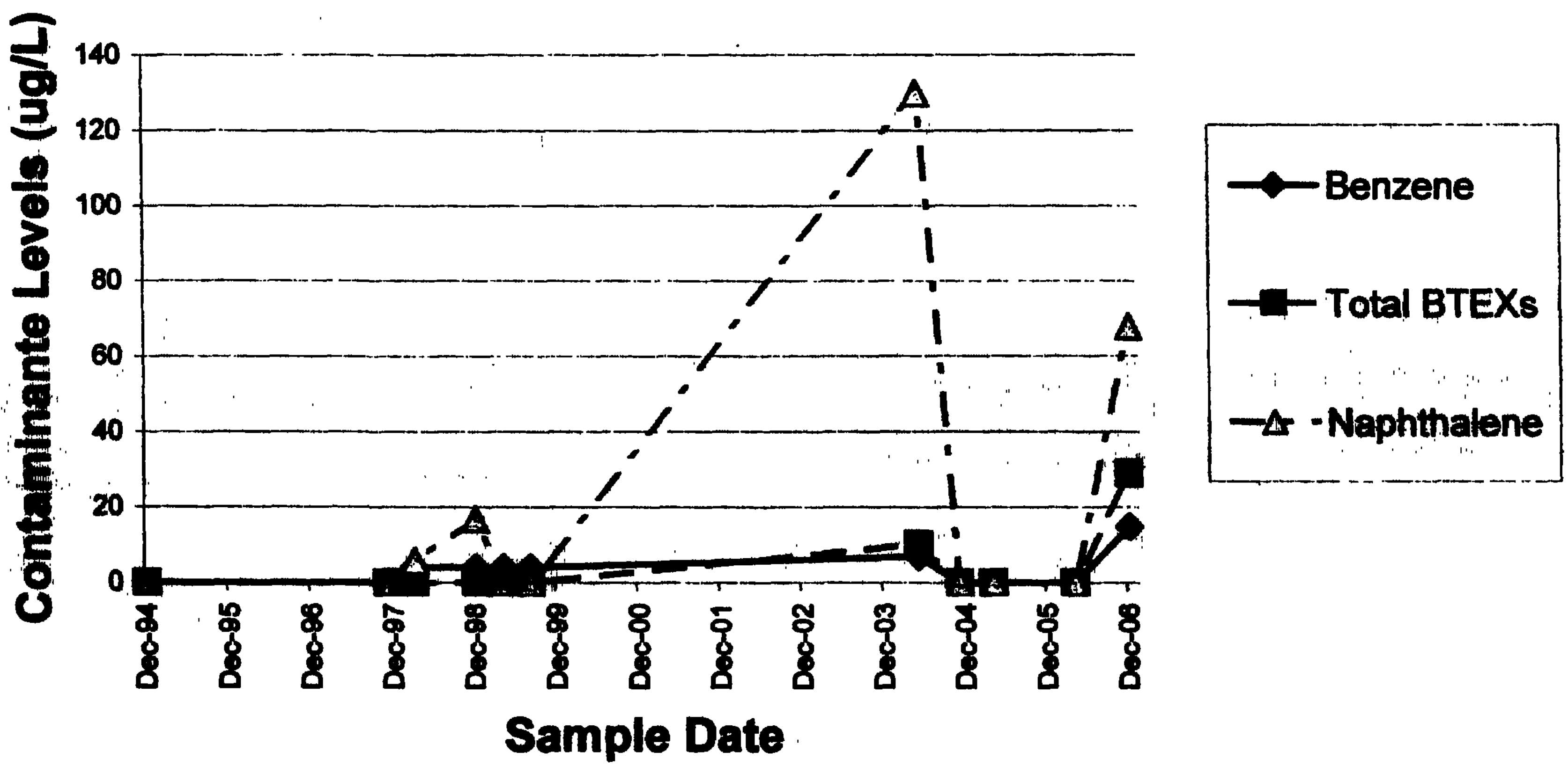
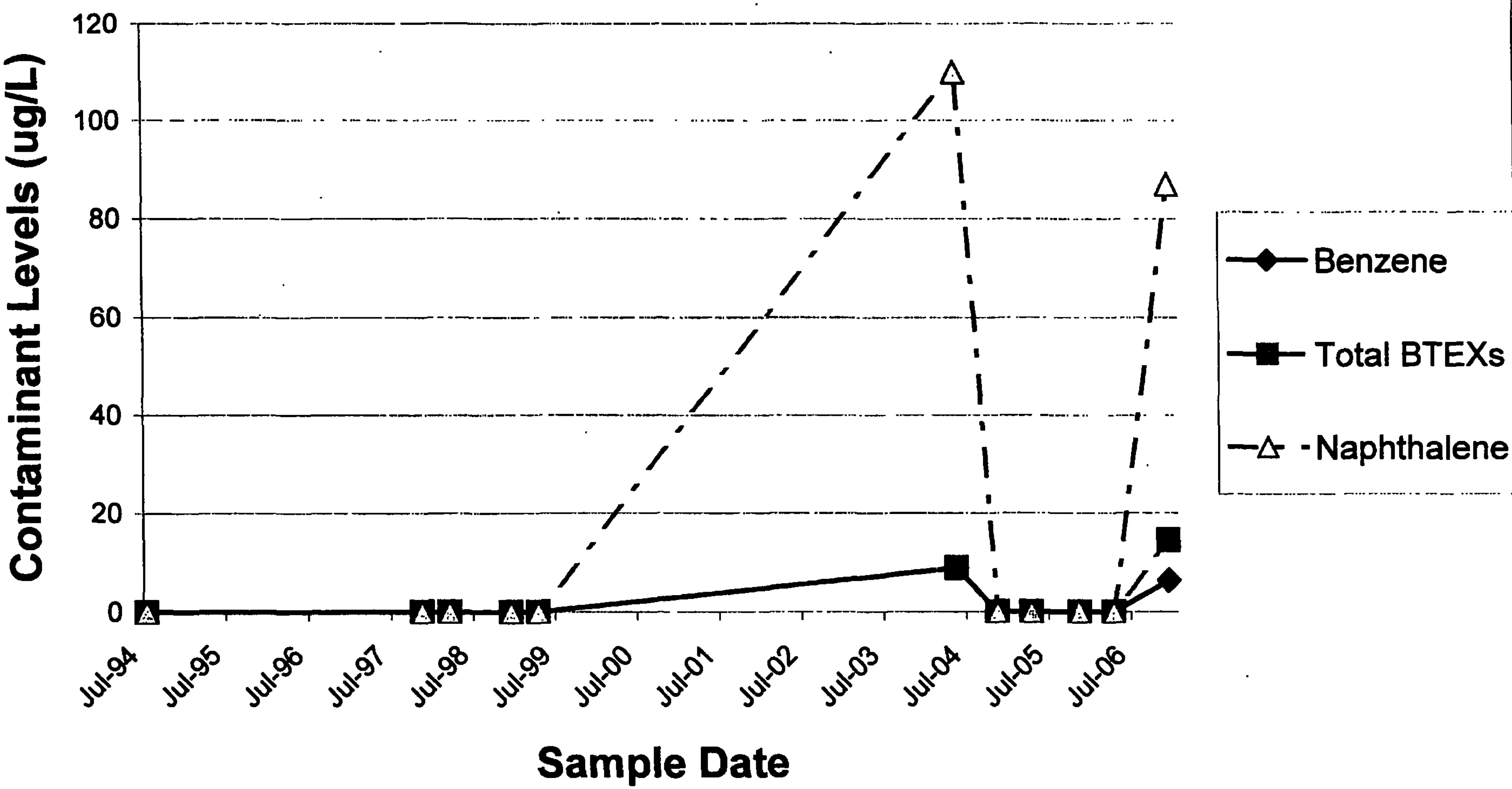


Figure 21
Well OW-4S



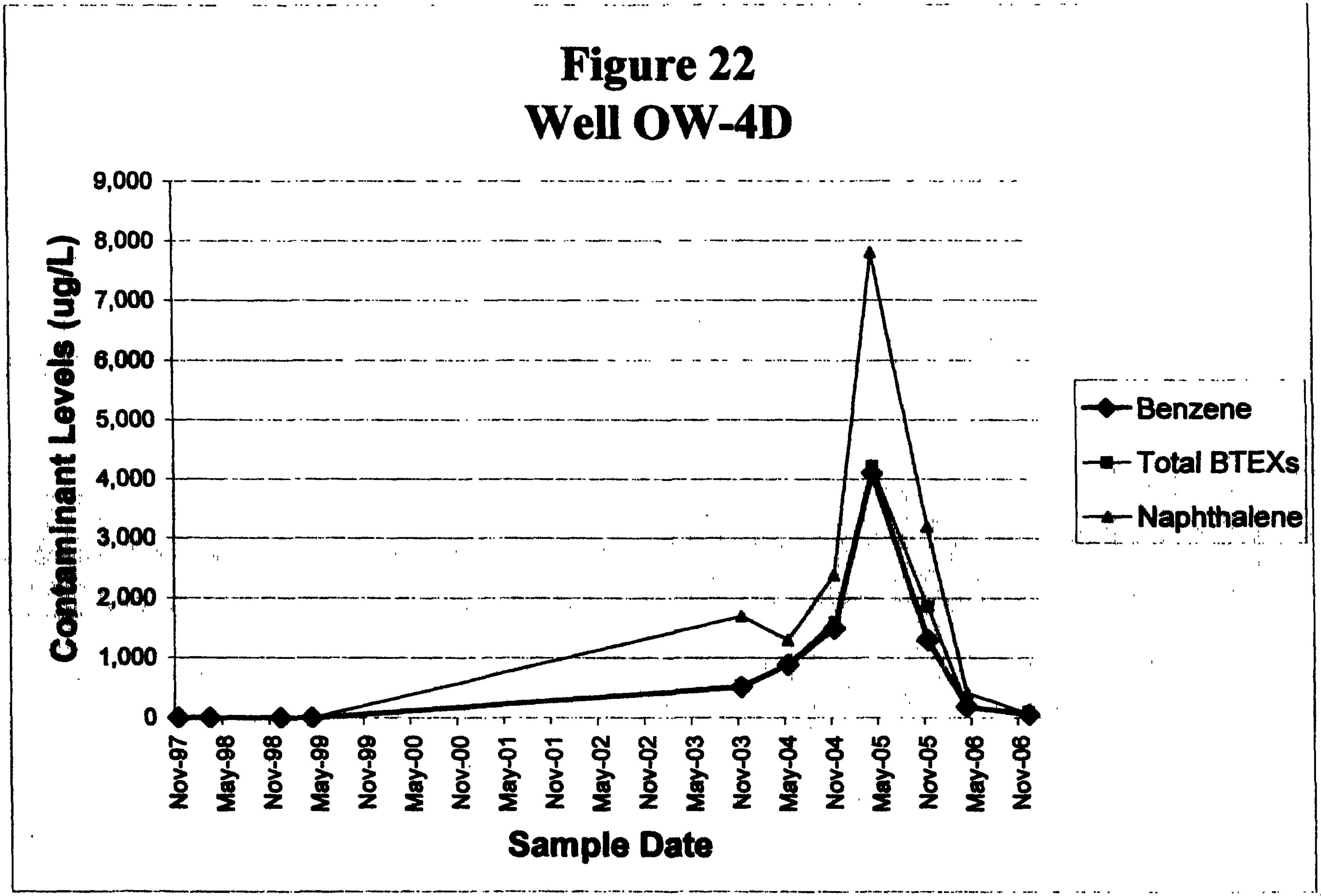


Figure 22
Well OW-4D
Contaminant Levels (ug/L)
9,000
8,000
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
Nov-97
May-98
Nov-98
May-99
Nov-99
May-00
Nov-00
May-01
Nov-01
May-02
Nov-02
May-03
Nov-03
May-04
Nov-04
May-05
Nov-05
May-06
Nov-06
Sample Date
Benzene
Total BTEXs
Naphthalene

Figure 23
Well BW-14S

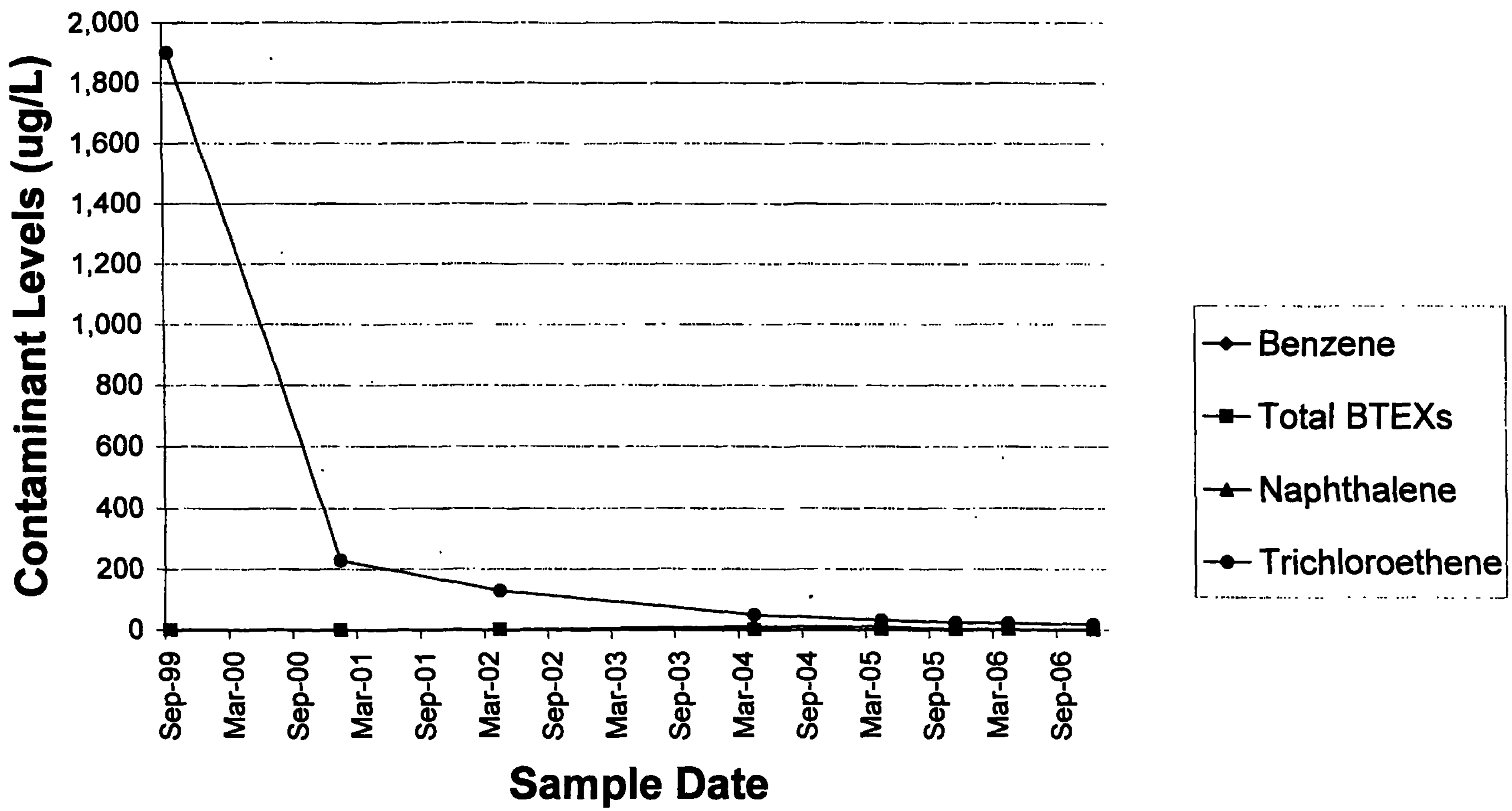


Figure 24
Well BW-14I

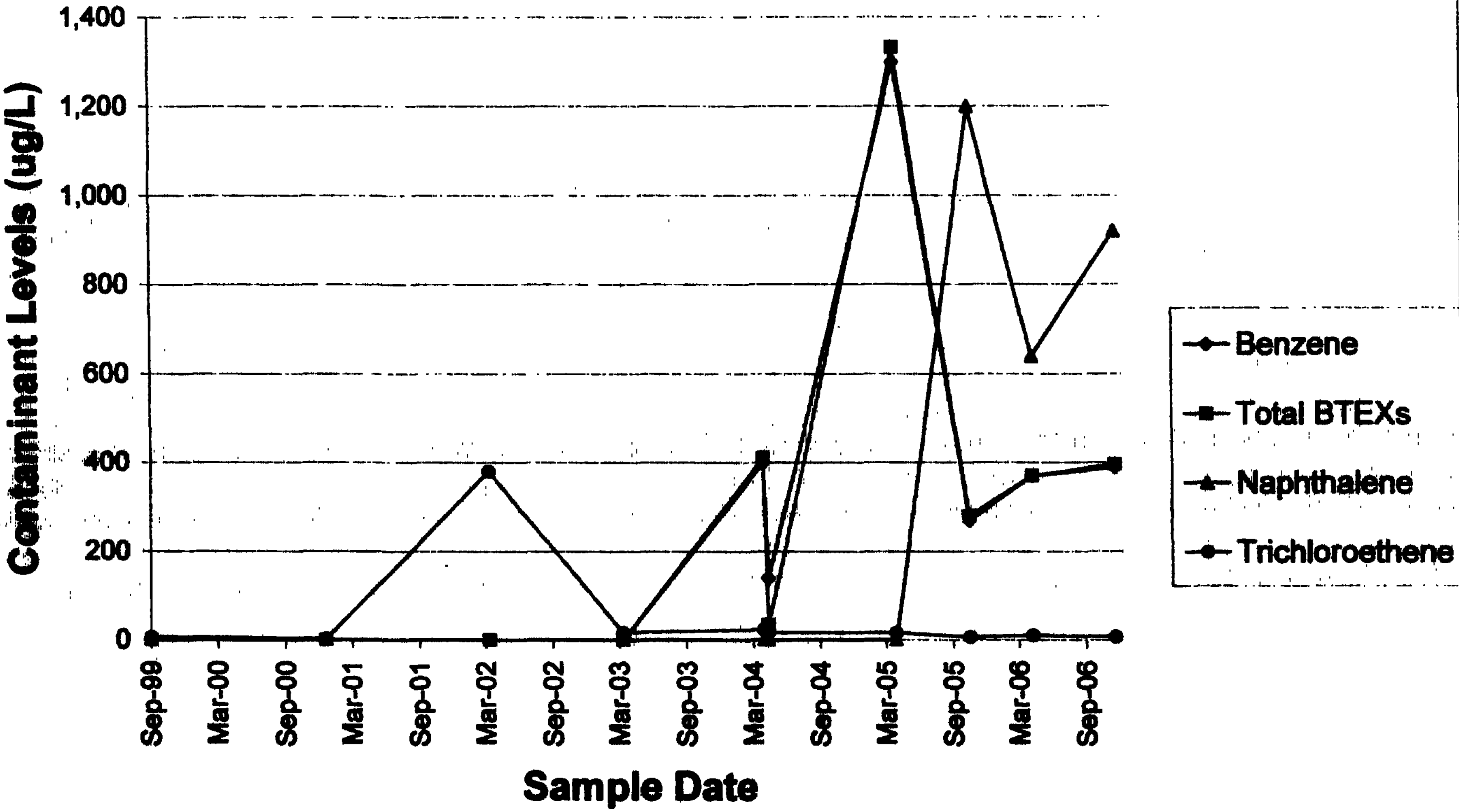


Figure 25
Well BW-14D

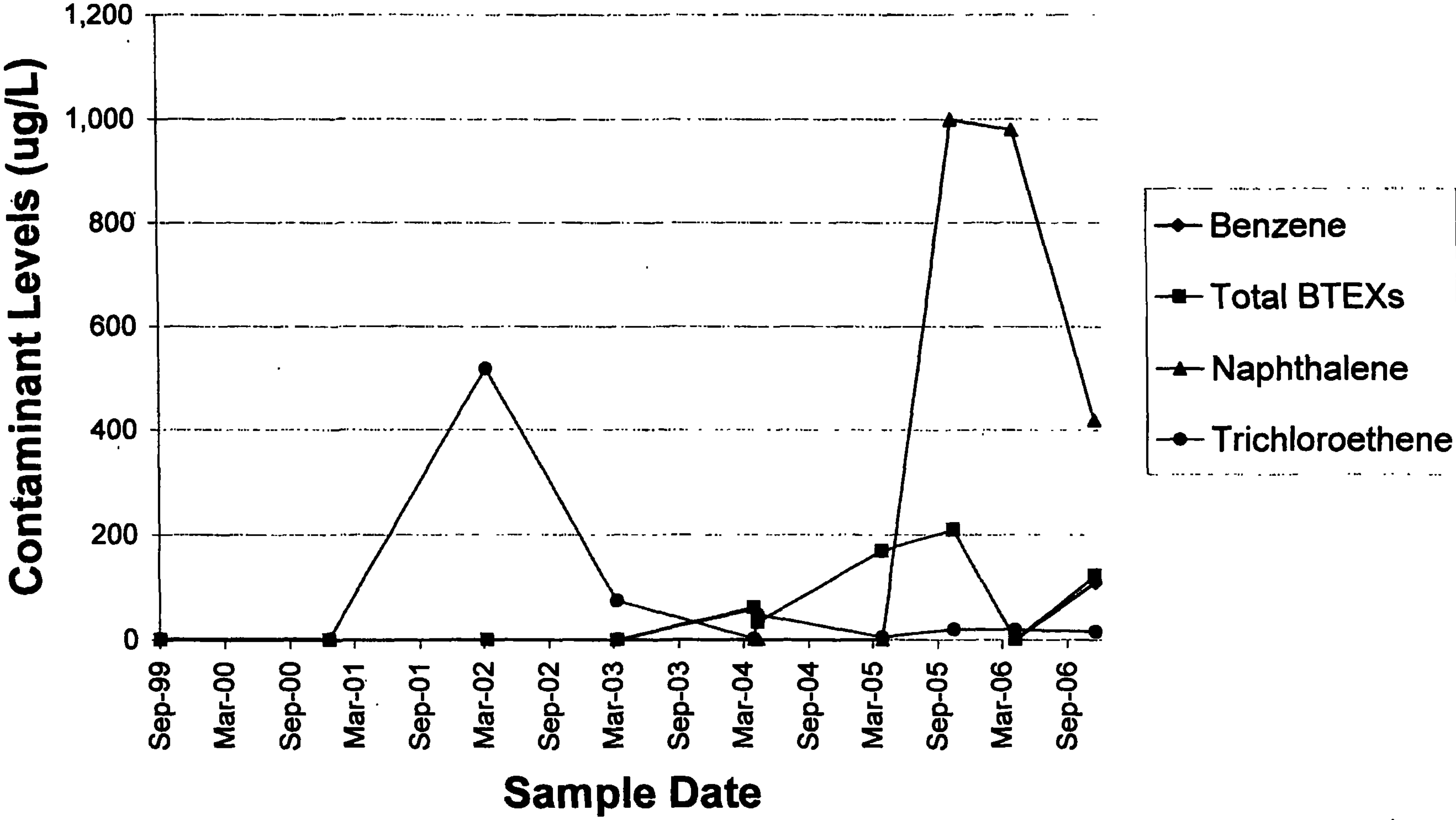
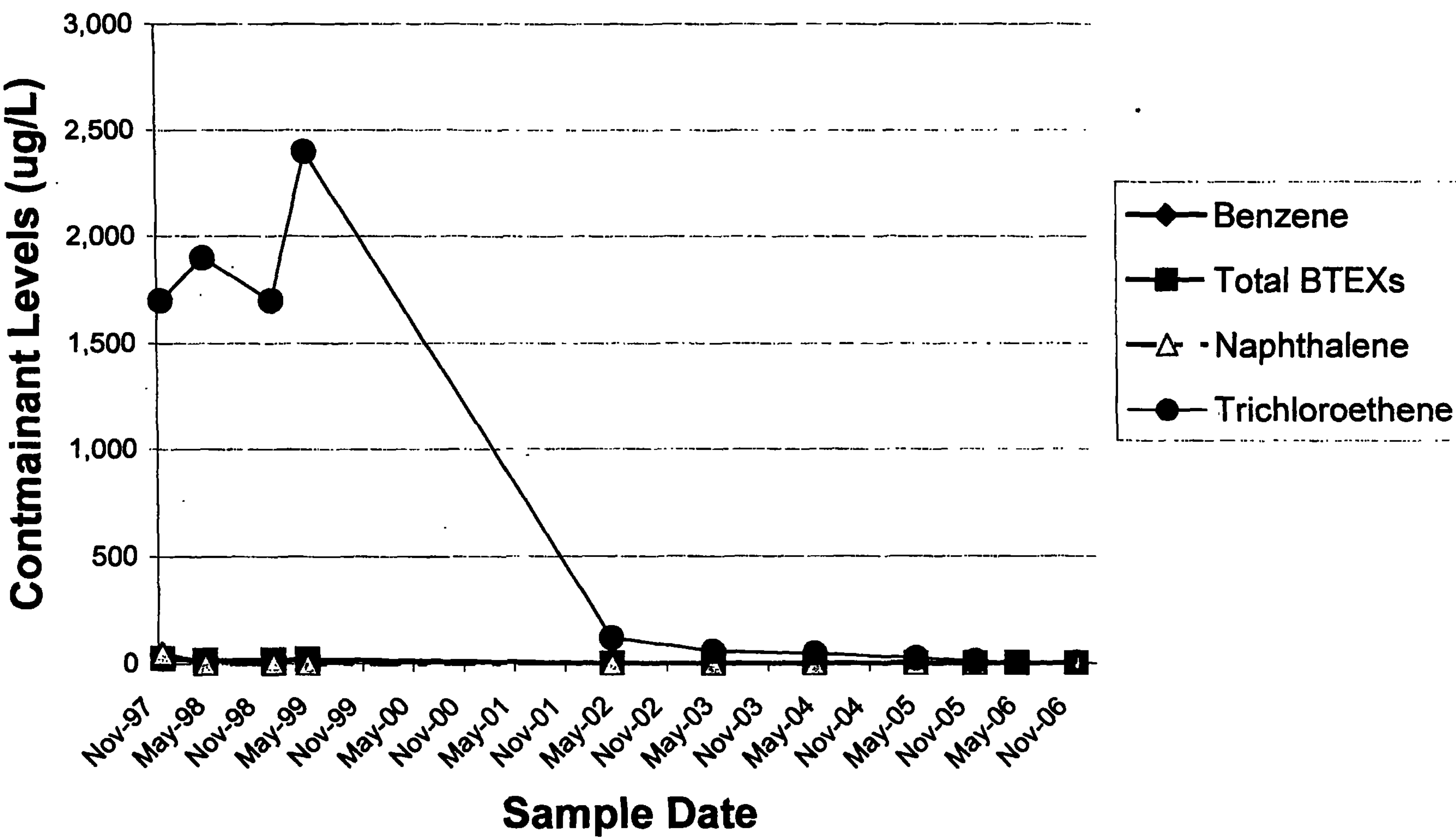


Figure 26
Well MW-4



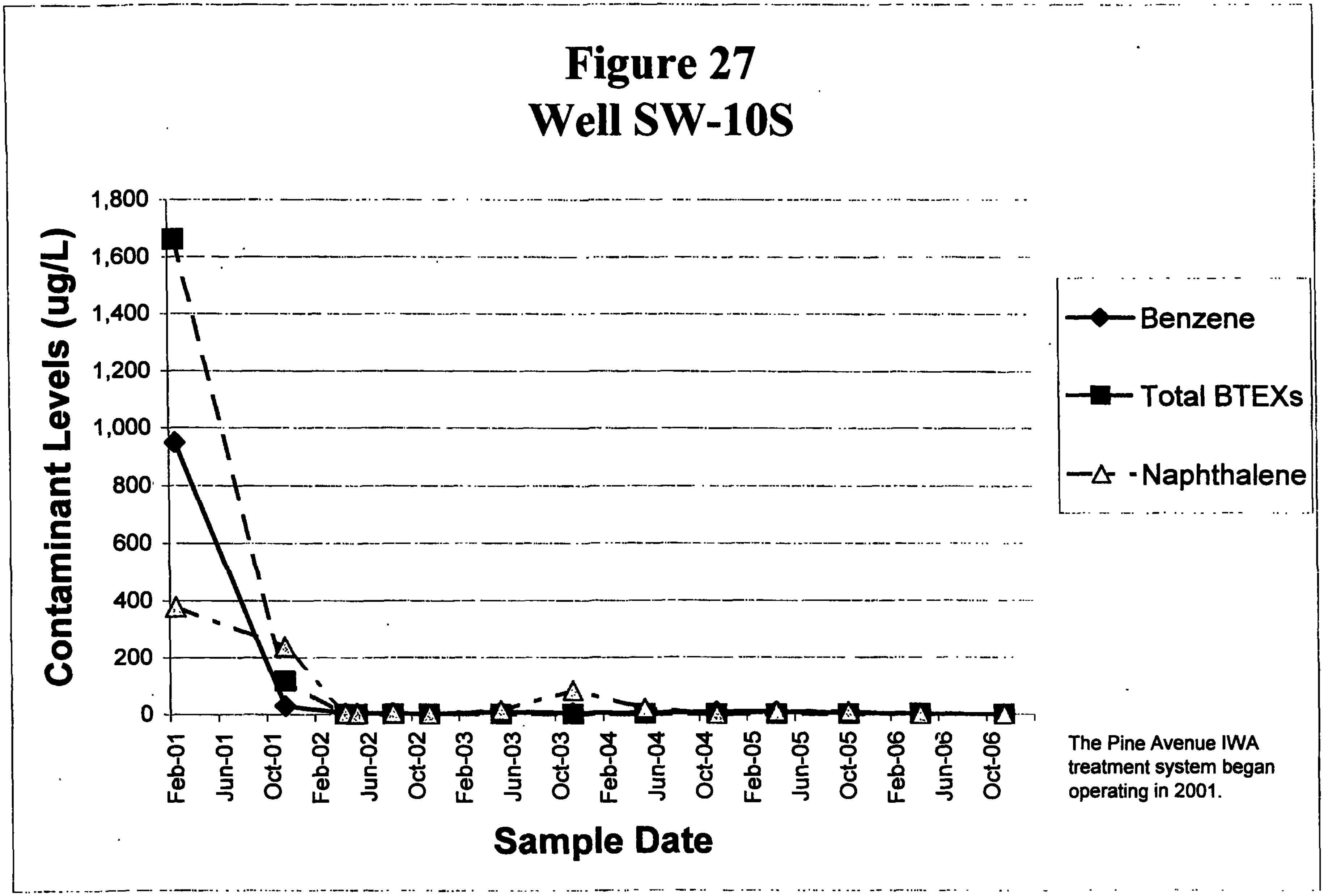


Figure 27
Well SW-10S
Contaminant Levels (ug/L)
1,800
1,600
1,400
1,200
1,000
800
600
400
200
0
Feb-01
Jun-01
Oct-01
Feb-02
Jun-02
Oct-02
Feb-03
Jun-03
Oct-03
Feb-04
Jun-04
Oct-04
Feb-05
Jun-05
Oct-05
Feb-06
Jun-06
Oct-06
Sample Date
Benzene
Total BTEXs
Naphthalene
The Pine Avenue IWA treatment system began operating in 2001.

Figure 28
Well SW-10I

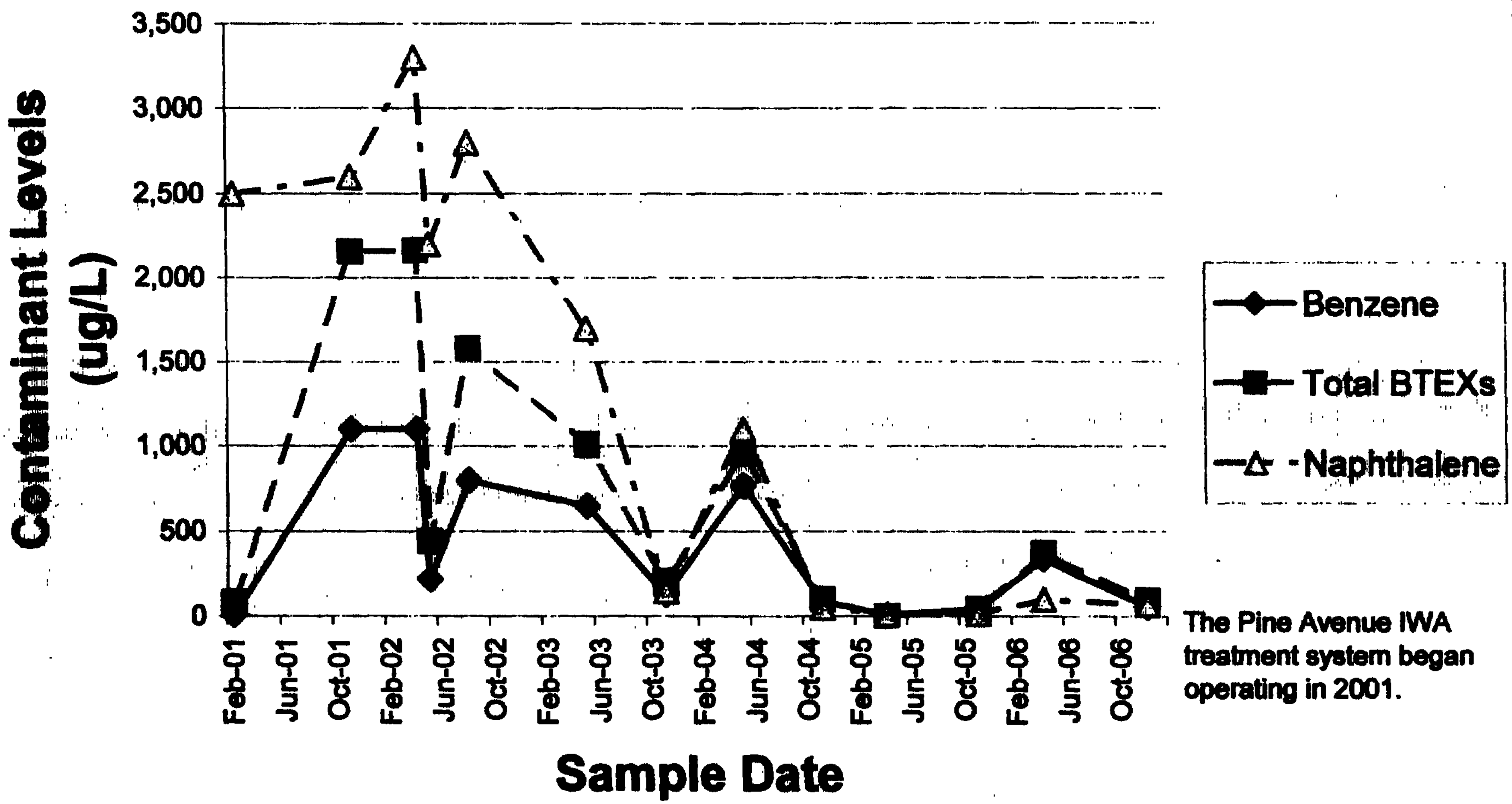
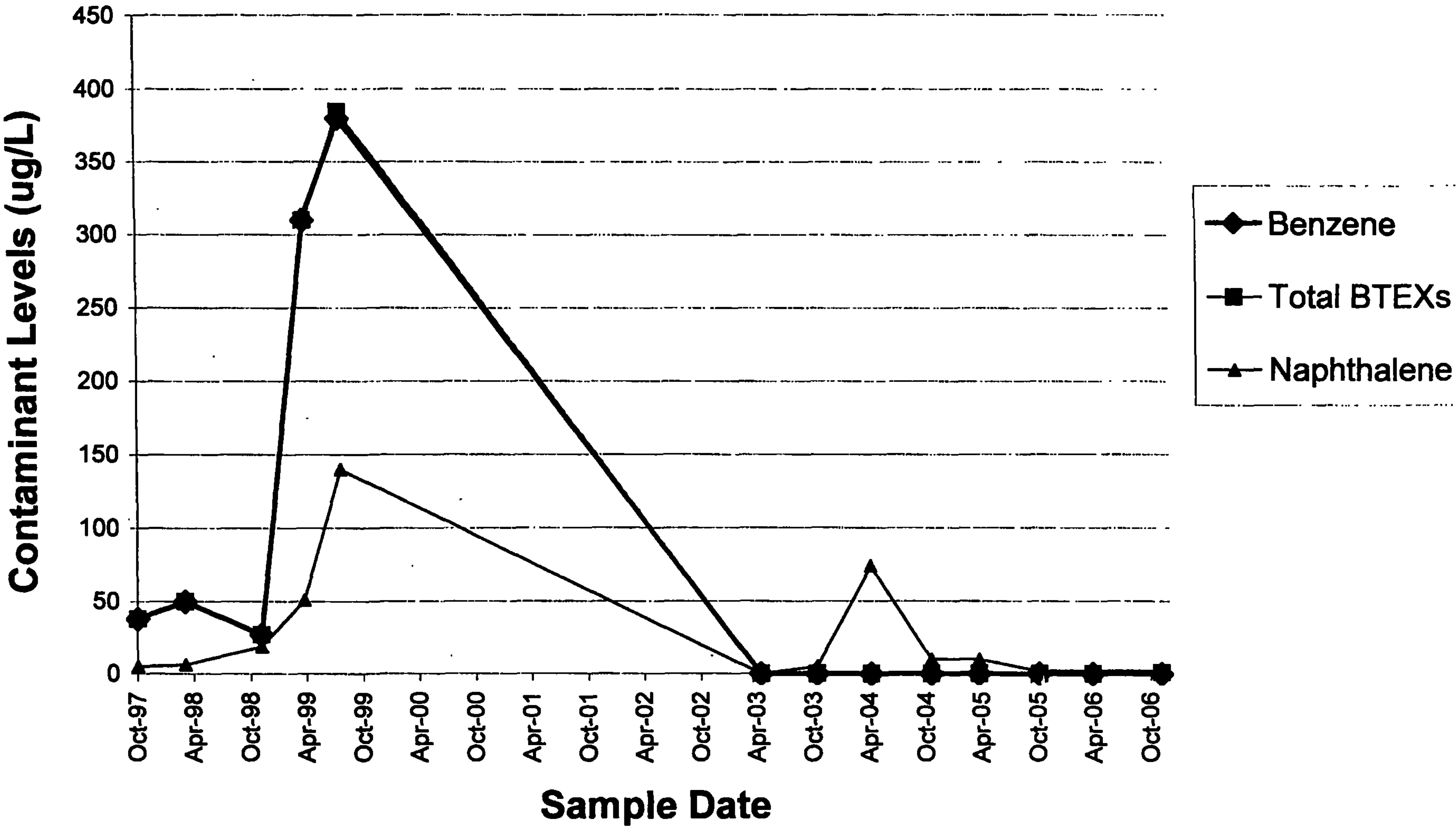


Figure 29
Well SW-05S



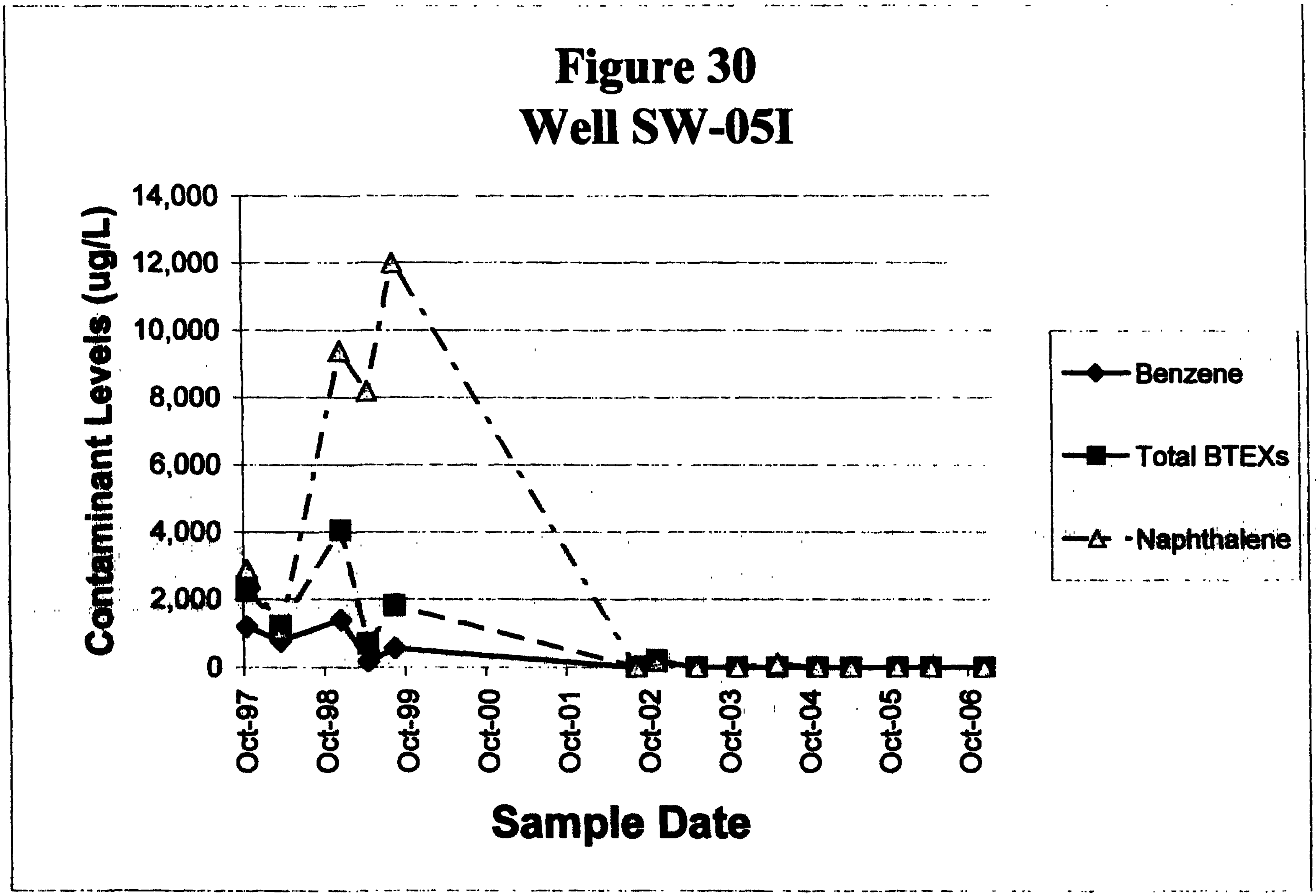


Figure 30
Well SW-05I
Contaminant Levels (ug/L)
14,000
12,000
10,000
8,000
6,000
4,000
2,000
0
Oct-97
Oct-98
Oct-99
Oct-00
Oct-01
Oct-02
Oct-03
Oct-04
Oct-05
Oct-06
Sample Date
Benzene
Total BTEXs
Naphthalene

Figure 31
Well SW-06I

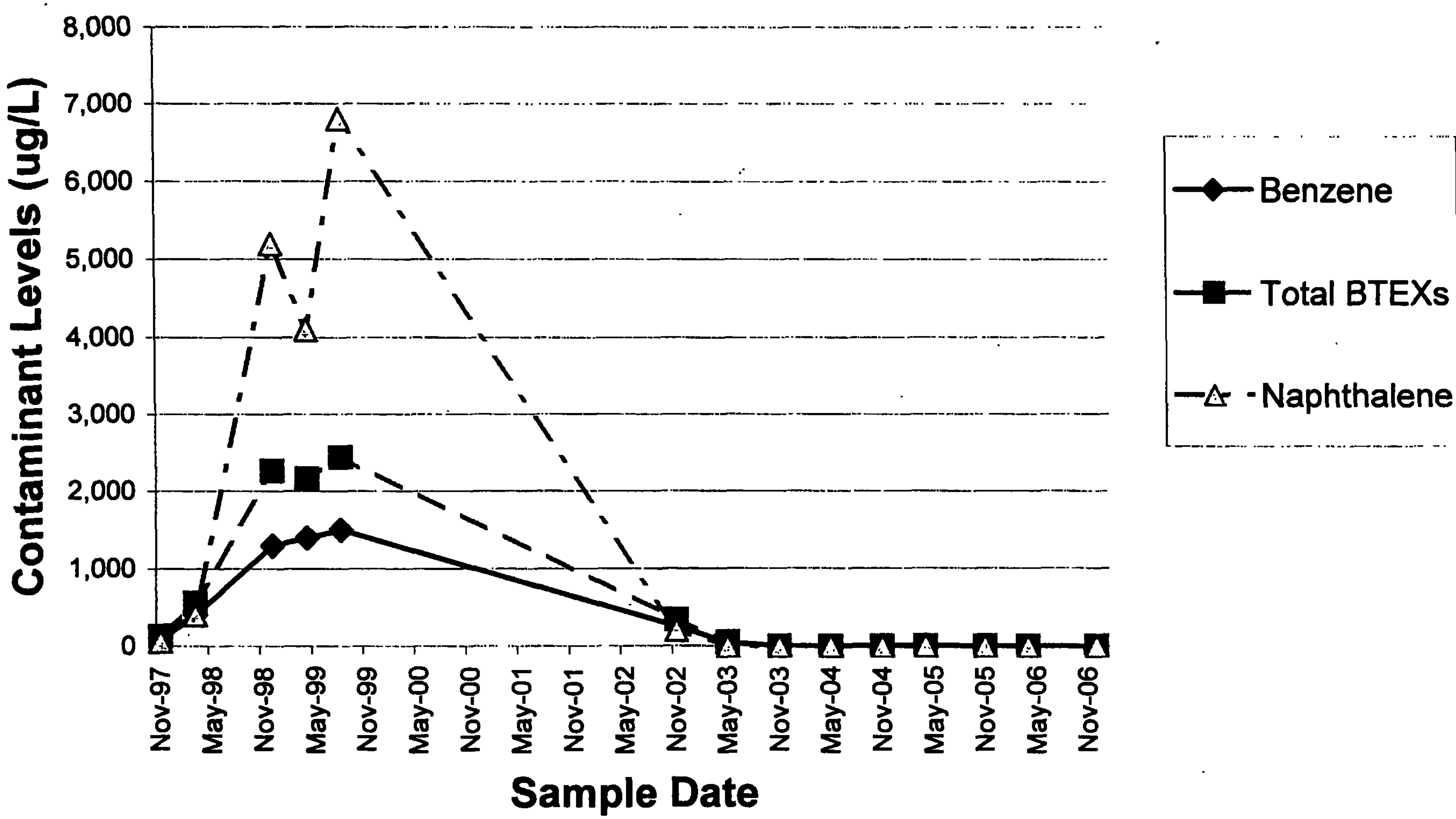


Figure 32
Well SW-07I

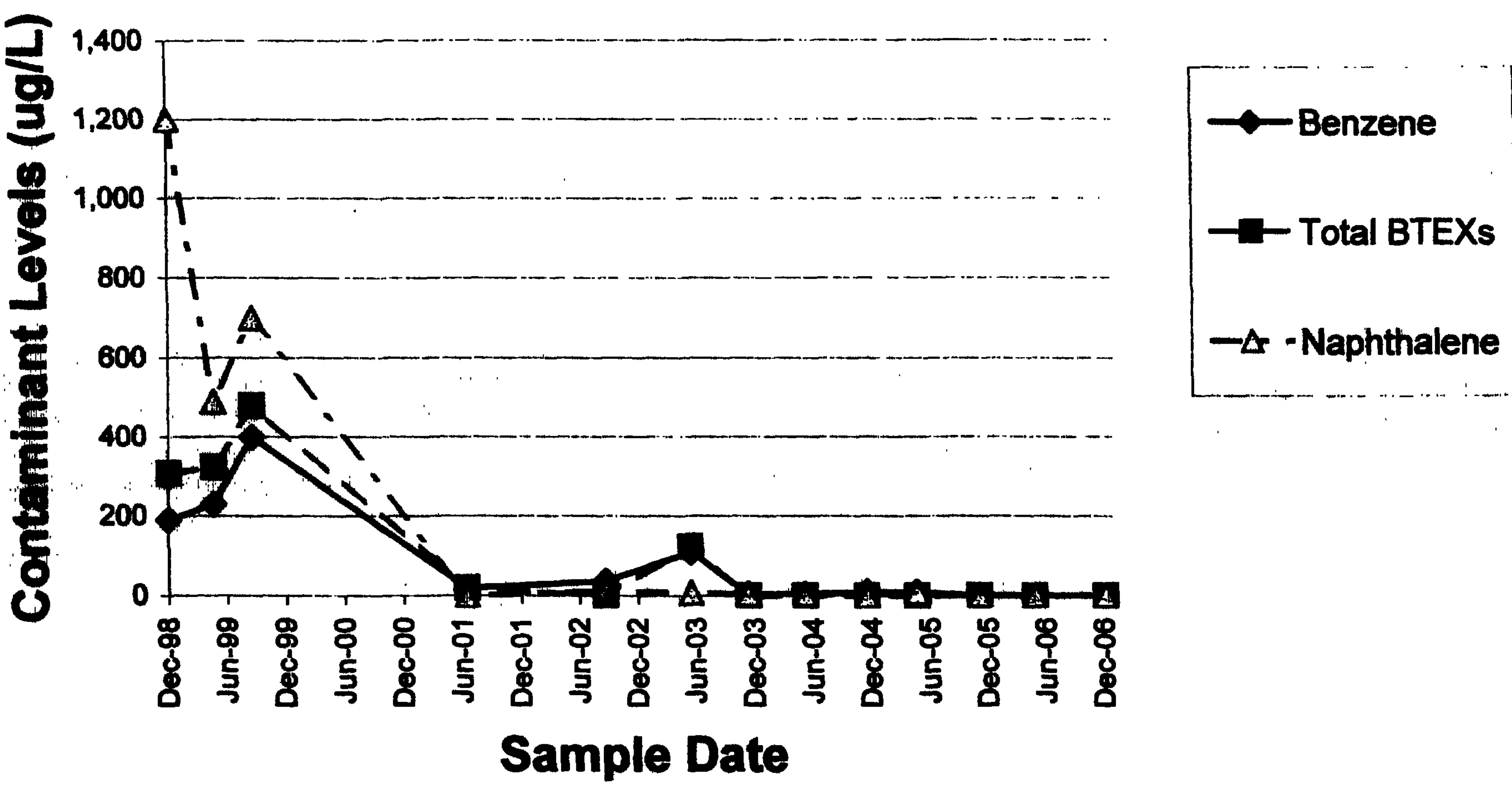


Figure 33
Well SW-8I

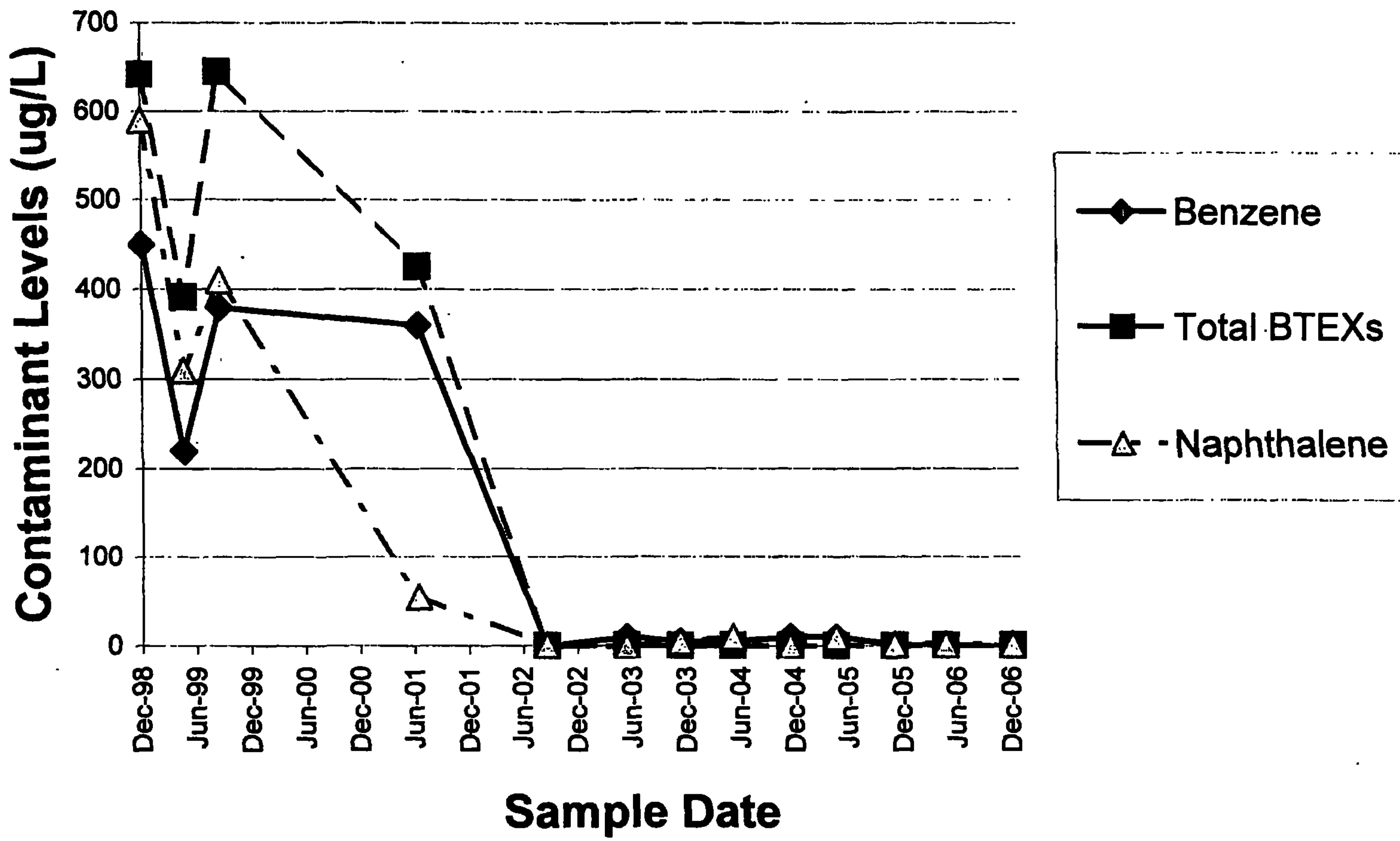


Figure 34
Well BW-13S

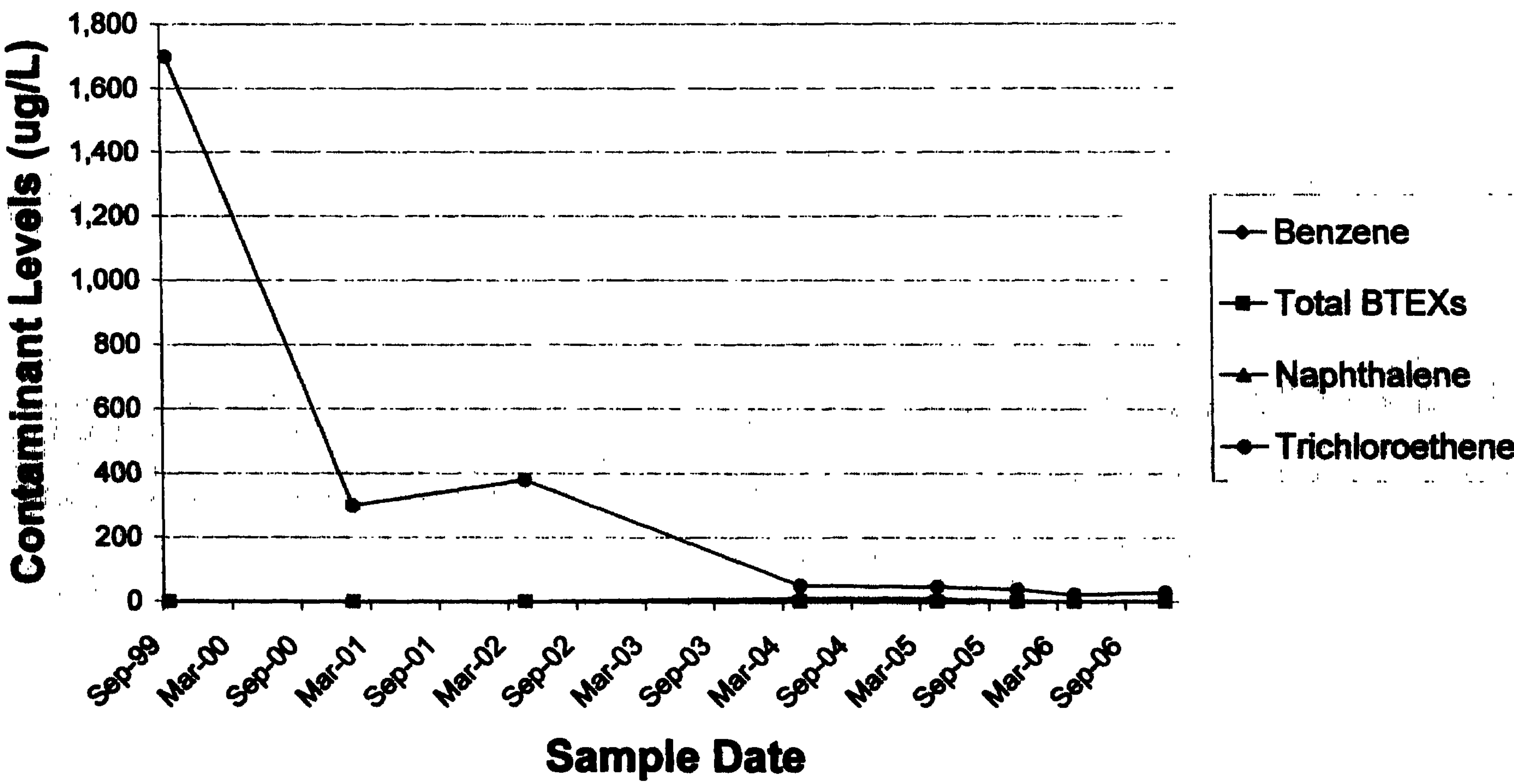


Figure 35
Well BW-13I

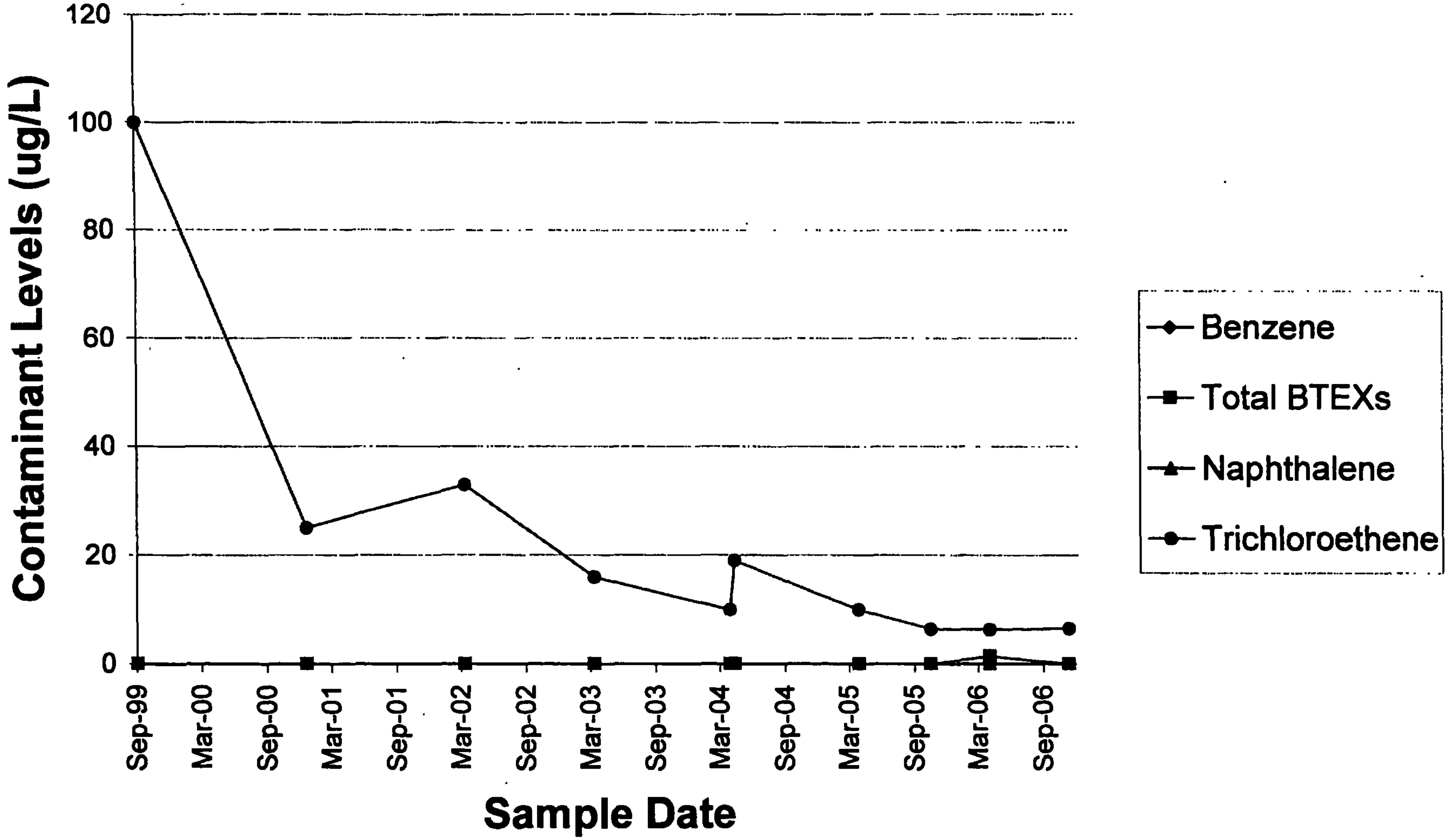
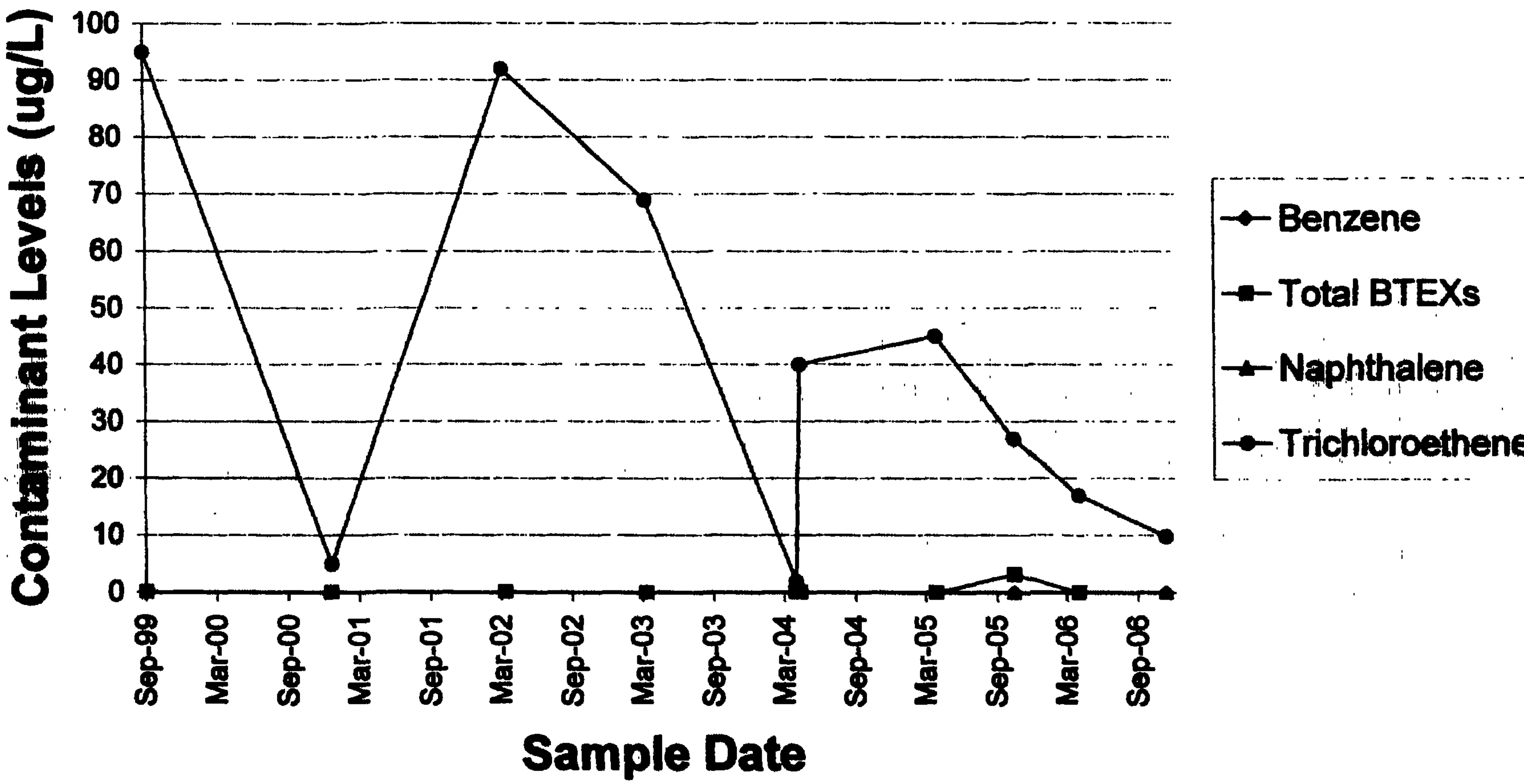


Figure 36
Well BW-13D



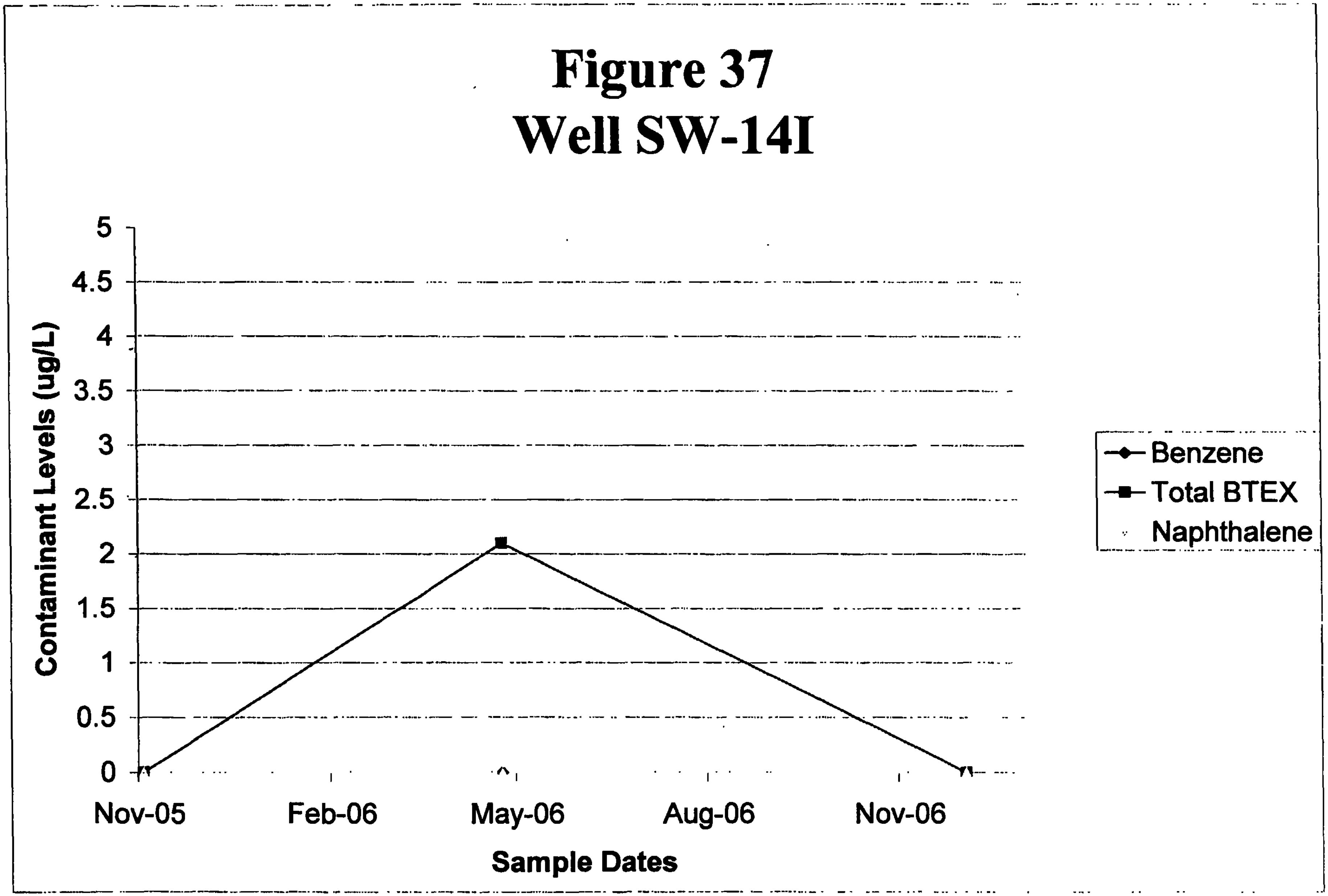


Figure 37
Well SW-14I
Contaminant Levels (ug/L)
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
Nov-05
Feb-06
May-06
Aug-06
Nov-06
Sample Dates
Benzene
Total BTEX
Naphthalene

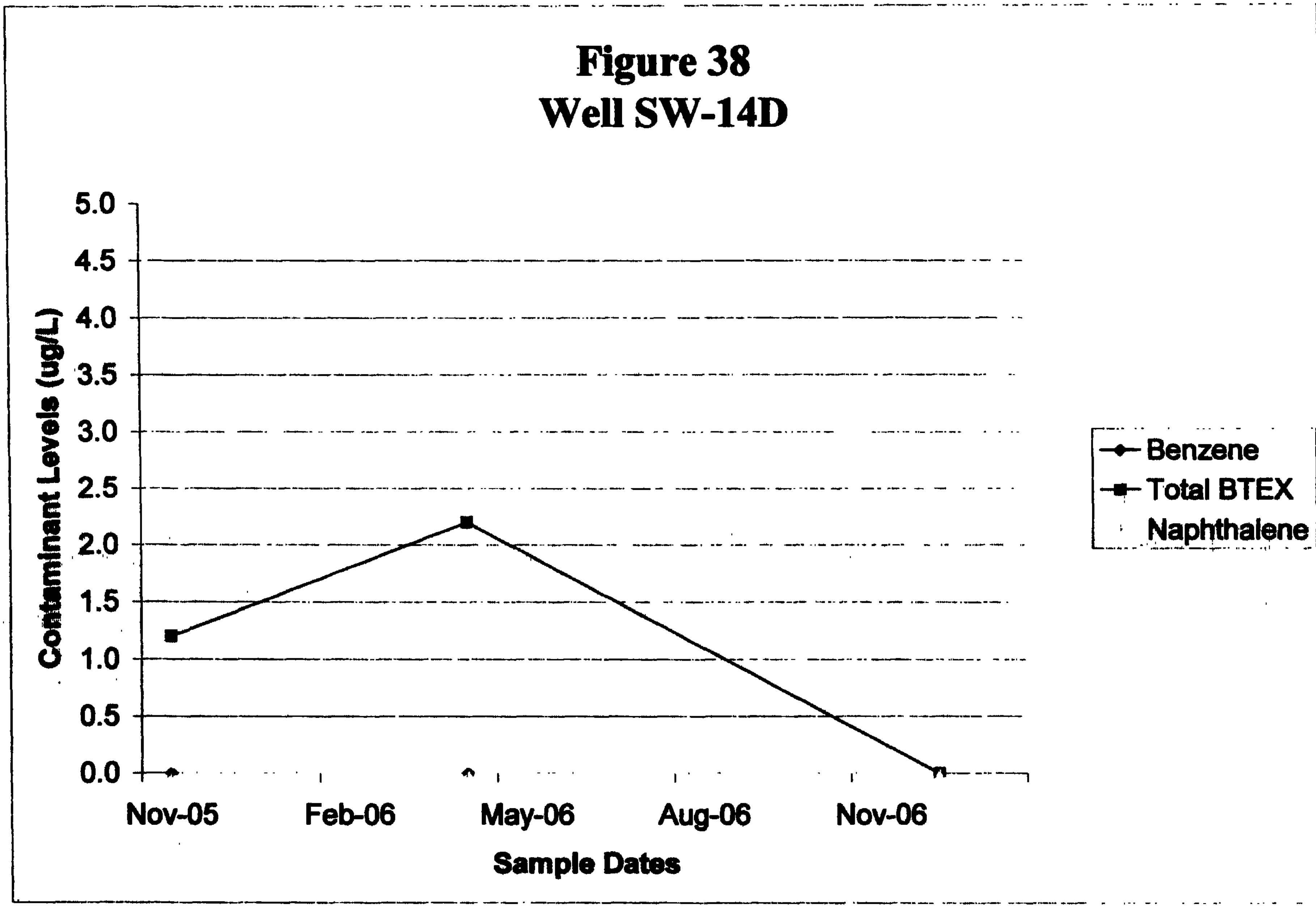
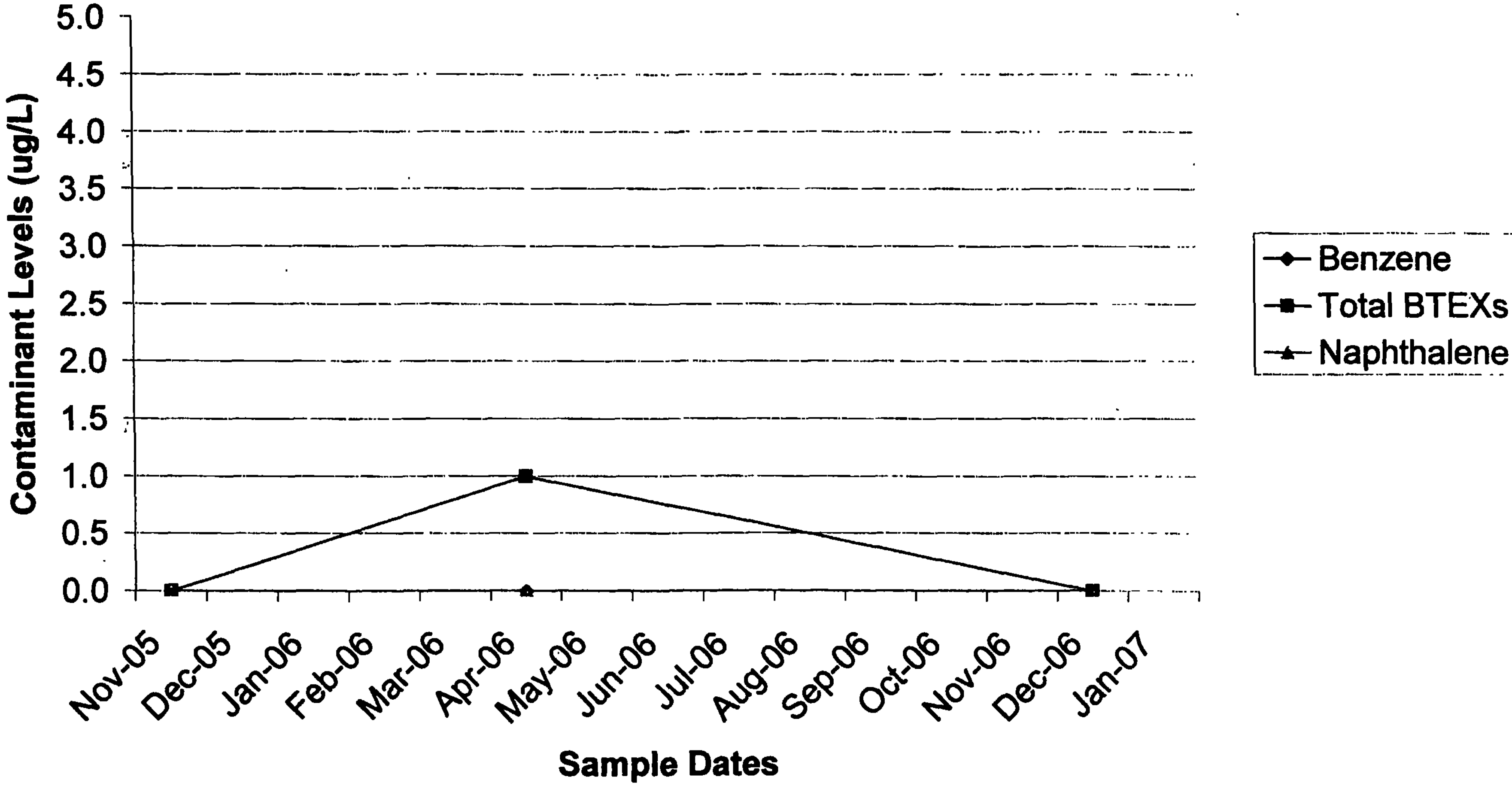


Figure 38
Well SW-14D
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Contaminant Levels (ug/L)
Nov-05
Feb-06
May-06
Aug-06
Nov-06
Sample Dates
Benzene
Total BTEX
Naphthalene

Figure 39
Well SW-15I



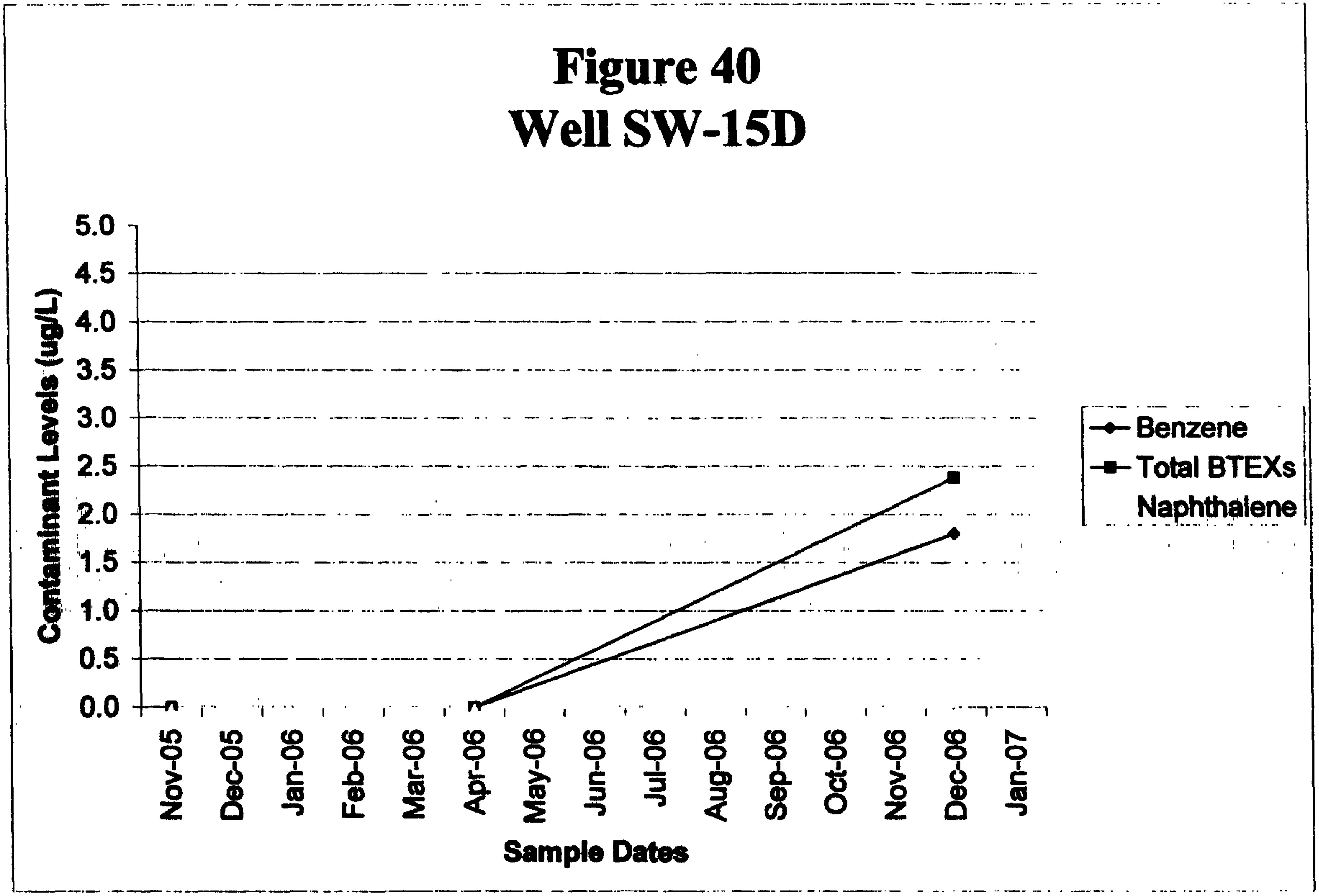


Figure 40
Well SW-15D
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Contaminant Levels (ug/L)
Nov-05
Dec-05
Jan-06
Feb-06
Mar-06
Apr-06
May-06
Jun-06
Jul-06
Aug-06
Sep-06
Oct-06
Nov-06
Dec-06
Jan-07
Sample Dates
Benzene
Total BTEXs
Naphthalene

Figure 41
Well MW-13

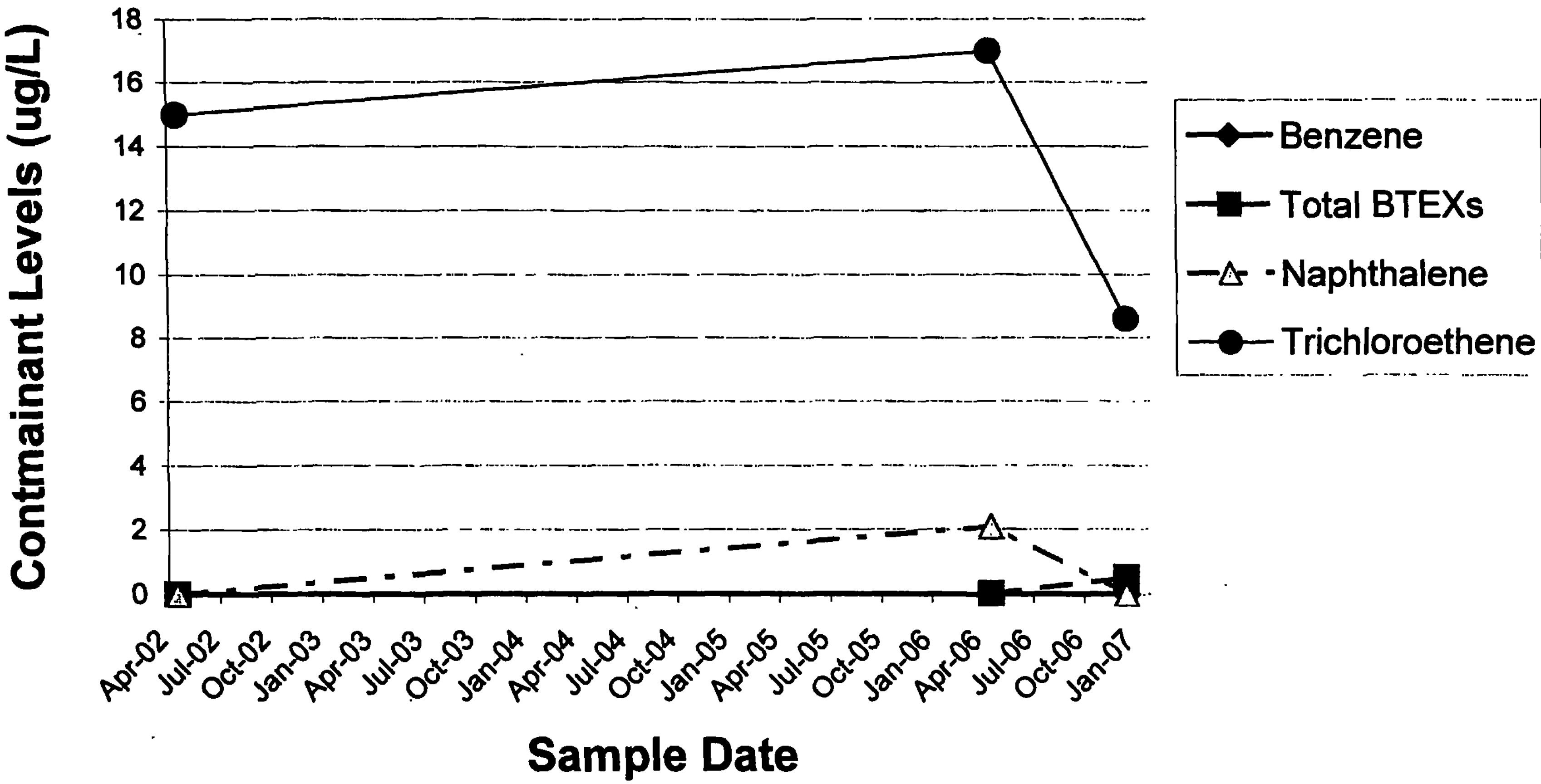
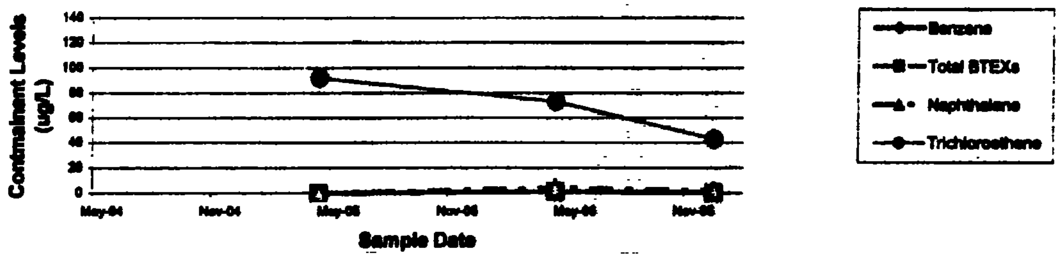
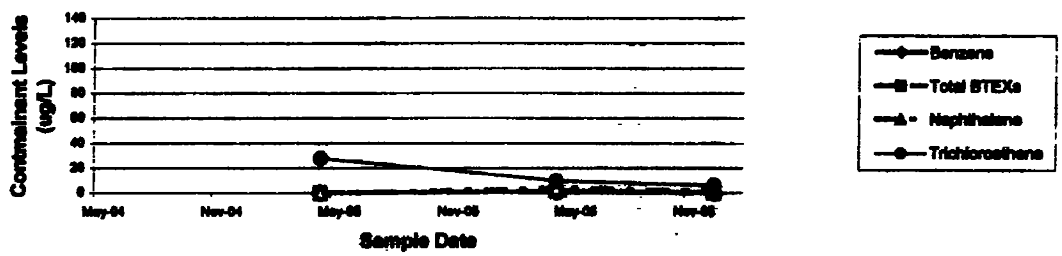


Figure 42
Well MLW-1

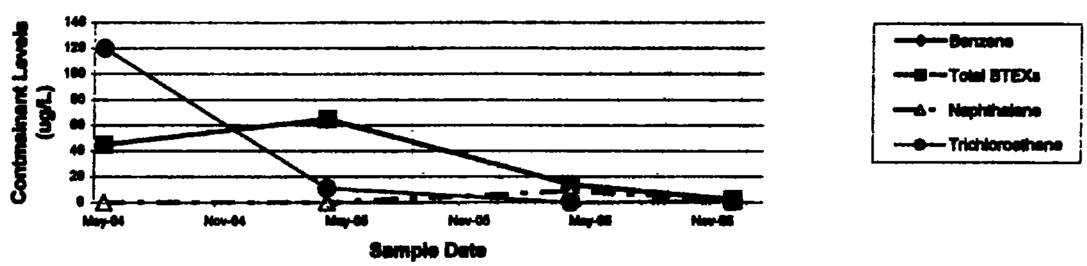
(148 to 158 feet)



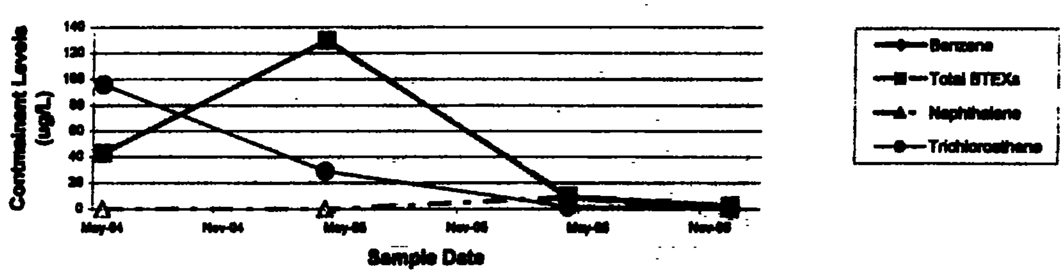
(165 to 180 feet)

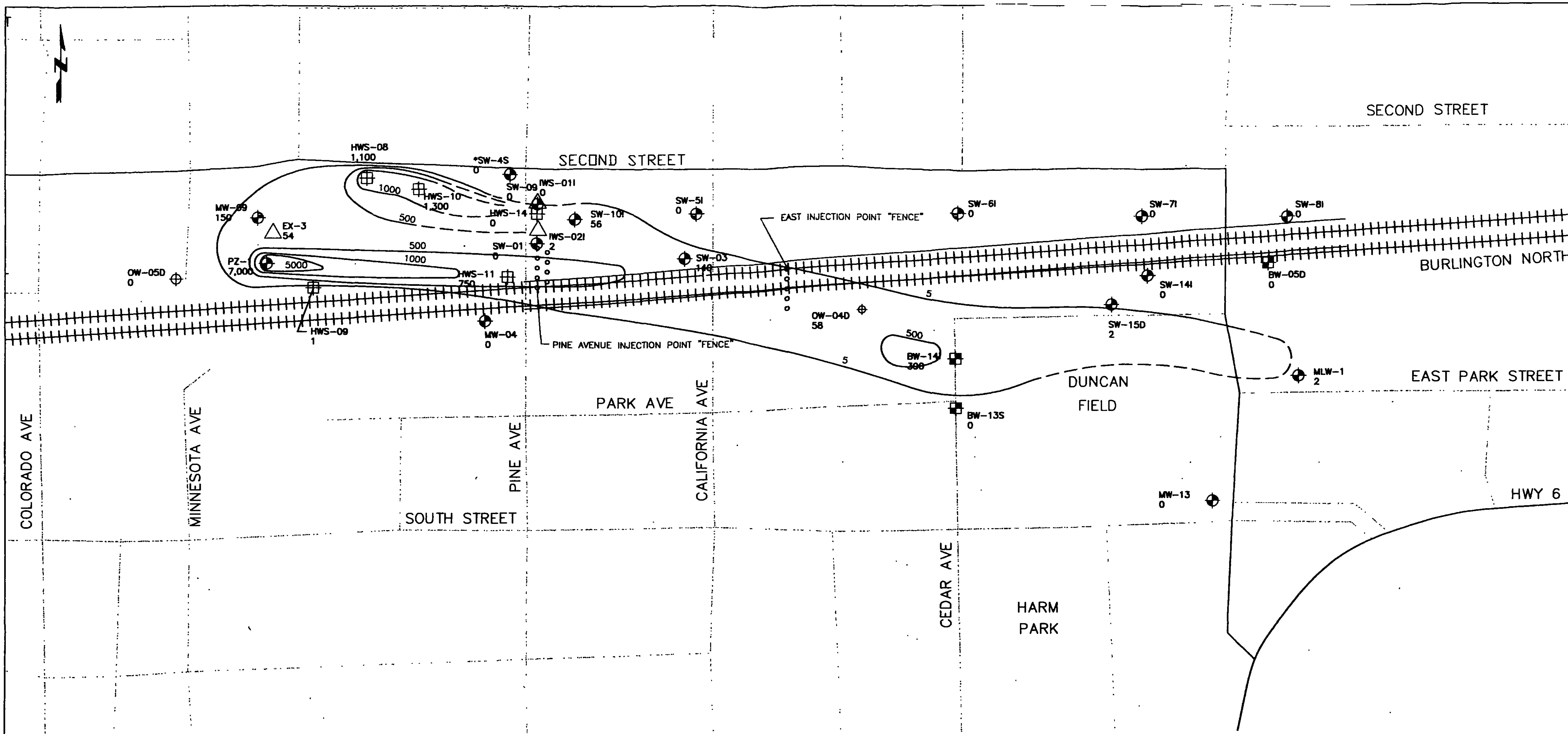


(186 to 196 feet)



(200 - 220 feet)





NOTE:

1. THE 1,000 AND 500 ug/L CONTOURS FOR HWS-8 AND HWS-10 ARE CUT OFF AT PINE AVENUE BECAUSE OF THE TWO IWA TREATMENT WELLS AT PINE (IWS-01 AND IWS-02).

LEGEND:

- 10 ⊕ EPA MONITORING WELL & BENZENE CONCENTRATION, IN ug/L
- 10 ⊕ STATE MONITORING WELL & BENZENE CONCENTRATION, IN ug/L
- 10 ⊞ FOOTE OIL MONITORING WELL & BENZENE CONCENTRATION, IN ug/L
- 10 △ EXTRACTION WELL & BENZENE CONCENTRATION, IN ug/L
- ESTIMATED BENZENE CONCENTRATION CONTOUR (ug/L)

FIGURE 46
BENZENE CONTOURS FOR
NOVEMBER/DECEMBER, 2006
SECOND STREET LTRA

PLOTTER: HP1055 TABLE: Half PLOT SCALE: 1=1 Original dwg size 17 x 11 Revised By: ...2908 ON Mar 14, 2007 @ 7:58am
Drawing: Z:\Projects\44718-Hastings, NE\Dwg\C0008167.dwg ACAD 16.1s (LMS Tech) Plot By: new02908 Mar 14, 2007, 12:47pm Attached Xref: X-Survey; XSITE: 2340486; X-WELLS

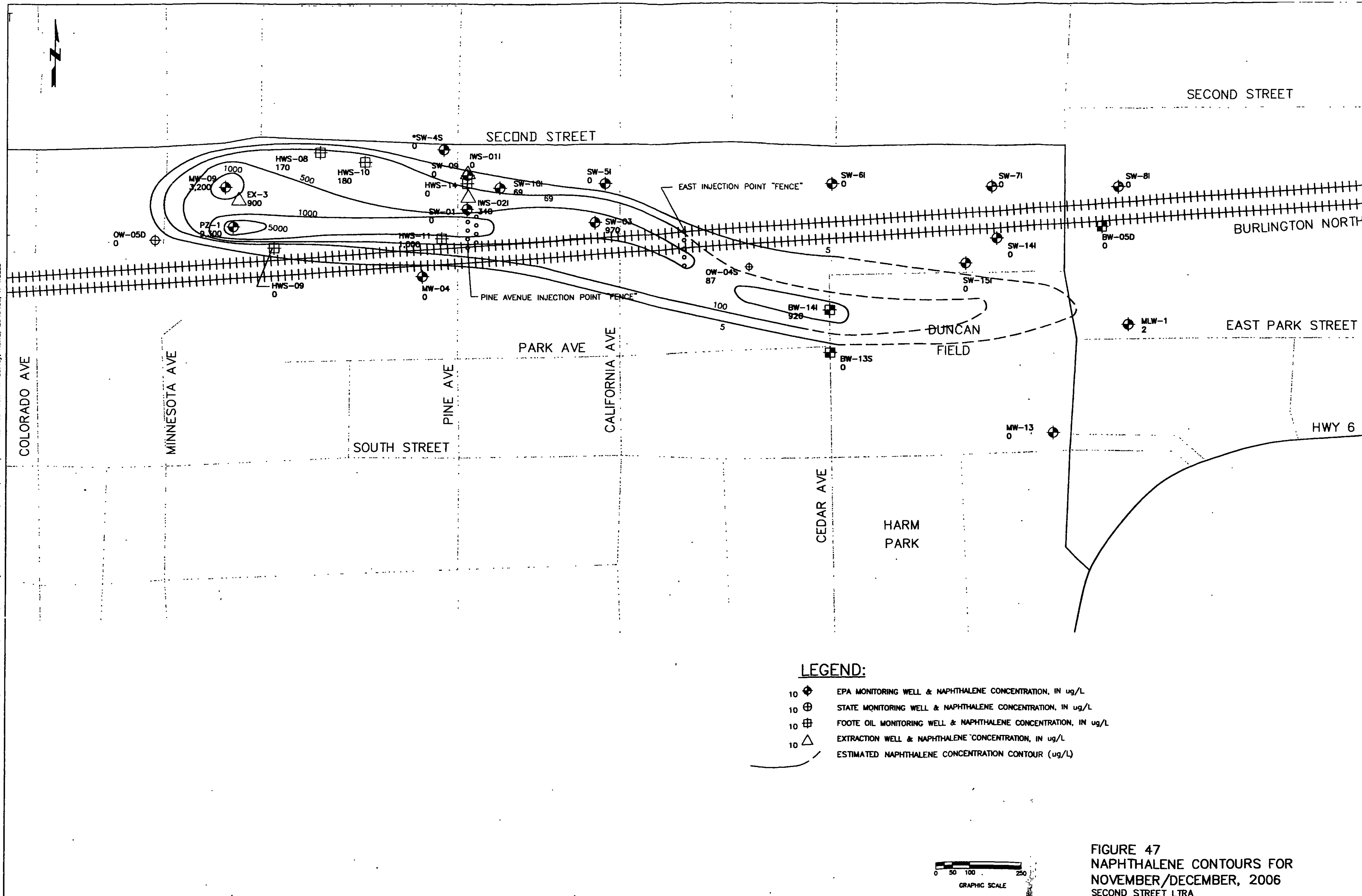
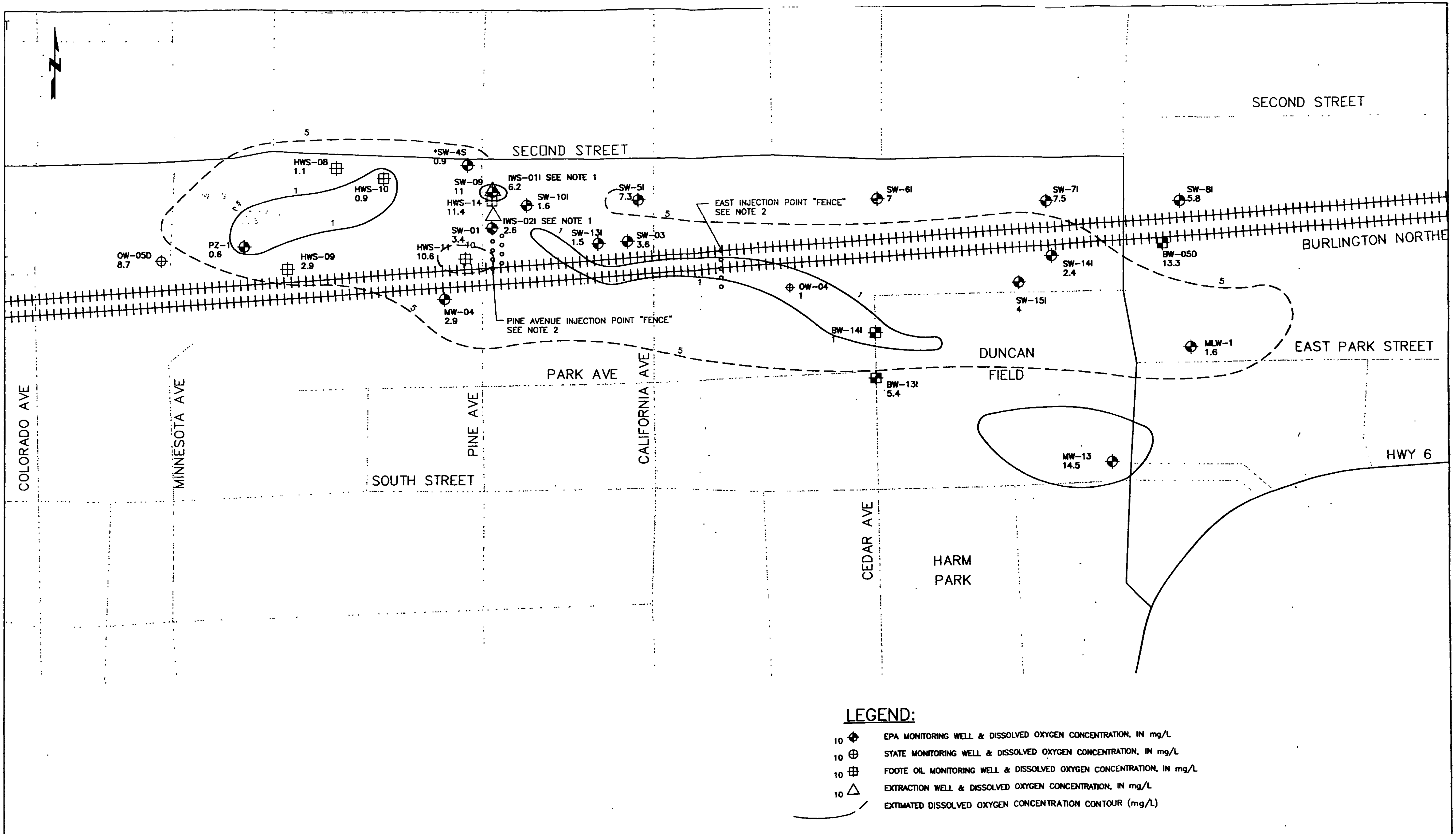


FIGURE 47
NAPHTHALENE CONTOURS FOR
NOVEMBER/DECEMBER, 2006
SECOND STREET LTRA

PLOTTER: HP1055 TABLE: Half PLOT SCALE: 1=1 Original dwg size 17 x 11 Revised By: ...908 ON Mar 14, 2007 @ 12:46pm
Drawing: Z:\Projects\44718-Hastings, NE\Drg\C0008166.dwg ACAD 16.1s (LMS Tech) Plot By: new02908 Mar 14, 2007, 12:47pm Attached Xref: X-Survey; XSITE; 2340486; X-WELLS



NOTE:

1. IWS WELLS ARE DESIGNED TO OXYGENATE GROUNDWATER. THE OXYGENATION PROCESS RESULTS IN FLUCTUATIONS IN DISSOLVED OXYGEN CONCENTRATION IN THIS AREA.

2. SLOW OXYGEN RELEASE CHEMICAL INJECTED THROUGH POINTS. DO AT INJECTION POINTS 19.99 mg/L.

FIGURE 48
DISSOLVED OXYGEN CONTOURS FOR NOVEMBER/DECEMBER, 2006
SECOND STREET LTRA

Appendix 4/b

"Jeremy Groves" <jgroves@cityofhastings.org>

07/13/2007 10:03 AM

To Brian Zurbuchen/SUPR/R7/USEPA/US@EPA

cc

bcc

Subject FW: 5 yr review

Jeremy T. Groves
Environmental Engineering Assistant
City of Hastings
220 North Hastings Ave. I Hastings, Nebraska 68901
P 402.461.2339 I F 402.461.2323
jgroves@cityofhastings.org I www.cityofhastings.org

-----Original Message-----
From: Brian E Steffes [mailto:BSTEFFES@mbakercorp.com]
Sent: Friday, July 13, 2007 6:52 AM
To: Jeremy Groves
Subject: Fwd: 5 yr review

Jeremy,

Here is the original email and attachments. Pls forward to Brian Zurbruchen (I don't have his email).

Darrell had asked me to break out the costs on Table 2 by Operable Unit, and I am still awaiting some financial info from Dravo to do that, but haven't received it yet, so the table has not been revised. I will resend the table when I can.

Let me know if there is anything else I can do.

I plan on being in Hastings next week and will try to stop by and say Hi.
Brian

Brian E. Steffes, P.G.
Michael Baker Jr., Inc.
100 Airside Drive
Moon Twp., PA 15108
(412) 269-6013
Fax (412) 375-3996
bsteffes@mbakercorp.com

----- Message from "Brian E. Steffes" <BSTEFFES@mbakercorp.com> on Mon, 12 Mar 2007 09:22:03 -0500 -----

To: "Jeremy Groves" <jgroves@cityofhastings.org>

cc: <Lisa.Potts@carmeusena.com>, <Stephen.Smith@carmeusena.com>, "Christine Harwood" <CHARWOOD@mbakercorp.com>

Subject: 5 yr review

Jeremy,
Attached are items requested from Dravo Corp. for the Colorado Ave. Subsite for the 5 Year Review. I have supplied the following:

* Exhibit 4.1 (including four data summary tables in two Excel files)
* Table 2 - O&M Costs
* Constructor interview questions
* Performance, Operations and Maintenance interview questions
* Chronology of site events

Please let me know if there are other items you need, or if you have any questions.
Brian Steffes

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(412) 269-6013
Fax (412) 375-3996
bsteffes@mbakercorp.com

Exhibit 4-1.doc Exhibit 4_1 IWA Vapor Table.xls Exhibit 4_1 SVE Tables.xls

→ see Appendix 5b

Table 2_Costs.xls Constructor Interview.doc
Five Yr Review Chronology of Site Events.doc P,O&M Interview Questions.doc

→ see Appendix 2

FIVE YEAR REVIEW

Exhibit 4-1: Three Questions Used to Determine Whether Remedy is Effective
Colorado Avenue Subsite
Dravo Corporation
Hastings, Nebraska
February 2007

Note: The Colorado Avenue Subsite is comprised of two Operable Units (OUs). OU 1 is the groundwater operable unit and OU 9 is the soils operable unit. The following discussions are broken into OU 1 and OU 9 as applicable.

Question A: Is the remedy functioning as intended by the decision documents?

Yes. The remedy at the Colorado Avenue Subsite consists of several operating remedial components, including the Phase I SVE system (OU 9), the Phase II IWA system (OU 1) and the Phase III IWA system (OU 1), and one remedial action under construction (Phase II SVE system) (OU 9).

OU 9 (Soil)

Phase I SVE

The Phase I SVE system was installed and has been operating at Areas 1, 2 and 3 since 1996. The Phase I SVE system at Area 1 includes SVE wellheads 4D, 5M, 6D and 7M, and monitoring probes 7D, 8D, 9D and 10D. The Phase I SVE system at Area 2 includes SVE wellheads 8D, 9M, 10D and 11M, and monitoring probes 11D, 12D, 13D and 14D. The Phase I SVE system at Area 3 includes SVE wellheads 1H (horizontal well), 2D and 3M, and monitoring probes 1D, 2D, 3S, 4S, 5S and 6S.

Attached Tables 1 and 2 present the results of historical vapor samples collected from the SVE monitoring probes and SVE wellheads, respectively. The tables document the significant reduction in contaminants of concern (COCs) throughout the treatment area, such that by 2001, only wellheads 3M, 5M, 8D, 9M, 10D and 11M were still being operated. After additional sampling conducted in April 2005, only wellheads 7M, 9M 10D and 11M were recommended for operation. The entire Phase I SVE system was put into a rest mode in December 2006 pending completion of the Phase II SVE system.

When operating, the system is checked each work day and operating parameters documented. Maintenance items are addressed on a routine basis or as they occur. Dravo previously utilized a local operator to conduct the routine checks, but this function is currently being handled by the City of Hastings.

Phase II SVE

The Phase II SVE system is currently under construction. The Phase II SVE is intended to address Areas A, E and F. Area A is defined as the shallow soils beneath the Marshalltown Instruments building. Investigations have identified historical operations at this facility as the primary source for solvent contamination. Area E is an open ditch located between Minnesota Avenue on the west and the former Union Pacific (UP) railroad bed on the east. The storm sewer discharges into this ditch and the ditch terminates into another underground storm sewer pipe. Area F is defined as the area bounded by the former UP railroad track on the west, the Burlington Northern (BN) railroad track on the north, Pine Street to the east, and residential properties to the south. When completed, the Phase II SVE will consist of two wellheads (12S and 13S) within Area A and four associated vent wells. Area E will receive three wellhead pairs (16S/17M, 18S/19M and 20S/21M) and one vent well. Area F will receive two wellheads (14S and 15S) and two monitoring probes (15S and 16S). The Phase II SVE system will be plumbed into the existing treatment shed.

The PRP performing the work has serious reservations that the proposed remediation will be effective for Areas A and E. Additionally, the need for remediation in these areas is questionable at best.

OU 1 (Groundwater)

Phase I – Air Sparge

The Phase I Air Sparge system was installed in the area of the Phase II SVE system but never operated. The interim standards for soil were lower than the interim standards for groundwater. It was of concern that the operation of the air sparge could have the potential to drive contamination from groundwater into soils. Therefore, the system was never operated.

Phase II IWA

The Phase II IWA systems were installed and have been operating since 1999. A two-well IWA system (IWA-1 and IWA-2) was constructed on the west side of Pine Avenue, in the vicinity of MW-22. A single-well IWA system (consisting of IWA-3) was constructed between California Avenue and Cedar Avenue, adjacent to Duncan Field. Phase II was constructed to focus on the mass removal of TCE within the 5,000 μg/L TCE isoconcentration contour. Other COCs treated and monitored at the Subsite include 1,1,1- TCA, PCE, 1,1-DCE, and 1,2-DCA.

Attached Table 3 presents the results of historical vapor samples collected from the Phase II IWA system. The results document the significant reduction in COC concentrations. The Phase II systems have reduced the COCs within the treatment area to below the performance standards established for the subsite, such that IWA-1 and IWA-2 are in a rest mode pending approval of beginning standby status. The carbon units at IWA-1 and IWA-2 (two units of 2,000-lb each) have never been replaced. However, the system is in a resting mode and, therefore, it is likely that the vapor from the annual week of operation (as required in standby status) will not require treatment (based on the extremely low levels of COCs remaining in vapor samples) and will be vented to the atmosphere. The carbon units will be removed at a future date.

The carbon canisters at IWA-3 were replaced July 18, 2005, and this portion of the Phase II system continues to recover minimal amounts of VOCs from the groundwater (less than 5 pounds during the period of July 1, 2005 to January 31, 2007). The vapor influent sampling results at IWA-3 indicate that asymptotic conditions have been reached or are decreasing dramatically. In addition, groundwater concentrations are well below interim standards. It has been requested that standby status for this system be initiated in the near future. As required by the CD SOW, the USEPA should notify Dravo in writing that the standby process can proceed. Approximately 99.3 million gallons of groundwater were treated by the Phase II IWA systems during July 1, 2005 to January 31, 2007.

When operating, the system is checked each work day and operating parameters documented. Maintenance items are addressed on a routine basis or as they occur. Static and operating water level measurements collected at IWA-3 on a monthly basis (they are not being collected at IWA-1 and IWA-2). Dravo utilizes a local operator to conduct the routine checks and maintenance issues.

Phase III IWA

The Phase III systems have been operational since November 2002. A three-well IWA system (consisting of IWA-4, IWA-5, and IWA-6) was constructed on the east side of Sixth Avenue, in the vicinity of MW-19. A single-well IWA system (consisting of IWA-7) was constructed along South Street, due south of the Sixth Avenue system. The Phase III interim groundwater remediation design focuses on containment of the TCE plume exceeding the 290 µg/L TCE isoconcentration contour at locations west of the North Landfill.

Attached Table 4 presents the results of historical vapor samples collected from the Phase III IWA system. The results document the significant reduction in COC concentrations. Although there were past performance issues based on carbon saturation, this problem has been resolved and carbon at the Phase III IWA systems is changed out routinely before the carbon has been saturated, therefore ensuring efficiency of the treatment systems.

Mass removal estimates indicated that approximately 194 pounds of VOCs were removed during July 1, 2005 to January 31, 2007, of which TCE comprised 77 percent. The Phase III system accounted for 98 percent of the mass removed, again indicating that the Phase II systems should be placed in standby status. Approximately 215 million gallons of groundwater were treated by the Phase III IWA systems during July 1, 2005 to January 31, 2007.

The carbon units (two units of 300 lbs each at IWA-4,5&6 and two units of 180 lbs each at IWA-7) are currently changed every two months.

When operating, the system is checked each work day and operating parameters documented. Maintenance items are addressed on a routine basis or as they occur. Static and operating water level measurements are collected on a bi-monthly basis. Vapor samples are collected at the Phase III IWA systems 30 days after carbon change outs. Dravo utilizes a local operator to conduct the routine checks and maintenance issues.

Question B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives used at the time of the remedy selection still valid?

Yes. There have been no significant changes in the standards for the COCs, including toxicity factors, nor have new contaminants or contaminant sources been identified. Land use in the vicinity of the site remains the same with no new uses anticipated that would affect the remedy. No new human health or ecological exposure pathways have been identified. Therefore the remedy remains suitable.

Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

No. The remedy continues to function as designed and is successfully reducing contamination in the source area and in the groundwater plume. Issues regarding ineffectiveness of the carbon units due to saturation have been addressed by routine influent, intermediate and effluent vapor testing and replacement of the carbon prior to saturation.

TABLE 3
IWA VAPOR SAMPLE RESULTS
PHASE II IWA SYSTEMS
COLORADO AVENUE SUBSITE
HASTINGS, NEBRASKA

Vapor Sample Location	Date of Sample	Vapor Analytical Results (ppbv)				
Pine Avenue (IWA 1,2) -- Phase 2		**TCE**	**PCE**	**1,1,1-TCA**	**1,1-DCE**	**1,2-DCA**
Influent	7/23/2003	94	10 U	23	59	10 U
Influent	10/1/2003	42	10 U	24	10 U	10 U
Influent	10/28/2003	47	1.9	25	35	0.5 U
Influent	1/1/2004	55	5 U	68	100	5 U
Influent	4/22/2004	88	3.6	31	68	2.5 U
Influent	4/21/2005	150	2.8 U	17	75	2.8 U
Influent	2/8/2006	180	4.8 U	19	67	4.8 U
Effluent	4/21/2005	140	1.6 U	13	73	16
Effluent	2/8/2006	220	4.8 U	23	79	4.8 U
Cedar Avenue (IWA-3) -- Phase 2		**TCE**	**PCE**	**1,1,1-TCA**	**1,1-DCE**	**1,2-DCA**
Influent	7/23/2003	170	10 U	24	48	10 U
Influent	10/1/2003	150	10 U	20	70	10 U
Influent	10/28/2003	460	13	60	100	7
Influent	1/1/2004	990 E	5 U	310	320	7.2
Influent	4/22/2004	330 D	6.1	41	63	3.3
Influent	4/21/2005	490	6.5 U	140	130	10
Influent - Duplicate	4/21/2005	480	6.9 U	160	140	7.7
Influent	12/1/2005	6.2	0.49	0.085 J	0.16 J	1.9
Influent - Duplicate	12/1/2005	6.7	0.58	0.090 J	0.17 J	2.2
Influent	5/9/2006	3.1	0.24	0.093	0.22	2.7
Influent	10/23/2006	130	0.84	6.2	2	3.2
Effluent	4/21/2005	490	6.8 U	150	130	9.2
Effluent	12/1/2005	0.31 U	0.31 U	0.31 U	0.31 U	0.31 U
Effluent	5/9/2006	0.20 U	0.20 U	0.041 J	0.15	1.9
Effluent	10/23/2006	14	2.0 U	0.59	0.9	2.6
Intermediate	10/23/2006	0.82	1.9 U	1.9 U	0.78	1.9 U

Notes:
All sampling was performed using a summa cannister.
ppbv--parts per billion by volume
E--Estimated concentration; the reported value exceeds the upper limit of the calibration.
D--Concentration reported from a diluted sample
U--Not detected

TABLE 1

COMPARISON OF RESULTS TO HISTORICAL VAPOR DATA - MONITORING PROBES
COLORADO AVENUE SUBSITE, HASTINGS, NEBRASKA
DRAVO CORPORATION

Sample Media/Area	Monitoring Probe	Sample Depth (ft bgs)	Sample Date	Trichloroethene (TCE)	1,1-Dichloroethene (1,1-DCE)	1,2-Dichloroethane (1,2-DCA)	1,1,1-Trichloroethane (1,1,1-TCA)	Tetrachloroethene (PCE)
COMPARISON CRITERIA		NA		250	1,500	100	15,000	300
Soil Gas Area 2	MP-11D	25	Sep-96	2000	ND	ND	400	ND
			Dec-97	ND	ND	ND	ND	ND
			Apr-05	200	3.6 U	3.6 U	17	34
	MP-11D	45	Sep-96	2900	ND	ND	700	ND
			Dec-97	ND	ND	ND	ND	ND
			Apr-05	16	0.22 J	0.67	4	7
	MP-11D	60	Sep-96	6100	ND	ND	1700	1500
			Dec-97	ND	ND	ND	ND	20 J
			Apr-05	530	9.2 U	9.2 U	14	470
	MP-11D	85	Sep-96	20500	ND	ND	2100	ND
			Dec-97	ND	ND	ND	ND	20 J
			Apr-05	110	2.2 U	2.2 U	8.1	32
	MP-11D	110	Sep-96	10000	ND	ND	1200	ND
			Dec-97	ND	ND	ND	ND	20 J
			Apr-05	41	0.92	1.4	7.1	13
			Apr-05 (2)	23	0.45	0.57	4.2	13
	MP-12D	25	Sep-96	7700	ND	ND	1500	1700
			Dec-97	ND	ND	ND	ND	ND
			Apr-05	10	0.38 U	0.27 J	1.3	3.7
	MP-12D	45	Sep-96	5900	ND	ND	1300	ND
			Dec-97	ND	ND	ND	ND	ND
			Apr-05	0.55	0.45 U	0.45 U	0.45 U	0.45 U
	MP-12D	60	Sep-96	4600	ND	ND	1000	ND
			Dec-97	ND	ND	ND	ND	ND
			Apr-05	72	0.96 U	0.96 U	4.2	32
	MP-12D	85	Sep-96	3000	ND	ND	600	ND
			Dec-97	ND	ND	ND	ND	ND
			Apr-05	260	7.2 U	7.2 U	3.2 J	360
	MP-12D	110	Sep-96	16800	ND	ND	2000	ND
			Dec-97	ND	ND	ND	ND	ND
			Apr-05	13	0.32 J	0.4	3.6	6.4
	MP-13D	25	Sep-96	5400	ND	ND	900	2200
			Dec-97	120	ND	ND	ND	40 J
			Apr-05	10	0.37 U	0.27 J	4.4	3.8
	MP-13D	45	Sep-96	23300	ND	ND	7600	2800
			Dec-97	840	ND	ND	60	200
			Apr-05	2500	17 J	30 U	570	340
	MP-13D	60	Sep-96	272000	1000	ND	95200	33800
			Dec-97	50	ND	ND	ND	50
			Apr-05	3100	25 J	28 U	1200	76
	MP-13D	85	Sep-96	229000	1700	ND	62600	30100
			Dec-97	ND	ND	ND	ND	ND
			Apr-05	310	2.9 J	6.6 U	190	40
	MP-13D	110	Sep-96	39900	ND	730	5400	3800
			Dec-97	ND	ND	ND	ND	ND
			Apr-05	13	0.38 U	0.51	3.1	4.5
	MP-14D	25	Sep-96	ND	ND	ND	700	3700
			Dec-97	40 J	ND	ND	ND	ND
			Apr-05	620	9.6 U	9.6 U	46	220
	MP-14D	45	Sep-96	ND	ND	ND	800	2900
			Dec-97	ND	ND	ND	ND	40
			Apr-05	280	3.7 U	3.7 U	130	30
	MP-14D	60	Sep-96	3000	ND	ND	900	1500
			Dec-97	ND	ND	ND	ND	ND
			Apr-05	11	0.38 U	0.31 J	3.2	3.8
	MP-14D	85	Sep-96	84500	5600	ND	14600	9000
			Dec-97	560	ND	ND	ND	40 J
			Apr-05	2200	18 U	18 U	470	130
	MP-14D	110	Sep-96	70200	13600	37100	15600	6800
			Dec-97	2300	ND	ND	ND	60
			Apr-05	1600	17 U	17 U	140	350

TABLE 1

COMPARISON OF RESULTS TO HISTORICAL VAPOR DATA - MONITORING PROBES
COLORADO AVENUE SUBSITE, HASTINGS, NEBRASKA
DRAVO CORPORATION

Sample Media/Area	Monitoring Probe	Sample Depth (ft bgs)	Sample Date	Trichloroethene (TCE)	1,1-Dichloroethene (1,1-DCE)	1,2-Dichloroethane (1,2-DCA)	1,1,1-Trichloroethane (1,1,1-TCA)	Tetrachloroethene (PCE)
COMPARISON CRITERIA		NA		250	1500	100	15000	300
Soil Gas Area 3	MP-1D	25	Sep-96	ND	1200	ND	10000	**99700**
			Dec-97	40	ND	ND	1300	**6500**
			Apr-05	5	2 U	0.91 J	120	200
	MP-1D	45	Sep-96	ND	**5000**	ND	**21300**	**132000**
			Dec-97	ND	ND	ND	220	**7100**
			Apr-05	1.2	2	0.96 U	72	70
	MP-1D	60	Sep-96	ND	**8500**	ND	**27700**	**137000**
			Dec-97	ND	ND	ND	980	**22000**
			Apr-05	3.6	5.6	1.9 U	200	110
	MP-1D	85	Sep-96	ND	**11300**	ND	**33900**	**95600**
			Dec-97	50	250	ND	1800	**23000**
			Apr-05	1.2 J	1.1 J	1.7 U	31	110
			Apr-05 (2)	2.6 J	2.3 J	4 U	71	270
	MP-1D	110	Sep-96	ND	**10800**	ND	**39800**	**57100**
			Dec-97	200	ND	ND	ND	280
			Apr-05 (1)	--	--	--	--	--
	MP-2D	25	Sep-96	ND	ND	ND	1000	ND
			Dec-97	ND	ND	ND	ND	ND
			Apr-05 (3)	0.11 J	0.35 U	0.12 J	0.35 U	0.63
	MP-2D	45	Sep-96	ND	ND	ND	1700	ND
			Dec-97	ND	ND	ND	90	ND
			Apr-05 (3)	0.47	0.37 U	0.37 U	1.4	1.1
	MP-2D	60	Sep-96	**400**	**10400**	ND	10100	ND
			Dec-97	ND	ND	ND	ND	ND
			Apr-05 (3)	71	8.1	7.9 U	210	**530**
	MP-2D	85	Sep-96	**1900**	**22900**	ND	**43300**	**1700**
			Dec-97	90	ND	ND	300	40
			Apr-05 (4)	--	--	--	--	--
	MP-2D	110	Sep-96	ND	**11100**	ND	**28300**	**1300**
			Dec-97	ND	ND	ND	ND	ND
			Apr-05 (4)	--	--	--	--	--
	MP-3S	25	Sep-96	ND	**4000**	ND	12900	ND
			Dec-97	ND	ND	ND	ND	40
			Apr-05	--	--	--	--	--
	MP-3S	45	Sep-96	ND	**12800**	ND	**35800**	ND
			Dec-97	ND	ND	ND	120	30
			Apr-05 (1)	--	--	--	--	--
	MP-4S	25	Apr-05	1.3	1.3	0.29 U	14	0.2 JB
	MP-4S	45	Apr-05	4.2	2.5	0.37 U	1.3	0.49 B
	MP-5S	25	Sep-96	**3100**	ND	ND	4600	ND
			Dec-97	60	ND	ND	ND	50
			Apr-05	210	2 U	2 U	36	47
	MP-5S	45	Sep-96	**1000**	ND	ND	5000	ND
			Dec-97	ND	ND	ND	ND	ND
			Apr-05	**330**	7.2 U	7.2 U	46	50
	MP-6S	25	Sep-96	ND	ND	ND	3900	ND
			Dec-97	ND	ND	ND	ND	**310**
			Apr-05	6	0.35 U	0.71	9.3	7.7
	MP-6S	45	Sep-96	ND	**2000**	ND	5400	**3900**
			Dec-97	ND	ND	ND	ND	80
			Apr-05	2.7	0.63	0.35 U	25	3.8 B

Notes:

(1) No Further Sampling Required
(2) Duplicate Sample
(3) Collected using Geoprobe rig
(4) Sample was not collected; malfunctioning probe

BOLD results exceed listed criteria
U - Not detected at associated reporting limit
ND - Not detected; reporting limit unknown
J - Estimated result. Result is less than the reporting limit
B - The associated Method Blank contains the analyte at a reportable level
NFSR - No Further Sampling Required
ft bgs - feet below ground surface
MP - Monitoring Probe

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November 15, 2006

Mr. William Gresham
Remedial Project Manager
U.S. Environmental Protection Agency
Region VII
901 N. Fifth St.
Kansas City, KS 66101

Re: North Landfill/Far-Mar-Co Subsite
Hastings Ground Water Contamination Site
Hastings, NE
MQ-8 quarterly sampling results

Dear Mr. Gresham:

Enclosed are the third quarter results for MQ-8. The well was inaccessible and sampling was delayed until the corn crop was removed from the field.

Sincerely,

Roy F. Spalding, Ph.D.
Project Manager

enclosure
c: G. McClure
A. Stehlik
M. Sullivan
D. Fisher

P.O. Box 266
Raymond, Nebraska
Zip 68428-0266
(402) 783-3931

TABLE 1

COMPARISON OF RESULTS TO HISTORICAL VAPOR DATA - MONITORING PROBES
COLORADO AVENUE SUBSITE, HASTINGS, NEBRASKA
DRAVO CORPORATION

Sample Media/Area	Monitoring Probe	Sample Depth (ft bgs)	Sample Date	Trichloroethene (TCE)	1,1-Dichloroethene (1,1-DCE)	1,2-Dichloroethane (1,2-DCA)	1,1,1-Trichloroethane (1,1,1-TCA)	Tetrachloroethene (PCE)
COMPARISON CRITERIA		NA		250	1500	100	15000	300
Soil Gas Area 1	MP-7D	25	Sep-96	**2800**	ND	ND	ND	ND
			Dec-97	**1100**	ND	ND	ND	160
			Apr-05	30	3.7 U	3.7 U	17	170
	MP-7D	45	Sep-96	**7800**	ND	ND	ND	ND
			Dec-97	ND	ND	ND	ND	ND
			Apr-05	20	1.1 U	1.1 U	27	38
	MP-7D	60	Sep-96	**9300**	ND	ND	ND	ND
			Dec-97	210	ND	ND	ND	100
			Apr-05	0.33 J	0.89 U	0.89 U	1.6	2.8
	MP-7D	85	Sep-96	**11900**	ND	ND	ND	ND
			Dec-97	**3100**	ND	ND	ND	**650**
			Aug-00	**1200**	12 U	12 U	89	**410**
			Apr-05	120	1.2 J	3.4 U	19	13
	MP-7D	110	Sep-96	**9700**	ND	ND	600	ND
			Dec-97	ND	ND	ND	ND	110
			Apr-05 (1)	--	--	--	--	--
	MP-8D	25	Sep-96	**5400**	ND	ND	ND	**1700**
			Dec-97	50	ND	ND	ND	220
			Apr-05	29	2 U	2 U	5.1	85
	MP-8D	45	Sep-96	**3800**	ND	ND	ND	**1100**
			Dec-97	ND	ND	ND	ND	70
			Apr-05	31	0.76 U	0.76 U	3	2.7
	MP-8D	60	Sep-96	**3500**	ND	ND	ND	**500**
			Dec-97	ND	ND	ND	ND	220
			Apr-05	69	1.3 U	1.3 U	7.4	39
	MP-8D	85	Sep-96	**5000**	ND	ND	ND	ND
			Dec-97	ND	ND	ND	ND	280
			Apr-05	180	4.3 U	4.3 U	1.5 J	53
	MP-8D	110	Sep-96	**7600**	500	ND	400	ND
			Dec-97	**350**	ND	ND	30	**600**
			Apr-05	34	1	0.42 U	4.9	5.5
	MP-9D	25	Sep-96	ND	ND	ND	ND	ND
			Dec-97	ND	ND	ND	ND	100
			Apr-05	51	1 U	1 U	2.5	11
	MP-9D	45	Sep-96	ND	ND	ND	ND	ND
			Dec-97	ND	ND	ND	ND	150
			Apr-05	7	0.37 U	0.34 J	0.35 J	5.6
	MP-9D	60	Sep-96	ND	ND	ND	ND	ND
			Dec-97	ND	ND	ND	ND	120
			Apr-05 (1)	--	--	--	--	--
	MP-9D	85	Sep-96	200	ND	ND	ND	ND
			Dec-97	80	ND	ND	ND	110
			Apr-05	50	0.75 U	0.75 U	2.5	23 B
			Apr-05 (2)	77	1.9 U	1.9 U	2	12
	MP-9D	110	Sep-96	**3600**	ND	**700**	200	ND
			Dec-97	ND	ND	ND	ND	120
			Apr-05	28	0.43	0.17 J	3.9	18
	MP-10D	25	Sep-96	**62300**	ND	ND	2600	**48300**
			Dec-97	**24000**	ND	ND	1900	**22000**
			Apr-05	**940**	18 U	18 U	33	100 B
	MP-10D	45	Sep-96	**42400**	ND	ND	900	**95000**
			Dec-97	240	ND	ND	ND	180
			Apr-05	170	1.2 J	3.6 U	26	22 B
	MP-10D	60	Sep-96	**35800**	ND	ND	500	**6800**
			Dec-97	ND	ND	ND	ND	ND
			Apr-05	**1700**	20 U	20 U	88	**880**
	MP-10D	85	Sep-96	**27400**	ND	ND	800	**2200**
			Dec-97	**290**	ND	ND	ND	90
			Apr-05 (1)	--	--	--	--	--
	MP-10D	110	Sep-96	**6500**	ND	ND	ND	ND
			Dec-97	**1400**	ND	ND	650	260
			Apr-05	14	0.71	0.56	3.7	5

Appendix 4c

HASTINGS ANALYTICAL
346 West 1st Street
Hastings, NE 68901
402-462-4949

Hastings – North Landfill/Far-Mar-Co Subsite Monitoring Wells

Analytes: Volatiles by USEPA Method 502.2
EDB by USEPA Method 504

Matrix: water

ANALYTE	MQ-08 sampled 11/6/06	Trip Blank 11/6/2006
vinyl chloride (μg/L)	< 2	< 2
1,1-dichloroethene (μg/L)	< 5	< 5
methylene chloride (μg/L)	< 5	< 5
trans-1,2-dichloroethene (μg/L)	< 5	< 5
1,1-dichloroethane (μg/L)	< 5	< 5
cis-1,2-dichloroethene (μg/L)	< 5	< 5
1,1,1-trichloroethane (μg/L)	< 5	< 5
carbon tetrachloride (μg/L)	< 5	< 5
1,2-dichloroethane (μg/L)	< 5	< 5
trichloroethene (μg/L)	< 5	< 5
1,1,2-trichloroethane (μg/L)	< 5	< 5
tetrachloroethene (μg/L)	< 5	< 5
ethylene dibromide (μg/L)	0.21	< 0.05

NOV 17 2006

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January 15, 2007

Mr. William Gresham
Remedial Project Manager
U.S. Environmental Protection Agency
Region VII
901 N. Fifth St.
Kansas City, KS 66101

Re: North Landfill/FAR-MAR-CO Subsite
Hastings Ground Water Contamination Site
Hastings, NE
Quarterly Progress Report

Dear Mr. Gresham:

On behalf of Morrison Enterprises (the Respondent), Hydro-Trace, Inc. is hereby submitting a progress report for work performed on the removal action through December 31, 2006.

1. **Work performed through December 31, 2006:**

With the exception of four hours in December, the extraction well (Well D) was in continuous operation during October, November, and December. The pumping rate during the three months averaged approximately 456 GPM.

Twenty-eight monitoring wells and the extraction well were sampled between December 4 and December 8. Samples from the 29 wells were analyzed for VOCs. Samples from 16 wells also were analyzed for EDB.

2. **Summary of findings:**

The concentrations of carbon tetrachloride, ethylene dibromide, and trichloroethylene in Well D from start-up through December 6, 2006 are shown in the first set of graphs. The second set of graphs shows that approximately 2,208 lbs (~1,003 kgs) of TCE, 240 lbs. (~109 kgs) of carbon tet, and 15 lbs. (~6.8 kg) EDB have been removed during more than nine years of operation.

