IX
Response Action Contract

U.S. Environmental Protection Agency
Contract No. 68-W-98-225

CH2M HILL, Inc.
and Team Subcontractors:
URS Greiner Woodward Clyde Federal Services, Inc.
E2 Consulting Engineers, Inc.

FIVE-YEAR REVIEW REPORT

FOR
HASSAYAMPA LANDFILL
SUPERFUND SITE
MARICOPA COUNTY, ARIZONA

September 2001

Prepared for
Contract No. 68-W-98-225/WA NO. 052-TBTA-09DM
U.S. Environmental Protection Agency
Region IX
75 Hawthorne Street
San Francisco, California 94105

Approved by: Date:

Keith A. Takata 9-27-01

Keith A. Takata
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San Francisco, CA 94105

September 28, 2001

MEMORANDUM FOR DISTRIBUTION

FROM: Kathleen Salyer
Remedial Project Manager

SUBJECT: Transmittal of the *Five-Year Review Report for Hassayampa Landfill Superfund Site*, September 2001

Transmitted by copy of this memorandum please find the final *Five-Year Review Report for the Hassayampa Landfill Superfund Site*, September 2001. This final version revises the draft final version of this document dated November 2000. Responses to comments received on the draft final version of this document were transmitted on August 9, 2001. If you have any questions please call me to (415) 744-2214.

Attachment

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Appendices

List of Acronyms

ADEQ	Arizona Department of Environmental Quality
ADHS	Arizona Department of Health Services
af	acre-feet
af/yr	acre-feet per year
AQD	Air Quality Division
ARARs	Applicable or Relevant and Appropriate Requirements
CERCLA	Comprehensive Environmental Response Compensation, and Liability Act
CFR	Code of Federal Regulations
COPCs	Chemicals of Potential Concern
CRA	Conestoga- Rovers & Associates, Inc.
DWR	Arizona Department of Water Resources
EPA	United States Environmental Protection Agency
FML	Flexible Membrane Liner
gpm	gallons per minute
GPS	Groundwater Pilot Study
GRS	Groundwater Remediation System
HBGL	Health-Based Guidance Level
HER	Hickman Egg Ranch
HSC	Hassayampa Steering Committee
kg	kilogram
M&A	Errol L. Montgomery & Associates, Inc.
MCL	Maximum Contaminant Level
MCLG	Maximum Contaminant Level Goals
NAS	National Academy of Sciences

O&M	operations and maintenance
PLC	Programmable Logic Controller
RCRA	Resource Conservation and Recovery Act
RI	Remedial Investigation
ROD	Record of Decision
SDWA	Safe Drinking Water Act
SVME	soil vapor monitoring/extraction
SVOCs	semi-volatile organic compounds
SVTS	Soil Venting and Treatment System
TBC	To Be Considered
TOC	Total Organic Compounds
UAO	Unilateral Administrative Order
UIC	Underground Injection Control
USC	United States Code
VOCs	volatile organic compounds

Executive Summary

A Five-Year Review of the Hassayampa Landfill Superfund Site in Maricopa County, Arizona was completed in September 2001. The Five-Year Review was required by statute and undertaken because hazardous substances, pollutants, or contaminants remain at the site above levels that allow for unrestricted use and unlimited exposure. The triggering action for the review was the initiation in August 1993 of construction of the first remedial action at the Site. This is the first Five-Year Review for this Site.

The August 1992 Record of Decision for the Site required implementation of actions that included two components: remediation of impacted groundwater and remediation of soils and soil vapor above the water table, known as the vadose zone.

The groundwater remedy included extraction of contaminated groundwater, treatment of the water using air stripping technology, reinjection of the treated water, and continued groundwater monitoring to measure the effectiveness of the remedy. The groundwater cleanup standards included Federal Maximum Contaminant Levels (MCLs) where they existed for a specific contaminant and State of Arizona Health Based Guidance Levels for contaminants where no MCL was established. The requirement is that these standards should be met within all points of the contaminated aquifer.

The vadose zone remedy included placement of a RCRA cap over the hazardous waste area of the landfill, as well as soil vapor extraction, vapor treatment and implementation of access and deed restrictions.

The Five-Year Review evaluated these two components to ascertain that the remedial actions remain protective of human health and the environment as originally intended by the Record of Decision. The Five-Year Review process consisted of the following activities: interviews with members of the local community; interviews with technical participants on the remedial action, including representatives of Arizona regulatory agencies; a regulatory review; a document review; and a Site inspection.

The results of the Five-Year Review indicate that the groundwater remedy and the soil cap portion of the vadose zone remedy have remained protective of human health and the environment. However, a protectiveness determination of the soil vapor extraction and treatment portion of the vadose zone remedy cannot be made at this time. The selected remedy required that soil vapor cleanup standards be at levels that were protective of the groundwater, whereby migration of contaminants from the vadose zone into groundwater did not result in groundwater contamination exceeding groundwater cleanup standards. These soil vapor cleanup standards that were set, based on site-specific analytical modeling, require further evaluation.

Originally, the SESOIL model was used for determining the soil vapor performance standards. This model and the corresponding performance standards were approved in 1996. The Arizona

Department of Environmental Quality (ADEQ) plans to submit a letter to EPA outlining concerns relative to the SESOIL model and its current applicability to this site. EPA will evaluate these documented concerns over the next six months, at which time a protectiveness determination relative to the soil vapor extraction and treatment phase of the remedy will be made.

Five-Year Review Summary Form

SITE IDENTIFICATION

Site name : Hassayampa Landfill Superfund Site

EPA ID: AZD980735666

Region: IX **State:** AZ **City/County:** Hassayampa / Maricopa County

SITE STATUS

NPL status: ■ Final ☐ Deleted ☐ Other (specify)____________________

Remediation status (choose all that apply): ☐ Under Construction ■ Operating ☐ Complete

Multiple OUs? ☐ YES ■ NO **Construction completion date:** 04 / 30 / 1998

Has site been put into reuse? ☐ YES ■ NO

REVIEW STATUS

Reviewing agency: ■ EPA ☐ State ☐ Tribe ☐ Other Federal Agency ____________________

Author name: Kathleen Salyer

Author title: Work Assignment Manager **Author affiliation:** EPA Region IX

Review period: 12/01/99 to 9/28/2001

Date(s) of site inspection: 01/19/2000

Type of review: ■ Statutory
☐ Policy (☐ 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 of Groundwater Remedial Component
☐ Actual RA Start at OU#______
☐ Previous Five-Year Review Report
☐ Construction Completion
☐ Other (specify) ____________________

Triggering action date: August 1993 (Beginning of Construction of Groundwater Remediation Component)

Due date *(*five years after triggering action date): August 1998

Five-Year Review Summary Form

Deficiencies:
A protectiveness determination of the soil vapor extraction and treatment portion of the vadose zone remedy cannot be made at this time. The selected remedy required that soil vapor cleanup standards be at levels that were protective of the groundwater, whereby migration of contaminants from the vadose zone into groundwater did not result in groundwater contamination exceeding groundwater cleanup standards. These soil vapor cleanup standards that were set, based on site-specific analytical modeling, require further evaluation.

An evaluation of remedial options for uncapped and Pit 1 polygon area, a small area of the site that does not meet the established performance standards, is needed. If the Soil Vapor Treatment System is restarted, testing for potential formation of dioxin and furans in treatement system effluent is necessary.

There are no significant deficiencies with regard to the groundwater component. Although incidents of non-compliance have occurred. The dewatered zone should be evaluated.

Recommendations and Follow-up Actions:
Originally, the SESOIL model was used for determining the soil vapor performance standards. This model and corresponding performance standards were approved in 1996, The Arizona Department of Environmental Quality (ADEQ) plans to submit a letter to EPA outlining concerns relative to the SESOIL model and its current applicability to the site. EPA will evaluate these documented concerns at which time a protectiveness determination relative to the soil vapor extraction and treatment phase of the remedy will be made.

Soil vapor sampling conducted in early 2000 indicated that established cleanup goals have been achieved in the capped areas of the site. If three additional confirmation sampling rounds confirm that the agreed to performance standards have been achieved, EPA may agree to closure of the capped areas. If that occurs, EPA could approve full dismantling of the SVTS equipment. On the other hand, if compliance sampling results exceed the performance standards , EPA may require that the SVTS be restarted and that sampling for dioxins occur.

The soil vapor sampling confirmed that an uncapped area near the northern perimeter, near the former Pit 1 disposal area, has not met the cleanup goals. The EPA is currently evaluating options to address the uncapped area, including: (1) placement of a cap over the uncapped area north from Pit 1; (2) construction of a system of passive vents in selected capped and uncapped locations, to promote remediation of the uncapped area; and (3) treatment of vapors in the uncapped areas with carbon absorption.

The EPA has requested increased maintenance and monitoring requirements that should minimize future groundwater treatment deficiencies and help evaluated the effectiveness of this remedy to meet the performance standards. It has been requested that an evaluation of the dewatered zone be completed.

Protectiveness Statement(s):
The results of the five-year review indicate that the groundwater remedy and thr soil cap portion of the vadose zone remedy have remained protective of human health and the environment. However, a protectiveness determination of the soil-vapor treatment portion of the vadose zone remedy cannot be made at this time. Further evaluation of the current soil-vapor performance standards is necessary to determine whether they are protective of groundwater. It is expected that this evaluation will take approximately six months to complete, at which time the protectiveness determination will be made.

Five-Year Review Report
Hassayampa Landfill Superfund Site
Maricopa County, Arizona

1.0 Introduction

The United States Environmental Protection Agency (EPA) has conducted a five-year review of the remedial actions implemented at the Hassayampa Landfill Superfund Site (the Site), in Maricopa County, Arizona (Figure 1). To assist the EPA, CH2M HILL has prepared this report, which documents the results of the five-year review.

The purpose of the five-year review process is to evaluate whether the remedy at the Site is protective of human health and the environment. The methods, findings, and conclusions of reviews are documented in five-year review reports. In addition, five-year review reports identify deficiencies, if any, found during the review, and provide recommendations for addressing them.

This review is required by statute. EPA must implement five-year reviews consistent with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). CERCLA Section 121(c), as amended, 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.

Consequently, this Five-Year Review Report has been undertaken because hazardous substances, pollutants, or contaminants remain at the Site above levels that allow for unrestricted use and unlimited exposure.

This is the first Five-Year Review Report for the Hassayampa Landfill Superfund Site. The triggering action for this review is the initiation, in August 1993, of construction of the groundwater remedial component, the first remedial construction activity at the Site.

Therefore, this initial Five-Year Review Report will actually address an eight-year period of activities at the Site.

1.1 Five-Year Review Process

The Hassayampa Landfill five-year review was led by Kathleen Salyer, the EPA's project manager for the Site. She was assisted by David Cooper, a community relations specialist at EPA, and received technical support from CH2M HILL.

The five-year review consisted of the following activities: a review of relevant documents (see Appendix A); interviews with members of the local community; interviews with technical participants on the remedial action, including representatives of Arizona regulatory agencies; a regulatory review; and a site inspection (Appendix B).

2.0 Site Chronology

The chronology of key events for the Site are provided below.

Chronology of Key Events

Event/Document	**Occurred/Issued**	**Approved**
Hazardous Waste Disposal	April 20, 1979 to October 28, 1980	
National Priorities List	June 10, 1986	July 22, 1987
Administrative Consent Order No. 88-08		February 19, 1988
■ Remedial Investigation Report	February 7, 1991	April 4, 1991
■ Feasibility Study Report	May 8, 1992	May 20, 1992
Record of Decision		August 6, 1992
Unilateral Administrative Order No. 93-09		March 30, 1993
■ Groundwater Pilot Study		
□ Design Report	July 19, 1993	August 23, 1993
□ Construction	August 20, 1993 to March 7, 1994	
□ Pilot Operation	March 1994 to June 1995	
■ Soil Cap		
□ Design Report	January 13, 1994	March 17, 1994
□ Construction	April 8 to June 27, 1994	
□ Remedial Action Report	August 28, 1995 (final)	September 25, 1995
Consent Decree No. CIV 94-1821	September 2, 1994	November 28, 1994
■ Hydraulic Containment Evaluation Report	January 17, 1995	June 1, 1995
(Redesignates Groundwater Pilot Study as the Groundwater Remediation System [GRS])	July 17, 1995	July 21, 1995
■ GRS		
□ Performance Standards Verification Plan	April 24, 1996 (final)	March 26, 1996
□ Remedial Action Report	September 16, 1996 (final)	September 19, 1996

Chronology of Key Events (continued)		
Event/Document	**Occurred/Issued**	**Approved**
■ Soil Venting and Treatment System (SVTS)		
☐ Design Report	September 6, 1995	October 13, 1995
Addendum No. 1	October 18, 1995	
Addendum No. 2	December 19, 1995	January 16 and 22, 1996
☐ Construction of Soil Vapor Wells	February 28 to March 6, 1996	
☐ Construction of SVTS	June 10 to July 29, 1996	
☐ Performance Standards Verification Plan	August 29, 1996	May 9, 1997
☐ Remedial Action Report	February 5, 1998 (final)	April 30, 1998
Preliminary Close-Out Report		September 30, 1997
Completion of Remedial Action		April 30, 1998

3.0 Site Background

The Hassayampa Landfill Superfund Site is located in a rural, desert area of Maricopa County, Arizona, about 40 miles west of Phoenix. The Site location is in the southeast quarter of Section 3, Township 1 South, Range 5 West. Figure 1 presents a regional map showing the location of the Hassayampa Landfill. The Superfund site, as defined by the Record of Decision (ROD), is situated in the northeastern corner of the landfill. Figure 2 illustrates where hazardous wastes were disposed of within the landfill.

3.1 Overview of Subsurface Conditions

The Hassayampa area is very arid, with annual precipitation averaging 6 to 8 inches per year. The Hassayampa River is located approximately 0.5 mile east of the Site; the river is a losing ephemeral river that flows only after a heavy rain, except where return irrigation water discharges into the drainage channel. The Arlington Mesa, a basaltic formation, lies south of the Site about 1.5 miles (Figure 1). A weathered basalt layer, approximately 17 feet thick, originates from the mesa south of the Site. This layer exists below the Site at about 57 feet below ground surface, and dips to the north and northeast. The Site is located in an alluvial-filled basin, which has been influenced by the nearby river and mesa. The basin consists of extremely variable lithologic sediments.

Regional hydrogeologic units at the Site include, in order of increasing depth, recent alluvial deposits, basin-fill deposits, and the bedrock complex. The basin-fill deposits have been classified into the upper, middle, and lower alluvium units. The upper alluvium unit was the target of hydrogeologic investigations for the Remedial Investigation (RI). The upper alluvium unit has been subdivided, in order of increasing depth, into an upper alluvial deposits unit, a basaltic lava-flow unit, and Units A and B, which are the water-bearing deposits (Errol L. Montgomery Associates, Inc. [M&A], May 24, 1994).

The upper alluvial deposits unit at the Site is composed of a coarse-grained zone (chiefly interbedded silty sand and gravelly sand, with carbonate cementation and caliche layers) and a fine-grained zone (chiefly silty, clayey fine sand and sandy silt and clay with siltstone and claystone interbeds). The coarse-grained zone occurs from land surface to an average depth of about 36 feet. The depth to the top of the fine-grained zone at the Site ranges from 36 to 60 feet below land surface. Thickness of the fine-grained zone at the Site ranges from 7 to 37 feet; the average thickness is about 28 feet (M&A, May 24, 1994).

The basaltic lava-flow unit at the Site consists chiefly of basaltic lava-flow rocks, which are generally weathered in the upper part of the unit and are generally vesicular. The upper surface of the basaltic lava-flow unit is irregular, which is typical for basalt flows in the region. Depth to the top of the basaltic lava-flow unit at the Site ranges from 39 to 74 feet below land surface; average depth is about 59 feet. Thickness of the unit at the Site ranges from 11 to 29 feet; average thickness is 17 feet. Thickness of the unit generally decreases to the north and northeast (M&A, May 24, 1994).

The upper alluvial deposits at the Site were subdivided into Unit A and Unit B for characterization purposes; therefore, the regional extent of these units is uncertain. The aquifer beneath the Site is characterized as anisotropic (properties vary with direction), which is often encountered where sediments are highly heterogeneous. Generally, the sediments in the upper portion of the aquifer (Unit A, which is approximately 30 feet thick), are finer grained and less permeable than the sediments directly beneath (Unit B). Unit A consists of interbeded clays and silts: Unit B is defined by the first sandy layer and extends to the Palo Verde clay.

Figures 11 through 16 present groundwater and potentiometric level contours that were measured in 1999 for Units A and B. The pieziometric level measured in Unit B can apparently range from approximately 4 to 10 feet above the top of Unit B, and from approximately 12 to 17 feet below the water level in Unit A. Therefore, although groundwater flow is primarily lateral, there is a vertical component of hydraulic gradient.

Although there is not a distinctly less permeable layer separating Units A and B, seasonal hydrographs indicate poor hydraulic communication between these units. Results of continuous water level monitoring conducted in 2000 indicate that the potentiometric level in Unit B can vary seasonally by as much as 9 feet, and that water levels in Unit A varied about 1 foot.

3.2 Overview of Historical Activities at the Site

The approximately 10-acre property, currently owned by Maricopa County, was used for disposal of hazardous wastes from April 20, 1979 to October 28, 1980. Disposal of hazardous wastes was conducted under a manifest program operated by the Arizona Department of Health Services (ADHS). An inventory of the information provided in the manifests indicate that over 3 million gallons of liquid hazardous wastes and approximately 4,000 tons of solid hazardous wastes were disposed of at the Site during the period of operation (Figure 2). Disposal was conducted with approval of ADHS.

The former hazardous waste disposal area is located adjacent to a sanitary landfill also owned by Maricopa County (Figure 3). The unlined sanitary landfill operated from 1961 until June 1997 for disposal of domestic and solid waste. Approximately 47 acres of the 77-acre area owned by the County received solid waste during the active life of the landfill. The sanitary landfill has received regulatory closure from the State and has been capped. The Arizona Department of Environmental Quality (ADEQ) requires that the County conduct biannual monitoring of four groundwater wells and that the County maintains soil gas probes around the landfill to monitor for oxygen and methane. Biannual monitoring is conducted on the Unit A groundwater at four monitoring well locations (MW-8UA, MW-9UA, MW-10UA, and MW-11UA). Groundwater is monitored for volatile organic compounds (VOCs).

Investigation of the former hazardous waste landfill began in 1981, shortly after disposal at the location ceased. The former hazardous waste disposal area was listed on the National Priorities List on July 22, 1987. Under the terms of Administrative Consent Order No. 88-08, and with EPA oversight, a group of the potentially responsible parties known as the Hassayampa Steering Committee (HSC) completed an RI in1991 and a feasibility study (FS) in 1992.

Hazardous substances, particularly VOCs and semi-volatile organic compounds (SVOCs), were detected in the soil and groundwater in concentrations above Arizona health-based guidance levels (HBGLs) and above Federal Maximum Contaminant Levels (MCLs) for groundwater. Ultimately, the following chemicals of potential concern (COPCs) at the Site were identified:

- 1, 1-dichloroethane
- tetrachloroethene
- trichloroethene
- 1, 1-dichloroethene
- 1, 2-dichloropropane
- 1, 1, 1-trichloroethane
- trichlorotrifluoroethane
- trichlorofluoromethane
- cis-1, 2-dichloroethene

In addition, metals (including chromium, copper, and lead) have been detected in waste and soil at the Site. However, concentrations of these metals in soil do not significantly exceed regulatory levels.

Initial remedial actions began in 1993 with the construction of a Groundwater Pilot Study (GPS), required under the terms of the Unilateral Administrative Order (UAO) No. 93-09. In 1994, Consent Decree No. CIV 94-1821 required the HSC to complete the remedy, addressing contamination in groundwater and soil vapor components at the Site (Figures 3 and 4).

The ROD specified the MCLs that were selected as groundwater cleanup standards for the Site. For those groundwater contaminants detected at the Site for which no MCLs exist, HBGLs proposed by the State of Arizona were selected as groundwater cleanup standards. The groundwater cleanup standards were specified to be met at all points within the contaminated aquifer. Similarly, the ROD specified that soil vapor cleanup standards would be defined as levels that protect groundwater quality (meaning that the migration of contaminants from the vadose zone to groundwater will not result in groundwater contamination that exceeds the groundwater cleanup standards). The soil vapor cleanup standards were to be determined through site-specific analytical modeling conducted during the remedial design stage.

The 1994 Consent Decree established performance standards for the Site, which were defined as cleanup standards; standards of control; and other substantive requirements, criteria, or limitations set forth in the ROD and in its own attached scope of work (SOW). The SOW in the Consent Decree identified specific contaminant concentrations that must be achieved to attain the groundwater remediation performance standards. The SOW also specified that the EPA would approve soil-vapor cleanup levels, based on the results of the additional investigation (M& A, February 7, 1994), which would meet the vadose zone performance standards.

3.3 Land and Resource Use

The site was used as a municipal landfill at the time the remedial action decision was made (August 1992) and had a continued life expectancy of approximately 10 years. The Hazardous Waste Area (HWA) of the landfill was already fenced and out of service. Surrounding land use includes mostly desert (undeveloped) land with some cultivation (approximately one-sixth of the total surrounding land use). Vegetation is sparse and includes creosote and salt bushes.

The land is owned and operated by Maricopa County, which had signed a 20-year lease on the 77-acre parcel from the Federal Aviation Administration (FAA). After the lease expired, the parcel was transferred to Maricopa County by quitclaim deed.

A regional aquifer consisting of basin-fill deposits underlies the site and comprises the principal source of groundwater to wells in the area. Within a three-mile radius of the Site, 349 groundwater wells have been identified, 172 of which potentially service individual residences. The nearest downgradient domestic well at the time of the ROD was approximately 2,500 feet south of the Site. No projections for potential future land use were made at the time of the issuance of the ROD.

4.0 Remedial Actions

The following sections summarize the remedial actions selected, and the implementation, operation, and maintenance of the remedial systems.

4.1 Remedy Selection

The ROD for the Hassayampa Site was signed on August 6, 1992. The selected remedy presented in the ROD addressed the threat of exposure to contaminated groundwater through the extraction of contaminated groundwater and treatment to federal and state regulatory levels (Figure 5). The selected remedy required that these levels be met throughout the contaminated aquifer. The implementation of deed restrictions provided further protection by ensuring that drinking-water wells were not installed onsite.

By requiring soil vapor extraction to levels that were considered protective of groundwater quality, the selected remedy presented in the ROD attempted to ensure that vadose zone contaminants (soil and soil vapor) would not migrate to groundwater. The selected remedy addressed the threat of ingestion and contact with contaminated waste and soil through the use of access and deed restrictions, and a cap over the former hazardous waste disposal area.

The remedy established in the ROD was selected based on existing land use in the Hassayampa area at that time. Changes that have developed in land use in the Hassayampa area since the issuance of the ROD, as well as potential land use changes in the future, are discussed in Section 5.6.

The remedy was separated into two primary components:

(1) The groundwater component of the remedy included extraction of contaminated groundwater, treatment of the water using air-stripping technology (vapor phase carbon adsorption to be performed as necessary to meet federal, state, and county regulations pertaining to air emissions), reinjection of the treated water, and continued groundwater monitoring to measure the effectiveness of the remedy (Figure 3).

(2) The vadose zone component of the remedy included capping the 10-acre hazardous waste area of the landfill with a cap that complies with the substantive capping requirements of Subtitle C of the Resource Conservation and Recovery Act (RCRA). The purposes of the construction of the RCRA cap over the hazardous waste area was to prevent direct contact with contaminated waste and soil left in place, to reduce infiltration of water, to reduce the release of VOCs into the atmosphere, and to improve the efficiency of the soil vapor extraction system (Figure 4).

Vadose zone analytical modeling was conducted in 1994 to project onsite concentrations for VOCs in soil vapor within the vadose zone that might potentially result in VOC concentrations in groundwater that exceed the groundwater performance standards established by EPA in the ROD.

The soil vapor performance standards are the VOC concentrations in soil vapor that are projected, via modeling, to result in VOC concentrations in groundwater that equal the groundwater performance standards. These soil vapor performance standards were then compared with results of soil vapor monitoring to develop target zones for soil venting at the Site (Conestoga-Rovers & Associates, Inc. [CRA], August 29, 1996). Revised vadose zone analytical modeling, which now incorporates into the mode the effects of the flexible membrane liner (FML) cap on the landfill, was approved by EPA (EPA, March 9, 2000). As a result, the soil vapor performance standards were revised (M&A, March 27, 2001). The vadose zone component of the selected remedy included performing onsite soil vapor extraction at all locations where soil vapor levels exceeded cleanup standards. The vapor was treated using vapor phase carbon adsorption or catalytic oxidation technology. Furthermore, the ROD required implementation of deed and access restrictions at the Site as a part of the vadose zone component of the remedy. The perimeter fencing was required to be upgraded and maintained to restrict access, and long-term deed restrictions were to be imposed on the property.

4.2 Remedy Implementation

The remedy at the Site was implemented by separately addressing the two primary components: the groundwater and the vadose zone.

4.2.1 Implementation of the Groundwater Remedial Component

Under the terms of the UAO, the HSC was responsible for designing and implementing a GPS for extraction and treatment of groundwater (Figure 3). A pilot scale pump and treat system was constructed in late 1993 and early 1994, and began operating in March 1994 (CRA and M&A, September 21, 1993). Contaminated groundwater was pumped from four groundwater extraction wells to a building (hereafter referred to as the Treatment Facility), located on the west side of the former hazardous waste disposal area, to remove VOCs through an air-stripping treatment system. The treated water was then pumped to an injection well, approximately 500 yards west of the former hazardous waste disposal area, for reinjection.

In 1995, the GPS was re-designated as a full-scale GRS, as discussed in the

Hydraulic Containment Evaluation Report (M&A, January 17, 1995). The GRS extracts groundwater from the contaminated, uppermost water-bearing zone, referred to as Unit A, using four extraction wells (EW-1UA, EW-2UA, EW-3UA, and EW-4UA). The extracted groundwater is then treated and injected into the deeper, more permeable portion of the aquifer, referred to as Unit B, via injection well IW-1UB. An evaluation was conducted to determine the appropriate location for the injection well (CRA and M&A, September 21, 1993), and potential well sites were considered at locations at the Site, as well as at locations north, south, east, and west of the Site. Locations north and west were believed to have the greatest remedial advantage, and because the current location to the west of the Site is owned by Maricopa County, that well site was chosen. The design called for injection into that unit of aquifer because Unit B was believed to have the capacity to handle the estimated injection rate. Table 4-1 summarizes the common constituents in groundwater for Unit A and Unit B.

The GRS extracts contaminated groundwater from four Unit A extraction wells at a total average pumping rate of 6 gallons per minute (gpm) during 2000. Approximately 3 million gallons of groundwater were extracted by the GRS during 2000. This extracted groundwater is then treated using air stripping, and injected into Unit B. The system consists of the following components:

- Fourteen Unit A groundwater monitoring wells, MW-1UA through MW-14UA
- Four Unit A extraction wells, EW-1UA through EW-4UA
- Eight Unit B groundwater monitoring wells, MW-1UB through MW-4UB, MW-6UB, MW-9UB, MW-10UB, and MW-15UB
- Unit B injection well IW-1UB, for injection of the treated water
- The groundwater treatment system, which includes the air stripper and associated piping, pumps, and controls

The GRS has generally been in constant operation since its implementation. Section 4.3.1 summarizes the operations and maintenance history of the GRS since its construction.

4.2.1.1 Evaluation of GRS Performance

Water-level measurements and groundwater results from the monitoring wells at the Site indicate that lateral hydraulic containment is being achieved. Figures 10 through 16 illustrate groundwater level contours for Unit A and Unit B. Figure 17 illustrates unit level hydrographs for Unit A and Unit B from 1988 to 2000. Sections 4.3.1.1 and 6.1 also discuss the functionality of the remedy as intended by the decision documents. Inspection of Figures 22, 23, 24, and 25 illustrate concentrations of VOCs and groundwater levels for 2000, 1999, 1998, and 1993. Monitoring events indicate that the GRS is containing and capturing the groundwater contamination. However, the geometry of the contaminant plume has changed over time and should continue to be monitored and evaluated in future annual reports. Figure 19 illustrates concentrations of VOCs in groundwater from 5 Unit A wells from 1989 to 2000. The total concentration of VOCs detected in the groundwater extraction wells is shown in Figure 20, and the rate and total amount of VOCs in groundwater removed is shown in Figure 21. The monitoring results indicate that VOC concentrations have fluctuated over time and no general decreasing trend is evident. Groundwater concentrations will continue to be evaluated by the monitoring program. At this time, it appears that the GRS remedy is effective; however, it is too early to determine if the performance standards will be met.

According to M&A, HSC’s contractor, 48 pounds of VOCs were removed in Unit A by the GRS from 1994 through 2000 (M&A, 2001) (Figure 21). M&A has also estimated the total mass of VOCs in groundwater based on groundwater results from the monitoring wells during April 2001 to be approximately 60 pounds (Figure 10). 1. Therefore, it appears that the overall performance of the GRS, as intended by the design requirements, is adequate. The GRS has slowly depressed the water levels within Unit A, potentially dewatering the contaminant or contaminated zone (Figures 17 and 18). The water table will equilibrate to its former level when the GRS is concluded. It is unknown what contaminants may have been stranded after the water table was lowered. More importantly, it is unknown what effect this zone will have on groundwater after the GRS is stopped and the water table equilibrates to its former elevation. An evaluation of potential contamination of the former and current capillary fringe zone (dewatered zone) should be completed, including an evaluation of how water level effects water quality.

4.2.2 Implementation of Vadose Zone Remedial Component

The soil vapor component of the remedy included deed and access restrictions at the Site. The ROD required that long-term deed restrictions be imposed, restricting future land use of the property and groundwater beneath the Site. In addition, the Consent Decree, signed in 1994 by the HSC, required that the Owner place a copy of the decree on file with the Recorder’s Office in Maricopa County. Consequently, each deed, title, or other instrument conveying an interest in the property shall reference the recorded location of the Consent Decree and any restrictions applicable to the property under it. The Site owner, Maricopa County, recorded the Consent Decree, as required, on January 4, 1995, imposing the deed restrictions.

Access controls at the Site included a 6-foot high, chain-link perimeter fence that was constructed in June 1994. Gates were installed adjacent to the Treatment Facility and south of the northwest corner of the Site. Signage, including warning signs and a phone number for contacting the EPA, have been installed on the perimeter fence.

Under the terms of the UAO, the HSC was responsible for designing and implementing a soil cap to entirely cover the former hazardous waste disposal area (Figure 4). A substantive change to the conceptual design of the cap, as presented in the UAO, was approved by EPA prior to construction. The design change involved the use of an engineered FML system, based on EPA’s concerns about the integrity and permeability of a soil cap. The design change was meant to produce a lower hydraulic conductivity and to ensure a higher level of quality control than may have been available with a soil cap.

The cap was constructed from April through June 1994 and is still in place. According to the Remedial Action Report-Construction of Soil Cap (M&A, August 28, 1995) and associated

1 The mass estimate of VOCs in groundwater was based on VOC concentrations measured in the Unit A extraction and monitoring wells during the April 2001 monitoring round using the following assumptions: (a) Distribution of VOCs in groundwater at the Site is smoothly varying, as it would be if a single source location were responsible for all VOCs at the Site. However, this may not be an accurate assumption for the Site. (b) Concentrations of VOCs between data points can he interpolated linearly. (c) The zero part-per-billion contour line passes through wells where VOCs were not detected, including EW-1UA, EW-2UA, MW-2UA, MW-3UA, MW-11UA, and MW-5UA. (d) The zero part-per-billion contour line passes outside wells where VOCs were detected, including MW-12UA and MW-13UA. (e) Porosity of Unit A is 35 percent. (f) Saturated thickness of Unit A ranges from 20 to 25 feet within the area projected to contain VOCs. inspection reports documenting the construction of the soil cap, the design consisted of (from bottom to top) an existing soil layer; a soil bedding layer; the FML, which was approximately 10 acres in area and manufactured of 40-mil HDPE; a drainage layer; filter fabric; a soil cover, and a top vegetative cover layer. The drainage layer, which lies above the FML, is made of sand. The soil cover consisted of backfill material compacted to 95 percent standard Proctor density using vibratory rollers, with the application of water as an aid to compaction. Protrusions through the cap at well vaults were fitted with prefabricated boots, which were heat-welded to a skirt and then welded to the liner. Each boot was additionally secured with a stainless-steel belt at the point where the structure exits the subgrade.

Design documents for the SVTS were prepared in 1995, and construction was begun in February 1996. Remediation of the vadose zone was designed to occur by extracting soil vapor from a series of vapor extraction wells drilled into both fine-and coarse-grained soils in areas where vadose zone conditions were believed to be a threat to groundwater quality. The extracted soil vapor would then be treated with technology designed for a minimum of 90 percent destruction efficiency of organic vapors. The ROD had originally specified that the soil vapors would be treated using either vapor-phase carbon adsorption or catalytic oxidation, as determined during remedial design. However, based on findings during the design phase, including concerns about catalyst fouling associated with chlorinated compounds in soil vapor, the HSC proposed thermal oxidation for treatment of soil vapors. The thermal oxidation system was designed to use the solvents in the influent air stream as a fuel source. The preheated VOC-laden soil vapor would enter the combustion chamber, where the burner would heat the vapors to the desired oxidation temperature (1,400 degrees Fahrenheit), with the desired retention time. Remaining fuel source requirements would be provided by propane fuel (CRA, January 30, 1998). EPA approved the Soil Venting Design Report on January 22, 1996.

Figure 4 presents the layout of the wells, piping, and treatment system. The system was started up on July 29, 1996; system commissioning was completed in July 1997. According to construction documentation, during its period of operation, the SVTS consisted of the following equipment:

- Eleven soil vapor monitoring/extraction (SVME) wells drilled into the coarse-grained, upper vadose zone (wells SP1 through SP-6, W-1, P-1, VB-2c. NW-2, and NE-1)

- Eleven SVME wells drilled into the fine-grained, lower vadose zone (wells SP-1 through SP-6, W-1, P-1, VB-2f, NW-2, and NE-1)

- Piping to the SVTS treatment unit

- The SVTS treatment unit itself, which consists of a thermal oxidation system designed with a 600 standard cubic-feet-per-minute flow capacity, and an organic destruction efficiency of at least 90 percent

- Eight dual-completion passive injection wells (V-1 through V-8)

- One dual-completion active injection well (V-9)

- Eight dual-completion, vadose zone piezometers (PZ-1 through PZ-8)

- Twelve soil-vapor monitoring wells (SP-7, SP-8, P-3, SE-1, N-1 through N-3, NW-1, NE-3, VB-1, VB-3, and VB-4)

- A condensate removal system

Between the initial startup and July 1997, significant operational problems occurred, including the breakdown of mechanical components, unreliable water supply, problems with storage capacity of wastewater and caustic, ash buildup in the heat exchanger, and quench/scrubber packing failure. Several changes were made to the initial design of the SVTS during construction and startup. In 1998, additional operational problems arose involving condensate collection at several locations along one of the extensions of the soil vapor lines, partially blocking vapor flow from the vapor wells (ADEQ, April 27, 1998). EPA requested that the HSC begin periodic sampling of the condensate as a condition for condensate commingling with SVTS wastewater. In addition, EPA requested that HSC assess and mitigate condensate buildup within the header piping. A Condensate Evaluation and Management Plan was submitted later that year (CRA and M&A, August 18, 1998) and a condensate collection system was constructed thereafter. The problems with operation of the SVTS will be discussed further in Section 4.3.2.

4.2.2.1 Evaluations of SVTS Performance

Four compliance tests were performed on the SVTS to evaluate its destruction effectiveness and to determine its performance status. The dates and results of the tests are as follows:

- A compliance test on August 27-28, 1996 demonstrated that the SVTS met the required 90 percent organic destruction efficiency, and was in compliance.

- On March 4, 1998, another compliance test was conducted on the SVTS; again it met the required destruction efficiency.

- A test conducted on October 29-30, 1998 resulted in the SVTS failing to meet the required destruction efficiency. CRA estimated the radius of influence of the SVTS based on the observed vacuum in soil vapor wells (Figure 9). (CRA, September 18, 2000). As a result of the failure of this compliance test, the heat exchanger was removed and a new one was manufactured and installed. Consequently, the SVTS was shut down for repairs until February 1999.

- A third compliance test was conducted on March 4, 1999; it indicated that the SVTS again met the required 90 percent efficiency and was in compliance.

Although the SVTS was found to be in compliance during the fourth testing, in early March 1999, the EPA requested that the system be shut down because of concerns about potential formation of dioxins and furans. Dioxins and furans may form as by-products of incomplete combustion when chlorinated VOCs are oxidized. Since that time, the SVTS has been partially decommissioned to preserve selected equipment.

At the time of this report, the EPA is conducting an evaluation of several aspects of the vadose zone remedy. Figures 5 through 8 illustrate interpreted contour maps of VOC concentrations in soil vapor. The primary focus is to evaluate the potential risk posed to groundwater from residual contaminants in the vadose zone. The secondary focus is to gain a better understanding of the characteristics of the combined influent vapor to the SVTS. This information will help in evaluating the performance of the SVTS if it is put back into service.

In 1996, both EPA and ADEQ had approved of the use of the SESOIL model for determining the soil vapor performance standards. ADEQ has recently questioned the applicability of the SESOIL model to the site, and correspondingly, the protectiveness of the soil vapor performance standards. ADEQ's concerns are currently being evaluated, and a final decision on the use of the SESOIL model and the protectiveness of the soil vapor performance standards will be documented in an addendum to this Five-Year Review Report.

At EPA's request, the HSC recently collected soil vapor samples at selected wells in the areas of the vadose zone targeted for remediation (M&A, 2000). Results of the sampling are as follows:

- <u>Evaluation of the Capped Area</u> - Initial sampling of the area capped with the FML, conducted in February and April 2000, indicate that the cleanup levels have been met, based on performance standards determined using the SESOIL model. However, as stated above, EPA is currently evaluating the protectiveness of the soil vapor performance standards. In addition, a sampling round was conducted in October 2000 and April 2001, and results have been submitted to EPA. One more round of confirmation sampling is required in November 2001 before EPA can determine if the performance standards have been attained,

  If confirmation sampling confirms that performance standards have been met, EPA will concur on closure for the capped area of the Site.

  If confirmation sampling indicates that the cleanup levels have not been met, HSC will prepare a plan to address this area. If the SVTS is restarted, emissions from the thermal oxidation unit will be sampled for dioxin. If emissions sampling is required, concentrations from the thermal oxidation unit must be below the 10x-6 risk level, as demonstrated through a risk assessment.

  The recent soil-vapor sampling effort also included monitoring for methane, oxygen, carbon dioxide, trace organic gases, and percent of the lower explosive limit (LEL). Results indicated that large concentrations of methane, percent LEL, and carbon dioxide, and low concentrations of oxygen were encountered at vapor wells located, in general, near municipal landfill cells adjacent to the south and west boundaries of the Site. The source of methane at these vapor wells (e.g., SP-2, SP-3, SP-5, SP-6, and SP-7) is believed to be biodegradation of buried municipal waste at the nearby landfill cells. Soil-venting operations are thought to have drawn soil vapor toward the vapor extraction wells from the adjacent municipal landfill cells. The relatively small oxygen concentrations at the same vapor wells are consistent with large methane and carbon dioxide concentrations detected at these wells (M&A, May 18, 2000).

- Evaluation of Uncapped Area - An area north of one of the historical disposal pits at the Site, referred to as Pit 1 and located on the northern edge of the former hazardous waste disposal area, was not covered with the FML cap (Figure 4). Recent sampling of this uncapped area indicates that soil-vapor performance standards determined using the SESOIL model have not been met in this location for one VOC. This low concentration is in the uncapped area and is quite low with respect to the adjacent capped area. However, because this area is not capped, these low concentrations are predicted by modeling to impact groundwater. In addition, if soil-vapor extraction wells are operated only in this uncapped area, they may actually worsen conditions by pulling higher concentrations of contaminants into the uncapped area than may have migrated by passive mechanisms.

  If cleanup levels are later found to be attained in the capped portions of the site, restarting the SVTS solely to address this small, uncapped area may be problematic. Consequently, the HSC is currently evaluating possible remedial options: (1) extending the FML or a soil cap to cover the uncapped area, (2) incorporating a passive venting system to promote remediation of the uncapped area, or (3) treating vapors in the uncapped area by soil-vapor extraction with carbon absorption.

CRA has estimated that approximately 3,734 pounds of total VOCs were removed from the vadose zone by the SVTS. M&A has estimated that the remaining mass of VOCs in the vadose zone is approximately 4,271 pounds2 (CRA, October 11, 2000 and M&A, 2001). Effectively, all contamination removed was from the vapor phase.

4.3 Systems Operations and Maintenance

The following sections discuss the operations and maintenance (O&M) of the remedial systems used as a part of the remedy for the groundwater and the soil-vapor components.

4.3.1 Operations and Maintenance of the Groundwater Remedial Component

The GRS monitoring has consisted of the following:

- Groundwater level measurements of monitoring, extraction, and injection wells

- Pump rate and injection rate measurements

- Collection of groundwater samples from monitoring wells and extraction wells

- Collection of water samples from the air-tripper influent and effluent

See Table 4-6 for the monitoring schedule.

4.3.1.1 O&M of the GRS

The HSC’s monitoring results indicate that COPCs in groundwater have not been detected and confirmed in the perimeter monitoring wells. Together with groundwater level data, this indicates that the GRS has been hydraulically containing the lateral movement of the contaminant plume. Figures 10 through 16 illustrate groundwater-level contour maps. Figures 17 and 18 illustrate water-level hydrographs. No COPCs have been detected and confirmed in Unit B monitoring wells. According to M&A, the vertical groundwater flow is very slow, on the order of 0.16 to 0.36 foot/year, because of the fine-grained nature of the Unit A. It is uncertain if contaminants in Unit A will reach the Unit B monitoring wells at detectable levels in the time period of groundwater remediation, considering this vertical flow rate, advection, adsorption, and dispersion.

Data suggest that the GRS has been functioning as designed (reporting typically non-detect levels in effluent water and at perimeter monitoring wells for contaminants of concern). Figures 22 through 25 present the results of a 2000, 1999, 1998, and 1993 monitoring event, respectively, showing concentrations of VOCs in Unit A groundwater. However, during the past five years there have been some significant equipment malfunctions and maintenance concerns. Three key operational incidents are discussed below:

- A problem occurred with the GRS on March 17, 1998, initiated by a shutdown of the air-tripper blower. The Programmable Logic Controller (PLC) failed to shut down the extraction wells and the transfer pumps to the injection well. Water continued to pump into the injection well, injecting into Unit B, for approximately 8 hours without active treatment by the air stripper.

After the incident, repairs and corrective actions were made to the unit. Corrective actions primarily consisted of reprogramming the PLC to sense the water level in the equalization tank, which receives water from the extraction wells. The PLC was also reprogrammed to start and stop the transfer pump at pre-set water levels (bypassing a dead-band switch that had apparently malfunctioned, leading to the incident). According to documentation prepared by the HSC's contractors (M&A, April 24, 1998), the PLC is now programmed to verify that both the air-stripper blower and the transfer pump are on. In addition, a redundant safety switch has been added, which blocks startup of the transfer pump unless the air-stripper blower is running. Consequently, the system should now require the air-stripper blower to be operating before the transfer pump will operate.

- In another incident, routine sampling results from a June 1999 sampling event revealed that the effluent from the air stripper contained 1,1-dichloroethene at concentrations above the MCL, in addition to detectable concentrations of 1,2-dichloropropane, trichlorotrifluoroethane, and trichloroethene. After evaluation of the air-stripper unit, it was suspected that a build-up of carbonate deposits on the underside of the bottom tray of the unit may have affected the efficiency of the groundwater treatment. The build-up may have reduced untreated water flow rate through the perforations in the tray, and hampered aeration of the water, causing a reduction in effectiveness of the unit. Back flow did not enter the wells. Each well is equipped with a check valve above the pump. However, water flowed from the GRS building to the wellheads only when the sampling ports at the wells were opened for sampling operations. The incident may have caused the injection of extracted groundwater, with concentrations of COPCs above MCLs, to be injected into Unit B groundwater for as little as a few weeks or as much as six months, based on the monitoring schedule at the time. As a result of the incident, the HSC initiated - and EPA approved - an annual disassembly and cleaning of the unit. This upgraded maintenance schedule will be reflected in the revised O&M Manual. In addition, the EPA has requested monthly monitoring of effluent from the air-stripper unit (see Section 4.3.1.2).

- Another recent incident discussed in the Annual Monitoring Report for 1999 (M&A, March 22, 2000) describes a period when the system shut down because of a faulty high-water-level alarm in the equalization tank. During the November 1999 sampling round, the extraction pumps were found to be shut down. It was determined that although the pumps were not operating, water flowed out of the wellhead sampling port during sampling, because of back flow from the influent pipeline. The pumps were then put back into operation; however, the pump in EW-2UA eventually shut off again. In February 2000, the influent pipe check valves were inspected; it was determined that they needed to be replaced, and that the check valves for EW-2UA and EW-4UA were stuck in the open position. Because selected check valves and pumps were not functioning during the November sampling round, it was determined that the samples collected from the extraction wells during the November sampling round were not representative groundwater samples. As a result of this problem, the influent manifold was redesigned during the spring of 2000.

> This incident was addressed in the Annual Monitoring Report for 1999, under the Groundwater Remediation System Modifications Section that discusses the period of operation. The incident is reported in Table 9 of that report, which lists the historical shutdown periods.

Overall, the Annual Monitoring Report calculated the GRS down time at 22 percent for 1999 (as shown in Table 4-2), and 6.7 percent for 2000 (as shown in Table 4-3). Table 4-4 summarizes the rate and volume of water extracted and injected during 2000. The great majority of the down time is the result of one issue: the problem with the suspected build-up of carbonates in the air-stripper unit. Increased maintenance of the air-stripper unit should make reoccurrence of the event unlikely. In 2000, uptime had improved to 93 percent during the year.

In the past, other causes of shutdown included unplanned power outages, malfunction of the air stripper and unplanned high-water levels in the equalization tank. Because of its location in a rural area, unreliable electrical power supply to the Site may be unavoidable. In addition, effluent water sampling has reported concentrations of VOCs in the past (Table 4-5). The increased requirement for monthly monitoring of treated effluent from the system is the result of the recent O&M problems and is currently justified. To protect the deeper aquifer, monthly monitoring is warranted and should continue. Furthermore, EPA is now requiring semi-annual sampling for VOCs at sentinel monitor wells, and semi-annual measurement of groundwater levels in all Unit A and Unit B wells at the Site (EPA, December 10, 1999).

Records provided by M&A indicate that O&M costs for the GRS have increased recently, chiefly because of improvements in O&M procedures, increased reporting requirements by EPA associated with the malfunctions, and increased monitoring requirements to investigate potential impacts from off-site pumping. Approximate annual costs for O&M of the GRS are summarized as follows:

1998	$91,075
1999	$135,069

These costs are said to include administrative costs and utility expenses at the Site.

4.3.1.2 Issues Regarding the O&M Plan for the GRS

Initial requirements for O&M were presented in the Groundwater Pilot Study Operation and Maintenance Manual (CRA and M&A, June 1995). The HSC is required to monitor both the hydraulic containment of contaminated groundwater and the effectiveness of the groundwater remediation system. As shown in Table 4-6, the O&M manual for the GRS established a schedule for monitoring the chemical and hydraulic data from all monitoring wells, and groundwater treatment system influent and effluent. In addition, it specified routine, scheduled inspection of equipment, including the functionality of wells and precast concrete vaults; the equipment in the Treatment Facility; the flow meters, pipes, and valves; and safety equipment and tools.

Results of monitoring and inspections have generally been submitted to the EPA by the HSC in the HSC's routine reports, on a monthly, quarterly, and annual basis. In addition, O&M needs have changed with modifications to the system and because of two failures of the GRS, which resulted in contaminated water being injected into Unit B (EPA, December 10, 1999), as discussed above in Section 4.3.1.1. During the five-year review technical interviews, several interviewees commented that the GRS O&M Manual needs to be revised.

In July 1999, M&A proposed revisions to the O&M Manual; the proposed revisions were reviewed by ADEQ and EPA. Correspondence regarding this issue (M&A, November 6, 1999) presents ADEQ requests for enhanced monitoring at the Site (e. g., monthly downloading of data loggers, an additional onsite monitoring well, additional monitoring of offsite wells, and GRS monthly sampling of influent and effluent) and other issues.

After consideration of M&A's proposals and ADEQ's comments regarding the adequacy of groundwater monitoring (M&A, November 6, 1999), EPA issued a request for immediate changes to monitoring frequencies, to continue until evaluation of the issue was further considered and resolved during the five-year review (EPA, December 10, 1999). As a result, EPA is now requesting that the HSC submit an addendum to the GRS O&M Manual that makes the following changes to monitoring and O&M schedules:

- Changes to the frequency of sampling for VOCs (1) From annually to semi-annually: MW-1UA, MW-1UB, MW-2UA, MW-2UB, MW-3UA, MW-3UB, MW-8UA, MW-9UA, MW-9UB, and MW-13UA (2) From semi-annually to monthly: GRS effluent (3) From semi-annually to quarterly: GRS influent

- Changes to the frequency of water level measurements (1) From annually to semi-annually: all Unit A and B wells (2) From annually to installation of pressure transducers and data loggers with quarterly downloading of data: MW-2UA, MW-2UB, MW-4UA, MW-6UA, MW-9UA, MW-9UB, and MW-15UB (3) From a previously unmonitored well to the installation of a pressure transducer and data logger with quarterly downloading of data: Well 55-518966 (the Robinson Well)

- Changes to the maintenance of the GRS to prevent carbonate build-up (1) Twice annually, the air stripper will be disassembled, inspected, and cleaned. If determined to be necessary, during disassembly, the air-stripper trays will be soaked in a trough filled with Baroid Aqua-Clear MGA, a 48 percent sulfamic acid solution that removes mineral buildup not otherwise removed by brushing and scraping. Following soaking, the acid is left in the trough to evaporate. Aqua- Clear will not be circulated through the system.

Further discussion of recommended O&M changes are provided in Section 7.1. However, in summary, it is recommended that this enhanced monitoring and O&M program be implemented for a period of one year and then be re-evaluated. As discussed in Section 7.1, an addendum revising the GRS O&M Manual should be submitted by the HSC, documenting all necessary O&M changes resulting from new equipment and monitoring or maintenance changes.

4.3.2 Operations and Maintenance of the Vadose Zone Remedial Component

O&M of the soil-vapor remedial component includes maintenance of both the landfill cap and the SVTS.

4.3.2.1 O&M of the Landfill Cap

Requirements for O&M of the landfill cap are provided in the O&M Manual for the Soil Cap (CRA and M&A, May 1995). Maintenance requirements for the cap include routine inspection, scheduled maintenance, unscheduled maintenance, and recordkeeping of those activities. They include inspection and maintenance of the access controls (fences, gates, signs, locks). Inspections of the cap are required annually and after severe storms, any required maintenance must be completed within 60 days. The log from the annual inspection of the soil cap has been included in the monthly data submittals, Progress Reports, and Annual Monitoring Reports submitted to the EPA.

Only minor repairs to the soil cap have been required since its construction. Minor damage and erosion caused by heavy rains required repairs to the cap in 1995, during the wet season after its construction, and on a few occasions thereafter. The eroded areas were reportedly repaired after each event by filling the eroded area with new soil and gravel, grading, and compacting the area to conform with the grade of the cap.

Costs for O&M of the cap have been minimal and have remained generally stable. The annual costs, which have been provided by M&A, are summarized as follows:

1998 $4,085

1999 $3,514

4.3.2.2 O&M of the SVTS

Requirements for O&M of the SVTS are provided in the O&M Manual for the SVTS (CRA and M&A, revised January 30, 1998) and the Soil Vapor Performance Standards Verification Plan (CRA and M&A, August 29, 1996). The monitoring program includes the following activities:

- Measurement of vapor flow and vacuum
- Measurement of VOC concentrations using PIDs and/or FIDs
- Emissions testing to comply with Maricopa County air emissions Rules 210, 320, and 330 (see Section 5.4 and Table 5-3)
- Collection of soil vapor samples for laboratory analyses (analytical methods and the summary of sampling results are presented in Tables 4 through 7)
- Collection of samples of wastewater and pipeline condensate for laboratory analyses

As previously mentioned, the SVTS experienced many operational problems during its two years of operation. Table 4-8 summarizes significant repairs, component replacements, and modifications. System operational uptime had increased, however, to more than 90 percent of the time, prior to its being shut down in September 1998. Table 4-9 summarizes the weekly operating times that were logged while the SVTS was in operation. The SVTS was initially shut down because the unit was damaged by a lightning strike in September 1998, and subsequently failed to meet the required destruction efficiency. Although the necessary repairs were made, the SVTS has remained shut down while EPA evaluates the potential formation of dioxins and furans.

Costs for O&M of the SVTS have been higher than originally anticipated, as a result of the many maintenance issues. In 1999, the annual cost for O&M decreased significantly because the system was not in operation. The annual costs for O& M have been provided by M& A and are as follows:

1998 $288,509

1999 $168,235

As discussed above, EPA is currently evaluating options to address soil-vapor issues in light of the agency's concern regarding operation of the SVTS.

4.3.2.3 Issues Regarding the O&M Plans for the Vadose Zone Remedy

The O&M Manual for the Soil Cap (CRA and M&A, May 11, 1995) has never undergone revision, but it appears to be functioning adequately to address the inspection and O&M needs of the soil cap. Checklists generated during the most recent cap inspection are provided in each subsequent Annual Monitoring Report.

The O&M Manual for the SVTS was revised in January 1998 (CRA and M&A, January 30, 1998), and included revisions to "Section 7.0 Maintenance Instructions." As shown in Table 4-8, the SVTS has experienced a variety of O&M problems, including problems with the heat exchanger, and various pumps, valves, and gauges. Furthermore, the system has at times failed to meet the required destruction efficiency. Currently, EPA is evaluating the possibility that soil-vapor clean-up goals may have been attained in areas of the Site capped with the FML. If that is the case, the EPA could approve full dismantling of the SVTS equipment. However, if EPA determines that the system should be restarted, outstanding O&M problems will be addressed as a part of start-up, and the system will again be required to meet destruction efficiency goals. In addition, EPA may then require monitoring for dioxins and furans as a part of re-starting the system. Consequently, whichever scenario occurs, there is a likelihood that the O&M Manual for the SVTS could require a second revision.

5.0 Five-Year Review Findings

The following sections discuss findings from the five-year review. Findings include information identified and evaluated during community interviews, technical interviews, an SI, a regulatory review, and during other data acquisition activities.

5.1 Community Interviews

Local residents, business owners, and school officials from the Hassayampa community, as well as concerned citizens, were interviewed regarding their knowledge of, or concerns about, the progress of the remedial activities at Hassayampa Landfill. The following people were interviewed:

- Glen Hickman, owner of Hickman Egg Ranch (HER) (interviewed on December 1, 1999)
- Steve Briddle, member of "Don't Waste Arizona" (interviewed on December 1, 1999)
- Mary Rose Wilcox, Maricopa County supervisor (interviewed on March 22, 2000)

5.1.1 Key Comments From the Community Interviews

Several of the interviewed members of the community had few or no questions or concerns regarding the remediation of the Site. However, Mr. Hickman, the owner of a business adjacent to the sanitary landfill property, said that he was uncomfortable with the slow progress of remediation, and commented that his business could be negatively affected if water use at his property is restricted because of its proximity to the Site. He is also considering purchasing another parcel of land near the Site, and is concerned about future use restrictions. In addition, Mr. Hickman expressed concern about the potential release of emissions containing dioxin, if the SVTS is put back into operation.

Ms. Wilcox stated that she had an interest in land reclamation of landfill property, in light of increasing development in the Hassayampa area. She expressed an interest in being notified regularly about activities at the Site, so that she could keep her constituents informed.

Other community residents were unaware of the existence of the Superfund Site until the time of the interview, but all were familiar with the location of the sanitary landfill, and knew that it had recently closed. The primary concern expressed during the community interviews was that all contaminants be contained within the boundaries of the Site.

5.2 Technical Interviews

From January 19 through January 21, 2000, the following individuals were interviewed in Phoenix, Arizona regarding their knowledge of, or concerns about, technical aspects of the remedy, and about issues related to operation and maintenance of the remedial components:

- Kris Kommalan, ADEQ
- Julie Linn, ADEQ
- Nancy Lou Minkler, ADEQ
- Ash Madhok, Maricopa County Department of Solid Waste Management

- Dale Lieb, Maricopa County Environmental Services Department, Air Quality Division (AQD)
- Greg Wallace, Assistant Director for Hydrology Section, DWR
- Bill Victor, M&A
- Dennis Hall, M&A
- John Lindquist, M&A
- Steve Quigley, CRA
- Don Robinson, CRA

On January 31, 2000, Mason Bolitho, DWR, was also interviewed, by conference call, from EPA offices in San Francisco.

5.2.1 Key Comments From the Technical Interviews

The following sections provide a brief summary of key comments by some of the technical contributors who were interviewed during the five-year review.

Arizona Department of Environmental Quality
Ms. Kommalan believes that land use in the Hassayampa area could change as a result of increasing industrial growth moving west from Phoenix. In addition, Ms. Kommalan has not been satisfied with the O&M reporting. She would like the HSC to generate more substantive and informative reports that provide interpretation of data and a conclusion section. She would also like the HSC to meet reporting due dates.

Ms. Linn suggested that the changing conditions at the Site, particularly construction of a production well on an egg ranch south of the landfill, could justify re-evaluation of hydraulic containment and reconsideration of monitoring requirements and reporting.

Ms. Linn said that the nearest irrigation well is about three-quarters of a mile to the northeast of the landfill; however, it is not in use. She commented that groundwater fluctuations observed during monitoring of Unit B at the Site may not be entirely the result of irrigation in the area, but may be influenced by seasonal precipitation and water use. She believes that previous water-level monitoring at the Site has been inadequate. She also thinks that the local basalt layer has not been studied closely enough, and could have played a part in impeding contaminant migration through the vadose zone.

Regarding the soil vapor component, Ms. Linn said that the vapor sampling protocol of HSC’s contractors needs to be improved. She said that the soil vapor sampling results (of emissions from the thermal oxidation unit) have been so inconsistent, sampling rounds cannot be compared to one another.

Ms. Linn said she has some concerns regarding the remedy. She wonders if the impermeable cap may assist in contaminant migration downward or laterally into the groundwater. In addition, she is concerned about the possibility of degradation of the aquifer as a result of reinjection, particularly in light of the two recent events of non-compliant injection into the Unit B.

Arizona Department of Water Resources

Mr. Wallace says that his primary concern, with respect to groundwater issues at the Site, is the possibility of construction of several new power plants planned for the Hassayampa area and their effects on the regional groundwater. He said that six new power plants have been considered for construction in the area. To date, two have received siting permits and two more applications have been proposed.

He does not believe the conditions at the Site have fully been defined, particularly the basalt layer. He believes there could be a separation between Units A and B, and that a good groundwater model would be helpful in better characterizing the Site conditions. In addition, he said he is concerned about the rationale for using reinjection into the Unit B as an aspect of the remedy.

Mr. Bolitho said that when the remedy was first designed and implemented, he thought it was an appropriate and adequate approach, partially because the Site was located in a very unpopulated area. However, now there is the potential for significant development in the area, and Phoenix is growing to the west. Consequently, he has become concerned about the groundwater treatment system's adequacy in light of future growth.

Maricopa County

Mr. Madhok of the Department of Solid Waste Management discussed the County's plans to establish a tire disposal facility at a 160-acre site north of the hazardous waste landfill. The County has submitted a request to the EPA to use uncontaminated water from the Site's groundwater extraction system for dust control at the future tire disposal facility.

He said that the proximity of the Site has not affected the County's decisions regarding either this new tire disposal facility or the sanitary landfill to the south. He said that because the County was identified as a primary responsible party at this Superfund site, they have routinely received reports regarding activities throughout the remedial action. Because the monitoring reports indicate that groundwater contamination appears to be contained, they have no concerns.

Mr. Lieb of the AQD mentioned that the AQD does not receive funding for any assistance that they might provide during remedial action at a Superfund site such as Hassayampa, making it difficult for the County to become significantly involved. He is concerned, however, that efficiency of the SVTS be maintained, if the system is started up again. If the SVTS is placed in operation again, Mr. Lieb stated that he would be concerned as to whether various equipment (e. g., scrubber) and systems (e. g., flowrate, pressure measurement, calibration) are working efficiently. He said that he presumes that Maricopa County Rules 200, 220, 241, 320, and 330 probably apply to processes at the Site.

Errol L. Montgomery & Associates, Inc.

Mr. Hall believes the GRS has functioned well and remarked on the high percentage (98 percent) of uptime for that system. He said the O&M manual for the GRS has been modified in the past, and requires more modifications now to reflect changes in electronic equipment and sampling requirements.

Mr. Victor said that the GRS O&M costs have remained relatively constant throughout the project. Manpower for O&M activities and laboratory costs have been the highest contributor to O&M costs.

Mr. Victor considers the groundwater remedy effective, and believes it was an overly conservative design. He believes the capture zone has been implemented as favorably as possible for the Site, and that containment has been effective. He believes that there is no evidence that the Hassayampa River has had a significant influence on the shallow groundwater beneath the Site; furthermore, the fluctuation in potentiometric levels in Unit B is likely due chiefly to the effects of groundwater pumping for irrigation. He believes the effects of the nearby Hickman production well have had only a nominal influence upon groundwater beneath the Site.

Conestoga-Rovers & Associates, Inc.

Mr. Robinson believes the RCRA cap is getting stronger with time, and that the minor erosion that has occurred after a few large rainstorms has not been detrimental to the effectiveness of the remedy. He has found the O&M manual for the cap to be adequate.

Mr. Robinson believes that because the soil vapor was sampled at the well head for characterization, it may not actually be representative of the contaminant mix that enters the SVTS as influent. He suspects that there is a higher concentration of non-targeted organic vapors, such as methane, within the soil vapor than has been presumed, contributing to operational problems with the SVTS system and a higher utilization than expected of products that supply the system, including propane and caustic soda. He commented that, with proper monitoring of influent, he believes that the SVTS system would perform adequately in the future.

Mr. Quigley believes the cap was over-designed and that the FML makes permeability almost zero. However, the purpose of the cap design, he believes, was not to eliminate percolation, but to control soil vapor. He regrets the decision to go with the FML, believing that the approach has been more expensive.

Despite the significant operational problems, Mr. Quigley believes that the SVTS has successfully removed contaminants from the vadose zone. He discussed what he considers to be a high percentage of uptime during the period in which the SVTS operated most consistently. He concurs with Mr. Robinson that, with improved influent monitoring, the SVTS system should perform adequately in the future.

5.3 Site Inspection

Representatives of EPA, ADEQ, M&A, and CH2M HILL took part in a Site inspection on January 19, 2000. During the inspection, remedial systems were inspected and groundwater monitoring efforts were observed. The inspection included the landfill cap, the groundwater extraction and treatment system, the soil vapor extraction and treatment system, and the Site security and controls. A summary of the inspection findings is presented below. A Site inspection checklist is provided as Appendix B.

Conditions during the inspection were favorable, with mild temperatures and no precipitation. Precipitation had not occurred at the Site in several days, so wet areas did not obscure observation of the landfill cap. Site vegetation was sparse, which also facilitated inspection of the cap and adjacent areas.

5.3.1 Inspection of the Landfill Cap

The landfill cap was found to be in generally good condition. With limited exceptions, the surface of the cap appeared to be well-compacted, free of significant cracking, and contoured to favorably enhance runoff toward the southeastern perimeter of the Site. Areas where there were constructed penetrations in the cap, including around monitoring well vaults and the concrete platform beneath the SVTS, appeared to be generally free of cracking or deterioration. In addition, the perimeter edges of the cap appeared in good condition and generally free of deterioration. There was no evidence of animal burrowing on the cap.

Only two areas of noticeable impact to the cap were observed:

- In the northeast corner of the landfill, an approximately 30-foot-long channel has been cut into the surface layer of the cap to serve as a cradle for PVC piping. The small-diameter piping is a component of the soil venting system. The cap has been excavated about 6 to 8 inches deep, but the FML was not visible in the excavation and did not appear to be affected.

- Cobbles have been placed on the surface of the cap, along the drainage swale, in the southeast corner of the landfill where minor erosion, probably the result of stormwater drainage, was evident. According to M&A, the minor erosion has decreased substantially since the cobbles were placed in the area. The FML did not appear to be impacted and was not visible.

Two low points in the cap are reported to pond occasionally after a heavy rainfall. These areas are located in the center of the cap and along the drainage swale that directs runoff toward the southeast perimeter. These two locations are the only areas in the landfill with significant vegetative cover; otherwise, vegetation is sparse. The surface cover of the cap was seeded as a part of the remedial action, and is reported to have been well-vegetated the first year after seeding. However, during successive years, growth has been sparse, occurring only in low spots briefly after a rainfall.

No other deterioration, evidence of intrusion, or deficiency was noted during the inspection of the landfill cap. The representative from M&A reported that the first year after construction, surface deterioration occurred in two discrete areas of the cap on the northwest and southeast corners of the landfill, following a rainstorm. The damage was said to have been repaired shortly after the event, and no signs of deficiency were currently noted in either area at the time of the inspection for the five-year review.

5.3.2 Inspection pf Soil Vapor Treatment System

Monitoring-well vaults, selected monitoring well heads, and the injection well heads and vaults were inspected. All visible well equipment and protective vaults appeared to be in good condition. The GRS equipment inside the Treatment Facility on the west side of the Site was also inspected. The air-stripper unit, equalization tank, influent and treated effluent piping, the sampling ports, electronic control panels, and other associated equipment, as well as the building itself, appeared clean, properly labeled where appropriate, and well-maintained.

The M&A representative was asked to demonstrate the effectiveness of the emergency back-ups of the GRS at the time of the inspection. He temporarily shut down the effluent pump, which caused the equalization tank to fill and the pumps for the extraction wells to shut down appropriately. Emergency lighting on the control panel was also properly illuminated. However, telephone communication, which is transmitted from the PLC via an automatic dialer on a land line to the M&A offices, either routinely or to alert M&A of emergencies, was delayed. The PLC ultimately did notify the M&A office of the change in status of the system, but only after a delay of several hours.

5.3.3 Inspection of Soil Vapor Treatment System

The aboveground PVC extraction piping, condensate removal ports, and the SVTS unit were visually inspected during the five-year review. The SVTS, which has not been in operation since 1998, was not operating at the time of the inspection, and has been partially decommissioned.

Generally, the system's aboveground PVC piping, as well as monitoring, injection and extraction well equipment, appeared to be in good condition at the time of the inspection. The piping appeared capable of continued use, should the SVTS again be made operational. However, several sections of the piping were inadequately supported off the ground by being propped up on, or secured to, loose stacks of wood blocks. In those areas, piping support appeared unstable and should be better secured, if the SVTS is put back in operation.

At the vapor treatment system, the scrubber stack had been covered with protective covering. Portions of electronic and other equipment in the venting system had been covered by a canopy, which was constructed to protect the equipment from heat. There were no apparent inadequacies observed during inspection of the venting and treatment equipment; however, the SVTS was not in operation at the time of the inspection.

5.3.4 Inspection of Site Fencing and Signage

The hazardous waste landfill Site is surrounded by a chain-link fence with barbed wire upper strands. The fence appeared to be in good condition at all locations inspected. Several warning signs were evident along the perimeter, written in both English and Spanish. In addition, at the entrance gate to the Site (one of three gates along the fenceline), an informational sign was affixed to the fence, identifying the landfill and providing a telephone number for contacting the EPA. This sign was in English only. Adjacent to the informational sign was a second sign, directing visitors to the Main Gate of the sanitary landfill, which is now closed. This second sign is clearly outdated, and should be removed. In addition, the telephone numbers on the informational sign should be checked to confirm that the numbers are still accurate.

The perimeter fencing and signage appeared to be in good condition and sufficient to discourage unauthorized access. However, it was reported that the area had been broken into twice during the past five years, resulting in the theft of tools and some small equipment parts. Tool boxes and the Treatment Facility have been made more secure as a result of the break-ins. No aspect of the remedy was undermined as a result of the break-ins.

The access roads to the Site are owned by Maricopa County and are only nominally maintained. The dirt road to the main Site gate is located partially on the sanitary landfill cover. Perimeter fencing around the sanitary landfill is not well maintained by the County, and there is evidence of vehicles driving into the Site and of illicit dumping.

5.4 Regulatory Review

This section provides a review of applicable or relevant and appropriate requirements (ARARs) and other standards to be considered “TBC” for the selected remedy at the Hassayampa Landfill Superfund Site. “Applicable” requirements are standards and other substantive environmental protection requirements promulgated under federal and state law that specifically address a circumstance at a CERCLA site, such as a hazardous substance, pollutant, contaminant, remedial action, or location. “Applicability” implies that circumstances at the Site satisfy all jurisdictional prerequisites of a requirement. “Relevant and appropriate” requirements are standards and other substantive environmental protection requirements promulgated under federal or state law that address situations sufficiently similar to a CERCLA site to be of use. “Relevance” implies that the requirement regulates or addresses situations sufficiently similar to those found at the CERCLA site.

“Appropriateness” implies that the circumstances of the release or threatened release are such that use of the standard is germane. TBCs are non-promulgated federal or state advisories or guidelines that are not legally binding and do not have the status of ARARs. However, TBCs may play an important role in the development of site-specific cleanup standards.

