SECOND FIVE-YEAR REVIEW REPORT
FOR THE
GULF COAST VACUUM SERVICES SUPERFUND SITE
ABBEVILLE, VERMILION PARISH, LOUISIANA

SEPTEMBER 2003

FINAL

Prepared for

U.S. ENVIRONMENTAL PROTECTION AGENCY
REGION 6
DALLAS, TEXAS

Prepared by

TETRA TECH EM INC.
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SECOND FIVE-YEAR REVIEW REPORT FOR THE GULF COAST VACCUM SERVICES SUPERFUND SITE ABBEVILLE, VERMILION PARISH, LOUISIANA

This memorandum documents the U.S. Environmental Protection Agency's (EPA) approval of the Second Five-Year Review Report for the Gulf Coast Vacuum Services (GCVS) Superfund site.

Summary of Five-Year Review Findings

The EPA signed two records of decision (ROD) for the GCVS site on September 30, 1992, and a ROD amendment on May 2, 1995. The remedial action objectives (RAO), selected remedy, and implementation status for each operable unit (OU) are discussed in the following paragraphs. OU-2 is discussed before OU-1 because OU-2 is an interim action that took place before OU-1.

OU-2, Interim Source Control Action

The RAOs for OU-2 are as follows:

- Prevent oral and dermal human exposure and environmental exposure to accumulated pit rainwater;
- Prevent contamination of adjacent soils due to overflow of the Washout and West Pits; and,
- Prevent migration of contaminated rainwater to the ground water.

The selected remedy for OU-2 includes: (1) pumping and on-site treatment and discharge of the accumulated contaminated rainwater in the Washout Pit and West Pit; (2) excavating the sludge and soil from the Washout Pit and consolidation into the West Pit; (3) placing an impermeable synthetic membrane over the consolidated material in the West Pit; and, (4) backfilling the Washout Pit with clean soil.

The remedial action (RA) activities began in March 1993 and concluded in January 1994 after placing a 60-millimeter high-density polyethylene liner over the consolidated material in the West Pit and backfilling the Washout Pit. No operation and maintenance (O&M) is associated with the OU-2 RA.

OU-1, Final Source Action

The RAOs for OU-1, the final source action, are as follows:

- Minimize potential human exposures by way of ingestion, inhalation, or direct contact with contaminants found in the contaminated pit sludge and associated soil, tank contents, buried pits, and site soil and sediment;
- Reduce the potential for the soil and sludge to act as a continued source of ground water contamination; and,
- Prevent human exposure to contaminated ground water.

The selected remedy according to the OU-1 ROD consists of the following:

- On-site incineration followed by on-site stabilization of (if necessary), disposal of, and construction of a clay cover over the ash of the organic and inorganic-contaminated pit sludge and associated soil and tank contents;
- On-site stabilization of, disposal of, and construction of a clay cover over inorganic-contaminated site soil and sediment; and,
- Institutional controls and long-term ground water monitoring.

On May 5, 1995, the ROD for OU-1 was amended to include: (1) on-site biological treatment of organic-contaminated pit sludge (surface and buried) and associated soil and tank contents; (2) stabilization and on-site disposal of the successfully treated residuals from the biotreatment as required to meet performance standards for inorganic compounds; (3) on-site stabilization and disposal of the site soils contaminated with metals; (4) capping with a 2-foot compacted clay cover; (5) ground water monitoring; and, (6) institutional controls (deed notice). The ROD amendment also included a contingency remedy of incineration for biological treatment residuals that did not meet treatment standards. This contingency was not needed because biological treatment of residual wastes met treatment standards.

Construction began on June 2, 1997, and was completed in 1999 after final grading and construction of a chain-link fence around the entire perimeter of the site for access control. O&M activities include a deed notice, ground water monitoring, and cap inspections. The potentially responsible party (PRP) group entered a "Right of Use Agreement and Declaration of Restrictions" with the Vermilion Parish Police Jury on September 23, 1999, for the GCVS site. The EPA approved a final closeout report for the GCVS site in March 2000. Although RA activities were not complete, the PRP group initiated post-RA ground water monitoring in April 1997. Quarterly monitoring was conducted from 1997 through 2001.

Semiannual monitoring was conducted in 2002 and is currently being conducted in 2003. The frequency will be reduced to annual ground water monitoring in 2004 because the statistical analysis report shows that concentrations are not increasing. Cap inspections have been conducted annually since 2000 and are documented in the ground water monitoring reports.