P.O. Box 266
Raymond, Nebraska
Zip 68428-0266
(402) 783-3931

3. **Results of sampling activities:**

The results of the quarterly ground-water sampling conducted in December are attached.

4. **Problems encountered and recommended solutions:**

The water meter on Well D failed in November. The well did not run for about four hours in December during which time the meter was replaced. The flow rates for November and December were estimated by Hastings Utilities.

5. **Scheduled activities:**

Weather permitting, 29 monitoring wells and the extraction well will be sampled during the first two weeks of March (3/4 and 3/11). Prior to sampling the water levels will be read in the 24 quarterly monitoring wells that do not have dedicated pumps and in wells DW-1, MQ-01, MQ-07A, MW-18, PZ-25, and PZ-250. MW-28R will be used as the control well. All the water levels will be read the same day and the water level in the control well will be the first and last water level read.

6. **Upgradient sampling:**

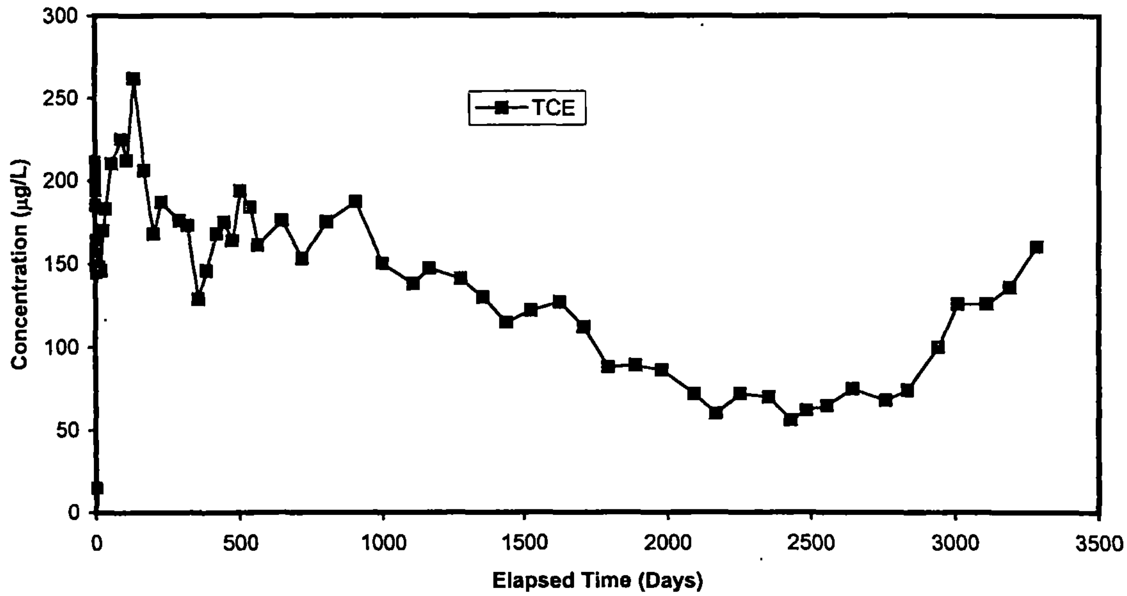
Sampling of the upgradient multilevel wells (MLW-1 and MLW-2) was incorporated into the quarterly sampling. The data are enclosed. These wells will be sampled again in March.

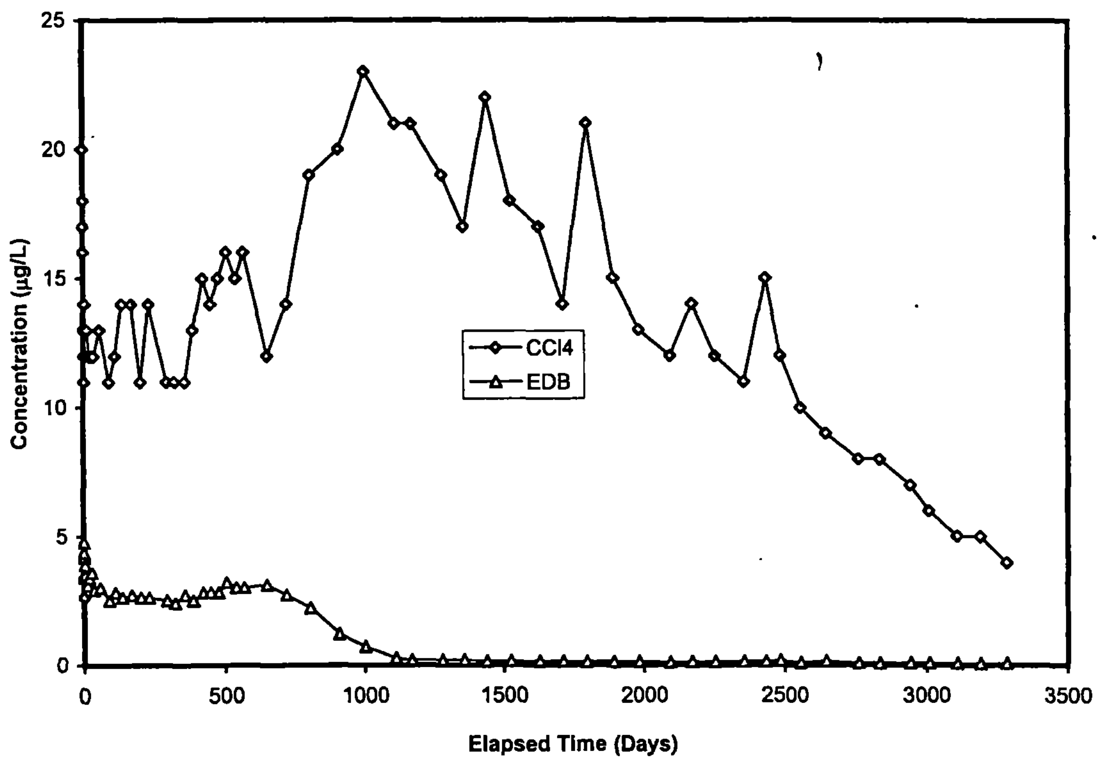
Sincerely,

Roy F. Spalding

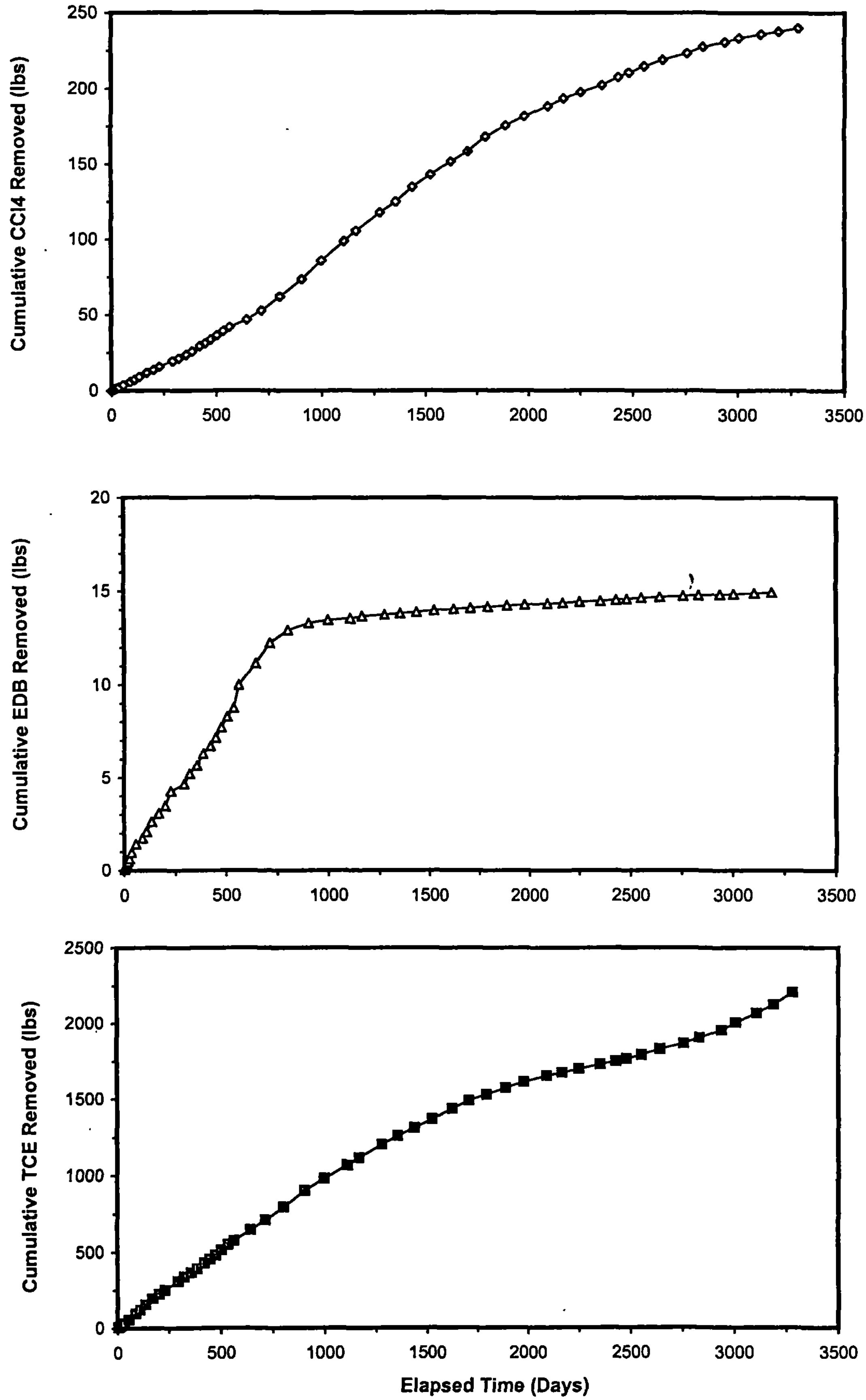
Roy F. Spalding, Ph.D.
Project Manager
President

enclosures
c.: G. McClure
D. Fisher
A. Stehlik
M. Sullivan





Concentrations of TCE, carbon tet, and EDB in Well D
July 22, 1997 - December 6, 2006



Mass Removal of Carbon Tetrachloride, EDB, and TCE by Well D
July 22, 1997 - December 6, 2006

Extraction Well	(gpm)	Cum. hours	Cum. Gals. remove	CCl4 cum (lbs.)	TCE cum (lbs.)	EDB cum (lbs.)
EW-1-7-22-97-1015	520	0	0	0.0	0.0	0.0
EW-1-7-22-97-1030	580	0	8,700	0.0	0.0	0.0
EW-1-7-22-97-1045	500	1	16,200	0.0	0.0	0.0
EW-1-7-22-97-1100	500	1	23,700	0.0	0.0	0.0
EW-1-7-22-97-1200	520	2	54,900	0.0	0.1	0.0
EW-1-7-22-97-1400	600	4	126,900	0.0	0.2	0.0
EW-1-7-22-97-1600	520	6	189,300	0.0	0.3	0.0
EW-1-7-22-97-2200	600	12	405,300	0.1	0.6	0.0
EW-1-7-23-97-0800	480	22	693,300	0.1	1.0	0.0
EW-1-7-23-97-1500	520	29	911,700	0.1	1.3	0.0
EW-1-7-24-97-1000	550	48	1,538,700	0.2	2.0	0.0
EW-1-7-25-97-1000	500	72	2,258,700	0.3	3.0	0.1
EW-1-7-28-97-1000	460	144	4,245,900	0.5	5.4	0.1
07/31/97		230	6,030,000			
EW-1-8-04-97-1000	500	312	8,490,000	0.9	10.6	0.2
EW-1-8-11-97-1000	420	480	12,723,600	1.4	15.8	0.4
EW-1-8-18-97-1000	450	648	17,259,600	1.8	22.2	0.5
EW-1-8-27-97-1000	440	864	22,962,000	2.4	30.9	0.6
08/31/97		974	25,731,300			
EW-1-9-17-97-1000	462	1,368	36,652,980	3.9	54.9	1.0
09/30/97	462	1,694	45,683,000			
EW-1-10-20-97-1000	449	2,160	58,237,040	5.8	95.3	1.4
10/31/97	449	2,438	65,711,400			
11/05/97	465	2,544	68,668,800			
11/12/97	465	2,544	68,668,800			
EW-1-11-17-97-1000	465	2,664	72,016,800	7.2	119.7	1.7
11/30/97	465	2,990	81,100,700			
EW-1-12-11-97-1000	470	3,240	88,150,700	9.1	154.9	2.1
12/31/97	470	3,734	102,059,400			
EW-1-1-15-98-1000	460	4,080	111,609,000	11.8	195.2	2.6
01/31/98	460	4,478	122,595,800			
EW-1-2-16-98-1000	437	4,848	132,297,200	13.7	224.2	3.1
02/28/98	437	5,150	140,198,100			
EW-1-3-16-98-1000	447	5,520	150,121,500	15.8	252.0	3.5
03/31/98	447	5,894	160,163,600			
04/30/98	384	6,614	176,739,400			
EW-1-5-18-98-1100	481	7,033	188,831,740	19.4	308.7	4.3
05/31/98	481	7,358	198,200,900			
EW-1-6-15-98-1000	509	7,704	208,767,740	21.2	337.5	4.7
06/30/98	509	8,078	220,180,100			
EW-1-7-20-98-1400	496	8,548	234,154,600	23.5	364.8	5.2
07/31/98	496	8,822	242,301,400			
EW-1-8-18-98-1400	521	9,244	255,493,120	25.8	390.7	5.7
08/31/98	521	9,566	265,563,000			
EW-1-9-23-98-1400	511	10,108	282,180,720	29.2	428.1	6.3
09/30/98	511	10,286	287,628,100			
EW-1-10-19-98-1400	447	10,732	299,589,820	31.2	453.5	6.7
10/31/98	447	11,030	307,477,600			
EW-1-11-16-98-1400	497	11,404	318,630,280	33.6	479.5	7.2
11/30/98	497	11,750	328,960,500			
EW-1-12-17-98-1400	498	12,110	339,717,300	36.4	513.6	7.7
12/31/98	498	12,456	350,060,900			
EW-1-1-18-99-1400	488	12,878	362,417,060	39.2	548.4	8.3
01/31/99	488	13,200	371,856,800			
EW-1-2-15-99-1400	445	13,550	381,201,800	41.7	573.65	8.8
02/28/99	445	13,872	389,806,900			
EW-1-3-3-99-1400	382	13,968	392,008,400			
04/30/99	408	14,076	394,654,200			
05/31/99	399	14,820	412,455,600			

Extraction Well	(gpm)	Cum. hours	Cum. Gals. removed	CCl4 cum (lbs.)	TCE cum (lbs.)	EDB cum (lbs.)
EW-1-6-29-99-1400	410	15,506	429,292,300	46.5	644.2	10.0
06/30/99	410	15,540	430,129,700			
7/31/1999	463	16,284	450,817,000			
8/31/1999	497	17,028	473,017,700			
EW-1-9-7-99-1400	490	17,186	480,506,900	52.5	709.5	11.1
9/30/1999	490	17,748	494,173,800			
10/31/1999	518	18,484	517,057,700			
11/30/1999	504	19,212	539,066,300			
EW-1-12-2-99-1400	498	19,248	540,142,340	61.96	796.50	12.24
12/31/1999	498	19,956	561,313,580			
01/31/00	452	20,700	581,505,380			
02/23/00	431	21,242	595,522,980			
03/02/00		21,242	595,522,980			
03/22/00	452	21,716	608,377,860	73.34	902.85	12.92
03/31/00	452	21,945	614,604,480			
4/30/2000	437	22,665	633,475,530			
5/31/2000	457	23,385	653,864,930			
6/26/2000	485	23,997	671,691,266	85.48	982.01	13.30
6/30/2000	485	24,129	674,834,230			
7/31/2000	471	24,873	695,848,630			
8/31/2000	479	25,617	717,216,530			
9/30/2000	480	26,335	737,898,930			
10/11/2000	477	26,611	745,798,050	98.45	1,067.24	13.48
10/31/00	477	27,079	759,175,130			
11/31/00	472	27,797	779,524,130			
12/08/00	474	27,979	784,696,024	105.25	1,114.90	13.54
12/31/00	474	28,539	800,606,930			
1/31/2001	478	29,277	821,774,330			
2/28/2001	473	29,947	840,771,330			
3/30/2001	475	30,683	861,660,622	117.44	1205.35	13.67
3/31/2001	475	30,693	862,059,930			
4/30/2001	471	31,339	880,323,230			
5/31/2001	429	32,083	899,481,930			
6/20/2001	470	32,563	913,004,970	124.72	1,260.99	13.75
6/30/2001	470	32,795	919,540,930			
7/31/2001	458	33,539	940,084,630			
8/31/2001	461	34,283	959,485,830			
9/10/2001	468	34,511	966,230,070	134.48	1,312.00	13.82
9/30/2001	468	35,003	979,718,430			
10/31/2001	431	35,664	996,826,930			
11/30/2001	448	36,384	1,016,167,830			
12/9/2001	455	36,590	1,021,791,630	142.81	1,368.50	13.90
12/31/2001	455	37,128	1,036,478,730			
1/31/2002	455	37,872	1,056,768,630			
2/28/2002	405	38,544	1,073,100,330			
3/19/2002	460	38,988	1,085,348,070	151.82	1,435.78	13.97
3/31/2002	460	39,288	1,093,631,830			
4/30/2002	514	40,007	1,115,825,430			
5/31/2002	445	40,747	1,135,565,430			
6/11/2002	462	40,999	1,142,553,642	158.49	1,489.18	14.05
6/30/2002	462	41,466	1,155,515,330			
7/31/2002	436	42,210	1,174,988,430			
8/31/2002	415	42,951	1,193,454,530			
9/5/2002	460	43,061	1,196,488,660	167.94	1,528.74	14.10
9/30/2002	460	43,671	1,213,314,030			
10/31/02	436	44,395	1,232,263,030			
11/30/02	423	45,112	1,250,464,130			
12/11/02	422	45,364	1,256,847,038	175.48	1,573.52	14.16
12/31/02	422	45,856	1,269,308,630			
1/31/2003	446	46,600	1,289,237,130			
2/28/2003	444	47,272	1,307,124,530			
3/11/2003	450	47,524	1,313,636,930	181.63	1,614.22	14.23

Extraction Well	(gpm)	Cum. hours	Cum. Gals. remove	CCl4 cum (lbs.)	TCE cum (lbs.)	EDB cum (lbs.)
3/31/2003	450	48,016	1,327,214,830			
4/30/2003	443	48,727	1,346,131,200			
5/31/2003	387	49,471	1,363,439,400			
6/30/2003	398	50,190	1,380,593,200			
7/2/2003	434	50,226	1,381,530,496	188.43	1,654.97	14.28
7/31/2003	434	50,930	1,399,859,600			
8/31/2003	392	51,678	1,417,462,000			
9/16/2003	359	52,050	1,425,476,740	193.55	1,676.94	14.32
9/30/2003	359	52,397	1,432,959,600			
10/31/2003	350	53,147	1,448,701,000			
11/30/2003	327	53,859	1,462,668,200			
12/8/2003	345	54,039	1,466,392,940	197.65	1,701.50	14.37
12/31/2003	345	54,605	1,478,101,100			
1/31/2004	339	55,347	1,493,204,500			
2/29/2004	349	56,043	1,507,779,300			
3/19/2004	355	56,487	1,517,243,160	202.31	1731.17	14.43
3/31/2004	355	56,605	1,519,758,100			
4/30/2004	403	56,975	1,528,698,350			
5/31/2004	380	57,722	1,545,740,450			
6/19/2004	385	58,172	1,556,130,350			
7/21/2004	411	58,340	1,560,268,190	207.69	1751.25	14.48
7/31/2004	411	58,624	1,567,263,250			
8/31/2004	419	59,306	1,584,420,450			
9/7/2004	449	59,462	1,589,028,218			
9/27/2004	449	59,585	1,591,938,386	210.85	1767.61	14.53
9/30/2004	449	59,669	1,594,201,850			
10/31/2004	465	60,417	1,615,065,550			
11/31/04	452	61,136	1,634,550,550			
12/9/2004	448	61,340	1,640,034,070	214.86	1793.67	14.57
12/31/2004	448	61,878	1,654,497,550			
01/31/05	460	62,621	1,675,011,850			
02/28/05	455	63,293	1,693,370,450			
03/08/05	457	63,473	1,698,306,230	219.23	1830.10	14.64
03/31/05	457	64,037	1,713,771,450			
04/30/05	429	64,756	1,732,289,450			
05/31/05	444	65,501	1,752,129,350			
06/17/05	477	65,897	1,763,460,890	223.58	1867.03	14.69
06/30/05	477	66,221	1,772,646,050			
07/31/05	480	66,967	1,794,135,750			
08/31/05	463	67,710	1,814,789,250			
09/13/05	461	68,034	1,823,752,710	227.60	1904.21	14.74
09/30/05	461	68,428	1,834,652,750			
10/31/05	400	69,176	1,852,611,550			
11/30/05	462	69,894	1,872,508,450			
12/19/05	454	70,338	1,884,592,354	231.15	1954.92	14.79
12/31/05	454	70,640	1,893,022,750			
1/31/2006	452	71,384	1,913,183,050			
2/28/2006	424	72,056	1,930,263,550			
3/6/2006	416	72,188	1,933,557,610	233.60	2,006.35	14.83
3/31/2006	416	72,799	1,948,805,150			
04/30/06	404	73,515	1,966,159,850			
05/31/06	415	74,251	1,984,484,950			
06/14/06	447	74,575	1,993,169,122	236.08	2,068.95	14.86
06/30/06	447	74,971	2,003,782,850			
07/31/06	441	75,714	2,003,858,564			
08/30/06	423	76,456	2,003,935,020			
09/05/06	431	76,564	2,004,011,584	238.24	2,127.75	14.90
09/30/06	431	77,179	2,004,088,763			
10/31/06	483	77,922	2,082,499,250			
11/30/06	450	78,639	2,101,858,250			
12/06/06	435	78,771	2,105,302,790	240.25	2,208.11	14.94
12/31/06	435	79,378	2,121,142,250			

HASTINGS ANALYTICAL

346 West 1st Street
Hastings, NE 68901
402-462-4949

Hastings – North Landfill/FAR-MAR-CO Subsite Monitoring Wells

Analytes: Volatiles by USEPA Method 502.2
EDB by USEPA Method 504

Matrix: water

ANALYTE	CD-06 sampled 12/8/06	EW-1 sampled 12/6/06	G-7D sampled 12/4/06
vinyl chloride (µg/L)	< 2	< 2	< 2
1,1-dichloroethene (µg/L)	< 5	< 5	< 5
methylene chloride (µg/L)	< 5	< 5	< 5
trans-1,2-dichloroethene (µg/L)	< 5	< 5	< 5
1,1-dichloroethane (µg/L)	< 5	< 5	< 5
cis-1,2-dichloroethene (µg/L)	< 5	< 5	7
chloroform (µg/L)	< 5	< 5	< 5
1,2-dichloroethane (µg/L)	< 5	< 5	9
1,1,1-trichloroethane (µg/L)	< 5	< 5	7
carbon tetrachloride (µg/L)	< 5	< 5	< 5
trichloroethene (µg/L)	< 5	160	258
1,1,2-trichloroethane (µg/L)	< 5	< 5	< 5
tetrachloroethene (µg/L)	< 5	< 5	13
ethylene dibromide (µg/L)	< 0.05	0.09	--

HASTINGS ANALYTICAL
346 West 1st Street
Hastings, NE 68901
402-462-4949

Hastings – North Landfill/FAR-MAR-CO Subsite Monitoring Wells

Analytes: Volatiles by USEPA Method 502.2
EDB by USEPA Method 504
Matrix: water

ANALYTE	G-7D field duplicate sampled 12/4/06	GM-1S sampled 12/6/06	GM-1D sampled 12/6/06
vinyl chloride (µg/L)	< 2	< 2	< 2
1,1-dichloroethene (µg/L)	< 5	< 5	9
methylene chloride (µg/L)	< 5	< 5	< 5
trans-1,2-dichloroethene (µg/L)	< 5	< 5	< 5
1,1-dichloroethane (µg/L)	< 5	< 5	< 5
cis-1,2-dichloroethene (µg/L)	7	< 5	5
chloroform (µg/L)	< 5	< 5	< 5
1,2-dichloroethane (µg/L)	9	< 5	< 5
1,1,1-trichloroethane (µg/L)	7	< 5	6
carbon tetrachloride (µg/L)	< 5	< 5	< 5
trichloroethene (µg/L)	260	< 5	184
1,1,2-trichloroethane (µg/L)	< 5	< 5	< 5
tetrachloroethene (µg/L)	12	< 5	< 5
ethylene dibromide (µg/L))	--	--	--

HASTINGS ANALYTICAL
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Hastings – North Landfill/FAR-MAR-CO Subsite Monitoring Wells

Analytes: Volatiles by USEPA Method 502.2
EDB by USEPA Method 504
Matrix: water

ANALYTE	GM-2S sampled 12/5/06	GM-2D sampled 12/5/06	I-46 sampled 12/6/06
vinyl chloride (µg/L)	< 2	< 2	< 2
1,1-dichloroethene (µg/L)	< 5	24	< 5
methylene chloride (µg/L)	< 5	< 5	< 5
trans-1,2-dichloroethene (µg/L)	< 5	< 5	< 5
1,1-dichloroethane (µg/L)	< 5	6	< 5
cis-1,2-dichloroethene (µg/L)	< 5	20	< 5
chloroform (µg/L)	< 5	< 5	< 5
1,2-dichloroethane (µg/L)	< 5	< 5	< 5
1,1,1-trichloroethane (µg/L)	< 5	18	< 5
carbon tetrachloride (µg/L)	< 5	< 5	< 5
trichloroethene (µg/L)	< 5	875	< 5
1,1,2-trichloroethane (µg/L)	< 5	< 5	< 5
tetrachloroethene (µg/L)	< 5	24	< 5
ethylene dibromide (µg/L)	--	--	--

HASTINGS ANALYTICAL
346 West 1st Street
Hastings, NE 68901
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Hastings – North Landfill/FAR-MAR-CO Subsite Monitoring Wells

Analytes: Volatiles by USEPA Method 502.2
EDB by USEPA Method 504
Matrix: water

ANALYTE	IN-04 sampled 12/8/06	IN-04 RO sampled 12/8/06	MQ-04 sampled 12/8/06
vinyl chloride (µg/L)	< 2	< 2	< 2
1,1-dichloroethene (µg/L)	< 5	< 5	< 5
methylene chloride (µg/L)	< 5	< 5	< 5
trans-1,2-dichloroethene (µg/L)	< 5	< 5	< 5
1,1-dichloroethane (µg/L)	< 5	< 5	< 5
cis-1,2-dichloroethene (µg/L)	< 5	< 5	< 5
chloroform (µg/L)	< 5	< 5	< 5
1,2-dichloroethane (µg/L)	< 5	< 5	< 5
1,1,1-trichloroethane (µg/L)	< 5	< 5	< 5
carbon tetrachloride (µg/L)	< 5	< 5	15
trichloroethene (µg/L)	< 5	< 5	< 5
1,1,2-trichloroethane (µg/L)	< 5	< 5	< 5
tetrachloroethene (µg/L)	< 5	< 5	< 5
ethylene dibromide (µg/L)	< 0.05	< 0.05	0.16

HASTINGS ANALYTICAL

346 West 1st Street
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Hastings – North Landfill/FAR-MAR-CO Subsite Monitoring Wells

Analytes: Volatiles by USEPA Method 502.2
EDB by USEPA Method 504

Matrix: water

ANALYTE	MQ-05 sampled 12/8/06	MQ-05 field duplicate sampled 12/8/06	MQ-06 sampled 12/8/06
vinyl chloride (µg/L)	< 2	< 2	< 2
1,1-dichloroethene (µg/L)	< 5	< 5	< 5
methylene chloride (µg/L)	< 5	< 5	< 5
trans-1,2-dichloroethene (µg/L)	< 5	< 5	< 5
1,1-dichloroethane (µg/L)	< 5	< 5	< 5
cis-1,2-dichloroethene (µg/L)	6	6	< 5
chloroform (µg/L)	< 5	< 5	< 5
1,2-dichloroethane (µg/L)	< 5	< 5	< 5
1,1,1-trichloroethane (µg/L)	< 5	< 5	< 5
carbon tetrachloride (µg/L)	< 5	< 5	< 5
trichloroethene (µg/L)	77	76	< 5
1,1,2-trichloroethane (µg/L)	< 5	< 5	< 5
tetrachloroethene (µg/L)	< 5	< 5	< 5
ethylene dibromide (µg/L)	0.08	0.08	< 0.05

HASTINGS ANALYTICAL
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Hastings – North Landfill/FAR-MAR-CO Subsite Monitoring Wells

Analytes: Volatiles by USEPA Method 502.2
EDB by USEPA Method 504
Matrix: water

ANALYTE	MQ-08 sampled 12/6/06	MQ-09 sampled 12/6/06	MW-5 sampled 12/4/06
vinyl chloride (µg/L)	< 2	< 2	< 2
1,1-dichloroethene (µg/L)	< 5	< 5	< 5
methylene chloride (µg/L)	< 5	< 5	< 5
trans-1,2-dichloroethene (µg/L)	< 5	< 5	< 5
1,1-dichloroethane (µg/L)	< 5	< 5	< 5
cis-1,2-dichloroethene (µg/L)	< 5	< 5	< 5
chloroform (µg/L)	< 5	< 5	< 5
1,2-dichloroethane (µg/L)	< 5	< 5	< 5
1,1,1-trichloroethane (µg/L)	< 5	< 5	< 5
carbon tetrachloride (µg/L)	< 5	< 5	< 5
trichloroethene (µg/L)	< 5	< 5	30
1,1,2-trichloroethane (µg/L)	< 5	< 5	< 5
tetrachloroethene (µg/L)	< 5	< 5	< 5
ethylene dibromide (µg/L)	0.19	< 0.05	--

HASTINGS ANALYTICAL
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Hastings – North Landfill/FAR-MAR-CO Subsite Monitoring Wells

Analytes: Volatiles by USEPA Method 502.2
EDB by USEPA Method 504
Matrix: water

ANALYTE	**MW-6** sampled 12/5/06	**MW-7** sampled 12/5/06	**MW-7 field duplicate** sampled 12/5/06
vinyl chloride (µg/L)	2	< 2	< 2
1,1-dichloroethene (µg/L)	< 5	< 5	< 5
methylene chloride (µg/L)	< 5	< 5	< 5
trans-1,2-dichloroethene (µg/L)	< 5	< 5	< 5
1,1-dichloroethane (µg/L)	7	< 5	< 5
cis-1,2-dichloroethene (µg/L)	133	20	19
chloroform (µg/L)	< 5	< 5	< 5
1,2-dichloroethane (µg/L)	< 5	< 5	< 5
1,1,1-trichloroethane (µg/L)	< 5	< 5	< 5
carbon tetrachloride (µg/L)	< 5	< 5	< 5
trichloroethene (µg/L)	170	158	155
1,1,2-trichloroethane (µg/L)	< 5	< 5	< 5
tetrachloroethene (µg/L)	< 5	< 5	< 5
ethylene dibromide (µg/L)	--	--	--

HASTINGS ANALYTICAL
346 West 1st Street
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Hastings – North Landfill/FAR-MAR-CO Subsite Monitoring Wells

Analytes: Volatiles by USEPA Method 502.2
EDB by USEPA Method 504
Matrix: water

ANALYTE	**MW-8** sampled 12/8/06	**MW-8 field duplicate** sampled 12/8/06	**MW-14** sampled 12/8/06
vinyl chloride (µg/L)	< 2	< 2	< 2
1,1-dichloroethene (µg/L)	< 5	< 5	< 5
methylene chloride (µg/L)	< 5	< 5	< 5
trans-1,2-dichloroethene (µg/L)	< 5	< 5	< 5
1,1-dichloroethane (µg/L)	< 5	< 5	< 5
cis-1,2-dichloroethene (µg/L)	19	18	10
chloroform (µg/L)	< 5	< 5	< 5
1,2-dichloroethane (µg/L)	< 5	< 5	< 5
1,1,1-trichloroethane (µg/L)	< 5	< 5	< 5
carbon tetrachloride (µg/L)	163	165	< 5
trichloroethene (µg/L)	28	28	< 5
1,1,2-trichloroethane (µg/L)	< 5	< 5	< 5
tetrachloroethene (µg/L)	< 5	< 5	< 5
ethylene dibromide (µg/L)	1.2	1.1	0.44

HASTINGS ANALYTICAL

346 West 1st Street
Hastings, NE 68901
402-462-4949

Hastings – North Landfill/FAR-MAR-CO Subsite Monitoring Wells

Analytes: Volatiles by USEPA Method 502.2
EDB by USEPA Method 504
Matrix: water

ANALYTE	MW-16 sampled 12/8/06	MW-17 sampled 12/5/06	MW-19 sampled 12/5/06
vinyl chloride (µg/L)	< 2	< 2	< 2
1,1-dichloroethene (µg/L)	< 5	15	< 5
methylene chloride (µg/L)	< 5	< 5	< 5
trans-1,2-dichloroethene (µg/L)	< 5	< 5	< 5
1,1-dichloroethane (µg/L)	< 5	< 5	< 5
cis-1,2-dichloroethene (µg/L)	10	6	< 5
chloroform (µg/L)	< 5	< 5	< 5
1,2-dichloroethane (µg/L)	< 5	< 5	< 5
1,1,1-trichloroethane (µg/L)	< 5	14	< 5
carbon tetrachloride (µg/L)	< 5	< 5	< 5
trichloroethene (µg/L)	19	278	14
1,1,2-trichloroethane (µg/L)	< 5	< 5	< 5
tetrachloroethene (µg/L)	< 5	8	< 5
ethylene dibromide (µg/L)	0.14	--	--

HASTINGS ANALYTICAL
346 West 1st Street
Hastings, NE 68901
402-462-4949

Hastings – North Landfill/FAR-MAR-CO Subsite Monitoring Wells

Analytes: Volatiles by USEPA Method 502.2
EDB by USEPA Method 504
Matrix: water

ANALYTE	MW-21 sampled 12/8/06	MW-25 sampled 12/5/06	MW-28R sampled 12/6/06
vinyl chloride (μg/L)	< 2	2	< 2
1,1-dichloroethene (μg/L)	< 5	< 5	< 5
methylene chloride (μg/L)	< 5	< 5	< 5
trans-1,2-dichloroethene (μg/L)	< 5	< 5	< 5
1,1-dichloroethane (μg/L)	< 5	< 5	< 5
cis-1,2-dichloroethene (μg/L)	< 5	71	< 5
chloroform (μg/L)	< 5	< 5	< 5
1,2-dichloroethane (μg/L)	< 5	< 5	< 5
1,1,1-trichloroethane (μg/L)	< 5	< 5	< 5
carbon tetrachloride (μg/L)	< 5	< 5	< 5
trichloroethene (μg/L)	8	94	30
1,1,2-trichloroethane (μg/L)	< 5	< 5	< 5
tetrachloroethene (μg/L)	< 5	< 5	< 5
ethylene dibromide (μg/L)	--	--	< 0.05

HASTINGS ANALYTICAL

346 West 1st Street
Hastings, NE 68901
402-462-4949

Hastings – North Landfill/FAR-MAR-CO Subsite Monitoring Wells

Analytes: Volatiles by USEPA Method 502.2
EDB by USEPA Method 504
Matrix: water

ANALYTE	PZ-80 sampled 12/6/06	WEC A sampled 12/6/06	WEC C sampled 12/6/06
vinyl chloride (µg/L)	< 2	< 2	< 2
1,1-dichloroethene (µg/L)	< 5	< 5	< 5
methylene chloride (µg/L)	< 5	< 5	< 5
trans-1,2-dichloroethene (µg/L)	< 5	< 5	< 5
1,1-dichloroethane (µg/L)	< 5	< 5	< 5
cis-1,2-dichloroethene (µg/L)	< 5	< 5	< 5
chloroform (µg/L)	< 5	< 5	< 5
1,2-dichloroethane (µg/L)	< 5	< 5	< 5
1,1,1-trichloroethane (µg/L)	< 5	< 5	< 5
carbon tetrachloride (µg/L)	< 5	< 5	< 5
trichloroethene (µg/L)	12	97	24
1,1,2-trichloroethane (µg/L)	< 5	< 5	< 5
tetrachloroethene (µg/L)	< 5	< 5	< 5
ethylene dibromide (µg/L)	< 0.05	0.11	< 0.05

HASTINGS ANALYTICAL
346 West 1st Street
Hastings, NE 68901
402-462-4949

Hastings – North Landfill/FAR-MAR-CO Subsite Monitoring Wells

Analytes: Volatiles by USEPA Method 502.2
EDB by USEPA Method 504
Matrix: water

ANALYTE	Trip Blank 12/4/06	Trip Blank 12/5/06	Trip Blank 12/6/06
vinyl chloride (µg/L)	< 2	< 2	< 2
1,1-dichloroethene (µg/L)	< 5	< 5	< 5
methylene chloride (µg/L)	< 5.	< 5	< 5
trans-1,2-dichloroethene (µg/L)	< 5	< 5	< 5
1,1-dichloroethane (µg/L)	< 5	< 5	< 5
cis-1,2-dichloroethene (µg/L)	< 5	< 5	< 5
chloroform (µg/L)	< 5	< 5	< 5
1,2-dichloroethane (µg/L)	< 5	< 5	< 5
1,1,1-trichloroethane (µg/L)	< 5	< 5	< 5
carbon tetrachloride (µg/L)	< 5	< 5	< 5
trichloroethene (µg/L)	< 5	< 5	< 5
1,1,2-trichloroethane (µg/L)	< 5	< 5	< 5
tetrachloroethene (µg/L)	< 5	< 5	< 5
ethylene dibromide (µg/L)	--	--	< 0.05

HASTINGS ANALYTICAL
346 West 1st Street
Hastings, NE 68901
402-462-4949

Hastings – North Landfill/FAR-MAR-CO Subsite Monitoring Wells

Analytes: Volatiles by USEPA Method 502.2
EDB by USEPA Method 504
Matrix: water

ANALYTE	Trip Blank	Field Blank at MLW 2-3	Field Blank at MW-17
	12/8/06	12/4/06	12/5/06
vinyl chloride (μg/L)	< 2	< 2	< 2
1,1-dichloroethene (μg/L)	< 5	< 5	< 5
methylene chloride (μg/L)	< 5	< 5	< 5
trans-1,2-dichloroethene (μg/L)	< 5	< 5	< 5
1,1-dichloroethane (μg/L)	< 5	< 5	< 5
cis-1,2-dichloroethene (μg/L)	< 5	< 5	< 5
chloroform (μg/L)	< 5	< 5	< 5
1,1,1-trichloroethane (μg/L)	< 5	< 5	< 5
carbon tetrachloride (μg/L)	< 5	< 5	< 5
1,2-dichloroethane (μg/L)	< 5	< 5	< 5
trichloroethene (μg/L)	< 5	< 5	< 5
1,1,2-trichloroethane (μg/L)	< 5	< 5	< 5
tetrachloroethene (μg/L)	< 5	< 5	< 5
ethylene dibromide (μg/L)	<0.05	--	--

HASTINGS ANALYTICAL

346 West 1st Street
Hastings, NE 68901
402-462-4949

Hastings – North Landfill/FAR-MAR-CO Subsite Monitoring Wells

Analytes: Volatiles by USEPA Method 502.2
EDB by USEPA Method 504

Matrix: water

ANALYTE	Field Blank at MW-28R 12/6/06	Field Blank at MW-14 12/8/06	Equipment Blank after GM-2D 12/5/06
vinyl chloride (µg/L)	< 2	< 2	< 2
1,1-dichloroethene (µg/L)	< 5	< 5	< 5
methylene chloride (µg/L)	< 5	< 5	< 5
trans-1,2-dichloroethene (µg/L)	< 5	< 5	< 5
1,1-dichloroethane (µg/L)	< 5	< 5	< 5
cis-1,2-dichloroethene (µg/L)	< 5	< 5	< 5
chloroform (µg/L)	< 5	< 5	< 5
1,1,1-trichloroethane (µg/L)	< 5	< 5	< 5
carbon tetrachloride (µg/L)	< 5	< 5	< 5
1,2-dichloroethane (µg/L)	< 5	< 5	< 5
trichloroethene (µg/L)	< 5	< 5	< 5
1,1,2-trichloroethane (µg/L)	< 5	< 5	< 5
tetrachloroethene (µg/L)	< 5	< 5	< 5
ethylene dibromide (µg/L)	< 0.05	< 0.05	--

HASTINGS ANALYTICAL
346 West 1st Street
Hastings, NE 68901
402-462-4949

Hastings – North Landfill/FAR-MAR-CO Subsite Monitoring Wells

Analytes: Volatiles by USEPA Method 502.2
EDB by USEPA Method 504
Matrix: water

ANALYTE	**Equipment Blank after MW-17** 12/5/06	**Equipment Blank after MW-8** 12/8/06
vinyl chloride (µg/L)	< 2	< 2
1,1-dichloroethene (µg/L)	< 5	< 5
methylene chloride (µg/L)	< 5	< 5
trans-1,2-dichloroethene (µg/L)	< 5	< 5
1,1-dichloroethane (µg/L)	< 5	< 5
cis-1,2-dichloroethene (µg/L)	< 5	< 5
chloroform (µg/L)	< 5	< 5
1,2-dichloroethane (µg/L)	< 5	< 5
1,1,1-trichloroethane (µg/L)	< 5	< 5
carbon tetrachloride (µg/L)	< 5	< 5
trichloroethene (µg/L)	< 5	< 5
1,1,2-trichloroethane (µg/L)	< 5	< 5
tetrachloroethene (µg/L)	< 5	< 5
ethylene dibromide (µg/L)	--	< 0.05

HASTINGS ANALYTICAL

346 West 1st Street
Hastings, NE 68901
402-462-4949

Hastings – North Landfill/FAR-MAR-CO Subsite Monitoring Wells

Analytes: Volatiles by USEPA Method 502.2
EDB by USEPA Method 504
Matrix: water

ANALYTE	MLW 1-1 sampled 12/4/06	MLW 1-2 sampled 12/4/06	MLW 1-3 sampled 12/4/06
vinyl chloride (µg/L)	< 2	< 2	< 2
1,1-dichloroethene (µg/L)	<5	< 5	< 5
methylene chloride (µg/L)	< 5	< 5	< 5
trans-1,2-dichloroethene (µg/L)	< 5	< 5	< 5
1,1-dichloroethane (µg/L)	< 5	< 5	< 5
cis-1,2-dichloroethene (µg/L)	< 5	< 5	< 5
chloroform (µg/L)	< 5	<5	< 5
1,2-dichloroethane (µg/L)	< 5	< 5	< 5
1,1,1-trichloroethane (µg/L)	< 5	< 5	< 5
carbon tetrachloride (µg/L)	< 5	< 5	< 5
trichloroethene (µg/L)	7	66	6
1,1,2-trichloroethane (µg/L)	< 5	< 5	< 5
tetrachloroethene (µg/L)	< 5	< 5	< 5
ethylene dibromide (µg/L)	--	--	--

HASTINGS ANALYTICAL

346 West 1st Street
Hastings, NE 68901
402-462-4949

Hastings – North Landfill/FAR-MAR-CO Subsite Monitoring Wells

Analytes: Volatiles by USEPA Method 502.2
EDB by USEPA Method 504
Matrix: water

ANALYTE	MLW 2-1 sampled 12/4/06	MLW 2-2 sampled 12/4/06	MLW 2-3 sampled 12/4/06
vinyl chloride (µg/L)	< 2	< 2	< 2
1,1-dichloroethene (µg/L)	< 5	< 5	< 5
methylene chloride (µg/L)	< 5	< 5	< 5
trans-1,2-dichloroethene (µg/L)	< 5	< 5	< 5
1,1-dichloroethane (µg/L)	< 5	< 5	< 5
cis-1,2-dichloroethene (µg/L)	< 5	< 5	< 5
chloroform (µg/L)	< 5	< 5	< 5
1,2-dichloroethane (µg/L)	< 5	< 5	< 5
1,1,1-trichloroethane (µg/L)	< 5	< 5	< 5
carbon tetrachloride (µg/L)	< 5	< 5	< 5
trichloroethene (µg/L)	44	88	46
1,1,2-trichloroethane (µg/L)	< 5	< 5	< 5
tetrachloroethene (µg/L)	< 5	< 5	12
ethylene dibromide (µg/L)	--	--	--

HTI
HYDRO-TRACE
INCORPORATED

January 15, 2007

To: Gayle McClure, Dave Fisher, Mike Sullivan

From: Roy Spalding RFS.

Re: Additonal data for December 7, 2006 meeting with USEPA & for requested report to USEPA

Enclosed are data taken in November 2006 for the University of Nebraska nested monitoring wells downgradient of the North Landfill. Two of the deep wells were sampled again in January as was NP-001R. NP-001R is a deep well sampled in June and September as part of the North Landfill/FAR-MAR-CO quarterly monitoring. We found that it is not winterized and thus can be monitored in December and March. We will include it with the quarterly monitoring as it is one of the few deep wells downgradient of the North Landfill. These data are very beneficial to our cause.

P.O. Box 266
Raymond, Nebraska
Zip 68428-0266
(402) 783-3931

JAN 17 2007

HASTINGS ANALYTICAL
346 West 1st Street
Hastings, NE 68901
402-462-4949

Hastings – University of Nebraska Monitoring Wells

Analytes: Volatiles by USEPA Method 502.2

Matrix: water

ANALYTE	UN-A-126 sampled 11/16/06	UN-A-141 sampled 11/16/06	UN-A-151 sampled 11/16/06
vinyl chloride (µg/L)	< 2	< 2	< 2
1,1-dichloroethene (µg/L)	6	5	6
methylene chloride (µg/L)	< 5	< 5	< 5
trans-1,2-dichloroethene (µg/L)	< 5	< 5	< 5
1,1-dichloroethane (µg/L)	7	5	< 5
cis-1,2-dichloroethene (µg/L)	28	39	< 5
chloroform (µg/L)	< 5	<5	<5
1,2-dichloroethane (µg/L)	< 5	< 5	< 5
1,1,1-trichloroethane (µg/L)	< 5	< 5	6
carbon tetrachloride (µg/L)	< 5	< 5	< 5
trichloroethene (µg/L)	124	124	159
1,1,2-trichloroethane (µg/L)	< 5	< 5	< 5
tetrachloroethene (µg/L)	< 5	< 5	< 5

HASTINGS ANALYTICAL
346 West 1st Street
Hastings, NE 68901
402-462-4949

Hastings – University of Nebraska Monitoring Wells

Analytes: Volatiles by USEPA Method 502.2

Matrix: water

ANALYTE	UN-B-133 sampled 11/18/06	UN-B-141 sampled 11/18/06	UN-B-151 sampled 11/18/06
vinyl chloride (µg/L)	4	7	< 2
1,1-dichloroethene (µg/L)	< 5	< 5	< 5
methylene chloride (µg/L)	< 5	< 5	< 5
trans-1,2-dichloroethene (µg/L)	< 5	< 5	< 5
1,1-dichloroethane (µg/L)	< 5	< 5	< 5
cis-1,2-dichloroethene (µg/L)	97	119	< 5
chloroform (µg/L)	< 5	< 5	< 5
1,2-dichloroethane (µg/L)	< 5	< 5	< 5
1,1,1-trichloroethane (µg/L)	< 5	< 5	< 5
carbon tetrachloride (µg/L)	< 5	< 5	< 5
trichloroethene (µg/L)	97	97	71
1,1,2-trichloroethane (µg/L)	< 5	< 5	< 5
tetrachloroethene (µg/L)	< 5	< 5	< 5

HASTINGS ANALYTICAL
346 West 1st Street
Hastings, NE 68901
402-462-4949

Hastings – University of Nebraska Monitoring Wells

Analytes: Volatiles by USEPA Method 502.2

Matrix: water

ANALYTE	UN-C-135 sampled 11/18/06	UN-C-145 sampled 11/18/06	UN-C-155 sampled 11/18/06
vinyl chloride (µg/L)	4	4	< 2
1,1-dichloroethene (µg/L)	< 5	< 5	5
methylene chloride (µg/L)	< 5	< 5	< 5
trans-1,2-dichloroethene (µg/L)	< 5	< 5	< 5
1,1-dichloroethane (µg/L)	< 5	< 5	< 5
cis-1,2-dichloroethene (µg/L)	94	62	< 5
chloroform (µg/L)	< 5	< 5	< 5
1,2-dichloroethane (µg/L)	< 5	< 5	< 5
1,1,1-trichloroethane (µg/L)	< 5	< 5	< 5
carbon tetrachloride (µg/L)	< 5	< 5	< 5
trichloroethene (µg/L)	44	75	45
1,1,2-trichloroethane (µg/L)	< 5	< 5	< 5
tetrachloroethene (µg/L)	< 5	< 5	< 5

HASTINGS ANALYTICAL
346 West 1st Street
Hastings, NE 68901
402-462-4949

Hastings – University of Nebraska Monitoring Wells

Analytes: Volatiles by USEPA Method 502.2

Matrix: water

ANALYTE	UN-C-165 sampled 11/18/06	UN-C-165 field duplicate sampled 11/18/06	UN-C-185 sampled 11/18/06
vinyl chloride (µg/L)	< 2	< 2	< 2
1,1-dichloroethene (µg/L)	5	< 5	< 5
methylene chloride (µg/L)	< 5	< 5	< 5
trans-1,2-dichloroethene (µg/L)	< 5	< 5	< 5
1,1-dichloroethane (µg/L)	< 5	< 5	< 5
cis-1,2-dichloroethene (µg/L)	< 5	< 5	< 5
chloroform (µg/L)	< 5	< 5	< 5
1,2-dichloroethane (µg/L)	< 5	< 5	< 5
1,1,1-trichloroethane (µg/L)	< 5	< 5	< 5
carbon tetrachloride (µg/L)	< 5	< 5	< 5
trichloroethene (µg/L)	43	39	35
1,1,2-trichloroethane (µg/L)	< 5	< 5	< 5
tetrachloroethene (µg/L)	< 5	< 5	< 5

HASTINGS ANALYTICAL

346 West 1st Street
Hastings, NE 68901
402-462-4949

Hastings – University of Nebraska Monitoring Wells

Analytes: Volatiles by USEPA Method 502.2

Matrix: water

ANALYTE	UN-D-140 sampled 11/17/06	UN-D-150 sampled 11/17/06	UN-D-150 field duplicate sampled 11/17/06
vinyl chloride (µg/L)	< 2	< 2	< 2
1,1-dichloroethene (µg/L)	< 5	5	< 5
methylene chloride (µg/L)	< 5	< 5	< 5
trans-1,2-dichloroethene (µg/L)	< 5	< 5	< 5
1,1-dichloroethane (µg/L)	< 5	< 5	< 5
cis-1,2-dichloroethene (µg/L)	20	22	23
chloroform (µg/L)	< 5	< 5	< 5
1,2-dichloroethane (µg/L)	< 5	< 5	< 5
1,1,1-trichloroethane (µg/L)	< 5	< 5	< 5
carbon tetrachloride (µg/L)	< 5	< 5	< 5
trichloroethene (µg/L)	51	54	59
1,1,2-trichloroethane (µg/L)	< 5	< 5	< 5
tetrachloroethene (µg/L)	< 5	< 5	< 5

HASTINGS ANALYTICAL

346 West 1st Street
Hastings, NE 68901
402-462-4949

Hastings – University of Nebraska Monitoring Wells

Analytes: Volatiles by USEPA Method 502.2

Matrix: water

ANALYTE	**UN-D-160** sampled 11/17/06	**UN-D-170** sampled 11/17/06	**UN-D-200** sampled 11/17/06
vinyl chloride (µg/L)	< 2	< 2	< 2
1,1-dichloroethene (µg/L)	7	< 5	< 5
methylene chloride (µg/L)	< 5	< 5	< 5
trans-1,2-dichloroethene (µg/L)	< 5	< 5	< 5
1,1-dichloroethane (µg/L)	< 5	< 5	< 5
cis-1,2-dichloroethene (µg/L)	< 5	< 5	< 5
chloroform (µg/L)	< 5	< 5	< 5
1,2-dichloroethane (µg/L)	< 5	< 5	< 5
1,1,1-trichloroethane (µg/L)	6	< 5	< 5
carbon tetrachloride (µg/L)	< 5	< 5	< 5
trichloroethene (µg/L)	115	83	306
1,1,2-trichloroethane (µg/L)	< 5	< 5	< 5
tetrachloroethene (µg/L)	< 5	< 5	6

HASTINGS ANALYTICAL
346 West 1st Street
Hastings, NE 68901
402-462-4949

Hastings – University of Nebraska Monitoring Wells

Analytes: Volatiles by USEPA Method 502.2

Matrix: water

ANALYTE	Trip Blank 11/16/06	Trip Blank 11/17/06	Trip Blank 11/18/06
vinyl chloride (µg/L)	< 2	< 2	< 2
1,1-dichloroethene (µg/L)	< 5	< 5	< 5
methylene chloride (µg/L)	< 5	< 5	< 5
trans-1,2-dichloroethene (µg/L)	< 5	< 5	< 5
1,1-dichloroethane (µg/L)	< 5	< 5	< 5
cis-1,2-dichloroethene (µg/L)	< 5	< 5	< 5
chloroform (µg/L)	< 5	< 5	< 5
1,2-dichloroethane (µg/L)	< 5	< 5	< 5
1,1,1-trichloroethane (µg/L)	< 5	< 5	< 5
carbon tetrachloride (µg/L)	< 5	< 5	< 5
1,2-dichloroethane (µg/L)	< 5	< 5	< 5
trichloroethene (µg/L)	< 5	< 5	< 5
1,1,2-trichloroethane (µg/L)	< 5	< 5	< 5
tetrachloroethene (µg/L)	< 5	< 5	< 5

HASTINGS ANALYTICAL
346 West 1st Street
Hastings, NE 68901
402-462-4949

Hastings – University of Nebraska Monitoring Wells

Analytes: Volatiles by USEPA Method 502.2

Matrix: water

ANALYTE	Field Blank at UN-A-151 11/16/06	Field Blank at UN-C-185 11/18/06	Equipment Blank at UN-D-170 11/17/06
vinyl chloride (µg/L)	< 2	< 2	< 2
1,1-dichloroethene (µg/L)	< 5	< 5	< 5
methylene chloride (µg/L)	< 5	< 5	< 5
trans-1,2-dichloroethene (µg/L)	< 5	< 5	< 5
1,1-dichloroethane (µg/L)	< 5	< 5	< 5
cis-1,2-dichloroethene (µg/L)	< 5	< 5	< 5
1,1,1-trichloroethane (µg/L)	< 5	< 5	< 5
carbon tetrachloride (µg/L)	< 5	< 5	< 5
1,2-dichloroethane (µg/L)	< 5	< 5	< 5
trichloroethene (µg/L)	< 5	< 5	< 5
1,1,2-trichloroethane (µg/L)	< 5	< 5	< 5
tetrachloroethene (µg/L)	< 5	< 5	< 5

HASTINGS ANALYTICAL
346 West 1st Street
Hastings, NE 68901
402-462-4949

Hastings – University of Nebraska Monitoring Wells

Analytes: Volatiles by USEPA Method 502.2

Matrix: water

ANALYTE	Equipment Blank at UN-C-165 11/18/09
vinyl chloride (µg/L)	< 2
1,1-dichloroethene (µg/L)	< 5
methylene chloride (µg/L)	< 5
trans-1,2-dichloroethene (µg/L)	< 5
1,1-dichloroethane (µg/L)	< 5
cis-1,2-dichloroethene (µg/L)	< 5
chloroform (µg/L)	< 5
1,2-dichloroethane (µg/L)	< 5
1,1,1-trichloroethane (µg/L)	< 5
carbon tetrachloride (µg/L)	< 5
trichloroethene (µg/L)	< 5
1,1,2-trichloroethane (µg/L)	< 5
tetrachloroethene (µg/L)	< 5

HASTINGS ANALYTICAL
346 West 1st Street
Hastings, NE 68901
402-462-4949

Hastings – University of Nebraska Monitoring Wells

Analytes: Volatiles by USEPA Method 502.2

Matrix: water

ANALYTE	UN-C-185 sampled 1/4/07	UN-C-185 field duplicate sampled 1/4/07	UN-D-170 sampled 1/4/07
vinyl chloride (µg/L)	< 2	< 2	< 2
1,1-dichloroethene (µg/L)	<5	< 5	< 5
methylene chloride (µg/L)	< 5	< 5	< 5
trans-1,2-dichloroethene (µg/L)	< 5	< 5	< 5
1,1-dichloroethane (µg/L)	< 5	< 5	< 5
cis-1,2-dichloroethene (µg/L)	< 5	< 5	< 5
chloroform (µg/L)	< 5	<5	< 5
1,2-dichloroethane (µg/L)	< 5	< 5	< 5
1,1,1-trichloroethane (µg/L)	< 5	< 5	< 5
carbon tetrachloride (µg/L)	< 5	< 5	< 5
trichloroethene (µg/L)	53	51	83
1,1,2-trichloroethane (µg/L)	< 5	< 5	< 5
tetrachloroethene (µg/L)	< 5	< 5	< 5

HASTINGS ANALYTICAL

346 West 1st Street
Hastings, NE 68901
402-462-4949

Hastings – North Landfill/FAR-MAR-CO Subsite Monitoring Wells

Analytes: Volatiles by USEPA Method 502.2

Matrix: water

ANALYTE	NP-001R sampled 1/4/07
vinyl chloride (μg/L)	< 2
1,1-dichloroethene (μg/L)	8
methylene chloride (μg/L)	< 5
trans-1,2-dichloroethene (μg/L)	< 5
1,1-dichloroethane (μg/L)	< 5
cis-1,2-dichloroethene (μg/L)	5
chloroform (μg/L)	< 5
1,2-dichloroethane (μg/L)	< 5
1,1,1-trichloroethane (μg/L)	8
carbon tetrachloride (μg/L)	< 5
trichloroethene (μg/L)	318
1,1,2-trichloroethane (μg/L)	< 5
tetrachloroethene (μg/L)	9

HASTINGS ANALYTICAL

346 West 1st Street
Hastings, NE 68901
402-462-4949

Hastings – QC Samples

Analytes: Volatiles by USEPA Method 502.2

Matrix: water

ANALYTE	Trip Blank	Field Blank	Equipment Blank at UN D-170
	1/4/07	1/4/07	1/4/07
vinyl chloride (µg/L)	< 2	< 2	< 2
1,1-dichloroethene (µg/L)	< 5	< 5	< 5
methylene chloride (µg/L)	< 5	< 5	< 5
trans-1,2-dichloroethene (µg/L)	< 5	< 5	< 5
1,1-dichloroethane (µg/L)	< 5	< 5	< 5
cis-1,2-dichloroethene (µg/L)	< 5	< 5	< 5
chloroform (µg/L)	< 5	< 5	< 5
1,2-dichloroethane (µg/L)	< 5	< 5	< 5
1,1,1-trichloroethane (µg/L)	< 5	< 5	< 5
carbon tetrachloride (µg/L)	< 5	< 5	< 5
trichloroethene (µg/L)	< 5	< 5	< 5
1,1,2-trichloroethane (µg/L)	< 5	< 5	< 5
tetrachloroethene (µg/L)	< 5	< 5	< 5

North Landfill Subsite
Projected Attainment of Performance Standards

Prepared on behalf of the City of Hastings and Dutton-Lainson Company

by

Hydro-Trace Inc.
P.O. 266
Raymond, NE 68428

March 23, 2007

Executive Summary

The performance standards in EPA's draft Statement of Work for the North Landfill OU 2 Final Groundwater Remedy call for active remediation of the contaminants of concern (COCs) until maximum contaminant levels (MCLs) have been achieved. Three In-Well Aeration (IWA) wells constructed in connection with remediation at the Colorado Avenue Subsite were placed in operation on November 13, 2002. In their initial years of operation the IWA wells were out of compliance with respect to performance. Excursions from the IWA wells into the shallow groundwater overwhelmed the low TCE concentrations emanating from the North Landfill. Thus, data from North Landfill indicator wells MW-6, MW-7, and MW-25 no longer can be relied upon to demonstrate natural attenuation (MNA). Exponential regression was used to best-fit the quarterly TCE MNA data at MW-6 and MW-7 and demonstrate the trend in decreasing TCE concentrations. The analysis indicates that North Landfill TCE concentrations in the two wells would have achieved MCLs by 2007 ± 1 year.

A shallow groundwater transport rate of 1.2 ft/day was derived from the breakthrough curves at MW-6 and MW-7. This transport rate is close to the estimated groundwater flow rate and indicates insignificant TCE retardation in the aquifer. This rate was used to estimate plume extraction times at the North Landfill Subsite Well D pump and treat system. Plume remediation of the North Landfill COCs will be completed in 2011.

Reverse breakthrough curves of decreasing TCE concentrations were noted in deep wells. Although these wells are downgradient of the North Landfill, their concentrations were markedly reduced by the remediation activities of the IWA system. These results indicate the source of the deep plume downgradient of the North Landfill is the Colorado Avenue Subsite.

North Landfill Subsite
Projected Attainment of Performance Standards

Prepared on behalf of the City of Hastings and Dutton-Lainson Company

by

Hydro-Trace Inc.
P.O. 266
Raymond, NE 68428

March 23, 2007

The following report is a feasibility assessment of both shallow and deep TCE excursions from the Colorado Avenue Subsite into the North Landfill (NL) Subsite using recent TCE data. Most of the figures were presented to Region 7 EPA personnel in meetings in Kansas City on November 13 and December 7, 2006 and were updated for this report.

The report has three focus areas: (1) impacts of shallow TCE transport from the IWA wells on the proposed Monitored Natural Attenuation (MNA) at the North Landfill Subsite; (2) deep transport of TCE from the Colorado Avenue Subsite and (3) implication of transport rates on interception of subsite VOC contaminants at Well D.

Shallow Zone TCE

Estimates of TCE transport in the shallow aquifer (120-140 ft bls) are now available due to field-quantified downgradient TCE excursion from the Colorado Avenue Subsite Phase III, Sixth Avenue system IWA wells (IWA-4, IWA-5, and IWA-6). The approximate date on which TCE was introduced into the shallow zone, a known travel distance from the point of introduction, and breakthrough times from quarterly monitoring at downgradient monitoring wells MW-6 and MW-7 are utilized in the estimates.

The distances and locations of the downgradient wells are shown in Figure 1. The distance between the IWA wells and downgradient wells MW-6 and MW-7 was measured with a meter wheel. The distance is 1120 feet. The IWA installation began in June 2002 and startup occurred on November 13, 2002. The carbon canisters were spent (overloaded with sorbed organics) two to four months after startup (USEPA, 2007). In-well VOC stripping with re-circulating wells is a patented advanced remediation technology that allows for closed-loop in situ stripping of TCE and related chlorinated VOCs. A sparge tube is used to pump air to the bottom of the well. Aeration of the water allows density driven flow (air-lift pumping) to develop from the bottom to the top of the well. The wells are constructed with slotted intervals in both the deep contaminated zone and the shallow previously uncontaminated zone at the top of the aquifer. This promotes the movement of water upward and its release into the shallow zone. When the process is working correctly, the TCE is removed by a combination of vacuum extraction and sorption on granular activated carbon. When the carbon canisters were spent in early 2003, the shallow screens of the closed-loop IWA wells promoted circulation and spreading of the deep TCE throughout the water column. Thus, the non-functional system diluted the deep groundwater TCE plume while contaminating the shallow groundwater.

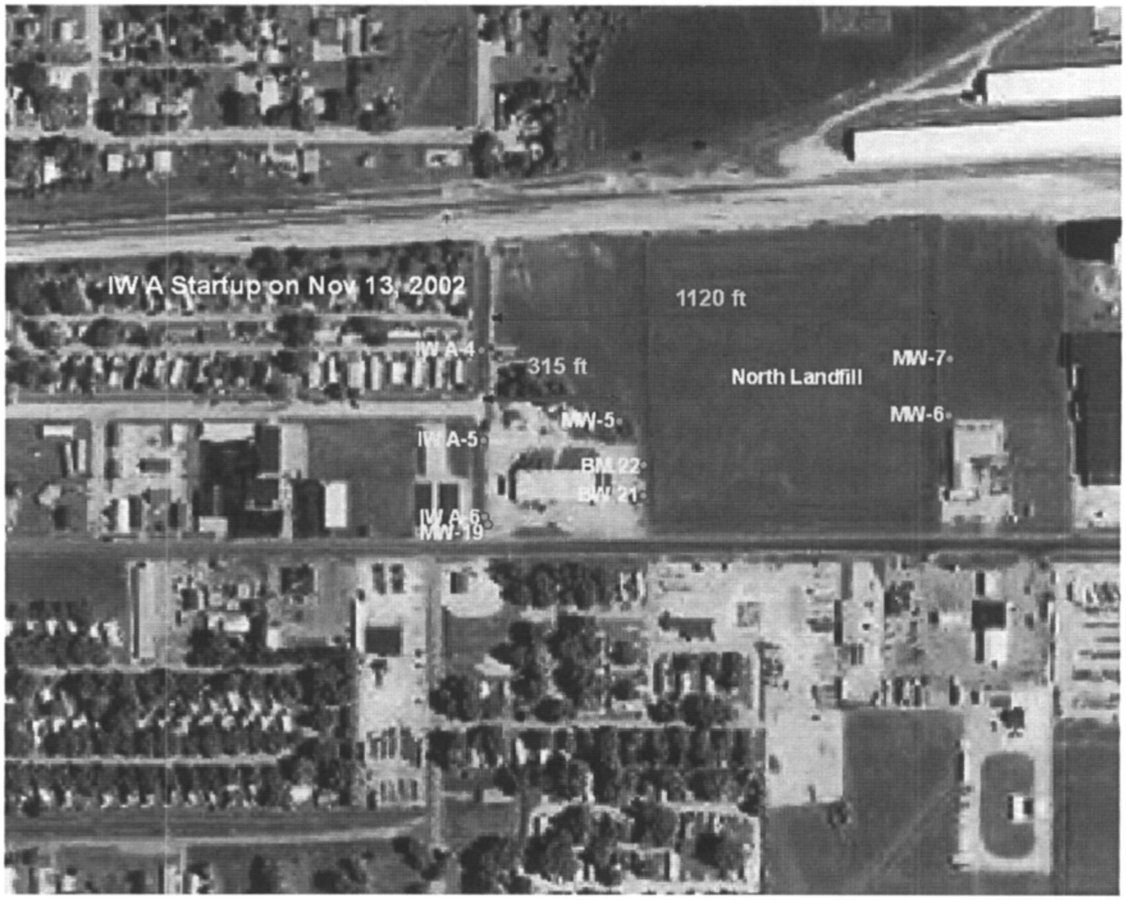

Figure 1. Overview of North Landfill with locations of immediately downgradient shallow North Landfill Subsite monitoring wells MW-6 and MW-7, NL upgradient shallow monitoring well MW-5 and Colorado Avenue Subsite downgradient monitoring wells BM-21 and BM-22 and in-well aeration wells IWA-4, IWA-5, and IWA-6.

The quarterly monitoring results clearly show TCE breakthrough (red lines) at both MW-6 and MW-7 (Figures 2 and 3). At both wells half-maximum breakthrough concentrations occurred about 940 days after the carbon was spent. Since the elapsed time from introduction into the shallow groundwater until interception at both MW-6 and MW-7 was equivalent, the TCE moved as a line source beneath the landfill. Further verification that the source of the shallow zone TCE contamination is the IWA well transect is available from temporal TCE data from MW-5, which is about 300 feet downgradient of the IWA transect and upgradient of the North Landfill (Figure 1). TCE concentrations in MW-5 during the period of the Five-Year Report (July 1997 to September 2002) (Hydro-Trace, 2002) were always less than the 5 ppb reporting limit. Elevated TCE concentrations first occurred in MW-5 after March 2003 and still remain above the MCL. (Appendix A).

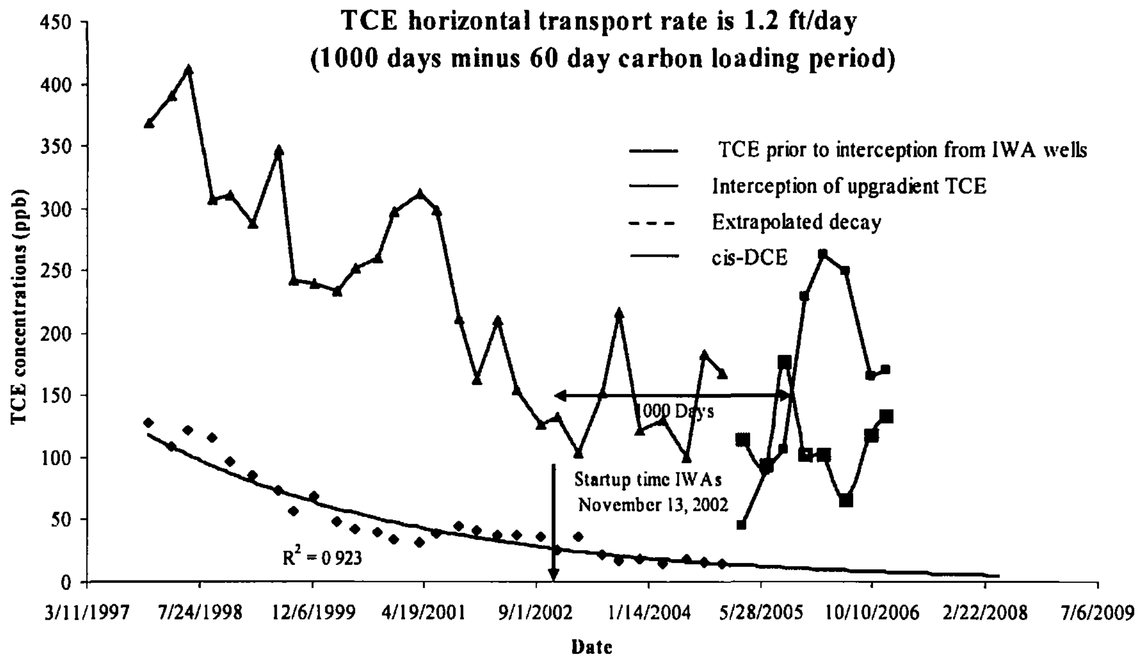

Figure 2. Quarterly monitored TCE (blue, red) and cis-DCE (green) concentrations at MW-6.

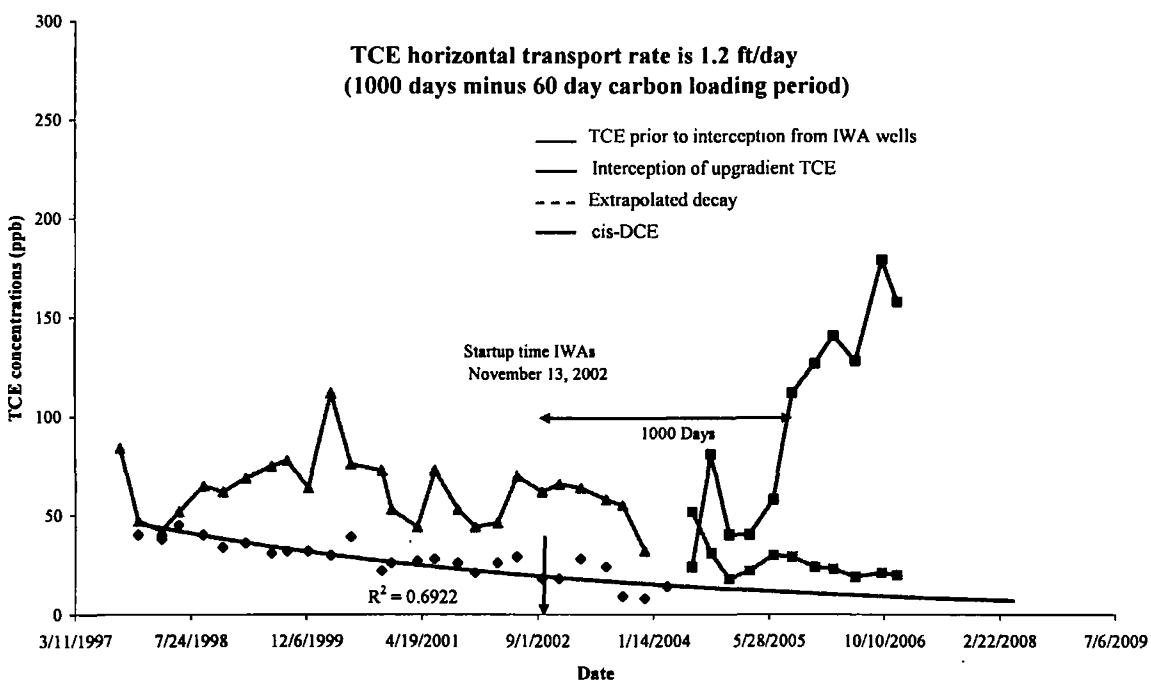

Figure 3. Quarterly monitored TCE (blue, red) and cis-DCE (green) concentrations at MW-7.

The operation of the IWA wells with spent carbon canisters for approximately two years (mid-January 2003 to December 2004) (USEPA, 2005b) allowed a large plume of TCE to develop in the shallow groundwater. TCE from the plume has been intercepted at MW-25 and shallow nested wells at UN-A and UN-B (Figure 4). TCE data for these wells are in Appendix A. Construction details for the UN nested wells (red labels in Figure 4) are in Appendix B. The shallow TCE plume stretches 1700 feet from the IWA transect on the west to beyond UN-B on the east. While the TCE concentrations in MW-5 have declined since breakthrough, they are still well above concentrations detected in downgradient North Landfill monitoring wells MW-6 and MW-7 prior to the interception of the IWA TCE excursions.

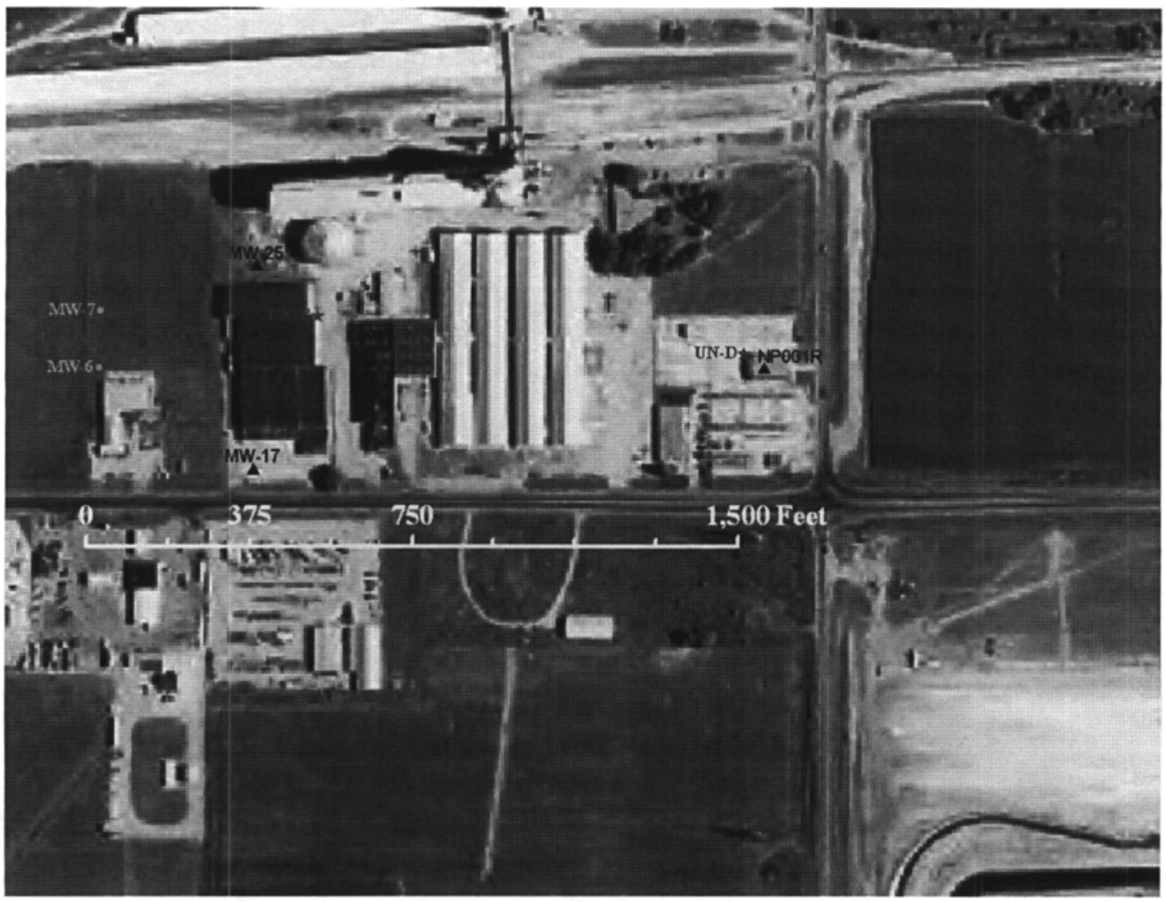

Figure 4. Location of monitored wells downgradient of the North Landfill. Locations of both EPA and University of Nebraska (UN) research well installations are depicted.

During the period covered by the Five-Year Report (July 1997 – September 2002) (Hydro-Trace, 2002) quarterly monitoring provided evidence that MNA was occurring at the capillary fringe and/or possibly in the shallow groundwater beneath the landfill. Lines of evidence for the occurrence of reductive dechlorination in anaerobic environments beneath the landfill included:

- Very low PCE concentrations (Appendix A)
- Trend toward decreased TCE concentrations (Appendix A)
- Trend toward increased cis-DCE concentrations (Appendix A)
- Detectable vinyl chloride concentrations (Appendix A)
- Reducing conditions (Five-Year Report, Hydro-Trace, 2002)
- Above background levels of DOC (Five-Year Report, Hydro-Trace, 2002)

The TCE deposited in the North Landfill reportedly was spent TCE, which was scraped from degreasers and poured into 55-gallon steel drums. These barrels were crushed in the landfill and the highly carbonaceous contents and TCE were released. The carbon in the scrapings appears to have been instrumental in providing the excess carbon favorable for lowered redox.

Figure 5. Shallow groundwater TCE plume in December 2006.

Reductive dechlorination sequentially removes a chlorine atom from chlorinated solvents and their chlorinated transformation products such that

perchloroethylene (PCE) ⟶ trichloroethylene (TCE) ⟶ cis-dichloroethylene (DCE) ⟶ vinyl chloride (VC).

High cis-DCE concentrations and moderately low VC concentrations have been detected in the NL monitoring wells for decades. Dechlorination rates are faster for the more highly chlorinated molecules in the sequence (ITRC, 1999); therefore, cis-DCE concentrations tend to increase relative to TCE concentrations. On the other hand, VC concentrations generally are low because VC can be transformed by a number of aerobic and anaerobic pathways. For the five years prior to the interception of IWA TCE, average cis-DCE /TCE concentration ratios in MW-6 and MW-7 were 6.7 and 2.9, respectively, and were reduced to ~0.5 after the upgradient TCE source was intercepted. Without the introduction of the IWA source, TCE concentrations would be at or below the 5 ppb MCL (Figures 2 and 3) by 2007 ± 1 year. The extent and level of TCE contamination from the IWA wells make future MNA unquantifiable. Residual NL TCE concentrations are completely overwhelmed by those from the IWA wells. In addition to drastically increased TCE concentrations at MW-6 and MW-7, cis-DCE concentrations have decreased at MW-7. This suggests that the rate of reductive dechlorination has been reduced and may in part reflect suspected higher dissolved oxygen (DO) concentrations introduced into the shallow groundwater by the IWA wells. Higher DO levels would curtail shallow groundwater reductive dechlorination of TCE, the basis for MNA.

TCE excursions from the IWA wells allowed for field calculations of the TCE transport rate. A minimum of 1.2 ft/day was calculated for transport from the IWA transect to both shallow downgradient monitoring wells MW-6 and MW-7 (Figures 2 and 3). EPA (2007) suggests that breakthrough may have occurred 120 days after startup. Using EPA's estimate the transport rate would be approximately 10% faster. The observed transport rates in Figures 2 and 3 are by far the most accurate data available. Previous data were dependent upon Darcy's Law estimations using higher retardation factors than are characteristic of the site. Robertson (2004) reported a groundwater velocity 0.96 to 1.13 ft/day; however, he applied a retardation factor of 1.49, which resulted in TCE transport rates of 0.64 to 0.76 ft/day. Low sorption effects have been reported at several sites (Wiedemeier et al., 1999). Widmer and Spalding (1996) reported that the amount of carbon in central Nebraska sand and gravel aquifers is low (~60 μg/g or 0.006%). Resultant low estimated R values for TCE in this aquifer indicate that sorption/desorption reactions are minimal. Therefore plume tailing should be limited to the effects of dispersion. Dravo (2005) used a transport rate of 400 ft/yr to explain lowered concentrations in MW-17 as a result of Phase III IWA activities. While this rate was insufficient to explain the reduction in concentration in this deep well, it does demonstrate that Dravo assumed minimal retardation.

Deep Zone TCE

The TCE transformation products in several deep (150 to 200-ft) monitoring wells downgradient of the North Landfill (MW-17, NP-001R, UN-C-5, UN-D-4) are different than those in the shallow TCE plume from the North Landfill. The North Landfill TCE plume is characterized by high concentrations of cis-DCE and high cis-DCE/TCE ratios; the deeper plume generally has low concentrations of cis-DCE and very low cis-DCE/TCE ratios (0.01). The North Landfill plume was severely impacted by reductive dechlorination; the deep plume obviously was not. The deep plume also contained significant concentrations of several VOCs that either were not present or were present in extremely low concentrations in the shallow plume. These compounds include PCE and 1,1,1-TCA and its transformation products 1,1-DCA and 1,1-DCE (Figure 6)

(Appendix A). These characteristics were identified in a deep plume that stretched from upgradient of the North Landfill to GM-2, which is more than 1500 feet downgradient of the North Landfill. Geoprobe® sampling filled in monitoring well spacing gaps and provided additional evidence of the continuity of this long and concentrated TCE plume (Hydro-Trace, 2002).

Even though there are identifiable and accepted transformation product ratios that differentiate the shallow and deep plumes, EPA (November 13, 2006 meeting) requested additional evidence that the North Landfill was not contributing contaminants to the deep zone. EPA suggested that there were not enough data from wells slotted deeper in the aquifer. Also Dravo has reported that deep dense nonaqueous phase liquids (DNAPLs) beneath the North Landfill could not be ruled out (Dravo Corporation, 2004a). Four wells (UN-C-5, UN-D-4, NP-001R and MW-17) downgradient of the NL have slotted intervals in the deep groundwater (Figure 4). The UN monitoring wells were sampled in mid-November 2006 and again in early January 2007 and additional sampling beyond that regularly scheduled occurred at NP-001R in early January 2007 (Appendix A). These wells all showed markedly similar trends in decreasing TCE concentrations (Figure 7). From 2001 to 2004 all four wells had TCE concentrations between 1,000 and 2,000 ppb. In early 2005 the TCE concentrations dramatically decreased and by 2007 were well below mid and late 1990s levels. Wells UN-C-5 and UN-D-4 are directly east of the NL and their TCE concentrations declined to levels well below 100 ppb. The decreasing trends in TCE concentrations indicate that the deep TCE plume was truncated by the IWA TCE remediation. The data also indicate that the source of the deep plume is the Colorado Avenue Subsite and not the North Landfill. If the North Landfill was the source of the deep TCE, the TCE concentrations would not be impacted by the operation of the IWA wells and these drastic concentration decreases would not have occurred. Variability in TCE concentrations among the wells in Figure 7 reflects the erratic performance and operation of the IWA wells during the first years of operation (Dravo, 2004b; USEPA, 2005a) and the distance from the IWA transect. Cis-DCE was present in these wells in very low concentrations. The November 2006 cis-DCE/TCE ratios

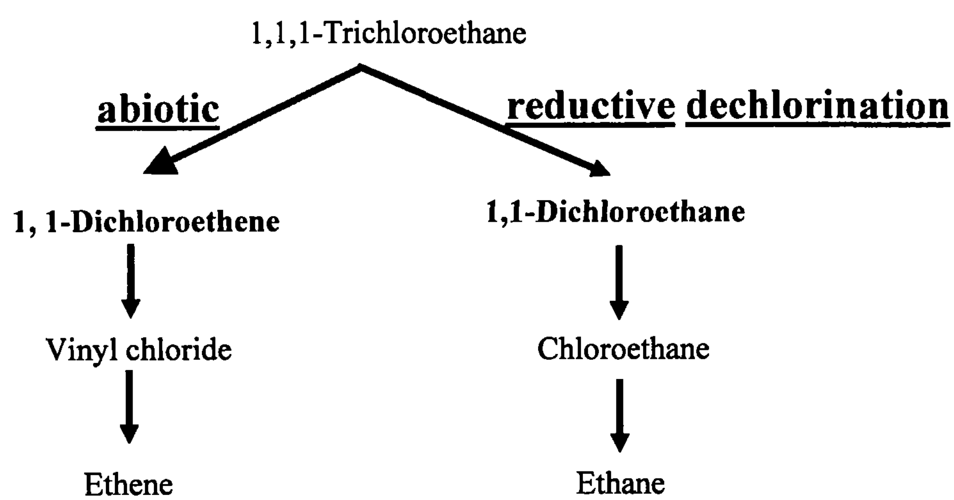

Figure 6. TCA abiotic and reductive dechlorination (microbial) transformation products.

were: 278/6, 318/5, 53/3 and 83/3 for MW-17, NP-001R, UN-C-5, UN-D-4, respectively, and averaged 0.04 ± 0.02. There also were relatively high levels of PCE in these wells before the IWA dilution impact occurred. PCE concentrations remain >5 ppb in MW-17 and NP-0001R. The above ratios and the presence of PCE provide additional support for the origin of the deep plume. The low cis-DCE/TCE ratios and relatively high PCE concentrations indicate that the plume did not originate at the North Landfill and that its composition is consistent with the Colorado Avenue plume. Thus, during the initial long period of operation when the carbon canisters were spent, the closed-loop system tended to dilute the deep plume by spreading it throughout the vertical thickness of the IWA wells. This dilution of the deep zone TCE is in evidence in several of the deep, downgradient monitoring wells.

The reverse breakthrough curves (Figure 7) also provide minimum estimates for TCE transport rates in the deep aquifer. The distance from the IWA transect to NP-001R and UN-D-4 is about 2700 feet (Figures 1 and 4). If IWA remediation began around January 1, 2003 (equilibrium established), there would be a 3.5-4.0 year transport time to these wells. This translates to a transport rate in the deep aquifer of 1.85 to 2.1 ft/day. More rapid transport times in the deep aquifer than in the shallow aquifer are a reflection of increased hydraulic conductivity with depth. It is well-known that the top of the aquifer generally grades from fine to medium sands in the first 30 feet and at 150 feet bls grades to sands and gravels with the greatest gravel content occurring in the bottom strata.

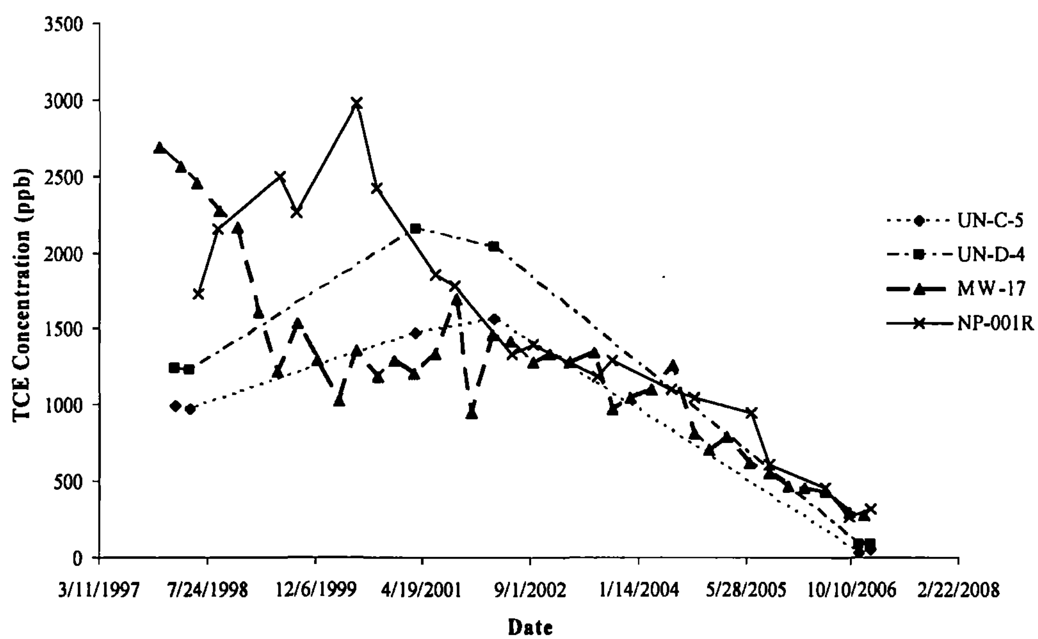

Figure 7. Trends in TCE concentrations in deep wells downgradient of the NL.

Impact of TCE Transport Rates on Plume Interception at Well D and Beyond

Figure 8 depicts the estimated times of arrival (ETA) of the shallow plume from the North Landfill. The ETAs conservatively assume that the TCE entered the shallow groundwater in 1970. This allows for a seven-year transport time through the unsaturated layer. The estimated arrival times indicate that irrigation wells such as I-49, I-51, I-58 and CI-15 and the Chief Ethanol and the Hastings Energy Center wells have captured and volatilized TCE for years. Certainly some contamination is present in the Institutional Control Area west of the Whelan Energy Center although sampling has confirmed that the TCE concentrations are relatively low. This is a result of the capture, vertical mixing, and remediation at high capacity irrigation wells (1,000 – 2,200 GPM) and at the industrial wells at Chief Ethanol and the Hastings Energy Center.

Figure 8. Downgradient high capacity irrigation wells and estimated TCE arrival times in the shallow zone from the North Landfill.

Spent TCE from the degreasers at Dravo's Colorado Avenue plant was released to private storm sewers in the 1960's and 1970's. These releases appear to have allowed a line-source of contamination to develop. This contamination is in the deep water beneath the North Landfill. The plume can be traced from ML-1 on the corner of Elm Avenue and East Park Street and farther east to Sixth Avenue. A conservative estimate of seven years was used for the vertical transport time from the storm drains to the water table. Thus the 1970 line represents the assumed entry date of the TCE into the groundwater (Figure 9). Jury (1993) and Robertson (2004) estimated unsaturated zone transport times for VOCs at the Hastings' subsites to be 0.5 to

5 years. Initial TCE concentrations at the Colorado Avenue Subsite were very high and rapid downward aquifer penetration may have occurred. Using conservative deep transport rates, TCE contamination would have reached the downgradient deep NL MW-17, a distance of about 7,100 ft, by the mid-1980's (7,100 ft ÷ 1.8 ft/day = 3944 days or 10.8 years). If shallow zone transport rates are used, one could argue an additional five years in transport time until the leading edge of the plume reached Elm Street.

Figure 9. Estimated arrival times for TCE transport from the Colorado Avenue Subsite.

Hydraulic and plume composition evidence indicate that the North Landfill was never a source of TCE in deep monitoring wells downgradient of the North Landfill. From June 1991 to June 2004 MW-17, the closest deep monitoring well downgradient of the North Landfill, contained relatively high average part per billion concentrations of PCE, (42 ± 11, n = 40), TCA (37 ± 11, n = 40), 1,1-DCE (19.6 ± 7.2, n = 40) and 1,1 DCA (9.2 ± 3.0, n = 39), and starting with the first measurements in June 1995, low levels of cis-DCE (20.8 ± 6.0, n = 37),and very low cis DCE/TCE ratios (0.012 ± 0.003, n = 37). Similar concentrations and ratios in deep wells downgradient of the North Landfill (UN-C-5, UN-D-4, NP-001R, GM-2D) were previously reported in Hydro-Trace's Five-Year Report (2002). These concentrations and ratios differ substantially from the concentrations and ratios during the same period in MW-6, the primary North Landfill indicator well. Average part per billion concentrations of PCE, TCA, 1,1-DCE and 1,1-DCA were very low (3.0 ± 1.7, 2.4 ± 0.5, 2.4 ± 0.5, 2.4 ± 0.4, respectively, n = 40). Cis-DCE concentrations were very high (296 ± 136, n = 37) and cis-DCE/TCE ratios (4.6 ± 2.6, n = 37) were two magnitudes higher than in the deep wells. Concentrations in MW-7 are very similar to those in MW-6. The data indicate that the Colorado Avenue Subsite is and has been the sole source of TCE contamination for the deep wells.

The transport rates indicate that Colorado Avenue TCE has been intercepted by Well D since its start up in July 1997 (Figure 9). The high capacity irrigation well (MO-1), which reportedly had a pumping capacity of 2,200 GPM and irrigated the quarter that the race track now occupies, intercepted part of the deep plume and drew it south of US Highway 6 during the growing season. Since this well was shut down in 2004, TCE concentrations have been increasing in Well D (Appendix A).

Conclusions

TCE transport rates in both the deep and shallow groundwater at the North Landfill Subsite and downgradient to Well D were estimated from monitored breakthrough curves. TCE transport rates in the shallow and deep groundwater are conservatively estimated at 1.2 and 1.8 ft/day, respectively.

The leading edge of the shallow groundwater plume delineated in April 2002 in the Five-Year Report (Hydro-Trace, 2002) will be removed by Well D by April 2007 and plume removal will be complete by August 2011. Figure 10 represents a conceptual model of the movement of the North Landfill TCE to Well D. At a transport rate of 1.2 ft/day complete removal of the 1800-ft long plume should occur in 4.1 years (1800 ft ÷ 1.2 ft/day = 1500 days). Model data were derived from field-monitored breakthrough curves. The model results are conservative because (1) they assume that the plume is not completely or partially extracted by the high capacity irrigation well I-49 before interception at well D and (2) the conservative transport rate is derived from carbon breakthrough after two months although USEPA (2007) reports the period to initial breakthrough likely was closer to four months.

The source of the deep TCE was truncated by remedial activities at the IWA transect. This is supported both by the rapid trend in decreased TCE concentrations in the downgradient wells and by the plume composition. Identifying characteristics of the Colorado Avenue plume as compared to the North Landfill plume include much lower average cis-DCE/TCE ratios, the presence of PCE, TCA, 1,1-DCE, 1,1-DCA and much higher concentrations of TCE. The results indicate that the North Landfill is not and to our knowledge has never been a source of dense nonaqueous phase liquids (DNAPLs) or TCE to the deep groundwater.

Figure 10. Conceptual model showing downgradient position of North Landfill TCE plume delineated in April 2002.

Recommendation

Both TCE concentrations greater than 50 ppb and tailing concentrations at the 10^{-6} health risk level will be extracted by Well D and/or I-49 by September 30, 2014. Therefore we recommend that our participation in pumping Well D as part of the North Landfill Subsite OU 2 cleanup terminate on September 30, 2014.

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APPENDIX A

Groundwater VOC Data

APPENDIX B

Construction Details for UN Wells

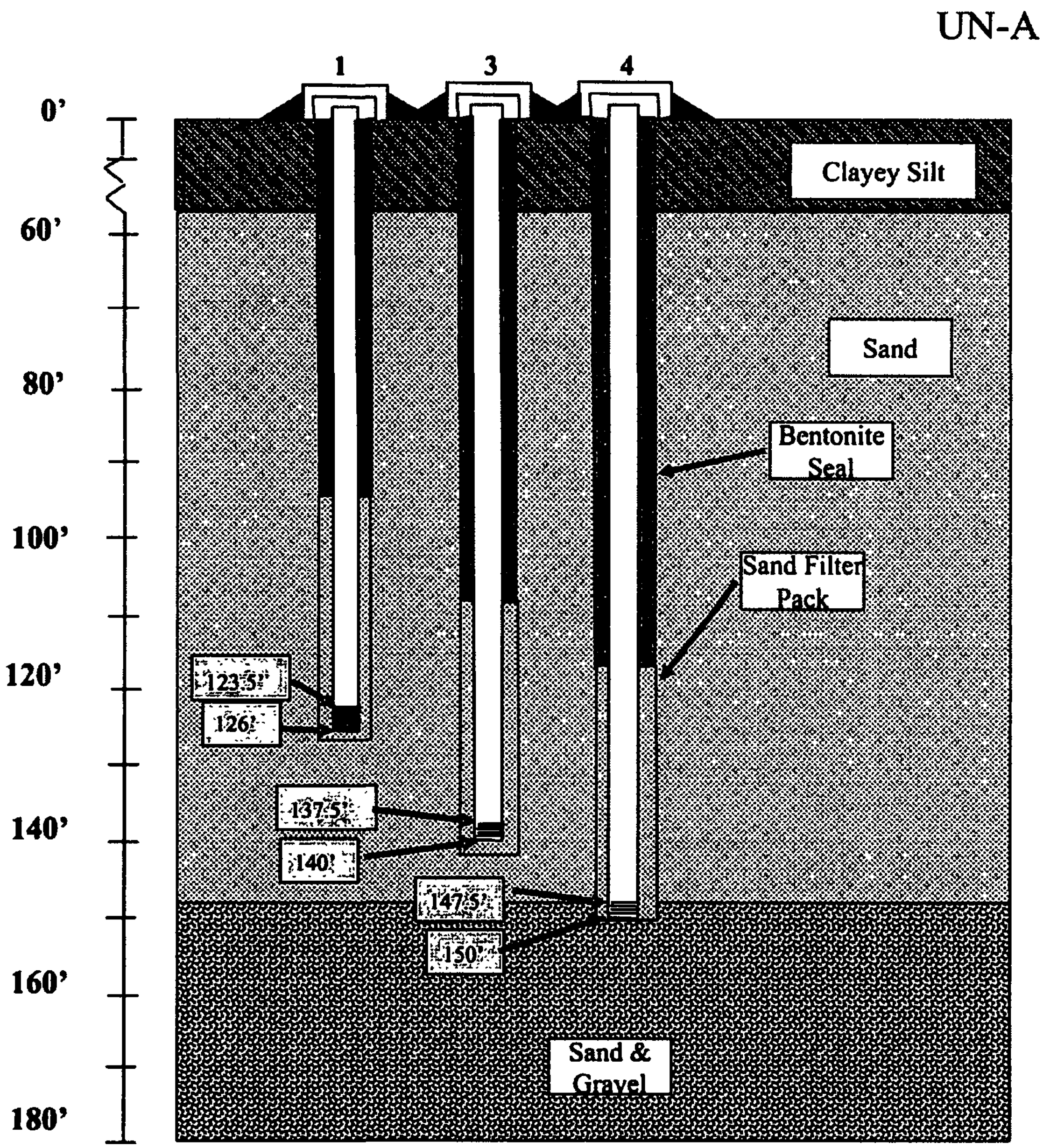

Figure B-1. UN-A-1, UN-A-3 and UN-A-4 construction details. Installed in February 1997 by Liehs Drilling Inc., Lexington, NE using a hollow stem auger.

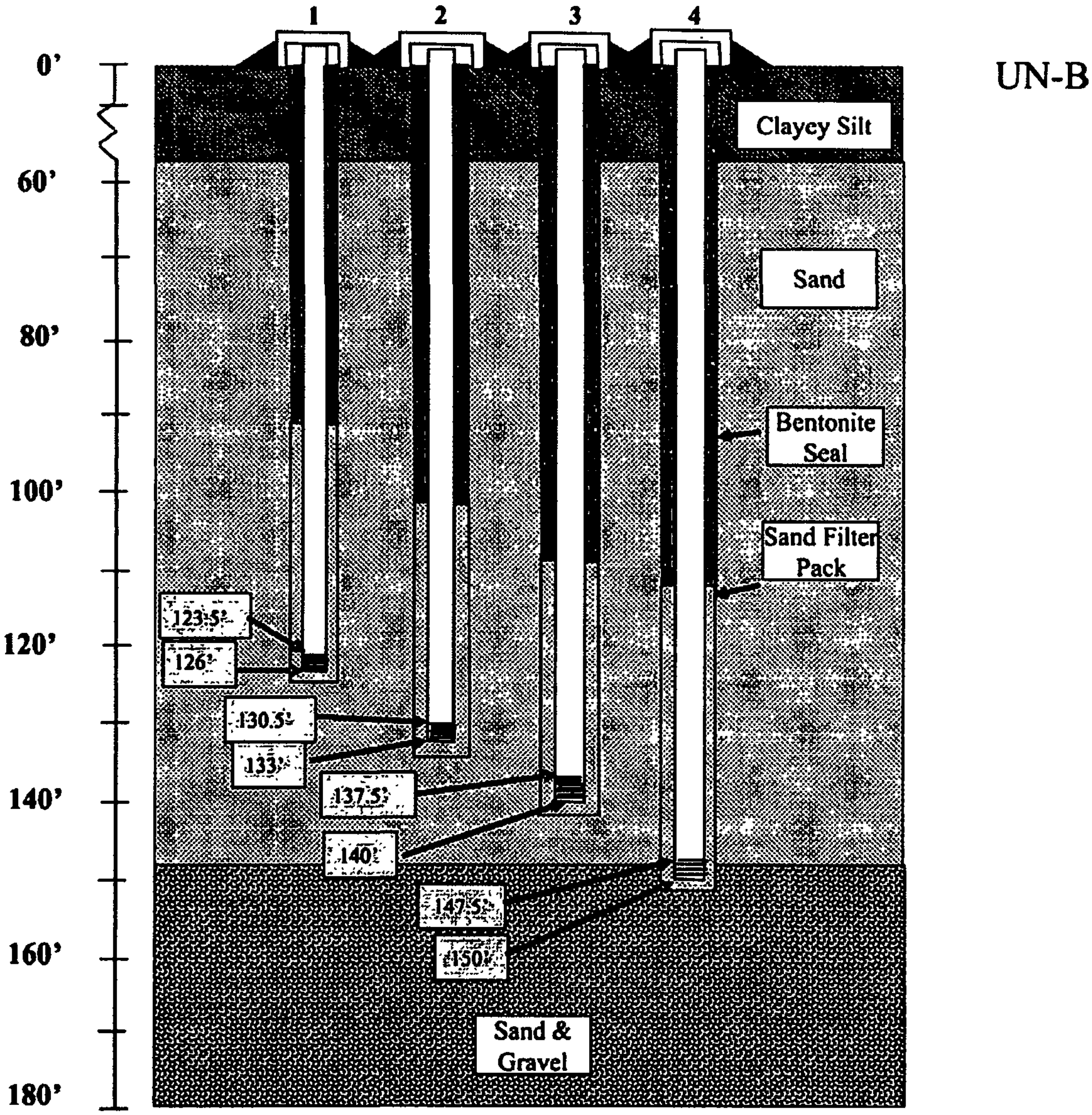

Figure B-2. UN-B-1, UN-B-2, UN-B-3 and UN-B-4 construction details. Installed in February 1997 by Liehs Drilling Inc., Lexington, NE using a hollow stem auger.

UN-C

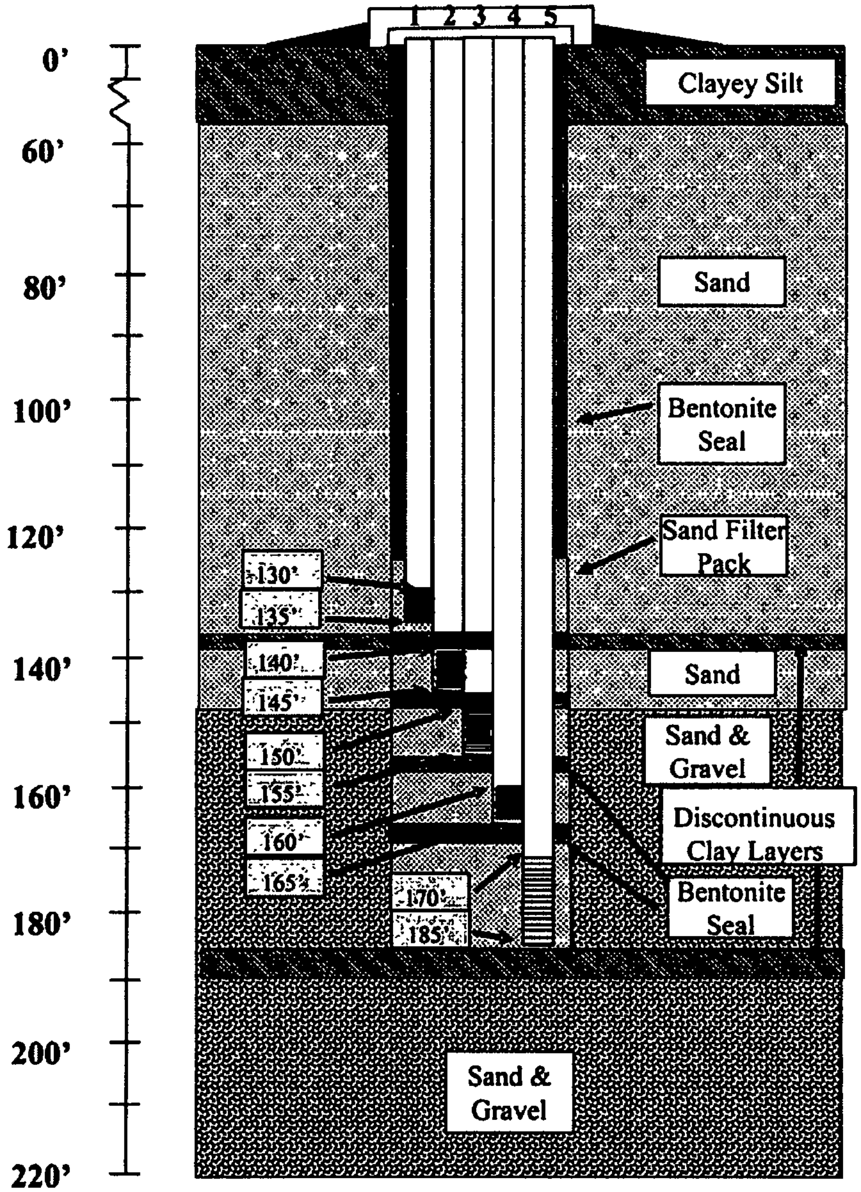

Figure B-3. Nested wells UN-C-1, UN-C-2, UN-C-3, UN-C-4 and UN-C-5 construction details. Installed in November 1997 by Pollock Well Drilling, Grand Island using reverse rotary drilling.

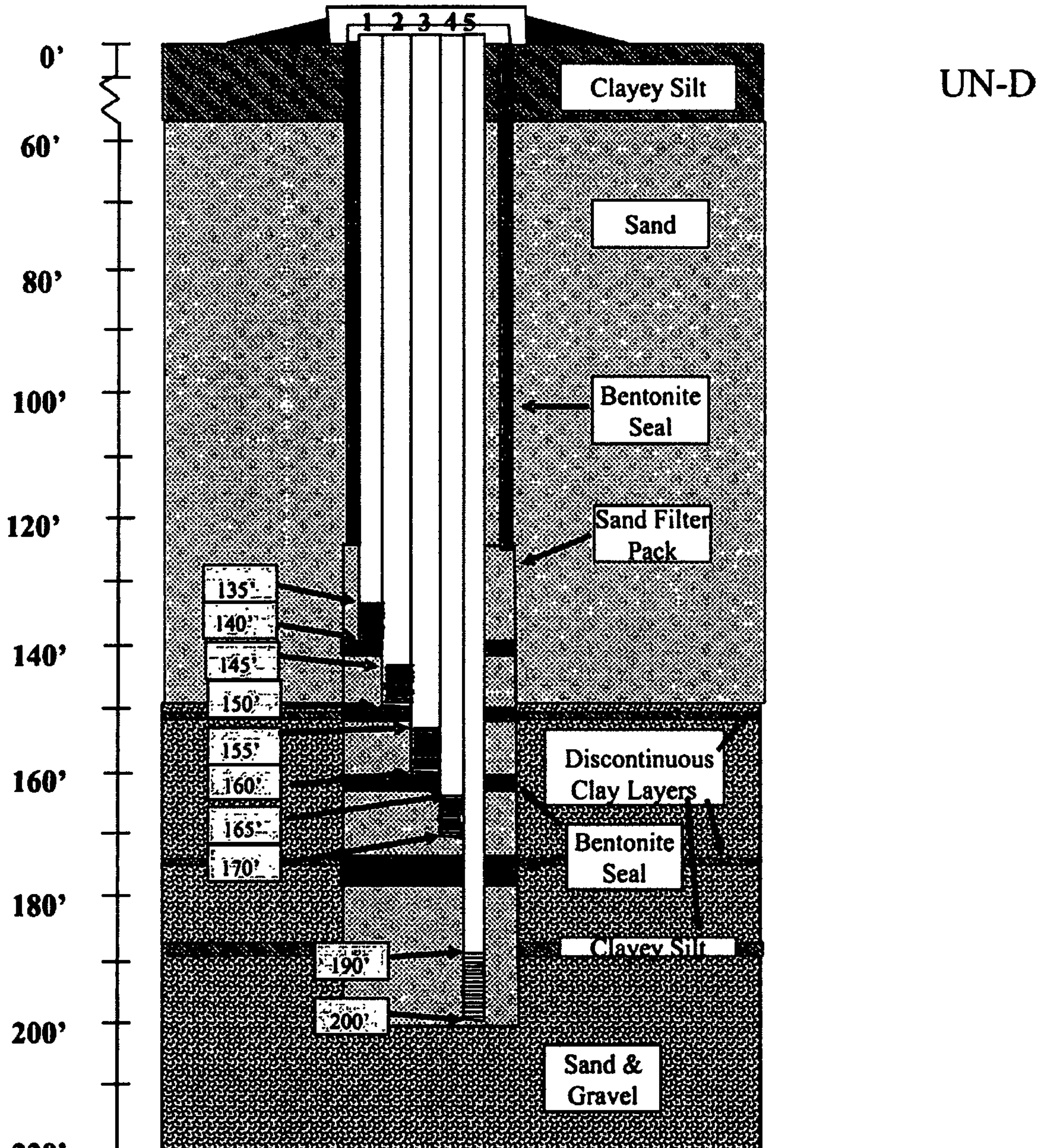

Figure B-4. Nested wells UN-D-1, UN-D-2, UN-D-3, UN-D-4 and UN-D-5 construction details. Installed in November 1997 by Pollock Well Drilling, Grand Island using reverse rotary drilling.

MW-5

Date	PCE µg/L	TCE µg/L	c-1,2-DCE µg/L	t-1,2-DCE µg/L	1,1-DCE µg/L	Vinyl Cl µg/L	1,1,1-TCA µg/L	1,1,2-TCA µg/L	1,1-DCA µg/L	1,2-DCA µg/L	Carbon tet µg/L	Chloroform µg/L	Met Cl µg/L	EDB µg/L
Sep-86		38												
Dec-86	5	17		<5	14	<10	41	<5	<5	<5	<5	<5	<5	
Mar-87		25												
Jul-87	<5	40	11 (total)		11	<10	31	<5	<5	<5	<5	<5	<5	
Sep-87		24												
Dec-87	6	40		9	16	<10	40	<5	<5	<5	<5	<5	<5	
Mar-88		34												
Mar-89		25												
Jun-89	<5	18	3 (total)		10	<10	22	<5	<5	<5	<5	<5	<5	
Mar-90		19												
6/20/1991	3	30	8 (total)		2	2	3	<1	<1	<1	<1	<1	<1	
10/1/1991	3	16	3 (total)		9	<1	18	<1	<1	<1	<1	<1	<2	
6/10/1992	2	9	<1 (total)	<1	12	<1	16	<1	<1	<1	<1	<1	<2	
3/25/1993	3	10		<1	7	<3	12	<1	<1	<1	<1	<1	<2	
6/15/1995	<5	<5	<5	<5	<5	<2	<5	<5	<5	<5	<5		<5	
9/12/1995	<5	<5	<5	<5	<5	<2	<5	<5		<5	<5		<5	
12/1/1995	<5	7	<5	<5	<5	<2	<5	<5	<5	<5	<5		<5	
3/13/1996	<5	<5	<5	<5	<5	<2	<5	<5	<5	<5	<5		<5	
6/17/1996	<5	<5	<5	<5	<5	<2	<5	<5	<5	<5	<5		<5	
9/10/1996	<5	<5	<5	<5	<5	<2	<5	<5	<5	<5	<5		<5	
12/2/1996	<5	<5	<5	<5	<5	<2	<5	<5	<5	<5	<5		<5	
3/18/1997	<5	<5	<5	<5	<5	<2	<5	<5	<5	<5	<5		<5	
6/16/1997	<5	<5	<5	<5	<5	<2	<5	<5	<5	<5	<5		<5	
9/22/1997	<5	<5	<5	<5	<5	<2	<5	<5	<5	<5	<5		<5	
12/8/1997	<5	<5	6	<5	<5	<2	<5	<5	<5	<5	<5		<5	
3/19/1998	<5	<5	<5	<5	<5	<2	<5	<5	<5	<5	<5		<5	
6/1/1998	<5	<5	<5	<5	<5	<2	<5	<5	<5	<5	<5		<5	
9/15/1998	<5	<5	<5	<5	<5	<2	<5	<5	<5	<5	<5		<5	
12/8/1998	<5	<5	<5	<5	<5	<2	<5	<5	<5	<5	<5		<5	
3/16/1999	<5	<5	<5	<5	<5	<2	<5	<5	<5	<5	<5		<5	
6/15/1999	<5	<5	<5	<5	<5	<2	<5	<5	<5	<5	<5		<5	
9/14/1999	<5	<5	<5	<5	<5	<2	<5	<5	<5	<5	<5		<5	
12/9/1999	<5	<5	<5	<5	<5	<2	<5	<5	<5	<5	<5		<5	
3/15/2000	<5	<5	<5	<5	<5	<2	<5	<5	<5	<5	<5		<5	
6/15/2000	<5	<5	<5	<5	<5	<2	<5	<5	<5	<5	<5		<5	
10/24/2000	<5	<5	<5	<5	<5	<2	<5	<5	<5	<5	<5		<5	
12/4/2000	<5	<5	<5	<5	<5	<2	<5	<5	<5	<5	<5		<5	
3/9/2001	<5	<5	<5	<5	<5	<2	<5	<5	<5	<5	<5		<5	

MW-5

Date	PCE µg/L	TCE µg/L	c-1,2-DCE µg/L	t-1,2-DCE µg/L	1,1-DCE µg/L	Vinyl Cl µg/L	1,1,1-TCA µg/L	1,1,2-TCA µg/L	1,1-DCA µg/L	1,2-DCA µg/L	Carbon tet µg/L	Chloroform µg/L	Met Cl µg/L	EDB µg/L
6/12/2001	<5	<5	<5	<5	<5	<2	<5	<5	<5	<5	<5		<5	
9/20/2001	<5	<5	<5	<5	<5	<2	<5	<5	<5	<5	<5		<5	
3/11/2002	<5	<5	<5	<5	<5	<2	<5	<5	<5	<5	<5		<5	
3/7/2003	<5	12	<5	<5	<5	<2	<5	<5	<5	<5	<5	<5	<5	
3/2/2005	<5	208	<5	<5	<5	<2	8	<5	<5	<5	<5	<5	<5	
3/2/2006	<5	40	<5	<5	<5	<2	<5	<5	<5	<5	<5	<5	<5	
10/12/2006	<5	39	<5	<5	<5	<2	<5	<5	<5	<5	<5	<5	<5	

MW-6

Date	PCE µg/L	TCE µg/L	DCE/TCE	c-1,2-DCE µg/L	t-1,2-DCE µg/L	1,1-DCE µg/L	Vinyl Cl µg/L	1,1,1-TCA µg/L	1,1,2-TCA µg/L	1,1-DCA µg/L	1,2-DCA µg/L	Carbon tet µg/L	Chloroform µg/L	Met Cl µg/L	EDB µg/L
Sep-86		2200													
Dec-86	11	1700			2000	<5	87	<5	16	<5	8	<5	<5	46	
Mar-87		2000													
Jul-87	8	1900			2000	<5	32	<5	<5	<5	20	<5	<5	<10	
Sep-87	<5	36			6	26	<10	76	<5	<5	<5	<5	<5	<5	
Dec-87	11	2300			1800	<5	51	<5	<5	<5	26	<5	<5	55	
Mar-88		1400													
Jun-88	11	1900		1800 (total)		<5	<14	<5	23	<5	27	<5	<5	<56	
Sep-88		1800													
Dec-88		1300													
Mar-89		1600													
Jun-89	<50	1600		1300 (total)		<5	<100	<5	<50	<5	<5	<50	<5	<55	
Sep-89	8	1300		1800 (total)		<5	31	<5	10	<5	15	<5	2	<36	
Dec-89		830													
Mar-90		1100													
6/19/1991	9	800		1100 (total)		<1	39	<1	9	<1	6	<1	1	<23	
10/1/1991	9	320		550 (total)		<1	38	<1	10	<1	6	<1	<1	<20	
6/11/1992	<120	720		920 (total)		<120	24	<120	<120	<120	<120	<120	<120	<250	<0.02
3/26/1993	8	840		1600	5	<1	101	<1	10	2	8	<1	<1	<19	
6/16/1995	<5	366		600	<5	<5	25	<5	6	<5	<5	<5		11	
9/12/1995	<5	450		599	<5	<5	39	<5	<5		<5	<5		9	
12/1/1995	<5	330		377	<5	<5	33	<5	<5	<5	<5	<5		8	
3/13/1996	<5	295		486	<5	<5	37	<5	<5	<5	<5	<5		9	
6/17/1996	<5	197		463	<5	<5	38	<5	6	<5	<5	<5		9	
9/10/1996	<5	141		357	<5	<5	27	<5	<5	<5	<5	<5		5	
12/3/1996	<5	132		321	<5	<5	21	<5	<5	<5	<5	<5		<5	
3/18/1997	<5	181	2.3	423	<5	<5	29	<5	<5	<5	<5	<5		7	
6/16/1997	<5	167	3.3	545	<5	<5	26	<5	6	<5	<5	<5		6	
9/22/1997	<5	102	0 0	413	<5	<5	19	<5	5	<5	<5	<5		<5	
12/9/1997	<5	128	2 9	368	<5	<5	21	<5	<5	<5	<5	<5		<5	
3/20/1998	<5	108	3.6	390	<5	<5	18	<5	<5	<5	<5	<5		5	
6/1/1998	<5	122	3.4	411	<5	<5	19	<5	<5	<5	<5	<5		6	
9/16/1998	<5	116	2.6	307	<5	<5	20	<5	<5	<5	<5	<5		<5	
12/9/1998	<5	96	3.2	311	<5	<5	20	<5	<5	<5	<5	<5		<5	
3/18/1999	<5	85	3.4	288	<5	<5	16	<5	<5	<5	<5	<5		<5	
7/9/1999	<5	73	4.8	347	<5	<5	20	<5	<5	<5	<5	<5		<5	
9/13/1999	<5	57	4.2	242	<5	<5	20	<5	<5	<5	<5	<5		<5	
12/13/1999	<5	68	3.5	240	<5	<5	20	<5	<5	<5	<5	<5		<5	
3/22/2000	<5	48	4.9	233	<5	<5	17	<5	<5	<5	<5	<5		<5	
6/16/2000	<5	42	6.0	252	<5	<5	17	<5	<5	<5	<5	<5		<5	
9/19/2000	<5	40	6.5	260	<5	<5	16	<5	<5	<5	<5	<5		<5	

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Date	PCE µg/L	TCE µg/L	DCE/TCE	c-1,2-DCE µg/L	t-1,2-DCE µg/L	1,1-DCE µg/L	Vinyl Cl µg/L	1,1,1-TCA µg/L	1,1,2-TCA µg/L	1,1-DCA µg/L	1,2-DCA µg/L	Carbon tet µg/L	Chloroform µg/L	Met Cl µg/L	EDB µg/L
12/5/2000	<5	34	8.7	297	<5	<5	16	<5	<5	<5	<5	<5		<5	
3/29/2001	<5	31	10.1	312	<5	<5	12	<5	<5	<5	<5	<5		<5	
6/12/2001	<5	39	7.6	298	<5	<5	14	<5	<5	<5	<5	<5		<5	
9/20/2001	<5	44	4 8	212	<5	<5	11	<5	<5	<5	<5	<5		<5	
12/4/2001	<5	41	4 0	162	<5	<5	11	<5	<5	<5	<5	<5		<5	
3/11/2002	<5	37	5.7	210	<5	<5	10	<5	<5	<5	<5	<5		<5	
6/3/2002	<5	37	4.2	154	<5	<5	6	<5	<5	<5	<5	<5		<5	
9/19/2002	<5	38	3 5	126	<5	<5	5	<5	<5	<5	<5	<5	<5	<5	
12/2/2002	<5	25	5.3	132	<5	<5	6	<5	<5	<5	<5	<5	<5	<5	
3/6/2003	<5	36	2.9	103	<5	<5	6	<5	<5	<5	<5	<5	<5	<5	
6/24/2003	<5	22	6.9	152	<5	<5	7	<5	<5	<5	<5	<5	<5	<5	
9/4/2003	<5	17	12.7	216	<5	<5	8	<5	<5	<5	<5	<5	<5	<5	
12/8/2003	<5	18	6.8	122	<5	<5	4	<5	<5	<5	<5	<5	<5	<5	
3/12/2004	<5	15	8.7	130	<5	<5	4	<5	<5	<5	<5	<5	<5	<5	
6/28/2004	<5	18	5 6	100	<5	<5	4	<5	<5	<5	<5	<5	<5	<5	
9/20/2004	<5	16	11.4	183	<5	<5	5	<5	<5	<5	<5	<5	<5	<5	
12/7/2004	<5	14	11.9	167	<5	<5	5	<5	<5	<5	<5	<5	<5	<5	
3/4/2005	<5	45	141.55	114	<5	<5	4	<5	<5	<5	<5	<5	<5	<5	
6/16/2005	<5	89		94	<5	<5	3	<5	<5	<5	<5	<5	<5	<5	
9/7/2005	<5	106		177	<5	<5	5	<5	<5	<5	<5	<5	<5	<5	
12/13/2005	<5	229		102	<5	6	3	<5	<5	9	<5	<5	<5	<5	
3/3/2006	<5	262		102	<5	7	2	<5	<5	11	<5	<5	<5	<5	
6/6/2006	<5	249		66	<5	7	<2	<5	<5	10	<5	<5	<5	<5	
9/29/2006	<5	165		118	<5	<5	3	<5	<5	7	<5	<5	<5	<5	
12/5/2006	<5	170		133	<5	<5	2	<5	<5	7	<5	<5	<5	<5	

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Date	PCE µg/L	TCE µg/L	c-1,2-DCE µg/L	DCE/TCE	t-1,2-DCE µg/L	1,1-DCE µg/L	Vinyl Cl µg/L	1,1,1-TCA µg/L	1,1,2-TCA µg/L	1,1-DCA µg/L	1,2-DCA µg/L	Carbon tet µg/L	Chloroform µg/L	Met Cl µg/L	EDB µg/L
Sep-86		86													
Dec-86	<5	98			22	<5	<10	6	<5	<5	<5	<5	<5	<5	
Mar-87		7													
Jul-87	<5	100			<5	9	<14	20	<5	<5	<5	<5	<5	<10	
Sep-87	<5	180			110	<5	<10	7	<5	<5	<5	<5	<5	<7	
Dec-87	5	180			78	<5	<10	12	<5	<5	<5	<5	<5	<5	
Mar-88		270													
Jun-88	5	250	<5 (total)			5	<14	12	<5	<5	<5	<5	<5	<9	
Sep-88		440													
Mar-89		240													
Jun-89	7	310	38 (total)			29	<17	59	<8	<8	<8	<8	<8	<8	
Sep-89		260													
Dec-89		220													
Mar-90		240													
6/19/1991	6	180	66 (total)			27	9	42	<1	<1	<1	<1	<1	<3	
10/1/1991	3	130	100 (total)			4	10	7	<1	<1	<1	<1	<1	<3	
6/10/1992	5	180	48 (total)			25	<1	59	1	<1	<1	<1	<1	<2	
3/26/1993	7	190	60		<1	32	5	63	<1	<1	<1	<1	<1	<2	
6/15/1995	<5	103	48		<5	19	3	37	<5	<5	<5	<5		<5	
9/12/1995	<5	54	106		<5	<5	16	<5	<5		<5	<5		<5	
12/1/1995	<5	30	54		<5	<5	5	<5	<5	<5	<5	<5		<5	
3/13/1996	<5	41	46		<5	6	5	10	<5	<5	<5	<5		<5	
6/17/1996	<5	42	62		<5	7	7	10	<5	<5	<5	<5		<5	
9/10/1996	<5	42	125		<5	<5	10	<5	<5	<5	<5	<5		<5	
12/3/1996	<5	31	70		<5	<5	4	<5	<5	<5	<5	<5		<5	
3/18/1997	<5	51	57	1.1	<5	8	4	12	<5	<5	<5	<5		<5	
6/17/1997	<5	60	59	1.0	<5	10	4	17	<5	<5	<5	<5		<5	
9/22/1997	<5	50	119	2.4	<5	<5	6	<5	<5	<5	<5	<5		<5	
12/9/1997	<5	40	84	2.1	<5	<5	5	<5	<5	<5	<5	<5		<5	
3/20/1998	<5	38	47	1.2	<5	11	2	13	<5	<5	<5	<5		<5	
6/1/1998	<5	45	42	0.9	<5	13	<2	13	<5	<5	58	<5		<5	
9/16/1998	<5	40	52	1.3	<5	11	3	13	<5	<5	<5	<5		<5	
12/9/1998	<5	34	65	1.9	<5	7	5	8	<5	<5	<5	<5		<5	
3/18/1999	<5	36	62	1.7	<5	11	3	12	<5	<5	<5	<5		<5	
7/8/1999	<5	31	69	2.2	<5	13	4	16	<5	<5	<5	<5		<5	
9/13/1999	<5	32	75	2.3	<5	14	5	15	<5	<5	<5	<5		<5	
12/13/1999	<5	32	78	2.4	<5	7	4	8	<5	<5	<5	<5		<5	
3/22/2000	<5	30	64	2.1	<5	16	4	17	<5	<5	<5	<5		<5	
6/16/2000	<5	39	112	2.9	<5	6	7	7	<5	<5	<5	<5		<5	
10/27/2000	<5	22	78	3.5	<5	10	4	7	<5	<5	<5	<5		<5	
12/8/2000	<5	26	73	2.8	<5	7	5	6	<5	<5	<5	<5		<5	

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Date	PCE µg/L	TCE µg/L	c-1,2-DCE µg/L	DCE/TCE	t-1,2-DCE µg/L	1,1-DCE µg/L	Vinyl Cl µg/L	1,1,1-TCA µg/L	1,1,2-TCA µg/L	1,1-DCA µg/L	1,2-DCA µg/L	Carbon tet µg/L	Chloroform µg/L	Met Cl µg/L	EDB µg/L
3/29/2001	<5	27	53	2.0	<5	9	<2	11	<5	<5	<5	<5		<5	
6/12/2001	<5	28	44	1.6	<5	12	2	12	<5	<5	<5	<5		<5	
9/20/2001	<5	26	73	2.8	<5	<5	<2	10	<5	<5	<5	<5		<5	
12/4/2001	<5	21	53	2.5	<5	<5	3	<5	<5	<5	<5	<5		<5	
3/11/2002	<5	28	44	1.7	<5	11	2	9	<5	<5	<5	<5		<5	
6/3/2002	<5	29	46	1 6	<5	6	2	9	<5	<5	<5	<5		<5	
9/19/2002	<5	18	70	3.9	<5	<5	2	<5	<5	<5	<5	<5	<5	<5	
12/2/2002	<5	18	62	3.4	<5	<5	3	<5	<5	<5	<5	<5	<5	<5	
3/6/2003	<5	28	66	2 4	<5	7	3	7	<5	<5	<5	<5	<5	<5	
6/24/2003	<5	24	64	2.7	<5	6	3	6	<5	<5	<5	<5	<5	<5	
9/4/2003	<5	9	58	6 4	<5	<5	<2	<5	<5	<5	<5	<5	<5	<5	
12/8/2003	<5	8	55	6 9	<5	<5	<2	<5	<5	<5	<5	<5	<5	<5	
3/12/2004	<5	14	32	2.3	<5	<5	<2	<5	<5	<5	<5	<5	<5	<5	
6/28/2004	<5	24	52	2.2	<5	<5	<2	<5	<5	<5	<5	<5	<5	<5	
9/20/2004	<5	81	31	59.7	<5	<5	<2	<5	<5	<5	<5	<5	<5	<5	
12/7/2004	<5	40	18		<5	<5	<2	<5	<5	<5	<5	<5	<5	<5	
3/4/2005	<5	40	22		<5	<5	<2	<5	<5	<5	<5	<5	<5	<5	
6/16/2005	<5	58	30		<5	<5	<2	<5	<5	<5	<5	<5	<5	<5	
9/7/2005	<5	112	29		<5	<5	<2	<5	<5	<5	<5	<5	<5	<5	
12/13/2005	<5	127	24		<5	<5	<2	<5	<5	<5	<5	<5	<5	<5	
3/3/2006	<5	141	23		<5	<5	<2	<5	<5	<5	<5	<5	<5	<5	
6/6/2006	<5	128	19		<5	<5	<2	<5	<5	<5	<5	<5	<5	<5	
9/29/2006	<5	179	21		<5	<5	<2	<5	<5	<5	<5	<5	<5	<5	
12/5/2006	<5	158	20		<5	<5	<2	<5	<5	<5	<5	<5	<5	<5	

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Date	PCE µg/L	TCE µg/L	c-1,2-DCE µg/L	t-1,2-DCE µg/L	1,1-DCE µg/L	Vinyl Cl µg/L	1,1,1-TCA µg/L	1,1,2-TCA µg/L	1,1-DCA µg/L	1,2-DCA µg/L	Carbon tet µg/L	Chloroform µg/L	Met Cl µg/L	EDB µg/L
Jun-88	<5	30	<5 (total)		7	<14	15	<5	<5	<5	8	<5	<10	
12/12/1990	13	1100	12 (total)		5	<15	12	<5	<5	<5	10	<5	<10	
6/19/1991	11	830	<1 (total)		4	<1	10	< 1	1	< 1	8	< 1	< 1	
6/11/1992	22	1500	16 (total)		6	<1	14	<1	3	<1	5	<1	<2	
3/27/1993	25	2200		< 1	7	<3	16	< 1	4	< 1	< 1	< 1	< 2	
6/16/1995	29	1603	18	<5	9	<2	24	<5	5	<5	<5		<5	
9/12/1995	34	3227	25	<5	16	<2	28	<5		<5	<5		<5	
12/2/1995	44	2498	24	<5	16	<2	31	<5	8	<5	<5		<5	
3/14/1996	41	2507	24	<5	12	<2	35	<5	9	<5	<5		<5	
6/18/1996	34	2749	20	<5	13	<2	28	<5	9	<5	<5		<5	
9/10/1996	57	2616	30	<5	17	<2	42	<5	10	<5	<5		<5	
12/3/1996	51	2723	31	<5	18	<2	46	<5	13	<5	<5		<5	
3/19/1997	52	2710	31	<5	17	<2	48	<5	12	<5	<5		<5	
6/16/1997	49	2625	30	<5	14	<2	44	<5	9	<5	<5		<5	
9/24/1997	56	3284	33	<5	25	<2	55	<5	15	<5	<5		<5	
12/10/1997	58	2694	29	<5	20	<2	48	<5	13	<5	<5		<5	
3/20/1998	59	2565	31	<5	24	<2	52	<5	14	<5	<5		<5	
6/4/1998	51	2459	22	<5	18	<2	43	<5	10	<5	<5		<5	
9/16/1998	46	2277	24	<5	22	<2	44	<5	12	<5	<5		<5	
12/9/1998	48	2169	19	<5	18	<2	37	<5	10	<5	<5		<5	
3/16/1999	31	1613	15	<5	15	<2	26	<5	8	<5	<5		<5	
6/18/1999	25	1212	11	<5	12	<2	22	<5	6	<5	<5		<5	
9/15/1999	35	1536	16	<5	19	<2	32	<5	8	<5	<5		<5	
12/16/1999	32	1290	13	<5	18	<2	30	<5	7	<5	<5		<5	
3/22/2000	24	1024	9	<5	13	<2	21	<5	5	<5	<5		<5	
6/15/2000	36	1355	15	<5	20	<2	35	<5	8	<5	<5		<5	
9/21/2000	41	1182	18	<5	26	<2	41	<5	10	<5	<5		<5	
12/8/2000	40	1296	16	<5	27	<2	37	<5	8	<5	<5		<5	
3/9/2001	38	1205	15	<5	16	<2	38	<5	9	<5	<5		<5	
6/15/2001	40	1337	18	<5	24	<2	40	<5	10	<5	<5		<5	
9/20/2001	52	1699	24	<5	23	<2	55	<5	12	<5	<5		<5	
12/4/2001	50	955	18	<5	30	<2	52	<5	13	<5	<5		<5	
3/13/2002	52	1486	22	<5	34	<2	50	<5	12	<5	<5		<5	
6/4/2002	44	1418	19	<5	29	<2	47	<5	11	<5	<5		<5	
9/19/2002	44	1282	19	<5	28	<2	43	<5	11	<5	<5	<1	<5	
12/2/2002	44	1330	20	<5	28	<2	45	<5	11	<5	<5	<5	<5	
3/6/2003	47	1279	18	<5	27	<2	46	<5	11	<5	<5	<5	<5	
6/24/2003	49	1347	21	<5	30	<2	48	<5	11	<5	<5	<5	<5	