The ARARs presented in the ROD were reviewed for any changes, additions, or deletions. Any findings that differ from the ROD are explained. Generally, ARARs are “frozen” at the time of the ROD, and will not be revised unless new standards affect the protectiveness of the selected remedy.

5.4.1 Chemical-Specific ARARs and TBCs

Table 5-1 presents the updated chemical-specific ARARs and TBCs for water, arranged by chemical compound. The Safe Drinking Water Act (SDWA) MCLs are based on human consumption of water for drinking, cooking, bathing, etc. Economic considerations and technical feasibility of treatment processes are included in the justification for these levels. MCLs are applicable to drinking water at the tap pursuant to the SDWA, as are ARARs for treated water when the end use is drinking water. Pursuant to 40 CFR Section 300.430(e)(2)(i)(B), MCLs and non-zero Maximum Contaminant Level Goals (MCLGs) are relevant and appropriate as in- situ aquifer standards for groundwater that is or may be used as drinking water. A few MCLs and MCLGs have changed since the signing of the ROD, and the new standards are marked with an asterisk in the table. However, only one MCL specified in the ROD as a cleanup level has been proposed to be changed. As shown on Table 5-1, the MCL for trihalomethanes has been proposed to change from 100 to 80 micrograms per liter (ug/L). The constituent has never been detected at the Site at a concentration greater than 63ug/L. Although proposed rules will not be ARARs, as defined by 40 CFR Section 300.5, the proposed MCL for trihalomethanes also does not question the protectiveness of the remedy, and therefore does not support a change in the selected ARARs.

ADEQ Aquifer Water Quality Standards (ADEQ MCLs), established pursuant to A. R. S. Section 49-223, are identical to SDWA MCLs for the compounds detected in groundwater at the Site. Since ADEQ MCLs are not more stringent than the SDWA MCLs, the ADEQ standards are not ARARs and are not included in Table 5-1.

ADEQ HBGLs for groundwater are TBCs for the Site. The HBGLs are derived from calculations based on ingestion of groundwater. The HBGLs have not been promulgated. Nonetheless, ADEQ HBGLs were selected as cleanup standards only for chemicals for which no SDWA MCLs or MCLGs existed. The ADEQ HBGLs for the Site have not been changed since the signing of the ROD.

Federal Health Advisories, which are criteria developed by either EPA’s Office of Drinking Waters Health Advisory Program or the National Academy of Sciences (NAS), were considered at the Site. The Federal Health Advisories are based on NAS-suggested Non-Adverse Response Levels at which no known or anticipated adverse human health effects would occur, given an adequate margin of safety. These Federal Health Advisories were not selected as cleanup standards, because they were less stringent than the SDWA MCLs and ADEQ HBGLs. Some TBCs, identified in Table 5-1 with an asterisk, have changed, but they do not affect the protectiveness of the selected remedy, and therefore do not support a change in the selected remedy standards.

5.4.2 Location-and Action-Specific ARARs and TBCs.

Table 5-2 provides the updated location-specific ARARs and TBCs for the Site. The table shows that revisions in the state and federal regulations did not affect the location-specific ARARs and TBCs in the ROD.

Table 5-3 presents the updated action-specific ARARs and TBCs for the Site. Changes in local, state, and federal rules and regulations were reviewed to determine whether the changes suggest a question of the protectiveness of the remedy at the site. Table 5-3 provides the action, requirements, prerequisites, citations, and comments in the ROD for each ARAR and TBC, with revisions, if applicable. The table also updates ARARs from the original ROD.

The Arizona Aquifer Protection Permit Program (Title 18, Chapter 9, Article 1) was reviewed with regard to the reinjection of treated groundwater in the drinking water aquifer at the site. This program is composed of several permits required for compliance, but CERCLA response actions generally are not subject to procedural permit requirements, as stated at 42 USC Section

9621(e). Therefore, the permit program is not an ARAR or TBC. However, substantive requirements of the program may be ARARs.

The review of action-specific ARARs indicates that the injected water from the GRS does not meet MCLs for nitrates, although regulations under the Underground Injection Control (UIC) Program (under Part C of the Safe Drinking Water Act) require MCLs to be met. But reinjection was approved by EPA because investigations conducted by HSC during the RI indicated that nitrate concentrations in Unit B exceeded those in the Unit A groundwater at five of seven paired wells sampled at the time. Reportedly, nitrate concentrations detected from Unit A and B monitoring wells are not unusual for nitrate in groundwater in the Hassayampa regional area, and were not considered to be the result of waste disposal operations at the Site (M&A, October 1991). As stated at Section 104(a)(3), CERCLA remedial actions do not provide direct remediation for naturally occurring substances where the substances are naturally found. Furthermore, assuming that the nitrates are not naturally occurring, because they may be the result of agricultural discharges, reinjection of Unit A groundwater to Unit B does not further degrade the quality of the aquifer.

An evaluation for injection of the extracted groundwater after treatment is documented in the technical screening memorandum (M&A, October 1991). The evaluation concluded that injecting into Unit B was most practical because of the higher permeability of Unit B than of Unit A. Injection into Unit A would have required more injection wells and higher operating and maintenance costs. In addition, it was concluded that general groundwater water quality should not prohibit injecting Unit A groundwater into Unit B, because laboratory results indicated that chloride, sulfate, nitrate, and total dissolved solids concentrations were higher in the deeper Unit B groundwater than most of the sampled locations in Unit A. Injecting Unit A groundwater into Unit B would not further degrade groundwater at the point of compliance.

5.5 Document Review

As a part of the five-year review process, CH2M HILL conducted a brief, cursory review of numerous documents related to site activities. The documents chosen for review primarily focused on operational issues that have occurred during the past five years, but ranged in publication date from 1991 to the present. Appendix A provides a summary of the reports, memorandums, and other correspondence reviewed, and serves as the reference list for documents cited in this report.

In general, the documentation submitted by the HSC and their contractors appeared to have been clear, complete, and with adequate presentation of the technical issues under consideration. The Health and Safety Plan (CRA and M&A, June 1995) still appears protective, and other key documents remain adequate, with the exception of the O&M manuals for both the GRS and the SVTS (CRA and M&A, revised January 30, 1998). Both O&M manuals will require updates and revisions when EPA resolves issues regarding the future use of the SVTS and future groundwater monitoring requirements. Some general concerns and deficiencies were noted during the document review, however, and they are itemized below:

- Intermittently, during the remedial action, a majority of the annual progress and monitoring reports have been issued significantly late. Timeliness with submittal of annual reports was of concern to ADEQ personnel, who were interviewed during the five-year review. Annual Monitoring Report(s) Nos. 3 and 4 were submitted 7 and 14 months after the reporting period, respectively (M&A, July 31, 1998 and February 29, 2000). Annual Monitoring Report No. 5 was submitted almost four months after the reporting period (M&A, March 22, 2000). However, until recently, there were no submittal deadlines for annual reporting under the Consent Decree. On October 12, 2000, EPA established, for the first time, a due date for Annual Reports, which are now required to be submitted within 90 days after the end of the reporting period (EPA, October 12, 2000).

- The schedule given in the Consent Decree for submittal of Progress Reports has varied during the project: monthly, through January 1998; quarterly, through April 1999; and semi-annually, to the present. On October 12, 2000, EPA approved modifying the schedule for progress reporting to coincide with the calendar year (EPA, October 12, 2000).

- The HSC generally reports O&M problems or other issues of concern to the EPA in letter correspondence generated by M&A. The annual monitoring reports then typically itemize correspondence that has occurred during the reporting period, allowing HSC to reference the correspondence list and summarize events. During the technical interviews, several people complained about the lack of detail in the HSC’s periodic monitoring reports, and requested that more in-depth discussion of problems and corrective actions be provided.

5.6 Changes in Land Use

Several additional issues regarding changes in land use were identified during the interviews and document review activities associated with the five-year review.

5.6.1 Maricopa County Request for Dust Control Water

According to Mr. Madhok of the Maricopa County Department of Solid Waste Management, who was interviewed during the five-year review, the County has procured from the Bureau of Land Management about 160 acres immediately north of the Site. The County intends to construct a tire disposal facility on approximately 100 acres of this land. According to Mr. Madhok, the facility will probably be constructed in 2003, although it could potentially occur next year, if the lease is not extended at the present (offsite) location. The facility will consist of 40 cells that will be graded to provide stormwater drainage. Two employees will work there during the day, and one guard will be present at night.

The County’s request for use of water from the Site for dust control at the proposed facility was submitted to EPA through M&A (M&A, February 8, 2000). EPA has granted the request, within the parameters that routine water use will be a maximum of 8,000 gallons per day during normal operations, and approximately twice that during construction. This is a use rate of about 9 acre-feet per year (af/yr), which EPA has acknowledged is less than the 10 af/yr limit imposed by DWR for exempted wells. EPA has approved the use of treated effluent from the GRS as the primary source of water for dust control while the SVTS is not operating. In addition, EPA has approved the use of water extracted from monitoring well MW-15UB as a backup water supply during construction if the GRS is shut down for repairs, or if the SVTS begins operations again in the future, thereby requiring make-up water from the GRS. The County has requested to store up to 24,000 gallons of the water at their tire facility for use as a fire suppressant (EPA, March 30, 2000).

EPA will develop an Explanation of Significant Difference from the ROD to finalize this approval for water use. However, EPA has also requested that Maricopa County, which is the well owner of MW-15UB, contact the Arizona Department of Water Resources, Water Management Support Section, to notify them of the change of the well's use to that of a production well. In response to the monthly monitoring requirements specified as a condition in EPA's March 30, 2000 approval for use of GRS effluent for dust control, the County has requested that the primary water supply for dust control operations be changed to well MW-15UB.

5.6.2 Impact From Hickman Egg Ranch Water Production Well

The HER is located on approximately 155 acres of property just across the Buckeye-Salome Highway from the sanitary landfill and, consequently, less than one mile southwest of the Site (Figure 26). The business, which involves raising chickens for the production of eggs, purchased the property in 1997 and has initiated significant development and construction on the property.

There was an existing well on the HER property, screened into Unit A and Unit B and capable of pumping 350 gpm, that was already present on the property at the time of the HER purchase. However, in August 1998, the HER submitted an application to DWR for a permit to drill a larger production well, to be screened into Unit B. The new well would increase the HER's pumping capacity to 500 gpm and increase the annual volume of water permitted for use from 22 af to 95 af (ADEQ, March 17, 1999). The HER's additional water production was needed for cooling the hen houses and supplying drinking water for human and livestock consumption at the business.

The new well location is on the southwest portion of the HER property (Figure 26). It is presumed that the smaller, previously existing well is still functional and capable of providing backup to the new production well. The approximate locations of the two wells are shown on Figure 8.

During review of the HER application, ADEQ completed an initial groundwater modeling of the potential impact to Site wells, using EPA WHPA Version 2.2, but based on very conservative parameters, including a presumption that the proposed HER well would be placed as close to the Site as possible. The model indicated that potential groundwater particle interference between the landfill wells and the proposed HER production well would occur between 10 and 15 years (ADEQ, March 17, 1999). In addition, a pump test was run on the HER existing well from June 24 through July 6, 1998. The results of the pump test from the existing well, which is located several hundred feet closer to the Site than the new production well, indicated that the "... water level in the Unit B landfill wells was clearly impacted...." (ADEQ, March 17, 1999).

Later, in March 1999, ADEQ completed a second groundwater modeling with revised information, including the revised location of the well and with parameters to simulate the most probable conditions. The results indicated that the proposed HER well could influence the GRS extraction wells under some circumstances. ADEQ's report to EPA provided recommended potential actions, including that a three-dimensional groundwater model be conducted to demonstrate that capture of contaminants at the Site will not be compromised (ADEQ, March 17, 1999).

Drilling of the new HER production well was completed in April 1999. Correspondence regarding potential impacts from the new well was generated during the following months. In September 1999, a meeting occurred with attendees from HER, ADEQ, DWR, EPA, and HER's technical consultant, Miller Brooks Environmental (Miller Brooks). In a subsequent letter to ADEQ, Miller Brooks discounted significant influence from the HER well on the Site's groundwater, and itemized several concerns that HER and Miller Brooks had about the remedy (Miller Brooks, November 4, 1999).

In March 2000, M&A submitted results of its own estimates of the influence of the HER production well on the Site groundwater, concluding: "Analysis suggests long-term drawdown impact on hydraulic head in Unit B would be relatively small, but could possibly cause perched groundwater conditions in Unit A in the FHWDA [former hazardous waste disposal area] in the time frame of the groundwater remediation" (M&A, March 20, 2000).

During the five-year review interviews, Mr. Victor of M&A said that, currently, there is no evidence that the HER production well has been affecting the Site groundwater. He believes any future effects on Unit A will be minimal at the current rate of pumping. He is aware of a continuing fluctuation in levels in Unit B, but does not believe it is due to the HER well. Nor does he believe that HER is currently influencing Unit A. In addition, during the technical interviews, both Mr. Wallace and Mr. Bolitho of DWR said that the HER production well, at the current pumping rate, should not affect groundwater at the Site.

During 1999, the HER began considering purchase of additional property located a short distance north of their existing operations. The property (locally referred to as the Frankel property) is adjacent to the Hassayampa Landfill (just across the Salome Highway), approximately 1,500 feet west and southwest of the Site. HER requested EPA's position on possible construction of a new water supply well on the Frankel property, should HER purchase the land for expansion of its business.

In early 2000, EPA considered the HSC's evaluation of a new well on the Frankel property. The HSC concluded that it would not oppose a new well if it were located as far as possible from the Site, and if the upper part of the aquifer, which is correlative with Unit A at the Site, is sealed from the well (Steptoe and Johnson, March 27, 2000). Stating similar restrictions on well location and construction, EPA concurred, saying that it would not oppose a new Frankel property well, based on the discussions with the State agencies and the HSC, and on its current understanding of both the Site and Frankel property conditions (EPA, March 29, 2000).

5.6.3 Changing Regional Conditions

During the five-year review, one of the concerns expressed by several people during the interviews was the increasing industrialization occurring in Maricopa County that could potentially affect water use in the area. Several interviewees mentioned that industrial growth appears to be moving to the west of Phoenix. Within the past five years, the HER has been constructed within one mile of the Site, but other, more extensive development is planned within the region. In recent correspondence with EPA, M&A presented an estimated annual amount of groundwater withdrawals by three new power generating stations being developed in the area (M&A, March 20, 2000). Their estimates were based upon information obtained from DWR. According to M&A's summary of information provided by the Arizona Department of Water Resources, "the generating stations that are in the general vicinity of the Site and that could potentially impact Unit B at the Site include: 1) the 2,120-megawatt Red Hawk Plant, developed by Pinnacle West Capital Corp.; 2) the 500-megawatt Arlington Valley Plant, developed by Duke Energy North America; and 3) the 1,000-megawatt Harquahala Generating Station, developed by PG&E Energy Services."

Approximately 8,000 acres are said to be controlled by these three generating stations, which are located to the west of the site, near the Palo Verde Nuclear Generating Station. In its summary of information, M&A continues by estimating groundwater demand from the new generating stations, using the design capacity and associated water requirement provided by DWR. "This method assumes that 6,000 af/yr are required for each 1,000 megawatts of plant capacity. The combined design generating capacity reported for these stations is 3,620 megawatts. The corresponding water demand would be about 22,000 af/yr, or an average total pumping rate of about 13,500 gpm" (M&A, March 20, 2000).

6.0 Assessment

The following conclusions support the determination that the remedy at Hassayampa is expected to be protective of human health and the environment upon completion.

6.1 Functioning of the Remedy as Intended by Decision Documents

Deed restrictions are in place, and institutional controls have been implemented at the Site. Although there have been incidents of trespass, generally, the fencing and gates appear to be adequate and are functioning as intended.

The RCRA cap over the former hazardous waste disposal area appears to be in good condition. It also appears to be providing an adequate barrier for preventing direct contact with contaminated waste, for reducing infiltration of water, and for reducing the release of VOCs into the atmosphere.

One measure of GRS effectiveness is hydraulic containment of contaminants in the Unit A groundwater. Routine monitoring of water levels and of COPCs in groundwater indicate that lateral hydraulic containment is occurring. The plume of VOCs in groundwater is depicted by detected VOC concentrations from groundwater monitoring and extraction wells. For the period of record, the plume has been relatively stable but influenced by the GRS. Based on the groundwater level contours illustrated in HSC reporting, the GRS has created an area of depressed water levels, referred to as a cone of depression, centered around the extraction wells (EW-1UA, EW-2UA, EW-3UA, EW-4UA). It appears that this depressed water level area creates a zone of capture for contaminants in Unit A groundwater. In addition, it appears that the VOC plume has migrated laterally to the south toward the GRS, also indicating that capture is taking place.

Secondly, the efficiency of the GRS system may be evaluated by considering the mass of VOCs removed. According to the HSC's contractor, about 33 pounds of VOCs have been removed in Unit A by the GRS from 1994 through 1999 (M&A, March 22, 2000). Consequently, it appears that the overall effectiveness of the GRS is adequate and generally functioning as intended by the design documents. At this time, it is uncertain if the GRS will meet the performance standards in a reasonable time period. Therefore, groundwater concentrations will continue to be evaluated by the monitoring program.

Despite a variety of O&M problems (discussed in Section 4.2.2), the SVTS appears to have functioned as intended when it was in operation. Concentrations of COPCs in soil vapor have decreased significantly at the Site. Present concentrations of most COPCs at most vapor wells have been reduced from approximately 50 percent to 1 percent of levels detected in December 1993 (M&A, May 18, 2000). While EPA evaluates the protectiveness of the soil vapor performance standards and whether the performance standards have been met, the SVTS is not in operation, and has been partially decommissioned. During its period of performance, the unit experienced various mechanical malfunctions and required several modifications and repairs, resulting in significant operational costs. In early 1999, the EPA requested that the unit be shut down because of concerns regarding the potential emissions of dioxins and furans. In the coming months, EPA will be evaluating the soil-vapor performance standards and soil-vapor sampling results to determine the status of future system operations.

6.2 Current Validity of Assumptions Used During Remedy Selection

The assumptions used to implement the remedy are generally unchanged from the time of the remedy selection. However, ADEQ has recently questioned the protectiveness of the soil vapor performance standards. In 1996, both EPA and ADEQ approved of the use of the SESOIL model for determining the soil vapor performance standards. ADEQ has recently questioned the applicability of the SESOIL model to the Site, and correspondingly, the protectiveness of the soil vapor performance standards. ADEQ's concerns are currently being evaluated and a final decision on the use of the SESOIL model and the protectiveness of the soil vapor performance standards will be documented in an addendum to this Five-Year Review Report. Additionally, there is now a potential change with regard to regional groundwater demand. There appears to be less groundwater demand for meeting traditional regional agricultural needs, but a growing need for industrial water use in the area as a result of increasing development. Future construction of power plants near the Site may require large volumes of process water. The potential installation of new production wells locally, such as the HER production well, and their effects on the GRS may require further consideration if industrial development continues.

6.3 Recent Information Affecting the Remedy

EPA has conducted an evaluation of the SVTS, specifically the thermal oxidizer, with respect to potential formation of dioxins, the by-products of incomplete combustion. The findings indicate that under stable operating conditions, the thermal oxidizer would be expected to generate minimal dioxins. However, the instability of the combustion process and variability of concentrations in the SVTS effluent indicate that dioxin-formation conditions may exist. As such, a recommendation was made to sample for dioxins if the SVTS were to be put back into service (EPA, April 21, 1999).

Because of incidents of malfunction in the air-stripping treatment system which allowed untreated groundwater to be injected into the drinking water aquifer, the GRS effluent is now being monitored monthly. To ensure protection of the Unit B aquifer, EPA has requested this increased monitoring of the effluent, as well as annual service of the air stripper. This request also appears appropriate, considering the possible use of groundwater for dust control by the County.

7.0 Conclusions and Recommendations

The following sections summarize conclusions and recommendations from the five-year review. Where follow-up action is required, Table 7-1 identifies the recommendation, the follow-up action to be conducted, and the proposed date for its completion.

7.1 Issues Related to Groundwater and the GRS

Four key GRS and groundwater issues were identified during the five-year review:

- An issue that generated considerable debate during the technical interviews involved the suggestion for conceptualization of the hydrogeologic conditions at the Site, using a three-dimensional computer model. This would allow assessment of vertical leakage, connectivity of Units A and B, potential mass transport, capture zone from current pumping rates, and evaluation of offsite pumping scenarios. Based on this concern, the HSC’s contractor prepared a memorandum entitled Potential Impacts and Proposed Modeling of Off-Site Groundwater Pumping (M&A, March 20, 2000). This document concluded that long-term drawdown effects of additional off-site pumping from Unit B would be relatively small, but could potentially cause Unit A to become separated or perched. Based on the calculations presented in the memorandum, there is a potential for increased vertical downward migration of the contaminated Unit A groundwater caused by long-term off-site pumping.

  The memorandum also concluded that a model currently would not provide useful information, but states that modeling should be reserved for potential future use, if conditions and available data warrant such an effort. However, hydrographs of the region indicate that regional roundwater levels have changed over time. In addition, as noted, several power-generating stations are planned for the area, potentially increasing use of groundwater in the region significantly. Therefore, it will continue to be important to evaluate the effects of offsite groundwater pumping and its effect upon the GRS. If modeling is not conducted at the present time, it is recommended that, minimally, the mass of VOCs in groundwater be calculated, and that the transport be estimated based on existing and potential future conditions. The M&A memorandum states that if the ongoing monitoring program should detect a change in groundwater conditions, suggesting that migration of VOCs to Unit B has occurred and could potentially move offsite, then an appropriate corrective action should be designed.

The O&M Manual for the GRS (June 1995) requires the development of a contingency plan if certain conditions are met, including “... if results of monitoring groundwater in Unit B indicate a significant impact to Unit B...”. The manual also identifies potential contingency actions. At this time, it does not appear three-dimensional hydrogeologic modeling is warranted; however, this conclusion should be revisited if groundwater conditions change. The hydrogeologic effects of the installation of new production wells in the vicinity, and the growing demand for regional groundwater use by industry will continue to be important to evaluate and plan for.

- A second issue of concern with regard to groundwater at the Site is the evaluation of the GRS efficiency by measurement of mass removal. Efficiency of the GRS may better be evaluated by considering the rate of VOCs removed from the groundwater in comparison to the total estimated mass of VOCs in groundwater beneath the Site. According to M&A, approximately 48 pounds of VOCs were removed by the GRS from 1994 through 2000. They have also estimated the total mass of VOCs in groundwater based on April 2001 groundwater monitoring to be approximately 60 pounds. Based on these estimates, it would appear that the GRS has been effective in removing mass relative to the estimated total remaining mass. This evaluation should be updated in future annual reports.

- A third issue relates to efficient operations of the GRS. GRS uptime has improved over time and was at more than 93 percent during the year 2000. In 1999, however, the GRS was shut down 22 percent of the time (M&A, February 29, 2000). Efforts should be made to improve operational performance of the GRS to increase operating time and to minimize the risk of release of untreated effluent. As a result of past O&M problems with the air- stripper unit, the GRS effluent is now being monitored monthly. To ensure protection of the groundwater, it is recommended that monthly monitoring of the GRS effluent be continued and that the increased monitoring frequency being considered (see Section 4.3.1) be implemented. Because of carbonate buildup and blockage of the air-stripping unit, it is also recommended that annual servicing of the air stripper be continued.

- The fourth issue is that the GRS has slowly depressed the water levels within Unit A, potentially dewatering the contaminant zone. The water table will equilibrate to its former level when the GRS is concluded. It is unknown what effect this zone will have on groundwater after the GRS is stopped and the water table equilibrates to its former elevation. Additionally, based on a review of water levels and VOC concentration trends over the period of monitoring, it appears that VOC concentrations in Unit A groundwater have increased during some periods of higher water levels, suggesting a possible contaminant zone above the water table. (As previously discussed, VOCs appear to be limited to the Unit A groundwater). An evaluation of potential contamination of the former and current capillary fringe zone should be completed, including an evaluation of how water level effects water quality.

  The hydrographs in Figure 17 indicate that during periods where Unit B groundwater has increased in elevation there has been a corresponding increase in Unit A groundwater elevations. Most evident are the increases in water levels during late 1992 to 1993, 1995, late 1997 to early 1998, and late 1999 to early 2000. Figures 19 and 20 illustrate the concentrations of detected VOCs over the period of monitoring. During this monitoring period, there have been several occasions where VOC results have increased. The most noticeable periods were during late 1992 to 1993, late 1995 to early 1996, 1997, and late 1999 to early 2000. These periods of increased VOC concentrations appear to also be periods when the water levels in Unit B and Unit A have increased.

7.2 Issues Related to Soil Vapor and the SVTS

EPA is currently evaluating options for the future approach to the soil vapor treatment remedy. Use of the SESOIL model for determining the soil vapor performance standards was approved in 1996. ADEQ has recently questioned the applicability of the SESOIL model to the site, and correspondingly, the protectiveness of the soil vapor performance standards. ADEQ's concerns are currently being evaluated, and a final decision on the use of the SESOIL model and the protectiveness of the soil vapor performance standards will be documented in an addendum to this Five-Year Review Report. In 1999, EPA requested that the HSC evaluate the potential risk posed to groundwater from residual contamination in the vadose zone. Consequently, the HSC conducted soil- vapor sampling and re-evaluation modeling (M&A, May 18, 2000), which incorporated current Site conditions, including the existence of the soil cap, into the model. Tables 7-2 and 7-3 summarize projected peak concentrations in groundwater from maximum COPC concentrations in soil-vapor samples from 2000 and 1993. Table 7-2 summarizes the sampling and re-evaluation modeling that led to the following conclusions:

- Initial post-shutdown sampling conducted in February and April 2000 indicated that, although asymptotic levels have not been reached, performance standards, determined using the SESOIL model, appear to have been achieved in the areas capped with the FML.

- The recent soil-vapor sampling confirmed that an uncapped area located along the northern perimeter of the Site, near the former Pit 1 disposal area, has not met the performance standards, determined using the SESOIL model. In the 1994 vadose modeling, four areas of the site were delineated and modeled separately, with each area assigned a "vadose zone polygon" and associated groundwater mixing cell, to project contaminant concentrations in groundwater resulting from residual concentrations in soil vapor (M&A, May 24, 1994). The Pit 1 polygon included an area centered on Pit 1, where basaltic lava-flow rocks occur in the subsurface at the base of the vadose zone. The basalt layer dips to the northeast and decreases in thickness until it pinches out northeast of the Site. Based on the orientation and density of the basalt layer, there is a potential for this unit to impede vertical migration and influence horizontal migration of contaminants along this less permeable basalt layer toward the northeast. Although VOC concentrations in groundwater near Pit 1 have been largest at the abandoned monitoring well HS-1, VOCs have not been detected and confirmed, except for acetone, at monitor well MW-11UA, north from Pit 1 in a "window" where the basalt layer does not occur. Acetone was only detected at this well (at concentrations below the performance standards based on the SESOIL model) in samples obtained during well development and the pumping test, and was attributed to the drilling fluids used to construct the well.

The Pit 1 polygon is capped on the south end, but uncapped on the north end. The HSC is currently evaluating options to address the uncapped area, including:

- Extension of the FML cap or a soil cap over the appropriate part of the uncapped Pit 1 polygon area

- Construction of a system of passive vents in selected capped and uncapped locations, to promote remediation of the uncapped area

- Treatment of vapors in the uncapped areas with carbon absorption

EPA will determine the appropriate remedial approach for the vadose zone after the evaluation of the protectiveness of the soil vapor performance standards, evaluation of the four soil vapor confirmation sampling events, and at the conclusion of HSC's evaluation of these options.

7.3 Issues Related to the Landfill Cap

Currently, significant erosion of the soil cap as a result of either wind or rain does not appear to be a problem. However, the cap design does provide for a fertilized and hydroseeded vegetative cover to encompass the upper 6 inches of the soil cover (CRA and M&A, January 1994). At the time of the site inspection, only limited areas of the cap had any apparent vegetative growth. With the extreme aridity of the Hassayampa area, it is unlikely that extensive cap vegetation can be induced to be successful without considerable expense. However, an attempt to encourage limited vegetation should be attempted, should erosion ever become of concern on the cap.

7.4 Issues Regarding the Document Review

Comments from interviewees and results from the document review during the five-year review indicate that the quality of the progress and annual reporting could be improved. Recommendations include:

- Confirm that incidents involving O&M problems are described and corrective actions are discussed in progress reports

- Confirm that issues involving compliance are described and corrective actions are discussed in Progress Reports

7.5 Issues Related to Changes in Land Use

Based on the potential future land use changes that may occur, as documented in Section 5.6 of this report (i. e., Maricopa County's request for dust control water, impact from HER production well, and other changing regional conditions), some issues have resulted. The request by Maricopa County is resulting in a need for EPA to develop an Explanation of Significant Differences (ESD) to finalize approval for this water use. It appears that for the other two potential changes to groundwater use within the area, the revised O&M requirements should be able to determine major impacts that might affect future remedy protectiveness.

8.0 Protectiveness Statements

The results of the five-year review indicate that the groundwater remedy and the soil cap portion of the vadose zone remedy have remained protective of human health and the environment. However, a protectiveness determination of the soil-vapor treatment portion of the vadose zone remedy cannot be made at this time. Further evaluation of the current soil-vapor performance standards is necessary to determine whether they are protective of groundwater. It is expected that this evaluation will take approximately six months to complete, at which time the protectiveness determination will be made.

The GRS has proven effective at hydraulic containment and mass removal of contaminants. Routine monitoring of groundwater indicates that lateral hydraulic containment is occurring. In addition, approximately 48 pounds of VOCs were removed by the system from 1994 through early 2001. There has been several incidents of non-compliance related to maintenance problems, but overall it appears that the effectiveness of the GRS is adequate and generally functioning as intended by the design.

The cap over the former hazardous waste disposal area was found to be in good condition and meeting the design goals of providing a barrier to prevent contact with contaminated waste, reducing the infiltration of water, and reducing the release of VOCs into the atmosphere.

EPA is currently evaluating the protectiveness of the soil-vapor performance standards. Use of the SESOIL model for determining the soil-vapor performance standards was approved in 1996. However, ADEQ has recently questioned the applicability of the SESOIL model to the Site, and correspondingly the protectiveness of the soil-vapor performance standards. ADEQ will submit a letter to EPA documenting its concerns with the use of the SESOIL model at this Site. The HSC will be given an opportunity to respond to ADEQ’s concerns before EPA will then make a final determination of the appropriateness of using the SESOIL model at this Site to determine the soil-vapor performance standards.

Following a determination of the protectiveness of soil-vapor performance standards, the ongoing evaluation of attainment of the soil-vapor performance standards will be completed. The SVTS, which has not operated since March 1999, may resume operation if current contaminant levels in the vadose zone are found to pose a threat to groundwater, according to the agreed to performance standards. While the SVTS has not been operating, the landfill cap has remained protective as a barrier, and the GRS has maintained hydraulic containment and mass removal.

This Site requires ongoing five-year reviews to ensure that protectiveness is not compromised. The next review will be conducted within five-years of the completion of the final Five-Year Review Report.

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TABLES

TABLE 4-1
Summary of Laboratory Chemical Results for Common Constituents and Routine Parameters in Water Samples from Groundwater Wells and Groundwater Remediation System Air Stripper Influent and Effluent
Hassayampa Landfill EPA Superfund Site

SAMPLE SOURCE[a]	SAMPLE IDENTIFIER FIELD	SAMPLE IDENTIFIER LAB	DATE SAMPLED	Ca	Mg	Na	K	CO_3	HCO_3	Cl	SO_4	NO_3	NH_3	F	PO_4	P	Alk	SiO_2	TDS	LAB EC (μmho/cm)[c]	LAB pH
				COMMON CONSTITUENTS[b] (milligrams per liter)																	
EFFLUENT	002414	100264678	11-03-94	26	10	170	1.8	14	278	98	100	10.0	---	4.0	---	---	240	31	610	1,000	8.6
EFFLUENT	002429	100283479	11-30-94	---	---	---	---	---	---	---	---	11	ND	---	ND	ND	---	---	---	---	---
EFFLUENT	002759	100372340	12-14-95	34	15	180	ND	ND	293	120	110	12.5	0.2	2.6	ND	ND	240	32	650	1,200	8.4
EFFLUENT	001357	100209856	12-04-96	38	16	190	ND	ND	268	150	93	16	ND	2.0	---	ND	220	32	710	800	8.5
EFFLUENT	002918	70908793	03-06-97	---	---	---	---	---	---	---	---	---	---	---	---	0.104	---	---	---	---	---
EFFLUENT	002942	10440964	12-17-97	36.6	15.7	187	3.29	ND	304	124	84.1	13.7	0.166	2.55	---	ND	249	31	682	1,090	8.5
EFFLUENT	000780	10103334	12-21-98	37.2	16.1	186	2.62	---	---	---	---	---	---	---	---	---	---	---	---	---	---
EFFLUENT	000781	101033843	12-21-98	---	---	---	---	---	---	---	---	17.2	---	---	---	---	---	---	---	---	---
EFFLUENT	000782	101033868	12-21-98	---	---	---	---	ND	282	---	---	---	---	---	---	---	231	---	685	1,070	7.8
EFFLUENT	000785	101033892	12-21-98	---	---	---	---	---	---	---	---	---	ND	---	---	---	---	---	---	---	---
EFFLUENT	*EFFLUENT*	*PHL01619*	*12-21-98*	*37*	*16*	*210*	*ND*	---	---	---	---	---	---	---	---	---	---	---	---	---	---
EFFLUENT	000806	101109163	02-09-99	40.1	17.9	202	ND	ND	275	156	92.1	---	---	2.87	---	0.29	225	37	682	1,140	8.4
EFFLUENT	000917	PIK0254-01	11-15-99	39	17	190	ND	7.2	268	160	100	18	1.4	2.0	ND	0.19	230	34	760	1,200	8.58
EFFLUENT	003177	PJJ0337-03	10-18-00	39	16	190	1.2	12	268	140	84	15	---	2.0	---	ND	230	35	720	1,200	8.46
EFFLUENT	003221	PJK0256-03	11-15-00	---	---	---	---	---	---	---	---	16	---	---	ND	---	---	---	---	---	---
INFLUENT	002412	100264660	11-03-94	27	10	180	1.3	ND	293	92	100	---	---	2.2	---	---	240	30	610	1,000	7.8
INFLUENT	002427	100283452	11-30-94	---	---	---	---	---	---	---	---	11	ND	---	ND	ND	---	---	---	---	---
INFLUENT	002761	100372382	12-14-95	34	15	180	0.69	ND	293	130	110	16	ND	2.5	ND-	ND	240	32	650	1,180	7.8
INFLUENT	001359	100209864	12-04-96	36	16	190	ND	ND	305	160	90	16	ND	1.9	---	0.08	250	31	690	790	7.8
INFLUENT	002916	70908785	03-06-97	---	---	---	---	---	---	---	---	---	---	---	---	0.1	---	---	---	---	---
INFLUENT	002940	10440956	12-17-97	34.8	15	184	ND	ND	270	121	84.2	13.7	0.172	2.58	---	ND	221	31.7	657	1,100	7.8
INFLUENT	000787	101031367	12-21-98	36.9	16.3	187	ND	---	---	---	---	---	---	---	---	---	---	---	---	---	---
INFLUENT	000788	101033918	12-21-98	---	---	---	---	---	---	---	---	17.3	---	---	---	---	---	---	---	---	---
INFLUENT	000790	101033942	12-21-98	---	---	---	---	ND	275	---	---	---	---	---	---	---	225	---	680	1,090	7.9
INFLUENT	000789	101033926	12-21-98	---	---	---	---	---	---	---	---	---	ND	---	---	---	---	---	---	---	---
INFLUENT	*INFLUENT*	*PHL01620*	*12-21-98*	*37*	*16*	*200*	*ND*	---	---	---	---	---	---	---	---	---	---	---	---	---	---
INFLUENT	000805	101109155	02-09-99	39.7	17.7	197	ND	ND	281	156	92.3	---	---	2.94	---	0.27	230	35	706	1,150	8.1
INFLUENT	000919	PIK0254-03	11-15-99	38	16	190	ND	ND	268	150	97	17	ND	2.0	ND	0.10	220	32	750	1,200	7.9
INFLUENT	003175	PJJ0337-01	10-18-00	37	16	190	1.2	ND	281	140	83	15	---	2.0	---	ND	230	34	700	1,200	7.90
INFLUENT	003219	PJK0256-01	11-15-00	---	---	---	---	---	---	---	---	16	---	---	ND	---	---	---	---	---	---
EW-1UA PT	001145	312566-01	12-02-93	23.7	9.3	175	1.1	ND	295	75	87	24	---	2.4	ND	---	242	28.9	560	939	8.2
EW-1UA	002912	70908744	03-06-97	---	---	---	---	---	---	---	---	---	---	---	---	ND	---	---	---	---	---
EW-2UA PT	001150	312768-01	12-09-93	21.5	8.6	166	ND	ND	306	61	87	8.6	---	2.64	ND	---	251	29.7	570	842	8.3
EW-2UA	002914	70908751	03-06-97	---	---	---	---	---	---	---	---	---	---	---	---	0.1	---	---	---	---	---
EW-3UA PT	001169	312120-02	12-22-93	22.1	9.4	190	ND	ND	303	68	133	6.8	---	2.38	ND	ND	248	30.8	620	936	8.0
EW-3UA	002908	70908769	03-06-97	---	---	---	---	---	---	---	---	---	---	---	---	0.102	---	---	---	---	---
EW-4UA PT	001164	312040-05	12-16-93	23.6	10.4	184	ND	ND	306	73	100	6.5	---	2.10	---	---	251	32.3	580	913	8.3
EW-4UA	002910	70908777	03-06-97	---	---	---	---	---	---	---	---	---	---	---	---	ND	---	---	---	---	---
MW-1UA D	014378	16208	04-08-88	3.75	0.36	236.5	10.6	138	ND	109	91	6.9	ND	0.24	0.2	---	236	34	674	1,170	10.4
MW-1UA	014412	808006-01	05-31-88	5.9	2.91	174	4.9	62.4	90	85.2	106	4.8	ND	2.26	---	0.11	178	29.9	526	920	9.7
MW-1UA	006089	809133-15	09-20-88	15	4.1	153	2.3	ND	242	75.7	122	11.2	0.08	2.24	ND	0.12	198	14.9	550	797	8.2
MW-1UA	006177	812527-14	12-06-88	22	4.6	153	1.6	ND	246	73.0	118	3.61	ND	2.09	ND	ND	202	20.9	520	834	8.0
MW-1UA dup	006178	812527-15	12-06-88	20	5.0	151	1.6	ND	248	71.6	119	3.94	ND	2.13	ND	ND	203	22.3	512	827	8.1
MW-1UA	006375	908706-06	08-24-89	18.4	5.64	168	1.4	ND	239	75	82	4.5	0.03	2.11	ND	ND	196	26.4	540	833	8.2
MW-1UA dup	006376	908706-07	08-24-89	18.2	5.44	169	1.5	ND	233	74	76	4.2	0.04	2.15	ND	ND	191	26.7	520	822	8.3
MW-1UA	006569	003588-02	03-08-90	15.2	5.2	158	1.2	ND	235	74	132	2.7	0.17	2.31	ND	ND	193	25.0	510	805	7.8

TABLE 4-1

Summary of Laboratory Chemical Results for Common Constituents and Routine Parameters in Water Samples From Groundwater Wells and Groundwater Remediation System Air Stripper Influent and Effluent

Hassayampa Landfill EPA Superfund Site

SAMPLE SOURCE[a]	SAMPLE IDENTIFIER: FIELD	SAMPLE IDENTIFIER: LAB	DATE SAMPLED	Ca	Mg	Na	K	CO_3	HCO_3	Cl	SO_4	NO_3	NH_3	F	PO_4	P	Alk	SiO_2	TDS	LAB EC (µmho/cm)[c]	LAB pH
				COMMON CONSTITUENTS[b] (milligrams per liter)																	
MW-1UA dup	006570	003588-03	03-08-90	15.3	5.2	159	1.3	ND	232	74	132	2.9	0.17	2.27	ND	ND	190	25.2	510	802	8.2
MW-1UA	006758	006599-11	06-07-90	19.9	6.6	167	ND	ND	254	82	120	4.9	0.04	2.24	ND	ND	208	28.0	560	880	8.2
MW-1UA dup	006759	006599-12	06-07-90	20.3	6.8	163	ND	ND	260	83	120	4.8	0.04	2.24	ND	ND	213	29.7	560	890	8.2
MW-1UA	010799	103882-17		16.0	3.9	155	1.1	ND	188	77	110	2.4	0.15	1.93	ND	ND	154	19.9	470	760	7.7
MW-1UA dup	010800	103882-18		14.4	3.1	147	1.1	ND	171	77	100	2.2	0.24	1.91	ND	ND	140	18.2	430	740	7.7
MW-1UA	010996	106790-37		19.3	4.7	156	1.3	ND	214	74	100	3.4	0.17	1.99	ND	ND	175	20.5	490	793	7.9
MW-1UA	002279	109902-36		19.5	6.4	176	1.0	ND	245	74	110	4.4	0.10	2.12	0.07	ND	201	29.3	520	868	8.0
MW-1UA	002383	112562-02	12-04-91	19.5	7.0	167	ND	ND	239	77	100	5.0	0.06	2.18	ND	ND	196	29.5	530	845	8.2
MW-1UA	002656	204659-13	04-10-92	18.6	5.6	156	1.2	ND	233	77	110	4.9	0.04	2.09	ND	ND	191	31.0	550	824	7.8
MW-2UA D	014382	804069-01	04-25-88	17.6	8.2	197	2.8	6.6	251	108	88.2	16	ND	1.59	0.28	—	217	26.7	680	1,140	8.5
MW-2UA	014421	806047-01	06-09-88	16.2	9.97	181	1.7	ND	281	98.5	98.0	14.8	ND	1.72	---	0.09	230	26.3	650	1,090	7.8
MW-2UA	006071	809086-02	09-13-88	17	9.0	184	1.5	ND	300	81.8	124	11.8	0.05	2.08	ND	ND	246	28.1	578	850	8.1
MW-2UA	006088	809133-17	09-20-88	17	8.8	170	1.7	ND	284	72.8	108	8.7	0.07	2.15	ND	ND	233	15.3	606	939	8.1
MW-2UA	006164	812527-01	12-05-88	15	8.2	169	1.4	ND	317	78.9	121	8.41	0.18	2.08	ND	ND	260	27.5	599	965	8.0
MW-2UA	006363	908692-03	08-23-89	24.9	8.00	189	1.3	ND	288	81	55	6.90	ND	1.90	ND	ND	236	29.4	590	947	8.3
MW-2UA	006554	003557-04	03-06-90	21.9	7.6	170	1.1	ND	300	84	116	6.9	ND	2.04	ND	ND	246	30.6	610	921	8.1
MW-2UA	006740	006576-03	06-05-90	26.0	8.3	172	1.3	ND	295	86	130	6.6	ND	1.96	ND	0.07	242	31.3	620	970	7.9
MW-2UA	010788	103882-07	03-21-91	24.0	8.8	181	1.0	ND	342	82	110	6.0	ND	1.97	ND	ND	280	32.7	580	950	7.8
MW-2UA	010962	106790-06	06-18-91	25.4	8.5	179	1.4	ND	290	79	100	5.6	ND	1.96	0.65	ND	238	33.2	540	922	7.9
MW-2UA	002261	109902-18	09-25-91	23.1	8.5	186	1.0	ND	232	72	110	5.7	ND	1.95	ND	ND	283	34.0	580	922	8.0
MW-2UA	002394	112587-02	12-05-91	22.2	8.3	176	ND	ND	282	77	100	4.8	ND	2.04	ND	ND	231	32.1	590	926	8.0
MW-2UA	002622	204640-05	04-09-92	21.8	8.2	158	ND	ND	292	74	110	5.3	ND	1.76	ND	ND	239	32.5	570	868	8.0
MW-3UA D	014387	805024-01	05-05-88	35.1	21	234	4.4	3.6	224	257	77	38.2	ND	1.10	---	0.13	190	28.7	1,004	2,970	8.4
MW-3UA	014413	806006-02	06-01-88	36.3	8.36	222	3.9	3.6	188	202	86	33.5	ND	1.68	---	0.12	144	26.1	858	1,410	8.4
MW-3UA	006075	809086-06	09-13-88	19	10.0	219	3.5	ND	355	161	122	16.3	ND	1.77	0.32	0.34	291	28.7	732	1,100	8.1
MW-3UA	006165	812527-02	12-05-88	22	12.6	205	2.8	ND	307	149	112	21.5	ND	1.71	ND	0.10	252	29.1	757	1,230	8.2
MW-3UA	006364	908692-04	08-23-89	26.0	11.4	222	1.7	ND	279	130	65	12.0	ND	1.76	ND	ND	229	31.5	710	1,120	8.4
MW-3UA	006556	003557-06	03-06-90	28.2	14.0	217	1.2	ND	271	190	112	19.5	ND	1.86	ND	ND	222	31.4	800	1,240	8.0
MW-3UA	006742	006576-05	06-06-90	28.5	12.5	205	1.4	ND	278	150	120	16	ND	1.81	ND	ND	228	32.1	740	1,200	7.9
MW-3UA	010789	103882-08	03-21-91	32.4	13.4	220	ND	ND	271	160	110	16	ND	1.79	ND	ND	222	34.2	750	1,200	7.8
MW-3UA	010966	106790-10	06-18-91	31.4	13.6	216	4.4	ND	279	150	100	15	ND	1.74	0.82	ND	229	34.2	780	1,154	7.9
MW-3UA	002267	109902-24	09-25-91	32.9	13.9	228	1.3	ND	271	160	110	18	ND	1.86	ND	ND	222	35.1	720	1,230	7.8
MW-3UA	002398	112587-06	12-05-91	27.0	13.8	210	ND	ND	266	150	99	13.2	ND	1.83	ND	ND	218	32.9	700	1,150	7.9
MW-3UA	002628	204640-11	04-09-92	44.3	17.2	218	1.0	ND	256	220	100	28	ND	1.46	ND	ND	210	34.6	870	1,420	7.6
MW-4UA D	014391	805060-01	05-13-88	11.2	3.6	165	3.4	10.8	267	61.6	82.9	8.3	ND	2.28	0.1	0.14	237	24.2	532	852	8.7
MW-4UA	014427	806130-01	06-22-88	9.9	7.67	185	1.6	---	329	66.8	97	7.1	ND	2.33	0.09	0.092	270	29.3	651	894	8.2
MW-4UA	006078	809086-09	09-14-88	16	9.5	183	ND	ND	337	64.8	120	8.8	ND	2.20	0.10	0.23	276	31.9	590	884	8.2
MW-4UA	006166	812527-03	12-05-88	22	8.8	178	ND	ND	350	64.9	111	7.88	ND	2.10	ND	ND	287	29.8	598	946	8.1
MW-4UA	006373	908706-04	08-24-89	21.8	9.86	191	ND	ND	329	73	71	7.5	0.04	2.11	ND	ND	270	33.5	630	961	8.3
MW-4UA	006558	003557-08	03-06-90	18.1	8.4	176	ND	ND	326	77	118	8.2	ND	2.33	ND	0.05	267	33.8	600	957	8.3
MW-4UA	006746	006576-09	06-06-90	22.1	10.1	183	1.0	ND	325	80	120	8.7	ND	2.20	ND	ND	265	34.6	640	980	8.2
MW-4UA	010792	103882-11	03-21-91	22.2	10.2	191	ND	ND	332	79	98	9.9	ND	2.19	ND	ND	264	35.7	560	940	8.2
MW-4UA	010980	106790-22	06-19-91	23.4	10.4	195	1.1	ND	320	77	92	9.5	ND	2.14	ND	ND	262	37.2	620	977	8.2
MW-4UA	002247	109902-04	09-24-91	22.6	10.2	193	ND	ND	317	83	96	20.1	ND	2.16	ND	ND	260	36.4	620	960	8.1

TABLE 4-1
Summary of Laboratory Chemical Results for Common Constituents and Routine Parameters in Water Samples From Groundwater Wells and Groundwater Remediation System Air Stripper Influent and Effluent
Hassayampa Landfill EPA Superfund Site

	SAMPLE IDENTIFIER			COMMON CONSTITUENTS[b] (milligrams per liter)																	
SAMPLE SOURCE[a]	FIELD	LAB	DATE SAMPLED	Ca	Mg	Na	K	CO_3	HCO_3	Cl	SO_4	NO_3	NH_3	F	PO_4	P	Alk	SiO_2	TDS	LAB EC (µmho/cm)[c]	LAB pH
MW-4UA dup	002248	109902-05	09-24-91	23.1	10.4	197	ND	ND	317	82	94	11.4	ND	2.22	ND	ND	260	37.0	610	976	8.1
MW-4UA	002406	112587-14	12-05-91	22.0	10.2	190	ND	ND	310	83	86	9	ND	2.23	ND	ND	254	35.3	610	975	8.2
MW-4UA	002630	204640-13	04-09-92	21.4	9.4	163	ND	ND	322	83	92	11.5	ND	1.99	ND	ND	264	34.4	600	975	8.1
MW-4UA dup	002631	204640-14	04-09-92	21.2	9.3	162	ND	ND	321	83	90	11.0	ND	2.08	ND	ND	263	34.2	610	958	8.0
MW-5UA D dup	014407	805139-02	05-26-88	11.3	4.62	175	5.0	6	230	73.2	89.5	8.8	ND	2.20	---	0.38	206	21.0	528	872	8.6
MW-5UA	014430	807002-02	06-30-88	20.7	10.88	154	1.6	ND	273	106	126	7.5	ND	2.17	ND	ND	224	26.2	640	1,000	8.0
MW-5UA dup	014431	807002-03	06-30-88	21.1	11.12	158	2.0	ND	272	107	129	7.8	ND	2.22	ND	ND	223	27.2	638	999	8.0
MW-5UA	006076	809086-07	09-13-88	91	38.4	291	1.9	ND	253	297	398	17.8	ND	1.96	0.12	0.27	207	26.1	1,270	1,730	8.3
MW-5UA	006167	812527-04	12-05-88	63	25.6	219	1.3	ND	277	235	264	13.9	ND	1.90	ND	ND	227	25.6	1,041	1,660	8.0
MW-5UA dup	006168	812527-05	12-05-88	69	26.9	225	1.5	ND	287	197	189	13.3	ND	1.98	ND	ND	235	24.6	900	1,310	7.9
MW-5UA	006367	908692-07	08-23-89	64.6	25.5	253	1.3	2.4	254	230	138	12.1	ND	1.89	ND	ND	212	28.1	980	1,570	8.4
MW-5UA dup	006368	908692-08	08-23-89	67.7	26.7	263	1.4	ND	261	235	147	12.1	ND	1.87	ND	ND	214	27.8	1,000	1,570	8.3
MW-5UA	006563	003572-04	03-07-90	51.7	22.4	232	1.2	ND	268	220	232	12.9	ND	2.15	ND	ND	220	26.7	950	1,460	8.1
MW-5UA	006757	006599-10	06-07-90	73.8	27.8	249	ND	ND	261	300	230	14.2	0.03	2.05	ND	ND	214	28.7	1,050	1,680	8.1
MW-5UA	010796	103882-14	03-22-91	55.4	21.6	224	ND	ND	351	200	170	15	ND	2.25	ND	ND	288	29.7	780	1,400	7.7
MW-5UA dup	010797	103882-15	03-22-91	55.1	21.5	225	ND	ND	259	200	170	15	ND	2.09	ND	ND	212	29.5	730	1,400	7.8
MW-5UA	010969	106790-13	06-19-91	70.8	26.5	244	1.4	ND	255	240	200	15	ND	2.05	0.20	ND	209	30.4	1,000	1,545	7.8
MW-5UA dup	010970	106790-40	06-19-91	71.6	26.5	242	1.3	ND	256	230	200	14	0.15	1.90	ND	ND	210	31.2	980	1,517	7.9
MW-5UA	002263	109902-20	09-25-91	54.9	20.4	222	ND	ND	264	190	160	14	0.03	2.01	ND	ND	216	30.6	830	1,340	7.8
MW-5UA	002388	112562-07	12-04-91	47.4	17.4	202	ND	ND	264	160	130	11.8	ND	2.13	ND	ND	216	28.7	750	1,220	7.9
MW-5UA dup	002390	112562-08	12-04-91	47.7	17.5	202	ND	ND	265	160	140	12.2	0.03	2.21	ND	ND	217	28.4	750	1,180	7.9
MW-5UA	002640	204640-23	04-09-92	37.9	12.8	171	ND	ND	282	120	110	12.6	ND	2.02	ND	ND	231	30.6	670	1,030	8.0
MW-5UA dup	002641	204640-24	04-09-92	38.2	12.9	172	ND	ND	275	120	110	12.6	ND	2.01	ND	ND	225	31.0	670	1,060	7.9
MW-6UA	004325	911782-05	11-28-89	26	11.9	178	1.1	ND	323	79	126	8.5	ND	1.68	ND	ND	265	36.6	600	933	8.0
MW-6UA	*HASS-A*	*18288*	*11-28-89*	*30.0*	*11.9*	*184*	---	---	---	*77.5*	*111*	*5.8*	---	*1.74*	---	---	*271*	---	*629*	*965*	*7.6*
MW-6UA	006560	003572-01	03-07-90	23.0	10.9	172	1.0	ND	328	75	124	4.6	ND	1.72	ND	0.07	269	34.0	580	867	8.2
MW-6UA dup	006561	003572-02	03-07-90	22.8	10.7	175	ND	ND	329	75	122	4.8	ND	1.75	ND	0.05	270	33.6	590	890	8.2
MW-6UA	006754	006599-08	06-07-90	28.6	11.4	177	ND	ND	323	82	120	4.6	ND	1.68	ND	ND	265	34.9	600	950	8.2
MW-6UA dup	006755	006599-13	06-07-90	28.4	11.1	170	ND	ND	322	85	120	4.7	ND	1.70	0.05	ND	264	34.9	610	950	8.2
MW-6UA	010794	103882-13	03-21-91	27.5	10.5	172	1.0	ND	327	69	110	4.1	ND	1.64	ND	ND	268	35.5	480	920	7.9
MW-6UA	010976	106790-18	06-19-91	28.4	11.0	172	1.5	ND	322	63	99	3.8	ND	1.62	0.8	ND	264	37.2	580	887	8.0
MW-6UA	002253	109902-10	09-24-91	28.0	10.2	174	ND	ND	310	62	100	2.1	ND	1.72	ND	ND	254	36.8	560	917	8.0
MW-6UA	002402	112587-10	12-05-91	26.5	10.5	165	ND	ND	317	64	93	3.4	0.24	1.70	ND	ND	260	35.5	560	904	8.0
MW-6UA	002634	204640-17	04-09-92	26.6	9.9	152	ND	ND	323	59	100	3.6	ND	1.66	ND	ND	265	36.4	550	854	8.0
MW-7UA	004392	002577-02	02-07-90	20.0	8.9	176	1.1	ND	317	69	109	7.2	0.04	2.56	ND	ND	260	32.9	570	902	8.2
MW-7UA	006562	003572-03	03-07-90	16.5	8.0	185	ND	ND	314	66	124	7.5	ND	2.71	ND	0.44	257	32.1	570	897	8.3
MW-7UA	006756	006599-09	06-07-90	20.3	8.5	179	ND	ND	320	69	110	7.3	ND	2.64	ND	0.02	262	33.4	590	920	8.3
MW-7UA	010798	103882-16	03-22-91	19.2	8.9	185	ND	ND	312	63	100	7.3	ND	2.49	ND	ND	256	35.1	360	930	8.1
MW-7UA	010989	106790-31	06-19-91	21.4	8.7	184	ND	ND	314	62	97	7.3	ND	2.52	ND	ND	257	36.8	590	922	8.1
MW-7UA	002255	109902-12	09-24-91	20.8	8.9	189	ND	ND	315	59	100	7.1	ND	2.62	ND	ND	258	36.8	570	918	8.1
MW-7UA	002410	112587-18	12-05-91	20.4	8.8	181	ND	ND	307	65	92	6.7	ND	2.74	ND	ND	252	35.1	590	899	8.1
MW-7UA	002638	204640-21	04-09-92	20.0	8.6	167	ND	ND	315	61	100	6.9	ND	2.32	ND	ND	258	36.1	560	900	8.2
MW-8UA	004396	002577-05	02-08-90	17.4	5.7	131	ND	ND	245	55	60	4.6	0.04	2.60	ND	ND	201	31.2	430	687	8.2
MW-8UA dup	004397	002577-06	02-08-90	17.8	5.8	130	ND	ND	244	56	73	4.7	ND	2.61	ND	0.07	200	30.6	410	689	8.2

TABLE 4-1
Summary of Laboratory Chemical Results for Common Constituents and Routine Parameters in Water Samples From Groundwater Wells and Groundwater Remediation System Air Stripper Influent and Effluent
Hassayampa Landfill EPA Superfund Site

SAMPLE SOURCE[a]	SAMPLE IDENTIFIER FIELD	SAMPLE IDENTIFIER LAB	DATE SAMPLED	Ca	Mg	Na	K	CO_3	HCO_3	Cl	SO_4	NO_3	NH_3	F	PO_4	P	Alk	SiO_2	TDS	LAB EC (µmho/cm)[a]	LAB pH
				COMMON CONSTITUENTS[a] (milligrams per liter)																	
MW-8UA	006564	003572-05	03-07-90	13.6	4.8	139	ND	ND	244	57	85	4.1	ND	2.66	ND	ND	200	28.9	380	636	8.3
MW-8UA	006752	006599-06	06-07-90	17.5	5.4	140	ND	ND	234	65	83	4.2	ND	2.52	ND	0.50	192	31.0	450	710	8.2
MW-8UA	010782	103882-02	03-20-91	16.6	6.0	136	1.0	ND	239	56	64	4.1	ND	2.58	ND	ND	196	31.7	430	690	8.1
MW-8UA	010983	106790-25	06-19-91	17.4	6.2	138	1.0	ND	243	56	55	4.2	0.06	2.45	ND	ND	199	32.3	460	683	8.1
MW-8UA	002269	109902-26	09-25-91	17.3	6.3	144	ND	ND	233	67	58	4.3	ND	2.48	0.06	ND	191	32.1	420	723	8.0
MW-8UA	002391	112562-09	12-04-91	17.3	6.4	140	ND	ND	237	62	56	4.3	ND	2.53	ND	ND	194	31.7	430	691	8.2
MW-8UA	002644	204659-01	04-10-92	17.7	6.3	127	ND	ND	244	61	60	4.3	ND	2.51	ND	ND	200	32.9	490	687	8.0
MW-8UA	*MW-8UA*	*9416649*	*09-02-94*	*19*	*7.2*	*130*	*ND*	*ND*	*244*	*75*	*58*	*4.5*	—	*2.4*	—	—	*200*	*32*	*440*	*710*	*8.25*
MW-8UA	*MW-8UA*	*9420502*	*10-26-94*	*18*	*7.1*	*130*	*ND*	*ND*	*256*	*90*	*56*	*4.1*	—	*2.7*	—	—	*210*	*14*	*450*	*650*	*7.89*
MW-8UA	*HMW#8VA*	*6060115*	*06-05-96*	*48*	*18*	*230*	*ND*	*ND*	*195*	*350*	*71*	*6.2*	—	*1.4*	—	—	*160*	*29*	*880*	*1,500*	*7.6*
MW-8UA	*MW-8UA*	*PGG00351*	*07-10-97*	*37*	*14*	*210*	*ND*	*ND*	*195*	*310*	*50*	*4.6*	—	*2.2*	—	—	*180*	*49*	*760*	*1,300*	*7.5*
MW-8UA	*8UA*	*PHK01166*	*11-18-98*	*95*	*35*	*320*	*7.2*	—	—	*630*	*70*	*8.4*	—	*1.4*	—	—	*130*	*36*	*1,500*	*2,400*	*7.6*
MW-8UA	*000860*	*PIF00177*	*06-03-99*	*120*	*44*	*350*	*2.1*	*ND*	*159*	*560*	*66*	*6.9*	—	*1.4*	—	—	*130*	*32*	*1,600*	*2,600*	*7.6*
MW-8UA	*000984*	*PJE0328-01*	*05-16-00*	*150*	*54*	*350*	*2.4*	*ND*	*134*	*880*	*77*	*11*	—	*1.3*	—	—	*110*	*31*	*1,800*	*3,000*	*7.72*
MW-8UA	*003209*	*PJJ0341-01*	*10-19-00*	*170*	*61*	*350*	*2.6*	*ND*	*146*	*810*	*65*	*9.8*	—	*1.3*	—	—	*120*	*32*	*2,000*	*3,100*	*7.33*
MW-9UA	004457	105644-01	05-07-91	20.6	8.2	149	1.6	6	268	64	78	8.1	0.03	2.32	ND	ND	229	31.2	510	800	8.5
MW-9UA	010985	106790-27	06-19-91	20.9	8.1	162	1.1	ND	272	64	77	7.6	ND	2.39	ND	ND	223	32.7	540	829	8.1
MW-9UA	002271	109902-28	09-25-91	22.2	8.0	163	ND	ND	273	62	81	6.8	ND	2.39	ND	ND	224	32.7	490	821	8.0
MW-9UA	002413	112587-21	12-05-91	21.8	7.8	155	ND	ND	268	64	75	6.0	ND	2.51	ND	ND	220	30.8	500	822	8.0
MW-9UA	002648	204659-05	04-10-92	22.3	7.6	141	ND	ND	276	66	81	6.3	ND	2.33	ND	ND	226	32.1	540	781	7.9
MW-9UA	*MW-9UA*	*9416650*	*09-02-94*	*20*	*6.7*	*140*	*ND*	*ND*	*256*	*52*	*92*	*5.3*	—	*2.6*	—	—	*210*	*30*	*490*	*790*	*8.15*
MW-9UA	*MW-9UA*	*9420503*	*10-26-94*	*19*	*6.8*	*140*	*ND*	*ND*	*281*	*53*	*91*	*4.4*	—	*2.6*	—	—	*230*	*14*	*480*	*670*	*7.71*
MW-9UA	*HMW#9VA*	*6060116*	*06-05-96*	*17*	*5.7*	*150*	*ND*	*ND*	*244*	*61*	*82*	*5.5*	—	*2.1*	—	—	*200*	*24*	*510*	*800*	*7.3*
MW-9UA	*MW-9UA*	*PGG00350*	*07-10-97*	*16*	*5.2*	*150*	*ND*	*ND*	*244*	*55*	*76*	*4.4*	—	*2.6*	—	—	*200*	*26*	*490*	*760*	*7.3*
MW-9UA	*9UA*	*PHK01168*	*11-18-98*	*16*	*5.8*	*150*	*ND*	—	—	*57*	*89*	*5.3*	—	*2.5*	—	—	*210*	*29*	*490*	*790*	*7.7*
MW-9UA	*000865*	*PIF00176*	*06-03-99*	*17*	*5.9*	*160*	*ND*	*ND*	*244*	*51*	*74*	*3.5*	—	*2.4*	—	—	*200*	*30*	*480*	*760*	*7.6*
MW-9UA	*MW-9VA*	*PJC0002-01*	*02-29-00*	*16*	*5.2*	*140*	*ND*	*ND*	*232*	*59*	*71*	*4.7*	—	*2.4*	—	—	*190*	*27*	*470*	*720*	—
MW-9UA	*000985*	*PJE0328-02*	*05-16-00*	*15*	*5.1*	*150*	*ND*	*ND*	*232*	*69*	*73*	*5.5*	—	*2.7*	—	—	*190*	*31*	*560*	*750*	*7.94*
MW-9UA	*003211*	*PJJ0341-03*	*10-19-00*	*18*	*6.4*	*150*	*ND*	*ND*	*220*	*81*	*57*	*5.6*	—	*2.4*	—	—	*180*	*30*	*490*	*820*	*7.57*
MW-10UA	004461	105723-01	05-14-91	60.4	27.5	242	1.2	ND	260	260	87	38	ND	1.52	ND	ND	213	37.4	980	1,570	8.2
MW-10UA	010991	106790-33	06-19-91	56.4	25.5	260	1.4	ND	254	260	92	36	ND	1.44	ND	ND	208	38.7	1,000	1,540	7.9
MW-10UA dup	010992	106790-41	06-19-91	57.2	25.7	262	1.3	ND	254	260	91	36	0.07	1.39	ND	ND	208	39.1	980	1,591	8.1
MW-10UA	002277	109902-34	09-25-91	59.4	26.3	237	1.5	ND	257	260	92	67	ND	1.49	0.10	ND	211	38.7	970	1,640	7.7
MW-10UA	002417	112587-25	12-05-91	58.3	25.8	248	ND	ND	251	290	77	40	ND	1.69	ND	ND	206	35.9	980	1,640	7.8
MW-10UA	002652	204659-09	04-10-92	59.6	24.5	224	ND	ND	256	290	86	38.	ND	1.47	ND	ND	209	37.0	1,000	1,570	7.7
MW-10UA	*MW-10UA*	*9416651*	*09-02-94*	*51*	*22*	*210*	*ND*	*ND*	*244*	*260*	*100*	*37*	—	*1.6*	—	—	*200*	*34*	*200*	*1,500*	*7.75*
MW-10UA	*MW-10UA*	*9420504*	*10-25-94*	*49*	*23*	*220*	*ND*	*ND*	*244*	*270*	*98*	*37*	—	*1.5*	—	—	*260*	*33*	*930*	*1,300*	*7.41*
MW-10UA	*HMW#10VA*	*6060118*	*06-05-96*	*47*	*22*	*260*	*ND*	*ND*	*219*	*270*	*99*	*34*	—	*1.2*	—	—	*180*	*30*	*960*	*1,600*	*7.2*
MW-10UA	*MW-10UA*	*PGG00349*	*07-09-97*	*46*	*20*	*260*	*ND*	*ND*	*231*	*310*	*86*	*33*	—	*1.7*	—	—	*190*	*30*	*1,000*	*1,600*	*7.3*
MW-10UA	*10UA*	*PHK01167*	*11-18-98*	*56*	*27*	*280*	*ND*	—	—	*290*	*110*	*38*	—	*1.5*	—	—	*200*	*36*	*1,100*	*1,700*	*7.6*
MW-10UA	*000853*	*PIF00178*	*06-02-99*	*59*	*29*	*290*	*ND*	*ND*	*232*	*230*	*87*	*15*	—	*1.3*	—	—	*190*	*36*	*1,100*	*1,800*	*7.9*
MW-10UA	*000986*	*PJE0328-03*	*05-16-00*	*63*	*31*	*260*	*1.5*	*ND*	*244*	*320*	*110*	*41*	—	*1.3*	—	—	*200*	*35*	*1,100*	*1,800*	*8.13*
MW-10UA	*003213*	*PJJ0341-05*	*10-19-00*	*69*	*33*	*250*	*1.5*	*ND*	*244*	*290*	*83*	*32*	—	*1.2*	—	—	*200*	*38*	*1,100*	*1,900*	*7.69*
MW-11UA PT	001027	309721-01	09-13-93	25.9	10.7	182	ND	ND	331	60	100	6.9	0.19	1.85	ND	ND	271	33.8	580	913	8.2

TABLE 4-1
Summary of Laboratory Chemical Results for Common Constituents and Routine Parameters in Water Samples From Groundwater Wells and Groundwater Remediation System Air Stripper Influent and Effluent
Hassayampa Landfill EPA Superfund Site