The second five-year review focused on data obtained during ground water monitoring activities performed from 1998 through 2003. In general, the selected remedy appears to be performing as intended and is currently protective of human health and the environment. However, the issues discussed below, which do not affect the protectiveness of the remedy, were noted.

1. **Broken well cover –** The well cover on well G-15 was broken, according to site inspection observations.

2. **Well G-24 is not needed –** Well G-24 was observed during the site inspection but is not part of the RA monitoring network and has not been sampled since 1994.

3. **Large fire ant hills on caps –** Large fire ant hills were observed on the caps during the site inspection. Fire ants may burrow deep enough through the caps to create a conduit between the ground surface and the buried waste.

4. **Ponded areas at base of cap side-slopes –** Ponded areas were observed at the base of the side-slopes on the south side of the West Pit cap and the east side of the Washout Pit cap. These ponded areas could cause erosion and deteriorate the caps' integrity.

5. **Several potholes on primary site road –** Several potholes were observed on the primary site road used by area residents. Residents complained about road conditions during interviews.

6. **Ground water concentrations exceeded maximum contaminant levels (MCL) and do not show decreasing trends –** According to laboratory analytical results, arsenic, barium, cadmium, and chromium were detected in ground water at concentrations exceeding MCLs. In several RA network wells, some of which are off-site and down gradient from the site, these concentrations show no decreasing trend.

The following actions are needed in response to the above issues:

1. The broken well cover on well G-15 should be replaced.

2. Well G-24 should be plugged and abandoned.

3. The threat posed by large anthills on the caps should be mitigated.

4. Drainage should be provided to prevent ponding and future erosion and deterioration of the caps.

5. Issues with the road maintenance should be worked out with the Vermilion Parish Police Jury because it is the current owner of record due to the purchase of the property through tax sale.

6. Annual ground water monitoring for arsenic, barium, cadmium, and chromium should be continued for all wells. Arsenic, barium, cadmium, and chromium have concentrations above MCLs in several wells that show no decreasing trend. Although chromium concentrations have been below the MCL for all wells since 2001, some wells do not show a decreasing trend. If concentrations significantly rise or a risk of imminent exposure surfaces, contingency measures will be implemented.

Determinations

I have determined that the selected remedy for the GCVS site is protective of human health and the environment and will remain so provided that the caps are maintained, ground water monitoring data are evaluated on a routine basis, and the deed notice is enforced.

Myron O. Knudson, P.E.
Director
Superfund Division
U.S. Environmental Protection Agency Region 6

9/16/03
Date

CONCURRENCES:

SECOND FIVE-YEAR REVIEW FOR
GULF COAST VACUUM SERVICES SUPERFUND SITE
EPA ID No. LAD980750137

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June Buzzell
Writer/Editor
Superfund Division

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ACRONYMS AND ABBREVIATIONS

§	Section
µg/L	Micrograms per liter
ARAR	Applicable or relevant and appropriate requirement
ARCADIS	ARCADIS Geraghty & Miller, Inc.
bgs	Below ground surface
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	*Code of Federal Regulations*
EPA	U.S. Environmental Protection Agency Region 6
GCVS	Gulf Coast Vacuum Services
HDPE	High density polyethylene
HI	Hazard Index
LDEQ	Louisiana Department of Environmental Quality
LNAPL	Light nonaqueous phase liquid
LTU	Land treatment unit
MCL	Maximum contaminant level
mg/kg	Milligrams per kilogram
mg/L	Milligrams per liter
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NGVD	National geodetic vertical datum
NPL	National Priorities List
O&M	Operation and maintenance
OU	Operable unit
PAH	Polynuclear aromatic hydrocarbon
PCB	Polychlorinated biphenyl
PRP	Potentially responsible party
RA	Remedial action
RAO	Remedial action objectives
RI	Remedial investigation
RI/FS	Remedial investigation and feasibility study
RME	Reasonable maximum exposure
ROD	Record of Decision
TCLP	Toxicity Characteristic Leaching Procedure
Tetra Tech	Tetra Tech EM Inc.
ThermoRetec	ThermoRetec Consulting Corporation
TPH	Total petroleum hydrocarbon
UAO	Unilateral Administrative Order

EXECUTIVE SUMMARY

The U.S. Environmental Protection Agency Region 6 (EPA) conducted a second five-year review of the remedial action (RA) implemented at the Gulf Coast Vacuum Services (GCVS) Superfund site in Abbeville, Louisiana. The purpose of this five-year review was to determine whether the selected remedy for the site continues to protect human health and the environment. This review was conducted from January through July 2003, and its findings and conclusions are documented in this report. The second five-year period extended from 1998 through 2003. Several documents were reviewed, including those that contain the following data: (1) ground water analytical data from 1998 through 2003; (2) statistical analysis results from data collected from 1998 through 2003; and, (3) confirmation and performance standard sampling results.