MW-17

Date	PCE	TCE	c-1,2-DCE	t-1,2-DCE	1,1-DCE	Vinyl Cl	1,1,1-TCA	1,1,2-TCA	1,1-DCA	1,2-DCA	Carbon tet	Chloroform	Met Cl	EDB
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
9/15/2003	35	976	15	<5	18	<2	31	<5	8	<5	<5	<5	<5	
12/8/2003	38	1043	17	<5	21	<2	33	<5	8	<5	<5	<5	<5	
3/15/2004	47	1095	20	<5	27	<2	38	<5	10	<5	<5	<5	<5	
6/24/2004	49	1255	21	<5	27	<2	41	<5	11	<5	<5	<5	<5	
9/28/2004	27	809	13	<5	15	<2	20	<5	6	<5	<5	<5	<5	
12/6/2004	27	708	12	<5	13	<2	20	<5	6	<5	<5	<5	<5	
3/2/2005	26	785	12	<5	15	<2	20	<5	6	<5	<5	<5	<5	
6/14/2005	23	621	10	<5	13	<2	16	<5	5	<5	<5	<5	<5	
9/13/2005	17	554	10	<5	15	<2	16	<5	5	<5	<5	<5	<5	
12/14/2005	13	468	8	<5	16	<2	16	<5	5	<5	<5	<5	<5	
3/3/2006	13	464	8	<5	15	<2	16	<5	5	<5	<5	<5	<5	
6/8/2006	11	436	8	<5	15	<2	14	<5	5	<5	<5	<5	<5	
9/29/2006	8	297	6	<5	14	<2	13	<5	<5	<5	<5	<5	<5	
12/5/2006	8	278	6	<5	15	<2	14	<5	<5	<5	<5	<5	<5	

MW-25

Date	PCE µg/L	TCE µg/L	c-1,2-DCE µg/L	t-1,2-DCE µg/L	1,1-DCE µg/L	Vinyl Cl µg/L	1,1,1-TCA µg/L	1,1,2-TCA µg/L	1,1-DCA µg/L	1,2-DCA µg/L	Carbon tet µg/L	Chloroform µg/L	Met Cl µg/L	EDB µg/L
Sep-88		370												
Mar-89		610												
Jun-89	<25	680	18 (total)		<25	<50	<25	<25	<25	<25	<25	<25	<25	<0.02
Sep-89	2	330	86 (total)		<5	<10	<5	<5	<5	<5	<5	<5	<5	<1
Dec-89		360												
Jun-90	<5	150	22 (total)		<5	<10	<5	<5	<5	<5	<5	<5	<5	
12/12/1990	<5	370	110 (total)		<5	<15	<5	<5	<5	<5	<5	<5	<10	<0.02
6/21/1991	3	410	130 (total)		<1	4	<1	2	<1	<1	<1	4	<2	
12/10/1991	<1	520	640	1	<1	<1	<1	6	<1	<2	<1	5	<5	
6/10/1992	3	410	390 (total)		<2	9	<2	5	<2	<2	<1	8	7	<0.02
3/26/1993	3	620	1200	<1	<1	17	<1	8	<1	<1	<1	6	<2	
6/16/1995	<5	295	225	<5	<5	23	<5	<5	<5	<5	<5		<5	
9/12/1995	<5	398	386	<5	<5	33	<5	6		<5	<5		6	
12/2/1995	<5	437	503	<5	<5	24	<5	11	<5	<5	<5		8	
3/13/1996	<5	449	491	<5	<5	23	<5	9	<5	<5	<5		6	
6/17/1996	<5	366	428	<5	<5	20	<5	8	<5	<5	<5		5	
9/10/1996	<5	372	510	<5	<5	20	<5	12	<5	<5	<5		7	
12/3/1996	<5	354	485	<5	<5	16	<5	9	<5	<5	<5		6	
3/19/1997	<5	328	342	<5	<5	17	<5	7	<5	<5	<5		<5	
6/17/1997	<5	280	376	<5	<5	15	<5	8	<5	<5	<5		<5	
9/22/1997	<5	315	480	<5	<5	13	<5	16	<5	<5	<5		<5	
12/20/1997	<5	320	459	<5	<5	16	<5	15	<5	<5	<5		<5	
3/20/1998	<5	223	304	<5	<5	10	<5	10	<5	<5	<5		<5	
6/1/1998	<5	241	366	<5	<5	12	<5	11	<5	<5	<5		<5	
9/16/1998	<5	274	474	<5	<5	16	<5	18	<5	<5	<5		<5	
12/9/1998	<5	278	467	<5	<5	22	<5	13	<5	<5	<5		<5	
3/18/1999	<5	183	338	<5	<5	12	<5	11	<5	<5	<5		<5	
6/15/1999	<5	191	377	<5	<5	18	<5	12	<5	<5	<5		<5	
9/14/1999	<5	216	456	<5	<5	20	<5	15	<5	<5	<5		<5	
12/16/1999	<5	228	456	<5	<5	18	<5	14	<5	<5	<5		<5	
3/16/2000	< 5	178	387	<5	<5	15	<5	12	<5	<5	<5		<5	
6/16/2000	<5	196	417	<5	<5	17	<5	14	<5	<5	<5		<5	
9/19/2000	<5	160	374	<5	<5	17	<5	14	<5	<5	<5		<5	
12/5/2000	<5	147	331	<5	<5	15	<5	15	<5	<5	<5		<5	
3/14/2001	<5	136	360	<5	<5	13	<5	14	<5	<5	<5		<5	
6/15/2001	<5	130	383	<5	<5	17	<5	14	<5	<5	<5		<5	
9/19/2001	<5	144	408	<5	<5	17	<5	16	<5	<5	<5		<5	
12/4/2001	<5	131	311	<5	<5	16	<5	17	<5	<5	<5		<5	

MW-25

Date	PCE	TCE	c-1,2-DCE	t-1,2-DCE	1,1-DCE	Vinyl Cl	1,1,1-TCA	1,1,2-TCA	1,1-DCA	1,2-DCA	Carbon tet	Chloroform	Met Cl	EDB
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
3/13/2002	<5	130	412	<5	<5	19	<5	17	<5	<5	<5		<5	
6/3/2002	<5	124	398	<5	<5	15	<5	12	<5	<5	<5		<5	
9/19/2002	<5	105	411	<5	<5	16	<5	20	<5	<5	<5	<1	<5	
12/2/2002	<5	102	463	<5	<5	17	<5	21	<5	<5	<5	<5	<5	
3/6/2003	<5	109	405	<5	<5	17	<5	17	<5	<5	<5	<5	<5	
7/2/2003	<5	95	452	<5	<5	20	<5	8	<5	<5	<5	<5	<5	
9/12/2003	<5	80	391	<5	<5	17	<5	9	<5	<5	<5	<5	<5	
12/5/2003	<5	68	366	<5	<5	15	<5	8	<5	<5	<5	<5	<5	
3/15/2004	<5	67	374	<5	<5	13	<5	7	<5	<5	<5	<5	<5	
6/24/2004	<5	74	353	<5	<5	13	<5	<5	<5	<5	<5	<5	<5	
9/27/2004	<5	59	308	<5	<5	11	<5	<5	<5	<5	<5	<5	<5	
12/6/2004	<5	53	268	<5	<5	8	<5	<5	<5	<5	<5	<5	<5	
3/2/2005	<5	49	244	<5	<5	7	<5	<5	<5	<5	<5	<5	<5	
9/12/2005	<5	37	147	<5	<5	5	<5	<5	<5	<5	<5	<5	<5	
12/13/2005	<5	38	149	<5	<5	4	<5	<5	<5	<5	<5	<5	<5	
3/3/2006	<5	41	131	<5	<5	3	<5	<5	<5	<5	<5	<5	<5	
6/5/2006	<5	53	99	<5	<5	3	<5	<5	<5	<5	<5	<5	<5	
9/18/2006	<5	91	88	<5	<5	3	<5	<5	<5	<5	<5	<5	<5	
12/5/2006	<5	94	71	<5	<5	2	<5	<5	<5	<5	<5	<5	<5	

NP-001R

Date	PCE µg/L	TCE µg/L	c-1,2-DCE µg/L	t-1,2-DCE µg/L	1,1-DCE µg/L	Vinyl Cl µg/L	1,1,1-TCA µg/L	1,1,2-TCA µg/L	1,1-DCA µg/L	1,2-DCA µg/L	Carbon tet µg/L	Chloroform µg/L	Met Cl µg/L	EDB µg/L
6/24/1996	15	1079	11	<5	9	<2	25	<5	<5	<5	<5		<5	
9/10/1996	22	1474	17	<5	13	<2	20	<5	<5	<5	<5		<5	
6/12/1997	28	2192	21	<5	8	<2	18	<5	<5	<5	<5		<5	
9/17/1997	24	1700	19	<5	12	<2	20	<5	<5	<5	<5		<5	
6/12/1998	29	1733	22	<5	8	<2	17	<5	6	7	<5		<5	
9/9/1998	34	2160	21	<5	10	<2	20	<5	7	7	<5		<5	
6/29/1999	41	2500	28	<5	16	<2	30	<5	12	<5	<5		<5	
9/7/1999	44	2267	29	<5	20	<2	35	<5	12	5	<5		<5	
6/16/2000	43	2974	29	<5	21	<2	37	<5	13	<5	<5		<5	
9/15/2000	46	2426	28	<5	24	<2	39	<5	13	<5	<5		<5	
6/19/2001	41	1853	21	<5	20	<2	32	<5	11	<5	<5		<5	
9/19/2001	41	1787	20	<5	17	<2	31	<5	10	<5	<5		<5	
6/11/2002	30	1336	16	<5	16	<2	26	<5	9	<5	<5		<5	
9/19/2002	37	1403	15	<5	15	<2	26	<5	9	<5	<5	<1	<5	
7/9/2003	35	1185	14	<5	16	<2	26	<5	8	<5	<5	<1	<5	
9/16/2003	36	1288	17	<5	18	<2	27	<5	9	<5	<5	<1	<5	
6/17/2004	33	1101	14	<5	17	<2	22	<5	8	<5	<5	<5	<5	
9/28/2004	28	1042	14	<5	16	<2	20	<5	8	<5	<5	<5	<5	
6/23/2005	34	953	16	<5	18	<2	20	<5	10	<5	<5	<5	<5	
9/12/2005	18	612	9	<5	14	<2	14	<5	5	<5	<5	<5	<5	
6/8/2006	12	463	7	<5	10	<2	9	<5	<5	<5	<5	<5	<5	
9/29/2006	7	268	<5	<5	7	<2	6	<5	<5	<5	<5	<5	<5	
1/4/2007	9	318	5	<5	8	<2	8	<5	<5	<5	<5	<5	<5	

UN-A-1

Date	PCE µg/L	TCE µg/L	c-1,2-DCE µg/L	t-1,2-DCE µg/L	1,1-DCE µg/L	Vinyl Cl µg/L	1,1,1-TCA µg/L	1,1,2-TCA µg/L	1,1-DCA µg/L	1,2-DCA µg/L	Carbon tet µg/L	Chloroform µg/L	Met Cl µg/L	EDB µg/L
3/12/1997	3.2	116	349	<1	<1	18	<1	<1	<1	<1	<1		3.8	
6/26/1997	5.9	165	524	1.6	<1	30	<1	<1	<1	<1	<1		7.4	
9/24/1997	5.6	167	545	1.5	<1	24	<1	<1	<1	<1	<1		6.6	
5/5/1998	6	141	460	1.5	<1	20	<1	<1	<1	1.4	<1		6.7	
3/29/2001	<5	7	532	<5	<5	10	<5	<5	<5	<5	<5		<5	
3/15/2002	<5	<5	372	<5	<5	11	<5	<5	<5	<5	<5		<5	
11/16/2006	<5	124	28	<5	6	<2	<5	<5	7	<5	<5	<5	<5	

UN-A-3

Date	PCE µg/L	TCE µg/L	c-1,2-DCE µg/L	t-1,2-DCE µg/L	1,1-DCE µg/L	Vinyl Cl µg/L	1,1,1-TCA µg/L	1,1,2-TCA µg/L	1,1-DCA µg/L	1,2-DCA µg/L	Carbon tet µg/L	Chloroform µg/L	Met Cl µg/L	EDB µg/L
3/12/1997	4	141	181	<1	6	14	9	<1	<1	<1	<1		4	
6/26/1997	5	151	158	<1	10	9	13	<1	<1	<1	<1		4	
9/24/1997	5	130	329	1	6	16	7	<1	<1	<1	<1		5	
5/5/1998	4	103	116	<1	15	7	19	<1	<1	<1	<1		3	
3/29/2001	5	190	130	<5	7	6	8	<5	<5	<5	<5		<5	
3/15/2002	<5	177	126	<5	<5	6	7	<5	<5	<5	<5		<5	
11/16/2006	<5	124	39	<5	5	<2	<5	<5	5	<5	<5	<5	<5	

UN-A-4

Date	PCE µg/L	TCE µg/L	c-1,2-DCE ug/L	t-1,2-DCE µg/L	1,1-DCE µg/L	Vinyl Cl µg/L	1,1,1-TCA µg/L	1,1,2-TCA µg/L	1,1-DCA µg/L	1,2-DCA µg/L	Carbon tet µg/L	Chloroform µg/L	Met Cl µg/L	EDB µg/L
3/12/1997	6	220	9	<1	31	<1	47	<1	1	2	<1		<1	
6/26/1997	10	440	5	<1	43	<1	51	<1	2	2	<1		<1	
9/24/1997	5	<1	3	<1	45	<1	58	<1	<1	51	<1		<1	
5/4/1998	7	104	2	<1	63	<1	81	<1	2	1	<1		<1	
3/29/2001	22	770	11	<5	27	<2	39	<5	6	<5	<5		<5	
3/15/2002	20	797	9	<5	25	<2	29	<5	6	<5	<5		<5	
11/16/2006	<5	159	<5	<5	6	<2	6	<5	<5	<5	<5	<5	<5	

UN-B-1

Date	PCE	TCE	c-1,2-DCE	t-1,2-DCE	1,1-DCE	Vinyl Cl	1,1,1-TCA	1,1,2-TCA	1,1-DCA	1,2-DCA	Carbon tet	Chloroform	Met Cl	EDB
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
3/12/1997	<1	136	172	<1	<1	11	<1	<1	<1	<1	<1		<1	
6/25/1997	<1	143	160	<1	<1	9	<1	<1	<1	<1	<1		<1	
9/24/1997	<1	140	159	<1	<1	8	<1	<1	<1	<1	<1		<1	
5/5/1998	<1	146	235	<1	<1	10	<1	<1	<1	<1	<1		<1	
3/29/2001	<5	91	147	<5	<5	7	<5	<5	<5	<5	<5		<5	
3/15/2002	<5	35	79	<5	<5	3	<5	<5	<5	<5	<5		<5	
11/18/2006	insufficient water													

UN-B-2

Date	PCE µg/L	TCE µg/L	c-1,2-DCE µg/L	t-1,2-DCE µg/L	1,1-DCE µg/L	Vinyl Cl µg/L	1,1,1-TCA µg/L	1,1,2-TCA µg/L	1,1-DCA µg/L	1,2-DCA µg/L	Carbon tet µg/L	Chloroform µg/L	Met Cl µg/L	EDB µg/L
3/12/1997	2	459	475	2	<1	29	<1	2	<1	1	<1		4	
6/25/1997	2	445	620	4	<1	24	<1	3	<1	1	<1		4	
9/24/1997	2	385	530	2	<1	21	<1	2	<1	1	<1		3	
5/5/1998	2	350	235	2	<1	21	<1	3	<1	1	<1		4	
3/29/2001	<5	120	217	<5	<5	12	<5	<5	<5	<5	<5		<5	
3/15/2002	<5	50	95	<5	<5	4	<5	<5	<5	<5	<5		<5	
11/18/2006	<5	97	97	<5	<5	4	<5	<5	<5	<5	<5	<5	<5	

UN-B-3

Date	PCE µg/L	TCE µg/L	c-1,2-DCE µg/L	t-1,2-DCE µg/L	1,1-DCE µg/L	Vinyl Cl µg/L	1,1,1-TCA µg/L	1,1,2-TCA µg/L	1,1-DCA µg/L	1,2-DCA µg/L	Carbon tet µg/L	Chloroform µg/L	Met Cl µg/L	EDB µg/L
3/12/1997	3	299	232	<1	11	11	17	1	<1	<1	<1		3	
6/25/1997	5	381	308	2	11	13	16	2	<1	<1	<1		5	
9/24/1997	4	499	437	1	8	13	10	3	<1	1	<1		6	
5/5/1998	5	351	275	<1	12	11	14	2	<1	1	<1		5	
3/29/2001	7	319	199	<5	11	8	12	<5	<5	<5	<5		<5	
3/15/2002	5	249	167	<5	9	4	8	<5	<5	<5	<5		<5	
11/18/2006	<5	97	119	<5	<5	7	<5	<5	<5	<5	<5	<5	<5	

UN-B-4

Date	PCE µg/L	TCE µg/L	c-1,2-DCE µg/L	t-1,2-DCE µg/L	1,1-DCE µg/L	Vinyl Cl µg/L	1,1,1-TCA µg/L	1,1,2-TCA µg/L	1,1-DCA µg/L	1,2-DCA µg/L	Carbon tet µg/L	Chloroform µg/L	Met Cl µg/L	EDB µg/L
3/12/1997	4	127	9	<1	21	<1	35	<1	<1	<1	<1		<1	
6/25/1997	7	258	6	<1	30	<1	39	<1	1	1	<1		<1	
9/24/1997	6	134	6	<1	47	<1	60	<1	1	<1	<1		<1	
5/5/1998	6	81	5	<1	37	<1	46	<1	<1	<1	<1		<1	
3/29/2001	16	675	10	<5	28	<2	32	<5	<5	<5	<5		<5	
3/15/2002	13	449	7	<5	21	<2	22	<5	<5	<5	<5		<5	
11/18/2006	<5	71	<5	<5	<5	<2	<5	<5	<5	<5	<5	<5	<5	

UN-C-1

Date	PCE µg/L	TCE µg/L	c-1,2-DCE µg/L	t-1,2-DCE µg/L	1,1-DCE µg/L	Vinyl Cl µg/L	1,1,1-TCA µg/L	1,1,2-TCA µg/L	1,1-DCA µg/L	1,2-DCA µg/L	Carbon tet µg/L	Chloroform µg/L	Met Cl µg/L	EDB µg/L
2/24/1998	2	312	326	1	<1	14	<1	<1	<1	<1	<1		2	
5/6/1998	2	412	364	1	1	13	2	<1	<1	<1	<1		2	
3/14/2001	<5	242	257	<5	<5	14	<5	<5	<5	<5	<5		<5	
3/14/2002	<5	175	192	<5	<5	17	<5	<5	<5	<5	<5		<5	
11/18/2006	<5	44	94	<5	<5	4	<5	<5	<5	<5	<5	<5	<5	

UN-C-2

Date	PCE µg/L	TCE µg/L	c-1,2-DCE µg/L	t-1,2-DCE µg/L	1,1-DCE µg/L	Vinyl Cl µg/L	1,1,1-TCA µg/L	1,1,2-TCA µg/L	1,1-DCA µg/L	1,2-DCA µg/L	Carbon tet µg/L	Chloroform µg/L	Met Cl µg/L	EDB µg/L
2/24/1998	5	190	97	<1	20	3	24	<1	<1	<1	<1		2	
5/6/1998	6	250	83	<1	23	2	28	<1	<1	<1	<1		2	
3/14/2001	15	561	77	<5	24	3	27	<5	<5	<5	<5		<5	
3/14/2002	11	438	76	<5	23	3	19	<5	<5	<5	<5		<5	
11/18/2006	<5	75	62	<5	<5	4	<5	<5	<5	<5	<5	<5	<5	

UN-C-3

Date	PCE µg/L	TCE µg/L	c-1,2-DCE µg/L	t-1,2-DCE µg/L	1,1-DCE µg/L	Vinyl Cl µg/L	1,1,1-TCA µg/L	1,1,2-TCA µg/L	1,1-DCA µg/L	1,2-DCA µg/L	Carbon tet µg/L	Chloroform µg/L	Met Cl µg/L	EDB µg/L
2/24/1998	8	253	5	<1	28	<1	36	<1	2	2	<1		<1	
5/6/1998	10	389	7	<1	39	<1	46	<1	3	2	<1		<1	
3/14/2001	42	1508	22	<5	48	<2	55	<5	11	<5	<5		<5	
3/14/2002	33	1226	16	<5	41	<2	39	<5	8	<5	<5		<5	
11/18/2006	<5	45	<5	<5	5	<2	<5	<5	<5	<5	<5	<5	<5	

UN-C-4

Date	PCE µg/L	TCE µg/L	c-1,2-DCE µg/L	t-1,2-DCE µg/L	1,1-DCE µg/L	Vinyl Cl µg/L	1,1,1-TCA µg/L	1,1,2-TCA µg/L	1,1-DCA µg/L	1,2-DCA µg/L	Carbon tet µg/L	Chloroform µg/L	Met Cl µg/L	EDB µg/L
2/24/1998	14	694	8	<1	39	<1	51	<1	3	3	<1		<1	
5/6/1998	17	854	9	<1	40	<1	50	<1	4	4	<1		<1	
3/14/2001	51	2086	27	<5	39	<2	56	<5	13	<5	<5		<5	
3/14/2002	47	1840	21	<5	37	<2	47	<5	12	<5	<5		<5	
11/18/2006	<5	43	<5	<5	5	<2	<5	<5	<5	<5	<5	<5	<5	

UN-C-5

Date	PCE µg/L	TCE µg/L	c-1,2-DCE µg/L	t-1,2-DCE µg/L	1,1-DCE µg/L	Vinyl Cl µg/L	1,1,1-TCA µg/L	1,1,2-TCA µg/L	1,1-DCA µg/L	1,2-DCA µg/L	Carbon tet µg/L	Chloroform µg/L	Met Cl µg/L	EDB µg/L
2/24/1998	14	995	14	<1	5	<1	14	<1	4	13	<1		<1	
5/5/1998	13	974	11	<1	5	<1	11	<1	3	12	<1		<1	
3/14/2001	33	1472	17	<5	12	<2	26	<5	8	9	<5		<5	
3/14/2002	38	1566	18	<5	18	<2	29	<5	10	7	<5		<5	
11/18/2006	<5	35	<5	<5	<5	<2	<5	<5	<5	<5	<5	<5	<5	
1/4/2007	<5	53	<5	<5	<5	<2	<5	<5	<5	<5	<5	<5	<5	

UN-D-1

Date	PCE µg/L	TCE µg/L	c-1,2-DCE µg/L	t-1,2-DCE µg/L	1,1-DCE µg/L	Vinyl Cl µg/L	1,1,1-TCA µg/L	1,1,2-TCA µg/L	1,1-DCA µg/L	1,2-DCA µg/L	Carbon tet µg/L	Chloroform µg/L	Met Cl µg/L	EDB µg/L
2/24/1998	5	1039	69	<1	17	<1	22	<1	<1	<1	<1		1	
5/7/1998	6	1002	84	<1	19	<1	20	2	<1	<1	<1		1	
3/14/2001	8	913	77	<5	13	2	21	<5	<5	<5	<5		<5	
3/15/2002	11	891	69	<5	21	<2	22	<5	<5	<5	<5		<5	
11/17/2006	<5	51	20	<5	<5	<2	<5	<5	<5	<5	<5	<5	<5	

UN-D-2

Date	PCE µg/L	TCE µg/L	c-1,2-DCE µg/L	t-1,2-DCE µg/L	1,1-DCE µg/L	Vinyl Cl µg/L	1,1,1-TCA µg/L	1,1,2-TCA µg/L	1,1-DCA µg/L	1,2-DCA µg/L	Carbon tet µg/L	Chloroform µg/L	Met Cl µg/L	EDB µg/L
2/24/1998	10	362	24	<1	31	<1	35	<1	2	1	<1		<1	
5/6/1998	10	608	23	<1	36	<1	40	<1	2	2	<1		<1	
3/14/2001	29	1324	32	<5	36	<2	41	<5	8	<5	<5		<5	
3/15/2002	40	1641	31	<5	44	<2	45	<5	11	<5	<5		<5	
11/17/2006	<5	54	22	<5	5	<2	<5	<5	<5	<5	<5	<5	<5	

UN-D-3

Date	PCE	TCE	c-1,2-DCE	t-1,2-DCE	1,1-DCE	Vinyl Cl	1,1,1-TCA	1,1,2-TCA	1,1-DCA	1,2-DCA	Carbon tet	Chloroform	Met Cl	EDB
	μg/L	μg/L	μg/L	μg/L	μg/L	μg/L	μg/L	μg/L	μg/L	μg/L	μg/L	μg/L	μg/L	μg/L
2/24/1998	26	1557	21	<1	32	<1	44	<1	6	6	<1		<1	
5/6/1998	26	1589	19	<1	27	<1	37	2	7	6	<1		<1	
3/14/2001	60	2471	33	<5	20	<2	54	<5	16	<5	<1		<5	
3/15/2002	57	2208	34	<5	35	<2	55	<5	16	<5	<5		<5	
11/17/2006	<5	115	<5	<5	7	<2	6	<5	<5	<5	<5	<5	<5	

UN-D-4

Date	PCE µg/L	TCE µg/L	c-1,2-DCE µg/L	t-1,2-DCE µg/L	1,1-DCE µg/L	Vinyl Cl µg/L	1,1,1-TCA µg/L	1,1,2-TCA µg/L	1,1-DCA µg/L	1,2-DCA µg/L	Carbon tet µg/L	Chloroform µg/L	Met Cl µg/L	EDB µg/L
2/24/1998	17	1240	15	<1	19	<1	29	<1	4	5	<1		<1	
5/6/1998	14	1223	14	<1	14	<1	20	1	4	5	<1		<1	
3/14/2001	46	2151	28	<5	15	<2	40	<5	13	6	<5		<5	
3/15/2002	49	2038	22	<5	18	<2	39	<5	12	<5	<5		<5	
11/17/2006	<5	83	<5	<5	<5	<2	<5	<5	<5	<5	<5	<5	<5	
1/4/2007	<5	83	<5	<5	<5	<2	<5	<5	<5	<5	<5	<5	<5	

UN-D-5

Date	PCE	TCE	c-1,2-DCE	t-1,2-DCE	1,1-DCE	Vinyl Cl	1,1,1-TCA	1,1,2-TCA	1,1-DCA	1,2-DCA	Carbon tet	Chloroform	Met Cl	EDB
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
2/24/1998	12	1056	12	<1	3	<1	6	<1	2	3	2		<1	
5/7/1998	10	1052	12	<1	4	<1	6	2	2	3	2		<1	
3/14/2001	14	1015	9	<5	<5	<2	<5	<5	<5	<5	<5		<5	
3/15/2002	11	884	7	<5	<5	<2	<5	<5	<5	<5	<5		<5	
11/17/2006	6	306	<5	<5	<5	<2	<5	<5	<5	<5	<5	<5	<5	

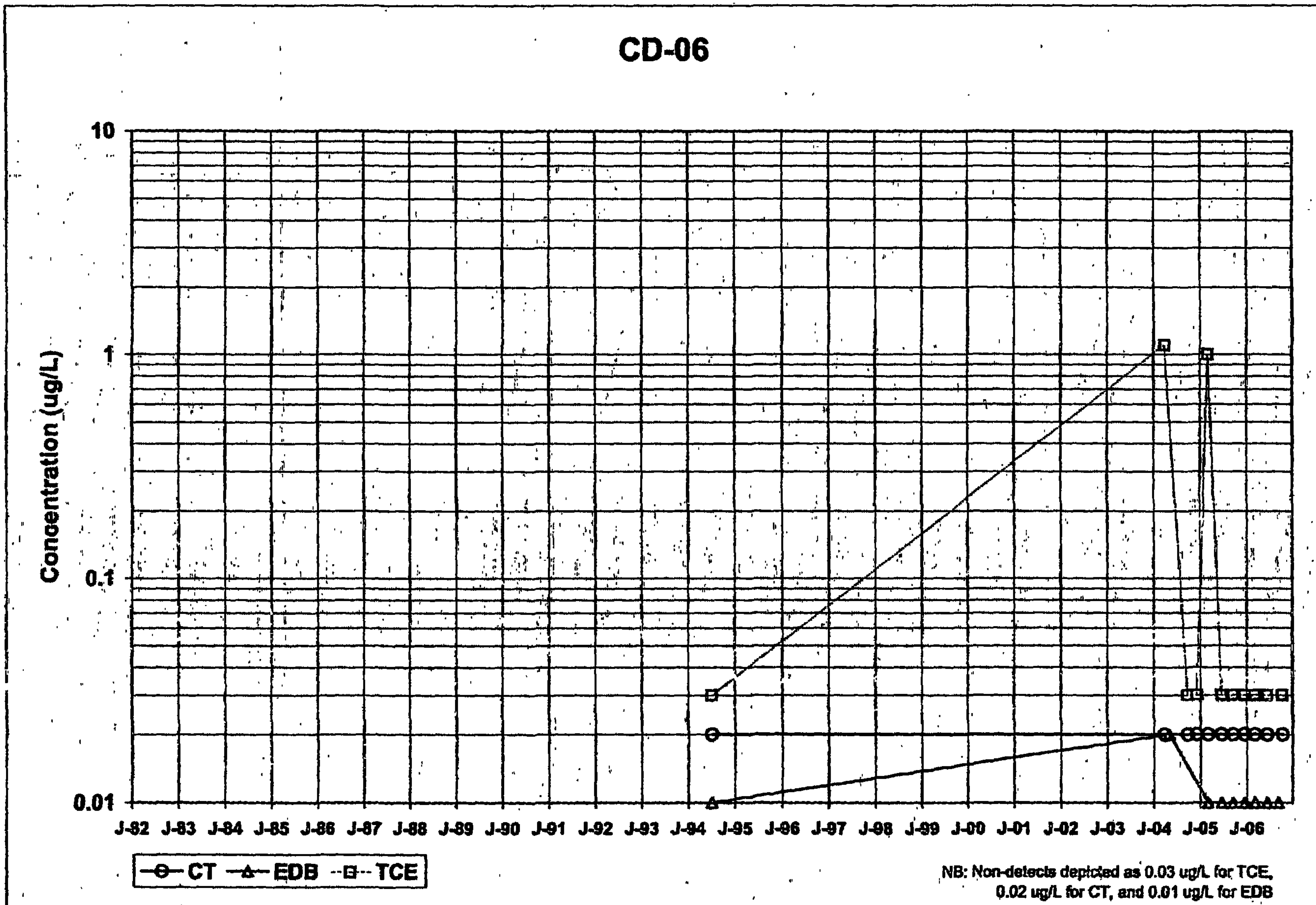
Well D

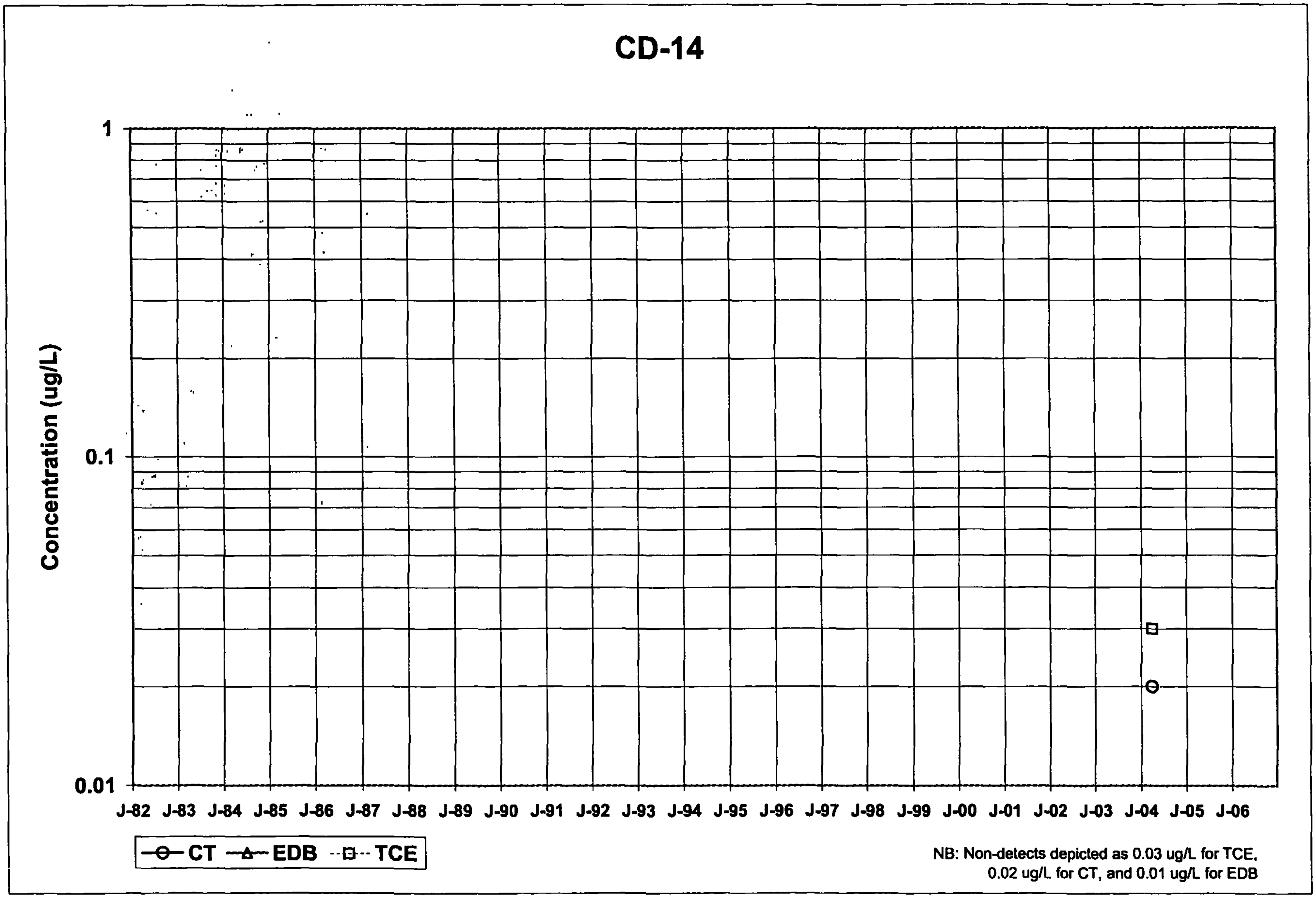
Date	PCE µg/L	TCE µg/L	c-1,2-DCE µg/L	t-1,2-DCE µg/L	1,1-DCE µg/L	Vinyl Cl µg/L	1,1,1-TCA µg/L	1,1,2-TCA µg/L	1,1-DCA µg/L	1,2-DCA µg/L	Carbon tet µg/L	Chloroform µg/L	Met Cl µg/L	EDB µg/L
7/22/1997 1015	<5	15	<5	<5	<5	<2	<5	<5	<5	<5	<5		<5	2.8
7/22/1997 1030	<5	205	<5	<5	<5	<2	5	<5	<5	<5	18		<5	4.3
7/22/1997 1045	<5	199	<5	<5	<5	<2	5	<5	<5	<5	17		<5	4.3
7/22/1997 1100	<5	185	<5	<5	<5	<2	<5	<5	<5	<5	16		<5	4.2
7/22/1997 1200	<5	194	<5	<5	<5	<2	5	<5	<5	<5	17		<5	4.8
7/22/1997 1400	<5	206	<5	<5	5	<2	8	<5	<5	<5	20		<5	4.8
7/22/1997 1600	<5	211	<5	<5	<5	<2	5	<5	<5	<5	17		<5	4.4
7/22/1997 2200	<5	164	<5	<5	<5	<2	<5	<5	<5	<5	13		<5	3.5
7/23/1997 0800	<5	155	<5	<5	<5	<2	<5	<5	<5	<5	12		<5	3.5
7/23/1997 1500	<5	145	<5	<5	<5	<2	<5	<5	<5	<5	11		<5	3.4
7/24/1997	<5	146	<5	<5	<5	<2	<5	<5	<5	<5	13		<5	3.5
7/25/1997	<5	159	<5	<5	<5	<2	<5	<5	<5	<5	14		<5	3.9
7/28/1997	<5	146	<5	<5	<5	<2	<5	<5	<5	<5	13		<5	3.5
8/4/1997	<5	148	<5	<5	<5	<2	<5	<5	<5	<5	13		<5	3.1
8/11/1997	<5	148	<5	<5	<5	<2	<5	<5	<5	<5	12		<5	3.4
8/18/1997	<5	170	<5	<5	<5	<2	<5	<5	<5	<5	12		<5	3.8
8/27/1997	<5	183	<5	<5	<5	<2	<5	<5	<5	<5	12		<5	2.9
9/17/1997	<5	210	<5	<5	<5	<2	<5	<5	<5	<5	13		<5	3.0
10/20/1997	<5	225	<5	<5	<5		<5	<5	<5	<5	11		<5	2.5
11/17/1997	<5	212	<5	<5	<5		<5	<5	<5	<5	12		<5	2.8
12/11/1997	<5	262	<5	<5	<5	<2	<5	<5	<5	<5	14		<5	2.6
1/15/1998	<5	206	<5	<5	<5	<2	<5	<5	<5	<5	14		<5	2.7
2/16/1998	<5	168	<5	<5	<5	<2	<5	<5	<5	<5	11		<5	2.6
3/16/1998	<5	187	<5	<5	<5	<2	<5	<5	<5	<5	14		<5	2.6
5/18/1998	<5	176	<5	<5	<5	<2	<5	<5	<5	<5	11		<5	2.5
6/15/1998	<5	173	<5	<5	<5	<2	<5	<5	<5	<5	11		<5	2.4
7/20/1998	<5	129	<5	<5	<5	<2	<5	<5	<5	<5	11		<5	2.7
8/18/1998	<5	146	<5	<5	<5	<2	<5	<5	<5	<5	13		<5	2.5
9/23/1998	<5	168	<5	<5	<5	<2	<5	<5	<5	<5	15		<5	2.8
10/19/1998	<5	175	<5	<5	<5	<2	<5	<5	<5	<5	14		<5	2.8
11/16/1998	<5	164	<5	<5	<5	<2	<5	<5	<5	<5	15		<5	2.8
12/17/1998	<5	194	<5	<5	<5	<2	5	<5	<5	<5	16		<5	3.2

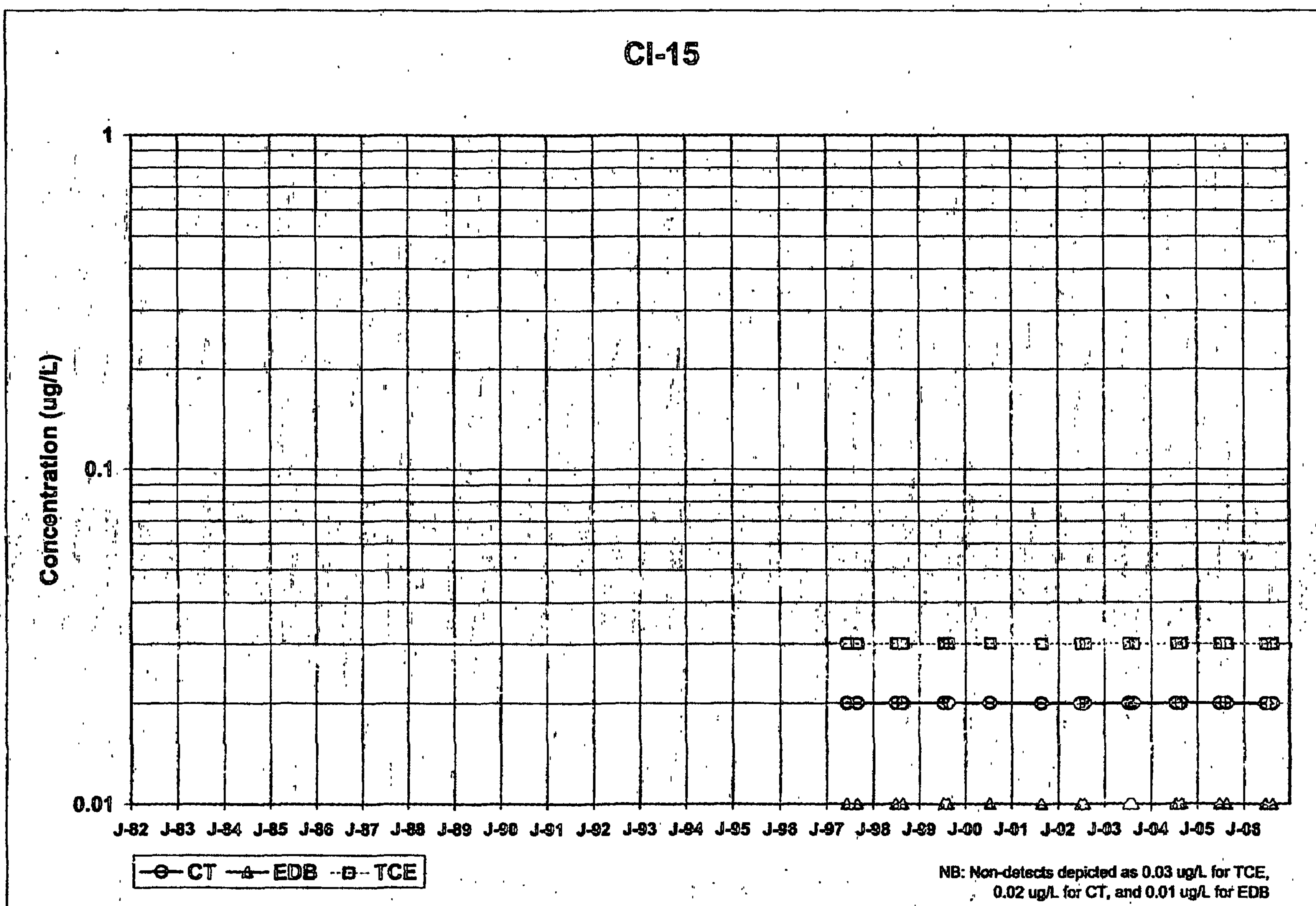
Well D

Date	PCE µg/L	TCE µg/L	c-1,2-DCE µg/L	t-1,2-DCE µg/L	1,1-DCE µg/L	Vinyl Cl µg/L	1,1,1-TCA µg/L	1,1,2-TCA µg/L	1,1-DCA µg/L	1,2-DCA µg/L	Carbon tet µg/L	Chloroform µg/L	Met Cl µg/L	EDB µg/L
1/18/1999	<5	184	<5	<5	<5	<2	<5	<5	<5	<5	15		<5	3.0
2/15/1999	<5	161	<5	<5	5	<2	<5	<5	<5	<5	16		<5	3.0
6/29/1999	<5	176	<5	<5	<5	<2	<5	<5	<5	<5	12	<1	<5	3.1
9/7/1999	<5	153	<5	<5	<5	<2	<5	<5	<5	<5	14	<1	<5	2.7
12/2/1999	<5	175	<5	<5	<5	<2	<5	<5	<5	<5	19	<1	<5	2.2
3/22/2000	<5	187	<5	<5	<5	<2	<5	<5	<5	<5	20	<1	<5	1.2
6/26/2000	<5	150	<5	<5	<5	<2	<5	<5	<5	<5	23	<1	<5	0.70
10/11/2000	<5	138	<5	<5	<5	<2	<5	<5	<5	<5	21	<1	<5	0.28
12/8/2000	<5	147	<5	<5	<5	<2	<5	<5	<5	<5	21	<1	<5	0.20
3/30/2001	<5	141	<5	<5	<5	<2	<5	<5	<5	<5	19		<5	0.20
6/20/2001	<5	130	<5	<5	<5	<2	<5	<5	<5	<5	17	<1	<5	0.20
9/10/2001	<5	115	<5	<5	<5	<2	<5	<5	<5	<5	22	<1	<5	0.15
12/9/2001	<5	122	<5	<5	<5	<2	<5	<5	<5	<5	18		<5	0.16
3/19/2002	<5	127	<5	<5	<5	<2	<5	<5	<5	<5	17	<1	<5	0.15
6/11/2002	<5	112	<5	<5	<5	<2	<5	<5	<5	<5	14	<1	<5	0.15
9/5/2002	<5	88	<5	<5	<5	<2	<5	<5	<5	<5	21	<1	<5	0.12
12/11/2002	<5	89	<5	<5	<5	<2	<5	<5	<5	<5	15	<1	<5	0.12
3/11/2003	<5	86	<5	<5	<5	<2	<5	<5	<5	<5	13	<1	<5	0.14
7/2/2003	<5	72	<5	<5	<5	<2	<5	<5	<5	<5	12	<1	<5	0.10
9/16/2003	<5	60	<5	<5	<5	<2	<5	<5	<5	<5	14	<1	<5	0.11
12/8/2003	<5	72	<5	<5	<5	<2	<5	<5	<5	<5	12	<5	<5	0.14
3/19/2004	<5	70	<5	<5	<5	<2	<5	<5	<5	<5	11	<5	<5	0.14
7/21/2004	<5	56	<5	<5	<5	<2	<5	<5	<5	<5	15	<5	<5	0.14
9/27/2004	<5	62	<5	<5	<5	<2	<5	<5	<5	<5	12	<5	<5	0.17
12/9/2004	<5	65	<5	<5	<5	<2	<5	<5	<5	<5	10	<5	<5	0.10
3/8/2005	<5	75	<5	<5	<5	<2	<5	<5	<5	<5	9	<5	<5	0.16
6/17/2005	<5	68	<5	<5	<5	<2	<5	<5	<5	<5	8	<5	<5	0.09
9/13/2005	<5	74	<5	<5	<5	<2	<5	<5	<5	<5	8	<5	<5	0.09
12/19/2005	<5	100	<5	<5	<5	<2	<5	<5	<5	<5	7	<5	<5	0.10
3/6/2006	<5	126	<5	<5	<5	<2	<5	<5	<5	<5	6	<5	<5	0.09
6/14/2006	<5	126	<5	<5	<5	<2	<5	<5	<5	<5	5	<5	<5	0.08
9/5/2006	<5	136	<5	<5	<5	<2	<5	<5	<5	<5	5	<5	<5	0.08
12/6/2006	<5	160	<5	<5	<5	<2	<5	<5	<5	<5	<5	<5	<5	0.09

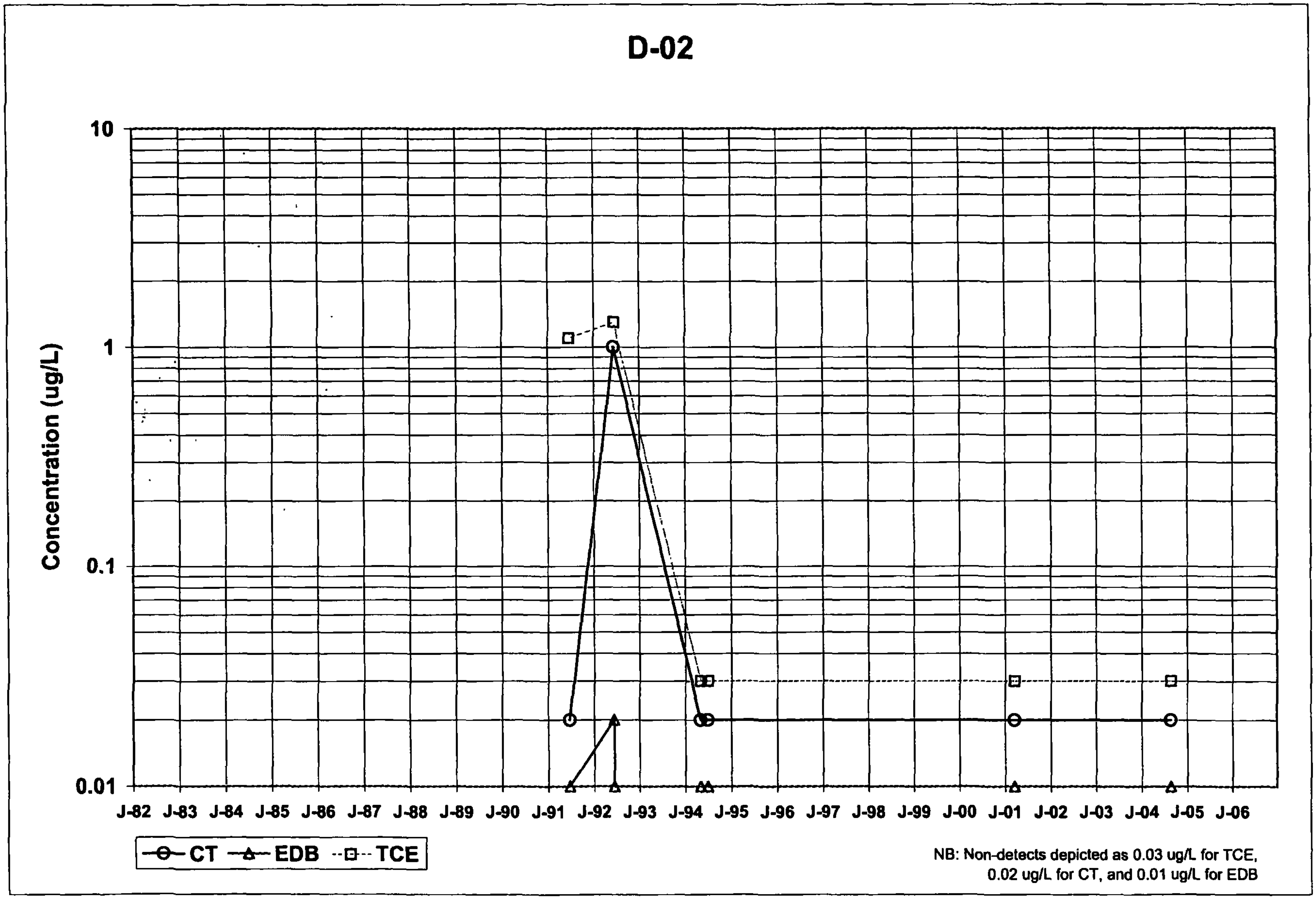
Water-Quality Data from Monitoring Wells - Hydrographs

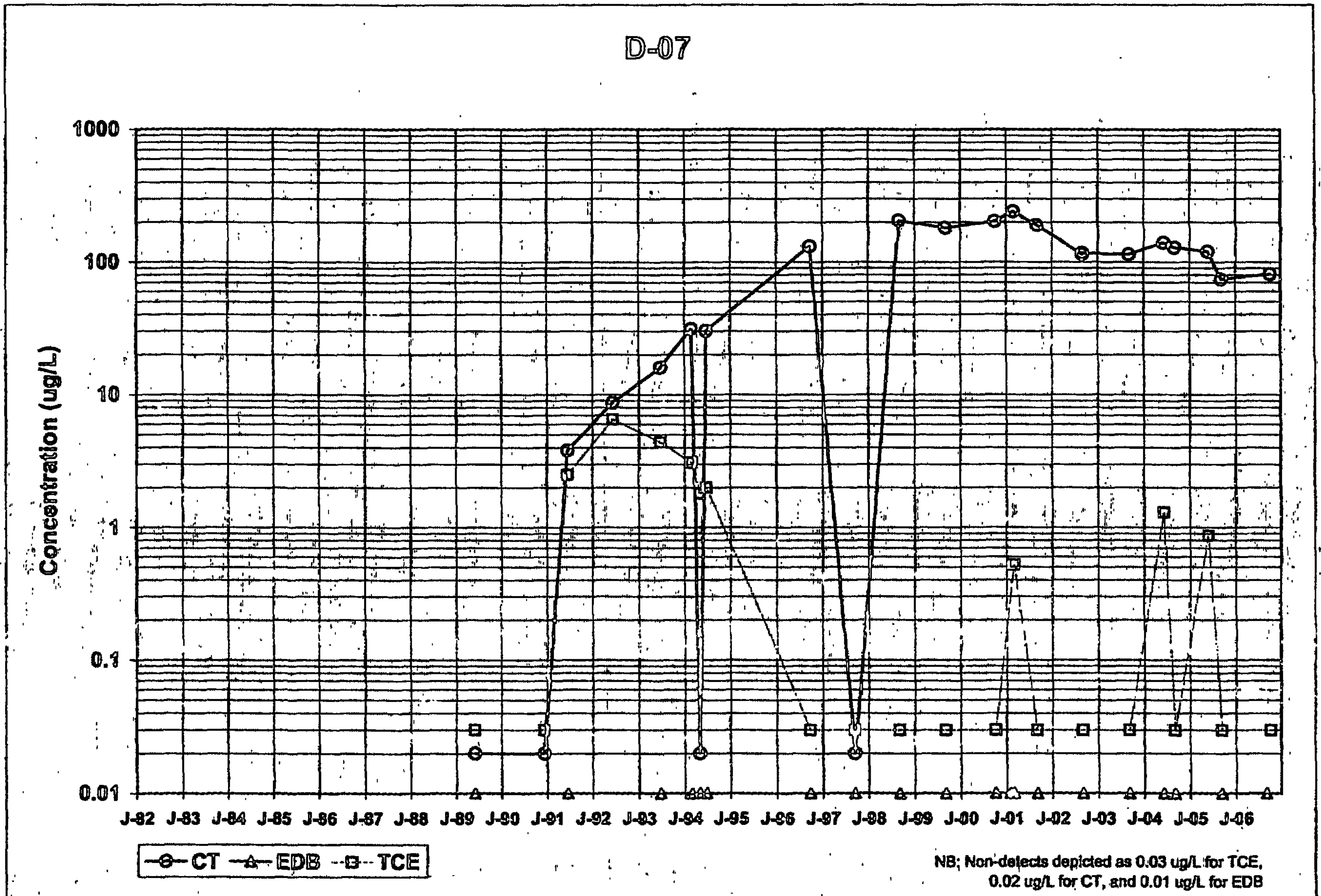

CD-06
Concentration (ug/L)
10
1
0.1
0.01
J-82 J-83 J-84 J-85 J-86 J-87 J-88 J-89 J-90 J-91 J-92 J-93 J-94 J-95 J-96 J-97 J-98 J-99 J-00 J-01 J-02 J-03 J-04 J-05 J-06
CT EDB TCE
NB: Non-detects depicted as 0.03 ug/L for TCE, 0.02 ug/L for CT, and 0.01 ug/L for EDB

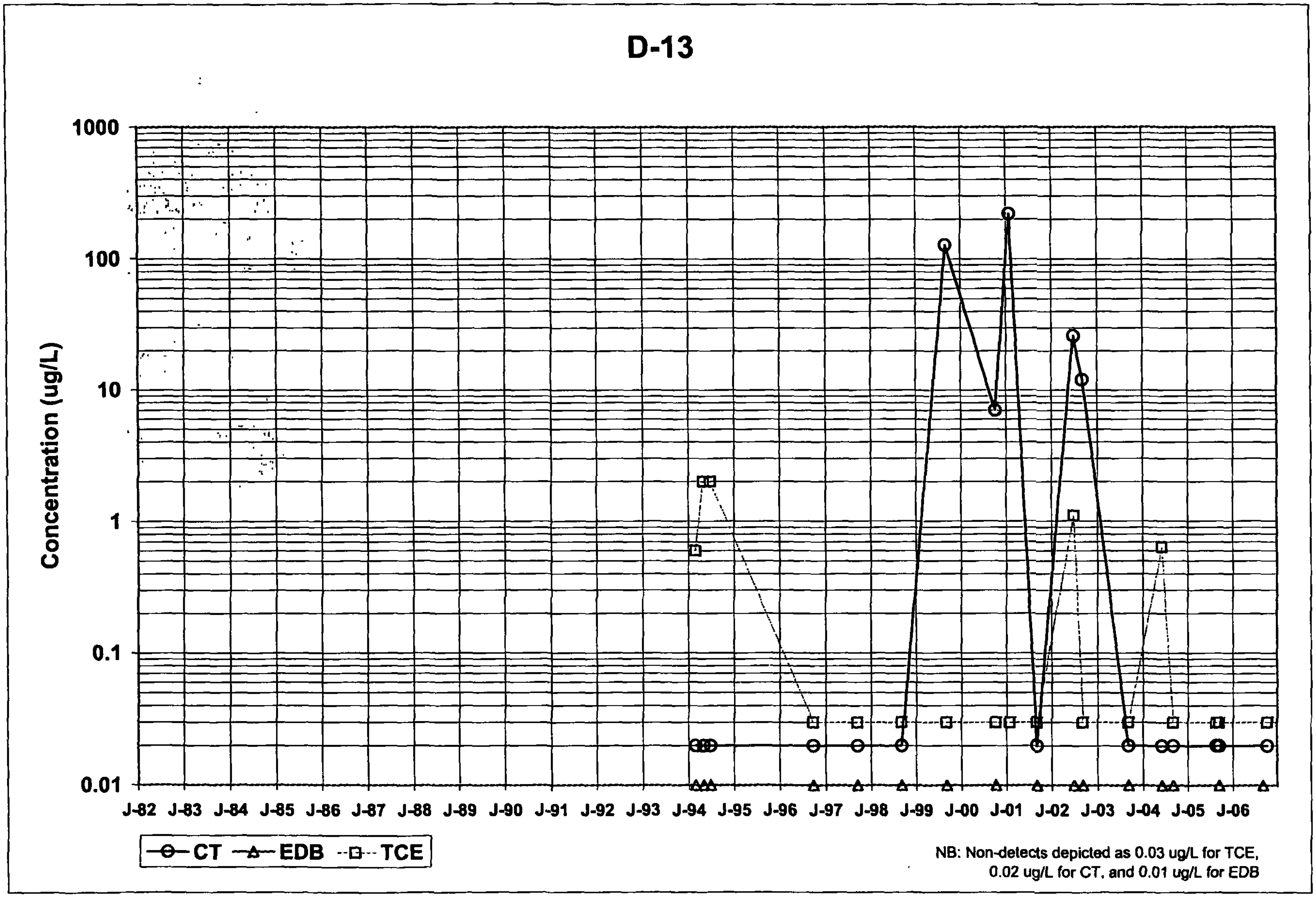

CD-14
Concentration (ug/L)
1
0.1
0.01
J-82 J-83 J-84 J-85 J-86 J-87 J-88 J-89 J-90 J-91 J-92 J-93 J-94 J-95 J-96 J-97 J-98 J-99 J-00 J-01 J-02 J-03 J-04 J-05 J-06
CT
EDB
TCE
NB: Non-detects depicted as 0.03 ug/L for TCE, 0.02 ug/L for CT, and 0.01 ug/L for EDB

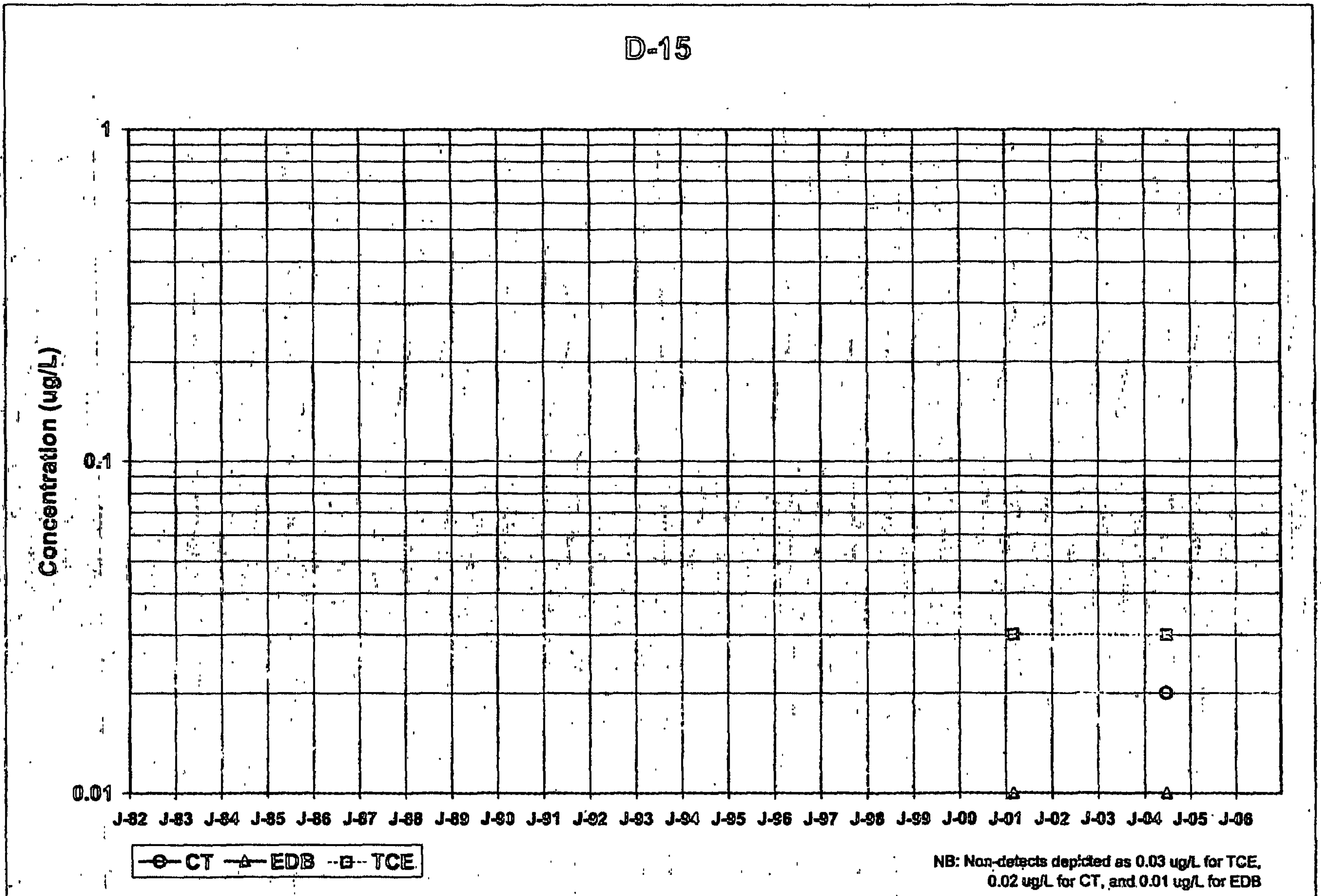


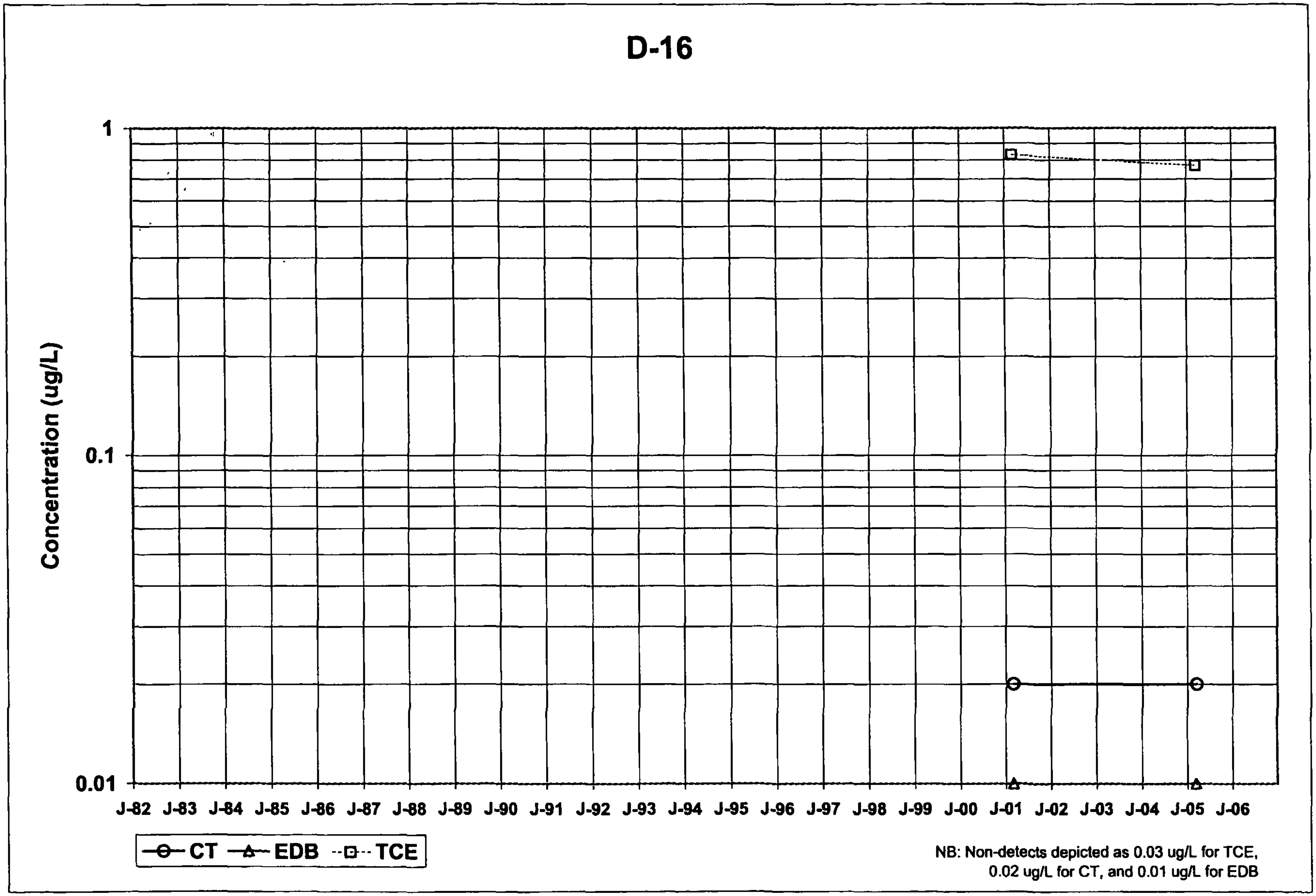
CI-15
Concentration (ug/L)
1
0.1
0.01
J-82 J-83 J-84 J-85 J-86 J-87 J-88 J-89 J-90 J-91 J-92 J-93 J-94 J-95 J-96 J-97 J-98 J-99 J-00 J-01 J-02 J-03 J-04 J-05 J-06
CT
EDB
TCE
NB: Non-detects depicted as 0.03 ug/L for TCE, 0.02 ug/L for CT, and 0.01 ug/L for EDB

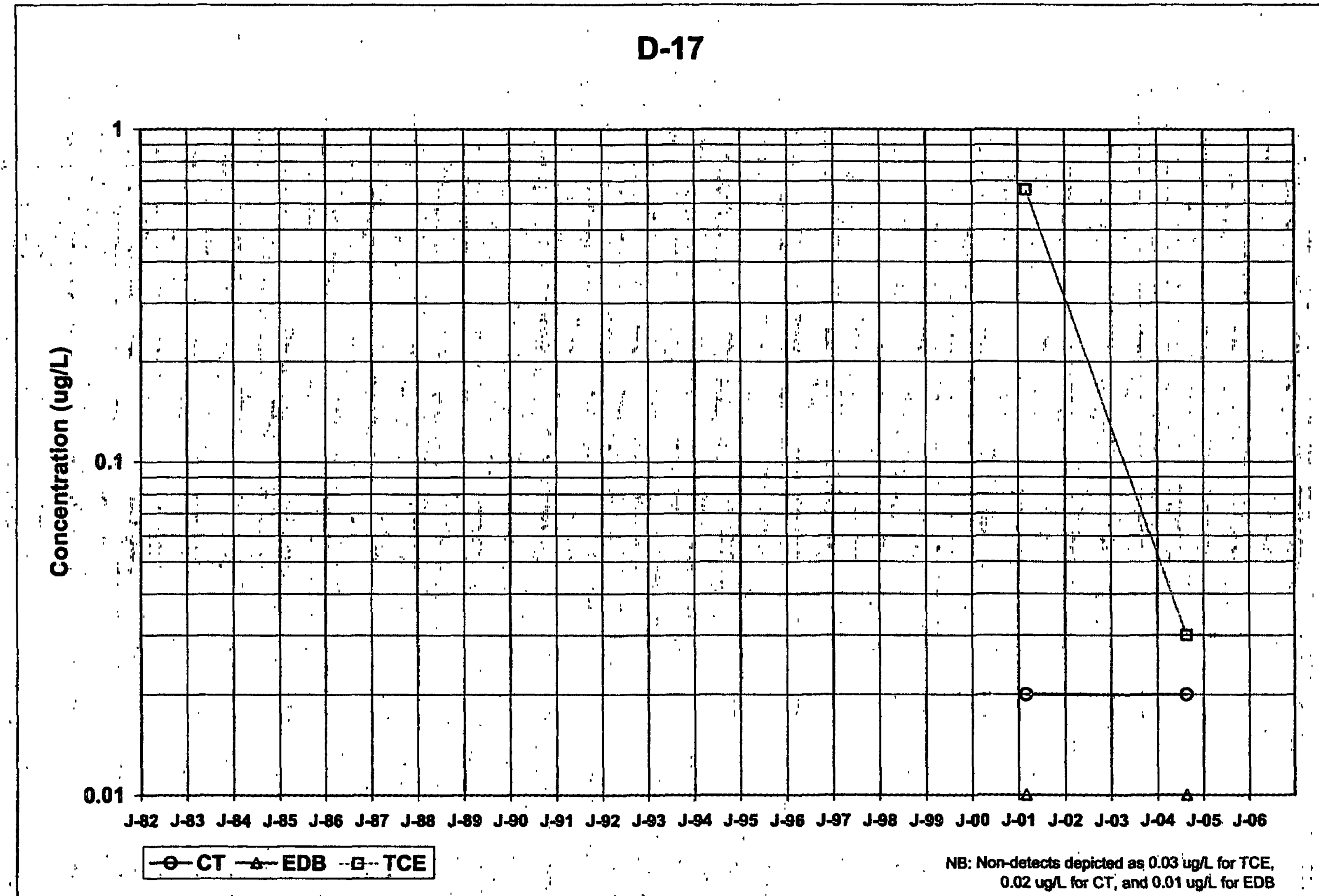

D-02
10
1
0.1
0.01
Concentration (ug/L)
J-82 J-83 J-84 J-85 J-86 J-87 J-88 J-89 J-90 J-91 J-92 J-93 J-94 J-95 J-96 J-97 J-98 J-99 J-00 J-01 J-02 J-03 J-04 J-05 J-06
CT
EDB
TCE
NB: Non-detects depicted as 0.03 ug/L for TCE, 0.02 ug/L for CT, and 0.01 ug/L for EDB

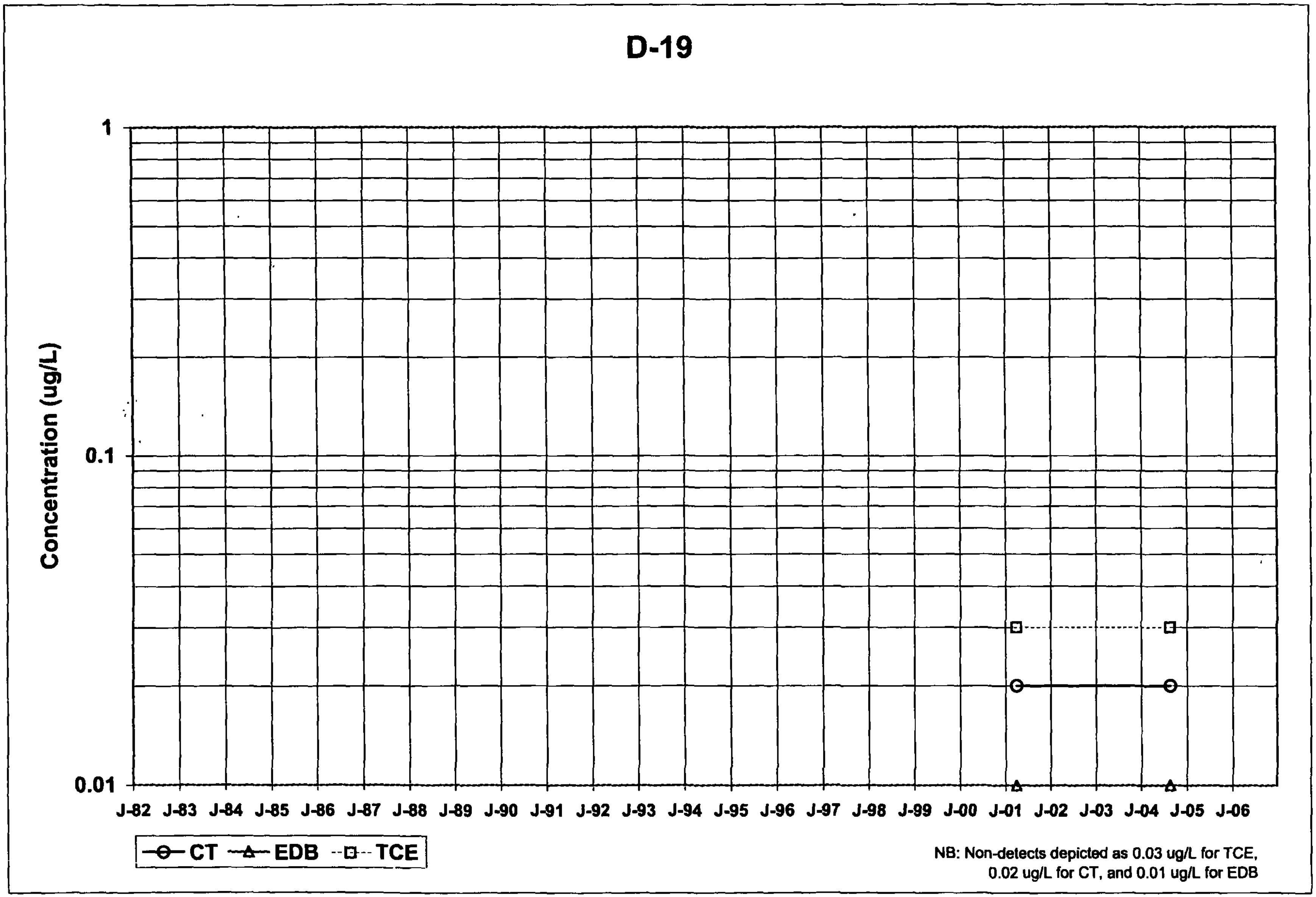

D-07
Concentration (ug/L)
1000
100
10
1
0.1
0.01
J-82 J-83 J-84 J-85 J-86 J-87 J-88 J-89 J-90 J-91 J-92 J-93 J-94 J-95 J-96 J-97 J-98 J-99 J-00 J-01 J-02 J-03 J-04 J-05 J-06
CT
EDB
TCE
NB; Non-detects depicted as 0.03 ug/L for TCE,
0.02 ug/L for CT, and 0.01 ug/L for EDB

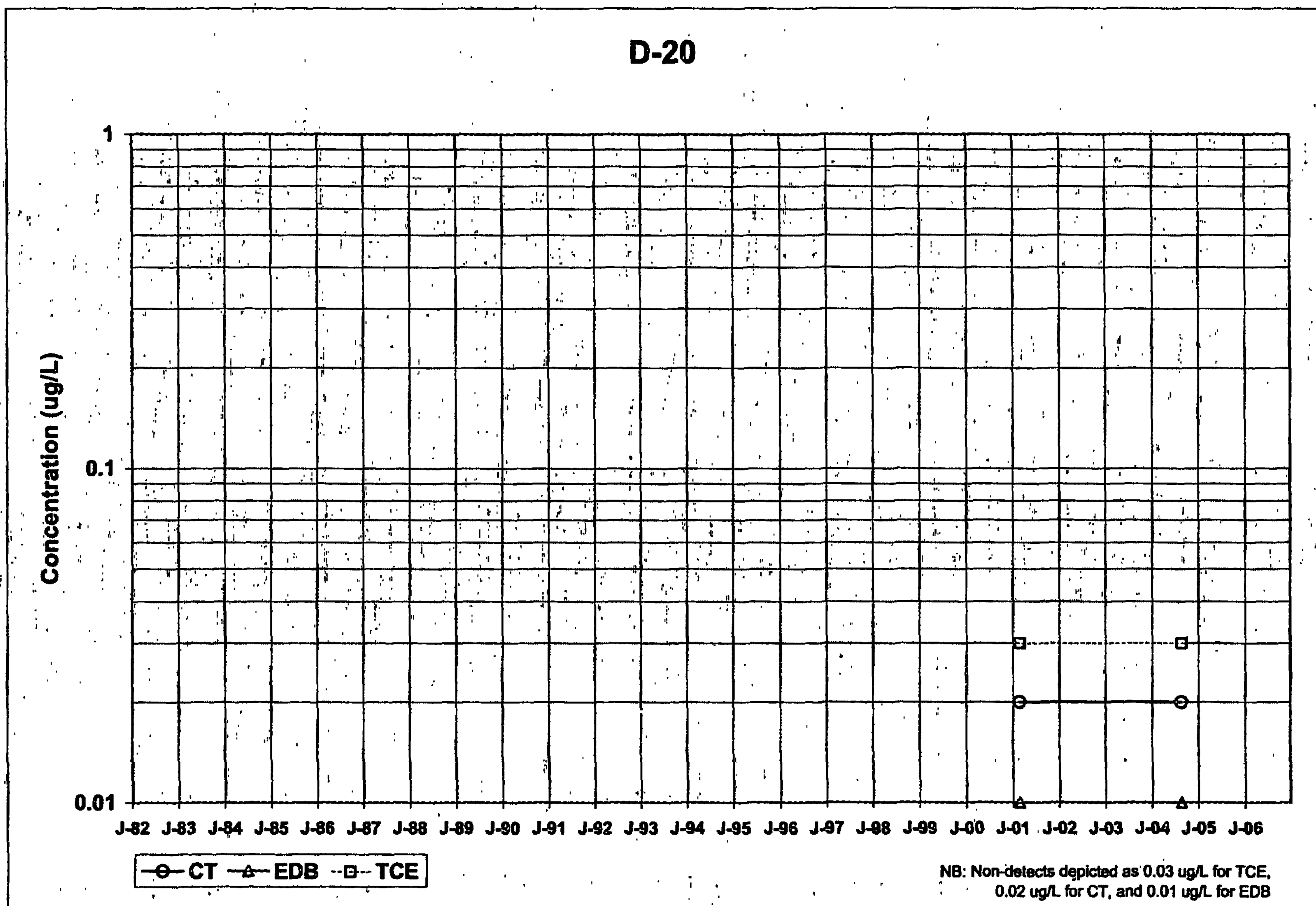

D-13
1000
100
10
1
0.1
0.01
Concentration (ug/L)
J-82 J-83 J-84 J-85 J-86 J-87 J-88 J-89 J-90 J-91 J-92 J-93 J-94 J-95 J-96 J-97 J-98 J-99 J-00 J-01 J-02 J-03 J-04 J-05 J-06
CT EDB TCE
NB: Non-detects depicted as 0.03 ug/L for TCE, 0.02 ug/L for CT, and 0.01 ug/L for EDB

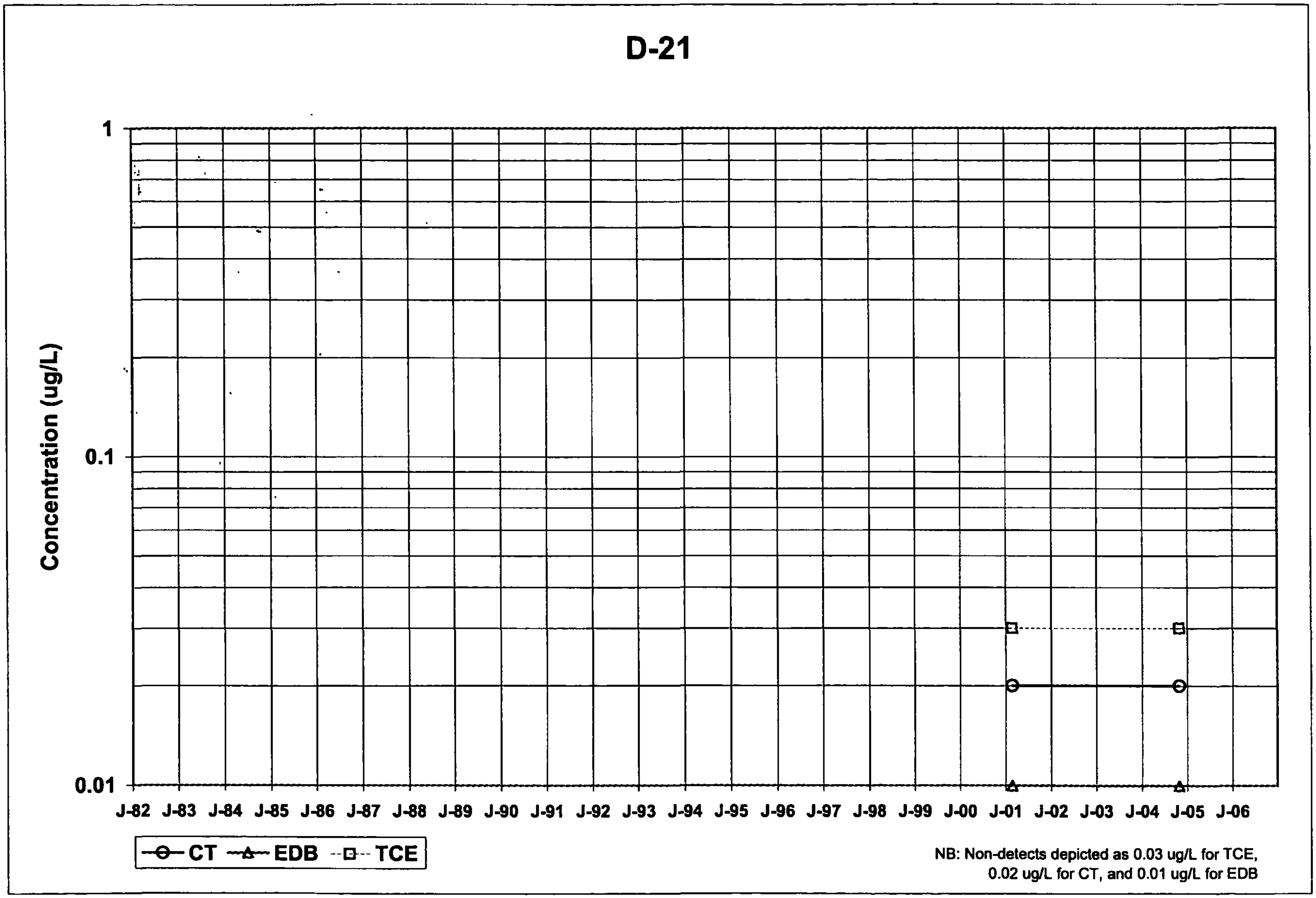

D-15
Concentration (ug/L)
1
0.1
0.01
J-82 J-83 J-84 J-85 J-86 J-87 J-88 J-89 J-90 J-91 J-92 J-93 J-94 J-95 J-96 J-97 J-98 J-99 J-00 J-01 J-02 J-03 J-04 J-05 J-06
CT
EDB
TCE
NB: Non-detects depicted as 0.03 ug/L for TCE, 0.02 ug/L for CT, and 0.01 ug/L for EDB

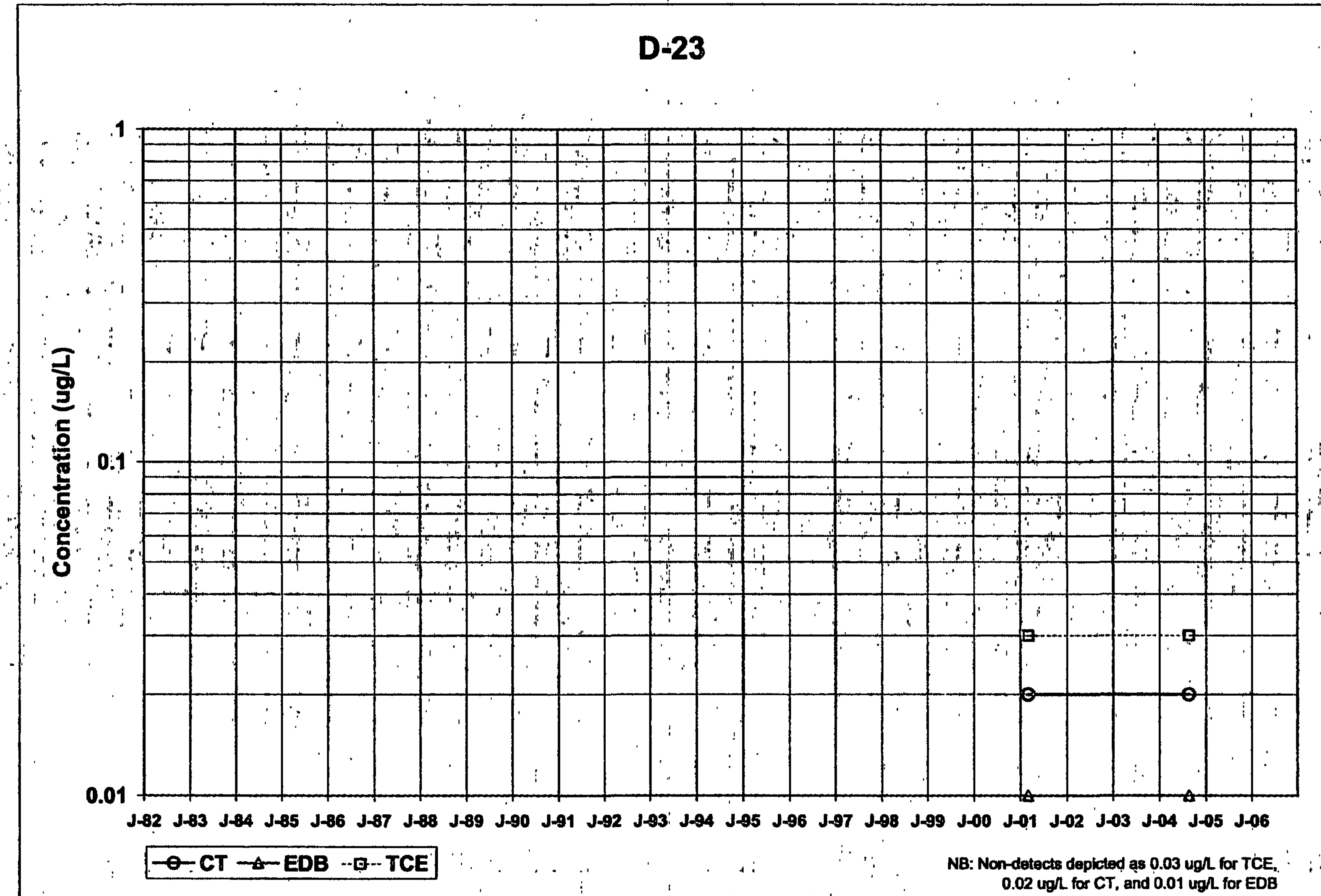

D-16
Concentration (ug/L)
1
0.1
0.01
J-82 J-83 J-84 J-85 J-86 J-87 J-88 J-89 J-90 J-91 J-92 J-93 J-94 J-95 J-96 J-97 J-98 J-99 J-00 J-01 J-02 J-03 J-04 J-05 J-06
CT EDB TCE
NB: Non-detects depicted as 0.03 ug/L for TCE,
0.02 ug/L for CT, and 0.01 ug/L for EDB

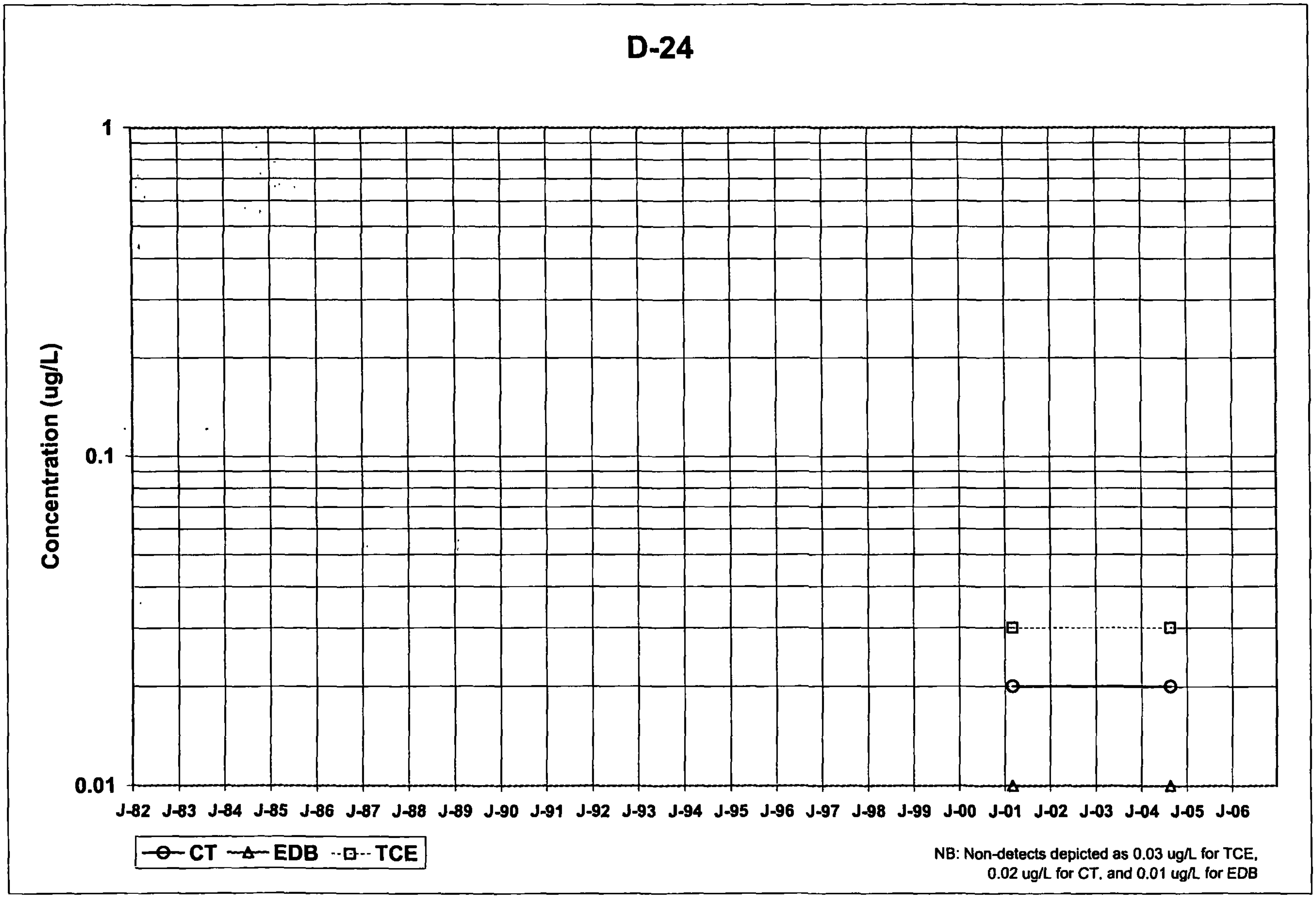

D-17
Concentration (ug/L)
1
0.1
0.01
J-82 J-83 J-84 J-85 J-86 J-87 J-88 J-89 J-90 J-91 J-92 J-93 J-94 J-95 J-96 J-97 J-98 J-99 J-00 J-01 J-02 J-03 J-04 J-05 J-06
CT
EDB
TCE
NB: Non-detects depicted as 0.03 ug/L for TCE, 0.02 ug/L for CT, and 0.01 ug/L for EDB

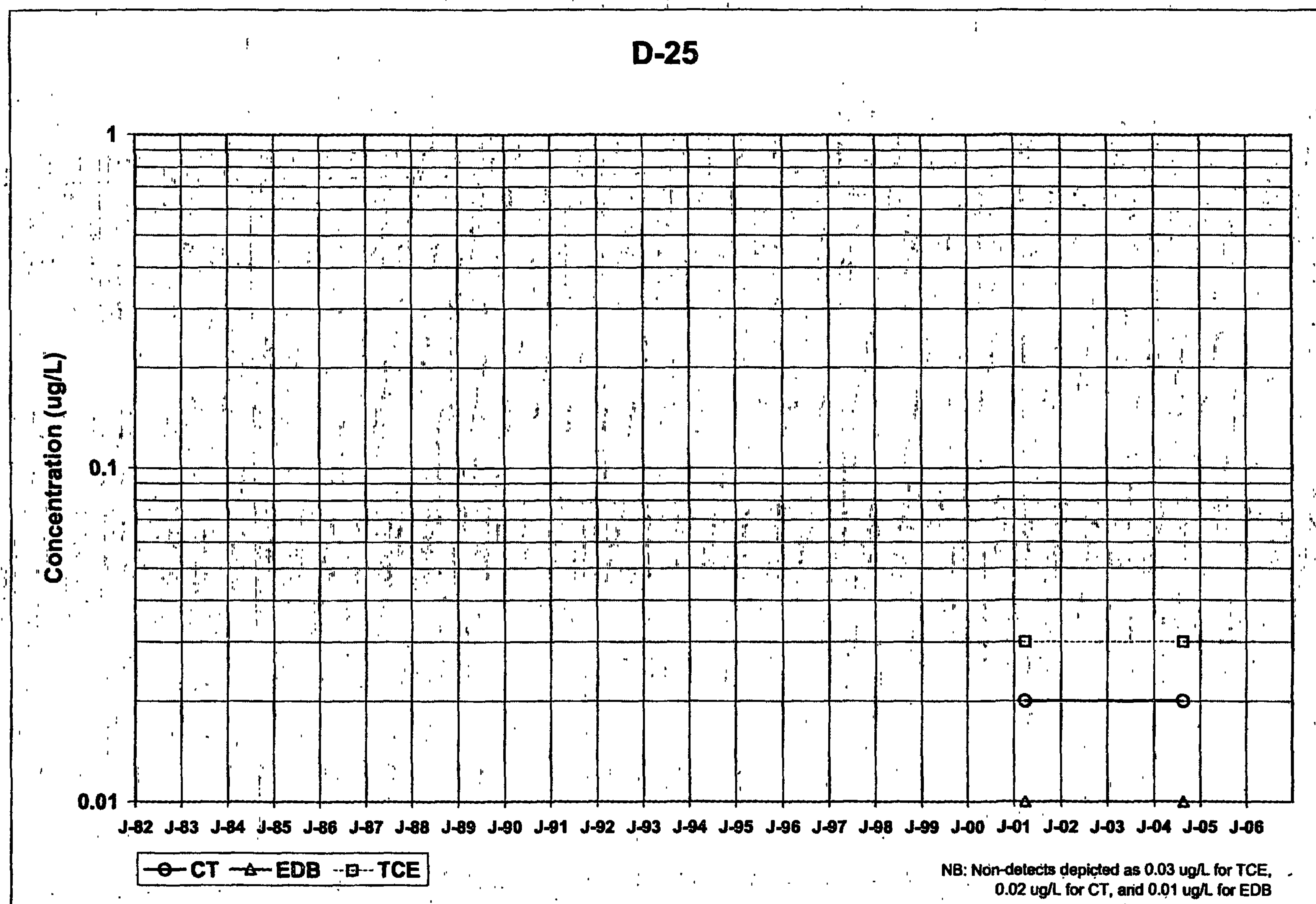

D-19
Concentration (ug/L)
1
0.1
0.01
J-82 J-83 J-84 J-85 J-86 J-87 J-88 J-89 J-90 J-91 J-92 J-93 J-94 J-95 J-96 J-97 J-98 J-99 J-00 J-01 J-02 J-03 J-04 J-05 J-06
CT
EDB
TCE
NB: Non-detects depicted as 0.03 ug/L for TCE,
0.02 ug/L for CT, and 0.01 ug/L for EDB

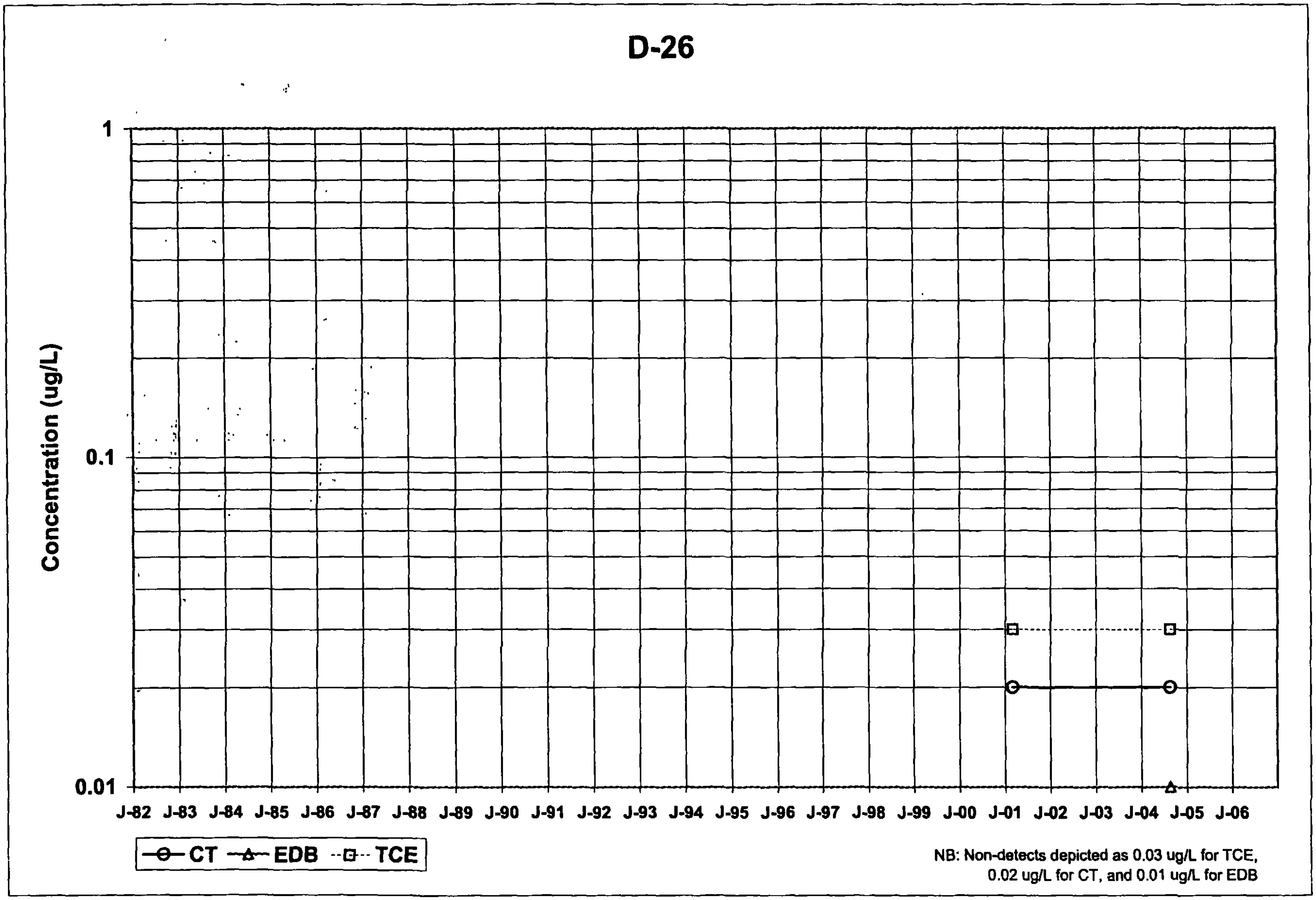

D-20
Concentration (ug/L)
1
0.1
0.01
J-82 J-83 J-84 J-85 J-86 J-87 J-88 J-89 J-90 J-91 J-92 J-93 J-94 J-95 J-96 J-97 J-98 J-99 J-00 J-01 J-02 J-03 J-04 J-05 J-06
CT
EDB
TCE
NB: Non-detects depicted as 0.03 ug/L for TCE, 0.02 ug/L for CT, and 0.01 ug/L for EDB

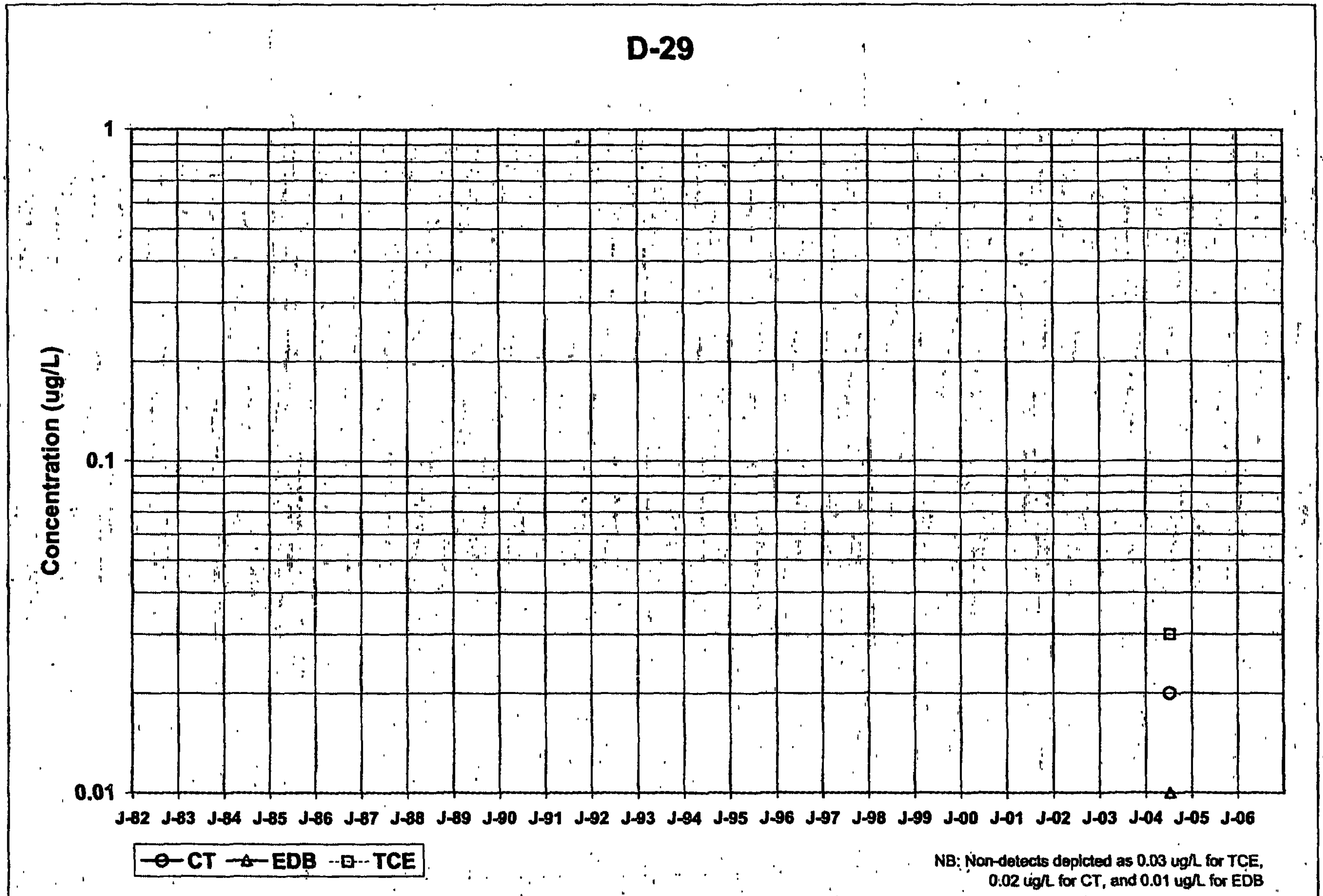

D-21
Concentration (ug/L)
1
0.1
0.01
J-82 J-83 J-84 J-85 J-86 J-87 J-88 J-89 J-90 J-91 J-92 J-93 J-94 J-95 J-96 J-97 J-98 J-99 J-00 J-01 J-02 J-03 J-04 J-05 J-06
CT
EDB
TCE
NB: Non-detects depicted as 0.03 ug/L for TCE,
0.02 ug/L for CT, and 0.01 ug/L for EDB

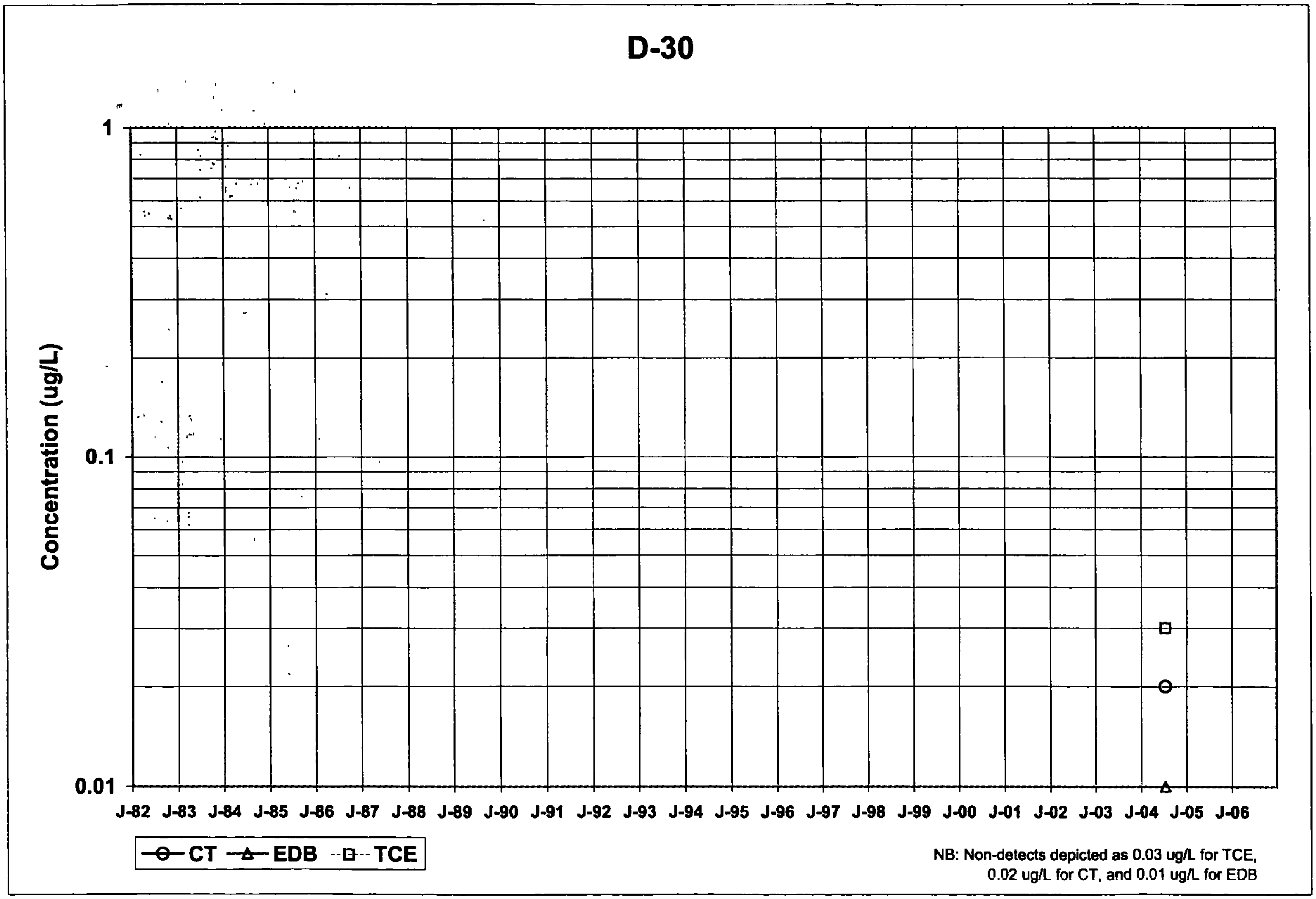

D-23
Concentration (ug/L)
1
0.1
0.01
J-82 J-83 J-84 J-85 J-86 J-87 J-88 J-89 J-90 J-91 J-92 J-93 J-94 J-95 J-96 J-97 J-98 J-99 J-00 J-01 J-02 J-03 J-04 J-05 J-06
CT
EDB
TCE
NB: Non-detects depicted as 0.03 ug/L for TCE, 0.02 ug/L for CT, and 0.01 ug/L for EDB

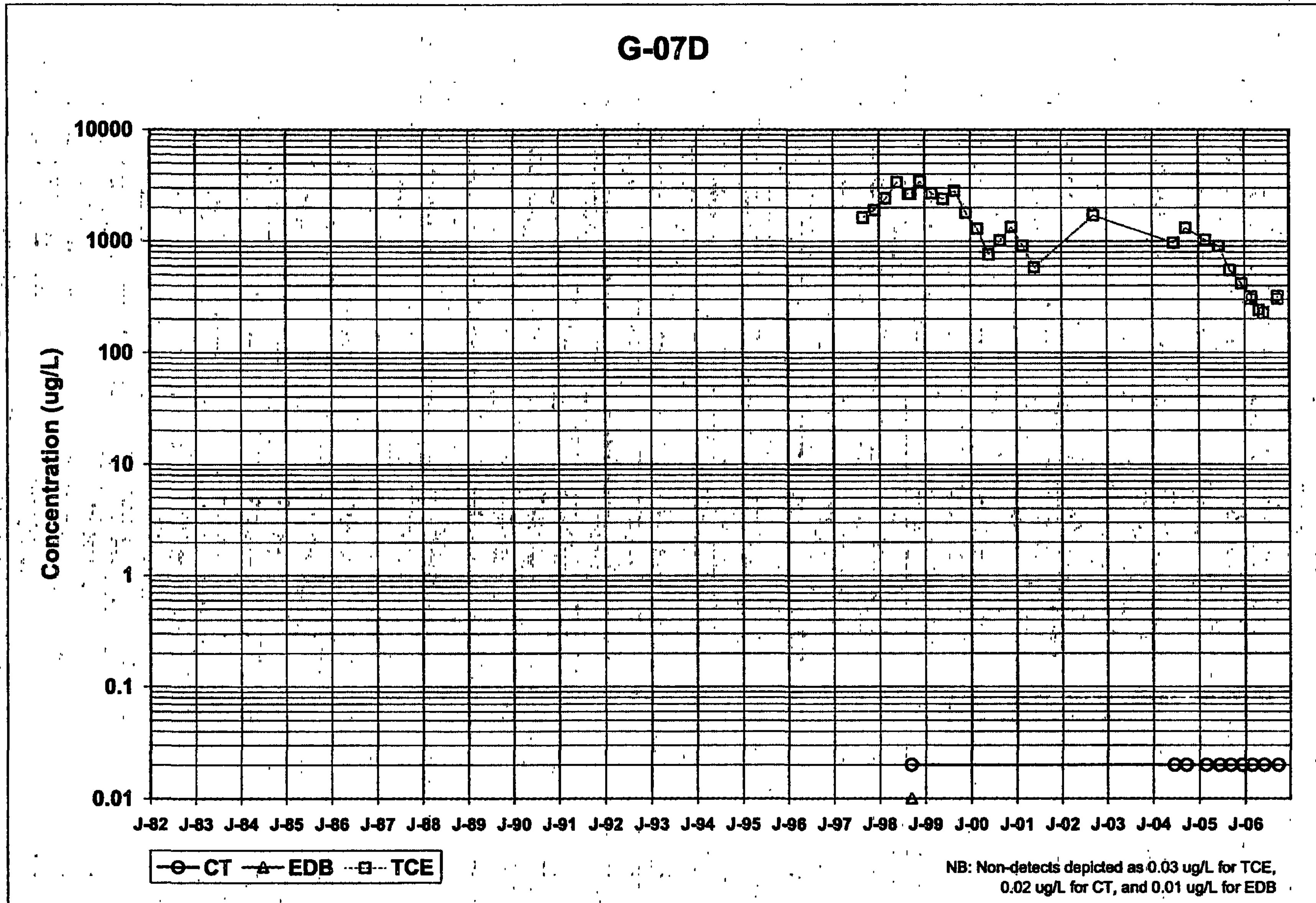

D-24
Concentration (ug/L)
1
0.1
0.01
J-82 J-83 J-84 J-85 J-86 J-87 J-88 J-89 J-90 J-91 J-92 J-93 J-94 J-95 J-96 J-97 J-98 J-99 J-00 J-01 J-02 J-03 J-04 J-05 J-06
CT EDB TCE
NB: Non-detects depicted as 0.03 ug/L for TCE, 0.02 ug/L for CT, and 0.01 ug/L for EDB

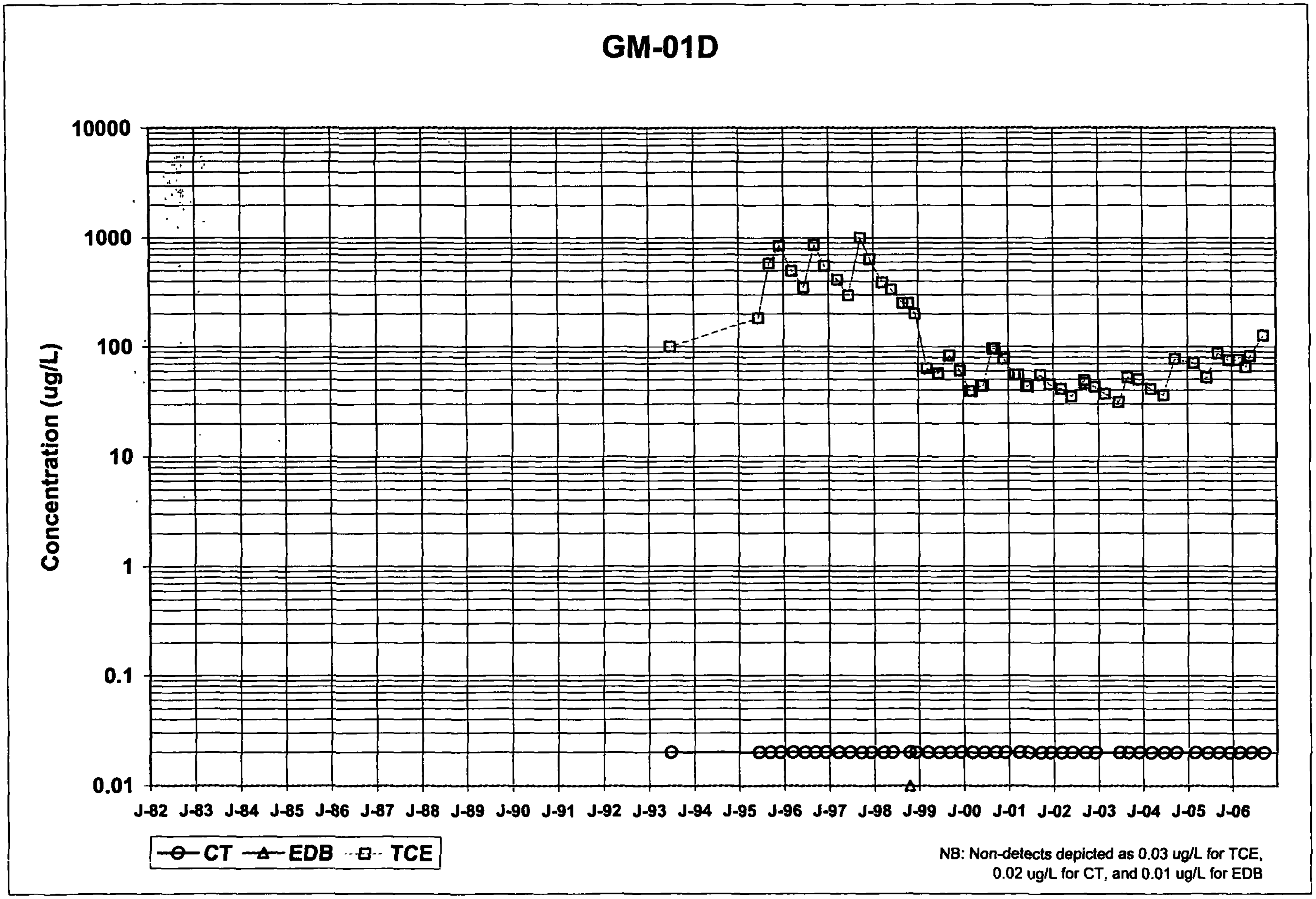

D-25
Concentration (ug/L)
1
0.1
0.01
J-82 J-83 J-84 J-85 J-86 J-87 J-88 J-89 J-90 J-91 J-92 J-93 J-94 J-95 J-96 J-97 J-98 J-99 J-00 J-01 J-02 J-03 J-04 J-05 J-06
CT
EDB
TCE
NB: Non-detects depicted as 0.03 ug/L for TCE,
0.02 ug/L for CT, and 0.01 ug/L for EDB

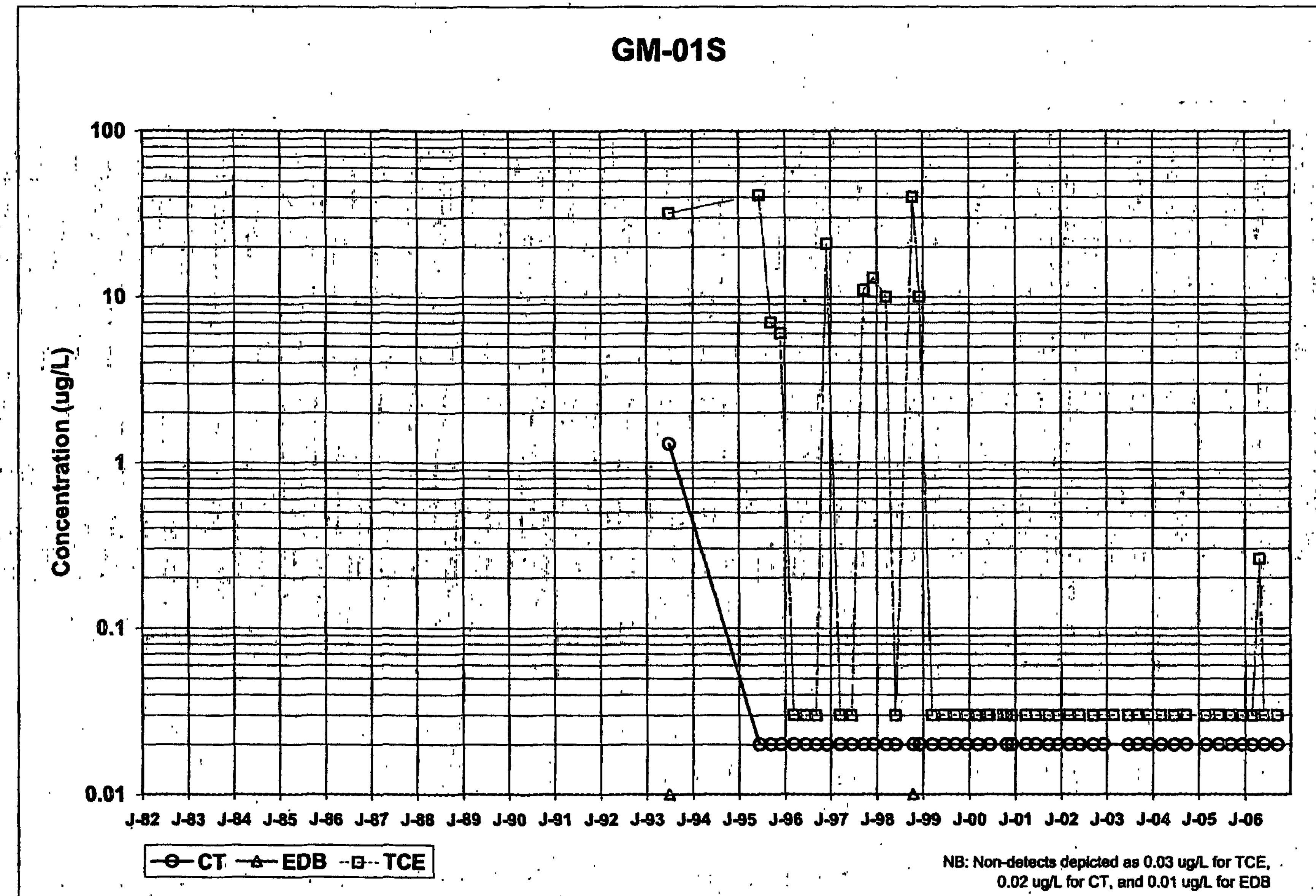

D-26
Concentration (ug/L)
1
0.1
0.01
J-82 J-83 J-84 J-85 J-86 J-87 J-88 J-89 J-90 J-91 J-92 J-93 J-94 J-95 J-96 J-97 J-98 J-99 J-00 J-01 J-02 J-03 J-04 J-05 J-06
CT
EDB
TCE
NB: Non-detects depicted as 0.03 ug/L for TCE, 0.02 ug/L for CT, and 0.01 ug/L for EDB

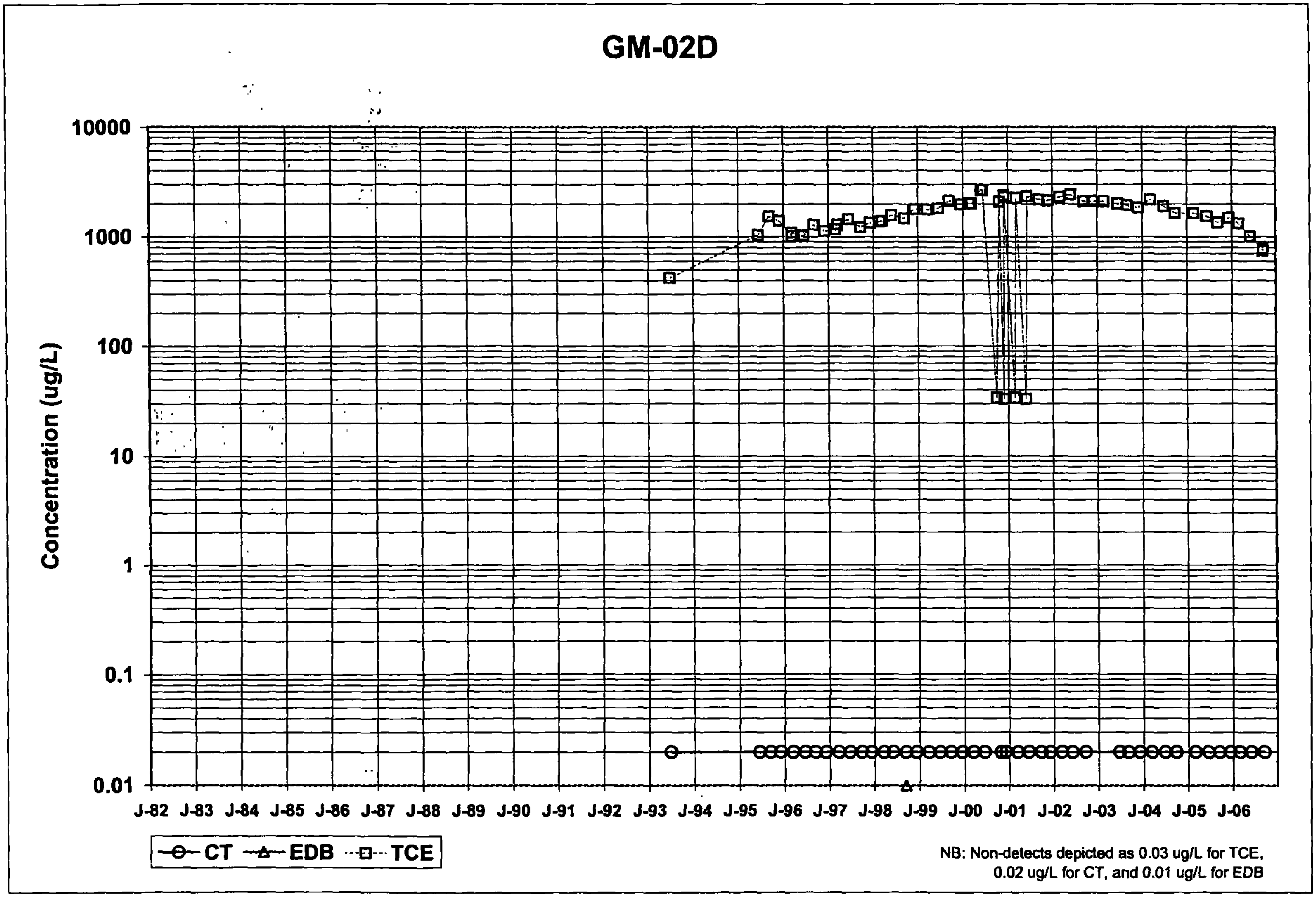

D-29
Concentration (ug/L)
1
0.1
0.01
J-82 J-83 J-84 J-85 J-86 J-87 J-88 J-89 J-90 J-91 J-92 J-93 J-94 J-95 J-96 J-97 J-98 J-99 J-00 J-01 J-02 J-03 J-04 J-05 J-06
CT
EDB
TCE
NB: Non-detects depicted as 0.03 ug/L for TCE, 0.02 ug/L for CT, and 0.01 ug/L for EDB

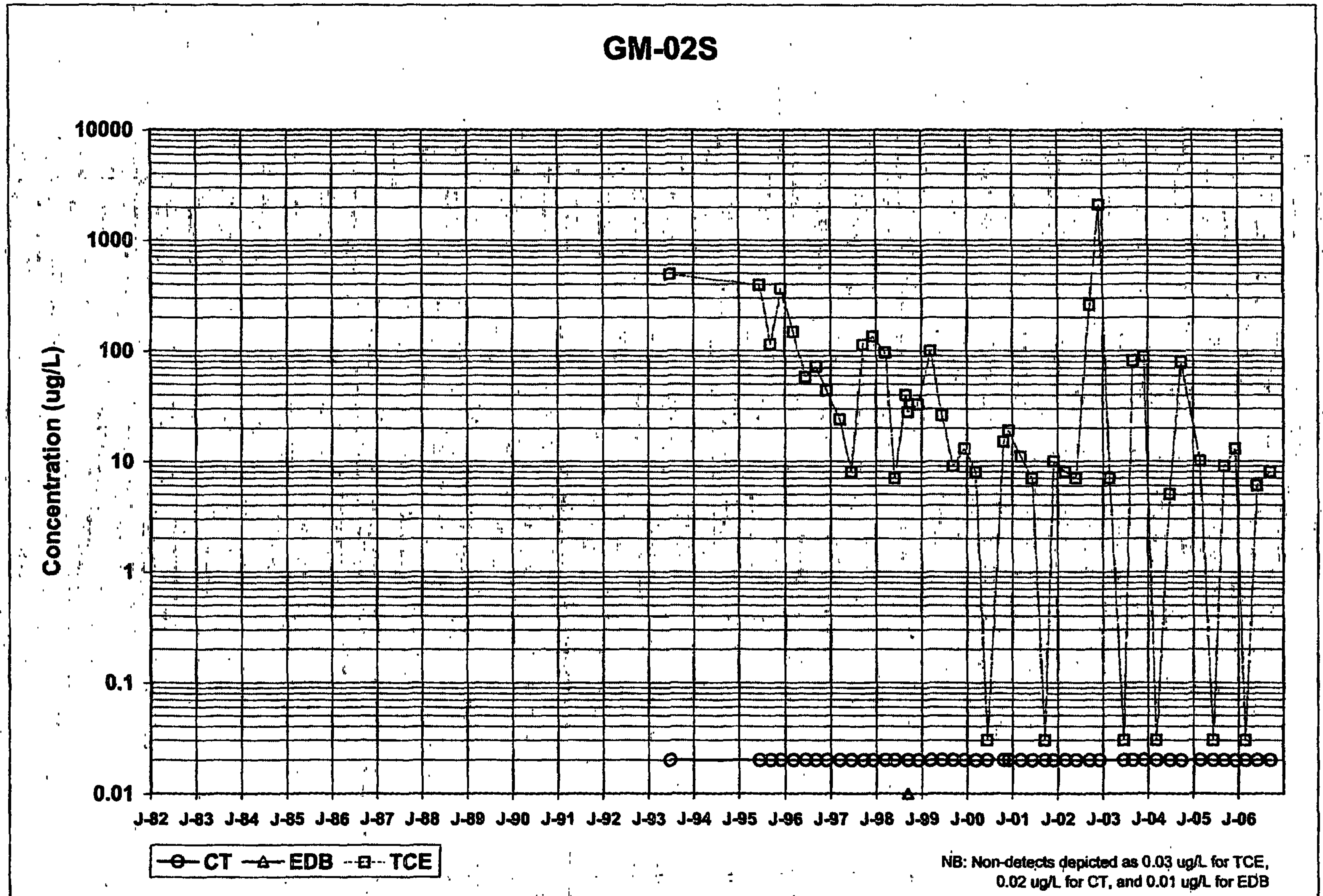

D-30
Concentration (ug/L)
1
0.1
0.01
J-82 J-83 J-84 J-85 J-86 J-87 J-88 J-89 J-90 J-91 J-92 J-93 J-94 J-95 J-96 J-97 J-98 J-99 J-00 J-01 J-02 J-03 J-04 J-05 J-06
CT
EDB
TCE
NB: Non-detects depicted as 0.03 ug/L for TCE, 0.02 ug/L for CT, and 0.01 ug/L for EDB