SAMPLE SOURCE[a]	SAMPLE IDENTIFIER		DATE SAMPLED	COMMON CONSTITUENTS[b] (milligrams per liter)																LAB EC (µmho/cm)[c]	LAB pH
	FIELD	LAB		Ca	Mg	Na	K	CO_3	HCO_3	Cl	SO_4	NO_3	NH_3	F	PO_4	P	Alk	SiO_2	TDS		
MW-11UA	*MW-11UA*	*9416652*	*09-02-94*	*22*	*11*	*180*	*ND*	*ND*	*329*	*69*	*130*	*3.7*	—	*1.2*	—	—	*270*	*35*	*620*	*1,000*	*8.18*
MW-11UA	*MW-11UA*	*9420505*	*10-26-94*	*21*	*10*	*350*	*ND*	*ND*	*378*	*69*	*120*	*3.6*	—	*1.3*	—	—	*310*	*33*	*600*	*840*	*7.81*
MW-11UA	*HMW#11VA*	*6060117*	*06-05-96*	*21*	*10*	*190*	*ND*	*ND*	*329*	*83*	*130*	*4.1*	—	*1.0*	—	—	*270*	*28*	*660*	*1,000*	*7.7*
MW-11UA	*MW-11UA*	*PGG00348*	*07-09-97*	*20*	*8.9*	*190*	*ND*	*ND*	*330*	*79*	*130*	*3.5*	—	*1.6*	—	—	*270*	*30*	*650*	*1,000*	*7.5*
MW-11UA	*11UA*	*PHK01165*	*11-18-98*	*24*	*11*	*190*	*ND*	—	—	*83*	*150*	*4.3*	—	*1.2*	—	—	*290*	*36*	*650*	*1,000*	*7.9*
MW-11UA	*000844*	*PIF00175*	*06-02-99*	*23*	*11*	*210*	*ND*	*ND*	*329*	*75*	*130*	*2.5*	—	*1.3*	—	—	*270*	*33*	*640*	*1,000*	*7.5*
MW-11UA	*000987*	*PJE0326-04*	*05-16-00*	*24*	*11*	*190*	*ND*	*ND*	*329*	*82*	*140*	*4.7*	—	*1.3*	—	—	*270*	*38*	*790*	*1,000*	*8.29*
MW-11UA	*003215*	*PJK0269-01*	*11-15-00*	*26*	*11*	*200*	*ND*	*ND*	*329*	*73*	*120*	*4.0*	—	*1.2*	—	—	*270*	*36*	*610*	*1,100*	*7.78*
MW-12UA PT	001035	309792-01	09-15-93	32.9	16.9	200	1.4	ND	283	138	81	20.6	0.07	1.28	ND	ND	232	28.7	710	6,900	8.1
MW-13UA PT	001016	309635-02	09-08-93	25.8	10.0	179	ND	ND	293	77	84	12.9	ND	2.24	ND	ND	240	29.3	640	933	8.2
MW-14UA PT	001031	309761-01	09-14-93	35.3	14.9	233	1.1	ND	271	180	110	8.4	0.09	1.73	ND	ND	222	33.8	760	1,300	8.2
MW-1UB D	014383	804087-01	04-27-88	15.3	7.0	100	1.8	ND	212	31.1	50.8	11.1	ND	1.48	ND	ND	174	24.1	360	671	7.91
MW-1UB	014425	806096-01	06-14-88	14.3	7.28	103	2.1	ND	241	32.5	42	12.7	—	1.64	ND	0.097	197.4	22.1	329	604	8.1
MW-1UB	006083	809086-14	09-14-88	18	7.6	88.8	1.6	ND	223	25.9	49	15.6	ND	1.36	0.25	0.44	183	24.0	364	554	8.1
MW-1UB	006171	812527-08	12-06-88	24	7.1	92.5	1.8	ND	235	32.6	47	12.4	ND	1.26	ND	0.05	193	23.5	347	584	8.1
MW-1UB	006360	908692-01	08-23-89	21.9	6.53	129	1.7	2.4	238	31	47	8.66	ND	1.55	ND	ND	195	27.5	400	614	8.4
MW-1UB	006552	003557-02	03-06-90	21.3	7.7	95.0	1.7	ND	233	34	54	9.6	ND	1.55	ND	ND	191	25.9	460	599	8.2
MW-1UB	006739	006576-02	06-06-90	23.5	7.9	114	1.6	ND	238	34	50	11	ND	1.63	ND	ND	195	28.2	420	630	8.1
MW-1UB	010781	103882-01	03-20-91	27.4	8.5	104	1.8	ND	232	35	48	10	ND	1.53	ND	ND	190	28.2	400	630	8.0
MW-1UB	010858	106790-02	06-18-91	25.3	8.1	110	2.0	ND	232	34	46	9.7	0.8	1.59	ND	ND	190	29.9	360	616	8.1
MW-1UB	002245	109902-02	09-24-91	26.7	8.2	95.9	1.2	ND	215	40	39	12	ND	1.32	ND	ND	176	27.6	370	593	8.0
MW-1UB	002385	112562-04	12-04-91	26.9	8.4	96.5	ND	ND	211	33	40	11.5	ND	1.34	ND	ND	173	27.4	370	569	8.1
MW-1UB	002620	204640-03	04-09-92	25.8	7.9	98.1	1.6	ND	233	34	47	9.6	ND	1.42	ND	ND	191	29.3	380	599	7.7
MW-2UB D	014379	804029-01	04-18-88	14.1	7.8	105	2.9	8.0	161	46.3	45	13.9	ND	1.2	0.08	—	145	28.4	460	674	8.7
MW-2UB	014414	806006-03	06-01-88	15.9	8.01	116	2.9	3.6	215	47.8	40	16.1	ND	1.21	—	0.10	182	22.8	440	730	8.4
MW-2UB	006076	809086-01	09-13-88	20	10.0	102	1.7	ND	229	38.7	49	17.8	ND	1.15	0.14	0.15	188	26.6	410	643	8.1
MW-2UB	006174	812527-11	12-06-88	29	9.3	99.2	1.7	ND	246	49.0	49	1.3	0.11	1.06	ND	ND	202	24.8	400	668	8.1
MW-2UB	006362	908692-02	08-23-89	30.3	10.2	112	1.8	2.4	228	43	46	12.8	ND	1.08	ND	ND	191	27.2	430	674	8.4
MW-2UB	006553	003557-03	03-06-90	26.4	10.5	101	1.6	ND	239	48	55	12.6	ND	1.22	ND	ND	196	26.7	390	642	8.1
MW-2UB	006741	006576-04	06-06-90	31.2	11.1	112	1.8	ND	238	50	52	16	ND	1.16	ND	ND	195	27.9	460	690	8.0
MW-2UB	010787	103882-06	03-21-91	32.0	11.2	106	1.6	ND	234	43	54	11	ND	1.13	ND	ND	192	28.7	410	6,900/683[d]	8.0
MW-2UB	010960	106790-04	06-18-91	32.4	11.3	108	1.6	ND	237	46	48	12	ND	1.15	0.64	ND	194	29.9	430	670	8.0
MW-2UB	002259	109902-16	09-25-91	31.9	11.3	110	1.2	ND	242	40	46	11	ND	1.12	ND	ND	198	29.9	400	655	8.1
MW-2UB	002396	112587-04	12-05-91	31.4	11.2	105	1.3	ND	239	42	58	7.8	ND	1.16	ND	ND	196	28.7	420	654	8.0
MW-2UB	002624	204640-07	04-09-92	32.3	11.0	97.9	1.5	ND	243	39	53	11.0	ND	1.12	ND	ND	199	29.3	410	648	8.2
MW-3UB D	014384	805010-01	04-29-88	18.3	8.8	106	3.3	1.2	210	44.7	56.3	12.5	ND	1.23	0.29	—	174	27.2	380	646	8.4
MW-3UB	014426	806096-02	06-16-88	21.0	9.99	111	2.2	ND	260	49.2	48	15.4	—	1.28	ND	0.092	213.2	23.3	420	724	8.0
MW-3UB	006073	809086-04	09-13-88	23	10.4	104	1.9	ND	250	36.4	60	16.3	ND	1.25	0.06	0.64	305	27.0	434	597	7.9
MW-3UB	006175	812527-12	12-06-88	31	9.8	105	2.0	ND	271	49.4	56	12.8	ND	1.12	ND	ND	222	24.9	444	700	8.0
MW-3UB	006365	908692-05	08-23-89	31.8	10.6	116	2.2	2.4	242	41	26	12.1	ND	1.21	ND	ND	202	28.2	440	647	8.4
MW-3UB	006743	006576-06	06-06-90	32.6	11.2	116	1.9	ND	250	50	50	10	ND	.25	ND	ND	205	28.7	480	720	8.1
MW-3UB	010790	103882-09	03-21-91	31.2	10.8	108	2.0	ND	237	45	51	13	ND	1.23	ND	ND	194	29.7	430	700	7.9
MW-3UB	010984	106790-08	06-18-91	32.9	11.3	111	2.3	ND	238	45	50	12	ND	1.23	0.69	ND	195	30.8	400	690	8.0
MW-3UB	002265	109902-22	09-25-91	32.0	11.4	112	2.2	ND	244	47	51	13	ND	1.28	ND	ND	200	30.8	430	699	8.0

TABLE 4-1
Summary of Laboratory Chemical Results for Common Constituents and Routine Parameters in Water Samples From Groundwater Wells and Groundwater Remediation System Air Stripper Influent and Effluent
Hassayampa Landfill EPA Superfund Site

SAMPLE SOURCE[a]	SAMPLE IDENTIFIER: FIELD	SAMPLE IDENTIFIER: LAB	DATE SAMPLED	Ca	Mg	Na	K	CO_3	HCO_3	Cl	SO_4	NO_3	NH_3	F	PO_4	P	Alk	SiO_2	TDS	LAB EC (µmho/cm)[c]	LAB pH
				COMMON CONSTITUENTS[a] (milligrams per liter)																	
MW-3UB	002400	112587-08	12-05-91	33.0	11.3	110	1.3	ND	237	48	54	12.4	ND	1.22	ND	ND	194	30.2	440	703	8.0
MW-3UB	002626	204640-09	04-09-92	32.6	10.5	99.5	1.7	ND	241	41	48	15.2	ND	1.21	ND	ND	197	30.8	420	676	8.2
MW-4UB D	014399	805105-01	05-19-88	10.0	4.7	109	5.1	14.4	168	41.4	49.3	11.5	0.2	1.30	---	0.33	162	25.7	408	602	9.0
MW-4UB	014428	806170-01	06-28-88	17.5	8.75	104	2.2	ND	240	36.4	76	9.4	ND	1.36	ND	ND	197	20.7	404	665	7.8
MW-4UB	006077	809086-08	09-14-88	21	9.0	102	1.5	ND	244	29.6	49	14.8	ND	1.34	ND	0.22	200	25.4	392	598	8.2
MW-4UB	006176	812527-13	12-06-88	28	8.0	99.2	1.7	ND	256	42.6	46	12.5	ND	1.29	ND	ND	210	24.5	396	644	8.1
MW-4UB	006374	908706-06	08-24-89	29.3	9.21	110	1.9	ND	233	41	35	13.2	0.04	1.25	ND	ND	191	27.9	440	663	8.3
MW-4UB	006557	003557-07	03-06-90	24.0	8.8	97.8	1.7	ND	229	45	49	13.1	ND	1.35	ND	ND	188	27.4	410	638	8.1
MW-4UB	006745	006576-08	06-06-90	29.4	9.5	109	2.0	ND	229	45	50	16	ND	1.25	ND	ND	188	27.9	420	670	8.0
MW-4UB	010793	103882-12	03-21-91	29.0	9.4	104	1.6	ND	224	43	44	13	ND	1.22	ND	ND	184	28.7	290	640	8.0
MW-4UB	010978	106790-20	06-19-91	31.4	9.9	107	1.9	ND	227	40	40	13	ND	1.19	0.15	ND	186	30.2	410	652	8.0
MW-4UB	002249	109902-06	09-24-91	30.8	9.9	109	1.3	ND	228	38	40	13	ND	1.26	ND	ND	187	29.9	410	652	8.0
MW-4UB dup	002250	109902-07	09-24-91	30.6	9.8	108	1.7	ND	226	37	40	13	ND	1.23	ND	ND	185	29.9	400	655	8.0
MW-4UB	002408	112587-16	12-05-91	29.3	9.6	104	1.3	ND	228	42	45	10	ND	1.30	ND	ND	187	28.2	390	632	8.1
MW-4UB	002632	204640-15	04-09-92	29.4	9.1	91.1	1.6	ND	236	39	45	12.6	ND	1.16	ND	ND	193	26.2	400	613	8.0
MW-6UB	010883	104835-02	04-23-91	33.2	9.8	101	2.3	ND	226	49	38	15	ND	1.04	ND	ND	185	27.8	410	652	8.2
MW-6UB	010973	106790-16	06-19-91	34.6	10.1	105	2.2	ND	220	47	37	15	ND	1.08	ND	ND	180	29.3	420	667	8.0
MW-6UB	002251	109902-08	09-24-91	33.6	10.2	106	1.6	ND	223	44	39	16	ND	1.16	0.16	ND	183	28.7	410	676	7.9
MW-6UB	002404	112587-12	12-05-91	32.5	10.0	101	1.2	ND	218	49	40	14	ND	1.14	ND	ND	179	35.3	420	689	8.0
MW-6UB	002636	204640-19	04-09-92	33.6	9.8	93.8	1.8	ND	226	45	41	14	ND	1.09	ND	ND	185	26.4	410	653	8.0
MW-9UB	014758	105570-01	05-02-91	81.5	23.9	123	3.9	ND	146	210	61	25	0.03	0.83	ND	ND	120	28.0	700	1,030	7.9
MW-9UB	010987	106790-29	06-19-91	81.6	23.1	130	3.2	ND	143	220	60	25	0.04	0.84	ND	ND	117	28.2	760	1,197	7.8
MW-9UB	002273	109902-30	09-24-91	80.2	23.1	127	3.0	ND	148	220	57	27	0.04	0.86	ND	ND	121	27.8	720	1,180	7.8
MW-9UB	002415	112587-23	12-05-91	79.5	23.4	119	2.3	ND	148	220	61	25	ND	0.86	ND	ND	121	26.3	700	1,180	7.7
MW-9UB	002650	204659-07	04-10-92	87.5	23.8	108	2.8	ND	148	220	57	25	ND	0.80	ND	ND	121	28.2	730	1,130	7.8
MW-10UB	004464	105873-02	05-22-91	205	48.6	187	3.6	ND	199	480	190	22	0.04	0.66	ND	ND	163	32.9	1,700	2,190	7.6
MW-10UB	010994	106790-35	06-19-91	244	60.7	214	4.9	ND	203	650	300	22	ND	0.58	ND	ND	166	35.3	1,800	2,441	7.7
MW-10UB	002275	109902-32	09-25-91	167	43.9	161	4.2	ND	192	430	180	19	0.03	0.75	0.24	ND	157	32.1	1,400	1,950	7.4
MW-10UB	002419	112587-27	12-05-91	209	55.2	195	3.6	ND	200	530	220	19	ND	0.70	ND	ND	164	31.2	1,600	2,260	7.6
MW-10UB dup	002421	112587-29	12-05-91	208	55.1	196	3.4	ND	196	540	220	20	ND	0.69	ND	ND	161	31.2	1,600	2,290	7.5
MW-10UB	002654	204659-11	04-10-92	236	57.1	185	4.2	ND	208	580	320	22	ND	0.63	ND	ND	170	33.6	1,700	2,380	7.5
MW-15UB PT	001041	309058-01	09-28-93	16.9	2.9	151	2.1	ND	126	34	220	4.2	---	1.45	ND	ND	103	17.1	560	813	8.2
HS-1	*39905*		*05-13-82*	*40*	*13*	*190*	*ND*	*0*	*287*	*105*	*113*	*5.8*	---	*1.56*	---	---	---	---	*867*	*1,300*	*7.7*
HS-1	*MY8148*		*05-13-82*	---	---	---	---	---	---	---	---	---	*0.15*	---	---	---	---	---	---	---	---
HS-1	*008294*		*09-14-82*	*36*	*12*	*180*	*2.9*	*0*	*234*	*113*	*108*	*6.0*	*0.18*	*1.32*	---	---	---	---	*659*	*1,090*	*7.6*
HS-1	*08295*		*09-14-82*	*36*	*12*	*180*	*2.99*	*0*	*242*	*111*	*109*	*5.0*	*ND*	*1.50*	---	---	---	---	*650*	*1,080*	*7.8*
HS-1	*08296*		*09-14-82*	*34*	*14*	*178*	*2.7*	*0*	*242*	*104*	*112*	*5.3*	*ND*	*1.50*	---	---	---	---	*646*	*1,060*	*7.7*
HS-1	*MY0229*		*05-18-83*	---	---	---	---	---	---	---	---	---	*ND*	---	---	---	---	---	---	---	---
HS-1	---		*04-15-87*	---	---	---	---	---	---	---	---	*2.3*	---	---	---	---	---	---	---	---	---
HS-1	004017	3043-2	07-15-87	---	---	---	---	---	---	---	---	7.6	ND	---	---	---	---	---	---	---	---
HS-2	*39903*		*05-12-82*	*25*	*6*	*159*	---	*0*	*244*	*59*	*84*	*7*	---	*2.38*	---	---	---	---	*515*	*1,010*	*7.7*
HS-2	*08297*		*09-14-82*	*26*	*6*	*159*	*1.7*	*0*	*232*	*58*	*87*	*6.5*	*ND*	*2.41*	---	---	---	---	*532*	*870*	*7.9*
HS-2	*MY0227*		*05-18-83*	---	---	---	---	---	---	---	---	---	*ND*	---	---	---	---	---	---	---	---
HS-2	---		*04-15-87*	---	---	---	---	---	---	---	---	*7.1*	---	---	---	---	---	---	---	---	---

SAMPLE SOURCE[a]	SAMPLE IDENTIFIER		DATE SAMPLED	COMMON CONSTITUENTS[b] (milligrams per liter)																LAB EC (µmho/cm)[c]	LAB pH
	FIELD	LAB		Ca	Mg	Na	K	CO_3	HCO_3	Cl	SO_4	NO_3	NH_3	F	PO_4	P	Alk	SiO_2	TDS		
HS-2	004018	3043-3	07-15-87	---	---	---	---	---	---	---	---	9.5	ND	---	---	---	---	---	---	---	---
HS-2	006081	809066-12	09-14-88	16	8.4	151	ND	ND	287	53.4	94	10.3	ND	2.31	0.30	0.36	235	29.6	474	786	8.1
HS-2	006173	812527-10	12-06-88	22	7.7	148	ND	ND	301	61.4	73	7.00	ND	2.36	ND	ND	247	27.6	509	816	8.1
HS-2	006372	908706-03	08-24-89	22.5	8.58	160	ND	ND	284	65	45	6.6	0.04	2.14	ND	ND	233	31.5	540	822	8.3
HS-2	006565	003672-06	03-07-90	18.6	8.6	163	ND	ND	284	65	102	6.8	ND	2.44	0.06	ND	233	30.8	550	809	8.2
HS-2	006750	006599-04	06-07-90	23.8	9.4	159	ND	ND	283	73	93	6.6	ND	2.33	ND	ND	232	31.0	510	830	8.3
HS-2	010784	103882-03	03-21-91	23.2	9.2	159	ND	ND	279	62	86	6.4	ND	2.34	ND	ND	229	34.0	530	820	8.0
HS-3	*38904*		*05-12-82*	*86*	*20*	*253*	---	*0*	*239*	*270*	*60*	*41*	---	*1.32*	---	---	---	---	*1,053*	*2,040*	*7.6*
HS-3	*MY8147*		*05-12-82*	---	---	---	---	---	---	---	---	---	*ND*	---	---	---	---	---	---	---	---
HS-3	*08298*		*09-14-82*	*83*	*20*	*249*	*2.5*	*0*	*222*	*271*	*90*	*36*	*ND*	*1.23*	---	---	---	---	*1,052*	*1,720*	*7.6*
HS-3	*MY0230*		*05-18-83*	---	---	---	---	---	---	---	---	---	*ND*	---	---	---	---	---	---	---	---
HS-3	---		*04-15-87*	---	---	---	---	---	---	---	---	*40.6*	---	---	---	---	---	---	---	---	---
HS-3	004016	3043-1	07-15-87	---	---	---	---	---	---	---	---	31.3	ND	---	---	---	---	---	---	---	---
HS-3	006082	809086-13	09-14-88	60	32.1	243	1.0	ND	287	297	92	43.3	ND	1.29	0.54	0.54	219	34.5	1,090	1,700	7.9
HS-3	006097	809133-18	09-20-88	59	32.4	239	1.4	ND	259	285	94	41.9	0.06	1.36	ND	ND	212	19.5	1,070	1,620	7.9
HS-3	006170	812527-07	12-05-88	48	29.4	228	1.1	ND	293	286	88	42.3	ND	1.19	ND	ND	240	32.7	1,029	1,510	8.0
HS-3	006370	908706-01	08-24-89	66.5	32.3	260	1.4	ND	261	310	59	36	0.06	1.25	ND	ND	214	36.4	1,080	1,720	8.1
HS-3	006568	003588-01	03-08-90	51.6	27.8	253	1.2	ND	261	310	102	39	ND	1.40	ND	ND	214	34.0	920	1,630	7.9
HS-3	006749	006599-03	06-07-90	67.4	32.0	255	ND	ND	262	260	88	40	ND	1.31	ND	ND	215	37.8	1,040	1,670	8.0
HS-3	010786	103882-05	03-21-91	61.8	29.5	246	1.2	ND	257	280	84	38	ND	1.31	ND	ND	211	37.6	950	1,700	7.7
IW-1UB	001098	310890-48	10-19-93	12.7	2.2	176	1.7	2	106	23	280	2.14	ND	1.37	ND	ND	86	15.4	590	889	8.5

NOTE: Except for results shown in italics, samples analyzed by one of the following chemical laboratories:

Analytical Technologies, Inc., Phoenix, Arizona, for samples obtained from 1987 through August 10, 1994
Pace Incorporated, Minneapolis, Minnesota, for samples obtained after August 10, 1994, and through March 4, 1999
Del Mar Analytical, Phoenix, Arizona, for samples obtained after March 4, 1999

Italics indicates groundwater sample not obtained by Errol L. Montgomery & Associates, Inc.
1982 Sample obtained by Arizona Department of Health Services
1983 Sample obtained by Ecology and Environment, Inc.
1987 Sample obtained by Maricopa County
1989 Sample obtained by Arizona Department of Environmental Quality
1994 Samples obtained by Maricopa County Department of Solid Waste Management
1996 Samples obtained by Maricopa County Department of Solid Waste Management
1998 Samples obtained by Arizona Department of Environmental Quality
1999 Samples obtained by Maricopa County Department of Solid Waste Management
February 2000 Samples obtained by Maricopa County Solid Waste Management
May 2000 Samples obtained for Maricopa County Solid Waste Management
October 2000 Samples obtained for Maricopa County Solid Waste Management
November 2000 Sample obtained for Maricopa County Solid Waste Management

[a] EFFLUENT = Groundwater Remediation System effluent
INFLUENT = Groundwater Remediation System influent
EW-#UA = Unit A groundwater extraction well
MW-#UA = Unit A groundwater monitor well
MW-#UB = Unit B groundwater monitor well
IW-#UB = Unit B injection well
D = Sample obtained during well development
PT = Sample obtained during pumping test
dup = Duplicate sample

[b]

Ca	=	Calcium	Cl	=	Chloride	P	=	Phosphorus (total)
Mg	=	Magnesium	SO_4	=	Sulfate	Alk	=	Alkalinity (as $CaCO_3$)
Na	=	Sodium	NO_3	=	Nitrate (as N)	SiO_2	=	Silica
K	=	Potassium	NH_3	=	Ammonia (as N)	TDS	=	Total dissolved solids
CO_3	=	Carbonate	F	=	Fluoride	ND	=	Not detected
HCO_3	=	Bicarbonate (as HCO_3)	PO_4	=	Phosphate (ortho) (as P)	---	=	Not analyzed

[c] EC = Electrical Conductance in μmho/cm (micromhos per centimeter)

[d] Electrical conductance initially measured in the laboratory was reported to be 6,900 μmho/cm, which is anomalous. A second laboratory measurement made after a holding time of 73 days was 683 μmho/cm. The second laboratory measurement corroborates the field measurements: the initial laboratory measurement is not considered to be representative.

TABLE 4-2 Summary of Groundwater Remediation System Shutdowns January - December 1999 Hassayampa Landfill Superfund Site

DATE	TIME	APPROXIMATE DURATION [a] (hours)	RESTART	CAUSE OF SHUTDOWN
02-23-99	11:00	5	auto	Unplanned – power outage
03-12-99	13:00	91	manual	Unplanned–high water level in equalization tank
03-18-99	9:00	32	manual	Unplanned-power outage
03-31-99	16:00	113	manual	Unplanned-high water level in equalization tank
04-13-99	10:00	<1	manual	EPA Site visit
06-13-99	11:00	28	manual	Unplanned-power outage
06-15-99	18:00	1,652	manual	Shutdown due to detection of volatile organic compound at a concentration that exceeded groundwater Performance Standard in effluent; remained off until August 23, except for sampling conducted on July 14 and 28
08-27-99	11:00	2	auto	Unplanned-power outage
09-07-99	14:00	2	manual	Planned–sampling
09-30-99	12:00	4	manual	Planned-sampling, measure non-injecting water levels
11-16-99	9:00	5	manual	Unplanned–high water level in equalization tank
11-29-99	8:00	<1	manual	Unplanned-power outage (?)
12-21-99	10:50	2	auto	Unplanned-power outage (?)
Total Down Time		1,936		

Total non-operational time:	1,930		
Total operational time [b]:	6,830		
Total time:	8,760		
Percent down time:	22.0%	=	(1,930 / 8,760)

[a] Datalogger records Groundwater Remediation System information once per hour. Therefore, potential error for estimates of duration of shutdowns in plus or minus one hour.

[b] Total operational time refers to the hours that the Groundwater Remediation System was operating, or was operational, but could not be operated due to other circumstance, such as sampling, inspections, etc.

Source: *Annual Monitoring Report No. 5 for 1999*, M&A, 3/22/00.

TABL
Groun Remediation System Shutdowns During 2000
Hassayampa Landfill EPA Superfund Site

SYSTEM OFF		SYSTEM ON		TOTAL TIME IN YEAR	OPERABLE[a] DOWN TIME			NON-OPERABLE[b] DOWN TIME			TOATAL DOWN TIME			TYPE OF RESTART	COMMENTS
DATE	TIME	DATE	TIME	(days)	EVENT (hours)	CUMMULATIVE (hours)	%	EVENT (hours)	CUMMULATIVE (hours)	%	EVENT (hours)	CUMMULATIVE (hours)	%		
01-01-00	23:45	01-02-00	2:45	1.1		0:00:00	0.0	3:00:00	3:00:00	11.2	3:00:00	3:00:00	11.2	automatic	Unplanned - probable power outage
01-10-00	16:00	01-10-00	17:00	9.7	1:00:00	1:00:00	0.4		3:00:00	1.3	1:00:00	4:00:00	1.7	manual	Planned - investigate EW-4UA function
01-11-00	10:00	01-11-00	14:20	10.6	4:20:00	5:20:00	2.1		3:00:00	1.2	4:20:00	8:20:00	3.3	manual	Planned - GRS O&M and acidize air stripper
01-19-00	11:50	01-19-00	12:00	18.5	0:10:00	5:30:00	1.2		3:00:00	0.7	0:10:00	8:30:00	1.9	manual	Planned - demonstration for EPA site visit
01-26-00	15:50	01-26-00	17:45	25.7	1:55:00	7:25:00	1.2		3:00:00	0.5	1:55:00	10:25:00	1.7	manual	Planned - replace EW-4UA transducer
02-01-00	12:50	02-01-00	13:00	31.5	0:10:00	7:35:00	1.0		3:00:00	0.4	0:10:00	10:35:00	1.4	manual	Planned - inspect check GRS valves
02-15-00	9:50	02-15-00	12:25	45.5	2:35:00	10:10:00	0.9		3:00:00	0.3	2:35:00	13:10:00	1.2	manual	Planned - replace GRS flow meter wheels
02-21-00	7:05	02-21-00	9:35	51.4		10:10:00	0.8	2:30:00	5:30:00	0.4	2:30:00	15:40:00	1.3	automatic	Unplanned - no alarm
02-21-00	16:40	02-21-00	17:20	51.7		10:10:00	0.8	0:40:00	6:10:00	0.5	0:40:00	16:20:00	1.3	automatic	Unplanned - no alarm
03-01-00	13:45	03-01-00	16:45	60.7	3:00:00	13:10:00	0.9		6:10:00	0.4	3:00:00	19:20:00	1.3	manual	Planned - modify PLC program
03-06-00	14:35	03-06-00	15:20	65.6		13:10:00	0.8	0:45:00	6:55:00	0.4	0:45:00	20:05:00	1.3	automatic	Unplanned - probable power outage - no alarm
06-20-00	17:55	06-20-00	20:00	171.8		13:10:00	0.3	2:05:00	9:00:00	0.2	2:05:00	22:10:00	0.5	automatic	Unplanned - power outage
06-28-00	20:45	06-28-00	22:05	179.9		13:10:00	0.3	1:20:00	10:20:00	0.2	1:20:00	23:30:00	0.5	automatic	Unplanned - power outage
07-26-00	9:05	07-26-00	11:55	207.5	2:50:00	16:00:00	0.3		10:20:00	0.2	2:50:00	26:20:00	0.5	manual	Planned - air stripper maintenance
07-30-00	22:05			213.0		16:00:00	0.3	25:55:00	36:15:00	0.7	25:55:00	52:15:00	1.0		Unplanned - power outage; APS problem
		08-03-00	15:50	215.7		16:00:00	0.3	63:50:00	100:05:00	1.9	63:50:00	116:05:00	2.2	manual	Unplanned - power outage; APS problem
08-16-00	9:30	08-16-00	13:13	228.6	3:43:00	19:43:00	0.4		100:05:00	1.8	3:43:00	119:48:00	2.2	manual	Planned - replace transducer in well EW-4UA
08-22-00	9:00	08-22-00	11:25	234.5	2:25:00	22:08:00	0.4		100:05:00	1.8	2:25:00	122:13:00	2.2	manual	Planned - troubleshoot datalogger interface
08-22-00	21:47	08-24-00	17:22	236.7		22:08:00	0.4	43:35:00	143:40:00	2.5	43:35:00	165:48:00	2.9	manual	Unplanned - power outage; APS problem
08-24-00	22:53	08-24-00	23:57	237.0		22:08:00	0.4	1:04:00	144:44:00	2.5	1:04:00	166:52:00	2.9	automatic	Unplanned - power outage; APS problem
08-28-00	13:18			244.0	82:41:00	104:49:00	1.8		144:44:00	2.5	82:41:00	249:33:00	4.3		Planned - Off until surge protector replaced
		09-14-00	15:15	257.6	327:15:00	432:04:00	7.0		144:44:00	2.3	327:15:00	576:48:00	9.3	manual	Planned - Off until surge protector replaced
10-19-00	19:10	10-19-00	19:30	292.8	0:20:00	432:24:00	6.2		144:44:00	2.1	0:20:00	577:08:00	8.2	manual	Planned - reinstall uninteruptable power supply
11-05-00	3:21	11-05-00	4:14	309.2		432:24:00	5.8	0:53:00	145:37:00	2.0	0:53:00	578:01:00	7.8	automatic	Unplanned - no alarm
12-29-00	7:51	12-29-00	14:53	363.6	7:02:00	439:26:00	5.0		145:37:00	1.7	7:02:00	585:03:00	6.7	manual	Planned - modify GRS influent manifold
JANUARY				31.0	7:25:00		1.0	3:00:00		0.4	10:25:00		1.4		
FEBRUARY				29.0	2:45:00		0.4	3:10:00		0.5	5:55:00		0.9		
MARCH				31.0	3:00:00		0.4	0:45:00		0.1	3:45:00		0.5		
APRIL				30.0	0:00:00		0.0	0:00:00		0.0	0:00:00		0.0		
MAY				31.0	0:00:00		0.0	0:00:00		0.0	0:00:00		0.0		
JUNE				30.0	0:00:00		0.0	3:25:00		0.5	3:25:00		0.5		
JULY				31.0	2:50:00		0.4	25:55:00		3.5	28:45:00		3.9		
AUGUST				31.0	88:49:00		11.9	108:29:00		14.6	197:18:00		26.5		
SEPTEMBER				30.0	327:15:00		45.5	0:00:00		0.0	327:15:00		45.5		
OCTOBER				31.0	0:20:00		0.0	0:00:00		0.0	0:20:00		0.0		
NOVEMBER				30.0	0:00:00		0.0	0:53:00		0.1	0:53:00		0.1		
DECEMBER				31.0	7:02:00		0.9	0:00:00		0.0	7:02:00		0.9		
YEAR-TO-DATE TOTALS:				366.0		439:26:00	5.0		145:37:00	1.7		585:03:00	6.7		

[a] Operable down time refers to the down time that occurred when the Groundwater Remediation System (GRS) could have operated, but was not operated due to other circumstances, such as sampling, routine maintenance, inspections, etc.

[b] Non-operable down time time refers to down time that occurred when the GRS could have operated, but did not operate due to system malfunctions and/or alarm conditions.

NOTES: Datalogger records Groundwater Remediation System information once every 15 to 60 minutes; generally, the recording interval is once every 30 minutes.
APS = Arizona Public Service Company, which is the power provider for the Site
% = percent

Tbl_4-3 2000ShutdownSummary.xls 1 09/08/2001

TAB.
Summary of Rate and Volume of Water Extracted and Injected During 2000
for Groundwater Remediation System Wells
Hassayampa Landfill EPA Superfund Site

Month	EXTRACTION WELLS														Injection Well IW-1
	EW-1			EW-2			EW-3			EW-4			Total		
	Rate While Pumping (gpm)	Run Time (percent)	Average Pumping Rate (gpm)	Rate While Pumping (gpm)	Run Time (percent)	Average Pumping Rate (gpm)	Rate While Pumping (gpm)	Run Time (percent)	Average Pumping Rate (gpm)	Rate While Pumping (gpm)	Run Time (percent)	Average Pumping Rate (gpm)	Rate While Pumping (gpm)	Average Pumping Rate (gpm)	Injection Rate (gpm)
January	1.669	98.6	1.646	0.940	98.6	0.927	1.041	98.6	1.027	2.283	89.7	2.048	5.933	5.648	5.307
February	1.672	99.2	1.659	0.997	99.2	0.989	1.015	99.2	1.007	2.905	99.2	2.882	6.589	6.537	6.042
March	1.681	99.4	1.671	1.028	99.4	1.022	1.005	99.4	0.999	3.021	99.4	3.003	6.735	6.695	6.104
April	1.696	100.0	1.696	0.993	100.0	0.993	1.001	100.0	1.001	3.026	100.0	3.026	6.717	6.717	6.044
May	1.678	100.0	1.678	0.949	100.0	0.949	1.006	100.0	1.006	2.294	100.0	2.294	5.927	5.927	5.293
June	1.655	99.5	1.647	0.938	99.5	0.933	0.995	99.5	0.990	2.987	99.5	2.972	6.575	6.543	5.868
July	1.677	96.1	1.612	0.930	96.1	0.894	0.983	96.1	0.945	2.977	96.1	2.862	6.567	6.313	5.619
August	1.630	73.5	1.198	0.965	73.5	0.709	0.994	73.5	0.731	2.974	73.5	2.186	6.563	4.824	4.318
September	1.585	54.5	0.864	0.961	54.5	0.524	0.985	54.5	0.537	2.912	54.5	1.587	6.443	3.512	3.147
October	1.658	100.0	1.658	0.964	99.9	0.963	0.977	100.0	0.977	2.880	100.0	2.879	6.479	6.477	5.772
November	1.648	99.9	1.646	0.954	99.9	0.953	0.963	99.9	0.962	2.851	99.9	2.848	6.416	6.409	5.731
December	1.615	99.1	1.600	0.933	99.0	0.924	0.953	99.1	0.944	2.750	99.1	2.724	6.251	6.192	5.545
Average	**1.660**	**93.594**	**1.552**	**0.965**	**93.583**	**0.901**	**0.996**	**93.599**	**0.930**	**2.828**	**92.838**	**2.615**	**6.449**	**5.998**	**5.413**

Month	VOLUME OF WATER PUMPED OR INJECTED (gallons)					
	EW-1	EW-2	EW-3	EW-4	EW s	IW-1
January	73,455	41,379	45,832	91,441	252,107	236,885
February	69,266	41,309	42,062	120,340	272,977	252,313
March	74,601	45,612	44,596	134,059	298,868	272,479
April	73,255	42,916	43,261	130,742	290,173	261,103
May	74,897	42,364	44,894	102,419	264,574	236,301
June	71,171	40,323	42,778	128,404	282,677	253,482
July	71,959	39,922	42,168	127,773	281,822	250,837
August	53,466	31,647	32,610	97,563	215,286	192,756
September	37,307	22,617	23,185	68,560	151,669	135,939
October	73,997	42,992	43,614	128,500	289,103	257,642
November	71,111	41,178	41,572	123,033	276,894	247,564
December	71,413	41,246	42,134	121,582	276,374	247,509
Total	**815,898**	**473,504**	**488,706**	**1,374,417**	**3,152,525**	**2,844,809**

NOTE: gpm = gallons per minute

TABLE 4-5
Summary of Laboratory Chemical Results for Volatile Organic Compounds in Water Samples from Groundwater Wells and Groundwater Remediation System Air Stripper Influent and Effluent
Hassayampa Landfill EPA Superfund Site

SAMPLE SOURCE[a]	SAMPLE IDENTIFIER FIELD	SAMPLE IDENTIFIER LAB	DATE SAMPLED	DATE ANALYZED	EPA METHOD	LABORATORY[b]	DILUTION FACTOR[c]	VOLATILE ORGANIC COMPOUNDS[d] (micrograms per liter): TOTAL VOCs[e]	1,1-DCE	TCE	PCE	1,1,1-TCA	TCTFA	1,1-DCA	1,2-DCP	OTHER VOCs
EFFLUENT	001268	403631-11	03-04-94	03-14-94	624	ATI	1	ND	ND	ND	ND	ND	---	ND	ND	ND
EFFLUENT	002074	404805-13	04-14-94	04-26-94	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EFFLUENT dup	002075	404805-14	04-14-94	04-23-94	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EFFLUENT	EFF	E94-2632	04-14-94	04-20-94	601/602	McKENZIE	---	ND	ND	ND	ND	ND	---	ND	ND	ND
EFFLUENT	002095	405566-12	05-03-94	05-14-94	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EFFLUENT	002116	405828-13	05-13-94	05-18-94	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EFFLUENT dup	002117	405828-14	05-13-94	05-17-94	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EFFLUENT	002134	405984-12	05-20-94	06-02-94	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EFFLUENT	002161	406103-12	05-26-94	06-07-94	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EFFLUENT	002181	406565-11	06-02-94	06-11-94	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EFFLUENT dup	002182	406565-12	06-02-94	06-11-94	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EFFLUENT	002203	406631-13	06-07-94	06-14-94	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EFFLUENT	002219	406760-12	06-14-94	06-26-94	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EFFLUENT	002256	406015-12	06-24-94	07-05-94	601/602	ATI	1	ND	ND	ND	[0.3]	ND	ND	ND	ND	ND
EFFLUENT	002250	406125-13	06-30-94	07-11-94	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EFFLUENT dup	002251	406125-14	06-30-94	07-11-94	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EFFLUENT	002264	407587-13	07-07-94	07-13-94	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EFFLUENT	002280	407704-12	07-13-94	07-22-94	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EFFLUENT	002294	407820-13	07-19-94	07-26-94	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EFFLUENT dup	002295	407820-14	07-19-94	07-26-94	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EFFLUENT	002333	407012-38	07-27-94	08-10-94	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EFFLUENT dup	002334	407012-39	07-27-94	08-10-94	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EFFLUENT	002350	408632-12	08-05-94	08-10-94	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EFFLUENT dup	002351	408632-13	08-05-94	08-17-94	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EFFLUENT	002393	100205249	09-02-94	09-11-94	601/602	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EFFLUENT	002414	100264687	11-03-94	11-10-94	8240	PACE	1	ND	ND	ND	ND	ND	---	ND	ND	ND
EFFLUENT	002429	100283479	11-30-94	12-11-94	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EFFLUENT	002496	100005100	01-06-95	01-17-95	8010/8020	PACE	1	ND	[1.6]	ND	ND	ND	ND	ND	ND	ND
EFFLUENT	GPS1EFF	E95-0111	01-06-95	01-11-95	601/602	McKENZIE	---	ND	[1.4]	ND	ND	ND	---	ND	ND	ND
EFFLUENT	002515	100033553	02-08-95	02-16-95	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EFFLUENT	002516	100033561	02-08-95	02-16-95	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EFFLUENT	002517	100033570	02-08-95	02-16-95	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EFFLUENT	002518	100033588	02-08-95	02-16-95	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EFFLUENT	002519	100033596	02-08-95	02-16-95	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EFFLUENT	002521	100033600	02-08-95	02-16-95	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EFFLUENT	EFFLUENT 1	993340-01	02-08-95	02-19-95	502.2	ADHS	1	ND	ND	ND	ND	ND	ND	ND	ND	---
EFFLUENT	EFFLUENT 2	993340-01	02-08-95	02-19-95	502.2	ADHS	1	ND	ND	ND	ND	ND	ND	ND	ND	---
EFFLUENT	EFFLUENT 3	993340-01	02-08-95	02-19-95	502.2	ADHS	1	ND	ND	ND	ND	ND	ND	ND	ND	---
EFFLUENT	EFFLUENT 4	993340-01	02-08-95	02-19-95	502.2	ADHS	1	ND	ND	ND	ND	ND	ND	ND	ND	---
EFFLUENT	EFFLUENT 5	993340-01	02-08-95	02-19-95	502.2	ADHS	1	ND	ND	ND	ND	ND	ND	ND	ND	---
EFFLUENT	EFFLUENT 6	993340-01	02-08-95	02-18-95	502.2	ADHS	1	ND	ND	ND	ND	ND	ND	ND	ND	---
EFFLUENT	002546	100057347	03-08-95	03-15-95	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EFFLUENT	002580	100085669	04-03-95	04-13-95	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EFFLUENT	002595	100130893	05-09-95	05-22-95	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EFFLUENT	002687	100165891	06-08-95	06-19-95	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EFFLUENT	EFFLUENT	E95-5426	06-07-95	06-14-95	601/602	McKENZIE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EFFLUENT	002712	100279277	09-19-95	09-25-95	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EFFLUENT dup	002713	100279285	09-19-95	09-25-95	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EFFLUENT	002716	100293245	09-28-95	10-03-95	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EFFLUENT	EFFLUENT	44898	09-28-95	09-29-95	502.2	ADHS	1	ND	ND	ND	ND	ND	---	ND	ND	ND
EFFLUENT	002759	100372340	12-14-95	12-22-95	8240	PACE	1	ND	ND	ND	ND	ND	---	ND	ND	DMK=Tr R; [MEK=Tr]; [MBK=Tr]; [MIBK=Tr]
EFFLUENT	EFFLUENT	W5120335-07	12-14-95	12-20-95	601/602	GTEL	1	ND	ND	ND	ND	ND	---	ND	ND	ND
EFFLUENT	002794	100036145	02-29-96	03-12-96	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	[Benzene=1.1]

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Hassayampa Landfill Epa Superfund Site

SAMPLE SOURCE[a]	SAMPLE IDENTIFIER FIELD	SAMPLE IDENTIFIER LAB	DATE SAMPLED	DATE ANALYZED	EPA METHOD	LABORATORY[b]	DILUTION FACTOR[c]	TOTAL VOCs[d]	1,1-DCE	TCE	PCE	1,1,1-TCA	TCTFA	1,1-DCA	1,2-DCP	OTHER VOCs
								VOLATILE ORGANIC COMPOUNDS[g] (micrograms per liter)								
EFFLUENT dup	002795	100036153	02-29-96	03-14-96	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EFFLUENT	003776	100511673	03-22-96	04-03-96	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EFFLUENT	*EFF #1*	*W6030480-05*	*03-22-96*	*04-02-96*	*8010/8020*	*GTEL*	*1*	*ND*	*ND*	*ND*	*ND*	*ND*	—	*ND*	*ND*	*ND*
EFFLUENT	001796	100101095	08-04-96	08-13-96	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EFFLUENT	001300	100158658	09-05-96	09-17-96	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EFFLUENT dup	001301	100158666	09-05-96	09-17-96	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EFFLUENT	001357	100209856	12-04-96	12-10-96	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EFFLUENT dup	001358	100209872	12-04-96	12-10-96	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EFFLUENT	*A/S EFF*	*6120114*	*12-04-96*	*12-12-96*	*601/602*	*DEL MAR*	*1*	*ND*	*ND*	*ND*	*ND*	*ND*	—	*ND*	*ND*	*ND*
EFFLUENT	002918	70908793	03-06-97	03-11-97	8021	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EFFLUENT	000669	10195600	07-09-97	07-21-97	8260	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EFFLUENT dup	000670	10195618	07-09-97	07-21-97	8260	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EFFLUENT	*EFFLUENT*	*PGG00380*	*07-11-97*	*07-21-97*	*601/602*	*DEL MAR*	*1*	*ND*	*ND*	*ND*	*ND*	*ND*	—	*ND*	*ND*	*ND*
EFFLUENT	003625	10292407	09-16-97	10-02-97	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EFFLUENT dup	003626	10292415	09-16-97	10-02-97	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EFFLUENT	002954	10440964	12-17-97	12-23-97	624	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EFFLUENT	002975	10661320	05-26-98	06-05-98	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EFFLUENT	*HLF-EFF*	*PHE01529*	*05-26-98*	*06-10-98*	*8021B*	*DEL MAR*	*1*	*ND*	*ND*	*ND*	*ND*	*ND*	—	*ND*	*ND*	*ND*
EFFLUENT	000783	101031342	12-21-98	12-31-98	8021	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EFFLUENT	*EFFLUENT*	*PHL01619*	*12-21-98*	*12-29-98*	*8260B*	*DEL MAR*	*1*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*
EFFLUENT	000812	PIF00141	06-01-99	06-07-99	8260B	DEL MAR	1	23.9	14	ND	ND	ND	7.0	ND	2.9	ND
EFFLUENT dup	000813	PIF00919	06-01-99	06-15-99	8260B	DEL MAR	1	31.7	19	2.1	ND	ND	7.5	ND	3.1	ND
EFFLUENT	000883	PIG01058	07-14-99	07-22-99	8260B	DEL MAR	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EFFLUENT dup	000884	PIG01059	07-14-99	07-22-99	8260B	DEL MAR	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EFFLUENT split	000885	9907230-01A	07-14-99	07-22-99	8260B	TURNER	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EFFLUENT	*EFFL*	*E9G160184-001*	*07-14-99*	*07-19-99*	*8260B*	*QUANTERRA*	*1*	*4.98*	*0.38*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*DMK=4.6*
EFFLUENT	000890	PIH02050	08-30-99	09-07-99	8260B	DEL MAR	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EFFLUENT dup	000891	PIH02051	08-30-99	09-07-99	8260B	DEL MAR	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EFFLUENT	000899	PII00574	09-07-99	09-09-99	8260B	DEL MAR	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EFFLUENT dup	000900	PII00575	09-07-99	09-09-99	8260B	DEL MAR	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EFFLUENT	000904	PIJ000079	09-30-99	10-12-99	8260B	DEL MAR	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EFFLUENT dup	000905	PIJ000080	09-30-99	10-12-99	8260B	DEL MAR	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EFFLUENT	000917	PIK0254-01	11-15-99	11-17-99	8260B	DEL MAR	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EFFLUENT	*EFFLUENT*	*E9K170275-002*	*11-15-99*	*11-18-99*	*8260B*	*ADEQ*	*1*	*2.1*	*ND*	*ND*	*Tr*	*ND*	*ND*	*ND*	*ND*	*CT=1.0; TCM=1.1*
EFFLUENT	000964	PIL0404-03	12-22-99	01-03-00	8260B	DEL MAR	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EFFLUENT	000970	PJA0456-01	01-26-00	02-03-99	8260B	DEL MAR	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EFFLUENT	000978	PJC0028-01	03-01-00	03-12-00	8260B	DEL MAR	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EFFLUENT	002579	PJD0079-05	04-05-00	04-19-00	8260B	DEL MAR	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EFFLUENT+	003126	PJE0348-48	05-15-00	05-29-00	8260B	DEL MAR	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EFFLUENT	*EFFLUENT*	*E0E170226-002*	*05-15-00*	*05-17-00*	*8260B*	*STL*	*1*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*
EFFLUENT	003137	PJF0443-03	06-22-00	06-29-00	8260B	DEL MAR	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EFFLUENT	003165	PJG0464-01	07-26-00	07-31-00	8260B	DEL MAR	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EFFLUENT	003168	PJH0344-01	08-16-00	08-22-00	8260B	DEL MAR	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EFFLUENT	003171	PJI0299-01	09-19-00	09-27-00	8260B	DEL MAR	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EFFLUENT	003177	PJJ0337-03	10-18-00	10-25-00	8260B	DEL MAR	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EFFLUENT	003221	PJK0256-03	11-15-00	11-22-00	8260B	DEL MAR	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EFFLUENT	003224	PJL0177-01	12-12-00	12-19-00	8260B	DEL MAR	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
INFLUENT	001266	403631-09	03-04-94	03-14-94	624	ATI	1	ND	ND	ND	ND	ND	---	ND	ND	ND
INFLUENT	002072	404805-11	04-14-94	04-23-94	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
INFLUENT	002093	405566-10	05-03-94	05-14-94	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
INFLUENT	002114	405829-11	05-13-94	05-17-94	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
INFLUENT	002132	405904-10	05-20-94	06-02-94	601/602	ATI	1	0.5	0.5	ND	ND	ND	ND	ND	ND	ND
INFLUENT	002159	405103-10	05-26-94	06-07-94	601/602	ATI	1	0.5	0.5	ND	ND	ND	ND	ND	ND	ND
INFLUENT	002170	406565-09	06-02-94	06-11-94	601/602	ATI	1	2.9	0.6	ND	ND	ND	2.3	ND	ND	ND
INFLUENT	002201	406631-11	06-07-94	06-13-94	601/602	ATI	1	1.1	0.8	ND	ND	ND	ND	ND	ND	1,2-DCA=0.3

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SAMPLE SOURCE[a]	SAMPLE IDENTIFIER FIELD	SAMPLE IDENTIFIER LAB	DATE SAMPLED	DATE ANALYZED	EPA METHOD	LABORATORY[b]	DILUTION FACTOR[c]	TOTAL VOCs[d]	1,1-DCE	TCE	PCE	1,1,1-TCA	TCTFA	1,1-DCA	1,2-DCP	OTHER VOCs
								VOLATILE ORGANIC COMPOUNDS[d] (micrograms per liter)								
INFLUENT	002217	406760-11	06-14-94	06-24-94	601/602	ATI	1	4.0	0.8	ND	ND	ND	3.2	ND	ND	ND
INFLUENT	002234	406015-10	06-24-94	07-04-94	601/602	ATI	1	0.3	0.3	ND	ND	ND	ND	ND	ND	ND
INFLUENT	002248	406125-11	06-30-94	07-11-94	601/602	ATI	1	0.4	0.4	ND	ND	ND	ND	ND	ND	ND
INFLUENT	002262	407587-11	07-07-94	07-13-94	601/602	ATI	1	2.7	0.7	ND	ND	ND	2.0	ND	ND	ND
INFLUENT	002278	407701-10	07-13-94	07-22-94	601/602	ATI	1	0.5	0.5	ND	ND	ND	ND	ND	ND	ND
INFLUENT	002292	407820-11	07-19-94	07-26-94	601/602	ATI	1	3.1	1.0	ND	ND	ND	2.1	ND	ND	ND
INFLUENT dup	002293	407820-12	07-19-94	07-26-94	601/602	ATI	1	2.6	0.6	ND	ND	ND	2.0	ND	ND	ND
INFLUENT	002331	407012-36	07-27-94	08-10-94	601/602	ATI	1	0.7	0.7	ND	ND	ND	ND	ND	ND	ND
INFLUENT	002348	408632-10	08-05-94	08-17-94	601/602	ATI	1	1.0	1.0	ND	ND	ND	ND	ND	ND	ND
INFLUENT	002391	100205222	09-02-94	09-15-94	601/602	PACE	1	1.3	1.3	ND	ND	ND	ND	ND	ND	ND
INFLUENT	002412	100264660	11-03-94	11-10-94	8240	PACE	1	ND	ND	ND	ND	ND	---	ND	ND	DMK=Tr (R)
INFLUENT	002427	100293462	11-30-94	12-11-94	8010/8020	PACE	1	5.3	5.3	ND	ND	ND	ND	ND	ND	ND
INFLUENT dup	002428	100283460	11-30-94	12-11-94	8010/8020	PACE	1	4.9	4.9	ND	ND	ND	ND	ND	ND	ND
INFLUENT	002496	100005086	01-08-95	01-17-95	8010/8020	PACE	1	12.7	8.8	1.5	ND	ND	1.1	ND	1.3	ND
INFLUENT	002512	100033537	02-08-95	02-16-95	8010/8020	PACE	1	25.6	20	3.0	ND	ND	ND	ND	2.6	ND
INFLUENT dup	002520	100033545	02-08-95	02-16-95	8010/8020	PACE	1	23.4	18	2.9	ND	ND	ND	ND	2.5	ND
INFLUENT	—	*INFLUENT 1*	*02-08-95*	*02-19-95*	*502.2*	*ADHS*	*1*	*19.3*	*12.1*	*2.6*	*0.6*	*ND*	—	*0.6*	*3.2*	*ND*
INFLUENT	—	*INFLUENT 2*	*02-08-95*	*02-18-95*	*502.2*	*ADHS*	*1*	*29.1*	*21.6*	*2.7*	*0.8*	*ND*	—	*0.6*	*3.4*	*ND*
INFLUENT	002558	100057312	03-09-95	03-15-95	8010/8020	PACE	1	48.7	37	5.1	1.2	ND	ND	0.7	4.7	ND
INFLUENT	002578	100089642	04-03-95	04-13-95	8010/8020	PACE	1	42.9	31	4.9	1.1	ND	ND	1.0	4.9	ND
INFLUENT	002593	100130865	05-09-95	05-22-95	8010/8020	PACE	1	94.9	72	8.2	2.0	ND	ND	1.7	11	ND
INFLUENT	002677	100165794	06-08-95	06-16-95	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
INFLUENT	002710	100278956	09-19-95	09-25-95	8010/8020	PACE	1 (5)	174.7	(120)	15	4.4	1.4	7.1	4.0	19	DCM=2.2 T[h]; TCFM=1.6
INFLUENT	002761	100372382	12-14-95	12-22-95	8240	PACE	1	180	140	18	Tr	Tr	—	Tr	22	DCM=Tr
INFLUENT	*INFLUENT*	*WS120335-06*	*12-14-95*	*12-21-95*	*601/602*	*GTEL*	*1*	*227.7*	*170*	*19*	*5.2*	*2.4*	—	*4.8*	*22*	*DCM=2.0; TCFM=2.3*
INFLUENT	002792	100036110	02-29-96	03-07-96	8010/8020	PACE	1	204.5	140	16	5.3	ND	15	3.8	22	TCFM=2.4
INFLUENT	003775	100051179	03-22-96	04-03-96	8010/8020	PACE	1	45.8	ND	9.1	2.5	0.9	13	2.0	15	DCM=2.6; TCFM=0.7
INFLUENT	*INF #1*	*W6030480-07*	*03-22-96*	*04-02-96*	*8010/8020*	*GTEL*	*1*	*201.6*	*150*	*17*	*4.7*	*2.4*	---	*4.6*	*21*	*TCFM=1.9*
INFLUENT	001798	100101079	06-04-96	06-12-96	8010/8020	PACE	1 (5)	189.2	(130)	13	4.0	2.5	16	3.6	17	DCM=1.1 T[h]; TCFM=2.0
INFLUENT dup	001799	100101087	06-04-96	06-13-96	8010/8020	PACE	1 (5)	178.3	(120)	13	4.0	2.6	15	3.7	17	DCM=1.0 T; TCFM=2.0
INFLUENT	001298	100158631	09-05-96	09-17-96	8010/8020	PACE	10	13,169	120	14	ND	ND	16	ND	19	DMK=13,000[h]
INFLUENT dup	001299	100158640	09-05-96	09-18-96	8010/8020	PACE	10	210	150	14	ND	ND	24	ND	22	ND
INFLUENT	001359	100209864	12-04-96	12-10-96	8010/8020	PACE	1 (10)	293.97	(190)	19	11	6.6	20	5.7	33	[1,1,2-TCA=0.52]; MB=0.59; TCFM=3.3; 1,2-DCA=0.57; DCM=4.8 T[h]
INFLUENT	*A/S INF*	*6120113*	*12-04-96*	*12-12-96*	*601/602*	*DEL MAR*	*20*	*275*	*230*	*23*	*ND*	*ND*	---	*ND*	*22*	*ND*
INFLUENT	002916	70906785	03-06-97	03-11-97	8021	PACE	1 (10)	293.3	(180)	21	7.0	9.4	36	6.9	26	DCM=2.8 FT; TCFM=4.2
INFLUENT	000671	10195592	07-09-97	07-21-97	8260	PACE	1	468	320	33	9.9	15	47	7.5	30	TCFM=5.6
INFLUENT	*INFLUENT*[f]	*PGG00281*	*07-11-97*	*07-21-97*	*601/602*	*DEL MAR*	*1*	*158.5*	*120*	*19*	*ND*	*5.5*	---	*ND*	*14*	*ND*
INFLUENT	003627	10292365	09-18-97	10-02-97	8020	PACE	1 (10)	519.9	(340)	31	8.6	15	(70)	8.9	38	DCM=2.8; TCFM=5.6 T; [cis-1,2-DCE=2.7]
INFLUENT dup	003628	10292415	09-18-97	10-02-97	8020	PACE	1 (10)	526.6	(350)	31	8.8	15	(67)	8.6	37	DCM=3.3; TCFM=5.8 T
INFLUENT	002928	10440956	12-17-97	12-23-97	624	PACE	1 (5)	275.6	(220)	18	ND	9.2	ND	6.4	22	ND
INFLUENT	002973	10661312	05-26-98	06-05-98	8010/8020	PACE	5	258.1	150	21	ND	6.8	46	6.3	28	MB=9.4M
INFLUENT	*H/F-INF*	*PHE01528*	*05-26-98*	*06-10-98*	*8021B*	*DEL MAR*	*5*	*189.1*	*150*	*15*	*3.7*	*2.6*	---	*ND*	*15*	*1,2-DCA=2.8*
INFLUENT	000794	101033967	12-21-98	01-04-99	8021	PACE	1	236.9	180	19	ND	5.2	ND	5.7	20	DCM=2.2; [1,3-DCP=8.8]; [BM=1.1FM]; TCFM=4.6
INFLUENT	*INFLUENT*	*PHL01620*	*12-21-98*	*01-04-99*	*8260B*	*DEL MAR*	*2.5*	*242*	*170*	*17*	*ND*	*ND*	*36*	*ND*	*19*	*ND*
INFLUENT	000810	PIF00140	06-01-99	06-07-99	8260B	DEL MAR	1	303.0	170	15	4.4	4.0	87	3.2	14	TCFM=5.4
INFLUENT	000881	PIG01057	07-14-99	07-22-99	8260B	DEL MAR	1 (5)	586.6	(320)	27	9.4	9.3	170	6.9	33	TCFM=11
INFLUENT	000892	PIH02052	08-30-99	09-07-99	8260B	DEL MAR	1 (2.6)	369.5	(220)	19	5.6	5.7	89	4.2	16	TCFM=6.0
INFLUENT	000897	PII00573	09-07-99	09-09-99	8260B	DEL MAR	1	371.7	210	20	6.2	6.4	99	4.4	17	TCFM=6.7
INFLUENT	000902	PIJ00078	09-30-99	10-13-99	8260B	DEL MAR	1 (5)	305.5	(180)	17	5.2	5.2	73	3.4	15	TCFM=6.7
INFLUENT	000919	PIK0254-03	11-15-99	11-17-99	8260B	DEL MAR	1 (10)	295.1	(180)	15	3.9	4.3	70	3.2	13	TCFM=5.7
INFLUENT	*INFLUENT*	*E9K170275-001*	*11-16-99*	*11-18-99*	*8260B*	*ADEQ*	*2.5*	*304*	*170*	*16*	*5.0*	*5.6*	*85*	*3.3*	*12*	*1,2-DCA=Tr; TCFM=7.1*
INFLUENT	000980	PJC0028-03	03-01-00	03-13-00	8260B	DEL MAR	1 (10)	377.9	(250)	21	5.9	7.9	(72)	4.1	17	ND
INFLUENT+	003123	PJE0348-45	05-15-00	05-29-00	8260B	DEL MAR	1	406.5	250	18	4.7	7.6	91	3.6	14	TCFM=7.6

TABLE 4-5
Summary of Laboratory Chemical Results for Volatile Organic Compounds in Water Samples from Groundwater Wells and Groundwater Remediation System Air Stripper Influent and Effluent
Hassayampa Landfill Epa Superfund Site

SAMPLE SOURCE[a]	SAMPLE IDENTIFIER: FIELD	SAMPLE IDENTIFIER: LAB	DATE SAMPLED	DATE ANALYZED	EPA METHOD	LABORATORY[a]	DILUTION FACTOR[c]	TOTAL VOCs[a]	1,1-DCE	TCE	PCE	1,1,1-TCA	TCTFA	1,1-DCA	1,2-DCP	OTHER VOCs
								VOLATILE ORGANIC COMPOUNDS[a] (micrograms per liter)								
INFLUENT	*INFLUENT*	*E0E170226-001*	*05-15-00*	*05-17-00*	*8260B*	*STL*	*5*	*422.5*	*240*	*20*	*6.0*	*9.5*	*130*	*Tr*	*17*	*TCFM=Tr*
INFLUENT	003135	PJF0443-01	06-22-00	06-29-00	8260B	DEL MAR	5	444	390	24	ND	11	---	ND	19	ND
INFLUENT	003175	PJJ0337-01	10-18-00	10-25-00	8260B	DEL MAR	1 (5)	507.3	(280)	24	8.2	12	(150)	4.1	17	DMK=Tr; TCFM=12
INFLUENT dup	003176	PJJ0337-02	10-18-00	10-25-00	8260B	DEL MAR	1 (5)	573.6	(310)	24	8.7	11	190	3.9	16	TCFM=10
EW-1UA D	001140	311122-01	11-30-93	12-01-93	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	[DMK=020]
EW-1UA PT	001145	312566-01	12-02-93	12-09-93	624	ATI	1	ND	ND	ND	ND	ND	---	ND	ND	[DMK=11]
EW-1UA	001284	403631-07	03-04-94	03-14-94	624	ATI	1	ND	ND	ND	ND	ND	---	ND	ND	ND
EW-1UA	002069	404805-08	04-14-94	04-25-94	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EW-1UA	002091	405566-08	05-03-94	05-14-94	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EW-1UA	002111	405828-08	05-13-94	05-17-94	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EW-1UA	002130	405964-08	05-20-94	06-02-94	601/602	ATI	1	0.7	0.4	0.3	ND	ND	ND	ND	ND	ND
EW-1UA	002151	405103-02	05-26-94	06-07-94	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EW-1UA	002177	406565-07	06-02-94	06-14-94	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EW-1UA	002198	406631-06	06-07-94	06-15-94	601/602	ATI	1	0.2	0.2	ND	ND	[0.5]	ND	ND	ND	ND
EW-1UA	002209	406760-02	06-14-94	06-24-94	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EW-1UA	002226	408015-02	06-24-94	07-04-94	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EW-1UA	002246	406125-09	06-30-94	07-10-94	601/602	ATI	1	0.5	0.3	0.2	ND	ND	ND	ND	ND	ND
EW-1UA dup	002247	406125-10	06-30-94	07-11-94	601/602	ATI	1	0.6	0.3	0.3	ND	ND	ND	ND	ND	ND
EW-1UA	002253	407587-02	07-07-94	07-16-94	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EW-1UA	002270	407701-02	07-13-94	07-22-94	601/602	ATI	1	0.4	0.2	0.2	ND	ND	ND	ND	ND	ND
EW-1UA	002284	407820-03	07-19-94	07-25-94	601/602	ATI	1	0.4	0.4	ND	ND	ND	ND	ND	ND	ND
EW-1UA	002329	407012-34	07-27-94	08-10-94	601/602	ATI	1	0.3	0.3	ND	ND	ND	ND	ND	ND	ND
EW-1UA	002346	408632-08	08-05-94	08-17-94	601/602	ATI	1	0.4	0.4	ND	ND	ND	ND	ND	ND	ND
EW-1UA	002382	100205133	09-02-94	09-08-94	601/602	PACE	1	0.7	0.7	ND	ND	ND	ND	ND	ND	ND
EW-1UA	002410	100264644	11-03-94	11-08-94	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EW-1UA	002480	100286656	12-05-94	12-14-94	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EW-1UA	002488	100009053	01-06-95	01-17-95	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EW-1UA	*EW1UA*	*E95-0112*	*01-06-95*	*01-11-95*	*610/602*	*McKENZIE*	---	*0.8*	*0.8*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*
EW-1UA	002509	100033618	02-08-95	02-16-95	8010/8020	PACE	1	0.6	0.6	ND	ND	ND	ND	ND	ND	ND
EW-1UA	002554	100057363	03-09-95	03-16-95	8010/8020	PACE	1	1.6	1.6	ND	ND	ND	ND	ND	ND	ND
EW-1UA	002570	100065561	04-03-95	04-11-95	8010/8020	PACE	1	1.7	1.1	0.6	ND	ND	ND	ND	ND	ND
EW-1UA	002585	100130842	05-09-95	05-22-95	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EW-1UA	002609	100165719	06-08-95	06-16-95	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EW-1UA	002702	100278912	09-19-95	09-25-95	8010/8020	PACE	1	1.2	1.2	ND	ND	ND	ND	ND	ND	ND
EW-1UA	002753	100374369	12-14-95	12-20-95	8010/8020	PACE	1	1.4	1.4	ND	ND	ND	ND	ND	ND	ND
EW-1UA	*EW1*	*W5120335-10*	*12-14-95*	*12-20-95*	*601/602*	*GTEL*	*1*	*ND*	*ND*	*ND*	*ND*	*ND*	---	*ND*	*ND*	*ND*
EW-1UA	002784	100036030	02-28-96	03-07-96	8010/8020	PACE	1	1.2	1.2	ND	ND	ND	ND	ND	ND	ND
EW-1UA	002785	100036048	02-28-96	03-07-96	8010/8020	PACE	1	1.2	1.2	ND	ND	ND	ND	ND	ND	[Benzene=1.1]
EW-1UA	001806	100100966	06-04-96	06-13-96	8010/8020	PACE	1	1.8	1.3	0.5	ND	ND	ND	ND	ND	ND
EW-1UA	001303	100158682	09-05-96	09-18-96	8010/8020	PACE	1	0.85	0.85	ND	ND	ND	ND	ND	ND	ND
EW-1UA	001304	100158690	09-05-96	09-18-96	8010/8020	PACE	1	1.1	1.1	ND	ND	ND	ND	ND	ND	ND
EW-1UA	001367	100212270	12-05-96	12-11-96	8010/8020	PACE	1	2.09	1.5	0.59	ND	ND	ND	ND	ND	ND
EW-1UA	002912	70908744	03-06-97	03-11-97	8021	PACE	1	2.8	1.7	1.1	ND	ND	ND	ND	ND	ND
EW-1UA	000722	10195535	07-11-97	07-21-97	8260	PACE	1	1.6	1.6	ND	ND	ND	[0.53]	ND	ND	ND
EW-1UA	003617	10292324	09-18-97	09-24-97	8010/8020	PACE	1	1.3	1.3	ND	ND	ND	ND	ND	ND	ND
EW-1UA	002969	10663573	05-26-98	06-05-98	8010/8020	PACE	1	1.7	1.7	ND	ND	ND	ND	ND	ND	ND
EW-1UA	000800	101031425	12-21-98	12-31-98	8021	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EW-1UA	000818	PIF00144	06-01-99	06-07-99	8260B	DEL MAR	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EW-1UA	000934	PIK0320-17	11-16-99	11-22-99	8260B	DEL MAR	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EW-1UA+	003128	PJE0348-50	05-15-00	05-29-00	8260B	DEL MAR	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EW-1UA	003139	PJF0443-05	06-22-00	06-29-00	8260B	DEL MAR	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EW-1UA	003179	PJJ0337-05	10-18-00	10-25-00	8260B	DEL MAR	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EW-2UA D	001143	311122-02	11-30-93	12-01-93	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	[DMK=420]
EW-2UA PT	001152	312768-03	12-09-93	12-17-93	624	ATI	1	ND	ND	ND	ND	ND	---	ND	ND	ND

TABLE 4-5
Summary of Laboratory Chemical Results for Volatile Organic Compounds in Water Samples from Groundwater Wells and Groundwater Remediation System Air Stripper Influent and Effluent
Hassayampa Landfill Epa Superfund Site