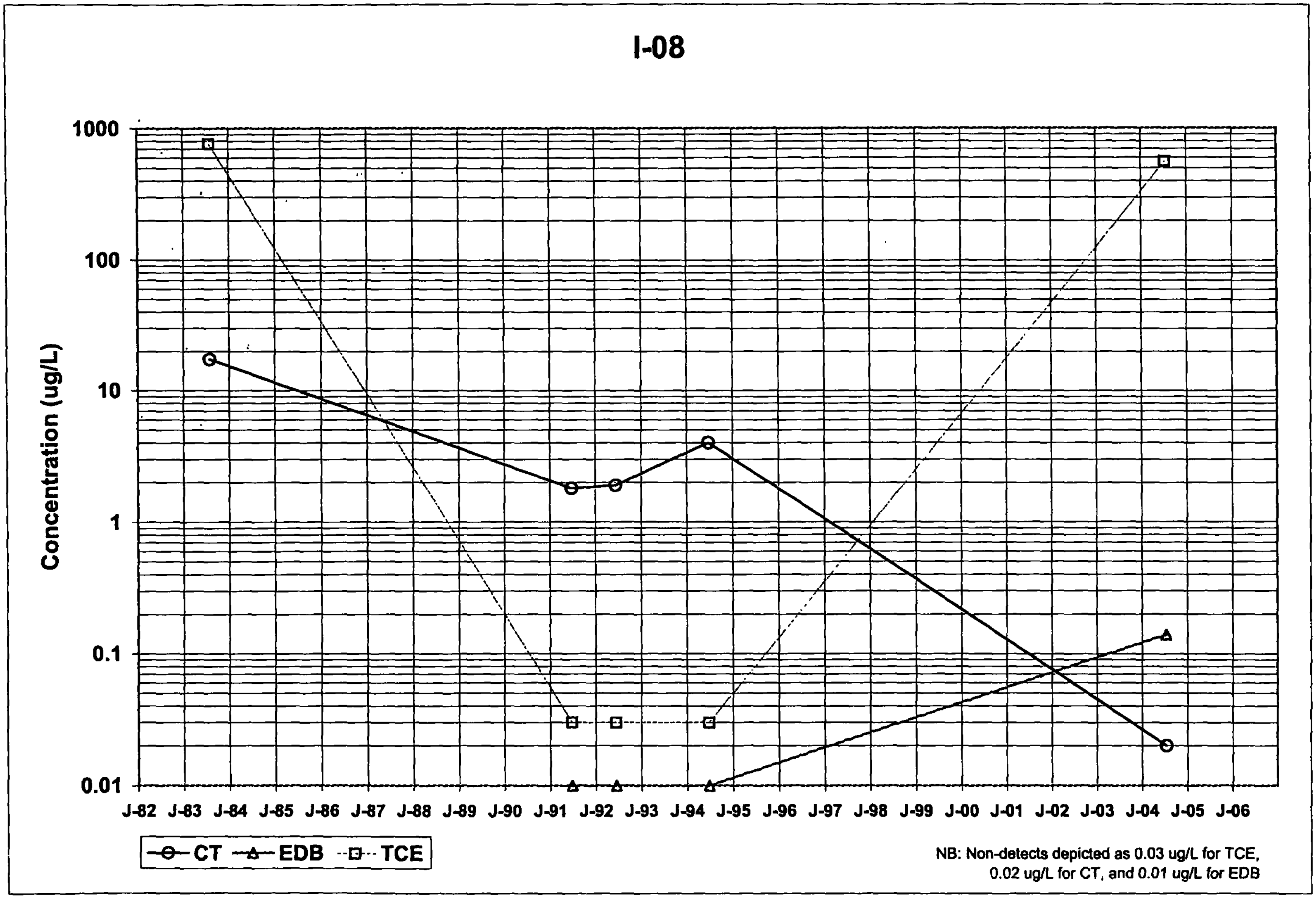

G-07D
Concentration (ug/L)
10000
1000
100
10
1
0.1
0.01
J-82 J-83 J-84 J-85 J-86 J-87 J-88 J-89 J-90 J-91 J-92 J-93 J-94 J-95 J-96 J-97 J-98 J-99 J-00 J-01 J-02 J-03 J-04 J-05 J-06
CT
EDB
TCE
NB: Non-detects depicted as 0.03 ug/L for TCE, 0.02 ug/L for CT, and 0.01 ug/L for EDB

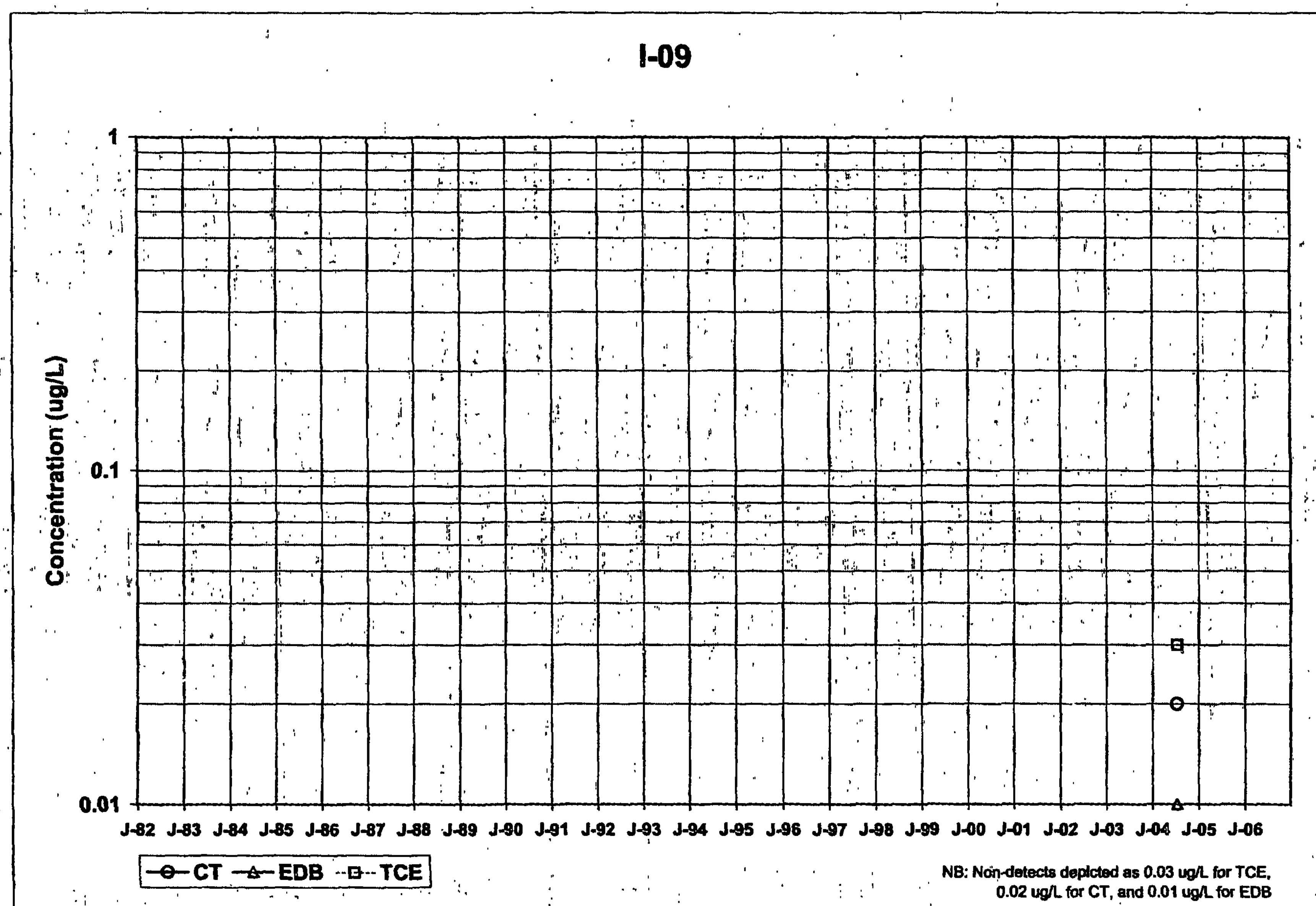

GM-01D
10000
1000
100
10
1
0.1
0.01
Concentration (ug/L)
J-82 J-83 J-84 J-85 J-86 J-87 J-88 J-89 J-90 J-91 J-92 J-93 J-94 J-95 J-96 J-97 J-98 J-99 J-00 J-01 J-02 J-03 J-04 J-05 J-06
CT
EDB
TCE
NB: Non-detects depicted as 0.03 ug/L for TCE,
0.02 ug/L for CT, and 0.01 ug/L for EDB


GM-01S
100
10
1
0.1
0.01
Concentration (ug/L)
J-82 J-83 J-84 J-85 J-86 J-87 J-88 J-89 J-90 J-91 J-92 J-93 J-94 J-95 J-96 J-97 J-98 J-99 J-00 J-01 J-02 J-03 J-04 J-05 J-06
CT
EDB
TCE
NB: Non-detects depicted as 0.03 ug/L for TCE, 0.02 ug/L for CT, and 0.01 ug/L for EDB

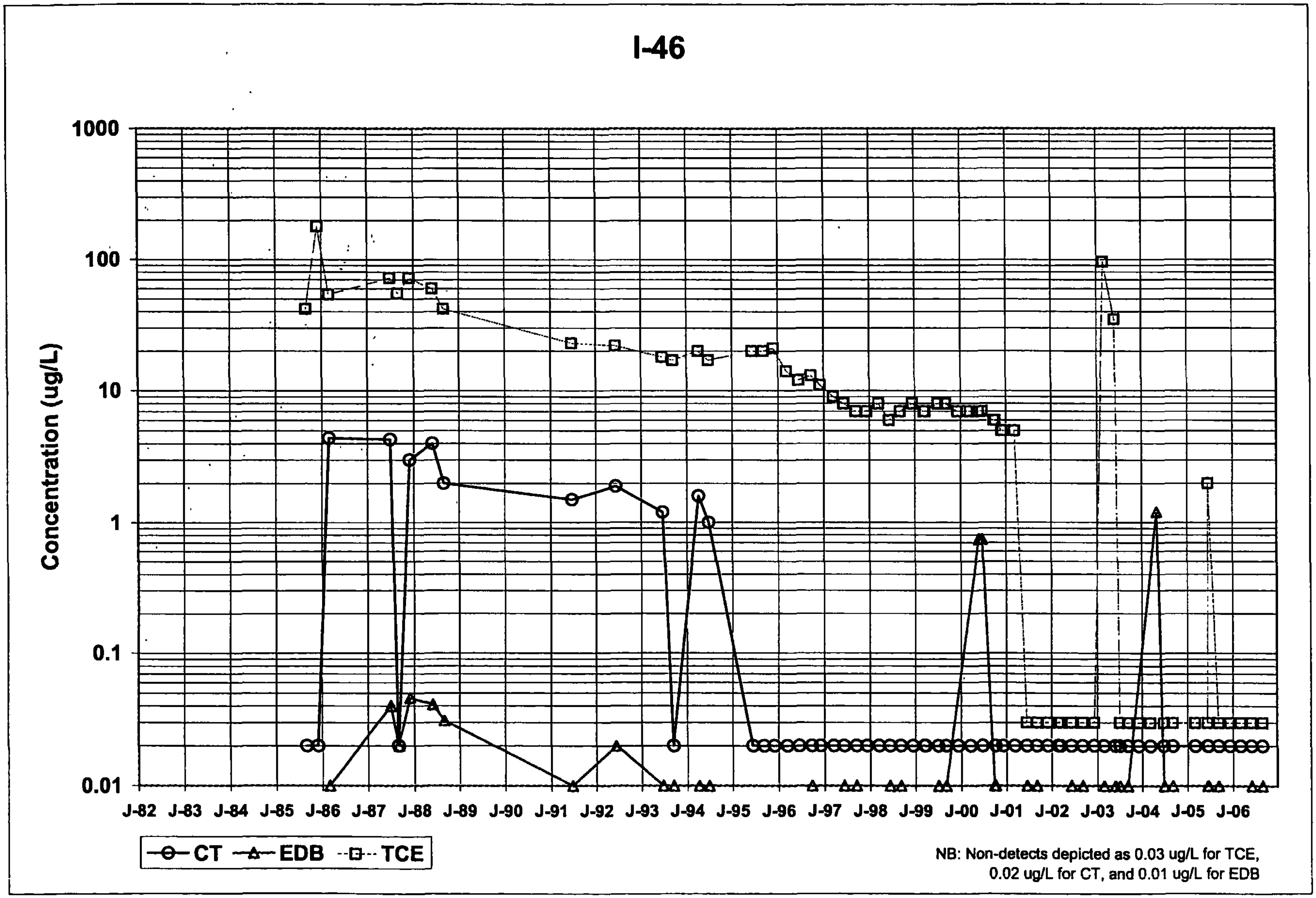

GM-02D
Concentration (ug/L)
10000
1000
100
10
1
0.1
0.01
J-82 J-83 J-84 J-85 J-86 J-87 J-88 J-89 J-90 J-91 J-92 J-93 J-94 J-95 J-96 J-97 J-98 J-99 J-00 J-01 J-02 J-03 J-04 J-05 J-06
CT
EDB
TCE
NB: Non-detects depicted as 0.03 ug/L for TCE, 0.02 ug/L for CT, and 0.01 ug/L for EDB

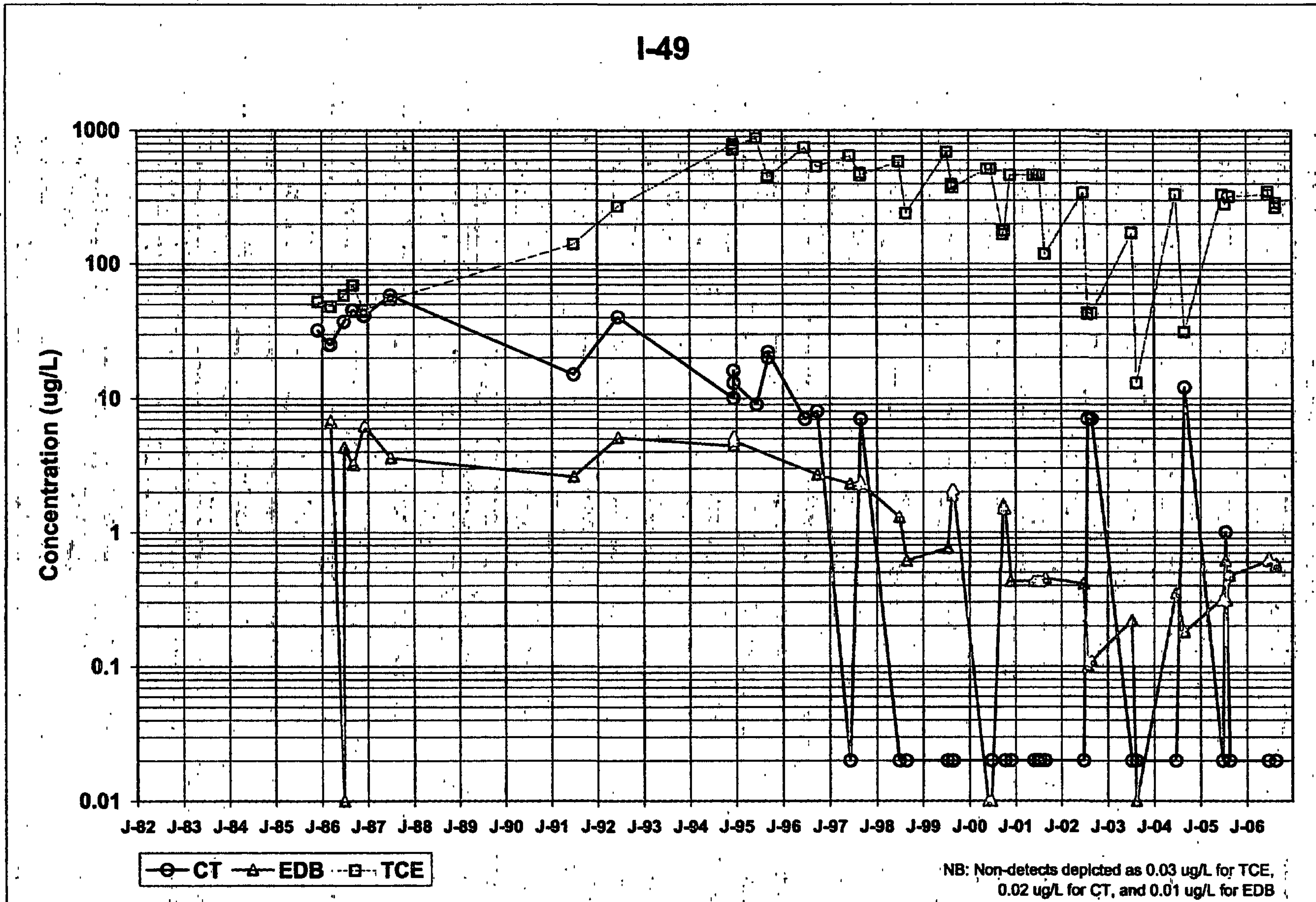

GM-02S
Concentration (ug/L)
10000
1000
100
10
1
0.1
0.01
J-82 J-83 J-84 J-85 J-86 J-87 J-88 J-89 J-90 J-91 J-92 J-93 J-94 J-95 J-96 J-97 J-98 J-99 J-00 J-01 J-02 J-03 J-04 J-05 J-06
CT EDB TCE
NB: Non-detects depicted as 0.03 ug/L for TCE, 0.02 ug/L for CT, and 0.01 ug/L for EDB

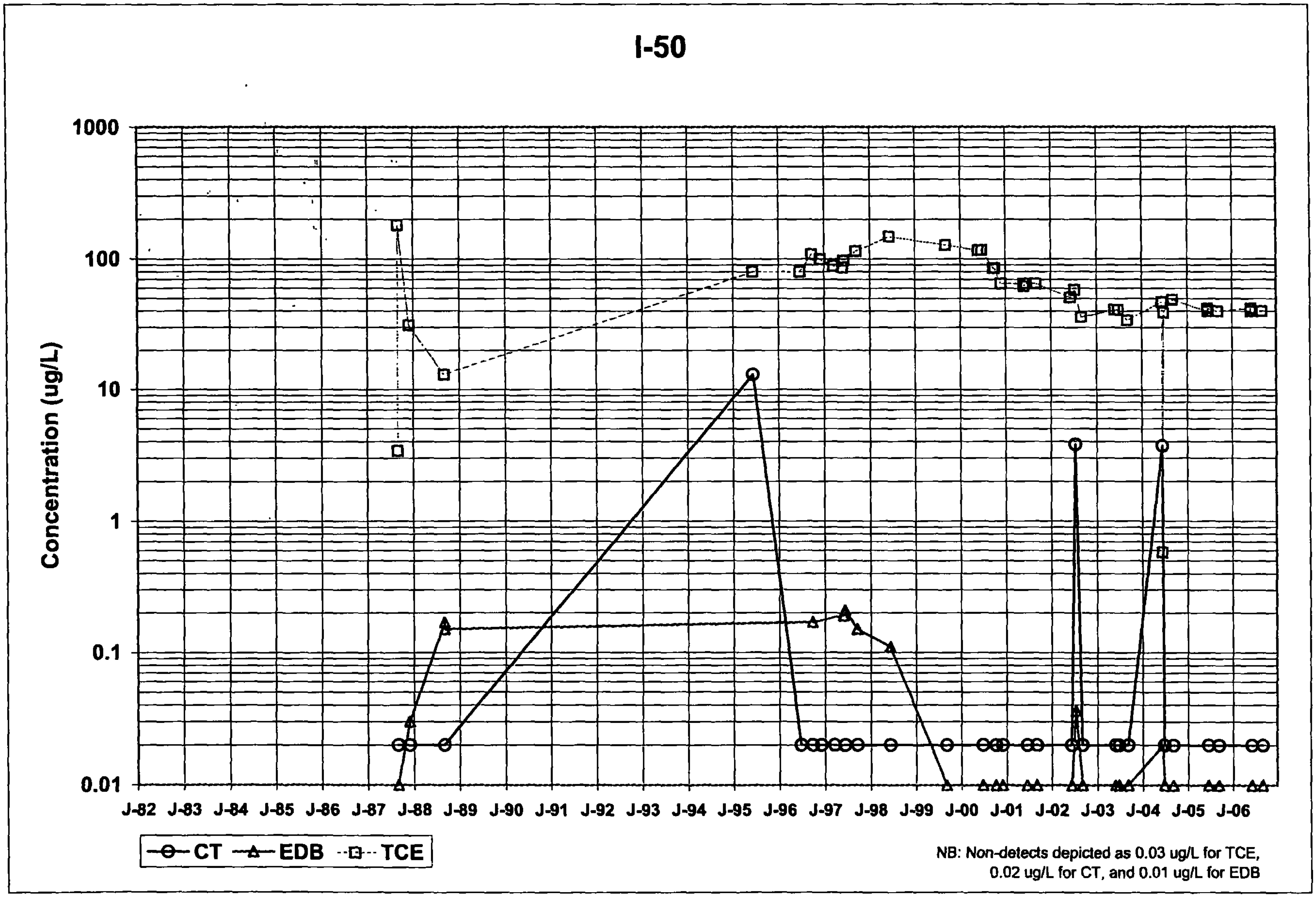

I-08
Concentration (ug/L)
1000
100
10
1
0.1
0.01
J-82 J-83 J-84 J-85 J-86 J-87 J-88 J-89 J-90 J-91 J-92 J-93 J-94 J-95 J-96 J-97 J-98 J-99 J-00 J-01 J-02 J-03 J-04 J-05 J-06
CT
EDB
TCE
NB: Non-detects depicted as 0.03 ug/L for TCE, 0.02 ug/L for CT, and 0.01 ug/L for EDB



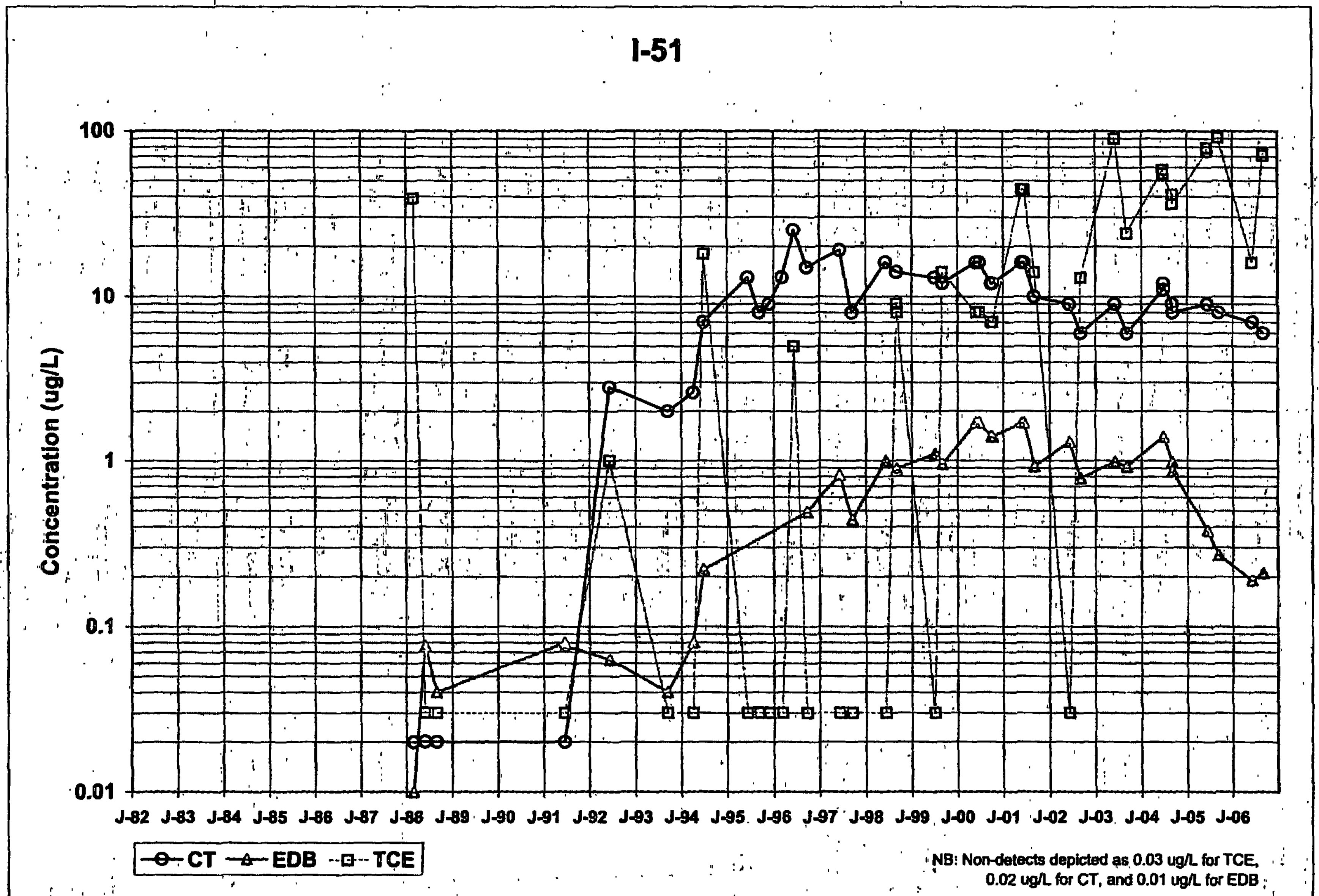
I-09
Concentration (ug/L)
1
0.1
0.01
J-82 J-83 J-84 J-85 J-86 J-87 J-88 J-89 J-90 J-91 J-92 J-93 J-94 J-95 J-96 J-97 J-98 J-99 J-00 J-01 J-02 J-03 J-04 J-05 J-06
CT
EDB
TCE
NB: Non-detects depicted as 0.03 ug/L for TCE, 0.02 ug/L for CT, and 0.01 ug/L for EDB


I-46
1000
100
10
1
0.1
0.01
Concentration (ug/L)
J-82 J-83 J-84 J-85 J-86 J-87 J-88 J-89 J-90 J-91 J-92 J-93 J-94 J-95 J-96 J-97 J-98 J-99 J-00 J-01 J-02 J-03 J-04 J-05 J-06
CT
EDB
TCE
NB: Non-detects depicted as 0.03 ug/L for TCE, 0.02 ug/L for CT, and 0.01 ug/L for EDB

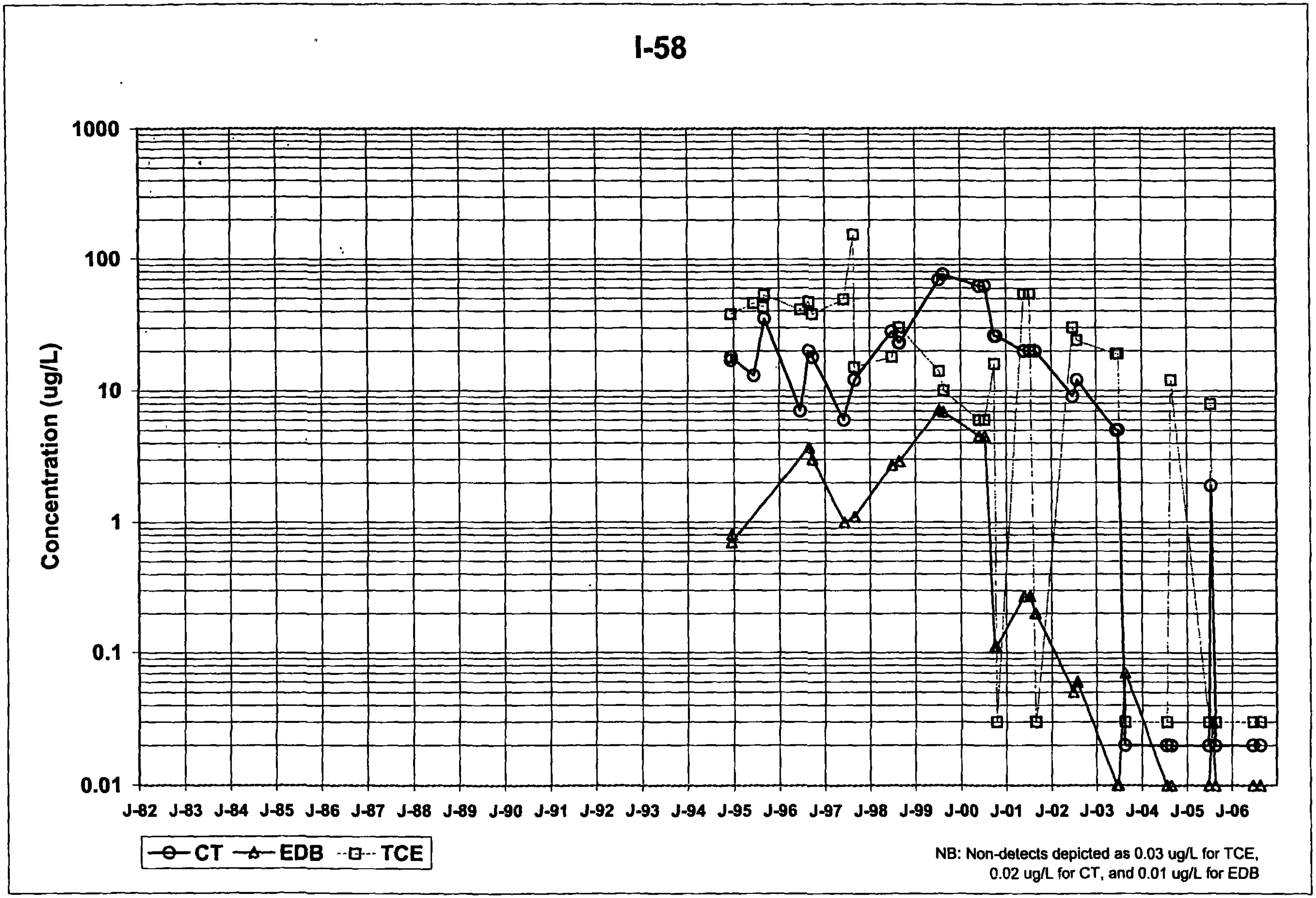

I-49
Concentration (ug/L)
1000
100
10
1
0.1
0.01
J-82 J-83 J-84 J-85 J-86 J-87 J-88 J-89 J-90 J-91 J-92 J-93 J-94 J-95 J-96 J-97 J-98 J-99 J-00 J-01 J-02 J-03 J-04 J-05 J-06
CT EDB TCE
NB: Non-detects depicted as 0.03 ug/L for TCE, 0.02 ug/L for CT, and 0.01 ug/L for EDB

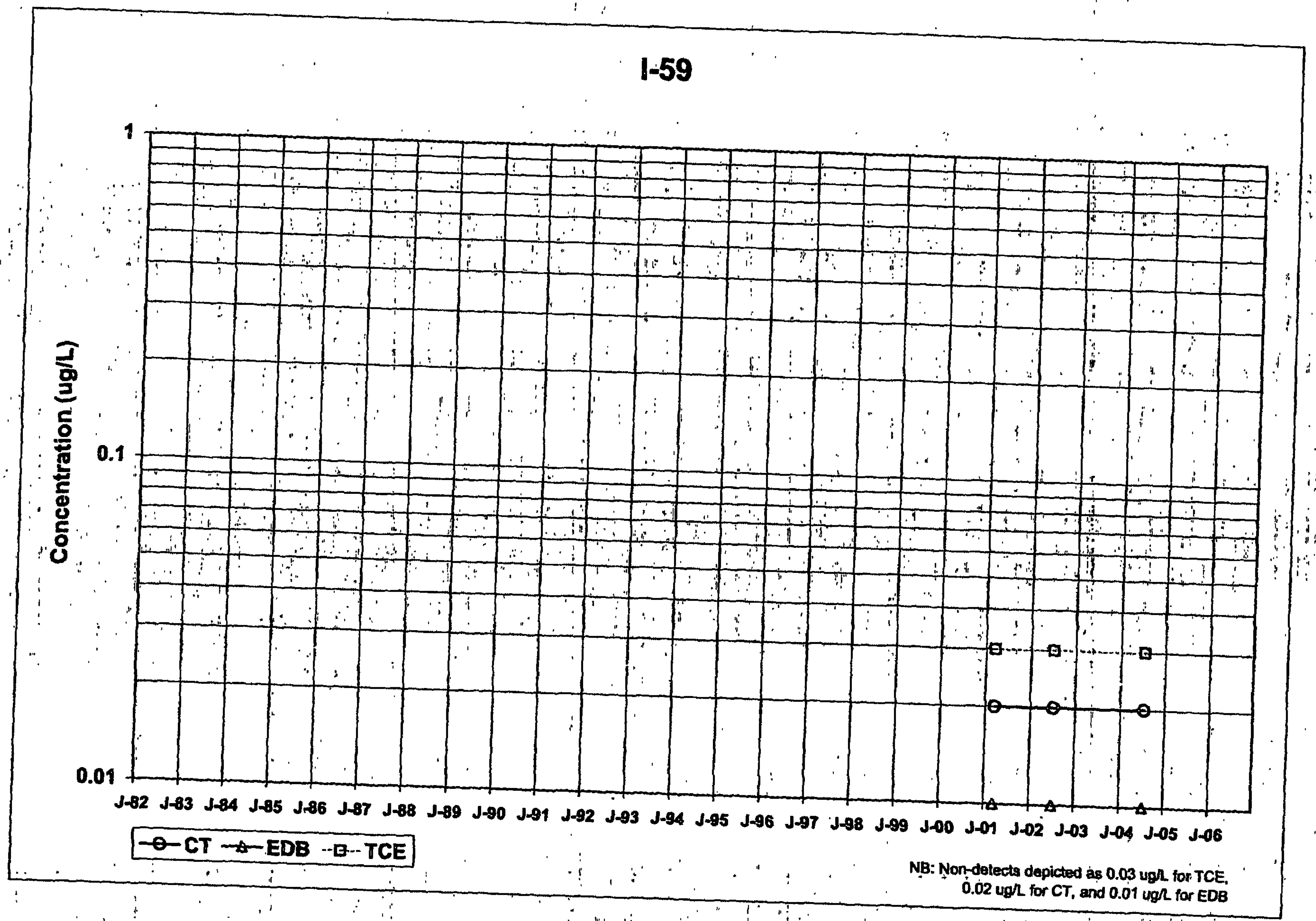


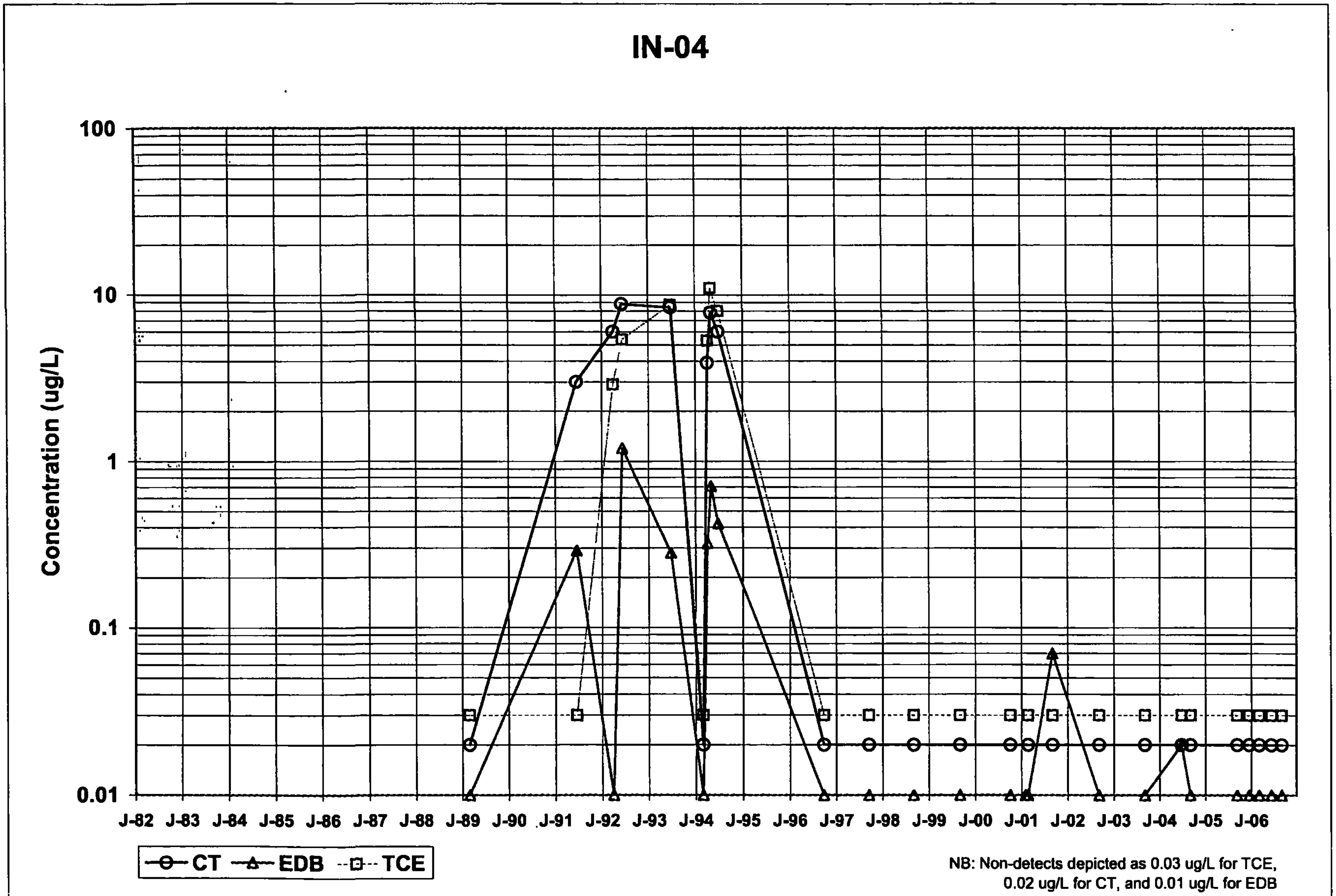
I-50
1000
100
10
1
0.1
0.01
Concentration (ug/L)
J-82 J-83 J-84 J-85 J-86 J-87 J-88 J-89 J-90 J-91 J-92 J-93 J-94 J-95 J-96 J-97 J-98 J-99 J-00 J-01 J-02 J-03 J-04 J-05 J-06
CT
EDB
TCE
NB: Non-detects depicted as 0.03 ug/L for TCE,
0.02 ug/L for CT, and 0.01 ug/L for EDB

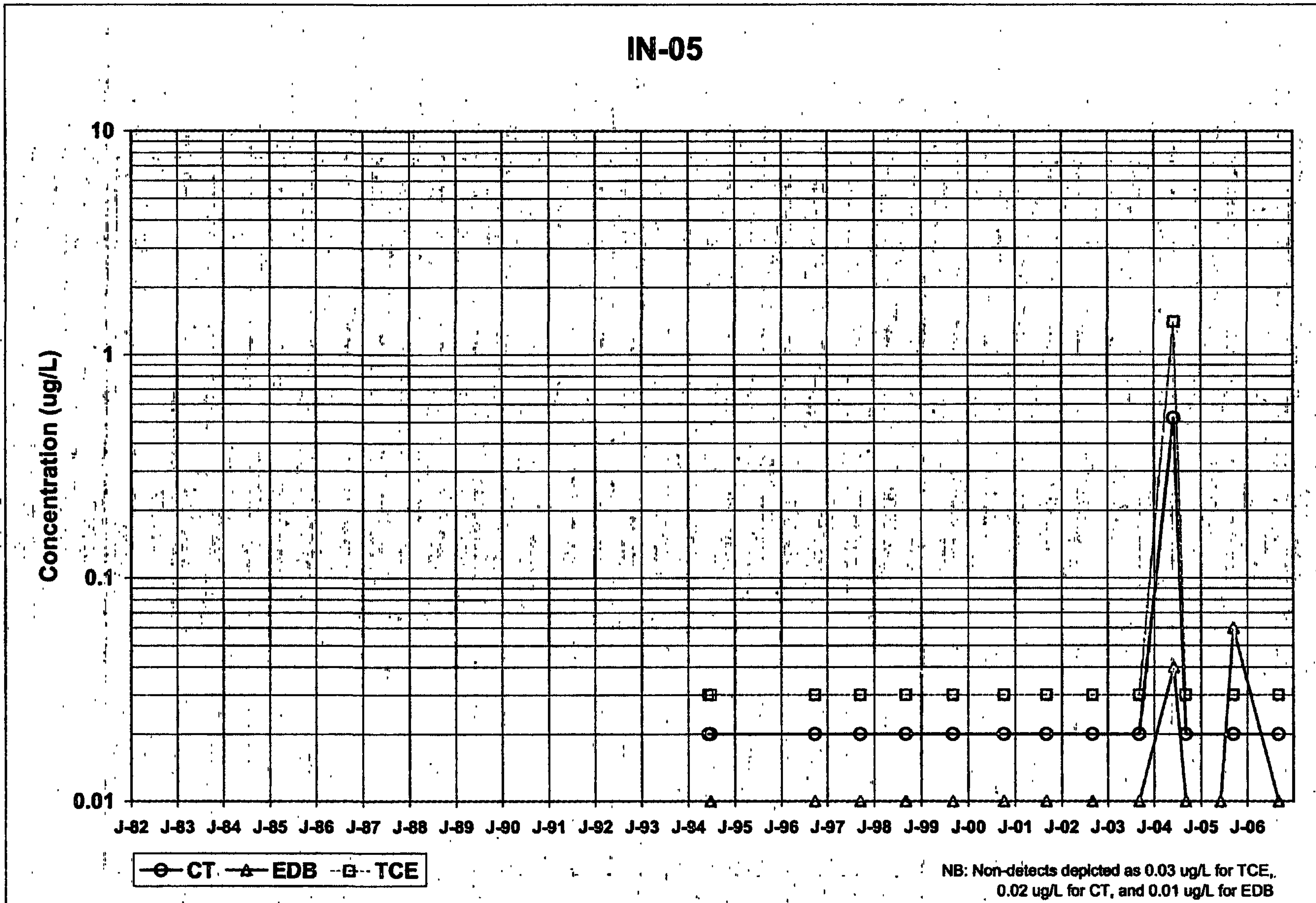


I-51
Concentration (ug/L)
100
10
1
0.1
0.01
J-82 J-83 J-84 J-85 J-86 J-87 J-88 J-89 J-90 J-91 J-92 J-93 J-94 J-95 J-96 J-97 J-98 J-99 J-00 J-01 J-02 J-03 J-04 J-05 J-06
CT
EDB
TCE
NB: Non-detects depicted as 0.03 ug/L for TCE, 0.02 ug/L for CT, and 0.01 ug/L for EDB

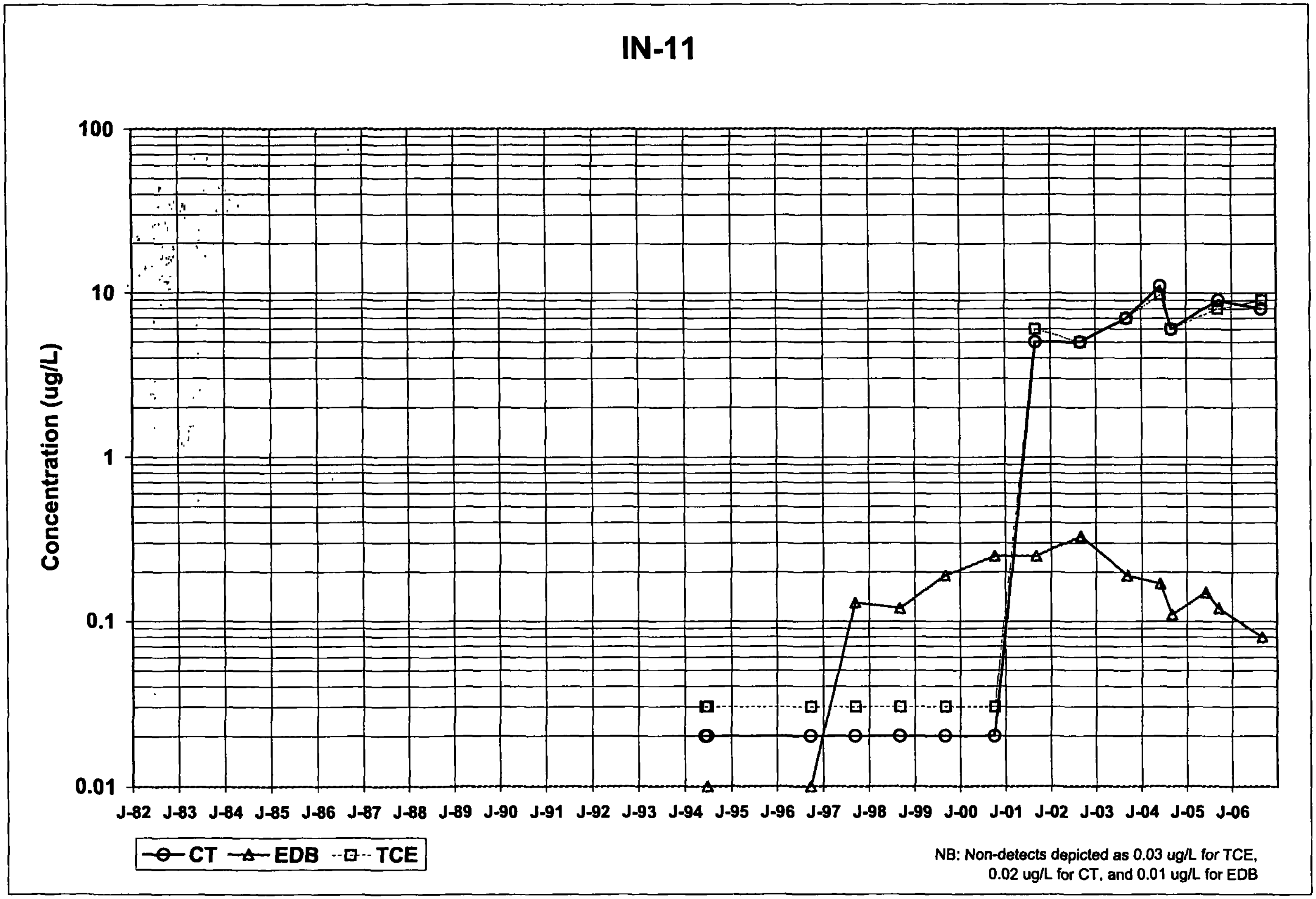

I-58
Concentration (ug/L)
1000
100
10
1
0.1
0.01
J-82 J-83 J-84 J-85 J-86 J-87 J-88 J-89 J-90 J-91 J-92 J-93 J-94 J-95 J-96 J-97 J-98 J-99 J-00 J-01 J-02 J-03 J-04 J-05 J-06
CT EDB TCE
NB: Non-detects depicted as 0.03 ug/L for TCE, 0.02 ug/L for CT, and 0.01 ug/L for EDB

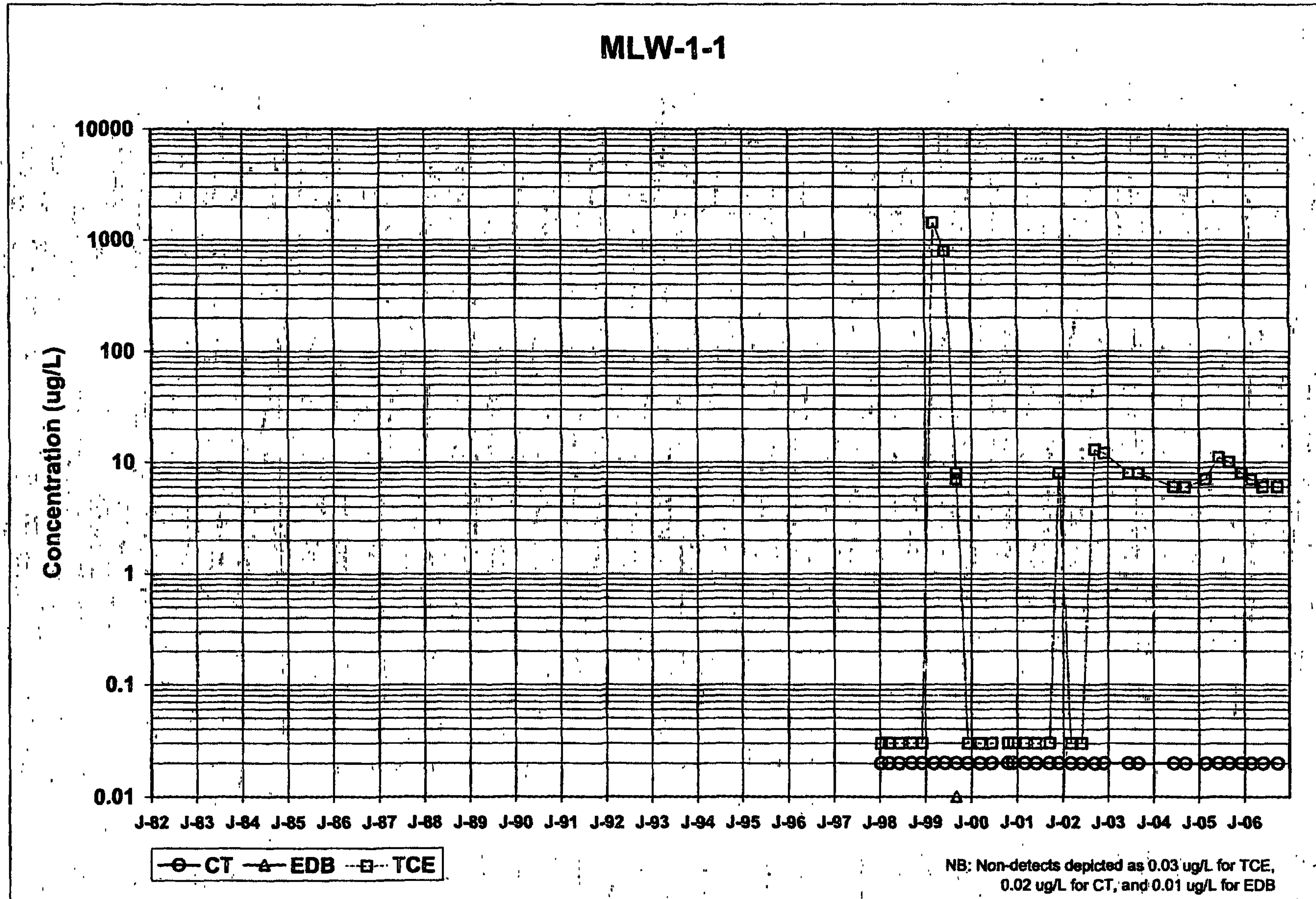

I-59
Concentration (ug/L)
1
0.1
0.01
J-82 J-83 J-84 J-85 J-86 J-87 J-88 J-89 J-90 J-91 J-92 J-93 J-94 J-95 J-96 J-97 J-98 J-99 J-00 J-01 J-02 J-03 J-04 J-05 J-06
CT
EDB
TCE
NB: Non-detects depicted as 0.03 ug/L for TCE, 0.02 ug/L for CT, and 0.01 ug/L for EDB


IN-04
Concentration (ug/L)
100
10
1
0.1
0.01
J-82 J-83 J-84 J-85 J-86 J-87 J-88 J-89 J-90 J-91 J-92 J-93 J-94 J-95 J-96 J-97 J-98 J-99 J-00 J-01 J-02 J-03 J-04 J-05 J-06
CT EDB TCE
NB: Non-detects depicted as 0.03 ug/L for TCE, 0.02 ug/L for CT, and 0.01 ug/L for EDB

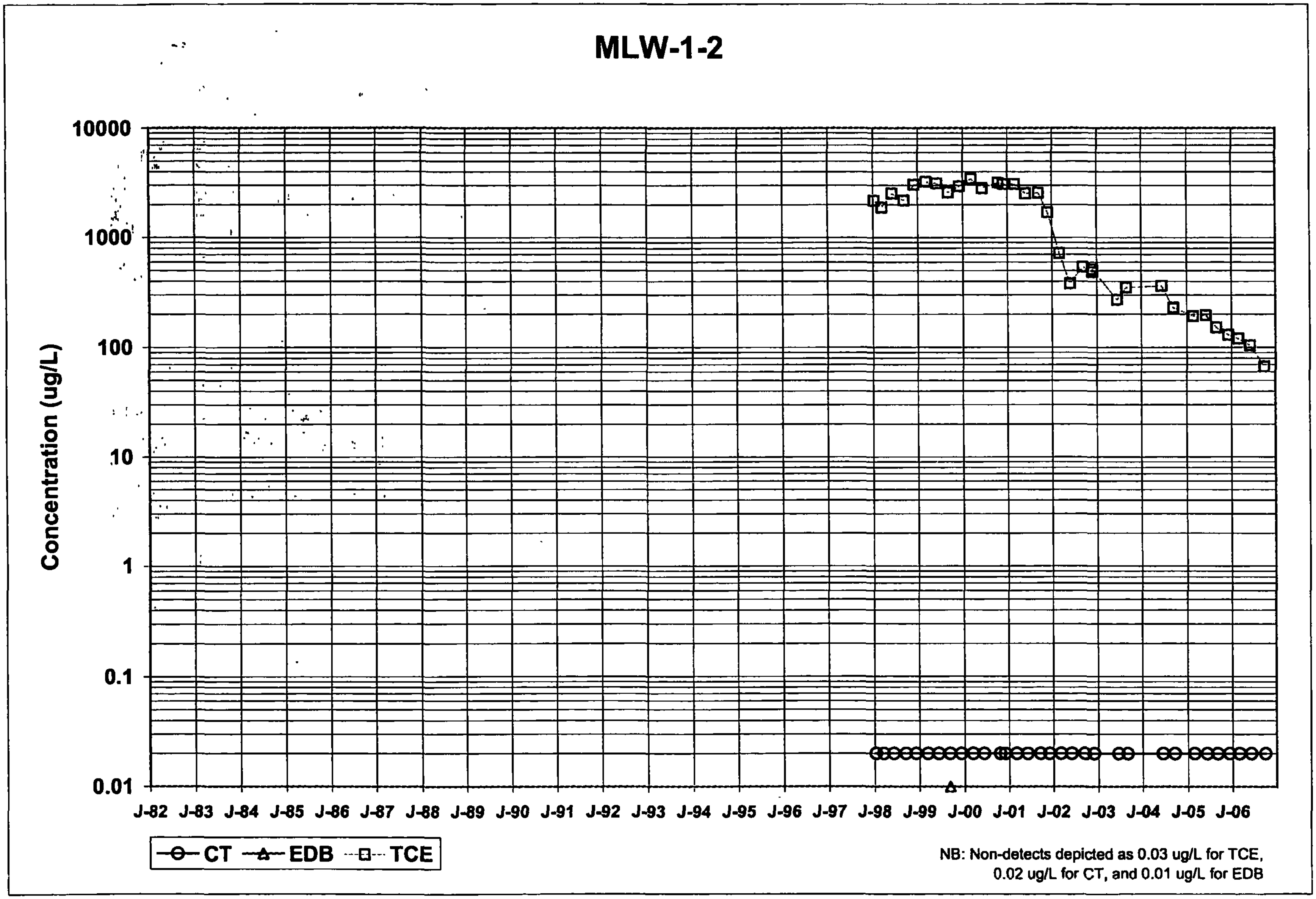


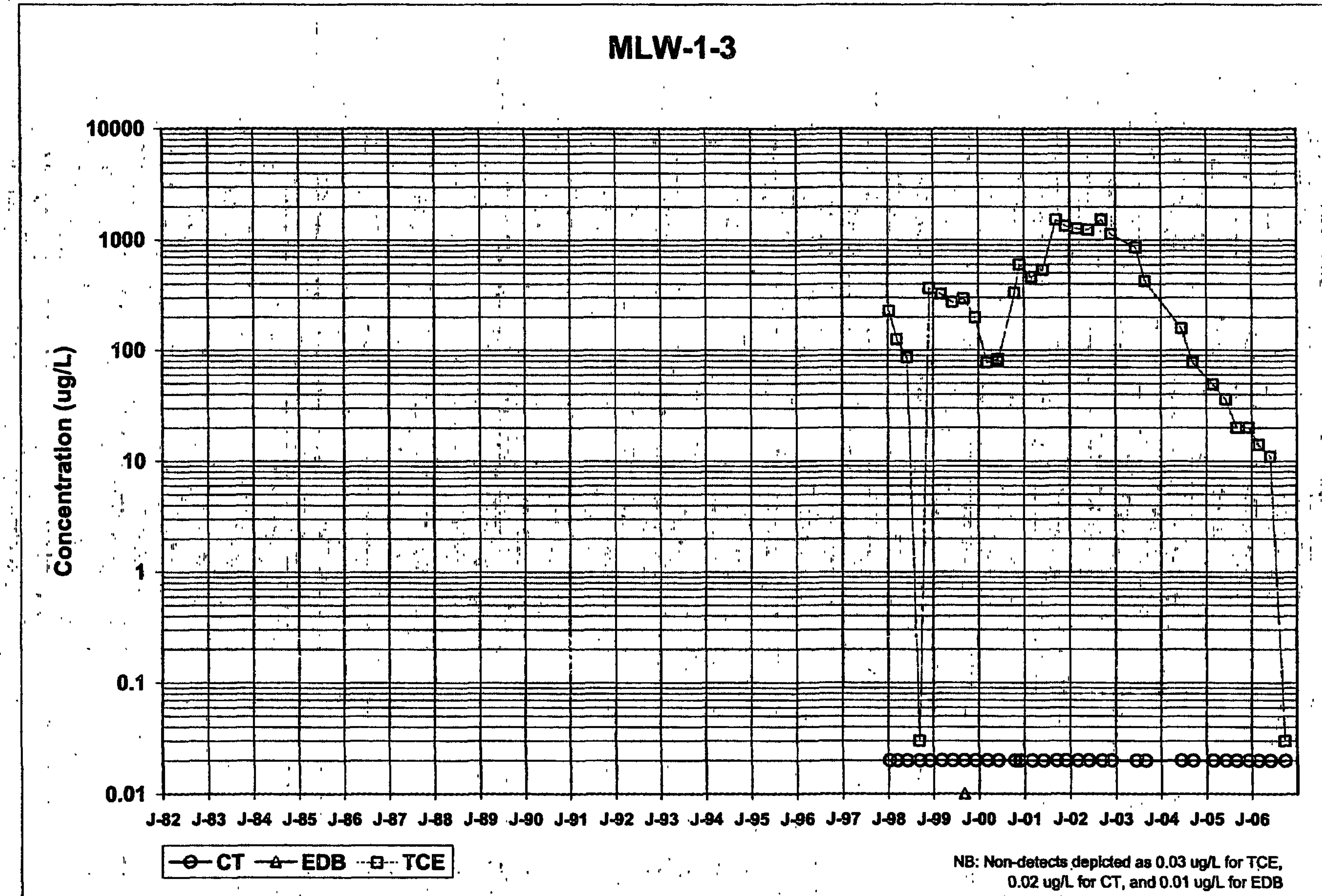
IN-05
Concentration (ug/L)
10
1
0.1
0.01
J-82 J-83 J-84 J-85 J-86 J-87 J-88 J-89 J-90 J-91 J-92 J-93 J-94 J-95 J-96 J-97 J-98 J-99 J-00 J-01 J-02 J-03 J-04 J-05 J-06
CT
EDB
TCE
NB: Non-detects depicted as 0.03 ug/L for TCE, 0.02 ug/L for CT, and 0.01 ug/L for EDB

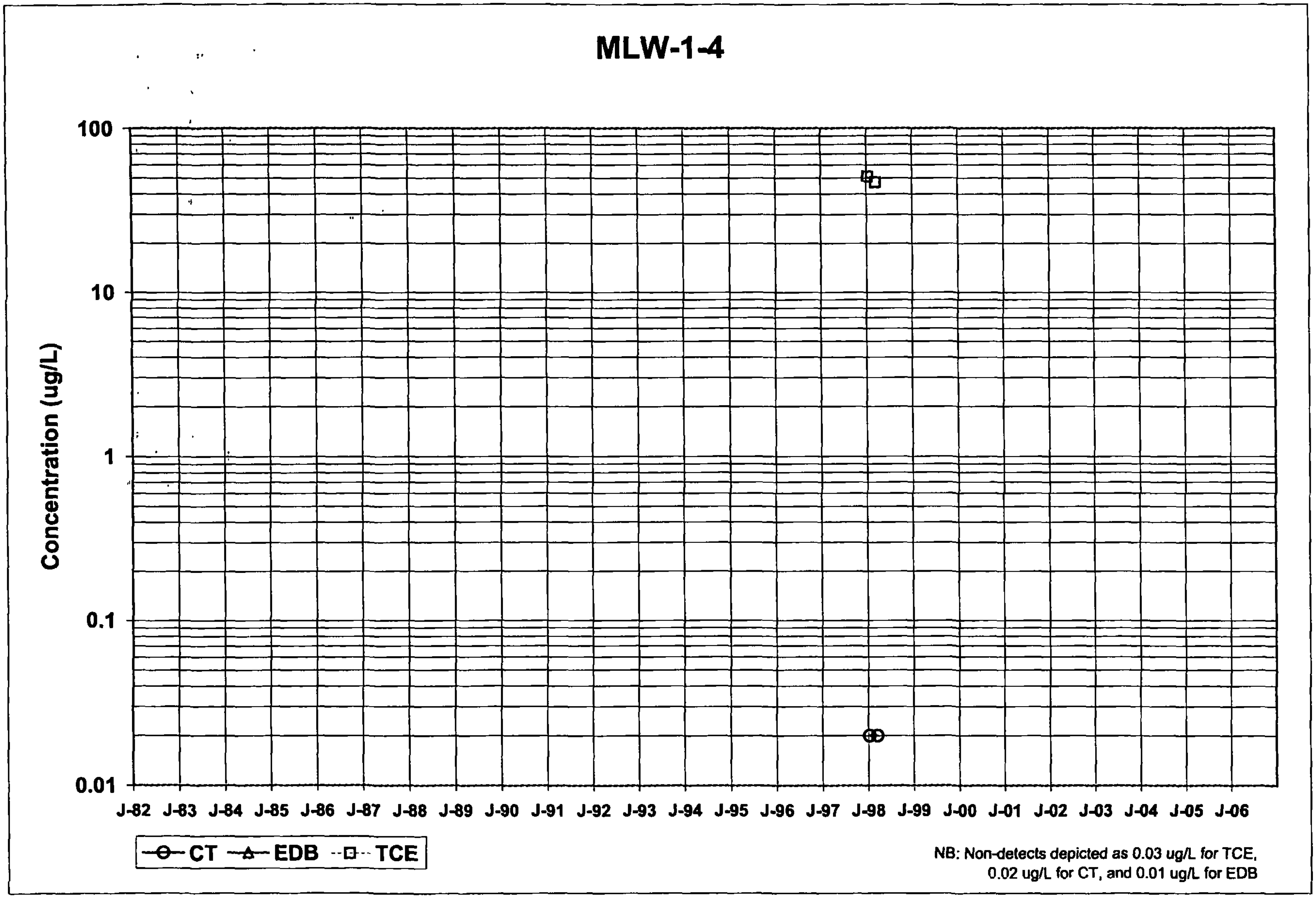

IN-11
Concentration (ug/L)
100
10
1
0.1
0.01
J-82 J-83 J-84 J-85 J-86 J-87 J-88 J-89 J-90 J-91 J-92 J-93 J-94 J-95 J-96 J-97 J-98 J-99 J-00 J-01 J-02 J-03 J-04 J-05 J-06
CT
EDB
TCE
NB: Non-detects depicted as 0.03 ug/L for TCE,
0.02 ug/L for CT, and 0.01 ug/L for EDB

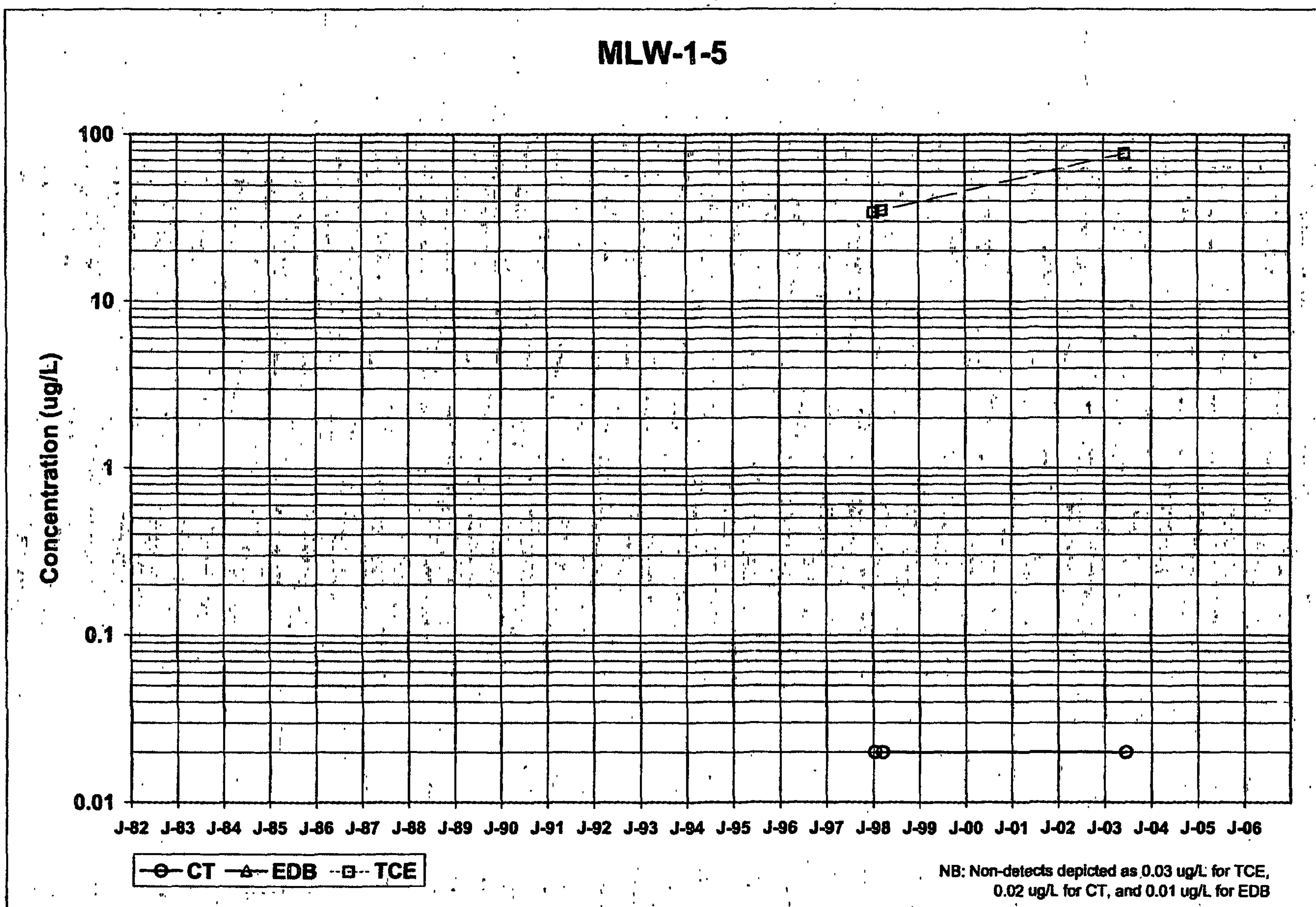


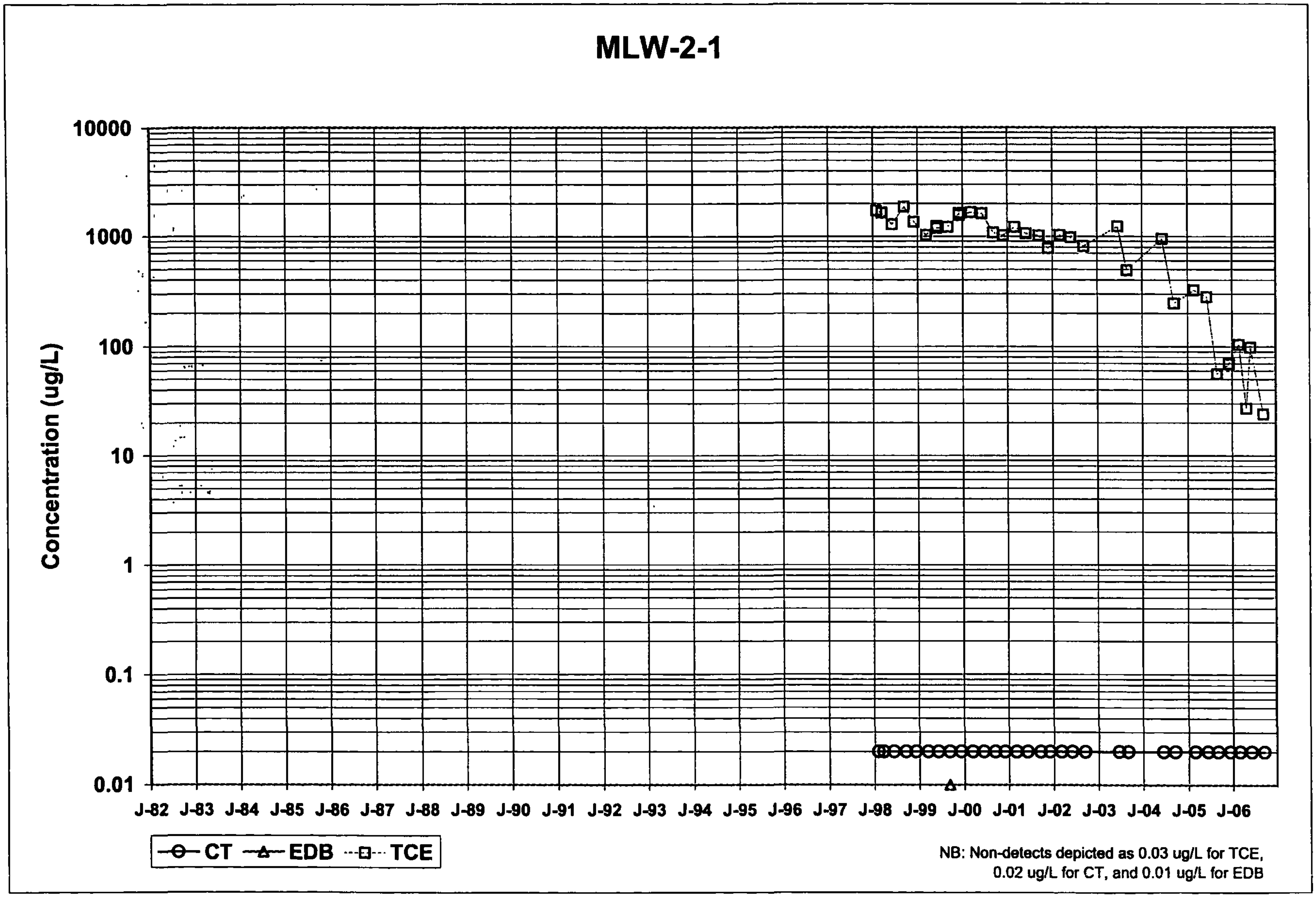
MLW-1-1
Concentration (ug/L)
10000
1000
100
10
1
0.1
0.01
J-82 J-83 J-84 J-85 J-86 J-87 J-88 J-89 J-90 J-91 J-92 J-93 J-94 J-95 J-96 J-97 J-98 J-99 J-00 J-01 J-02 J-03 J-04 J-05 J-06
CT
EDB
TCE
NB: Non-detects depicted as 0.03 ug/L for TCE, 0.02 ug/L for CT, and 0.01 ug/L for EDB

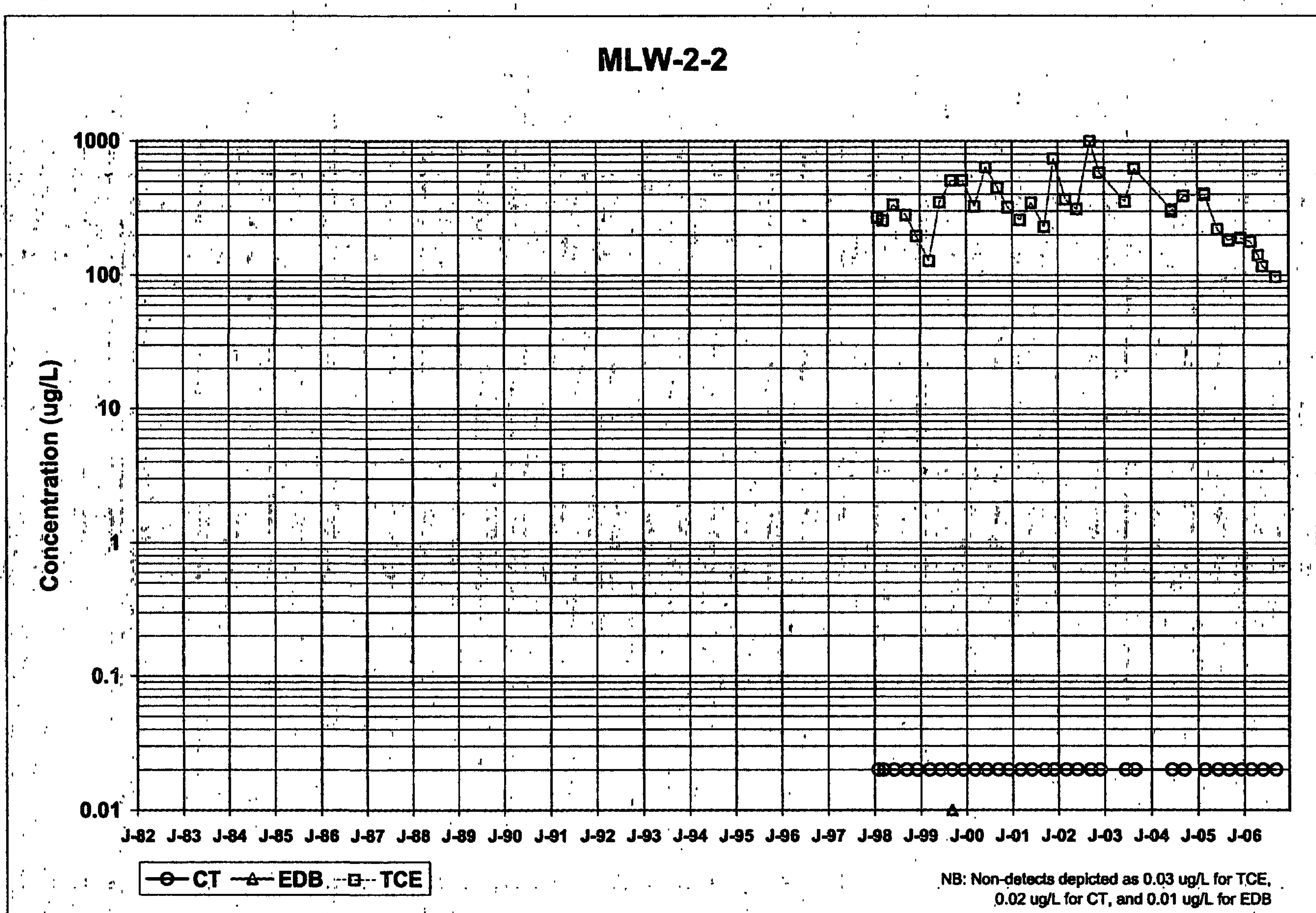

MLW-1-2
Concentration (ug/L)
10000
1000
100
10
1
0.1
0.01
J-82 J-83 J-84 J-85 J-86 J-87 J-88 J-89 J-90 J-91 J-92 J-93 J-94 J-95 J-96 J-97 J-98 J-99 J-00 J-01 J-02 J-03 J-04 J-05 J-06
CT EDB TCE
NB: Non-detects depicted as 0.03 ug/L for TCE, 0.02 ug/L for CT, and 0.01 ug/L for EDB

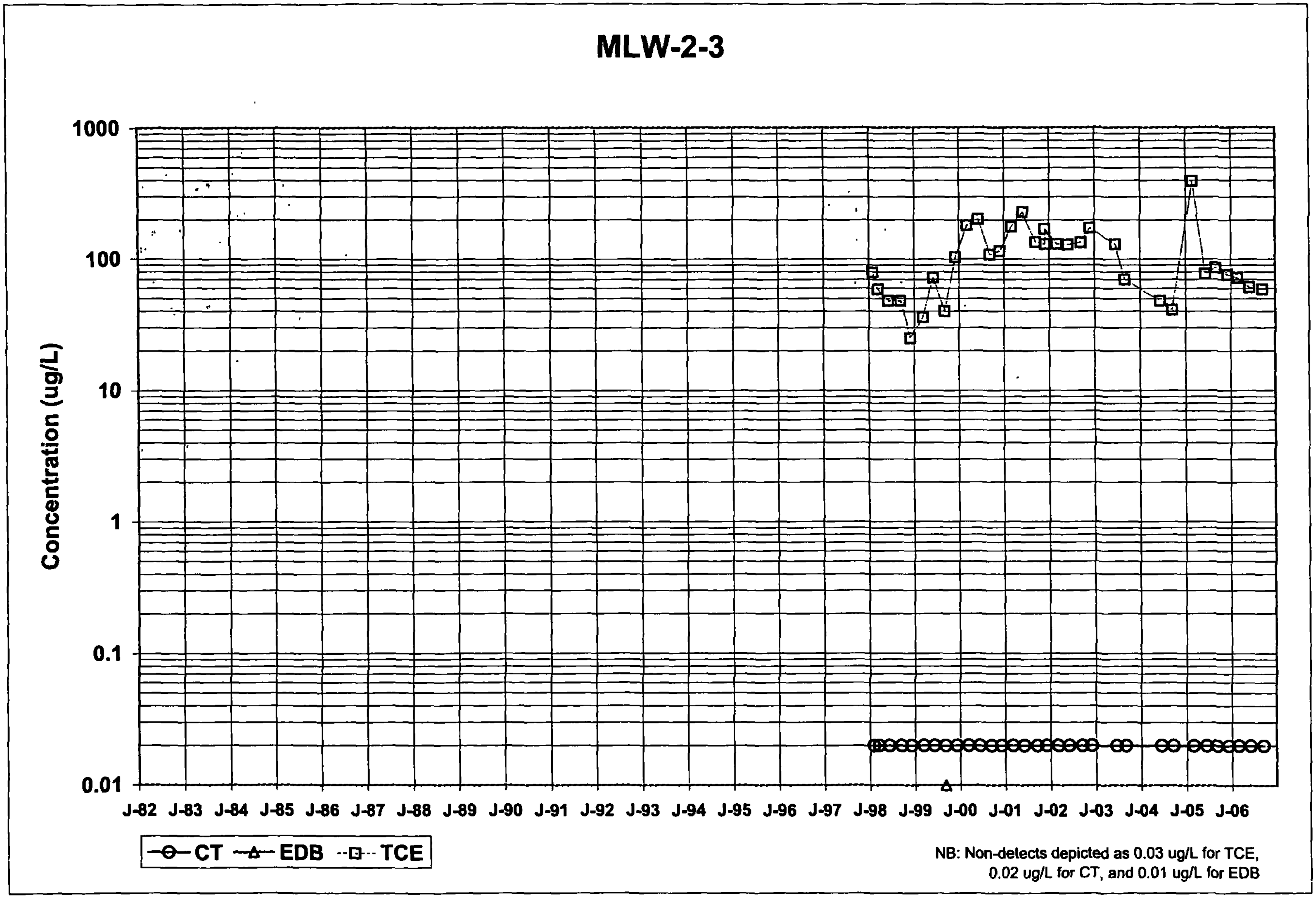

MLW-1-3
Concentration (ug/L)
10000
1000
100
10
1
0.1
0.01
J-82 J-83 J-84 J-85 J-86 J-87 J-88 J-89 J-90 J-91 J-92 J-93 J-94 J-95 J-96 J-97 J-98 J-99 J-00 J-01 J-02 J-03 J-04 J-05 J-06
CT
EDB
TCE
NB: Non-detects depicted as 0.03 ug/L for TCE,
0.02 ug/L for CT, and 0.01 ug/L for EDB

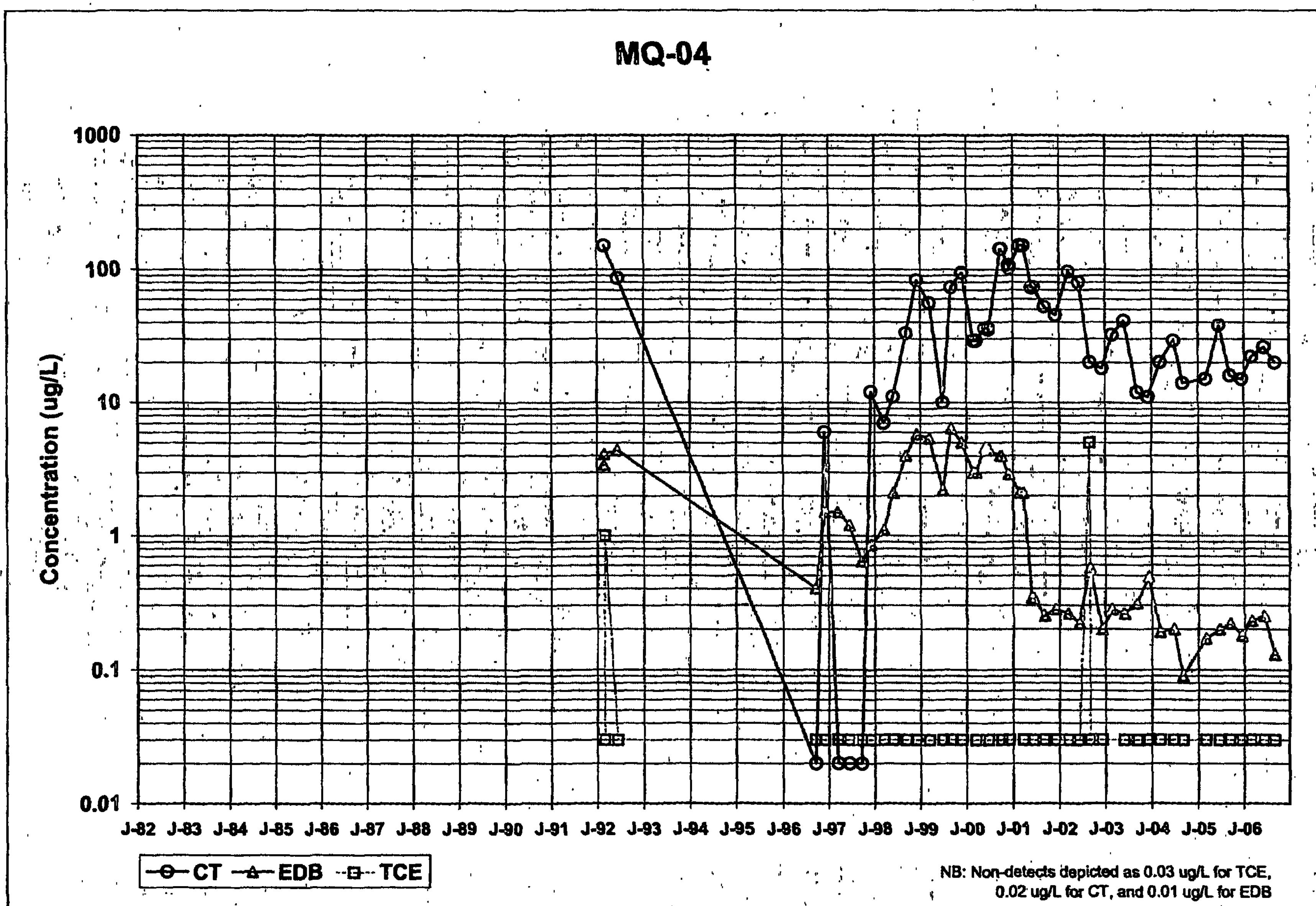

MLW-1-4
100
10
1
0.1
0.01
Concentration (ug/L)
J-82 J-83 J-84 J-85 J-86 J-87 J-88 J-89 J-90 J-91 J-92 J-93 J-94 J-95 J-96 J-97 J-98 J-99 J-00 J-01 J-02 J-03 J-04 J-05 J-06
CT
EDB
TCE
NB: Non-detects depicted as 0.03 ug/L for TCE, 0.02 ug/L for CT, and 0.01 ug/L for EDB

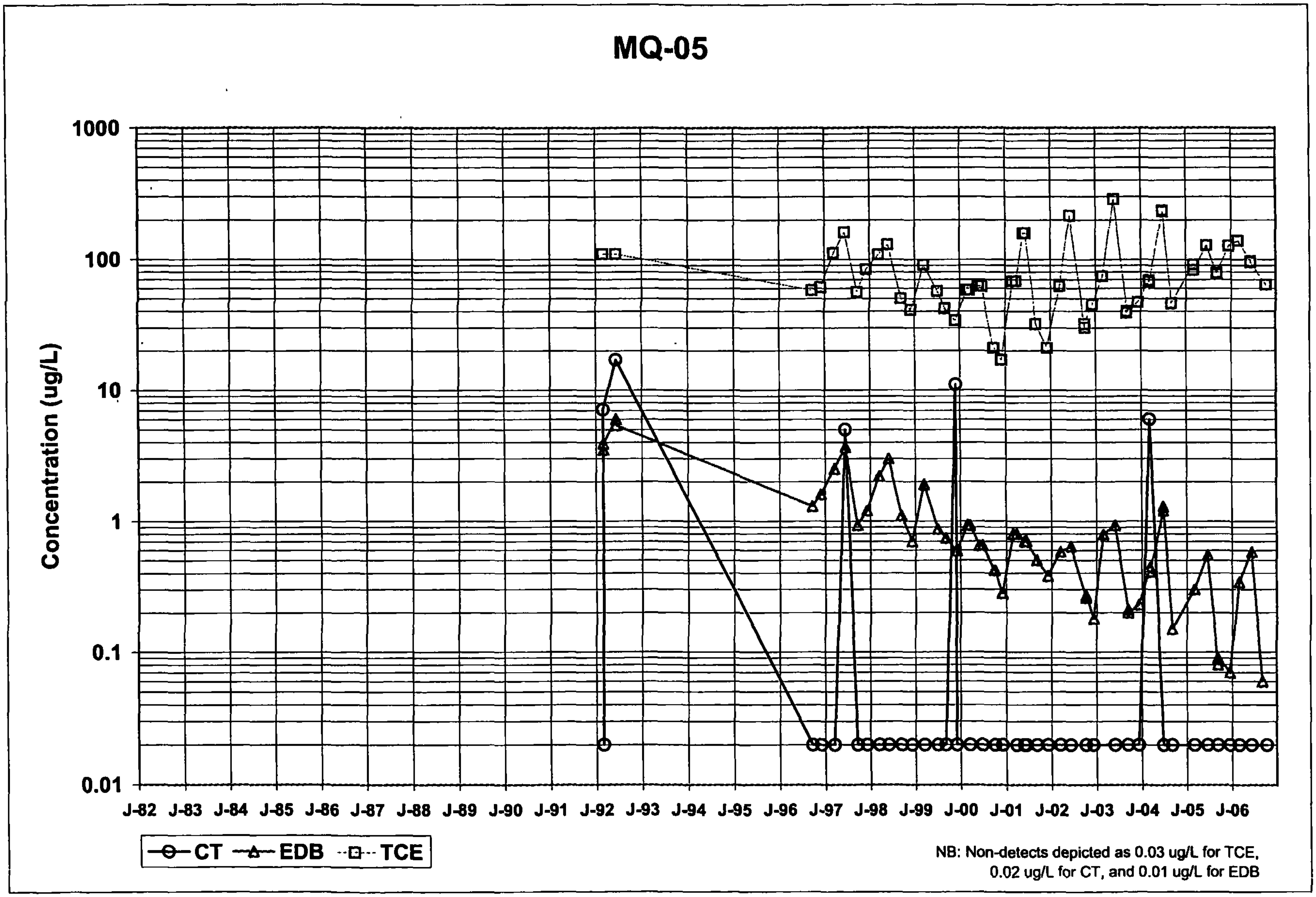

MLW-1-5
Concentration (ug/L)
100
10
1
0.1
0.01
J-82 J-83 J-84 J-85 J-86 J-87 J-88 J-89 J-90 J-91 J-92 J-93 J-94 J-95 J-96 J-97 J-98 J-99 J-00 J-01 J-02 J-03 J-04 J-05 J-06
CT EDB TCE
NB: Non-detects depicted as 0.03 ug/L for TCE, 0.02 ug/L for CT, and 0.01 ug/L for EDB

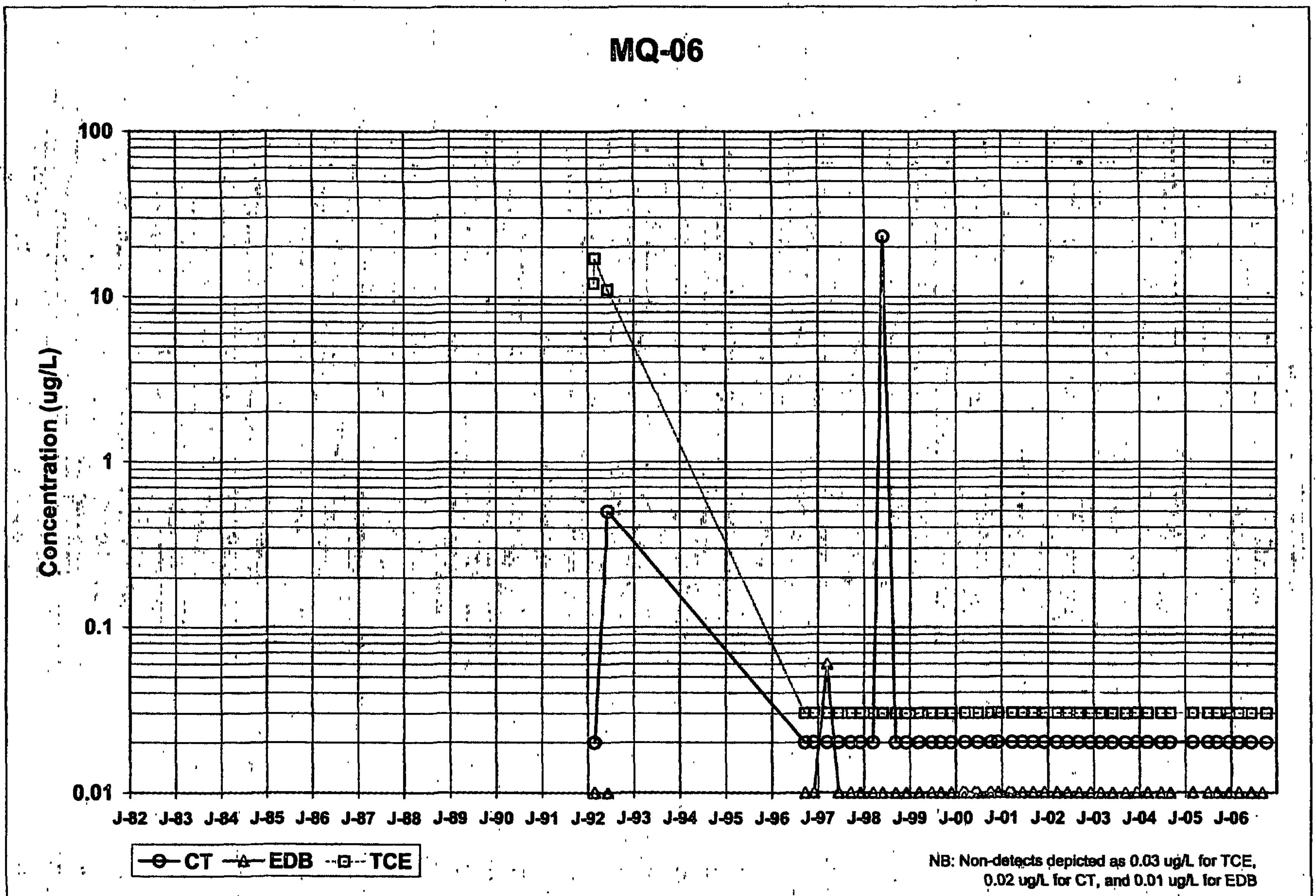

MLW-2-1
Concentration (ug/L)
10000
1000
100
10
1
0.1
0.01
J-82 J-83 J-84 J-85 J-86 J-87 J-88 J-89 J-90 J-91 J-92 J-93 J-94 J-95 J-96 J-97 J-98 J-99 J-00 J-01 J-02 J-03 J-04 J-05 J-06
CT
EDB
TCE
NB: Non-detects depicted as 0.03 ug/L for TCE,
0.02 ug/L for CT, and 0.01 ug/L for EDB

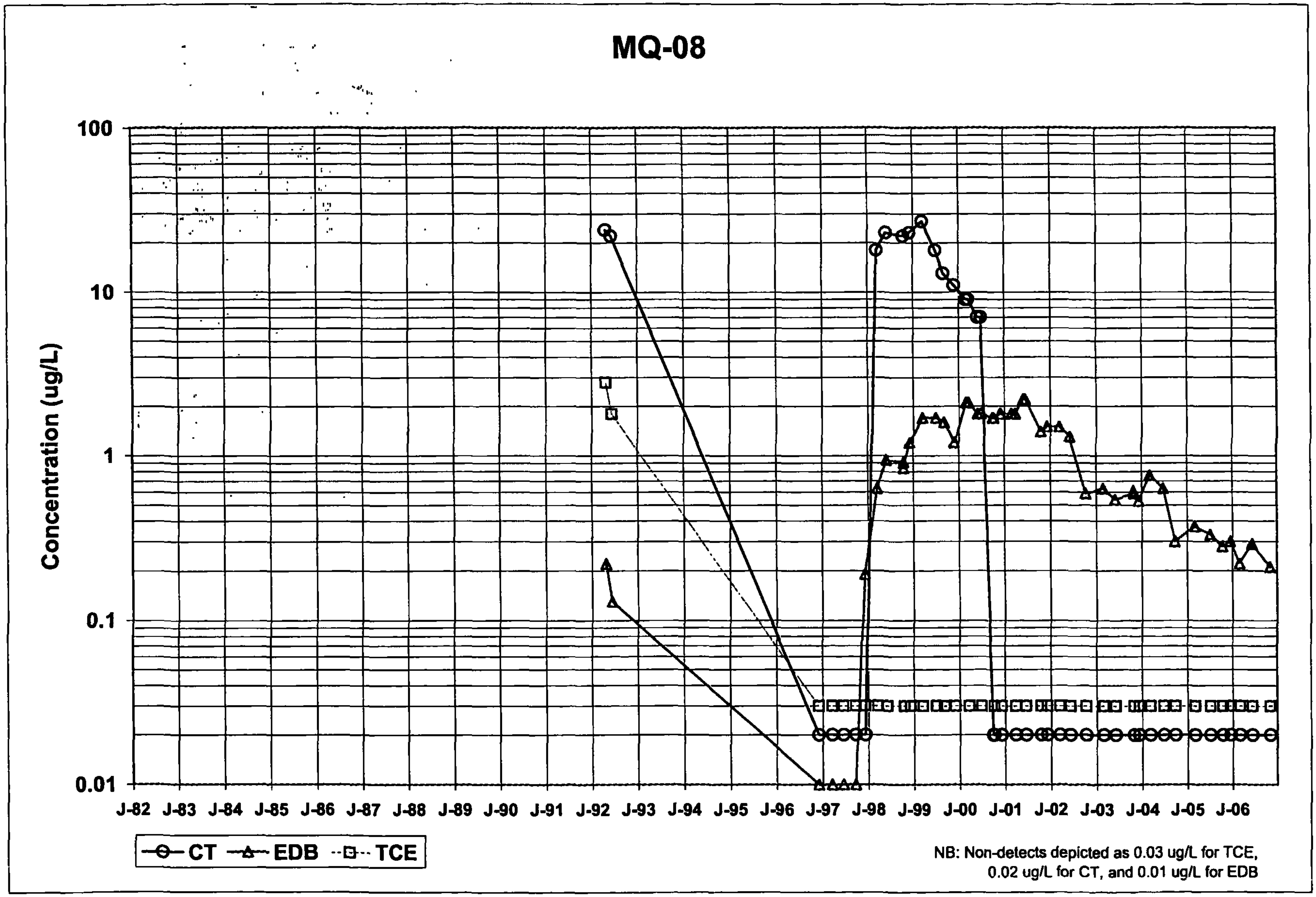

MLW-2-2
Concentration (ug/L)
1000
100
10
1
0.1
0.01
J-82 J-83 J-84 J-85 J-86 J-87 J-88 J-89 J-90 J-91 J-92 J-93 J-94 J-95 J-96 J-97 J-98 J-99 J-00 J-01 J-02 J-03 J-04 J-05 J-06
CT
EDB
TCE
NB: Non-detects depicted as 0.03 ug/L for TCE, 0.02 ug/L for CT, and 0.01 ug/L for EDB

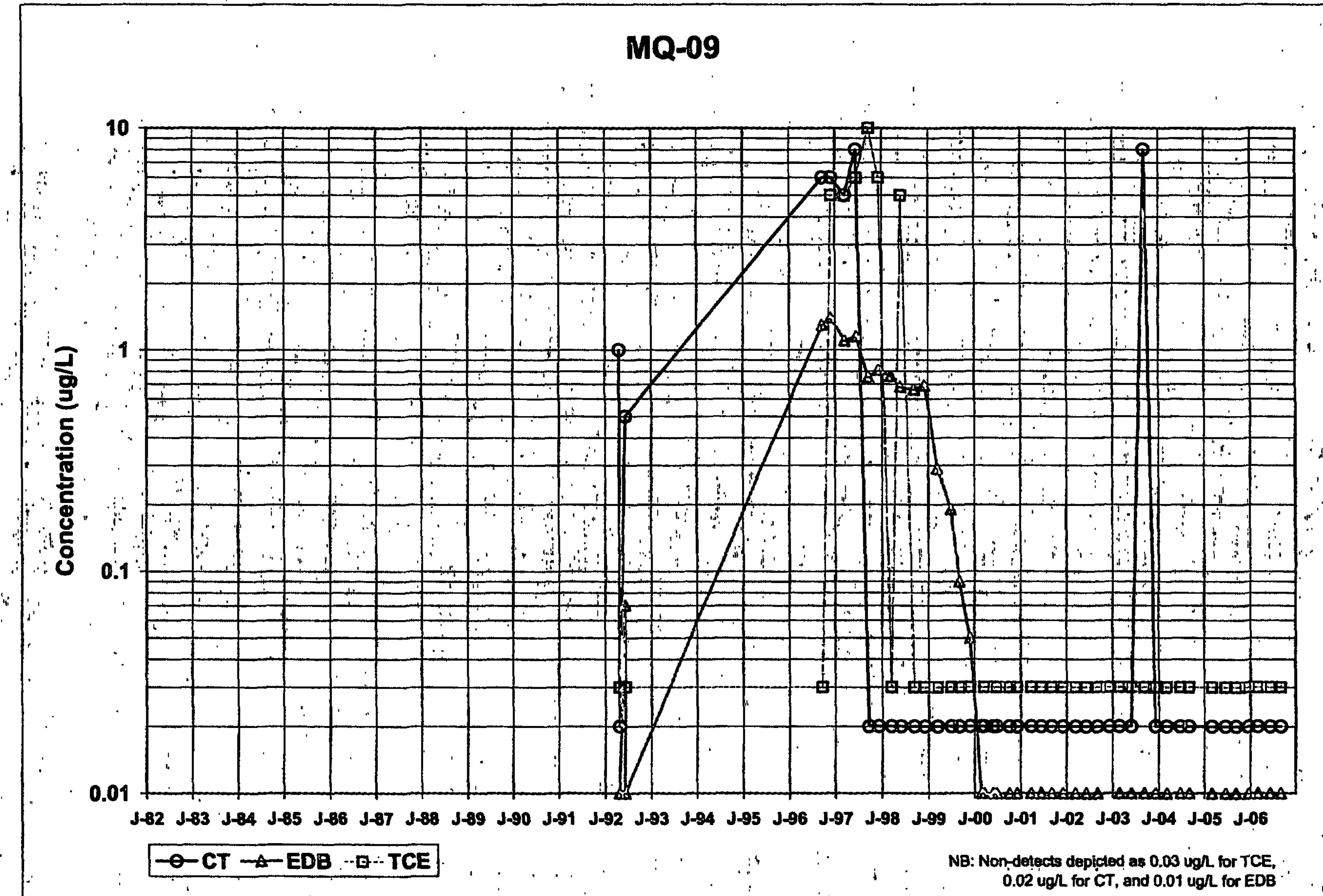

MLW-2-3
1000
100
10
1
0.1
0.01
Concentration (ug/L)
J-82 J-83 J-84 J-85 J-86 J-87 J-88 J-89 J-90 J-91 J-92 J-93 J-94 J-95 J-96 J-97 J-98 J-99 J-00 J-01 J-02 J-03 J-04 J-05 J-06
CT
EDB
TCE
NB: Non-detects depicted as 0.03 ug/L for TCE, 0.02 ug/L for CT, and 0.01 ug/L for EDB

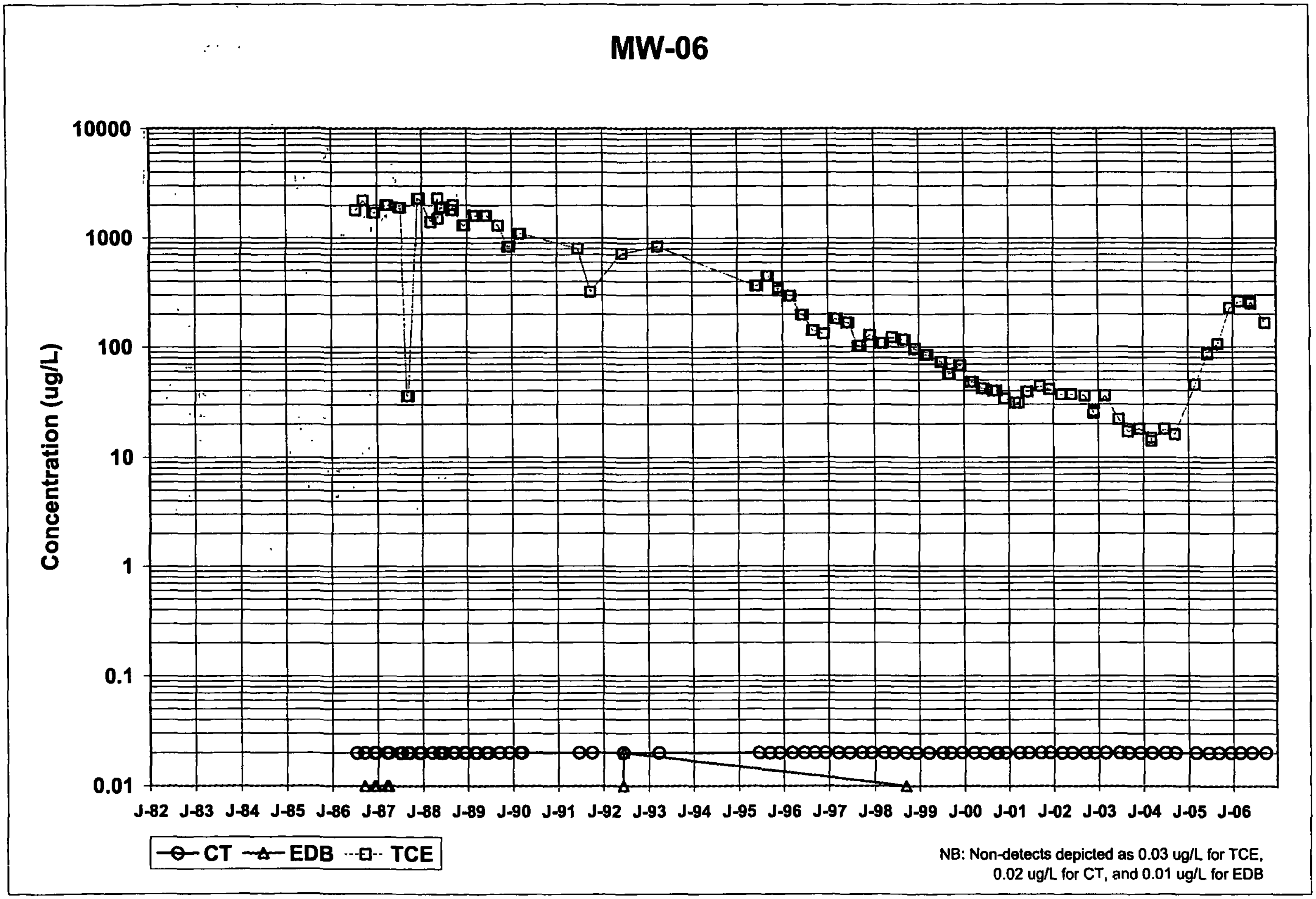

MQ-04
Concentration (ug/L)
1000
100
10
1
0.1
0.01
J-82 J-83 J-84 J-85 J-86 J-87 J-88 J-89 J-90 J-91 J-92 J-93 J-94 J-95 J-96 J-97 J-98 J-99 J-00 J-01 J-02 J-03 J-04 J-05 J-06
CT EDB TCE
NB: Non-detects depicted as 0.03 ug/L for TCE, 0.02 ug/L for CT, and 0.01 ug/L for EDB

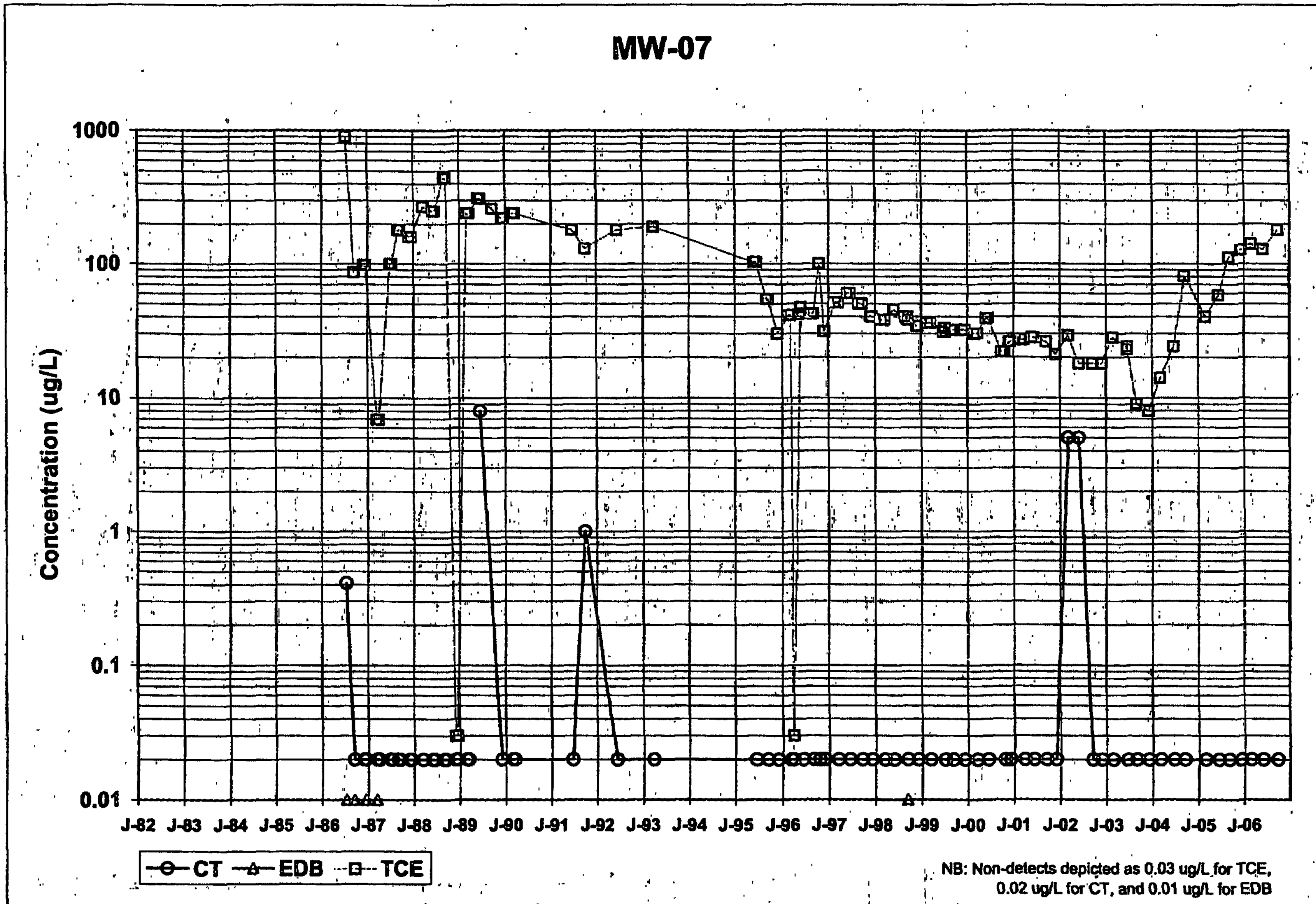

MQ-05
Concentration (ug/L)
1000
100
10
1
0.1
0.01
J-82 J-83 J-84 J-85 J-86 J-87 J-88 J-89 J-90 J-91 J-92 J-93 J-94 J-95 J-96 J-97 J-98 J-99 J-00 J-01 J-02 J-03 J-04 J-05 J-06
CT EDB TCE
NB: Non-detects depicted as 0.03 ug/L for TCE,
0.02 ug/L for CT, and 0.01 ug/L for EDB


MQ-06
Concentration (ug/L)
100
10
1
0.1
0.01
J-82 J-83 J-84 J-85 J-86 J-87 J-88 J-89 J-90 J-91 J-92 J-93 J-94 J-95 J-96 J-97 J-98 J-99 J-00 J-01 J-02 J-03 J-04 J-05 J-06
CT
EDB
TCE
NB: Non-detects depicted as 0.03 ug/L for TCE, 0.02 ug/L for CT, and 0.01 ug/L for EDB

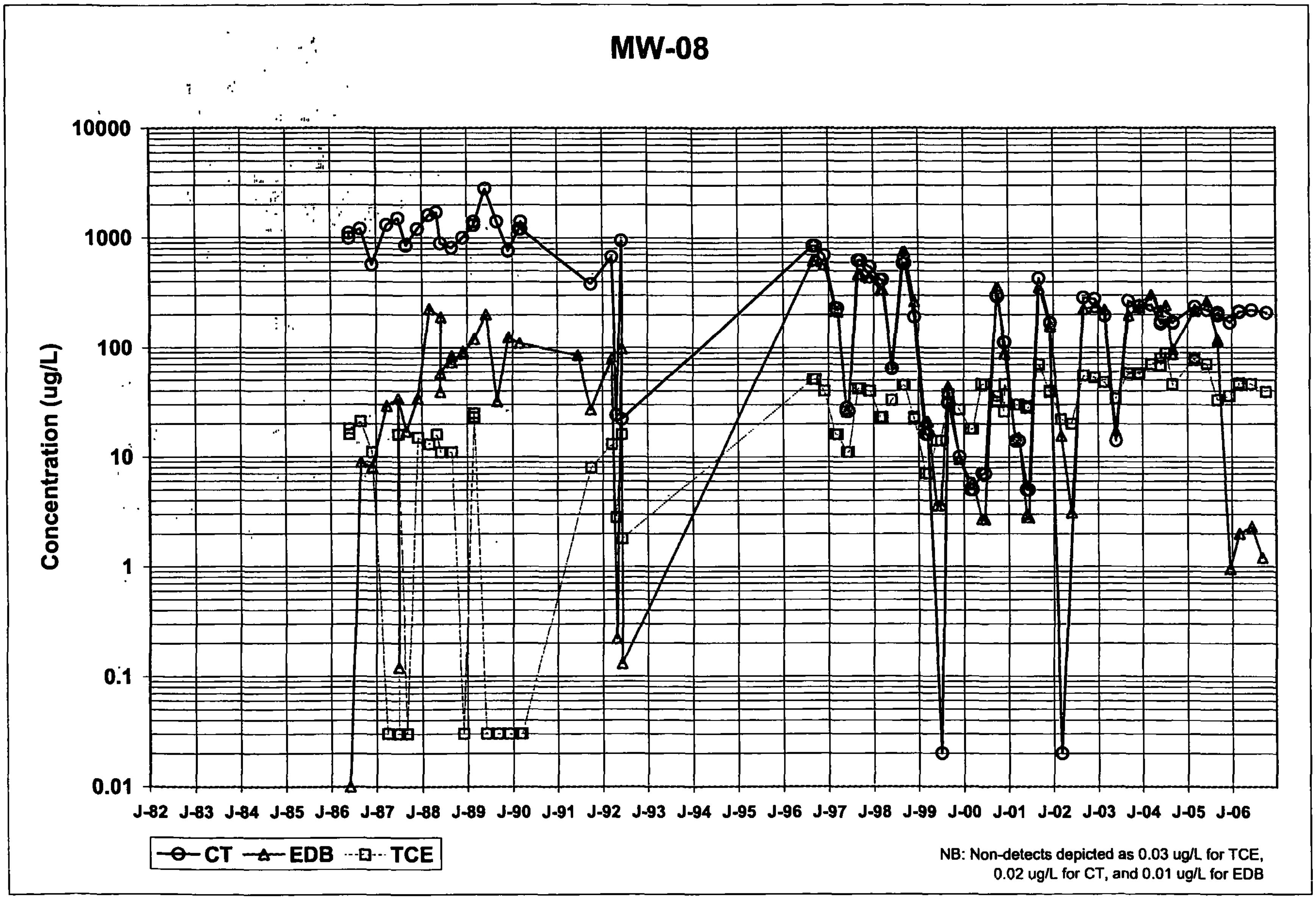

MQ-08
Concentration (ug/L)
100
10
1
0.1
0.01
J-82 J-83 J-84 J-85 J-86 J-87 J-88 J-89 J-90 J-91 J-92 J-93 J-94 J-95 J-96 J-97 J-98 J-99 J-00 J-01 J-02 J-03 J-04 J-05 J-06
CT
EDB
TCE
NB: Non-detects depicted as 0.03 ug/L for TCE, 0.02 ug/L for CT, and 0.01 ug/L for EDB

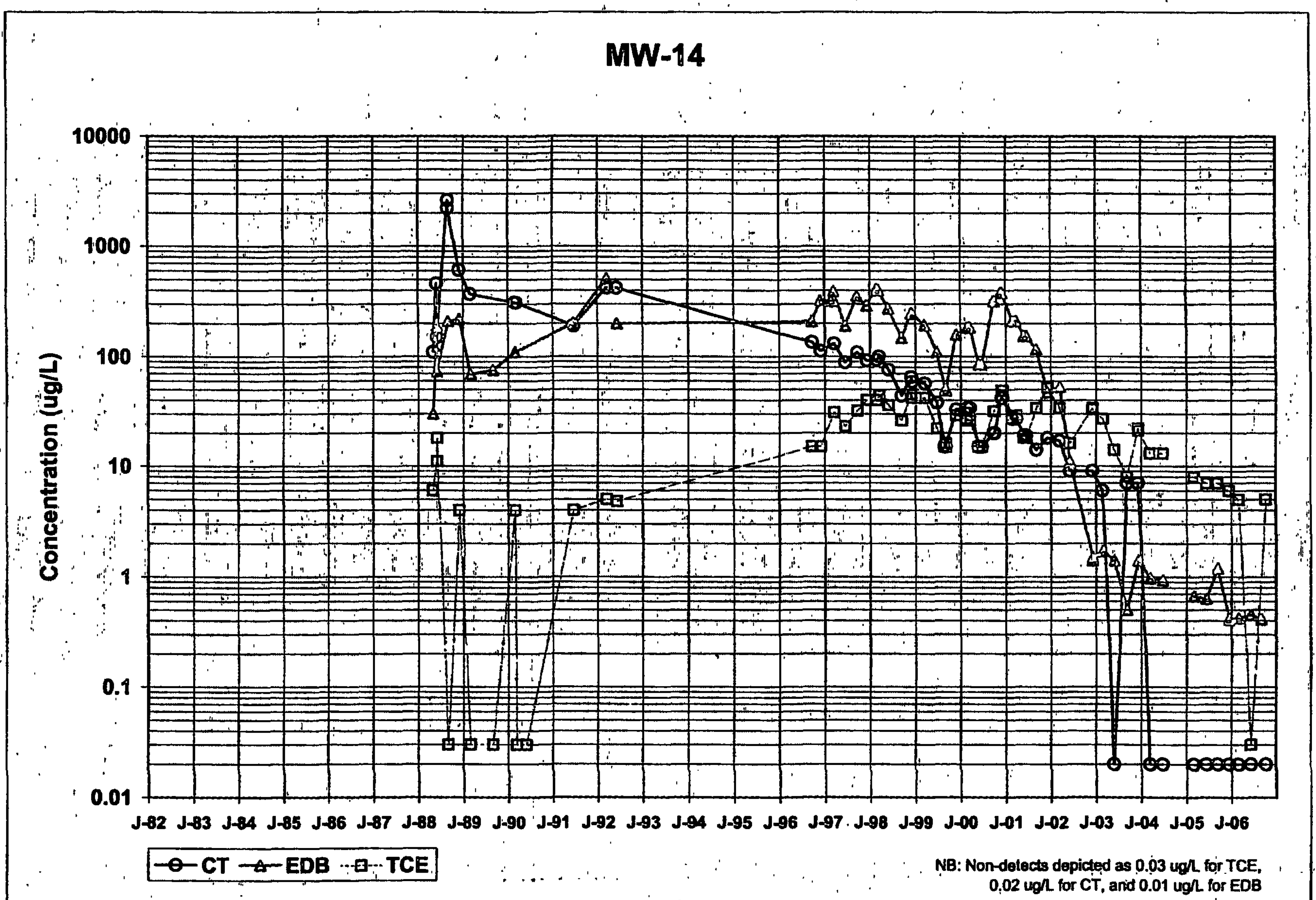

MQ-09
Concentration (ug/L)
10
1
0.1
0.01
J-82 J-83 J-84 J-85 J-86 J-87 J-88 J-89 J-90 J-91 J-92 J-93 J-94 J-95 J-96 J-97 J-98 J-99 J-00 J-01 J-02 J-03 J-04 J-05 J-06
CT EDB TCE
NB: Non-detects depicted as 0.03 ug/L for TCE, 0.02 ug/L for CT, and 0.01 ug/L for EDB

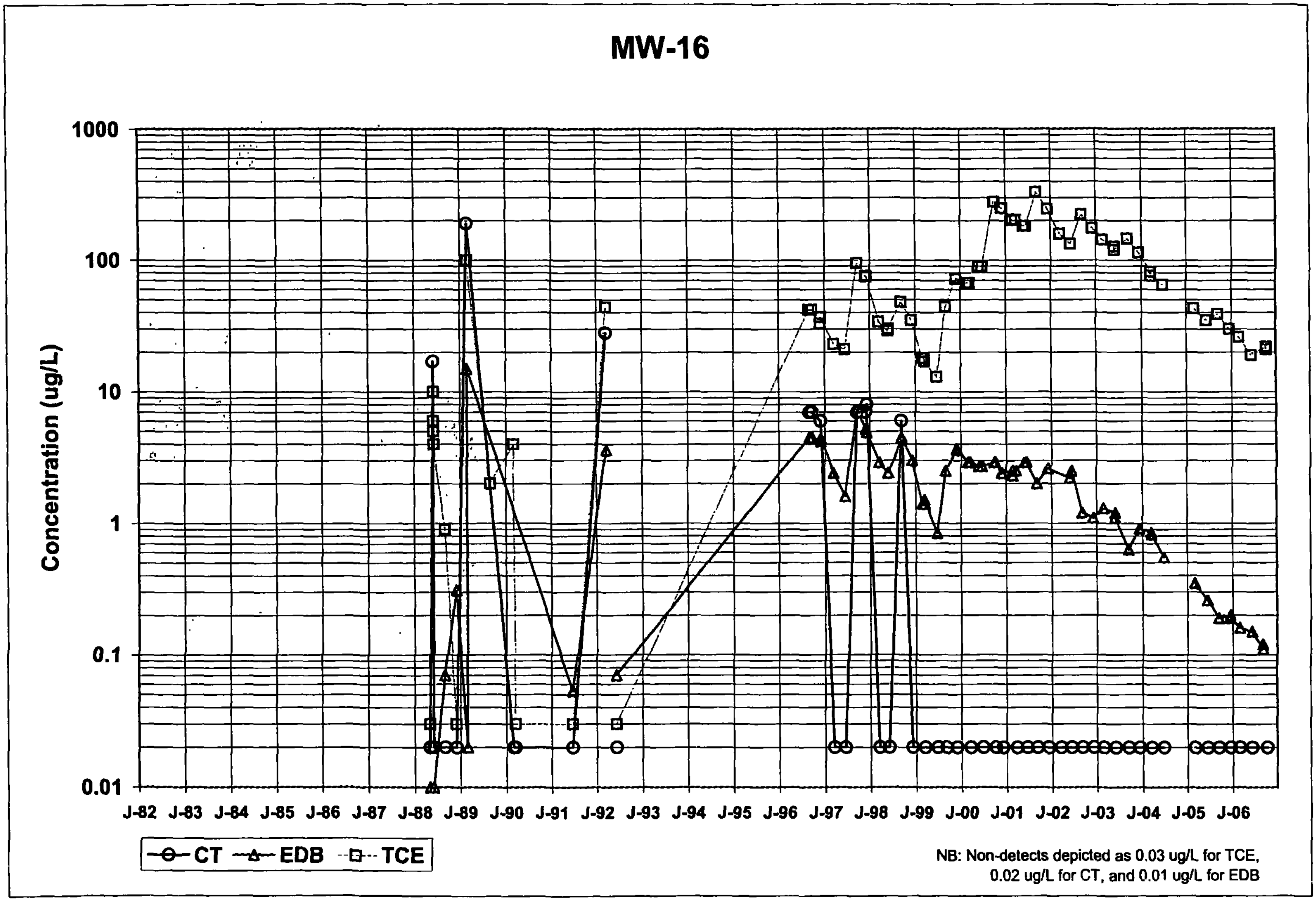

MW-06
Concentration (ug/L)
10000
1000
100
10
1
0.1
0.01
J-82 J-83 J-84 J-85 J-86 J-87 J-88 J-89 J-90 J-91 J-92 J-93 J-94 J-95 J-96 J-97 J-98 J-99 J-00 J-01 J-02 J-03 J-04 J-05 J-06
CT
EDB
TCE
NB: Non-detects depicted as 0.03 ug/L for TCE, 0.02 ug/L for CT, and 0.01 ug/L for EDB

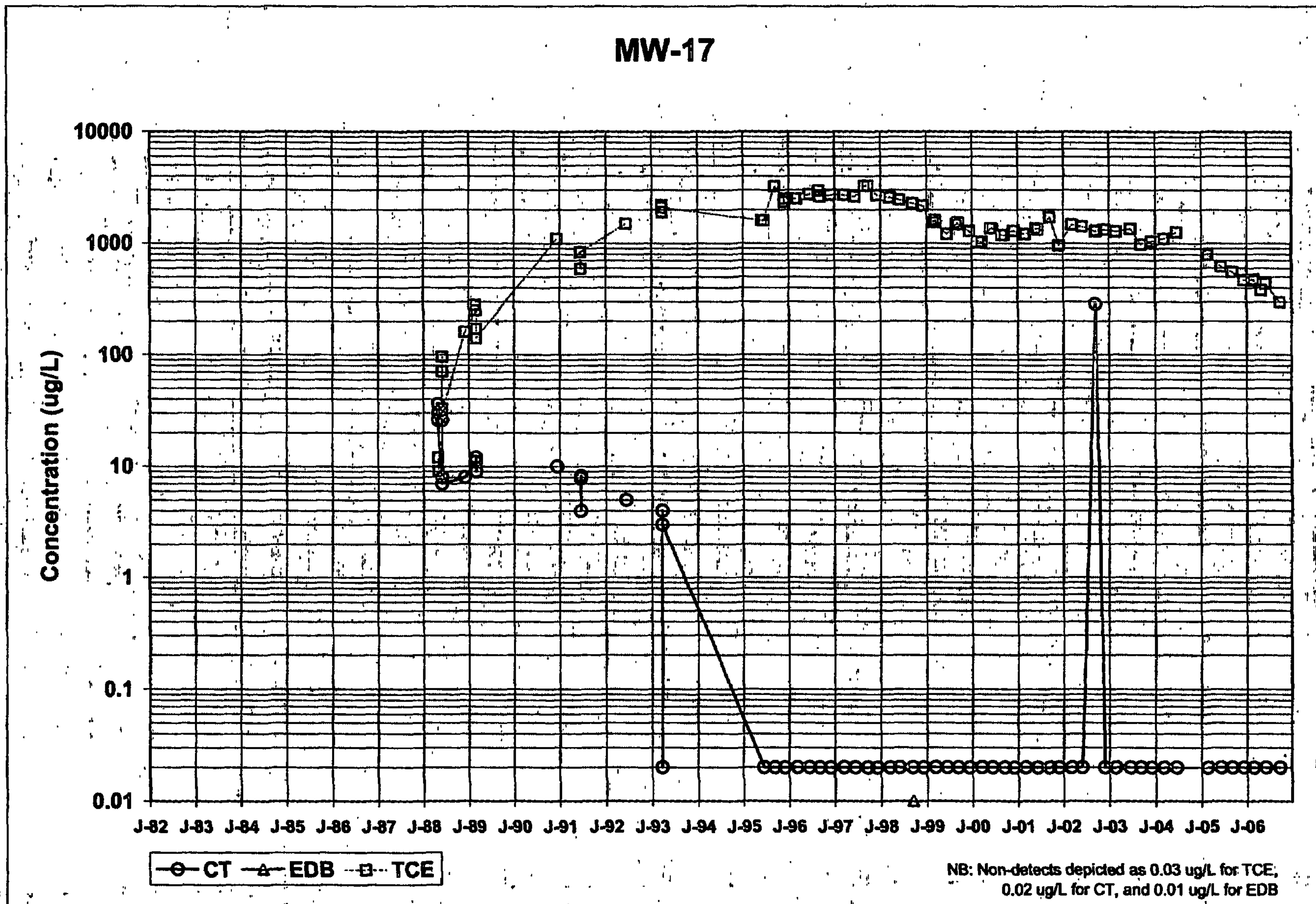


MW-07
Concentration (ug/L)
1000
100
10
1
0.1
0.01
J-82 J-83 J-84 J-85 J-86 J-87 J-88 J-89 J-90 J-91 J-92 J-93 J-94 J-95 J-96 J-97 J-98 J-99 J-00 J-01 J-02 J-03 J-04 J-05 J-06
CT EDB TCE
NB: Non-detects depicted as 0.03 ug/L for TCE, 0.02 ug/L for CT, and 0.01 ug/L for EDB

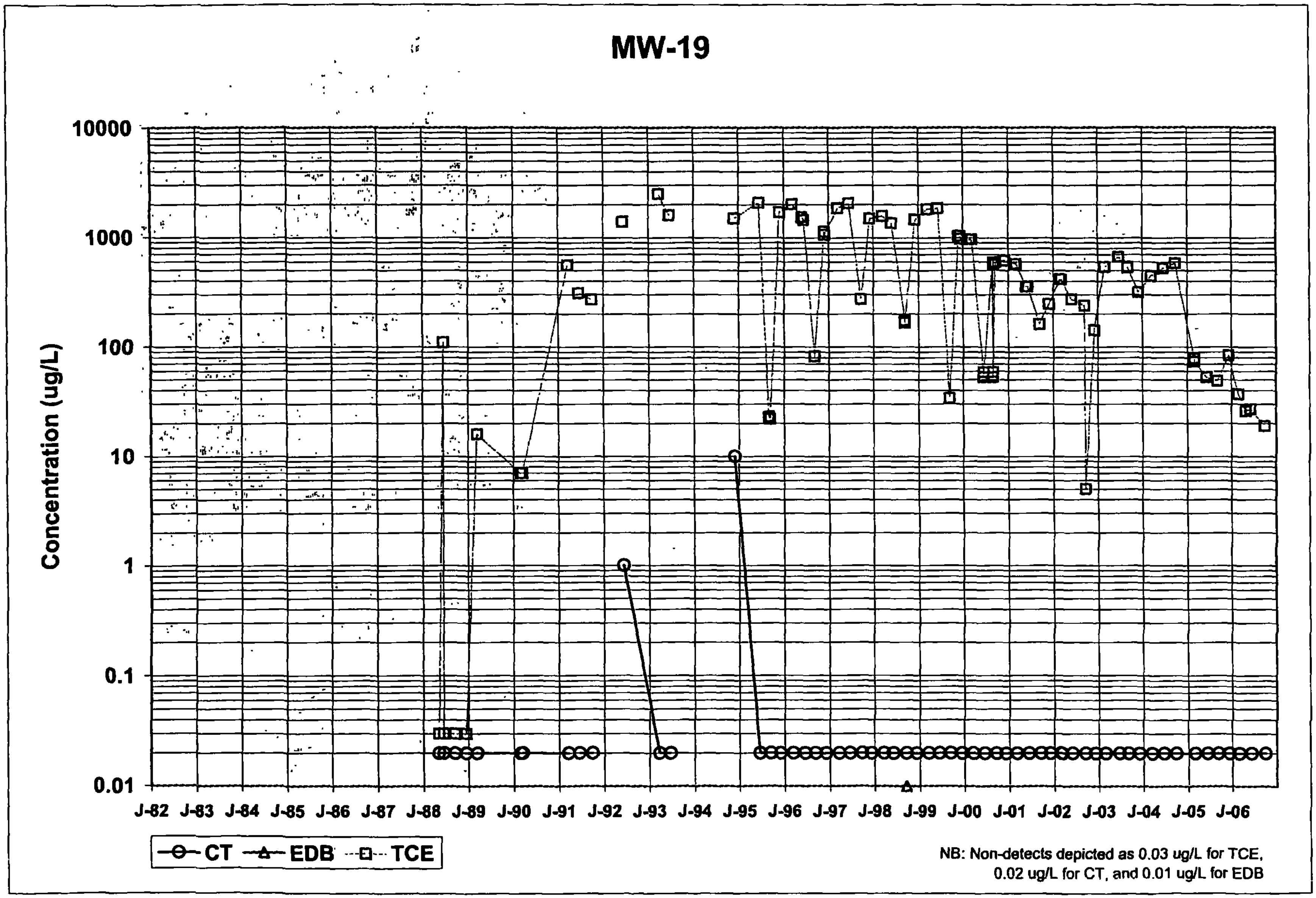

MW-08
Concentration (ug/L)
10000
1000
100
10
1
0.1
0.01
J-82 J-83 J-84 J-85 J-86 J-87 J-88 J-89 J-90 J-91 J-92 J-93 J-94 J-95 J-96 J-97 J-98 J-99 J-00 J-01 J-02 J-03 J-04 J-05 J-06
CT EDB TCE
NB: Non-detects depicted as 0.03 ug/L for TCE, 0.02 ug/L for CT, and 0.01 ug/L for EDB

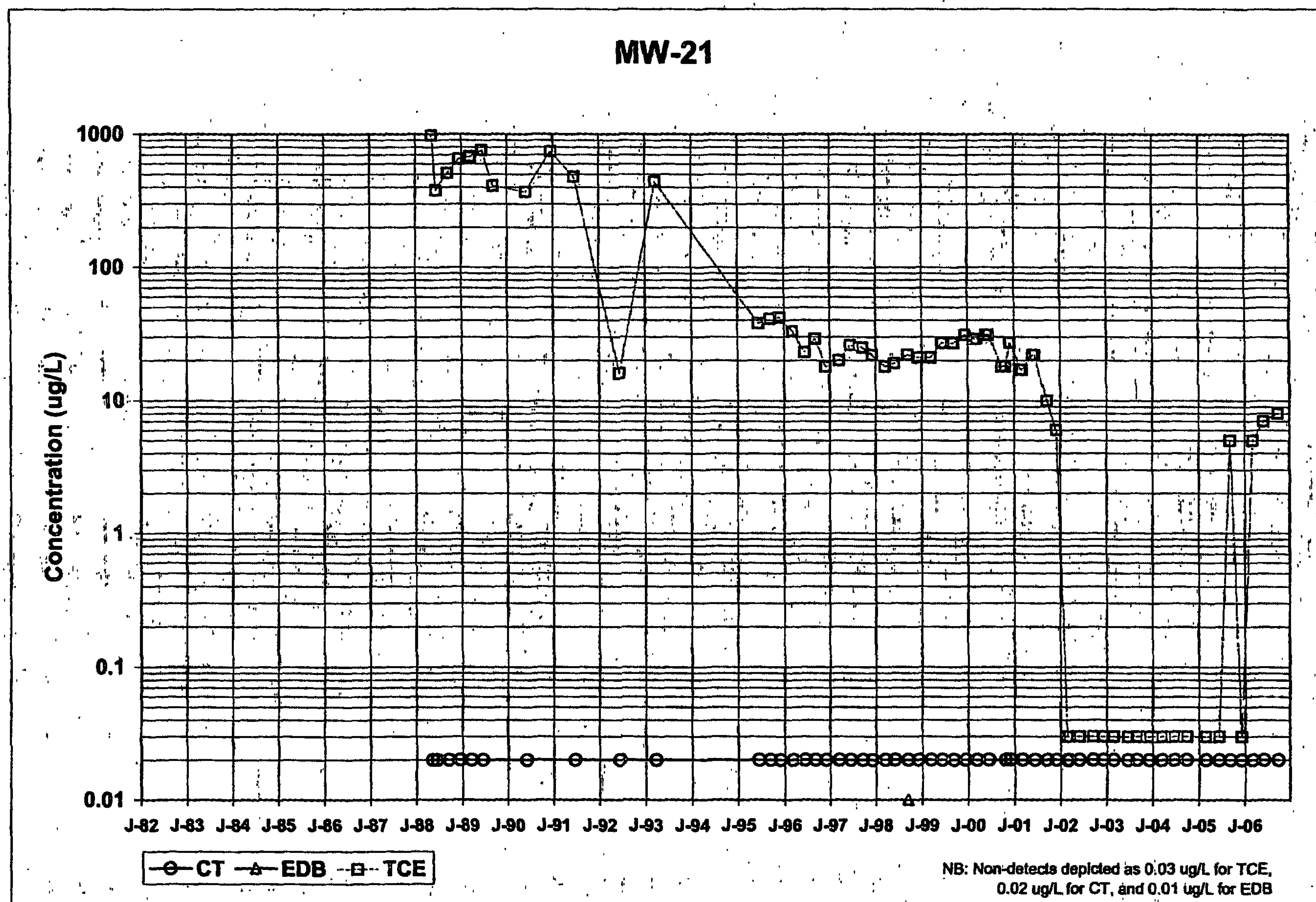

MW-14
Concentration (ug/L)
10000
1000
100
10
1
0.1
0.01
J-82 J-83 J-84 J-85 J-86 J-87 J-88 J-89 J-90 J-91 J-92 J-93 J-94 J-95 J-96 J-97 J-98 J-99 J-00 J-01 J-02 J-03 J-04 J-05 J-06
CT
EDB
TCE
NB: Non-detects depicted as 0.03 ug/L for TCE, 0.02 ug/L for CT, and 0.01 ug/L for EDB


MW-16
Concentration (ug/L)
1000
100
10
1
0.1
0.01
J-82 J-83 J-84 J-85 J-86 J-87 J-88 J-89 J-90 J-91 J-92 J-93 J-94 J-95 J-96 J-97 J-98 J-99 J-00 J-01 J-02 J-03 J-04 J-05 J-06
CT
EDB
TCE
NB: Non-detects depicted as 0.03 ug/L for TCE, 0.02 ug/L for CT, and 0.01 ug/L for EDB

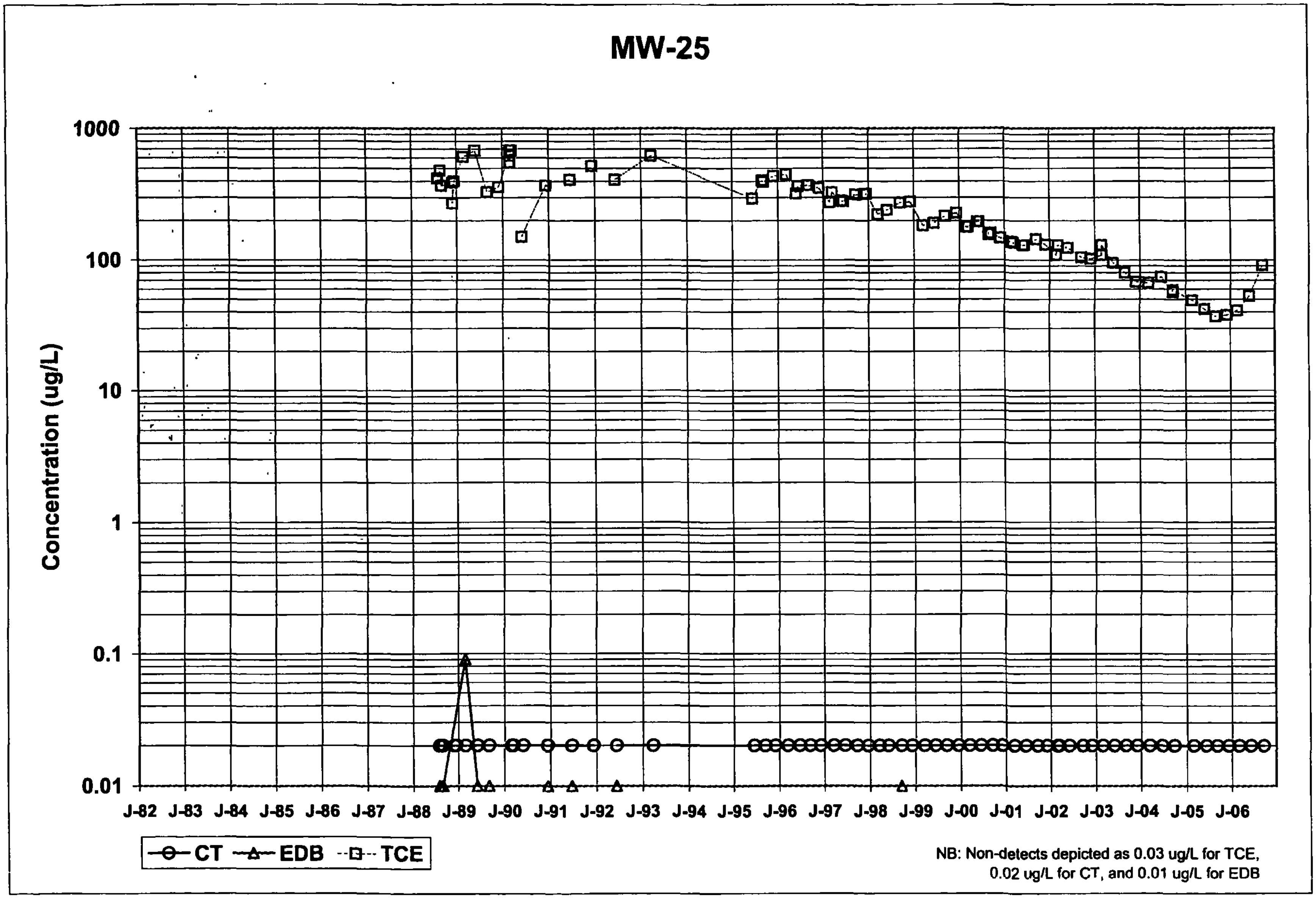


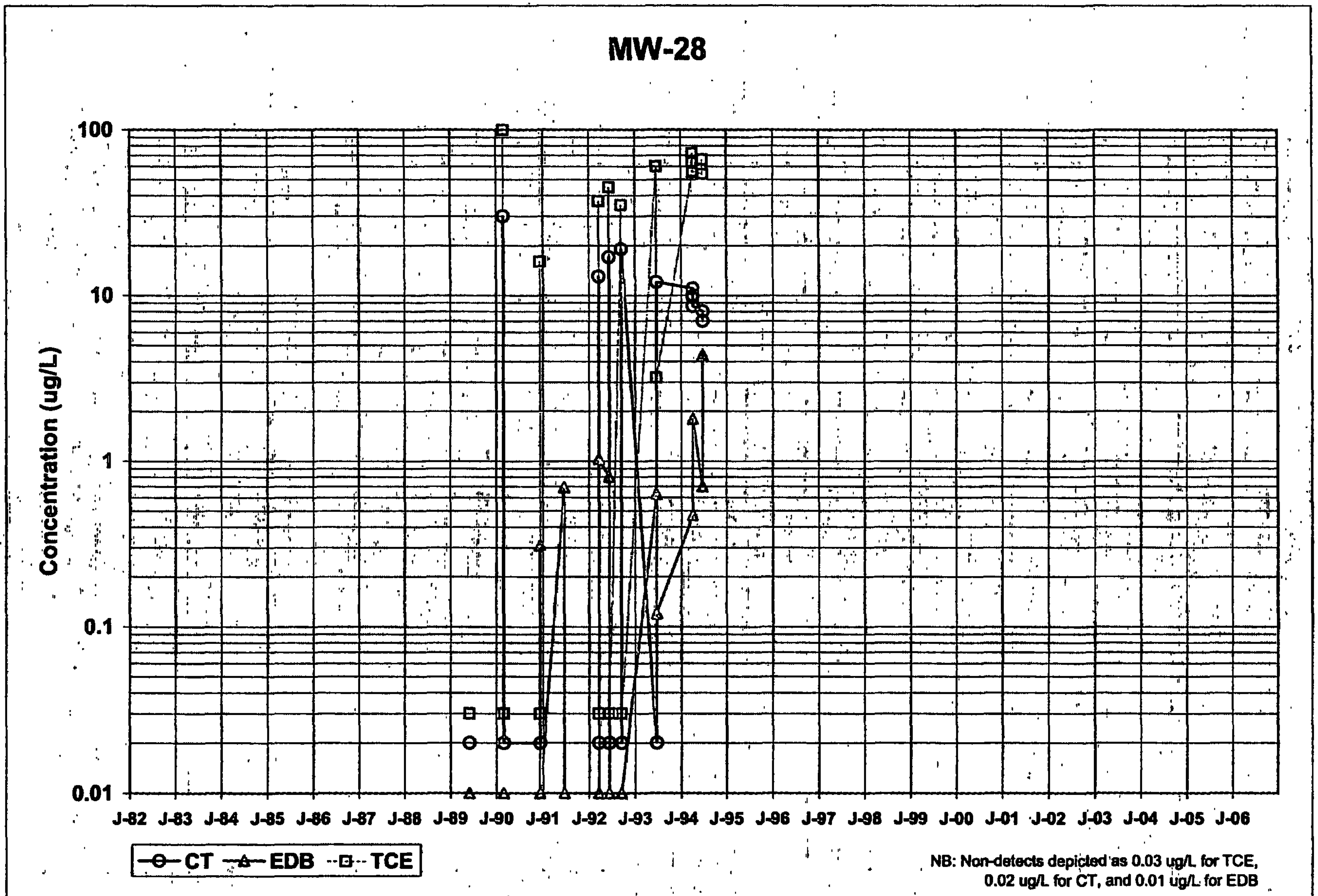
MW-17
Concentration (ug/L)
10000
1000
100
10
1
0.1
0.01
J-82 J-83 J-84 J-85 J-86 J-87 J-88 J-89 J-90 J-91 J-92 J-93 J-94 J-95 J-96 J-97 J-98 J-99 J-00 J-01 J-02 J-03 J-04 J-05 J-06
CT
EDB
TCE
NB: Non-detects depicted as 0.03 ug/L for TCE, 0.02 ug/L for CT, and 0.01 ug/L for EDB

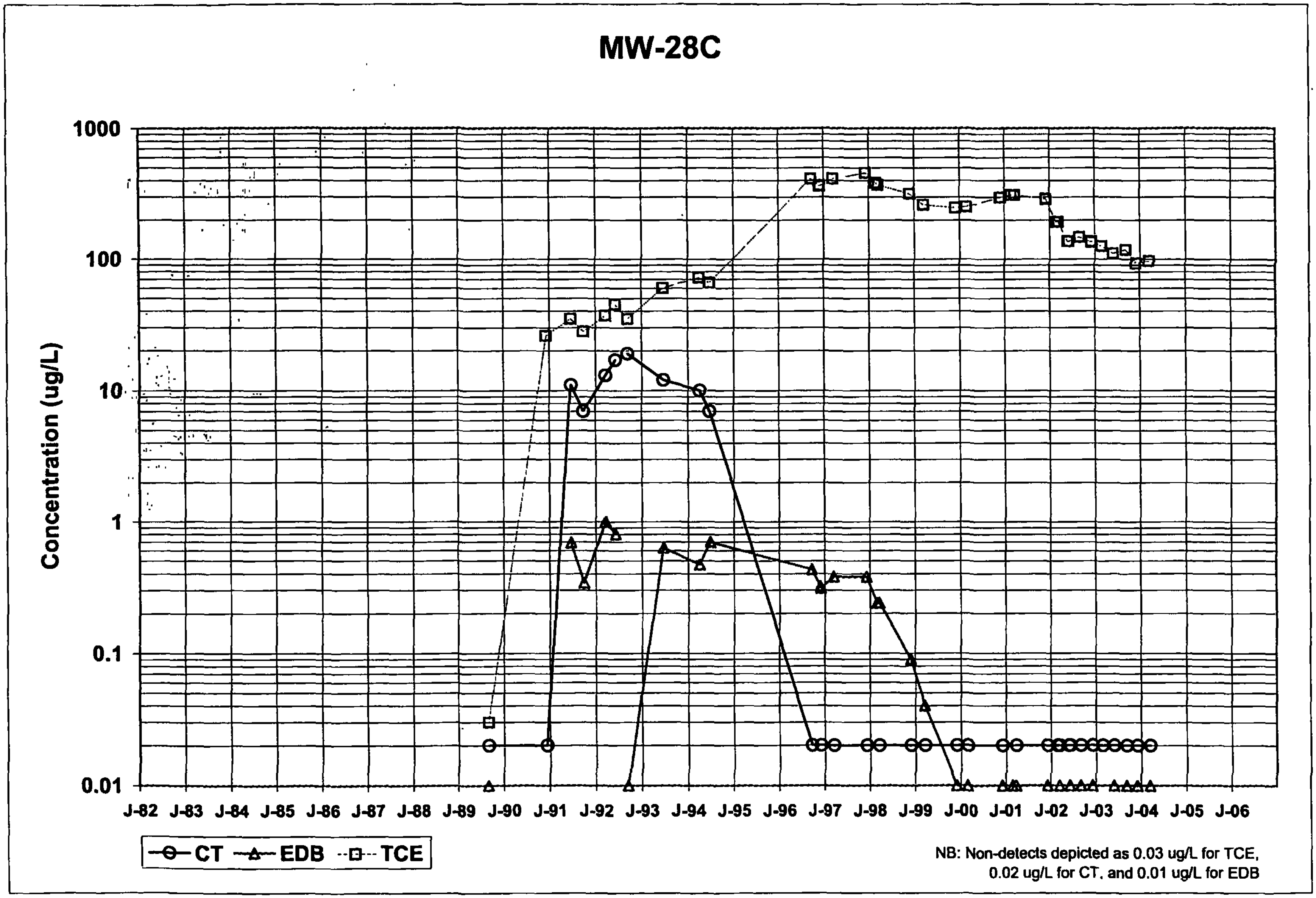

MW-19
10000
1000
100
10
1
0.1
0.01
Concentration (ug/L)
J-82 J-83 J-84 J-85 J-86 J-87 J-88 J-89 J-90 J-91 J-92 J-93 J-94 J-95 J-96 J-97 J-98 J-99 J-00 J-01 J-02 J-03 J-04 J-05 J-06
CT
EDB
TCE
NB: Non-detects depicted as 0.03 ug/L for TCE, 0.02 ug/L for CT, and 0.01 ug/L for EDB

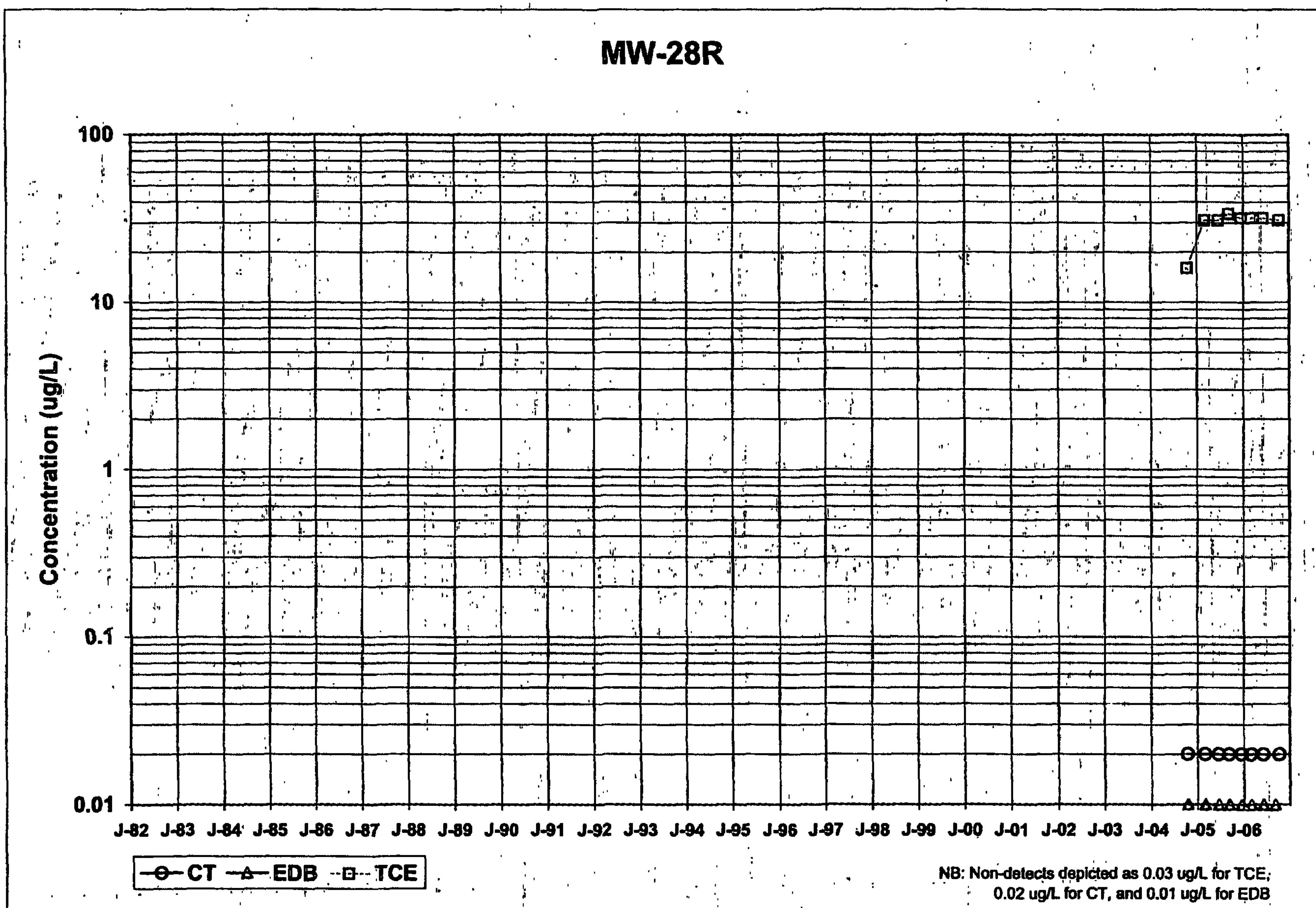


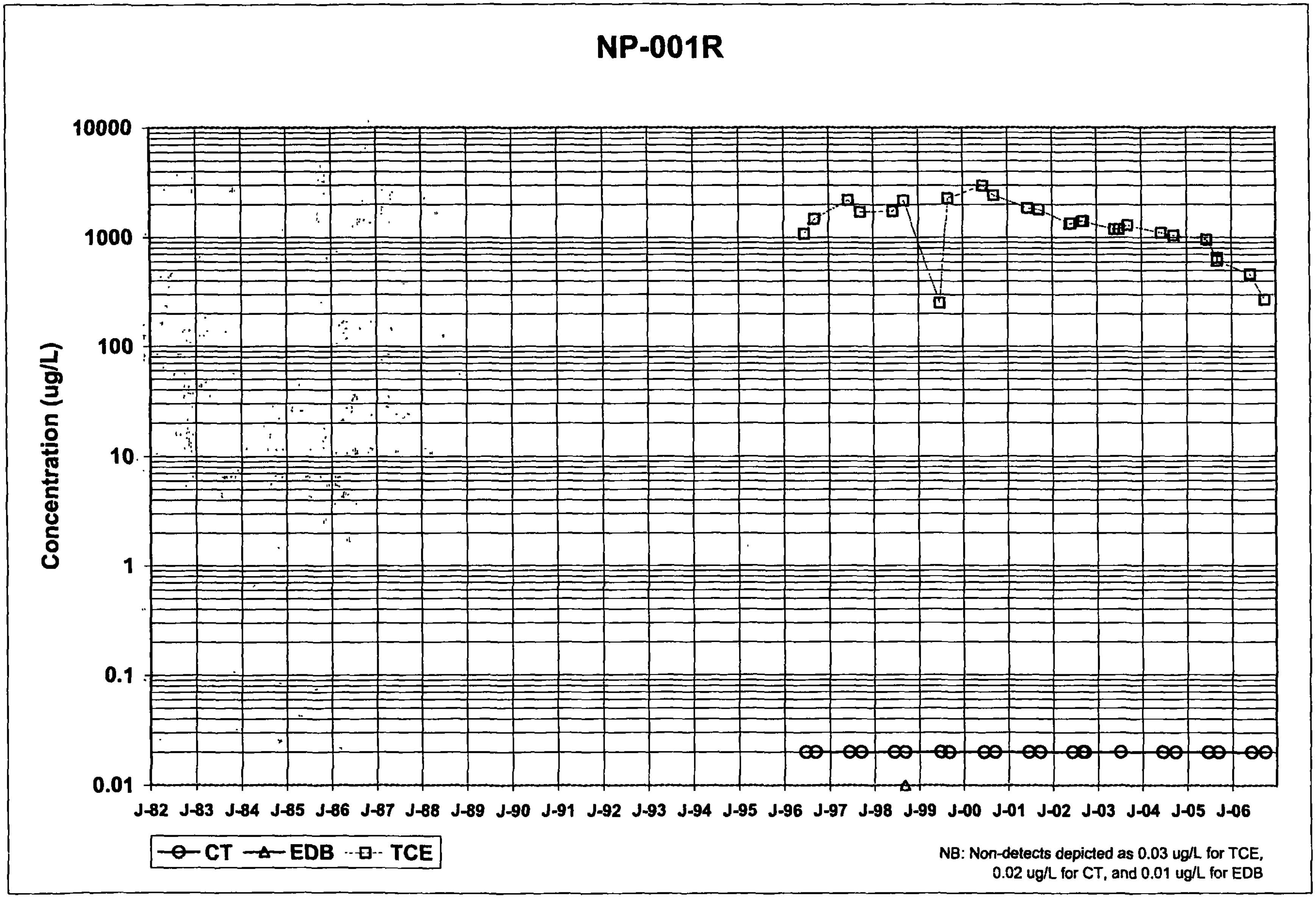
MW-21
Concentration (ug/L)
1000
100
10
1
0.1
0.01
J-82 J-83 J-84 J-85 J-86 J-87 J-88 J-89 J-90 J-91 J-92 J-93 J-94 J-95 J-96 J-97 J-98 J-99 J-00 J-01 J-02 J-03 J-04 J-05 J-06
CT
EDB
TCE
NB: Non-detects depicted as 0.03 ug/L for TCE, 0.02 ug/L for CT, and 0.01 ug/L for EDB

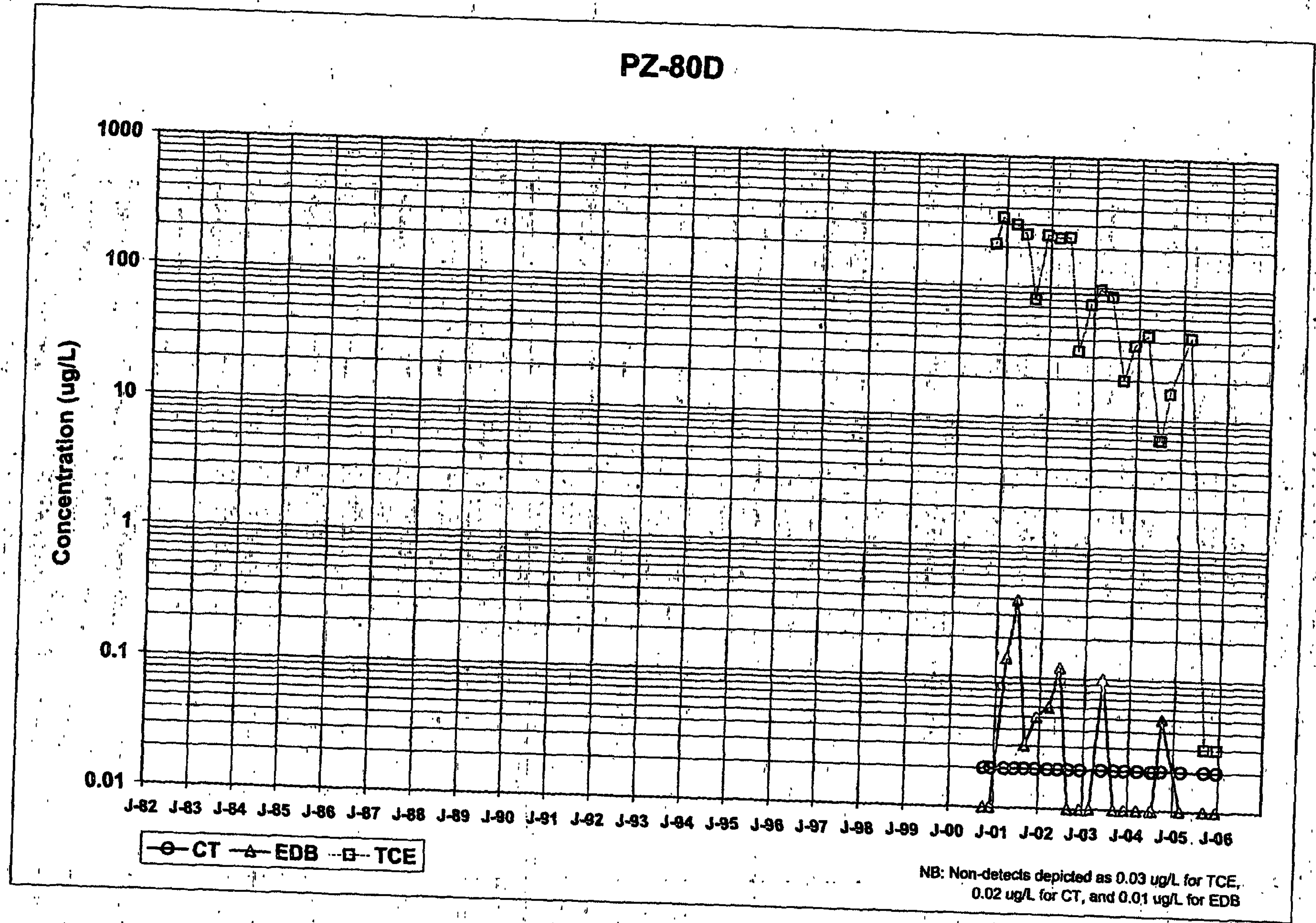

MW-25
1000
100
10
1
0.1
0.01
Concentration (ug/L)
J-82 J-83 J-84 J-85 J-86 J-87 J-88 J-89 J-90 J-91 J-92 J-93 J-94 J-95 J-96 J-97 J-98 J-99 J-00 J-01 J-02 J-03 J-04 J-05 J-06
CT
EDB
TCE
NB: Non-detects depicted as 0.03 ug/L for TCE,
0.02 ug/L for CT, and 0.01 ug/L for EDB

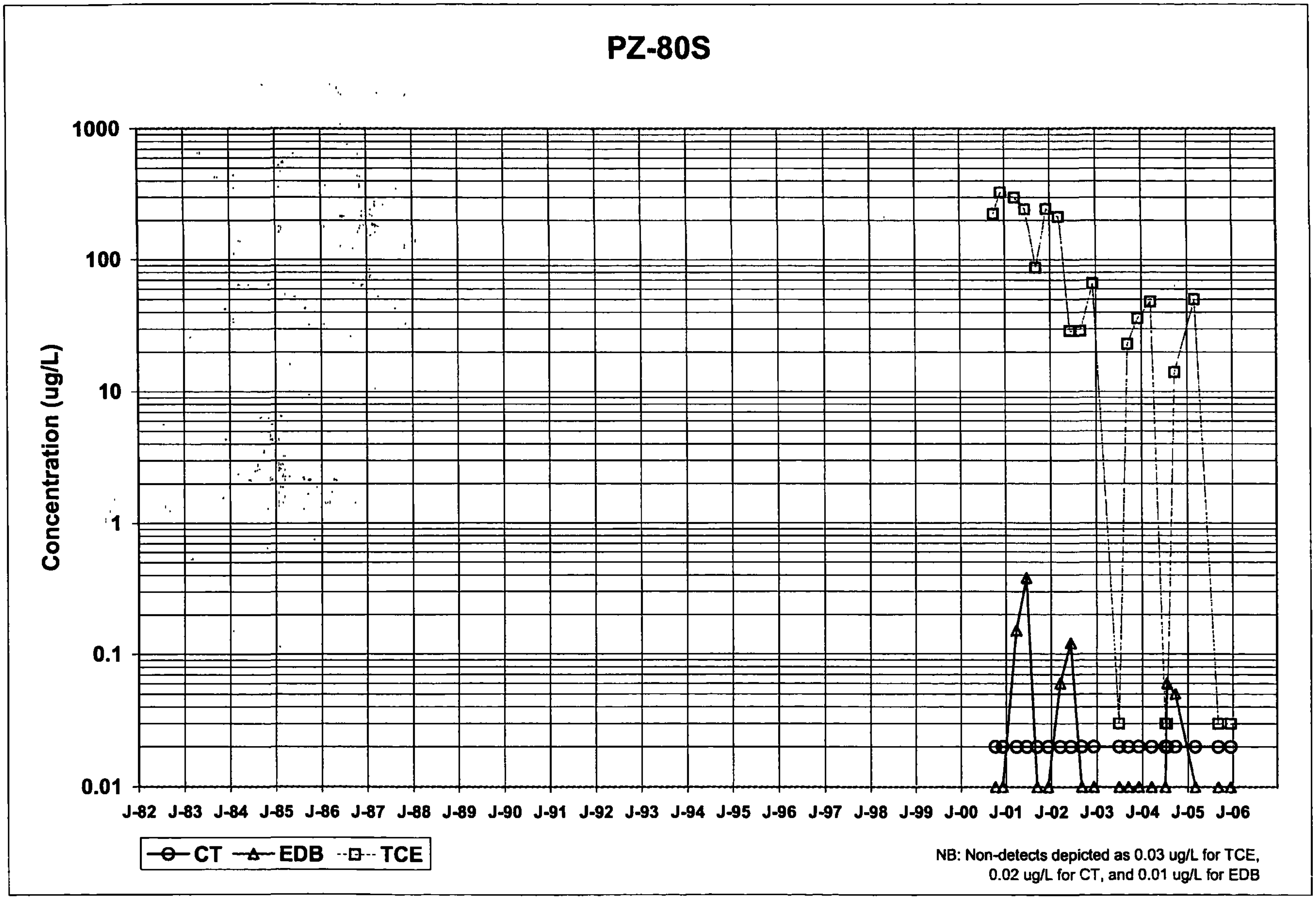

MW-28
Concentration (ug/L)
100
10
1
0.1
0.01
J-82 J-83 J-84 J-85 J-86 J-87 J-88 J-89 J-90 J-91 J-92 J-93 J-94 J-95 J-96 J-97 J-98 J-99 J-00 J-01 J-02 J-03 J-04 J-05 J-06
CT EDB TCE
NB: Non-detects depicted as 0.03 ug/L for TCE, 0.02 ug/L for CT, and 0.01 ug/L for EDB

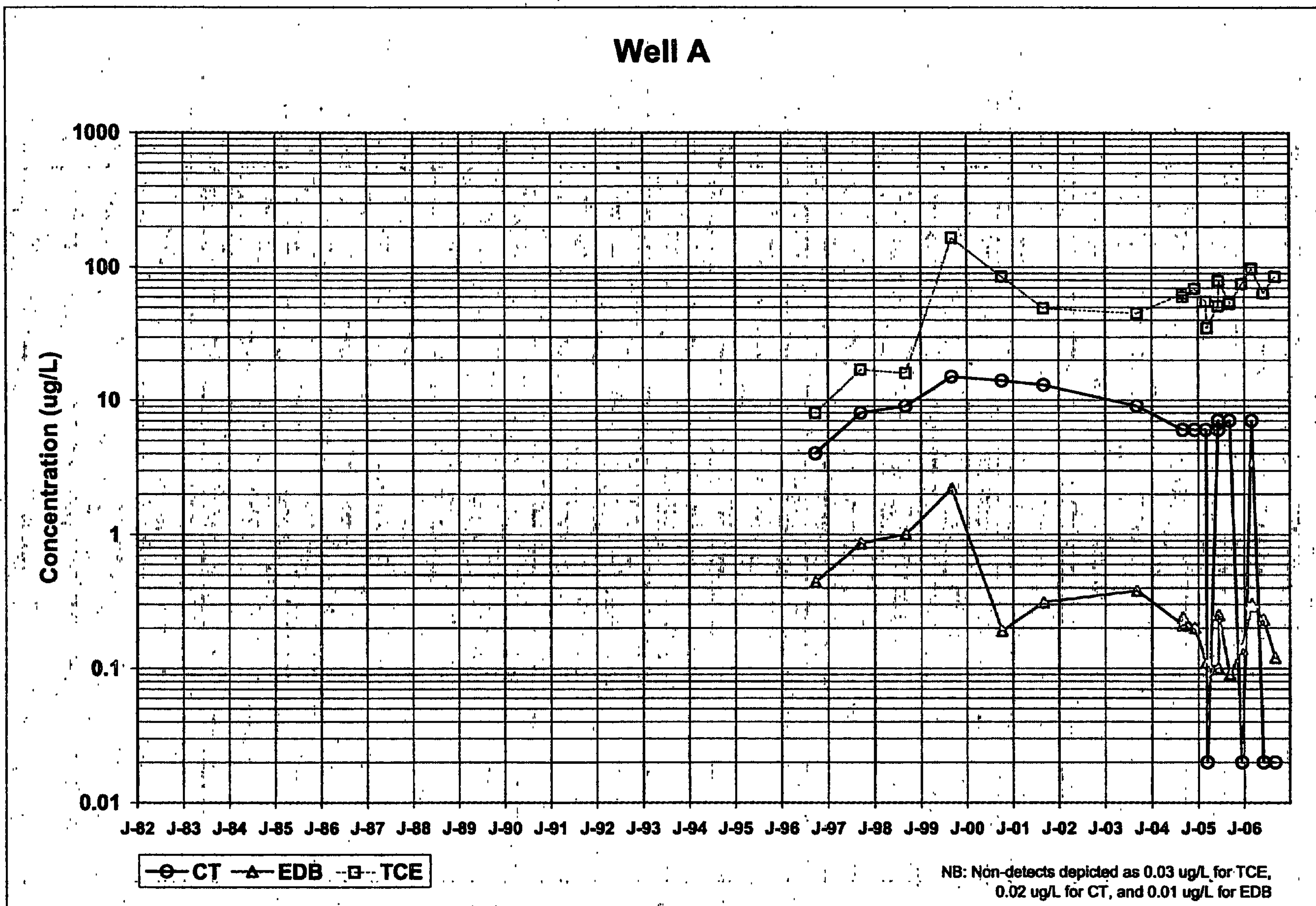

MW-28C
Concentration (ug/L)
1000
100
10
1
0.1
0.01
J-82 J-83 J-84 J-85 J-86 J-87 J-88 J-89 J-90 J-91 J-92 J-93 J-94 J-95 J-96 J-97 J-98 J-99 J-00 J-01 J-02 J-03 J-04 J-05 J-06
CT
EDB
TCE
NB: Non-detects depicted as 0.03 ug/L for TCE, 0.02 ug/L for CT, and 0.01 ug/L for EDB

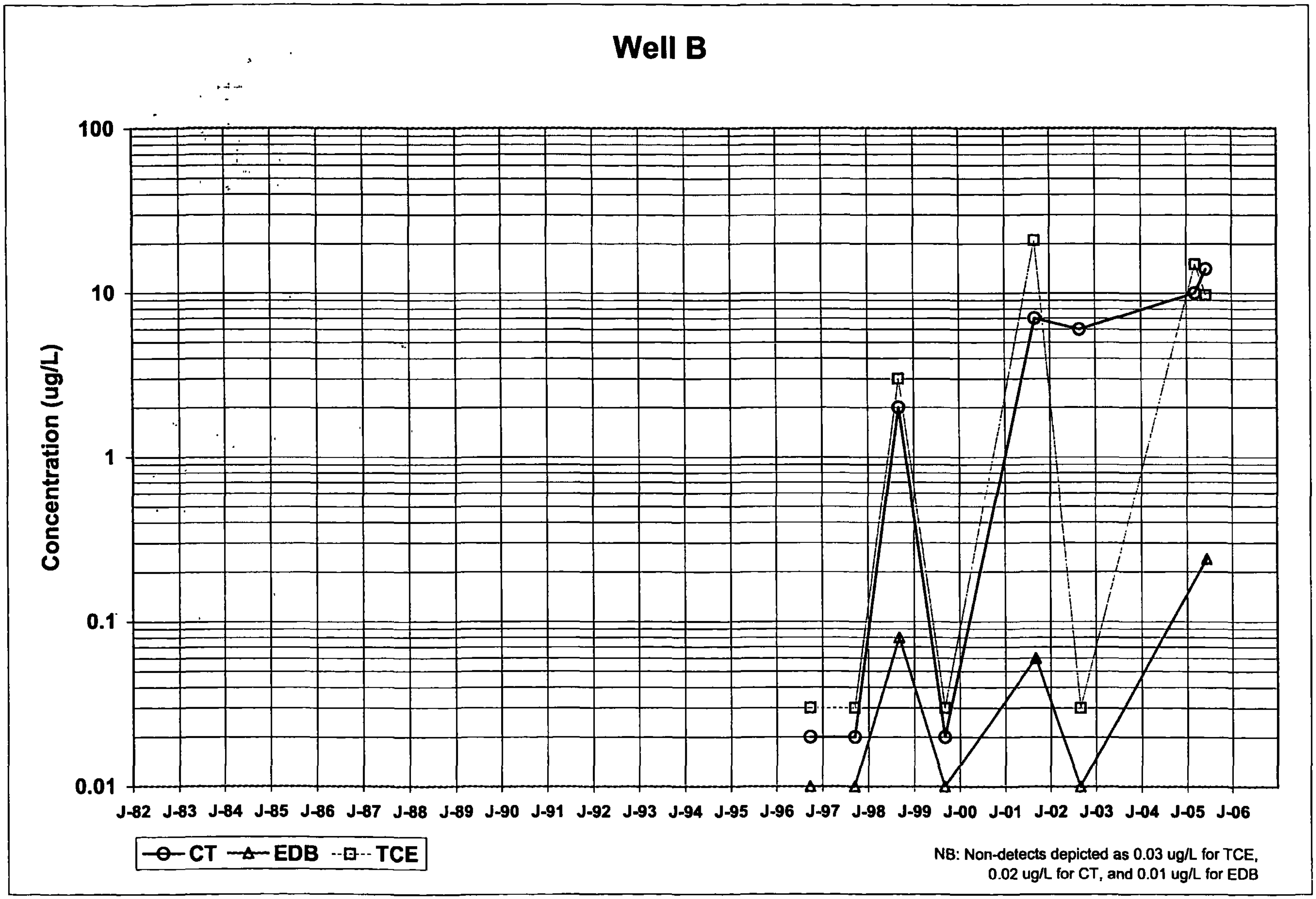

MW-28R
Concentration (ug/L)
100
10
1
0.1
0.01
J-82 J-83 J-84 J-85 J-86 J-87 J-88 J-89 J-90 J-91 J-92 J-93 J-94 J-95 J-96 J-97 J-98 J-99 J-00 J-01 J-02 J-03 J-04 J-05 J-06
CT
EDB
TCE
NB: Non-detects depicted as 0.03 ug/L for TCE, 0.02 ug/L for CT, and 0.01 ug/L for EDB

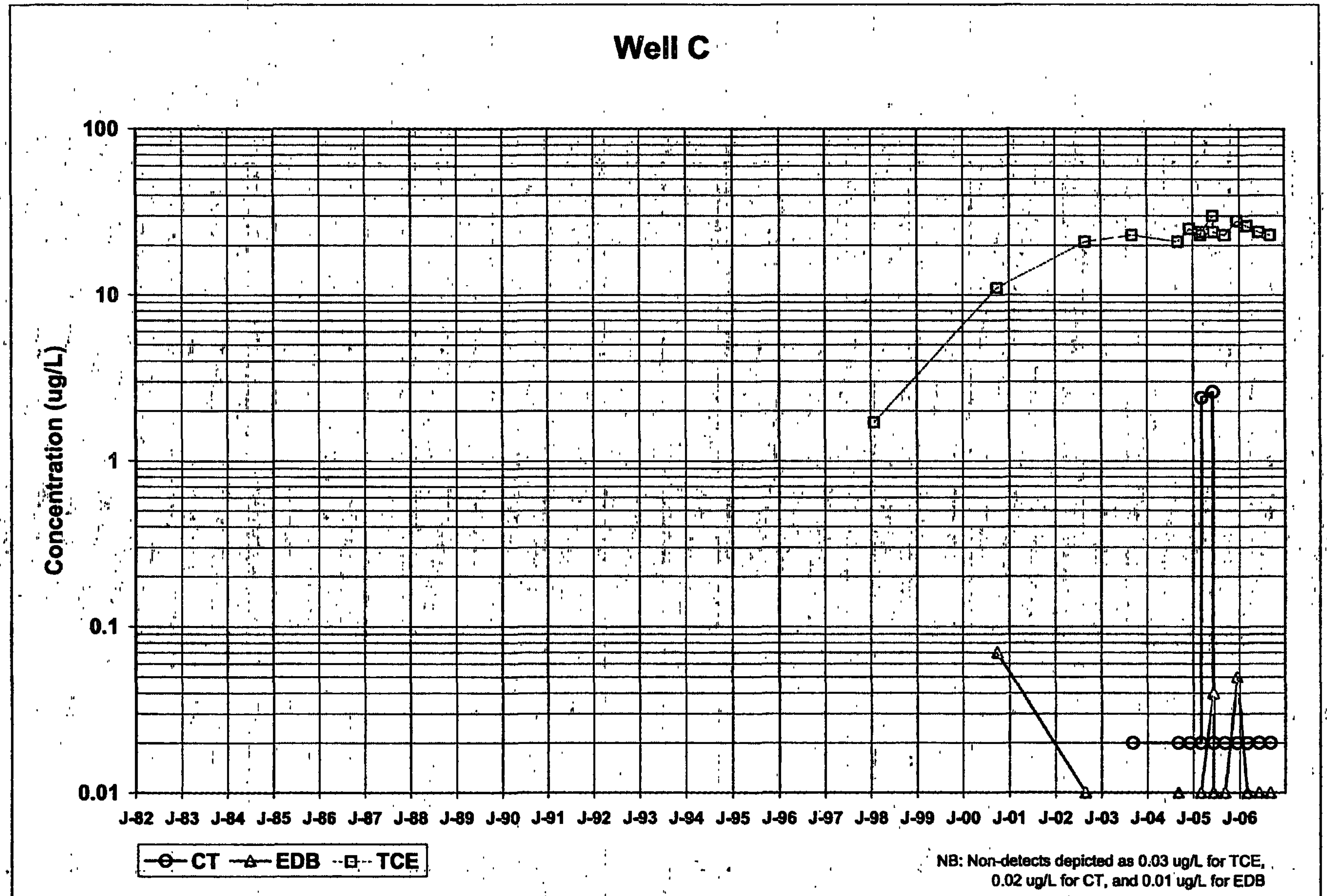

NP-001R
Concentration (ug/L)
10000
1000
100
10
1
0.1
0.01
J-82 J-83 J-84 J-85 J-86 J-87 J-88 J-89 J-90 J-91 J-92 J-93 J-94 J-95 J-96 J-97 J-98 J-99 J-00 J-01 J-02 J-03 J-04 J-05 J-06
CT
EDB
TCE
NB: Non-detects depicted as 0.03 ug/L for TCE, 0.02 ug/L for CT, and 0.01 ug/L for EDB


PZ-80D
1000
100
10
1
0.1
0.01
Concentration (ug/L)
J-82 J-83 J-84 J-85 J-86 J-87 J-88 J-89 J-90 J-91 J-92 J-93 J-94 J-95 J-96 J-97 J-98 J-99 J-00 J-01 J-02 J-03 J-04 J-05 J-06
CT
EDB
TCE
NB: Non-detects depicted as 0.03 ug/L for TCE, 0.02 ug/L for CT, and 0.01 ug/L for EDB


PZ-80S
Concentration (ug/L)
1000
100
10
1
0.1
0.01
J-82 J-83 J-84 J-85 J-86 J-87 J-88 J-89 J-90 J-91 J-92 J-93 J-94 J-95 J-96 J-97 J-98 J-99 J-00 J-01 J-02 J-03 J-04 J-05 J-06
CT
EDB
TCE
NB: Non-detects depicted as 0.03 ug/L for TCE, 0.02 ug/L for CT, and 0.01 ug/L for EDB

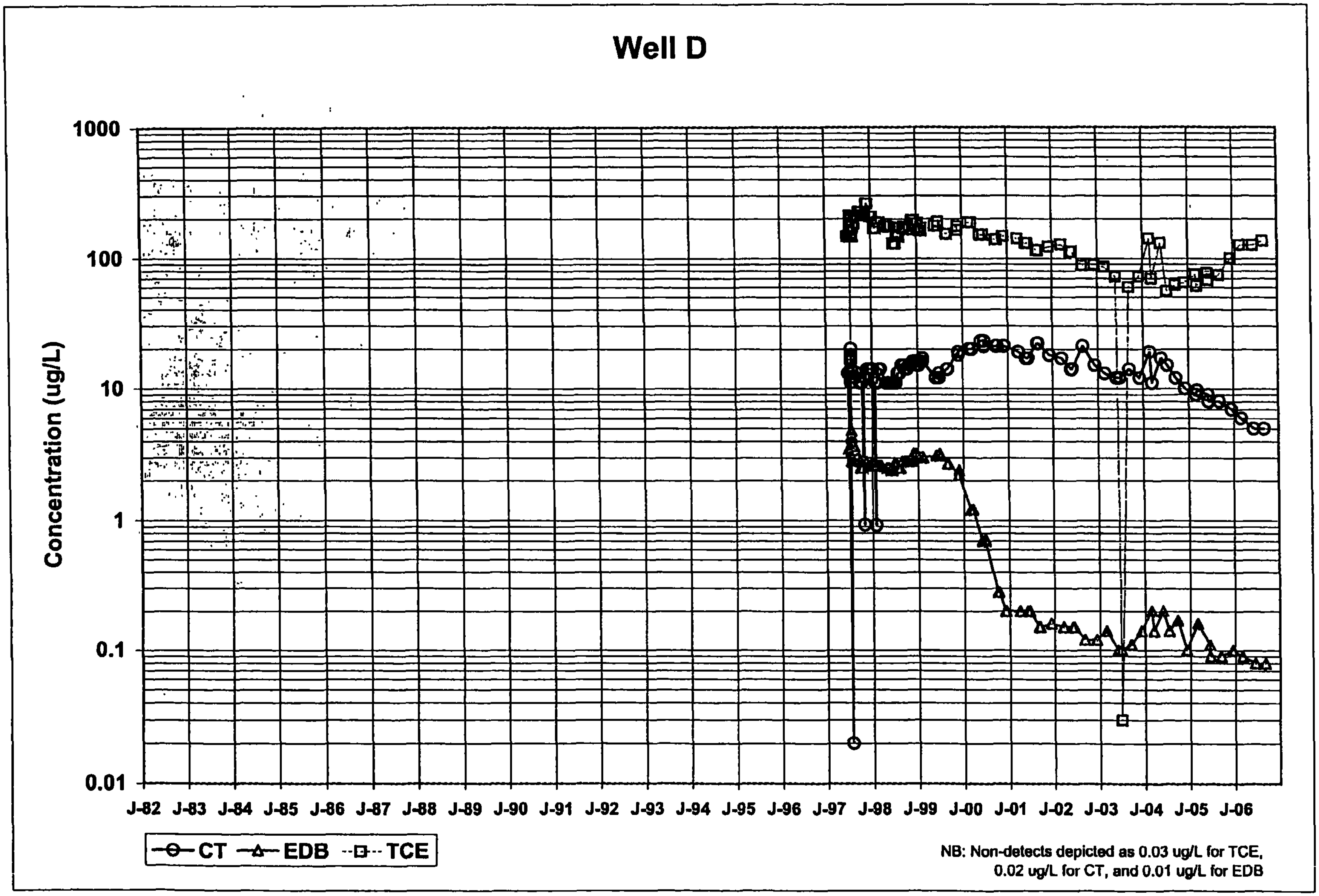

Well A
1000
100
10
1
0.1
0.01
Concentration (ug/L)
J-82 J-83 J-84 J-85 J-86 J-87 J-88 J-89 J-90 J-91 J-92 J-93 J-94 J-95 J-96 J-97 J-98 J-99 J-00 J-01 J-02 J-03 J-04 J-05 J-06
CT EDB TCE
NB: Non-detects depicted as 0.03 ug/L for TCE, 0.02 ug/L for CT, and 0.01 ug/L for EDB


Well B
Concentration (ug/L)
100
10
1
0.1
0.01
J-82 J-83 J-84 J-85 J-86 J-87 J-88 J-89 J-90 J-91 J-92 J-93 J-94 J-95 J-96 J-97 J-98 J-99 J-00 J-01 J-02 J-03 J-04 J-05 J-06
CT EDB TCE
NB: Non-detects depicted as 0.03 ug/L for TCE, 0.02 ug/L for CT, and 0.01 ug/L for EDB



Well C
Concentration (ug/L)
100
10
1
0.1
0.01
J-82 J-83 J-84 J-85 J-86 J-87 J-88 J-89 J-90 J-91 J-92 J-93 J-94 J-95 J-96 J-97 J-98 J-99 J-00 J-01 J-02 J-03 J-04 J-05 J-06
CT EDB TCE
NB: Non-detects depicted as 0.03 ug/L for TCE, 0.02 ug/L for CT, and 0.01 ug/L for EDB

S.S. PAPADOPULOS & ASSOCIATES, INC.



Appendix 4 d
South Landfill

HTI
HYDRO-TRACE
INCORPORATED

September 23, 2005

Ms. Diane Easley
Remedial Project Manager
U.S. Environmental Protection Agency
Region VII
901 N. Fifth St.
Kansas City, KS 66101

Re: Revised Baseline Assessment Report, South Landfill Subsite, Hastings, NE

Dear Ms. Easley:

Enclosed is the revised South Landfill Baseline Survey and Assessment Report prepared by Hydro-Trace, Inc. on behalf of the PRPs.

EPA's comments in their June 7, 2005 correspondence have been incorporated into the revised document. Specifically, the additions include (1) a short description of monitored natural attenuation (MNA) and a discussion of MNA indicator species in the subsite wells; (2) identification of on-site wells for MNA study monitoring; (3) a brief discussion of the need for installing off-site monitoring wells; (4) clarification of the NDEQ Geoprobe findings and (5) addition of EPA identifications and available analytical data for the off-site downgradient wells.

Sincerely,

Roy F. Spalding mo

Roy F. Spalding, Ph.D.

c: R. Franz, NDEQ
M. Myers, NDEQ
M. Sullivan, City of Hastings
D. Fisher, Dutton-Lainson Company
D. Wacker, City of Hastings

P.O. Box 266
Raymond, Nebraska
Zip 68428-0266
(402) 783-3931

HYDRO-TRACE
INCORPORATED

SOUTH LANDFILL BASELINE SURVEY AND ASSESSMENT REPORT

REVISED
September 19, 2005

Prepared by
Hydro-Trace, Inc.

P.O. Box 266
Raymond, Nebraska
Zip 68428-0266
(402) 783-3931

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LIST OF APPENDICES

SOUTH LANDFILL BASELINE SURVEY AND ASSESSMENT REPORT

The South Landfill Baseline Survey and Assessment contains (1) analytical data from monitored wells at the South Landfill subsite; (2) delination of the trichloroethylene plume; (3) an inventory of the wells potentially impacted by the South Landfill; (4) a discussion of monitored natural attenuation (MNA); (5) evaluation of the wells to be included in the MNA study; and (6) an assessment of the need for additional monitoring wells.

Monitored Wells

Eleven wells are monitored at the South Landfill subsite. Seven specially constructed monitoring wells are located on the 58-acre landfill site (Figure 1). Monitoring wells SL-01, SL-02, SL-03, SL-04S, and SL-05S are screened in approximately the top 20 feet of the aquifer (Morrison Knudsen, 1996). The two deep monitoring wells (SL-04D and SL-05D) are screened from 159 to 179 feet below ground surface (bgs) (Morrison Knudsen, 1996). An upgradient public supply well (M-20) and an irrigation well (D-31) and two downgradient domestic wells (D-01 and D-10) are also monitored (Figure 1). Appendix A contains the available pedigree information for the eleven wells.

Analytical Data

Eleven wells were monitored in December 2000. Beginning in May 2003 the wells were monitored quarterly for seven consecutive quarters. Parameters indicative of monitored natural attenuation (MNA) and eight volatile organic compounds (VOCs) were measured quarterly. Those data are in Appendix B.

Water-Level Data

Since May 2003 the depth to water has been measured quarterly in the seven specially constructed monitoring wells. Water-levels also were measured in December 2000. Water-level data are presented in Appendix C. As noted by the water-table contours from a previous study (Morrison Knudsen, 1996) (Figure 2) and those generated from November 2004 depth to water measurements (Figure 3), the direction of ground-water flow is easterly or east south-east. The direction of ground-water flow in this area of the Hastings Superfund Site may be a few degrees south of east, but it is predominately easterly.

TCE Plume

The eight contaminants of concern in the ground water are tetrachloroethylene (PCE), trichloroethylene (TCE), cis-1,2-dichloroethylene (cis-1,2-DCE), 1,1-dichloroethylene (1,1-DCE), vinyl chloride, 1,1,1-trichloroethane (1,1,1-TCA), 1,1-dichloroethane (1,1-DCA) and benzene. None of the eight VOCs of concern have been detected in the off-site wells (D-01, D-10, D-31, and M-20).

Delineation of the TCE plume describes the approximate extent of the off-site contamination. The plume (Figure 4) was generated using TCE concentrations from the quarterly monitoring and from downgradient Geoprobe sampling. TCE concentrations in the monitoring wells are average values for the last seven quarters (May 2003 – November 2004). The Geoprobe™ sampling was conducted in October 2004 by Tetra Tech EM Inc. for the Nebraska Department of Environmental Quality (NDEQ). These unpublished data are very much appreciated as they provide downgradient control sites for delineating the TCE plume.

At Geoprobe™ locations GP-14 and GP-15 on the eastern edge of section 17 along Showboat Boulevard groundwater was sampled at 3 depths (126-130 ft, 146-150 ft, and 166-170 ft bgs) between 126 and 170 feet. GP-15 is located due east of the landfill and GP-14 is directly east of the Floyd Frerichs residence. None of the six sampled intervals contained detectable concentrations of TCE or its commonly found transformation products cis-1,2-DCE or vinyl chloride (unpublished data). The data strongly suggest that off-site transport to Showboat Boulevard and beyond has not occurred. Off-site well D-10 at the Gerald Frerichs residence clearly is not impacted by TCE or TCE degradates associated with the South Landfill.

Two additional Geoprobe™ sites (GP-9 and GP-17) located immediately downgradient of the landfill contained TCE and associated degradates. At both sites the groundwater was sampled at three depths (126-130 ft, 146-150 ft, and 166-170 ft bgs at GP-9 and 126-130 ft, 136-140 ft, and

146-150 ft bgs at GP-17). GP-17 is located 600 feet east of GP-9, which is 50 feet south of SL-05 and on landfill property. At each location the interval with the highest field-measured TCE concentration was sent to a fixed laboratory for analysis. At GP-9 the highest concentrations of TCE and cis-1,2-DCE were in the shallowest interval. The fixed laboratory reported TCE and cis-1,2-DCE concentrations were 420 and 120 µg/L, respectively(unpublished data). The field results showed that the TCE concentration declined to 7 ppb at 146-150 ft and was undetected at 166-170 ft. At GP-17 (600 feet east of GP-9) the highest concentrations were in the 136-140 ft interval. The fixed laboratory reported TCE and cis-1,2-DCE concentrations of 230 and 74 µg/L, respectively, (unpublished data). Field results showed that TCE was present in the 126-130 ft interval at 62 ppb and in the 146-150 ft interval at 17 ppb.

Potentially Impacted Off-site Wells

Downgradient off-site wells that could potentially be impacted by landfill leachates include one domestic well (D-01) and two irrigation wells (I-21 and CI-10). Their locations are shown in Figure 5. Pedigree information for these wells is presented in Appendix D. Analytical data for I-21 and CI-10 are in Appendix E. Analytical data for D-01 which has been monitored quarterly as part of the subsite monitoring are in Appendix B. No other existing wells are in the line of transport from the South Landfill.

Natural Attenuation of Chlorinated Ethenes

Natural attenuation (NA) of chlorinated ethenes can result from several processes that may occur singly or simultaneously. These processes may include volatilization (Henry's Law), biodegradation (co-metabolism or reductive dechlorination), sorption, mineralization and dispersion. Dispersion is a physical process that dilutes the contaminant without decreasing its mass. Depending upon the specific natural process, NA can act without human intervention to reduce mass, toxicity, mobility, or concentration of aquifer contaminants. Monitored Natural Attenuation (MNA) uses all of the above processes to provide site cleanup that will reduce groundwater contaminant concentrations to levels protective of human health and the environment within a reasonable time frame. Although all these processes help attenuate chlorinated ethenes, the dominant remedial process is usually biodegradation.

At landfills reductive dechlorination is an important remedial process for the removal of chlorine atoms from perchloroethylene (PCE) and trichloroethylene (TCE) and their substitution with hydrogen atoms as in the expression:

$$R\text{-}Cl + H^{+} + 2e^{-} \rightarrow R\text{-}H + Cl^{-}$$

The two electrons transferred in the process may provide an energy gain for the organism. Although PCE must first degrade to TCE, the South Landfill subsite has little, if any, PCE. Reductive dechlorination occurs as a step-wise process. The more highly chlorinated the ethene compound is, the faster the reduction. For that reason, cis-1,2-DCE and VC tend to accumulate in the groundwater immediately downgradient from source areas. At the South Landfill subsite reductive dechlorination begins with primarily TCE being transformed to cis-1,2-DCE, which then degrades to vinyl chloride (VC) and finally VC degrades to ethene.

Anaerobic groundwater is required for reductive dechlorination. Each candidate compound for reductive dechlorination is redox dependent and can only be dechlorinated within a specified oxidation-reduction potential (ORP) range. Environments where sulfate reduction or methanogenesis occurs are preferred for the reduction of VC. The more dechlorinated ethenes require highly reducing environments for reductive dechlorination. Other carbon substrates such as alcohols, ketones, and/or natural organic compounds must be present to donate electrons. Thus, the characterization of aquifers with respect to organic carbon concentrations, ORP, and electron acceptors is important to understanding the environment.

Co-metabolism is a process in which the chlorinated compounds are transformed without an energy gain for the microbe. This occurs only in the presence of compounds the organism can use for growth (substrates) and is an important process in intensely reducing environments such as landfills (Lee et al., 1998).

VC and possibly cis-1,2-DCE can be degraded under aerobic conditions. There is abundant evidence for both co-metabolic and direct aerobic degradation of VC and co-metabolic degradation of cis-1,2-DCE. Thus, there isn't a great concern that low concentrations of VC and cis-1,2-DCE will be transported downgradient from the South Landfill.

In summation, a site-specific evaluation of MNA potential must take into account the presence of transformation products, electron acceptors and electron donors, the ORP of the groundwater and the stability of the contaminant plume. MNA is not an acceptable approach in cases where contaminant migration will reach receptors prior to remediation. Thus, while time frames are site specific, normally it is at least 20 years.

Assessment of Future Monitoring

Monitoring of onsite upgradient well SL-01 should continue as a means of determining whether groundwater beneath the South Landfill subsite is receiving contaminated water from upgradient sites.

Onsite monitoring wells SL-02, SL-03, SL-04S, and SL-05S should be included in the MNA study. TCE and its degradation products cis-1, 2-DCE and vinyl chloride are present in all four wells. Each of these wells has a 20-ft screened interval from 113 and 135 ft bgs. The presence of cis-1,2-DCE and VC are excellent indicators that natural attenuation (reductive dechlorination) is occurring in the shallow groundwater or in the deep vadose zone beneath the South Landfill. SL-02 and SL-03 are considered to be source area wells and have consistently been the most contaminated of the monitored wells. These wells should remain a part of future quarterly monitoring.

Neither the contaminant of concern nor its degradation products are present in the two deep wells (SL-04D and SL-05D). These wells provide information that the vertical plume boundary is not deeper than 158 feet as both wells are screened 159-179 ft bgs. SL-04D and SL-05D should be sampled annually.

Clearly, off-site monitoring should be limited to wells east or slightly southeast of the eastern border of the South Landfill. D-1, I-21 and CI-10 could be impacted by the contaminant plume. Future monitoring of wells D-10, D-31 and M-20 should be discontinued. Some of these wells, however, could be included in monitoring another site where carbon tetrachloride was used.

There is no evidence of downgradient transport of TCE approximately 1,000 feet east of the eastern landfill boundary (Figure 4). Siting a monitoring well 1,000 feet downgradient would position it in the middle of Frerichs' irrigated corn field and would adversely impact his ability to efficiently farm the quarter section. Since the flow is primarily to the east and there are no residences in the path of the plume, there is little justification for installing downgradient monitoring wells at this time. Installation of a monitoring well in the high voltage line right-of-way in Frerich's cornfield has been suggested. Drilling there is very risky and would be declined by a well driller. Furthermore, the only location would be at one of the towers and even if the tower was in a suitable location for siting a monitoring well, access would not be available during the growing season as there is no access road.

It is imperative that good field indicator data are obtained during all future sampling. Field instruments need to be calibrated frequently. An air-free flow must be maintained in the flow cell. Good indicator data will allow prediction of downgradient natural attenuation.

Acknowlegement

Bob Zimmerman at NDEQ provided the unpublished results of Tetra Tech EM's Geoprobe investigation which enabled more definitive delineation of the TCE plume than would have otherwise been possible.

References

Hastings Utilities. 2005. Hastings Institutional Control Area Annual Report Reporting Year 2004, Hastings, Nebraska.

Lee, M.D., J.M. Odum, and B.J. Buchanan. 1998. New perspectives on microbial dehalogenation of chlorinated solvents: Insights from the field. Annual Reviews of Microbiology 52:423-452.

Morrison Knudsen Corporation. 1996. Remedial Investigation Report, South Landfill Subsite, Hastings Ground Water Contamination Site, Hastings, Nebraska. December 1996.

FIGURES

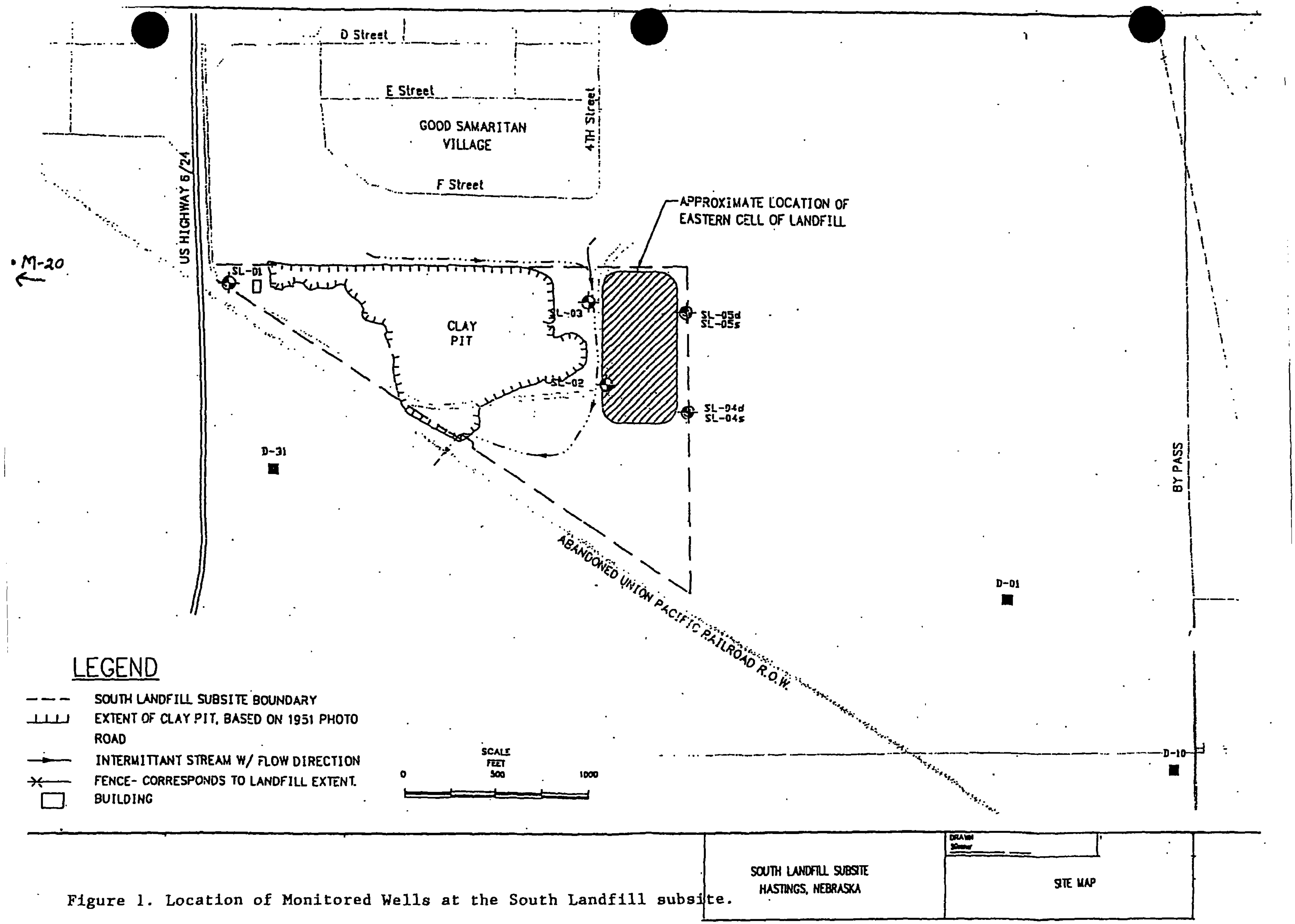


Figure 1. Location of Monitored Wells at the South Landfill subsite.

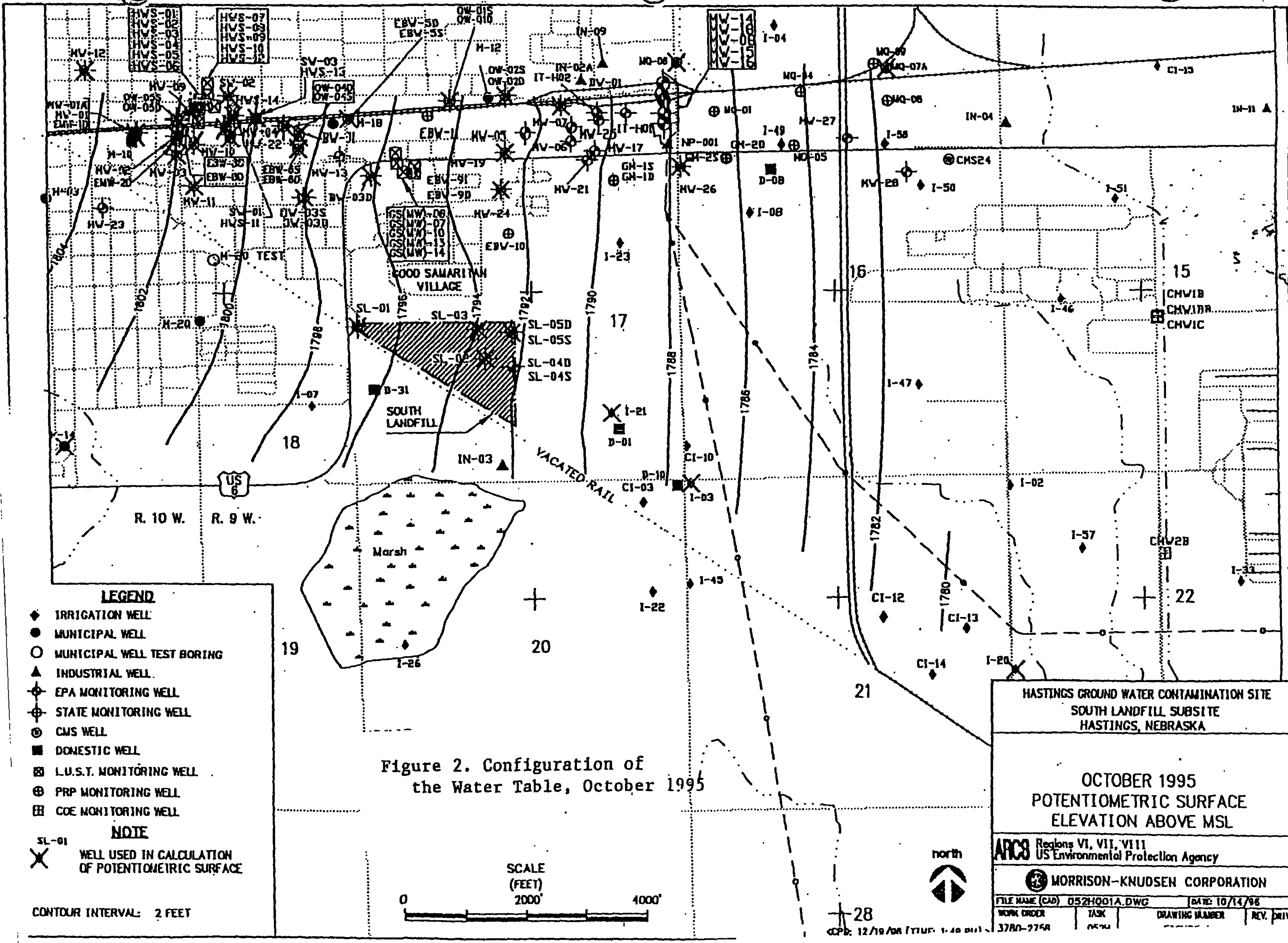


Figure 2. Configuration of the Water Table, October 1995

Figure 3. Configuration of the water table, November 2004

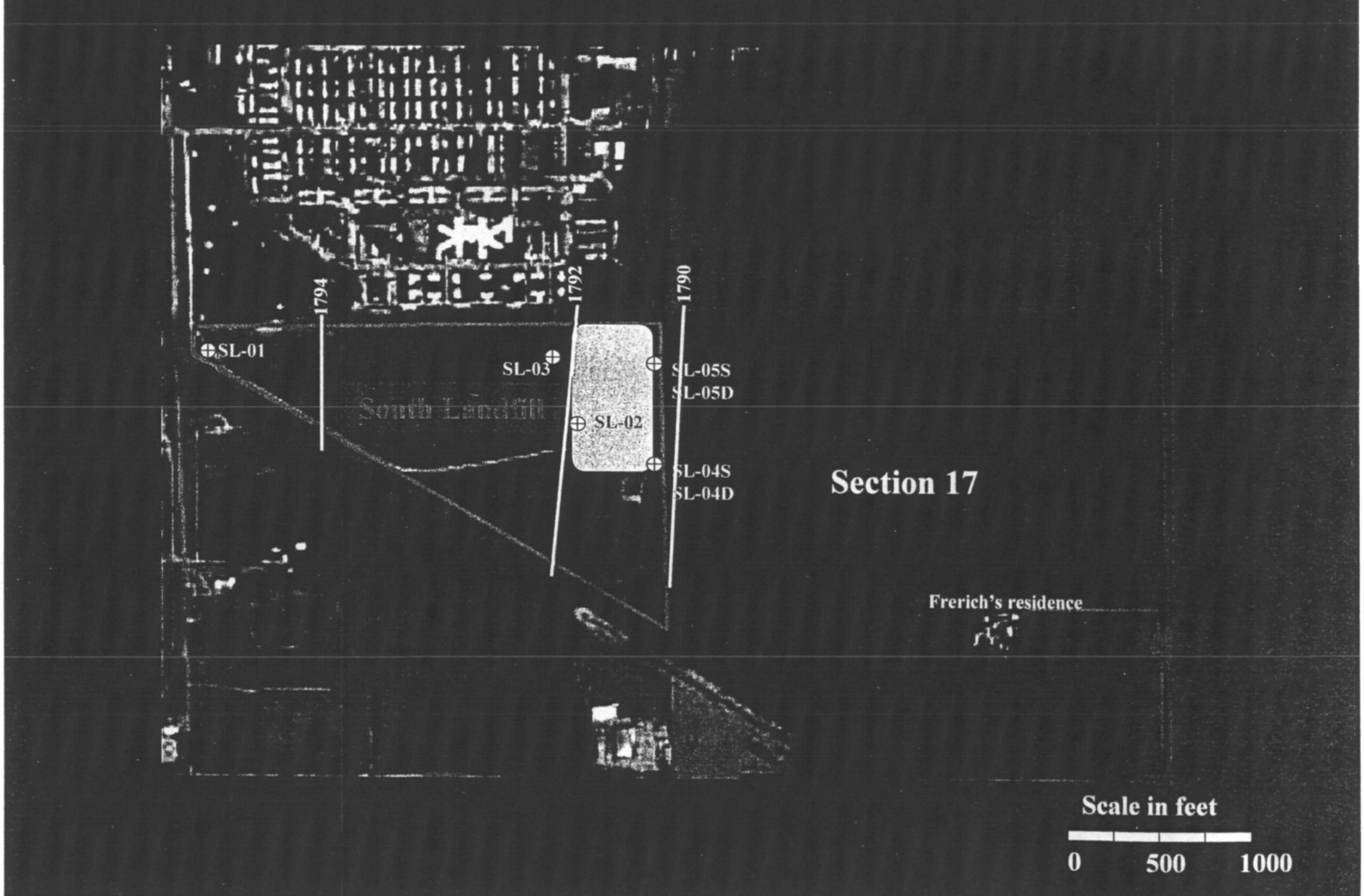


Figure 4. Lines of isoconcentration of TCE in groundwater beneath and downgradient of the South Landfill subsite, May 2003 – November 2004

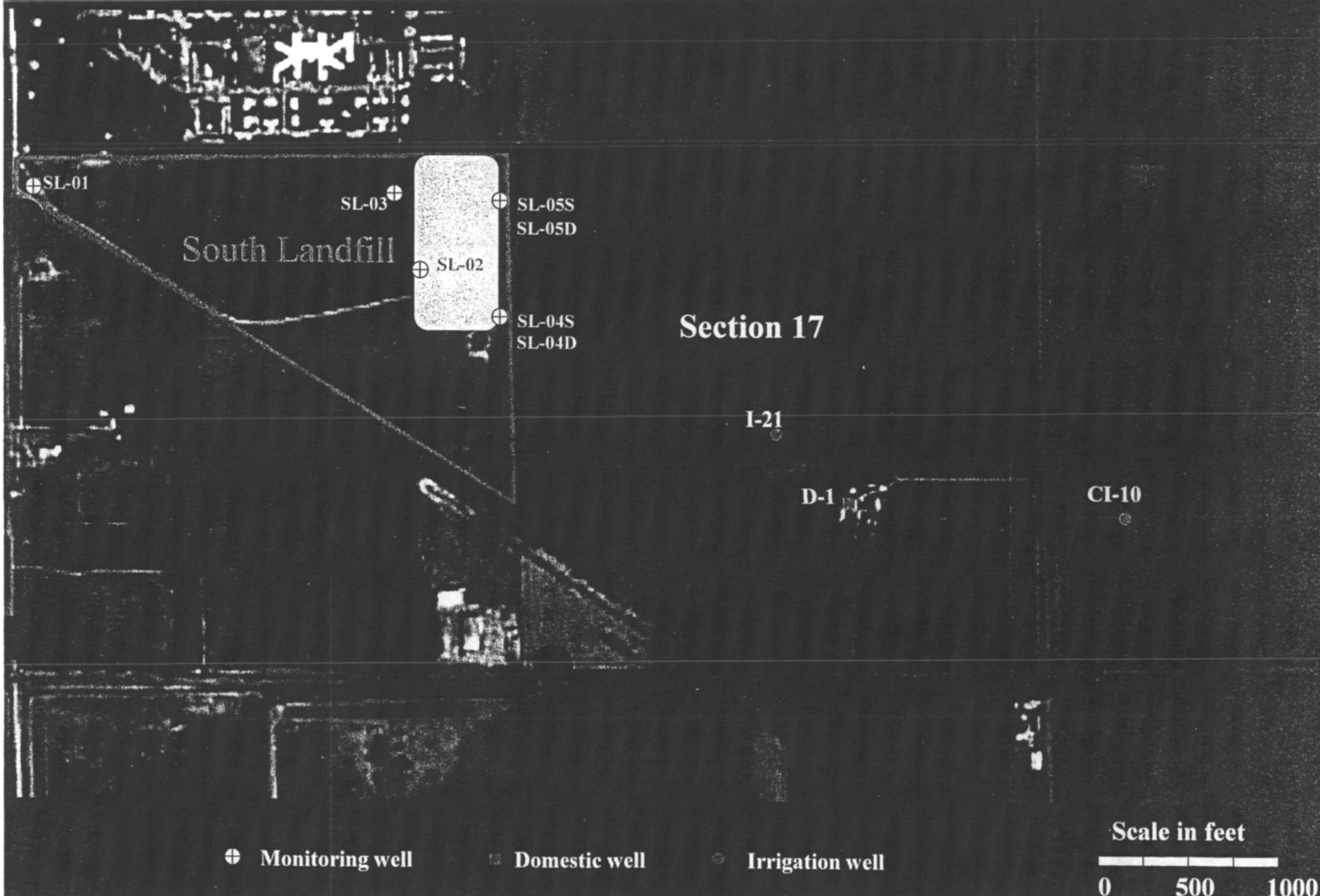
Legend

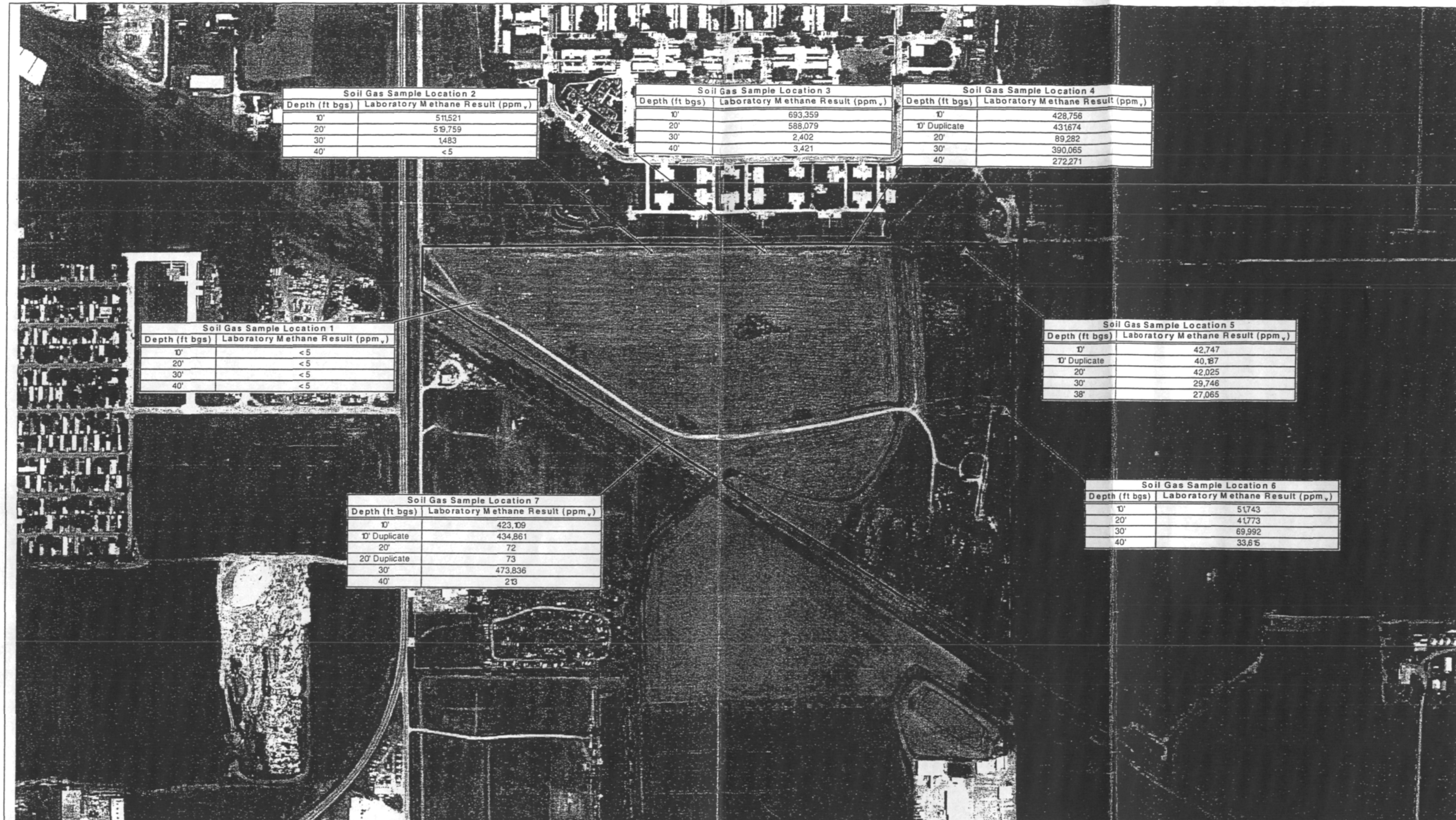
- Geoprobe sites
- Monitored wells
- —5— TCE concentrations (ug/l)
- 25 Average concentration for 7 analyses

Scale in feet

0 500 1000

Figure 5. Locations of wells for MNA study





Soil Gas Sample Location 1

Depth (ft bgs)	Laboratory Methane Result (ppm_v)
10'	< 5
20'	< 5
30'	< 5
40'	< 5

Soil Gas Sample Location 2

Depth (ft bgs)	Laboratory Methane Result (ppm_v)
10'	511,521
20'	519,759
30'	1,483
40'	< 5

Soil Gas Sample Location 3

Depth (ft bgs)	Laboratory Methane Result (ppm_v)
10'	693,359
20'	588,079
30'	2,402
40'	3,421

Soil Gas Sample Location 4

Depth (ft bgs)	Laboratory Methane Result (ppm_v)
10'	428,756
10' Duplicate	431,674
20'	89,282
30'	390,065
40'	272,271

Soil Gas Sample Location 5

Depth (ft bgs)	Laboratory Methane Result (ppm_v)
10'	42,747
10' Duplicate	40,187
20'	42,025
30'	29,746
38'	27,065

Soil Gas Sample Location 6

Depth (ft bgs)	Laboratory Methane Result (ppm_v)
10'	51,743
20'	41,773
30'	69,992
40'	33,615

Soil Gas Sample Location 7

Depth (ft bgs)	Laboratory Methane Result (ppm_v)
10'	423,109
10' Duplicate	434,861
20'	72
20' Duplicate	73
30'	473,836
40'	213

Legend

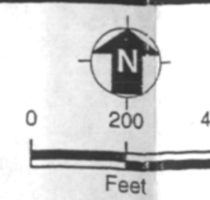
(ft bgs) Feet below ground surface

ppm_v Parts per million by volume of air

▲ Approximate soil gas sample location

▭ Landfill site boundary

Source: Hastings East, NE 7.5 Minute DOQ, 2003 FSA Imagery



South Landfill Site
Hastings, Nebraska

Figure 2
Soil Gas Sample Locations and Methane Results

Date: 07/05/05

Drawn By: Sasquil Environmental

APPENDIX C

Scope of Investigation

EXHIBIT "A" to GENERAL PROVISIONS ATTACHED TO
LETTER AGREEMENT FOR PROFESSIONAL SERVICES
BETWEEN CLIENT AND OA, DATED SEPTEMBER 20, 2005

DESCRIPTION OF BASIC PROFESSIONAL SERVICES AND RELATED MATTERS

This is an exhibit attached to and made a part of the General Provisions attached to the Proposed Letter Agreement for Professional Services dated September 20, 2005 between the City of Hastings (Client) and Olsson Associates (OA) providing for professional services. The Basic Services of OA are as indicated below.

GENERAL

OA shall perform for Client professional services in all phases of the Project to which this Agreement applies as hereinafter provided. These services will include serving as Client's professional representative for the Project, providing professional consultation and advice and furnishing customary services incidental thereto.

BASIC SERVICES

Task 1 – Monitor Buildings for Methane Gas

OA will take methane gas readings at buildings near the south landfill. Specifically, a methane gas reading will be taken at each building in the first row of residences and buildings north of the landfill, and at the buildings nearest to the southwest side of the landfill, east of Spencer Avenue. OA will also take a methane gas reading at each of the sewer manholes immediately north of the landfill. A verbal report of the readings will then be given Client. A written description of the monitoring event will be included in the report provided under Task 2. Client is expected to contact the owners and/or residents of the buildings, and the owner of the sewer, to get approval for the monitoring in time for OA to perform the monitoring as described. Client is also expected to accompany OA during the monitoring, and make arrangements for opening the sewer manholes.

Task 2 – Investigation of the Extent of Subsurface Methane Gas Migration

OA will conduct an investigation at the south landfill during one mobilization to the landfill. The purpose of the investigation is to identify the vertical and lateral extent of methane gas migration. The action level will be the lower explosive level (LEL) of methane (5% methane per volume of air (50,000 ppm)).

This investigation will be a continuation of the investigation conducted in June 2005. At that time seven (7) locations were monitored around the perimeter of the landfill. Field readings at three of these locations (Location 1, 5, and 6) are below the action level, so no further investigation is planned near these sites. Field readings at the remaining sites, Location 2, 3, 4, and 7, are above the action level. Therefore, this investigation will be conducted near these four (4) sites. The investigation will continue until the locations monitored show methane gas readings below the action level.

Task 2A – Initial Investigation

The initial investigation will consist of the following:

1. Monitor the concentration of methane gas in the subsurface outside of Locations 2, 3, 4, and 7. Monitoring will be conducted using direct-push equipment and a meter calibrated to measure the concentration of methane gas. Measurements will be taken in each probe hole at 10-foot intervals. Based on the readings measured in the previous investigation, it is anticipated that monitoring will be conducted to the following depths:

Location	Depth
2	30'
3	40'
4	50'
7	40'

2. Review the monitoring results with Client during and/or immediately after the readings are taken. These reading will be compared to the action level to determine if additional investigation is needed. Additional investigation will be conducted as described in Task 2B, if necessary.
3. Following the investigation, OA will submit a letter report to Client summarizing this investigation. The report will also include a summary of the monitoring conducted at the buildings under Task 1.

Task 2B – Additional Investigation (if necessary)

OA will monitor the concentration of methane gas at additional depths and/or additional locations outside of the landfill as necessary to identify the extent of gas migration. The monitoring approach will be the same as described under Task 2A.1 above. This monitoring will be conducted during the same mobilization to the landfill under Task 2A.

APPENDIX D

Monitoring of Buildings and Structures

METHANE GAS MIGRATION INVESTIGATION
South Landfill Subsite Operable Unit #5
Methane Gas Field Readings, Collected November 22, 2005

Structure Type	Structure Location	Methane (ppm)
Good Samaritan Village Duplex	817-819 Circle N – main floor	100-120
	817-819 Circle N – basement	40-80
	810-812 Circle N – main floor	20
	810-812 Circle N – basement	40-80
	819-817 Circle O – main floor	120
	819-817 Circle O – basement	40-120
	810-812 Circle P – main floor	0-60
	810-812 Circle P – basement	120-220
	819-817 Circle P – main floor	0-100
	819-817 Circle P – basement	100-300
	825-827 Circle P – main floor	0-40
	825-827 Circle P – basement	0-140
	819-817 Circle Q – main floor	0-40
	819-817 Circle Q – basement	40-360
Business	Miller Masonry – floor	0
	Miller Masonry – crack in floor at walk in door	240
Sanitary Sewer Manhole	#1 – eastern most manhole – 1'	5360
	#1 – eastern most manhole – 12'	5460
	#2 – western most manhole – 1'	2700
	#2 – western most manhole – 5'	3480
	#3 – next east manhole – 1'	2900
	#3 – next east manhole – 5'	3520
	#4 – next east manhole – 1'	3160
	#4 – next east manhole – 5'	3840
	#5 – next east manhole – 1'	5100
	#6 – next east manhole – 1'	5440
	#6 – next east manhole – 5'	5580

All basements/crawl spaces are in duplexes. Main floor readings were taken in only one side of duplex. The basements/crawl spaces are 2 ½ to 4 feet deep. The majority of the basement/crawl space floor is covered with plastic and in some cases carpet or cardboard. Manhole measurements are depth below top of manhole.

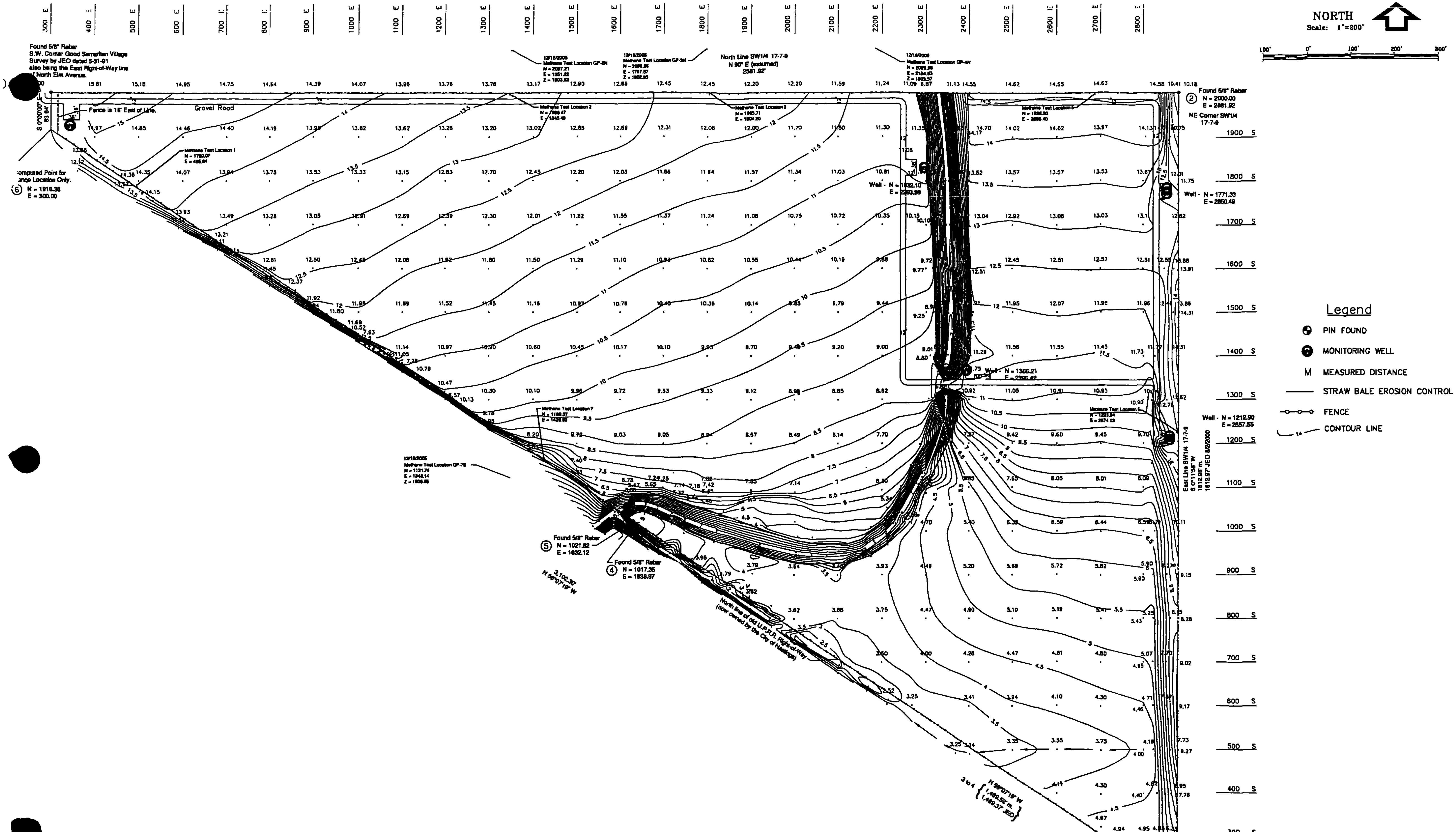
APPENDIX E

Subsurface Monitoring Locations and Results

METHANE GAS MIGRATION INVESTIGATION
South Landfill Subsite Operable Unit #5
Hastings, Nebraska

Subsurface Methane Gas Field Readings
December 15, 2005

Geoprobe Location (elevation)	Depth (ft below ground)	Methane Gas Reading (ppm)	O_2 Reading (%)	Time
GP-2N 1903.67'	10	no flow	20.9	1328
	20	20	20.9	1335
	30	80	20.9	1345
GP-3N 1902.95'	10	1740	20.8	1213
	20	240	20.9	1205
	30	540	20.9	1158
	40	4000	20.8	1150
GP-4N 1903.57'	10	40	20.9	0925
	20	800	18.1	0938
	30	460	20.2	0950
	40	740	20.9	1010
	50	580	20.9	1020
GP-7S 1906.65'	10	540	18.9	1416
	20	0	20.9	1425
	30	920	20.8	1437
	40	540	20.7	1445



CITY OF HASTINGS, ENGINEERING DEPT.

Project	SOUTH LANDFILL EVAPOTRANSPIRATION CAP
Proj. No.	SLEC-2004
Description	Final Grading
Design By	D.W.M.
Date	3/2005
Drawn By	B.B.
Sht. No.	1 of 1

APPENDIX A

PEDIGREE INFORMATION FOR WELLS

MONITORED AT THE SOUTH LANDFILL SUBSITE

Pedigree Information for Wells Monitored at the South Landfill Subsite

Well ID	Legal Location	Registration Number	Well Use	Well Depth (ft)	Screened Interval (ft)	Owner
SL-01	7N-9W-17CB		M	138.9	119.1 – 138	
SL-02	7N-9W-17CA		M	137.2	112.7 – 132.2	
SL-03	7N-9W-17CA		M	140	115 – 135	
SL-04S	7N-9W-17CA		M	138	113 – 133	
SL-04D	7N-9W-17CA		M	179	159 – 179	
SL-05S	7N-9W-17CA		M	140	115 – 135	
SL-05D	7N-9W-17CA		M	179	159 - 179	
D-01	7N-9W-17DD		D			Floyd Frerichs
D-10	7N-9W-20AA		D			Gerald Frerichs
D-31	7N-9W-17CB		I			Jim Dykeman
M-20	7N-9W-18AC	G-70350	PS	220	142-152, 162-192, 200-220	Hastings Utilities

M – monitoring; D – domestic; I – irrigation; PS – public supply

APPENDIX B

ANALYTICAL DATA FOR WELLS

MONITORED AT THE SOUTH LANDFILL SUBSITE

SL-01 (upgradient)

Date	conductivity µmhos/cm	chloride mg/L	temperature °C	pH	alkalinity mg/L	dissolved O_2 mg/L	Eh (+) mV	TOC mgC/L	PCE mg/L	TCE µg/L	c-1,2-DCE µg/L	1,1-DCE µg/L
7/18/1995*									0.4	<1	<1	<2
10/24/1995*									<1	<1	<1	<2
1/23/1996*									<1	<1	<1	<2
12/6/2000	900	27	12.8	6.8	67	6.3	478	1.9	<1	<1	<1	<1
5/23/2003	920	29	14.5	6.4	312	6.3	343	2.3	<1	<1	<1	<1
8/26/2003	1110	29	15.0	6.3	314	5.5	363	2.5	<1	<1	<1	<1
11/20/2003	978	27	14.4	6.3	292	6.0	323	1.4	<1	<1	<1	<1
3/3/2004	1060	44	14.2	6.3	320	8.5	328	1.3	<1	<1	<1	<1
5/26/2004	808	33	14.7	6.4	285	9.1	334	2.7	<1	<1	<1	<1
8/26/2004	856	44	14.5	6.0	308	6.1	349	1.9	<1	<1	<1	<1
11/17/2004	911	43	14.3	6.9	360	9.1	312	2.0	<1	<1	<1	<1

Date	Vinyl Cl µg/L	1,1,1-TCA µg/L	1,1-DCA µg/L	benzene µg/L	nitrate-N mg/L	nitrite-N mg/L	manganese mg/L	sulfate mg/L	iron mg/L	methane µg/L	ethane µg/L	ethene µg/L
7/18/1995*	1	<1	<1	<1								
10/24/1995*	<1	<1	<1	<1								
1/23/1996*	<1	<1	<1	<1								
12/6/2000	<1	<1	<1		7.6	<0.1	ND	82	ND	9.7	<1	<1
5/23/2003	<1	<1	<1	<1	11	<0.1	ND	80	ND	<1	<1	<1
8/26/2003	<1	<1	<1	<1	12	<0.1	ND	83	ND	<1	<1	<1
11/20/2003	<1	<1	<1	<1	12	<0.1	ND	78	ND	<1	<1	<1
3/3/2004	<1	<1	<1	<1	13	<0.1	ND	87	ND	<1	<1	<1
5/26/2004	<1	<1	<1	<1	13	<0.1	ND	88	ND	<1	<1	<1
8/26/2004	<1	<1	<1	<1	12	<0.1	ND	87	ND	<1	<1	<1
11/17/2004	<1	<1	<1	<1	13	<0.1	ND	91	ND	<1	<1	<1

* Morrison Knudsen, 1996

SL-02 (mid-landfill, western edge)

Date	conductivity µmhos/cm	chloride mg/L	temperature °C	pH	alkalinity mg/L	dissolved O_2 mg/L	Eh (+) mV	TOC mgC/L	PCE µg/L	TCE µg/L	c-1,2-DCE µg/L	1,1-DCE µg/L
7/18/1995*									11	33	75	28
10/24/1995*									12	52	72	29
1/23/1996*									11	292	94	27
12/7/2000	972	54	14.3	6.6	92	0.6	525	2.9	9.2	16	39	17
5/23/2003	1160	53	15.8	6.4	388	0.9	275	3.3	6.9	20	50	18
8/26/2003	1340	55	16.0	6.1	320	0.3	314	3.8	6.4	29	68	17
11/20/2003	1210	44	15.6	6.1	385	0	269	2.2	7.5	22	69	17
3/3/2004	1250	63	15.2	6.1	340	1.5	289	2.0	8.9	24	63	21
5/26/2004	1030	44	16.4	6.3	390	2.0	268	3.9	6.4	27	70	19
8/26/2004	982	65	17.1	4.1	392	1.5	328	2.6	7.8	27	67	17
11/17/2004	1005	60	15.6	6.8	365	2.9	307	3.1	8.2	29	64	18

Date	Vinyl Cl µg/L	1,1,1-TCA µg/L	1,1-DCA µg/L	benzene µg/L	nitrate-N mg/L	nitrite-N mg/L	manganese mg/L	sulfate mg/L	iron mg/L	methane µg/L	ethane µg/L	ethene µg/L
7/18/1995*	26	7	20	0.5								
10/24/1995*	16	9	12	0.5								
1/23/1996*	13	7	21	0.6								
12/7/2000	5.6	3.8	18		5.4	<0.1	ND	86	ND	1205	<1	<1
5/23/2003	7.5	3.0	17	<1	6.2	<0.1	ND	82	ND	1278	<1	<1
8/26/2003	3.3	3.2	14	<1	7.9	<0.1	ND	90	ND	1228	<1	<1
11/20/2003	7.1	3.2	13	<1	7.3	<0.1	ND	87	ND	1344	<1	<1
3/3/2004	7.8	2.8	16	<1	6.8	<0.1	ND	91	ND	1331	<1	<1
5/26/2004	10	2.7	15	<1	6.9	<0.1	ND	82	ND	1296	<1	<1
8/26/2004	7.1	2.7	14	<1	6.7	<0.1	ND	85	ND	1540	<1	<1
11/17/2004	9.1	2.9	15	<1	5.8	<0.1	ND	85	ND	1458	<1	<1

* Morrison Knudsen, 1996

SL-03 (immediately upgradient)

Date	conductivity µmhos/cm	chloride mg/L	temperature °C	pH	alkalinity mg/L	dissolved O_2 mg/L	Eh (+) mV	TOC mgC/L	PCE mg/L	TCE µg/L	c-1,2-DCE µg/L	1,1-DCE µg/L
7/18/1995*									6	220	52	3
10/24/1995*									8	300	74	3
1/23/1996*									7	51	340	3
12/7/2000	748	29	15.0	6.1	56	0.7	414	1.8	12	876	195	4
5/23/2003	740	31	15.1	5.9	344	0.5	283	2.2	7.6	712	139	2.5
8/26/2003	882	33	15.8	5.7	320	0.3	323	3.2	9.1	857	174	3.2
11/20/2003	784	28	15.7	5.7	305	0	276	1.6	9.7	974	184	3.6
3/3/2004	764	32	14.9	5.8	255	2.8	293	1.4	8.3	698	159	3.1
5/26/2004	629	24	16.1	6.0	320	2.0	283	3.1	6.9	625	149	2.7
8/26/2004	677	43	16.5	5.9		1.3	346	1.6	11	791	165	2.8
11/17/2004	694	37	15.4	6.7	290	2.7	317	1.7	9.1	693	159	3.1

Date	Vinyl Cl µg/L	1,1,1-TCA µg/L	1,1-DCA µg/L	benzene µg/L	nitrate-N mg/L	nitrite-N mg/L	manganese mg/L	sulfate mg/L	iron mg/L	methane µg/L	ethane µg/L	ethene µg/L
7/18/1995*	28	1	<1	<1								
10/24/1995*	27	2	<1	0.2								
1/23/1996*	21	1	<1	<1								
12/7/2000	37	<1	<1		0.8	<0.1	ND	57	ND	1986	<1	<1
5/23/2003	36	<1	<1	<1	0.9	<0.1	ND	51	ND	1970	<1	1.1
8/26/2003	34	<1	<1	<1	1.5	<0.1	ND	60	ND	2023	<1	<1
11/20/2003	34	<1	<1	<1	0.6	<0.1	ND	57	ND	2589	<1	<1
3/3/2004	39	<1	<1	<1	0.4	<0.1	ND	45	ND	2241	<1	<1
5/26/2004	48	<1	1.2	<1	0.2	<0.1	ND	42	ND	2040	<1	<1
8/26/2004	38	<1	<1	<1	<0.1	<0.1	ND	42	ND	2622	<1	<1
11/17/2004	43	<1	1.2	<1	0.2	<0.1	ND	42	ND	2608	<1	1.4

* Morrison Knudsen, 1996

SL-04S (southeast edge of landfill)

Date	conductivity µmhos/cm	chloride mg/L	temperature °C	pH	alkalinity mg/L	dissolved O_2 mg/L	Eh (+) mV	TOC mgC/L	PCE mg/L	TCE µg/L	c-1,2-DCE µg/L	1,1-DCE µg/L
7/18/1995*									8	22	42	25
10/24/1995*									12	37	55	19
1/23/1996*									12	30	47	29
12/7/2000	929	40	14.0	6.5	80	0.4	358	2.2	8	13	16	13
5/23/2003	990	43	15.5	6.0	370	0.8	231	2.7	6.2	13	21	15
8/26/2003	1210	45	16.1	6.1	392	0.4	341	4.2	6.7	13	25	12
11/20/2003	1120	35	15.8	6.0	380	0	274	1.8	7.4	14	33	13
3/3/2004	1140	54	15.4	6.1	400	1.9	256	1.8	8.5	14	35	13
5/26/2004	891	36	15.8	6.2	400	2.6	253	3.3	6.5	13	32	13
8/26/2004	1010	63	16.9	6.0	405	1.8	333	2.5	9.6	14	28	12
11/17/2004	976	55	16.1	6.9	390	2.7	310	2.7	8.3	14	36	11

Date	Vinyl Cl µg/L	1,1,1-TCA µg/L	1,1-DCA µg/L	benzene µg/L	nitrate-N mg/L	nitrite-N mg/L	manganese mg/L	sulfate mg/L	iron mg/L	methane µg/L	ethane µg/L	ethene µg/L
7/18/1995*	44	9	18	0.6								
10/24/1995*	15	9	18	0.7								
1/23/1996*	23	11	22	0.8								
12/7/2000	9	4	16		1.3	<0.1	ND	48	<1	1513	<1	<1
5/23/2003	10	2.6	15	<1	3.2	<0.1	ND	62	ND	1440	<1	<1
8/26/2003	6.1	2.7	14	<1	3	<0.1	ND	56	ND	1379	<1	<1
11/20/2003	5.9	2.8	15	<1	3.3	<0.1	ND	67	ND	1724	<1	<1
3/3/2004	6.8	2.7	15	<1	3.5	<0.1	ND	66	ND	1550	<1	<1
5/26/2004	10	2.3	17	<1	3.1	<0.1	ND	65	ND	1643	<1	<1
8/26/2004	6.3	2.5	17	<1	2.4	<0.1	ND	61	ND	1790	<1	<1
11/17/2004	6.0	2.6	15	<1	3.2	<0.1	ND	68	ND	2109	<1	<1

* Morrison Knudsen, 1996

SL-04D (southeast edge of landfill)

Date	conductivity µmhos/cm	chloride mg/L	temperature °C	pH	alkalinity mg/L	dissolved O_2 mg/L	Eh (+) mV	TOC mgC/L	PCE mg/L	TCE µg/L	c-1,2-DCE µg/L	1,1-DCE µg/L
7/18/1995*									<1	<1	<1	<2
10/24/1995*									<1	<1	<1	<2
1/23/1996*									<1	<1	<1	<2
12/7/2000	550	21	14.0	7.1	40	7.4	466	0.9	<1	<1	<1	<1
5/23/2003	570	20	14.8	6.4	221	7.3	337	1.0	<1	<1	<1	<1
8/26/2003	657	22	15.4	6.6	200	7.7	309	1.2	<1	<1	<1	<1
11/20/2003	604	19	14.7	6.4	190	7.0	269	0.7	<1	<1	<1	<1
3/3/2004	600	25	14.5	6.4	160	8.9	314	0.6	<1	<1	<1	<1
5/26/2004	493	18	15.1	6.5	200	9.5	312	1.5	<1	<1	<1	<1
8/26/2004	537	25	15.7	5.9	230	7.6	332	1.4	<1	<1	<1	<1
11/17/2004	596	24	15.2	7.0	180	10.2	303	1.1	<1	<1	<1	<1

Date	Vinyl Cl µg/L	1,1,1-TCA µg/L	1,1-DCA µg/L	benzene µg/L	nitrate-N mg/L	nitrite-N mg/L	manganese mg/L	sulfate mg/L	iron mg/L	methane µg/L	ethane µg/L	ethene µg/L
7/18/1995*	<1	<1	<1	<1								
10/24/1995*	<1	<1	<1	<1								
1/23/1996*	<1	<1	<1	<1								
12/7/2000	<1	<1	<1	<1	6.9	<0.1	ND	36	ND	6.4	<1	<1
5/23/2003	<1	<1	<1	<1	8.7	<0.1	ND	43	ND	<1	<1	<1
8/26/2003	<1	<1	<1	<1	9.1	<0.1	ND	35	ND	5.7	<1	<1
11/20/2003	<1	<1	<1	<1	9.3	<0.1	ND	47	ND	<1	<1	<1
3/3/2004	<1	<1	<1	<1	8.8	<0.1	ND	45	ND	<1	<1	<1
5/26/2004	<1	<1	<1	<1	8.8	<0.1	ND	45	ND	<1	<1	<1
8/26/2004	<1	<1	<1	<1	9.0	<0.1	ND	49	ND	<1	<1	<1
11/17/2004	<1	<1	<1	<1	9.0	<0.1	ND	48	ND	<1	<1	<1

* Morrison Knudsen, 1996

SL-05S (east edge of landfill; north well cluster)

Date	conductivity µmhos/cm	chloride mg/L	temperature °C	pH	alkalinity mg/L	dissolved O_2 mg/L	Eh (+) mV	TOC mgC/L	PCE mg/L	TCE µg/L	c-1,2-DCE µg/L	1,1-DCE µg/L
7/18/1995*									5	54	5	7
10/24/1995*									6	52	4	8
1/23/1996*									5	59	5	7
12/6/2000	780	30	14.1	6.6	57	1.7	346	2.0	6	102	25	2
5/23/2003	840	37	15.3	6.1	390	1.0	257	2.5	7.0	253	66	2.7
8/26/2003	1080	43	16.1	6.0	368	1.2	278	2.6	6.1	236	59	2.6
11/20/2003	944	34	15.4	5.9	330	0	213	1.6	7.7	277	69	3.1
3/3/2004	882	40	15.0	5.9	360	1.6	273	1.4	7.2	304	73	3.3
5/26/2004	739	29	16.0	6.1	320	2.1	254	3.4	6.5	308	81	3.3
8/26/2004	831	54	16.5	6.2	396	1.4	327	1.8	8.8	285	70	2.8
11/17/2004	826	45	15.6	6.8	320	2.6	310	1.8	7.4	297	72	2.9

Date	Vinyl Cl µg/L	1,1,1-TCA µg/L	1,1-DCA µg/L	benzene µg/L	nitrate-N mg/L	nitrite-N mg/L	manganese mg/L	sulfate mg/L	iron mg/L	methane µg/L	ethane µg/L	ethene µg/L
7/18/1995*	16	8	4	0.3								
10/24/1995*	10	10	6	0.5								
1/23/1996*	9	8	5	0.4								
12/6/2000	8	2	6		0.1	<0.1	ND	36	ND	490	<1	<1
5/23/2003	17	<1	7.7	<1	<0.1	<0.1	ND	41	ND	1668	<1	<1
8/26/2003	13	1.2	9.4	<1	<0.1	<0.1	ND	41	ND	1395	<1	<1
11/20/2003	14	1.5	11	<1	<0.1	<0.1	ND	39	ND	1722	<1	<1
3/3/2004	16	1.1	7.4	<1	<0.1	<0.1	ND	40	ND	1697	<1	<1
5/26/2004	24	<1	8.7	<1	0.2	<0.1	ND	41	ND	1639	<1	<1
8/26/2004	15	1.2	12	<1	<0.1	<0.1	ND	38	ND	1774	<1	<1
11/17/2004	15	1.3	9.3	<1	<0.1	<0.1	ND	40	ND	1950	<1	<1

* Morrison Knudsen, 1996

SL-05D (east edge of landfill; north well cluster)

Date	conductivity µmhos/cm	chloride mg/L	temperature °C	pH	alkalinity mg/L	dissolved O_2 mg/L	Eh (+) mV	TOC mgC/L	PCE mg/L	TCE µg/L	c-1,2-DCE µg/L	1,1-DCE µg/L
7/18/1995*									<1	<1	<1	<2
10/24/1995*									<1	<1	<1	<2
1/23/1996*									<1	<1	<1	<2
12/6/2000	508	19	11.8	7.0	37	7.6	421	0.98	<1	<1	<1	<1
5/23/2003	630	21	14.8	6.7	202	6.7	260	1.1	<1	<1	<1	<1
8/26/2003	678	21	15.7	6.6	182	7.6	151	1.5	<1	<1	<1	<1
11/20/2003	623	18	14.9	6.4	204	6.4	195	0.7	<1	<1	<1	<1
3/3/2004	650	25	14.5	6.4	210	8.8	298	0.7	<1	<1	<1	<1
5/26/2004	537	20	15.4	6.6	188	9.0	280	1.9	<1	<1	<1	<1
8/26/2004	541	23	16.2	6.4	200	7.5	329	0.9	<1	<1	<1	<1
11/17/2004	582	22	15.1	7	200	10	302	1.0	<1	<1	<1	<1

Date	Vinyl Cl µg/L	1,1,1-TCA µg/L	1,1-DCA µg/L	benzene µg/L	nitrate-N mg/L	nitrite-N mg/L	manganese mg/L	sulfate mg/L	iron mg/L	methane µg/L	ethane µg/L	ethene µg/L
7/18/1995*	<1	<1	<1	<1								
10/24/1995*	<1	<1	<1	<1								
1/23/1996*	<1	<1	<1	<1								
12/6/2000	<1	<1	<1		7.4	<0.1	ND	46	ND	1.8	<1	<1
5/23/2003	<1	<1	<1	<1	9.5	<0.1	ND	51	ND	3.2	<1	<1
8/26/2003	<1	<1	<1	<1	10	<0.1	ND	50	ND	3.2	<1	<1
11/20/2003	<1	<1	<1	<1	9.8	<0.1	ND	51	ND	4.7	<1	<1
3/3/2004	<1	<1	<1	<1	9.8	<0.1	ND	52	ND	3.7	<1	<1
5/26/2004	<1	<1	<1	<1	10	<0.1	ND	52	ND	2.3	<1	<1
8/26/2004	<1	<1	<1	<1	8.6	<0.1	ND	48	ND	4.4	<1	<1
11/17/2004	<1	<1	<1	<1	8.3	<0.1	ND	51	ND	4.0	<1	<1

* Morrison Knudsen, 1996

D-01 (Floyd Frerichs)

Date	conductivity µmhos/cm	chloride mg/L	temperature °C	pH	alkalinity mg/L	dissolved O_2 mg/L	Eh (+) mV	TOC mgC/L	PCE mg/L	TCE µg/L	c-1,2-DCE µg/L	1,1-DCE µg/L
7/14/2000									<1	<1	<1	<1
12/7/2000	654	82	11.8	6.9	65	8.4	474	3.8	<1	<1	<1	<1
6/2/2003	1200	62	14.9	6.9	320	10.5	305	3.6	<1	<1	<1	<1
8/26/2003	616	28	15.0	6.5	240	8.9	348	3.0	<1	<1	<1	<1
11/20/2003	1220	42	15.1	6.6	350	10.4	305	2.0	<1	<1	<1	<1
3/3/2004	1130	57	13.2	6.7	396	9.6	338	1.6	<1	<1	<1	<1
5/26/2004	951	50	16.5	6.9	395	10.3	284	3.3	<1	<1	<1	<1
8/26/2004	551	28	16.3	5.9	240	8.0	364	0.8	<1	<1	<1	<1
11/17/2004	748	37	14.9	6.7	250	10.6	341	1.6	<1	<1	<1	<1

Date	Vinyl Cl µg/L	1,1,1-TCA µg/L	1,1-DCA µg/L	benzene µg/L	nitrate-N mg/L	nitrite-N mg/L	manganese mg/L	sulfate mg/L	iron mg/L	methane µg/L	ethane µg/L	ethene µg/L
7/14/2000	<1	<1	<1									
12/7/2000	<1	<1	<1		22	<0.1	ND	44	ND	<1	<1	<1
6/2/2003	<1	<1	<1	<1	17	<0.1	ND	42	ND	<1	<1	<1
8/26/2003	<1	<1	<1	<1	6.3	<0.1	ND	21	ND	<1	<1	<1
11/20/2003	<1	<1	<1	<1	18	<0.1	ND	43	ND	<1	<1	<1
3/3/2004	<1	<1	<1	<1	18	<0.1	ND	36	ND	<1	<1	<1
5/26/2004	<1	<1	<1	<1	19	<0.1	ND	42	ND	1.2	<1	<1
8/26/2004	<1	<1	<1	<1	5.4	<0.1	ND	19	ND	<1	<1	<1
11/17/2004	<1	<1	<1	<1	10	<0.1	ND	28	ND	<1	<1	<1

D-10 (Gerald Frerichs)

Date	conductivity µmhos/cm	chloride mg/L	temperaure °C	pH	alkalinity mg/L	dissolved O_2 mg/L	Eh (+) mV	TOC mgC/L	PCE mg/L	TCE µg/L	c-1,2-DCE µg/L	1,1-DCE µg/L
7/14/2000									<1	<1	<1	<1
12/7/2000	388	12	11.5	6.9	24	7.6	417	0.8	<1	<1	<1	<1
6/2/2003	460	15	15.0	6.4	160	10.5	313	1.0	<1	<1	<1	<1
8/26/2003	470	12	16.8	6.6	184	6.0	348	1.9	<1	<1	<1	<1
11/20/2003	449	12	16.5	6.4	180	15.7	326	0.6	<1	<1	<1	<1
3/3/2004	462	16	12.4	6.3	200	7.9	362	0.6	<1	<1	<1	<1
5/26/2004	408	14	18.2	6.4	186	8.6	317	1.7	<1	<1	<1	<1
8/26/2004	395	14	16.4	5.4	136	7.1	374	<0.5	<1	<1	<1	<1
11/17/2004	467	17	15.5	6.4	200	9.1	353	0.9	<1	<1	<1	<1

Date	Vinyl Cl µg/L	1,1,1-TCA µg/L	1,1-DCA µg/L	benzene µg/L	nitrate-N mg/L	nitrite-N mg/L	manganese mg/L	sulfate mg/L	iron mg/L	methane µg/L	ethane µg/L	ethene µg/L
7/14/2000	<1	<1	<1									
12/7/2000	<1	<1	<1		1.5	<0.1	ND	15	ND	<1	<1	<1
6/2/2003	<1	<1	<1	<1	3.2	<0.1	ND	23	ND	<1	<1	<1
8/26/2003	<1	<1	<1	<1	3.8	<0.1	ND	18	ND	<1	<1	<1
11/20/2003	<1	<1	<1	<1	3.2	<0.1	ND	21	ND	<1	<1	<1
3/3/2004	<1	<1	<1	<1	3.1	<0.1	ND	19	ND	<1	<1	<1
5/26/2004	<1	<1	<1	<1	3.2	<0.1	ND	19	ND	<1	<1	<1
8/26/2004	<1	<1	<1	<1	3.2	<0.1	ND	19	ND	<1	<1	<1
11/17/2004	<1	<1	<1	<1	3.4	<0.1	ND	22	ND	<1	<1	<1

D-31 (Jim Dykeman)

Date	conductivity µmhos/cm	chloride mg/L	temperature °C	pH	alkalinity mg/L	dissolved O_2 mg/L	Eh (+) mV	TOC mgC/L	PCE mg/L	TCE µg/L	c-1,2-DCE µg/L	1,1-DCE µg/L
7/18/1995									<1	<1	<1	<2
12/6/2000	431	13	11.8	7.0	34	6.0	435	0.54	<1	<1	<1	<1
6/2/2003	480	14	14.3	6.8	172	9.4	273	0.74	<1	<1	<1	<1
8/26/2003	489	12	14.9	7.0	180	8.3	313	1.7	<1	<1	<1	<1
11/20/2003	432	9.3	14.2	6.8	180	9.0	291	0.4	<1	<1	<1	<1
5/26/2004	362	11	14.6	5.8	180	14.3	347	1.4	<1	<1	<1	<1
8/26/2004	375	13	15.1	5.6	192	11.0	341	<0.5	<1	<1	<1	<1

Date	Vinyl Cl µg/L	1,1,1-TCA µg/L	1,1-DCA µg/L	benzene µg/L	nitrate-N mg/L	nitrite-N mg/L	manganese mg/L	sulfate mg/L	iron mg/L	methane µg/L	ethane µg/L	ethene µg/L
7/18/1995	<1	<1	<1	<1								
12/6/2000	<1	<1	<1		4.3	<0.1	ND	18	ND	<1	<1	<1
6/2/2003	<1	<1	<1	<1	5.6	2.8	ND	24	ND	<1	<1	<1
8/26/2003	<1	<1	<1	<1	4.8	<0.1	ND	18	ND	<1	<1	<1
11/20/2003	<1	<1	<1	<1	4.3	<0.1	ND	21	ND	<1	<1	<1
5/26/2004	<1	<1	<1	<1	4.0	<0.1	ND	21	ND	<1	<1	<1
8/26/2004	<1	<1	<1	<1	3.4	<0.1	ND	20	ND	<1	<1	<1

Date	conductivity µmhos/cm	chloride mg/L	temperature °C	pH	alkalinity mg/L	dissolved O_2 mg/L	Eh (+) mV	TOC mgC/L	PCE mg/L	TCE µg/L	c-1,2-DCE µg/L	1,1-DCE µg/L
7/18/1995									<1	<1	<1	<2
5/23/2003		22						1.1	<1	<1	<1	<1
8/26/2003		52						2.1	<1	<1	<1	<1
5/26/2004	509	19	16.1	6.6	250	13.8	75	1.8	<1	<1	<1	<1
8/26/2004	743	41	17.9	5.1	244	9.0	334	1.4	<1	<1	<1	<1

Date	Vinyl Cl µg/L	1,1,1-TCA µg/L	1,1-DCA µg/L	benzene µg/L	nitrate-N mg/L	nitrite-N mg/L	manganese mg/L	sulfate mg/L	iron mg/L	methane µg/L	ethane µg/L	ethene µg/L
7/18/1995	<1	<1	<1	<1								
5/23/2003	<1	<1	<1	<1	7.8	<0.1		37		<1	<1	<1
8/26/2003	<1	<1	<1	<1	14	<0.1		52		<1	<1	<1
5/26/2004	<1	<1	<1	<1	7.4	<0.1	ND	40	ND	<1	<1	<1
8/26/2004	<1	<1	<1	<1	9.4	<0.1	ND	42	ND	<1	<1	<1

APPENDIX C

WATER LEVEL DATA FOR SOUTH LANDFILL SUBSITE

MONITORING WELLS

Water Level Data for South Landfill Subsite Monitoring Wells

		December 2000			May 2003			August 2003			November 2003		
Well ID	MP Elev. feet	Date	D T W feet	W T Elev feet	Date	D T W feet	W T Elev feet	Date	D T W feet	W T Elev feet	Date	D T W feet	W T Elev feet
SL-1	1917.42	12/6/00	117.87	1799.55	5/23/03	118.70	1798.72	8/26/03	120.62	1796.80	11/20/03	120.87	1796.55
SL-2	1914.15	12/7/00	117.79	1796.36	5/23/03	118.35	1795.80	8/26/03	121.27	1792.88	11/20/03	121.19	1792.96
SL-3	1913.97	12/7/00	117.31	1796.66	5/23/03	117.70	1796.27	8/26/03	119.78	1794.19	11/20/03	120.03	1793.94
SL-4S	1915.63	12/7/00	120.35	1795.28	5/23/03	121.27	1794.36	8/26/03	124.00	1791.63	11/20/03	123.29	1792.34
SL-4D	1916.10	12/7/00	120.29	1795.81	5/23/03	121.17	1794.93	8/26/03			11/20/03	123.95	1792.15
SL-5S	1915.92	12/6/00	120.42	1795.50	5/23/03	120.33	1795.59	8/26/03	123.80	1792.12	11/20/03	123.02	1792.90
SL-5D	1916.11	12/6/00	120.55	1795.56	5/23/03	121.27	1794.84	8/26/03	130.89	1785.22	11/20/03	124.00	1792.11

		March 2004			May 2004			August 2004			November 2004		
Well ID	MP Elev. feet	Date	D T W feet	W T Elev feet	Date	D T W feet	W T Elev feet	Date	D T W feet	W T Elev feet	Date	D T W feet	W T Elev feet
SL-1	1917.42	3/3/04	120.70	1796.72	5/26/04	123.50	1793.92	8/26/04	121.85	1795.57	11/17/04	122.25	1795.17
SL-2	1914.15	3/3/04	120.20	1793.95	5/26/04	119.98	1794.17	8/26/04	121.40	1792.75	11/17/04	121.90	1792.25
SL-3	1913.97	3/3/04	120.50	1793.47	5/26/04	119.68	1794.29	8/26/04	120.95	1793.02	11/17/04	120.95	1793.02
SL-4S	1915.63	3/3/04	123.35	1792.28	5/26/04	122.81	1792.82	8/26/04	124.90	1790.73	11/17/04	125.18	1790.45
SL-4D	1916.10	3/3/04	123.40	1792.70	5/26/04	122.85	1793.25	8/26/04	132.00	1784.10	11/17/04	125.24	1790.86
SL-5S	1915.92	3/3/04	122.70	1793.22	5/26/04	122.65	1793.27	8/26/04	123.00	1792.92	11/17/04	125.00	1790.92
SL-5D	1916.11	3/3/04	123.40	1792.71	5/26/04	122.87	1793.24	8/26/04	131.25	1784.86	11/17/04	125.25	1790.86

APPENDIX D

PEDIGREE INFORMATION AND WELL REGISTRATIONS FOR WELLS POTENTIALLY IMPACTED BY THE SOUTH LANDFILL

Pedigree Information for Wells Potentially Impacted by the South Landfill

EPA ID	Hastings Permit #	DNR Registration Number	Legal Location	Well Type	Well Depth (ft)	Screened Interval (ft)	Capacity (GPM)	Completion Date	Owner
D-01	ICA-152	--	7N 9W 17 DD	D					Floyd Frerichs
CI-10	ICA-028	G-12817	7N 9W 16 CC	I	241	141-241	1100	8/18/04	Robt. & Arlene Laux 925 Sycamore Ave. Hastings, NE
I-21	ICA-176	G-13153	7N 9W 17 DD	I	190	130-190	1000	5/13/56	Gerald Frerichs 413 S. St. Joseph Hastings, NE

D - domestic; I - irrigation

Registration No. G-13153 County of Adams Date Filed SEP 2 1 1

STATE OF NEBRASKA
IRRIGATION WELL REGISTRATION

I, G H Orerichs (Name of Person registering well) of 413 S St. Joe (Postoffice Address)

County of Adams State of Nebr, being first duly sworn upon my oath sa

1st. That the name of the owner of the land upon which the irrigation well is located is Ger Orerichs, of 413 S St Joe Street, Hastings (City or Village) County of Ad

State of Nebr.

2nd. That the irrigation well is located on the SE Quarter of the [illegible] Quarter of Sectio

Township 7, Range 9 of the Sixth P. M., County, and is

feet from the East line and 1300 feet from the South line of said tı

3rd. That the well was installed with the intention of irrigating all or parts of the following

land: 17 - 7 - 9 (Give Quarter, Section, Township and Range)

amounting in all to approximately 160 → (150) acres.

(If installation consists of a battery of wells with one outlet, give details on a sheet to be attached

4th. That the capacity of said well under normal operating conditions is 1000 gallons pe

5th. That the depth of the well is 190 feet, measured from the surface of the ground.

6th. That the inside diameter of the casing is 18 inches.

7th. That the static water level in the well is 112 feet below ground surface.

8th. That the depth to water under normal pumping conditions is 135 (Pumping Level) feet bel surface.

9th. That the diameter of the pump column is 8 5/8 inches. That the diameter of the 3 (Give nu

bowl or bowls is 12 inches.

10th. That the type and size of impeller is as follows:

Type B - BOWLS H + 1/4 C. IMPELLERS

11th. That the well was completed on or about the 19th day of MAY, 195

57-3

Registration No. G-13153 County of Adams Date Filed SEP 2

STATE OF NEBRASKA
CERTIFICATE OF WELL DRILLER

I, PATTERSON BRO'S (Name of Driller) of 143 N MAPLE AVE. H. (Postoffice Address)

County of ADAMS State of NEBRASKA, do hereby certify that:

1. I am the driller of an irrigation well located on the S E Quarter, Section N

Township 7 North, Range 9, owned by Gerd H FRERICH

whose postoffice address is 413 So. ST. JOE, HASTINGS State of NEBRASK

2. That the drilling was begun on the 1ST day of MAY, 1956, and

the 13TH day of MAY, 1956

3. That the well is cased and screened in the following manner: 18" [illegible] (Give kind of casing, lengths and po

130' PLAIN ON TOP & 60' SCREEN ON BOTTOM. screen casing, weight of metallic casing, etc.)

4. That the diameter of drilled hole is 36 inches.

5. That Reverse HYDRAULIC type of drilling machine

6. That the drilled hole is/is not sealed, as follows: 4'X4'X8" cement Box

Pump Head

7. That the following is an accurate log of the depth, thickness and character of the dif penetrated, and the location of water-bearing strata:

DEPTH IN FEET FROM	TO	MATERIAL DRILLED

Mail to
DNR
PO Box 94676
Lincoln, NE 68509-4676
Phone (402)471-2363

10082004 - 161242 - WWRF

January 2004
DNR Form 145

STATE OF NEBRASKA
DEPARTMENT OF NATURAL RESOURCES

Department of Natural Resources (2)

WATER WELL REGISTRATION 2ND REPLACEMENT WELL

FOR DEPARTMENT USE ONLY

Registration Date 10/8/04 Sequence No. 161242 Registration No. G-012817(2R)
Owner Code No. 19124 Receipt No. R116876 Little Blue NRD

1. a. Well Owner's First Name Robert + Arlene Last Name Laux
b. Company Name
c. Correspondent Name Attention
Address 925 Sycamore
City Hastings State NE Zip 68901 Telephone 402)463-4154

2. a. Contractor's License No 39407 Contractor's Name Richard Kirschner
Contractor's Email Address —
b. Drilling Firm Name Fairbanks Irrigation Inc.
Address PoBox 338
City Wood River State NE Zip 68883 Telephone 308) 583-2717
Drilling Firm's Email Address —

3. a. Well location SW ¼ of the SW ¼ of Section 16, Township 7 North, Range 9 East/(West) Adams County.
b. Natural Resources District Little Blue
c. The well is 840 feet from the (North/(South)) section line and 384 feet from the (East/(West)) section line
(circle one) (circle one)
or Latitude Degree 40 Minute 34 Second 12.8
Longitude Degree 098 Minute 21 Second 11.4
d. Street address and subdivision, if applicable
Block Lot
e. Location of water use, if applicable (give legal descriptions) Southwest Quarter of Sec. 16, T7, R9 of Adams Co.
f. If for irrigation, the land to be irrigated is 130 acres.
g. Well reference letter(s), if applicable HHSS PWSID

4. Permits
Management Area Permit Number LBMA-865
Geothermal Permit Number
Municipal Permit Number
Well Spacing Permit Number
HHSS
Surface Water Permit Number
Industrial Permit Number
Transfer Out-Of-State Permit Number
Conduct Permit Number
Other Permit Number
NDEQ

5. Purpose of well (indicate one) ___Aquaculture ___Commercial/Industrial ___Dewatering (over 90 days)
___Domestic ___Ground Heat Exchanger ___Groundwater Source Heat Pump X Irrigation ___Injection
___Livestock ___Monitoring ___Observation ___Public Water Supply (with spacing (46-638))
___Public Water Supply (without spacing) ___Recovery ___Other ___
(indicate use)

6. Wells in a Series.
a. Is this well a part of a series? ___Yes go to part b of this section X No go to part 7 of this application
b. If one or more of the wells in the series is currently registered, give the well registration number
c. How many wells in the series are you registering at this time?

7. Replacement and abandoned well information. 2ND REPLACEMENT WELL
a. Is this well a replacement well? X Yes ___No PREVIOUSLY FILED 6-21-1971
b. Registration number of abandoned well G-012817 If not registered, date abandoned well was constructed (m)__/(d)__/(y)__
c. Replacement well is 30 feet from abandoned well. d. Abandoned well last operated (m) 8 /(d) 12 /(y) 04
e. Original well pump column size 10 inches. f. Completion of original well abandonment on (m) 8 /(d) 20 /(y) 04
g. Location of water use of abandoned well Southwest Quarter of Sec 16, T7 R9 of Adams Co.