SAMPLE SOURCE[a]	SAMPLE IDENTIFIER: FIELD	SAMPLE IDENTIFIER: LAB	DATE SAMPLED	DATE ANALYZED	EPA METHOD	LABORATORY[b]	DILUTION FACTOR[c]	TOTAL VOCs[d]	1,1-DCE	TCE	PCE	1,1,1-TCA	TCTFA	1,1-DCA	1,2-DCP	OTHER VOCs
								VOLATILE ORGANIC COMPOUNDS[e] (micrograms per liter)								
EW-2UA	001262	403631-03	03-04-94	03-14-94	624	ATI	1	ND	ND	ND	ND	ND	—	ND	ND	ND
EW-2UA	002067	404805-06	04-14-94	04-23-94	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EW-2UA	002089	405556-06	05-03-94	05-14-94	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EW-2UA	002109	405828-06	05-13-94	05-17-94	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EW-2UA	002120	405964-06	05-20-94	05-20-94	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EW-2UA	002153	406103-04	05-26-94	06-07-94	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EW-2UA	002175	406565-05	06-02-94	06-11-94	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EW-2UA	002196	406631-06	06-07-94	06-13-94	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EW-2UA	002211	406760-04	06-14-94	06-24-94	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EW-2UA	002228	406015-04	06-24-94	07-03-94	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EW-2UA	002244	406125-07	06-30-94	07-10-94	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EW-2UA	002255	407587-04	07-07-94	07-13-94	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EW-2UA	002272	407701-04	07-13-94	07-21-94	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EW-2UA	002286	407820-05	07-19-94	07-25-94	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EW-2UA	002327	407012-32	07-27-94	08-10-94	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EW-2UA	002344	408632-06	08-05-94	08-18-94	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EW-2UA	002385	100205168	09-02-94	09-11-94	601/602	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EW-2UA	002408	100264628	11-03-94	11-08-94	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EW-2UA	002478	100296630	12-05-94	12-14-94	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EW-2UA	002490	100005081	01-06-95	01-17-95	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EW-2UA	002513	100033634	02-08-95	02-16-95	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EW-2UA dup	002514	100033642	02-08-95	02-16-95	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EW-2UA	002556	100057380	03-09-95	03-16-95	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EW-2UA	002572	100085589	04-03-95	04-11-95	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EW-2UA	002587	100130650	05-09-95	05-22-95	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EW-2UA	002671	100165736	06-08-95	06-16-95	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EW-2UA	002704	100278920	09-19-95	09-25-95	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EW-2UA	002720	100293199	09-28-95	10-03-95	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EW-2UA	*EW-2UA*	*44697*	*09-28-95*	*10-03-95*	*502.2*	*ADHS*	*1*	*ND*	*ND*	*ND*	*ND*	*ND*	---	*ND*	*ND*	*ND*
EW-2UA	002757	100374377	12-14-95	12-20-95	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EW-2UA	*EW2*	*W5120335-11*	*12-14-95*	*12-21-95*	*601/602*	*GTEL*	*1*	*ND*	*ND*	*ND*	*ND*	*ND*	—	*ND*	*ND*	*ND*
EW-2UA	002786	100036056	02-28-96	03-07-96	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EW-2UA.	003772	100051225	03-22-96	04-02-96	8010/8020	PACE	1	ND	[4.3][h]	ND	ND	ND	[2.7][f]	ND	ND	ND
EW-2UA split	*EW-2UA*	*W6030480-01*	*03-22-96*	*04-02-96*	*8010/8020*	*GTEL*	*1*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*
EW-2UA	001804	100101010	06-04-96	06-13-96	8010/8020	PACE	1	0.4	ND	ND	ND	ND	ND	ND	ND	TCFM=0.4
EW-2UA dup	001805	100101028	06-04-96	06-13-96	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EW-2UA	001305	100158704	09-05-96	09-18-96	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EW-2UA dup	001306	100158712	09-05-96	09-18-96	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EW-2UA	001355	100209880	12-04-96	12-10-96	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EW-2UA	*EW2UA*	*6120110-2*	*12-04-96*	*12-12-96*	*601/602*	*DEL MAR*	*1*	*ND*	*ND*	*ND*	*ND*	*ND*	—	*ND*	*ND*	*ND*
EW-2UA	002914	70908751	03-06-97	03-11-97	8021	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EW-2UA	000720	10195543	07-11-97	07-21-97	8260	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EW-2UA	*EW-2UA*	*PG000383*	*07-11-97*	*07-21-97*	*601/602*	*DEL MAR*	*1*	*ND*	*ND*	*ND*	*ND*	*ND*	—	*ND*	*ND*	*ND*
EW-2UA	003613	1029332	09-18-97	10-02-97	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EW-2UA	002971	10661304	05-26-98	06-04-98	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EW-2UA	000802	101031433	12-21-98	01-04-99	8021	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	[BM=1.2 FM]
EW-2UA	000820	PIF00145	06-01-99	06-07-99	8260B	DEL MAR	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EW-2UA¥	000936	PIK0320-19	11-16-99	11-23-99	8260B	DEL MAR	1 (2)	187.2	(120)	6.7	2.4	2.8	42	2.0	9.3	TCFM=Tr
EW-2UA+	003129	PJE0348-51	05-15-00	05-30-00	8260B	DEL MAR	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EW-2UA dup+	003130	PJE0348-52	05-15-00	05-30-00	8260B	DEL MAR	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EW-2UA split	*EW-2UA*	*E0E170226-03*	*05-15-00*	*05-17-00*	*8260B*	*STL*	*1*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*TCFM=Tr*
EW-2UA	003141	PJF0443-07	06-22-00	06-29-00	8260B	DEL MAR	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EW-2UA	003161	PJJ0537-07	10-18-00	10-26-00	8260B	DEL MAR	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EW-3UA D	001160	312931-01	12-15-93	12-17-93	624	ATI	1	ND	ND	ND	ND	ND	—	ND	ND	[DMK=13]; [MB=2]; [Benzene=3]

TABLE 4-5
Summary of Laboratory Chemical Results for Volatile Organic Compounds in Water Samples from Groundwater Wells and Groundwater Remediation System Air Stripper Influent and Effluent
Hassayampa Landfill Epa Superfund Site

SAMPLE SOURCE[a]	SAMPLE IDENTIFIER FIELD	SAMPLE IDENTIFIER LAB	DATE SAMPLED	DATE ANALYZED	EPA METHOD	LABORATORY[b]	DILUTION FACTOR[c]	TOTAL VOCs[e]	1,1-DCE	TCE	PCE	1,1,1-TCA	TCTFA	1,1-DCA	1,2-DCP	OTHER VOCs
								VOLATILE ORGANIC COMPOUNDS[d] (micrograms per liter)								
EW-3UA PT	001170	312120-03	12-22-93	12-27-93	624	ATI	1	2	ND	ND	ND	ND	2	ND	ND	[DMK=140]
EW-3UA	001260	403631-03	03-04-94	03-14-94	624	ATI	1	ND	ND	ND	ND	ND	---	ND	ND	ND
EW-3UA	002065	404805-04	04-14-94	04-22-94	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EW-3UA	002087	405566-04	05-03-94	05-11-94	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EW-3UA	002107	405828-04	05-13-94	05-17-94	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EW-3UA	002126	405964-04	05-20-94	05-24-94	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EW-3UA	002155	405103-06	05-26-94	06-07-94	601/602	ATI	1	-0.3	0.3	ND	ND	ND	ND	ND	ND	ND
EW-3UA	002173	406565-03	06-02-94	06-11-94	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EW-3UA	002194	406631-04	06-07-94	06-13-94	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EW-3UA	002213	406760-06	06-14-94	06-24-94	601/602	ATI	1	0.3	0.3	ND	ND	ND	ND	ND	ND	ND
EW-3UA	002230	406015-06	06-24-94	07-03-94	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EW-3UA	002242	406125-05	06-30-94	07-10-94	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EW-3UA	002257	407587-05	07-07-94	07-13-94	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EW-3UA	002274	407701-06	07-13-94	07-22-94	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EW-3UA	002288	407820-07	07-19-94	07-25-94	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EW-3UA	002325	407012-30	07-27-94	08-09-94	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EW-3UA	002342	408632-04	08-05-94	08-17-94	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EW-3UA	002387	100205184	09-02-94	09-08-94	601/602	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EW-3UA	002407	100264610	11-03-94	11-08-94	8010/8020	PACE	1	1.5	0.8	ND	ND	ND	0.7	ND	ND	ND
EW-3UA	002476	100286613	12-05-94	12-14-94	8010/8020	PACE	1	0.7	0.7	ND	ND	ND	ND	ND	ND	ND
EW-3UA	002492	100005070	01-06-95	01-17-95	8010/8020	PACE	1	1.3	1.3	ND	ND	ND	ND	ND	ND	ND
EW-3UA	*EW3UA*	*E95-0113*	*01-06-95*	*01-11-95*	*601/602*	*McKENZIE*	---	*1.3*	*1.3*	*ND*	*ND*	*ND*	---	*ND*	*ND*	*ND*
EW-3UA	002522	100033650	02-08-95	02-16-95	8010/8020	PACE	1	1.6	1.1	0.5	ND	ND	ND	ND	ND	ND
EW-3UA	002562	100057410	03-09-95	03-16-95	8010/8020	PACE	1	1.5	1.5	ND	ND	ND	ND	ND	ND	ND
EW-3UA	002574	100085620	04-03-95	04-12-95	8010/8020	PACE	1	5.9	2.7	3.2	ND	ND	ND	ND	ND	ND
EW-3UA	002589	100130869	05-09-95	05-22-95	8010/8020	PACE	1	0.7	0.7	ND	ND	ND	ND	ND	ND	ND
EW-3UA	002673	100166751	06-08-95	06-16-95	8010/8020	PACE	1	0.6	0.6	ND	ND	ND	ND	ND	ND	ND
EW-3UA	002706	1002780330	09-19-95	09-28-95	8010/8020	PACE	1	3.7	2.8	0.9	ND	ND	ND	ND	ND	ND
EW-3UA	002751	100374395	12-14-95	12-20-95	8010/8020	PACE	1	5.8	4.4	1.4	ND	ND	ND	ND	ND	ND
EW-3UA	*EW3*	*WS120335-09*	*12-14-95*	*12-20-95*	*601/602*	*GTEL*	*1*	*5.2*	*3.8*	*1.4*	*ND*	*ND*	---	*ND*	*ND*	*ND*
EW-3UA	002788	100036072	02-29-96	03-07-96	8010/8020	PACE	1	8.4	5.2	2.0	ND	ND	1.2	ND	ND	ND
EW-3UA	001802	100101036	06-04-96	06-13-96	8010/8020	PACE	1	14.9	8.7	2.9	ND	ND	3.3	ND	ND	ND
EW-3UA	001307	100158720	09-05-96	09-18-96	8010/8020	PACE	1	19.8	11	3.5	ND	ND	5.3	ND	ND	[CE=4.1][h]
EW-3UA dup	001308	100158739	09-05-96	09-18-96	8010/8020	PACE	1	17.2	7.6	3.8	ND	ND	5.8	ND	ND	ND
EW-3UA	001363	100212296	12-05-96	12-11-96	8010/8020	PACE	1	35.6	23	5.9	ND	ND	6.6	ND	ND	DCM=1.1[h]
EW-3UA	002908	70908769	03-06-97	03-11-97	8021	PACE	1	55.99	31	8.8	1.5	[1.0]	13	ND	ND	DCM=0.93 FT; TCFM=0.86
EW-3UA	000724	10195650	07-11-97	07-22-97	8260	PACE	10	69	55	14	ND	ND	ND	ND	ND	ND
EW-3UA	003619	10292340	09-18-97	10-02-97	8010/8020	PACE	1	48.1	32	9.6	1.2	ND	5.3	ND	ND	ND
EW-3UA	002965	10661296	05-26-98	06-04-98	8010/8020	PACE	1	30.3	18	8.4	1.3	ND	2.6	ND	ND	ND
EW-3UA	000796	101031409	12-21-98	12-31-98	8021	PACE	1	42	31	11	ND	ND	ND	ND	ND	[1,3-DCP=2.3]
EW-3UA	000814	PIF00142	06-01-99	06-07-99	8260B	DEL MAR	1	27	17	10	ND	ND	ND	ND	ND	ND
EW-3UA	000936	PIK0320-21	11-17-99	11-22-99	8260B	DEL MAR	1	51	27	18	Tr	ND	6.0	ND	ND	ND
EW-3UA+	003131	PJE0348-53	05-15-00	05-30-00	8260B	DEL MAR	1	39.9	17	14	ND	ND	ND	ND	ND	DMK=30; [MEK=10]; TCFM=8.9
EW-3UA	003143	PJF0443-09	06-22-00	06-29-00	8260B	DEL MAR	1	42	25	17	ND	ND	---	ND	ND	ND
EW-3UA	003183	PJJ0337-09	10-18-00	10-26-00	8260B	DEL MAR	1	36.7	14	18	ND	ND	4.7	ND	ND	ND
EW-3UA dup	003184	PJJ0337-10	10-18-00	10-26-00	8260B	DEL MAR	1	47	23	19	ND	ND	5.0	ND	ND	ND
EW-4UA D	001157	312872-01	12-11-93	12-15-93	624	ATI	1	ND	ND	ND	ND	ND	---	ND	ND	[DMK=59]
EW-4UA PT	001168	312040-03	12-18-93	12-27-93	624	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EW-4UA	001258	403631-01	03-04-94	03-15-94	624	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EW-4UA	002063	404805-02	04-14-94	04-22-94	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EW-4UA	002085	405566-02	05-03-94	05-11-94	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
EW-4UA	002105	405828-02	05-13-94	05-17-94	601/602	ATI	1	0.5	0.5	ND	ND	ND	ND	ND	ND	ND
EW-4UA	002124	405964-02	05-20-94	05-24-94	601/602	ATI	1	5.7	0.9	ND	ND	ND	4.8	ND	ND	ND
EW-4UA	002157	405103-08	05-26-94	06-07-94	601/602	ATI	1	4.5	1.1	ND	ND	ND	3.4	ND	ND	ND

TABLE 4-5
Summary of Laboratory Chemical Results for Volatile Organic Compounds in Water Samples from Groundwater Wells and Groundwater Remediation System Air Stripper Influent and Effluent
Hassayampa Landfill Epa Superfund Site

SAMPLE SOURCE[a]	SAMPLE IDENTIFIER FIELD	SAMPLE IDENTIFIER LAB	DATE SAMPLED	DATE ANALYZED	EPA METHOD	LABORATORY[a]	DILUTION FACTOR[c]	TOTAL VOCs[d]	1,1-DCE	TCE	PCE	1,1,1-TCA	TCTFA	1,1-DCA	1,2-DCP	OTHER VOCs
								VOLATILE ORGANIC COMPOUNDS[e] (micrograms per liter)								
EW-4UA	002171	406565-01	06-02-94	06-11-94	601/602	ATI	1	7.3	1.5	ND	ND	ND	5.8	ND	ND	ND
EW-4UA dup	002172	406565-02	06-02-94	06-14-94	601/602	ATI	1	7.1	1.5	ND	ND	ND	5.6	ND	ND	ND
EW-4UA	002192	406631-02	06-07-94	06-13-94	601/602	ATI	1	8.4	1.5	0.4	ND	ND	6.5	ND	ND	ND
EW-4UA	002215	406760-08	06-14-94	06-24-94	601/602	ATI	1	9.9	1.8	ND	ND	ND	8.1	ND	ND	ND
EW-4UA	002232	406015-09	06-24-94	07-03-94	601/602	ATI	1	6.6	1.2	ND	ND	ND	5.4	ND	ND	ND
EW-4UA	002240	406125-03	06-30-94	07-10-94	601/602	ATI	1	3.5	1.5	ND	ND	ND	2.0	ND	ND	ND
EW-4UA	002259	407587-09	07-07-94	07-13-94	601/602	ATI	1	5.9	1.7	ND	ND	ND	4.2	ND	ND	ND
EW-4UA	002276	407701-08	07-13-94	07-21-94	601/602	ATI	1	7.7	1.7	ND	ND	ND	6.0	ND	ND	ND
EW-4UA	002290	407820-09	07-19-94	07-25-94	601/602	ATI	1	6.9	1.9	ND	ND	ND	5.0	ND	ND	ND
EW-4UA	002323	407012-28	07-27-94	08-09-94	601/602	ATI	1	9.3	2.1	ND	1.6	0.4	5.2	ND	ND	ND
EW-4UA	002340	409632-02	08-05-94	08-16-94	601/602	ATI	1	7.9	2.6	0.3	0.2	ND	4.8	ND	ND	ND
EW-4UA	002369	100205206	09-02-94	09-08-94	601/602	PACE	1	3.3	2.1	ND	ND	ND	1.2	ND	ND	ND
EW-4UA	002411	100264652	11-03-94	11-08-94	8010/8020	PACE	1	0.6	0.6	ND	ND	ND	ND	ND	ND	ND
EW-4UA	002474	100299591	12-05-94	12-14-94	8010/8020	PACE	1	10.7	7.7	0.8	ND	ND	1.6	ND	0.6	ND
EW-4UA dup	002475	100299606	12-05-94	12-14-94	8010/8020	PACE	1	10.9	7.8	0.9	ND	ND	1.6	ND	0.6	ND
EW-4UA	002494	100005060	01-06-95	01-17-95	8010/8020	PACE	1	31.3	24	3.0	ND	ND	2.3	ND	2.0	ND
EW-4UA	002524	100033677	02-08-95	02-16-95	8010/8020	PACE	1	41.1	27	5.8	1.5	ND	ND	1.1	5.7	ND
EW-4UA	002560	100057436	03-09-95	03-16-95	8010/8020	PACE	1	101.4	75	11	2.8	ND	0.8 F	1.9	9.9	ND
EW-4UA	002576	100065626	04-03-95	04-12-95	8010/8020	PACE	1	107.3	78	11	2.6	ND	1.2	2.5	12	ND
EW-4UA	002591	100130877	05-09-95	05-22-95	8010/8020	PACE	1 (5)	193.5	(140)	18	4.3	ND	1.7	3.5	24	TCFM=0.7; DCM=1.3; [EB=5.4]; [XYL=2.6]
EW-4UA	002675	100165778	06-08-95	06-19-95	8010/8020	PACE	1 (5)	194.5	(140)	14	5.4	ND	3.2	2.9	28	DCM=1.0
EW-4UA	002708	100278947	09-19-95	09-25-95	8010/8020	PACE	1 (5)	384.6	(270)	29	9.1	3.0	15	9.2	42	DCM=3.8 T[h]; TCFM=3.5
EW-4UA	*EW-4UA*	*44898*	*09-20-95*	*09-29-95*	*502.2*	*ADHS*	*1*	*380.7*	*285*	*28*	*8.7*	*4.0*	*---*	*8.8*	*40*	*TCFM=6.2*
EW-4UA	002718	100293237	09-28-95	10-05-95	8010/8020	PACE	1 (5)	316.5	(210)	27	8.9	3.1	20	7.9	36	DCM=2.0 T; TCFM=1.6
EW-4UA	002755	100374393	12-14-95	12-21-95	8010/8020	PACE	10	490.1	330	32	ND	46	ND	7.1	45	ND
EW-4UA dup	002756	100374580	12-14-95	12-28-95	8240	PACE	2	342	260	33	10	Tr	---	Tr	39	DCM=Tr
EW-4UA	*EW4*	*W5120335-08*	*12-14-95*	*12-21-95*	*601/602*	*GTEL*	*1*	*521.3*	*420*	*36*	*10*	*4.9*	*---*	*8.9*	*42*	*DCM=2.7; TCFM=5.8; [Benzene=0.5]*
EW-4UA	002790	100036099	02-29-96	03-07-96	8010/8020	PACE	10	417.3	290	32	13	ND	28	8.3	46	ND
EW-4UA	003770	100051217	03-22-96	04-02-96	8010/8020	PACE	1	428.7	307	27	8.0	3.4	38	6.8	40	DCM=1.5[h]; TCFM=4.0
EW-4UA split	*EW-4UA*	*W6030480-02*	*03-22-96*	*04-09-96*	*8010/8020*	*GTEL*	*1*	*393.2*	*280*	*30*	*11*	*6.3*	*---*	*11*	*44*	*TCFM=4.9*
EW-4UA	001800	100101052	06-04-96	06-13-96	8010/8020	PACE	1 (10)	443.9	(300)	31	9.9	6.4	40	8.9	39	DCM=2.9; TCFM=5.2; 1,1,2-TCA=0.8
EW-4UA	001309	100158747	09-05-96	09-18-96	8010/8020	PACE	10	530.4	360	34	10	8.1	58	9.3	51	ND
EW-4UA dup	001310	100158755	09-05-96	09-18-96	8010/8020	PACE	10	572	390	35	11	11	62	11	52	ND
EW-4UA	*EW4UA*	*6120171*	*12-04-96*	*12-12-96*	*601/602*	*DEL MAR*	*50*	*529*	*440*	*44*	*ND*	*ND*	*---*	*ND*	*45*	*ND*
EW-4UA	000910	70908777	03-06-97	03-11-97	8021	PACE	1 (10)	601.52	(380)	38	14	18	70	14	49	DCM=6.9; TCM=0.72; MB=2.6 T; TCFM=8.3
EW-4UA	000726	10195598	07-11-97	07-21-97	8260	PACE	50	835	660	60	ND	ND	60	ND	65	ND
EW-4UA	003621	10232357	09-18-97	10-02-97	8010/8020	PACE	1 (20)	1,072.8	(880)	69	19	32	(140)	16	92	DCM=7.2; TCM=1.0; MB=1.6; 1,1,2-TCA=1.0; TCFM=12 T
EW-4UA	002967	10663565	05-26-98	06-05-98	8010/8020	PACE	20	675	370	49	ND	22	120	ND	67	MB=47 M; [CM=32]; [CA=31]
EW-4UA	000798	101031417	12-21-98	12-31-98	8021	PACE	1	543.2	320	30	11	9.8	130	10	22	DCM=1.8; TCFM=8.8; [trans-1,2-DCE=1.6]
EW-4UA	000896	PIF00143	06-01-99	06-07-99	8260B	DEL MAR	5	571	360	28	ND	ND	150	ND	33	ND
EW-4UA dup	000817	PIF00241	06-01-99	06-08-99	8260B	DEL MAR	5	662	390	30	10	ND	200	ND	32	ND
EW-4UA	000874	9906061-05A	06-03-99	06-15-99	8260B	TURNER	10	284.5	180	17	5.5	ND	64	ND	18	ND
EW-4UA	000911	PIK0320-01	11-15-99	11-22-99	8260B	DEL MAR	10	701	500	38	Tr	ND	130	ND	33	ND
EW-4UA dup	000912	PIK0320-02	11-15-99	11-22-99	8260B	DEL MAR	10	660	460	37	Tr	ND	130	ND	33	ND
EW-4UA	*EW-4UA*	*ESK170275-003*	*11-15-99*	*11-18-99*	*8260B*	*ADEQ*	*10*	*866*	*490*	*29*	*14*	*16*	*250*	*Tr*	*38*	*TCFM=27*
EW-4UA+	003134	PJE0348-56	05-15-00	05-29-00	8260B	DEL MAR	1 (20)	956	(660)	55	15	24	(120)	11	44	TCFM=27
EW-4UA	003145	PJF0443-11	06-22-00	07-01-00	8260B	DEL MAR	10	972	860	48	ND	24	---	ND	40	ND
EW-4UA	003185	PJJ0337-11	10-18-00	10-26-00	8260B	DEL MAR	1(10)	1,326	(860)	56	20	33	(270)	11	42	TCFM=36
MW-1UA D	014378	16208	04-08-88	04-21-88	624	ATI	1	19	ND	ND	ND	ND	ND	ND	ND	[DMK=19 RT]
MW-1UA	014412	806006-01	05-31-88	06-03-88	624	ATI	1	30	11	ND	ND	3	ND	2	ND	DCM=14 RT
MW-1UA	006084	809086-15	09-14-88	09-22-88	601	ATI	1	17.7	15.5	ND	ND	0.9	ND	1.3	ND	ND
MW-1UA	006099	809133-15	09-20-88	09-29-88	624	ATI	1	25	16	ND	ND	ND	ND	ND	ND	DCM=6 RT; MB=3 RT

TABLE 4-6
Summary of Laboratory Chemical Results for Volatile Organic Compounds in Water Samples from Groundwater Wells and Groundwater Remediation System Air Stripper Influent and Effluent
Hassayampa Landfill Epa Superfund Site

SAMPLE SOURCE[a]	SAMPLE IDENTIFIER FIELD	SAMPLE IDENTIFIER LAB	DATE SAMPLED	DATE ANALYZED	EPA METHOD	LABORATORY[b]	DILUTION FACTOR[c]	TOTAL VOCs[e]	VOLATILE ORGANIC COMPOUNDS[d] (micrograms per liter) 1,1-DCE	TCE	PCE	1,1,1-TCA	TCTFA	1,1-DCA	1,2-DCP	OTHER VOCs
MW-1UA	006177	812527-14	12-06-88	12-16-88	624	ATI	1	169	111	ND	ND	9	ND	-5	ND	[DMB=2 T]; DCM=11 RT; MEK=31 FT; MB=2 F
MW-1UA dup	006178	812527-15	12-06-88	12-15-88	624	ATI	1	206	127	ND	ND	11	ND	8	ND	DCM=18 RT; MEK=39 FT; MB=3 F
MW-1UA	006375	908706-06	08-24-89	08-30-89	601/602	ATI	10	649	547	ND	ND	25	ND	30	ND	DCM=47 F
MW-1UA dup	006376	908706-07	08-24-89	08-29-89	601/602	ATI	1 (10)	425.4	(380)	ND	ND	22.7	ND	19.3	ND	DCM=3.4 RF
MW-1UA	006569	003588-02	03-08-90	03-15-90	601/602	ATI	1 (50)	130.1	(110)	ND	ND	6.9 T	ND	7.2	ND	DCM=6.0 RT
MW-1UA dup	006570	003588-03	03-08-90	03-15-90	601/602	ATI	1 (50)	159.8	(140)	ND	ND	6.8 T	ND	7.5	ND	1,2-DCE=0.6; DCM=4.9 RT
MW-1UA	006758	006599-11	06-07-90	06-13-90	601/602	ATI	1 (10)	233.1	(199)	0.3	ND	13.0	ND	14.9	ND	1,2-DCE=1.1; DCM=4.8 RT
MW-1UA	010799	103882-17	03-22-91	04-04-91	601/602	ATI	1 (10)	184.5	(156)	ND	ND	6.7	ND	17.9	ND	DCDFM=0.3; DCM=3.6 RFT
MW-1UA dup	010800	103882-18	03-22-91	04-04-91	601/602	ATI	1 (50)	176.2	(140)	0.2	ND	7.8	ND	18.5	ND	DCDFM=0.4; [1,2-DCA=0.2]; DCM=3.0 RFT; MB= 6.3 FT
MW-1UA	010966	106790-37	06-19-91	07-03-91	601/602	ATI	1	66.6	57.4	ND	ND	2.4	ND	6.8	ND -	ND
MW-1UA	002279	109902-36	09-25-91	10-02-91	601/602	ATI	1 (5)	123.3	(105)	ND	ND	2.8	ND	15.5	ND	ND
MW-1UA	002383	112562-02	12-04-91	12-05-91	601/602	ATI	1	26.5	23	ND	ND	1.4	ND	2.1	ND	ND
MW-1UA dup	002384	112562-03	12-04-91	12-19-91	601/602	ATI	1	28.8	20	ND	ND	1.3	ND	1.7	ND	DCM=5.8 R
MW-1UA	002656	204659-13	04-10-92	04-18-92	601/602	ATI	1	32.8	29	ND	ND	0.9	ND	2.9	ND	ND
MW-1UA	1UA	29498	04-10-92	04-23-92	601/602	ADHS		12.1[f]	10.8	ND	ND	ND	ND	1.3	ND	ND
MW-1UA dup	111UA	29499	04-10-92	04-23-92	601/602	ADHS		18.9[f]	17.1	ND	ND	ND	ND	1.8	ND	ND
MW-1UA	014972	210011-37	10-29-92	11-10-92	601/602	ATI	1	50.3	44	ND	ND	1.0	ND	4.3	ND	CE=1.0
MW-1UA	007532	304579-34	04-06-93	04-14-93	601/602	ATI	1	61.6	54	ND	ND	0.9	ND	6.7	ND	ND
MW-1UA	001068	310890-18	10-19-93	10-25-93	601/602	ATI	2	110.1	97	ND	ND	0.6	ND	12	ND	CE=0.5
MW-1UA	001226	403593-01	03-01-94	03-14-94	601/602	ATI	1	45.1	41	ND	ND	0.3	ND	3.8	ND	ND
MW-1UA	1UA	E94-1519	03-02-94	03-08-94	601/602	MCKENZIE		39.2	34	ND	ND	ND	ND	4.0	ND	DCDFM=1.2
MW-1UA	002337	407012-42	07-26-94	08-10-94	601/602	ATI	1	17.1	15	ND	ND	0.5	ND	1.6	ND	ND
MW-1UA	002472	100286567	12-05-94	12-14-94	8010/8020	PACE	1	64.1	55	ND	ND	ND	ND	9.1	ND	ND
MW-1UA	002629	100165310	06-07-95	06-15-95	8010/8020	PACE	1	41.5	38	ND	ND	ND	ND	3.5	ND	ND
MW-1UA	002775	100374407	12-15-95	12-20-95	8010/8020	PACE	1	25.2	23	ND	ND	ND	ND	2.2	ND	ND
MW-1UA dup	002776	100374423	12-15-95	12-20-95	8010/8020	PACE	1	23.1	21	ND	ND	ND	ND	2.1	ND	ND
MW-1UA	001751	100100480	06-06-96	06-11-96	8010/8020	PACE	1	41.5	37	ND	ND	ND	ND	4.5	ND	ND
MW-1UA	001381	100212172	12-05-96	12-11-96	8010/8020	PACE	1	23	19	ND	ND	ND	ND	4.0	ND	ND
MW-1UA	000726	10195279	07-11-97	07-21-97	8260	PACE	1	4.8	3.8	1.0	ND	ND	ND	ND	ND	ND
MW-1UA	003003	10661486	05-27-98	06-05-98	8010/8020	PACE	1	2.8	2.8	ND	ND	ND	ND	ND	ND	ND
MW-1UA	000854	PIF00161	06-02-99	06-05-99	8260B	DEL MAR	1	11.3	9.3	ND	ND	ND	ND	2.0	ND	ND
MW-1UA	000947	PIK0320-30	11-17-99	11-23-99	8260B	DEL MAR	1	32.2	19	Tr.	ND	ND	[Tr RF]	4.1	ND	TCFM=9.1
MW-1UA	003079	PJE0348-01	05-15-00	05-26-00	8260B	DEL MAR	1	36.2	24	ND	ND	ND	ND	6.6	ND	TCFM=5.4
MW-1UA dup	003080	PJE0348-02	05-15-00	05-26-00	8260B	DEL MAR	1	24.4	17	ND	ND	ND	ND	7.4	ND	ND
MW-1UA	003187	PJL0177-03	12-02-00	12-19-00	8260B	DEL MAR	1	24.4	15	ND	ND	ND	ND	9.4	ND	ND
MW-2UA D	014382	804069-01	04-25-88	05-02-88	624	ATI	1	8	ND	ND	ND	ND	ND	ND	ND	DCM=8 RT
MW-2UA	014421	806047-01	06-09-88	06-15-88	624	ATI	1	5	ND	NQ	ND	ND	ND	ND	ND	DCM=5 RT
MW-2UA	006088	809133-04	09-20-88	09-28-88	624	ATI	1	61	ND	ND	ND	ND	ND	ND	ND	MEK=57; MB=4 RFT
MW-2UA dup	006089	809133-05	09-20-88	09-28-88	624	ATI	1	23	ND	ND	ND	ND	ND	ND	ND	MEK=23
MW-2UA	006164	812527-01	12-05-88	12-13-88	624	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-2UA	006363	908692-03	08-23-89	08-29-89	601/602	ATI	1	2.2	ND	ND	ND	ND	ND	ND	ND	DCM=2.2 RFT
MW-2UA	006554	003557-04	03-06-90	03-13-90	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-2UA	006740	006576-03	06-06-90	06-06-90	601/602	ATI	1	2.2	ND	ND	ND	ND	ND	ND	ND	DCM=2.2 RT
MW-2UA	010788	103882-07	03-21-91	04-03-91	601/602	ATI	1	2.5	ND	ND	ND	ND	ND	ND	ND	MB=2.5 FT
MW-2UA	010962	106790-06	06-18-91	07-02-91	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-2UA	002261	109902-18	09-25-91	09-30-91	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-2UA	002394	112587-02	12-05-91	12-10-91	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-2UA	002622	204640-05	04-09-92	04-16-92	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND -	ND	ND
MW-2UA	2UA	29468	04-09-92	04-23-92	601/602	ADHS		ND[f]	ND	ND	ND	ND	ND	ND	ND	ND
MW-2UA	014940	210011-05	10-28-92	11-07-92	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-2UA	2UA	E92-5200	10-28-92	11-06-92	601/602	MCKENZIE		ND[f]	ND	ND	ND	ND	ND	ND	ND	ND
MW-2UA	007508	304579-06	04-05-93	04-13-93	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-2UA	001052	310890-25	10-17-93	10-25-93	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND

TABLE 4-5
Summary of Laboratory Chemical Results for Volatile Organic Compounds in Water Samples from Groundwater Wells and Groundwater Remediation System Air Stripper Influent and Effluent
Hassayampa Landfill Epa Superfund Site

SAMPLE SOURCE[a]	SAMPLE IDENTIFIER FIELD	SAMPLE IDENTIFIER LAB	DATE SAMPLED	DATE ANALYZED	EPA METHOD	LABORATORY[b]	DILUTION FACTOR[c]	TOTAL VOCs[e]	1,1-DCE	TCE	PCE	1,1,1-TCA	TCTFA	1,1-DCA	1,2-DCP	OTHER VOCs
								VOLATILE ORGANIC COMPOUNDS[d] (micrograms per liter)								
MW-2UA	001222	403593-06	03-02-94	03-14-94	601/602	ATI	1	ND	[0.6]	ND	ND	ND	ND	ND	ND	ND
MW-2UA dup	001223	403593-07	03-02-94	03-14-94	601/602	ATI	1	ND	[0.5]	ND	ND	ND	ND	ND	ND	ND
MW-2UA	002300	407012-05	07-26-94	08-05-94	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-2UA	002494	100286486	12-05-94	12-14-94	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-2UA	*MW-2UA*	*WS120335-04*	*12-14-95*	*12-21-95*	*601/602*	*GTEL*	*1*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*
MW-2UA	002526	100057061	03-08-95	03-15-95	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-2UA	002633	100165352	06-08-95	06-15-95	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-2UA	002746	100374160	12-14-95	12-18-95	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-2UA	001762	100100536	06-06-96	06-12-96	8010/8020	PACE	1	ND	ND	ND	ND	[0.9]	ND	ND	ND	ND
MW-2UA dup	001763	100100544	06-06-96	06-19-96	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-2UA	001345	100209937	12-04-96	12-11-96	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-2UA	000699	10195295	07-10-97	07-20-97	8260	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-2UA	003014	10663631	05-28-98	06-08-98	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-2UA	000824	PIF00147	06-01-99	06-07-99	8260B	DEL MAR	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-2UA	000926	PIK0320-09	11-16-99	11-21-99	8260B	DEL MAR	1	ND	ND	ND	ND	ND	[Tr,RF]	ND	ND	ND
MW-2UA	003083	PJE0348-05	05-16-00	05-26-00	8260B	DEL MAR	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-2UA	003189	PJJ0337-13	10-19-00	10-30-00	8260B	DEL MAR	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-3UA D	014387	805024-01	05-05-88	05-16-88	624	ATI	1	14	ND	ND	ND	ND	ND	ND	ND	DCM=14 R
MW-3UA	014413	806006-02	06-01-88	06-03-88	624	ATI	1	9	ND	ND	ND	ND	ND	ND	ND	DCM=9 RT
MW-3UA	006091	809133-07	09-20-88	09-28-88	624	ATI	1	2	ND	ND	ND	ND	ND	ND	ND	MB=2 RFT
MW-3UA	006165	812527-02	12-05-88	12-13-88	624	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-3UA	006364	908692-04	08-23-89	08-28-89	601/602	ATI	1	2.1	ND	ND	ND	ND	ND	ND	ND	DCM=2.1 R
MW-3UA	006556	003567-06	03-06-90	03-13-90	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-3UA	006742	006576-05	06-06-90	06-08-90	601/602	ATI	1	2.1	ND	ND	ND	ND	ND	ND	ND	DCM=2.1 RT
MW-3UA	010789	103882-06	03-21-91	04-03-91	601/602	ATI	1	1.1	ND	ND	ND	ND	ND	ND	ND	MB=1.1 FT
MW-3UA	010966	106790-10	06-18-91	07-02-91	601/602	ATI	1	ND	ND	[0.3]	ND	ND	ND	ND	ND	ND
MW-3UA	002267	109902-24	09-25-91	10-01-91	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-3UA	002398	112587-06	12-05-91	12-10-91	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-3UA	002628	204640-11	04-09-92	04-16-92	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-3UA	*3UA*	*29459*	*04-09-92*	*04-23-92*	*601/602*	*ADHS*		*ND[f]*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*
MW-3UA	014944	210011-09	10-28-92	11-07-92	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-3UA	007552	304579-12	04-05-93	04-13-93	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-3UA	001058	310890-31	10-18-93	10-25-93	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-3UA	001230	403593-10	03-02-94	03-14-94	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-3UA	002298	407012-03	07-26-94	08-05-94	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-3UA	002468	100285524	12-05-94	12-14-94	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-3UA	002528	100057088	03-08-95	03-16-95	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-3UA	002637	100165395	06-09-95	06-15-95	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-3UA	002749	100374202	12-14-95	12-19-95	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-3UA	001756	100100579	06-06-96	06-12-96	8010/8020	PACE	1	1.2	ND	ND	ND	ND	ND	ND	ND	DCM=1.2 T[h]
MW-3UA	001341	100209061	12-04-96	12-12-96	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-3UA	000691	10195337	07-10-97	07-21-97	8260	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-3UA	002977	10661338	05-26-98	06-04-98	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-3UA	000828	PIF00149	06-01-99	06-07-99	8260B	DEL MAR	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-3UA	000930	PIK0320-13	11-16-99	11-21-99	8260B	DEL MAR	1	ND	[Tr]	[Tr]	ND	ND	ND	ND	ND	[Benzene=Tr]; [CB=Tr]; MB=Tr
MW-3UA	003087	PJE0348-09	05-15-00	05-26-00	8260B	DEL MAR	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-3UA	003191	PJJ0337-15	10-19-00	10-30-00	8260B	DEL MAR	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-4UA D	014391	805080-01	05-13-88	05-17-88	624	ATI	1	9	ND	ND	ND	ND	ND	ND	ND	DCM=9 R
MW-4UA	014427	806130-01	06-22-88	06-29-88	624	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-4UA	006093	809133-09	09-20-88	09-28-88	624	ATI	1	2	ND	ND	ND	ND	ND	ND	ND	MB=2 RFT
MW-4UA dup	006094	809133-10	09-20-88	09-29-88	624	ATI	1	2	ND	ND	ND	ND	ND	ND	ND	MB=2 RFT
MW-4UA	006166	812527-03	12-05-88	12-13-88	624	ATI	1	7	ND	ND	ND	ND	ND	ND	ND	DCM=7 RT; [MEK=36 FT]
MW-4UA	006373	908706-04	08-24-89	08-30-89	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND

SAMPLE SOURCE[a]	SAMPLE IDENTIFIER FIELD	SAMPLE IDENTIFIER LAB	DATE SAMPLED	DATE ANALYZED	EPA METHOD	LABORATORY[b]	DILUTION FACTOR[c]	TOTAL VOCs[e]	1,1-DCE	TCE	PCE	1,1,1-TCA	TCTFA	1,1-DCA	1,2-DCP	OTHER VOCs
								VOLATILE ORGANIC COMPOUNDS[d] (micrograms per liter)								
MW-4UA	006558	003557-08	03-06-90	03-14-90	601/602	ATI	1	0.6	ND	ND	ND	ND	0.6 T	ND	ND	ND
MW-4UA	006746	006576-09	06-06-90	06-09-90	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-4UA	010792	103882-11	03-21-91	04-03-91	601/602	ATI	1	16.8	ND	ND	ND	ND	15.9	ND	ND	MB=0.9 FT
MW-4UA	010909	105704-09	05-13-91	05-22-91	601/602	ATI	1	29.9	0.3	ND	ND	ND	28	ND	ND	MB=0.7 F; CM=0.9
MW-4UA dup	010910	105704-10	05-13-91	05-22-91	601/602	ATI	1	28	0.4	ND	ND	ND	27	ND	ND	MB=0.6 F
MW-4UA	010980	106790-22	06-19-91	07-02-91	601/602	ATI	1	21.9	ND	ND	ND	ND	21.9	ND	ND	ND
MW-4UA	002247	109902-04	09-24-91	09-28-91	601/602	ATI	1	30.5	0.5	ND	ND	ND	30	ND	ND	ND
MW-4UA dup	002248	109902-05	09-24-91	09-28-91	601/602	ATI	1	35.5	0.5	ND	ND	ND	35	ND	ND	ND
MW-4UA	002406	112587-14	12-05-91	12-11-91	601/602	ATI	1	50.9	3.5	0.3	0.2	0.5	46	ND	ND	TCFM=0.4
MW-4UA dup	002407	112587-15	12-05-91	12-11-91	601/602	ATI	1	65.7	ND	ND	ND	ND	65	ND	ND	TCFM=0.7
MW-4UA	002630	204640-13	04-09-92	04-16-92	601/602	ATI	1	60.5	1.5	ND	ND	ND	59	ND	ND	ND
MW-4UA dup	002631	204640-14	04-09-92	04-16-92	601/602	ATI	1	61.9	1.4	ND	ND	ND	60	ND	ND	TCFM=0.5
MW-4UA	4UA	29470	04-09-92	04-23-92	601/602	ADHS		1.8[f]	1.8	ND	ND	ND	ND	ND	ND	ND
MW-4UA	014948	210011-13	10-28-92	11-07-92	601/602	ATI	1 (5)	109.0	1.9	0.2	ND	ND	(106)	ND	ND	TCFM=0.9
MW-4UA	007550	304579-16	04-05-93	04-14-93	601/602	ATI	1 (5)	172.6	0.7	0.3	ND	ND	(170)	ND	ND	TCFM=1.6
MW-4UA	001062	310890-01	10-18-93	10-22-93	601/602	ATI	1 (5)	94.3	7.0	0.2	0.2	ND	(84)	ND	ND	CM=0.4; TCFM=2.5
MW-4UA dup	001063	310890-02	10-18-93	10-22-93	601/602	ATI	1 (5)	89.5	6.8	0.3	ND	ND	(80)	ND	ND	TCFM=2.4
MW-4UA	001235	403593-15	03-03-94	03-16-94	601/602	ATI	1 (10)	129.3	7.2	ND	ND	ND	(120)	ND	ND	TCFM=2.1
MW-4UA dup	001236	403593-16	03-03-94	03-16-94	601/602	ATI	1 (10)	87.9	9.8	ND	ND	ND	(76)	ND	ND	TCFM=2.1
MW-4UA	002319	407012-24	07-27-94	08-09-94	601/602	ATI	1	27.2	12	0.6	ND	ND	14	ND	ND	TCFM=0.6
MW-4UA dup	002320	407012-25	07-27-94	08-09-94	601/602	ATI	1	27.4	12	0.6	0.2	ND	14	ND	ND	TCFM=0.6
MW-4UA	002437	100286184	12-01-94	12-11-94	8010/8020	PACE	1	31	19	ND	ND	ND	12	ND	ND	ND
MW-4UA	002533	100057100	03-08-95	03-19-95	8010/8020	PACE	1	22.7	12	0.8	ND	ND	9.2 F	ND	ND	TCFM=0.7
MW-4UA	002641	100165433	06-08-95	06-16-95	8010/8020	PACE	1	49	30	ND	ND	ND	19	ND	ND	ND
MW-4UA	002765	100374210	12-15-95	12-19-95	8010/8020	PACE	1 (5)	137.6	(90)	2.9	ND	ND	(41)	ND	ND	TCFM=3.7
MW-4UA	001766	100100617	06-06-96	06-12-96	8010/8020	PACE	1 (10)	339.5	(200)	11	2.9	ND	(120)	ND	ND	TCFM=5.6
MW-4UA	001361	100212180	12-05-96	12-11-96	8010/8020	PACE	1 (5)	296.32	(190)	24	8.8	0.72	(66)	[0.74]	ND	TCFM=5.6; DCM=1.2 T
MW-4UA	000714	10195352	07-11-97	07-21-97	8260	PACE	10	333	150	150	ND	ND	33	ND	ND	[cis-1,2-DCE=56]
MW-4UA	MW-4UA	PGG00378	07-11-97	07-21-97	601/602	DEL MAR	1	126	100	26	ND	ND	ND	ND	ND	ND
MW-4UA	002982	10661353	05-27-98	06-05-98	8010/8020	PACE	5	129.6	80	28	ND	ND	16	ND	ND	MB=5.6 M
MW-4UA	000868	PIF00167	06-03-99	06-04-99	8260B	DEL MAR	1	42	31	11	ND	ND	ND	ND	ND	ND
MW-4UA dup	000869	PIF00242	06-03-99	06-08-99	8260B	DEL MAR	1	37.9	28	9.9	ND	ND	ND	ND	ND	ND
MW-4UA split	000872	9906061-03A	06-03-99	06-15-99	8260B	TURNER	2.5	63.5	50.0	12.0	1.5	ND	---	ND	ND	ND
MW-4UA	003091	PJE0348-13	05-15-00	05-27-00	8260B	DEL MAR	1	109.3	83	8.3	ND	ND	18	ND	ND	ND
MW-5UA D	014406	805139-01	05-26-88	05-27-88	624	ATI	1	10	ND	ND	ND	ND	ND	ND	ND	DCM=10 RT
MW-5UA D,dup	014407	805139-02	05-26-88	05-27-88	624	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-5UA	014430	807002-02	06-30-88	07-13-88	624	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	[1,2-DCE=10]
MW-5UA dup	014431	807002-03	06-30-88	07-13-88	624	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-5UA	006076	809086-07	09-13-88	10-12-88	601	ATI	1	0.3	0.3	ND	ND	ND	ND	ND	ND	ND
MW-5UA	006098	809133-14	09-20-88	09-29-88	624	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-5UA	006167	812527-04	12-05-88	12-13-88	624	ATI	1	12	ND	ND	ND	ND	ND	ND	ND	MEK=12 FT
MW-5UA dup	006168	812527-05	12-05-88	12-13-88	624	ATI	1	32	ND	ND	ND	ND	ND	ND	ND	DCM=10 RT; MEK=22 FT
MW-5UA	006367	908692-07	08-23-89	08-28-89	601/602	ATI	1	1.4	ND	ND	ND	ND	1.4	ND	ND	ND
MW-5UA dup	006368	908692-08	08-23-89	08-29-89	601/602	ATI	1	1.7	ND	ND	ND	ND	1.7	ND	ND	ND
MW-5UA	006563	003572-04	03-07-90	03-13-90	601/602	ATI	1	3.0	0.9	ND	ND	ND	2.1 T	ND	ND	ND
MW-5UA	006757	006599-10	06-07-90	06-13-90	601/602	ATI	1	2.0	1.8	0.2	ND	ND	ND	ND	ND	ND
MW-5UA	010796	103882-14	03-22-91	04-04-91	601/602	ATI	1	2.9	0.7	0.2	ND	ND	2.0	ND	ND	[1,2-DCA=0.2]; [MB=18.2 FT]
MW-5UA dup	010797	103882-15	03-22-91	04-04-91	601/602	ATI	1	5.9	0.9	ND	ND	ND	5.0	ND	ND	ND
MW-5UA	010969	106790-13	06-19-91	07-02-91	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-5UA	002263	109902-20	09-25-91	09-30-91	601/602	ATI	1	0.6	0.6	ND	ND	ND	ND	ND	ND	ND
MW-5UA	002388	112562-07	12-04-91	12-06-91	601/602	ATI	1	0.3	0.3	ND	ND	ND	ND	ND	ND	[CM=0.8]
MW-5UA	002640	204640-23	04-09-92	04-17-92	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-5UA dup	002641	204640-24	04-09-92	04-17-92	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-5UA	5UA	29475	04-09-92	04-23-92	601/602	ADHS		ND[f]	ND	ND	ND	ND	ND	ND	ND	ND
MW-5UA	014960	210011-25	10-29-92	11-10-92	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND

TABLE 4-5
Summary of Laboratory Chemical Results for Volatile Organic Compounds in Water Samples from Groundwater Wells and Groundwater Remediation System Air Stripper Influent and Effluent
Hassayampa Landfill Epa Superfund Site

SAMPLE SOURCE[a]	SAMPLE IDENTIFIER FIELD	SAMPLE IDENTIFIER LAB	DATE SAMPLED	DATE ANALYZED	EPA METHOD	LABORATORY[b]	DILUTION FACTOR[c]	TOTAL VOCs[e]	1,1-DCE	TCE	PCE	1,1,1-TCA	TCTFA	1,1-DCA	1,2-DCP	OTHER VOCs
								VOLATILE ORGANIC COMPOUNDS[d] (micrograms per liter)								
MW-5UA	5UA	E92-5209	10-29-92	11-06-92	601/602	MCKENZIE		ND[f]	ND	ND	ND	ND	ND	ND	ND	ND
MW-5UA dup	15UA	E92-5210	10-29-92	11-06-92	601/602	MCKENZIE		ND[f]	ND	ND	ND	ND	ND	ND	ND	ND
MW-5UA	007062	304579-04	04-05-93	04-13-93	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-5UA	5UA	E93-1682	04-05-93	04-13-93	601/602	MCKENZIE		ND[f]	ND	ND	ND	ND	ND	ND	ND	ND
MW-5UA	001094	310890-05	10-19-93	10-22-93	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-5UA	001250	403593-20	03-03-94	03-15-94	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-5UA	002306	407012-13	07-26-94	08-08-94	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-5UA	002456	100286427	12-05-94	12-13-94	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-5UA	002542	100057126	03-08-95	03-19-95	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-5UA	002645	100165476	06-07-95	06-21-95	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-5UA dup	002646	100165484	06-07-95	06-21-95	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-5UA	002736	100374245	12-13-95	12-18-95	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-5UA	001772	100100650	06-06-96	06-12-96	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-5UA	001339	100209970	12-03-96	12-11-96	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-5UA	000683	10195378	07-09-97	07-21-97	8260	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-5UA	002990	10661411	05-27-98	06-08-98	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	[Benzene=1.0]
MW-5UA	000830	PIF00150	06-01-99	06-07-99	8260B	DEL MAR	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-5UA	003095	PJE0348-17	05-16-00	05-27-00	8260B	DEL MAR	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-6UA D	004316	911752-01	11-22-89	12-01-89	601/602	ATI	1	7.3	ND	0.4	ND	ND	ND	ND	ND	DCM=2.4 R; MB=4.5 T
MW-6UA	HASS-A	911769-01	11-28-89	12-01-89	601/602	ADEQ		0.3	0.3	ND	ND	ND	ND	ND	ND	ND
MW-6UA	004323	911782-03	11-28-89	12-01-89	601/602	ATI	1	7.5	0.5	0.3	0.2	ND	5.9 T	ND	ND	MB=0.6
MW-6UA	004325	911782-05	11-28-89	11-29-89	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-6UA	004330	912546-01	12-05-89	12-06-89	624	ATI	1	9	3	ND	ND	ND	6	ND	ND	ND
MW-6UA dup	004331	912546-02	12-05-89	12-06-89	624	ATI	1	10	3	ND	ND	ND	7	ND	ND	ND
MW-6UA	006560	003572-01	03-07-90	03-13-90	601/602	ATI	1 (100)	343.2	(140)	2.5	1.0	7.4 T	(180)	2.4	0.2	TCFM=4.4; DCM=5.3 RT
MW-6UA dup	006561	003572-02	03-07-90	03-13-90	601/602	ATI	1 (100)	293.1	(140)	2.5	1.2	7.9 T	(130) T	1.9	ND	TCFM=3.9; DCM=5.7 RT
MW-6UA	006754	006599-06	06-07-90	06-13-90	601/602	ATI	1 (10)	664.6	(266)	5.0	2.1	15.4	(359)	5.0	ND	1,2-DCE=1.2; TCFM=6.5; DCM=4.4 RT
MW-6UA	010794	103882-13	03-21-91	04-03-91	601/602	ATI	1 (20)	404.4	(212)	11.1	4.1	20.7	(133)	12.6	1.0	TCFM=4.8; DCM=2.5 RFT; MB=2.6 FT
MW-6UA	010976	106790-18	06-19-91	07-02-91	601/602	ATI	1 (100)	664.5	(210)	30.3	11.4	46.2	(320)	23.7	2.6	TCFM=10.3
MW-6UA	002253	109902-10	09-24-91	09-30-91	601/602	ATI	1 (10)	480.7	(235)	18.1	7.4	23.2	(176)	15.5	1.7	[Benzene=0.6]; TCFM=3.8
MW-6UA	002402	112567-10	12-05-91	12-10-91	601/602	ATI	1 (50)	467.0	(170)	30	13	44	(170)	27	3.9	TCFM=9.1
MW-6UA	002634	204640-17	04-09-92	04-17-92	601/602	ATI	5	115.9	47	2.1	1.1	3.9	59	1.9	ND	TCFM=0.9
MW-6UA	6UA	29471	04-09-92	05-13-92	601/602	ADHS		327.9[f]	284	8.6	4.2	23.0	ND	7.1	1.0	ND
MW-6UA	014956	210011-21	10-29-92	11-10-92	601/602	ATI	1 (10)	1,007.6	(370)	18	8.2	33	(550)	19	2.4	[CA=0.6]; TCFM=7.0
MW-6UA dup	014957	210011-22	10-29-92	11-10-92	601/602	ATI	1 (50)	1,156	(570)	19	10	36	(490)	22	3	TCFM=8
MW-6UA	6UA	E92-5206	10-29-92	11-06-92	601/602	MCKENZIE		502.9[f]	420	18	9.5	28	ND	15	2.7	TCFM=9.7
MW-6UA dup	16UA	E92-5207	10-29-92	11-06-92	601/602	MCKENZIE		473.1[f]	400	15	7.9	25	ND	14	2.2	TCFM=9.0
MW-6UA	007546	304579-20	04-05-93	04-14-93	601/602	ATI	5 (10)	1,359.2	(800)	28	14 F	38	(630)	35	5	TCFM=9.2
MW-6UA	001072	310890-07	10-18-93	10-22-93	601/602	ATI	10	995	410	21	14	29	490	23	30	TCFM=8
MW-6UA	001240	403593-22	03-03-94	03-15-94	601/602	ATI	1 (20)	450.4	(210)	20	9.0	17	(180)	11	ND	TCFM=3.4
MW-6UA dup	001241	403593-23	03-03-94	03-16-94	601/602	ATI	1 (25)	316.9	(120)	20	9.6	19	(130)	12	2.0	TCFM=4.3
MW-6UA	002321	407012-26	07-27-94	08-09-94	601/602	ATI	5	125.2	56	6.8	3.6	7.2	46	3.4	2.2	ND
MW-6UA	002441	100286222	12-01-94	12-11-94	8010/8020	PACE	1	212.4	130	7.3	4.4	7.9	49	4.1	2.1	DCM=1.6; TCFM=15
MW-6UA	002535	100057142	03-08-95	03-16-95	8010/8020	PACE	1	87.0	44	4.5	2.4	3.4	27 F	2.1	1.1	1,2-DCE=2.1; TCFM=0.4
MW-6UA	002647	100165492	06-08-95	06-21-95	8010/8020	PACE	1	32.5	18	2.2	ND	1.4	9.1	1.2	0.6	ND
MW-6UA	002744	100374253	12-14-95	12-19-95	8010/8020	PACE	1	35.1	18	1.5	ND	0.6	15	ND	ND	ND
MW-6UA split	MW-6UA	W5120235-03	12-14-95	12-27-95	601/602	GTEL	1	22.9	20	1.9	1.0	ND	ND	ND	ND	ND
MW-6UA	003766	100051209	03-22-96	04-03-96	8010/8020	PACE	1	308.2	100[i]	4.6	2.3	3.3	190[i]	1.7	0.8	TCFM=2.9; DCM=2.6[h]
MW-6UA split	MW-6UA	W6030480-03	03-22-96	04-02-96	8010/8020	ADEQ	1	95.1	72	6.8	3.0	5.3	ND	3.3	ND	TCFM=4.7
MW-6UA	001752	100100676	06-06-96	06-12-96	8010/8020	PACE	1 (5)	246.6	(110)	7.2	4.8	6.0	(110)	3.0	1.5	TCFM=2.7; DCM=1.4 T[h]
MW-6UA	001349	100209810	12-04-96	12-11-96	8010/8020	PACE	1 (5)	113	39	ND	ND	ND	(74)	ND	ND	ND
MW-6UA	MW6UA	6120109	12-04-96	12-12-96	601/602	ADEQ	5	51.6	49	2.6	ND	ND	ND	ND	ND	ND
MW-6UA	000709	10195386	07-10-97	07-20-97	8260	PACE	1	7.3	3.7	ND	ND	ND	3.6	ND	ND	ND
MW-6UA	003022	10661610	05-29-98	06-05-98	8010/8020	PACE	1	5.3	3.2	ND	ND	ND	2.1	ND	ND	ND

SAMPLE SOURCE	SAMPLE IDENTIFIER FIELD	SAMPLE IDENTIFIER LAB	DATE SAMPLED	DATE ANALYZED	EPA METHOD	LABORATORY	DILUTION FACTOR	TOTAL VOCs	1,1-DCE	TCE	PCE	1,1,1-TCA	TCTFA	1,1-DCA	1,2-DCP	OTHER VOCs
								VOLATILE ORGANIC COMPOUNDS (micrograms per liter)								
MW-6UA	000846	PIF00157	06-02-99	06-04-99	8260B	DEL MAR	1	38.3	8.3	ND	ND	ND	30	ND	ND	ND
MW-6UA	003097	PJE0348-19	05-15-00	05-27-00	8260B	DEL MAR	1	147	57	ND	ND	ND	90	ND	ND	ND
MW-6UA dup	003098	PJE0348-20	05-15-00	05-27-00	8260B	DEL MAR	1	113	45	ND	ND	ND	68	ND	ND	ND
MW-7UA D	004333	912583-01	12-07-89	12-20-89	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-7UA	004391	002577-01	02-07-90	02-16-90	624	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-7UA dup	004392	002577-02	02-07-90	02-16-90	624	ATI	1	1	ND	ND	ND	ND	ND	ND	ND	MB= 1RFT
MW-7UA	*MW-7UA*	*19188*	*02-07-90*	*02-14-90*	*601/602*	*ADEQ*		*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*
MW-7UA	006562	003572-03	03-07-90	03-13-90	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-7UA	006756	006589-09	06-07-90	06-13-90	601/602	ATI		ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-7UA	010798	103882-16	03-22-91	04-04-91	601/602	ATI		2.8	ND	ND	ND	ND	ND	ND	ND	MB=2.8 FT
MW-7UA	010989	106790-31	06-19-91	07-02-91	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-7UA	002258	109902-12	09-24-91	09-30-91	601/602	ATI	1	0.2	ND	0.2	ND	ND	ND	ND	ND	ND
MW-7UA	002410	112587-18	12-05-91	12-12-91	601/602	ATI	1	1.1	0.4	0.4	ND	ND	ND	ND	ND	TCM=0.3
MW-7UA dup	002411	112587-19	12-05-91	12-12-91	601/602	ATI	1	0.9	0.5	0.4	ND	ND	ND	ND	ND	ND
MW-7UA	002638	204640-21	04-09-92	04-17-92	601/602	ATI	1	1.0	0.6	0.4	ND	ND	ND	ND	ND	ND
MW-7UA	*7UA*	*29473*	*04-09-92*	*04-23-92*	*601/602*	*ADHS*		*1.0*	*1.0*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*
MW-7UA dup	*17UA*	*29474*	*04-09-92*	*04-23-92*	*601/602*	*ADHS*		*1.0*	*1.0*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*
MW-7UA	014952	210011-17	10-29-92	11-10-92	601/602	ATI	1	2.5	1.5	1.0	ND	ND	ND	ND	ND	ND
MW-7UA dup	014953	210011-18	10-29-92	11-10-92	601/602	ATI	1	0.9	0.6	ND	ND	ND	ND	ND	ND	TCM=0.3 F
MW-7UA	*7UA*	*E92-5204*	*10-29-92*	*11-06-92*	*601/602*	*MCKENZIE*		*5.3*	*3.1*	*2.2*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*
MW-7UA dup	*7UB*	*E92-5203*	*10-29-92*	*11-06-92*	*601/602*	*MCKENZIE*		*5.2*	*3.1*	*2.1*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*
MW-7UA	007556	304579-10	04-05-93	04-13-93	601/602	ATI	1	7.2	2.6	1.7	ND	ND	2.9	ND	ND	ND
MW-7UA dup	007555	304579-11	04-05-93	04-13-93	601/602	ATI	1	8.0	2.7	2.1	[0.2 F]	ND	3.2	ND	ND	ND
MW-7UA	*7UA*	*E93-1684*	*04-05-93*	*04-13-93*	*601/602*	*MCKENZIE*		*7.4*	*4.2*	*3.2*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*
MW-7UA	001096	310890-11	10-19-93	10-22-93	601/602	ATI	1	8.0	5.6	2.2	0.2	ND	ND	ND	ND	ND
MW-7UA	001248	403693-26	03-03-94	03-16-94	601/602	ATI	1	25.7	16	5.4	0.4	ND	3.9	ND	ND	ND
MW-7UA dup	001249	403693-27	03-03-94	03-17-94	601/602	ATI	1	25.3	16	4.8	0.4	ND	4.1	ND	ND	ND
MW-7UA	002310	407012-15	07-26-94	08-06-94	601/602	ATI	1	3.6	1.7	1.0	ND	0.7	ND	ND	0.2	[1,2-DCA=0.2]
MW-7UA	002462	100286460	12-05-94	12-13-94	8010/8020	PACE	1	3.8	2.8	1.0	ND	ND	ND	ND	ND	ND
MW-7UA dup	002463	100286478	12-05-94	12-13-94	8010/8020	PACE	1	4.1	3.0	ND	1.1	ND	ND	ND	ND	ND
MW-7UA	002539	100057177	03-08-95	03-15-95	8010/8020	PACE	1	7.6	4.0	3.6	ND	ND	ND	ND	ND	ND
MW-7UA	002649	100165514	06-07-95	06-21-95	8010/8020	PACE	1	15.1	11	3.0	ND	ND	1.1	ND	ND	ND
MW-7UA dup	002650	100165522	06-07-95	06-21-95	8010/8020	PACE	1	31.4	18	7.1	ND	1.1	5.2	ND	ND	ND
MW-7UA	002740	100374261	12-14-95	12-19-95	8010/8020	PACE	1 (2)	80.0	(56)	12	1.4	1.0	9.6	ND	ND	ND
MW-7UA split	*MW-7UA*	*Q5120335-01*	*12-14-95*	*12-21-95*	*601/602*	*GTEL*	*1*	*69.9*	*55*	*12*	*1.5*	*1.4*	*ND*	*ND*	*ND*	*ND*
MW-7UA	003763	100051195	03-22-96	04-02-96	8010/8020	PACE	1 (5)	88.2	(58)	16	1.9	1.3	11	ND	ND	[DCM=2.7]
MW-7UA split	*MW-7UA*	*W6030480-04*	*03-22-96*	*04-02-96*	*8010/8020*	*GTEL*	*1*	*118.9*	*89*	*23*	*3.6*	*3.3*	*ND*	*ND*	*ND*	*ND*
MW-7UA	001768	100160714	06-06-96	06-11-96	8010/8020	PACE	1 (5)	168.8	(120)	22	4.0	2.8	19.	ND	ND	TCFM=0.8
MW-7UA	001351	100209902	12-04-96	12-11-96	8010/8020	PACE	1 (5)	141.6	(100)	27	5.5	2.6	6.5	ND	ND	ND
MW-7UA	*MW-7UA*	*6120110*	*12-04-96*	*12-12-96*	*601/602*	*ADEQ*	*10*	*165*	*130*	*35*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*
MW-7UA	000718	10195402	07-11-97	07-21-97	8260	PACE	10	250	180	58	ND	ND	12	ND	ND	ND
MW-7UA	*MW-7UA*	*PGG00382*	*07-11-97*	*07-21-97*	*601/602*	*DEL MAR*	*1*	*170.3*	*120*	*45*	*5.3*	*ND*	*ND*	*ND*	*ND*	*ND*
MW-7UA	003005	10683581	05-28-98	06-05-98	8010/8020	PACE	5	154.8	82	49	6.8	ND	12	ND	ND	MB=5.0 M
MW-7UA	*MW-7UA*	*PHE01527*	*05-28-98*	*06-10-98*	*8021B*	*DEL MAR*	*5*	*136.4*	*94*	*38*	*4.4*	*ND*	*ND*	*ND*	*ND*	*ND*
MW-7UA	000866	PIF00166	06-03-99	06-04-99	8260B	DEL MAR	1	46.4	ND	36	2.8	ND	7.6	ND	ND	ND
MW-7UA split	000870	9906061-01A	06-03-99	06-15-99	8260B	TURNER	2	121.0	60.0	46.0	4.2	ND	8.8	ND	ND	ND
MW-7UA+	003101	PJE0348-23	05-15-00	05-29-00	8260B	DEL MAR	1	118.3	54	61	3.3	ND	ND	ND	ND	ND
MW-7UA	*MW-07*	*E0E170226-004*	*05-15-00*	*05-17-00*	*8260B*	*STL*	*1*	*150.5*	*72*	*58*	*4.5*	*ND*	*15*	*1.0*	*ND*	*TCFM=Tr*
MW-7UA	003147	PIF0443-13	06-22-00	06-29-00	8260B	DEL MAR	1	100.9	44	53	3.9	ND	ND	ND	ND	ND
MW-8UA D	004335	912583-03	12-08-89	12-20-89	601/602	ATI	1	0.7	ND	ND	ND	ND	ND	ND	ND	MB=0.7 T
MW-8UA	004395	002577-05	02-08-90	02-16-90	624	ATI	1	2	ND	ND	ND	ND	[1 T]	ND	ND	MB=2 RFT
MW-8UA dup	004397	002577-06	02-08-90	02-17-90	624	ATI	1	1	ND	ND	ND	ND	ND	ND	ND	MB=1 RFT
MW-8UA	006564	003572-05	03-07-90	03-14-90	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND

TABLE 4-5
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SAMPLE SOURCE[a]	SAMPLE IDENTIFIER FIELD	SAMPLE IDENTIFIER LAB	DATE SAMPLED	DATE ANALYZED	EPA METHOD	LABORATORY[b]	DILUTION FACTOR[c]	TOTAL VOCs[e]	1,1-DCE	TCE	PCE	1,1,1-TCA	TCTFA	1,1-DCA	1,2-DCP	OTHER VOCs
								VOLATILE ORGANIC COMPOUNDS[d] (micrograms per liter)								
MW-8UA	006752	006509-06	06-07-90	06-13-90	601/602	ATI	1	ND	ND	ND	ND	[0.7]	ND	ND	ND	ND
MW-8UA dup	006753	006509-07	06-07-90	06-13-90	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-8UA	010782	103882-02	03-20-91	04-02-91	601/602	ATI	1	ND	ND	[1.3]	ND	ND	ND	ND	ND	[DCM=2.4 RFT]
MW-8UA	101902	105704-02	05-13-91	05-22-91	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-8UA dup	010903	105704-03	05-13-91	05-23-91	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-8UA	010983	106790-25	06-19-91	07-02-91	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-8UA dup	010984	106790-26	06-19-91	07-02-91	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-8UA	002269	109902-26	09-25-91	10-02-91	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	[CM=0.3]
MW-8UA	002391	112562-09	12-04-91	12-06-91	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-8UA	002644	204658-01	04-10-92	04-17-92	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-8UA	*8UA*	*29493*	*04-10-92*	*04-23-92*	*601/602*	*ADHS*		*ND[f]*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*
MW-8UA	014962	210011-27	10-29-92	11-10-92	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-8UA	*8UA*	*E92-5215*	*10-29-92*	*11-06-92*	*601/602*	*MCKENZIE*		*ND[f]*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*[TCM=1.0]*
MW-8UA	007542	304579-24	04-05-93	04-14-93	601/602	ATI	1	0.8	ND	ND	ND	ND	ND	ND	ND	DCDFM=0.8; [TCFM=0.5]
MW-8UA dup	007541	304579-25	04-05-93	04-14-93	601/602	ATI	1	0.8	ND	ND	ND	ND	ND	ND	ND	DCDFM=0.8; [TCFM=0.6]
MW-8UA	001080	310890-13	10-19-93	10-22-93	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-8UA	001252	403593-28	03-01-94	03-16-94	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-8UA	002335	407012-40	07-27-94	08-10-94	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-8UA	*MW-8UA*	*9416849*	*09-02-94*	*09-12-94*	*8260*	*WESTECH*		*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*
MW-8UA	*MW-8UA*	*9420502*	*10-26-94*	*11-01-94*	*8240/8260*	*WESTECH*		*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*
MW-8UA	002400	100286443	12-05-94	12-13-94	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-8UA	002544	100057193	03-09-95	03-15-95	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-8UA	002651	100165530	06-07-95	06-15-95	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-8UA	002733	100374288	12-13-95	12-19-95	8010/8020	PACE	1	1.8	ND	ND	ND	ND	ND	ND	ND	DCDFM=1.8
MW-8UA	001791	100100730	06-05-96	06-12-96	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-8UA	*HMW8VA*	*6060115*	*06-05-96*	*06-10-96*	*8260*	*DEL MAR*	*1*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*
MW-8UA	001373	100212199	12-05-96	12-11-96	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-8UA	000701	10195410	07-10-97	07-20-97	8260	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-8UA split	*MW-8UA*	*PGG00351*	*07-10-97*	*07-14-97*	*8260*	*DEL MAR*	*1*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*
MW-8UA	000013	10663623	05-28-98	06-08-98	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-8UA	*MW-8UA*	*PHK0116*	*11-18-98*	*12-01-98*	*8260B*	*DEL MAR*	*1*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*
MW-8UA	000858	PIF00163	06-03-99	06-05-99	8260B	DEL MAR	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-8UA	*000860*	*PIF00177*	*06-03-99*	*06-07-99*	*8260B*	*DEL MAR*	*1*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*
MW-8UA	000943	PIK0320-26	11-17-99	11-22-99	8260B	DEL MAR	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-8UA	*000894*	*PJE0328-01*	*05-16-00*	*05-30-00*	*8260B*	*DEL MAR*	*1*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*
MW-8UA	*003209*	*PJJ0341-01*	*10-19-00*	*10-26-00*	*8260B*	*DEL MAR*	*1*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*
MW-9UA D	014751	104861-01	04-25-91	05-07-91	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	[1,2-DCA=0.5]; [MB=0.5 T]
MW-9UA	004457	105644-01	05-07-91	05-20-91	624	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-9UA	010985	106790-27	06-19-91	07-02-91	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-9UA	002271	109902-28	09-25-91	10-02-91	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	[CM=0.5]
MW-9UA	002413	112587-21	12-05-91	12-13-91	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-9UA	002648	204659-05	04-10-92	04-17-92	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-9UA	*9UA*	*29495*	*04-10-92*	*04-23-92*	*601/602*	*ADHS*		*ND[f]*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*
MW-9UA	014964	210011-29	10-29-92	11-10-92	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-9UA	*9UA*	*E92-5211*	*10-29-92*	*11-06-92*	*601/602*	*MCKENZIE*		*ND[f]*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*
MW-9UA dup	*19UA*	*E92-5214*	*10-29-92*	*11-06-92*	*601/602*	*MCKENZIE*		*ND[f]*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*[TCM=0.9]*
MW-9UA	007540	304579-26	04-06-93	04-14-93	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-9UA	001078	310890-15	10-18-93	10-25-93	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-9UA	001209	403593-30	03-01-94	03-15-94	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-9UA	002315	407012-20	07-27-94	08-09-94	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-9UA	*MW-9UA*	*9416850*	*09-02-94*	*09-12-94*	*8260*	*WESTECH*		*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*
MW-9UA	*MW-9UA*	*9420503*	*10-26-94*	*11-01-94*	*8240/8260*	*WESTECH*		*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*
MW-9UA	002443	100286249	12-01-94	12-11-94	8010/8020	PACE	1	ND	[0.7]	ND	ND	ND	ND	ND	ND	ND
MW-9UA	002653	100165557	06-07-95	06-14-95	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND

TABLE 4-5
Summary of Laboratory Chemical Results for Volatile Organic Compounds in Water Samples from Groundwater Wells and Groundwater Remediation System Air Stripper Influent and Effluent
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SAMPLE SOURCE[a]	SAMPLE IDENTIFIER: FIELD	SAMPLE IDENTIFIER: LAB	DATE SAMPLED	DATE ANALYZED	EPA METHOD	LABORATORY[b]	DILUTION FACTOR[c]	TOTAL VOCs[d]	1,1-DCE	TCE	PCE	1,1,1-TCA	TCTFA	1,1-DCA	1,2-DCP	OTHER VOCs
								VOLATILE ORGANIC COMPOUNDS[e] (micrograms per liter)								
MW-9UA	MW-9UA	E95-5427	06-07-95	06-15-95	601/602	MCKENZIE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-9UA	002772	100374296	12-15-95	12-19-95	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-9UA	001769	100100757	06-05-96	06-12-96	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-9UA	HMW#9VA	6060116	06-05-96	06-10-96	8260	DEL MAR		ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-9UA	001377	100212229	12-05-96	12-12-96	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-9UA	MW-9UA	7040439	04-09-97	04-15-97	8260		1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-9UA	000703	10195428	07-10-97	07-21-97	8260	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-9UA split	MW-9UA	PGG00350	07-10-97	07-14-97	8260	DEL MAR	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-9UA	003011	10663615	05-28-98	06-08-98	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	[Benzene=1.0]
MW9UA	MW-9UA	PHE01533	05-28-98	06-10-98	8021B	DEL MAR	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-9UA	9UA	PHK01168	11-18-98	12-01-98	8260B	DEL MAR	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-9UA	000861	PIF00164	06-03-99	06-04-99	8260B	DEL MAR	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-9UA	000865	PIF00176	06-03-99	06-07-99	8260B	DEL MAR	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-9UA	000940	PIK0320-23	11-16-99	11-22-99	8260B	DEL MAR	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-9UA dup	000941	PIK0320-24	11-16-99	11-22-99	8260B	DEL MAR	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-9UA	MW-9VA	PJC0002-01	02-29-00	03-11-00	8260B	DEL MAR	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-9UA	000985	PJE0328-02	05-16-00	05-30-00	8260B	DEL MAR	1	ND	ND	ND	ND	ND	ND	ND	ND	[DCDFM=Tr]; [TCFM=Tr]
MW-9UA	003211	PJJ0341-03	10-19-00	10-28-00	8260B	DEL MAR	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-10UA D	014753	104890-01	04-29-91	05-09-91	601/602	ATI	1	0.5	ND	ND	ND	ND	ND	ND	ND	[1,2-DCA=0.6 T]; MB=0.5 T
MW-10UA	004461	105723-01	05-14-91	05-25-91	624	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-10UA	010991	106790-33	06-19-91	07-02-91	601-602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-10UA	002277	109902-34	09-25-91	10-02-91	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	[CM=0.8]
MW-10UA	002417	112587-25	12-05-91	12-13-91	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-10UA	002652	204659-09	04-10-92	04-17-92	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-10UA	10UA	29497	04-10-92	04-23-92	601/602	ADHS		1.2[f]	ND	ND	ND	ND	ND	ND	ND	MB=1.2
MW-10UA	014968	210011-33	10-29-92	11-10-92	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-10UA	007536	304579-30	04-06-93	04-14-93	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-10UA	001062	310890-36	10-19-93	10-26-93	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-10UA	001218	403593-36	03-02-94	03-15-94	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-10UA	002317	407012-22	07-27-94	08-09-94	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-10UA	MW-10UA	94116651	09-02-94	09-12-94	8260	WESTECH		ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-10UA	MW-10UA	9420504	10-26-94	11-01-94	8240/8260	WESTECH		ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-10UA	002450	100286311	12-02-94	12-12-94	8010/8020	PACE	1	ND	ND	ND	[5.3][f]	ND	ND	ND	ND	ND
MW-10UA	002548	100057215	03-09-95	03-15-95	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-10UA	002657	100165590	06-08-95	06-16-95	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-10UA	002773	100374300	12-15-95	12-19-95	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-10UA	001763	100100838	06-05-96	06-12-96	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	[DCM=1.3 T][f]
MW-10UA	HMW#10VA	6060118	06-05-96	06-10-96	8260	DEL MAR	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-10UA	001379	100212237	12-05-96	12-12-96	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-10UA	000685	10195444	07-09-97	07-21-97	8260	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-10UA split	MW-10UA	PGG00349	07-09-97	07-14-97	8260	DEL MAR	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-10UA	002997	10661452	05-27-98	06-05-98	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-10UA	10UA	PHK01167	11-18-98	12-01-98	8260B	DEL MAR	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-10UA	000849	PIF00159	06-02-99	06-04-99	8260B	DEL MAR	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-10UA	000863	PIF00178	06-03-99	06-08-99	8260B	DEL MAR	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-10UA	000986	PJE0328-03	05-16-00	05-30-00	8260B	DEL MAR	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-10UA	003213	PJJ0341-05	10-19-00	10-28-00	8260B	DEL MAR	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-11UA D	001022	309585-01	09-10-93	09-13-93	624	ATI	10 (25)	ND	ND	ND	ND	ND	ND	ND	ND	[2-Propanol=100]; DMK=(4,100)
MW-11UA PT	001027	309721-01	09-13-93	09-21-93	624	ATI	1 (5)	ND	ND	ND	ND	ND	ND	ND	ND	DMK=(470)
MW-11UA	001066	310890-40	10-19-93	10-26-93	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-11UA	MW-11UA	E93-6053	10-19-93	10-27-93	601/602	ADEQ		ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-11UA	001244	403583-40	03-03-94	03-16-94	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-11UA	002312	407012-17	07-26-94	08-09-94	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	[DCDFM=1.5]

TABLE 4-5
Summary of Laboratory Chemical Results for Volatile Organic Compounds in Water Samples from Groundwater Wells and Groundwater Remediation System Air Stripper Influent and Effluent
Hassayampa Landfill Epa Superfund Site

SAMPLE SOURCE[a]	SAMPLE IDENTIFIER: FIELD	SAMPLE IDENTIFIER: LAB	DATE SAMPLED	DATE ANALYZED	EPA METHOD	LABORATORY[b]	DILUTION FACTOR[c]	VOLATILE ORGANIC COMPOUNDS[d] (micrograms per liter): TOTAL VOCs[e]	1,1-DCE	TCE	PCE	1,1,1-TCA	TCTFA	1,1-DCA	1,2-DCP	OTHER VOCs
MW-11UA	*MW-11UA*	*9416652*	*09-02-94*	*09-12-94*	*8260*	*WESTECH*		*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*
MW-11UA	*MW-11UA*	*9420505*	*10-26-94*	*11-01-94*	*8240/8260*	*WESTECH*		*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*
MW-11UA	002456	100286400	12-02-94	12-13-94	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-11UA	002537	100057231	03-08-95	03-15-95	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-11UA	002659	100165611	06-06-95	06-16-95	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-11UA	002769	100374318	12-15-95	12-19-95	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-11UA	001785	100100689	06-05-96	06-12-96	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	[DCM=1.1 T]
MW-11UA	*HMW#11VA*	*6060117*	*06-05-96*	*06-10-96*	*8260*	*DEL MAR*	*1*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*
MW-11UA	001371	100212245	12-05-96	12-12-96	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-11UA	000681	10195459	07-09-97	07-20-97	8260	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-11UA	*MW-11UA*	*PG000348*	*07-09-97*	*07-14-97*	*8260*	*DEL MAR*	*1*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*[*]	*ND*
MW-11UA	002993	10661437	05-27-98	06-05-98	8010/8020	PACE	1	2.3	[1.2]	ND	ND	ND	2.3	ND	ND	ND
MW-11UA split	*11UA*	*PHK01165*	*11-18-98*	*12-01-98*	*8260B*	*DEL MAR*	*1*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*
MW-11UA	000840	PIF00155	06-02-99	06-04-99	8260B	DEL MAR	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-11UA	*000844*	*PIF00175*	*06-02-99*	*06-07-99*	*8260B*	*DEL MAR*	*1*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*
MW-11UA	*000987*	*PJE0326-04*	*05-16-00*	*05-30-00*	*8260B*	*DEL MAR*	*1*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*
MW-11UA	*003215*	*PJK0269-01*	*11-15-00*	*11-22-00*	*8260B*	*DEL MAR*	*1*	*ND*	*ND*	*ND*	*ND*	*ND*	*Tr*	*ND*	*ND*	*ND*
MW-12UA D	001025	309665-03	09-10-93	09-13-93	624	ATI	5	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-12UA PT	001035	309792-01	09-15-93	09-22-93	624	ATI	5	ND	ND	ND	ND	ND	ND	ND	ND	DMK=550
MW-12UA	001068	310890-42	10-18-93	10-26-93	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-12UA	*MW-12UA*	*E93-6046*	*10-18-93*	*10-27-93*	*601/602*	*ADEQ*		*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*DMK=88*[g]
MW-12UA	001256	403593-42	03-03-94	03-16-94	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-12UA	002304	407012-09	07-26-94	08-06-94	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-12UA	002454	100286389	12-02-94	12-13-94	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-12UA	002550	100057258	03-09-95	03-15-95	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-12UA	002661	100165638	06-06-95	06-16-95	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-12UA	002763	100374326	12-15-95	12-19-95	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-12UA	001776	100100900	06-05-96	06-12-96	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	[DCM=1.4 T][a]
MW-12UA	001365	100212253	12-05-96	12-12-96	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-12UA	000677	10195477	07-09-97	07-20-97	8260	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-12UA	002995	10661445	05-27-98	06-05-98	8010/8020	PACE	1	ND	[1.1]	ND	ND	ND	ND	ND	ND	ND
MW-12UA	000848	PIF00158	06-02-99	06-04-99	8260B	DEL MAR	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-12UA+	003115	PJE0348-37	05-16-00	05-30-00	8260B	DEL MAR	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-12UA	003153	PJF0443-19	06-22-00	06-30-00	8260B	DEL MAR	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-13UA D	001012	308999-01	08-27-93	08-30-93	601/602	ATI	1	0.8	0.3	0.2	ND	ND		ND		[BM=0.2]; DCDFM=0.3; DMK=245[g] [MB=4.2]
MW-13UA PT	001016	309635-02	09-08-93	09-14-93	624	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	[PMCH=6]
MW-13UA dup	001018	309635-04	09-08-93	09-14-93	624	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	DMK=11
MW-13UA	004954	309888-02	09-21-93	09-23-93	601/602	ATI	1	3.4	ND	ND	ND	ND	ND	ND	ND	TCFM=3.4
MW-13UA	004954	309888-02	09-21-93	09-22-93	624	ATI	1	12	ND	ND	ND	ND	ND	ND	ND	[Unknown=10]; [TMH=7]; DMK=Tr; TCFM=12
MW-13UA	001049	310700-04	10-06-93	10-18-93	601/602	ATI	1	2.5	0.2	ND	ND	ND	ND	ND	ND	TCFM=2.3
MW-13UA	001065	310890-44	10-18-93	10-26-93	601/602	ATI	1	57.6	1.8	ND	ND	ND	ND	ND	ND	DCDFM=1.8; TCFM=54
MW-13UA	*MW-13UA*	*E93-6045*	*10-18-93*	*10-27-93*	*601/602*	*ADEQ*		*46.8*	*1.8*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*TCFM=45*
MW-13UA	004966	310030-01	10-23-93	10-31-93	601/602	ATI	1	3.9	ND	ND	ND	ND	ND	ND	ND	TCFM=3.9
MW-13UA	004973	311512-02	11-01-93	11-02-93	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-13UA	001254	403593-44	03-03-94	03-16-94	601/602	ATI	1	10.5	0.4	0.5	ND	ND	ND	ND	ND	DCDFM=0.3; TCFM=5.9; CA=3.4
MW-13UA dup	001255	403593-45	03-03-94	03-16-94	601/602	ATI	1	9.4	0.5	0.4	ND	ND	ND	ND	ND	DCDFM=0.4; TCFM=5.3; CA=2.8
MW-13UA	002306	407012-11	07-26-94	08-06-94	601/602	ATI	1	26.7	1.4	0.8	ND	[0.5]	ND	ND	ND	TCFM=16; CA=8.5
MW-13UA	002431	100286095	12-01-94	12-11-94	8010/8020	PACE	1	25.7	1.7	ND	ND	ND	ND	ND	ND	TCFM=24
MW-13UA dup	002432	100286117	12-01-94	12-11-94	8010/8020	PACE	1	23.1	1.1	ND	ND	ND	ND	ND	ND	TCFM=22
MW-13UA	002552	100057274	03-09-95	03-16-95	8010/8020	PACE	1	15.8	2.2	0.6	ND	ND	ND	ND	ND	TCFM=13
MW-13UA dup	002553	100057282	03-09-95	03-19-95	8010/8020	PACE	1	12.7	0.7	ND	ND	ND	ND	ND	ND	TCFM=12
MW-13UA	002663	100165654	06-07-95	06-16-95	8010/8020	PACE	1	13	ND	ND	ND	ND	ND	ND	ND	TCFM=13
MW-13UA	002738	100374334	12-14-95	12-20-95	8010/8020	PACE	1	18.3	1.3	ND	ND	ND	ND	ND	ND	TCFM=17

TABLE 4-5
Summary of Laboratory Chemical Results for Volatile Organic Compounds in Water Samples from Groundwater Wells and Groundwater Remediation System Air Stripper Influent and Effluent
Hassayampa Landfill Epa Superfund Site

SAMPLE SOURCE[a]	SAMPLE IDENTIFIER: FIELD	SAMPLE IDENTIFIER: LAB	DATE SAMPLED	DATE ANALYZED	EPA METHOD	LABORATORY[b]	DILUTION FACTOR[c]	TOTAL VOCs[d]	1,1-DCE	TCE	PCE	1,1,1-TCA	TCTFA	1,1-DCA	1,2-DCP	OTHER VOCs
								VOLATILE ORGANIC COMPOUNDS[e] (micrograms per liter)								
MW-13UA dup	002739	100374342	12-14-95	12-20-95	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-13UA	001774	100100927	06-05-96	06-12-96	8010/8020	PACE	1	8.1	ND	ND	ND	ND	ND	ND	ND	TCFM=8.1
MW-13UA	001369	100212361	12-05-96	12-12-96	8010/8020	PACE	1	15.52	0.52	ND	ND	ND	ND	ND	ND	TCFM=15
MW-13UA	000675	10195485	07-09-97	07-20-97	8260	PACE	1	12	ND	ND	ND	ND	ND	ND	ND	TCFM=12
MW-13UA	002992	10661429	05-27-98	06-05-98	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-13UA	000834	PIF00152	06-02-99	06-07-99	8260B	DEL MAR	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-13UA dup	000835	PIF00240	06-02-99	06-08-99	8260B	DEL MAR	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-13UA	000914	PIK0320-04	11-15-99	11-21-99	8260B	DEL MAR	1	14	ND	ND	ND	ND	ND	ND	ND	TCFM=14; DCDFM=Tr
MW-13UA	*MW-13UA*	*E9K170275-004*	*11-15-99*	*11-18-99*	*8260B*	*ADEQ*	*1*	*18.7*	*Tr*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*TCFM=16; DCDFM=2.7; 1,2-DCA=Tr*
MW-13UA+	003117	PJE0340-39	05-15-00	05-29-00	8260B	DEL MAR	1	7.2	ND	ND	ND	ND	ND	ND	ND	TCFM=7.2
MW-13UA	003155	PJF0443-21	06-22-00	06-30-00	8260B	DEL MAR	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-13UA	003193	PJJ0337-17	10-19-00	10-30-00	8260B	DEL MAR	1	5.5	ND	ND	ND	ND	ND	ND	ND	TCFM=5.5
MW-14UA D	001019	309635-05	09-09-93	09-10-93	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	DMK=570[g]
MW-14UA PT	001031	309761-01	09-14-93	09-21-93	624	ATI	1 (5)	ND	ND	ND	ND	ND	ND	ND	ND	DMK=(720 F)
MW-14UA	004953	309888-01	09-21-93	09-23-93	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-14UA	004953	309888-01	09-21-93	09-22-93	624	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	[Total Xylenes=1]; DMK=140
MW-14UA	001050	310700-05	10-07-93	10-18-93	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-14UA	001070	310890-46	10-18-93	10-26-93	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-14UA dup	001071	310890-47	10-18-93	10-26-93	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	[CM=0.2]
MW-14UA	*MW-14UA*	*E93-6047*	*10-18-93*	*10-27-93*	*601/602*	*ADEQ*		*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*
MW-14UA	004967	310030-02	10-25-93	10-31-93	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-14UA	004974	311512-03	11-01-93	11-02-93	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-14UA	001228	403593-46	03-02-94	03-15-94	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-14UA	001229	403593-47	03-02-94	03-16-94	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-14UA	*14UA*	*E94-1520*	*03-02-94*	*03-08-94*	*601/602*	*MCKENZIE*		*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*
MW-14UA	002302	407012-07	07-26-94	08-05-94	601/602	ATI		ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-14UA	002435	100286150	12-01-94	12-11-94	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-14UA	002531	100057290	03-08-95	03-15-95	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-14UA	002665	100165670	06-07-95	06-19-95	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-14UA	002742	100374350	12-14-95	12-20-95	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-14UA	*MW-14UA*	*W5120335-02*	*12-14-95*	*12-21-95*	*601/602*	*GTEL*	*1*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*
MW-14UA	001770	100100943	06-06-96	06-12-96	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-14UA	001347	100209929	12-04-96	12-11-96	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-14UA	000696	10195519	07-10-97	07-20-97	8260	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-14UA	003007	10663599	05-28-98	06-06-98	8010/8020	PACE	1	ND	(1.3)[h]	ND	ND	ND	ND	ND	ND	ND
MW-14UA	*MW-14UA*	*PHE01530*	*05-28-98*	*06-10-98*	*8021B*	*DEL MAR*	*1*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*
MW-14UA	000832	PIF00151	06-01-99	06-08-99	8260B	DEL MAR	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-14UA+	003119	PJE0348-41	05-16-00	05-30-00	8260B	DEL MAR	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-14UA	003158	PJF0443-24	06-22-00	06-30-00	8260B	DEL MAR	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-1UB D	014383	804087-01	04-27-88	05-02-88	624	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	[MBK=Tr]; [DCM=16 R]
MW-1UB	014425	806096-01	06-14-88	06-27-88	624	ATI	1	1	ND	ND	ND	ND	ND	ND	ND	MB=1
MW-1UB	006096	809133-02	09-20-88	09-28-88	624	ATI	1	25	ND	ND	ND	ND	ND	ND	ND	MEK=22; MB=3 RFT
MW-1UB	006171	812527-08	12-06-88	12-14-88	624	ATI	1	40	ND	ND	ND	ND	ND	ND	ND	DCM=15 RT; MEK=24 FT; MB=1 F
MW-1UB	006360	908592-01	08-23-89	08-28-89	601/602	ATI	1	2.2	ND	ND	ND	ND	ND	ND	ND	DCM=2.2 R
MW-1UB	006552	003557-02	03-06-90	03-12-90	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-1UB	006739	006576-02	06-05-90	06-08-90	601/602	ATI	1	2.0	ND	ND	ND	ND	ND	ND	ND	DCM=2.0 RT
MW-1UB	010781	103882-01	03-20-91	04-02-91	601/602	ATI	1	2.0	ND	ND	ND	ND	ND	ND	ND	DCM=2.0 RFT
MW-1UB	010958	106790-02	06-18-91	07-01-91	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-1UB	002245	109902-02	09-24-91	09-28-91	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-1UB	002385	112362-04	12-04-91	12-05-91	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-1UB	002620	204640-03	04-09-92	04-16-92	601-602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-1UB	014938	210011-03	10-28-92	11-06-92	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-1UB	*1UB*	*E92-5199*	*10-28-92*	*11-06-92*	*601/602*	*MCKENZIE*		*ND[f]*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*

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Hassayampa Landfill Epa Superfund Site

SAMPLE SOURCE[a]	SAMPLE IDENTIFIER: FIELD	SAMPLE IDENTIFIER: LAB	DATE SAMPLED	DATE ANALYZED	EPA METHOD	LABORATORY[b]	DILUTION FACTOR[c]	TOTAL VOCs[d]	VOLATILE ORGANIC COMPOUNDS[e] (micrograms per liter): 1,1-DCE	TCE	PCE	1,1,1-TCA	TCTFA	1,1-DCA	1,2-DCP	OTHER VOCs
MW-1UB	007594	304579-02	04-05-93	04-14-93	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-1UB	001092	310890-22	10-19-93	10-25-93	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-1UB	001216	403593-04	03-02-94	03-14-94	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-1UB	002424	100283428	11-30-94	12-11-94	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-1UB	002631	100165336	06-07-95	06-15-95	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-1UB	001794	100100510	06-05-96	06-12-96	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-1UB	000679	10190287	07-09-97	07-21-97	8260	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-1UB	002987	10561387	05-27-98	06-05-98	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-1UB	000836	PIF00153	06-02-99	06-07-99	8260B	DEL MAR	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-1UB	000944	PIK0320-27	11-17-99	11-22-99	8260B	DEL MAR	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-1UB	003081	PJE0348-03	05-15-00	05-26-00	8260B	DEL MAR	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-1UB	003195	PJJ0337-19	10-19-00	10-31-00	8260B	DEL MAR	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-2UB D	014379	804029-01	04-18-88	04-23-88	624	ATI	1	14	ND	ND	ND	ND	ND	ND	ND	DCM=14 R; [DMK=18 R]
MW-2UB	014414	806006-03	06-01-88	06-03-88	624	ATI	1	10	ND	ND	ND	ND	ND	ND	ND	DCM=10 RF
MW-2UB	006087	809133-03	09-20-88	09-28-88	624	ATI	1	7	ND	ND	ND	ND	ND	ND	ND	DCM=5 RFT; MB=2 RFT
MW-2UB	006174	812527-11	12-06-88	12-15-88	624	ATI	1	3	ND	ND	ND	ND	ND	ND	ND	[MEK=34 FT]; MB=3 F
MW-2UB	006362	908692-02	08-23-89	08-29-89	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-2UB	006553	003557-03	03-06-90	03-13-90	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-2UB	006741	006576-04	06-06-90	06-08-90	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-2UB	010787	103882-06	03-21-91	04-03-91	601/602	ATI	1	1.1	ND	ND	ND	ND	ND	ND	ND	MB=1.1 FT
MW-2UB	010960	106790-04	06-18-91	07-01-91	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-2UB	002259	109902-16	09-25-91	09-30-91	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-2UB	002396	112587-04	12-05-91	12-10-91	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-2UB	002624	204640-07	04-09-92	04-16-92	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-2UB	014942	210011-07	10-28-92	11-07-92	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-2UB	*2UB*	*E92-5207*	*10-28-92*	*11-06-92*	*601/602*	*MCKENZIE*		*ND[f]*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*
MW-2UB	007559	304579-08	04-05-93	04-13-93	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-2UB	*2UB*	*E93-1683*	*04-05-93*	*04-13-93*	*601/602*	*MCKENZIE*		*ND[f]*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*
MW-2UB	001054	310890-27	10-17-93	10-25-93	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-2UB	001224	403593-08	03-02-94	03-14-94	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-2UB	002466	100286508	12-05-94	12-14-94	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-2UB	002635	100165379	06-08-95	06-15-95	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-2UB	001760	100100552	06-05-96	06-12-96	8010/8020	PACE	1	1.1	ND	ND	ND	ND	ND	ND	ND	DCM=1.1 T[g]
MW-2UB	000698	10195303	07-10-97	07-21-97	8260	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-2UB	003016	10563649	05-28-98	06-08-98	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-2UB	000822	PIF00146	06-01-99	06-07-99	8260B	DEL MAR	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-2UB	000929	PIK0320-12	11-16-99	11-21-99	8260B	DEL MAR	1	ND	ND	ND	ND	ND	Tr RF	ND	ND	ND
MW-2UB	003085	PJE0348-07	05-16-00	05-26-00	8260B	DEL MAR	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-2UB	003197	PJJ0337-21	10-19-00	10-31-00	8260B	DEL MAR	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-3UB D	014384	805010-01	04-29-88	05-02-88	624	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-3UB	014426	806096-02	06-16-88	06-27-88	624	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-3UB	006090	809133-06	09-20-88	09-28-88	624	ATI	1	2	ND	ND	ND	ND	ND	ND	ND	MB=2 RFT
MW-3UB	006175	812527-12	12-06-88	12-15-88	624	ATI	1	8	ND	ND	ND	ND	ND	ND	ND	DCM=6 RT; [MEK=32 FT]; MB=2 F
MW-3UB	006365	908692-05	08-23-89	08-29-89	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-3UB	006555	003557-05	03-06-90	03-13-90	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-3UB	006743	006576-06	06-06-90	06-08-90	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-3UB	010790	103882-09	03-21-91	04-03-91	601/602	ATI	1	8.6	ND	ND	ND	ND	ND	ND	ND	DCM=2.5 RFT; MB=6.1 FT
MW-3UB	010964	106790-08	06-18-91	07-02-91	601/602	ATI	1	ND	ND	[1.0]	ND	ND	ND	ND	ND	ND
MW-3UB	002265	109902-22	09-25-91	10-01-91	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-3UB	002400	112587-08	12-05-91	12-11-91	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-3UB	002626	204640-09	04-09-92	04-16-92	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-3UB	014946	210011-11	10-28-92	11-07-92	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-3UB	07554	304579-14	04-05-93	04-13-93	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND

TABLE 4-5
Summary of Laboratory Chemical Results for Volatile Organic Compounds in Water Samples from Groundwater Wells and Groundwater Remediation System Air Stripper Influent and Effluent
Hassayampa Landfill Epa Superfund Site

SAMPLE SOURCE[a]	SAMPLE IDENTIFIER FIELD	SAMPLE IDENTIFIER LAB	DATE SAMPLED	DATE ANALYZED	EPA METHOD	LABORATORY[b]	DILUTION FACTOR[c]	TOTAL VOCs[d]	1,1-DCE	TCE	PCE	1,1,1-TCA	TCTFA	1,1-DCA	1,2-DCP	OTHER VOCs
								VOLATILE ORGANIC COMPOUNDS[e] (micrograms per liter)								
MW-3UB	001080	310890-33	10-18-93	10-26-93	601/603	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-3UB	001246	403593-12	03-03-94	03-15-94	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-3UB	002470	100266540	12-05-94	12-14-94	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-3UB	002639	100165417	06-08-95	06-15-95	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-3UB	001768	100100595	06-06-96	06-12-96	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-3UB	000689	10195345	07-10-97	07-20-97	8260	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-3UB	002979	10661346	05-26-98	06-04-98	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-3UB	000626	PIF00146	06-01-99	06-07-99	8260B	DEL MAR	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-3UB	000932	PIK0320-15	11-16-99	11-22-99	8260B	DEL MAR	1	ND	ND	ND	ND	ND	[Tr RF]	ND	ND	ND
MW-3UB	003069	PJE0348-11	05-15-00	05-27-00	8260B	DEL MAR	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-3UB	003199	PJJ0337-23	10-19-00	10-30-00	8260B	DEL MAR	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-4UB D	014399	805105-01	05-19-88	05-27-88	624	ATI	1	11	ND	ND	ND	ND	ND	ND	ND	DCM=11 RT; [DMK=10 R]
MW-4UB	014428	806170-01	06-28-88	07-02-88	624	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-4UB	006092	809133-08	09-20-88	09-26-88	624	ATI	1	2	ND	ND	ND	ND	ND	ND	ND	MB=2 RFT
MW-4UB	006176	812527-13	12-06-88	12-15-88	624	ATI	1	10	ND	ND	ND	ND	ND	ND	ND	DCM=6 RT; [MEK=24 FT]; MB=2 F
MW-4UB	006374	908706-05	08-24-89	08-29-89	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-4UB	006557	003557-07	03-06-90	03-13-90	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-4UB	006745	006576-08	06-05-90	06-11-90	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-4UB	010793	103882-12	03-21-91	04-03-91	601/602	ATI	1	18.3	ND	[0.3]	ND	ND	ND	ND	ND	DCM=3.5 RFT; MB=14.8 FT
MW-4UB	010907	105704-07	05-13-91	05-22-91	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	[Benzene=0.5 F]
MW-4UB dup	010908	105704-08	05-13-91	05-22-91	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-4UB	010978	106790-20	06-19-91	07-02-91	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-4UB dup	010979	106790-21	06-19-91	07-02-91	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-4UB	002249	109902-06	09-24-91	09-28-91	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-4UB dup	002250	109902-07	09-24-91	09-28-91	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-4UB	002406	112587-16	12-05-91	12-12-91	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-4UB	002632	204640-15	04-09-92	04-17-92	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-4UB	014950	210011-15	10-28-92	11-07-92	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-4UB	007548	304579-18	04-05-93	04-14-93	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-4UB	001064	310890-03	10-18-93	10-22-93	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-4UB	001238	403593-18	03-03-94	03-16-94	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-4UB	002436	100266206	12-01-94	12-11-94	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-4UB	002643	100165450	06-08-95	06-15-95	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-4UB	001764	100100633	06-06-96	06-12-96	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-4UB	000716	10195360	07-11-97	07-21-97	8260	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-4UB	*MW-4UB*	*POG00379*	*07-11-97*	*07-15-97*	*601/602*	*DEL MAR*	*1*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*
MW-4UB	002984	10661361	05-27-98	06-04-98	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-4UB	000638	PIF00154	06-02-99	06-07-99	8260B	DEL MAR	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-4UB	03093	PJE0348-15	05-15-00	05-27-00	8260B	DEL MAR	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-6UB D	010676	104730-02	04-17-91	04-18-91	601/602	ATI	1	ND	ND	ND	ND	ND	[2.1 RT]	ND	ND	[1,2-DCA=0.2]; [MB=6.6]
MW-6UB	010685	104835-02	04-23-91	05-03-91	624	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-6UB	010673	106790-16	06-19-91	07-02-91	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-6UB	002251	109902-08	09-24-91	09-30-91	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-6UB	002404	112587-12	12-05-91	12-11-91	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-6UB	002636	204640-19	04-09-92	04-17-92	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-6UB	*6UB*	*29472*	*04-09-92*	*04-23-92*	*601/602*	*ADHS*		*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*
MW-6UB	014958	210011-23	10-29-92	11-10-92	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-6UB	*6UB*	*E92-5206*	*10-29-92*	*11-06-92*	*601/602*	*MCKENZIE*		*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*
MW-6UB dup	*16UB*	*E92-5206*	*10-29-92*	*11-06-92*	*601/602*	*MCKENZIE*		*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*
MW-6UB	007544	304579-22	04-05-93	04-14-93	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-6UB	001074	310890-09	10-18-93	10-22-93	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-6UB	001242	403593-24	03-03-94	03-15-94	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-6UB	002447	100266281	12-02-94	12-12-94	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-6UB	002689	100165913	06-08-95	06-16-95	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND

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Hassayampa Landfill Epa Superfund Site

SAMPLE SOURCE[a]	SAMPLE IDENTIFIER FIELD	SAMPLE IDENTIFIER LAB	DATE SAMPLED	DATE ANALYZED	EPA METHOD	LABORATORY[b]	DILUTION FACTOR[c]	TOTAL VOCs[d]	1,1-DCE	TCE	PCE	1,1,1-TCA	TCTFA	1,1-DCA	1,2-DCP	OTHER VOCs
								VOLATILE ORGANIC COMPOUNDS[e] (micrograms per liter)								
MW-6UB	001754	100100692	06-05-96	06-12-96	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-6UB	000707	10195394	07-10-97	07-20-97	8260	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-6UB	002986	10661379	05-27-98	06-08-98	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-6UB	000842	PIF00156	06-02-99	06-04-99	8260B	DEL MAR	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-6UB	003099	PJE0348-21	05-15-00	05-27-00	8260B	DEL MAR	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-9UB D	014749	104737-01	04-17-91	04-26-91	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	[1,2-DCA=0.4]
MW-9UB	014758	105570-01	05-02-91	05-15-91	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-9UB	010987	105790-29	06-19-91	07-02-91	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-9UB	002273	109902-30	09-25-91	10-02-91	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	[CM=0.3]
MW-9UB	002415	112587-23	12-05-91	12-13-91	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-9UB	002650	204659-07	04-10-92	04-17-92	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-9UB	014966	210011-31	10-29-92	11-10-92	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-9UB	*9UB*	*E92-5212*	*10-29-92*	*11-06-92*	*601/602*	*MCKENZIE*		*ND[f]*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*
MW-9UB dup	*19UB*	*E92-5213*	*10-29-92*	*11-06-92*	*601/602*	*MCKENZIE*		*ND[f]*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*
MW-9UB	007538	304579-29	04-06-93	04-14-93	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-9UB	001076	310690-17	10-18-93	10-25-93	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-9UB	001211	403593-32	03-01-94	03-15-94	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-9UB	002445	100286265	12-01-94	12-11-94	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-9UB	002655	100165573	06-07-95	06-15-95	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-9UB	001787	100100773	06-05-96	06-12-96	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	[DCM=1.1 T][g]
MW-9UB	000705	10195436	07-10-97	07-20-97	8260	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-9UB	003019	10661494	05-29-98	06-05-98	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-9UB	*MW9UB*	*PHE01747*	*05-29-98*	*06-11-98*	*8021B*	*DEL MAR*	*1*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*
MW-9UB	000863	PIF00165	06-03-99	06-04-99	8260B	DEL MAR	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-9UB	000951	PIK0410-02	11-23-99	11-30-99	8260B	DEL MAR	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-9UB	003149	PIF0443-15	06-22-00	06-30-00	8260B	DEL MAR	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-9UB	003201	PJJ0337-25	10-19-00	10-31-00	8260B	DEL MAR	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-10UB D	014757	105548-03	05-02-91	05-12-91	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	[1,2-DCA=0.8]
MW-10UB	004464	105873-02	05-22-91	06-02-91	624	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-10UB	010994	106790-35	06-19-91	07-02-91	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-10UB	002275	109902-32	09-25-91	10-02-91	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	[CM=0.3]
MW-10UB	002419	112587-27	12-05-91	12-13-91	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-10UB	002654	204659-11	04-10-92	04-17-92	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-10UB	014970	210011-35	10-29-92	11-10-92	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-10UB	007534	304579-32	04-06-93	04-14-93	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-10UB	001084	310690-38	10-19-93	10-26-93	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-10UB	001220	403593-36	03-02-94	03-15-94	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-10UB	002452	100286346	12-02-94	12-13-94	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-10UB	002685	100165875	06-08-95	06-19-95	8010/8020	PACE	1	ND	ND	ND	ND	[0.7]	ND	ND	ND	ND
MW-10UB	001781	100100862	06-05-96	06-12-96	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-10UB	000687	10195451	07-09-97	07-21-97	8260	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-10UB	002999	10661460	05-27-98	06-05-98	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-10UB	000851	PIF00160	06-02-99	06-04-99	8260B	DEL MAR	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-10UBe	003111	PJE0348-33	05-16-00	05-30-00	8260B	DEL MAR	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-10UB	003152	PJF0443-18	06-22-00	06-30-00	8260B	DEL MAR	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-15UB PT	001041	309058-01	09-28-93	10-06-93	624	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	[DMK=230]
MW-15UB	001232	403593-48	03-02-94	03-15-94	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-15UB	*15UB*	*E94-1527*	*03-02-94*	*03-08-94*	*601/602*	*MCKENZIE*	-	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*
MW-15UB	002433	100286125	12-01-94	12-11-94	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-15UB dup	002434	100286133	12-01-94	12-11-94	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-15UB	002667	100165697	06-06-95	06-16-95	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-15UB	001778	100100960	06-05-96	06-12-96	8010/8020	PACE	1	ND	[0.9]	ND	ND	ND	[0.7]	ND	ND	ND
MW-15UB dup	001779	100100978	06-05-96	06-19-96	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND

TABLE 4-5
Summary of Laboratory Chemical Results for Volatile Organic Compounds in Water Samples from Groundwater Wells and Groundwater Remediation System Air Stripper Influent and Effluent
Hassayampa Landfill Epa Superfund Site

SAMPLE SOURCE[a]	SAMPLE IDENTIFIER: FIELD	SAMPLE IDENTIFIER: LAB	DATE SAMPLED	DATE ANALYZED	EPA METHOD	LABORATORY[b]	DILUTION FACTOR[c]	TOTAL VOCs[c]	1,1-DCE	TCE	PCE	1,1,1-TCA	TCTFA	1,1-DCA	1,2-DCP	OTHER VOCs
								VOLATILE ORGANIC COMPOUNDS [d] (micrograms per liter)								
MW-15UB	003615	10292423	09-18-97	10-02-97	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-15UB	003008	10663607	05-28-98	06-08-98	8010/8020	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	[Benzene=1.3]
MW-15UB	*MW-15UB*	*PHE01532*	*05-29-98*	*06-10-98*	*8021B*	*DEL MAR*	*1*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*
MW-15UB dup	*MW-15UB*	*PHE01531*	*05-28-98*	*06-10-98*	*8021B*	*DEL MAR*	*1*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*
MW-15UB	000739	10324132	10-28-98	11-11-98	8021	PACE	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-15UB	000878	PIF00168	06-03-99	06-04-99	8260B	DEL MAR	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-15UB	000888	PIG01955	07-28-99	08-04-99	8260B	DEL MAR	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-15UB	000895	PIH02054	08-30-99	09-07-99	8260B	DEL MAR	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-15UB	000907	PIJ00083	09-30-99	10-12-99	8260B	DEL MAR	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-15UB	000915	PIK0320-05	11-16-99	11-21-99	8260B	DEL MAR	1	ND	ND	ND	ND	ND	Tr RF	ND	ND	ND
MW-15UB dup	000916	PIK0320-06	11-16-99	11-21-99	8260B	DEL MAR	1	ND	ND	ND	ND	ND	Tr RF	ND	ND	ND
MW-15UB	000968	PIL0404-07	12-22-99	01-03-00	8260B	DEL MAR	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-15UB	000974	PJA0496-05	01-26-00	02-03-00	8260B	DEL MAR	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-15UB+	003122	PJE0348-44	05-15-00	05-29-00	8260B	DEL MAR	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-15UB	*MW-15UB*	*E0E170326-005*	*05-15-00*	*05-18-00*	*8260B*	*STL*	*1*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*
MW-15UB	003159	PJF0443-25RE1	06-22-00	06-30-00	8260B	DEL MAR	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
HS-1	*Y1409*		*05-13-82*					*163.6*	*111*	*Tr*	*ND*	*37.1*	****	*15.5*	*ND*	*TCFM=Tr; DCTFA**; MB=Tr F; DCM=Tr F*
HS-1	*Y1711*		*09-14-82*					*931*	*640*	*ND*	*ND*	*200*	***F*	*Tr*	*ND*	*TCFM=75; DCTFA**; DCM=16**
HS-1 dup	*Y1711 dup*		*09-14-82*					*1,194*	*810*	*ND*	*ND*	*250*	*ND*	*13*	*ND*	*TCFM=95; DCM=26**
HS-1	*Y1712*		*09-14-82*					*2,007*	*1,300*	*ND*	*ND*	*490*	***F*	*10*	*ND*	*TCFM=190; DCTFA**; DCM=17**
HS-1	*Y1713*		*09-14-82*					*594*	*400*	*ND*	*ND*	*110*	***F*	*ND*	*ND*	*TCFM=53; DCTFA**; DCM=21**
HS-1	*Y2334*		*05-18-83*					*2,039.9*	*1,100*	*7.9*	*Tr*	*290*	*610***	*Tr*	*ND*	*TCFM=32; [STY=Tr]; [1,3-DMB=Tr]*
HS-1	*Y4169*		*09-05-84*					*417.9*	*257*	*6.2*	*25*	*108*	*ND*	*14*	*ND*	*DCM=7.7 F*
HS-1	*Y4171*		*09-05-84*					*656.5*	*435*	*8.8*	*25*	*166*	*ND*	*14*	*ND*	*DCM=7.7 F*
HS-1		*1*	*04-15-87*		*601/602*			*3,639*	*2,000*	*115*	*22*	*1,500*	*ND*	*ND*	*ND*	*[1,2-DCA=890]; [1,2-DCE=160]; [DCBM=44]; [CB=13]; [TBM=6]; DCM=2*
HS-1	004017	3043-2	07-15-87	07-16-87	601/602	ATI	1	192.5	140	8.4	3.8	32.2	ND	8.1	ND	ND
HS-1	014409	805139-04	05-26-88	05-27-88	624	ATI	1 (10)	1,657	(910)	46	21	150	500	20	ND	TCFM=10
HS-1 dup	014410	805139-05	05-26-88	05-27-88	624	ATI	1	1,716	830	52	23	170	600	21	ND	TCFM=20
HS-2	*Y1408*		*05-12-82*					*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*DCM=Tr F; MB=Tr F*
HS-2	*Y1714*		*09-14-82*					*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*
HS-2	*Y2331*		*05-18-83*					*14*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*DCM=14**
HS-2	*Y4168*		*09-05-84*					*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*DCM=Tr F; MB=Tr**
HS-2		*2*	*04-15-87*		*601/602*			*2*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*DCM=2*
HS-2	004018	3043-3	07-15-87	07-16-87	601/602	ATI		1.3	[0.6]	ND	ND	ND	1.3	ND	ND	ND
HS-2 dup	004018	8770790-01	07-15-87	07-20-87	601/602	CEC[f]		ND	ND	ND	ND	ND	ND	ND	ND	ND
HS-2	006095	809133-11	09-20-88	09-29-88	624	ATI	1	2	ND	ND	ND	ND	ND	ND	ND	MB=2 RFT
HS-2	006173	812527-10	12-06-88	12-15-88	624	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	[MEK=26 FT]
HS-2	006372	908706-03	08-24-89	08-29-89	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
HS-2	006565	003572-06	03-07-90	03-14-90	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
HS-2	006750	006599-04	06-07-90	06-13-90	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
HS-2 dup	006751	006599-05	06-07-90	06-12-90	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
HS-2	010784	103882-03	03-21-91	04-03-91	601/602	ATI	1	25	ND	ND	ND	ND	ND	ND	ND	DCM=24 RFT; MB=1.0 FT
HS-3	*Y1407*		*05-12-82*					*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*DCM=Tr F*
HS-3	*Y1715*		*09-14-82*					*NI*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*DCM=18**
HS-3	*Y2333*		*05-18-83*					*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*
HS-3	*Y4167*		*09-05-84*					*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*DCM=Tr F*
HS-3		*3*	*04-15-87*		*601/602*			*ND*	*[2]*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*
HS-3	004016	3043-1	07-15-87	07-16-87	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
HS-3	006097	809133-13	09-20-88	09-29-88	624	ATI	1	7	ND	ND	ND	ND	ND	ND	ND	DCM=5 RFT; MB=2 RFT
HS-3	006170	812527-07	12-05-88	12-14-88	624	ATI	1	15	ND	ND	ND	ND	ND	ND	ND	DCM=15 RT
HS-3	006370	908706-01	08-24-89	08-29-89	601/602	ATI	1	2.7	ND	ND	ND	ND	ND	ND	ND	DCM=2.7 R
HS-3	006568	003588-01	03-08-90	03-15-90	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND

TABLE 4-3
Summary of Laboratory Chemical Results for Volatile Organic Compounds in Water Samples from Groundwater Wells and Groundwater Remediation System Air Stripper Influent and Effluent
Hassayampa Landfill Epa Superfund Site

SAMPLE SOURCE[a]	SAMPLE IDENTIFIER FIELD	SAMPLE IDENTIFIER LAB	DATE SAMPLED	DATE ANALYZED	EPA METHOD	LABORATORY[a]	DILUTION FACTOR[a]	TOTAL VOCs[#]	1,1-DCE	TCE	PCE	1,1,1-TCA	TCTFA	1,1-DCA	1,2-DCP	OTHER VOCs
								VOLATILE ORGANIC COMPOUNDS[#] (micrograms per liter)								
HS-3	006749	006599-03	06-07-90	06-12-90	601/602	ATI	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
HS-3	010786	103682-05	03-21-91	04-03-91	601/602	ATI	1	25.7	ND	ND	ND	ND	ND	ND	ND	DCM=25.1 RFT; MB=0.6 FT
IW-1UB PT	001045	310700-01	10-09-93	10-18-93	524	ATI	1	ND	ND	ND	ND	ND	---	ND	ND	ND

NOTES:

ND = Not detected
--- = Not analyzed or measured

Italics:
Samples not obtained by Errol L. Montgomery & Associates, Inc.
1982 and 1984 sample obtained by Arizona Department of Health Services.
1983 sample obtained by Ecology and Environment, Inc.
1987 sample obtained by Maricopa County.
1988 sample obtained by Arizona Department of Environmental Quality; duplicate of Errol L. Montgomery & Associates, Inc. sample no. 004323 (laboratory accession no. 911782-03).
1990 samples obtained by Arizona Department of Environmental Quality; sample no. 18186 is a duplicate of Errol L. Montgomery & Associates, Inc. sample no. 004381 (laboratory accession no. 002577-01).
1992, 1993, 1994, 1995, 1996, and 1997 samples obtained by Arizona Department of Environmental Quality; they are duplicates of samples obtained by Errol L. Montgomery & Associates, Inc. during quarterly and semiannual sampling rounds.
04-09-97 sample obtained by Maricopa County.
09-02-94, 10-26-94, and 06-05-96 samples obtained by Maricopa County Solid Waste Management Department.
05-29-98 samples obtained by Arizona Department of Environmental Quality; they are duplicates of samples obtained by Errol L. Montgomery & Associates, Inc. semiannual sampling rounds.
11-10-98 samples obtained by Maricopa County Solid Waste Management Department.
June 1999 samples obtained for Maricopa County Solid Waste Management.
November 1999 samples obtained by Arizona Department of Environmental Quality
February 2000 samples obtained for Maricopa County Solid Waste Management.
May 2000 samples obtained for Maricopa County Solid Waste Management.
May 2000 samples obtained by Arizona Department of Environmental Quality
October 2000 samples obtained for Maricopa County Solid Waste Management
November 2000 sample obtained for Maricopa County Solid Waste Management

[a] EFFLUENT = Groundwater Remediation System effluent
INFLUENT = Groundwater Remediation System influent
EW-#UA = Unit A groundwater extraction well
MW-#UA = Unit A groundwater monitor well
MW-#UB = Unit B groundwater monitor well
IW-1UB = Unit B injection well
dup = Duplicate sample
D = Sample obtained during well development
PT = Sample obtained during pumping test
split = Split sample obtained concurrently with primary sample

[a]
ADEQ	= Arizona Department of Environmental Quality
ADHS	= Arizona Department of Health Services
ATI	= Analytical Technologies, Inc., Phoenix, Arizona
CEC	= Clayton Environmental Consultants, Inc., Pleasanton, California
DEL MAR	= Del Mar Analytical, Phoenix, Arizona
GTEL	= GTEL Environmental Laboratories, Wichita, Kansas
MCKENZIE	= McKenzie Laboratories, Phoenix, Arizona
PACE	= Pace Incorporated, Minneapolis, Minnesota
QUANTERRA	= Quanterra, West Sacramento, California (merged with STL in 2000)
TURNER	= Turner Laboratories, Inc., Tucson, Arizona
STL	= Severn Trent Laboratories, Los Angeles, California
WESTECH	= Westech Laboratories, Inc., Phoenix, Arizona

[c] A dilution factor greater than one indicates that sample was diluted with water prior to analysis. A dilution factor of 50 indicates that one volume of sample was diluted with 49 volumes of water prior to analysis. Parentheses indicate dilution factor used for constituents with results.

[d]
1,1-DCE	= 1,1-Dichloroethene	EB	= Ethyl Benzene
TCE	= Trichloroethene	XYL	= Total Xylenes
DMB	= Dimethylbenzene (Total Xylenes)	DCM	= Dichloromethane (Methylene chloride)
DCDFM	= Dichlorodifluoromethane	MEK	= Methyl ethyl ketone (2-Butanone)
PCE	= Tetrachloroethene	MBK	= Methyl butyl ketone (2-Hexanone)
1,1,1-TCA	= 1,1,1-Trichloroethane	CE	= Chloroethene (Vinyl Chloride)
TCFM	= Trichlorofluoromethane (Freon-11®)	1,1,2-TCA	= 1,1,2-Trichloroethane
TCTFA	= Trichlorotrifluoroethane (Freon-113®)	CM	= Chloromethane
DMK	= Dimethylketone (Acetone)	CA	= Chloroethane
MB	= Methylbenzene (Toluene)	trans-1,2-DCE	= trans-1,2-Dichloroethene
1,2-DCP	= 1,2-Dichloropropane	BM	= Bromomethane
1,3-DCP	= 1,3-Dichloropropane	TCM	= Trichloromethane (Chloroform)
1,1-DCA	= 1,1-Dichloroethane	MIBK	= 4-Methyl-2-Pentanone
1,2-DCA	= 1,2-Dichloroethane	cis-1,2-DCE	= cis-1,2-Dichloroethene
CT	= Carbon tetrachloride	PMCH	= Tetramethylcyclohexane
TMH	= Trimethylhexane	DCTFA	= Dichlorotrifluoroethane
STY	= Styrene (Ethenylbenzene)	1,3-DMB	= 1,3-Dimethylbenzene
DBCM	= Dibromochloromethane	CB	= Chlorobenzene
TBM	= Tribromomethane		

Tr	= Trace concentration; compound positively identified, but detected below limit of quantitation for method used.
R	= Compound also detected in reagent blank for that sample.
T	= Compound also detected in trip blank for that sample.
F	= Compound also detected in field blank for that sample.
M	= Compound also detected in method blank for that sample.
**	= ADHS reported this constituent as "tentatively identified"; concentration, if provided, is "tentative" (Arizona Department of Health Services, 1986).
*	= May be invalid or partially invalid due to introduction of contamination during field sampling or laboratory analysis (Arizona Department of Health Services, 1986).
[ ]	= Constituent was detected, but not confirmed, for the well. A constituent is not confirmed if it is not detected during at least one other sampling round, or if the detection is attributable to contamination in the laboratory or in the field.

[e] Total VOCs = Sum of volatile organic compounds (VOCs) detected and confirmed, excluding laboratory and field contaminants, acetone derived from drilling operations, or constituents reported as trace concentrations.

[f] The list of VOCs analyzed for Arizona Department of Environmental Quality (ADEQ) does not contain the same VOCs analyzed for Errol L. Montgomery & Associates, Inc. (M&A). For example, TCTFA was not analyzed for ADEQ. Therefore, the total VOCs detected for some ADEQ samples may be different than the total VOCs detected for M&A.

[g] Laboratory results for acetone for samples analyzed using EPA method 601/602 or 8010/8020 are approximate.

[h] The detection was attributed to laboratory contamination by Pace Incorporated.

[i] Results for 1,1-DCE are: Vial #1-230 μg/L; Vial #2-340 μg/L with the average reported as 285 μg/L. The large amount of 1,1-DCE in the sample interfered with the quantitation of DCM.

[j] Due to laboratory error, these concentrations are not within the calibration limits for the analysis instrument and/or method used, and therefore, should be considered approximate.
+ Due to laboratory instrument failure, quality control data are unavailable for these samples.
Ψ These data are considered unrepresentative.

TABLE 4 Original GRS Monitoring Schedule

ACTIVITIES	Months (Year 1)													Year 2 (Qtr No.)				Year 3 (Qtr No.)				Continuing from Year 4
	0	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	1	2	3	4	
Groundwater Hydraulic Monitoring (All Wells)	*	*	*	*	*	*	*			*			*		*		*		*		*	ANNUAL →
Groundwater Sampling (VOC)																						
-Unit A Monitoring Wells	*			*			*			*			*		*		*		*		*	ANNUAL →
-Unit B Monitoring Wells	*						*						*				*				*	ANNUAL →
-Extraction Wells	*	▲	▲	▲	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	SEMI-ANNUAL →
Treatment System Sampling i) VOCs																						
-Influent	*	▲	▲	▲	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	SEMI-ANNUAL →
-Effluent	*	▲	▲	▲	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	SEMI-ANNUAL →
ii) TCL/TAL																						
-Influent (1)						*									*				*			ANNUAL →
-Effluent (1)						*									*				*			ANNUAL →

LEGEND

▲	ONCE PER WEEK
*	ONE SAMPLING EVENT
VOCs	VOLATILE ORGANIC COMPOUNDS
TCL/TAL	TARGET COMPOUND LIST/TARGET ANALYTE LIST
(1)	TIMING MAY BE MODIFIED BASED ON MONITORING RESULTS OR SCHEDULING CONSTRAINTS

SOURCE: *Groundwater Pilot Study Operation and Maintenance Manual* (CRA and M&A, June 1995).

TAB'
Sum Laboratory Chemical Results for Voltile Organic Compounds Detected in Soil Vapor Samp... ...ained from Soil Vapor Wells
Hassa...pa Landfill EPA Superfund Site

VAPOR WELL IDENTIFIER [a]	FIELD SAMPLE IDENTIFIER [b]	DATE SAMPLED	MINIMUM DILUTION FACTOR [d]	VOLATILE ORGANIC COMPOUNDS [e] (micrograms per liter) [f] TOTAL VOCs [g]	DCM	DMK	1,1-DCE	1,1,1-TCA	TCE	PCE	MB	TCFM	TCTFA	1,1-DCA	1,2-DCP	OTHER CONSTITUENTS
N-1 COARSE	2705	05/19/92	1,000	90,398.9	4,500	ND	12,000	8,700	770	420	16	280	63,000	330	340	Benzene=17; EB=5.9; o-Xylene=20
N-1 COARSE	2724	06/08/92	1,000	35,258.9	1,700	ND	4,900	4,600	380	210	5.1	97	23,000	160	190	Benzene=8.8; o-Xylene=8.0
N-1 COARSE	7401	12/02/93	10,000	24,944	850	ND	3,800	2,700	200	140	ND	69	17,000	85	100	ND
N-1 COARSE	3053	02/15/00	1,000	286.1	ND	ND	79	31	5.4	6.1	ND	1.1	160	1.3	2.2	ND
N-1 COARSE LD	3053	02/15/00	1,000	315.1	ND	ND	83	34	6.0	7.1	ND	1.2	180	1.4	2.4	ND
N-1 COARSE	2557	04/05/00	2,500	1,074.5	Tr	ND	270	72	16	13	ND	4.2	690	3.8	5.5	ND
N-1 COARSE	3366	10/16/00	4,000	1,991.0	ND	ND	510	180	33	31	ND	7.0	1,200	7.0	11	DCFM=12
N-1 FINE	2706	05/19/92	1,000	215,118	1,000	ND	28,000	3,000	970	590	19	1,200	180,000	240	86	Benzene=13
N-1 FINE	2725	06/08/92	1,000	290,770.8	1,900	ND	32,000	2,900	1,200	800	23	1,400	250,000	430	88	CE=5.0; Benzene=15; EB=9.8
N-1 FINE	7400	12/02/93	10,000	50,280	4,200	ND	9,000	4,800	430	270	ND	150	31,000	180	250	ND
N-1 FINE LD	7400	12/02/93	10,000	49,730	4,100	ND	8,800	4,600	410	260	ND	150	31,000	170	240	ND
N-1 FINE	3054	02/15/00	4,000	1,806.4	92	ND	510	100	33	26	ND	7.4	1,000	11	27	ND
N-1 FINE	2558	04/05/00	10,000	2,908	97	ND	740	150	39	23	ND	17	1,800	15	27	ND
N-1 FINE LD	2558	04/05/00	10,000	3,066	100	ND	780	160	40	23	ND	17	1,900	16	30	ND
N-1 FINE	3367	10/17/00	8,000	2,296.5	51	ND	650	180	42	30	ND	8.5	1,300	11	24	ND
N-1 FINE LD	3367	10/17/00	8,000	2,305.4	50	ND	660	180	42	31	ND	8.4	1,300	11	23	ND
N-2 COARSE	2707	05/19/92	1,000	27,126	210	ND	3,100	360	160	9.3	ND	130	23,000	47	26	ND
N-2 COARSE	2726	06/08/92	1,000	19,045	170	ND	2,300	260	110	67	ND	85	16,000	32	21	ND
N-2 COARSE	7399	12/02/93	2,000	7,098	120	ND	1,000	240	47	30	ND	28	5,600	17	16	ND
N-2 COARSE FD	7398	12/02/93	2,000	6,187	65	ND	850	160	38	24	ND	25	5,000	13	12	ND
N-2 COARSE	3055	02/15/00	1,000	547	ND	ND	120	Tr	9.5	4.8	ND	2.2	400	3.5	7.0	ND
N-2 COARSE	2571	04/05/00	2,000	919.3	ND	ND	200	ND	15	7.3	ND	3.7	680	4.8	8.5	ND
N-2 COARSE	3364	10/16/00	2,000	1,525.1	2.7	ND	340	2.5	29	16	ND	7.4	1,100	9.8	15	DCFM=2.7
N-2 FINE	2708	05/19/92	1,000	40,291	64	ND	3,700	84	110	82	ND	230	36,000	21	ND	ND
N-2 FINE	2727	06/08/92	1,000	42,545	77	ND	3,900	92	120	96	ND	230	38,000	30	ND	ND
N-2 FINE	7397	12/02/93	5,000	13,605	Tr	ND	2,100	200	110	73	ND	59	11,000	34	29	ND
N-2 FINE	3056	02/15/00	10,000	2,405	ND	ND	630	ND	34	20	ND	11	1,700	Tr	10	ND
N-2 FINE	2572	04/05/00	5,000	2,523	Tr	ND	630	ND	33	14	ND	14	1,800	14	18	ND
N-2 FINE	3365	10/16/00	10,000	3,552	ND	ND	890	ND	64	37	ND	14	2,500	17	20	DCFM=10
N-3 COARSE	2699	05/19/92	1,000	3,030.6	ND	ND	300	ND	9.4	5.2	ND	16	2,700	ND	ND	ND
N-3 COARSE	2718	06/08/92	400	1,129.7	Tr	ND	120	3.3	4.0	2.4	ND	ND	1,000	ND	ND	ND
N-3 COARSE	7396	12/02/93	200	605.6	Tr	Tr	83	2.7	3.2	3.1	ND	3.6	510	Tr	ND	ND
N-3 COARSE	2574	04/05/00	1,000	503.8	ND	ND	64	ND	4.4	2.4	ND	2	430	1.0	ND	ND
N-3 COARSE	3362	10/16/00	1,000	734.3	1.7	0.92	110	ND	8.1	4.7	ND	3.3	600	2.0	1.0	DCFM=2.6
N-3 FINE	2700	05/19/92	1,000	3,170	ND	ND	250	ND	ND	ND	ND	20	2,900	ND	ND	ND
N-3 FINE LD	2700	05/19/92	1,000	3,251	ND	ND	230	ND	ND	ND	ND	21	3,000	ND	ND	ND
N-3 FINE	2719	06/08/92	400	3,798.4	ND	ND	270	ND	3.5	2.9	ND	22	3,500	ND	ND	ND
N-3 FINE	7395	12/02/93	500	879.1	Tr	ND	100	4.1	5.5	4.7	ND	4.8	760	Tr	ND	ND
N-3 FINE	2573	04/05/00	4,000	1,121	ND	ND	130	ND	4.8	ND	ND	6.2	980	ND	ND	ND
N-3 FINE LD	2573	04/05/00	4,000	1,060.5	ND	ND	120	ND	4.5	ND	ND	6.0	930	ND	ND	ND
N-3 FINE	3363	10/16/00	1,000	1,182.3	1.4	ND	150	ND	12	6.9	ND	5.5	1,000	2.7	1.1	DCFM=2.7
NE-1 COARSE	2703	05/19/92	1,000	49,331.1	1,400	ND	6,900	3,000	370	210	ND	230	37,000	130	82	Benzene=9.1
NE-1 COARSE	2722	06/08/92	1,000	20,620	360	ND	3,200	1,600	180	96	ND	81	15,000	59	44	Benzene=Tr
NE-1 COARSE	7394	12/02/93	4,000	15,104	86	ND	2,600	1,100	110	76	ND	64	11,000	37	31	ND
NE-1 COARSE	3051	02/15/00	2,000	924.3	ND	ND	230	31	13	7.9	ND	6.0	630	3.0	3.4	ND
NE-1 COARSE LD	3051	02/15/00	2,000	914.3	ND	ND	230	31	13	7.9	ND	6.0	620	3.0	3.4	ND
NE-1 COARSE	2559	04/05/00	5,000	2,324.8	ND	ND	600	58	23	11	ND	19	1,600	7.4	6.4	ND
NE-1 COARSE	3368	10/17/00	5,000	1,624.5	ND	34	610	170	210	230	6.0	6.5	430	13	37	2-BT=14; Benzene=3.7; EB=6.8; m-&p-Xylene=31; o-Xylene=13; 1,2-DCB=9.5

TAE
Sum. Laboratory Chemical Results for Voltile Organic Compounds Detected in Soil Vapor Sampl... ...tained from Soil Vapor Wells
Hassayampa Landfill EPA Superfund Site

VAPOR WELL IDENTIFIER[a]	FIELD SAMPLE IDENTIFIER[b]	DATE SAMPLED	MINIMUM DILUTION FACTOR[d]	VOLATILE ORGANIC COMPOUNDS[e] (micrograms per liter)[f] TOTAL VOCs[g]	DCM	DMK	1,1-DCE	1,1,1-TCA	TCE	PCE	MB	TCFM	TCTFA	1,1-DCA	1,2-DCP	OTHER CONSTITUENTS
NE-1 FINE	2704	05/19/92	1,000	301,793	1,500	ND	48,000	6,600	1,100	730	49	3,300	240,000	430	58	Benzene=14; EB=12
NE-1 FINE	2723	06/08/92	1,000	112,727	1,600	ND	19,000	3,700	760	450	15	820	86,000	290	78	Benzene=14
NE-1 FINE	7393	12/02/93	6,667	28,072	910	ND	5,700	1,600	230	150	ND	140	19,000	75	67	ND
NE-1 FINE LD	7393	12/02/93	6,667	29,146	920	ND	5,800	1,800	210	130	ND	150	20,000	73	63	ND
NE-1 FINE	3052	02/15/00	5,000	2,200.9	20	ND	630	62	36	18	ND	15	1,400	8.9	11	ND
NE-1 FINE	2560	04/05/00	10,000	7,873	51	ND	1,700	130	65	25	ND	61	5,800	21	20	ND
NE-1 FINE	3370	10/17/00	1,000	248.7	3.6	ND	100	9.4	6.4	3.0	ND	1.6	120	1.8	2.9	ND
NE-1 FINE LD	3370	10/17/00	1,000	259.8	3.8	ND	110	9.6	6.5	3.2	ND	1.7	120	1.9	3.1	ND
NE-3 COARSE	2701	05/19/92	1,000	4,349	ND	ND	310	ND	Tr	ND	ND	39	4,000	ND	ND	ND
NE-3 COARSE	2720	06/08/92	1,000	1,722	ND	ND	110	ND	ND	ND	ND	12	1,600	ND	ND	ND
NE-3 COARSE	7392	12/02/93	500	1,013.3	ND	ND	75	Tr	Tr	Tr	ND	8.3	930	ND	ND	ND
NE-3 COARSE	2569	04/05/00	5,000	1,917	ND	ND	200	Tr	Tr	ND	ND	17	1,700	ND	ND	ND
NE-3 COARSE	3359	10/16/00	2,000	2,087.4	ND	ND	260	ND	4.4	3.0	ND	20	1,800	ND	ND	ND
NE-3 COARSE SS	ADEQ	10/16/00	931.3	1,858	ND	ND	240	ND	ND	ND	ND	18	1,600	ND	ND	ND
NE-3 FINE	2702	05/19/92	1,000	88,722	29	ND	6,400	190	41	62	ND	1,000	81,000	ND	ND	ND
NE-3 FINE	2721	06/08/92	1,000	5,152.4	ND	ND	550	15	7.4	10	ND	60	4,500	ND	ND	ND
NE-3 FINE LD	2721	06/08/92	1,000	5,245.6	ND	ND	560	15	7.6	10	ND	53	4,600	ND	ND	ND
NE-3 FINE	7390	12/02/93	1,000	4,006	ND	ND	520	14	11	13	ND	48	3,400	ND	ND	ND
NE-3 FINE	2570	04/05/00	10,000	11,586	ND	ND	1,400	ND	22	14	ND	150	10,000	ND	ND	ND
NE-3 FINE	3360	10/16/00	4,000	5,379.1	8.6	4.7	750	10	18	14	2.8	49	4,500	ND	ND	DCFM=22
NE-3 FINE FD	3361	10/16/00	4,000	4,741.7	8.0	8.1	650	7.2	26	16	3.4	47	3,900	ND	ND	EB=6.0; m-&p-Xylene=31; o-Xylene=11; 1,2-DCB=11; DCFM=17
NE-3 FINE SS	ADEQ	10/16/00	933.2	2,597	ND	ND	370	ND	ND	ND	ND	27	2,200	ND	ND	ND
NW-1 COARSE	7436	11/17/93	5,000	10,131	ND	ND	960	140	31	Tr	ND	ND	9,000	ND	ND	ND
NW-1 COARSE FD	7435	11/17/93	10,000	8,150	ND	ND	750	100	Tr	Tr	ND	ND	7,300	ND	ND	ND
NW-1 COARSE	7403	12/02/93	4,000	7,441	ND	ND	720	110	35	33	ND	43	6,500	ND	ND	ND
NW-1 COARSE	2567	04/05/00	5,000	6,131.2	Tr	ND	660	85	28	15	ND	37	5,300	6.2	4.1	ND
NW-1 COARSE	3374	10/17/00	2,000	2,630.4	4.3	ND	330	34	18	11	10	14	1,900	3.3	2.6	DCFM=3.5
NW-1 FINE	7434	11/17/93	20,000	48,733	200	ND	6,000	1,200	200	110	ND	ND	41,000	Tr	ND	ND
NW-1 FINE	7402	12/02/93	10,000	30,990	130	ND	3,700	700	140	110	ND	210	26,000	ND	ND	ND
NW-1 FINE	2568	04/05/00	20,000	12,081	65	ND	1,700	160	50	25	ND	81	10,000	15	ND	ND
NW-1 FINE	3375	10/17/00	2,000	3,643.9	15	2.7	570	53	31	17	13	23	2,900	6.2	5.5	m-&p-Xylene=1.4, DCFM=6.1
NW-2 COARSE	2561	04/05/00	20,000	10,729	380	ND	2,700	770	150	75	ND	48	6,600	24	82	ND
NW-2 COARSE	3371	10/17/00	10,000	5,806.0	20	12	1,200	640	140	93	65	19	3,500	32	63	m-&p-Xylene=7.0 DCFM=15
NW-2 FINE	2562	04/05/00	100,000	34,590	1,500	ND	8,000	810	450	240	ND	210	23,000	150	230	ND
NW-2 FINE	3372	10/17/00	20,000	11,703	880	25	3,100	740	300	170	130	51	6,200	81	160	DCFM=66
P-1 COARSE	7497	07/01/93	50,000	397,030	10,000	13,000	1,500	270,000	3,700	5,700	2,800	Tr	85,000	2,800	2,000	ND
P-1 COARSE	7412	12/01/93	100,000	115,120	4,200	6,700	1,300	70,000	1,800	3,500	1,500	ND	23,000	1,200	920	ND
P-1 COARSE	3062	02/15/00	400,000	60,410	2,200	510	1,200	32,000	810	2,100	1,200	ND	19,000	940	450	m-&p-Xylene=Tr
P-1 COARSE	3356	10/16/00	500,000	103,160	3,600	740	2,500	56,000	1,000	2,200	690	ND	34,000	1,800	630	ND
P-1 COARSE SS	ADEQ	10/16/00	36,820	77,800	3,000	1,200	1,800	38,000	950	2,100	670	ND	28,000	1,400	680	ND
P-1 FINE	7496	07/01/93	50,000	1,199,870	96,000	12,000	44,000	470,000	6,000	2,900	2,600	1,100	560,000	2,500	2,300	m-& p-Xylene=470; o-Xylene=Tr
P-1 FINE	7411	12/01/93	200,000	659,400	49,000	7,700	36,000	240,000	3,800	2,100	1,600	Tr	270,000	1,700	1,500	ND
P-1 FINE	3063	02/15/00	2,000,000	267,700	16,000	6,100	19,000	180,000	4,100	2,300	2,200	ND	38,000	Tr	1,400	ND
P-1 FINE	3355	10/16/00	2,000,000	458,900	25,000	9,700	36,000	310,000	8,800	5,700	4,500	ND	54,000	2,400	2,800	ND
P-1 FINE SS	ADEQ	10/16/00	123,700	169,400	10,000	6,900	14,000	110,000	2,400	ND	1,100	ND	25,000	ND	ND	ND