8. Pump Information:

G-012817(2R7

a. Is pump installed at this time ✓ Yes ___ No
Is pump installed by well owner in section 1? ___ Yes ✓ No Is pump installed by contractor in section 2? ✓ Yes ___ No
If pump installed by pump installer, please fill out license number below
b. Pump Installer's License No. 69265 Pump Installer's Name Michael Smith
Pump Installer's Email Address ___
Pump Installer's Firm Name Fairbanks Irrigation Inc
Pump Installer's Firm Address Po Box 388
City Wood River State NE Zip 68883 Telephone 308) 583-2717
Pump Installer's Firm Email Address ___
c. Pumping rate 1100 gallons per minute ✓ Measured ___ Estimated
d. Drop pipe diameter 10 inches e. Length of drop pipe 170 feet
f. Pumping equipment installed (m) 8 /(d) 21 /(y) 04 g. Pump Brand WLR
h. This well is designed and constructed to pump less than 50 gpm ___ Yes ✓ No

. Well Construction Information.
a. Total well depth 241 feet. b. Static water level 142 feet.
c. Pumping water level 148 1/2 feet d. Well Construction began (month) 8 /(day) 18 /(year) 04
e. Well Construction completed (month) 8 /(day) 18 /(year) 04 f. Bore hole diameter in inches Top 28 Bottom 28
g. Casing and Screen Joints are Welded ___ Glued ✓ Threaded ___ Other ___

). Well Construction (Casing & Screen)- c, d, e, & g measurements should be in inches to three decimal places

a		b	c	d	e	f	g	h
Placement Depth in Feet		Casing or Screen	Inside Diameter	Outside Diameter	Wall Thickness	Screen Slot Size	Type of Material	Trade Name
From	To							
0	141	Plain Casing	17"	18"	1/2"		PVC	Certainteed
141	241	Screen	17"	18"	1/2"	.085	PVC	Certainteed

1. Grout and Gravel Pack

Placement Depth in Feet		Grout or Gravel Pack	Material Description
From	To		
241	10	Gravel	Class A
10	8	Bentonite Hole Plug	3/8" Chip
8	0	Clay	

2. Geologic Materials Logged

Depth in Feet From	To	Description
0	82	Top Soil + Clay
82	85	Clay + Gravel
85	93	Fine Sand + Gravel + Clay
93	98	Sand + Gravel
98	109	Clay
109	135	Sand + Gravel
135	139	Sand + Gravel + Clay
139	243	Sand + Gravel
243		Stop

(Additional sheets may be submitted)

3. I am familiar with the information submitted on this registration, and to the best of my knowledge it is true.

Richard Kirschner 10/6/04
Water Well Contractor's Signature Date

___ Well Owner's Signature if Contractor is unknown or Deceased ___ Date

APPENDIX E

ANALYTICAL DATA FOR OFF-SITE IRRIGATION WELLS POTENTIALLY IMPACTED BY THE SOUTH LANDFILL

CI-10

Date	conductivity	chloride	temperature	pH	alkalinity	dissolved O_2	Eh	TOC	PCE	TCE	c-1,2-DCE	1,1-DCE
	µmhos/cm	mg/L	°C		mg/L	mg/L	(+) mV	mgC/L	mg/L	µg/L	µg/L	µg/L
7/15/2005*									<1	<1	<1	<1

Date	Vinyl Cl	1,1,1-TCA	1,1-DCA	benzene	nitrate-N	nitrite-N	manganese	sulfate	iron	methane	ethane	ethene
	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L
7/15/2005*	<1	<1	<1	<1								

* Marty Stange, personal communication

Date	conductivity	chloride	temperature	pH	alkalinity	dissolved O_2	Eh	TOC	PCE	TCE	c-1,2-DCE	1,1-DCE
	μmhos/cm	mg/L	°C		mg/L	mg/L	(+) mV	mgC/L	mg/L	μg/L	μg/L	μg/L
8/23/2001*									<1	<1	<1	<1
8/26/2004*									<1	<1	<1	1.2
7/15/2005**									<1	<1	<1	<1

Date	Vinyl Cl	1,1,1-TCA	1,1-DCA	benzene	nitrate-N	nitrite-N	manganese	sulfate	iron	methane	ethane	ethene
	μg/L	μg/L	μg/L	μg/L	mg/L	mg/L	mg/L	mg/L	mg/L	μg/L	μg/L	μg/L
8/23/2001*	<1	<1	1.1	<1								
8/26/2004*	<1	<1	<1	<1								
7/15/2005**	<1	<1	1.9	<1								

* Hastings Utilities, 2005

** Marty Stange, personal communication

METHANE GAS MIGRATION INVESTIGATION REPORT

SOUTH LANDFILL SUBSITE OPERABLE UNIT #5

HASTINGS, NEBRASKA

JANUARY 2006

OLSSON ASSOCIATES
ENGINEERS • PLANNERS • SCIENTISTS • SURVEYORS

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APPENDICES

Executive Summary

Olsson Associates (OA) conducted a subsurface methane gas investigation at the South Landfill Subsite, Operable Unit #5 (South Landfill) on November 22 and December 15, 2005. The objective of this investigation was to identify the extent of methane gas migration to the north and south of the South Landfill. The extent of methane gas migration was defined to be locations where the methane gas reading was below the lower explosive limit for methane (50,000 ppm). In the work plan approved by the United States Environmental Protection Agency, the investigation would involve 1) collecting methane gas readings in the basements or crawl spaces of the residences north of the South Landfill and at the business south of the South Landfill, 2) collecting methane gas readings in the sanitary sewer that runs parallel to the north side of the South Landfill, and 3) collecting methane gas readings in the subsurface outside of the north and south sides of the South Landfill.

The results of this investigation showed methane gas was present at each location sampled. However, none of the methane concentrations were near the lower explosive limit for methane. Therefore, the extent of methane gas migration was identified.

1. Introduction

The City of Hastings, Nebraska (City) contracted with Olsson Associates (OA) to conduct a subsurface methane gas investigation at the South Landfill Subsite, Operable Unit #5 (South Landfill). The South Landfill is located southeast of the City's central business district (see Appendix A). This investigation was performed subsequent to a subsurface methane gas investigation conducted by the City in June 2005. The primary objective of the first investigation was to determine subsurface methane gas concentrations at the boundary/perimeter of the South Landfill. During the first investigation, seven (7) locations were monitored around the perimeter of the landfill. A summary of the results from the first investigation is provided in Appendix B. Field readings at three of the sites monitored (Location 1, 5, and 6) were below the lower explosive limit for methane (LEL). Field readings at the remaining sites, Location 2, 3, 4, and 7, were above the LEL. Because the readings at four locations were above the LEL, the United States Environmental Protection Agency (EPA) required the City to conduct a second investigation to identify the extent of methane gas migration at these four locations, i.e. to the north and south of the South Landfill.

2. Scope of Investigation

The scope of the investigation as approved by EPA is provided in Appendix C. It involved monitoring buildings and structures for methane gas, and investigating the extent of subsurface methane gas migration on the north and south sides of the South Landfill.

A. Monitoring Buildings and Structures

Methane gas readings would be taken at buildings nearest the north and southwest sides of the South Landfill. Specifically, a methane gas reading would be taken at each residence in the first row of residences of the Good Samaritan Village opposite the north side of the landfill, and at a commercial building opposite the southwest side of the landfill, east of Spencer Avenue. Methane gas readings would also be taken at each of the sanitary sewer manholes immediately north of the landfill.

B. Subsurface Investigation

A subsurface investigation would be conducted to identify the vertical and lateral extent of methane gas migration near Location 2, 3, 4, and 7. The investigation would continue until the locations monitored showed methane gas readings below the LEL (5% methane per volume of air (50,000 ppm)), also referred to as the action level.

Monitoring would be conducted using direct-push technology and a meter calibrated to measure the concentration of methane gas. Measurements would be taken in each probe hole at 10-foot intervals. Based on the readings measured in the first investigation, it was anticipated that monitoring would be conducted to the following depths:

Location	Depth
2	30'
3	40'
4	50'
7	40'

These reading will be compared to the action level to determine if additional investigation is needed. If the readings are above the action level, the investigation would be expanded to monitor the concentration of methane gas at additional depths and/or additional locations outside of the landfill as necessary to identify the extent of gas migration. The approach for the additional monitoring would be the same as previously described.

3. *Field Investigation*

Methane gas readings were measured with a Gas-Tech Land Surveyor, which was calibrated prior to being taken to the field. This instrument can measure methane gas in parts per million (ppm), LEL, and percent methane as appropriate, and also measure percent oxygen.

A. Monitoring Buildings and Structures

Methane gas readings were taken at the building and structures near the South Landfill on November 22, 2005.

1) At the Good Samaritan Village (see Appendix D), seven (7) duplexes are located on the south side of the Village and directly north of the South Landfill. Methane gas readings were taken just above the main floor and in the basement/crawl space of each duplex. The methane gas readings are provided in Appendix D. The readings ranged from 0 to 360 ppm methane.
2) The nearest occupied structure southwest of the landfill is a shop used by Miller Masonry. The shop has a manway door on the west side and an overhead door on the east side of the building. The methane gas readings taken at the shop are provided in Appendix D. The readings ranged from 0 to 240 ppm methane.

3) The sanitary sewer that runs parallel to the north side of the South Landfill was monitored at six (6) manholes (see Appendix D). Methane gas readings were taken one-foot below the top of the manhole, and again at 5 to 12-feet below the top of the manhole. The readings were taken by lowering the meter probe through a hole in the manhole lid. The readings ranged from 2,700 to 5,440 ppm methane just below the manhole lid, and 3,480 to 5,580 ppm methane about 5 feet below the manhole lid.

B. Subsurface Investigation

The subsurface investigation involved monitoring subsurface soil gas from four locations, described as follows (see also Appendix E):

1) GP-2N: located north of Location 2, about 95 feet north of the South Landfill fence, and about 10 feet north of the concrete lined ditch between the South Landfill and the Good Samaritan Village.
2) GP-3N: located north of Location 3, about 100 feet north of the South Landfill fence, and about 10 feet north of the concrete lined ditch between the South Landfill and the Good Samaritan Village.
3) GP-4N: located north of Location 4, about 100 feet north of the South Landfill fence, and about 10 feet north of the concrete lined ditch between the South Landfill and the Good Samaritan Village.
4) GP-7S: located south of Location 7, about 76 feet south of the South Landfill fence.

OA conducted the field investigation on December 15, 2005. A Geoprobe 5600, operated by Plains Environmental Services, was used to advance holes to the required depths. At each location, steel rods were pushed and/or driven to the required depth where an extractable point was opened, exposing a small void space where soil gas could be collected. A polyethylene tube was then attached to the bottom of the rod string. The other end of the tube was attached to a hand pump used to purge the tube, bringing the soil gas to the surface. The tube was then detached from the hand pump and attached to the gas meter. The methane and oxygen readings were recorded after the measurements had stabilized. After methane gas and oxygen readings had been taken at each of the appropriate depths at a location, the steel rods were removed, and the hole backfilled with bentonite.

The readings taken at each location and depth are given in Appendix E. The readings ranged from 0 to 4,000 ppm.

4. Summary and Conclusion

A subsurface methane gas investigation was conducted at the South Landfill on November 22 and December 15, 2005. The investigation showed the maximum methane gas reading in the residences north of the landfill (Good Samaritan Village) was 360 ppm. The maximum methane gas reading in the building near south side of the landfill (Miller Masonry) was 240 ppm. The maximum methane gas reading in the sanitary sewer manholes was 5,580 ppm. The maximum subsurface methane gas reading on the north side of the landfill was 4,000 ppm in GP-3N at 40 feet below ground surface. The maximum subsurface methane gas reading on the south side of the landfill was 920 ppm in GP-7S at 40 feet below ground surface.

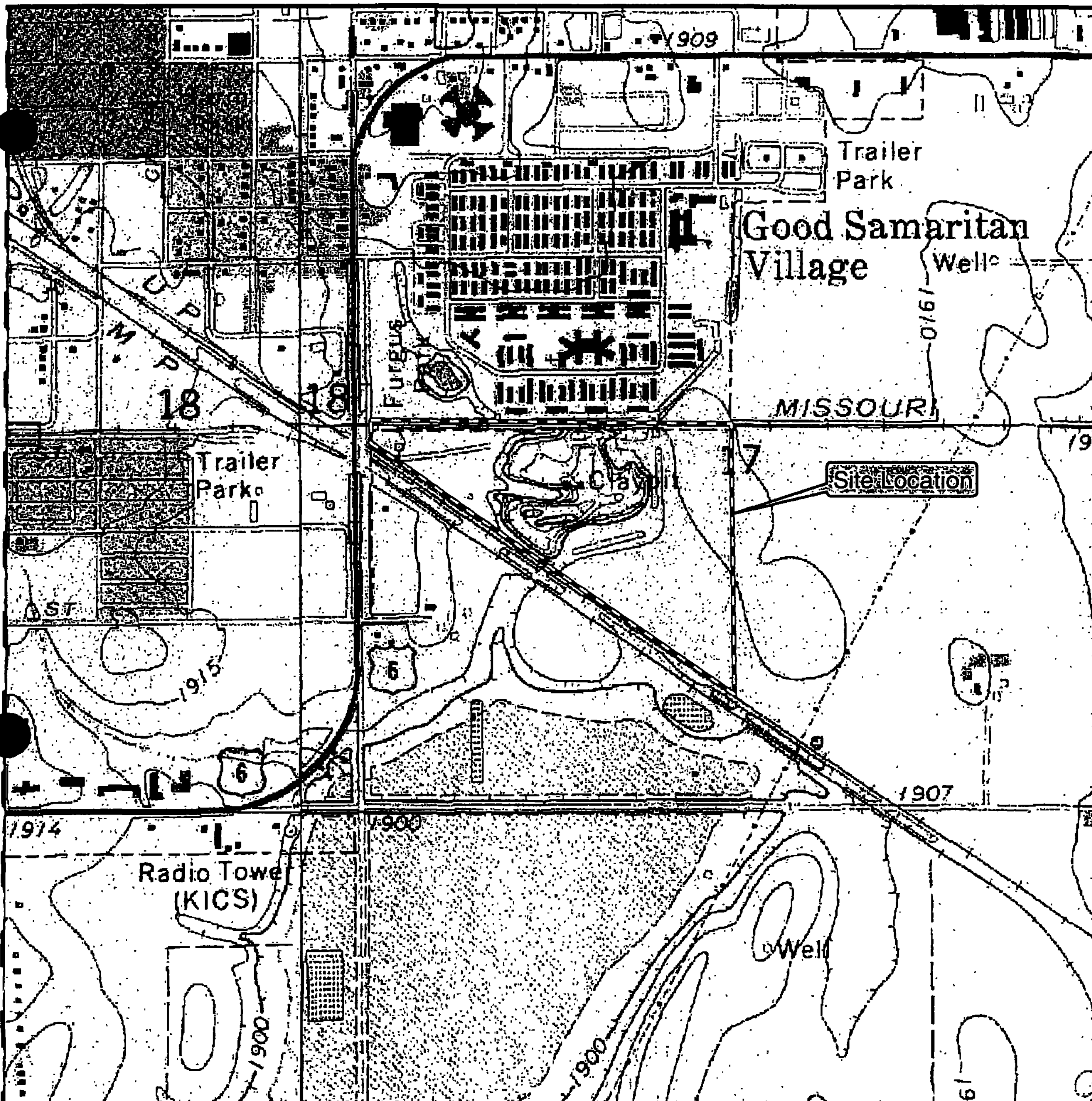
The source of the methane gas in the subsurface is likely methane gas that has migrated from the landfill. The source of the methane gas detected in the buildings and sanitary sewer manholes could potentially be the landfill, although other sources are possible. Other potential sources for the methane gas detected in the buildings include other manmade sources such as sanitary sewage and the natural gas system within the residences (i.e. furnace, water heater, stoves, etc.), and natural sources including bugs and the soil below the buildings. Another potential source for the methane gas detected in the sanitary sewer manholes includes the sanitary sewage in the collection line.

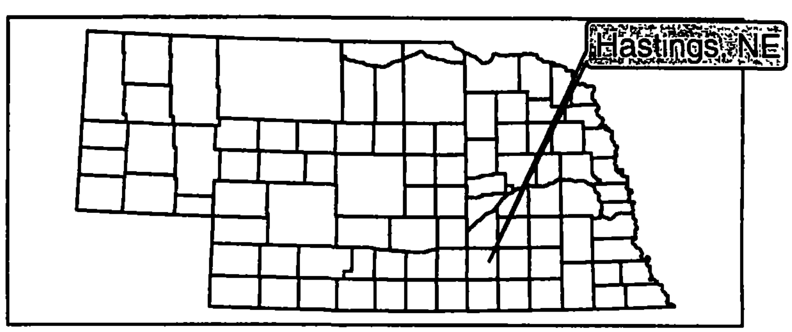
All locations monitored during this investigation gave methane gas readings below the action level of 50,000 ppm. The results of this investigation show the vertical and lateral extent of methane gas migration has been identified.

David J. Montague, PE

APPENDIX A

Location of South Landfill





USGS Hastings East, NE 7.5 Minute Topo Quad, 1969, PR 1983
USGS Hastings West, NE 7.5 Minute Topo Quad, 1969, PR 1983

PROJECT: 2-2005-1468 1-11-702	SITE LOCATION MAP South Landfill Subsite Operable Unit #5 Hastings, Nebraska	OLSSON ASSOCIATES ENGINEERS · PLANNERS · SCIENTISTS · SURVEYORS	FIGURE
DRAWN BY: RD			1
DATE: December 29, 2005			

APPENDIX B

Summary of Results From June 2005 Investigation

TABLE 2

SUMMARY OF FIELD SCREENING DATA AND LABORATORY RESULTS
SOUTH LANDFILL SITE – HASTINGS, NEBRASKA

Sample Location	Sample Depth (' bgs)	Methane – Lab Result (ppm_v)	Methane – Field Screening Result (ppm_v)	O_2 (%)	CO_2 (%)	CO (ppm)	H_2S (ppm)	Barometric Pressure (" of Hg)	Static Pressure (" of H_2O)
1	10	< 5	< 500	20.3	0.5	0	0	27.69	+ 000.02
	20	< 5	< 500	20.5	0.5	NS	0	27.69	+ 000.02
	30	< 5	< 500	17.7	0.2	NS	0	27.74	+ 000.02
	40	< 5	< 500	17.7	1.6	85	0	27.74	+ 000.02
2	10	511,521	300,000	8.4	28.4	54	1	27.76	- 000.13
	20	519,759	290,000	8.2	28.3	94	1	27.74	- 000.13
	30	1,483	NS-IF	NS-IF	NS-IF	NS-IF	NS-IF	NS-IF	NS-IF
	40	<5	NS-IF	NS-IF	NS-IF	NS-IF	NS-IF	NS-IF	NS-IF
3	10	693,359	450,000	5.9	35	9	10	27.80	+ 000.14
	20	588,079	420,000	5.3	44	82	8	27.79	+ 000.10
	30	2,402	142,000	15.1	11.1	> 1,000	10	27.79	+ 000.12
	40	3,421	NS-IF	NS-IF	NS-IF	NS-IF	NS-IF	NS-IF	NS-IF
4	10	428,756 (Laboratory Duplicate = 431,674)	250,000	8.5	32.5	208	8	27.83	- 001.65
	20	89,282	10,600	18.5	4.2	> 1,000	4	27.83	- 001.65
	30	390,065	240,000	6.9	35	85	7	27.83	+ 000.13
	40	272,271	200,000	8.8	29.2	> 1,000	8	27.83	+ 000.12
5	10	42,747 (Laboratory Duplicate = 40,187)	8,000	14.7	16.9	250	3	27.84	- 003.28
	20	42,025	10,000	8.7	24.1	130	2	27.82	+ 000.16
	30	29,746	5,000	6.8	24.6	67	2	27.82	+ 000.15
	38	29,065	2,000	6.9	23.1	152	5	27.82	+ 000.14

TABLE 2 (Continued)

SUMMARY OF FIELD SCREENING DATA AND LABORATORY RESULTS
SOUTH LANDFILL SITE – HASTINGS, NEBRASKA

Sample Location	Sample Depth (' bgs)	Methane – Lab Result (ppm_v)	Methane – Field Screening Result (ppm_v)	O_2 (%)	CO_2 (%)	CO (ppm)	H_2S (ppm)	Barometric Pressure (" of Hg)	Static Pressure (" of H_20)
6	10	51,743	10,600	13.2	14	123	0	27.81	- 001.46
	20	41,773	4,000	15.7	8.3	630	2	27.81	- 001.10
	30	69,992	10,900	8.2	20.6	119	5	27.81	- 001.10
	40	33,615	5,000	8.3	17.4	87	5	27.81	+ 000.16
7	10	423,109 (Laboratory Duplicate =434,861)	338,000	11.4	23.1	0	NS	27.77	+ 000.08
	20	72 (Laboratory Duplicate = 73)	< 500	20.7	1.2	50	NS	27.77	+ 000.07
	30	473,836	220,000	3.8	26.2	127	4	27.77	+ 003.03
	40	213	< 500	20.9	0.5	500	7	27.77	+ 000.08

Notes:

A Landtec GEM 2000 landfill meter was used for field screening of methane, O_2, CO_2, barometric pressure, and static pressure.
An MSA Passport CGI was used for field screening of CO and H_2S.
Shaded results distinguish laboratory results from field screening results, which are not shaded.

" of Hg inches of mercury
" of H_20 inches of water
' feet
% percent
bgs below ground surface
CO carbon monoxide
CO_2 carbon dioxide
H_2S hydrogen sulfide
O_2 oxygen
ppm parts per million
ppm_v parts per million by volume of air
NS-IF not screened due to insufficient flow of soil gas
NS not screened

Appendix 4e - Part 1
Well # 3

APPENDIX 4E, Part I

Well #3 subsite, OU18 Data

State of Nebraska Laboratory 1983 – 1985

Data Collected by EPA and Others 1991 – 1998

Data Collected by HTI 2002 - 2006

Site
ID #
Break
Other

GROUND WATER EVALUATION

HASTINGS GROUNDWATER CONTAMINATION SITE

HASTINGS, NEBRASKA

MAY 7, 1987

WORK ASSIGNMENT NO 90-7LS2

DOCUMENT NO 190-RI1-RT-CWVX-1

WOODWARD-CLYDE CONSULTANTS
5055 Antioch Road
Overland Park, Kansas 66203

TABLE 2-38
SUMMARY OF DETECTED VOLATILE ORGANIC COMPOUNDS
HASTINGS GROUND WATER CONTAMINATION SITE

(Concentrations in ug/l)

MUNICIPAL WELL M-3 (CITY OF HASTINGS)

Parameters	4/83	5/11/83	5/24/83	4/85	9/85	12/85	3/86	6/86	9/86
Carbon Tetrachloride	27.1	46.4*	31.3	22.0	26.0	32.0J	NS	NS	NS
Chloroform	ND	ND	ND	ND(1)	ND(5)	ND(1)	NS	NS	NS
Trichloroethene	ND	ND	ND	ND(1)	ND(5)	ND(1)	NS	NS	NS

Notes
1) Only detected compounds are listed.
2) ND( ) - compound not detected at the level indicated.
3) "*"- Multiple samples collected during this month; concentration reported is the highest concentration detected during the month.
4) -, Not analyzed for compound listed.
5) Data reported as less than ( ) reported as received from Nebraska State Laboratories.
6) J - compound was qualitatively identified; however, compound failed to meet all QA criteria and, therefore, is only an estimated value.
7) NS - not sampled.

0752
Well#3OU#13
NJD980862068
9.4
1/13/99

asp

January 13 1999

MEMORANDUM

SUBJECT Annual Review of Operation of Well #3 Ground Water System

FROM Diane Easley

TO Ron King Hastings Team Leader
Audrey Asher CNSL

I have reviewed the Well #3 analytical data from the 1998 quarterly sampling The following is a summary of my findings

Operational Information Phase 1 was operated continuously except for a 2 week period from thanksgiving to Christmas when it was down due to equipment problems Phase 2 was in continuous operation except for rainfall events which shut down the system automatically Electrical costs are approximately $10 000 /year for continuous operation of both systems Personnel costs are approximately $45 000 which includes the oversight of the system and the collection and shipment of the quarterly samples Installation of the irrigation system at Lincoln Park (Phase 3) was completed this year

Current Status Both Phase 1 and Phase 2 systems operate continuously (24 hours per day 7 days per week) For Plume 2 Dutton Lainson conducted a removal action to remove the Plume 2 contaminants from the vadose zone Dutton Lainson extended the operation of the SVE system until June 10th 1998 when the SVE system was removed from Dutton Lainson This action focused primarily on TCE with a cleanup goal of <290 ug/l

Purpose of Plume 1 Phase1 and Phase 2 The Interim ROD s goals was to remove CT from the aquifer to <31 ug/l This goal was attained and verified EPA and NDEQ agreed verbally to continue the operation of the system until MCLs (5 ug/l for CT) was attained Attainment was to be evaluated by the collection of quarterly ground water samples from the monitoring well network

Evaluation of Quarterly Results
Evaluation of the contaminant levels in the extraction wells

CW 5 is the location of the Phase 1 extraction well The quarterly samples indicate that the levels of CT ranged from 3 ug/l in December 1997 to 0 19U in September 1998 to 0 8 ug/l in December 1998 The level of the Phase 2 components ranged for the following compounds 1 1 1 trichloroethane 1 5 3 0 ug/l trichloroethylene 8 9 to 20 ug/l and tetrachloroethylene from 2 4 to 4 0 ug/l The highest levels were in December 1997 and the lowest levels were in December 1998 which would indicate that the Plume 2 contaminants were reduced by the removal action and are declining within the aquifer through natural attenuation processes

M 3 is the location of the Phase 2 extraction well A review of the quarterly sampling indicate that CT ranged from 3 3 to 6 0 ug/l during the year Plume 2 contaminants appeared in the March sampling effort and ranged as follows 1 1 1 trichloroethane was present in the December sampling at 1 3 ug/l trichloroethylene ranged from 1 7 to 7 2 ug/l and tetrachloroethylene ranged from 0 5 to 1 3 ug/l These contaminants **increased** throughout the year showing that the Plume 2 contaminants are being captured by M 3 and are present upgradient to the extraction well

Evaluation of the Monitoring Wells

CW 2 is a monitoring well upgradient to the Plume 1 source area at a depth of 130 The only contaminant present in this monitoring well is tetrachloroethylene The levels ranged from 2 to 9 ug/l with the levels increasing throughout the sampling period This would indicate that an upgradient source of PCE is present

CW 1 is a CT source monitoring well with a depth of 125 135 Plume 1 contaminants were present CT ranged from 0 45 to 1 1 ug/l during this monitoring period Chloroform (CF) was present above detection limits in 3 of the 5 periods and ranged from 0 47 to 0 69 ug/l Plume 2 contaminants were present during all 5 periods and ranged as follows TCE from 2 4 to 6 ug/l with the lowest level reported in September and the highest reported in December 1997 or the oldest data set which would indicate a dilution occurring PCE ranged from 3 0 to 4 0 ug/l and showed an increase This is a very small increase but combined with the CW 2 evidence would indicate a source of PCE upgradient to this well 1 1 1 TCA was present above detection levels for the March 1998 period only and was reported at 0 89 ug/l

CW 3R is an 8" monitoring well directly east of the Plume 1 source area and is sampled using a bailer This well had no detection of either Plume 1 or Plume 2 contaminants I recommend that this well be sampled only on an annual basis

CW 4 is a monitoring well farther east of the Plume 1 source area and upgradient to the Plume 2 source area and is at a depth of 140 This location was sampled for 3 out of the 5 periods Plume 1 contaminants were present in the September 1998 sample only with CF at 0 51 ug/l and CT at 0 37 ug/l Plume 2 contaminants were present in all samples collected and ranged as follows 1 1-dichloroethylene from 6 to 7 1 ug/l increasing in trend 1 1 1 TCA from 6 to 8 ug/l and showing fluctuation, and PCE from 9 0 to 11 0 ug/l with fluctuation This well is being sampled quarterly by Dutton Lainson and the results are in fairly good agreement with their results

CW 6 is a monitoring well south of the Plume 1 phase 1 system and is sampled from at 165 depth and was installed to serve as an early warning well to the municipal well M 9 No contaminants were present in the well above detection limits for either Plume 1 or Plume 2 contaminants Recommend sampling this well on an annual basis

CW 7 is a monitoring well which was installed and the Plume 2 contaminants first noted The Plume 1 contaminant CT was present in this well for 3 out of the 5 sampling periods at levels which ranged from 0 19 to 0 32 ug/l The Plume 2 contaminants were present in all samples and ranged as follows 11 DCE from 12 to 21 ug/l with the September 1998 sampling period the highest and the December 1997 sampling period being the lowest cis 1 2 dichloroethylene was present for 4 out of 5 samples and ranged from 1 5 to 2 2 ug/l with the September 1998 period the highest 111 TCA ranged from 11 18 ug/l again the September 1998 sample was the highest TCE was present and ranged from 16 to 107 ug/l with September 1998 being the highest and PCE was present and ranged from 8 to 21 ug/l with September and December 1998 reporting 21 ug/l for both periods The Plume 2 constituents are trending higher at this location and will be monitoring during 1999 to verify this trend This would indicate that the pumping of extraction well M 3 is bringing this plume south into its zone of influence

CW 8 is a monitoring well that is north of the railroad tracks downgradient from Dutton Lainson and is a shallow well (140 deep) This well was sampled by EPA 3 out of the 5 periods and contained only Plume 2 contaminants The following were present 1 1 DCE ranged from 1 8 to 3 5 ug/l 1 1 1 TCA was present from 0 59 to 2 7 ug/l TCE was present from 9 1 ug/l to 39 ug/l and PCE was present 0 31 to 0 9 ug/l These samples indicate a **decrease** in levels from the March 1998 to the December 1998 levels

CW 9 is a monitoring well which is located close to the suspected source area for Plume 2 and was installed at a depth of 140 The Plume 1 contaminants were present at low levels CT was present above detection levels at 0 65 to 1 0 ug/l CF was present in 4 out of 5 samples and ranged from 0 36 to 1 0 ug/l The Plume 2 contaminants were present in all samples and ranged as follows 1 1 DCE from 25 to 73 ug/l **decreasing** throughout the reporting period cis 1 2 DCE was present from 2 9 to 13 ug/l **decreasing** throughout the reporting period 1 1 DCA was present and ranged from 0 75 to 3 0 ug/l again showing a **decrease** 1 1 1 TCA ranged from 24 to 73 ug/l showing a **decrease** TCE ranged from 150 to 520 ug/l showing a **decrease** throughout the reporting period and PCE ranged from 45 to 180 ug/l showing a **decrease** This monitoring location is the closest location to the Dutton Lainson facility

CW 10 is a monitoring well directly downgradient from CW 7 and is located at a depth of 160 Plume 1 contaminant CT was present and ranged from 0 45 to 4 ug/l the highest levels were during the December 1997 sampling The following Plume 2 contaminants were present 1 1 DCE ranged from 6 to 12 ug/l with the highest present in December 1998 1 1 1 TCA ranged from 5 to 11 ug/l with the highest reported in December 1998 TCE ranged from 32 to 74 ug/l with the highest levels present in December 1998 cis 1,2 DCE ranged from 0 74 to 1 4 with the highest levels reported in December 1998 and PCE ranged from 3 to 11 ug/l with the highest reported in December 1998 This would indicate that the levels present in CW 7 in September 1998 migrated to CW 10

CW 11 is a monitoring well directly upgradient to CW 5 the Phase 1 extraction well for Plume 1 and is 140 deep For Plume 1 CT was detected at one time March 1998 at a level of 0 22 ug/l For the Plume 2 contaminants TCE was detected in 4 out of 5 samples above detection limits and ranged from 0 67 to 2 ug/l with fluctuations and PCE was present above detection limits once in September 1998 at 0 48 ug/l

CW 12 is a monitoring well directly downgradient to the CW 5 extraction system and is 140 deep For the Plume 1 contaminants CT ranged from0 98 to 1 4 ug/l The following Plume 2 contaminants were present 11 DCE and ranged from 1 8 2 ug/l with the highest level in September 1998 1 1 1 TCA ranged from 1 to 18 ug/l with the highest level present in September 1998 TCE ranged from 9 to 50 ug/l with the highest being present in September 1998 and PCE ranged from 2 to 9 0 with the highest level in June 1998 the second highest was 8 8 ug/l and was present in the September 1998 sampling effort These increasing levels would indicate the presence of the Plume 2 upgradient to this well and not being effectively captured by the Plume 1 Phase 1 system

MW 23 is a 100 foot screened interval which EPA has sampled using a interval bladder and the Grundfos pumping system EPA evaluated the information collected using both of these systems and determine that the analytical results using low flow techniques are equivalent The shallow levels were at a depth of approximately 137 deep and contained CT in all 5 samples The levels ranged from 0 46 to 25 ug/l with the highest being in December 1997 CF was present in the March 1998 sample at 1 0 ug/l levels The mid depth range at 162 with CT levels being between 0 86 to 25 ug/l CF was present in the March 1998 sample and was present at 1 2 ug/l The deepest level is approximately 193 deep and CT was present between 1 1 to 25 ug/l and CF was present in the March 1998 sample at a 1 1 ug/l level Plume 2 contaminants were present in all March 1998 samples with TCE ranging from 0 82 in the shallow well 0 88 in the mid level and 1 1 ug/l in the deepest location PCE was present in the March sample and was found at 0 52 ug/l in the shallowest location 0 50 ug/l in the middle level and 0 6 in the deepest location

Other Effects on the progress of ground water remediation
The SVE system was operated at the Dutton Lainson facility until June 10th 1998 September and December ground water quarterly sampling occurred after this system was removed . The Phase 1 system was down due to equipment problems for approximately 2 weeks prior to the December quarterly sampling

EPA has provided the city of Hastings with the GIS/Key system and data with the task of entering the Well #3 subsite information into the data base Also directed the city to determine if maps showing the influence of both ground water extraction systems It is anticipated that the city will be able to product these maps within the next 6 months

Recommendations

As shown by the above data remediation progress for both Plume 1 and Plume 2 has been achieved during the past year

Operate both Phase 1 and Phase 2 system continuously A system shut down may cause equipment problems which could be more costly that operation of the systems on an intermittent basis

Continue quarterly sampling for this year

TABLE 4 MASS OF CCL_4 REMOVED BY THE PHASE 1 EXTRACTION SYSTEM

SAMPLE DATE	CCL_4 Concentration (ug/L)		Water Treated (gallons)		Mass of CCL_4 removed (lbs)	
	Influent	Effluent (1)	Total	Between sampling events	Between sampling events	Total
09-25 96*	4 5	0 1	36 904 266	9 403 604	0.344	2 661
12-10-96	3 0	0 5	45 903 064	8 998 798	0 187	2 849
03-10 97	4 0	0 5	55 570 610	9 667 546	0 282	3 131
06-16 97	4 0	0 5	64 648 898	9 078 288	0 265	3 396
09-10 97	2 0	0 5	73 341 163	8 692 265	0 109	3 505
12-10 97	1 0	0 5	82 339 447	8 998 284	0 0751	3 580
03 09 98	0 6	0 5	91 484 259	9 144 872	0 008	3 588
06-01-98	1 0 K	0 5	99 903 491	8 419 232	0 000	3 588

Note Values may vary slightly due to rounding of the raw data

(1) Values less than 1 0 are below the MDL one half of the detection limit (0 5 μg/L) was assumed

* data values obtained from MK s December 1996 quarterly report

K - actual value of sample is < the measurement detection limit One half the detection limit (0 5 μg/L) was assumed for calculations

TABLE 5 MASS OF 1,1-DCE, 1,1,1-TCA, TCE, PCE, and CCL_4 REMOVED BY THE PHASE 1 TREATMENT SYSTEM

SAMPLE DATE	Total VOC Concentration (ug/L)		Water Treated (gallons)		Total Mass of VOCs removed (lbs)	
	Influent	Effluent (1)	Total	Between sampling events	Between sampling events	Total
09 25 96*	37 5	2 6	36 904 266	9 403 604	2 739	2 739
12 10 96	27 0	1 0	45 903 064	8 998 798	1 953	4 692
03 10 97	45 0	1 0	55 570 610	9 667 546	3 549	8 242
06 16 97	40 0	1 0	64 648 898	9 078 288	2 955	11 379
09 10 97	49 0	4 0	73 341 163	8 692 265	3 264	14 643
12 10 97	31 0	3 0	82 339 387	8 998 824	2 028	16 671
03 09 98	22 9	0 5	91 484 259	9 144 872	1 710	18 381
06 01 98	19 0	4 0	99 903 491	8 419 232	1 054	19 453

Note Values may vary slightly due to rounding of the raw data
(1) Values less than 1 0 are below the MDL one half of the detection limit (0 5 μg/L) was assumed
* data values obtained from MK s December 1996 quarterly report

Table 6

PHASE 1 GROUNDWATER EXTRACTION TREATMENT SYSTEM
AIR STRIPPER REMOVAL EFFICIENCIES FOR JUNE 1998

Date	Sample ID	Compound	Influent ($\mu g/L$)	Effluent (1) ($\mu g/L$)	% Removal	Flow Rate (gpm)
09/10/97	CW-5 (inf)	1,1-DCE	5 0	0 5	90 0	79
	CW-5 (eff)	1 1 1-TCA	5 0	0 5	90 0	79
		CCl_4	2 0	0 5	75 0	79
		TCE	30 0	4 0	86 7	79
		PCE	7 0	0 5	92 8	79
12/10/97	CW-5 (inf)	1 1 DCE	3 0	0 5	83 3	79
	CW-5 (eff)	1 1 1-TCA	3 0	0 5	83 3	79
		CCl_4	1 0	0 5	50 0	79
		TCE	20 0	3 0	85 0	79
		PCE	4 0	0 5	87 5	79
3/10/98	CW-5 (inf)	1 1-DCE	2 6	0 5	80 8	79
	CW-5 (eff)	1 1 1-TCA	2 4	0 5	79 2	79
		CCl_4	0 6	0 5	16 7	79
		TCE	14 0	0 5	96 4	79
		PCE	3 3	0 5	84 8	79
6/1/98	CW-5 (inf)	1 1-DCE	2 0	0 5	75 0	79
	CW 5 (eff)	1 1 1-TCA	2 0	0 5	75 0	79
		CCl_4	1 0 K	0 5	00 0	79
		TCE	12	3 0	66 7	79
		PCE	3 0	0 5	83 3	79

(1) Values less than 1 0 μg/L are less than the MDL for the above compounds one half of the detection limit was assumed for the calculations

K= actual value of sample is < the measurement detection limit One half the detection limit (5μg/L) was assumed for calculations

TABLE 7 MASS OF CCL_4 REMOVED BY THE PHASE 2 PUMP AND TREAT SYSTEM

SAMPLE DATE	CCL_4 Concentration (ug/L)		Water Treated (gallons)		Mass of CCL_4 removed (lbs)	
	Influent	Effluent	Total	Between sampling events	Between sampling events	Total
12-18-96*	15 0	3 0	22 775 900			
03 05 97	13 0	2 0	42 278 200	19 502 300	1. 7903	1 7903
06 25 97	11 0	2 0	75 263 700	32 985 500	2 4775	4 2678
08 27-97	13 0	2 0	93 427 800	18 184 100	1 6675	5 9353
12-10-97	6 0	2 0	124 401 900	30 974 100	1 0340	6 9693
03 09-98	4 9	0 53	146 507 300	22 105 400	0 8062	7 7755
06 01 98	11 0	2 0	169 528 300	23 021 100	1 7291	9 5046

Note Values may vary slightly due to rounding of the raw data
* Values reported will serve as initial reading for pounds removed after 1996

Results for CW 5 Influent Samples
(based on onsite analysis)

Date	CCl_4	TCA	TCE	PCE
6/13/95	14 0	0 0	0 0	0 0
8/13/95	34 2	0 0	1 2	0 9
8/22/95	8 8	0 4	0 5	0 1
8/27/95	31 2	0 0	5 4	2 1
9/9/95	21 0	2 3	10 6	4 8
9/16/95	40 2	7 1	27 0	7 5
9/23/95	12 9	3 4	16 1	7 9
9/28/95	9 1	2 6	*	7 9
10/7/95	18 1	6 2	31 3	12 4
10/13/95	11 6	4 2	19.2	9 6
10/21/95	7 0	2 3	8 5	6 1
10/24/95	11 8	5 3	23 3	11 6
11/2/95	4 4	3 8	6 4	4 7
11/11/95	13 3	6 6	23 4	9 0
11/17/95	9 6	5 3	12 0	4 1
11/25/95	7 9	3 1	15 9	7 6
12/2/95	2 7	1 4	2 9	2 7
12/4/95	2 2	0 0	4 1	2 1
12/9/95	14 5	3.8	17 6	6 0
12/15/95	2 3	0 9	6 9	4 0
1/20/96	17 6	7 7	31 7	9 9
1/27/96	3 8	1 6	7 2	2 1
2/3/96	8 1	4 3	2 3	7 7
2/10/96	5 5	2 9	16 4	5 8
2/17/96	4 8	2 4	13 4	4 1
2/24/96	3 5	1 8	11 1	4 9
3/2/96	5 4	2 9	13 6	2 8
3/6/96	10 9	6 2	30 0	9 5
3/16/96	6 0	3 1	13 3	4 1
3/21/96	9 8	5 5	26 0	7 3
3/28/96	4 0	2 4	13 7	4 6
4/7/96	4 9	2 7	14 5	4 2
4/13/96	9 5	5 5	26 6	7 7
4/17/96	7 8	4 2	24 7	8 0
4/27/96	5 3	3 0	13 9	4 1

CCl_4 Carbon Tetrachloride
TCA Trichloroethane
TCE Trichloroethylene
PCE Tetrachloroethylene

* The baseline for TCE analysis was incorrect

therefore the results were not reported

Well # CW-4 4" Diameter 128-148 well screen depth
Concentrations of VOCs in ug/l
Detection Limits (DL) varied

DATE	PCE	TCA	TCE	DCE
10-91	DL	DL	35	DL
12-91	DL	DL	18	DL
3-92	DL	DL	3	DL
6-92	4	5	52	4J
9-92	3	3	27	3
12-92	2	2	18	2
3-93				
6-93	DL	DL	4 3	DL
9-93	DL	DL	6 7	1 2
12-93	DL	DL	6	1
4-94	0 5	DL	4	DL
6-94	2	3	14	4

Well # CW-7 4" Diameter 156-175 well screen depth
Concentrations of VOCs in ug/l
Detection Limits (DL) varied

DATE	PCE	TCA	TCE	DCE
10-91	19	89	700	55
12-91	23	68	740	63
3-92	19	24	492	33
6-92	16	43	450	36
9-92	11	24	210	18
12-92	9	20	150	17
3-93				
6-93	6	12K	79	9 5
9-93	6 2	9 2	82	9 6

12-93	8	12	100	10
4-94	24	29	230	22
6-94	37	47	240	43

Monitoring Well CW-8 2" 135-155'depth
Concentrations in ug/l
Detection limits vary

DATE	PCE	TCA	TCE	DCE
9-92	DL	2	150	2
12-92	DL	2	140	2
3-93				
6-93	DL	DL	130	3 4
9-93	DL	2 6	110	4
12-93	DL	DL	120	DL
4-94	DL	DL	39	DL
6-94	DL	2	48	2

Monitoring Well CW-9 2" 132-142'depth

DATE	PCE	TCA	TCE	DCE
9-92	160	170	920	130
12-92	200	200	990	150
3-93				
6-93	33	31	190	23
9-93	16	29	170	27
12-93	2	5	36	4
4-94	1	3	21	4
6-94	7	20	108	19

Monitoring Well CW-10 2" 154-174'depth

DATE	PCE	TCA	TCE	DCE

9-92	DL	DL	10	DL
12-92	DL	DL	11	DL
3-93				
6-93	DL	DL	6 2	DL
9-93	DL	DL	4 3	DL
12-93	DL	DL	6	DL
4-94	DL	DL	4	DL
6-94	DL	DL	4	DL

Well # CW-4 4" Diameter 128-148 well screen depth
Concentrations of VOCs in ug/l
Detection Limits (DL) varied

date	PCE	TCA	TCE	DCE
10-91	DL	DL	35	DL
12-91	DL	DL	18	DL
3-92	DL	DL	3	DL
6-92	4	5	52	4J
9-92	3	3	27	3
12-92	2	2	18	2
3-93				
6-93	DL	DL	4 3	DL
9-93	DL	DL	6 7	1 2
12-93	DL	DL	6	1
4-94	0 5	DL	4	DL
6-94	2	3	14	4
3-96	52	47	351	38
4-96	59	58	385	49
6-96*	24	23	140	23
7-96	21	16	113	14
10-96	25	18	98	15
2-97	14	10	64	8
4-97	9	6	48	7
6-97*	19	21	139	22
8-97	46	27	206	29
12-97	11/9*	5/6*	44/41*	6/6*
3-98				
6/98	11*	8*	45*	8*

7/98	<5	<5	11	<5
8/98	7	<5	24	<5
9/98	11	5	42	6
9/98	10*	7*	40*	7 1*
12/98				
3/99				
6/99				

* EPA's data

Well # CW-7 4" Diameter 156-175 well screen depth
Concentrations of VOCs in ug/l
Detection Limits (DL) varied

date	PCE	TCA	TCE	DCE
10-91	19	89	700	55
12-91	23	68	740	63
3-92	19	24	492	33
6-92	16	43	450	36
9-92	11	24	210	18
12-92	9	20	150	17
3-93				
6-93	6	12K	79	9 5
9-93	6 2	9 2	82	9 6
12-93	8	12	100	10
4-94	24	29	230	22
6-94	37	47	240	43
3-96	<5	<5	20	<5
4-96	<5	<5	19	<5
6-96*	2	3	20	3
7-96	<5	<5	11	<5
10-96	<5	<5	20	<5
2-97	<5	<5	19	<5
4-97	<5	<5	34	<5
8-97	10	11	85	13
9-97*	14	20	104J	22
12/97*	11/8*	10/11*	80/76*	11/12*
3/98	10*	12*	83*	14
6/98	15*	14*	88*	18*

7/98	10	9	62	11
8/98	20	13	106	17
9/98	19	14	100	18
9/98	21*	18*	107*	21*

*EPA's data

Monitoring Well CW-9 2" 132-142'depth
Concentrations in ug/l
Detection limits vary

DATE	PCE	TCA	TCE	DCE
9-92	160	170	920	130
12-92	200	200	990	150
3-93				
6-93	33	31	190	23
9-93	16	29	170	27
12-93	2	5	36	4
4-94	1	3	21	4
6-94	7	20	108	19
3-96	30	40	250	39
4-96	31	34	211	37
6-96*	53	47	220	53
7-96	48	30	188	29
9-96*	140	91	380	100
10-96	114	44	309	43
2-97	66	38	296	36
4-97	50	24	197	30
6-97*	40	29	199	32
8-97	85	36	296	41
9-97*	120	65	390	64
12/97	249/180*	64/73*	580/520*	67/76*
3/98	56*	25*	88*	18*
6/98	56*	25*	180*	29*
7/98	78	25	205	28

8/98	112	30	291	36
9/98	107	29	264	33
9/98	77*	36*	230*	32*

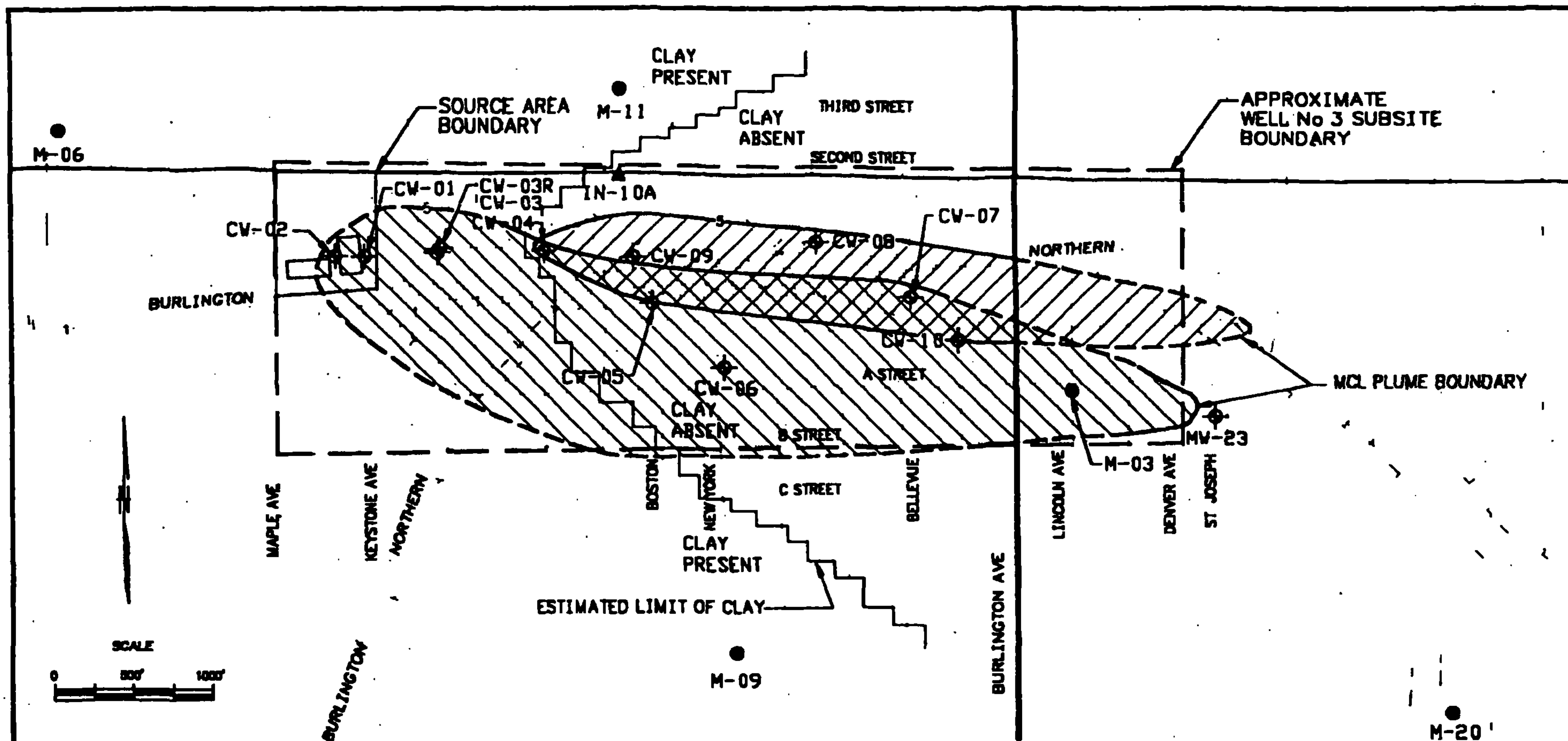
*EPA's data

Monitoring Well CW-8 2" 135-155'depth
Concentrations in ug/l
Detection limits vary

DATE	PCE	TCA	TCE	DCE
9-92	DL	2	150	2
12-92	DL	2	140	2
3-93				
6-93	DL	DL	130	3 4
9-93	DL	2 6	110	4
12-93	DL	DL	120	DL
4-94	DL	DL	39	DL
6-94	DL	2	48	2
3-96	<5	<5	36	<5
4-96	<5	<5	40	<5
6-96*	2	5	60	5
7-96	<5	<5	34	<5
10-96	<5	<5	26	<5
2-97	<5	<5	23	<5
4-97	<5	<5	27	<5
6-97*	1	2	30	3
8-97	<5	<5	29	<5
12-97	<5	<5	58	<5
3/98	0 9*	2 7	39	3 5
6/98				
7/98	<5	<5	31	<5
8/98	<5	<5	32	<5
9/98	<5	<5	22	<5

9/98	) 31*	1 3*	21	1 8

*EPA's data



LEGEND

SYMBOL	WELL ID. NO.	WELL TYPE
⊖	M-11	MUNICIPAL WELL
⌖	MW-23	EPA MONITORING WELL
▲	IN 10A	INDUSTRIAL WELL (ABANDONED)
~ 5 ~		ISOPLETH CONCENTRATION IN PPB (DASHED WHERE INFERRED)
(hatched ellipse)		TCE CONTAMINATION
(hatched ellipse)		CCl_4 CONTAMINATION

NOTE

1 CCl_4 PLUME BOUNDARY BASED ON COMPILATION OF IN-SITU AND WELL SAMPLING DATA

2 TCE PLUME BOUNDARY BASED ON AVERAGE CONCENTRATIONS FROM WELLS CW-4 CW-5 CW-7 CW-8 CW-9 & CW-10 (9-91 THROUGH 9-92 SAMPLES) PLUME IS ASSUMED TO BE SYMMETRICAL ABOUT GROUND WATER FLOW AXIS

HASTINGS GROUND WATER CONTAMINATION SITE
WELL NO 3 SUBSITE
HASTINGS NEBRASKA

FIGURE 2-2
GROUND WATER PLUME MAP FOR THE CCl_4 AND TCE MCL PLUMES

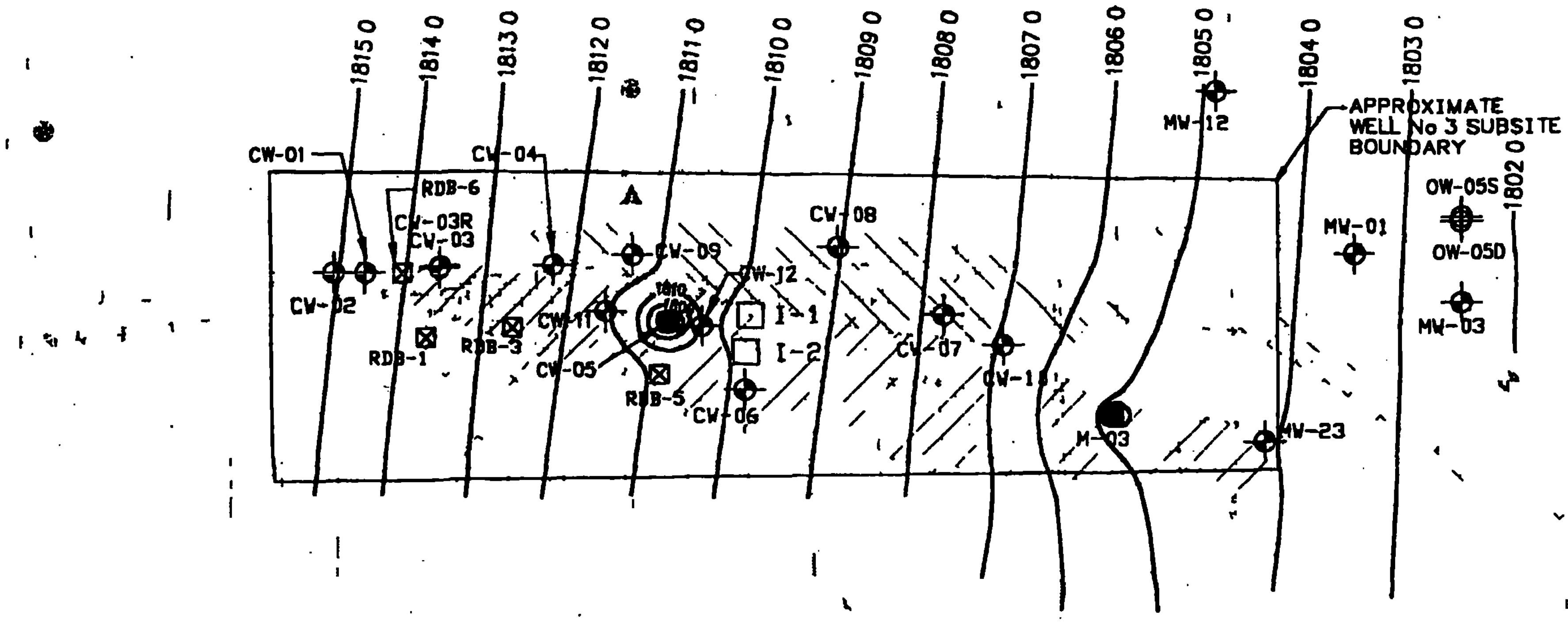
ARCS Regions VI VII VIII US Environmental Protection Agency

MORRISON-KNUDSEN CORPORATION

FILE NAME (CAD) 132K202A | DATE 11/19/92

PROJECT	SITE	TASK	DWG	REV
3780	2715	132K	FIGURE 2 2	A

<CPD 01/06/92 [TIME 08 33 AM] >

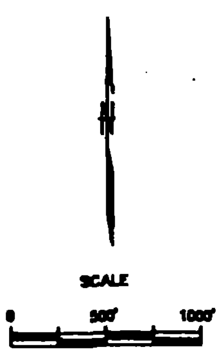


LEGEND

■	EXTRACTION WELL (80 gpm)
□	INJECTION WELL (I-1 @ 60 gpm I-2 @ 20 gpm)
⊠ RDB-1	INVESTIGATORY BOREHOLE
● M-09	MUNICIPAL WELL
MW-23	EPA MONITORING WELL
▲ IN-10A	INDUSTRIAL WELL
	AREA OF CCl4 CONTAMINATION ABOVE 5 ppb
	AREA OF TCE CONTAMINATION ABOVE 5 ppb
—1809 0—	GROUND WATER ELEVATION MSL

NOTE 1 HATCHED AREAS OF CCL4 AND TCE CONTAMINATION INFERRED FROM RD INVESTIGATION AND APRIL 1994 GROUND WATER SAMPLING

NOTE 2 ALL WATER LEVELS OBTAINED WHILE EXTRACTION WELLS M-03 AND CW-5 WERE PUMPING AND INJECTION WELLS I-1 AND I-2 WERE RECEIVING TREATED WATER FROM CW-5



HASTINGS GROUND WATER CONTAMINATION SITE
WELL NO 3 SUBSITE OU13
HASTINGS, NEBRASKA

FIGURE 5-1

WATER TABLE ELEVATIONS MAP FOR OCTOBER 1996

ARCS Regions VI, VII, VIII US Environmental Protection Agency

MORRISON-KNUDSEN CORPORATION

FILE NAME (CAD) 134C015A DWG		DATE 1 /21/98	
WORK ORDER	TASK	DRAWING NUMBER	REV
3780-2788	134C	FIGURE 1	A

<CPD 11/27/96 [TIME 09 27 AM]>

TABLE 3

CONCENTRATION (μg/L) OF DETECTED COMPOUNDS IN GROUNDWATER SAMPLES ACTIVITY NO HESES2, SEPTEMBER 8 10, 1998

COMPOUND	CW 1	CW 2 (130)	CW 3R (133)	CW 4 (140)	CW-5 (I)	CW 5 (E)	CW-6 (160)	CW-7 (170)	CW-8 (140')	CW 9 (140')	CW-9R (140')
1 1-dichloroethene	1 60 U	1 60 U	1 60 U	7 10	2 60	1 60 U	1 60 U	21 0	1 80	32 0	1 60 U
cis 1 2-dichloroethene	0 84 U	0 84 U	0 84 U	0 84 U	0 84 U	0 84 U	0 84 U	2 20	0 84 U	1 00	0 84 U
1 1 1 trichloroethane	0 58 U	0 58 U	0 58 U	6 60	2 40	0 63	0 58 U	18 0	1 30	36 0	0 58 U
Carbon Tetrachloride	0 45	0 19 U	0 19 U	0 37	0 60	0 19 U	0 19 U	0 19 U	0 19 U	0 19 U	0 19 U
Chloroform	0 47	0 36 U	0 36 U	0 41	0 36 U	0 36 U	0 36 U	0 36 U	0.36 U	0 45	0 36 U
Trichloroethane	2 40	0 54 U	0 54 U	40 0	13 0	4 70	0 54 U	107	21 0	230	1 20
Tetrachloroethene	3 10	5 70	0 31 U	9 90	3 10	1 1	0.31 U	21 0	0 31	77 0	0 60

COMPOUND	CW-10 (160)	CW 10 (160) D	CW 11 (140)	CW 11 (140) D	CW 12 (140')	CW 12R (140)	M 03 (I)	SEWER (M 03 E)	MW 23 (190 195)	MW 23 (160-165')	MW 23 (135-140)
1 1 dichloroethene	7 70	8 20	1 60 U	1 60 U	8 20	1 60 U	1 60 U	1 60 U	1 60 U	1 60 U	1 60 U
cis 1 2 dichloroethene	0 74	0 87	0 84 U	0 84 U	0 84 U	0 84 U	0 84 U	0 84 U	0 84 U	0 84 U	0 84 U
1 1 1-trichloroethane	6 20	6 80	0 58 U	0 58 U	18 0	0 58 U	0 71	0 58 U	0 58 U	0 58 U	0 58 U
Carbon Tetrachloride	0 45	0 42	0 19 U	0 19 U	1 40	0 19 U	3 50	0 51	4 70	4 60	4 00
Chloroform	0 36 U	0 36 U	0 36 U	0 36 U	0 36 U	0 36 U	0.36 U	0 36 U	0 36 U	0 36 U	0 36 U
Trichloroethene	45 0	47 0	1 20	1 10	50 0	5 90	4 50	0 97	0 54 U	0 54 U	0 54 U
Tetrachloroethene	5 80	6 20	0 48	0 47	8 80	1 30	1 00	0 31 U	0 31 U	0 31 U	0 31 U

NOTE

NS = Not Sampled
U = Actual value of sample is < the measurement detection limit (reported value)
J = Data reported but not valid by approved QC procedures
I = Influent sample
E = Effluent sample
R = Rinsate sample
D = Duplicate sample

Post-it Fax Note 7671	Date 1/11/99 # of pages ▶ 1
To Diane Easley	From Kristina Kenna
Co Dept EPA	Co City of Hastings
Phone # 913) 551-7797	Phone
Fax # (913)551 7063	Fax #

TABLE 3

CONCENTRATION (μg/L) OF DETECTED COMPOUNDS IN GROUNDWATER SAMPLES
ACTIVITY NO QSES2, JUNE 5-7, 2000

COMPOUND	CW-1	CW-2 (130')	CW-3R (133')	CW-4 (140')	CW-05 (INF_A)	CW-05 (INF_B)	CW-05 (EFF_A)	CW-6 (160')	CW-7 (170')	CW-7D	CW-8 (140')	CW-9 (140')
1 1 dichloroethene	NS	1 0 U	1 0 U	1 0	1 0 U	1 0 U	1 0 U	1 0 U	19	13	2 5	2 7
cis 1 2 dichloroethene	NS	1 0 U	1 0 U	1 0 U	1 0 U	1 0 U	1 0 U	1 0 U	1 8	1 0 U	1 0 U	1 0 U
1 1 1 trichloroethane	NS	1 0 U	1 0 U	1 0U	1 0U	1 0 U	1 0 U	1 0 U	11	10	1 6	1 5
Carbon Tetrachloride	NS	1 0 U	1 0 U	1 0 U	1 0 U	1 0 U	1 0 U	1 0 U	1 0 U	1 0 U	1 0 U	1 0 U
Chloroform	NS	1 0 U	1 0 U	1 0 U	1 0 U	1 0U	1 0 U	1 0 U	1 0 U	1 0 U	1 0 U	1 0 U
Trichloroethylene	NS	1 0 U	1 0 U	6 2	1 0U	1 0U	1 0 U	1 0 U	94	90	37	13
Tetrachloroethene	NS	14	1 0 U	1 8	1 4	1 4	1 0 U	1 0 U	28	28	1 0 U	3 9

COMPOUND	CW-9R (140')	CW-10 (160')	CW-10 (160') D	CW-11 (140')	CW-12 (140')	M-20	M-03 (I)	M-3 SEW	SEWER (M-03 E)	MW-23 (150')	MW-23 (165')	MW-23 (135')
1 1 dichloroethene	1 0 U	10	NS	1 0 U	1 8	1 0 U	2 1	1 0 U	1 0 U	1 0U	1 0 U	1 0 U
cis 1 2 dichloroethene	1 0 U	1 0 U	NS	1 0 U	1 0 U	1 0 U	1 0 U	1 0 U	1 0 U	1 0 U	1 0 U	1 0 U
1 1 1 trichloroethane	1 0 U	7 7J	NS	1 0 U	1 0 U	1 0 U	1 1	1 0 U	1 0 U	1 0 U	1 0 U	1 0 U
Carbon Tetrachloride	1 0 U	1 0 U	NS	1 0 U	1 0 U	1 0 U	1 1	1 0 U	1 0 U	2 1	2 2	2 2
Chloroform	1 0 U	1 0 U	NS	1 0 U	1 0 U	1 0 U	1 0 U	1 0 U	1 0 U	1 0 U	1 0 U	1 0 U
Trichloroethene	1 0 U	80	NS	1 0 U	6 8	1 0 U	11	1 3	1 0	1 0 U	1 0 U	1 0 U
Tetrachloroethene	1 0 U	15J	NS	1 0 U	1 4	1 0 U	1 9	1 0 U	1 0 U	1 0 U	1 0 U	1 0 U

NOTE

U = The material was analyzed for but not detected The associated numerical value is the sample reporting limit
INF_A = Influent sample taken at initial system start up
INF_B = Influent sample taken after pump had been running consistently for a minimum of five hours
EFF_A = Effluent sample taken after pump had been running consistently for a minimum of five hours
R = Rinsate sample
D = Duplicate sample
NS= NOT SAMPLED

HTI
HYDRO-TRACE
INCORPORATED

May 6, 2002

Ms. Diane Easley
Remedial Project Manager
U.S. Environmental Protection Agency
Region VII
901 N. Fifth St.
Kansas City, KS 66101

Re: Ground-water data
Dutton-Lainson Property
Well #3 Subsite
Hastings Ground Water Contamination Site
Hastings, Nebraska

Dear Ms. Easley:

Enclosed are the first quarter (March) monitoring data for monitoring wells CW-4, CW-7, CW-8, and CW-9 at the Dutton-Lainson Property at the Well #3 Subsite. We continue to monitor 10^{-6} concentrations of the analytes of interest in CW-4 and CW-7. The slight slug in CW-8 continues to decline and presumably is being transported to the M-3 extraction well.

Sincerely,

Roy F. Spalding

Roy F. Spalding
Project Manager
President

enclosure
c: G. McClure
D. Fisher

P.O. Box 266
Raymond, Nebraska
Zip 68428-0266
(402) 783-3931

HASTINGS ANALYTICAL

346 West 1st Street
Hastings, NE 68901
402 462-4949

Hastings – Well #3 Subsite Monitoring Wells

Analytes: USEPA Method 502.2
Matrix: water

ANALYTE	CW-4 sampled 3/14/02	CW-7 sampled 3/13/02
1,1-dichloroethene (µg/L)	< 1	< 1
1,1,1-trichloroethane (µg/L)	< 1	< 1
trichloroethene (µg/L)	1.6	5.2
tetrachloroethene (µg/L)	< 1	1.3

HASTINGS ANALYTICAL
346 West 1st Street
Hastings, NE 68901
402-462-4949

Hastings – Well #3 Subsite Monitoring Wells

Analytes: USEPA Method 502.2
Matrix: water

ANALYTE	CW-8 sampled 3/13/02	CW-9 sampled 3/14/02
1,1-dichloroethene (µg/L)	1.2	< 1
1,1,1-trichloroethane (µg/L)	< 1	< 1
trichloroethene (µg/L)	24	6.2
tetrachloroethene (µg/L)	< 1	1.8

HASTINGS ANALYTICAL
346 West 1st Street
Hastings, NE 68901
402-462-4949

Hastings – Well #3 Subsite Monitoring Wells

Analytes: USEPA Method 502.2
Matrix: water

ANALYTE	Trip Blank*	Trip Blank*	Field Blank at UN-C-4*
	3/13/02	3/14/02	3/14/02
1,1-dichloroethene (µg/L)	< 1	< 1	< 1
1,1,1-trichloroethane (µg/L)	< 1	< 1	< 1
trichloroethene (µg/L)	< 1	< 1	< 1
tetrachloroethene (µg/L)	< 1	< 1	< 1

*Well site 3 quarterly sampling was combined with North Landfill/Far-Mar-Co quarterly sampling and sampling of UN wells

HASTINGS ANALYTICAL
346 West 1st Street
Hastings, NE 68901
402-462-4949

Hastings – Well #3 Subsite Monitoring Wells

Analytes: USEPA Method 502.2
Matrix: water

ANALYTE	Equipment Blank after UN-C-3* 3/14/02
1,1-dichloroethene (µg/L)	< 1
1,1,1-trichloroethane (µg/L)	< 1
trichloroethene (µg/L)	< 1
tetrachloroethene (µg/L)	< 1

*Well site 3 quarterly sampling was combined with North Landfill/Far-Mar-Co quarterly sampling and sampling of UN wells

HASTINGS ANALYTICAL
346 West 1st Street
Hastings, NE 68901
402-462-4949

METHOD DETECTION LIMITS FOR ANALYTES IN A WATER MATRIX

October 2001

Volatiles by USEPA Method 502.2

ANALYTE	µg/L
1,1-dichloroethene	0.04
1,1,1-trichloroethane	0.01
trichloroethene	0.02
tetrachloroethene	0.02

HTI
HYDRO-TRACE
INCORPORATED

July 11, 2002

Ms. Diane Easley
Remedial Project Manager
U.S. Environmental Protection Agency
Region VII
901 N. Fifth St.
Kansas City, KS 66101

Re: Ground-water data for Dutton-Lainson Property, Well #3 Subsite, Hastings Ground Water Contamination Site, Hastings, Nebraska

Dear Ms. Easley:

Enclosed are the second quarter (June) monitoring data for monitoring wells CW-7, CW-8, and CW-9 at the Dutton-Lainson Property at the Well #3 Subsite. CW-4 was decommissioned by EPA since we sampled it in March. We continue to monitor the analytes of interest at 10^{-6} health risk levels in CW-7 and now in CW-9. When the concentrations have remained at this level for four consecutive quarters, we will request permission to decommission the wells. The slight TCE slug in CW-8 persists and presumably is being transported to the M-3 extraction well.

Sincerely,

Roy F. Spalding

Roy F. Spalding
Project Manager
President

enclosure
c: G. McClure
D. Fisher

P.O. Box 266
Raymond, Nebraska
Zip 68428-0266
(402) 783-3931

HASTINGS ANALYTICAL
346 West 1st Street
Hastings, NE 68901
402-462-4949

Hastings – Well #3 Subsite Monitoring Wells

Analytes: USEPA Method 502.2
Matrix: water

ANALYTE	CW-7 sampled 6/3/02	CW-8 sampled 6/3/02	CW-9 sampled 6/3/02
1,1-dichloroethene (µg/L)	< 1	< 1	< 1
1,1,1-trichloroethane (µg/L)	< 1	< 1	< 1
trichloroethene (µg/L)	2.5	37	4.4
tetrachloroethene (µg/L)	< 1	< 1	1.4

HASTINGS ANALYTICAL
346 West 1st Street
Hastings, NE 68901
402-462-4949

Hastings – Well #3 Subsite Monitoring Wells

Analytes: USEPA Method 502.2
Matrix: water

ANALYTE	Trip Blank	Field Blank at CW-8	Equipment Blank after MLW 1 -2*
	6/3/02	6/3/02	6/3/02
1,1-dichloroethene (µg/L)	< 1	< 1	< 1
1,1,1-trichloroethane (µg/L)	< 1	< 1	< 1
trichloroethene (µg/L)	< 1	< 1	< 1
tetrachloroethene (µg/L)	< 1	< 1	< 1

*Well site 3 quarterly sampling was combined with North Landfill/Far-Mar-Co quarterly sampling and sampling of MLW monitoring wells.

HASTINGS ANALYTICAL
346 West 1st Street
Hastings, NE 68901
402-462-4949

METHOD DETECTION LIMITS FOR ANALYTES IN A WATER MATRIX

May 2002

Volatiles by USEPA Method 502.2

ANALYTE	µg/L
1,1-dichloroethene	0.04
1,1,1-trichloroethane	0.01
trichloroethene	0.01
tetrachloroethene	0.01

HTI
HYDRO-TRACE
INCORPORATED

Site: Hastings
ID #: NLD980862166
Break: 7.1
Other: —
10-6-02

40225309

SUPERFUND RECORDS

October 6, 2002

Ms. Diane Easley
Remedial Project Manager
U.S. Environmental Protection Agency
Region VII
901 N. Fifth St.
Kansas City, KS 66101

Re: Ground-water data for Dutton-Lainson Property, Well #3 Subsite, Hastings Ground Water Contamination Site, Hastings, Nebraska

Dear Ms. Easley:

Enclosed are the third quarter (September) monitoring data for monitoring wells CW-7, CW-8, and CW-9 at the Dutton-Lainson Property at the Well #3 Subsite. We continue to monitor the analytes of interest at 10^{-6} health risk levels in CW-7 and CW-9. Previous reports have stated that we will request permission to decommission the wells when the concentrations have remained at the 10^{-6} health risk levels for four consecutive quarters. TCE concentrations in CW-7 have remained at 5 parts per billion or less since December 2001. Thus, we are requesting that EPA consider the abandonment of CW-7.

The slight TCE slug in CW-8 persists and presumably is being transported to the M-3 extraction well.

Sincerely,

Roy F. Spalding

Roy F. Spalding, Ph.D.
Project Manager
President

RECEIVED
OCT 09 2002
SUPERFUND DIVISION

enclosure
c: G. McClure
D. Fisher

P.O. Box 266
Raymond, Nebraska
Zip 68428-0266
(402) 783-3931

HASTINGS ANALYTICAL
346 West 1st Street
Hastings, NE 68901
402-462-4949

Hastings – Well #3 Subsite Monitoring Wells

Analytes: USEPA Method 502.2
Matrix: water

ANALYTE	CW-7 sampled 9/18/02	CW-8 sampled 9/18/02	CW-9 sampled 9/18/02
1,1-dichloroethene (µg/L)	< 1	1.2	< 1
1,1,1-trichloroethane (µg/L)	< 1	< 1	< 1
trichloroethene (µg/L)	4.8	35	5.3
tetrachloroethene (µg/L)	1.7	< 1	1.5

HASTINGS ANALYTICAL
346 West 1st Street
Hastings, NE 68901
402-462-4949

Hastings – Well #3 Subsite Monitoring Wells

Analytes: USEPA Method 502.2
Matrix: water

ANALYTE	Trip Blank 9/18/02	Field Blank at CW-8 9/18/02	Equipment Blank after GM-2D* 9/19/02
1,1-dichloroethene (µg/L)	< 1	< 1	< 1
1,1,1-trichloroethane (µg/L)	< 1	< 1	< 1
trichloroethene (µg/L)	< 1	< 1	< 1
tetrachloroethene (µg/L)	< 1	< 1	< 1

*Well site 3 quarterly sampling was combined with North Landfill/Far-Mar-Co quarterly sampling and sampling of MLW monitoring wells.

HASTINGS ANALYTICAL
346 West 1st Street
Hastings, NE 68901
402-462-4949

METHOD DETECTION LIMITS FOR ANALYTES IN A WATER MATRIX

May 2002

Volatiles by USEPA Method 502.2

ANALYTE	µg/L
1,1-dichloroethene	0.04
1,1,1-trichloroethane	0.01
trichloroethene	0.01
tetrachloroethene	0.01

40225313

HTI
HYDRO-TRACE
INCORPORATED

January 12, 2003

Ms. Diane Easley
Remedial Project Manager
U.S. Environmental Protection Agency
Region VII
901 N. Fifth St.
Kansas City, KS 66101

Re: Ground-water data for Dutton-Lainson Property, Well #3 Subsite, Hastings Ground Water Contamination Site, Hastings, Nebraska

Dear Ms. Easley:

Enclosed are the fourth quarter (December) monitoring data for monitoring wells CW-7, CW-8, and CW-9 at the Dutton-Lainson Property at the Well #3 Subsite. We continue to monitor the analytes of interest at 10^{-6} health risk levels in CW-7 and CW-9. Previous reports have stated that we will request permission to decommission the wells when the concentrations have remained at the 10^{-6} health risk levels for four consecutive quarters. TCE concentrations in CW-7 have remained at 5 parts per billion or less since December 2001. We requested last quarter that EPA consider the abandonment of CW-7. We are asking again that EPA permit us to abandon CW-7.

Sincerely,

Roy F. Spalding

Roy F. Spalding, Ph.D.
Project Manager
President

enclosure
c: G. McClure
D. Fisher

P.O. Box 266
Raymond, Nebraska
Zip 68428-0266
(402) 783-3931

HASTINGS ANALYTICAL
346 West 1st Street
Hastings, NE 68901
402-462-4949

Hastings – Well #3 Subsite Monitoring Wells

Analytes: USEPA Method 502.2
Matrix: water

ANALYTE	CW-7 sampled 12/9/02	CW-8 sampled 12/9/02	CW-9 sampled 12/9/02
1,1-dichloroethene (μg/L)	< 1	1.8	< 1
1,1,1-trichloroethane (μg/L)	< 1	< 1	< 1
trichloroethene (μg/L)	4.6	62	3.6
tetrachloroethene (μg/L)	1.5	< 1	<1

HASTINGS ANALYTICAL

346 West 1st Street
Hastings, NE 68901
402-462-4949

Hastings – Well #3 Subsite Monitoring Wells

Analytes: USEPA Method 502.2
Matrix: water

ANALYTE	Trip Blank	Field Blank at CW-7	Equipment Blank after G-7D*
	12/9/02	12/9/02	12/9/02
1,1-dichloroethene (µg/L)	< 1	< 1	< 1
1,1,1-trichloroethane (µg/L)	< 1	< 1	< 1
trichloroethene (µg/L)	< 1	< 1	< 1
tetrachloroethene (µg/L)	< 1	< 1	< 1

*Well site 3 quarterly sampling was combined with North Landfill/FAR-MAR-CO quarterly sampling and sampling of MLW monitoring wells.

HASTINGS ANALYTICAL
346 West 1st Street
Hastings, NE 68901
402-462-4949

METHOD DETECTION LIMITS FOR ANALYTES IN A WATER MATRIX

October 2002

Volatiles by USEPA Method 502.2

ANALYTE	µg/L
1,1-dichloroethene	0.04
1,1,1-trichloroethane	0.02
trichloroethene	0.04
tetrachloroethene	0.02

Well # CW-7, 4" Diameter, 156-175 well screen depth
Concentrations of VOCs in ug/l
Detection Limits (DL) varied

DATE	PCE	TCA	TCE	DCE
10-91	19	89	700	55
12-91	23	68	740	63
3-92	19	24	492	33
6-92	16	43'	450	36
9-92	11	24	210	18
12-92	9	20	150	17
3-93	NS	NS	NS	NS
6-93	6	12K	79	9.5
9-93	6.2	9.2	82	9.6
12-93	8	12	100	10
4-94	24	29	230	22
6-94	37	47	240	43
5-95	5	4	23	1U
9-95	18	12	94	18
3-96	<5	<5	20	<5
4-96	<5	<5	19	<5
6-96*	2	3	20	3
7-96	<5	<5	11	<5
9-96*	2	3	20	3
10-96	<5	<5	20	<5
2-97	<5	<5	19	<5
4-97	<5	<5	34	<5
8-97	10	11	85	13
9-97*	12/14	17/20	120/104J	17/22

Monitoring Well #CW-07

DATE	PCE	TCA	TCE	1,1-DCE
10-97	11	11	86	12
12-97	11/8*	10/11*	80/76*	11/12*
3-98*	10	12	83	14
4-98	12	10	78	12
6-98	13/15*	11/14*	75/88*	13/18*
7-98	10	9	62	11
8-98	20	13	106	17
9-98	19/21*	14/18*	100/107*	18/21*
10-98	20	13	99	16
11-98	20	12	101	16
12-98	22/21*	11/15*	96/100*	14/16*
1-99	21	11	92	13
2-99	18	10	77	13
3-99	24/22*	10/19*	92/91*	13/22*
6-99	25/28*/29*	11/15*/14*	89/110*/120*	15/19*/19*
9-99	29/24*	11/5.3*	95/96*	14/6.1*
11-99*	20	10	88	11
12-99	22	7	75	10
3-00	25/22*	8/8.3*	76/80*	11/12*
6-00	37/28*/28*	10/10*/11*	93/94*/90*	13/19*/13*
8-00*	31/33	13/14	100/110	17/18
10-00	26	7	67	13
12-00	14/22	6/6	51/64	7/8
03-01	7/7	3/3	23/23	3/3
06-01	<5	<5	14	<5
09-01	3.4	1.2	11	1.9

Monitoring Well #CW-07

Date	PCE	TCA	TCE	11-DCE
12-01	1.8	0.62	6.5	0.94
03-02	1.3	0.62	4.6	0.94
06-02	0.69	0.5U	2.2	0.5U
09-02	1.7	1U	4.8J	1U
12-02	1.7	0.55	6.1	1.1
03-02				
06-02				

* EPA's data. EPA's ROD issued in June 1993

** EPA's data collected prior to December 1995.

*** SVE system started March 1996 ended July 1998

HTI
HYDRO-TRACE
INCORPORATED

March 30, 2003

Ms. Diane Easley
Remedial Project Manager
U.S. Environmental Protection Agency
Region VII
901 N. Fifth St.
Kansas City, KS 66101

Re: Ground-water data
Dutton-Lainson Property
Well #3 Subsite
Hastings Ground Water Contamination Site
Hastings, Nebraska

Dear Ms. Easley:

Enclosed are the first quarter (March) monitoring data for monitoring wells CW-7, CW-8, and CW-9 at the Dutton-Lainson Property at the Well #3 Subsite.

Sincerely,

Roy F. Spalding
Project Manager
President

enclosure
c: G. McClure
D. Fisher

P.O. Box 266
Raymond, Nebraska
Zip 68428-0266
(402) 783-3931

HASTINGS ANALYTICAL
346 West 1st Street
Hastings, NE 68901
402-462-4949

Hastings – Well #3 Subsite Monitoring Wells

Analytes: USEPA Method 502.2
Matrix: water

ANALYTE	CW-7 sampled 3/7/03	CW-8 sampled 3/7/03	CW-8 field duplicate sampled 3/7/03
1,1-dichloroethene (µg/L)	< 1	1.9	1.9
1,1,1-trichloroethane (µg/L)	< 1	1.0	1.0
trichloroethene (µg/L)	3.5	67	67
tetrachloroethene (µg/L)	1.1	1.0	1.1

HASTINGS ANALYTICAL

346 West 1st Street
Hastings, NE 68901
402-462-4949

Hastings – Well #3 Subsite Monitoring Wells

Analytes: USEPA Method 502.2
Matrix: water

ANALYTE	CW-9 sampled 3/7/03
1,1-dichloroethene (µg/L)	< 1
1,1,1-trichloroethane (µg/L)	< 1
trichloroethene (µg/L)	4.9
tetrachloroethene (µg/L)	1.3

HASTINGS ANALYTICAL

346 West 1st Street
Hastings, NE 68901
402-462-4949

Hastings – Well #3 Subsite Monitoring Wells

Analytes: USEPA Method 502.2
Matrix: water

ANALYTE	Trip Blank*	Field Blank at CW-9	Equipment Blank after G-7D*
	3/7/03	3/7/03	3/7/03
1,1-dichloroethene (µg/L)	< 1	< 1	< 1
1,1,1-trichloroethane (µg/L)	< 1	< 1	< 1
trichloroethene (µg/L)	< 1	< 1	< 1
tetrachloroethene (µg/L)	< 1	< 1	< 1

*Well site 3 quarterly sampling was combined with North Landfill/FAR-MAR-CO quarterly sampling.

HASTINGS ANALYTICAL
346 West 1st Street
Hastings, NE 68901
402-462-4949

METHOD DETECTION LIMITS FOR ANALYTES IN A WATER MATRIX

October 2002

Volatiles by USEPA Method 502.2

ANALYTE	µg/L
1,1-dichloroethene	0.04
1,1,1-trichloroethane	0.02
trichloroethene	0.04
tetrachloroethene	0.02

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INCORPORATED

RECEIVED
SEP 26 2003
SUPERFUND DIVISION

Site: Hastings
ID #: NLD9500[illegible]
Break: 7.1
Other: —
9-22-03
0752
Amd

40225317

SUPERFUND RECORDS

September 22, 2003

Ms. Diane Easley
Remedial Project Manager
U.S. Environmental Protection Agency
Region VII
901 N. Fifth St.
Kansas City, KS 66101

Re: Well #3 Subsite Operable Unit #18
Hastings Ground Water Contamination Site
Hastings, NE
Semi-annual Progress Report

Dear Ms. Easley:

On behalf of Dutton-Lainson Company (the Respondent), Hydro-Trace, Inc. is hereby submitting a progress report for work performed on the removal action through July 2, 2003.

1. **Work performed through July 2, 2003:**
Extraction well M-3 was in continuous operation since Dutton-Lainson Company assumed its operation on May 16, 2003. The pumping rate is approximately 212 GPM.

The first semi-annual sampling of M-3 and the storm drain outfall was conducted June 25 while monitoring wells CW-7, CW-8, CW-9, and CW-10 were sampled July 2, 2003.

Each Monday M-3 was inspected and the pumping rate recorded. Twice each week there was a drive-by visual inspection to ensure the pump was operating.

2. **Summary of findings:**
The concentrations of 1,1-dichloroethene, 1,1,1-trichloroethane, trichloroethene, and tetrachloroethene in M-3 and the storm sewer outfall were less than 1 part per billion. Trichloroethene was the only contaminant of concern that exceeded 5 ppb in the monitoring wells. The exceedances occurred in CW-8 (58 ppb) and CW-10 (8 ppb). Both CW-7 and CW-9 were in compliance with respect to VOC concentrations and have been since June and December 2002, respectively.

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Zip 68428-0266
(402) 783-3931

3. **Results of sampling activities:**
The results of the first semi-annual ground-water sampling conducted in June and July are attached.

4. **Effectiveness of the remedial action:**
In the phone conversation between you and Mary Spalding on September 12, 2003, it was agreed that since the concentrations of the contaminants of concern in M-3 are below the reporting limits, it is difficult to estimate the amount of contaminant removed. The order requires operation of M-3 until the monitoring well concentrations of the contaminants of concern remain at the performance standards for two consecutive years.

5. **Problems encountered and recommended solutions:**
Problems with the Grundfos submersible pump resulted in the monitoring wells being sampled later than M-3 and the storm sewer outfall. The pump has been fixed. In the future sampling will be completed in one day.

6. **Scheduled activities:**
Operation of M-3 continues. The next semi-annual sampling of M-3, the storm sewer outfall, and the four monitoring wells is scheduled for December.

7. **Additional activities:**
In July Dutton-Lainson Company received the 1997 modification to the current Nebraska Department of Environmental Quality permit that changed the sampling from monthly to quarterly. At the request of the NDEQ, Dutton-Lainson Company reapplied in September for a discharge permit for M-3. NDEQ determined that the changes sought (semi-annual sampling and different contaminants of concern) warranted a new permit.

Sincerely,

Roy F. Spalding

Roy F. Spalding, Ph.D.
Project Manager
President

enclosures
c.: G. McClure
D. Fisher

HASTINGS ANALYTICAL
346 West 1st Street
Hastings, NE 68901
402-462-4949

Hastings – Well #3 Subsite Monitoring Wells

Analytes: USEPA Method 502.2
Matrix: water

ANALYTE	CW-7 sampled 7/2/03	CW-8 sampled 7/2/03	CW-8 field duplicate sampled 7/2/03
1,1-dichloroethene (µg/L)	< 1	1.4	1.5
1,1,1-trichloroethane (µg/L)	< 1	< 1	< 1
trichloroethene (µg/L)	2.6	58	56
tetrachloroethene (µg/L)	< 1	< 1	< 1

HASTINGS ANALYTICAL
346 West 1st Street
Hastings, NE 68901
402-462-4949

Hastings – Well #3 Subsite Monitoring Wells

Analytes: USEPA Method 502.2
Matrix: water

ANALYTE	CW-9 sampled 7/2/03	CW-10 sampled 7/2/03	M-3 sampled 6/25/03
1,1-dichloroethene (µg/L)	< 1	1.5	< 1
1,1,1-trichloroethane (µg/L)	< 1	< 1	< 1
trichloroethene (µg/L)	2.4	8	< 1
tetrachloroethene (µg/L)	< 1	2.9	< 1

HASTINGS ANALYTICAL

346 West 1st Street
Hastings, NE 68901
402-462-4949

Hastings – Well #3 Subsite Monitoring Wells

Analytes: USEPA Method 502.2
Matrix: water

ANALYTE	Storm Sewer Outfall sampled 6/25/03
1,1-dichloroethene (µg/L)	< 1
1,1,1-trichloroethane (µg/L)	< 1
trichloroethene (µg/L)	< 1
tetrachloroethene (µg/L)	< 1

HASTINGS ANALYTICAL

346 West 1st Street
Hastings, NE 68901
402-462-4949

Hastings – Well #3 Subsite Monitoring Wells

Analytes: USEPA Method 502.2
Matrix: water

ANALYTE	Trip Blank 6/25/03	Trip Blank 7/2/03	Field Blank at CW-7 7/2/03
1,1-dichloroethene (µg/L)	< 1	< 1	< 1
1,1,1-trichloroethane (µg/L)	< 1	< 1	< 1
trichloroethene (µg/L)	< 1	< 1	< 1
tetrachloroethene (µg/L)	< 1	< 1	< 1

HASTINGS ANALYTICAL

346 West 1st Street
Hastings, NE 68901
402-462-4949

Hastings – Well #3 Subsite Monitoring Wells

Analytes: USEPA Method 502.2
Matrix: water

ANALYTE	Equipment Blank after MW-16* 7/3/03
1,1-dichloroethene (μg/L)	< 1
1,1,1-trichloroethane (μg/L)	< 1
trichloroethene (μg/L)	< 1
tetrachloroethene (μg/L)	< 1

* Well Site #3 semi-annual sampling was combined with North Landfill/FAR-MAR-CO quarterly sampling

HASTINGS ANALYTICAL
346 West 1st Street
Hastings, NE 68901
402-462-4949

METHOD DETECTION LIMITS FOR ANALYTES IN A WATER MATRIX

October 2002

Volatiles by USEPA Method 502.2

ANALYTE	µg/L
1,1-dichloroethene	0.04
1,1,1-trichloroethane	0.02
trichloroethene	0.04
tetrachloroethene	0.02

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JAN 2· 2004

January 26, 2004

Site: Hastings
ID #: NLD980862668
Break: 7.1
Other: —
1-26-04

#0752
Ams

40225318

SUPERFUND RECORDS

Ms. Diane Easley
Remedial Project Manager
U.S. Environmental Protection Agency
Region VII
901 N. Fifth St.
Kansas City, KS 66101

Re: Well #3 Subsite Operable Unit #18
Hastings Ground Water Contamination Site
Hastings, NE
Semi-annual Progress Report

Dear Ms. Easley:

On behalf of Dutton-Lainson Company (the Respondent), Hydro-Trace, Inc. is hereby submitting a progress report for work performed on the removal action through December 31, 2003.

1. **Work performed through December 31, 2003:**
Extraction well M-3 was in almost continuous operation since the close of the last reporting period on July 2, 2003. The pumping rate was approximately 212 GPM.

Each Monday M-3 was inspected. Twice each week there was a drive-by visual inspection to ensure the pump was operating. At the end of each month, the pumping rate, total gallons pumped and the hotbox temperature were recorded on the operations report.

The second semi-annual sampling of M-3, the storm drain outfall and the monitoring wells CW-7, CW-8, CW-9, and CW-10 was conducted December 5, 2003.

2. **Summary of findings:**
The concentrations of 1,1-dichloroethene, 1,1,1-trichloroethane, and tetrachloroethene in M-3 and the storm sewer outfall were less than 1 part per billion. The concentrations of trichloroethene in both M-3 and the storm sewer outfall were less than 2 ppb. Trichloroethene was the only contaminant of concern that exceeded 5 ppb in the monitoring wells. The exceedances occurred in CW-8 (57 ppb) and CW-9 (8.4 ppb). The

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(402) 783-3931

TCE concentration in CW-8 has remained stable for the last two reporting periods. The concentration in CW-10 has fallen below 5 ppb while the concentration in CW-9, which had been in compliance, has increased slightly. CW-7 has been in compliance with respect to VOC concentrations since June 2002.

3. **Results of sampling activities:**
The results of the second semi-annual ground-water sampling conducted in December are attached.

4. **Effectiveness of the remedial action:**
During the 6-month period, approximately 56 million gallons of water were removed by M-3. Assuming the TCE concentration in M-3 was at the reporting limit (1 ppb) during the entire 6 months, approximately 0.6 lbs of TCE were removed.

5. **Problems encountered and recommended solutions:**
Since November a leaky valve at M-3 has been an ongoing problem. So far the remedies have not been successful. Dutton-Lainson Company personnel are working with the City of Hastings' plumber to resolve the problem. The pump has been shut down on two occasions (November 21 for two hours and November 25 for 5 hours) so that repairs could be made.

6. **Scheduled activities:**
Operation of M-3 continues. The next semi-annual sampling of M-3, the storm sewer outfall, and the four monitoring wells is scheduled for June.

7. **Additional activities:**
Dutton-Lainson Company received a draft NPDES permit for M-3 on January 22, 2004. NDEQ will submit a public notice to the local newspaper "in the near future."

Sincerely,

Roy F. Spalding

Roy F. Spalding, Ph.D.
Project Manager
President

enclosures
c.: G. McClure
D. Fisher

HASTINGS ANALYTICAL
346 West 1st Street
Hastings, NE 68901
402-462-4949

Hastings – Well #3 Subsite Monitoring Wells

Analytes: USEPA Method 502.2
Matrix: water

ANALYTE	CW-7 sampled 12/5/03	CW-8 sampled 12/5/03	CW-8 field duplicate sampled 12/5/03
1,1-dichloroethene (µg/L)	< 1	1.4	1.5
1,1,1-trichloroethane (µg/L)	< 1	< 1	< 1
trichloroethene (µg/L)	4.9	57	59
tetrachloroethene (µg/L)	1.3	< 1	< 1

HASTINGS ANALYTICAL
346 West 1st Street
Hastings, NE 68901
402-462-4949

Hastings – Well #3 Subsite Monitoring Wells

Analytes: USEPA Method 502.2
Matrix: water

ANALYTE	CW-9 sampled 12/5/03	CW-10 sampled 12/5/03	M-3 sampled 12/5/03
1,1-dichloroethene (µg/L)	< 1	< 1	< 1
1,1,1-trichloroethane (µg/L)	< 1	< 1	< 1
trichloroethene (µg/L)	8.4	1.5	1.3
tetrachloroethene (µg/L)	2.6	< 1	< 1

HASTINGS ANALYTICAL

346 West 1st Street
Hastings, NE 68901
402-462-4949

Hastings – Well #3 Subsite Monitoring Wells

Analytes: USEPA Method 502.2
Matrix: water

ANALYTE	**Storm Sewer Outfall** sampled 12/5/03
1,1-dichloroethene (µg/L)	< 1
1,1,1-trichloroethane (µg/L)	< 1
trichloroethene (µg/L)	1.9
tetrachloroethene (µg/L)	< 1

HASTINGS ANALYTICAL

346 West 1st Street
Hastings, NE 68901
402-462-4949

Hastings – Well #3 Subsite Monitoring Wells

Analytes: USEPA Method 502.2
Matrix: water

ANALYTE	Trip Blank	Field Blank at CW-7	Equipment Blank after G-7D*
	12/5/03	12/5/03	12/5/03
1,1-dichloroethene (µg/L)	< 1	< 1	< 1
1,1,1-trichloroethane (µg/L)	< 1	< 1	< 1
trichloroethene (µg/L)	< 1	< 1	< 1
tetrachloroethene (µg/L)	< 1	< 1	< 1

* Well Site #3 semi-annual sampling was combined with North Landfill/FAR-MAR-CO quarterly sampling

HASTINGS ANALYTICAL
346 West 1st Street
Hastings, NE 68901
402-462-4949

METHOD DETECTION LIMITS FOR ANALYTES IN A WATER MATRIX

October 2003

Volatiles by USEPA Method 502.2

ANALYTE	µg/L
1,1-dichloroethene	0.03
1,1,1-trichloroethane	0.03
trichloroethene	0.03
tetrachloroethene	0.05

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INCORPORATED

July 15, 2004

Ms. Diane Easley
Remedial Project Manager
U.S. Environmental Protection Agency
Region VII
901 N. Fifth St.
Kansas City, KS 66101

Re: Well #3 Subsite Operable Unit #18
Hastings Ground Water Contamination Site
Hastings, NE
Semi-annual Progress Report

Dear Ms. Easley:

On behalf of Dutton-Lainson Company (the Respondent), Hydro-Trace, Inc. is hereby submitting a progress report for work performed on the removal action from January 1, 2004 through June 30, 2004.

1. **Work performed through June 30, 2004:**
Extraction well M-3 was in almost continuous operation since the close of the last reporting period on December 31, 2003. The pumping rate was approximately 212 GPM.

Each Monday M-3 was inspected. Twice each week (Wednesday and Friday) there was a drive-by visual inspection to ensure the pump was operating. At the end of each month, the pumping rate, total gallons pumped, and the hotbox temperature were recorded on the operations report.

The first 2004 semi-annual sampling of M-3, the storm drain outfall, and the monitoring wells CW-7, CW-8, CW-9, and CW-10 was conducted on June 15.

2. **Summary of findings:**
The concentrations of 1,1-dichloroethene, 1,1,1-trichloroethane, trichloroethene, (TCE) and tetrachloroethene in M-3 and the storm sewer outfall were less than 1 part per billion. Trichloroethene was the only contaminant of concern that exceeded 5 ppb in the monitoring wells. The exceedances occurred in CW-8 (73 ppb) and CW-9 (6.2 ppb). The

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Zip 68428-0266
(402) 783-3931

TCE concentration in CW-8 has increased slightly since the last reporting period while the TCE concentration in CW-9 remains just above the compliance level. The concentration in CW-10 remains below 5 ppb. CW-7 has been in compliance with respect to VOC concentrations since June 2002 and the well should be a candidate for abandonment.

3. **Results of sampling activities:**
The results of the semi-annual ground-water sampling conducted in June are attached.

4. **Effectiveness of the remedial action:**
During the 6-month period, approximately 55 million gallons of water were removed by M-3. If the TCE concentration in M-3 was at the reporting limit (1 ppb) during the entire 6 months, approximately 0.5 lbs of TCE would be removed. It should be emphasized that 0.5 lbs is an inordinately high removal estimate.

5. **Problems encountered and recommended solutions:**
The leaky valve at M-3 has been an ongoing problem. A professional plumber hired by Dutton-Lainson Company obtained a special gasket from the valve manufacturer. The leak was repaired April 1. M-3 was shut down for 1.5 days in April so that the City of Hastings could perform repair work downstream of the discharge.

6. **Scheduled activities:**
Operation of M-3 continues. The next semi-annual sampling of M-3, the storm sewer outfall, and the four monitoring wells is scheduled for June.

7. **Additional activities:**
Dutton-Lainson Company received the NPDES permit for M-3 on February 27, 2004.

Sincerely,

Roy F. Spalding

Roy F. Spalding, Ph.D.
Project Manager
President

enclosure
c.: G. McClure
D. Fisher

HASTINGS ANALYTICAL
346 West 1st Street
Hastings, NE 68901
402-462-4949

Hastings -- Well #3 Subsite Monitoring Wells

Analytes: USEPA Method 502.2
Matrix: water

ANALYTE	CW-7 sampled 6/15/04	CW-8 sampled 6/15/04	CW-8 field duplicate sampled 6/15/04
1,1-dichloroethene (µg/L)	< 1	1.1	1.1
1,1,1-trichloroethane (µg/L)	< 1	< 1	< 1
trichloroethene (µg/L)	3.0	73	66
tetrachloroethene (µg/L)	< 1	< 1	< 1

HASTINGS ANALYTICAL

346 West 1st Street
Hastings, NE 68901
402-462-4949

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Hastings – Well #3 Subsite Monitoring Wells

Analytes: USEPA Method 502.2
Matrix: water

ANALYTE	CW-9 sampled 6/15/04	CW-10 sampled 6/15/04	M-3 sampled 6/15/04
1,1-dichloroethene (µg/L)	< 1	< 1	< 1
1,1,1-trichloroethane (µg/L)	< 1	< 1	< 1
trichloroethene (µg/L)	6.2	< 1	< 1
tetrachloroethene (µg/L)	2.4	< 1	< 1

HASTINGS ANALYTICAL
346 West 1st Street
Hastings, NE 68901
402-462-4949

Hastings – Well #3 Subsite Monitoring Wells

Analytes: USEPA Method 502.2
Matrix: water

ANALYTE	Storm Sewer Outfall sampled 6/15/04
1,1-dichloroethene (μg/L)	< 1
1,1,1-trichloroethane (μg/L)	< 1
trichloroethene (μg/L)	< 1
tetrachloroethene (μg/L)	< 1

HASTINGS ANALYTICAL
346 West 1st Street
Hastings, NE 68901
402-462-4949

Hastings – Well #3 Subsite Monitoring Wells

Analytes: USEPA Method 502.2
Matrix: water

ANALYTE	Trip Blank 6/15/04	Field Blank at CW-7 6/15/04	Equipment Blank after MLW 1-2* 6/17/04
1,1-dichloroethene (µg/L)	< 1	< 1	< 1
1,1,1-trichloroethane (µg/L)	< 1	< 1	< 1
trichloroethene (µg/L)	< 1	< 1	< 1
tetrachloroethene (µg/L)	< 1	< 1	< 1

* Well Site #3 semi-annual sampling was combined with North Landfill/FAR-MAR-CO quarterly sampling

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JAN 13 2005
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January 8, 2005

Site: Hastings
ID #: NED980862668
Break: 11
Other: —
1-8-05

#0152
AMD

40225320

SUPERFUND RECORDS

Ms. Diane Easley
Remedial Project Manager
U.S. Environmental Protection Agency
Region VII
901 N. Fifth St.
Kansas City, KS 66101

Re: Well #3 Subsite Operable Unit #18
Hastings Ground Water Contamination Site
Hastings, NE
Semi-annual Progress Report

Dear Ms. Easley:

On behalf of Dutton-Lainson Company (the Respondent), Hydro-Trace, Inc. is hereby submitting a progress report for work performed on the removal action from July 1, 2004 through December 31, 2004.

1. **Work performed through December 31, 2004:**
Extraction well M-3 was in continuous operation since the close of the last reporting period on June 30, 2004. The pumping rate was approximately 212 GPM.

Each Monday M-3 was inspected. Twice each week (Wednesday and Friday) there was a drive-by visual inspection to ensure the pump was operating. At the end of each month, the pumping rate, total gallons pumped, and the hotbox temperature were recorded on the operations report.

The 2004 semi-annual sampling of M-3, the storm drain outfall, and the monitoring wells CW-7, CW-8. CW-9, and CW-10 was conducted on December 7.

2. **Summary of findings:**
The concentrations of 1,1-dichloroethene, 1,1,1-trichloroethane, trichloroethene, (TCE) and tetrachloroethene in M-3 and the storm sewer outfall were less than 1 part per billion. Trichloroethene was the only contaminant of concern that exceeded 5 ppb in the monitoring wells. The exceedances occurred in CW-8 (57 ppb) and CW-9 (6.8 ppb). The

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Raymond, Nebraska
Zip 68428-0266
(402) 783-3931

HASTINGS ANALYTICAL
346 West 1st Street
Hastings, NE 68901
402-462-4949

Hastings – Well #3 Subsite Monitoring Wells

Analytes: USEPA Method 502.2
Matrix: water

ANALYTE	CW-7 sampled 12/7/04	CW-8 sampled 12/7/04	CW-8 field duplicate sampled 12/7/04
1,1-dichloroethene (μg/L)	< 1	< 1	< 1
1,1,1-trichloroethane (μg/L)	< 1	< 1	< 1
trichloroethene (μg/L)	2.7	57	58
tetrachloroethene (μg/L)	< 1	< 1	< 1

TCE concentration in CW-8 has decreased slightly since the last reporting period while the TCE concentration in CW-9 remains just above the compliance level. The concentration in CW-10 remains below 5 ppb. Concentrations of the target compounds in CW-7 have remained below 5 ppb since June 2003. As detailed in the Work Plan this well is a candidate for abandonment and we request permission to abandon CW-7.

3. **Results of sampling activities:**
The results of the semi-annual ground-water sampling conducted in December are attached.

4. **Effectiveness of the remedial action:**
During the 6-month period, approximately 56 million gallons of water were removed by M-3. If the TCE concentration in M-3 was at the reporting limit (1 ppb) during the entire 6 months, approximately 0.5 lbs of TCE would be removed. It should be emphasized that 0.5 lbs is an inordinately high removal estimate.

5. **Problems encountered and recommended solutions:**
No problems were encountered.

6. **Scheduled activities:**
Operation of M-3 continues. The next semi-annual sampling of M-3, the storm sewer outfall, and the monitoring wells is scheduled for June.

Sincerely,

Roy F. Spalding

Roy F. Spalding, Ph.D.
Project Manager
President

enclosure
c.: G. McClure
D. Fisher

HASTINGS ANALYTICAL
346 West 1st Street
Hastings, NE 68901
402-462-4949

Hastings – Well #3 Subsite Monitoring Wells

Analytes: USEPA Method 502.2
Matrix: water

ANALYTE	CW-9 sampled 12/7/04	CW-10 sampled 12/7/04	M-3 sampled 12/7/04
1,1-dichloroethene (µg/L)	< 1	< 1	< 1
1,1,1-trichloroethane (µg/L)	< 1	< 1	< 1
trichloroethene (µg/L)	6.8	< 1	< 1
tetrachloroethene (µg/L)	2.4	< 1	< 1

HASTINGS ANALYTICAL
346 West 1st Street
Hastings, NE 68901
402-462-4949

Hastings – Well #3 Subsite Monitoring Wells

Analytes: USEPA Method 502.2
Matrix: water

ANALYTE	**Storm Sewer Outfall** sampled 12/7/04
1,1-dichloroethene (µg/L)	< 1
1,1,1-trichloroethane (µg/L)	< 1
trichloroethene (µg/L)	< 1
tetrachloroethene (µg/L)	< 1

HASTINGS ANALYTICAL
346 West 1st Street
Hastings, NE 68901
402-462-4949

Hastings – Well #3 Subsite Monitoring Wells

Analytes: USEPA Method 502.2
Matrix: water

ANALYTE	Trip Blank 12/7/04	Field Blank at CW-10 12/7/04	Equipment Blank after G-7D* 12/7/04
1,1-dichloroethene (µg/L)	< 1	< 1	< 1
1,1,1-trichloroethane (µg/L)	< 1	< 1	< 1
trichloroethene (µg/L)	< 1	< 1	< 1
tetrachloroethene (µg/L)	< 1	< 1	< 1

* Well Site #3 semi-annual sampling was combined with North Landfill/FAR-MAR-CO quarterly sampling

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August 15, 2005

Ms. Diane Easley
Remedial Project Manager
U.S. Environmental Protection Agency
Region VII
901 N. Fifth St.
Kansas City, KS 66101

Re: Well #3 Subsite Operable Unit #18
Hastings Ground Water Contamination Site
Hastings, NE
Semi-annual Progress Report

Dear Ms. Easley:

On behalf of Dutton-Lainson Company (the Respondent), Hydro-Trace, Inc. is hereby submitting a progress report for work performed on the removal action from January 1, 2005 through June 30, 2005.

1. ***Work performed through June 30, 2005:***
With the exception of three days in March, extraction well M-3 was in continuous operation since the close of the last reporting period on December 31, 2004. The pumping rate was approximately 212 GPM.

Each Monday M-3 was inspected. Twice each week (Wednesday and Friday) there was a drive-by visual inspection to ensure the pump was operating. At the end of each month, the pumping rate, total gallons pumped, and the hotbox temperature were recorded on the operations report.

The 2005 semi-annual sampling of M-3, the storm drain outfall, and the monitoring wells CW-8, CW-9, and CW-10 was conducted on June 13.

2. **Summary of findings:**
Trichloroethene was the only contaminant of concern that exceeded 5 ppb. The exceedance occurred in CW-8 (46 ppb).

P.O. Box 266
Raymond, Nebraska
Zip 68428-0266
(402) 783-3931

The TCE concentration in CW-8 has decreased slightly since the last reporting period while the TCE concentration in CW-9 has declined to below the compliance level of 5 ppb. The TCE concentration in CW-10 remains below 5 ppb.

3. **Results of sampling activities:**
The results of the semi-annual ground-water sampling conducted in June are attached.

4. **Effectiveness of the remedial action:**
During the 6-month period, approximately 56 million gallons of water were removed by M-3. If the TCE concentration in M-3 was at the reporting limit (1 ppb) during the entire 6 months, approximately 0.5 lbs of TCE would have been removed. It should be emphasized that 0.5 lbs is an inordinately high removal estimate.

5. **Problems encountered and recommended solutions:**
The flow meter was not operational from March 1 through March 13. The pump, however, ran continuously except for three days (March 11-13) when the flow meter was replaced. The new flow meter is not reading the same each month and it is being monitored to determine if there is drift.

6. **Scheduled activities:**
Operation of M-3 continues. The next semi-annual sampling of M-3, the storm sewer outfall, and the three monitoring wells is scheduled for December.

Sincerely,

Roy F. Spalding

Roy F. Spalding, Ph.D.
Project Manager
President

enclosure
c.: G. McClure
D. Fisher

HASTINGS ANALYTICAL
346 West 1st Street
Hastings, NE 68901
402-462-4949

Hastings – Well #3 Subsite Monitoring Wells

Analytes: USEPA Method 502.2
Matrix: water

ANALYTE	CW-8 sampled 6/13/05	CW-8 field duplicate sampled 6/13/05	CW-9 sampled 6/13/05
1,1-dichloroethene (μg/L)	< 1	< 1	< 1
1,1,1-trichloroethane (μg/L)	< 1	< 1	< 1
trichloroethene (μg/L)	46	46	3.1
tetrachloroethene (μg/L)	< 1	< 1	1.0

HASTINGS ANALYTICAL
346 West 1st Street
Hastings, NE 68901
402-462-4949

Hastings – Well #3 Subsite Monitoring Wells

Analytes: USEPA Method 502.2
Matrix: water

ANALYTE	CW-10 sampled 6/13/05	M-3 sampled 6/13/05	Storm Sewer Outfall sampled 6/13/05
1,1-dichloroethene (µg/L)	< 1	< 1	< 1
1,1,1-trichloroethane (µg/L)	< 1	< 1	< 1
trichloroethene (µg/L)	< 1	< 1	< 1
tetrachloroethene (µg/L)	< 1	< 1	< 1

HASTINGS ANALYTICAL

346 West 1st Street
Hastings, NE 68901
402-462-4949

Hastings – Well #3 Subsite Monitoring Wells

Analytes: USEPA Method 502.2
Matrix: water

ANALYTE	Trip Blank 6/13/05	Field Blank at M-3 6/13/05	Equipment Blank after MLW 2-2* 6/14/05
1,1-dichloroethene (μg/L)	< 1	< 1	< 1
1,1,1-trichloroethane (μg/L)	< 1	< 1	< 1
trichloroethene (μg/L)	< 1	< 1	< 1
tetrachloroethene (μg/L)	< 1	< 1	< 1

* Well Site #3 semi-annual sampling was combined with North Landfill/FAR-MAR-CO quarterly sampling

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January 23, 2006

Ms. Diane Easley
Remedial Project Manager
U.S. Environmental Protection Agency
Region VII
901 N. Fifth St.
Kansas City, KS 66101

Re: Well #3 Subsite Operable Unit #18
Hastings Ground Water Contamination Site
Hastings, NE
Semi-annual Progress Report

Dear Ms. Easley:

On behalf of Dutton-Lainson Company (the Respondent), Hydro-Trace, Inc. is hereby submitting a progress report for work performed on the removal action from July 1, 2005 through December 31, 2005.

1. **Work performed through December 31, 2005:**
M-3 was operational for approximately 110 days during the reporting period. During that time the pumping rate averaged approximately 205 GPM.

Each Monday M-3 was inspected. Twice each week (Wednesday and Friday) there was a drive-by visual inspection to ensure the pump was operating. At the end of each month, the pumping rate, total gallons pumped, and the hotbox temperature were recorded on the operations report.

CW-7 was abandoned on August 30 following NHHS protocols for well abandonment.

The 2005 semi-annual sampling of monitoring wells CW-8, CW-9, and CW-10 was conducted on December 14. The sampling of M-3 and the storm drain outfall was postponed until the channel relocation work was completed; M-3 was placed back in service; and the well could be pumped for several days. The sampling was completed on December 30.

P.O. Box 266
Raymond, Nebraska
Zip 68428-0266
(402) 784-3931

HASTINGS ANALYTICAL
346 West 1st Street
Hastings, NE 68901
402-462-4949

Hastings – Well #3 Subsite Monitoring Wells

Analytes: USEPA Method 502.2
Matrix: water

ANALYTE	CW-8	CW-8 field duplicate	CW-9
	sampled 12/14/05	sampled 12/14/05	sampled 12/14/05
1,1-dichloroethene (µg/L)	< 1	< 1	< 1
1,1,1-trichloroethane (µg/L)	< 1	< 1	< 1
trichloroethene (µg/L)	28	28	5.4
tetrachloroethene (µg/L)	< 1	< 1	2.1

HASTINGS ANALYTICAL
346 West 1st Street
Hastings, NE 68901
402-462-4949

Hastings – Well #3 Subsite Monitoring Wells

Analytes: USEPA Method 502.2
Matrix: water

ANALYTE	**CW-10** sampled 12/14/05	**M-3** sampled 12/30/05	**Storm Sewer Outfall** sampled 12/30/05
1,1-dichloroethene (µg/L)	< 1	< 1	< 1
1,1,1-trichloroethane (µg/L)	< 1	< 1	< 1
trichloroethene (µg/L)	< 1	< 1	< 1
tetrachloroethene (µg/L)	< 1	< 1	< 1

HASTINGS ANALYTICAL
346 West 1st Street
Hastings, NE 68901
402-462-4949

Hastings – Well #3 Subsite Monitoring Wells

Analytes: USEPA Method 502.2
Matrix: water

ANALYTE	Trip Blank	Field Blank at MW-17*	Equipment Blank after MW-17*
	12/14/05	12/14/05	12/14/05
1,1-dichloroethene (µg/L)	< 1	< 1	< 1
1,1,1-trichloroethane (µg/L)	< 1	< 1	< 1
trichloroethene (µg/L)	< 1	< 1	< 1
tetrachloroethene (µg/L)	< 1	< 1	< 1

* Well Site #3 semi-annual sampling was combined with North Landfill/FAR-MAR-CO quarterly sampling

HASTINGS ANALYTICAL
346 West 1st Street
Hastings, NE 68901
402-462-4949

Hastings – Well #3 Subsite Monitoring Wells

Analytes: USEPA Method 502.2
Matrix: water

ANALYTE	Trip Blank 12/30/05
1,1-dichloroethene (µg/L)	< 1
1,1,1-trichloroethane (µg/L)	< 1
trichloroethene (µg/L)	< 1
tetrachloroethene (µg/L)	< 1

2. **Summary of findings:**
Trichloroethene was the only contaminant of concern that exceeded 5 ppb. The exceedances occurred in CW-8 (28 ppb) and CW-9 (5.4 ppb).

The TCE concentration in CW-8 has decreased since the last reporting period while the TCE concentration in CW-9 continues to hover around the compliance level of 5 ppb. The TCE concentration in CW-10 remains well below 5 ppb. Concentrations of the four target compounds have remained below 5 ppb in CW-10 since December 2003. As detailed in the Work Plan, **this well is a candidate for abandonment and we request permission to abandon CW-10.**

3. **Results of sampling activities:**
The results of the semi-annual ground-water sampling conducted in December are attached.

4. **Effectiveness of the remedial action:**
During the 6-month period, approximately 34 million gallons of water were removed by M-3. If the TCE concentration in M-3 was at the reporting limit (1 ppb) during the approximately 110 days of operation, approximately 0.3 lbs of TCE would have been removed. It should be emphasized that 0.3 lbs is an inordinately high removal estimate.

5. **Problems encountered and recommended solutions:**
M-3 was shut down for two extensive periods. The first shutdown was caused by an August 18 lightning strike which destroyed the underground pump. A new pump was ordered and installed. M-3 was put back into service on September 12. Between November 3 and December 22, M-3 was taken out of service to facilitate excavation and channel relocation work by the City of Hastings. Thus M-3 was not operational for approximately 74 days during the reporting period. In both situations NDEQ and USEPA were notified of noncompliance in the operation of M-3.

6. **Scheduled activities:**
Operation of M-3 continues. The next semi-annual sampling of M-3, the storm sewer outfall, and the three monitoring wells is scheduled for June.

Sincerely,

Roy F. Spalding

Roy F. Spalding, Ph.D.
Project Manager

enclosure
c.: G. McClure
D. Fisher

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INCORPORATED

July 25, 2006

Ms. Diane Easley
Remedial Project Manager
U.S. Environmental Protection Agency
Region VII
901 N. Fifth St.
Kansas City, KS 66101

Re: Well #3 Subsite Operable Unit #18
Hastings Ground Water Contamination Site
Hastings, NE
Semi-annual Progress Report

Dear Ms. Easley:

On behalf of Dutton-Lainson Company (the Respondent), Hydro-Trace, Inc. is hereby submitting a progress report for work performed on the removal action from January 1, 2006 through June 30, 2006.

1. **Work performed through June 30, 2006:**
M-3 was operational for all but four days during the reporting period. During that time the pumping rate averaged approximately 209 GPM.

Each Monday M-3 was inspected. Twice each week (Wednesday and Friday) there was a drive-by visual inspection to ensure the pump was operating. At the end of each month, the pumping rate, total gallons pumped, and the hotbox temperature were recorded on the operations report.

The 2006 semi-annual sampling of monitoring wells CW-8 and CW-9, M-3 and the storm sewer outfall was conducted on June 6.

2. **Summary of findings:**
Trichloroethene was the only contaminant of concern that exceeded 5 ppb. The exceedance occurred in CW-8 (32 ppb).

The TCE concentration in CW-8 increased slightly since the last reporting period while the TCE concentration in CW-9 has decreased to below the compliance level of 5 ppb.

P.O. Box 266
Raymond, Nebraska
Zip 68428-0266
(402) 783-3931

3. **Results of sampling activities:**
The results of the semi-annual ground-water sampling conducted in June are attached.

4. **Effectiveness of the remedial action:**
During the 6-month period, approximately 53 million gallons of water were removed by M-3. If the TCE concentration in M-3 was at the reporting limit (1 ppb) during the 6 months of operation, approximately 0.4 lbs of TCE would have been removed. It should be emphasized that 0.4 lbs is an inordinately high removal estimate.

5. **Problems encountered and recommended solutions:**
M-3 was shut down for four days in March (3/6- 3/10) to facilitate road work by the City of Hastings. USEPA and NDEQ were notified of this outage by Dutton-Lainson Company's compliance engineer.

6. **Scheduled activities:**
Operation of M-3 continues. The next semi-annual sampling of M-3, the storm sewer outfall, and the two monitoring wells is scheduled for December. Monitoring well CW-10 will be abandoned in September following NHHS protocols for well abandonment.

Sincerely,

Roy F. Spalding

Roy F. Spalding, Ph.D.
Project Manager

enclosure
c.: G. McClure
D. Fisher

HASTINGS ANALYTICAL
346 West 1st Street
Hastings, NE 68901
402-462-4949

Hastings – Well #3 Subsite Monitoring Wells

Analytes: USEPA Method 502.2
Matrix: water

ANALYTE	CW-8 sampled 6/6/06	CW-9 sampled 6/6/06
1,1-dichloroethene (µg/L)	< 1	< 1
1,1,1-trichloroethane (µg/L)	< 1	< 1
trichloroethene (µg/L)	32	3.9
tetrachloroethene (µg/L)	< 1	1.6

HASTINGS ANALYTICAL
346 West 1st Street
Hastings, NE 68901
402-462-4949

Hastings – Well #3 Subsite Monitoring Wells

Analytes: USEPA Method 502.2
Matrix: water

ANALYTE	M-3 sampled 6/6/06	Storm Sewer Outfall sampled 6/6/06
1,1-dichloroethene (μg/L)	< 1	< 1
1,1,1-trichloroethane (μg/L)	< 1	< 1
trichloroethene (μg/L)	< 1	< 1
tetrachloroethene (μg/L)	< 1	< 1

HASTINGS ANALYTICAL
346 West 1st Street
Hastings, NE 68901
402-462-4949

Hastings – Well #3 Subsite Monitoring Wells

Analytes: USEPA Method 502.2
Matrix: water

ANALYTE	Trip Blank	Field Blank at CW-8
	6/6/06	6/6/06
1,1-dichloroethene (µg/L)	< 1	< 1
1,1,1-trichloroethane (µg/L)	< 1	< 1
trichloroethene (µg/L)	< 1	< 1
tetrachloroethene (µg/L)	< 1	< 1

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January 5, 2007

Ms. Diane Easley
Remedial Project Manager
U.S. Environmental Protection Agency
Region VII
901 N. Fifth St.
Kansas City, KS 66101

Re: Well #3 Subsite Operable Unit #18
Hastings Ground Water Contamination Site
Hastings, NE
Semi-annual Progress Report

Dear Ms. Easley:

On behalf of Dutton-Lainson Company (the Respondent), Hydro-Trace, Inc. is hereby submitting a progress report for work performed on the removal action from July 1, 2006 through December 30, 2006.

1. **Work performed through December 30, 2006:**
M-3 was operational entire during the reporting period. During that time the pumping rate averaged approximately 207 GPM.

   Each Monday M-3 was inspected. Twice each week (Wednesday and Friday) there was a drive-by visual inspection to ensure the pump was operating. At the end of each month, the pumping rate, total gallons pumped, and the hotbox temperature were recorded on the operations report.

   CW-10 was abandoned on November 11 following NHHS protocols for well abandonment.

   The 2006 semi-annual sampling of monitoring wells CW-8 and CW-9, M-3 and the storm sewer outfall was conducted on December 6.

2. **Summary of findings:**
Trichloroethene was the only contaminant of concern that exceeded 5 ppb. The exceedance occurred in CW-8 (13 ppb).

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Zip 68428-0266
(402) 783-3931

The TCE concentration in CW-8 decreased since the last reporting period while the TCE concentration in CW-9 remains at the compliance level of 5 ppb.

3. **Results of sampling activities:**
The results of the semi-annual ground-water sampling conducted in December are attached.

4. **Effectiveness of the remedial action:**
During the 6-month period, approximately 55 million gallons of water were removed by M-3. If the TCE concentration in M-3 was at the reporting limit (1 ppb) during the 6 months of operation, approximately 0.5 lbs of TCE would have been removed. It should be emphasized that 0.5 lbs is an inordinately high removal estimate.

5. **Problems encountered and recommended solutions:**
No problems were encountered.

6. **Scheduled activities:**
Operation of M-3 continues. The next semi-annual sampling of M-3, the storm sewer outfall, and the two monitoring wells is scheduled for June.

Sincerely,

Roy F. Spalding

Roy F. Spalding, Ph.D.
Project Manager

enclosure
c.: G. McClure
D. Fisher

HASTINGS ANALYTICAL
346 West 1st Street
Hastings, NE 68901
402-462-4949

Hastings – Well #3 Subsite Monitoring Wells

Analytes: USEPA Method 502.2
Matrix: water

ANALYTE	CW-8 sampled 12/6/06	CW-9 sampled 12/6/06
1,1-dichloroethene (µg/L)	< 1	< 1
1,1,1-trichloroethane (µg/L)	< 1	< 1
trichloroethene (µg/L)	13	5.0
tetrachloroethene (µg/L)	< 1	2.4

HASTINGS ANALYTICAL
346 West 1st Street
Hastings, NE 68901
402-462-4949

Hastings – Well #3 Subsite Monitoring Wells

Analytes: USEPA Method 502.2
Matrix: water

ANALYTE	M-3 sampled 12/6/06	Storm Sewer Outfall sampled 12/6/06
1,1-dichloroethene (µg/L)	< 1	< 1
1,1,1-trichloroethane (µg/L)	< 1	< 1
trichloroethene (µg/L)	< 1	< 1
tetrachloroethene (µg/L)	< 1	< 1

HASTINGS ANALYTICAL
346 West 1st Street
Hastings, NE 68901
402-462-4949

Hastings – Well #3 Subsite Monitoring Wells

Analytes: USEPA Method 502.2
Matrix: water

ANALYTE	Trip Blank 12/6/06	Field Blank at MW-28R* 12/6/06	Equipment Blank after GM-2D* 12/5/06
1,1-dichloroethene (μg/L)	< 1	< 1	< 1
1,1,1-trichloroethane (μg/L)	< 1	< 1	< 1
trichloroethene (μg/L)	< 1	< 1	< 1
tetrachloroethene (μg/L)	< 1	< 1	< 1

* Well Site #3 semi-annual sampling was combined with North Landfill/FAR-MAR-CO quarterly sampling

Appendix 4e - Part 2

APPENDIX 4E, Part II

Well #3 subsite, OU18 Data

Data from Dravo's Annual Remedial Action Reports

2002 - 2007

ENSR.
Consulting • Engineering • Remediation

One Chatham Center, Suite 900
112 Washington Place
Pittsburgh, PA 15219
(412) 261-2910
FAX (412) 765-1421

July 5, 2000

Via Facsimile and Regular Mail

Mr. Darrell Sommerhauser
U.S. EPA, Region VII
901 N. 5th Street
Kansas City, KS 66101

RE: Up-Gradient Monitoring Well Installation, Colorado Avenue Subsite, Hastings, Nebraska, USEPA Unilateral Administrative Order Docket Number VII-93-F0019

Dear Mr. Sommerhauser:

The purpose of this letter is to inform the United States Environmental Protection Agency (USEPA), Region VII of Dravo Corporation's plan to install two groundwater monitoring wells (BW-17 and BW-18) up-gradient of the Colorado Avenue Subsite. The locations of the proposed groundwater monitoring wells are illustrated in Figure 1.

The proposed monitoring wells will be constructed as multi-nested wells with three specific screened zones at 200, 175 and 150 feet below ground surface. Since multi-nested well design does not comply with Title 178, Chapter 12, Section 007.07, an Order on Substantial Equivalent Procedure was requested by ENSR and granted by the Nebraska Department of Health in June 2000. The proposed well construction details for the two groundwater monitoring wells are illustrated in Figure 2.

If you have any questions or comments regarding this letter or the attached figures, please contact me at (412) 261-2910.

Sincerely,

Jason E. Tsaggaris, EIT
Civil Engineer

Reviewed by,

Matthew A. Cousino, P.G.
Program Manager

cc: L. Potts/Dravo

Attachments

2013596

200497

dravo/groundwater remediation/234069a

PROJ47166

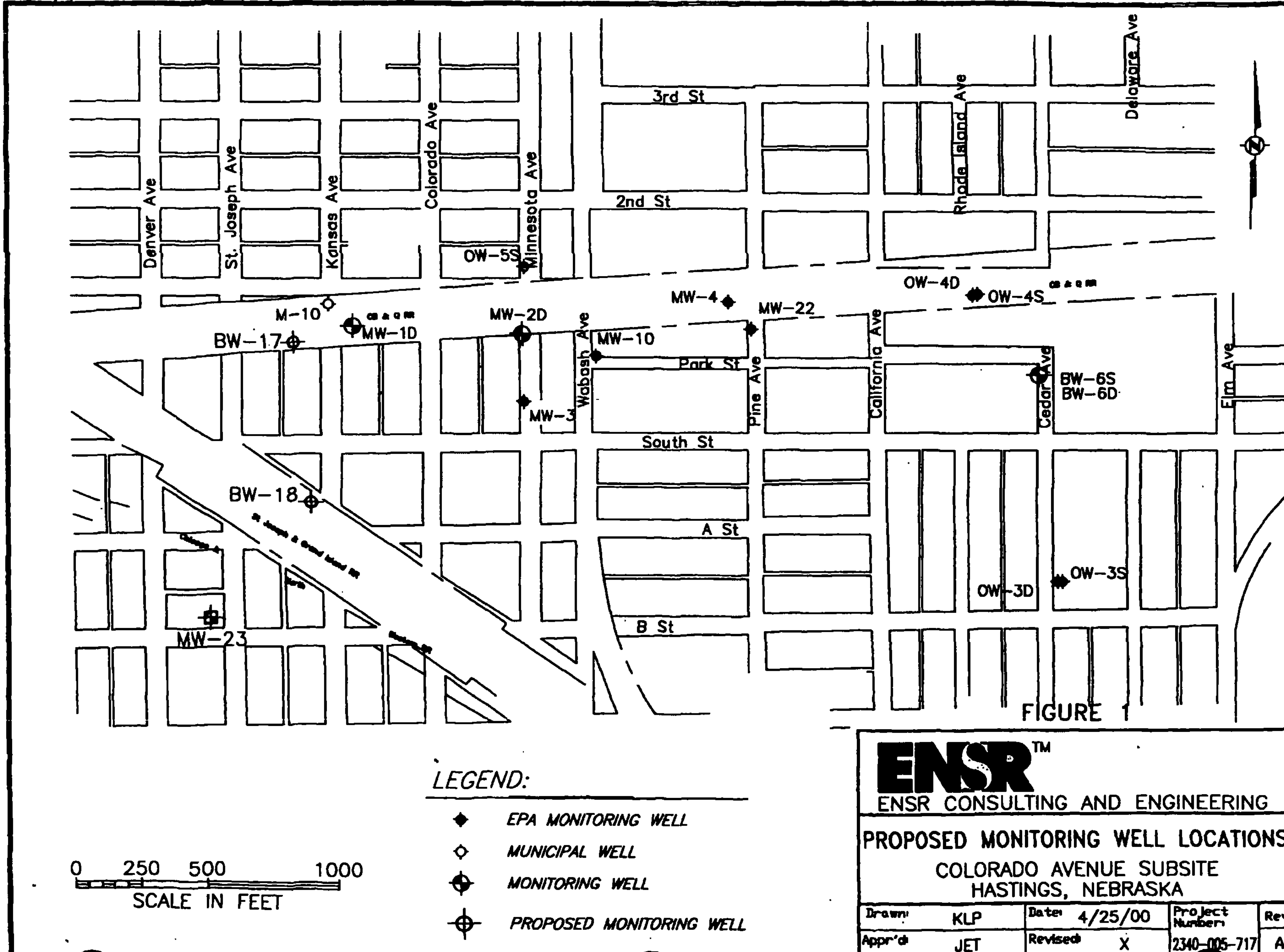

FIGURE 1

ENSR CONSULTING AND ENGINEERING

PROPOSED MONITORING WELL LOCATIONS

COLORADO AVENUE SUBSITE
HASTINGS, NEBRASKA

Drawn: KLP	Date: 4/25/00	Project Number: 2340-005-717	Rev.: A
Appr'd: JET	Revised: X		

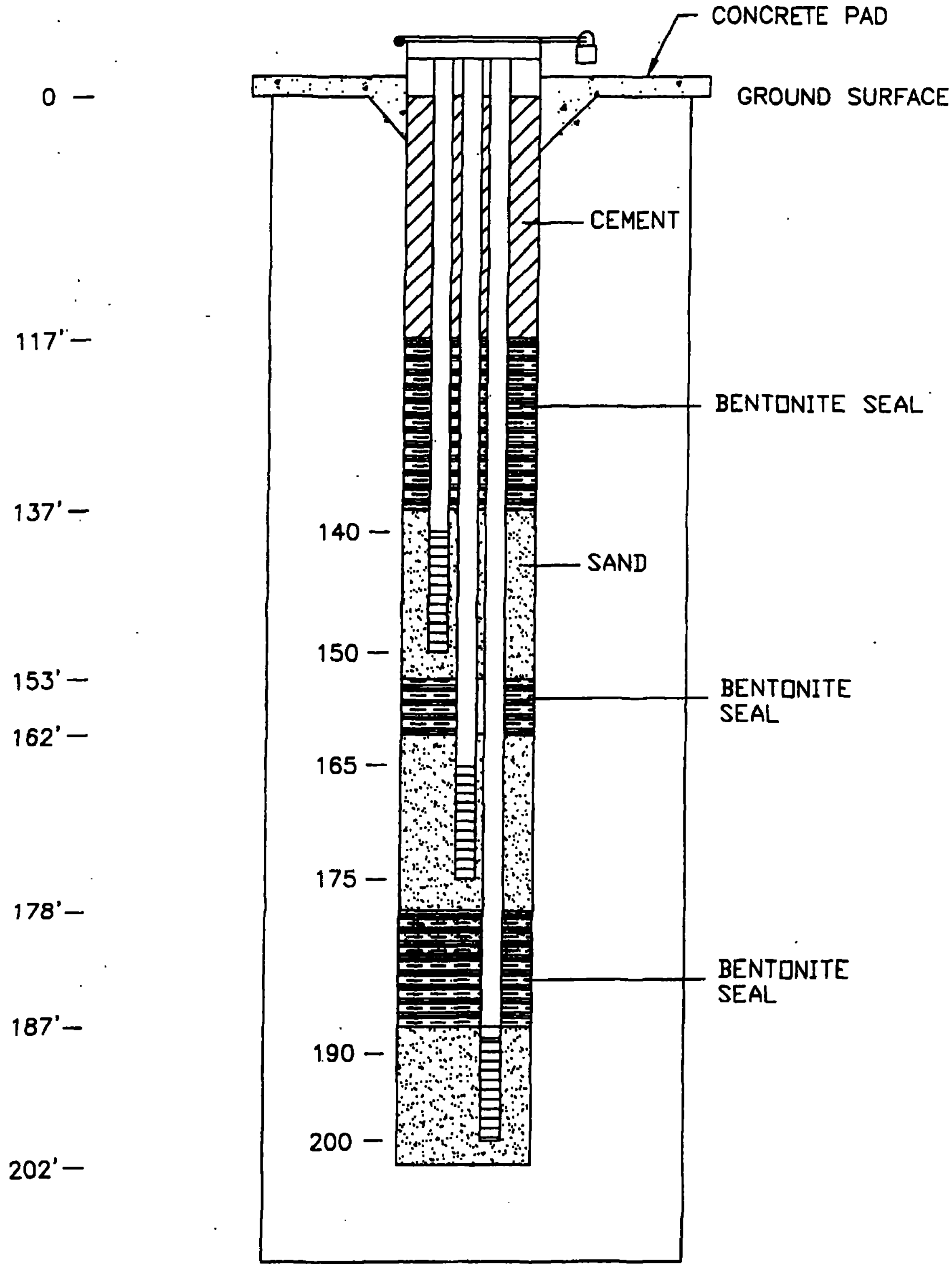

FIGURE 2
PROPOSED WELL CONSTRUCTION DETAIL
COLORADO AVENUE SUBSITE
HASTINGS, NEBRASKA

ENSR™
ENSR CONSULTING AND ENGINEERING

PROJ47167

Dravo/Construction Wells/234010A

Table 4-2 (cont'd)
Annual Performance Data
Groundwater Analytical Results
Phase 2 IWA Systems
Colorado Avenue Subsite
Hastings, Nebraska

Well Number	Date of Sample	GW Analytical Results (ug/l)				
		TCE	PCE	TCA	DCE	DCA
BW-17S (140-155)	4/3/2002	160	0.8J	N/D	0.7J	N/D
BW-17M (165-175)	4/3/2002	10	N/D	N/D	N/D	N/D
BW-17D (190-200)	4/3/2002	2J	0.5J	N/D	N/D	N/D
BW-18S (145-155)	4/4/2002	150	18	13	16	N/D
BW-18M (165-175)	4/4/2002	200	26	20	25	N/D
BW-18D (190-200)	4/4/2002	36	5J	3J	5J	N/D

(1) J - Indicates that the compound was analyzed for and determined to be present in the sample. The listed is an estimated value, which is less than the detection limit, but greater than zero.
(2) N/D - Not Detected
(3) NS - Not Sampled

Table 4-2
Annual Performance Data
Groundwater Analytical Results

Colorado Avenue Subsite
Hastings, Nebraska

Well Number	Date of Sample	GW Analytical Results (ug/l)					Sampling Method
		TCE	PCE	TCA	DCE	DCA	
BW-12 (122)	4/2/2003	4 J	ND	ND	ND	ND	PDB[3]
BW-12 (128)	4/2/2003	4 J	ND	ND	ND	ND	PDB
BW-12 (115-130)	4/5/2002	14	0.8J	ND[2]	ND	ND	LF[4]
BW-12 (115-130)	1/11/2001	23	0.7J	1J	ND	ND	LF
BW-12 (145-155)	1/11/2001	ND	ND	ND	ND	ND	LF
BW-12 (182)	4/2/2003	88	0.5 J	ND	ND	ND	PDB
BW-12 (188)	4/2/2003	93	0.4 J	ND	ND	ND	PDB
BW-12 (180-190)	4/5/2002	110	2J	ND	0.6J	ND	LF
BW-12 (180-190)	1/11/2001	10	ND	ND	ND	ND	LF
BW-13 (128)	4/2/2003	5 J	ND	ND	ND	ND	PDB
BW-13 (115-130)	4/2/2002	21	1J	ND	ND	ND	LF
BW-13 (115-130)	1/11/2001	10J	ND	ND	ND	ND	LF
BW-13 (147)	4/2/2003	200	5	7	5	ND	PDB
BW-13 (145-155)	4/2/2002	380	12J	22J	9J	ND	LF
BW-13 (145-155)	4/2/2002	33	2J	ND	ND	ND	LF
BW-13 (145-155)	1/11/2001	300	17J	18J	8J	ND	LF
BW-13 (145-155)	1/11/2001	25	3J	ND	ND	ND	LF
BW-13 (177)	4/2/2003	16	ND	ND	ND	ND	PDB
BW-13 (197)	4/2/2003	69	1 J	ND	2 J	ND	PDB
BW-13 (195-205)	4/2/2002	92	4J	4J	2J	ND	LF
BW-13 (195-205)	1/11/2001	5	1J	ND	ND	ND	LF
BW-14 (128)	4/2/2003	6	ND	ND	2 J	ND	PDB
BW-14 (115-130)	4/1/2002	6	ND	ND	ND	ND	LF
BW-14 (115-130)	1/10/2001	13	0.5J[1]	0.5J	ND(2)	ND	LF
BW-14 (145-155)	4/2/2002	130	6	6	3J	ND	LF
BW-14 (145-155)	1/10/2001	230	12J	7J	5J	ND	LF
BW-14 (177)	4/2/2003	17	0.7 J	ND	ND	ND	PDB
BW-14 (170-180)	4/2/2002	380	18J	27	6J	ND	LF
BW-14 (203)	4/2/2003	75	2 J	ND	ND	ND	PDB
BW-14 (195-205)	4/1/2002	520	16J	35	10J	ND	LF
BW-17 (150)	4/3/2003	180	ND	ND	2 J	ND	PDB
BW-17S (140-155)	4/3/2002	160	0.8J	ND	0.7J	ND	LF
BW-17 (167)	4/3/2003	10	ND	ND	ND	ND	PDB
BW-17M (165-175)	4/3/2002	10	ND	ND	ND	ND	LF
BW-17 (192)	4/3/2003	ND	ND	ND	ND	ND	PDB
BW-17D (190-200)	4/3/2002	2J	0.5J	ND	ND	ND	LF
BW-18 (146)	4/3/2003	82	4 J	6	13	ND	PDB
BW-18 (151)	4/3/2003	97	9	6	13	ND	PDB
BW-18S (145-155)	4/4/2002	150	18	13	16	ND	LF
BW-18 (167)	4/3/2003	35	4 J	ND	5 J	ND	PDB
BW-18 (172)	4/3/2003	35	3 J	ND	4 J	ND	PDB
BW-18M (165-175)	4/4/2002	200	26	20	25	ND	LF
BW-18 (192)	4/3/2003	8	ND	ND	ND	ND	PDB
BW-18 (195)	4/3/2003	48	3 J	ND	7	ND	PDB
BW-18D (190-200)	4/4/2002	36	5J	3J	5J	ND	LF
BW-20 (123)	5/12/2003	37	ND	1 J	5	ND	PDB

TABLE 4-2
PHASE 2 PERFORMANCE MONITORING WELLS--COC ANALYTICAL RESULTS
ANNUAL REMEDIAL ACTION REPORT, 7/2003-6/2004
COLORADO AVENUE SUBSITE
HASTINGS, NEBRASKA

Site ID/Sample ID	Colorado Avenue	SDWA	BW-14	BW-14	BW-14Dup	BW-17	BW-17
Date Sampled	Interim Action	Federal	21-Apr-04	21-Apr-04	21-Apr-04	21-Apr-04	21-Apr-04
Depth Range (ft bgs)	Concentrations [1]	MCLs	177	203	203	145	150
Volatile Organic Compounds (ug/L)							
1 1 1-Trichloroethane	NA	200	10 U	5 U	5 U	5 U	10 U
1 1-Dichloroethene	5	7	10 U	2 J	2 J	5 U	2 J
1 2-Dichloroethane	45	5	**25**	**12**	**12**	5 U	10 U
Tetrachloroethene	150	5	10 U	5 U	5 U	5 U	10 U
Trichloroethene	290	5	**24**	2 J	2 J	**41**	**280**

Notes:
[1] Reference: Colorado Avenue
Ground Water Interim Action
Operable Unit Feasibility Study, June 1991
ug/L--micrograms per liter
ft bgs - feet below ground surface
U--not detected
J--estimated concentration
COC--Contaminants of Concern
SDWA--Safe Drinking Water Act
MCL--maximum contaminant level
NA--not applicable
Shading indicates exceedance of Interim Levels
Bold indicates exceedance of MCLs

TABLE 4-2
PHASE 2 PERFORMANCE MONITORING WELLS--COC ANALYTICAL RESULTS
ANNUAL REMEDIAL ACTION REPORT, 7/2003-6/2004
COLORADO AVENUE SUBSITE
HASTINGS, NEBRASKA

Site ID/Sample ID	Colorado Avenue	SDWA	BW-17	BW-17	BW-17	BW-17	BW-18
Date Sampled	Interim Action	Federal	21-Apr-04	21-Apr-04	21-Apr-04	21-Apr-04	21-Apr-04
Depth Range (ft bgs)	Concentrations [(1)]	MCLs	167	172	192	195	146
Volatile Organic Compounds (ug/L)							
1 1 1-Trichloroethane	NA	200	5 U	5 U	5 U	5 U	5 U
1 1-Dichloroethene	5	7	5 U	5 U	5 U	5 U	2 J
1 2-Dichloroethane	45	5	5 U	5 U	5 U	5 U	5 U
Tetrachloroethene	150	5	5 U	5 U	5 U	5 U	5 U
Trichloroethene	290	5	**28**	**20**	5 U	5 U	**10**

Notes:
[(1)] Reference: Colorado Avenue
Ground Water Interim Action
Operable Unit Feasibility Study, June 1991
ug/L--micrograms per liter
ft bgs - feet below ground surface
U--not detected
J--estimated concentration
COC--Contaminants of Concern
SDWA--Safe Drinking Water Act
MCL--maximum contaminant level
NA--not applicable
Shading indicates exceedance of Interim Levels
Bold indicates exceedance of MCLs

TABLE 4-2
PHASE 2 PERFORMANCE MONITORING WELLS--COC ANALYTICAL RESULTS
ANNUAL REMEDIAL ACTION REPORT, 7/2003-6/2004
COLORADO AVENUE SUBSITE
HASTINGS, NEBRASKA

Site ID/Sample ID	Colorado Avenue	SDWA	BW-18	BW-18-Dup	BW-18	BW-18	BW-18	BW-18
Date Sampled	Interim Action	Federal	21-Apr-04	21-Apr-04	21-Apr-04	21-Apr-04	21-Apr-04	21-Apr-04
Depth Range (ft bgs)	Concentrations [1]	MCLs	151	151	167	172	192	195
Volatile Organic Compounds (ug/L)								
1 1 1-Trichloroethane	NA	200	5 U	5 U	2 J	5 U	5 U	2 J
1 1-Dichloroethene	5	7	5 U	1 J	5 J	4 J	2 J	4 J
1 2-Dichloroethane	45	5	5 U	5 U	5 U	5 U	5 U	5 U
Tetrachloroethene	150	5	0.9 J	1 J	**7**	**8**	5 U	**6**
Trichloroethene	290	5	**8**	**11**	**37**	**35**	**10**	**31**

Notes:
[1] Reference: Colorado Avenue
Ground Water Interim Action
Operable Unit Feasibility Study, June 1991
ug/L--micrograms per liter
ft bgs - feet below ground surface
U--not detected
J--estimated concentration
COC--Contaminants of Concern
SDWA--Safe Drinking Water Act
MCL--maximum contaminant level
NA--not applicable
Shading indicates exceedance of Interim Levels
Bold indicates exceedance of MCLs

TABLE 4-1
SUMMARY OF SAMPLING PROGRAM
ANNUAL REMEDIAL ACTION REPORT, 7/2004 - 6/2005
COLORADO AVENUE SUBSITE
HASTINGS, NEBRASKA

Sample Media	Sample ID	Sample Depth (ft bgs)	Sample Date	Sample Time	Sampler Type/Comments
Groundwater Phase 2	BW-12	182	4/20/2005	1510	PDB
	BW-13	147	4/19/2005	1035	PDB
	BW-13	177	4/19/2005	1045	PDB; Split sample with EPA
	BW-13	197	4/19/2005	1205	PDB
	BW-14	128	4/19/2005	1115	PDB; Split sample with EPA
	BW-14	153	4/19/2005	1055	PDB; Split sample with EPA
	BW-14	177	4/19/2005	1105	PDB; Split sample with EPA
	BW-14	203	4/19/2005	1225	PDB
	BW-17	145	4/20/2005	1252	PDB
	BW-17	150	4/20/2005	1256	PDB
	BW-17	167	4/20/2005	1300	PDB
	BW-17	172	4/20/2005	1305	PDB
	BW-17	192	4/20/2005	1308	PDB
	BW-17	195	4/20/2005	1310	PDB
	BW-18	146	4/20/2005	1330	PDB
	BW-18	151	4/20/2005	1335	PDB
	BW-18-DUP	151	4/20/2005	1335	PDB; Duplicate
	BW-18	167	4/20/2005	1338	PDB
	BW-18	172	4/20/2005	1342	PDB
	BW-18	192	4/20/2005	1345	PDB
	BW-18	195	4/20/2005	1350	PDB
	IAS-3	138	4/20/2005	1425	PDB
	IAS-3-DUP	138	4/20/2005	1425	PDB; Duplicate
	IAS-4	148	4/20/2005	1435	PDB
	IWA-1D	195	4/20/2005	0840	Bailer
	IWA-3D	188	4/20/2005	0925	Bailer
	IWA-3D-DUP	188	4/20/2005	0925	Bailer; Duplicate
	IWA-3S	118	4/20/2005	0910	Bailer
	MLW-1	195			PDB; EPA Sampled
	MLW-1	212			PDB; EPA Sampled
	MLW-2	190			PDB; EPA Sampled
	MW-1	129	4/19/2005	0920	PDB
	MW-1D	169	4/20/2005	1245	PDB
	MW-10	133	4/20/2005	1235	PDB
	MW-10-DUP	133	4/20/2005	1235	PDB; Duplicate
	MW-13	167	4/20/2005	1125	PDB
	MW-2	128	4/20/2005	1420	PDB
	MW-22	125	4/20/2005	1455	PDB
	MW-4	135	4/20/2005	1445	PDB
	MW-4-DUP	135	4/20/2005	1445	PDB; Duplicate
	OW-4D	177	4/20/2005	1220	PDB
	OW-4S	137	4/20/2005	1210	PDB

TABLE 4-3
PHASE 2 PERFORMANCE MONITORING WELLS–COC ANALYTICAL RESULTS
ANNUAL REMEDIAL ACTION REPORT
7/2004-6/2005
COLORADO AVENUE SUBSITE
HASTINGS, NEBRASKA

Site ID/Sample ID	Colorado Avenue	SDWA	BW-12	BW-13	BW-13	BW-13
Date Sampled	Interim Action	Federal	20-Apr-05	19-Apr-05	19-Apr-05	19-Apr-05
Depth Range (ft bgs)	Concentrations [1]	MCLs	182	147	177	197
Volatile Organic Compounds (ug/L)						
1,1,1-Trichloroethane	NA	200	1 U	0.75 J	0.49 J	1.1 J
1,1-Dichloroethene	5	7	1 U	0.99 J	1 U	3 U
1,2-Dichloroethane	45	5	1 U	1 U	1 U	3 U
Tetrachloroethene	150	5	1 U	0.8 J	0.27 J	1.3 J
Trichloroethene	290	5	**18**	**28**	**9.2**	**45**

Notes:
[1] Reference: Colorado Avenue
Ground Water Interim Action
Operable Unit Feasibility Study, June 1991
ug/L--micrograms per liter
ft bgs--feet below ground surface
U--not detected
J--estimated concentration
COC--Contaminants of Concern
SDWA--Safe Drinking Water Act
MCL--maximum contaminant level
NA--not applicable
Shading indicates exceedance of Interim Levels
Bold indicates exceedance of MCLs

TABLE 4-3
PHASE 2 PERFORMANCE MONITORING WELLS--COC ANALYTICAL RESULTS
ANNUAL REMEDIAL ACTION REPORT
7/2004-6/2005
COLORADO AVENUE SUBSITE
HASTINGS, NEBRASKA

Site ID/Sample ID	Colorado Avenue	SDWA	BW-17	BW-17	BW-17	BW-17
Date Sampled	Interim Action	Federal	20-Apr-05	20-Apr-05	20-Apr-05	20-Apr-05
Depth Range (ft bgs)	Concentrations [1]	MCLs	145	150	167	172
Volatile Organic Compounds (ug/L)						
1,1,1-Trichloroethane	NA	200	1 U	3 U	1 U	1 U
1,1-Dichloroethene	5	7	1 U	3 U	1 U	1 U
1,2-Dichloroethane	45	5	1 U	3 U	1 U	1 U
Tetrachloroethene	150	5	1 U	3 U	1 U	1 U
Trichloroethene	290	5	**14**	**73**	**19**	**7.2**

Notes:
[1] Reference: Colorado Avenue
Ground Water Interim Action
Operable Unit Feasibility Study, June 1991
ug/L--micrograms per liter
ft bgs--feet below ground surface
U--not detected
J--estimated concentration
COC--Contaminants of Concern
SDWA--Safe Drinking Water Act
MCL--maximum contaminant level
NA--not applicable
Shading indicates exceedance of Interim Levels
Bold indicates exceedance of MCLs

TABLE 4-3
PHASE 2 PERFORMANCE MONITORING WELLS--COC ANALYTICAL RESULTS
ANNUAL REMEDIAL ACTION REPORT
7/2004-6/2005
COLORADO AVENUE SUBSITE
HASTINGS, NEBRASKA

Site ID/Sample ID	Colorado Avenue	SDWA	BW-17	BW-17	BW-18	BW-18 Dup
Date Sampled	Interim Action	Federal	20-Apr-05	20-Apr-05	20-Apr-05	20-Apr-05
Depth Range (ft bgs)	Concentrations [1]	MCLs	192	195	146	151
Volatile Organic Compounds (ug/L)						
1,1,1-Trichloroethane	NA	200	1 U	1 U	1 U	1
1,1-Dichloroethene	5	7	1 U	1 U	0.56 J	1.8
1,2-Dichloroethane	45	5	1 U	1 U	1 U	1 U
Tetrachloroethene	150	5	1 U	1 U	1 U	2.2
Trichloroethene	290	5	1 U	1 U	2.3	**13**

Notes:
[1] Reference: Colorado Avenue
Ground Water Interim Action
Operable Unit Feasibility Study, June 1991
ug/L--micrograms per liter
ft bgs--feet below ground surface
U--not detected
J--estimated concentration
COC--Contaminants of Concern
SDWA--Safe Drinking Water Act
MCL--maximum contaminant level
NA--not applicable
Shading indicates exceedance of Interim Levels
Bold indicates exceedance of MCLs

TABLE 4-3
PHASE 2 PERFORMANCE MONITORING WELLS--COC ANALYTICAL RESULTS
ANNUAL REMEDIAL ACTION REPORT
7/2004-6/2005
COLORADO AVENUE SUBSITE
HASTINGS, NEBRASKA

Site ID/Sample ID	Colorado Avenue	SDWA	BW-18	BW-18	BW-18	BW-18
Date Sampled	Interim Action	Federal	20-Apr-05	20-Apr-05	20-Apr-05	20-Apr-05
Depth Range (ft bgs)	Concentrations [1]	MCLs	151	167	172	192
Volatile Organic Compounds (ug/L)						
1,1,1-Trichloroethane	NA	200	1.3	1.2	1.3	0.31 J
1,1-Dichloroethene	5	7	2.1	2.1	2.2	0.66 J
1,2-Dichloroethane	45	5	1 U	1 U	1 U	1 U
Tetrachloroethene	150	5	2.2	3.6	4.4	0.25 J
Trichloroethene	290	5	**13**	**29**	**32**	4.9

Notes:
[1] Reference: Colorado Avenue
Ground Water Interim Action
Operable Unit Feasibility Study, June 1991
ug/L--micrograms per liter
ft bgs--feet below ground surface
U--not detected
J--estimated concentration
COC--Contaminants of Concern
SDWA--Safe Drinking Water Act
MCL--maximum contaminant level
NA--not applicable
Shading indicates exceedance of Interim Levels
Bold indicates exceedance of MCLs

TABLE 4-3
PHASE 2 PERFORMANCE MONITORING WELLS--COC ANALYTICAL RESULTS
ANNUAL REMEDIAL ACTION REPORT
7/2004-6/2005
COLORADO AVENUE SUBSITE
HASTINGS, NEBRASKA

Site ID/Sample ID	**Colorado Avenue**	**SDWA**	BW-18	IAS-3 Dup	IAS-3	IAS-4
Date Sampled	**Interim Action**	**Federal**	20-Apr-05	20-Apr-05	20-Apr-05	20-Apr-05
Depth Range (ft bgs)	**Concentrations** [1]	**MCLs**	195	138	138	148
Volatile Organic Compounds (ug/L)						
1,1,1-Trichloroethane	NA	200	0.48 J	1 U	1 U	1 U
1,1-Dichloroethene	5	7	0.49 J	1 U	1 U	1 U
1,2-Dichloroethane	45	5	1 U	1 U	1 U	1 U
Tetrachloroethene	150	5	1.4	1 U	1 U	1 U
Trichloroethene	290	5	**6.6**	**19**	**20**	**20**

Notes:
[1] Reference: Colorado Avenue
Ground Water Interim Action
Operable Unit Feasibility Study, June 1991
ug/L--micrograms per liter
ft bgs--feet below ground surface
U--not detected
J--estimated concentration
COC--Contaminants of Concern
SDWA--Safe Drinking Water Act
MCL--maximum contaminant level
NA--not applicable
Shading indicates exceedance of Interim Levels
Bold indicates exceedance of MCLs

TABLE 4-3
PHASE 2 PERFORMANCE MONITORING WELLS--COC ANALYTICAL RESULTS
ANNUAL REMEDIAL ACTION REPORT
7/2004-6/2005
COLORADO AVENUE SUBSITE
HASTINGS, NEBRASKA

Site ID/Sample ID	Colorado Avenue	SDWA	MW-10 Dup	MW-10	MW-1	MW-13
Date Sampled	Interim Action	Federal	20-Apr-05	20-Apr-05	19-Apr-05	20-Apr-05
Depth Range (ft bgs)	Concentrations [1]	MCLs	133	133	129	167
Volatile Organic Compounds (ug/L)						
1,1,1-Trichloroethane	NA	200	0.94 J	0.9 J	1 U	1 U
1,1-Dichloroethene	5	7	0.64 J	1 U	1 U	1 U
1,2-Dichloroethane	45	5	0.4 J	0.4 J	1 U	1 U
Tetrachloroethene	150	5	1.8	1.7	1 U	0.37 J
Trichloroethene	290	5	**30**	**28**	1 U	**13**

Notes:
[1] Reference: Colorado Avenue
Ground Water Interim Action
Operable Unit Feasibility Study, June 1991
ug/L--micrograms per liter
ft bgs--feet below ground surface
U--not detected
J--estimated concentration
COC--Contaminants of Concern
SDWA--Safe Drinking Water Act
MCL--maximum contaminant level
NA--not applicable
Shading indicates exceedance of Interim Levels
Bold indicates exceedance of MCLs

TABLE 4-3
PHASE 2 PERFORMANCE MONITORING WELLS--COC ANALYTICAL RESULTS
ANNUAL REMEDIAL ACTION REPORT
7/2004-6/2005
COLORADO AVENUE SUBSITE
HASTINGS, NEBRASKA

Site ID/Sample ID	**Colorado Avenue**	**SDWA**	MW-1D	MW-2	MW-22	MW-4 Dup
Date Sampled	**Interim Action**	**Federal**	20-Apr-05	20-Apr-05	20-Apr-05	20-Apr-05
Depth Range (ft bgs)	**Concentrations [(1)]**	**MCLs**	169	128	125	135
Volatile Organic Compounds (ug/L)						
1,1,1-Trichloroethane	NA	200	1 U	3 U	1 U	1 U
1,1-Dichloroethene	5	7	1 U	3 U	0.5 J	1 U
1,2-Dichloroethane	45	5	1 U	3 U	1 U	1 U
Tetrachloroethene	150	5	1 U	1.8 J	0.73 J	0.52 J
Trichloroethene	290	5	0.61 J	**49**	**34**	**26**

Notes:
[(1)] Reference: Colorado Avenue
Ground Water Interim Action
Operable Unit Feasibility Study, June 1991
ug/L--micrograms per liter
ft bgs--feet below ground surface
U--not detected
J--estimated concentration
COC--Contaminants of Concern
SDWA--Safe Drinking Water Act
MCL--maximum contaminant level
NA--not applicable
Shading indicates exceedance of Interim Levels
Bold indicates exceedance of MCLs

TABLE 4-1
SUMMARY OF SAMPLING PROGRAM
ANNUAL REMEDIAL ACTION REPORT, JULY 1, 2005 - JANUARY 31, 2007
COLORADO AVENUE SUBSITE
HASTINGS, NEBRASKA

Sample Media	Sample ID	Sample Depth (ft bgs)	Sample Event - 12/01/05	Sample Event - 5/02/06	Sample Event - 11/29/06	Sampler Type/Comments
Groundwater Phase 2	BW-12	185	X	X	X	PDB
	BW-13	150	X	EPA	X	PDB
	BW-14	150	X	EPA	X	PDB
	BW-17	150	X	X		PDB
	BW-18	167	X	X		PDB
	IAS -2	148	X	X	X	PDB
	IAS-4	148	X	X	X	PDB
	IWA-1D	195	X	X	X	Bailer
	IWA-1S	118		X	X	Bailer
	IWA-2D	198		X	X	Bailer
	IWA-2S	128		X +DUP	4	Bailer
	IWA-3D	188	X		X	Bailer
	IWA-3S	118	X +DUP		X	Bailer
	MLW-1	155	X	EPA	X	PDB
	MLW-1	190	X	EPA	X	PDB
	MLW-2	148	X	X	X	PDB
	MLW-2	160	X	X	X	PDB
	MP-13	125	X	X	X	PDB
	MP-14	125	X	X	X	PDB
	MW-2	133	X	X +DUP	X	PDB
	MW-4	135	X	EPA	X	PDB
	MW-10	135	X +DUP	X	X	PDB
	MW-13	155	X	EPA	X	PDB
	MW-22	125	X	X	X	PDB
	MW-22	155	X	X	X	PDB
	MW-24	135		3		PDB
	MW-24	160		X		PDB
	OW-4D	175	X	EPA	X	PDB
	OW-4S	130	X	EPA	X +DUP	PDB

APPENDIX C

PERFORMANCE MONITORING WELLS–ANALYTICAL RESULTS–NOVEMBER 2005
COLORADO AVENUE SUBSITE
HASTINGS, NEBRASKA

Site ID	IWA-6D	IWA-6S	IWA-7D	IWA-7S	BW-12	BW-13	BW-14	BW-17	BW-18
Sample ID	IWA-6D-11-05-P	IWA-6S-11-05-P	IWA-7D-11-05-P	IWA-7S-11-05-P	BW-12-12-01-05-P	BW-13-12-01-05-P	BW-14-12-01-05-P	BW-17-12-01-05-P	BW-18-12-01-05-P
Sample Type	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary
Sample Date	11-30-2005	11-30-2005	11-30-2005	11-30-2005	12-01-2005	12-01-2005	12-01-2005	12-01-2005	12-01-2005
Sample Depth (ft)	(1)	(1)	(1)	(1)	185	150	198	150	167
Volatiles (ug/L)									
1,1,1-Trichloroethane (TCA)	2.7	2.8	6.3	7.1	1 U	1.9 J	0.56 J	0.35 J	0.87 J
1,1-Dichloroethene	6.6	6.6	14	18	1 U	2.1	0.67 J	0.68 J	2.1
1,2-Dichloroethane	2.4	2.4	5 U	5 U	1 U	2 U	2 U	0.24 J	1 U
Tetrachloroethene (PCE)	0.75 J	0.8 J	0.63 J	0.64 J	1 U	1.5 J	0.34 J	0.96 J	2
Trichloroethene (TCE)	80	81	150	180	7.4	78	24	110	50
1,1,2,2-Tetrachloroethane	2 U	2 U	5 U	5 U	1 U	2 U	2 U	2 U	1 U
1,1,2-Trichloroethane	2 U	2 U	5 U	5 U	1 U	2 U	2 U	2 U	1 U
1,1-Dichloroethane	4	3.8	8.3	9.9	1 U	1.5 J	0.63 J	2 U	1 U
1,2-Dichloroethene (cis)	7.8	7.7	18	21	1 U	3.2	1.6 J	0.58 J	0.25 J
1,2-Dichloroethene (trans)	2 U	2 U	5 U	5 U	1 U	2 U	2 U	2 U	1 U
1,2-Dichloropropane	2 U	2 U	5 U	5 U	1 U	2 U	2 U	2 U	1 U
1,3-Dichloropropene (cis)	2 U	2 U	5 U	5 U	1 U	2 U	2 U	2 U	1 U
1,3-Dichloropropene (trans)	2 U	2 U	5 U	5 U	1 U	2 U	2 U	2 U	1 U
2-Butanone (MEK)	10 U	10 U	25 U	25 U	5 U	10 U	10 U	10 U	1.3 J
2-Hexanone (MBK)	10 U	10 U	25 U	25 U	5 U	10 U	10 U	10 U	5 U
4-Methyl-2-pentanone (MIBK	10 U	10 U	25 U	25 U	5 U	10 U	10 U	10 U	5 U
Acetone	20 U	20 U	12 J	50 U	2.2 J B	20 U	3.5 J B	3.5 J	3.8 J
Benzene	2 U	2 U	5 U	5 U	1 U	2 U	2 U	2 U	1 U
Bromodichloromethane	2 U	2 U	5 U	5 U	1 U	2 U	2 U	2 U	1 U
Bromoform	2 U	2 U	5 U	5 U	1 U	2 U	2 U	2 U	1 U
Bromomethane	4 U	4 U	10 U	10 U	2 U	4 U	4 U	4 U	2 U
Carbon Disulfide	2 U	2 U	5 U	5 U	1 U	2 U	2 U	2 U	1 U
Carbon Tetrachloride	2 U	2 U	5 U	5 U	1 U	2 U	2 U	2 U	0.19 J
Chlorobenzene	2 U	2 U	5 U	5 U	1 U	2 U	2 U	2 U	1 U
Chloroethane	4 U	4 U	10 U	10 U	2 U	4 U	4 U	4 U	2 U
Chloroform	2 U	2 U	5 U	0.55 J	0.25 J	0.29 J	0.21 J	0.48 J	1 U
Chloromethane	4 U	4 U	10 U	10 U	2 U	4 U	4 U	4 U	2 U
Dibromochloromethane	2 U	2 U	5 U	5 U	1 U	2 U	2 U	2 U	1 U
Ethylbenzene	2 U	2 U	5 U	5 U	1 U	2 U	2 U	2 U	1 U
Methylene Chloride	4 U	4 U	10 U	10 U	2 U	4 U	4 U	4 U	2 U
Styrene (Ethenylbenzene)	2 U	2 U	5 U	5 U	1 U	2 U	2 U	2 U	1 U
Toluene	2 U	2 U	5 U	5 U	0.16 J	2 U	2 U	2 U	1 U
Vinyl Acetate	4 U	4 U	10 U	10 U	2 U	4 U	4 U	4 U	2 U
Vinyl Chloride	2 U	2 U	5 U	5 U	1 U	2 U	2 U	2 U	1 U
Xylenes, total	2 U	2 U	5 U	5 U	1 U	2 U	2 U	2 U	1 U

(1) Sampled with a bailer

APPENDIX C

PERFORMANCE MONITORING WELLS--ANALYTICAL RESULTS--MAY 2006
COLORADO AVENUE SUBSITE
HASTINGS, NEBRASKA

	1WA-5S 05-01-2006	1WA-5SA 05-01-2006	1WA-6D 05-01-2006	1WA-6S 05-01-2006	1WA-7D 05-01-2006	1WA-7S 05-01-2006	BW-12-182 05-02-2006	BW-17-150 05-02-2006	BW-18-167 05-02-2006	BW-20-123 05-02-2006
Volatiles (ug/L)										
1,1,1-Trichloroethane (TCA)	1 U	1 U	0.75 J	0.51 J	0.72 J	0.78 J	1 U	4 U	0.49 J	0.67 J
1,1-Dichloroethene	0.67 J	0.42 J	1.2	1 U	0.67 J	0.86 J	1 U	4 U	1.3	0.72 J
1,2-Dichloroethane	1	0.95 J	0.82 J	1.8	1 U	1 U	1 U	4 U	1 U	1 U
Tetrachloroethene (PCE)	1 U	1 U	0.26 J	0.42 J	0.56 J	0.61 J	1 U	0.95 J	1.6	0.63 J
Trichloroethene (TCE)	8.4	7.5	15	21	27	27	2	120	29	24
1,1,2,2-Tetrachloroethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	4 U	1 U	1 U
1,1,2-Trichloroethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	4 U	1 U	1 U
1,1-Dichloroethane	0.58 J	0.53 J	0.9 J	0.66 J	1.1	1.1	1 U	4 U	1 U	1
1,2-Dichloroethene (cis)	1.3	1.2	1.9	1.6	3	2.9	1 U	4 U	1 U	2.5
1,2-Dichloroethene (trans)	1 U	1 U	1 U	1 U	1 U	1 U	1 U	4 U	1 U	1 U
1,2-Dichloropropane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	4 U	1 U	1 U
1,3-Dichloropropene (cis)	1 U	1 U	1 U	1 U	1 U	1 U	1 U	4 U	1 U	1 U
1,3-Dichloropropene (trans)	1 U	1 U	1 U	1 U	1 U	1 U	1 U	4 U	1 U	1 U
2-Butanone (MEK)	5 U	5 U	5 U	5 U	5 U	5 U	5 U	20 U	5 U	5 U
2-Hexanone (MBK)	5 U	5 U	5 U	5 U	5 U	5 U	5 U	20 U	5 U	5 U
4-Methyl-2-pentanone (MIBK)	5 U	5 U	5 U	5 U	5 U	5 U	5 U	20 U	5 U	5 U
Acetone	5 U	5 U	5 U	5 U	5 U	5 U	5 U	20 U	5 U	5 U
Benzene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	4 U	1 U	1 U
Bromodichloromethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	4 U	1 U	1 U
Bromoform	1 U	1 U	1 U	1 U	1 U	1 U	1 U	4 U	1 U	1 U
Bromomethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	4 U	1 U	1 U
Carbon Disulfide	1 U	1 U	1 U	1 U	1 U	1 U	1 U	4 U	1 U	1 U
Carbon Tetrachloride	1 U	1 U	1 U	1 U	1 U	1 U	1 U	4 U	1 U	1 U
Chlorobenzene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	4 U	1 U	1 U
Chloroethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	4 U	1 U	1 U
Chloroform	1 U	1 U	1 U	1 U	1 U	1 U	0.2 J	4 U	1 U	1 U
Chloromethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	4 U	1 U	1 U
Dibromochloromethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	4 U	1 U	1 U
Ethylbenzene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	4 U	1 U	1 U
Methylene Chloride	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1.8 J	1 U	1 U
Styrene (Ethenylbenzene)	1 U	1 U	1 U	1 U	1 U	1 U	1 U	4 U	1 U	1 U
Toluene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	4 U	1 U	1 U
Vinyl Acetate	1 U	1 U	1 U	1 U	1 U	1 U	1 U	4 U	1 U	1 U
Vinyl Chloride	1 U	1 U	1 U	1 U	1 U	1 U	1 U	4 U	1 U	1 U
Xylenes, total	3 U	3 U	3 U	3 U	3 U	3 U	3 U	12 U	3 U	3 U

Appendix 5

Inspection CheckList

Well #3

INTERVIEW RECORD

Site Name: HASTINGS SITE/WELL #3		**EPA ID No.:** 18	
Subject: HASTINGS SITE FIVE YEAR REVIEW		**Time:** 8:00	**Date:** 2/28/2007
Type: ☐ Telephone ☒ Visit ☐ Other **Location of Visit:**		☐ Incoming ☐ Outgoing	
Contact Made By:			
Name: DARRELL SOMMERHAUSER	**Title:** RPM	**Organization:** EPA, R7	
Individual Contacted:			
Name: SEE BELOW	**Title:**	**Organization:**	
Telephone No: **Fax No:** **E-Mail Address:**		**Street Address:** **City, State, Zip:**	

Summary Of Conversation

MS. MARY SPALDING, HTI & MR. SCOTT FONG, HTI ACCOMPANIED EPA & NDEQ REPS TO CW-9, CW-8 AND SAMPLE COLLECTION POINT AT STORM SEWER OUTFALL NEAR LINCOLN PARK.

WE BRIEFLY DISCUSSED ANAL. DATA FOR EXTRACTION WELL #3. MS. SPALDING UNDERSTANDS THAT SAMPLES COLLECTED FROM CONVERTED WELL #3 ARE NON DETECT FOR TCE.

MR. JEREMY GROVES ESCORTED EPA & NDEQ TO THE SUMP AND WELL HOUSE USED BY THE CITY FOR PUMPING WATER TO IRRIGATE LINCOLN PARK.

WE ALSO DROVE TO END OF BURLINGTON STREET WHERE WATER FLOWS TO A PRIVATE PROPERTY OWNED BY BECKER.

NOTE:

I WAS ACCOMPANIED BY BILL GRESHAM & BRIAN ZURBUCHEN, EPA R7 AND ED SOUTHWICK & SCOTT SUMMERSIDE, NDEQ.

Site Inspection Checklist

I. SITE INFORMATION	
Site name: HASTINGS/WELL 3 SUBSITE	**Date of inspection:** 2/28/2007
Location and Region: HASTINGS, NE	**EPA ID:** NLD980862668
Agency, office, or company leading the five-year review: EPA R7	**Weather/temperature:** ~34° F
Remedy Includes: (Check all that apply) ☐ Landfill cover/containment ☐ Access controls ☐ Institutional controls ☒ Groundwater pump and treatment ☐ Surface water collection and treatment ☐ Other ______	☐ Monitored natural attenuation ☐ Groundwater containment ☐ Vertical barrier walls
Attachments: ☒ Inspection team roster attached	☒ Site map attached

II. INTERVIEWS (Check all that apply)
1. ***O&M site manager*** ______ ______ ______ Name Title Date Interviewed ☐ at site ☐ at office ☐ by phone Phone no. ______ Problems, suggestions; ☐ Report attached NOTE, DUTTON-LAINSON REP. WAS NOT INTERVIEWED THIS DATE
2. **O&M staff** MR. SCOTT FONG HTI CHEMIST 2/28/07 Name Title Date Interviewed ☒ at site ☐ at office ☐ by phone Phone no. ______ Problems, suggestions; ☐ Report attached ______

3.	**Local regulatory authorities and response agencies** (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.) Fill in all that apply.

Agency City
Contact JEREMY GROVES | ENG. ASSIST. | 2/28/07 | 402 461-2339
Name | Title | Date | Phone no.
Problems; suggestions; ☐ Report attached

Agency NDEQ
Contact ED SOUTHWICK | PROJECT MGR | 2/28/07 | 402 471-4875
Name | Title | Date | Phone no.
Problems; suggestions; ☐ Report attached

Agency
Contact
Name | Title | Date | Phone no.
Problems; suggestions; ☐ Report attached

Agency
Contact
Name | Title | Date | Phone no.
Problems; suggestions; ☐ Report attached

4. **Other interviews** (optional) ☐ Report attached.

MARY SPALDING, HTI

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)			
1. **O&M Documents**			
☐ O&M manual	☐ Readily available	☐ Up to date	☐ N/A
☐ As-built drawings	☐ Readily available	☐ Up to date	☐ N/A
☐ Maintenance logs	☐ Readily available	☐ Up to date	☐ N/A
Remarks			
2. **Site-Specific Health and Safety Plan**	☐ Readily available	☐ Up to date	☐ N/A
☐ Contingency plan/emergency response plan	☐ Readily available	☐ Up to date	☐ N/A
Remarks			
3. **O&M and OSHA Training Records**	☐ Readily available	☐ Up to date	☐ N/A
Remarks			
4. **Permits and Service Agreements**			
☐ Air discharge permit	☐ Readily available	☐ Up to date	☒ N/A
☐ Effluent discharge	☐ Readily available	☐ Up to date	☐ N/A
☐ Waste disposal, POTW	☐ Readily available	☐ Up to date	☒ N/A
☐ Other permits	☐ Readily available	☐ Up to date	☐ N/A
Remarks			
5 **Groundwater Monitoring Records**	☒ Readily available	☐ Up to date	☐ N/A
Remarks SEMI ANNUAL REPORTS REVIEWED FOR 2005 + 2006			

IV. O&M COSTS

1. **O&M Organization**

- ☐ State in-house ☐ Contractor for State
- ☒ PRP in-house ☐ Contractor for PRP
- ☐ Federal Facility in-house ☐ Contractor for Federal Facility
- ☐ Other ______________________

2. **O&M Cost Records**

- ☐ Readily available ☐ Up to date
- ☐ Funding mechanism/agreement in place

Original O&M cost estimate __________ ☐ Breakdown attached

Total annual cost by year for review period if available

From (Date)	To (Date)	Total cost	
			☐ Breakdown attached
			☐ Breakdown attached
			☐ Breakdown attached
			☐ Breakdown attached
			☐ Breakdown attached

3. **Unanticipated or Unusually High O&M Costs During Review Period**

Describe costs and reasons: NO MENTION IN SEMI-ANNUAL REPORTS

V. ACCESS AND INSTITUTIONAL CONTROLS ☐ Applicable ☐ N/A

A. Fencing

1. **Fencing damaged** ☐ Location shown on site map ☐ Gates secured ☒ N/A

Remarks ______________________

B. Other Access Restrictions

1. **Signs and other security measures** ☐ Location shown on site map ☐ N/A

Remarks ______________________

C. Institutional Controls (ICs)

1. **Implementation and enforcement**

Site conditions imply ICs not properly implemented ☐ Yes ☐ No ☐ N/A
Site conditions imply ICs not being fully enforced ☐ Yes ☐ No ☐ N/A

Type of monitoring (*e.g.*, self-reporting, drive by) ICA BY HASTINGS PRP GROUP
Frequency ______
Responsible party/agency HASTINGS PRP GROUP / HASTINGS UTILITIES
Contact ______ Name ______ Title ______ Date ______ Phone no.

Reporting is up-to-date ☐ Yes ☐ No ☐ N/A
Reports are verified by the lead agency ☐ Yes ☐ No ☐ N/A

Specific requirements in deed or decision documents have been met ☐ Yes ☐ No ☐ N/A
Violations have been reported ☐ Yes ☐ No ☐ N/A
Other problems or suggestions: ☐ Report attached
SEE LATEST (RY 2005) ANNUAL ICA REPORT
DATED 3/29/2006

2. **Adequacy** ☐ ICs are adequate ☐ ICs are inadequate ☐ N/A
Remarks ______

D. General

1. **Vandalism/trespassing** ☐ Location shown on site map ☒ No vandalism evident
Remarks ______

2. **Land use changes on site** ☒ N/A
Remarks ______

3. **Land use changes off site** ☒ N/A
Remarks ______

VI. GENERAL SITE CONDITIONS

A. Roads ☐ Applicable ☒ N/A

1. **Roads damaged** ☐ Location shown on site map ☐ Roads adequate ☐ N/A
Remarks ______

B. Other Site Conditions

Remarks ____

____

____

____

____

____

VII. LANDFILL COVERS ☐ Applicable ☒ N/A

A. Landfill Surface

1. **Settlement** (Low spots) ☐ Location shown on site map ☐ Settlement not evident
   Areal extent__________ Depth__________
   Remarks ____
   ____

2. **Cracks** ☐ Location shown on site map ☐ Cracking not evident
   Lengths__________ Widths__________ Depths__________
   Remarks ____
   ____

3. **Erosion** ☐ Location shown on site map ☐ Erosion not evident
   Areal extent__________ Depth__________
   Remarks ____
   ____

4. **Holes** ☐ Location shown on site map ☐ Holes not evident
   Areal extent__________ Depth__________
   Remarks ____
   ____

5. **Vegetative Cover** ☐ Grass ☐ Cover properly established ☐ No signs of stress
   ☐ Trees/Shrubs (indicate size and locations on a diagram)
   Remarks ____
   ____

6. **Alternative Cover (armored rock, concrete, etc.)** ☐ N/A
   Remarks ____
   ____

7. **Bulges** ☐ Location shown on site map ☐ Bulges not evident
   Areal extent__________ Height__________
   Remarks ____
   ____

H. Retaining Walls ☐ Applicable ☒ N/A

1. **Deformations** ☐ Location shown on site map ☐ Deformation not evident
Horizontal displacement_________ Vertical displacement_________
Rotational displacement_________
Remarks____

2. **Degradation** ☐ Location shown on site map ☐ Degradation not evident
Remarks____

I. Perimeter Ditches/Off-Site Discharge ☐ Applicable ☐ N/A

1. **Siltation** ☐ Location shown on site map ☐ Siltation not evident
Areal extent_________ Depth_________
Remarks____

2. **Vegetative Growth** ☐ Location shown on site map ☐ N/A
☐ Vegetation does not impede flow
Areal extent_________ Type_________
Remarks____

3. **Erosion** ☐ Location shown on site map ☐ Erosion not evident
Areal extent_________ Depth_________
Remarks____

4. **Discharge Structure** ☐ Functioning ☐ N/A
Remarks____

VIII. VERTICAL BARRIER WALLS ☐ Applicable ☒ N/A

1. **Settlement** ☐ Location shown on site map ☐ Settlement not evident
Areal extent_________ Depth_________
Remarks____

2. **Performance Monitoring** Type of monitoring________________
☐ Performance not monitored
Frequency________________ ☐ Evidence of breaching
Head differential________________
Remarks____

IX. GROUNDWATER/SURFACE WATER REMEDIES ☐ Applicable ☐ N/A
A. Groundwater Extraction Wells, Pumps, and Pipelines ☐ Applicable ☐ N/A
1. **Pumps, Wellhead Plumbing, and Electrical** ☐ Good condition ☐ All required wells properly operating ☐ Needs Maintenance ☐ N/A Remarks
2. **Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances** ☐ Good condition ☐ Needs Maintenance Remarks
3. **Spare Parts and Equipment** ☐ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided Remarks
B. Surface Water Collection Structures, Pumps, and Pipelines ☐ Applicable ☐ N/A
1. **Collection Structures, Pumps, and Electrical** ☐ Good condition ☐ Needs Maintenance Remarks
2. **Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances** ☐ Good condition ☐ Needs Maintenance Remarks
3. **Spare Parts and Equipment** ☐ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided Remarks

C. Treatment System ☐ Applicable ☐ N/A	
1.	**Treatment Train** (Check components that apply) ☐ Metals removal ☐ Oil/water separation ☐ Bioremediation ☐ Air stripping ☐ Carbon adsorbers ☐ Filters________ ☐ Additive (*e.g.*, chelation agent, flocculent)________ ☐ Others________ ☐ Good condition ☐ Needs Maintenance ☐ Sampling ports properly marked and functional ☐ Sampling/maintenance log displayed and up to date ☐ Equipment properly identified ☐ Quantity of groundwater treated annually________ ☐ Quantity of surface water treated annually________ Remarks________
2.	**Electrical Enclosures and Panels** (properly rated and functional) ☐ N/A ☐ Good condition ☐ Needs Maintenance Remarks________
3.	**Tanks, Vaults, Storage Vessels** ☐ N/A ☐ Good condition ☐ Proper secondary containment ☐ Needs Maintenance Remarks________
4.	**Discharge Structure and Appurtenances** ☐ N/A ☐ Good condition ☐ Needs Maintenance Remarks________
5.	**Treatment Building(s)** ☐ N/A ☐ Good condition (esp. roof and doorways) ☐ Needs repair ☐ Chemicals and equipment properly stored Remarks________
6.	**Monitoring Wells** (pump and treatment remedy) ☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition ☐ All required wells located ☐ Needs Maintenance ☐ N/A Remarks________
D. Monitoring Data	
1.	Monitoring Data ☒ Is routinely submitted on time ☒ Is of acceptable quality
2.	Monitoring data suggests: ☐ Groundwater plume is effectively contained ☐ Contaminant concentrations are declining

D. Monitored Natural Attenuation N/A
1. **Monitoring Wells** (natural attenuation remedy) ☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition ☐ All required wells located ☐ Needs Maintenance ☐ N/A Remarks

X. OTHER REMEDIES

If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).

INTENT OF REMEDY IS TO CAPTURE AND TREAT TCE GW CONTAMINANT PLUME UNTIL MCLS ARE ATTAINED.

2005 DATA FOR COLO. AVE. SUBSITE WELLS BW-17 AND BW-18 SHOW MCL EXCEEDANCE FOR TCE - SEE ATTACHED DATA TABLES FROM DRAVO'S JULY 2004 - JUNE 2005 ANNUAL RA REPORT

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

- ALL WELLS LOCKED AND IN GOOD ORDER.
- ALL EQUIPMENT FUNCTIONING AND IN GOOD ORDER.

C.	Early Indicators of Potential Remedy Problems
	Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs, that suggest that the protectiveness of the remedy may be compromised in the future. DATA CONTAINED IN SEMI-ANNUAL PROGRESS REPORTS SUGGESTS WELL 3 IS NOT REMOVING CONTAMINANT MASS
D.	Opportunities for Optimization
	Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy. TO BE DISCUSSED W/ PRP + NDEQ

Copy 2 of 2

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DRAFT

ANNUAL REMEDIAL ACTION REPORT
JULY 2004 – JUNE 2005

COLORADO AVENUE GROUNDWATER CONTAMINATION SUBSITE
HASTINGS, NEBRASKA

AUGUST 2005

Prepared for:

DRAVO CORPORATION
Pittsburgh, Pennsylvania
Unilateral Administrative Order Docket No. VII-93-F-0019

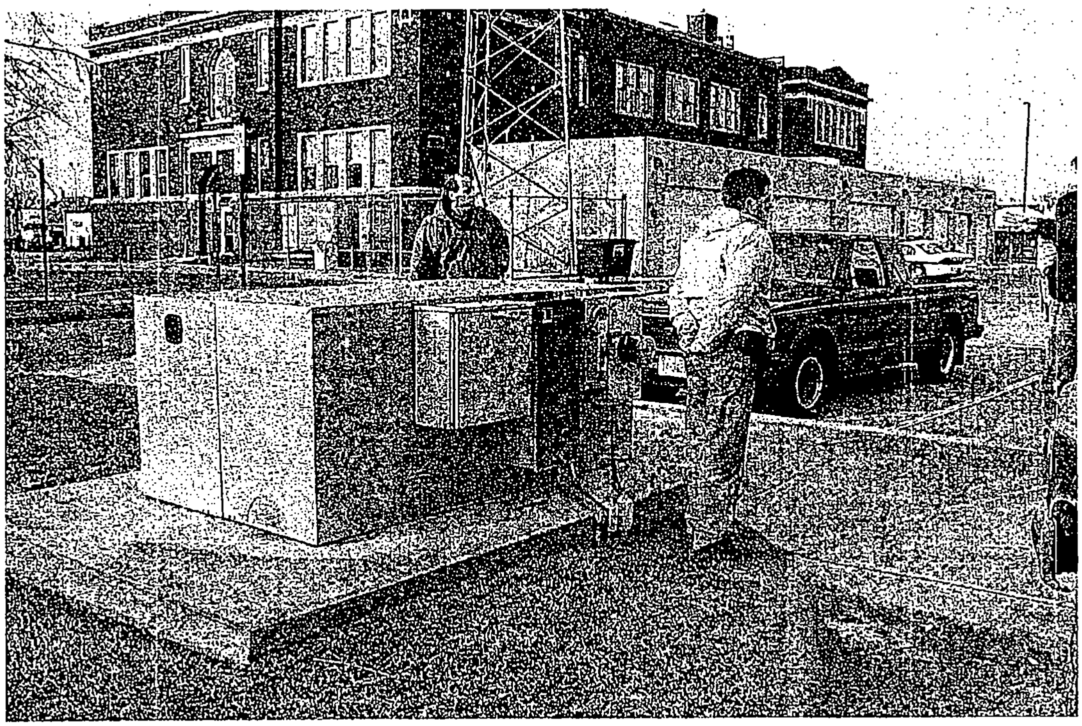
DRAVO

1 8 9 1

Prepared by:

MICHAEL BAKER JR., INC.
Moon Township, Pennsylvania

Baker



2/28/2007

Img_ 2598

TABLE 4-3
PHASE 2 PERFORMANCE MONITORING WELLS--COC ANALYTICAL RESULTS
ANNUAL REMEDIAL ACTION REPORT
7/2004-6/2005
COLORADO AVENUE SUBSITE
HASTINGS, NEBRASKA

Site ID/Sample ID	Colorado Avenue	SDWA	BW-17	BW-17	BW-17	BW-17
Date Sampled	Interim Action	Federal	20-Apr-05	20-Apr-05	20-Apr-05	20-Apr-05
Depth Range (ft bgs)	Concentrations [1]	MCLs	145	150	167	172
Volatile Organic Compounds (ug/L)						
1,1,1-Trichloroethane	NA	200	1 U	3 U	1 U	1 U
1,1-Dichloroethene	5	7	1 U	3 U	1 U	1 U
1,2-Dichloroethane	25	5	1 U	3 U	1 U	1 U
Tetrachloroethene	150	5	1 U	3 U	1 U	1 U
Trichloroethene	290	5	**14**	**73**	**19**	**7.2**

Notes:
[1] Reference: Colorado Avenue
Ground Water Interim Action
Operable Unit Feasibility Study, June 1991
ug/L--micrograms per liter
ft bgs--feet below ground surface
U--not detected
J--estimated concentration
COC--Contaminants of Concern
SDWA--Safe Drinking Water Act
MCL--maximum contaminant level
NA--not applicable
Shading indicates exceedance of Interim Levels
Bold indicates exceedance of MCLs

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ANNUAL REMEDIAL ACTION REPORT
7/2004-6/2005
COLORADO AVENUE SUBSITE
HASTINGS, NEBRASKA

Site ID/Sample ID **Date Sampled** **Depth Range (ft bgs)**	Colorado Avenue Interim Action Concentrations[1]	**SDWA Federal MCLs**	BW-17 20-Apr-05 192	BW-17 20-Apr-05 195	BW-18 20-Apr-05 146	BW-18 Dup 20-Apr-05 151
Volatile Organic Compounds (ug/L)						
1,1,1-Trichloroethane	NA	200	1 U	1 U	1 U	1
1,1-Dichloroethene	5	7	1 U	1 U	0.56 J	1.8
1,2-Dichloroethane	45	5	1 U	1 U	1 U	1 U
Tetrachloroethene	150	5	1 U	1 U	1 U	2.2
Trichloroethene	290	5	1 U	1 U	2.3	**13**

Notes:
[1] Reference: Colorado Avenue
Ground Water Interim Action
Operable Unit Feasibility Study, June 1991
ug/L--micrograms per liter
ft bgs--feet below ground surface
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TABLE 4-3
PHASE 2 PERFORMANCE MONITORING WELLS--COC ANALYTICAL RESULTS
ANNUAL REMEDIAL ACTION REPORT
7/2004-6/2005
COLORADO AVENUE SUBSITE
HASTINGS, NEBRASKA

Site ID/Sample ID	Colorado Avenue	**SDWA**	BW-18	BW-18	BW-18	BW-18
Date Sampled	Interim Action	**Federal**	20-Apr-05	20-Apr-05	20-Apr-05	20-Apr-05
Depth Range (ft bgs)	Concentrations [1]	**MCLs**	151	167	172	192
Volatile Organic Compounds (ug/L)						
1,1,1-Trichloroethane	NA	200	1.3	1.2	1.3	0.31 J
1,1-Dichloroethene	5	7	2.1	2.1	2.2	0.66 J
1,2-Dichloroethane	45	5	1 U	1 U	1 U	1 U
Tetrachloroethene	150	5	2.2	3.6	4.4	0.25 J
Trichloroethene	290	5	**13**	**29**	**32**	4.9

Notes:
[1] Reference: Colorado Avenue
Ground Water Interim Action
Operable Unit Feasibility Study, June 1991
ug/L--micrograms per liter
ft bgs--feet below ground surface
U--not detected
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COC--Contaminants of Concern
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MCL--maximum contaminant level
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SCHEDULE

Five-Year Review Site Inspections
Hastings Superfund Site, Hastings, Nebraska

Site Inspection Schedule
February 28, 2007
8:00 AM – 5:30 PM

Time	Activity	Federal and State Personnel	Site Manager/Personnel
8:00 – 8:45 AM	**Well 3 (OU07, OU13, OU17, OU18)**	Sommerhauser / Gregson *	Mary Spalding
8:45 – 9:00 AM	*Mobilize to Colorado Ave*		
9:00 – 10:30 AM	**Colorado Ave (OU01, OU09)**	Sommerhauser / Borovich *	Bob Dangler
10:30 – 10:45 AM	*Mobilize to 2nd Street*		
10:45 – 12:15 PM	**Second Street (OU12, OU20)**	Gresham & Sommerhauser / Summerside	Jeremy Groves (CoH)
12:15 – 1:15 PM	Lunch Break		
1:15 – 1:45 PM	**North Landfill (OU02, OU10)**	Gresham / Borovich *	Jeremy Groves (CoH), Jack Newlen (CoH), Mary Spalding (HTI)
1:45 – 2:00 PM	*Mobilize to South Landfill*		
2:00 – 2:45 PM	**South Landfill (OU05)**	Sommerhauser / Southwick	Jeremy Groves (CoH), Jack Newlen (CoH)
2:45 – 3:00 PM	*Mobilize to Well D*		
3:00 – 4:00 PM	**Well D, Secondary & Tertiary Containment Wells**	Sommerhauser, Gresham, Zurbuchen	Jenny Sidlo (HU)
4:00 – 4:15 PM	*Mobilize to Far-Mar-Co*		
4:15 – 5:00 PM	**Far-Mar-Co *(OU03, OU06, OU11)***	Gresham / Borovich *	HTI is just sampling and *analyzing [Papadopouls is the consultant]*
5:00 – 5:30 PM	**Area-Wide (OU19)**	Zurbuchen / Southwick	Jeremy Groves (CoH)

REVISED * NOTE, GREGSON + BOROVICH DID NOT ATTEND THIS INSPECTION.

Colorado Ave(0401)

INTERVIEW RECORD

Site Name: HASTINGS SITE / COLO. AVE.		EPA ID No.: OU 1	
Subject:		Time: 9:00	Date: 2/28/07
Type: ☐ Telephone ☒ Visit ☐ Other Location of Visit: 108 S. COLO AVE + IWA LOCATIONS (4)		☐ Incoming ☐ Outgoing	

Contact Made By:

Name: DARRELL SOMMERHAUSER	Title: RPM	Organization: EPA-R7

Individual Contacted:

Name: BOB DANGLER	Title: OPERATOR	Organization: CONTRACTOR TO DRAVO
Telephone No: 402-462-4353 Fax No: E-Mail Address:	Street Address: City, State, Zip: HASTINGS, NE.	

Summary Of Conversation

Bob Dangler performs routine O+M duties and collects vapor samples from the IWA systems. He is preparing to sample the carbon at the Pine Ave. location. Dravo will arrange for off-site disposal of the spent carbon.

- IW-3 SYSTEM IS OPERATING TODAY
- IWA-4,-5-6 SYSTEM IS OPERATING TODAY
- IWA-7 SYSTEM IS OPERATING TODAY

Site Inspection Checklist

I. SITE INFORMATION	
Site name: HASTINGS/COLO. AVE OU 1	**Date of inspection:** 2/28/2007
Location and Region: HASTINGS, NE.	**EPA ID:** NID 980862668
Agency, office, or company leading the five-year review: EPA - R7	**Weather/temperature:** ~ 35° F

Remedy Includes: (Check all that apply)

- ☐ Landfill cover/containment
- ☐ Access controls
- ☐ Institutional controls
- ☐ Groundwater pump and treatment
- ☐ Surface water collection and treatment
- ☒ Other IN-WELL AERATION WITH CARBON TREATMENT
- ☐ Monitored natural attenuation
- ☐ Groundwater containment
- ☐ Vertical barrier walls

Attachments: ☐ Inspection team roster attached ☒ Site map attached

II. INTERVIEWS (Check all that apply)

1. **O&M site manager** ______ Name ______ Title ______ Date
   Interviewed ☐ at site ☐ at office ☐ by phone Phone no. ______
   Problems, suggestions; ☐ Report attached ______

2. **O&M staff** BOB DANGLER (Name) OPERATOR (Title) 2/28/2007 (Date)
   Interviewed ☒ at site ☐ at office ☐ by phone Phone no. ______
   Problems, suggestions; ☐ Report attached ______

3. **Local regulatory authorities and response agencies** (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.) Fill in all that apply.

Agency ____________________
Contact ____________________ ____________ ______ ________
Name Title Date Phone no.
Problems; suggestions; ☐ Report attached ______________________________

Agency ____________________
Contact ____________________ ____________ ______ ________
Name Title Date Phone no.
Problems; suggestions; ☐ Report attached ______________________________

Agency ____________________
Contact ____________________ ____________ ______ ________
Name Title Date Phone no.
Problems; suggestions; ☐ Report attached ______________________________

Agency ____________________
Contact ____________________ ____________ ______ ________
Name Title Date Phone no.
Problems; suggestions; ☐ Report attached ______________________________

4. **Other interviews** (optional) ☐ Report attached.

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)			
1. **O&M Documents**			
☐ O&M manual	☐ Readily available	☐ Up to date	☐ N/A
☐ As-built drawings	☐ Readily available	☐ Up to date	☐ N/A
☐ Maintenance logs	☒ Readily available	☐ Up to date	☐ N/A
Remarks DOCUMENTS ARE BEING UPDATED			
2. **Site-Specific Health and Safety Plan**	☒ Readily available	☐ Up to date	☐ N/A
☐ Contingency plan/emergency response plan	☐ Readily available	☐ Up to date	☐ N/A
Remarks			
3. **O&M and OSHA Training Records**	☐ Readily available	☐ Up to date	☐ N/A
Remarks			
4. **Permits and Service Agreements**			
☐ Air discharge permit	☐ Readily available	☐ Up to date	☒ N/A
☐ Effluent discharge	☐ Readily available	☐ Up to date	☒ N/A
☐ Waste disposal, POTW	☐ Readily available	☐ Up to date	☒ N/A
☐ Other permits	☐ Readily available	☐ Up to date	☒ N/A
Remarks SPENT CARBON REMOVAL SERVICE PROVIDED UNDER CONTRACT WITH CALGON			
7. **Groundwater Monitoring Records**	☐ Readily available	☒ Up to date	☐ N/A
Remarks SEE DRAVO'S LATEST ANNUAL REPORT			

IV. O&M COSTS

1. **O&M Organization**
☐ State in-house ☐ Contractor for State
☒ PRP in-house ☒ Contractor for PRP
☐ Federal Facility in-house ☐ Contractor for Federal Facility
☐ Other ______

2. **O&M Cost Records** TO BE PROVIDED DIRECTLY TO CITY
☐ Readily available ☐ Up to date
☐ Funding mechanism/agreement in place
Original O&M cost estimate ______ ☐ Breakdown attached

Total annual cost by year for review period if available

From ______ (Date) To ______ (Date) ______ (Total cost) ☐ Breakdown attached
From ______ (Date) To ______ (Date) ______ (Total cost) ☐ Breakdown attached
From ______ (Date) To ______ (Date) ______ (Total cost) ☐ Breakdown attached
From ______ (Date) To ______ (Date) ______ (Total cost) ☐ Breakdown attached
From ______ (Date) To ______ (Date) ______ (Total cost) ☐ Breakdown attached

3. **Unanticipated or Unusually High O&M Costs During Review Period**
Describe costs and reasons: SEE REPORT TO BE PREPARED BY DRAVO CORP.

V. ACCESS AND INSTITUTIONAL CONTROLS ☐ Applicable ☐ N/A

A. Fencing

1. **Fencing damaged** ☐ Location shown on site map ☐ Gates secured ☒ N/A
Remarks ______

B. Other Access Restrictions

1. **Signs and other security measures** ☐ Location shown on site map ☒ N/A
Remarks ______

C. Institutional Controls (ICs)

1. **Implementation and enforcement**
Site conditions imply ICs not properly implemented ☐ Yes ☐ No ☐ N/A
Site conditions imply ICs not being fully enforced ☐ Yes ☐ No ☐ N/A

Type of monitoring (*e.g.*, self-reporting, drive by) ICA BY HASTINGS PRP GROUP
~~Frequency~~ HASTINGS PRP GROUP / HASTINGS UTILITIES
Responsible party/agency ______
Contact ______ Name ______ Title ______ Date ______ Phone no.

Reporting is up-to-date ☒ Yes ☐ No ☐ N/A
Reports are verified by the lead agency ☒ Yes ☐ No ☐ N/A

Specific requirements in deed or decision documents have been met ☐ Yes ☐ No ☒ N/A
Violations have been reported ☐ Yes ☐ No ☒ N/A
Other problems or suggestions: ☐ Report attached
SEE LATEST (RY 2005) ANNUAL ICA REPORT DATED 3/29/2006.

2. **Adequacy** ☒ ICs are adequate ☐ ICs are inadequate ☐ N/A
Remarks ______

D. General

1. **Vandalism/trespassing** ☐ Location shown on site map ☒ No vandalism evident
Remarks ______

2. **Land use changes on site** ☒ N/A
Remarks ______

3. **Land use changes off site** ☒ N/A
Remarks ______

VI. GENERAL SITE CONDITIONS

A. Roads ☐ Applicable ☒ N/A

1. **Roads damaged** ☐ Location shown on site map ☐ Roads adequate ☐ N/A
Remarks ______

B. Other Site Conditions

Remarks ____

____

____

____

____

____

VII. LANDFILL COVERS ☐ Applicable ☒ N/A

A. Landfill Surface

1. **Settlement** (Low spots) ☐ Location shown on site map ☐ Settlement not evident
   Areal extent______________ Depth____________
   Remarks____
   ____

2. **Cracks** ☐ Location shown on site map ☐ Cracking not evident
   Lengths____________ Widths____________ Depths__________
   Remarks____
   ____

3. **Erosion** ☐ Location shown on site map ☐ Erosion not evident
   Areal extent______________ Depth____________
   Remarks____
   ____

4. **Holes** ☐ Location shown on site map ☐ Holes not evident
   Areal extent______________ Depth____________
   Remarks____
   ____

5. **Vegetative Cover** ☐ Grass ☐ Cover properly established ☐ No signs of stress
   ☐ Trees/Shrubs (indicate size and locations on a diagram)
   Remarks____
   ____

6. **Alternative Cover (armored rock, concrete, etc.)** ☐ N/A
   Remarks____
   ____

7. **Bulges** ☐ Location shown on site map ☐ Bulges not evident
   Areal extent______________ Height____________
   Remarks____
   ____

H. Retaining Walls	☐ Applicable	☒ N/A
1. **Deformations** Horizontal displacement____________ Vertical displacement______________ Rotational displacement____________ Remarks________________________________	☐ Location shown on site map	☐ Deformation not evident
2. **Degradation** Remarks________________________________	☐ Location shown on site map	☐ Degradation not evident

I. Perimeter Ditches/Off-Site Discharge	☐ Applicable	☒ N/A
1. **Siltation** Areal extent____________ Depth____________ Remarks________________________________	☐ Location shown on site map	☐ Siltation not evident
2. **Vegetative Growth** ☐ Vegetation does not impede flow Areal extent____________ Type____________ Remarks________________________________	☐ Location shown on site map	☐ N/A
3. **Erosion** Areal extent____________ Depth____________ Remarks________________________________	☐ Location shown on site map	☐ Erosion not evident
4. **Discharge Structure** Remarks________________________________	☐ Functioning	☐ N/A

VIII. VERTICAL BARRIER WALLS	☐ Applicable	☒ N/A
1. **Settlement** Areal extent____________ Depth____________ Remarks________________________________	☐ Location shown on site map	☐ Settlement not evident
2. **Performance Monitoring** ☐ Performance not monitored Frequency________________________ Head differential________________________ Remarks________________________________	Type of monitoring________________________	☐ Evidence of breaching

IX. GROUNDWATER/SURFACE WATER REMEDIES ☒ Applicable ☐ N/A

A. Groundwater Extraction Wells, Pumps, and Pipelines ☐ Applicable ☐ N/A

1. **Pumps, Wellhead Plumbing, and Electrical**
☐ Good condition ☐ All required wells properly operating ☐ Needs Maintenance ☐ N/A
Remarks____________________

2. **Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances**
☐ Good condition ☐ Needs Maintenance
Remarks____________________

3. **Spare Parts and Equipment**
☐ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided
Remarks____________________

B. Surface Water Collection Structures, Pumps, and Pipelines ☐ Applicable ☒ N/A

1. **Collection Structures, Pumps, and Electrical**
☐ Good condition ☐ Needs Maintenance
Remarks____________________

2. **Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances**
☐ Good condition ☐ Needs Maintenance
Remarks____________________

3. **Spare Parts and Equipment**
☐ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided
Remarks____________________

C. Treatment System	☒ Applicable ☐ N/A
1.	**Treatment Train** (Check components that apply) ☐ Metals removal ☐ Oil/water separation ☐ Bioremediation ☒ Air stripping IN-WELL ☒ Carbon adsorbers ☐ Filters ____ ☐ Additive (*e.g.*, chelation agent, flocculent) ____ ☐ Others ____ ☒ Good condition ☐ Needs Maintenance ☒ Sampling ports properly marked and functional EXCEPT IWA-3. ☐ Sampling/maintenance log displayed and up to date ☐ Equipment properly identified ☐ Quantity of groundwater treated annually SEE LATEST ANNUAL REPORT ☐ Quantity of surface water treated annually ____ Remarks ____
2.	**Electrical Enclosures and Panels** (properly rated and functional) ☐ N/A ☒ Good condition ☐ Needs Maintenance Remarks ____
3.	**Tanks, Vaults, Storage Vessels** ☐ N/A ☒ Good condition ☐ Proper secondary containment ☐ Needs Maintenance Remarks CARBON IS CONTAINED IN STEEL CANISTERS
4.	**Discharge Structure and Appurtenances** ☒ N/A ☐ Good condition ☐ Needs Maintenance Remarks ____
5.	**Treatment Building(s)** ☐ N/A ☒ Good condition (esp. roof and doorways) ☐ Needs repair ☐ Chemicals and equipment properly stored Remarks ____
6.	**Monitoring Wells** (pump and treatment remedy) ☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☒ Good condition ☒ All required wells located ☐ Needs Maintenance ☐ N/A Remarks MW-19 & MW-17 NOT LOCKED
D. Monitoring Data	
1.	Monitoring Data ☒ Is routinely submitted on time ☒ Is of acceptable quality
2.	Monitoring data suggests: ☐ Groundwater plume is effectively contained ☒ Contaminant concentrations are declining

D. Monitored Natural Attenuation N/A
1. **Monitoring Wells** (natural attenuation remedy) ☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition ☐ All required wells located ☐ Needs Maintenance ☐ N/A Remarks

X. OTHER REMEDIES
If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.

XI. OVERALL OBSERVATIONS
A. Implementation of the Remedy
Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.). - SEE DRAVO'S ANNUAL R.A. REPORTS - SEE ALSO LETTER BY EPA TO DRAVO REGARDING THESE ANNUAL R.A. REPORTS - DECISION ON SCOPE OF FULL REMEDY IMPLEMENTATION AWAITS COMPLETION OF PHASE IV INVESTIGATION
B. Adequacy of O&M
Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy. SIGNS OF IMPROVEMENT NOTED DURING 2006

C.	Early Indicators of Potential Remedy Problems
	Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs, that suggest that the protectiveness of the remedy may be compromised in the future. CHANGEOUT OF SPENT WAS NOT PROPERLY MANAGED DURING 2003 & 2004. THIS LAPSE CAUSED FAILURE OF THE REMEDY DURING THOSE YEARS
D.	**Opportunities for Optimization**
	Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy. REGARDING GROUND WATER MONITORING, SAMPLING SCOPE WAS OPTIMIZED DURING RECENT CD NEGOTIATIONS CD WAS ENTERED BY THE COURT IN 5/2006. REGARDING VAPOR SAMPLING FOR CARBON CONDITION, DRAVO IS TO PERFORM QUARTERLY SAMPLING

Table for Listing Issues COLO. AVE. OU #1

Issues 2/28/2007	Affects Protectiveness (Y/N)	
	Current	Future
2 MONITORING WELL CAPS NOT SECURED DUE TO ROPE INTERFERENCE	Y	Y
MW-1d - NO ID TAG ON EXTERIOR BW-12 - NO ID TAG ON EXTERIOR	N N	N N
CEDAR/EAST PARK AVE IWA-3 SAMPLE PORTS NOT IDENTIFIED	Y	Y

Table for Listing Recommendations and Follow-up Actions

Recommendations/ Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Follow-up Actions: Affects Protectiveness (Y/N)	
				Current	Future
- SEE ATTACHED E-MAIL TO DRAVO - SEE ALSO RESPONSE FROM BAKER					

"Brian E. Steffes" <BSTEFFES@mbakercorp.com>

03/21/2007 07:33 AM

To Lisa.Potts@carmeusena.com, Darrell Sommerhauser/SUPR/R7/USEPA/US@EPA

cc Christine Harwood <CHARWOOD@mbakercorp.com>

bcc

Subject Re: Colo. Ave. OU1/monitoring wells

History: This message has been forwarded.

Darrell,
I will include these items on my To Do list during my upcoming trip.
Brian

Brian E. Steffes, P.G.
Michael Baker Jr., Inc.
100 Airside Drive
Moon Twp., PA 15108
(412) 269-6013
Fax (412) 375-3996
bsteffes@mbakercorp.com

>>> <Sommerhauser.Darrell@epamail.epa.gov> 3/20/2007 10:27 AM >>>

Lisa, Christine and Brian,

During the 5 - Year inspection performed on 2/28/2007 we noted that some well caps are not adequately closing and/or are not secured with locks. I have attached photos for MW - 19 and G - 7D. In addition the well cap at MW - 17 was not the proper type for use of the diffusion bags and therefore was not properly secured.

The attached photos show MW - 19 and G - 7D. You can see the cap being used at MW -19 does not allow for adequate placement of the well cap. Also, we will see that G - 7D has the proper well cap, but the lock is not in place to prevent unauthorized entry to the well. I do not have a photo for MW - 17. Well MW - 17 needs a proper cap to allow secure placement on the well casing.

Hopefully, when Brian is in Hastings next week, he would be able to correct these problems. Please advise regarding Dravo's plans.

Darrell Sommerhauser, RPM

(See attached file: IMG_2660.JPG) (See attached file: IMG_2661.JPG) (See attached file: IMG_2662.JPG)

Darrell Sommerhauser/SUPR/R7/USEPA/US

03/20/2007 09:27 AM

To Lisa.Potts@carmeusena.com

cc CHARWOOD@mbakercorp.com, BSteffes@mbakercorp.com

bcc blakere@BV.com; Jeremy Groves - private

Subject Colo. Ave. OU1/monitoring wells

Lisa, Christine and Brian,

During the 5 - Year inspection performed on 2/28/2007 we noted that some well caps are not adequately closing and/or are not secured with locks. I have attached photos for MW - 19 and G - 7D. In addition the well cap at MW - 17 was not the proper type for use of the diffusion bags and therefore was not properly secured.

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IMG_2660.JPG IMG_2661.JPG IMG_2662.JPG

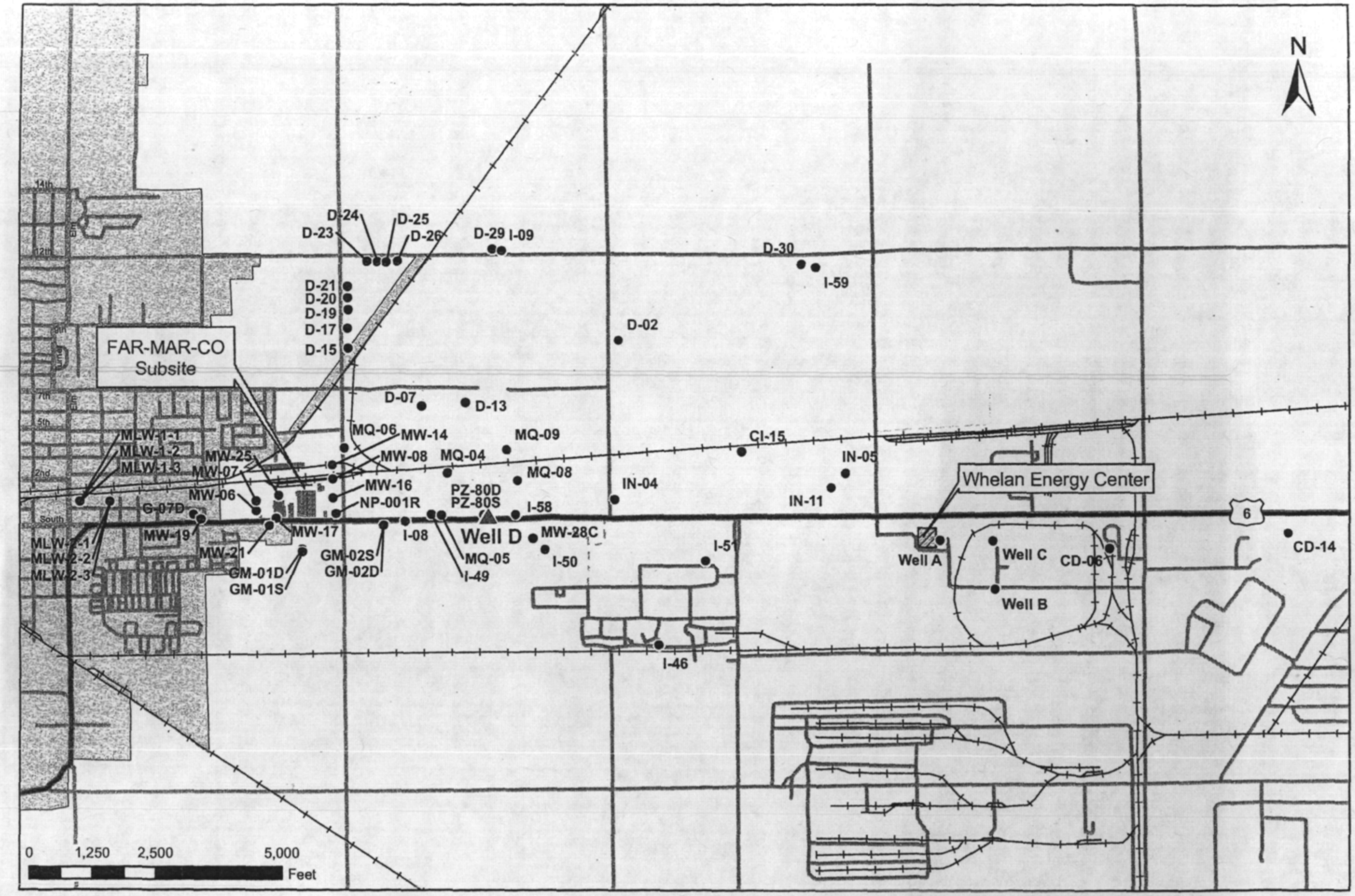
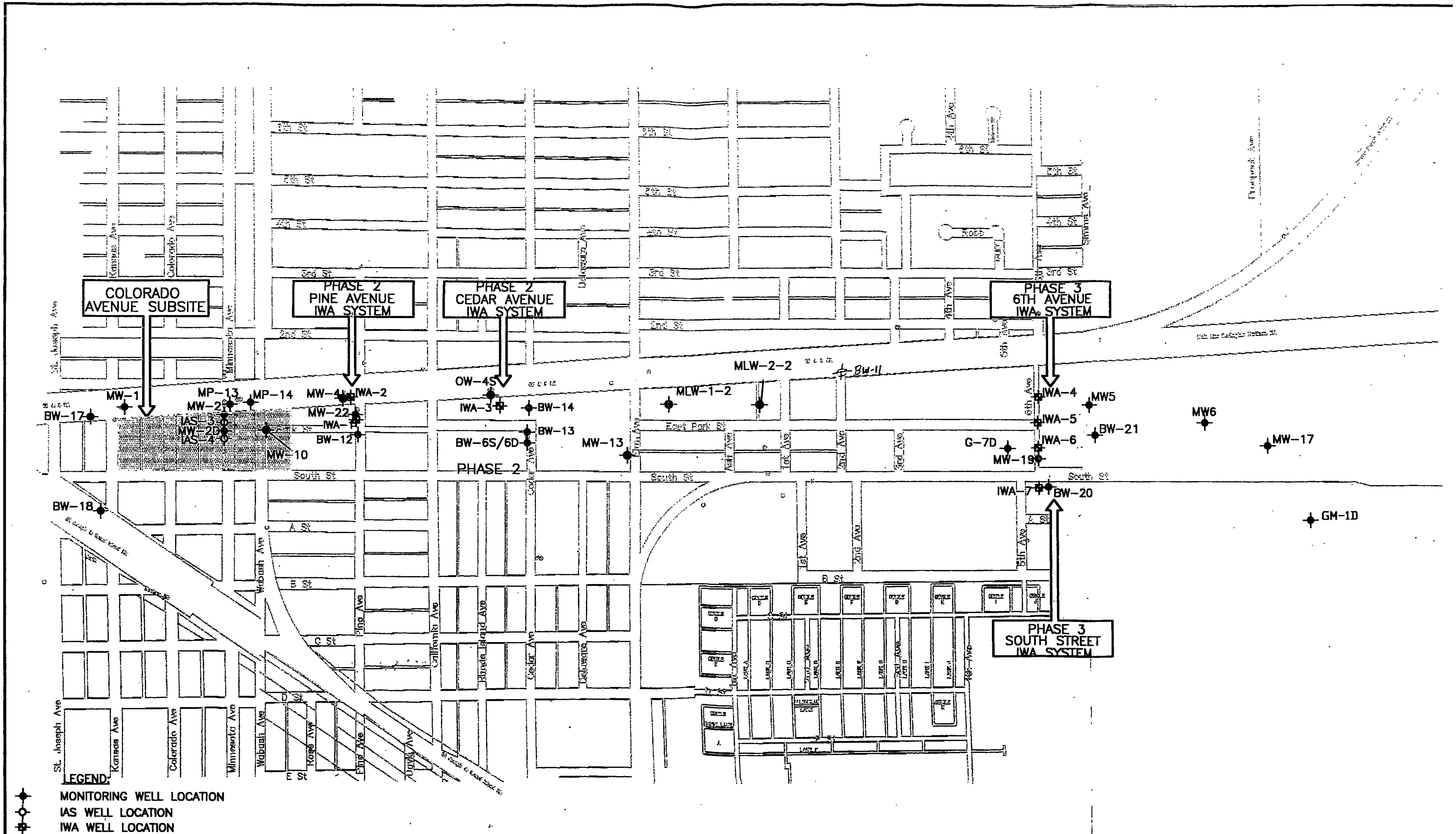


Figure 1 Location of the FAR-MAR-CO Subsite of the Hastings Groundwater Contamination Site. Wells of Quarterly Monitoring Program, and Selected Other Wells are Shown.



SCALE:	1"=600'	DATE:	AUG. 2005
S.O. NO.:	103052	FILE:	103052F05
DSN/DWN:		CHK:	

Baker

MICHAEL BAKER Jr., INC.
MOON TOWNSHIP, PENNSYLVANIA

FIGURE 2-1
IWA SYSTEMS AND WELL LOCATION
COLORADO AVENUE SUBSITE
HASTINGS, NEBRASKA

SCHEDULE

Five-Year Review Site Inspections
Hastings Superfund Site, Hastings, Nebraska

Site Inspection Schedule
February 28, 2007
8:00 AM – 5:30 PM

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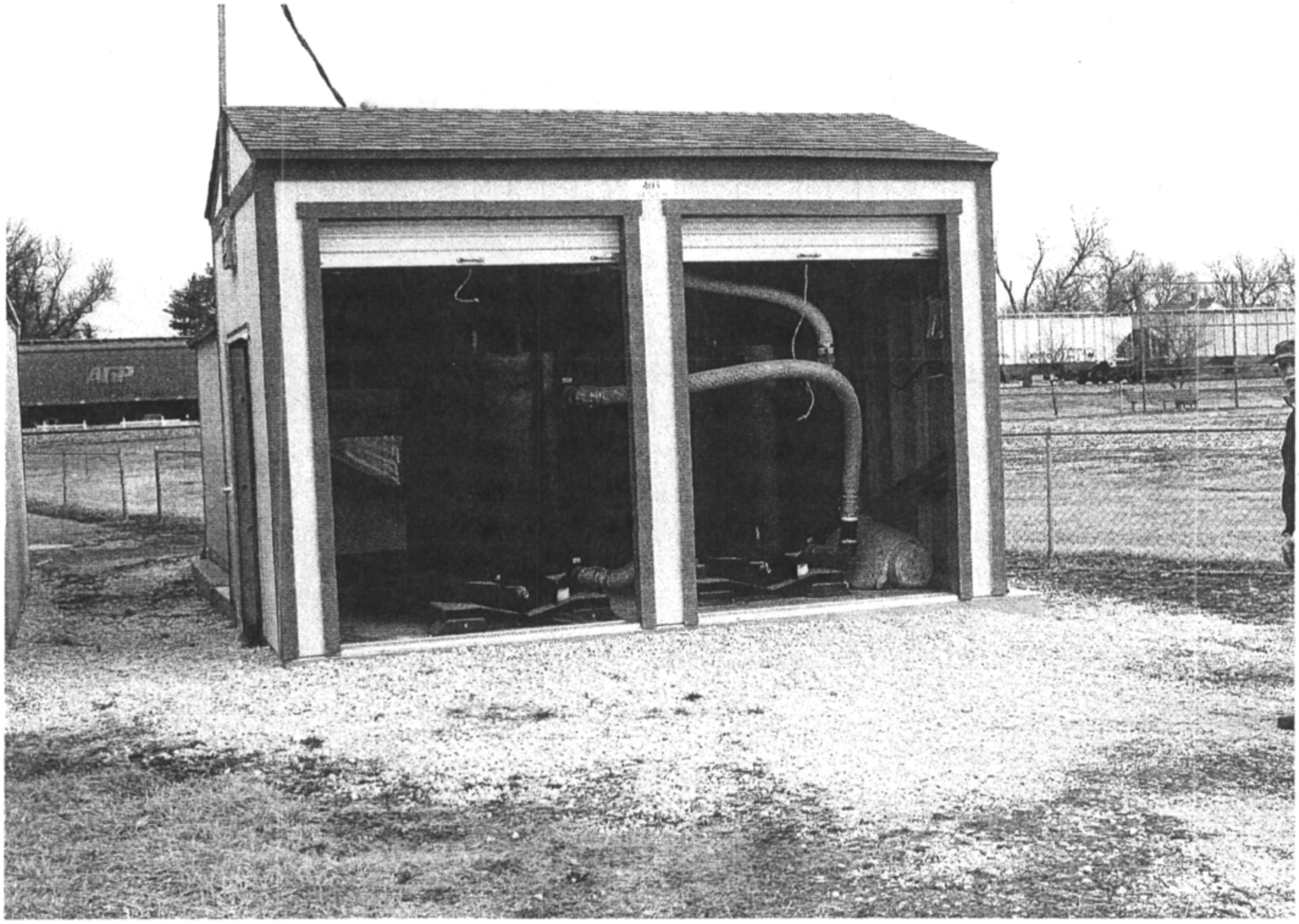
10:30 – 10:45 AM	*Mobilize to 2nd Street*		
10:45 – 12:15 PM	**Second Street (OU12, OU20)**	Gresham & Sommerhauser / Summerside	Jeremy Groves (CoH)
12:15 – 1:15 PM	Lunch Break		
1:15 – 1:45 PM	**North Landfill (OU02, OU10)**	Gresham / Borovich *	Jeremy Groves (CoH), Jack Newlen (CoH), Mary Spalding (HTI)
1:45 – 2:00 PM	*Mobilize to South Landfill*		
2:00 – 2:45 PM	**South Landfill (OU05)**	Sommerhauser / Southwick	Jeremy Groves (CoH), Jack Newlen (CoH)
2:45 – 3:00 PM	*Mobilize to Well D*		
3:00 – 4:00 PM	**Well D, Secondary & Tertiary Containment Wells**	Sommerhauser, Gresham, Zurbuchen	Jenny Sidlo (HU)
4:00 – 4:15 PM	*Mobilize to Far-Mar-Co*		
4:15 – 5:00 PM	**Far-Mar-Co (OU03, OU06, OU11)**	Gresham / Borovich *	HTI is just sampling and analyzing [Papadopouls is the consultant]
5:00 – 5:30 PM	**Area-Wide (OU19)**	Zurbuchen / Southwick	Jeremy Groves (CoH)

REVISED

* NOTE, GREGSON + BOROVICH DID NOT ATTEND THIS INSPECTION.

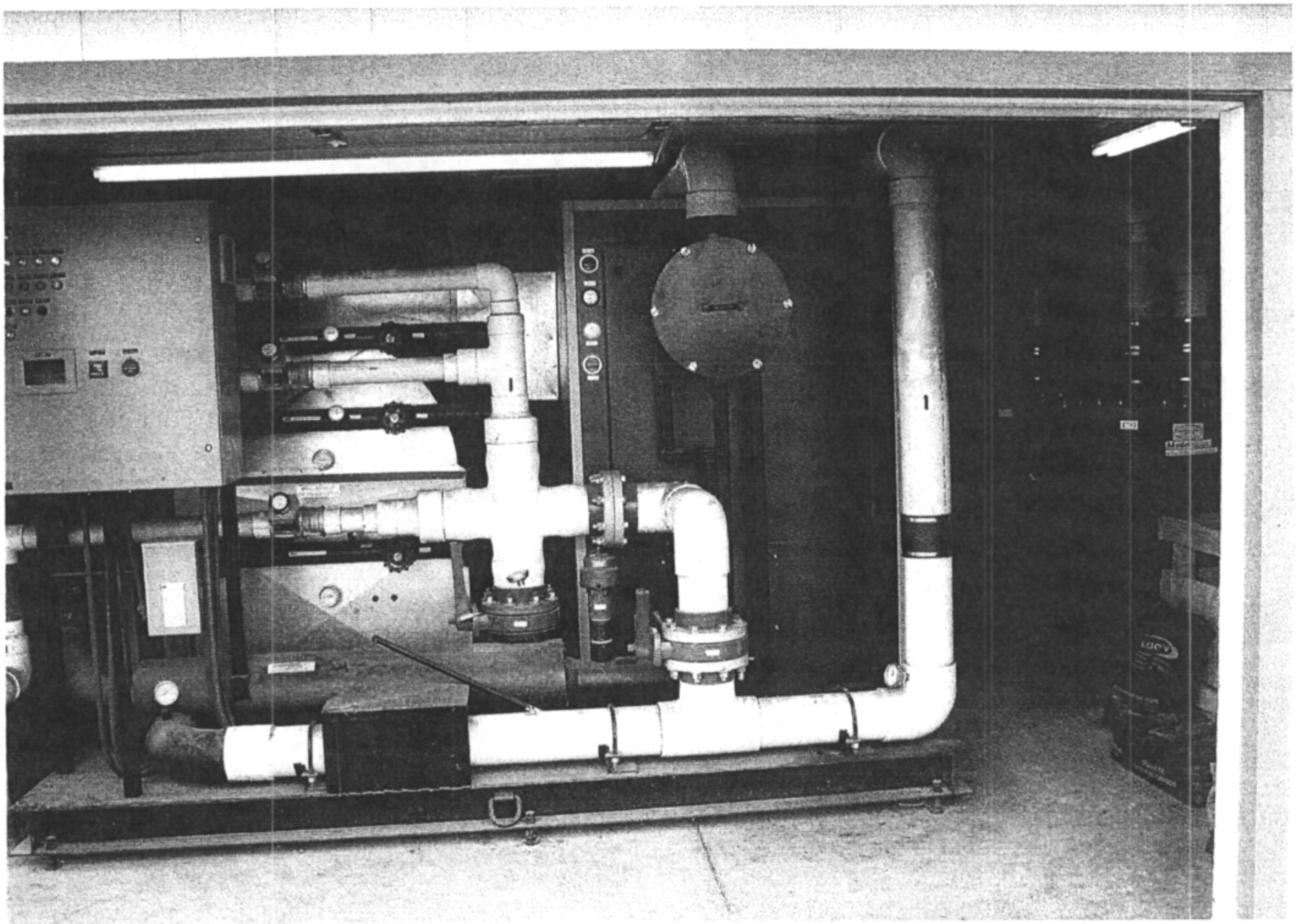


IWA-3

2/28/2007
IMG_2625

IWA-4, -5, -6

2/28/2007
IMG_2628

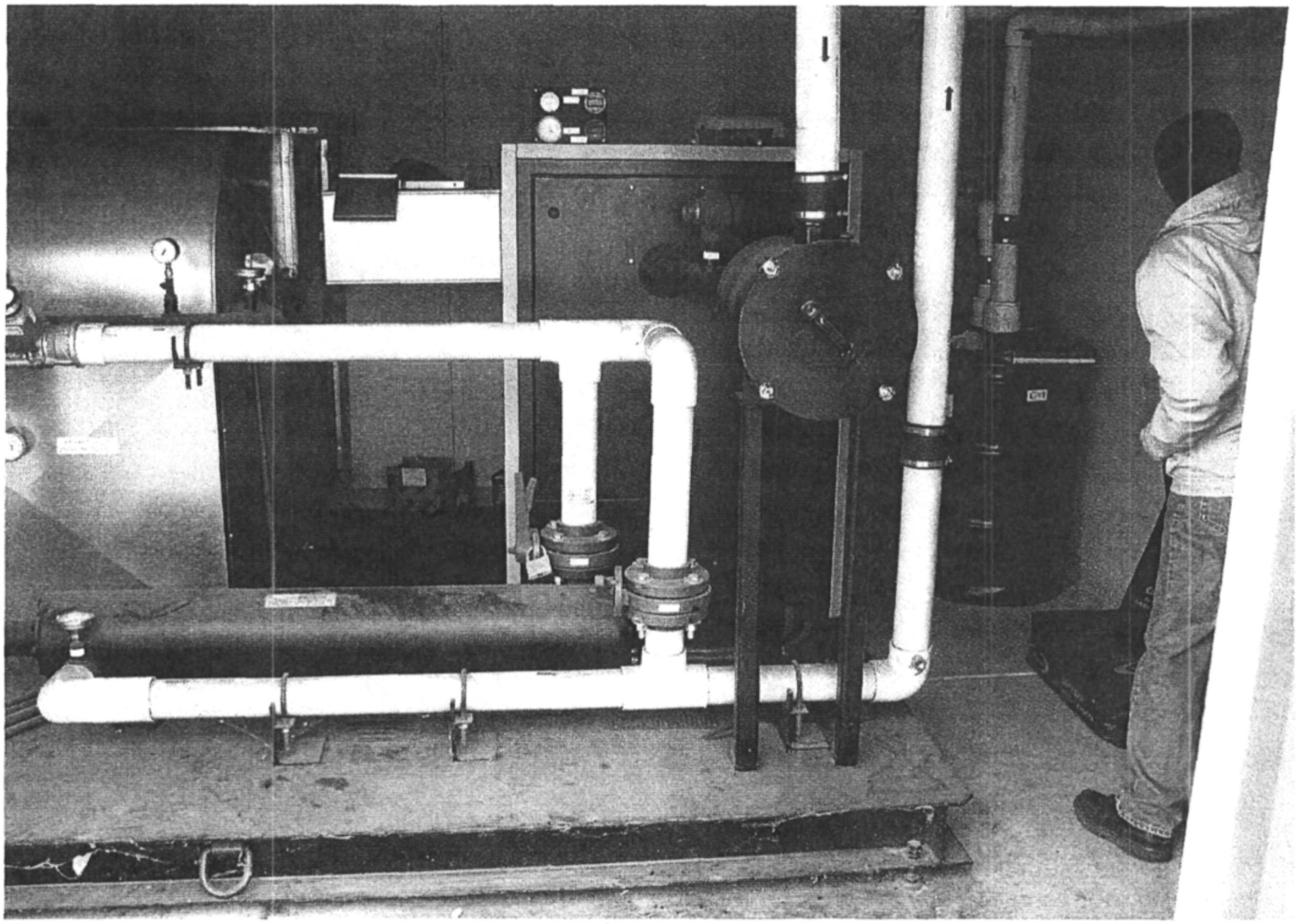


IWA-4, -5, -6

2/28/2007
IMG_2630

IWA-7

2/28/2007
IMG_2631



IWA - 7 2/28/2007

IMG_2632

Colorado Ave. (OU 9)

INTERVIEW RECORD

Site Name: HASTINGS SITE/COLO. AVE.		**EPA ID No.:** OU 9	
Subject: Colo. Ave SVE		**Time:** 9:30	**Date:** 3/1/07
Type: ☐ Telephone ☒ Visit ☐ Other **Location of Visit:** HASTINGS UTILITIES		☐ Incoming ☐ Outgoing	

Contact Made By:

Name: DARRELL SOMMERHAUSER	**Title:** RPM	**Organization:** EPA-R7

Individual Contacted:

Name: JENNY SIDLO	**Title:**	**Organization:** H.U.

Telephone No: 402-462-3664 **Fax No:** **E-Mail Address:**	**Street Address:** 1228 N. DENVER AVE. **City, State, Zip:** HASTINGS, NE. 68901

Summary Of Conversation

MRS. Jenny Sidlo will be performing limited O+M duties when Dravo restarts the SVE system at Colo. Ave. Currently the system is resting. We discussed the scope for the new Phase II SVE wells being installed by Dravo at the subsite.

Site Inspection Checklist

OU 9 I. SITE INFORMATION	
Site name: HASTINGS GWC/COLORADO AVE	**Date of inspection:** 2/28/2007
Location and Region: HASTINGS, NE.	**EPA ID:** NED980862668
Agency, office, or company leading the five-year review: EPA - R7	**Weather/temperature:** ~ 35° F

Remedy Includes: (Check all that apply)

- ☐ Landfill cover/containment
- ☐ Access controls
- ☐ Institutional controls
- ☐ Groundwater pump and treatment
- ☐ Surface water collection and treatment
- ☒ Other SOIL VAPOR EXTRACTION
- ☐ Monitored natural attenuation
- ☐ Groundwater containment
- ☐ Vertical barrier walls

Attachments: ☒ Inspection team roster attached ☒ Site map attached

II. INTERVIEWS (Check all that apply)

1. **O&M site manager** ______________ ______________ ______________
   Name Title Date
   Interviewed ☐ at site ☐ at office ☐ by phone Phone no. __________
   Problems, suggestions; ☐ Report attached ______________

2. **O&M staff** ______________ ______________ ______________
   Name Title Date
   Interviewed ☐ at site ☐ at office ☐ by phone Phone no. __________
   Problems, suggestions; ☐ Report attached ______________

3. **Local regulatory authorities and response agencies** (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.) Fill in all that apply.

Agency NDEQ
Contact ED SOUTHWICK | PROJECT MGR. | 3/28/07 | 402 471-4875
Name | Title | Date | Phone no.
Problems; suggestions; ☐ Report attached MEMBER OF INSPECTION TEAM

Agency ______
Contact ______ | ______ | ______ | ______
Name | Title | Date | Phone no.
Problems; suggestions; ☐ Report attached ______

Agency ______
Contact ______ | ______ | ______ | ______
Name | Title | Date | Phone no.
Problems; suggestions; ☐ Report attached ______

Agency ______
Contact ______ | ______ | ______ | ______
Name | Title | Date | Phone no.
Problems; suggestions; ☐ Report attached ______

4. **Other interviews** (optional) ☐ Report attached.

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)				
1.	**O&M Documents**			
	☐ O&M manual	☐ Readily available	☐ Up to date	☐ N/A
	☐ As-built drawings	☐ Readily available	☐ Up to date	☐ N/A
	☒ Maintenance logs	☐ Readily available	☐ Up to date	☐ N/A
	Remarks PLANS AND DWGS TO BE UPDATED UPON COMPLETION OF PHASE II CONSTRUCTION			
2.	**Site-Specific Health and Safety Plan**	☐ Readily available	☒ Up to date	☐ N/A
	☐ Contingency plan/emergency response plan	☐ Readily available	☐ Up to date	☐ N/A
	Remarks			
3.	**O&M and OSHA Training Records**	☐ Readily available	☐ Up to date	☐ N/A
	Remarks			
4.	**Permits and Service Agreements**			
	☐ Air discharge permit	☐ Readily available	☐ Up to date	☒ N/A
	☐ Effluent discharge	☐ Readily available	☐ Up to date	☒ N/A
	☐ Waste disposal, POTW	☐ Readily available	☐ Up to date	☒ N/A
	☒ Other permits	☐ Readily available	☐ Up to date	☐ N/A
	Remarks ACCESS TO BNSF ROW PENDING FOR CONSTRUCTION OF PHASE II SYSTEM			
7.	***Groundwater Monitoring Records***	☒ Readily available	☒ Up to date	☐ N/A
	Remarks			

IV. O&M COSTS

1. **O&M Organization**
☐ State in-house ☐ Contractor for State
☒ PRP in-house ☒ Contractor for PRP
☐ Federal Facility in-house ☐ Contractor for Federal Facility
☒ Other CITY EMPLOYEE HAS LIMITED DUTIES

2. **O&M Cost Records**
☐ Readily available ☒ Up to date SEE BAKER REPORT SENT TO CITY
☐ Funding mechanism/agreement in place
Original O&M cost estimate________ ☐ Breakdown attached

Total annual cost by year for review period if available

From	To		
____ Date	____ Date	____ Total cost	☐ Breakdown attached
____ Date	____ Date	____ Total cost	☐ Breakdown attached
____ Date	____ Date	____ Total cost	☐ Breakdown attached
____ Date	____ Date	____ Total cost	☐ Breakdown attached
____ Date	____ Date	____ Total cost	☐ Breakdown attached

3. **Unanticipated or Unusually High O&M Costs During Review Period**
Describe costs and reasons: SEE REPORT PREPARED FOR DRAVO

V. ACCESS AND INSTITUTIONAL CONTROLS ☒ Applicable ☐ N/A

A. Fencing

1. **Fencing damaged** ☐ Location shown on site map ☐ Gates secured ☒ N/A
Remarks________

B. Other Access Restrictions

1. **Signs and other security measures** ☐ Location shown on site map ☐ N/A
Remarks TREATMENT BLDG. & SVE WELL ENCLOSURES ARE SECURELY LOCKED

C. Institutional Controls (ICs)

1. **Implementation and enforcement**

Site conditions imply ICs not properly implemented ☐ Yes ☐ No ☐ N/A
Site conditions imply ICs not being fully enforced ☐ Yes ☐ No ☐ N/A

Type of monitoring (e.g., self-reporting, drive by) ICA BY HASTINGS PRP GROUP
~~Frequency~~ HASTINGS PRP GROUP / HASTINGS UTILITIES
Responsible party/agency ______
Contact ______ ______ ______ ______
Name Title Date Phone no.

Reporting is up-to-date ☒ Yes ☐ No ☐ N/A
Reports are verified by the lead agency ☒ Yes ☐ No ☐ N/A

Specific requirements in deed or decision documents have been met ☐ Yes ☐ No ☒ N/A
Violations have been reported ☐ Yes ☐ No ☒ N/A
Other problems or suggestions: ☐ Report attached
SEE LATEST (RY 2005) ANNUAL ICA REPORT
DATED 3/29/2006

2. **Adequacy** ☒ ICs are adequate ☐ ICs are inadequate ☐ N/A
Remarks ______

D. General

1. **Vandalism/trespassing** ☐ Location shown on site map ☒ No vandalism evident
Remarks ______

2. **Land use changes on site** ☒ N/A
Remarks ______

3. **Land use changes off site** ☒ N/A
Remarks ______

VI. GENERAL SITE CONDITIONS

A. Roads ☐ Applicable ☒ N/A

1. **Roads damaged** ☐ Location shown on site map ☐ Roads adequate ☐ N/A
Remarks ______

B. Other Site Conditions

Remarks ____________________

VII. LANDFILL COVERS ☐ Applicable ☒ N/A

A. Landfill Surface

1. **Settlement** (Low spots) ☐ Location shown on site map ☐ Settlement not evident
   Areal extent ________ Depth ________
   Remarks ____________________

2. **Cracks** ☐ Location shown on site map ☐ Cracking not evident
   Lengths ________ Widths ________ Depths ________
   Remarks ____________________

3. **Erosion** ☐ Location shown on site map ☐ Erosion not evident
   Areal extent ________ Depth ________
   Remarks ____________________

4. **Holes** ☐ Location shown on site map ☐ Holes not evident
   Areal extent ________ Depth ________
   Remarks ____________________

5. **Vegetative Cover** ☐ Grass ☐ Cover properly established ☐ No signs of stress
   ☐ Trees/Shrubs (indicate size and locations on a diagram)
   Remarks ____________________

6. **Alternative Cover (armored rock, concrete, etc.)** ☐ N/A
   Remarks ____________________

7. **Bulges** ☐ Location shown on site map ☐ Bulges not evident
   Areal extent ________ Height ________
   Remarks ____________________

H. Retaining Walls		☐ Applicable	☒ N/A
1.	**Deformations** *Horizontal displacement*______ Rotational displacement______ Remarks______	☐ Location shown on site map Vertical displacement______	☐ Deformation not evident
2.	**Degradation** Remarks______	☐ Location shown on site map	☐ Degradation not evident
I. Perimeter Ditches/Off-Site Discharge		☐ Applicable	☐ N/A
1.	**Siltation** Areal extent______ Remarks______	☐ Location shown on site map Depth______	☐ Siltation not evident
2.	**Vegetative Growth** ☐ Vegetation does not impede flow Areal extent______ Remarks______	☐ Location shown on site map Type______	☐ N/A
3.	**Erosion** Areal extent______ Remarks______	☐ Location shown on site map Depth______	☐ Erosion not evident
4.	**Discharge Structure** Remarks______	☐ Functioning	☐ N/A
VIII. VERTICAL BARRIER WALLS		☐ Applicable	☒ N/A
1.	**Settlement** Areal extent______ Remarks______	☐ Location shown on site map Depth______	☐ Settlement not evident
2.	**Performance Monitoring** ☐ Performance not monitored Frequency______ Head differential______ Remarks______	Type of monitoring______	☐ *Evidence of breaching*

IX. GROUNDWATER/SURFACE WATER REMEDIES ☐ Applicable ☒ N/A
A. Groundwater Extraction Wells, Pumps, and Pipelines ☐ Applicable ☒ N/A
1. **Pumps, Wellhead Plumbing, and Electrical** ☐ Good condition ☐ All required wells properly operating ☐ Needs Maintenance ☐ N/A Remarks
2. **Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances** ☐ Good condition ☐ Needs Maintenance Remarks
3. **Spare Parts and Equipment** ☐ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided Remarks
B. Surface Water Collection Structures, Pumps, and Pipelines ☐ Applicable ☒ N/A
1. **Collection Structures, Pumps, and Electrical** ☐ Good condition ☐ Needs Maintenance Remarks
2. **Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances** ☐ Good condition ☐ Needs Maintenance Remarks
3. **Spare Parts and Equipment** ☐ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided Remarks

C. Treatment System	☒ Applicable ☐ N/A
1.	**Treatment Train** (Check components that apply) ☐ Metals removal ☒ Oil/water separation ☐ Bioremediation ☐ Air stripping ☐ Carbon adsorbers ☒ Filters ____ ☐ Additive (*e.g.*, chelation agent, flocculent) ____ ☐ Others ____ ☐ Good condition ☐ Needs Maintenance ☐ Sampling ports properly marked and functional ☐ Sampling/maintenance log displayed and up to date ☐ Equipment properly identified ☐ Quantity of groundwater treated annually N/A ☐ Quantity of surface water treated annually N/A Remarks REMEDY IS SVE, CARBON TREATMENT UNITS REMOVED IN 2004
2.	**Electrical Enclosures and Panels** (properly rated and functional) ☐ N/A ☒ Good condition ☐ Needs Maintenance Remarks ____
3.	**Tanks, Vaults, Storage Vessels** ☐ N/A ☒ Good condition ☐ Proper secondary containment ☐ Needs Maintenance Remarks ____
4.	**Discharge Structure and Appurtenances** ☒ N/A ☐ Good condition ☐ Needs Maintenance Remarks ____
5.	**Treatment Building(s)** ☐ N/A ☒ Good condition (esp. roof and doorways) ☐ Needs repair ☐ Chemicals and equipment properly stored Remarks ____
6.	**Monitoring Wells** (pump and treatment remedy) ☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition ☐ All required wells located ☐ Needs Maintenance ☒ N/A Remarks ____
D. Monitoring Data	
1.	Monitoring Data REMEDY NOT FULLY IMPLEMENTED ☐ Is routinely submitted on time ☐ Is of acceptable quality
2.	Monitoring data suggests: REMEDY NOT FULLY IMPLEMENTED ☐ Groundwater plume is effectively contained ☐ Contaminant concentrations are declining

D. Monitored Natural Attenuation N/A

1. **Monitoring Wells** (natural attenuation remedy)
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ All required wells located ☐ Needs Maintenance ☐ N/A
Remarks

X. OTHER REMEDIES

If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).

- SCHEDULE FOR COMPLETION OF PHASE II CONSTRUCTION WORK IS PENDING.
- INTENT OF THE SOURCE CONTROL INTERIM ACTION IS TO REMOVE VOLATILE CONTAMINANTS FROM THE SOILS AND MINIMIZE FURTHER CONTAMINATION OF GW.
- DRAVO PREPARES QUARTERLY PROGRESS REPORTS LATEST REPORT IS DATED FEB. 9, 2007.

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

- SVE PHASE I SYSTEM WAS IN REST CYCLE AS OF DATE OF INSPECTION
- DRAVO WILL RESTART THE SVE SYSTEM WHEN INSTALLATION OF PHASE II SVE WELLS IS COMPLETED.

C.	Early Indicators of Potential Remedy Problems
	Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs, that suggest that the protectiveness of the remedy may be compromised in the future. - PHASE I CONSTRUCTION WAS COMPLETED IN 1996. AS OF THIS DATE A SCHEDULE FOR COMPLETION OF PHASE II WORK IS PENDING. - SAMPLING PERFORMED IN 1999 BY EPA DEMONSTRATED NEED FOR ADDITIONAL SVE WELLS.
D.	Opportunities for Optimization
	Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy. - THE WRITTEN RECORD FOR THIS PROJECT REFLECTS MANY OPTIMIZATION REVIEWS.

Table for Listing Issues COLORADO AVENUE, OU 9

Issues 2/28/2007	Affects Protectiveness (Y/N)	
	Current	Future
MP-7D IS MISSING ID TAG. ALL OTHERS SHOULD BE CHECKED	N	N
ACCESS TO BNSF ROW HAS BEEN DELAYED FOR SEVERAL MONTHS.	Y	Y
ALL SVE WELL HEAD ENCLOSURES SHOULD BE PAINTED	N	N

Table for Listing Recommendations and Follow-up Actions

Recommendations/ Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Follow-up Actions: Affects Protectiveness (Y/N)	
				Current	Future

SCHEDULE

Five-Year Review Site Inspections
Hastings Superfund Site, Hastings, Nebraska

Site Inspection Schedule
February 28, 2007
8:00 AM – 5:30 PM

Time	Activity	Federal and State Personnel	Site Manager/Personnel
8:00 – 8:45 AM	**Well 3 (OU07, OU13, OU17, OU18)**	Sommerhauser / Gregson *	Mary Spalding
8:45 – 9:00 AM	*Mobilize to Colorado Ave*		
9:00 – 10:30 AM	**Colorado Ave (OU01, OU09)**	Sommerhauser / Borovich *	Bob Dangler
10:30 – 10:45 AM	*Mobilize to 2nd Street*		
10:45 – 12:15 PM	**Second Street (OU12, OU20)**	Gresham & Sommerhauser / Summerside	Jeremy Groves (CoH)
12:15 – 1:15 PM	Lunch Break		
1:15 – 1:45 PM	**North Landfill (OU02, OU10)**	Gresham / Borovich *	Jeremy Groves (CoH), Jack Newlen (CoH), Mary Spalding (HTI)
1:45 – 2:00 PM	*Mobilize to South Landfill*		
2:00 – 2:45 PM	**South Landfill (OU05)**	Sommerhauser / Southwick	Jeremy Groves (CoH), Jack Newlen (CoH)
2:45 – 3:00 PM	*Mobilize to Well D*		
3:00 – 4:00 PM	**Well D, Secondary & Tertiary Containment Wells**	Sommerhauser, Gresham, Zurbuchen	Jenny Sidlo (HU)
4:00 – 4:15 PM	*Mobilize to Far-Mar-Co*		
4:15 – 5:00 PM	**Far-Mar-Co (OU03, OU06, OU11)**	Gresham / Borovich *	HTI is just sampling and analyzing [Papadopouls is the consultant]
5:00 – 5:30 PM	**Area-Wide (OU19)**	Zurbuchen / Southwick	Jeremy Groves (CoH)

REVISED * NOTE, GREGSON + BOROVICH DID NOT ATTEND THIS INSPECTION.

DRAVO CORPORATION
11 Stanwix Street
Pittsburgh, PA 15222
412-995-5500 • FAX: 412-995-5594

DRAVO
1891

January 31, 2001

Mr. Darrell J. Sommerhauser
U.S. Environmental Protection Agency
Region 7
901 N. 5th Street
Kansas City, Kansas 66101

RE: **Response to EPA Letter dated December 21, 2000**
Colorado Avenue Subsite, Hastings Nebraska
UAO Docket No. VII-90-F-0040

Dear Mr. Sommerhauser:

As requested in EPA's letter dated December 21, 2000, drawing number 8011-100-01 has been revised. The location of MP-9D is now correct on the drawing. Additionally, MP-5S and MP-6S have been switched on the drawing to indicate the tags on the probes and the historic data collected. Lastly, MP-4S has been removed from the drawing. MP-4S has not been operational since installation and sampling events did not include this point. Dravo feels the area is adequately covered by probes MP-2D, MP-3S, MP-5S and MP-6S.

During my site visit in early January I examined MP-2D and the obvious damage done to the post of this probe. It appears that the damage is to the extension that was added to this probe. Due to the lack of heavy equipment available at the site we were unable to disassemble the post and confirm this. We have contacted Marshalltown Instruments to notify them of the damage we believe they did during their exiting the site, but have not heard back from them as of the date of this letter. I would propose that during our next visit and prior to the next sampling event we attempt to remove the top portion of the probe and reset the posting.

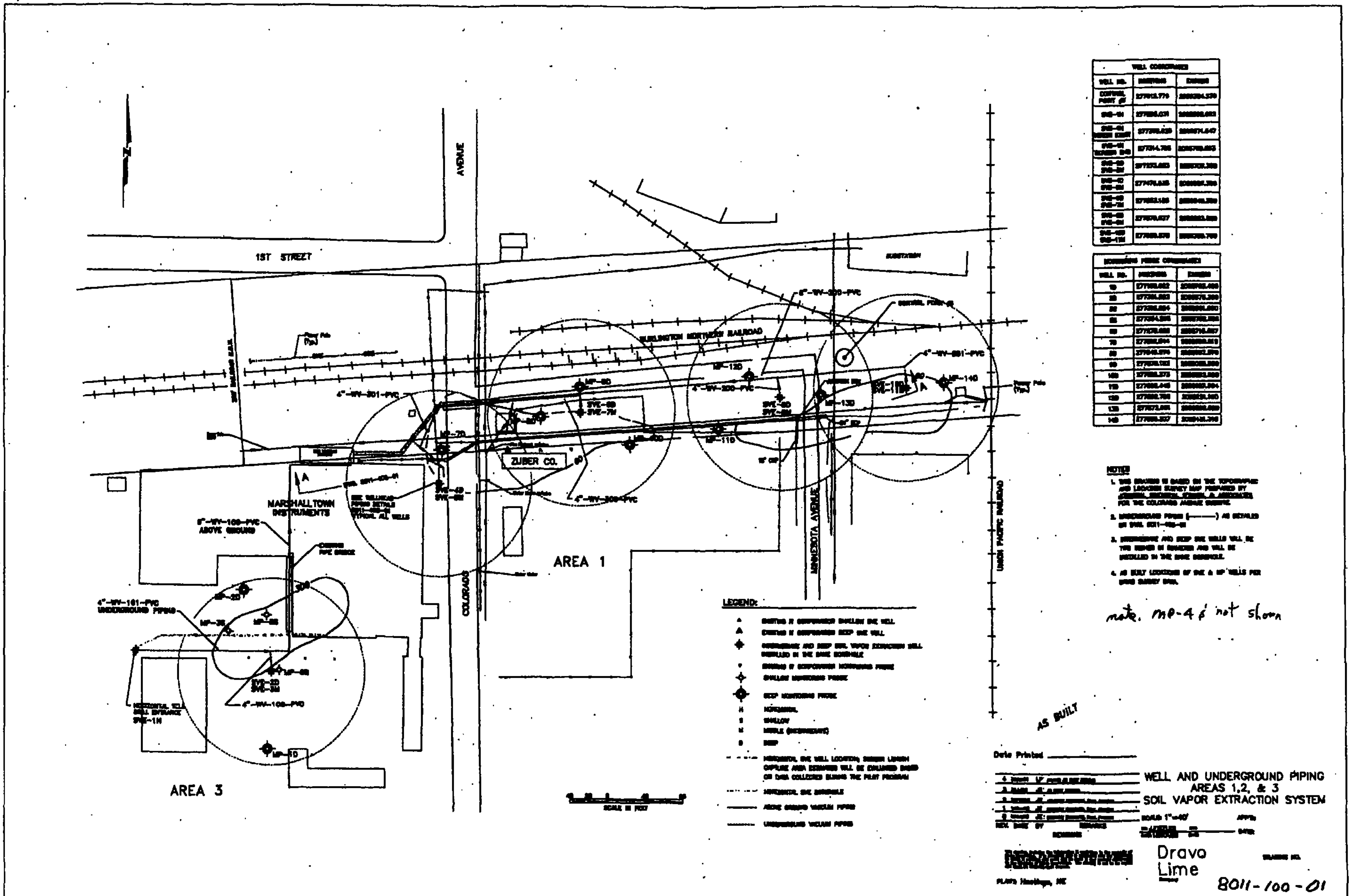
If there are any questions or comments, please feel free to call me at (412) 995-5547.

Very truly yours,

Lisa A Potts

Lisa A Potts
Environmental Manager

Cc: Joe Rowe – Black & Veatch (w/att.)
Vicki Murt – NDEQ (w/att.)



N
AVENUE
1ST STREET
BURLINGTON NORTHERN RAILROAD
COLORADO
MINNESOTA AVENUE
UNION PACIFIC RAILROAD
ZUBER CO.
MARSHALLTOWN INSTRUMENTS
AREA 1
AREA 3
4"-WV-201-PVC
4"-WV-300-PVC
4"-WV-101-PVC UNDERGROUND PIPING
4"-WV-100-PVC
6"-WV-100-PVC ABOVE GROUND
MP-3D
MP-3S
MP-7D
MP-8D
MP-9D
MP-10D
MP-11D
MP-12D
MP-13D
MP-14D
SVE-7D
SVE-7M
SVE-3D
SVE-3M
SVE-1H
LEGEND:
NOTES
note. MP-4 & not shown
AS BUILT
Date Printed
WELL AND UNDERGROUND PIPING
AREAS 1,2, & 3
SOIL VAPOR EXTRACTION SYSTEM
SCALE 1"=40'
Dravo Lime
8011-100-01

Second Street

Site Inspection Checklist

OU 20

I. SITE INFORMATION

Site name: HASTINGS SECOND STREET	**Date of inspection:** 2/28/2007
Location and Region: NEBRASKA - R7	**EPA ID:** NTD 980862668
Agency, office, or company leading the five-year review: EPA + CITY	**Weather/temperature:** COLD / 35°

Remedy Includes: (Check all that apply)

- ☐ Landfill cover/containment
- ☐ Access controls
- ☐ Institutional controls
- ☒ Groundwater pump and treatment
- ☐ Surface water collection and treatment
- ☒ Other SOIL VAPOR EXTRACTION, IN WELL AERATION AND IN-SITU BIOREMEDIATION
- ☐ Monitored natural attenuation
- ☐ Groundwater containment
- ☐ Vertical barrier walls

Attachments: ☒ Inspection team roster attached ☐ Site map attached

II. INTERVIEWS (Check all that apply)

1. **O&M site manager** JEREMY GROVES — ENG. ASSISTANT — 2/28/07
   Name — Title — Date
   Interviewed ☒ at site ☐ at office ☐ by phone Phone no. 402-461-2339
   Problems, suggestions; ☒ Report attached ______

2. **O&M staff** SAME AS ABOVE ______ ______
   Name — Title — Date
   Interviewed ☐ at site ☐ at office ☐ by phone Phone no. ______
   Problems, suggestions; ☐ Report attached ______

3. **Local regulatory authorities and response agencies** (*i.e., State and Tribal offices, emergency response* office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.) Fill in all that apply.

Agency NDEQ
Contact SCOTT SUMMERSIDE | P M | 2/28/07 | 402 471-4247
Name | Title | Date | Phone no.
Problems; suggestions; ☐ Report attached ______________________

Agency ______________________
Contact ______________________ | ______ | ______ | ______
Name | Title | Date | Phone no.
Problems; suggestions; ☐ Report attached ______________________

Agency ______________________
Contact ______________________ | ______ | ______ | ______
Name | Title | Date | Phone no.
Problems; suggestions; ☐ Report attached ______________________

Agency ______________________
Contact ______________________ | ______ | ______ | ______
Name | Title | Date | Phone no.
Problems; suggestions; ☐ Report attached ______________________

4. **Other interviews** (optional) ☐ Report attached.

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)				
1.	**O&M Documents**			
	☒ O&M manual	☒ Readily available	☐ Up to date	☐ N/A
	☐ As-built drawings	☐ Readily available	☐ Up to date	☐ N/A
	☒ Maintenance logs	☒ Readily available	☐ Up to date	☐ N/A
	Remarks AS-BUILT DWGS BEING PREPARED BY B+V			
2.	**Site-Specific Health and Safety Plan**	☒ Readily available	☐ Up to date	☐ N/A
	☐ Contingency plan/emergency response plan	☒ Readily available	☐ Up to date	☐ N/A
	Remarks			
3.	**O&M and OSHA Training Records**	☐ Readily available	☒ Up to date	☐ N/A
	Remarks			
4.	**Permits and Service Agreements**			
	☐ Air discharge permit	☐ Readily available	☐ Up to date	☒ N/A
	☐ Effluent discharge	☒ Readily available	☐ Up to date	☐ N/A
	☐ Waste disposal, POTW	☐ Readily available	☐ Up to date	☒ N/A
	☐ Other permits	☐ Readily available	☐ Up to date	☒ N/A
	Remarks			
X 5.	**Groundwater Monitoring Records**	☒ Readily available	☐ Up to date	☐ N/A
	Remarks SEE LATEST REPORTS BY BLACK + VEATCH			

IV. O&M COSTS

1. **O&M Organization**

☐ State in-house ☐ Contractor for State
☐ PRP in-house ☐ Contractor for PRP
☐ Federal Facility in-house ☐ Contractor for Federal Facility
☒ Other EPA FUNDING FIRST TEN YEARS FOR GW ACTION

2. **O&M Cost Records**

☐ Readily available ☐ Up to date BEING PREPARED BY B&V
☒ Funding mechanism/agreement in place
Original O&M cost estimate__________ ☐ Breakdown attached

Total annual cost by year for review period if available

From______ To______ ______ ☐ Breakdown attached
Date Date Total cost
From______ To______ ______ ☐ Breakdown attached
Date Date Total cost
From______ To______ ______ ☐ Breakdown attached
Date Date Total cost
From______ To______ ______ ☐ Breakdown attached
Date Date Total cost
From______ To______ ______ ☐ Breakdown attached
Date Date Total cost

3. **Unanticipated or Unusually High O&M Costs During Review Period**

Describe costs and reasons: COSTS ARE IN LINE WITH EPA ESTIMATES.

V. ACCESS AND INSTITUTIONAL CONTROLS ☒ Applicable ☐ N/A

A. Fencing

1. **Fencing damaged** ☐ Location shown on site map ☐ Gates secured ☒ N/A
Remarks__________

B. Other Access Restrictions

1. **Signs and other security measures** ☐ Location shown on site map ☐ N/A
Remarks BOTH TREATMENT BLDGS. ARE SECURELY LOCKED

C. Institutional Controls (ICs)

1. **Implementation and enforcement**

Site conditions imply ICs not properly implemented ☐ Yes ☐ No ☐ N/A

Site conditions imply ICs not being fully enforced ☐ Yes ☐ No ☐ N/A

Type of monitoring (*e.g.*, self-reporting, drive by) ICA BY HASTINGS PRP GROUP

Frequency

Responsible party/agency HASTINGS PRP GROUP/HASTINGS UTILITIES

Contact

Name	Title	Date	Phone no.

Reporting is up-to-date ☒ Yes ☐ No ☐ N/A

Reports are verified by the lead agency ☒ Yes ☐ No ☐ N/A

Specific requirements in deed or decision documents have been met ☐ Yes ☐ No ☒ N/A

Violations have been reported ☐ Yes ☐ No ☒ N/A

Other problems or suggestions: ☐ Report attached

SEE LATEST (RY2005) ANNUAL ICA REPORT DATED 3/29/2006.

2. **Adequacy** ☒ ICs are adequate ☐ ICs are inadequate ☐ N/A

Remarks

D. General

1. **Vandalism/trespassing** ☐ Location shown on site map ☒ No vandalism evident

Remarks

2. **Land use changes on site** ☒ N/A

Remarks

3. **Land use changes off site** ☒ N/A

Remarks

VI. GENERAL SITE CONDITIONS

A. Roads ☐ Applicable ☒ N/A

1. **Roads damaged** ☐ Location shown on site map ☐ Roads adequate ☐ N/A

Remarks

B. Other Site Conditions

Remarks SUBSTATION FENCE TO BE REPLACED BY H.U. EPA IS COORDINATING WITH H.U. TO REMOVE EPA'S AIR MANIFOLD AND RELOCATE AFTER NEW FENCE IS INSTALLED

VII. LANDFILL COVERS ☐ Applicable ☒ N/A

A. Landfill Surface

1. **Settlement** (Low spots) ☐ Location shown on site map ☐ Settlement not evident
   Areal extent________ Depth________
   Remarks________

2. **Cracks** ☐ Location shown on site map ☐ Cracking not evident
   Lengths________ Widths________ Depths________
   Remarks________

3. **Erosion** ☐ Location shown on site map ☐ Erosion not evident
   Areal extent________ Depth________
   Remarks________

4. **Holes** ☐ Location shown on site map ☐ Holes not evident
   Areal extent________ Depth________
   Remarks________

5. **Vegetative Cover** ☐ Grass ☐ Cover properly established ☐ No signs of stress
   ☐ Trees/Shrubs (indicate size and locations on a diagram)
   Remarks________

6. **Alternative Cover (armored rock, concrete, etc.)** ☐ N/A
   Remarks________

7. **Bulges** ☐ Location shown on site map ☐ Bulges not evident
   Areal extent________ Height________
   Remarks________

H. Retaining Walls		☐ Applicable ☒ N/A	
1.	**Deformations** Horizontal displacement__________ Vertical displacement__________ Rotational displacement__________ Remarks__________	☐ Location shown on site map	☐ Deformation not evident
2.	**Degradation** Remarks__________	☐ Location shown on site map	☐ Degradation not evident
I. Perimeter Ditches/Off-Site Discharge		☐ Applicable	☒ N/A
1.	**Siltation** Areal extent__________ Depth__________ Remarks__________	☐ Location shown on site map	☐ Siltation not evident
2.	**Vegetative Growth** ☐ *Vegetation does not impede flow* Areal extent__________ Type__________ Remarks__________	☐ Location shown on site map	☐ N/A
3.	**Erosion** Areal extent__________ Depth__________ Remarks__________	☐ Location shown on site map	☐ Erosion not evident
4.	**Discharge Structure** Remarks__________	☐ Functioning	☐ N/A
VIII. VERTICAL BARRIER WALLS		☐ Applicable	☒ N/A
1.	**Settlement** Areal extent__________ Depth__________ Remarks__________	☐ Location shown on site map	☐ Settlement not evident
2.	**Performance Monitoring** Type of monitoring__________ ☐ Performance not monitored Frequency__________ ☐ Evidence of breaching Head differential__________ Remarks__________		

IX. GROUNDWATER/SURFACE WATER REMEDIES ☒ Applicable ☐ N/A	
A. Groundwater Extraction Wells, Pumps, and Pipelines ☒ Applicable ☐ N/A	
1.	**Pumps, Wellhead Plumbing, and Electrical** ☒ Good condition ☒ All required wells properly operating ☐ Needs Maintenance ☐ N/A Remarks ____
2.	**Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances** ☒ Good condition ☐ Needs Maintenance Remarks ____
3.	**Spare Parts and Equipment** ☒ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided Remarks ____
B. Surface Water Collection Structures, Pumps, and Pipelines ☐ Applicable ☒ N/A	
1.	**Collection Structures, Pumps, and Electrical** ☐ Good condition ☐ Needs Maintenance Remarks ____
2.	**Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances** ☐ Good condition ☐ Needs Maintenance Remarks ____
3.	**Spare Parts and Equipment** ☐ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided Remarks ____

C. Treatment System ☒ Applicable ☐ N/A

1. **Treatment Train** (Check components that apply)
   - ☐ Metals removal ☒ Oil/water separation ☒ Bioremediation IN-SITU WELLS (15)
   - ☒ Air stripping ☒ Carbon adsorbers
   - ☒ Filters AIR FOR SVE + BAG FILTERS FOR WATER
   - ☐ Additive (*e.g.*, chelation agent, flocculent)
   - ☒ Others IN-WELL AREATION SYSTEM AT PINE AVE.
   - ☒ Good condition ☐ Needs Maintenance
   - ☒ Sampling ports properly marked and functional
   - ☒ Sampling/maintenance log displayed and up to date
   - ☐ Equipment properly identified
   - ☒ Quantity of groundwater treated annually SEE REMEDIAL ACTION REPORT
   - ☐ Quantity of surface water treated annually IN PREPARATION
   - Remarks

2. **Electrical Enclosures and Panels** (properly rated and functional)
   - ☐ N/A ☒ Good condition ☐ Needs Maintenance
   - Remarks

3. **Tanks, Vaults, Storage Vessels**
   - ☐ N/A ☒ Good condition ☒ Proper secondary containment ☐ Needs Maintenance
   - Remarks

4. **Discharge Structure and Appurtenances**
   - ☐ N/A ☒ Good condition ☐ Needs Maintenance
   - Remarks

5. **Treatment Building(s)**
   - ☐ N/A ☒ Good condition (esp. roof and doorways) ☐ Needs repair
   - ☐ Chemicals and equipment properly stored
   - Remarks

6. **Monitoring Wells** (pump and treatment remedy)
   - ☐ Properly secured/locked ☐ Functioning ☒ Routinely sampled ☒ Good condition
   - ☒ All required wells located ☐ Needs Maintenance ☐ N/A
   - Remarks

D. Monitoring Data

1. Monitoring Data
   - ☒ Is routinely submitted on time ☒ Is of acceptable quality

2. Monitoring data suggests:
   - ☐ Groundwater plume is effectively contained ☒ Contaminant concentrations are declining AT WELL MW-9

D. Monitored Natural Attenuation

1. **Monitoring Wells** (natural attenuation remedy)
☐ Properly secured/locked ☐ Functioning ☒ Routinely sampled ☒ Good condition
☒ All required wells located ☐ Needs Maintenance ☐ N/A
Remarks

X. OTHER REMEDIES

If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).