TAB
Sur. Laboratory Chemical Results for Voltile Organic Compounds Detected in Soil Vapor Samp... ...tained from Soil Vapor Wells
Hassayampa Landfill EPA Superfund Site

VAPOR WELL IDENTIFIER[a]	FIELD SAMPLE IDENTIFIER[b]	DATE SAMPLED	MINIMUM DILUTION FACTOR[c]	VOLATILE ORGANIC COMPOUNDS[e] (micrograms per liter)[f] TOTAL VOCs[g]	DCM	DMK	1,1-DCE	1,1,1-TCA	TCE	PCE	MB	TCFM	TCTFA	1,1-DCA	1,2-DCP	OTHER CONSTITUENTS
P-3 COARSE	7500	07/01/93	1,250	5,797	ND	ND	580	710	49	200	ND	20	3,400	820	18	ND
P-3 COARSE	7414	12/01/93	500	2,384.1	ND	ND	230	300	20	110	ND	6.7	1,400	310	7.4	ND
P-3 FINE	7499	07/01/93	6,667	43,369	ND	ND	2,000	120	59	110	ND	320	42,000	760	ND	ND
P-3 FINE FD	7498	07/01/93	5,000	73,088	ND	ND	2,600	90	68	120	ND	440	69,000	770	ND	ND
P-3 FINE	7413	12/01/93	6,667	26,463	ND	ND	1,800	820	100	430	ND	180	22,000	1,100	33	ND
SE-1 COARSE	7438	11/17/93	5,000	11,056	35	ND	1,700	72	69	48	ND	ND	9,100	32	ND	ND
SE-1 COARSE	7406	12/02/93	4,000	10,565	32	ND	1,600	94	79	65	ND	63	8,600	32	ND	ND
SE-1 COARSE FD	7405	12/02/93	10,000	8,692	51	ND	1,200	120	84	76	ND	61	7,100	Tr	ND	ND
SE-1 COARSE	3057	02/15/00	4,000	1,494.8	ND	ND	260	4.0	9.0	5.0	ND	12	1,200	4.8	ND	ND
SE-1 COARSE	3380	10/17/00	2,000	2,069.6	5.T	2.7	380	13	16	8.2	13	17	1,600	8.2	1.7	DCFM=4.1
SE-1 FINE	7437	11/17/93	10,000	22,463	130	ND	3,900	89	160	110	ND	ND	22,000	74	ND	ND
SE-1 FINE	7404	12/02/93	13,300	25,512	160	ND	3,600	190	180	130	ND	170	21,000	82	ND	ND
SE-1 FINE	3058	02/15/00	10,000	2,425	ND	ND	390	ND	16	Tr	ND	19	2,000	Tr	ND	ND
SE-1 FINE	3381	10/17/00	5,000	1,919.6	ND	ND	370	8.3	13	7.3	ND	14	1,500	7.0	ND	ND
SP-1 COARSE	7506	07/01/93	2,500	24,436	83	390	280	840	3,100	380	63	ND	1,500	ND	ND	EB=2,200; 1,2-DCB=1,100
SP-1 COARSE	7426	12/01/93	10,000	38,651	100	430	560	1,300	3,500	590	61	ND	1,700	ND	ND	EB=3,600; m-&p-Xylene=18,000; o-Xylene=7,900; 1,2-DCB=1,300
SP-1 COARSE	3066	02/15/00	20,000	7,987	ND	83	95	120	510	140	29	ND	420	Tr	ND	EB=660; m-&p-Xylene=3,500; o-Xylene=2,000; 1,2-DCB=430
SP-1 COARSE LD	3066	02/15/00	20,000	7,743	ND	85	95	120	500	140	33	ND	420	Tr	ND	EB=650; m-&p-Xylene=3,400; o-Xylene=1,900; 1,2-DCB=400
SP-1 COARSE	3384	10/17/00	25,000	11,533	100	130	220	220	850	220	230	ND	690	28	ND	CDS=86; 2-BT=19; EB=870; m-&p-Xylene=4,600; o-Xylene=2,800; 1,2-DCB=470; DCFM=Tr
SP-1 COARSE FD	3385	10/17/00	25,000	10,157	110	120	220	210	800	210	240	ND	670	28	ND	CDS=84; EB=730; m-&p-Xylene=3,900; o-Xylene=2,400; 1,2-DCB=410; DCFM=25
SP-1 FINE	7505	07/01/93	10,000	61,400	1,400	ND	1,900	2,800	12,000	730	240	ND	22,000	ND	ND	EB=3,300; 1,2-DCB=330; m-&p-Xylene=10,000; o-Xylene=3,700
SP-1 FINE LD	7505	07/01/93	10,000	62,540	1,300	ND	1,800	2,900	12,000	750	260	ND	22,000	ND	ND	EB=3,400; 1,2-DCB=330; m-&p-Xylene=14,000; o-Xylene=3,800
SP-1 FINE	7425	12/01/93	20,000	68,760	1,300	ND	1,900	3,400	12,000	850	230	ND	17,000	ND	ND	EB=4,800; m-&p-Xylene=21,000; o-Xylene=5,800; 1,2-DCB=480
SP-1 FINE	3067	02/15/00	20,000	8,229	67	59	160	250	1,300	120	43	ND	570	ND	ND	2-BT=Tr; EB=630; m-&p-Xylene=3,600; o-Xylene=1,100; 1,2-DCB=130
SP-1 FINE	3386	10/17/00	10,000	5,085.7	48	53	120	170	930	74	26	ND	380	ND	ND	2-BT=9.7; EB=490; m-&p-Xylene=2,100; o-Xylene=630; 1,2-DCB=55
SP-2 COARSE	7504	07/01/93	3,333	17,087	140	46	1,600	3,700	4,200	810	150	21	2,700	60	ND	TCM=Tr; EB=530; 1,2-DCB=220; m-&p-Xylene=2,100; o-Xylene=810
SP-2 COARSE LD	7504	07/01/93	3,333	16,694	140	45	1,600	3,600	4,100	810	150	21	2,500	58	ND	TCM=Tr; EB=530; 1,2-DCB=230; m-&p-Xylene=2,100; o-Xylene=810
SP-2 COARSE	7428	12/01/93	10,000	21,456	110	ND	2,300	5,100	5,300	1,300	130	ND	2,800	95	ND	EB=530; m-&p-Xylene=2,300; o-Xylene=1,100; 1,2-DCB=430
SP-2 COARSE	3075	02/15/00	20,000	13,343	96	1,100	580	1,100	1,400	540	200	ND	670	22	ND	2-BT=35; EB=1,100; m-&p-Xylene=4,500; o-Xylene=1,500; 1,2-DCB=500
SP-2 COARSE	3352	10/16/00	10,000	8,640.5	68	890	520	800	990	270	110	ND	430	32	ND	2-BT=15; TCM=8.4; EB=470; m-&p-Xylene=2,000; o-Xylene=720; 1,4-DCB=7.1; 1,2-DCB=210; DCFM=1,100
SP-2 COARSE LD	3352	10/16/00	10,000	8,139.4	62	800	480	760	950	280	100	ND	430	31	ND	2-BT=13; TCM=7.2; EB=450; m-&p-Xylene=1,900; o-Xylene=680; 1,4-DCB=6.2; 1,2-DCB=190; DCFM=1,000
SP-2 COARSE SS	ADEQ	10/16/00	1,836	6,112	38	640	270	420	580	210	74	ND	250	20	ND	EB=360; Xylenes=2,100; 1,2-DCB=150

TAB

Sum Laboratory Chemical Results for Voltile Organic Compounds Detected in Soil Vapor Sam ained from Soil Vapor Wells

Hass pa Landfill EPA Superfund Site

VAPOR WELL IDENTIFIER [a]	FIELD SAMPLE IDENTIFIER [b]	DATE SAMPLED	MINIMUM DILUTION FACTOR [d]	VOLATILE ORGANIC COMPOUNDS[e] (micrograms per liter)[f] TOTAL VOCs [g]	DCM	DMK	1,1-DCE	1,1,1-TCA	TCE	PCE	MB	TCFM	TCTFA	1,1-DCA	1,2-DCP	OTHER CONSTITUENTS
SP-2 FINE	7503	07/01/93	6,667	30,653	420	ND	3,000	4,000	7,200	1,200	480	42	5,000	61	ND	EB=1,500; m-&p-Xylene=5,900; o-Xylene=1,600; 1,2-DCB=250
SP-2 FINE	7427	12/01/93	10,000	35,073	370	ND	3,300	5,500	7,400	1,500	430	ND	4,100	93	ND	EB=1,800; m-&p-Xylene=7,700; o-Xylene=2,300; 1,2-DCB=380
SP-2 FINE	3076	02/15/00	10,000	6,001	160	14	790	410	1,200	250	130	Tr	870	16	ND	EB=420; m-&p-Xylene=1,200; o-Xylene=470; 1,2-DCB=71
SP-2 FINE	3353	10/16/00	10,000	4,940	99	ND	460	500	830	190	91	ND	350	19	ND	EB=360; m-&p-Xylene=1,500; o-Xylene=460; 1,2-DCB=81
SP-2 FINE LD	3353	10/16/00	10,000	4,514	94	ND	450	470	740	160	79	ND	370	18	ND	EB=320; m-&p-Xylene=1,300; o-Xylene=430; 1,2-DCB=83
SP-3 COARSE	7502	07/01/93	556	3,180.5	ND	ND	620	200	1,000	220	Tr	12	1,000	52	ND	TCM=2.9; EB=7.5; m-&p-Xylene=9.8; o-Xylene=50; 1,2-DCB=5.3
SP-3 COARSE	7423	12/01/93	2,000	3,698	ND	ND	810	460	1,100	270	ND	13	900	54	ND	TCM=Tr; EB=11; m-&p-Xylene=36; o-Xylene=14; 1,2-DCB=Tr
SP-3 COARSE	3068	02/15/00	1,000	202.8	ND	ND	62	40	31	8.5	ND	5.3	30	26	ND	TCM=Tr
SP-3 COARSE	3350	10/16/00	1,000	556.5	2.9	ND	110	84	69	15	1.0	9.7	90	62	ND	CA=1.0; TCM=1.9; Benzene=0.88; DCFM=150
SP-3 FINE	7501	07/01/93	667	2,995.9	ND	9.6	570	200	900	200	6.1	9.6	1,000	51	ND	TCM=Tr; EB=5.3; m-&p-Xylene=6.3; o-Xylene=38
SP-3 FINE	7422	12/01/93	2,000	4,260	ND	ND	940	440	1,300	320	ND	15	1,100	85	ND	TCM=Tr; EB=Tr; m-&p-Xylene=14; o-Xylene=36; 1,2-DCB=10
SP-3 FINE	3069	02/15/00	1,000	420.1	2.7	ND	130	45	100	21	ND	9.1	61	42	ND	TCM=1.3; o-Xylene=6.3; 1,2-DCB=1.7
SP-3 FINE	3351	10/16/00	1,000	947.4	3.1	ND	130	76	110	25	1.6	11	68	61	ND	CDS=1.3; TCM=2.1; Benzene=0.86; o-Xylene=5.8; 1,2-DCB=1.6; DCFM=450
SP-4 COARSE	7451	11/17/93	2,500	3,776	14	ND	1,000	740	480	110	ND	ND	1,400	13	ND	EB=Tr; m-&p-Xylene=Tr; o-Xylene=19
SP-4 COARSE LD	7451	11/17/93	2,500	3,796	15	ND	1,000	760	480	110	ND	ND	1,400	12	ND	EB=Tr; m-&p-Xylene=Tr; o-Xylene=19
SP-4 COARSE	7432	12/01/93	2,000	3,850	Tr	ND	960	800	530	160	ND	ND	1,400	Tr	ND	ND
SP-4 COARSE LD	7432	12/01/93	2,000	3,870	Tr	ND	970	820	520	160	ND	ND	1,400	Tr	ND	ND
SP-4 COARSE	3064	02/15/00	2,000	1,442	ND	ND	260	80	150	38	5.3	7.2	870	4.4	ND	TCM=4.1; o-Xylene=20; 1,2-DCB=3.0
SP-4 COARSE	3382	10/17/00	5,000	2,146.6	ND	ND	430	120	220	53	ND	11	1,300	6.7	ND	TCM=5.9
SP-4 FINE	7450	11/17/93	6,667	10,504	75	ND	2,700	620	650	160	ND	ND	6,100	38	ND	EB=36; m-&p-Xylene=73; o-Xylene=52
SP-4 FINE [h]	7431	12/01/93	1	2.139	0.03	0.084	0.590	0.350	0.260	0.120	0.022	0.0062	0.510	0.0091	0.0065	2-BT=Tr; EB=0.026; m-&p-Xylene=0.060; o-Xylene=0.055; 1,2-DCB=0.0099
SP-4 FINE	3065	02/15/00	4,000	1,446.6	ND	ND	280	44	140	31	9.2	7.3	900	4.1	ND	o-Xylene=31; 1,2-DCB=Tr
SP-4 FINE	3383	10/17/00	5,000	2,250.6	ND	ND	440	100	230	49	ND	11	1,400	6.6	ND	TCM=5.0; o-Xylene=9.0
SP-5 COARSE	7449	11/17/93	2,000	2,085	Tr	ND	400	920	380	96	ND	ND	210	47	ND	TCM=Tr; 1,2-DBA=12
SP-5 COARSE	7430	12/01/93	2,000	2,208	Tr	ND	450	1,000	370	110	ND	ND	230	48	ND	ND
SP-5 COARSE	3072	02/15/00	2,000	429.9	9.8	ND	94	170	44	9.9	5.1	Tr	57	38	ND	CA=2.1
SP-5 COARSE	3387	10/17/00	2,000	538.7	9.8	ND	120	200	53	11	7.0	ND	55	74	ND	CA=2.6; c-1,2-DCE=1.6; m-&p-Xylene=1.4; o-Xylene=1.6; 1,2-DCB=1.7; DCFM=Tr
SP-5 FINE	7448	11/17/93	2,500	4,691	64	ND	1,700	540	910	140	ND	ND	1,200	69	ND	EB=13; m-&p-Xylene=33; o-Xylene=22
SP-5 FINE FD	7447	11/17/93	2,500	4,660	66	ND	1,700	550	870	140	ND	ND	1,200	70	ND	EB=13; m-&p-Xylene=31; o-Xylene=21
SP-5 FINE	7429	12/01/93	2,000	4,896	60	ND	1,700	590	920	180	ND	ND	1,300	61	ND	EB=18; m-&p-Xylene=40; o-Xylene=27
SP-5 FINE	3073	02/15/00	4,000	1,027.6	40	ND	300	67	220	35	Tr	5.5	310	22	ND	m-&p-Xylene=Tr; o-Xylene=24; 1,2-DCB=4.1
SP-5 FINE FD	3074	02/15/00	4,000	1,140.3	45	ND	340	67	240	39	Tr	6.1	350	23	ND	o-Xylene=26; 1,2-DCB=4.2
SP-5 FINE	3388	10/17/00	5,000	2,065.9	90	ND	620	140	430	66	33	9.0	560	44	ND	TCM=4.0; m-&p-Xylene=5.1; o-Xylene=42; 1,2-DCB=9.8; DCFM=13
SP-6 COARSE	7446	11/17/93	4,000	3,462	120	ND	1,200	1,300	25	Tr	ND	ND	57	760	ND	ND
SP-6 COARSE	7421	12/01/93	2,000	4,491	130	ND	1,500	1,700	40	22	ND	45	48	990	ND	EB=Tr; m-&p-Xylene=16; o-Xylene=Tr
SP-6 COARSE	3070	02/15/00	1,000	352.3	14	ND	64	110	7.3	12	3.7	25	4.9	110	ND	CE=Tr; CA=Tr; c-1,2-DCE=Tr; Benzene=1.4
SP-6 COARSE	3396	10/16/00	1,000	462.3	27	ND	78	110	6.1	12	10	17	2.4	150	ND	m-&p-Xylene=1.3; o-Xylene=1.7; CE=1.3; CA=1.7; c-1,2-DCE=0.88; Benzene=1.9; DCFM=41

VAPOR WELL IDENTIFIER [a]	FIELD SAMPLE IDENTIFIER [b]	DATE SAMPLED	MINIMUM DILUTION FACTOR [c]	VOLATILE ORGANIC COMPOUNDS [d] (micrograms per liter) [f] TOTAL VOCs [g]	DCM	DMK	1,1-DCE	1,1,1-TCA	TCE	PCE	MB	TCFM	TCTFA	1,1-DCA	1,2-DCP	OTHER CONSTITUENTS
SP-6 FINE	7445	11/17/93	4,000	4,018	790	ND	1,600	840	28	Tr	ND	ND	110	650	ND	ND
SP-6 FINE	7420	12/01/93	2,000	5,200	820	ND	1,900	1,400	36	21	ND	52	51	920	ND	ND
SP-6 FINE FD	7419	12/01/93	2,000	5,012	780	ND	1,800	1,400	35	19	ND	50	48	880	ND	ND
SP-6 FINE	3071	02/15/00	4,000	715.7	290	ND	110	82	8.9	15	13	42	4.8	150	ND	o-Xylene=Tr
SP-6 FINE	3395	10/16/00	1,000	762.2	130	ND	110	110	8.8	16	27	25	3.6	160	ND	CE=1.5; CA=1.6; CDS=1.5; c-1,2-DCE=1.2; TCM=0.91; 1,2-DCA=1.0; Benzene=2.7; EB=2.5; m-&p-Xylene=3.7; o-Xylene=5.2; DCFM=150
SP-7 COARSE	7444	11/17/93	200	472.6	ND	ND	56	11	100	24	ND	ND	280	1.6	ND	TCM=Tr
SP-7 COARSE	7418	12/01/93	100	304.17	ND	1.1	32	7.5	77	24	ND	0.66	160	0.81	ND	TCM=0.56; 1,2-DCB=0.54
SP-7 FINE	7443	11/17/93	667	1,736.9	ND	ND	160	13	290	70	ND	ND	1,200	3.9	ND	ND
SP-7 FINE	7417	12/01/93	200	743.3	ND	Tr	73	8.3	180	49	ND	1.7	430	1.3	ND	TCM=Tr; 1,2-DCB=Tr
SP-7 FINE LD	7417	12/01/93	200	748.2	ND	Tr	79	9	180	47	ND	1.7	430	1.5	ND	TCM=Tr; 1,2-DCB=Tr
SP-8 COARSE	7442	11/17/93	1,000	1,727	ND	ND	93	26	140	26	ND	ND	1,400	42	ND	ND
SP-8 COARSE	7416	12/01/93	1,000	999	ND	ND	51	19	90	21	ND	Tr	790	28	ND	ND
SP-8 FINE	7441	11/17/93	6,667	15,648	ND	ND	370	Tr	190	39	ND	ND	15,000	49	ND	ND
SP-8 FINE	7415	12/01/93	5,000	10,077	ND	ND	250	43	210	57	ND	54	9,400	63	ND	ND
W-1 COARSE	7440	11/17/93	5,000	11,154	ND	ND	1,500	120	67	41	ND	ND	9,400	26	ND	ND
W-1 COARSE LD	7440	11/17/93	5,000	11,154	ND	ND	1,500	120	67	41	ND	ND	9,400	26	ND	ND
W-1 COARSE	7408	12/01/93	10,000	14,603	96	ND	1,900	270	130	110	ND	97	12,000	Tr	ND	ND
W-1 COARSE	3377	10/17/00	8,000	3,610	ND	ND	1,000	170	49	21	23	18	2,300	21	8.0	DCFM=Tr
W-1 COARSE LD	3377	10/17/00	8,000	3,421.6	ND	ND	930	160	45	20	23	17	2,200	19	7.6	DCFM=Tr
W-1 FINE	7439	11/17/93	10,000	28,802	72	ND	4,300	150	170	110	ND	ND	24,000	Tr	ND	ND
W-1 FINE	7407	12/01/93	20,000	24,490	180	ND	3,400	350	210	170	ND	180	20,000	Tr	ND	ND
W-1 FINE	3378	10/17/00	5,000	4,550.7	29	4.7	1,300	210	76	31	29	27	2,800	32	12	DCFM=Tr
W-1 FINE FD	3379	10/17/00	5,000	4,032.1	29	6.1	1,100	200	71	28	33	24	2,500	29	12	DCFM=Tr
VB-1 COARSE	4468	06/04/91	50	29,264.3	8,400	—	7,200	12,000	250	230	5.3	310	2,100	250	185	CE=30; Benzene=14;
VB-1 COARSE	14775	07/08/91	1,300,000	50,000	Tr	ND	Tr	30,000	ND	ND	ND	ND	20,000	ND	ND	ND
VB-1 COARSE	91212003-05	07/30/91	1,000	87,346	7,500	ND	9,600	21,000	1,200	650	68	280	46,000	560	410	EB=17; Benzene=29; Xylenes=32
VB-2 COARSE	4467	06/04/91	50	7,584.8	1,600	—	2,700	940	360	218	5.3	304	920	390	80	CE=20; Benzene=7.5; 1,2-DCA=40
VB-2 COARSE	14773	07/08/91	630,000	49,800	Tr	ND	6,800	Tr	ND	ND	ND	ND	43,000	ND	ND	ND
VB-2 COARSE	91212003-03	07/30/91	1,000	58,565.1	3,300	ND	8,100	5,400	630	360	16	250	40,000	310	170	Benzene=14; EB=5.1; Xylenes=10
VB-2 COARSE	7410	12/01/93	13,300	28,702	760	ND	4,600	2,600	240	170	ND	100	20,000	160	72	ND
VB-2 COARSE	3059	02/15/00	10,000	4,119	ND	ND	1,100	660	60	40	ND	18	2,200	28	13	ND
VB-2 COARSE	3376	10/17/00	10,000	7,712	ND	ND	2,100	1,200	130	82	55	38	4,000	77	30	DCFM=Tr
VB-2 FINE	4469	06/04/91	1,000	11,925.8	2,800	—	4,700	1,700	236	93	4.8	440	1,500	303	84	1,2-DCA=37; CE=28
VB-2 FINE	14774	07/08/91	630,000	169,000	11,000	ND	23,000	15,000	ND	ND	ND	ND	120,000	ND	ND	ND
VB-2 FINE	91212003-04	07/30/91	1,000	146,674	9,200	ND	19,000	14,000	1,600	790	49	630	100,000	880	440	Benzene=32; EB=23; Xylenes=30
VB-2 FINE	7409	12/01/93	20,000	100,600	6,700	ND	17,000	9,500	840	550	ND	310	65,000	340	260	ND
VB-2 FINE	3060	02/15/00	40,000	14,010	1,400	ND	3,800	1,200	230	150	45	58	7,000	71	56	ND
VB-2 FINE FD	3061	02/15/00	40,000	12,968	1,300	ND	3,400	1,200	210	140	46	54	6,500	65	53	ND
VB-2 FINE LD	3061	02/15/00	40,000	12,670	1,200	ND	3,400	1,100	210	140	51	53	6,400	64	52	ND
VB-2 FINE	3354	10/16/00	50,000	24,771	2,400	79	6,300	2,600	470	300	110	92	12,000	130	120	DCFM=170
VB-2 FINE SS	ADEQ	10/16/00	3,704	10,884	1,100	ND	3,000	1,100	190	130	ND	45	5,200	60	59	ND

VAPOR WELL IDENTIFIER [a]	FIELD SAMPLE IDENTIFIER [b]	DATE SAMPLED	MINIMUM DILUTION FACTOR [d]	VOLATILE ORGANIC COMPOUNDS [e] (micrograms per liter) [f]													
				TOTAL VOCs [g]	DCM	DMK	1,1-DCE	1,1,1-TCA	TCE	PCE	MB	TCFM	TCTFA	1,1-DCA	1,2-DCP	OTHER CONSTITUENTS
VB-3 COARSE	4466	06/04/91	50	5,532.7	460	---	3,400	390	182	85	ND	218	520	186	49	1,2-DCA=13; CE=25; Benzene=4.7
VB-3 COARSE LD	4466	06/04/91	50	5,165.4	540	---	2,500	500	152	69	ND	188	980	156	35	1,2-DCA=22; Benzene=4.4; CE=19
VB-3 COARSE	14772	07/08/91	500,000	16,100	ND	ND	5,100	ND	ND	ND	ND	ND	11,000	ND	ND	ND
VB-3 COARSE	91212003-02	07/30/91	1,000	33,948.3	1,100	ND	4,900	1,900	360	210	ND	190	25,000	210	71	Benzene=7.3
VB-3 COARSE LD	91212003-02	07/30/91	1,000	31,541.6	1,100	ND	4,600	1,900	340	180	ND	180	23,000	170	65	Benzene=6.6
VB-4 COARSE	14771	07/08/91	50,000	9,700	ND	ND	1,400	ND	ND	ND	ND	ND	8,300	ND	ND	ND
VB-4 COARSE LD	14771	07/08/91	50,000	14,000	ND	ND	1,400	ND	ND	ND	ND	ND	12,600	ND	ND	ND
VB-4 COARSE LD	14771	07/08/91	50,000	14,400	ND	ND	1,500	ND	ND	ND	ND	ND	12,900	ND	ND	ND
VB-4 COARSE	91212003-01	07/30/91	1,000	16,603	120	ND	2,500	530	160	95	ND	87	13,000	86	25	ND
V-9 COARSE	2563	04/05/00	5,000	2,874.9	140	ND	410	490	44	63	ND	12	1,700	6.0	9.9	ND
V-9 COARSE FD	2564	04/05/00	5,000	3,457	180	ND	520	600	53	71	ND	14	2,000	7.0	12	ND
V-9 COARSE	3357	10/16/00	5,000	4,041.3	200	36	690	920	100	170	24	11	1,800	17	28	EB=4.3; m-&p-Xylene=9.4; o-Xylene=6.6; DCFM=25
V-9 COARSE SS	ADEQ	10/16/00	931.3	2,639	130	43	440	610	58	110	16	ND	1,200	10	22	ND
V-9 FINE	2565	04/05/00	400,000	149,340	1,900	ND	16,000	20,000	520	Tr	ND	920	110,000	ND	ND	ND
V-9 FINE FD	2566	04/05/00	400,000	148,150	1,800	ND	16,000	19,000	460	ND	ND	890	110,000	ND	ND	ND
V-9 FINE	3358	10/16/00	100,000	76,204	2,300	130	13,000	12,000	690	540	ND	340	47,000	84	120	ND
V-9 FINE SS	ADEQ	10/16/00	19,070	47,060	1,400	ND	6,800	7,800	410	350	410	ND	29,000	ND	ND	Xylenes=910

[a] COARSE = Well completed in coarse-grained zone of t
FINE = Well completed in fine-grained zone of the
FD = Field duplicate sample

LD = Laboratory duplicate sample
SS = Split sample

[b] All soil vapor samples were obtained by Montgomery & Associates (M&A) except for samples with the field identifiers "ADEQ", which were obtained by the Arizona Department of Environmental Quality; the ADEQ samples were obtained concurrently with M&A samples.

[c] Soil vapor samples obtained on June 4, 1991, were obtained in Tedlar® bags and were analyzed by Analytical Technologies Inc., Phoenix, Arizona, using EPA method 8010 (modified for air).
Soil vapor samples obtained on July 8, 1991, were obtained in Tedlar® bags and were analyzed by Analytical Technologies Inc., Phoenix, Arizona, using EPA method T0-14.
Soil vapor samples obtained on July 30, 1991, were obtained in Tedlar® bags and were analyzed by Performance Analytical Incorporated, Simi Valley, California, using EPA method T0-14.
Soil vapor samples obtained in 1992 were obtained in Tedlar® bags and were analyzed by Performance Analytical Incorporated, Simi Valley, California, using EPA method T0-14.
Soil vapor samples obtained in 1993 were obtained in Summa® canisters and were analyzed by Performance Analytical Incorporated, Simi Valley, California, using EPA method T0-14.
Soil vapor samples obtained in 2000 were obtained in Summa® canisters and were analyzed by Performance Analytical Incorporated, Simi Valley, California, using EPA method T0-15.
Soil vapor samples obtained on October 16, 2000, with a field identifier of "ADEQ" were obtained in Summa® canisters and were analyzed by Severn Trent Laboratories, Los Angeles, California, using EPA method T0-14A.

[d] Some samples were analyzed using two or more dilutions to accurately quantify concentrations for all volatile organic compounds (VOCs) in the samples. The dilution factor reported in this table is the smallest dilution used to analyze the sample.
For results listed as "ND" (not detected), the dilution factor that corresponds to the ND is the smallest dilution used.

[e] VOLATILE ORGANIC COMPOUNDS

Benzene = Benzene
2-BT = 2-Butanone
CA = Chloroethane
CDS = Carbon Disulfide
CE = Chloroethene (Vin
1,2-DBA = 1,2-Dibromoethan
1,1-DCA = 1,1-Dichloroethan

1,2-DCA
1,2-DCB
1,4-DCB
1,1-DCE
c-1,2-DCE
DCFM
DCM

1,2-DCP = 1,2-Dichloropropane
DMK = Dimethyl ketone (Acetone)
EB = Ethylbenzene
MB = Methylbenzene (Toluene)
m- & p-Xylene = 1,3- and 1,4-Dimethylbenzene
o-Xylene = 1,2-Dimethylbenzene
PCE = Tetrachloroethene

1,1,1-TCA = 1,1,1-Trichloroethane
TCE = Trichloroethene
TCFM = Trichlorofluoromethane (Freon 11®)
TCM = Trichloromethane (Chloroform)
TCTFA = Trichlorotrifluoroethane (Freon 113®)
Xylenes = Total xylenes

ND = Not detected
Tr = Trace concentration; compound positively identified, but detected below method quantitation limit.
--- = Not analyzed

[f] The units "micrograms per liter" is equivalent to milligrams per cubic meter, which is the unit used on most laboratory reports.

[g] TOTAL VOCs: Sum of concentrations of all VOCs detected in each sample.

[h] Results for the December 1993 sample for SP-4 FINE are not believed to be representative for concentrations of VOCs in soil vapor in the fine-grained zone at vapor well SP-4. Trace gas analyzer measurements obtained immediately prior to sampling suggest that VOC concentrations in soil vapor from vapor well SP-4 FINE in December 1993 should have been in the same order of magnitude as SP-4 FINE in November 1993.

TABLE 4-8 Summary of Repairs and Replacements to the SVTS	
DATE	REPAIR OR COMPONENT REPLACEMENT
August 27, 1996	Repaired makeup water solenoid valve and makeup water supply line.
September 6, 1996	Float repaired in makeup storage tank.
September 11, 1996	Replaced Warrick control on scrubber sump stillwell.
September 25, 1996	Installed original Warrick control back into system.
October 2, 1996	Installed a new Warrick Control Card at the scrubber sump level control.
October 3, 1996	Installed magnetic floats in scrubber sump stillwell.
October 5, 1996	Installed new scrubber sump float system.
October 18, 1996	Installed replacement blowdown solenoid valve.
November 1, 1996	Installed new PLC control module.
November 5, 1996	Replaced gasket on caustic pump.
November 12, 1996	Installed pan gasket at top connection between scrubber sump and level control stillwell.
November 12, 1996	Installed new PLC processor.
November 15, 1996	Blind flange installed at top connection between scrubber sump and level control stillwell.
November 23-29, 1996	Installed Fernco 8-inch couplings at the extraction and reinjection pipeline expansion joints.
December 4, 1996	Installed UPS system.
December 18, 1996	Installed hand valve (gate valve) at blow down piping to better regulate volume of blow down.
December 31, 1996	Repaired break in caustic delivery tubing leading to scrubber sump.
January 6, 1997	Replaced electrical wiring to both solenoid valves and new fuses.
January 7, 1997	Installed replacement blow down and makeup water solenoid valves.
January 8, 1997	Replaced PLC output card.
January 13, 1997	Installed replacement parts for caustic pump. Replaced a section of the polyethylene caustic tubing with vinyl tubing.
January 15, 1997	Replaced caustic pump tubing and remaining polyethylene caustic supply tubing with vinyl tubing.
January 16, 1997	Repaired 2 expansion joints.
January 20, 1997	Installed replacement parts for caustic pump.
January 22, 1997	Repaired leaking Fernco expansion coupling.
January 24, 1997	Installed 10 additional condensate drainports in the extraction piping.

TABLE 4-8 Summary of Repairs and Replacements to the SVTS (continued)

DATE	REPAIR OR COMPONENT REPLACEMENT
January 30, 1997	Installed a new caustic pump output relay (SLC 500 Model 174C 0A8) and a new antenna for the autodialer cellular phone.
February 8, 1997	Installed a pressure gauge in heat exchanger base.
February 11, 1997	Installed a pressure gauge above the heat exchanger. Installed a pressure gauge below the heat exchanger.
March 12-14, 1997	Cleaned heat exchanger.
March 13, 1997	Installed new bolts, ring and gasket for quench cover.
March 13, 1997	Installed gauge ports.
March 27, 1997	Replaced phone system.
March 27, 1997	Replaced Fireye Scanner.
March 30, 1997	Installed new UV Scanner.
April 16, 1997	Replaced makeup water solenoid valve.
April 23, 1997	Replaced pump P200.
April 25, 1997	Replaced 3/4-inch makeup water solenoid valve with 1-inch valve.
May 1, 1997	Installed scrubber sump level indicator.
May 5, 1997	Replaced pump P200 due to leak.
May 6, 1997	Installed strainer and check valve in makeup water piping.
May 8, 1997	Installed replacement vacuum relief valve in effluent piping.
May 8, 1997	Installed replacement site glass in air stripper sump.
June 13, 1997	Replaced damaged ceramic quench packing.
June 16, 1997	Installed dedicated makeup water pump.
June 18, 1997	Installed 2,000-gallon wastewater tank.
July 2, 1997	Installed 1,650-gallon caustic storage tank.
July 2, 1997	Installed expansion card in autodialer.
August 8, 1997	Installed inspection hatches in scrubber sump and quench sump.
August 14, 1997	Installed inspection hatches in combustion chamber and heat exchanger top section.
August 14, 1997	Installed vacuum gauges at each side of in-line filters.
August 15, 1997	Installed cover on wastewater sump.
January 19, 1998	Replaced flow meters - FM-200 and FM-201.

TABLE 4-8	Summary of Repairs and Replacements to the SVTS (continued)
DATE	**REPAIR OR COMPONENT REPLACEMENT**
February 16, 1998	Found faulty PSC-101 switch - ordered new one.
February 20, 1998	Replaced caustic pump.
February 27, 1998	Replaced recycle pump, replaced packing for the Quench and replaced MOD motor for CGZ.
February 28, 1998	Replaced P-3 and P-4 gauges.
March 20, 1998	Installed new P-200 pump.
March 31, 1998	Replaced Thermo-couple 100 A and B.
April 1, 1998	Replaced light bulb in makeup pump control panel, reconnected and adjusted linkage in combustion air blower linkage.
April 21, 1998	Opened Flame Arrestor Bowl and replaced broken fusible element.
April 29, 1998	Replaced motor starter for combustion air blower.
May 5, 1998	Replaced storage tank drain valve.
May 8, 1998	Installed new combustion air blower motor, electrical overload fuse block and PSH-100 switch.
May 19, 1998	Replaced bolts in Heat Exchanger middle flange area.
May 27, 1998	Repaired three areas of SVE Header pipe.
May 29, 1998	Replaced Well Head control valve on Well P1.
May 31, 1998	Replaced solenoid in makeup water line from holding tank to scrubber sump.
June 8, 1998	Repaired linkage on coarse grain well head/dilution motor control.
July 1, 1998	Began system modifications; moved recirculation pump, installed ¼-inch pipe for P1, P2, P3, P4, removed coarse grain piping.
July 6, 1998	Completed ¼-inch pipe plumbing, completed 99% of cross over piping system, gate valve installed.
July 8, 1998	Continued revisions to SVE system, piping etc.
July 9, 1998	Continued revisions; completed plumbing, wiring, installed recirculation flow sensor readouts.
July 10, 1998	Repaired four water leaks, replaced six expansion joints in header pipe, replaced pH probe, repaired leak in caustic line.
July 15, 1998	Repaired two air leaks in header pipe, replaced vacuum gauges on wellheads, replaced broken brass fitting between ¼-inch pipe.
July 22, 1998	Installed ¼-inch stainless steel tubing from exhaust stack to manifold, began installation of manual dilution valve assembly. No electrical power.

TABLE 4-8 Summary of Repairs and Replacements to the SVTS (continued)

DATE	REPAIR OR COMPONENT REPLACEMENT
July 23, 1998	Completed valve assembly.
July 24, 1998	Replaced fusible link in Flame Trap Assembly #3.
July 31, 1998	Replaced five 2-inch Fernco couplings with flexible tubing.
August 11, 1998	Replaced five 2-inch Fernco couplings with flexible tubing, replaced vacuum gauge on wells.
September 19, 1998	Repaired UV sensor electrical connection, UV sensor, flame igniter.
October 1, 1998	Installed seven condensate drains and made a five-head manifold drain connection.
October 2, 1998	Installed fourteen drains and made eight 2-head manifold drain connections.
October 7, 1998	Plumbed and installed condensate collector.
October 8, 1998	A loose wire in the main electrical control panel on Slab 2 was identified through troubleshooting with Ken Hackler, Rockwell Automation. Inspected and re-connected Fernco connectors in three locations in SVE header pipe. Replaced ¼-inch drain in compressed air line header pipe and re-connected compressed air line header pipe in one location.
October 19, 1998	Installed drain pipe.
November 2, 1998	Meeting with Bryan Gerngi, Power Quality Engineer (APS) to discuss lightning protection. It was recommended that lightning protection be placed on both phone lines and electrical service entrance and to connect the phone and power ground wires.
November 6, 1998	Began to dismantle the heat exchanger unit and removed the protective covers from the inlet (wellheads) and from the outlet (combustion chamber) pipes.
November 11, 1998	Completed the dismantling of the heat exchanger and took to Anderson Contracting yard.
December 4, 1998	Loaded and transported heat exchanger shell to Anderson Contracting yard.
February 10, 1999	Completed installation of new heat exchanger

Source: ______________________________???

TABLE 4-9
SUMMARY OF WEEKLY OPERATING TIMES - SOIL VENTING AND TREATMENT SYSTEM
HASSAYAMPA LANDFILL SUPERFUND SITE

Week No.		Available * Hours	Cumulative Available Hours	Operating Time	Cumulative Operating Time	Percent Operation vs. Available Hours	Comments	Cumulative Percent Operation vs. Available Hours	4-Week Running Average Percent Operation vs. Available Hours
1	August 14 - August 18, 1996	109	109	7.5	8	7		7	
2	August 19 - August 25, 1996	168	277	49.5	57	29		21	
3	August 26 - September 1, 1996	168	445	101.5	159	60		36	
4	September 2 - September 8, 1996	168	613	70	229	42		37	35
5	September 9 - September 15,	168	781	3	232	2		30	33
6	September 16 - September 22,	168	949	0	232	0		24	26
7	September 23 - September 29,	168	1,117	20	252	12		23	14
8	September 30 - October 6, 1996	168	1,285	38	290	23		23	9
9	October 7 - October 13, 1996	168	1,453	24.5	314	15		22	12
10	October 14 - October 20, 1996	168	1,621	12	326	7		20	14
11	October 21 - October 27, 1996	168	1,789	27	353	16		20	15
12	October 28 - November 3, 1996	168	1,957	26	379	15		19	13
13	November 4 - November 10,	168	2,125	0	379	0		18	10
14	November 11 - November 17,	168	2,293	3	382	2		17	8
15	November 18 - November 24,	168	2,461	0	382	0	Official startup was 11-19-96.	16	1
16	November 25 - December 1, 1996	168	2,629	0	382	0		15	0

TABLE 4-9
SUMMARY OF WEEKLY OPERATING TIMES - SOIL VENTING AND TREATMENT SYSTEM
HASSAYAMPA LANDFILL SUPERFUND SITE

Week No.		*Available * Hours*	*Cumulative Available Hours*	*Operating Time*	*Cumulative Operating Time*	*Percent Operation vs. Available Hours*	*Comments*	*Cumulative Percent Operation vs. Available Hours*	*4-Week Running Average Percent Operation vs. Available Hours*
17	December 2 - December 8, 1996	168	2,797	0	382	0		14	0
18	December 9 - December 15,	168	2,965	37	419	22		14	6
19	December 16 - December 22,	168	3,133	38	457	23		15	11
20	December 23 - December 29,	168	3,301	89	546	53		17	21
21	December 30, 1996 - January 5,	168	3,469	0	546	0		16	21
22	January 6 - January 12, 1997	168	3,637	0	546	0		15	19
23	January 13 - January 19, 1997	168	3,805	54	600	32		16	21
24	January 20 - January 26, 1997	168	3,973	0	600	0		15	8
25	January 27 - February 2, 1997	168	4,103	13	613	8		15	10
26	February 3 - February 9, 1997	168	4,271	13	626	8		15	12
27	February 10 - February 16, 1997	168	4,439	13	639	8		14	6
28	February 17 - February 23, 1997	168	4,607	13	652	8		14	8
29	February 23 - March 2, 1997	168	4,775	13	666	8		14	8
30	March 3 - March 9, 1997	168	4,943	13	679	8		14	8
31	March 10 - March 16, 1997	168	5,111	13	692	8	Cleaned Heat Exchanger - March 13, 1997	14	8
32	March 17 - March 23, 1997	168	5,279	13	705	8		13	8

TABLE 4-9
SUMMARY OF WEEKLY OPERATING TIMES - SOIL VENTING AND TREATMENT SYSTEM
HASSAYAMPA LANDFILL SUPERFUND SITE

Week No.		*Available * Hours*	*Cumulative Available Hours*	*Operating Time*	*Cumulative Operating Time*	*Percent Operation vs. Available Hours*	*Comments*	*Cumulative Percent Operation vs. Available Hours*	*4-Week Running Average Percent Operation vs. Available Hours*
33	March 24 - March 30, 1997	168	5,447	13	718	8		13	8
34	March 31 - April 6, 1997	168	5,615	50	768	30		14	13
35	April 7 - April 13, 1997	168	5,783	50	818	30		11	19
36	April 14 - 20, 1997	168	5,951	50	868	30		15	21
37	April 21 - 27 1997	168	6,119	50	918	30		15	30
38	April 28 - May 4, 1997	168	6,287	91	1,009	54		16	36
39	May 5 - May 11, 1997	168	6,455	91	1,100	54		17	42
40	May 12 - May 18, 1997	168	6,623	91	1,191	54	Cleaned Heat Exchanger - May 13, 1997	18	48
41	May 19 - May 25, 1997	168	6,791	91	1,282	54		19	51
42	May 26 - June 1, 1997	168	6,959	10	1,292	6	Clean and repack system	19	42
43	June 2 - June 8, 1997	168	7,127	10	1,302	6		18	30
44	June 9 - June 15, 1997	168	7,295	11	1,313	7		18	18
45	June 16 - June 22, 1997	168	7,463	11	1,324	7		18	6
46	June 23 - 29, 1997	168	7,631	130	1,454	77	Low makeup water shutdowns	19	21
47	June 30 - July 6, 1997	168	7,822	111	1,565	77	Shutdowns for construction. Startup and commissioning ended 06-30-97	20	12

TABLE 4-9
SUMMARY OF WEEKLY OPERATING TIMES - SOIL VENTING AND TREATMENT SYSTEM
HASSAYAMPA LANDFILL SUPERFUND SITE

Week No.		*Available* Hours*	*Cumulative Available Hours*	*Operating Time*	*Cumulative Operating Time*	*Percent Operation vs. Available Hours*	*Comments*	*Cumulative Percent Operation vs. Available Hours*	*4-Week Running Average Percent Operation vs. Available Hours*
48	July 7 - July 13, 1997	168	7,990	59	1,624	35	Cleaned Heat Exchanger tubes - July 9, 1997. Ran out of caustic during switch from drums to bulk.	20	49
49	July 14 - July 20, 1997	168	8,158	144	1,768	87	Shutdowns caused by high temperature and switch from caustic drums to bulk.	22	60
50	July 21 - July 27, 1997	168	8,326	126	1,894	75	Shutdowns caused by high temperature spikes	23	60
51	July 28 - August 3, 1997	168	8,494	65	1,959	39	Power outages and damage to injection well	23	59
52	August 4 - August 10, 1997	168	8,662	10	1,969	6	Installing inspection hatches; repair to injection line; correcting programming error; completion of modifications.	23	52
53	August 11 - August 17, 1997	168	8,830	60	2,029	36	Programming error repaired August 13, 1997. Installing hatches; completing modifications. Two power failures.	23	39
54	August 18 - August 24, 1997	168	8,998	18	2,047	11	Pump problems - recirculation pump and sump pump; repaired spray nozzles; power failures.	23	23
55	August 25 - August 31, 1997	168	9,166	96	2,143	57	Power failures; reprogramming.	23	28

TABLE 4-9
SUMMARY OF WEEKLY OPERATING TIMES - SOIL VENTING AND TREATMENT SYSTEM
HASSAYAMPA LANDFILL SUPERFUND SITE

Week No.		*Available * Hours*	*Cumulative Available Hours*	*Operating Time*	*Cumulative Operating Time*	*Percent Operation vs. Available Hours*	*Comments*	*Cumulative Percent Operation vs. Available Hours*	*4-Week Running Average Percent Operation vs. Available Hours*
56	September 1 - September 7, 1997	168	9,334	32	2,175	19	Power failures; heat exchanger plugging. Cleaned Heat Exchanger - September 8, 1997.	23	31
57	September 8 - September 14, 1997	168	9,502	148	2,323	88	Power failure on September 10. Repaired quench and scrubber sump manways.	24	41
58	September 15 - September 21,	168	9,670	156	2,479	93	pH failure. Maintenance.	26	64
59	September 22 - September 28, 1997	168	9,838	117	2,596	70	pH failure.	26	68
60	September 29 - October 5, 1997	168	10,006	164	2,760	98	Weekly and monthly scheduled maintenance.	28	87
61	October 6 - October 12, 1997	168	10,174	136	2,896	81	Weekly scheduled maintenance. Fireye malfunction 10/12/97 (Sunday morning); burner technician not available until 10/13/97 (Monday). Repairs to conduit 10/11/97.	28	85

TABLE 4-9
SUMMARY OF WEEKLY OPERATING TIMES - SOIL VENTING AND TREATMENT SYSTEM
HASSAYAMPA LANDFILL SUPERFUND SITE

Week No.		*Available * Hours*	*Cumulative Available Hours*	*Operating Time*	*Cumulative Operating Time*	*Percent Operation vs. Available Hours*	*Comments*	*Cumulative Percent Operating vs. Available Hours*	*4-Week Running Average Percent Operation vs. Available Hours*
62	October 13 - October 19, 1997	168	10,342	116	3,012	69	Fireye repairs as above. Power failure 10/14. Flame failure 10/16. Cleaned heat exchanger 10/17. Flame failures 10/18 and 10/19 probably caused by condensate. Removed condensate - 25 gallons on 10/17 and 22 gallons on 10/21.	29	79
63	October 20 - October 26, 1997	168	10,510	145	3,157	86	Power failure 10/21. Drain condensate and replace drains. Replace Fernco coupling. Scheduled maintenance.	30	83
64	October 27 - November 2, 1997	168	10,678	124	3,281	74	Draining condensate. Install additional drains. Failures due to condensate buildup. Weekly and monthly maintenance.	31	78
65	November 3 - November 9, 1997	168	10,846	150	3,431	89	Installed new pump P-200. Installed condensate drain. Scheduled maintenance; draining condensate.	32	80
66	November 10 - November 16, 1997	168	11,014	160	3,591	95	Weekly maintenance. Draining condensate. Ran out of propane morning of 11/17.	33	86

TABLE 4-9
SUMMARY OF WEEKLY OPERATING TIMES - SOIL VENTING AND TREATMENT SYSTEM
HASSAYAMPA LANDFILL SUPERFUND SITE

Week No.		*Available * Hours*	*Cumulative Available Hours*	*Operating Time*	*Cumulative Operating Time*	*Percent Operation vs. Available Hours*	*Comments*	*Cumulative Percent Operation vs. Available Hours*	*4-Week Running Average Percent Operation vs. Available Hours*
67	November 17 - November 23, 1997	168	11,182	136	3,727	81	Replaced seals in pump P-200. Drained condensate. Ran out of propane 11/17 & 11/24.	33	85
68	November 24 - November 30, 1997	168	11,350	92	3,819	55	Cleaned heat exchanger 11/24. System down 11/29 due to FCV100 (control motor) malfunction. To be repaired/replaced 12/2.	34	80
69	December 1 - December 7, 1997	168	11,518	73	3,892	43	FCV100 repaired 12/2. System down 12/3; alarm not received by CRA. Restarted on 12/5/97. Flame failure 12/7.	34	60
70	December 8 - December 14, 1997	168	11,686	146	4,038	87	Weekly maintenance. Draining condensate. pH malfunction on 12/11 (Ch. 15. Alarm).	35	67
71	December 15 - December 21, 1997	168	11,854	121	4,159	72	System down 12/25 - no alarm. Restarted 12/29. Autodialer not malfunctioning properly.	35	64
72	December 22 - December 28, 1997	168	12,022	64	4,223	38	Maintenance.	35	60
73	December 29, 1997 - January 4,	168	12,190	165	4,388	98	Maintenance.	36	71
74	January 5 - January 11, 1998	168	12,358	163	4,551	97	Maintenance.	37	76
75	January 12 - January 18, 1998	168	12,526	159	4,710	95	Maintenance.	38	82

TABLE 4-9
SUMMARY OF WEEKLY OPERATING TIMES - SOIL VENTING AND TREATMENT SYSTEM
HASSAYAMPA LANDFILL SUPERFUND SITE

Week No.		*Available * Hours*	*Cumulative Available Hours*	*Operating Time*	*Cumulative Operating Time*	*Percent Operation vs. Available Hours*	*Comments*	*Cumulative Percent Operation vs. Available Hours*	*4-Week Running Average Percent Operation vs. Available Hours*
76	January 19 - January 25, 1998	192	12,718	188	4,898	98	Maintenance.	39	97
77	January 26 - February 1, 1998	168	12,886	97	4,995	58	System down 1/27 - no alarm. Restarted 1/30. Connected autodialer directly from alarm light. Maintenance. Draining condensate.	39	87
78	February 2 - February 8, 1998	168	13,054	163	5,158	97	Maintenance.	40	87
79	February 9 - February 15, 1998	168	13,222	79	5,237	47	Maintenance; PLC fault; PSL101 malfunction; draining condensate.	40	75
80	February 16 - February 22, 1998	168	13,390	82	5,319	49	PLS101 replaced 2/17. Maintenance; Caustic feed pump malfunction 2/20; replaced 2/23; draining condensate.	40	63
81	February 23 - March 1, 1998	192	13,582	159	5,478	83	Maintenance; draining condensate; quench packing replaced 2/27; control motor replaced 2/27; recycle pump replaced 2/27; pH control module replaced 3/3.	40	69
82	March 2 - March 8, 1998	144	13,726	139	5,617	97	Maintenance; draining condensate.	41	69
83	March 9 - March 15, 1998	168	13,894	135	5,752	80	Maintenance; draining condensate; over-temperature alarms.	41	77
84	March 16 - March 22, 1998	System not running due to GRS blower malfunction.							87

TABLE 4-9
SUMMARY OF WEEKLY OPERATING TIMES - SOIL VENTING AND TREATMENT SYSTEM
HASSAYAMPA LANDFILL SUPERFUND SITE

Week No.		*Available * Hours*	*Cumulative Available Hours*	*Operating Time*	*Cumulative Operating Time*	*Percent Operation vs. Available Hours*	*Comments*	*Cumulative Percent Operation vs. Available Hours*	*4-Week Running Average Percent Operation vs. Available Hours*
85	March 23 - March 29, 1998	System not running due to GRS blower malfunction.					GRS repaired 3/31/98 @ 1700. Anticipate restart 4/1/98 following EPA approval.		89
86	March 30 - April 5, 1998	168	14,062	149	5,901	89	System restarted 4/1/98 at 1737. Maintenance and two Ch. 14 alarms (Blower 1 malfunction due to loose connection). Percent average operating time over 4-week period based upon last four operating weeks of February 24, March 4 and 10, and April 1, 1998.	42	85
87	April 6 to April 12, 1998	144	14,206	131	6,032	91	Maintenance, draining condensate, out of propane for approx. 5 hours. Percent average operating time based upon last four operating weeks of March 4 and 10, April 1 and 8, 1998.	42	90
88	April 13 - April 19, 1998	168	14,374	144	6,176	86	Maintenance, draining condensate, system down afternoon of April 20 for flame arrestor valve malfunction.	43	89
89	April 20 - April 26, 1998	168	14,542	22	6,198	13	System down while troubleshooting startup fault.	43	70

TABLE 4-9
SUMMARY OF WEEKLY OPERATING TIMES - SOIL VENTING AND TREATMENT SYSTEM
HASSAYAMPA LANDFILL SUPERFUND SITE

Week No.		*Available * Hours*	*Cumulative Available Hours*	*Operating Time*	*Cumulative Operating Time*	*Percent Operation vs. Available Hours*	*Comments*	*Cumulative Percent Operation vs. Available Hours*	*4-Week Running Average Percent Operation vs. Available Hours*
90	April 27 - May 3, 1998	168	14,710	60	6,258	36	System down while troubleshooting startup fault.	43	56
91	May 4 - May 10, 1998	168	14,878	77	6,335	46	System restarted 5/9/98 after replacing blower motor and pressure switches.	43	45
92	May 11 - May 17, 1998	168	15,046	145	6,480	86	Maintenance, draining condensate, system down afternoon of May 17th for low propane pressure.	43	45
93	May 18 - May 24, 1998	168	15,214	83 *	6,563	49	System down for low propane pressure alarms. Raised system operating temperature and adjustments were required. *System ran for 12 hours with blower M1 off.	43	54
94	May 25 - May 31, 1998	168	15,382	77	6,640	46	Corrected low low scrubber sump failures and low propane pressure failures. System running on Blower M2 only.	43	57
95	June 1, 1998 - June 7, 1998	168	15,550	167	6,807	99	System down on June 8, 1998 for routine scheduled maintenance.	41	70
96	June 8, 1998 - June 14, 1998	168	15,718	73	6,880	43	System was down throughout the weekend. No alarm was received due to a problem with the phone line. Telephone repair has been contacted.	41	59

TABLE 4-9
SUMMARY OF WEEKLY OPERATING TIMES - SOIL VENTING AND TREATMENT SYSTEM
HASSAYAMPA LANDFILL SUPERFUND SITE

Week No.		*Available * Hours*	*Cumulative Available Hours*	*Operating Time*	*Cumulative Operating Time*	*Percent Operation vs. Available Hours*	*Comments*	*Cumulative Percent Operation vs. Available Hours*	*4-Week Running Average Percent Operation vs. Available Hours*
97	June 15, 1998 - June 21, 1998	144	15,862	140	7,020	97	System was shut down on June 22, 1998 in preparation for the Hickman Ranch pumping test. 24-hours of available run time for June 23 was subtracted from the available hours because the system could not have run due to the GRS shut down for the pumping test.	44	72
98	June 22, 1998 - June 28, 1998	System down for pumping test			7,020				80
99	June 29, 1998 - July 5, 1998	System down for pumping test			7,020				70
100	July 6, 1998 - July 12, 1998	96	15,958	96	7,116	100	System was down through July 10, 1998 while modifications were being done. Due to modifications 72 hours of operation time was not available.	45	99
101	July 13, 1998 - July 19, 1998	168	16,126	131	7,247	78	System went down morning of July 20, 1998 due to a large area power outage. As of July 21,1998 power has not yet been restored.	45	89

TABLE 4-9
SUMMARY OF WEEKLY OPERATING TIMES - SOIL VENTING AND TREATMENT SYSTEM
HASSAYAMPA LANDFILL SUPERFUND SITE

Week No.		*Available * Hours*	*Cumulative Available Hours*	*Operating Time*	*Cumulative Operating Time*	*Percent Operation vs. Available Hours*	*Comments*	*Cumulative Percent Operation vs. Available Hours*	*4-Week Running Average Percent Operation vs. Available Hours*
102	July 20, 1998 - July 26, 1998	112	16,238	112	7,359	100	System went down morning of July 20, 1998 due to a large area power outage. Power was not restored until July 24, 1998. For this reason 56 hours of available hours have been subtracted.	45	93
103	July 27, 1998 - August 2, 1998	168	16,406	168	7,527	100	System ran without failure.	46	95
104	August 3, 1998 - August 9, 1998	168	16,574	168	7,695	100	System ran without failure.	46	95
105	August 10 - August 16, 1998	168	16,742	163	7,858	97	System shut down on Aug 17, 1998 due to flame failure. System was restarted on Aug. 17, 1998.	47	99
106	August 17 - August 23, 1998	168	16,910	167	8,025	99	Maintenance - 1 hour	47	99
107	August 24 - August 30, 1998	168	17,078	168	8,193	100	System ran without failure.	48	99
108	August 31 - Sept. 6, 1998	143	17,221	143	8,336	100	GRS down, Channel 1 & 2 alarms 9/6/98. SVTS ran out of water at 0646 on 9/7/98.	48	99
109	Sept. 7 - Sept. 13, 1998	0	17,221	0	8,336	NA	GRS down, SVTS unable to operate due to lack of makeup water.	48	100
110	Sept. 14 - Sept. 20, 1998	0	17,221	0	8,336	NA	GRS down, SVTS unable to operate due to lack of makeup water.	48	100

TABLE 4-9
SUMMARY OF WEEKLY OPERATING TIMES - SOIL VENTING AND TREATMENT SYSTEM'
HASSAYAMPA LANDFILL SUPERFUND SITE

Week No.		Available * Hours	Cumulative Available Hours	Operating Time	Cumulative Operating Time	Percent Operation vs. Available Hours	Comments	Cumulative Percent Operation vs. Available Hours	4-Week Running Average Percent Operation vs. Available Hours
111	Sept. 21 - Sept. 27, 1998	0	17,221	0	8,336	NA	SVTS down due to problems caused by power surge.	48	100
112	September 28 - October 4, 1998	0	17,221	0	8,336	NA	SVTS down due to problems caused by power surge.	48	
113	October 5 - October 11, 1998	0	17,221	0	8,336	NA	SVTS shut down awaiting compliance test.	48	
114	October 12 - October 18, 1998	0	17,221	0	8,336	NA	SVTS shut down awaiting compliance test.	48	
115	October 19 - October 25, 1998	0	17,221	0	8,336	NA	SVTS shut down awaiting compliance test.	48	
116	October 26 - November 1, 1998	65	17,286	65	8,401	100	Compliance Test October 30, 1998. System was shut down following test.	49	100
	October 31, 1998 - March 4, 1999						Review of compliance test data, troubleshooting efficiency problem, heat exchanger removed and a new heat exchanger manufactured and installed.		
	March 5 - December 31, 1999			0			Waiting on EPA approval to restart system		

TABLE 4-9
SUMMARY OF WEEKLY OPERATING TIMES - SOIL VENTING AND TREATMENT SYSTEM
HASSAYAMPA LANDFILL SUPERFUND SITE

Week No.		*Available * Hours*	*Cumulative Available Hours*	*Operating Time*	*Cumulative Operating Time*	*Percent Operation vs. Available Hours*	*Comments*	*Cumulative Percent Operation, vs. Available Hours*	*4-Week Running Average Percent Operation vs. Available Hours*
	August 14, 1996 - September 6, 1998	17,236	18,072		8,253	46	Total period of SVTS was operation.		
	November 19, 1996 - September 6, 1998	14,943	15,714		8,215	52	SVTS operation since official startup on 11-19-96.		
	June 30, 1997 - September 6, 1998	14,943	10,392		8,196	79	SVTS operation since startup and commissioning ended 06-30-97.		
	* Available hours refers to the hours that the system was operational, however, could not be operated due to some other circumstance.								

Data reported by Conestoga-Rovers & Associates Inc. Summary at end of table prepared by Errol L. Montgomery & Associates.
Source: Errol L. Montgomery & Associates

TABLE 5. Groundwater Cleanup Standards, Chemical Specific AI 's and Requirements To Be Considered Iassayampa Landfill Superfund Site

Concentrations in Micrograms per Liter (µg/L)

Compound (A)	Maximum Concentration Detected	Selected Cleanup Standard	Applicable or Relevant and Appropriate		Other Criteria To Be Considered (TBC)**							
			SDWA MCL	SDWA MCLG	SDWA Proposed MCL	SDWA Proposed MCLG	1-day 10 kg	10-day 10 kg	Longer Term 10 kg	Longer Term 70 kg	Life-Time 70 kg	ADEQ HBGL
Benzene	0.6	5	5	0			200	200	NA	NA	NA	
Dichlorodifluoromethane	0.35	1,400	NA	NA	NA	NA	40,000	40,000	9,000	30,000	1,000	1,400
1,1-Dichloroethene	200	7	7	7			2,000	1,000	1,000	4,000	7	7
1,1-Dichloroethane	27	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
1,1,1-trichloroethane	1,500	200	200	200			100,000	40,000	40,000	100,000	200	200
1,2-dichloroethane	800	5	5	0			700	700	700	2,600	NA	0.38
1,2-dichlorothene(cis)	160	70	70	70			4,000	3,000	3,000	11,000	70	
1,2-dichloroethene (trans)	160	100	100	100			20,000	2,000	2,000	6,000	100	100
1,2-dichloropropane	4	5	5	0			NA	90	NA	NA	NA	0.56
Acetone	19	700	NA	NA	NA	NA	NA	NA	NA	NA	NA	700
Chlorobenzene	13	100	NA*	NA*			NA*	NA*	NA*	NA*	NA*	100
Trichlorofluoromethane (Freon 11)	190	2,100	NA	NA	NA	NA	7,000	7,000	3,000	10,000	2,000*	2,100
Trichlorotrifluoroethane (Freon 113)	610	210,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	210,000
Methyl ethyl ketone (under review)	40	170	NA	NA	NA	NA	80,000	8,000	3,000	9,000	200	170
Dichloromethane	15	5	5*	0*			10,000	2,000	NA	NA	NA	
Tetrachloroethene	25	5	5	0			2,000	2,000	1,000	5,000	NA	0.67
Toluene	15	1,000	1,000	1,000			20,000	2,000	2,000	7,000	1,000	2,000
Trihalomethanes (B)	63	100	100	0*	80*							
Trichloroethene	115	5	5	0			NA	NA	NA	NA	NA	
Chromium (total)	40	50	100	100			1,000*	1,000*	200*	800*	200*	100
Xylenes (total)	1	10,000	10,000	10,000			40,000	40,000	10,000	100,000	10,000	
Vinyl chloride (C)	ND	2	2	0			3,000	3,000	10	50	NA	

Notes:

*Value changed from ARARs in ROD.

**TBCs have not yet been promulgated, and are only considered if there are no ARARs.

(A) Compounds listed were detected and confirmed in groundwater samples taken during the RI and supplementary field investigations.

(B) The sum of trihalomethanes includes chloroform, bromodichloromethane, dibromochloromethane, and tribromomethane.

(C) Vinyl Chloride has never been detected in groundwater samples as the site, but has been detected in soil gas samples.

SDWA MCL = Safe Drinking Water Act Maximum Contaminant Level (40 CFR 141)

SDWA MCLG = Safe Drinking Water Act Maximum Contaminant Level Goal (40 CFR 142)

ADEQ HBGL = Arizona Department of Environmental Quality Health Based Guidance Levels

NA = No Standard Available

U.S. EPA Health Advisories

1-day/10 kg = Concentration of compound in drinking water that could pose a risk if consumed by a 10 kg child for 1 day

10-day/10 kg = Concentration of compound in drinking water that could pose a risk if consumed by a 10 kg child for 10 days

Longer term/10 kg = Concentration of compound in drinking water that could pose a risk if consumed by a 10 kg child for more than 10 days

Longer Term / 70 kg = Concentration of compound in drinking water that could pose a risk if consumed by a 70 kg adult for more than 70 days

Lifetime/70 kg = concentration of compound in drinking water that could pose a risk if consumed by a 70 kg adult for a lifetime

TABLE 5-2
Location-Specific ARARs and Other Criteria
Hassayampa Landfill Superfund Site

Location	Requirement	Prerequisite(s)	Citation	ARAR	Comments
Within floodplain.	Action to avoid adverse effects, minimize potential harm, restore and preserve natural and beneficial values.	Action that will occur in a floodplain, i.e., lowlands, and relatively flat areas adjoining inland and coastal waters and other flood-prone areas.	Executive Order 11988, Protection of Floodplains (40 CFR 6, Appendix A).	ARAR	Federal agencies are directed to ensure that planning programs and budget requests reflect consideration of flood-plain management, including the restoration and preservation of such land as natural undeveloped flood plains. If newly constructed facilities are to be located in a floodplain, accepted floodproofing and other flood control measures shall be undertaken to achieve flood protection. Whenever practical, structures shall be elevated above the base flood level rather than filling land. As part of any Federal plan or action, the potential for restoring and preserving floodplains so their natural beneficial values can be realized must be considered.
Within area where action may cause irreparable harm, loss, or destruction of significant artifacts.	Action to recover and preserve artifacts.	Alteration of terrain that threatens significant scientific, prehistoric, historic, or archaeological data.	National Archaeological and Historical Preservation Act (16 USC Section 469); 36 CFR Part 65.	ARAR	No artifacts are known to have been found in the vicinity of the Site. If artifacts are identified at the Site, this requirement will be applicable.
Critical habitat upon which endangered species or threatened species depend.	Action to conserve endangered species or threatened species, including consultation with the Department of the Interior.	Determination of endangered species or threatened species.	Endangered Species Act of 1973 (16 USC 1531 et seq.); 50 CFR Part 200, 50 CFR Part 402.	ARAR	No endangered or threatened species have been identified at the Site. If such species are identified at the Site, this requirement will be applicable.
Area affecting stream or river.	Action to protect fish or wildlife.	Diversion, channeling, or other activity that modifies a stream or river and affects fish or wildlife.	Fish and Wildlife Coordination Act (16 USC 661 et seq.); 40 CFR 6.302.	ARAR	This act requires coordination with the Department of Fish and Wildlife prior to any action that would alter a body of water of the United States. No activity is expected in the vicinity of the river, and the selected remedy is not expected to affect the river or associated riparian habitat and wetlands. This requirement will be applicable if the selected remedy will impact the river.
Riparian area.	Requires ADEQ to consider protection of riparian areas in its decision making.	Impact on riparian areas.	Executive Order No. 91-06 of the Governor of AZ.	ARAR	The landfill lies within the drainage area of the Hassayampa River, a riparian area as defined in Executive Order 91-06 of the State of Arizona. No activity is expected in the vicinity of the river, and the selected remedy is not expected to affect the river or associated riparian habitat and wetlands. This requirement will be applicable if the selected remedy will impact the river.

TABLE 5-3
Action-Specific ARARs and Other Criteria
Hassayampa Landfill Superfund Site
Page 1 of 3

Action	Requirements	Prerequisites	Citation	ARAR	Comments	Change in Status	Requirements	Prerequisites	Citation	ARAR	Comments
Container storage (onsite)	Containers of hazardous waste must be: • Maintained in good condition • Compatible with hazardous waste to be stored • Closed during storage (except to add or remove waste).	RCRA hazardous waste (listed or characteristic) held for a temporary period before treatment, disposal, or storage elsewhere, (40 CFR 264.10) in a container (i.e., any portable device in which a material is stored, transported, disposed of, or handled).	40 CFR 264.171-173 (R18-8-264.170, et seq.).	ARAR	These requirements are applicable or relevant and appropriate for any contaminated soil or groundwater or treatment system waste that might be contained and stored onsite prior to treatment or final disposal.	No change.					
	Inspect container storage areas weekly for deterioration. Place containers on a sloped, crack-free base, and protect from contact with accumulated liquid. Provide containment system with a capacity of 10 percent of the volume of containers of free liquids.		40 CFR 264.174.	ARAR							
	Remove spilled or leaked waste in a timely manner to prevent overflow of the containment system.		40 CFR 264.175.	ARAR							
	Keep containers of ignitable or reactive waste at least 50 feet from the facility's property line.		40 CFR 264.176.	ARAR							
	Keep incompatible materials separate. Separate incompatible materials stored near each other by a dike or other barrier.		40 CFR 264.177.	ARAR							
	At closure, remove all hazardous waste and residues from the containment system, and decontaminate or remove all containers, liners.		40 CFR 264.178.	ARAR							
Treatment	RCRA Standards for control of VOCs.	Emissions of VOCs or gaseous contaminants.	40 CFR 265 Subparts AA and BB.	ARAR	This standard requires reduction of VOC emissions from process vents. Process vents include air strippers. The standard also sets emissions standards for equipment leaks.	No change.					
	Control of VOCs and gaseous contaminants.	Emissions of VOCs or gaseous contaminants.	Maricopa County Rules 210, 320, 330.	TBC	Maricopa County's January 1991 guidelines for implementing Rule 210 require VOC emission controls for remediation site where uncontrolled VOC air emissions would exceed 3 pounds per day. The air emission controls must have an overall efficiency of at least 90 percent. These criteria are selected as the air emission standards at the Site based on considerations of the potential aggregate	Maricopa County promulgated standards to implement the delegated federal air program.	Control of VOCs and gaseous contaminants.	Emissions of VOCs or gaseous contaminants.	Maricopa County Rules 200, 220, 241, 320, 370.	ARAR	Maricopa County rules require VOC emission controls where uncontrolled VOC air emissions would exceed 3 pounds per day. The air emission controls must have an overall efficiency of at least 90 percent. These criteria are selected as the air emission standards at the Site based on considerations of the potential aggregate impacts of the air stripping and SVE systems. The Maricopa County Rules have always been required at the Site, so the revised rules do not affect the protectiveness of the remedy.