HWS PERSONNEL WE ONSITE AT THE ADJACENT FOOTE OIL PROPERTY PERFORMING MAINT. + TESTING

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

DATA EVALUATION REPORT IS IN PREPARATION RPM HAS REVIEWED DRAFT REPORT INTERIM REMEDIAL ACTION REPORT IS IN PREPARATION. RPM HAS REVIEWED DRAFT. SCOPE OF OU. 20 REMEDY IS ROUTINELY DISCUSSED BETWEEN EPA + NDEQ. ABOVE REFERENCED REPORTS WILL BE PROVIDED TO NDEQ IN MARCH 2007.

C.	Early Indicators of Potential Remedy Problems
	Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs, that suggest that the protectiveness of the remedy may be compromised in the future. DATA BEING COLLECTED INDICATES THE VARIOUS TECHNOLOGIES ARE EFFECTIVELY REDUCING THE MASS OF CONTAMINANTS IN THE VADOSE ZONE AND THE A QUIFER.
D.	***Opportunities for Optimization***
	Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy. 3 REMEDY OPTIMIZATION ACTIVITIES COMPLETED: 1) NEW EXTRACTION WELL EX-1 INSTALLED 12/2006 2) NEW MONITORING WELL SW-16 INSTALLED 12/2006 3) OXYGEN RELEASE CHEMICAL SOCKS INSTALLED IN 4 INCH WELL BW-1, 8/2006.

INTERVIEW RECORD

Site Name: HASTINGS/SECOND STREET		EPA ID No.: OU 20	
Subject: 5-YR. REVIEW		Time: 11:30	Date: 2/28/07
Type: ☐ Telephone ☒ Visit ☐ Other Location of Visit: SECOND STREET TREATMENT BLDG.		☐ Incoming ☐ Outgoing	

Contact Made By:

Name: DARRELL SOMMERHAUSER	Title: RPM	Organization: USEPA-R7

Individual Contacted:

Name: JEREMY GROVES	Title: CITY ENG. AST.	Organization:

Telephone No: 402-461-2339 Fax No: E-Mail Address:	Street Address: CITY HALL City, State, Zip: 220 N. HASTINGS AVE. HASTINGS, NE. 68901

Summary Of Conversation

MET WITH JEREMY GROVES INSIDE TREATMENT BLDG. AT 105 WEST SECOND STREET

NEW WELL EX-3 IS PUMPING AT 35 gpm.

SVE SYSTEM IS OPERATING NORMALLY WITH 8 OF 10 WELLS OPERATING.

Note: SEE ATTACHED LIST OF FINDINGS.

Table for Listing Issues

Issues SECOND STREET ON 20	Affects Protectiveness (Y/N)	
	Current	Future
IDENT, TAGS NEEDED FOR NEWLY INSTALLED WELLS SW-16 + EX-3	N	N

Table for Listing Recommendations and Follow-up Actions

Recommendations/ Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Follow-up Actions: Affects Protectiveness (Y/N)	
				Current	Future

SCHEDULE

Five-Year Review Site Inspections
Hastings Superfund Site, Hastings, Nebraska

Site Inspection Schedule
February 28, 2007
8:00 AM – 5:30 PM

Time	Activity	Federal and State Personnel	Site Manager/Personnel
8:00 – 8:45 AM	**Well 3 (OU07, OU13, OU17, OU18)**	Sommerhauser / Gregson *	Mary Spalding
8:45 – 9:00 AM	*Mobilize to Colorado Ave*		
9:00 – 10:30 AM	**Colorado Ave (OU01, OU09)**	Sommerhauser / Borovich *	Bob Dangler
10:30 – 10:45 AM	*Mobilize to 2nd Street*		
10:45 – 12:15 PM	**Second Street (OU12, OU20)**	Gresham & Sommerhauser / Summerside	Jeremy Groves (CoH)
12:15 – 1:15 PM	Lunch Break		
1:15 – 1:45 PM	**North Landfill (OU02, OU10)**	Gresham / Borovich *	Jeremy Groves (CoH), Jack Newlen (CoH), Mary Spalding (HTI)
1:45 – 2:00 PM	*Mobilize to South Landfill*		
2:00 – 2:45 PM	**South Landfill (OU05)**	Sommerhauser / Southwick	Jeremy Groves (CoH), Jack Newlen (CoH)
2:45 – 3:00 PM	*Mobilize to Well D*		
3:00 – 4:00 PM	**Well D, Secondary & Tertiary Containment Wells**	Sommerhauser, Gresham, Zurbuchen	Jenny Sidlo (HU)
4:00 – 4:15 PM	*Mobilize to Far-Mar-Co*		
4:15 – 5:00 PM	**Far-Mar-Co (OU03, OU06, OU11)**	Gresham / Borovich *	HTI is just sampling and analyzing [Papadopouls is the consultant]
5:00 – 5:30 PM	**Area-Wide (OU19)**	Zurbuchen / Southwick	Jeremy Groves (CoH)

REVISED

* NOTE, GREGSON + BOROVICH DID NOT ATTEND THIS INSPECTION.

"Claxton, Marshall" <ClaxtonM@bv.com>
02/22/2007 07:36 AM

To Darrell Sommerhauser/SUPR/R7/USEPA/US@EPA
cc
bcc
Subject Jan 2007 City Status Report - Second Street Source Area Systems

Darrell,

Attached is a pdf of the Jan 2007 status report for the Second Street Source Area systems prepared and submitted by the City on Feb 15. If you have any questions, please let me or Jeremy know.

<<2007-01.pdf>>

Marshall R. Claxton
Black & Veatch Special Projects Corp.
6601 College Boulevard
Overland Park, KS 66211
Phone: (913) 458-6508
Fax: (913) 458-6633
E-mail: claxtonm@bv.com

2007-01.pdf

Report No. 2007-01
Report Period: January 2007

STATUS REPORT
2ND ST. (HASTINGS) LTRA

OPERATION STATUS (end of period):
Hours of Operation:
MW-9 27418.0 EXW-1 6615.0 EXW-2 000.6 EXW-3 162.9 SVE 1246.3
Total Gallons:
MW-9 28,000,295 EXW-1 0 EXW-2 NR EXW-3 250,797 EQ 41,473,600

DATA COLLECTED (List Date/Time):
Site Visit/Maintenance Logs: (See Attached): January 2007
Operations Logs: (See Attached): 01/05/06; 01/12/06; 01/19/07; 01/31/07;
Sample Logs: (See Attached): January 2007
Routine Maintenance Logs: (See Attached): January 2007

1.0 OPERATIONS CHRONOLOGY

Water System
The Water system ran fairly run consistently throughout January with the exception of the following outages:

- 01/02/07: VFD Drive Failed: Reset & Restarted: readjust valve to control flow.
- 01/17/07 through 01/19/07: Transfer pump PI-401 was cleaned to see if gpm would increase.
- 01/28/07 through 01/31/07: GAC 2 was drained on 01/28/07, on 01/29/07 GAC 2 was changed out with GAC 4. GAC 4 needed to thaw out until 01/31/07 before operation.

There were no outages for filter bag change outs. They were performed throughout this period. As indicated on the inspection/maintenance log, left all 3 filter bag canisters open most of the time, one or two filter bags are usually changed out on a frequency of every three to four days of operation, or as needed if there is down time.

SVE System
The SVE system was run consistently throughout January with following outages:

- SVE system zerts were greased on 01/2/07, 01/6/07, 01/16/06, 01/22/07, and 01/29/07.

0107Stat_Rpt.doc

By Jeremy Groves
Title Environmental Engineering Assistant
Affiliation City of Hastings

STATUS REPORT
2ND ST. (HASTINGS) LTRA

- SVE was shut down manually temporarily for noise factor on 01/17/07 while cleaning transfer pump PI 401.
- SVE motor starter was found tripped on 01/29/07 and 01/31/07.

2.0 ANALYTICAL RESULTS

There was not any analytical sample taken for the month of January. The results of qualitative samples collected are noted on the January operations logs.

3.0 SIGNIFICANT OBSERVATIONS FOR THE SYSTEM

New batteries are needed for the flow analyzers.

As of January 31, 2007, approximately 41,473,600 gallons of contaminated water has been removed from the aquifer and treated in the system.

4.0 ACTIVITIES ANTICIPATED FOR NEXT OPERATIONS PERIOD

The following activities are anticipated to be performed during the next operations period:

- Continue weekly operations and monitoring of the systems in accordance with Operations and Maintenance manual for the sub site.
- Repairs to SVE control panel main on/off switch.
- New transfer pumps may be installed to replace at Air Stripper transfer pump PI-401 and EQ transfer pump PI-300, when they become available.

Please call or email me if you have any questions or comments concerning this report.

Jeremy T. Groves
City of Hastings
Phone: (402) 461-2339
Fax: (402) 461-2323
E-mail: jtgroves@cityofhastings.org

0107Stat_Rpt.doc

By Jeremy Groves
Title Environmental Engineering Assistant
Affiliation City of Hastings

2nd Street System Site Inspection/Maintenance Log

DATE	TIME	INSPECTION OBSERVATION/ MAINTENANCE PROCEDURE	CAUSE OF SHUTDOWN	TOTAL GALLONS	OPERATORS INITIALS
1/02	8:30	W.S. Down, Changed filter bags.	VFD Drive Failed	40,999,200	JTG
1/05	10:00	Changed Filter Bags	----	41,000,400	JTG
1/09	8:30	Changed Filter Bags	---	41,023,300	JTG
1/12	9:45	Changed Filter Bags	---	41,131,600	JTG
1/17	8:45	Cleaned AS transfer pump for gpm increase, Changed Filter bags	manually	----	JTG
1/19	3:00	Restarted System	----	41,293,600	JTG
1/24	8:30	Opened FB-3	----	41,361,400	JTG
1/28	9:00	W.S. Down, GAC 2 Spent, drained GAC 2 for change out	----	----	JTG
1/29	1:30	Changed out GAC 2 with GAC 4	----	41,472,400	JTG
1/29	1:30	SVE Down; Also, the Control Panel main On/Off Switch broke while getting inside to reset the MS.	MS Tripped	SVE Hours 1222.2	JTG
1/30	13:45	W.S. Down	AS High Level	41,473,600	JTG
1/31	9:00	SVE Down	MS Tripped	SVE Hours 1246.1	JTG

OPERATIONS LOG SHEET

DATE 01/05/06 **TIME:** 15:45 **DATA COLLECTOR:** JTG

GENERAL SYSTEMS OPERATING CONDITIONS: SVE system operating with all wells except SVE 5S & SVE10S; Water system operating with only well MW09

SVE WELL MEASUREMENTS:

SVE WELLS			SVE WELLS		
Location	Valve Pos. % open	PI-10# in Hg	Location	Valve Pos. % open	PI-10# in Hg
SVE1D	100	5.5	SVE6S	100	5.0
SVE2I	100	5.5	SVE7S	100	5.0
SVE3D	100	4.0	SVE8S	100	2.5
SVE4I	100	5.0	SVE9S	100	4.0
SVE5S	Closed	N/A	SVE10S	Closed	N/A

Comments:

GROUNDWATER

Well Location	MW9	EXW01	EXW02	EXW03
Pressure (PI#) psig	(201): 45	(202): NA	(203): NA	(204): NA
Flowrate (FE#) gpm	(201): 24.325	(202): NA	(203): NA	(204): NA
Total Flow (FE#)gals	(201):27416267	(202): NA	(203):NA	(204): 74320.7
Valve Pos %open	10	NR	NR	33
Hours Run hours	27172.5	6615.0	0.6	43.7

Comments: NR-Not Running. 01/05/07 took qualitative water samples: OWS Inlet- Clear, Strong odor. OWS Outlet- Small to medium particles floating. : EQ Tank Outlet- Slight tint, Small floating particles, strong odor. : AS Outlet- Smaller to few medium particles floating, slight odor. : GAC outlet – clear, no odor.

OPERATIONS LOG SHEET

DATE: 01/05/07 **TIME:** 15:45 **DATA COLLECTOR:** JTG

PROCESS MEASUREMENTS

Parameter	Reading	Parameter	Reading	Parameter	Reading
Vapor		**Water**		**Vapor Treatment**	
Vacuum Extraction (SVE)		**Vacuum Extraction (SVE)**		**Pre-Catalytic Oxidizer (CO)**	
Dil Air Damp Out (DAO)	0 click	LG 500	50 %	AS Damp to Atm (ASA)	6 click
Dil Air Damp In (DAI)	100%	PI-500	0 psig	AS Damp to CO (ASCO)	0 click
PI-111 (vac)	5 in Hg	**Equalization Tank**		PI-601 (AS)	1.0 in H_2O
TI-111	63 deg F	LIC-300	3.913 ft	SVE Damp to Atm (SVEA)	6 click
SVE Flow Damp (SVEFD)	2.5 click	PI-300	3-8 psig	SVE Damp to CO (SVECO)	0 click
PI-501A (vac)	10 in Hg	FI-300/gpm	25 gpm	PI-600 (SVE)	2.5 in H_2O
PI-501B (vac)	10.5 in Hg	FI-300/tot	41000400gal	**Catalytic Oxidizer (CO)**	
DPI-501	2 in H_2O	PI301(FB1-3)	FB1 15 psig	Inlet Temp	NA deg F
PI-502 (pos)	* in H_2O	FB2 25.5 psig	FB3 15.5 psig	Outlt Temp	NA deg F
TI-500	150 deg F	**Air Stripper (AS)**		%LFL	NA %
FE-111	395 scfm	LG-400	75%	Flame Sgnl	NA V
Hours	772.7 hrs	PI-401	3-8psig	Flow	NA scfm
Air Stripper (AS)					
Blow Damp (ASBD)	40 %	**Carbon Adsorbers**			
PI-400	38 in H_2O	PI-204	11.8 psi		
FE-210	221 scfm	FI-204/gpm	35.374 gpm		
TI-210	59 degF	FI-204/tot	3653913 gal		
		PI-205	3.0 psi		

Comment: * Broke.

OPERATIONS LOG SHEET

DATE 01/12/07 **TIME:** 9:45 **DATA COLLECTOR:** JTG

GENERAL SYSTEMS OPERATING CONDITIONS: SVE system operating with all wells except SVE 5S & SVE10S; Water system operating with only well MW09

SVE WELL MEASUREMENTS:

SVE WELLS			SVE WELLS		
Location	Valve Pos. % open	PI-10# in Hg	Location	Valve Pos. % open	PI-10# in Hg
SVE1D	100	5.25	SVE6S	100	5.25
SVE2I	100	5.5	SVE7S	100	5.0
SVE3D	100	4.0	SVE8S	100	3.5
SVE4I	100	5.0	SVE9S	100	4.25
SVE5S	Closed	N/A	SVE10S	Closed	N/A
Comments:					

GROUNDWATER

Well Location	MW9	EXW01	EXW02	EXW03
Pressure (PI#) psig	(201): 45	(202): NA	(203): NA	(204): NA
Flowrate (FE#) gpm	(201): 25.628	(202): NA	(203): NA	(204): NA
Total Flow (FE#)gals	(201):27658187	(202): NA	(203):NA	(204): 99028
Valve Pos %open	10	NR	NR	33
Hours Run hours	27190.1	6615.0	0.6	66.8

Comments: NR-Not Running. 01/12/07 took qualitative water samples: OWS Inlet- Clear, Strong odor. OWS Outlet- Small to medium particles floating. : EQ Tank Outlet- Slight tint, Small floating particles, strong odor. : AS Outlet- Smaller to few medium particles floating, slight odor. : GAC outlet – clear, no odor.

OPERATIONS LOG SHEET

DATE: 01/12/07 **TIME:** 9:45 **DATA COLLECTOR:** JTG

PROCESS MEASUREMENTS

Parameter	Reading	Parameter	Reading	Parameter	Reading
Vapor		**Water**		**Vapor Treatment**	
Vacuum Extraction (SVE)		**Vacuum Extraction (SVE)**		**Pre-Catalytic Oxidizer (CO)**	
Dil Air Damp Out (DAO)	0 click	LG 500	50 %	AS Damp to Atm (ASA)	6 click
Dil Air Damp In (DAI)	100%	PI-500	0 psig	AS Damp to CO (ASCO)	0 click
PI-111 (vac)	5 in Hg	**Equalization Tank**		PI-601 (AS)	0.8 in H_2O
TI-111	61 deg F	LIC-300	3.997 ft	SVE Damp to Atm (SVEA)	6 click
SVE Flow Damp (SVEFD)	2.5 click	PI-300	3-8 psig	*SVE Damp to CO* (SVECO)	0 click
PI-501A (vac)	10 in Hg	FI-300/gpm	25 gpm	PI-600 (SVE)	3.5 in H_2O
PI-501B (vac)	10.5 in Hg	FI-300/tot	41131600gal	**Catalytic Oxidizer (CO)**	
DPI-501	2 in H_2O	PI301(FB1-3)	FB1 5 psig	Inlet Temp	NA deg F
PI-502 (pos)	* in H_2O	FB2 5.5 psig	FB3 5 psig	Outlt Temp	NA deg F
TI-500	156 deg F	**Air Stripper (AS)**		%LFL	NA %
FE-111	398 scfm	LG-400	75%	Flame Sgnl	NA V
Hours	940.8 hrs	PI-401	3-8 psig	Flow	NA scfm
Air Stripper (AS)					
Blow Damp (ASBD)	40 %	**Carbon Adsorbers**			
PI-400	38 in H_2O	PI-204	13 psi		
FE-210	220 scfm	FI-204/gpm	37.574 gpm		
TI-210	58 degF	FI-204/tot	3712331 gal		
		PI-205	3.0 psi		

Comment: * Broke:

OPERATIONS LOG SHEET

DATE 01/19/07 **TIME:** 15:00 **DATA COLLECTOR:** JTG

GENERAL SYSTEMS OPERATING CONDITIONS: SVE system operating with all wells except SVE 5S & SVE10S; Water system operating with only well MW09

SVE WELL MEASUREMENTS:

SVE WELLS			SVE WELLS		
Location	Valve Pos. % open	PI-10# in Hg	Location	Valve Pos. % open	PI-10# in Hg
SVE1D	100	5.5	SVE6S	100	5.5
SVE2I	100	5.5	SVE7S	100	5.5
SVE3D	100	4.5	SVE8S	100	3.5
SVE4I	100	5.25	SVE9S	100	4.5
SVE5S	Closed	N/A	SVE10S	Closed	N/A
Comments:					

GROUNDWATER

Well Location	MW9	EXW01	EXW02	EXW03
Pressure (PI#) psig	(201): 45	(202): NA	(203): NA	(204): NA
Flowrate (FE#) gpm	(201): 25.283	(202): NA	(203): NA	(204): NA
Total Flow (FE#)gals	(201):27820295	(202): NA	(203):NA	(204): 171052
Valve Pos %open	15	NR	NR	33
Hours Run hours	27298.2	6615.0	0.6	114.7
Comments: NR-Not Running. 01/19/07 took qualitative water samples: OWS Inlet- Clear, Strong odor. OWS Outlet- Small to medium particles floating. : EQ Tank Outlet- Slight tint, Small floating particles, strong odor. : AS Outlet- Smaller to few medium particles floating, slight odor. : GAC outlet – clear, no odor.				

OPERATIONS LOG SHEET

DATE: 01/19/07 **TIME:** 15:00 **DATA COLLECTOR:** JTG

PROCESS MEASUREMENTS

Parameter	Reading	Parameter	Reading	Parameter	Reading
Vapor		**Water**		**Vapor Treatment**	
Vacuum Extraction (SVE)		**Vacuum Extraction (SVE)**		**Pre-Catalytic Oxidizer (CO)**	
Dil Air Damp Out (DAO)	0 click	LG 500	50 %	AS Damp to Atm (ASA)	6 click
Dil Air Damp In (DAI)	100%	PI-500	0 psig	AS Damp to CO (ASCO)	0 click
PI-111 (vac)	5 in Hg	**Equalization Tank**		PI-601 (AS)	5 in H_2O
TI-111	54 deg F	LIC-300	3.912 ft	SVE Damp to Atm (SVEA)	6 click
SVE Flow Damp (SVEFD)	2.5 click	PI-300	3-8 psig	SVE Damp to CO (SVECO)	0 click
PI-501A (vac)	10 in Hg	FI-300/gpm	25 gpm	PI-600 (SVE)	3.5 in H_2O
PI-501B (vac)	10.5 in Hg	FI-300/tot	41293600gal	**Catalytic Oxidizer (CO)**	
DPI-501	3 in H_2O	PI301(FB1-3)	FB1 3.5 psig	Inlet Temp	NA deg F
PI-502 (pos)	* in H_2O	FB2 3.5 psig	FB3 3.0 psig	Outlt Temp	NA deg F
TI-500	140 deg F	**Air Stripper (AS)**		%LFL	NA %
FE-111	392 scfm	LG-400	100%	Flame Sgnl	NA V
Hours	1096.2 hrs	PI-401	20 psig	Flow	NA scfm
Air Stripper (AS)					
Blow Damp (ASBD)	40 %	**Carbon Adsorbers**			
PI-400	38 in H_2O	PI-204	12 psi		
FE-210	250 scfm	FI-204/gpm	38.187 gpm		
TI-210	59.7 degF	FI-204/tot	3832211 gal		
		PI-205	4.0 psi		

Comments: * Broke.

OPERATIONS LOG SHEET

DATE 1/31/07 **TIME:** 14:15 **DATA COLLECTOR:** JTG

GENERAL SYSTEMS OPERATING CONDITIONS: SVE system operating with all wells except SVE 5S & SVE10S; Water system not operating.

SVE WELL MEASUREMENTS:

SVE WELLS			SVE WELLS		
Location	Valve Pos. % open	PI-10# in Hg	Location	Valve Pos. % open	PI-10# in Hg
SVE1D	100	5.0	SVE6S	100	4.75
SVE2I	100	1.0	SVE7S	100	4.75
SVE3D	100	3.5	SVE8S	100	1.5
SVE4I	100	4.5	SVE9S	100	4.0
SVE5S	Closed	N/A	SVE10S	Closed	N/A

Comments:

GROUNDWATER

Well Location	MW9	EXW01	EXW02	EXW03
Pressure (PI#) psig	(201): NA	(202): NA	(203): NA	(204): NA
Flowrate (FE#) gpm	(201): NA	(202): NA	(203): NA	(204): NA
Total Flow (FE#)gals	(201):28000295	(202): NA	(203):NA	(204): 250797.4
Valve Pos %open	15	NR	NR	10
Hours Run hours	27418.0	6615.0	0.6	162.9

Comments: NR-Not Running. 1/31/07 Drained OWS- Dark Black water got clearer after ¼ gallon. OWS Outlet- Many small to large particles floating. : Drained EQ: ¼ gallon of black water. EQ Tank Outlet- Slight tint, Small to large floating particles, strong odor. :

OPERATIONS LOG SHEET

DATE: 1/31/07 **TIME:** 14:15 **DATA COLLECTOR:** JTG

PROCESS MEASUREMENTS

Parameter	Reading	Parameter	Reading	Parameter	Reading
Vapor		**Water**		**Vapor Treatment**	
Vacuum Extraction (SVE)		**Vacuum Extraction (SVE)**		**Pre-Catalytic Oxidizer (CO)**	
Dil Air Damp Out (DAO)	0 click	LG 500	50 %	AS Damp to Atm (ASA)	6 click
Dil Air Damp In (DAI)	100%	PI-500	0 psig	AS Damp to CO (ASCO)	0 click
PI-111 (vac)	4 in Hg	**Equalization Tank**		PI-601 (AS)	5 in H_2O
TI-111	50 deg F	LIC-300	4.246 ft	SVE Damp to Atm (SVEA)	6 click
SVE Flow Damp (SVEFD)	2.5 click	PI-300	NA psig	SVE Damp to CO (SVECO)	0 click
PI-501A (vac)	10 in Hg	FI-300/gpm	NA gpm	PI-600 (SVE)	3.5 in H_2O
PI-501B (vac)	10.25 in Hg	FI-300/tot	41473600gal	**Catalytic Oxidizer (CO)**	
DPI-501	5 in H_2O	PI301(FB1-3)	FB1 psig	Inlet Temp	NA deg F
PI-502 (pos)	* in H_2O	FB2 psig	FB3 psig	Outlt Temp	NA deg F
TI-500	125 deg F	**Air Stripper (AS)**		%LFL	NA %
FE-111	384 scfm	LG-400	100 %	Flame Sgnl	NA V
Hours	1246.3 hrs	PI-401	3-6 psig	Flow	NA scfm
Air Stripper (AS)					
Blow Damp (ASBD)	40 %	**Carbon Adsorbers**			
PI-400	36 in H_2O	PI-204	0 psi		
FE-210	249 scfm	FI-204/gpm	gpm		
TI-210	59.5 degF	FI-204/tot	4105811 gal		
		PI-205	0 psi		

Comments: * Broke.

Sample Collection Log

	January 2007				February 2007				March 2007			
	WK1	WK 2	WK 3	WK 4/5	WK 1	WK 2	WK 3	WK 4	WK 1	WK 2	WK 3	WK 4
Operations Log	1/05	1/12	1/19	1/31								
Water Qualitative (basis noted)												
EXW1& EXW2& EXW3 Samples (monthly)				1/31								
OWS Inlet (well MW09) & Outlet Samples (weekly)	1/05	1/12	1/19	1/31								
EQ Tank Outlet Sample (weekly)	1/05	1/12	1/19	1/31								
AS Outlet Sample (weekly)	1/05	1/12	1/19	1/31								
GAC Outlet Samples (weekly)	1/05	1/12	1/19	1/31								
Soil Gas/Process Vapor Quantitative (Semi-/Annually)												
SVE Well Samples												
Vent Well Samples												

0107samplecollog.doc

Routine Maintenance Log

Maintenance	January 2007				February 2007				March 2007			
	WK 1	WK 2	WK 3	WK 4/5	WK 1	WK 2	WK 3	WK 4	WK 1	WK 2	WK 3	WK 4
Grease zerts on SVE blower (weekly)	1/02	1/08	1/16	1/22 & 1/29								
Clean outside SVE screen (weekly)												
Change SVE (blower) oil (every 1000 hrs)												
Check/remove sludge from OWS (weekly check/ remove as needed)	1/5			1/22 & 1/29								
Drain/Clean OWS (as needed/semiannually)												
Check/remove sludge from EQ Tank (monthly)				1/31								
Change EQ Tank Filter Bags (as needed)	1/02 & 1/5	1/9, 1/12	1/17	1/29								
Acid Wash AS (qrtrly)												
Removed carbon (as needed)			1/23									
Clean Y valve filter on storm sewer (monthly)				1/31								

0107Rt-main-log.doc

North Landfill

Please note that "O&M" is referred to throughout this checklist. At sites where Long-Term Response Actions are in progress, O&M activities may be referred to as "system operations" since these sites are not considered to be in the O&M phase while being remediated under the Superfund program.

Five-Year Review Site Inspection Checklist (Template)

(Working document for site inspection. Information may be completed by hand and attached to the Five-Year Review report as supporting documentation of site status. "N/A" refers to "not applicable.")

I. SITE INFORMATION	
Site name: Hastings North Landfill OU2/10	**Date of inspection:** Feb. 28, 2007
Location and Region: Hastings, NE/Region 7	**EPA ID:** NQD980862668
Agency, office, or company leading the five-year review: US EPA	**Weather/temperature:** Cloudy, breezy, 35°F

Remedy Includes: (Check all that apply)

- ✓ Landfill cover/containment
- ✓ Access controls
- ✓ Institutional controls
- ✓ Groundwater pump and treatment
- Surface water collection and treatment
- Other ______
- ✓ Monitored natural attenuation
- Groundwater containment
- Vertical barrier walls

Attachments: Inspection team roster attached (Site map attached) [circled]

II. INTERVIEWS (Check all that apply)

1. **O&M site manager** Jack Newlun — Solid Waste Superintendent — Feb. 28, 2007
   Name / Title / Date
   Interviewed (at site) [circled] at office by phone Phone no. 402-461-2308
   Problems, suggestions; Report attached ______

2. **O&M staff** ______ ______ ______
   Name / Title / Date
   Interviewed at site at office by phone Phone no. ______
   Problems, suggestions; Report attached ______

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)

1.	**O&M Documents**			
	O&M manual	Readily available	Up to date	N/A
	As-built drawings	Readily available	Up to date	N/A
	Maintenance logs	Readily available	Up to date	N/A
	Remarks___			
2.	**Site-Specific Health and Safety Plan**	Readily available	Up to date	N/A
	Contingency plan/emergency response plan	Readily available	Up to date	N/A
	Remarks___			
3.	**O&M and OSHA Training Records**	Readily available	Up to date	N/A
	Remarks___			
4.	**Permits and Service Agreements**			
	Air discharge permit	Readily available	Up to date	N/A
	Effluent discharge	Readily available	Up to date	N/A
	Waste disposal, POTW	Readily available	Up to date	N/A
	Other permits___	Readily available	Up to date	N/A
	Remarks___			
5.	**Gas Generation Records**	Readily available	Up to date	N/A
	Remarks___			
6.	**Settlement Monument Records**	Readily available	Up to date	N/A
	Remarks___			
7.	**Groundwater Monitoring Records**	Readily available	Up to date	N/A
	Remarks___			
8.	**Leachate Extraction Records**	Readily available	Up to date	N/A
	Remarks___			
9.	**Discharge Compliance Records**			
	Air	Readily available	Up to date	N/A
	Water (effluent)	Readily available	Up to date	N/A
	Remarks___			
10.	**Daily Access/Security Logs**	Readily available	Up to date	N/A
	Remarks___			

C. Institutional Controls (ICs)

1. **Implementation and enforcement**

	Yes	No	N/A
Site conditions imply ICs not properly implemented	Yes	(No) circled	N/A
Site conditions imply ICs not being fully enforced	Yes	(No) circled	N/A

Type of monitoring (*e.g.*, self-reporting, drive by) self-reporting

Frequency monthly

Responsible party/agency City

Contact Jack Newlun — Solid Waste Superintendent — 02/28/07 — 402-461-2308
(Name — Title — Date — Phone no.)

	Yes	No	N/A
Reporting is up-to-date	(Yes) circled	No	N/A
Reports are verified by the lead agency	(Yes) circled	No	N/A
Specific requirements in deed or decision documents have been met	(Yes) circled	No	N/A
Violations have been reported	Yes	No	(N/A) circled

Other problems or suggestions: Report attached

2. **Adequacy** (ICs are adequate) circled — ICs are inadequate — N/A
Remarks

D. General

1. **Vandalism/trespassing** Location shown on site map (No vandalism evident) circled
Remarks

2. **Land use changes on site** (N/A) circled
Remarks

3. **Land use changes off site** (N/A) circled
Remarks

VI. GENERAL SITE CONDITIONS

A. Roads Applicable (N/A) circled

1. **Roads damaged** Location shown on site map Roads adequate (N/A) circled
Remarks

8. **Wet Areas/Water Damage**	Wet areas/water damage not evident		
Wet areas	Location shown on site map	Areal extent______	
(Ponding)	(Location shown on site map)	Areal extent ~400 ft²	
Seeps	Location shown on site map	Areal extent______	
Soft subgrade	Location shown on site map	Areal extent______	
Remarks______			
9. **Slope Instability** Slides	Location shown on site map	(No evidence of slope instability)	
Areal extent______			
Remarks______			
B. Benches Applicable (N/A)			
(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)			
1. **Flows Bypass Bench**	Location shown on site map	(N/A or okay)	
Remarks______			
2. **Bench Breached**	Location shown on site map	(N/A or okay)	
Remarks______			
3. **Bench Overtopped**	Location shown on site map	(N/A or okay)	
Remarks______			
C. Letdown Channels Applicable (N/A)			
(Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)			
1. **Settlement**	Location shown on site map	(No evidence of settlement)	
Areal extent______	Depth______		
Remarks______			
2. **Material Degradation**	Location shown on site map	(No evidence of degradation)	
Material type______	Areal extent______		
Remarks______			
3. **Erosion**	Location shown on site map	(No evidence of erosion)	
Areal extent______	Depth______		
Remarks______			

E. Gas Collection and Treatment	Applicable	N/A (circled)	
1. **Gas Treatment Facilities** Flaring Good condition Remarks______	 Thermal destruction Needs Maintenance	 Collection for reuse	
2. **Gas Collection Wells, Manifolds and Piping** Good condition Remarks______	 Needs Maintenance		
3. **Gas Monitoring Facilities** (*e.g.*, gas monitoring of adjacent homes or buildings) Good condition Remarks______	 Needs Maintenance	 N/A (circled)	
F. Cover Drainage Layer	Applicable	N/A (circled)	
1. **Outlet Pipes Inspected** Remarks______	Functioning	N/A (circled)	
2. **Outlet Rock Inspected** Remarks______	Functioning	N/A (circled)	
G. Detention/Sedimentation Ponds	Applicable	N/A (circled)	
1. **Siltation** Areal extent______ Siltation not evident Remarks______	Depth______		N/A (circled)
2. **Erosion** Areal extent______ Erosion not evident Remarks______	Depth______		
3. **Outlet Works** Remarks______	Functioning	N/A (circled)	
4. **Dam** Remarks______	Functioning	N/A (circled)	

IX. GROUNDWATER/SURFACE WATER REMEDIES	Applicable N/A BL
A. Groundwater Extraction Wells, Pumps, and Pipelines	Applicable N/A
1. **Pumps, Wellhead Plumbing, and Electrical** Good condition All required wells properly operating Needs Maintenance N/A Remarks___	
2. **Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances** Good condition Needs Maintenance Remarks___	
3. **Spare Parts and Equipment** Readily available Good condition Requires upgrade Needs to be provided Remarks___	
B. Surface Water Collection Structures, Pumps, and Pipelines	Applicable N/A
1. **Collection Structures, Pumps, and Electrical** Good condition Needs Maintenance Remarks___	
2. **Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances** Good condition Needs Maintenance Remarks___	
3. **Spare Parts and Equipment** Readily available Good condition Requires upgrade Needs to be provided Remarks___	

D. Monitored Natural Attenuation

1. **Monitoring Wells** (natural attenuation remedy)
   Properly secured/locked Functioning Routinely sampled Good condition
   All required wells located Needs Maintenance (N/A circled)
   Remarks

X. OTHER REMEDIES

If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

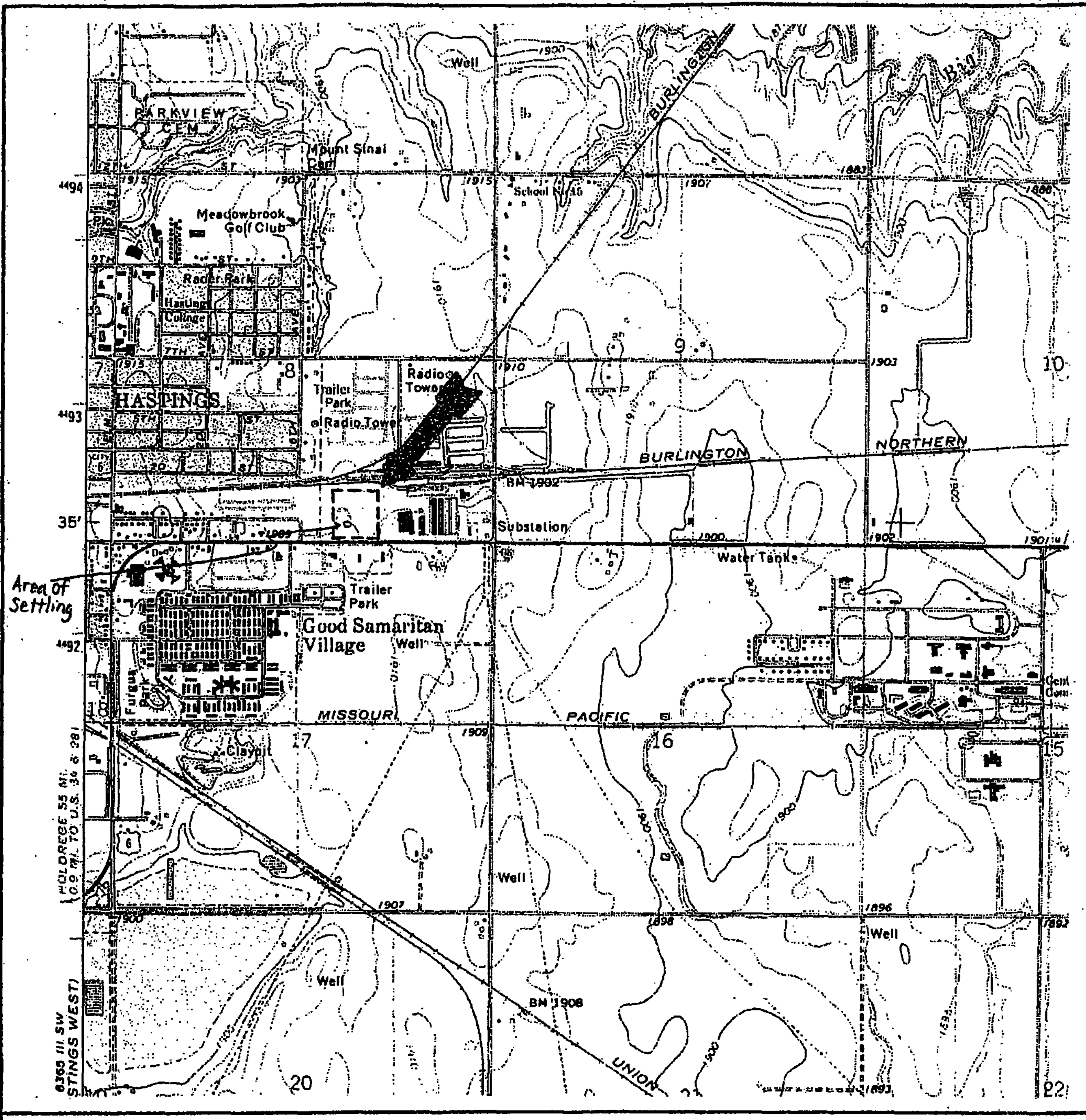
Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).

The remedies for OUs 2 &10, including the landfill cap, institutional controls, and extraction and treatment of groundwater appear to be functioning as designed, That is, to prevent access and infiltration, and to remediate the groundwater associated with the Subsite.

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

O&M procedures for the remedies for OUs 2&10 appear to be effective. There does seem to be a small low spot in the landfill cap, which allows a bit of water ponding, and MW-6 & MW-7 may be without concrete pads.



SOURCE: USGS 7.5 MIN. TOPOGRAPHIC MAP, ADAMS COUNTY, NEBRASKA.

0' 1000' 2000' 4000'

SCALE IN FEET

N

Date\Time : Tue, 23 Nov 2004 - 3:46pm

Acad Version : R16.0

Path\Name : G:\Drafting\CLIENTCURRENT\HASTINGS\ACHSITE.DWG

User Name : fsoto

ARCADIS

35 East Wacker Drive, Suite 1000
Chicago, IL 60601
Tel (312)263-6703 Fax (312)263-7897

Drawing Date	File Name	File Location	Drawn BY	Checked BY	Project Manager
11/23/04	ACHSITE.DWG	G:\drafting\Hastings	FS	A. SENH	J. KRATZMEYER

NORTH LANDFILL SUBSITE
U.S. HIGHWAY 6

SITE LOCATION MAP

HASTINGS, NEBRASKA

Department Manager: J. KRATZMEYER

Unique Number:

Project Number: CI001302.0001

Figure: 1

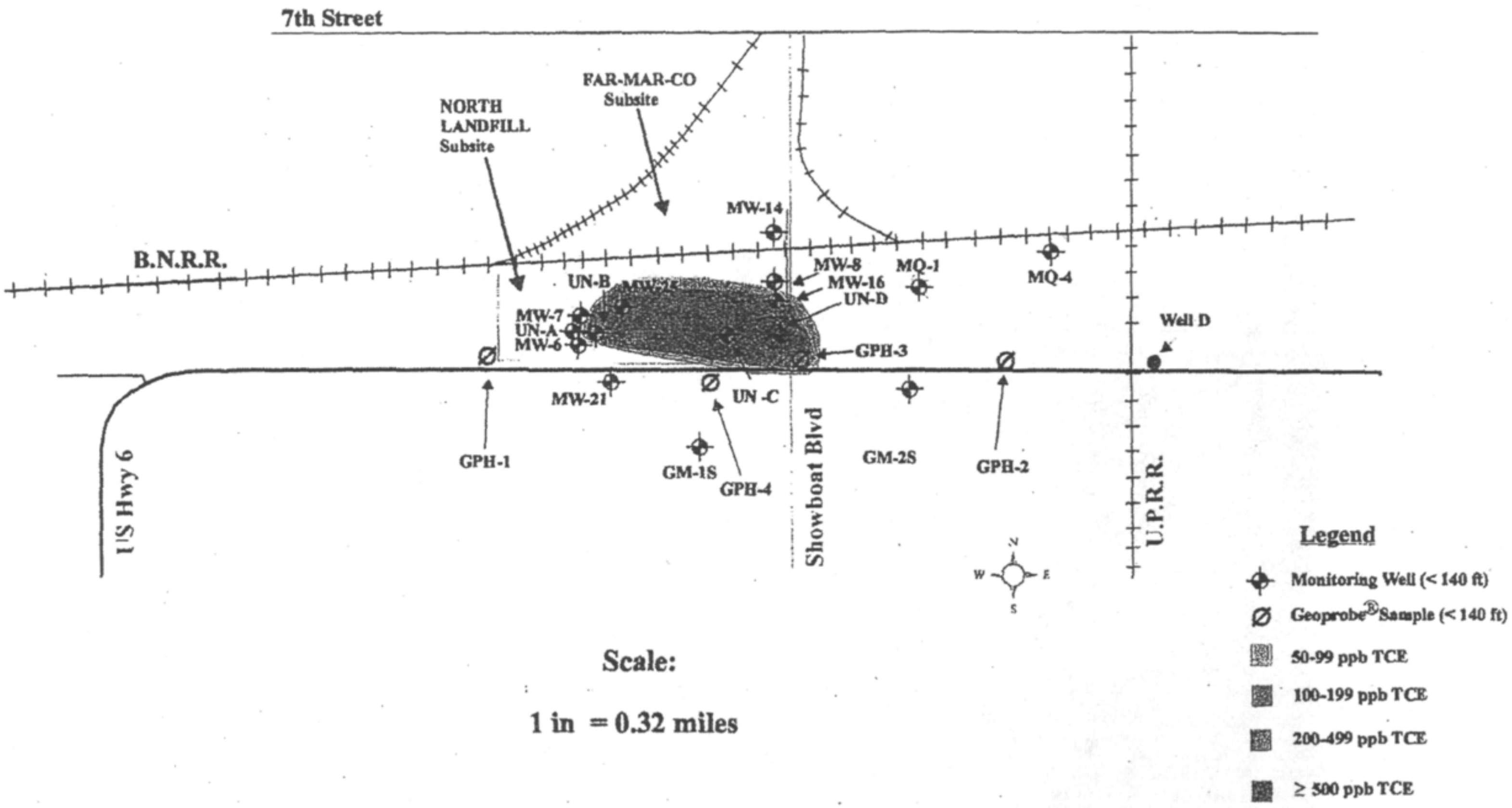


Figure 36. TCE Concentrations in Shallow Ground Water Downgradient of the North Landfill Subsite. (March 2000 monitoring well data; April 2000 Geoprobe® data)

INTERVIEW RECORD

Site Name: Hastings North Landfill OU2/10		**EPA ID No.:** NQD980862668	
Subject: Second Five-Year Review		**Time:**	**Date:** 02/28/07
Type: ☐ Telephone ☒ Visit ☐ Other **Location of Visit:** Hastings, NE		☐ Incoming ☐ Outgoing	
Contact Made By:			
Name: Bill Gresham	**Title:** RPM	**Organization:** US EPA	
Individual Contacted:			
Name: Jack Newlun	**Title:** Solid Waste Superintendent	**Organization:** City of Hastings	
Telephone No: (402)461-2308 **Fax No:** 2304 **E-Mail Address:**		**Street Address:** 220 North Hastings Avenue **City, State, Zip:** Hastings, NE 68901	

Summary Of Conversation

Mr. Newlun provided us access to the North Landfill. We walked the extent of the Subsite, looking at various features. Mr. Newlun stated that the drive-through gate was always locked, but the walk-through gate was kept unlocked. He was not aware whether concrete well pads were present at MWs 6 & 7. He did indicate signage was present on the Subsite fence.

North Landfill Subsite

Photo File No. IMG_2641
Taken 02/28/07 at 1:26 pm
Direction N-NW
Shows ponding on the cap at the North Landfill

Photo File No. IMG_2642
Taken 02/28/07 at 1:28 pm
Direction SE
Shows heaving vadose zone wells

Photo File No. IMG_2643
Taken 02/28/07 at 1:32 pm
Direction S-SE
Shows MW-6, with no apparent concrete pad

SCHEDULE

Five-Year Review Site Inspections
Hastings Superfund Site, Hastings, Nebraska

Site Inspection Schedule
February 28, 2007
8:00 AM – 5:30 PM

Time	Activity	Federal and State Personnel	Site Manager/Personnel
8:00 – 8:45 AM	**Well 3 (OU07, OU13, OU17, OU18)**	Sommerhauser / Gregson *	Mary Spalding
8:45 – 9:00 AM	*Mobilize to Colorado Ave*		
9:00 – 10:30 AM	**Colorado Ave (OU01, OU09)**	Sommerhauser / Borovich *	Bob Dangler
10:30 – 10:45 AM	*Mobilize to 2nd Street*		
10:45 – 12:15 PM	**Second Street (OU12, OU20)**	Gresham & Sommerhauser / Summerside	Jeremy Groves (CoH)
12:15 – 1:15 PM	Lunch Break		
1:15 – 1:45 PM	**North Landfill (OU02, OU10)**	Gresham / Borovich *	Jeremy Groves (CoH), Jack Newlen (CoH), Mary Spalding (HTI)
1:45 – 2:00 PM	*Mobilize to South Landfill*		
2:00 – 2:45 PM	**South Landfill (OU05)**	Sommerhauser / Southwick	Jeremy Groves (CoH), Jack Newlen (CoH)
2:45 – 3:00 PM	*Mobilize to Well D*		
3:00 – 4:00 PM	**Well D, Secondary & Tertiary Containment Wells**	Sommerhauser, Gresham, Zurbuchen	Jenny Sidlo (HU)
4:00 – 4:15 PM	*Mobilize to Far-Mar-Co*		
4:15 – 5:00 PM	**Far-Mar-Co (OU03, OU06, OU11)**	Gresham / Borovich *	HTI is just sampling and analyzing [Papadopouls is the consultant]
5:00 – 5:30 PM	**Area-Wide (OU19)**	Zurbuchen / Southwick	Jeremy Groves (CoH)

REVISED * NOTE, GREGSON + BOROVICH DID NOT ATTEND THIS INSPECTION.

FAR-MAR-CO

Please note that "O&M" is referred to throughout this checklist. At sites where Long-Term Response Actions are in progress, O&M activities may be referred to as "system operations" since these sites are not considered to be in the O&M phase while being remediated under the Superfund program.

Five-Year Review Site Inspection Checklist (Template)

(Working document for site inspection. Information may be completed by hand and attached to the Five-Year Review report as supporting documentation of site status. "N/A" refers to "not applicable.")

I. SITE INFORMATION	
Site name: Hastings FAR-MAR-CO OU 3/6/11	**Date of inspection:** Feb. 28, 2007
Location and Region: Hastings, NE / Region 7	**EPA ID:** NOD980862668
Agency, office, or company leading the five-year review: US EPA	**Weather/temperature:** Cloudy, breezy, drizzly, 35°F
Remedy Includes: (Check all that apply) Landfill cover/containment Access controls Institutional controls ✓ Groundwater pump and treatment Surface water collection and treatment Other ______	Monitored natural attenuation ✓ Groundwater containment Vertical barrier walls
Attachments: Inspection team roster attached	(Site map attached) (circled)
II. INTERVIEWS (Check all that apply)	
1. **O&M site manager** ______ (Name) ______ (Title) ______ (Date) Interviewed __ at site __ at office __ by phone __ Phone no. ______ Problems, suggestions; Report attached ______	
2. **O&M staff** Scott Fong (Name) Technician (Title) 02/28/07 (Date) Interviewed (at site) (circled) at office by phone Phone no. ______ Problems, suggestions; Report attached ______	

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)				
1.	**O&M Documents**			
	O&M manual	Readily available	Up to date	N/A
	As-built drawings	Readily available	Up to date	N/A
	Maintenance logs	Readily available	Up to date	N/A
	Remarks			
2.	**Site-Specific Health and Safety Plan**	Readily available	Up to date	N/A
	Contingency plan/emergency response plan	Readily available	Up to date	N/A
	Remarks			
3.	**O&M and OSHA Training Records**	Readily available	Up to date	N/A
	Remarks			
4.	**Permits and Service Agreements**			
	Air discharge permit	Readily available	Up to date	N/A
	Effluent discharge	Readily available	Up to date	N/A
	Waste disposal, POTW	Readily available	Up to date	N/A
	Other permits	Readily available	Up to date	N/A
	Remarks			
5.	**Gas Generation Records**	Readily available	Up to date	N/A
	Remarks			
6.	**Settlement Monument Records**	Readily available	Up to date	N/A
	Remarks			
7.	**Groundwater Monitoring Records**	~~Readily available~~	~~Up to date~~	N/A
	Remarks			
8.	**Leachate Extraction Records**	Readily available	Up to date	N/A
	Remarks			
9.	**Discharge Compliance Records**			
	Air	Readily available	Up to date	N/A
	Water (effluent)	Readily available	Up to date	N/A
	Remarks			
10.	**Daily Access/Security Logs**	Readily available	Up to date	N/A
	Remarks			

C. Institutional Controls (ICs)

1. **Implementation and enforcement**

Site conditions imply ICs not properly implemented	Yes	~~No~~	(N/A)
Site conditions imply ICs not being fully enforced	Yes	~~No~~	(N/A)

Type of monitoring (e.g., self-reporting, drive by) __________

Frequency __________

Responsible party/agency __________

Contact __________ Name __________ Title __________ Date __________ Phone no.

Reporting is up-to-date	Yes	No	(N/A)
Reports are verified by the lead agency	Yes	No	(N/A)
Specific requirements in deed or decision documents have been met	Yes	No	(N/A)
Violations have been reported	Yes	No	(N/A)

Other problems or suggestions: Report attached

2. **Adequacy** ICs are adequate ICs are inadequate (N/A)
Remarks __________

D. General

1. **Vandalism/trespassing** Location shown on site map (No vandalism evident)
Remarks __________

2. **Land use changes on site** (N/A)
Remarks __________

3. **Land use changes off site** (N/A)
Remarks __________

VI. GENERAL SITE CONDITIONS

A. Roads Applicable N/A

1. **Roads damaged** Location shown on site map Roads adequate (N/A)
Remarks __________

8. **Wet Areas/Water Damage**	Wet areas/water damage not evident		
Wet areas	Location shown on site map	Areal extent______	
Ponding	Location shown on site map	Areal extent______	
Seeps	Location shown on site map	Areal extent______	
Soft subgrade	Location shown on site map	Areal extent______	
Remarks______			
9. **Slope Instability** Slides	Location shown on site map	No evidence of slope instability	
Areal extent______			
Remarks______			
B. Benches Applicable	N/A		
(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)			
1. **Flows Bypass Bench**	Location shown on site map	N/A or okay	
Remarks______			
2. **Bench Breached**	Location shown on site map	N/A or okay	
Remarks______			
3. **Bench Overtopped**	Location shown on site map	N/A or okay	
Remarks______			
C. Letdown Channels Applicable	N/A		
(Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)			
1. **Settlement**	Location shown on site map	No evidence of settlement	
Areal extent______	Depth______		
Remarks______			
2. **Material Degradation**	Location shown on site map	No evidence of degradation	
Material type______	Areal extent______		
Remarks______			
3. **Erosion**	Location shown on site map	No evidence of erosion	
Areal extent______	Depth______		
Remarks______			

E. Gas Collection and Treatment	Applicable N/A
1.	**Gas Treatment Facilities** Flaring Thermal destruction Collection for reuse Good condition Needs Maintenance Remarks______________________________
2.	**Gas Collection Wells, Manifolds and Piping** Good condition Needs Maintenance Remarks______________________________
3.	**Gas Monitoring Facilities** (*e.g.*, gas monitoring of adjacent homes or buildings) Good condition Needs Maintenance N/A Remarks______________________________
F. Cover Drainage Layer	Applicable N/A
1.	**Outlet Pipes Inspected** Functioning N/A Remarks______________________________
2.	**Outlet Rock Inspected** Functioning N/A Remarks______________________________
G. Detention/Sedimentation Ponds	Applicable N/A
1.	**Siltation** Areal extent__________ Depth__________ N/A Siltation not evident Remarks______________________________
2.	**Erosion** Areal extent__________ Depth__________ Erosion not evident Remarks______________________________
3.	**Outlet Works** Functioning N/A Remarks______________________________
4.	**Dam** Functioning N/A Remarks______________________________

IX. GROUNDWATER/SURFACE WATER REMEDIES	Applicable	N/A

A. Groundwater Extraction Wells, Pumps, and Pipelines				Applicable	N/A
1.	**Pumps, Wellhead Plumbing, and Electrical** Good condition All required wells properly operating Needs Maintenance N/A Remarks________________				
2.	**Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances** Good condition Needs Maintenance Remarks________________				
3.	**Spare Parts and Equipment** Readily available Good condition Requires upgrade Needs to be provided Remarks________________				
B. Surface Water Collection Structures, Pumps, and Pipelines				Applicable	N/A
1.	**Collection Structures, Pumps, and Electrical** Good condition Needs Maintenance Remarks________________				
2.	**Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances** Good condition Needs Maintenance Remarks________________				
3.	**Spare Parts and Equipment** Readily available Good condition Requires upgrade Needs to be provided Remarks________________				

D. Monitored Natural Attenuation

1. **Monitoring Wells** (natural attenuation remedy)
Properly secured/locked Functioning Routinely sampled Good condition
All required wells located Needs Maintenance N/A (circled)
Remarks

X. OTHER REMEDIES

If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).

The remedies for OUs 3, 6, & 11, including source-area removal, institutional controls, and extraction and treatment of groundwater appear to be functioning as designed. Source-area removal is complete, and groundwater remediation is on-going. It was noted that the pumping rate at Well D showed only about 225 gpm at 120 psi, and, at Wells A and B (at the Whelan Energy Center), the flow meter and totalizer were not working, nor were the electronics connected. At Well IN-11 (at Chief Ethanol), there was pressure (40 psi) in the well discharge piping, although the well was not running. This could have created a situation where water was injecting into the aquifer, unless the well is outfitted with a ~~backflow~~ preventer.

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

The current and long-term effectiveness of the remedy are affected by whether the treatment system is maintained and operational. In fact it is (operational and maintained). It was noted that MW-16 has been damaged at the surface (the manhole ~~is da~~ cover is damaged, and the cap is unlocked) and needs to be repaired.

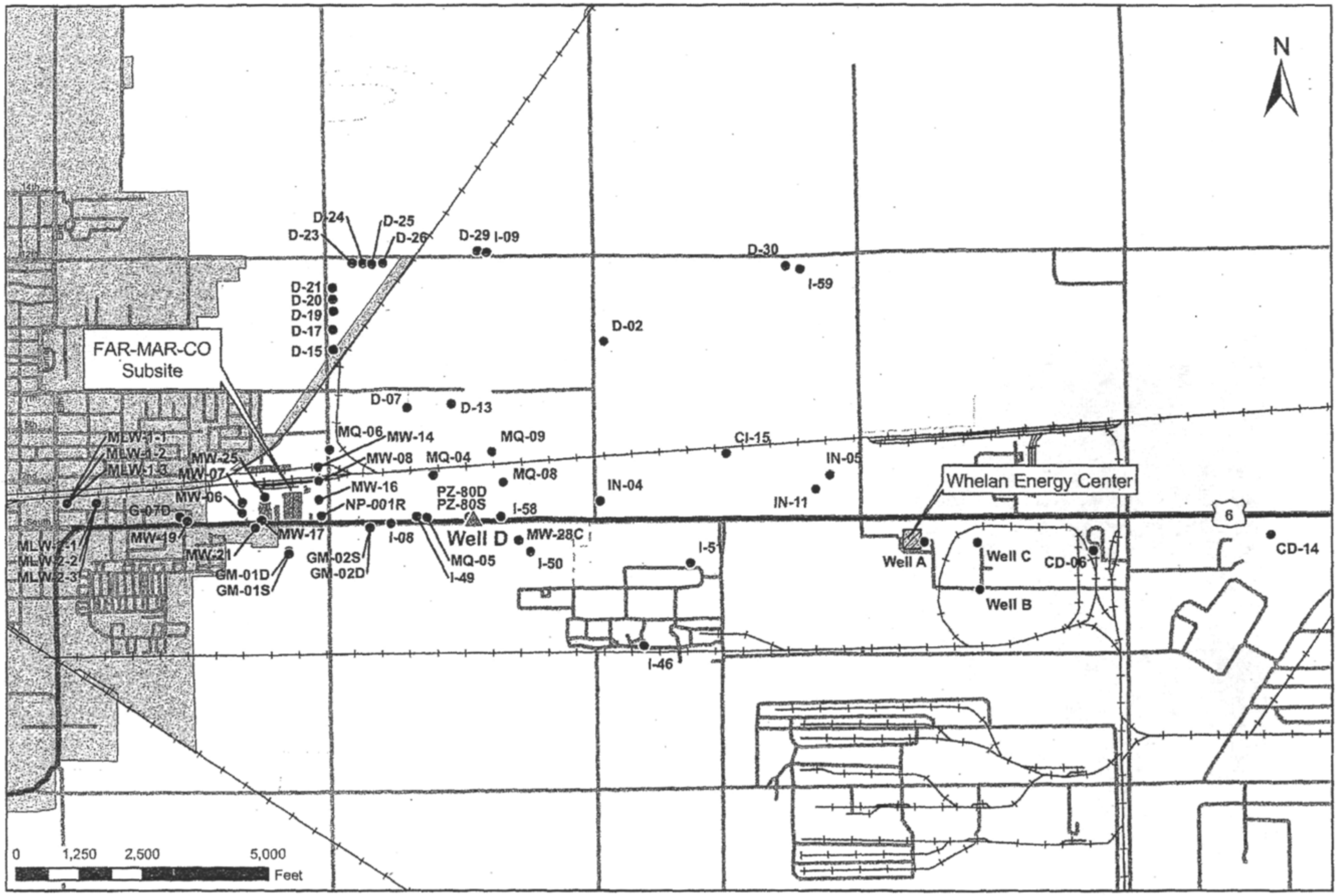


Figure 1 Location of the FAR-MAR-CO Subsite of the Hastings Groundwater Contamination Site. Wells of Quarterly Monitoring Program, and Selected Other Wells are Shown.

INTERVIEW RECORD

Site Name: Hastings FAR-MAR-CO OU 3/6/11		**EPA ID No.:** NOD980862668
Subject: Second Five-Year Review	**Time:**	**Date:** 02/28/07
Type: ☐ Telephone ☒ Visit ☐ Other **Location of Visit:** Hastings, NE		☐ Incoming ☐ Outgoing

Contact Made By:

Name: Bill Gresham	**Title:** RPM	**Organization:** USEPA

Individual Contacted:

Name: Scott Fong	**Title:** Sampling Technician	**Organization:** HTI
Telephone No: 402-783-3931 **Fax No:** **E-Mail Address:**	**Street Address:** P.O. Box 266 **City, State, Zip:** Raymond, NE 68428-0266	

Summary Of Conversation

Mr. Fong guided our group on a tour of the Subsite, including all monitoring wells and wells IN-05 and IN-11 at Chief Ethanol.

Page 1 of ____

INTERVIEW RECORD

Site Name: Hastings FAR-MAR-CO OU 3/6/11		**EPA ID No.:** NCD980862668
Subject: Second Five-Year Review	**Time:**	**Date:** 02/28/07
Type: ☐ Telephone ☒ Visit ☐ Other **Location of Visit:** Hastings, NE		☐ Incoming ☐ Outgoing

Contact Made By:

Name: Bill Gresham	**Title:** RPM	**Organization:** USEPA

Individual Contacted:

Name: Jenny Sidlo	**Title:** Engineer	**Organization:** Hastings Utilities
Telephone No: 402-462-3664 **Fax No:** 463-1705 **E-Mail Address:**	**Street Address:** 1228 North Denver Ave **City, State, Zip:** Hastings, NE 68902-0289	

Summary Of Conversation

Ms. Sidlo was able to get us access to Well D, and Wells A, B, & C, as well as the cooling tower at the Whelan Energy Center. These wells provide primary and tertiary containment of the groundwater contamination associated with this Subsite. Ms Sidlo showed that all features were in working order.

Page 1 of ____

FAR-MAR-CO Subsite

Photo File No. IMG_2666
Taken 02/28/07 at 3:52 pm
Direction SE
Well A pumphouse

Photo File No. IMG_2675
Taken 02/28/07 at 4:23
Direction NE
Chief Ethanol industrial well IN-05, which pumps continuously

Photo File No. IMG_2677
Taken 02/28/07 at 4:25
Direction NE
Chief Ethanol industrial well IN-11, which was not pumping, but had 40 psi pressure in the discharge line

Photo File No. IMG_2680
Taken 02/28/07 at 4:55 pm
Direction NW
Shows damaged manhole casing, and cap is damaged and won't seal wellhead, MW-16

SCHEDULE

Five-Year Review Site Inspections
Hastings Superfund Site, Hastings, Nebraska

Site Inspection Schedule
February 28, 2007
8:00 AM – 5:30 PM

Time	Activity	Federal and State Personnel	Site Manager/Personnel
8:00 – 8:45 AM	**Well 3 (OU07, OU13, OU17, OU18)**	Sommerhauser / Gregson *	Mary Spalding
8:45 – 9:00 AM	*Mobilize to Colorado Ave*		
9:00 – 10:30 AM	**Colorado Ave (OU01, OU09)**	Sommerhauser / Borovich *	Bob Dangler
10:30 – 10:45 AM	*Mobilize to 2nd Street*		
10:45 – 12:15 PM	**Second Street (OU12, OU20)**	Gresham & Sommerhauser / Summerside	Jeremy Groves (CoH)
12:15 – 1:15 PM	Lunch Break		
1:15 – 1:45 PM	**North Landfill (OU02, OU10)**	Gresham / Borovich *	Jeremy Groves (CoH), Jack Newlen (CoH), Mary Spalding (HTI)
1:45 – 2:00 PM	*Mobilize to South Landfill*		
2:00 – 2:45 PM	**South Landfill (OU05)**	Sommerhauser / Southwick	Jeremy Groves (CoH), Jack Newlen (CoH)
2:45 – 3:00 PM	*Mobilize to Well D*		
3:00 – 4:00 PM	**Well D, Secondary & Tertiary Containment Wells**	Sommerhauser, Gresham, Zurbuchen	Jenny Sidlo (HU)
4:00 – 4:15 PM	*Mobilize to Far-Mar-Co*		
4:15 – 5:00 PM	**Far-Mar-Co (OU03, OU06, OU11)**	Gresham / Borovich *	HTI is just sampling and analyzing [Papadopouls is the consultant]
5:00 – 5:30 PM	**Area-Wide (OU19)**	Zurbuchen / Southwick	Jeremy Groves (CoH)

REVISED

* NOTE, GREGSON + BOROVICH DID NOT ATTEND THIS INSPECTION.

South Landfill

INTERVIEW RECORD

Site Name: HASTINGS SOUTH LANDFILL	EPA ID No.: OU 5
Subject: 5-YEAR REVIEW	Time: 2:00	Date: 2/28/2007
Type: ☐ Telephone ☒ Visit ☐ Other Location of Visit: SOUTH LANDFILL SUBSITE	☐ Incoming ☐ Outgoing

Contact Made By: ~~DARRELL SOMMERHAUSER~~

Name: BILL GRESHAM + BRIAN ZURBUCHEN	Title: RPM	Organization: EPA R7

Individual Contacted:

Name: SEE BELOW	Title:	Organization:

Telephone No: Fax No: E-Mail Address:	Street Address: City, State, Zip:

Summary Of Conversation

JACK NEWLUN, CITY OF HASTINGS
JEREMY GROVES, CITY ENG. DEPT.
ED SOUTHWICK, NDEQ
SCOTT SUMMERSIDE, NDEQ
VIEWED FENCE, GATE, LOCK, VEG. CAP. UPGRADIENT MONITORING WELL SW-1.
DISCUSSED MONTHLY INSPECTIONS + POSSIBLE FUTURE USE OF WESTERN AREA OF S. LANDFILL SUBSITE PROPERTY.

BILL GRESHAM, BRIAN ZURBUCHEN, ED SOUTHWICK & JEREMY GROVES WALKED THE PERIMETER OF THE LANDFILL, WHILE I ACCOMPANIED SCOTT SUMMERFIELD TO OBSERVE THE REMAINING DOWNGRADIENT AREAS FOR THE SECOND STREET SUBSITE.

Site Inspection Checklist

I. SITE INFORMATION	
Site name: HASTINGS SITE	Date of inspection: 2/28/2007
Location and Region: SOUTH LANDFILL	EPA ID: NHD980862668
Agency, office, or company leading the five-year review: EPA + CITY	Weather/temperature: ~ 36° F
Remedy Includes: (Check all that apply) ☒ Landfill cover/containment ☐ Access controls ☐ Institutional controls ☐ Groundwater pump and treatment ☐ Surface water collection and treatment ☐ Other ________	☒ Monitored natural attenuation ☐ Groundwater containment ☐ Vertical barrier walls
Attachments: ☐ Inspection team roster attached	☐ Site map attached

II. INTERVIEWS (Check all that apply)
1. O&M site manager JACK NEWLUN (Name) LANDFILL SUPERINTENDANT (Title) 2/28/07 (Date) Interviewed ☒ at site ☐ at office ☒ by phone Phone no. 402-461-2308 Problems, suggestions; ☐ Report attached ________
2. O&M staff JEREMY GRIVES (Name) ENG. ASSISTANT (Title) 2/28/07 (Date) Interviewed ☒ at site ☐ at office ☐ by phone Phone no. 402-461-2339 Problems, suggestions; ☐ Report attached ________

3. **Local regulatory authorities and response agencies** (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.) Fill in all that apply.

Agency N DEQ
Contact ED SOUTHWICK — PROJECT MGR. — 2/28/07 — 402 471-4875
Name — Title — Date — Phone no.
Problems; suggestions; ☐ Report attached ______

Agency ______
Contact ______ ______ ______ ______
Name — Title — Date — Phone no.
Problems; suggestions; ☐ Report attached ______

Agency ______
Contact ______ ______ ______ ______
Name — Title — Date — Phone no.
Problems; suggestions; ☐ Report attached ______

Agency ______
Contact ______ ______ ______ ______
Name — Title — Date — Phone no.
Problems; suggestions; ☐ Report attached ______

4. **Other interviews** (optional) ☐ Report attached.

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)			
1. **O&M Documents**			
☐ O&M manual	☐ Readily available	☒ Up to date	☐ N/A
☐ As-built drawings	☐ Readily available	☒ Up to date	☐ N/A
☐ Maintenance logs	☒ Readily available	☒ Up to date	☐ N/A
Remarks CITY'S 2006 REPORT IS ATTACHED			
2. **Site-Specific Health and Safety Plan**	☐ Readily available	☒ Up to date	☐ N/A
☐ Contingency plan/emergency response plan	☐ Readily available	☐ Up to date	☐ N/A
Remarks			
3. **O&M and OSHA Training Records**	☐ Readily available	☒ Up to date	☐ N/A
Remarks			
4. **Permits and Service Agreements**			
☐ Air discharge permit	☐ Readily available	☐ Up to date	☒ N/A
☐ Effluent discharge	☐ Readily available	☐ Up to date	☒ N/A
☐ Waste disposal, POTW	☐ Readily available	☐ Up to date	☒ N/A
☐ Other permits	☐ Readily available	☐ Up to date	☒ N/A
Remarks			
7. **Groundwater Monitoring Records**	☒ Readily available	☒ Up to date	☐ N/A
Remarks			

IV. O&M COSTS

1. **O&M Organization**
☐ State in-house ☐ Contractor for State
☐ PRP in-house ☐ Contractor for PRP
☐ Federal Facility in-house ☐ Contractor for Federal Facility
☒ Other CITY - AS REPRESENTATIVE FOR PRP GROUP

2. **O&M Cost Records**
☐ Readily available ☐ Up to date
☐ Funding mechanism/agreement in place
Original O&M cost estimate________ ☐ Breakdown attached

Total annual cost by year for review period if available

From________ To________ ________ ☐ Breakdown attached
Date Date Total cost
From________ To________ ________ ☐ Breakdown attached
Date Date Total cost
From________ To________ ________ ☐ Breakdown attached
Date Date Total cost
From________ To________ ________ ☐ Breakdown attached
Date Date Total cost
From________ To________ ________ ☐ Breakdown attached
Date Date Total cost

3. **Unanticipated or Unusually High O&M Costs During Review Period**
Describe costs and reasons: REFER TO FIVE-YEAR REVIEW REPORT

V. ACCESS AND INSTITUTIONAL CONTROLS ☐ Applicable ☐ N/A

A. Fencing

1. **Fencing damaged** ☐ Location shown on site map ☒ Gates secured ☐ N/A
Remarks________

B. Other Access Restrictions

1. **Signs and other security measures** ☐ Location shown on site map ☐ N/A
Remarks________

C. Institutional Controls (ICs)

1. **Implementation and enforcement**

Site conditions imply ICs not properly implemented	☐ Yes	☐ No	☐ N/A
Site conditions imply ICs not being fully enforced	☐ Yes	☐ No	☐ N/A

Type of monitoring (e.g., self-reporting, drive by) SEE ANNUAL ICA REPORT
Frequency BY HASTINGS PRP GROUP/HASTINGS GWC SITE
Responsible party/agency
Contact ______ Name ______ Title ______ Date ______ Phone no.

Reporting is up-to-date	☒ Yes	☐ No	☐ N/A
Reports are verified by the lead agency	☒ Yes	☐ No	☐ N/A
Specific requirements in deed or decision documents have been met	☐ Yes	☐ No	☒ N/A
Violations have been reported	☐ Yes	☐ No	☒ N/A

Other problems or suggestions: ☐ Report attached
SEE LATEST (RY2005) ANNUAL ICA REPORT DATED 3/29/2006

2. **Adequacy** ☒ ICs are adequate ☐ ICs are inadequate ☐ N/A
Remarks

D. General

1. **Vandalism/trespassing** ☐ Location shown on site map ☒ No vandalism evident
Remarks

2. **Land use changes on site** ☐ N/A
Remarks SEEDING VEG. COVER ON LANDFILL COMPLETED 12/2004

3. **Land use changes off site** ☒ N/A
Remarks

VI. GENERAL SITE CONDITIONS

A. Roads ☒ Applicable ☐ N/A

1. **Roads damaged** ☐ Location shown on site map ☒ Roads adequate ☐ N/A
Remarks

B. Other Site Conditions

Remarks FENCE AND LOCKED GATE ARE SECURE. WELLS ARE IN GOOD CONDITION (1 WELL PAD SHOULD HAVE SEALANT APPLIED TO CRACK) VEG. COVER IS IN GOOD CONDITION

VII. LANDFILL COVERS ☒ Applicable ☐ N/A

A. Landfill Surface

1. **Settlement** (Low spots) ☒ Location shown on site map ☐ Settlement not evident
   Areal extent ____ Depth ____
   Remarks POSSIBLE SLIGHT SETTLEMENT IN AREA OF PONDED WATER - SOUTH SIDE

2. **Cracks** ☐ Location shown on site map ☒ Cracking not evident
   Lengths ____ Widths ____ Depths ____
   Remarks ____

3. **Erosion** ☒ Location shown on site map (B) ☐ Erosion not evident
   Areal extent SMALL AREA Depth ____
   Remarks AREA ON EAST SIDE NEEDS ATTENTION

4. **Holes** ☒ Location shown on site map (A) ☐ Holes not evident
   Areal extent ____ Depth ____
   Remarks ANIMAL BURROWS ON SOUTH SIDE

5. **Vegetative Cover** ☒ Grass ☒ Cover properly established ☐ No signs of stress
   ☐ Trees/Shrubs (indicate size and locations on a diagram)
   Remarks ONE AREA ON EAST SIDE NEEDS ATTENTION

6. **Alternative Cover (armored rock, concrete, etc.)** ☒ N/A
   Remarks ____

7. **Bulges** ☐ Location shown on site map ☒ Bulges not evident
   Areal extent ____ Height ____
   Remarks ____

8.	**Wet Areas/Water Damage**	☐ Wet areas/water damage not evident	
	☐ Wet areas	☐ Location shown on site map	Areal extent______
	☒ Ponding	☒ Location shown on site map	Areal extent SMALL
	☐ Seeps	☐ Location shown on site map	Areal extent______
	☐ Soft subgrade	☐ Location shown on site map	Areal extent______
	Remarks______		
9.	**Slope Instability** ☐ Slides	☐ Location shown on site map	☒ No evidence of slope instability
	Areal extent______		
	Remarks______		
B. Benches	☐ Applicable ☒ N/A		
	(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)		
1.	**Flows Bypass Bench**	☐ Location shown on site map	☐ N/A or okay
	Remarks______		
2.	**Bench Breached**	☐ Location shown on site map	☐ N/A or okay
	Remarks______		
3.	**Bench Overtopped**	☐ Location shown on site map	☐ N/A or okay
	Remarks______		
C. Letdown Channels	☐ Applicable ☒ N/A		
	(Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)		
1.	**Settlement**	☐ Location shown on site map	☐ No evidence of settlement
	Areal extent______	Depth______	
	Remarks______		
2.	**Material Degradation**	☐ Location shown on site map	☐ No evidence of degradation
	Material type______	Areal extent______	
	Remarks______		
3.	**Erosion**	☐ Location shown on site map	☐ No evidence of erosion
	Areal extent______	Depth______	
	Remarks______		
4.	**Undercutting**	☐ Location shown on site map	☐ No evidence of undercutting
	Areal extent______	Depth______	
	Remarks______		

5. **Obstructions** *Type*____________ ☐ No obstructions
☐ Location shown on site map Areal extent________
Size________
Remarks________________________

6. **Excessive Vegetative Growth** Type____________
☐ No evidence of excessive growth
☐ Vegetation in channels does not obstruct flow
☐ Location shown on site map Areal extent________
Remarks________________________

D. Cover Penetrations ☒ Applicable ☐ N/A

1. **Gas Vents** ☐ Active ☐ Passive
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ Evidence of leakage at penetration ☐ Needs Maintenance
☒ N/A
Remarks________________________

2. ***Gas Monitoring Probes***
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ Evidence of leakage at penetration ☐ Needs Maintenance ☒ N/A
Remarks________________________

3. **Monitoring Wells (within surface area of landfill)**
☒ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☒ Good condition
☐ Evidence of leakage at penetration ☐ Needs Maintenance ☐ N/A
Remarks________________________

4. **Leachate Extraction Wells**
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ Evidence of leakage at penetration ☐ Needs Maintenance ☒ N/A
Remarks________________________

5. **Settlement Monuments** ☐ Located ☐ Routinely surveyed ☒ N/A
Remarks________________________

E. Gas Collection and Treatment ☐ Applicable ☒ N/A

1. **Gas Treatment Facilities**
☐ Flaring ☐ Thermal destruction ☐ Collection for reuse
☐ Good condition ☐ Needs Maintenance
Remarks____________________

2. **Gas Collection Wells, Manifolds and Piping**
☐ Good condition ☐ Needs Maintenance
Remarks____________________

3. **Gas Monitoring Facilities** (*e.g.*, gas monitoring of adjacent homes or buildings)
☐ Good condition ☐ Needs Maintenance ☐ N/A
Remarks____________________

F. Cover Drainage Layer ☐ Applicable ☒ N/A

1. **Outlet Pipes Inspected** ☐ Functioning ☐ N/A
Remarks____________________

2. **Outlet Rock Inspected** ☐ Functioning ☐ N/A
Remarks____________________

G. Detention/Sedimentation Ponds ☐ Applicable ☒ N/A

1. **Siltation** Areal extent__________ Depth__________ ☐ N/A
☐ Siltation not evident
Remarks____________________

2. **Erosion** Areal extent__________ Depth__________
☐ Erosion not evident
Remarks____________________

3. **Outlet Works** ☐ Functioning ☐ N/A
Remarks____________________

4. **Dam** ☐ Functioning ☐ N/A
Remarks____________________

H. Retaining Walls	☐ Applicable	☒ N/A
1. **Deformations**	☐ Location shown on site map	☐ Deformation not evident
Horizontal displacement________ Vertical displacement________ Rotational displacement________ Remarks________		
2. **Degradation**	☐ Location shown on site map	☐ Degradation not evident
Remarks________		
I. Perimeter Ditches/Off-Site Discharge	☐ Applicable	☐ N/A
1. **Siltation**	☐ Location shown on site map	☐ Siltation not evident
Areal extent________ Depth________ Remarks________		
2. **Vegetative Growth**	☐ Location shown on site map	☐ N/A
☐ Vegetation does not impede flow Areal extent________ Type________ Remarks________		
3. **Erosion**	☐ Location shown on site map	☐ Erosion not evident
Areal extent________ Depth________ Remarks________		
4. **Discharge Structure**	☐ Functioning	☐ N/A
Remarks________		
VIII. VERTICAL BARRIER WALLS	☐ Applicable	☒ N/A
1. **Settlement**	☐ Location shown on site map	☐ Settlement not evident
Areal extent________ Depth________ Remarks________		
2. **Performance Monitoring**	Type of monitoring________	
☐ Performance not monitored Frequency________ Head differential________ Remarks________	☐ Evidence of breaching	

IX. GROUNDWATER/SURFACE WATER REMEDIES ☐ Applicable ☒ N/A	
A. Groundwater Extraction Wells, Pumps, and Pipelines ☐ Applicable ☐ N/A	
1.	**Pumps, Wellhead Plumbing, and Electrical** ☐ Good condition ☐ All required wells properly operating ☐ Needs Maintenance ☐ N/A Remarks
2.	**Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances** ☐ Good condition ☐ Needs Maintenance Remarks
3.	**Spare Parts and Equipment** ☐ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided Remarks
B. Surface Water Collection Structures, Pumps, and Pipelines ☐ Applicable ☒ N/A	
1.	**Collection Structures, Pumps, and Electrical** ☐ Good condition ☐ Needs Maintenance Remarks
2.	**Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances** ☐ Good condition ☐ Needs Maintenance Remarks
3.	**Spare Parts and Equipment** ☐ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided Remarks

C. Treatment System ☐ Applicable ☒ N/A

1. **Treatment Train** (Check components that apply)
☐ Metals removal ☐ Oil/water separation ☐ Bioremediation
☐ Air stripping ☐ Carbon adsorbers
☐ Filters____________________
☐ Additive (*e.g.*, chelation agent, flocculent)____________________
☐ Others____________________
☐ Good condition ☐ Needs Maintenance
☐ Sampling ports properly marked and functional
☐ Sampling/maintenance log displayed and up to date
☐ Equipment properly identified
☐ Quantity of groundwater treated annually____________________
☐ Quantity of surface water treated annually____________________
Remarks____________________

2. **Electrical Enclosures and Panels** (properly rated and functional)
☐ N/A ☐ Good condition ☐ Needs Maintenance
Remarks____________________

3. **Tanks, Vaults, Storage Vessels**
☐ N/A ☐ Good condition ☐ Proper secondary containment ☐ Needs Maintenance
Remarks____________________

4. **Discharge Structure and Appurtenances**
☐ N/A ☐ Good condition ☐ Needs Maintenance
Remarks____________________

5. **Treatment Building(s)**
☐ N/A ☐ Good condition (esp. roof and doorways) ☐ Needs repair
☐ Chemicals and equipment properly stored
Remarks____________________

6. **Monitoring Wells** (pump and treatment remedy)
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ All required wells located ☐ Needs Maintenance ☐ N/A
Remarks____________________

D. Monitoring Data

1. Monitoring Data
☒ Is routinely submitted on time ☒ Is of acceptable quality

2. Monitoring data suggests: DATA IS INADEQUATE AT THIS TIME
☐ Groundwater plume is effectively contained ☐ Contaminant concentrations are declining

D. Monitored Natural Attenuation
1. **Monitoring Wells** (natural attenuation remedy) ☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition ☐ All required wells located ☐ Needs Maintenance ☐ N/A Remarks OFF-SITE WELLS NEEDED GROUND WATER REMEDIAL ACTION IS PLANNED

X. OTHER REMEDIES

If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).

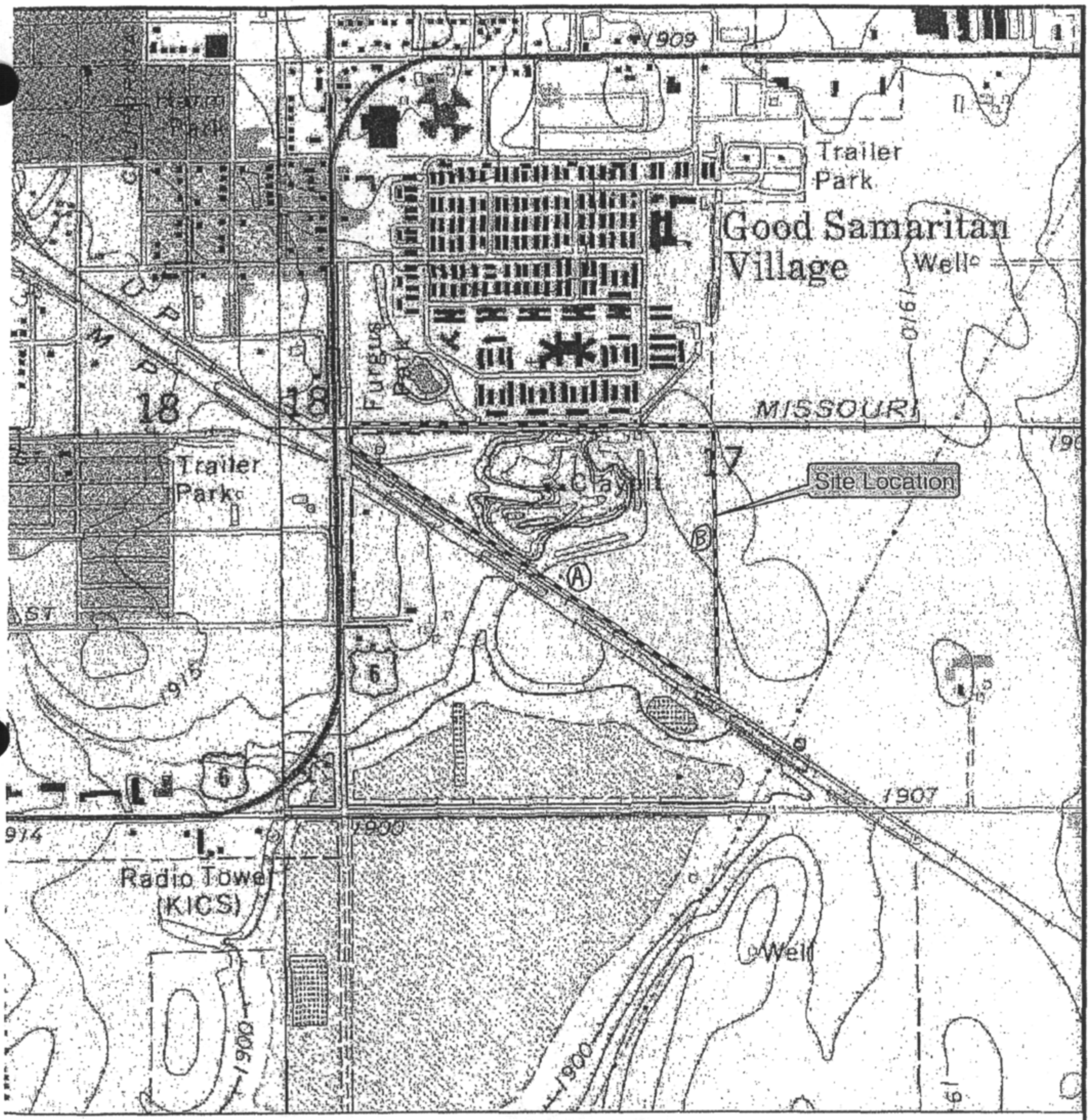
INTENT IS TO MINIMIZE CONTAMINANT RELEASES TO THE GROUND WATER AND MONITOR NATURAL ATTENUATION OF THE EXISTING GROUND WATER CONTAMINANT PLUME UNTIL MCL COMPLIANCE IS DEMONSTRATED.

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

- ROUTINE MAINTENANCE ITEMS SHOULD BE ADDRESSED AS WEATHER & SOIL CONDITIONS PERMIT.
- ACCESS TO PRIVATE PROPERTY IS NECESSARY TO PERFORM GROUND WATER MONITORING.
- A LONG-TERM PLAN IS NEEDED FOR MANAGEMENT OF LANDFILL GAS.

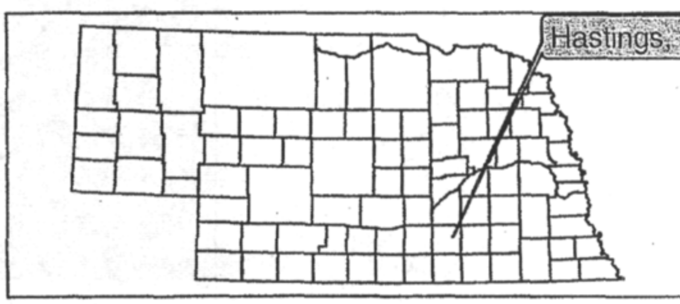
C.	**Early Indicators of Potential Remedy Problems**
	Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs, that suggest that the protectiveness of the remedy may be compromised in the future. NEED TO GAIN ACCESS TO ADJOINING FARM FIELD TO COLLECT GROUND WATER SAMPLES USING GEOPROBE SAMPLING EQUIPMENT.
D.	**Opportunities for Optimization**
	Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy. OPTIMIZATION TO BE CONSIDERED AFTER GROUND WATER REMEDIAL ACTION IS IMPLEMENTED



N

0 500 1,000 2,000

Scale in Feet



USGS Hastings East, NE 7.5 Minute Topo Quad, 1969, PR 1983
USGS Hastings West, NE 7.5 Minute Topo Quad, 1969, PR 1983

PROJECT: 2-2005-1468 1-11-702 DRAWN BY: RD DATE: December 29, 2005	SITE LOCATION MAP South Landfill Subsite Operable Unit #5 Hastings, Nebraska	OLSSON ASSOCIATES ENGINEERS · PLANNERS · SCIENTISTS · SURVEYORS	FIGURE 1

Table for Listing Issues SOUTH LANDFILL, OU #5

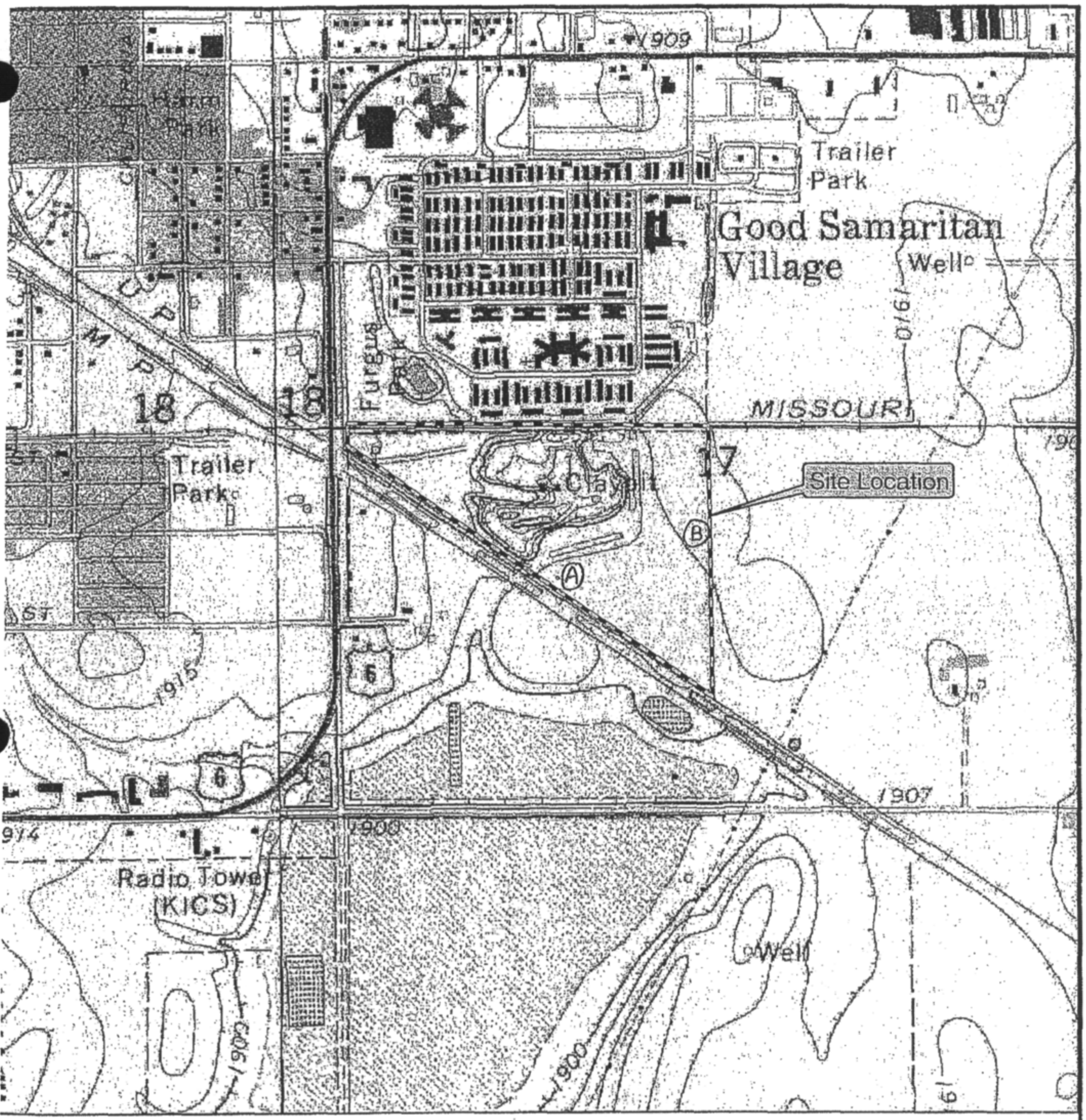
Issues	Affects Protectiveness (Y/N)	
	Current	Future
ANIMAL BURROW HOLES NOTED ALONG SOUTH FENCE OF LANDFILL	N	N
PONDED WATER NOTED IN SOUTH AREA OF LANDFILL	N	N
SILT WASH AND DAMAGE TO VEG. COVER NOTED ALONG EAST FENCE	N	N
WELL PAD HAS A CRACK. WELL LOCATED ALONG EAST FENCE	N	N

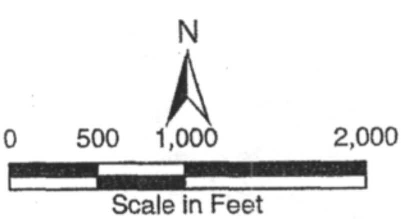
Table for Listing Recommendations and Follow-up Actions

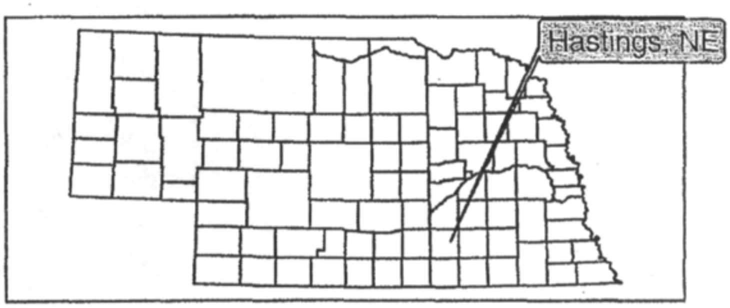
Recommendations/ Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Follow-up Actions: Affects Protectiveness (Y/N)	
				Current	Future

2/28/2007

IMG - 2646







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PROJECT: 2-2005-1468 1-11-702 DRAWN BY: RD DATE: December 29, 2005	SITE LOCATION MAP South Landfill Subsite Operable Unit #5 Hastings, Nebraska	OLSSON ASSOCIATES ENGINEERS · PLANNERS · SCIENTISTS · SURVEYORS	FIGURE 1

CITY OF HASTINGS
SOLID WASTE DEPARTMENT
HASTINGS, NEBRASKA
68901

December 21, 2006

RECEIVED
DEC 20 2006
SUPERFUND DIVISION

Bill Gresham
EPA Region VII
901 North 5th Street
Kansas City, KS 66101

RE: Edwards South Landfill
EPA Sub-Site #5, Hastings, Nebraska

Dear Mr. Gresham:

Please find enclosed the following:

Reports for Sub-Site #5 in Hastings, Nebraska for the past year:

- South Landfill: Operations and Maintenance, Yearly Reports (Year 2006)
- South Landfill: Monthly Site Inspection Report (Year 2006)

Each year, reports will be sent following the completion of the December inspection.

If you have any questions, please feel free to call me at 402-461-2308.

Sincerely,

Jack E. Newlun
Solid Waste Superintendent/Environmental Officer
City of Hastings

Cc: Dave Wacker (Letter Only)

Enc: As referenced above.

EPA SOUTH LANDFILL
SUB-SITE #5

2006 OPERATIONS AND MAINTENANCE

Monthly Inspections:

Date: **Twelve (12) Months 2006**

Employee: **Terry Embree**

Total Time: **1 hr X 12 months = 12 hrs**

Employee Hourly Wage: **$19.00**

Total Cost for Inspection: **$228.00**

Site Mowing/Maintenance:

Date: **June 2006 & September 2006**

Employee: **Terry Embree**

Activity: **Mow Site Cap Edges**

Total Time: **4 hrs X 2 = 8hrs Total**

Employee Hourly Wage: **$19.00 X 8 hrs = $152.00**

Equipment Used: **Tractor Mower**

Equipment Hourly Rate: **$35.00 X 8 = $280.00**

Total Cost: **$432.00**

Site Repairs: **NONE**

Date: **N/A**

Employee/Firm: **N/A**

Activity: **N/A**

Total Cost: **$ N/A**

SOUTH LANDFILL
EPA SUB-SITE #5

Monthly Site Inspection Log

Inspected By: Terry [illegible]
Date: 12-10-06

ITEM	TYPES OF PROBLEMS	STATUS OF SITE A=Acceptable U=Unacceptable	OBSERVATIONS	DATE AND NATURE OF REPAIR/MAINTENANCE OF PROBLEM
Final Cover	• Erosion/rutting • Burrowing animals • Differential settlement • Grass cover burn-off	U	There is some burrowing going under [illegible].	I filled holes in while I was there
Drainage Ditches	• Erosion/rutting • Loss of grass cover • Obstructions	A	Looks Good	None
Perimeter Fences/Signs	• Damage to chain link or posts/gates • Gates closed • Signage in place	A	Looks Good	None
Monitoring Wells	• Wells in intact/closed • Protective posts in place	A	Looks Good	None
Site Mowing	• Is site well mowed/trimmed • Date of last mowing	A	Looks Good	Mowed 9-18-06

gw.

SOUTH LANDFILL
EPA SUB-SITE #5

Monthly Site Inspection Log

Inspected By: [illegible] Embree
Date: 11-6-06

ITEM	TYPES OF PROBLEMS	STATUS OF SITE A=Acceptable U=Unacceptable	OBSERVATIONS	DATE AND NATURE OF REPAIR/MAINTENANCE OF PROBLEM
Final Cover	• Erosion/rutting • Burrowing animals • Differential settlement • Grass cover burn-off	A	Looks Good	None
Drainage Ditches	• Erosion/rutting • Loss of grass cover • Obstructions	A	Looks Good	None
Perimeter Fences/Signs	• Damage to chain link or posts/gates • Gates closed • Signage in place	A	Looks Good	None
Monitoring Wells	• Wells in intact/closed • Protective posts in place	A	Looks Good	None
Site Mowing	• Is site well mowed/trimmed • Date of last mowing	A	Looks Good	Last Mowed 9-18-06

[illegible]

SOUTH LANDFILL
EPA SUB-SITE #5

Monthly Site Inspection Log

Inspected By: Terry Kimbree
Date: 10-2-06

ITEM	TYPES OF PROBLEMS	STATUS OF SITE A=Acceptable U=Unacceptable	OBSERVATIONS	DATE AND NATURE OF REPAIR/MAINTENANCE OF PROBLEM
Final Cover	• Erosion/rutting • Burrowing animals • Differential settlement • Grass cover burn-off	A	Looks Good	None
Drainage Ditches	• Erosion/rutting • Loss of grass cover • Obstructions	A	Looks Good	None
Perimeter Fences/Signs	• Damage to chain link or posts/gates • Gates closed • Signage in place	A	Looks Good	None
Monitoring Wells	• Wells in intact/closed • Protective posts in place	A	Looks Good	None
Site Mowing	• Is site well mowed/trimmed • Date of last mowing	A	Looks Good	Mowed 9-18-06

JW

SOUTH LANDFILL
EPA SUB-SITE #5

Monthly Site Inspection Log

Inspected By: Terry Eidsness
Date: 9-6-06

ITEM	TYPES OF PROBLEMS	STATUS OF SITE A=Acceptable U=Unacceptable	OBSERVATIONS	DATE AND NATURE OF REPAIR/MAINTENANCE OF PROBLEM
Final Cover	• Erosion/rutting • Burrowing animals • Differential settlement • Grass cover burn-off	A	Looks Good	None
Drainage Ditches	• Erosion/rutting • Loss of grass cover • Obstructions	A	Looks Good	None
Perimeter Fences/Signs	• Damage to chain link or posts/gates • Gates closed • Signage in place	A	Looks Good	None
Monitoring Wells	• Wells in intact/closed • Protective posts in place	A	Looks Good	None
Site Mowing	• Is site well mowed/trimmed • Date of last mowing	A	Looks Good	Last mowed 6-1-06

DJN.

SOUTH LANDFILL
EPA SUB-SITE #5

Monthly Site Inspection Log

Inspected By: Terry EMBRY
Date: 8-4-06

ITEM	TYPES OF PROBLEMS	STATUS OF SITE A=Acceptable U=Unacceptable	OBSERVATIONS	DATE AND NATURE OF REPAIR/MAINTENANCE OF PROBLEM
Final Cover	• Erosion/rutting • Burrowing animals • Differential settlement • Grass cover burn-off	A	Look Good	None
Drainage Ditches	• Erosion/rutting • Loss of grass cover • Obstructions	A	Looks Good	None
Perimeter Fences/Signs	• Damage to chain link or posts/gates • Gates closed • Signage in place	A	Looks Good	None
Monitoring Wells	• Wells in intact/closed • Protective posts in place	A	Looks Good	None
Site Mowing	• Is site well mowed/trimmed • Date of last mowing	A	Road needs mowed	Last mowed 6-1-06

JN

SOUTH LANDFILL
EPA SUB-SITE #5

Monthly Site Inspection Log

Inspected By: Terry Embry[illegible]
Date: 7-11-06

ITEM	TYPES OF PROBLEMS	STATUS OF SITE A=Acceptable U=Unacceptable	OBSERVATIONS	DATE AND NATURE OF REPAIR/MAINTENANCE OF PROBLEM
Final Cover	• Erosion/rutting • Burrowing animals • Differential settlement • Grass cover burn-off	A	Looks Good	None
Drainage Ditches	• Erosion/rutting • Loss of grass cover • Obstructions	A	Looks Good	None
Perimeter Fences/Signs	• Damage to chain link or posts/gates • Gates closed • Signage in place	A	Looks Good	None
Monitoring Wells	• Wells in intact/closed • Protective posts in place	A	Looks Good	None
Site Mowing	• Is site well mowed/trimmed • Date of last mowing	A	Looks Good	Mowed 6-1-06

JN.

SOUTH LANDFILL
EPA SUB-SITE #5

Monthly Site Inspection Log

Inspected By: Terry [illegible]
Date: 6-13-06

ITEM	TYPES OF PROBLEMS	STATUS OF SITE A=Acceptable U=Unacceptable	OBSERVATIONS	DATE AND NATURE OF REPAIR/MAINTENANCE OF PROBLEM
Final Cover	• Erosion/rutting • Burrowing animals • Differential settlement • Grass cover burn-off	A	Looks Good	None
Drainage Ditches	• Erosion/rutting • Loss of grass cover • Obstructions	A	Looks Good	None
Perimeter Fences/Signs	• Damage to chain link or posts/gates • Gates closed • Signage in place	A	Looks Good	None
Monitoring Wells	• Wells in intact/closed • Protective posts in place	A	Looks Good	None
Site Mowing	• Is site well mowed/trimmed • Date of last mowing	A	Looks Good	Mowed 6-6-06

JN.

SOUTH LANDFILL
EPA SUB-SITE #5

Monthly Site Inspection Log

Inspected By: [illegible signature]
Date: 5-4-06

ITEM	TYPES OF PROBLEMS	STATUS OF SITE A=Acceptable U=Unacceptable	OBSERVATIONS	DATE AND NATURE OF REPAIR/MAINTENANCE OF PROBLEM
Final Cover	• Erosion/rutting • Burrowing animals • Differential settlement • Grass cover burn-off	A	Looks Good	None
Drainage Ditches	• Erosion/rutting • Loss of grass cover • Obstructions	A	Looks Good	None
Perimeter Fences/Signs	• Damage to chain link or posts/gates • Gates closed • Signage in place	A	Looks Good	None
Monitoring Wells	• Wells in intact/closed • Protective posts in place	A	Looks Good	None
Site Mowing	• Is site well mowed/trimmed • Date of last mowing	A	Look Good	Last Mowed 9-16-05

[illegible initials]
JN.

SOUTH LANDFILL
EPA SUB-SITE #5

Monthly Site Inspection Log

Inspected By: Jerry Embree
Date: 4-5-06

ITEM	TYPES OF PROBLEMS	STATUS OF SITE A=Acceptable U=Unacceptable	OBSERVATIONS	DATE AND NATURE OF REPAIR/MAINTENANCE OF PROBLEM
Final Cover	• Erosion/rutting • Burrowing animals • Differential settlement • Grass cover burn-off	A	Looks Good	7/6 7U
Drainage Ditches	• Erosion/rutting • Loss of grass cover • Obstructions	A	Looks Good	7/6 7U
Perimeter Fences/Signs	• Damage to chain link or posts/gates • Gates closed • Signage in place	A	Looks Good	7/0 7U
Monitoring Wells	• Wells in intact/closed • Protective posts in place	A	Looks Good	7/0 7U
Site Mowing	• Is site well mowed/trimmed • Date of last mowing	A	Looks Good	9-10-05 was mowed

J.N.

SOUTH LANDFILL
EPA SUB-SITE #5

Monthly Site Inspection Log

Inspected By: Terry Embert
Date: 3-9-06

ITEM	TYPES OF PROBLEMS	STATUS OF SITE A=Acceptable U=Unacceptable	OBSERVATIONS	DATE AND NATURE OF REPAIR/MAINTENANCE OF PROBLEM
Final Cover	• Erosion/rutting • Burrowing animals • Differential settlement • Grass cover burn-off	A	Looks Good	None
Drainage Ditches	• Erosion/rutting • Loss of grass cover • Obstructions	A	There is some erosion on south side of Road next to Cluvert	None At this time
Perimeter Fences/Signs	• Damage to chain link or posts/gates • Gates closed • Signage in place	A	Looks Good	None
Monitoring Wells	• Wells in intact/closed • Protective posts in place	A	Look Good	None
Site Mowing	• Is site well mowed/trimmed • Date of last mowing	A	Looks Good	Mowed last 9-10-05

J.N.

SOUTH LANDFILL
EPA SUB-SITE #5

Monthly Site Inspection Log

Inspected By: Terry [illegible]
Date: 2-7-06

ITEM	TYPES OF PROBLEMS	STATUS OF SITE A=Acceptable U=Unacceptable	OBSERVATIONS	DATE AND NATURE OF REPAIR/MAINTENANCE OF PROBLEM
Final Cover	• Erosion/rutting • Burrowing animals • Differential settlement • Grass cover burn-off	A	looks Good	None
Drainage Ditches	• Erosion/rutting • Loss of grass cover • Obstructions	A	looks Good	None
Perimeter Fences/Signs	• Damage to chain link or posts/gates • Gates closed • Signage in place	A	looks Good	None
Monitoring Wells	• Wells in intact/closed • Protective posts in place	A	looks Good	None
Site Mowing	• Is site well mowed/trimmed • Date of last mowing	A	looks Good	9-10-05 Last mowed

9N

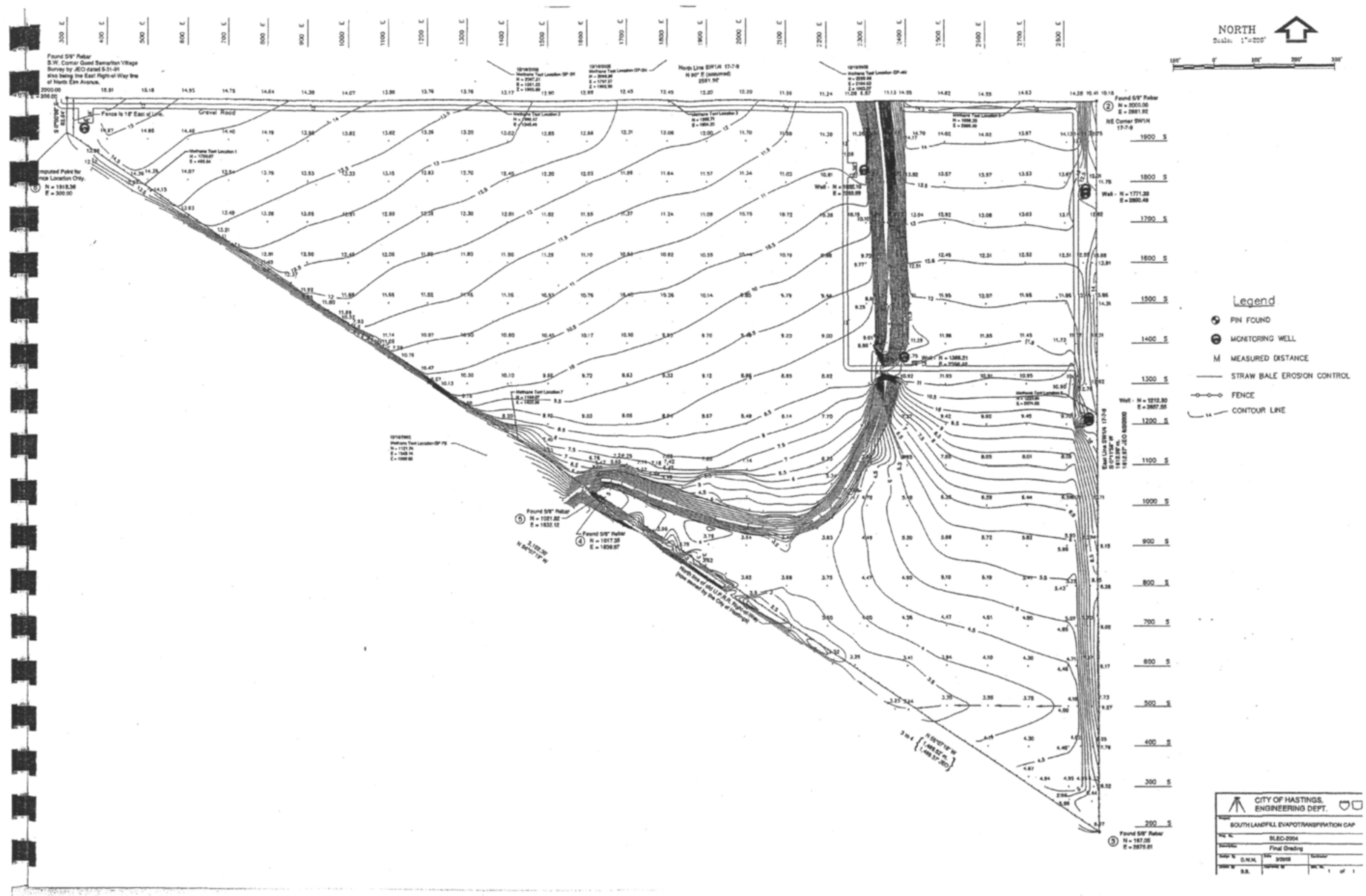
SOUTH LANDFILL
EPA SUB-SITE #5

Monthly Site Inspection Log

Inspected By: Terry Embree
Date: 1-12-06

ITEM	TYPES OF PROBLEMS	STATUS OF SITE A=Acceptable U=Unacceptable	OBSERVATIONS	DATE AND NATURE OF REPAIR/MAINTENANCE OF PROBLEM
Final Cover	• Erosion/rutting • Burrowing animals • Differential settlement • Grass cover burn-off	A	Looks Good	None
Drainage Ditches	• Erosion/rutting • Loss of grass cover • Obstructions	A	Looks Good	None
Perimeter Fences/Signs	• Damage to chain link or posts/gates • Gates closed • Signage in place	A	Looks Good	None
Monitoring Wells	• Wells in intact/closed • Protective posts in place	A	Looks Good	None
Site Mowing	• Is site well mowed/trimmed • Date of last mowing	A	Looks Good	Last mowed 9-10-05

9N.


NORTH
Scale: 1"=200'
Legend
PIN FOUND
MONITORING WELL
M MEASURED DISTANCE
STRAW BALE EROSION CONTROL
FENCE
CONTOUR LINE
Found 5/8" Rebar
S.W. Corner Good Samaritan Village
Survey by JEO dated 5-31-91
also being the East Right-of-Way line
of North Elm Avenue.
Fence is 18' East of Line.
Gravel Road
North Line SW1/4 17-7-9
N 90° E (assumed)
2581.56'
NE Corner SW1/4
17-7-9
East Line SW1/4 17-7-9
Found 5/8" Rebar
North line of old U.P.R.R. Right-of-Way
(Now owned by the City of Hastings)
CITY OF HASTINGS,
ENGINEERING DEPT.
SOUTH LANDFILL EVAPOTRANSPIRATION CAP
SLEC-2004
Final Grading
D.H.H.
1 of 1

Area Wide

Please note that "O&M" is referred to throughout this checklist. At sites where Long-Term Response Actions are in progress, O&M activities may be referred to as "system operations" since these sites are not considered to be in the O&M phase while being remediated under the Superfund program.

Five-Year Review Site Inspection Checklist (Template)

(Working document for site inspection. Information may be completed by hand and attached to the Five-Year Review report as supporting documentation of site status. "N/A" refers to "not applicable.")

I. SITE INFORMATION

Site name: Hastings Area Wide (OU19)	**Date of inspection:** Feb. 28, 2007 ~~28~~ March 1
Location and Region: Hastings, NE Region 7	**EPA ID:** NRD980862668
Agency, office, or company leading the five-year review: US EPA	**Weather/temperature:** cloudy, breezy, drizzly, 35°F

Remedy Includes: (Check all that apply)

- ☐ Landfill cover/containment
- ☐ Access controls
- ☑ Institutional controls
- ☐ Groundwater pump and treatment
- ☐ Surface water collection and treatment
- ☐ Other ____________________
- ☐ Monitored natural attenuation
- ☐ Groundwater containment
- ☐ Vertical barrier walls

Attachments: ☐ Inspection team roster attached ☐ Site map attached

II. INTERVIEWS (Check all that apply)

1. **O&M site manager** ~~Jeremy Groves~~ __________ __________
   Name Title Date
   Interviewed ☐ at site ☐ at office ☐ by phone Phone no. __________
   Problems, suggestions; ☐ Report attached ____________________

2. **O&M staff** Jeremy Groves Environmental Eng. Asst. 02/28/07
   Name Title Date
   Interviewed ☒ at site ☐ at office ☐ by phone Phone no. __________
   Problems, suggestions; ☐ Report attached ____________________

3. O&M Staff Jenny Sidlo Hastings Utilities ~~02/28/07~~ 03/01/07
   ☒ at office

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)

1. **O&M Documents**
   - ☐ O&M manual ☐ Readily available ☐ Up to date ☒ N/A
   - ☐ As-built drawings ☐ Readily available ☐ Up to date ☒ N/A
   - ☐ Maintenance logs ☐ Readily available ☐ Up to date ☒ N/A

   Remarks ______

2. **Site-Specific Health and Safety Plan** ☐ Readily available ☐ Up to date ☒ N/A
   - ☐ Contingency plan/emergency response plan ☐ Readily available ☐ Up to date ☒ N/A

   Remarks ______

3. **O&M and OSHA Training Records** ☐ Readily available ☐ Up to date ☒ N/A

   Remarks ______

4. **Permits and Service Agreements**
   - ☐ Air discharge permit ☐ Readily available ☐ Up to date ☒ N/A
   - ☐ Effluent discharge ☐ Readily available ☐ Up to date ☒ N/A
   - ☐ Waste disposal, POTW ☐ Readily available ☐ Up to date ☒ N/A
   - ☒ Other permits Private Water Well ☒ Readily available ☒ Up to date ☐ N/A

   Remarks These are private well permits maintained by the City that contain ~~as~~ well owner, well location, & well construction information

5. **Gas Generation Records** ☐ Readily available ☐ Up to date ☒ N/A

   Remarks ______

6. **Settlement Monument Records** ☐ Readily available ☐ Up to date ☒ N/A

   Remarks ______

7. **Groundwater Monitoring Records** ☒ Readily available ☐ Up to date ☐ N/A

   Remarks ______

8. **Leachate Extraction Records** ☐ Readily available ☐ Up to date ☒ N/A

   Remarks ______

9. **Discharge Compliance Records**
   - ☐ Air ☐ Readily available ☐ Up to date ☒ N/A
   - ☐ Water (effluent) ☐ Readily available ☐ Up to date ☒ N/A

   Remarks ______

10. **Daily Access/Security Logs** ☐ Readily available ☐ Up to date ☒ N/A

    Remarks ______

C. Institutional Controls (ICs)

1. **Implementation and enforcement**

Site conditions imply ICs not properly implemented	☒ Yes ☒ No ☐ N/A
Site conditions imply ICs not being fully enforced	☐ Yes ☒ No ☐ N/A

Type of monitoring (e.g., self-reporting, drive by) private Water well sampling & analysis

Frequency Varies - quarterly, semi-annually, anually, biannually

Responsible party/agency City of Hastings

Contact David L. Wacker (Name) City Engineer (Title) ______ (Date) (402)461-2330 (Phone no.)

Reporting is up-to-date	☒ Yes ☐ No ☐ N/A
Reports are verified by the lead agency	☒ Yes ☐ No ☐ N/A
Specific requirements in deed or decision documents have been met	☐ Yes ☐ No ☐ N/A
Violations have been reported	☐ Yes ☒ No ☐ N/A

Other problems or suggestions: ☐ Report attached

Ten (10) IC signs are to be posted at the IC boundaries per the Work plan. EPA inspection found four (4) of the six sign locations lacked signage. These locations were 1) East side Blvd at 12th St, 2) Hwy 6 on west IC boundary, 3) 12th St & Crane Ave, 4) Maxon Ave & 12th St.

2. **Adequacy** ☒ ICs are adequate ☐ ICs are inadequate ☐ N/A

Remarks Documentation of the enforcement of the private well Ordinance No. 3754 by the City of Hastings is in order. Once signage issue noted above ~~is~~ is resolved, the PRPs will be in compliance.

D. General

1. **Vandalism/trespassing** ☐ Location shown on site map ☒ No vandalism evident

Remarks Per the ~~Feb 29~~ March 1 conversation w/ Marty Stange, there have been no significant land use changes that would affect the IC.

2. **Land use changes on site** ☒ N/A

Remarks ______

3. **Land use changes off site** ☒ N/A

Remarks ______

VI. GENERAL SITE CONDITIONS

A. Roads ☐ Applicable ☒ N/A

1. **Roads damaged** ☐ Location shown on site map ☐ Roads adequate ☒ N/A

Remarks ______

8. **Wet Areas/Water Damage** ☐ Wet areas/water damage not evident
☐ Wet areas ☐ Location shown on site map Areal extent______
☐ Ponding ☐ Location shown on site map Areal extent______
☐ Seeps ☐ Location shown on site map Areal extent______
☐ Soft subgrade ☐ Location shown on site map Areal extent______
Remarks______

9. **Slope Instability** ☐ Slides ☐ Location shown on site map ☐ No evidence of slope instability
Areal extent______
Remarks______

B. Benches ☐ Applicable ☐ N/A
(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)

1. **Flows Bypass Bench** ☐ Location shown on site map ☐ N/A or okay
Remarks______

2. **Bench Breached** ☐ Location shown on site map ☐ N/A or okay
Remarks______

3. **Bench Overtopped** ☐ Location shown on site map ☐ N/A or okay
Remarks______

C. Letdown Channels ☐ Applicable ☐ N/A
(Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)

1. **Settlement** ☐ Location shown on site map ☐ No evidence of settlement
Areal extent______ Depth______
Remarks______

2. **Material Degradation** ☐ Location shown on site map ☐ No evidence of degradation
Material type______ Areal extent______
Remarks______

3. **Erosion** ☐ Location shown on site map ☐ No evidence of erosion
Areal extent______ Depth______
Remarks______

E. Gas Collection and Treatment	☐ Applicable	☐ N/A	
1.	**Gas Treatment Facilities** ☐ Flaring ☐ Thermal destruction ☐ Collection for reuse ☐ Good condition ☐ Needs Maintenance Remarks________________________________		
2.	**Gas Collection Wells, Manifolds and Piping** ☐ Good condition ☐ Needs Maintenance Remarks________________________________		
3.	**Gas Monitoring Facilities** (*e.g.*, gas monitoring of adjacent homes or buildings) ☐ Good condition ☐ Needs Maintenance ☐ N/A Remarks________________________________		
F. Cover Drainage Layer	☐ Applicable	☐ N/A	
1.	**Outlet Pipes Inspected** ☐ Functioning ☐ N/A Remarks________________________________		
2.	**Outlet Rock Inspected** ☐ Functioning ☐ N/A Remarks________________________________		
G. Detention/Sedimentation Ponds	☐ Applicable	☐ N/A	
1.	**Siltation** Areal extent__________ Depth__________ ☐ N/A ☐ Siltation not evident Remarks________________________________		
2.	**Erosion** Areal extent__________ Depth__________ ☐ Erosion not evident Remarks________________________________		
3.	**Outlet Works** ☐ Functioning ☐ N/A Remarks________________________________		
4.	**Dam** ☐ Functioning ☐ N/A Remarks________________________________		

IX. GROUNDWATER/SURFACE WATER REMEDIES ☐ Applicable ☒ N/A
A. Groundwater Extraction Wells, Pumps, and Pipelines ☐ Applicable ☒ N/A
1. **Pumps, Wellhead Plumbing, and Electrical** ☐ Good condition ☐ All required wells properly operating ☐ Needs Maintenance ☐ N/A Remarks____________
2. **Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances** ☐ Good condition ☐ Needs Maintenance Remarks____________
3. **Spare Parts and Equipment** ☐ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided Remarks____________
B. Surface Water Collection Structures, Pumps, and Pipelines ☐ Applicable ☒ N/A
1. **Collection Structures, Pumps, and Electrical** ☐ Good condition ☐ Needs Maintenance Remarks____________
2. **Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances** ☐ Good condition ☐ Needs Maintenance Remarks____________
3. **Spare Parts and Equipment** ☐ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided Remarks____________

D. Monitored Natural Attenuation

1. **Monitoring Wells** (natural attenuation remedy)
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ All required wells located ☐ Needs Maintenance ☐ N/A
Remarks

X. OTHER REMEDIES

If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).

The remedy for OU19, that consists of institution controls, has been implemented by the City of Hastings through the city ordinance 3754. This ordinance requires registration and periodic sampling of private wells within the IC area, as well as signage at a number of locations on the boundary of the IC Area. An example of the water well registration form is provided as Attachment A. Photo of the sign marking IC boundary at corner of ~~Maxon Ave~~ Showboat Blvd & 'J' Street is provided. ~~as Attachment B.~~
Photo of signpost missing sign at corner of Maxon and 12th St is provided.

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

Water well registrations for the ordinance are being ~~maintained &~~ stored at Hastings Utilities. These records were examined by EPA. This partial examination found the records to be in order.

Attachment A

Hastings Utilities / City of Hastings, NE Water Well Registration

1228 North Denver Avenue
Hastings, NE 68901

HastingsPermit No.	
Date	App'd By

Please print

1. **Name of Owner:**

____

Name *Address* *City* *State* *Zip*

Phone No. ____________ E-mail Address ____________________

2. **Indicate the Use: Please place "x" in appropriate box(es)**

☐ Irrigation ☐ Municipal ☐ Industrial ☐ Domestic

If the well is for more than one purpose or for a purpose other than indicated above, explain below.

____

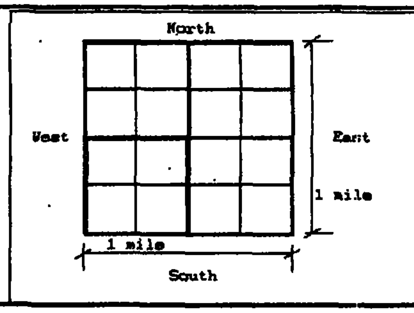
3. **Identify the Location of the Well:**

________ County, Township _____ North,

Range ________ West, Section _______

The box at right represents one square mile, (section). Indicate with an "x" the location of the well. If the well is for irrigation, indicate the location of lands irrigated.

How many acres will be irrigated? __________



4. **Specifications of Well and Pump:**

Pump column diameter: ________ inches. Well Depth __________ feet.

Pumping rate under normal operating conditions: __________ gallons per minute.

5. **Well Registration and Construction Schedule:**

If the well is registered with another agency, such as NRD or NWR,

give the registration number: ____________________

Indicate the date construction was begun: ____________________

Indicate the date construction was completed: ____________________

6. **Well Driller's** Name: ____________________

Address: ____________________

Bus Ph# __________ Fax __________ Cellular __________

E-Mail Address ____________________

7. **Certification:** I certify that I am familiar with the information contained in this application, and that to the best of my knowledge and belief such information is true, complete and accurate.

Date ____________________ ____________________

Signature of Applicant

NOTICE: Hastings Utilities has not conducted any independent testing regarding the water to be produced by this well. Therefore, issuance of this permit should not be construed as any guarantee or representation that the water produced by this well can or will meet drinking water quality standards. Water quality varies throughout our region. It is therefore strongly recommended that, prior to consuming or using the water for domestic purposes, the water produced by this well should be tested by a qualified laboratory, following established sampling and testing protocols.

Please provide as much information as possible. If any information as requested is not known, please leave blank.

hu03/adm/msw/pjs/water/water well registration 2003
1/21/03 Hastings Utilities

Attachment B

SCHEDULE

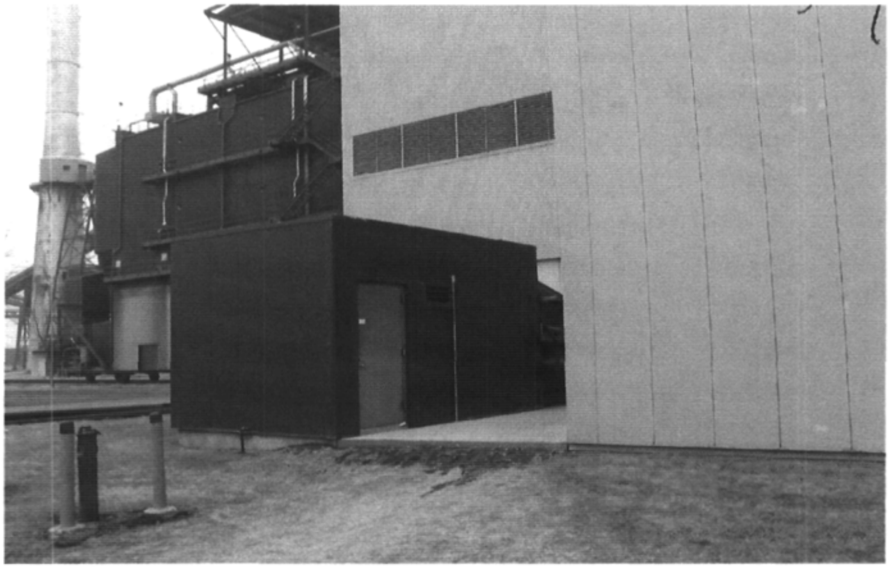
Five-Year Review Site Inspections
Hastings Superfund Site, Hastings, Nebraska

Site Inspection Schedule
February 28, 2007
8:00 AM – 5:30 PM

Time	Activity	Federal and State Personnel	Site Manager/Personnel
8:00 – 8:45 AM	**Well 3 (OU07, OU13, OU17, OU18)**	Sommerhauser / Gregson *	Mary Spalding
8:45 – 9:00 AM	*Mobilize to Colorado Ave*		
9:00 – 10:30 AM	**Colorado Ave (OU01, OU09)**	Sommerhauser / Borovich *	Bob Dangler
10:30 – 10:45 AM	*Mobilize to 2nd Street*		
10:45 – 12:15 PM	**Second Street (OU12, OU20)**	Gresham & Sommerhauser / Summerside	Jeremy Groves (CoH)
12:15 – 1:15 PM	Lunch Break		
1:15 – 1:45 PM	**North Landfill (OU02, OU10)**	Gresham / Borovich *	Jeremy Groves (CoH), Jack Newlen (CoH), Mary Spalding (*HTI*)
1:45 – 2:00 PM	*Mobilize to South Landfill*		
2:00 – 2:45 PM	**South Landfill (OU05)**	Sommerhauser / Southwick	Jeremy Groves (CoH), Jack Newlen (CoH)
2:45 – 3:00 PM	*Mobilize to Well D*		
3:00 – 4:00 PM	**Well D, Secondary & Tertiary Containment Wells**	Sommerhauser, Gresham, Zurbuchen	Jenny Sidlo (HU)
4:00 – 4:15 PM	*Mobilize to Far-Mar-Co*		
4:15 – 5:00 PM	**Far-Mar-Co (OU03, OU06, OU11)**	Gresham / Borovich *	HTI is just sampling and analyzing [Papadopouls is the consultant]
5:00 – 5:30 PM	**Area-Wide (OU19)**	Zurbuchen / Southwick	Jeremy Groves (CoH)

REVISED   * NOTE, GREGSON + BOROVICH DID NOT ATTEND THIS INSPECTION.

Hastings Groundwater Contamination Site
Hastings, Nebraska

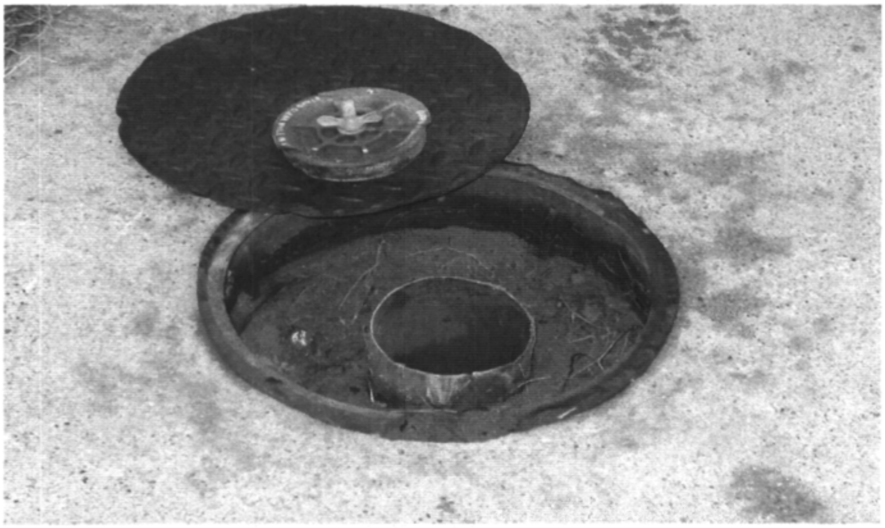


FAR-MAR-CO Subsite	DESCRIPTION	Photograph of Well A pumphouse	1
	File No. IMG_2666	U.S. Environmental Protection Agency Region 7	Date
Direction: SE	PHOTOGRAPHER	Brian Zurbuchen	02/28/2007 3:52 pm

FAR-MAR-CO Subsite	DESCRIPTION	Photograph of Chief Ethanol industrial well IN-05 (which pumps continuously)	2
	IMG_2675	U.S. Environmental Protection Agency Region 7	Date
Direction: NE	PHOTOGRAPHER	Brian Zurbuchen	02/28/2007 4:23 pm

Hastings Groundwater Contamination Site
Hastings, Nebraska

FAR-MAR-CO Subsite	DESCRIPTION	Photograph of Chief Ethanol industrial well IN-11 (not pumping)	3
	File No. IMG_2677	U.S. Environmental Protection Agency Region 7	Date
Direction: NE	PHOTOGRAPHER	Brian Zurbuchen	02/28/2007 4:25 pm



FAR-MAR-CO Subsite	DESCRIPTION	Photograph of MW-16, showing damaged manhole casing; cap is damaged and won't seal wellhead	4
	IMG_2680	U.S. Environmental Protection Agency Region 7	Date
Direction: NW	PHOTOGRAPHER	Brian Zurbuchen	02/28/2007 4:55 pm

Hastings Groundwater Contamination Site
Hastings, Nebraska

North Landfill Subsite	DESCRIPTION	Photograph of ponding on the North Landfill cap	5
	File No. IMG_2641	U.S. Environmental Protection Agency Region 7	Date
Direction: N-NW	PHOTOGRAPHER	Brian Zurbuchen	02/28/2007 1:26 pm

North Landfill Subsite	DESCRIPTION	Photograph of heaving vadose zone wells	6
	IMG_2642	U.S. Environmental Protection Agency Region 7	Date
Direction: SE	PHOTOGRAPHER	Brian Zurbuchen	02/28/2007 1:28 pm

Hastings Groundwater Contamination Site
Hastings, Nebraska

North Landfill Subsite	DESCRIPTION	Photograph of MW-6, with no apparent concrete pad	7
	File No. IMG_2677	U.S. Environmental Protection Agency Region 7	Date
Direction: S-SNE	PHOTOGRAPHER	Brian Zurbuchen	02/28/2007 1:32 pm

Area-Wide Subsite (OU19)	DESCRIPTION	Hastings Institutional Control Area sign at the corner of Showboat Blvd and 'J' Street	8
	File No. IMG_2681	U.S. Environmental Protection Agency Region 7	Date
Direction: N	PHOTOGRAPHER	Brian Zurbuchen	03/01/2007

Hastings Groundwater Contamination Site
Hastings, Nebraska

Area-Wide Subsite (OU19)	DESCRIPTION	Hastings Institutional Control Area sign missing from signpost at intersection of Maxon and 12th Streets	9
	File No. IMG_2682	U.S. Environmental Protection Agency Region 7	Date
Direction: SW	PHOTOGRAPHER	Brian Zurbuchen	03/01/2007

Area-Wide Subsite (OU19)	DESCRIPTION		10
		U.S. Environmental Protection Agency Region 7	Date
Direction: SW	PHOTOGRAPHER	Brian Zurbuchen	03/01/2007