TABLE 5-3
Action-Specific ARARs and Other Criteria
Hassayampa Landfill Superfund Site
Page *2 of 5*

Action	Requirements	Prerequisites	Citation	ARAR	Comments	Change in Status	Requirements	Prerequisites	Citation	ARAR	Comments
					impacts of the air stripping and SVE systems.						
	Control of air emissions from air strippers exceeding 3 pounds per hour, 15 pounds per day, or a potential rate of 10 tons per year total VOCs, because VOCs are ozone precursors.	Actual emission rate of 3 pounds per hour, 15 pounds per day, or a potential rate of 10 tons per year.	EPA OSWER Directive No. 9355.0-28 (June 1989).	TBC	This guidance on the control of air emissions from air strippers used at Superfund sites is a TBC for the Site. This policy evinces a need to control VOC emissions from sites which exceed 15 pounds per day of total VOCs from air stripping and other vented extraction techniques (e.g., SVE).	No change.					
	Standards for miscellaneous units to satisfy environmental performance standards.	Treatment of hazardous wastes in units not regulated elsewhere under RCRA (e.g., air strippers).	40 CFR 264 Subpart X	ARAR	Air stripping towers and SVE units are considered miscellaneous units. Therefore, the substantive requirements are relevant and appropriate.	No change.					
	Treatment of wastes subject to ban on land disposal must attain levels achievable by best demonstrated available treatment technologies (BDAT) for each hazardous constituent in each listed waste.	Treatment of LDR waste.	40 CFR 268 Subpart D	ARAR	The substantive portions of these requirements are applicable to the disposal of any Hassayampa site wastes that can be defined as restricted hazardous wastes (i.e., drill cuttings).	No change.					
Treatment	Remedial actions must comply with the substantive requirements of the CAA and its related programs, including the EPA-approved State Implementation Plan.		40 CFR 50-99.	ARAR	The Clean Air Act (CAA) regulations define air quality management programs used to achieve the CAA goals. The State of AZ is responsible for the State Implementation Plan, which describes how the air quality programs will be implemented.	No change.					
	Installation permits must be obtained to make alterations to machinery that may cause or contribute to air pollution.	An alteration to machinery that may cause or contribute to air pollution.	A.R.S. 49-480.	ARAR	The substantive requirements of the Air Pollution Control Rules and Regulations for groundwater and soil treatment facilities are applicable to the Site.	No change.					
Capping	At final closure of a landfill or cell, the landfill must be capped or maintained in accordance with 40 CFR 265.310 and 265.177.	Closure of a RCRA interim status landfill.	40 CFR 265.310 and 265.117. EPA Technical Guidance Documents: Final Covers on Hazardous Waste Landfills and Surface Impoundments (EPA/530-SW-89-047).	ARAR TBC	Although the site is not a RCRA interim status facility, the closure and post-closure care regulations contained in 40 CFR 265.310 and 265.117 are relevant and appropriate. Furthermore, the capping and maintenance requirements described in the "EPA Technical Guidance Document: Final Covers on Hazardous Waste Landfills and Surface	No change.					

Action	Requirements	Prerequisites	Citation	ARAR	Comments	Change in Status	Requirements	Prerequisites	Citation	ARAR	Comments
					Impoundments" are TBCs. The cap at the site will comply with the substantive design and maintenance requirements specified in these regulations and in the guidance document.						
Underground injection of treated groundwater	This regulation sets standards for types of underground injection wells. The UIC program prohibits activities that allow movement of contaminants into underground sources of drinking water that may result in violations of MCLs or adversely affect health. Compliance with the UIC program includes (1) meeting MCLs for all constituents reinjected, (2) submitting inventory information, (3) obtaining a permit if the point of injection is offsite.	Action involving underground injection.	40 CFR Parts 144-147.	ARAR	Reinjection of treated groundwater at the site shall comply with these regulations. While a permit is not required for onsite CERCLA actions, the substantive requirements would apply for reinjection of treated groundwater onsite. Offsite reinjection will have to comply with the procedural and substantive portions of these regulations.	No change.					
Underground injection of treated groundwater	Any person who discharges to an aquifer must obtain an Aquifer Protection Permit from ADEQ.	Discharge to an aquifer.	ARS 49-241 to 49-246.	ARAR	The substantive requirements of the permit must be met for onsite reinjection.	Best available control technology required, and must not cause a water quality violation or further degrade the aquifer at the point of compliance.	Any person who discharges to an aquifer must obtain an Aquifer Protection permit from ADEQ.	Discharge to an aquifer.	A.R.S. 49-241 to 49-246.		Best available control technology required, and must not cause a water quality violation or further degrade the aquifer at the point of compliance.
Groundwater well installation, development, testing, and sampling	Any non-waste material (e.g., groundwater or soil) that contains a listed hazardous waste must be managed as if it were a hazardous waste.	Non-waste material containing listed hazardous waste.	EPA "contained in" policy of defining "hazardous waste" under 40 CFR 261.3.	ARAR	Contaminated soil and groundwater containing a listed hazardous waste must be managed as a hazardous waste. The "contained in" principle will not apply to groundwater treated to MCLs and ADEQ HBGLs at the Site.		Any non-waste material (e.g., groundwater or soil) that contains a listed hazardous waste must be managed as if it were a hazardous waste.	Non waste material containing listed hazardous waste.	40 CFR 261.3	ARAR	Contaminated soil and groundwater containing a listed hazardous waste must be managed as a hazardous waste. The "contained in" principle will not apply to groundwater treated to MCLs or ADEQ HBGLs at the Site.
Groundwater monitoring	Groundwater monitoring at new or existing RCRA disposal units.	Creation of a new disposal unit, remedial actions at an existing RCRA unit or disposal of RCRA hazardous waste.	40 CFR, Subpart F.	ARAR	The groundwater monitoring requirements contained in 40 C.F.R. Section 265 Subpart F are relevant and appropriate for the Site.						

TABLE 7-1
Recommendations and Follow Up Actions
Hassayampa Landfill Superfund Site
(Page 1 of 2)

ISSUES	RECOMMENDATIONS	FOLLOW UP ACTION	RESPON-SIBLE PARTY	OVERSIGHT AGENCY	TARGET COMPLETION DATE (MILESTONE)
Effluent treatment monitoring protectiveness	Maintain the current monthly monitoring of treated effluent from the GRS	Prepare a schedule for monthly monitoring and submit an addendum to the GPS O&M Manual which reflects the new schedule	HSC	EPA	Within 90 days of completion of the final Five-Year Review Report
Groundwater Treatment System O&M	Continue to conduct annual disassembly, inspection, and cleaning of the air stripper unit	Prepare a schedule for annual disassembly, cleaning and inspection and submit an addendum to the GPS O&M Manual which reflects the new schedule	HSC	EPA	Within 90 days of completion of the final Five-Year Review Report
GPS O&M	Update the Groundwater Pilot Study Operation and Maintenance Manual (GPS O&M Manual) to address equipment modifications and changes to sampling frequency	Submit an addendum to the GPS O&M Manual	HSC	EPA	Within 90 days of completion of the final Five-Year Review Report
Vapor zone clean-up goals	Determine achievement of soil vapor cleanup goals in the FML capped area	Complete verification sampling in accordance with the requirements of the *Soil Vapor Performance Standards Verification Plan*	HSC	EPA	January 2002

TABLE 7-1
Recommendations and Follow Up Actions
Hassayampa Landfill Superfund Site
(Page 2 of 2)

ISSUES	RECOMMENDATIONS	FOLLOW UP ACTION	RESPON-SIBLE PARTY	OVERSIGHT AGENCY	TARGET COMPLETION DATE (MILESTONE)
Remediation of uncapped and Pit 1 area	Complete evaluation of remedial options for uncapped and Pit 1 polygon area	Submit final proposal for remedial action	HSC	EPA	A date will be determined by EPA after final determination on protectiveness of vadose zone performance standards (March 29, 2002)
Soil Vapor O&M	Update the *Operations and Maintenance Manual Soil Venting and Treatment System* to address new or modified equipment and changes to sampling frequency	Submit an addendum to the O&M Manual for the SVTS	HSC	EPA	A date will be determined by EPA if decision is made to resume operation of the SVTS
Access Controls	Update and/or correct information on signage on the perimeter fencing	The HSC should propose a plan to update signage on perimeter fencing	HSC	EPA	A proposed date should be submitted at the completion of the final Five-Year Review
Groundwater remediation effectiveness	Estimation of mass of VOCs in groundwater	The HSC has estimated the mass of VOCs in the groundwater, and should intermittently update this calculation in the annual reports	HSC	EPA	Annual Reports
Characterization of dewatered Unit A	Evaluate dewatered area of Unit A	Submit evaluation of VOCs in dewatered area of Unit A	HSC	EPA	December 15, 2001
Protectiveness of vadose zone clean-up standards in context of the five-year review process	Evaluate appropriateness of SESOIL model	Submit memorandum explaining concerns with use of SESOIL at the site.	ADEQ	EPA	October 17, 2001
Appropriateness of using SESOIL model at site	To be determined	Final determination on protectiveness of vadose zone clean-up standards	EPA	EPA	March 29, 2002

TABLE 7-3
Summary of Projected Peak Concentrations in Groundwater for Contaminants of Potential Concern (COPC)
Resulting from Maximum COPC Concentrations Detected in Soil Vapor Samples Obtained in December 1993
Hassayampa Landfill EPA Superfund Site

POLYGON	CONTAMINANT OF POTENTIAL CONCERN[a]	MAXIMUM CONCENTRATION DETECTED IN SOIL VAPOR SAMPLES (December 1993) (µg/L)[b] COARSE-GRAINED ZONE	FINE-GRAINED ZONE	PROJECTED PEAK CONCENTRATION IN GROUNDWATER[c] (µg/L)	GROUNDWATER PERFORMANCE STANDARD (µg/L)
SPECIAL PITS POLYGON	DCM	130	1,300	0.59	5
	DMK	430	2 (Tr)[d]	6.56	700
	1,1-DCE	2,300	3,300	0.028	7
	TCE	5,300	12,000	0.63	5
	PCE	1,300	1,500	0.023	5
PIT 1 CAPPED POLYGON	DCM	4,200	49,000	2.70	5
	DMK	6,700	7,700	147	700
	1,1-DCE	4,600	36,000	0.046	7
	1,1,1-TCA	70,000	240,000	0.17	200
	1,2-DCP	920	1,500	0.098	5
	TCE	1,800	3,800	0.038	5
	PCE	3,500	2,100	0.0088	5

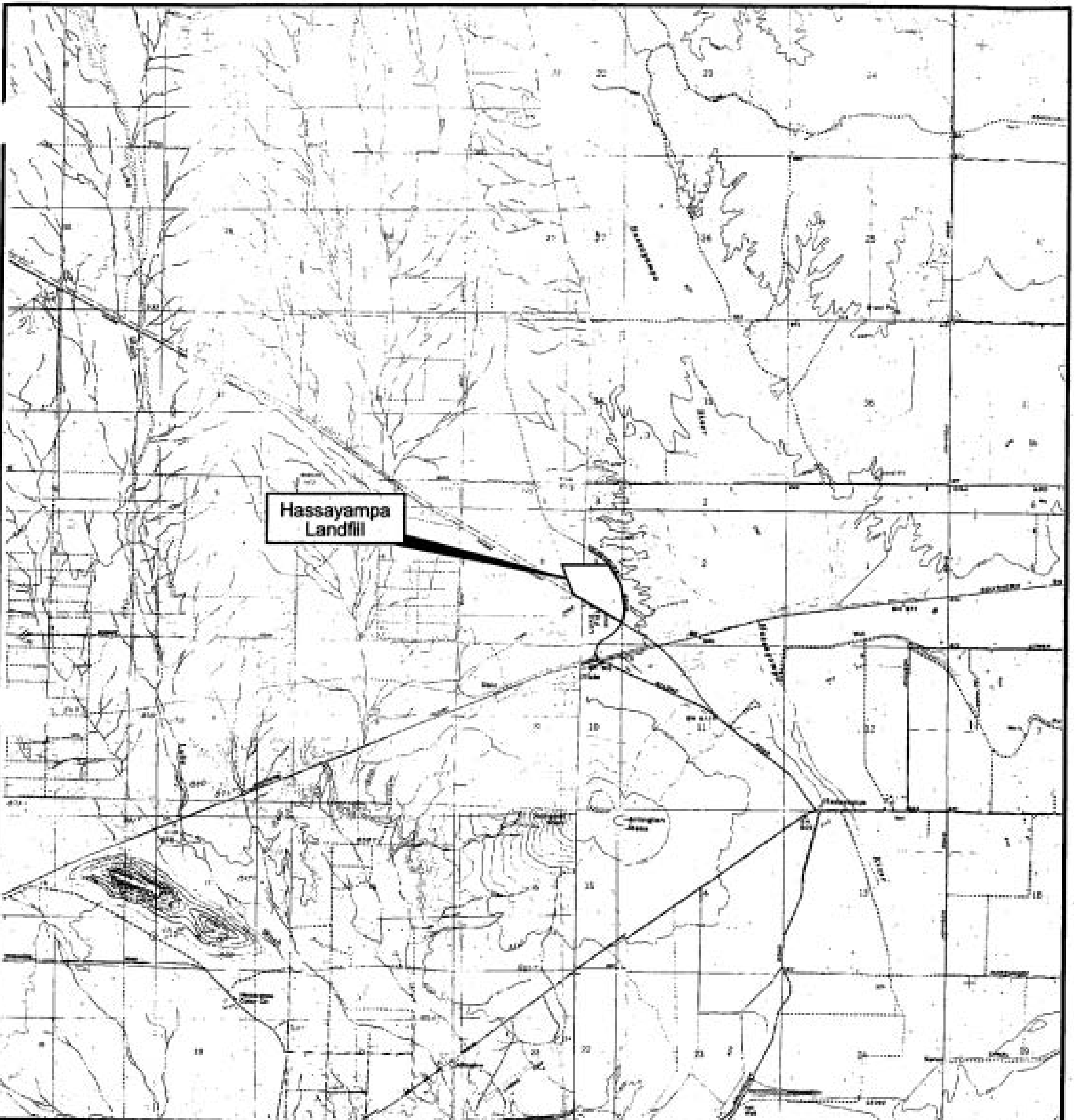
[a] DCM = Dichloromethane (Methylene chloride)
DMK = Dimethylketone (Acetone)
1,1-DCE = 1,1-Dichloroethene
TCE = Trichloroethene
PCE = Tetrachloroethene
1,1,1-TCA = 1,1,1-Trichloroethane
1,2-DCP = 1,2-Dichloropropane

[b] µg/L = micrograms per liter

[c] Peak COPC concentrations in groundwater are based on model projections that simulate the effects of an FML cap over the modeled area.

[d] (Tr) = Trace concentration; compound positively identified, but detected below method quantitation limit.

FIGURES

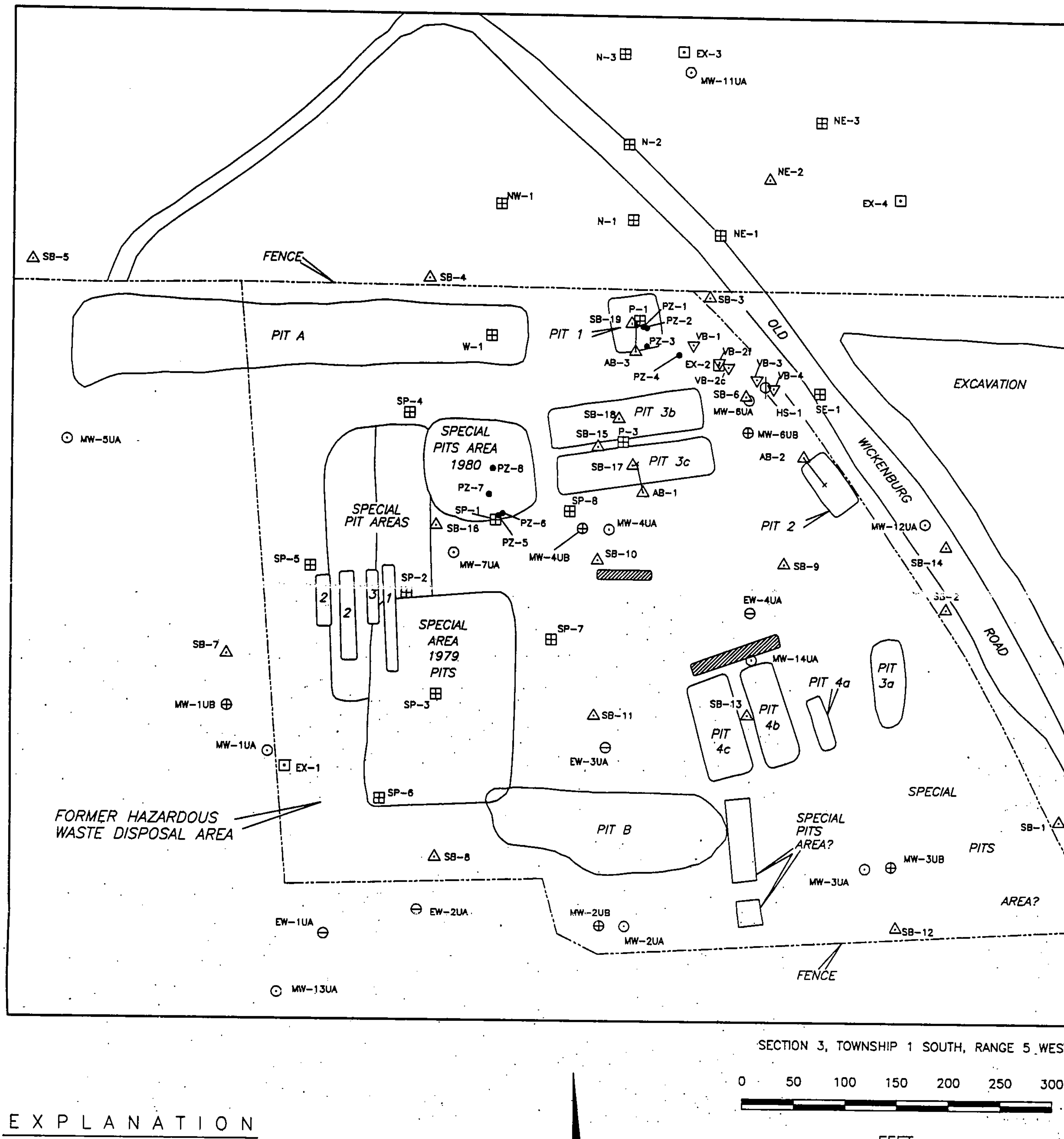


SOURCE: Errol L. Montgomery & Associates, Inc.

0 2000 4000
Scale In Feet

N

Figure 1
Regional Location Map
Five-Year Review
Hassayampa Landfill Superfund Site
Maricopa County, Arizona



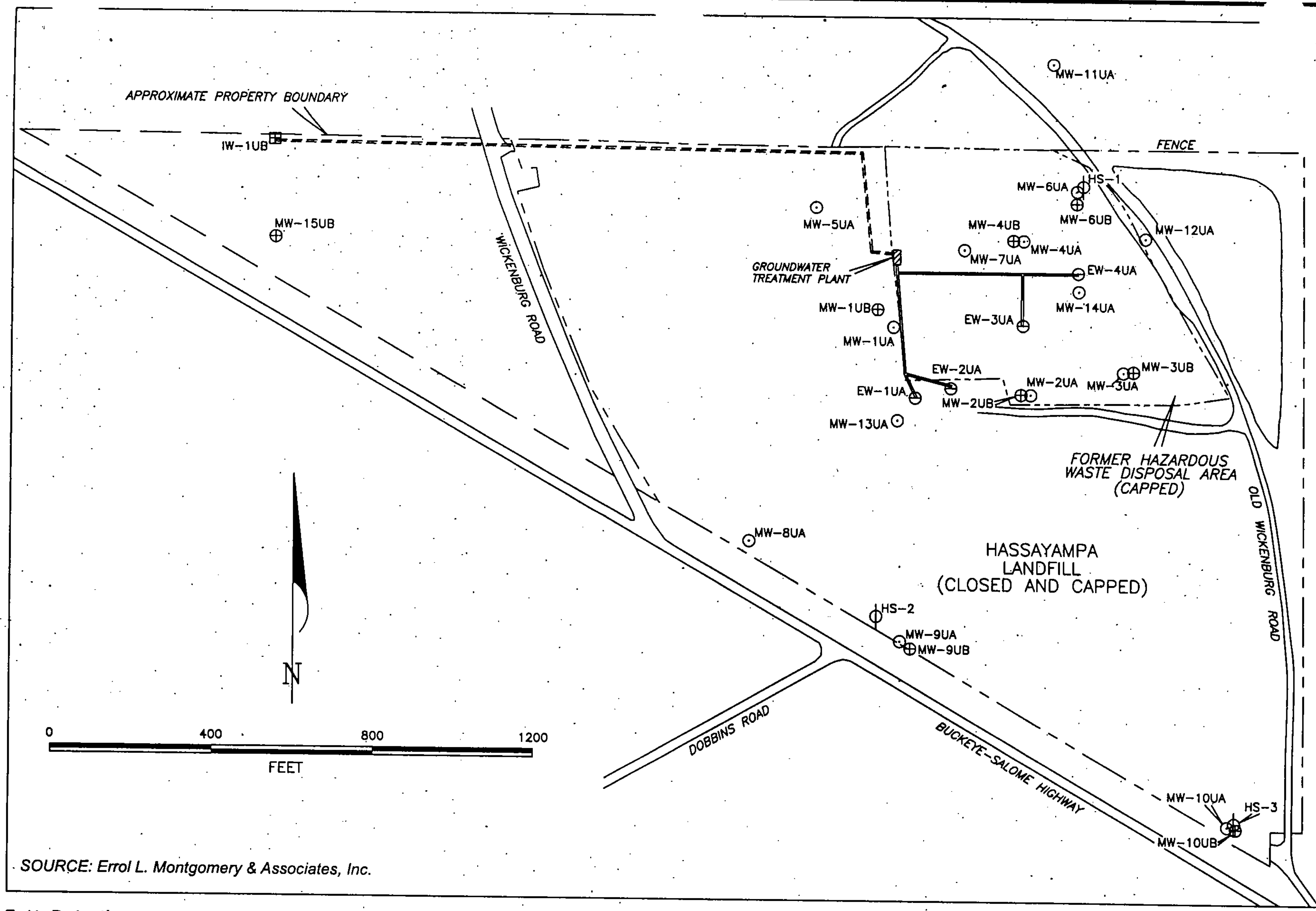
EXPLANATION

- MW-1UA — UNIT A GROUNDWATER MONITOR WELL AND IDENTIFIER
- MW-1UB — UNIT B GROUNDWATER MONITOR WELL AND IDENTIFIER
- EW-1UA — UNIT A GROUNDWATER EXTRACTION WELL AND IDENTIFIER
- HS-1 — ABANDONED MONITOR WELL AND IDENTIFIER; CONSTRUCTED BY ARIZONA DEPARTMENT OF HEALTH SERVICES; ABANDONED JUNE 1988
- EX-1 — EXPLORATION BORING AND IDENTIFIER
- SB-1 — VERTICAL SOIL BORING AND IDENTIFIER
- AB-1 — ANGLED SOIL BORING AND IDENTIFIER; dot in center of triangle indicates location at land surface; x indicates estimated location at bottom of hole
- VB-1 — VADOSE ZONE MONITOR BORING AND IDENTIFIER
- P-1 — SOIL VAPOR MONITOR/EXTRACTION WELL AND IDENTIFIER
- PZ-1 — SOIL VAPOR PIEZOMETER AND IDENTIFER

- PIT 1 — DISPOSAL PIT: Locations and boundaries for Pits 1, 2, 3a, 3b, 3c, 4b, and 4c were determined approximately based on trenching operations. Locations and boundaries for other disposal pits are based on analysis of a January 26, 1981, aerial photo and on reports. Locations and boundaries are tentative and approximate.
- 2 — LINED CUTTINGS DISPOSAL PIT FOR PREVIOUS FIELD INVESTIGATIONS, 1988–1992; LOCATIONS APPROXIMATE; NUMBER INDICATES FIELD OPERATIONS FOR WHICH PIT WAS USED
  - 1 = STAGE I FIELD INVESTIGATION
  - 2 = STAGE II FIELD INVESTIGATION
  - 3 = SUPPLEMENTAL WORK
- LINED CUTTINGS DISPOSAL PIT FOR ADDITIONAL INVESTIGATION, 1993; LOCATION APPROXIMATE

SOURCE: Errol L. Montgomery & Associates, Inc.

Figure 2
Location Map for Former Hazardous Waste Disposal Area
Hassayampa Landfill Superfund Site
Maricopa County, Arizona



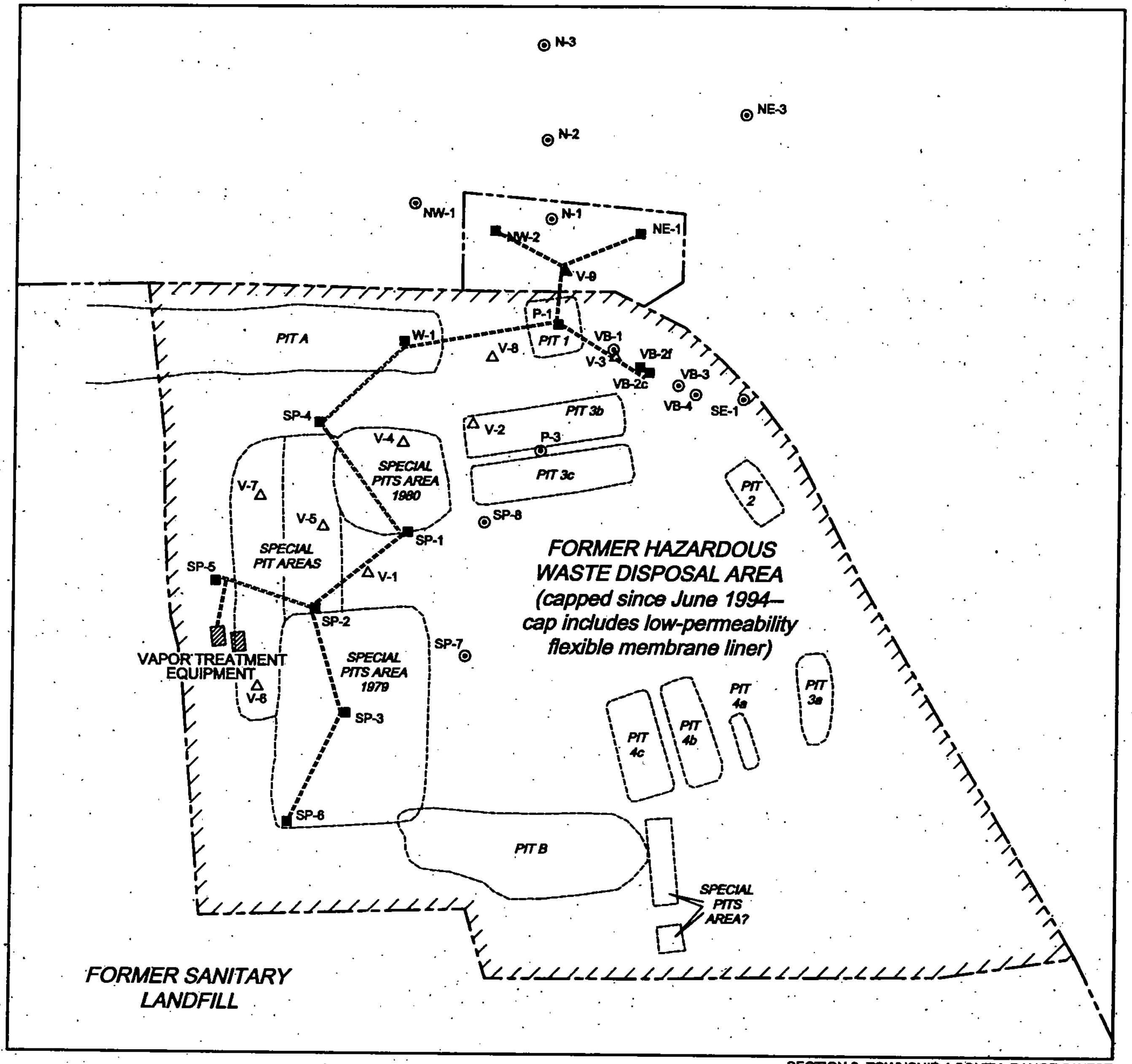
EXPLANATION

- MW-1UA — UNIT A MONITOR WELL AND IDENTIFIER
- MW-1UB — UNIT B MONITOR WELL AND IDENTIFIER
- EW-1UA — UNIT A EXTRACTION WELL AND IDENTIFIER
- IW-1UB — UNIT B INJECTION WELL AND IDENTIFIER
- HS-2 — ABANDONED MONITOR WELL CONSTRUCTED BY ARIZONA DEPARTMENT OF HEALTH SERVICES
- INJECTION PIPELINE
- EXTRACTION PIPELINE

Figure 3
Location Map for Groundwater Remediation System and Caps
Five-Year Review
Hassayampa Landfill Superfund Site
Maricopa County, Arizona

CH2MHILL

155719.FR.01 GrdWtrWells&Caps.FH8 9/6/01 pm

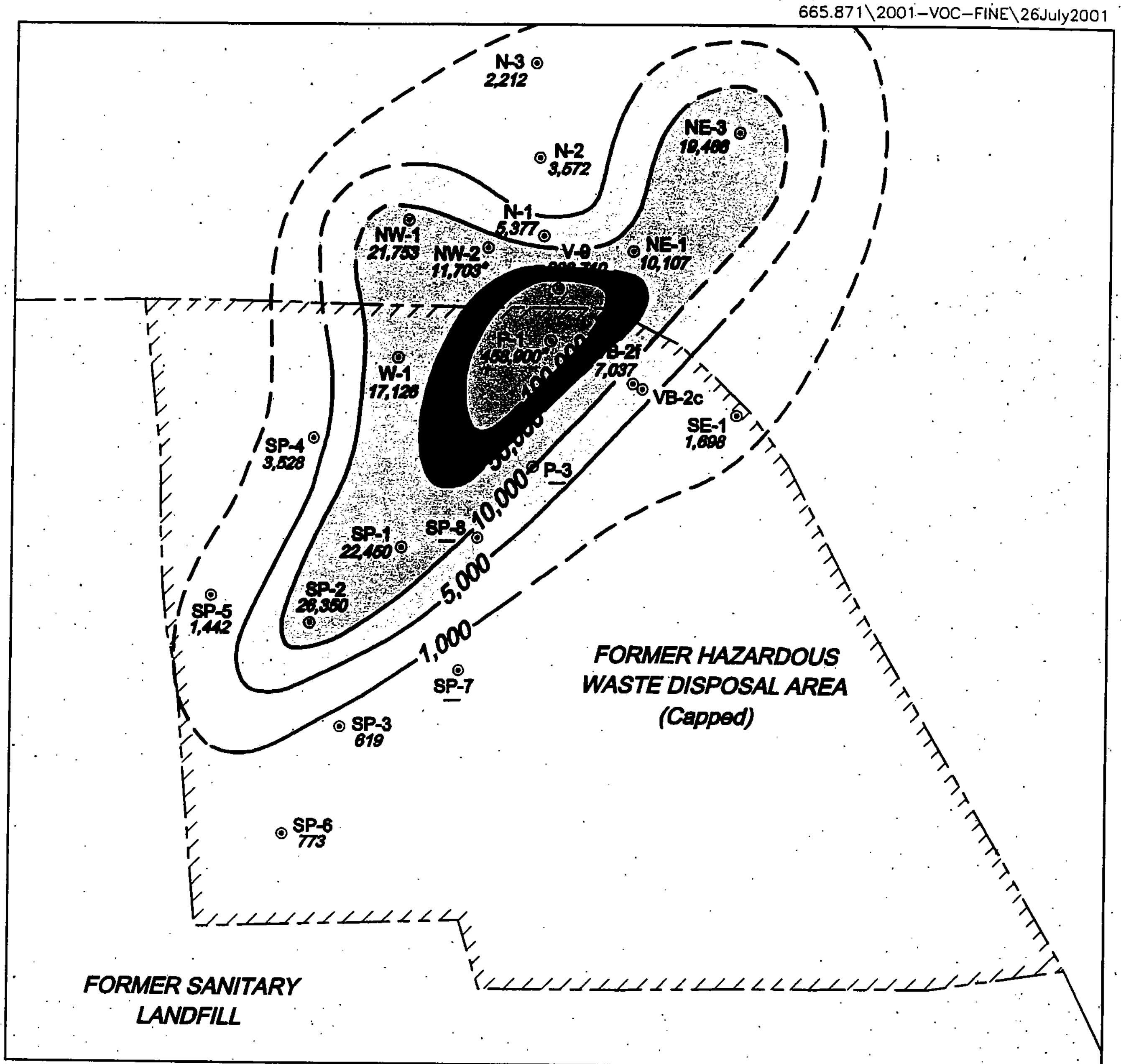


EXPLANATION

- VB-1 SOIL VAPOR MONITOR WELL
- NE-1 SOIL VAPOR EXTRACTION WELL
- V-8 PASSIVE SOIL VAPOR INJECTION WELL
- V-9 ACTIVE SOIL VAPOR INJECTION WELL
- SOIL VENTING AND TREATMENT SYSTEM PIPELINE
- PIT 1 DISPOSAL PIT: Locations and boundaries for Pits 1, 2, 3a, 3b, 3c, 4b, and 4c were determined approximately based on trenching operations. Locations and boundaries for other disposal pits are based on analysis of a January 26, 1981 aerial photo and on reports. Locations and boundaries are tentative and approximate.

Figure 4
Location Map for Soil Venting and Treatment System
Hassayampa Landfill Superfund Site
Maricopa County, Arizona

665.871\2001–VOC–FINE\26July2001



EXPLANATION

SE-1 1,698 — SOIL VAPOR WELL

TOTAL VOC CONCENTRATION, in micrograms per liter, April 2001
— = not analyzed
* Concentration measured during the October 2000 sampling round

—*1,000*— CONTOUR FOR TOTAL VOC CONCENTRATION, in micrograms per liter, dashed and queried where inferred

SOURCE: Errol L. Montgomery & Associates, Inc.

N

0 50 100 150 200 250 300
FEET

Figure 5

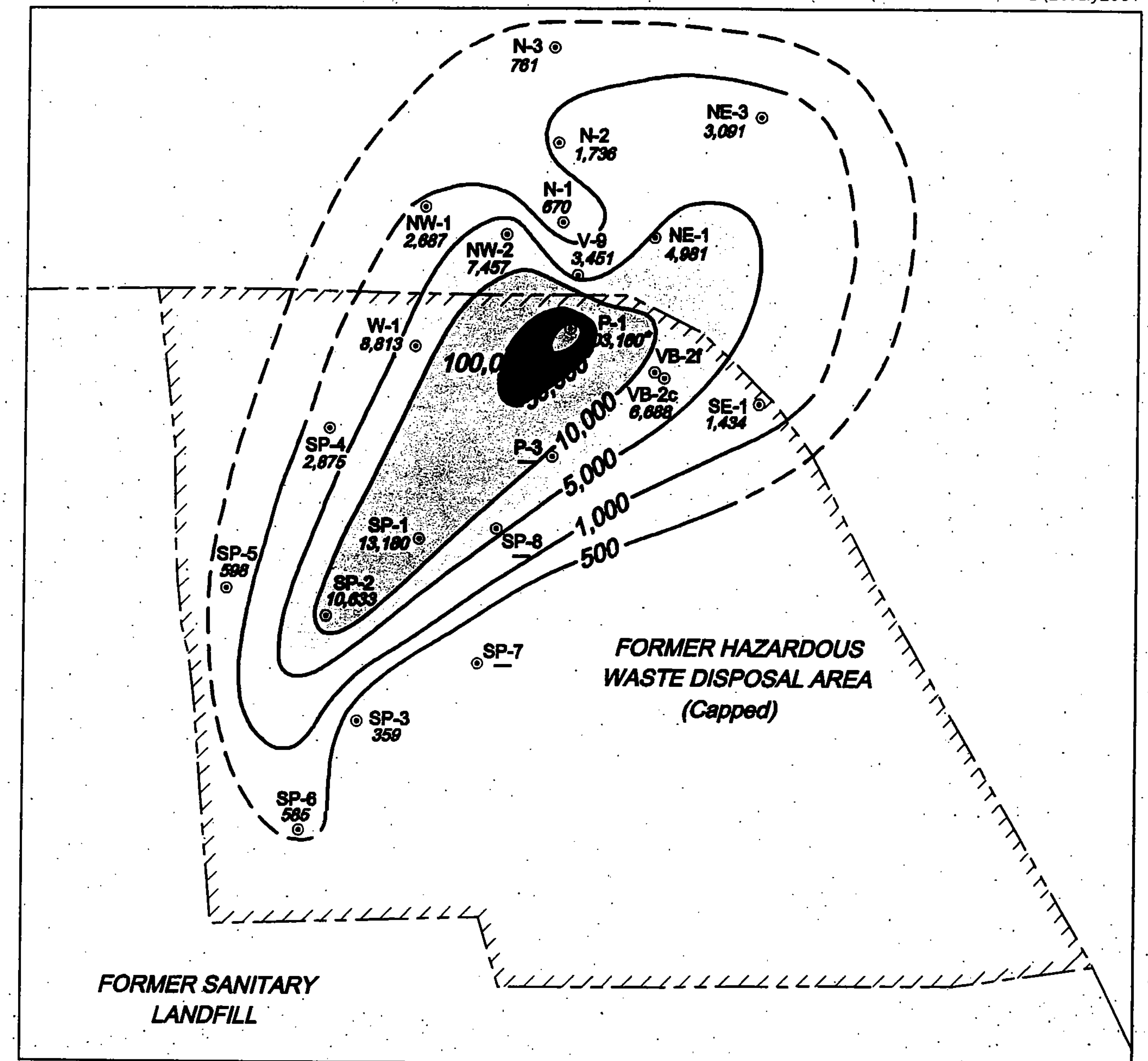
Contour Map for Total VOC Concentrations Detected in Soil Vapor Samples Obtained in 2001 from the Fine-Grained Zone Completions of Vapor Wells

Hassayampa Landfill Superfund Site
Maricopa County, Arizona

155719.FR.01•VOCs April01 fine•9/6/01•pm•SFO

CH2MHILL

665.871\2001-VOC-COARSE\26July2001



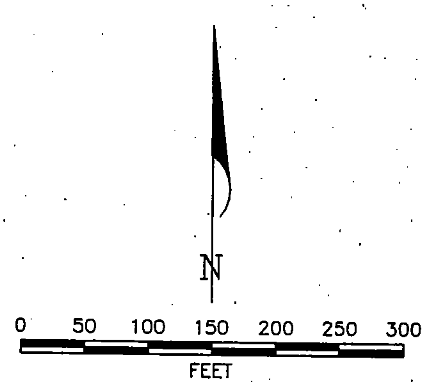
SECTION 3, TOWNSHIP 1 SOUTH, RANGE 5 WEST

EXPLANATION

SE-1 1,434 — SOIL VAPOR WELL

TOTAL VOC CONCENTRATION, in micrograms per liter, April 2001
— = not analyzed
* Concentration measured during the October 2000 sampling round

—1,000— CONTOUR FOR TOTAL VOC CONCENTRATION, in micrograms per liter, dashed and queried where inferred



SOURCE: Errol L. Montgomery & Associates, Inc.

Figure 6

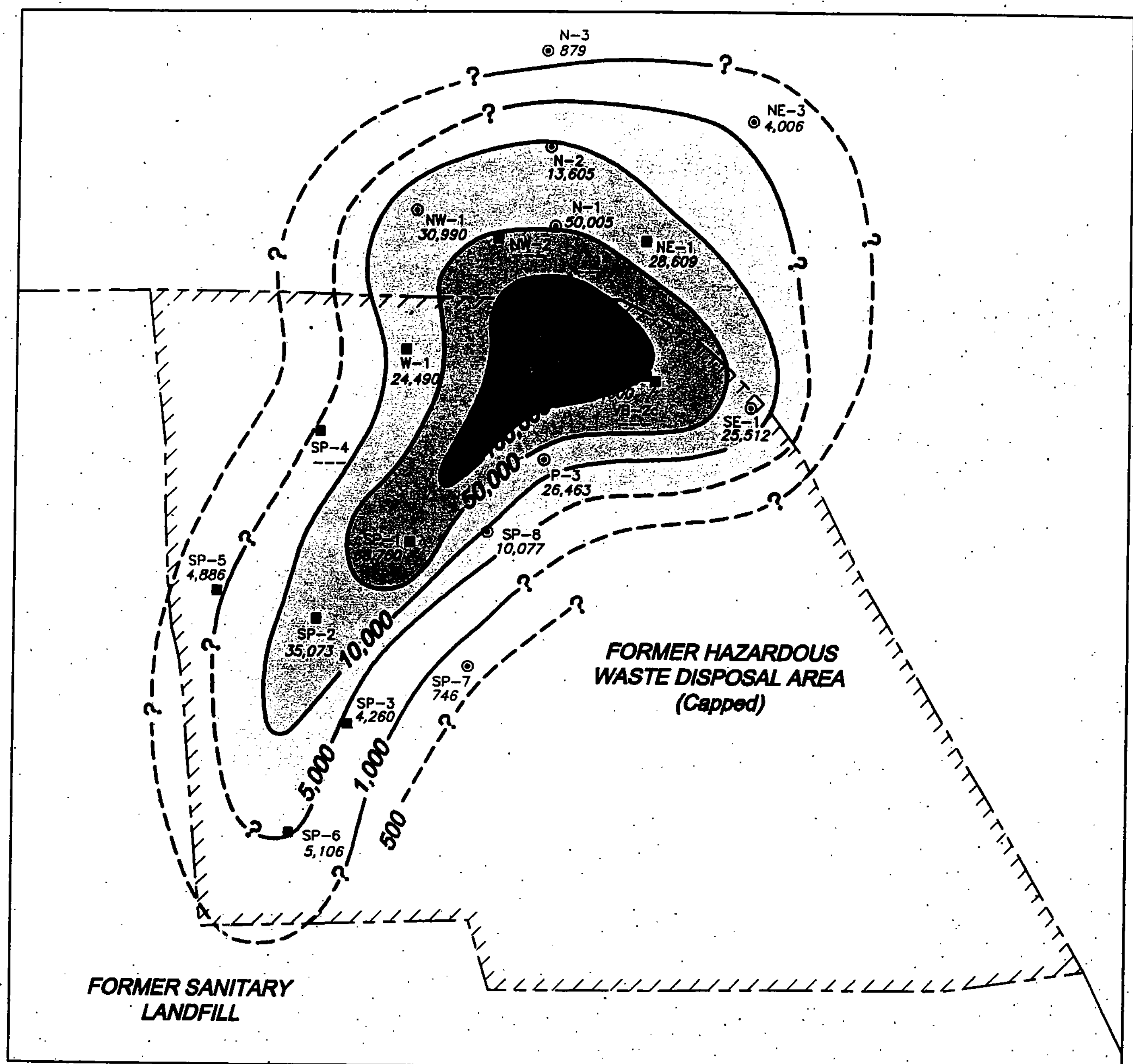
Contour Map for Total VOC Concentrations Detected in Soil Vapor Samples Obtained in 2001 from the Coarse-Grained Zone Completions of Vapor Wells

Hassayampa Landfill Superfund Site

Maricopa County, Arizona

155719.FR.01•VOCs April01 Coarse•9/6/01•pm•SFO

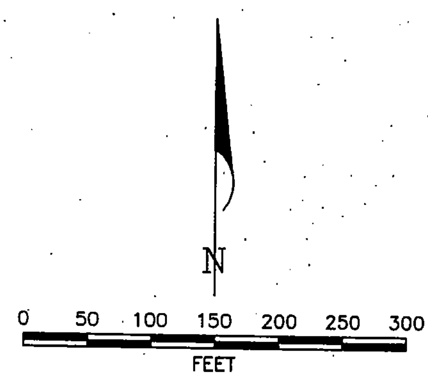
CH2MHILL



SECTION 3, TOWNSHIP 1 SOUTH, RANGE 5 WEST

EXPLANATION

◎ N-1	SOIL VAPOR MONITOR WELL
50,005 ——	TOTAL VOC CONCENTRATION, DECEMBER 1993, in micrograms per liter
■ NE-1	SOIL VAPOR EXTRACTION WELL
▲ V-9	ACTIVE SOIL VAPOR INJECTION WELL
— 100 —	CONTOUR FOR TOTAL VOC CONCENTRATION, in micrograms per liter, dashed and queried where inferred



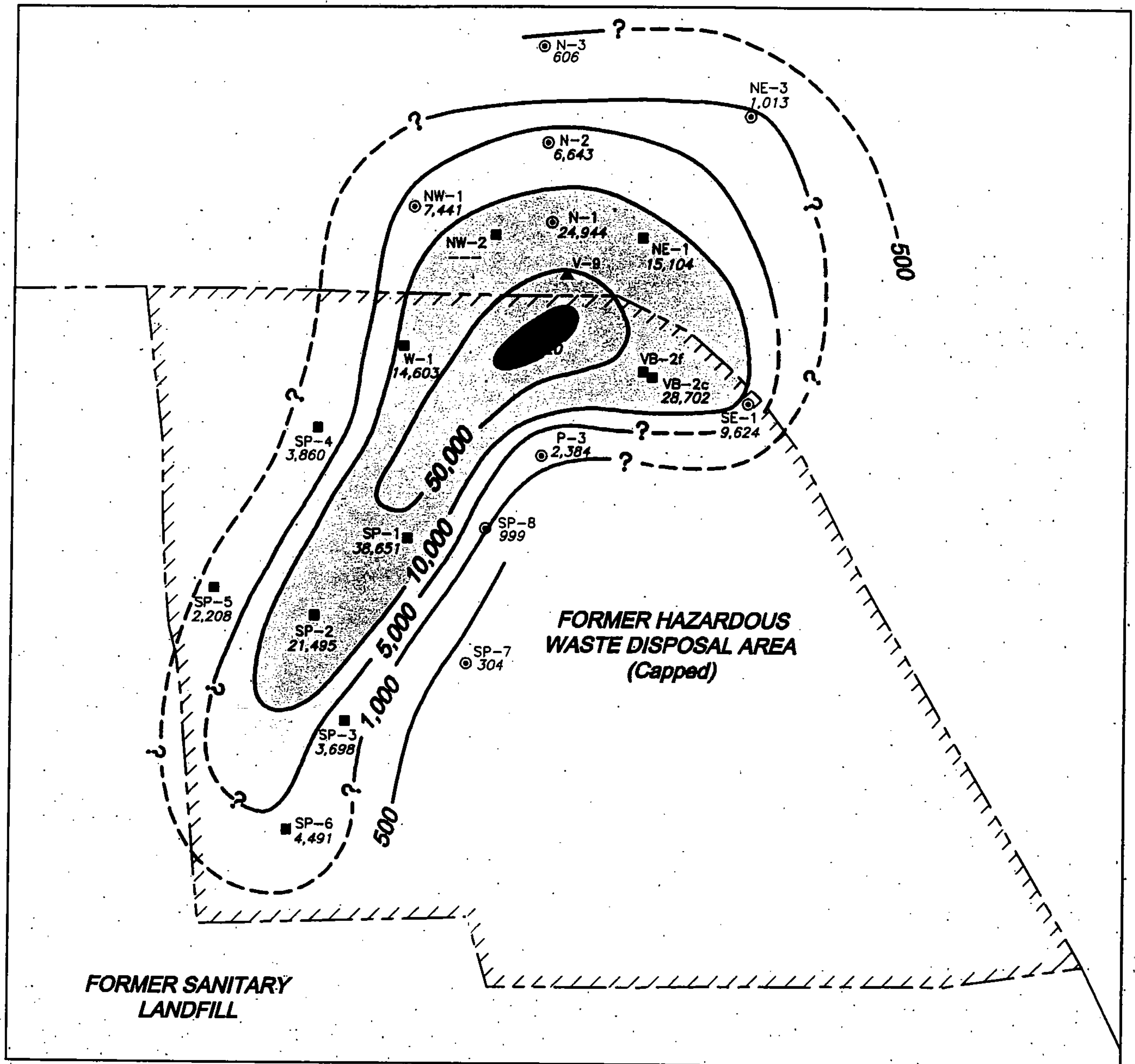
SOURCE: Errol L. Montgomery & Associates, Inc.

Figure 7

Contour Map for Total VOC Concentrations Detected in Soil Vapor Samples Obtained in 1993 from the Fine-Grained Zone Completions of Vapor Wells

Hassayampa Landfill Superfund Site

Maricopa County, Arizona



SECTION 3, TOWNSHIP 1 SOUTH, RANGE 5 WEST

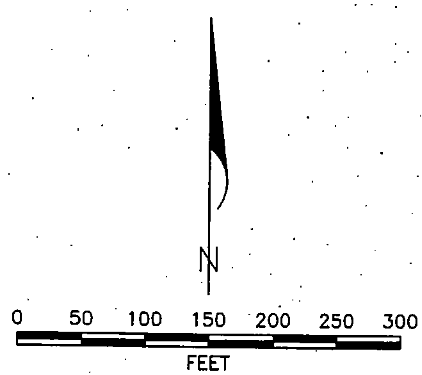
EXPLANATION

⊙ N-1 — SOIL VAPOR MONITOR WELL
24,944 — TOTAL VOC CONCENTRATION, DECEMBER 1993, in micrograms per liter

■ NE-1 — SOIL VAPOR EXTRACTION WELL

▲ V-9 — ACTIVE SOIL VAPOR INJECTION WELL

— 100 — CONTOUR FOR TOTAL VOC CONCENTRATION, in micrograms per liter, dashed and queried where inferred

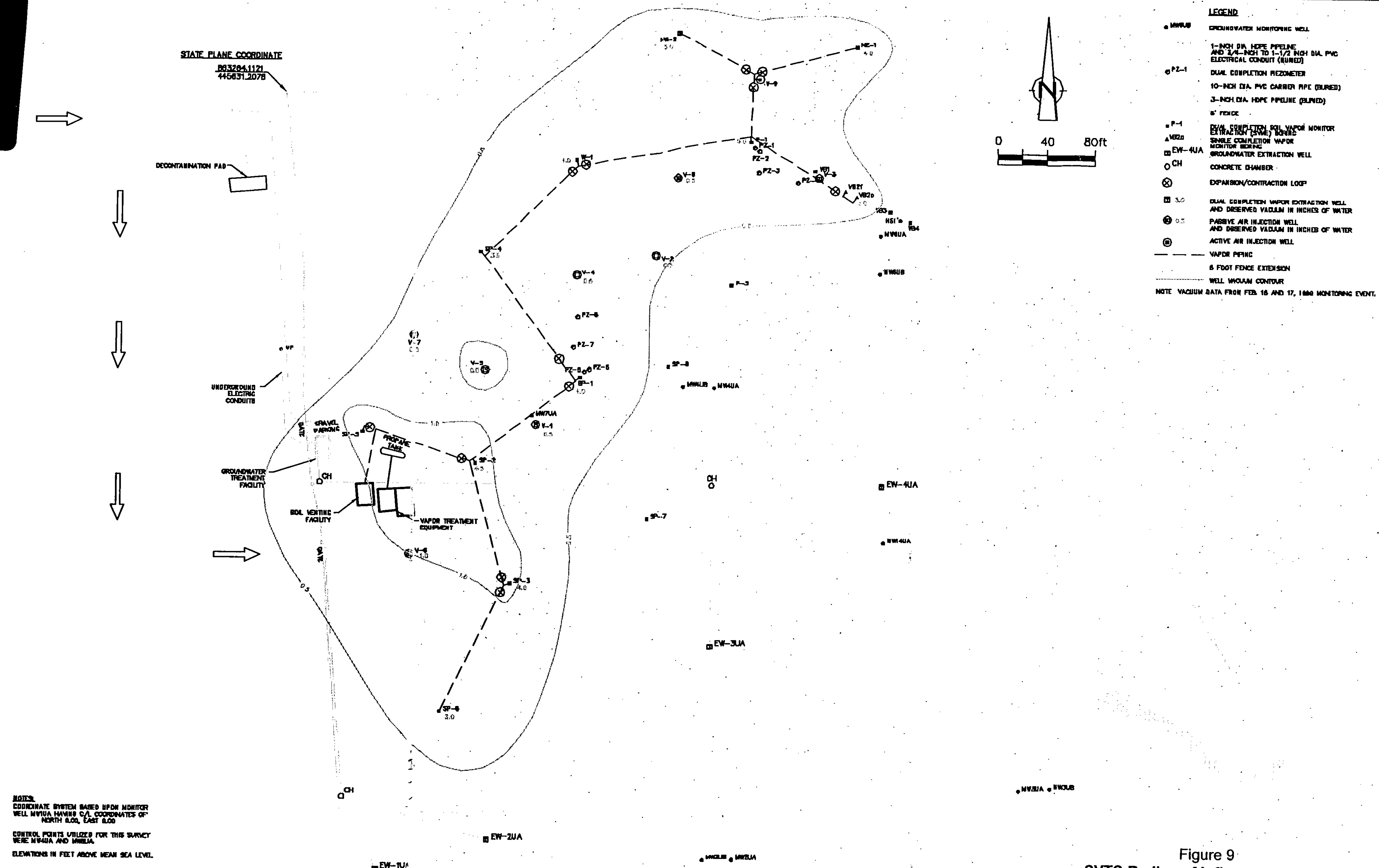


SOURCE: Errol L. Montgomery & Associates, Inc.

Figure 8
Contour Map for Total VOC Concentrations Detected in Soil Vapor Samples Obtained in 1993 from the Coarse-Grained Zone Completions of Vapor Wells
Hassayampa Landfill Superfund Site
Maricopa County, Arizona

155719.FR.01•Soil Vapor VOCs Coarse•9/6/01•pm•SFO

CH2MHILL



CRA

Figure 9
SVTS Radius of Influence Contour
Course Grained Zone
Hassayampa Landfill Superfund Site
Maricopa County, Arizona

155719.FR.01 Radius-Course.FH8 9/8/01 pm

CH2MHILL

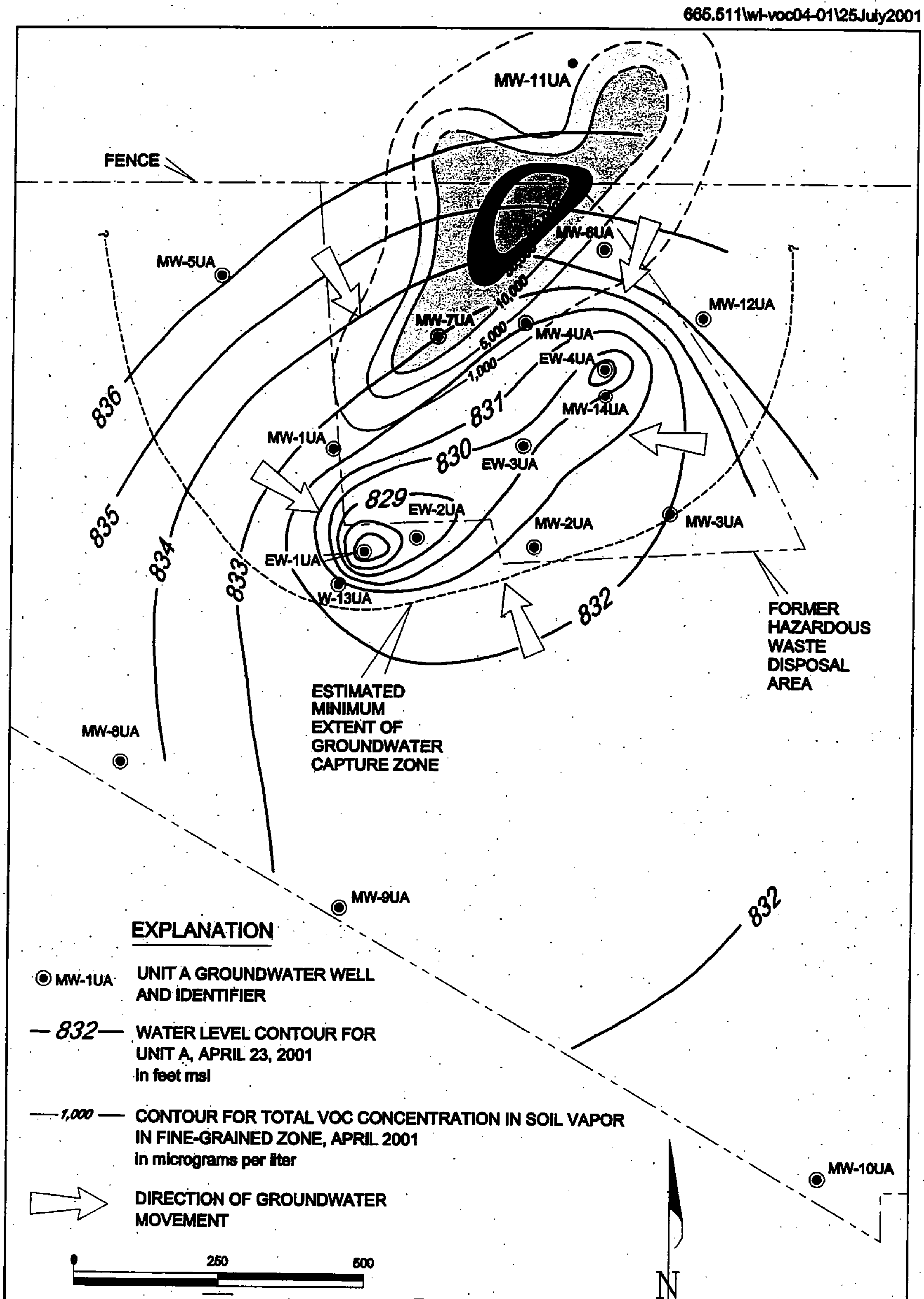


Figure 10
Groundwater Level Contours for Unit A and Contours for Total VOC Concentrations in Vadose Zone April 2001
Hassayampa Landfill Superfund Site
Maricopa County, Arizona

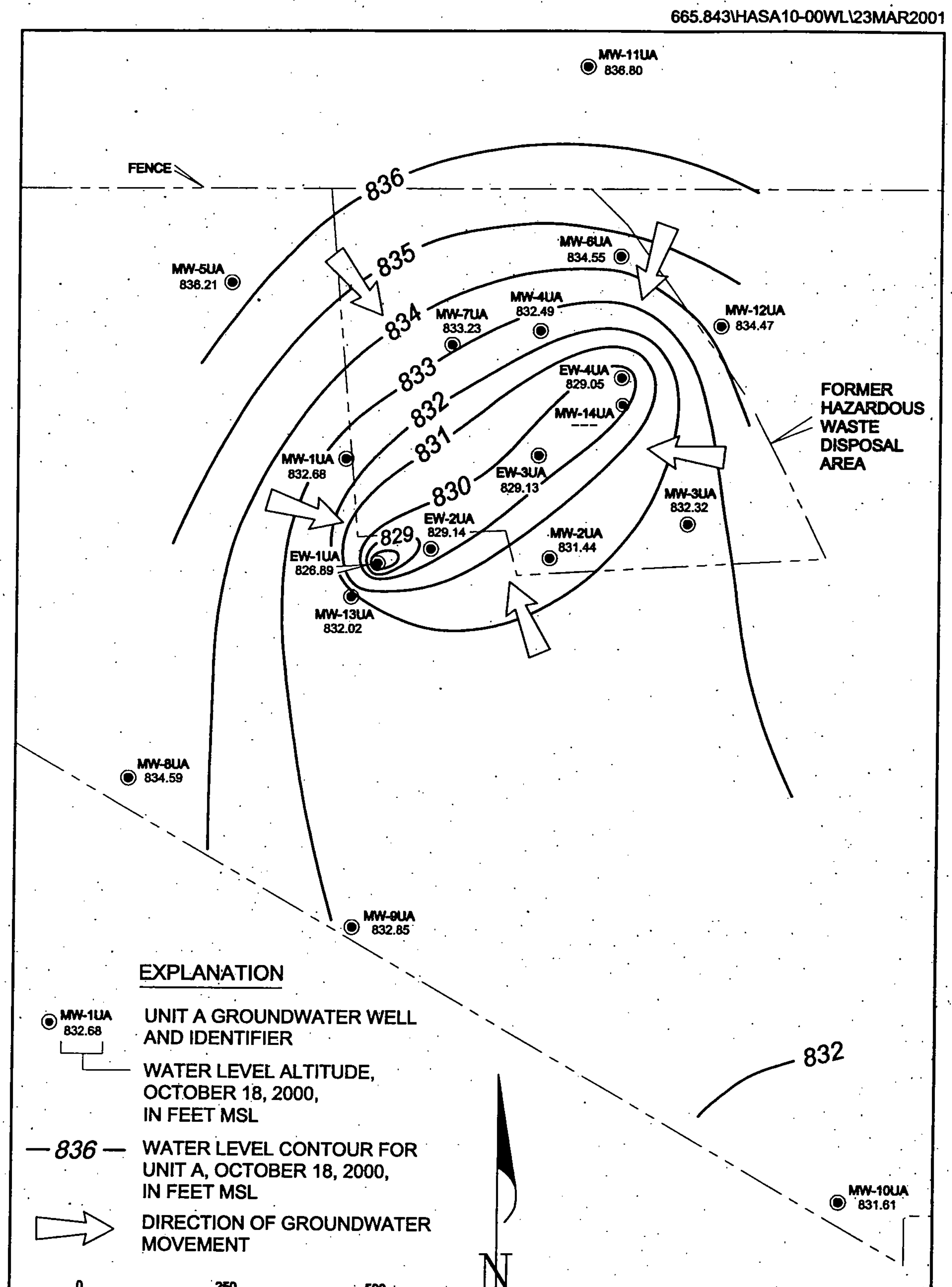


Figure 11
Groundwater Level Contours for Unit A October 18, 2000
Hassayampa Landfill Superfund Site
Maricopa County, Arizona

CH2MHILL

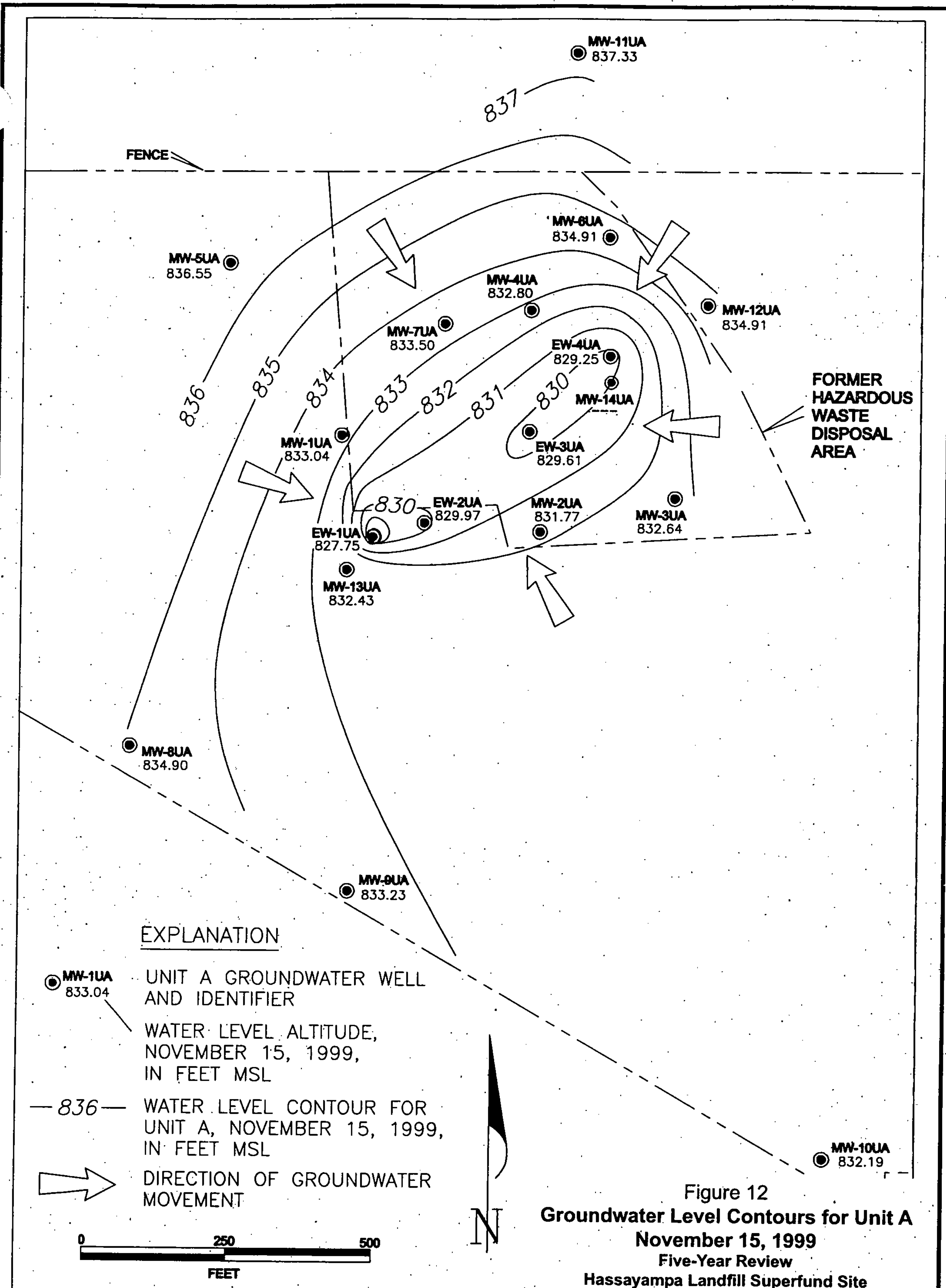


Figure 12
Groundwater Level Contours for Unit A
November 15, 1999
Five-Year Review
Hassayampa Landfill Superfund Site
Maricopa County, Arizona

SOURCE: Errol L. Montgomery & Associates, Inc.

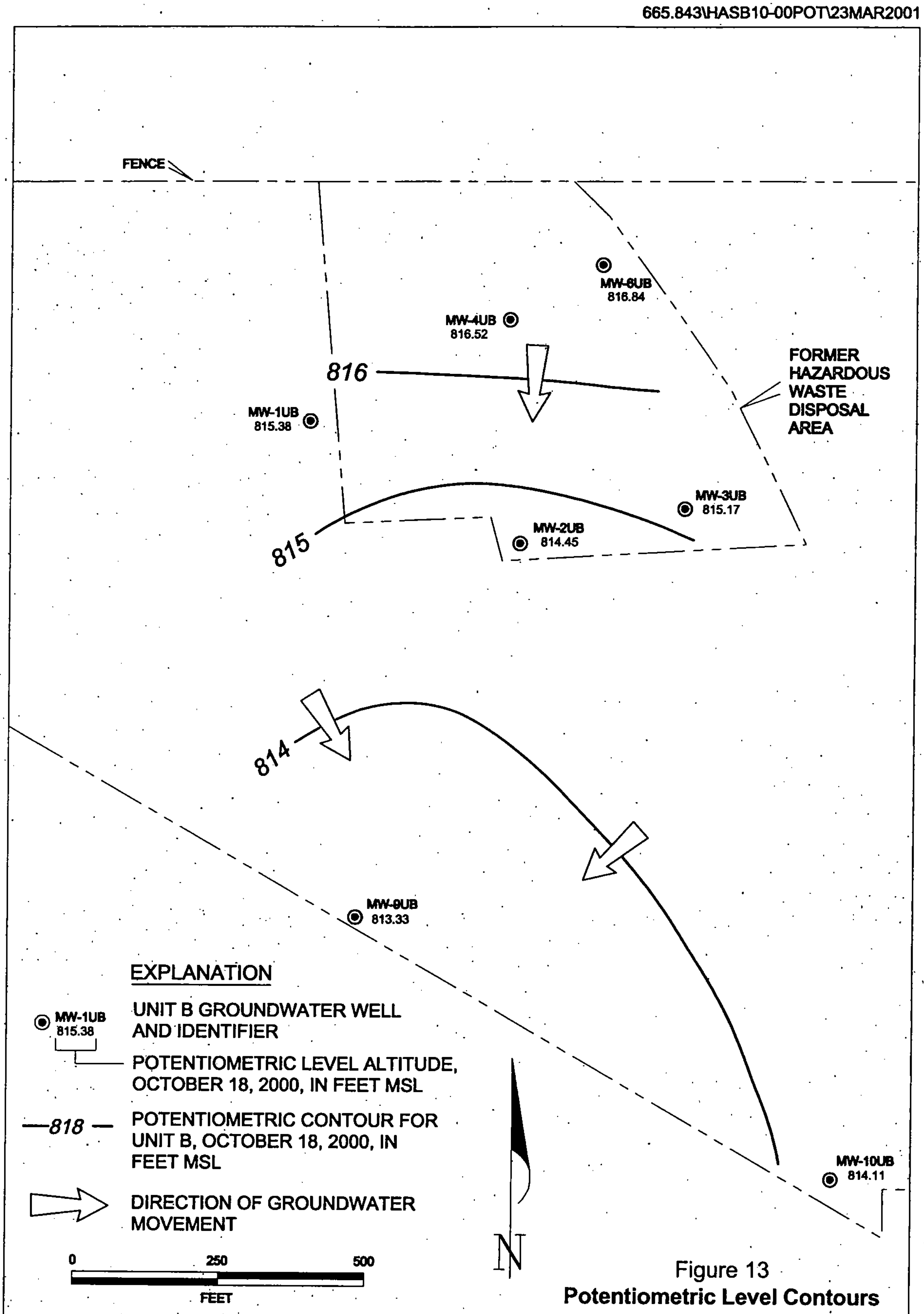


Figure 13
Potentiometric Level Contours for Unit B
October 18, 2000
Hassayampa Landfill Superfund Site
Maricopa County, Arizona

CH2MHILL

665.843\HASB05-00POT\23MAR2001

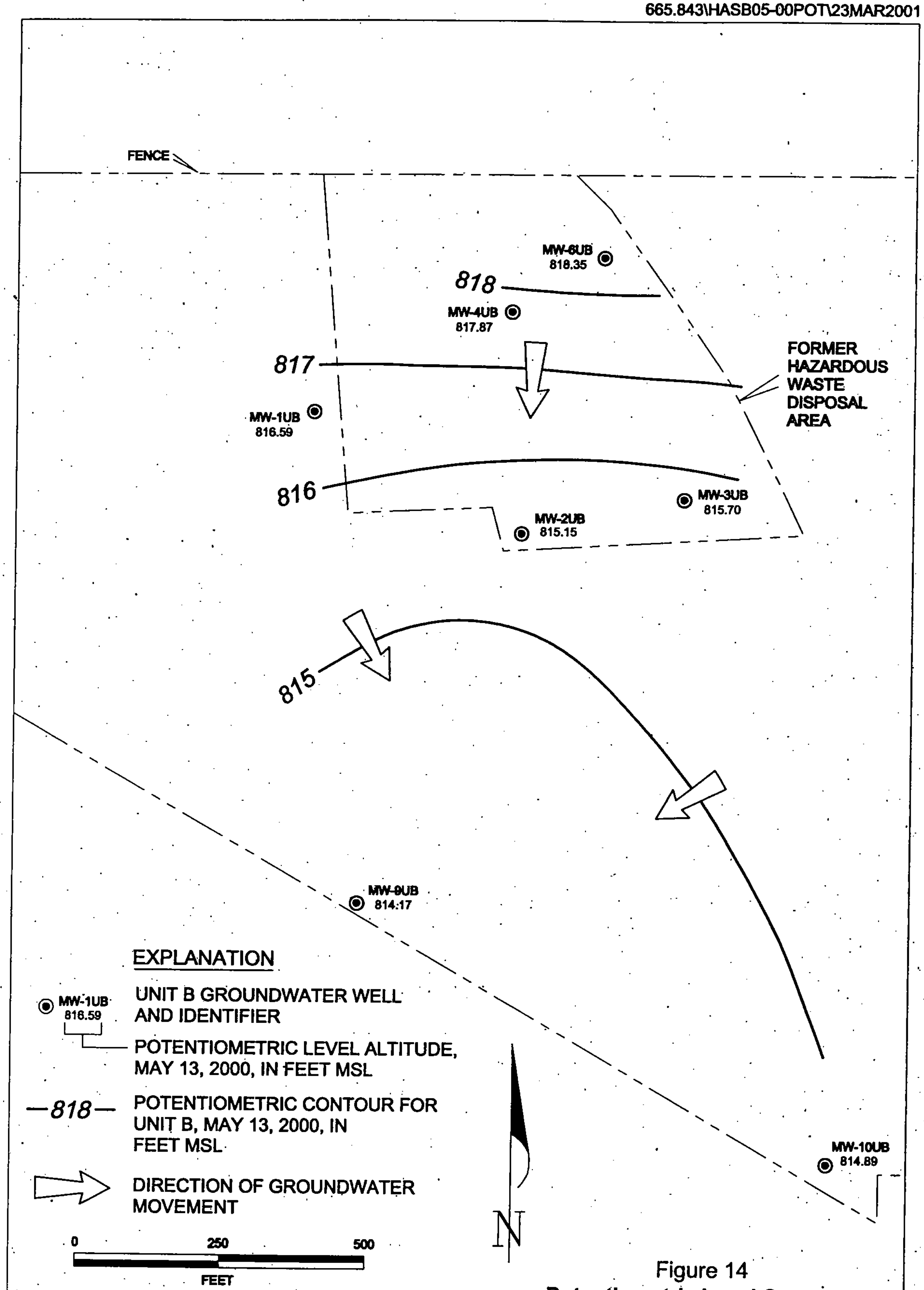
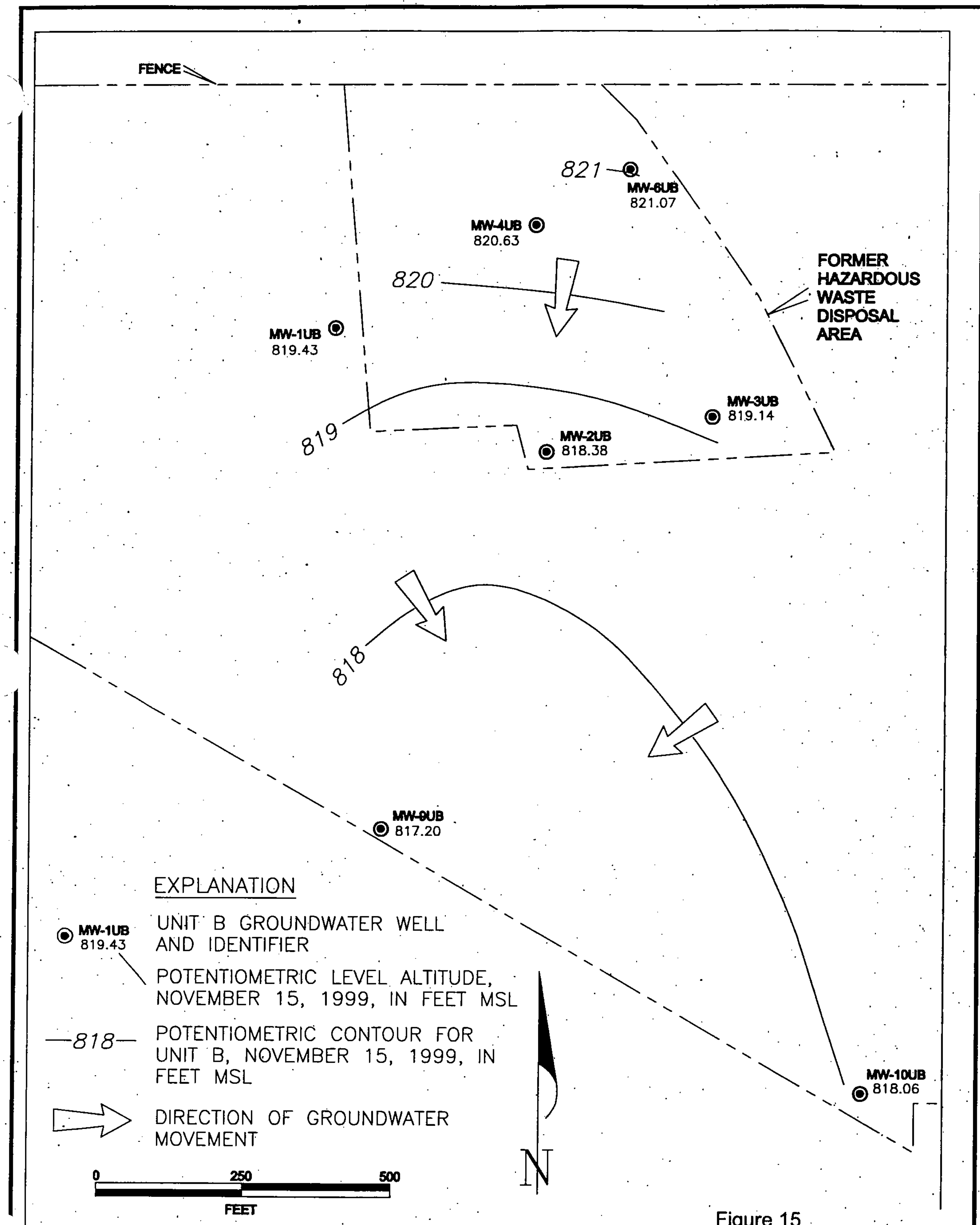


Figure 14
Potentiometric Level Contours for Unit B May 13, 2000
Hassayampa Landfill Superfund Site
Maricopa County, Arizona

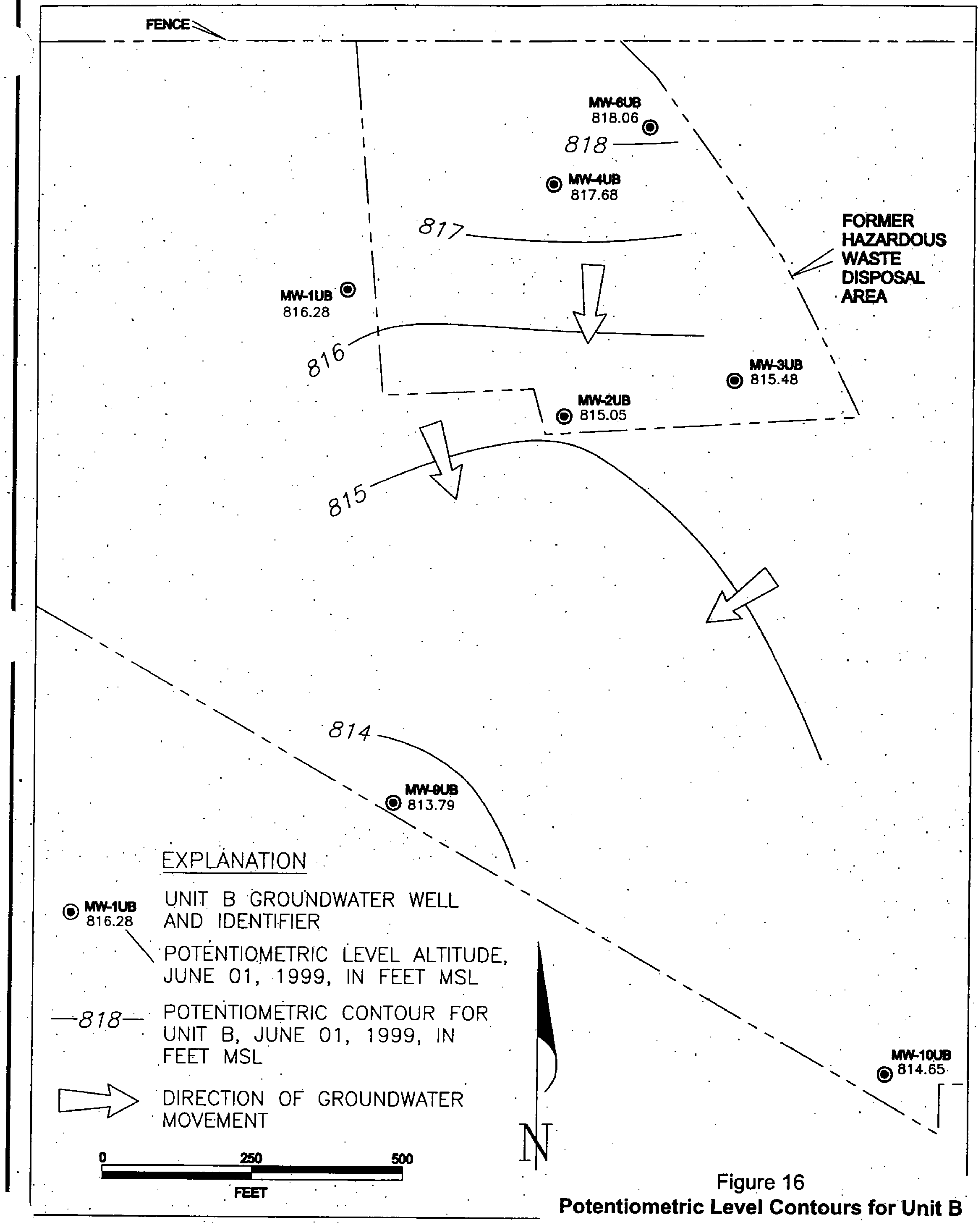


SOURCE: *Errol L. Montgomery & Associates, Inc.*

Figure 15
Potentiometric Level Contours for Unit B
November 15, 1999
Five-Year Review
Hassayampa Landfill Superfund Site
Maricopa County, Arizona

CH2MHILL

155719.FR.01 ContourUnitB Nov99.FH8 9/6/00 pm



SOURCE: Errol L. Montgomery & Associates, Inc.

Figure 16
Potentiometric Level Contours for Unit B
June 1, 1999
Five-Year Review
Hassayampa Landfill Superfund Site
Maricopa County, Arizona

155719.FR.01 ContoursUnitB June99.FH8 9/6/00 pm

CH2MHILL

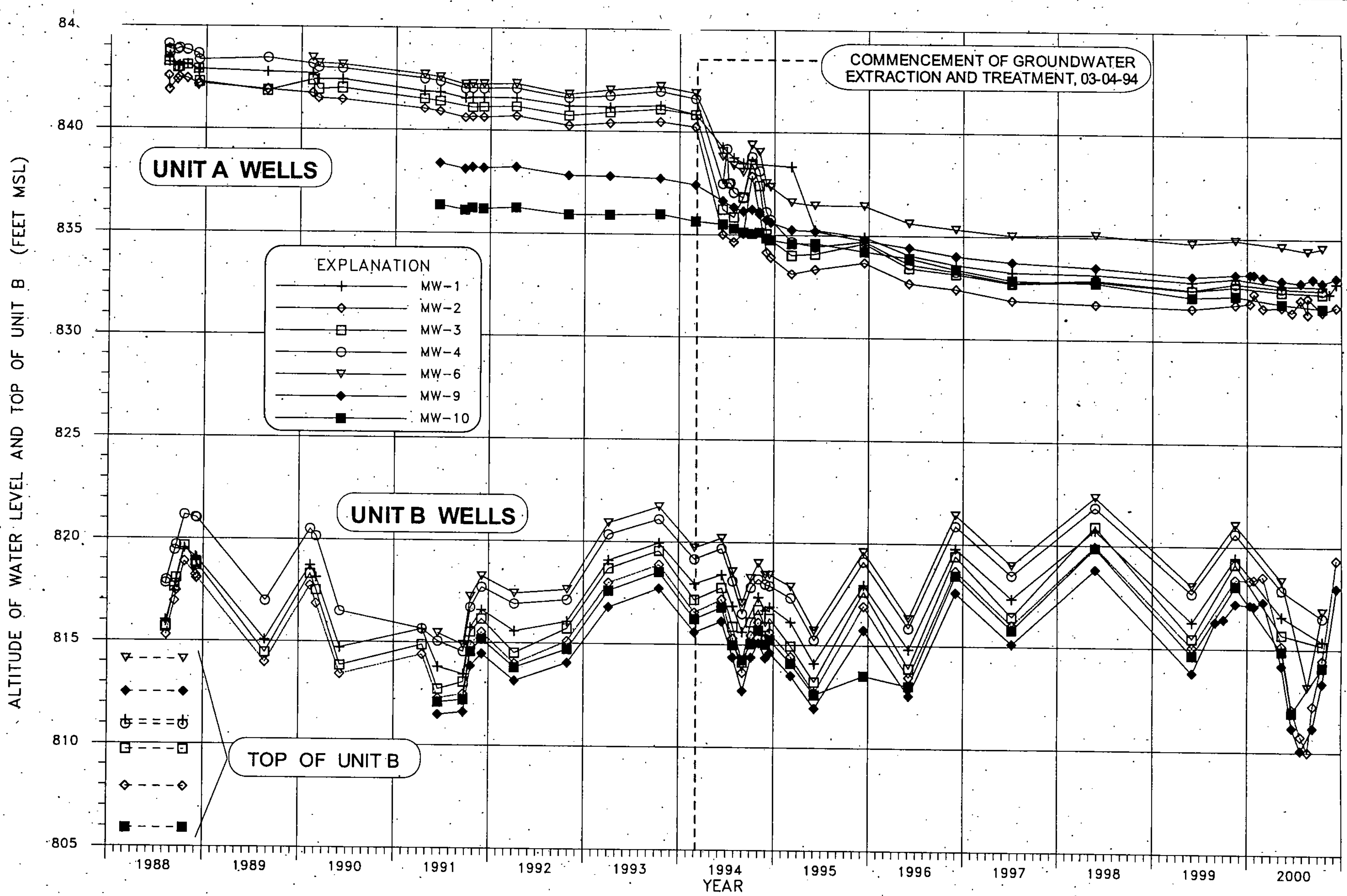
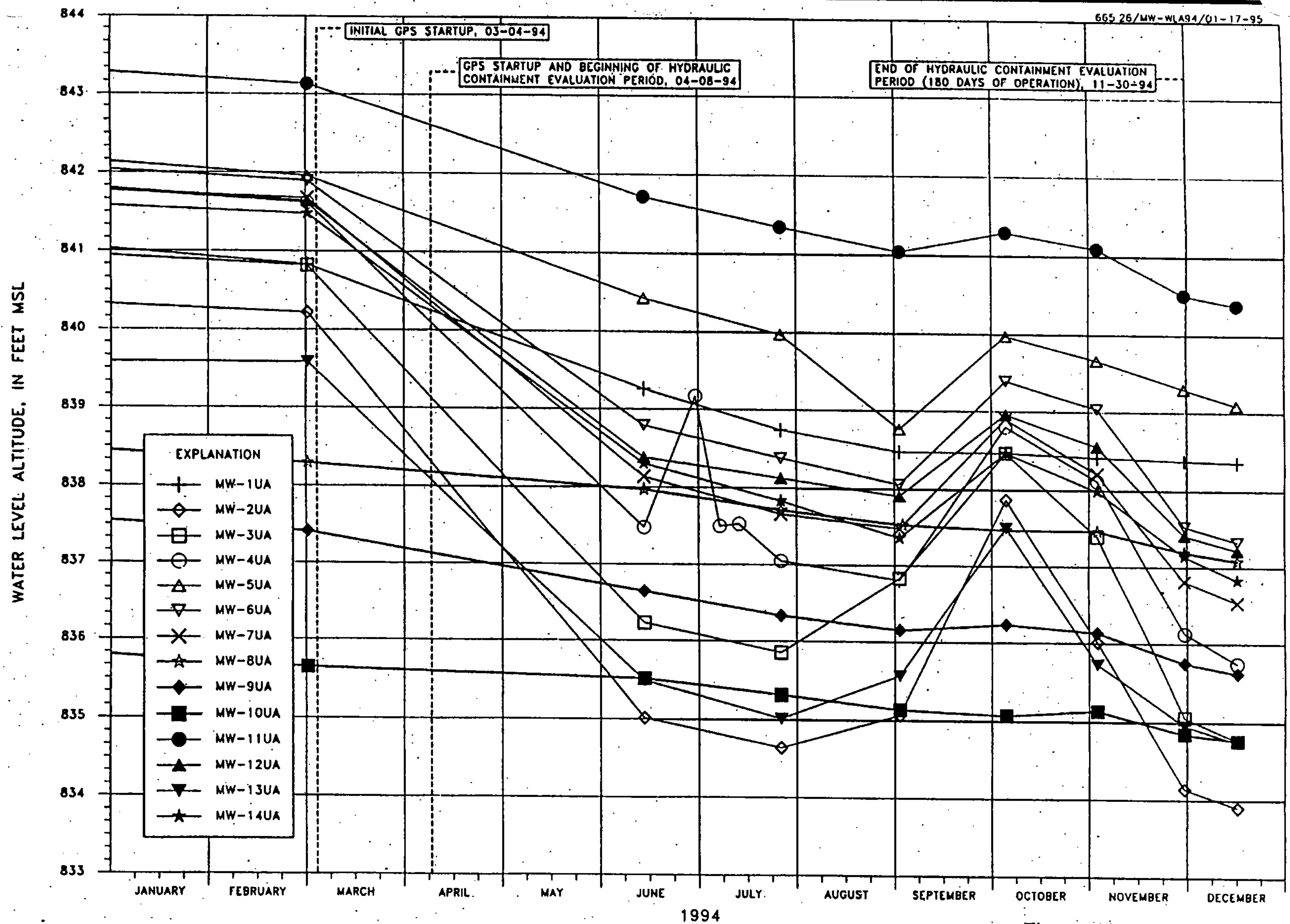


Figure 17
Water Level Hydrograph for Paired Unit A and Unit B Underground Monitor Wells and Altitude of Top of Unit B at Each Well Site
Hassayampa Landfill Superfund Site
Maricopa County, Arizona



SOURCE: Errol L. Montgomery & Associates, Inc.

Figure 18
Water Level Hydrograph for Unit A and Unit B Groundwater Monitor Wells, 1994
Five-Year Review
Hassayampa Landfill Superfund Site
Maricopa County, Arizona

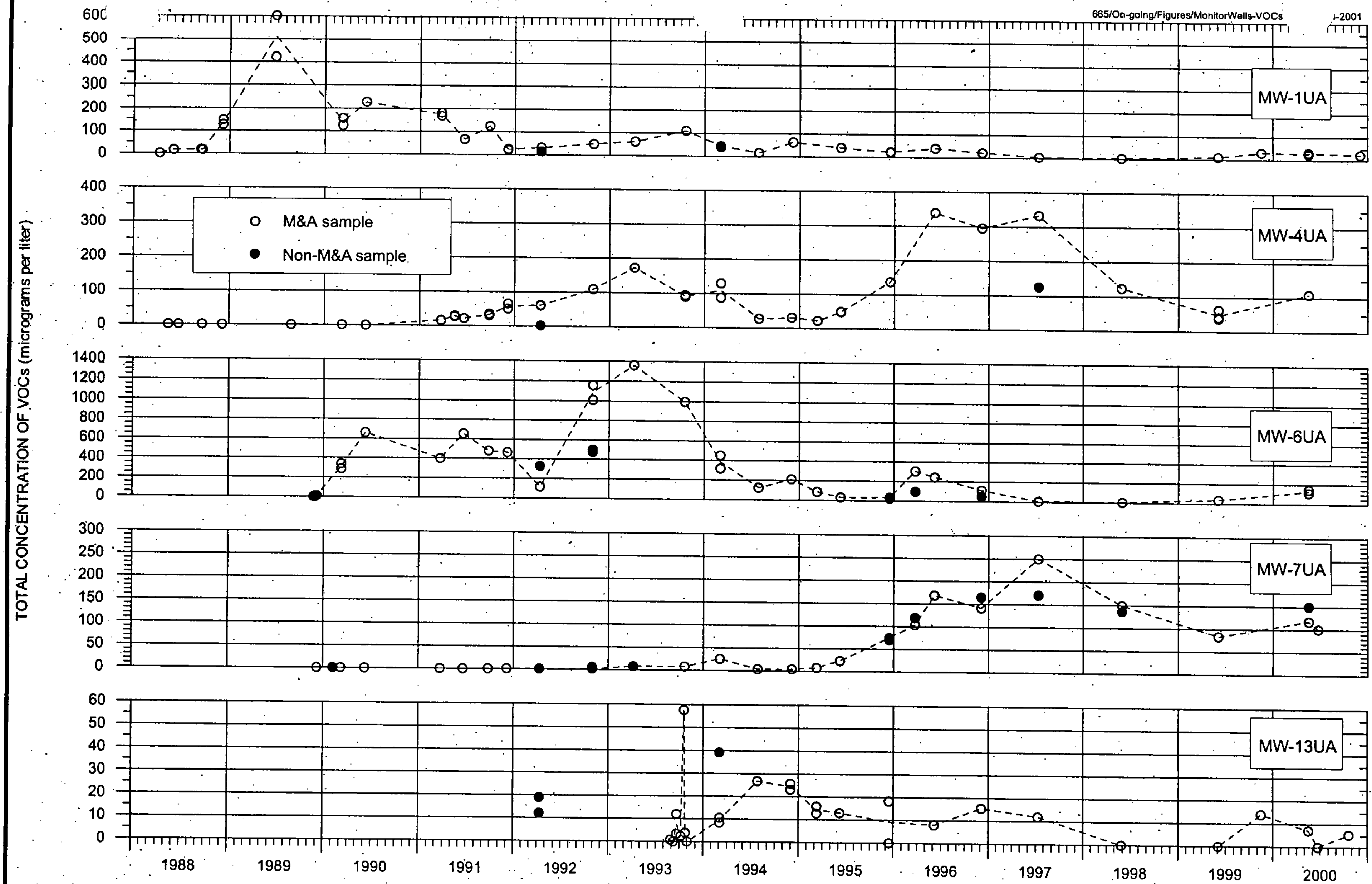


Figure 19
Total Concentration of Volatile Organic Compounds (VOCs) Detected and Confirmed in Groundwater Samples from Selected Groundwater Monitoring Wells
Hassayampa Landfill Superfund Site
Maricopa County, Arizona

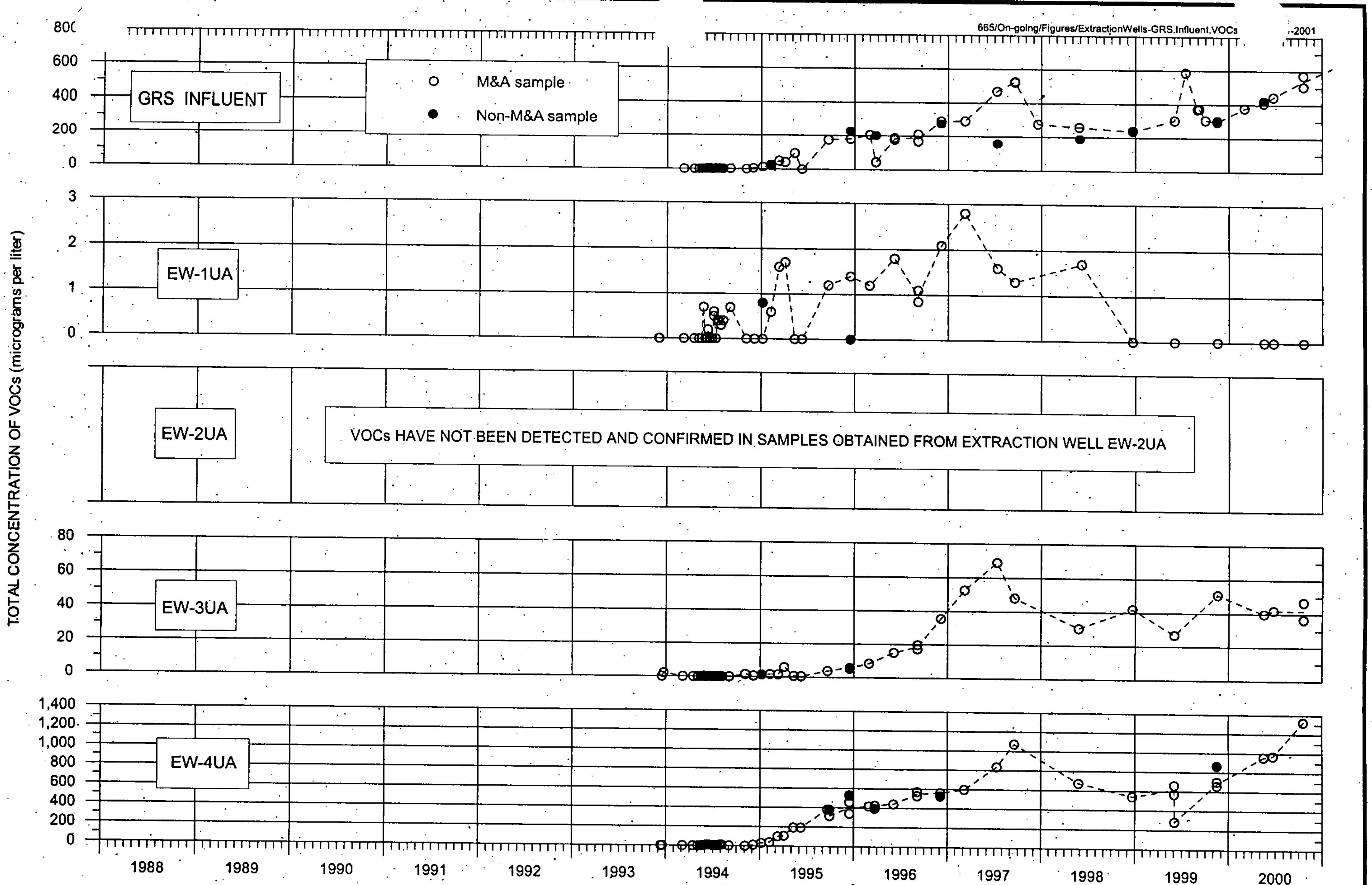


Figure 20

Total Concentration of Volatile Organic Compounds (VOCs) Detected and Confirmed in Groundwater Samples from Extraction Wells and Groundwater Remediation System Air Stripper Influent

Hassayampa Landfill Superfund Site

Maricopa County, Arizona

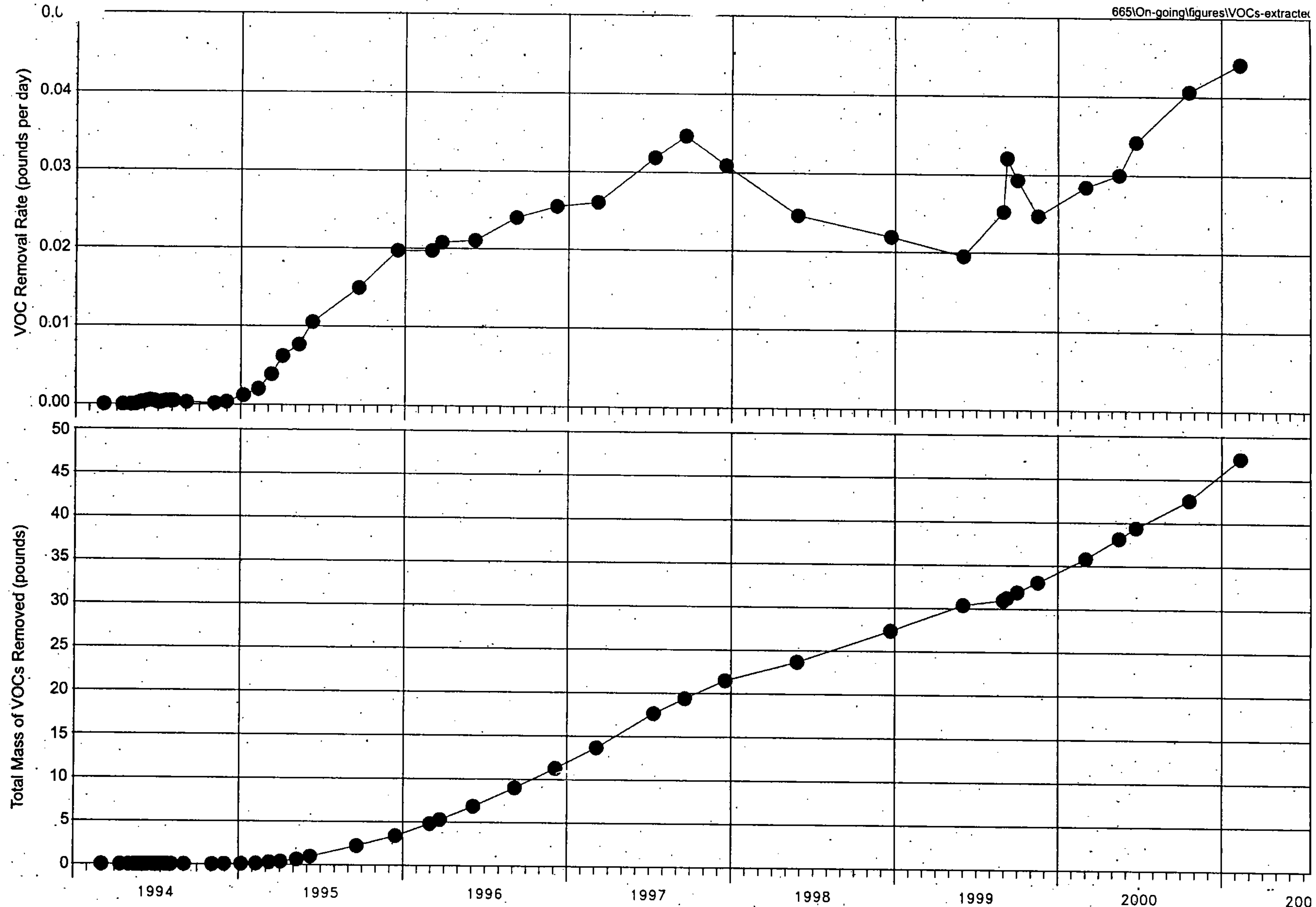


Figure 21
Estimated Mass of Volitile Organic Compounds (VOCs) Removed and VOC Mass Removal Rate Groundwater Remediation System
Hassayampa Landfill Superfund Site
Maricopa County, Arizona

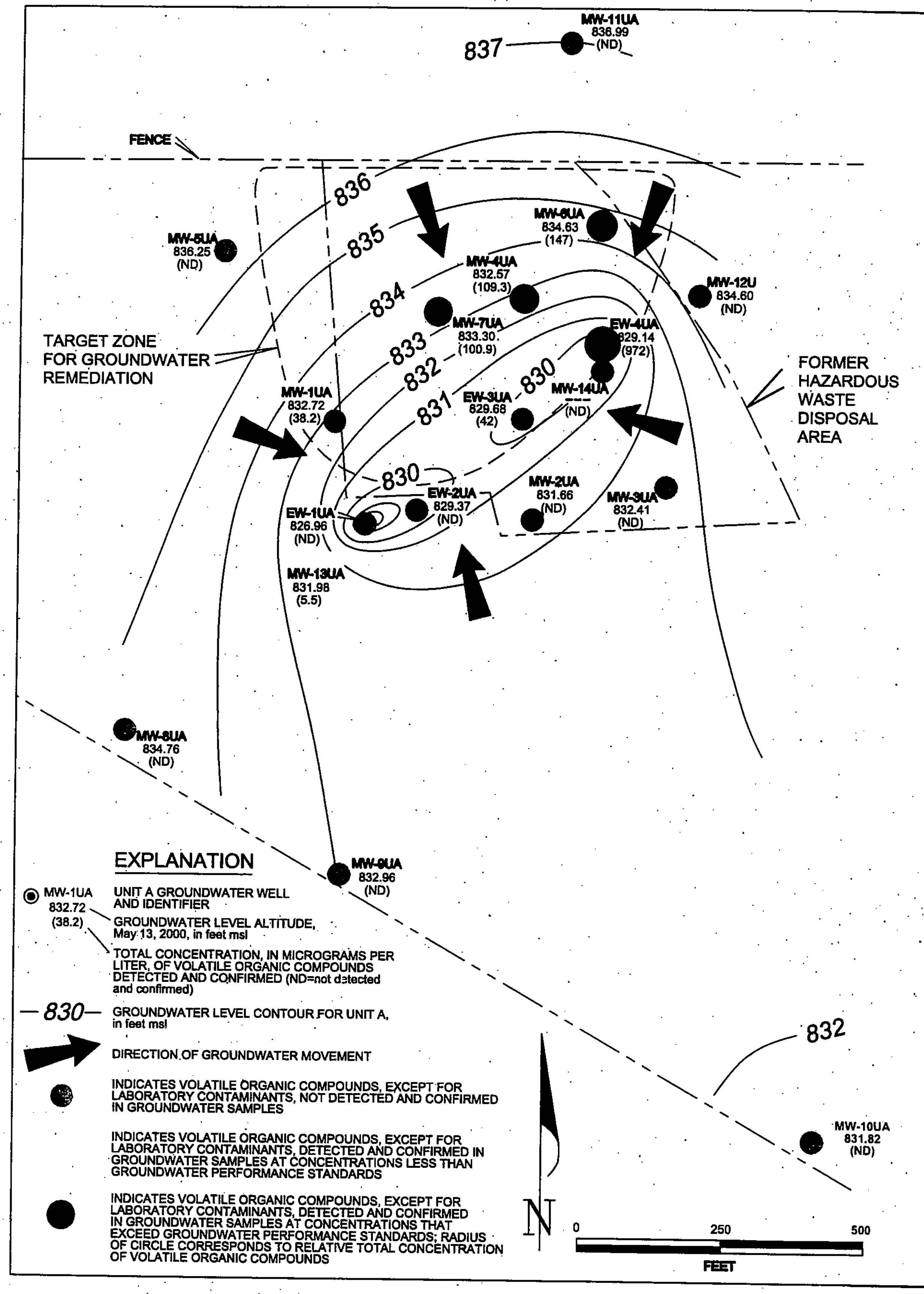


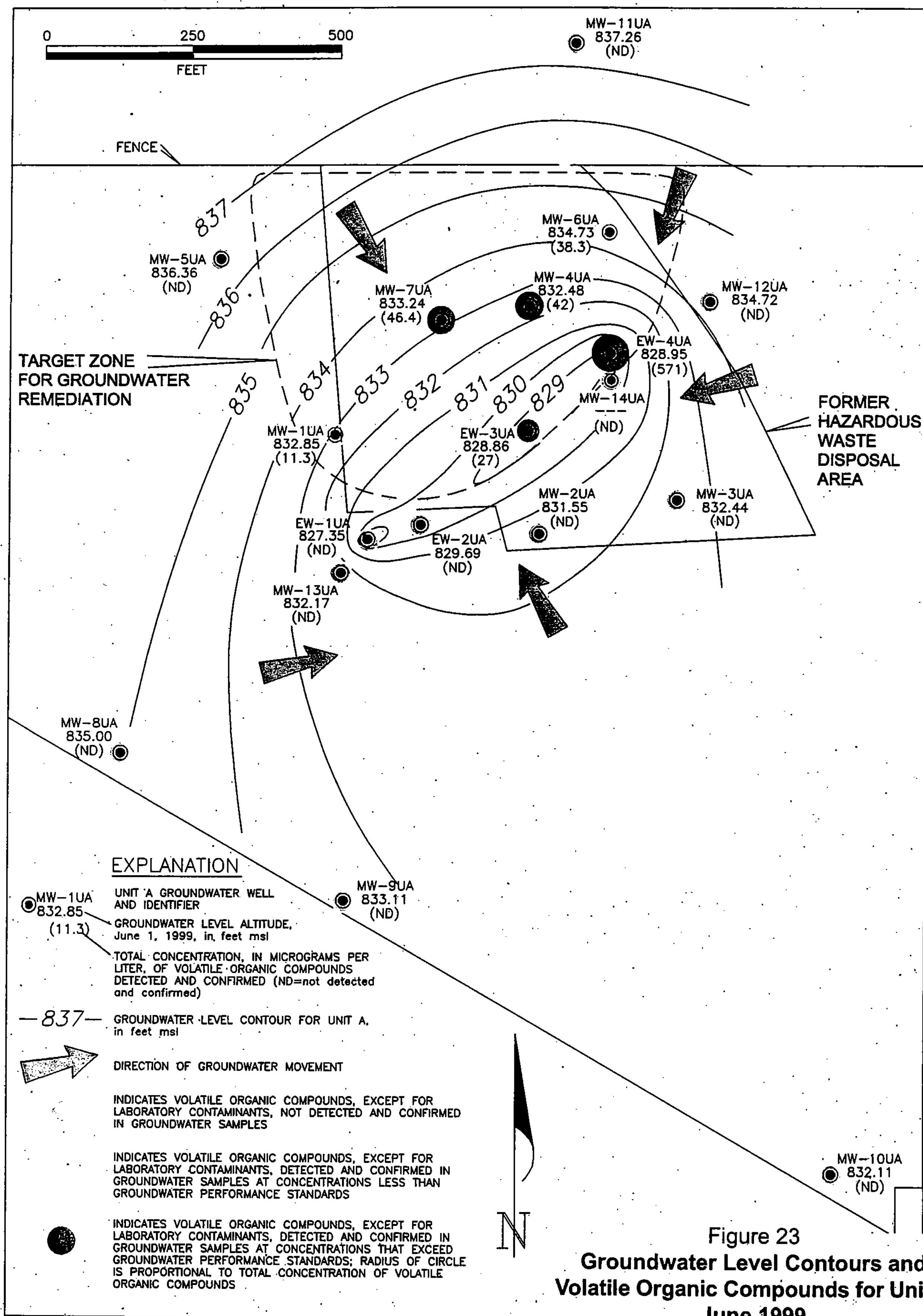
Figure 22

Groundwater Level Contours and Volatile Organic Compounds for Unit A May 13, 2000

Hassayampa Landfill Superfund Site Maricopa County, Arizona

155719.FR.01•GrdWlr Unit A 2000•9/14/01•pm•SFO

CH2MHILL



SOURCE: Errol L. Montgomery & Associates, Inc.

Figure 23
Groundwater Level Contours and Volatile Organic Compounds for Unit A June 1999
Five-Year Review
Hassayampa Landfill Superfund Site
Maricopa County, Arizona

CH2MHILL

155719.FR.01 GrdWtrUnitA.FH8 9/7/00 pm

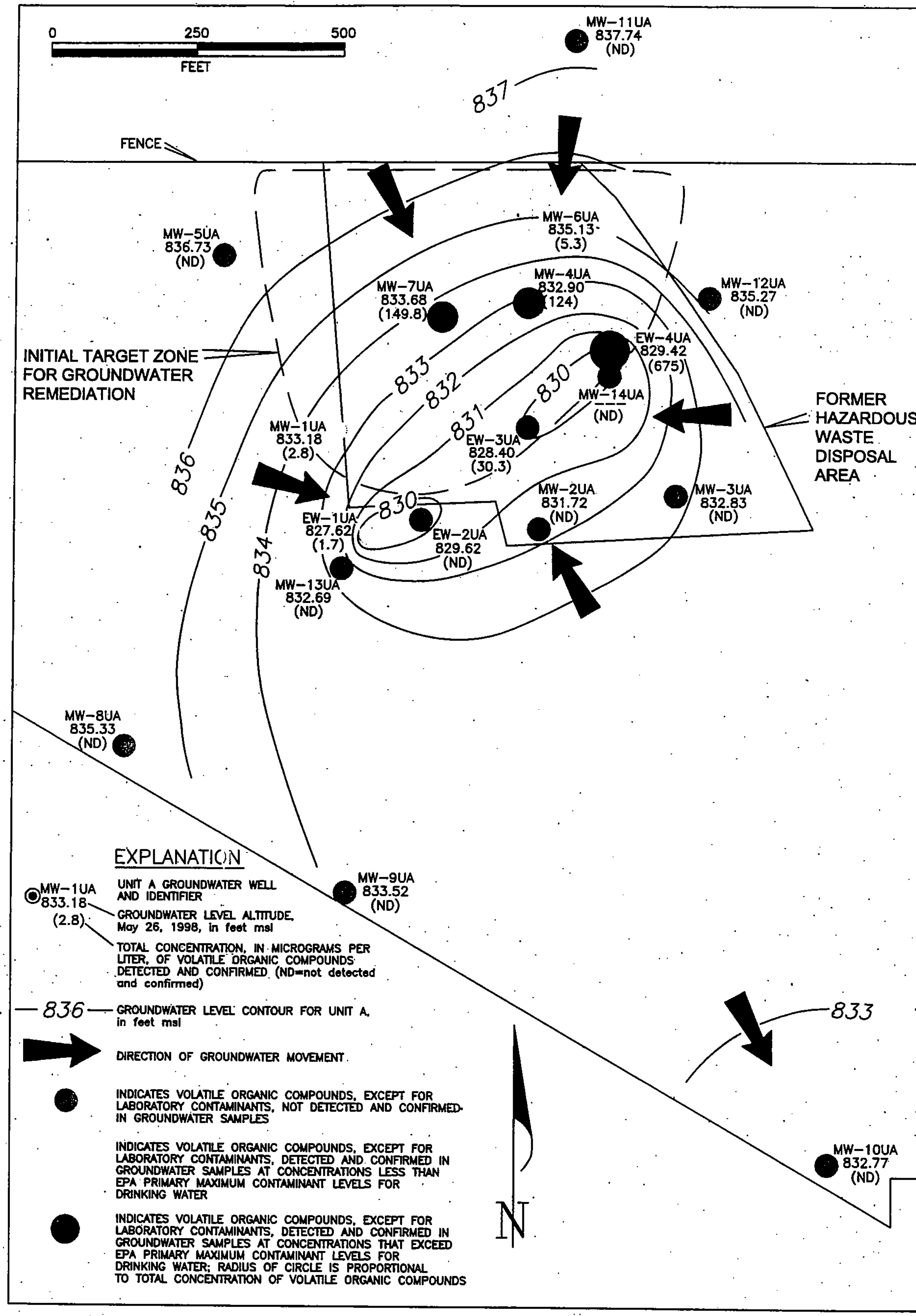
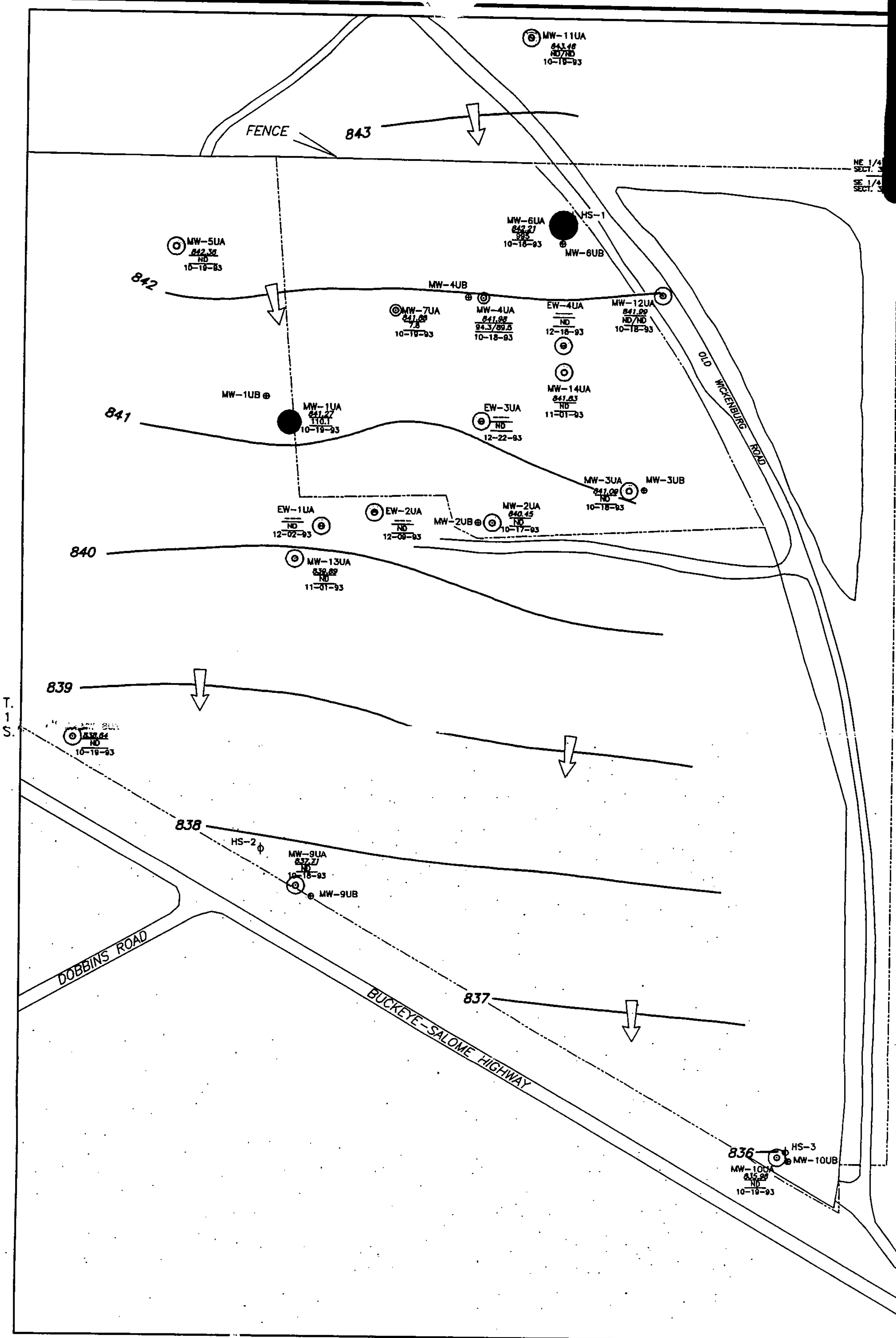


Figure 24

Groundwater Level Contours and Volatile Organic Compounds for Unit A
May 1998

Hassayampa Landfill Superfund Site
Maricopa County, Arizona



EXPLANATION

MW-1UA — UNIT A GROUNDWATER MONITOR WELL AND IDENTIFIER

841.27 — WATER LEVEL ALTITUDE: OCTOBER 1993; IN FEET MSL; --- = NOT MEASURED IN OCTOBER 1993

110.1 — TOTAL CONCENTRATION, IN MICROGRAMS PER LITER, OF VOLATILE ORGANIC COMPOUNDS IN MOST RECENT GROUNDWATER SAMPLE; ND=NOT DETECTED; SLASH SEPARATES DUPLICATE SAMPLES

10-19-93 — DATE MOST RECENT GROUNDWATER SAMPLE WAS OBTAINED

MW-1UB — UNIT B GROUNDWATER MONITOR WELL AND IDENTIFIER

EW-1UA — UNIT A GROUNDWATER EXTRACTION WELL AND IDENTIFIER

HS-1 — ABANDONED MONITOR WELL AND IDENTIFIER; CONSTRUCTED BY ARIZONA DEPARTMENT OF HEALTH SERVICES; HS-1 ABANDONED JUNE 1988; HS-2 AND HS-3 ABANDONED MAY 1991

○ INDICATES VOLATILE ORGANIC COMPOUNDS, EXCEPT FOR LABORATORY CONTAMINANTS AND ACETONE DERIVED FROM DRILLING OPERATIONS; NOT DETECTED AND CONFIRMED IN GROUNDWATER SAMPLES

○ INDICATES VOLATILE ORGANIC COMPOUNDS, EXCEPT FOR LABORATORY CONTAMINANTS AND ACETONE DERIVED FROM DRILLING OPERATIONS, DETECTED AND CONFIRMED IN GROUNDWATER SAMPLES AT CONCENTRATIONS LESS THAN EPA PRIMARY MAXIMUM CONTAMINANT LEVELS FOR DRINKING WATER

● INDICATES VOLATILE ORGANIC COMPOUNDS, EXCEPT FOR LABORATORY CONTAMINANTS AND ACETONE DERIVED FROM DRILLING OPERATIONS, DETECTED AND CONFIRMED IN GROUNDWATER SAMPLES AT CONCENTRATIONS THAT EXCEED EPA PRIMARY MAXIMUM CONTAMINANT LEVELS FOR DRINKING WATER; RADIUS OF CIRCLE IS PROPORTIONAL TO TOTAL CONCENTRATION OF VOLATILE ORGANIC COMPOUNDS

N

0 50 100 150 200 250 300
FEET

—837— WATER LEVEL CONTOUR: OCTOBER 1993, UNIT A; IN FEET MSL

INDICATES DIRECTION OF GROUNDWATER MOVEMENT IN UNIT A

SOURCE: Errol L. Montgomery & Associates, Inc.

Figure 25
Water Level Contours and Volatile Organic Compounds for Unit A October, 1993
Hassayampa Landfill Superfund Site
Maricopa County, Arizona

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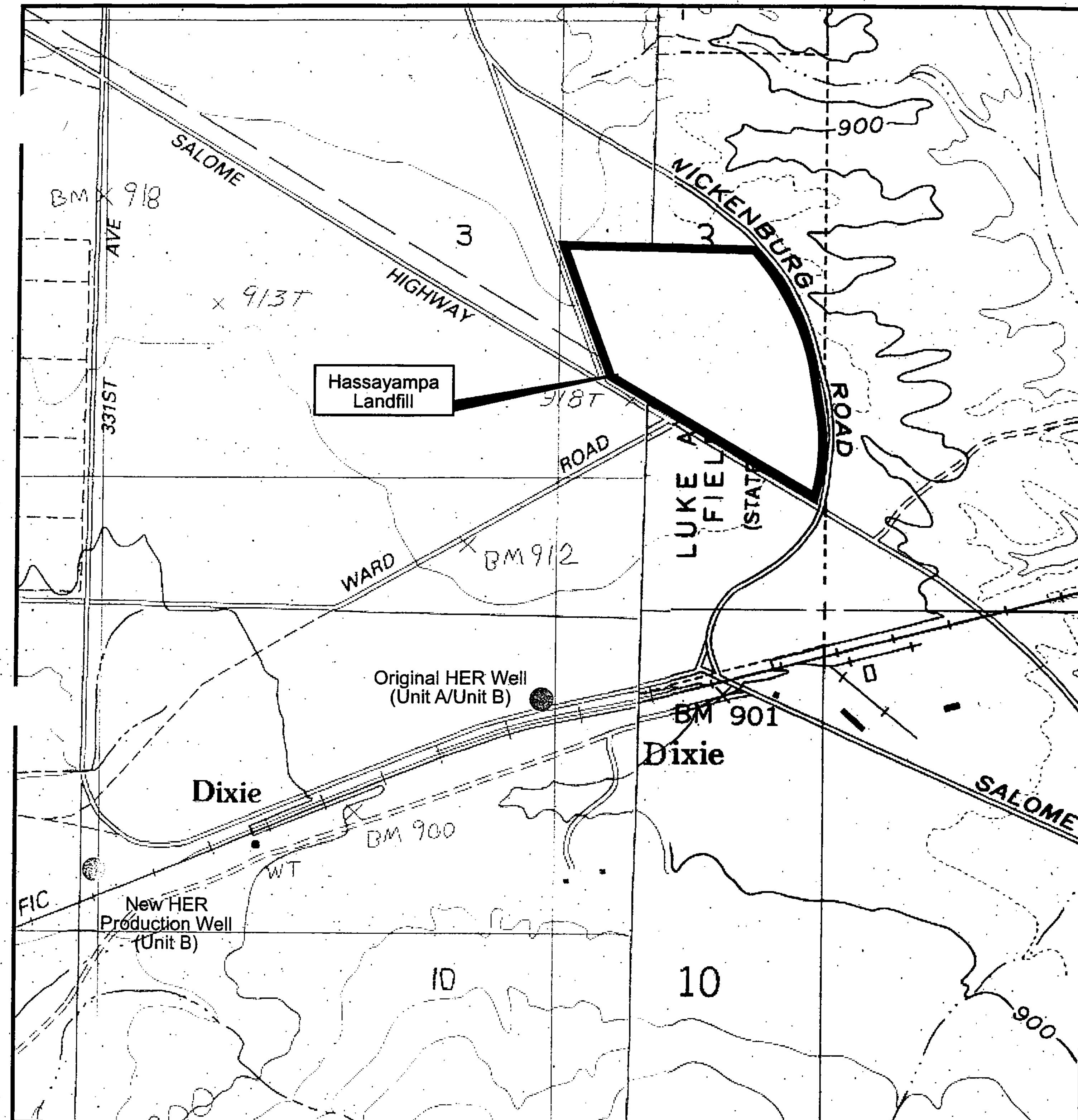
155719.FR.01-Unit A VOCs-9/7/01-pm-SFO



SOURCE: Approximate well locations by Errol L. Montgomery & Associates, Inc.

Well Location (approximate)

HER Hickman Egg Ranch

0 1000

Scale In Feet (Approximate)

Figure 26
Hickman Egg Ranch Well Locations
Five-Year Review
Hassayampa Landfill Superfund Site
Maricopa County, Arizona

155719.FR.01 Egg Ranch Wells.FH8 9/7/01 pm

CH2MHILL

APPENDIX A

Documents Reviewed

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Arizona Department of Environmental Quality. 1999. "Proposed Hickman Egg Ranch Water Production Well Downgradient of the Hassayampa Landfill, Arizona Department of Environmental Quality." Letter to U.S. Environmental Protection Agency Region IX. March 17.

Arizona Department of Environmental Quality. 1999. "Review of Assessment of Potential Impact, Groundwater Remediation System, Hassayampa Landfill Superfund Site, Maricopa County, Arizona." Letter to U.S. Environmental Protection Agency Region IX. December 17.

Arizona Department of Environmental Quality. 1999. "Review of Miscellaneous Documents Regarding the Soil Venting and Treatment System; Hassayampa Landfill Superfund Site, Maricopa County, Arizona." Letter to U.S. Environmental Protection Agency Region IX. May 10.

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Clerk, U.S. District Court, District of Arizona. 1994. *Consent Decree Civil Action No. CIV94-1821 PHX RCB.* September 2.

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Conestoga-Rovers & Associates, Inc. 1997. "Responses to U.S. Environmental Protection Agency Comments on the O&M Manual, RA Report, and Construction Inspection Report, Soil Venting and Treatment System - Hassayampa Landfill Superfund Site, Maricopa County Arizona." Letter to U.S. Environmental Protection Agency Region IX. December 3.

Conestoga-Rovers & Associates, Inc. 1998. "Construction Inspection Report - Soil Remediation Soil Venting and Treatment System - Hassayampa Superfund Site, Maricopa County, Arizona." Letter to U.S. Environmental Protection Agency Region IX. January 30.

Conestoga-Rovers & Associates, Inc. and E.L. Montgomery & Associates, Inc. 1998. *Operation and Maintenance Manual Soil Venting and Treatment System - Hassayampa Landfill Superfund Site*. Revised. January 30.

Conestoga-Rovers & Associates, Inc. and E.L. Montgomery & Associates, Inc. 1998. *Remedial Action Report, Construction of Soil Venting and Treatment System, Hassayampa Landfill Superfund Site, Maricopa County, Arizona.* Revised. February 5.

Conestoga-Rovers & Associates, Inc. and E.L. Montgomery & Associates, Inc. 1998. "Revisions to the Operation and Maintenance (O&M) Manual, Soil Venting and Treatment System, Hassayampa Landfill Superfund Site." Revised. January 30.

Derouin, James G. 2000. "Proposed Hickman Well on Frankel Property, Hassayampa Landfill EPA Superfund Site." Letter to U.S. Environmental Protection Agency Region IX. March 27.

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E.L. Montgomery & Associates, Inc. 1994. "Use of Groundwater for Dust Control Hassayampa Landfill Superfund Site," Letter to U.S. Environmental Protection Agency Region IX. June 22.

E.L. Montgomery & Associates, Inc. 1994. *Vadose Zone Analytical Modeling Report, Hassayampa Landfill Superfund Site, Maricopa County, Arizona.* May 24.

E.L. Montgomery & Associates, Inc. 1998. "Permission to Resume Operation of Groundwater Remediation System and Soil Venting Treatment System," Letter to U.S. Environmental Protection Agency Region IX. April 3.

E.L. Montgomery & Associates, Inc. 1998. "Progress Report No. 62 - July, August, and September 1998." Letter to U.S. Environmental Protection Agency Region IX. October 15.

E.L. Montgomery & Associates, Inc. 1998. "Summary of Repairs and Modifications to Groundwater Remediation System - Hassayampa Landfill EPA Superfund Site." Letter to U.S. Environmental Protection Agency Region IX. April 24.

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E.L. Montgomery & Associates, Inc. 2000. "Potential Impacts and Proposed Modeling of Off-Site Groundwater Pumping, Hassayampa Landfill EPA Superfund Site." Letter to U.S. Environmental Protection Agency Region IX. March 20.

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U.S. Environmental Protection Agency Region IX. 1998. "GRS Malfunction at the Hassayampa Landfill Superfund Site." Letter to E.L. Montgomery & Associates, Inc. March 25.

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U.S. Environmental Protection Agency Region IX. 2000. "EPA Comments Regarding Progress Report No. 65- 2nd and 3rd Quarters 1999, Hassayampa Landfill Superfund Site, Dated November 1, 1999." Letter to E.L. Montgomery & Associates, Inc. March 9.

U.S. Environmental Protection Agency Region IX. 2000. "Proposed Work Plan for Re-Evaluating Potential Impact to Groundwater From Residual Contaminants of Potential Concern in Soil Vapor, Hassayampa Landfill." Letter to E.L. Montgomery & Associates, Inc. February 2.

U.S. Environmental Protection Agency Region IX. 2000. "Responses to Comments on the Assessment of Potential Impact from Injection of Partially Treated Groundwater, Hassayampa Landfill Superfund Site, dated February 15, 2000." Letter to E.L. Montgomery & Associates, Inc. March 6.

U.S. Environmental Protection Agency Region IX. 2000. "Revised Work Plan for Re-Evaluating Potential Impact to Groundwater from Residual Contaminants of Potential Concern in Soil Vapor, Hassayampa Landfill Superfund Site, Dated February 15, 2000." Letter to E.L. Montgomery & Associates, Inc. March 9.

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APPENDIX B

Five-Year Review Site Inspection Checklist
Hassayampa Landfill Superfund Site

I. SITE INFORMATION	
Site name: Hassayampa	**Date of inspection:** January 19, 2000
Location and Region: Maricopa County, AZ, Region IX	**EPA ID:**
Agency, office, or company leading the five-year review: EPA Region IX	**Weather/temperature:** 75°, clear
Remedy Includes: (Check all that apply) ☒ Landfill cover/containment ☒ Access controls ☐ Institutional controls ☒ Groundwater pump and treatment ☐ Surface water collection and treatment ☒ Other Deed restrictions Soil vapor extraction and treatment	
Attachments: ☒ Inspection team roster attached ☒ Site map attached [in report]	
II. INTERVIEWS (Check all that apply)	
1. **O&M site manager** Bill Victor (Name) — Montgomery & Associates (M&A) (Title) — 1/19/00 (Date) Interviewed ☒ at site ☒ at office ☐ by phone Phone No. (480) 948-7747 Problems, suggestions; ☒ Report attached NOTE: All referenced attachments can be found in Five-Year Review Report.	
2. **O&M staff** Dennis Hall (Name) — M&A (Title) — 1/19/00 (Date) Interviewed ☐ at site ☒ at office ☐ by phone Phone No. (480) 948-7747 Problems, suggestions; ☒ Report attached	

3. **Local regulatory authorities and responsible 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 Arizona Department of Environmental Quality (ADEQ)

Contact	Kris Kommalan	Former PM for the site	1/20/00	(602) 207-4193
	Name	Title	Date	Phone No.

Problems; suggestions; ☒ Report attached

Agency ADEQ

Contact	Nancy Lou Minkler	Current PM for the site	1/19/00-1/20/00	(602) 207-4187
	Name	Title	Date	Phone No.

Problems; suggestions; ☒ Report attached

Agency Maricopa County Department of Solid Waste Management

Contact	Ash Madhok	Director	1/20/00	(602) 506-7336
	Name	Title	Date	Phone No.

Problems; suggestions; ☒ Report attached

Agency Arizona Department of Water Resources (ADWR)

Contact	Greg Wallace	Assistant Director, Hydrology	1/21/00	(602) 417-2400
	Name	Title	Date	Phone No.

Problems; suggestions; ☒ Report attached

4. **Other interviews** (optional) ☒ Report attached.

Julie Linn, ADEQ

Dale Lieb, Maricopa County Environmental Services, Air Quality Division

Mason Bolitho, ADWR

III. ONSITE DOCUMENTS AND 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 Reviewed, but not during onsite inspection.

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 Reviewed, but not during onsite inspection.

3. **O&M and OSHA Training Records** — ☐ Readily available ☐ Up to date ☐ N/A

   Remarks Not reviewed.

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 Survey data taken from off four corners of site. Groundwater wells surveyed in. No permanent markers installed.

7. **Groundwater Monitoring Records** — ☐ Readily available ☐ Up to date ☐ N/A

   Remarks Reviewed, but not during onsite inspection.

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 Not reviewed onsite.

10. **Daily Access/Security Logs** — ☒ Readily available ☐ Up to date ☐ N/A

    Remarks Visitor's sign-in logs.

IV. O&M COSTS

1. **O&M Organization**
   - ☐ State in-house
   - ☐ Contractor for State
   - ☐ PRP in-house
   - ☒ Contractor for PRP
   - ☐ Other Discussed in Section 4.0 of Five-Year Review Report

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
1998	1998	$383,669	☒ Breakdown attached
1999	1999	$306,818	☒ Breakdown attached
			☐ Breakdown attached
			☐ Breakdown attached
			☐ Breakdown attached

3. **Unanticipated or Unusually High O&M Costs During Review Period**
   Describe costs and reasons: High costs in 1998 for repair of SVTS equipment. Low costs in 1997, because SVTS was not in operation.

V. ACCESS AND INSTITUTIONAL CONTROLS ☒ Applicable ☐ N/A

A. Fencing

1. **Fencing damaged** ☐ Location shown on site map ☒ Gates secured ☐ N/A
   Remarks As discussed in Section 6.3.4, found in good condition.

B. Other Access Restrictions

1. **Signs and other security measures** ☐ Location shown on site map ☐ N/A
Remarks Good condition. Two incidents of access onto the site have occurred, with minor theft of tools.

C. Institutional Controls

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) Deed restrictions filed
Frequency
Responsible party/agency Hassayampa Steering Committee

Contact	James G. Derouin	Steptoe & Johnson		(602) 257-5237
	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 Discussed in Section 6.3.4

2. **Land use changes onsite** ☐ N/A
Remarks No

3. **Land use changes offsite** ☐ N/A
Remarks Increasing industrial development nearby. Further discussion in Five-Year Review Report (attached).

VI. GENERAL SITE CONDITIONS

A. Roads ☒ Applicable ☐ N/A

1. **Roads damaged** ☐ Location shown on site map ☐ Roads adequate ☐ N/A
Remarks Access roads only; no onsite roads

B. Other Site Conditions

Remarks Complete discussion of site inspection provided in Section 6.3 of Five-Year Review Report (attached).

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______ Depth______
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 Very little successful growth of vegetative cover

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 Area/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 Minor erosion visible in drainage channel
4.	**Undercutting** ☐ Location shown on site map ☒ No evidence of undercutting Areal extent_______ Depth_______ Remarks _______
5.	**Obstruction** Type_______ ☒ No obstruction ☐ Location shown on site map Areal extent_______ Size_______ Remarks _______
6.	**Excessive Vegetative Growth** Type grasses ☒ 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/located ☐ Functioning ☐ Routinely sampled ☐ Good condition ☐ Evidence of leakage at penetration Remarks _______
2.	**Gas Monitoring Probes** ☒ Properly secured/located ☐ Functioning ☐ Routinely sampled ☐ Good condition ☐ Evidence of leakage at penetration Remarks _______
3.	**Monitoring Wells** (within surface area of landfill) ☒ Properly secured/located ☒ Functioning ☒ Routinely sampled ☒ Good condition ☐ Evidence of leakage at penetration Remarks _______

4. **Leachate Extraction Wells**
☐ Properly secured/located ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ Evidence of leakage at penetration ☐ Needs O&M ☒ N/A
Remarks ______

5. **Settlement Monuments** ☐ Located ☐ Routinely surveyed ☐ N/A
Remarks Not observed

E. Gas Collection and Treatment ☒ Applicable ☐ N/A

1. **Gas Treatment Facilities**
☐ Flaring ☒ Thermal destruction ☐ Collection for reuse
☐ Good condition ☐ Needs O&M
Remarks Shut down and partially decommissioned

2. **Gas Collection Wells, Manifolds and Piping**
☐ Good condition ☐ Needs O&M
Remarks Shut down

3. **Gas Treatment Facilities** (e.g., gas monitoring of adjacent homes or buildings)
☐ Good condition ☐ Needs O&M ☐ N/A
Remarks Shut down

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__________ ☐ 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 located ☐ Needs O&M ☐ N/A
Remarks ______________________________

2. **Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances**
☒ Good condition ☐ Needs O&M
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 O&M
Remarks ______________________________

2. **Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances**
☐ Good condition ☐ Needs O&M
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 O&M ☒ 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 O&M Remarks ______
3. **Tanks, Vaults, Storage Vessels** ☐ N/A ☒ Good condition ☐ Proper secondary containment ☐ Needs O&M Remarks ______
4. **Discharge Structure and Appurtenances** ☐ N/A☐☒ Good condition ☐ Needs O&M Remarks ______
5. **Treatment Building(s)** ☐ N/A☐☒ Good condition (especially 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 O&M ☐ N/A Remarks ______
D. Monitored Natural Attenuation
1. **Monitoring Wells** (natural attenuation remedy) ☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition ☐ All required wells located ☐ Needs O&M ☒ 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 GRS and landfill cap are functioning as intended. The SVTS is not in operation at the present time. See further discussion of protectiveness of the remedy in Section 9.0.

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 problems have occured in the past with the SVTS (see Section 4.3.2).

The GRS has experienced only infrequent O&M problems, but they have resulted in two incidents of non-compliant discharge of effluent (see Section 4.3.1).

O&M of the landfill cap has been adequate.

C.	Early Indicators of Potential Remedy Failure
	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. The high cost of O&M on the SVTS in 1998 was an indicator of the many operational problems associated with the system. In 1999, the EPA requested that the system be shut down while they evaluate concerns regarding formation of by-products (dioxins, furans).
D.	**Opportunities for Optimization**
	Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy. Frequent inspections, O&M and monitoring of the GRS equipment is necessary to avoid any reduction in treatment effectiveness. The EPA is currently evaluating analytical and monitoring data to determine if, and under what circumstances, the SVTS will be again made operable.