The GCVS site was listed on the National Priorities List (NPL) in 1989. The EPA signed two records of decision (ROD) for the GCVS site on September 30, 1992 and a ROD amendment on May 2, 1995. The remedial action objectives (RAO), selected remedy, and implementation status for each operable unit (OU) are discussed in the following paragraphs. OU-2 is discussed before OU-1 because OU-2 is an interim action that took place before OU-1.

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1. **Broken well cover –** The well cover on well G-15 was broken according to site inspection observations.

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Based on the information available during the second five-year review, the selected remedy for the GCVS site is currently protective of human health and the environment. For the remedy to remain protective in the long-term, caps need to be maintained, ground water monitoring data need to be evaluated on a routine basis, and the deed notice needs to be enforced.

Five-Year Review Summary Form

SITE IDENTIFICATION

Site Name (from WasteLAN): Gulf Coast Vacuum Services Site

EPA ID (from WasteLAN): LAD980750137

Region: 6	**State:** Louisiana	**City/County:** Abbeville/Vermilion Parish

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:** 1999

Has site been put into reuse? ☐ YES ☒ NO

REVIEW STATUS

Reviewing Agency: ☒ EPA ☐ State ☐ Tribe ☐ Other Federal Agency _____

Author Name: Katrina Coltrain

Author Title: Remedial Project Manager	**Author Affiliation:** EPA Region 6

Review Period:** 1998 to 2003

Date(s) of Site Inspection: 1/27 and 1/28 2003

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 at OU-1 ☐ Actual RA Start
☐ Construction Completion ☒ Previous Five-Year Review Report
☐ Other (specify)_____

Triggering Action Date (from WasteLAN): 9/30/98

Due Date (Five Years After Triggering Action Date): 9/30/03

* "OU" refers to operable unit.

** The review period refers to the period during which the five-year review was conducted.

Five-Year Review Summary Form (Continued)

Issues:

1. **Broken well cover –** The well cover on well G-15 was broken according to site inspection observations.

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Recommendations and Follow-up Actions:

1. The broken well cover on well G-15 should be replaced.

2. Well G-24 should be plugged and abandoned.

3. The threat posed by large anthills on the caps should be mitigated.

4. Drainage should be provided to prevent ponding and future erosion and deterioration of the caps.

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Protectiveness Statement:

The RA is currently protective of human health and the environment.

Long-Term Protectiveness:

Based on the information available during the second five-year review, the selected remedy for the GCVS site is currently protective of human health and the environment. For the remedy to remain protective in the long-term, caps need to be maintained, ground water monitoring data need to be evaluated on a routine basis, and the deed notice needs to be enforced.

1.0 INTRODUCTION

The U.S. Environmental Protection Agency Region 6 (EPA), with assistance from Tetra Tech EM Inc. (Tetra Tech) and in coordination with the Louisiana Department of Environmental Quality (LDEQ), conducted a second five-year review of the remedial action (RA) implemented at the Gulf Coast Vacuum Services (GCVS) Superfund site in Abbeville, Louisiana. The purpose of a five-year review is to determine whether the remedy at a site is protective of human health and the environment.

The EPA must implement five-year reviews in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) if hazardous substances, pollutants, or contaminants remain onsite above levels that allow for unlimited use and unrestricted exposure. CERCLA Section § 121(c), 42 U.S.C. § 9621(c), as amended, states the following:

> "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 5 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."

NCP §300.430(f)(4)(ii), 40 C.F.R. § 300.430(f)(4)(ii), states the following:

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

Because hazardous substances, pollutants, or contaminants remain at the GCVS site above levels that allow for unlimited use and unrestricted exposure, a five-year review is required.

The GCVS site has two operable units (OU): Interim Source Action (OU-2) and Final Source Action (OU-1). The second five-year review addressed the entire site. The period addressed by the second five-year review for GCVS extended from 1998 to 2003. The triggering action for this review was the previous five-year review that was completed in September 1998. The second five-year review was conducted from January through July 2003, and its methods, findings, conclusions, and recommendations are documented in this report.

This report documents the second five-year review for the GCVS site by providing the following information: the site chronology (Section 2.0), background information (Section 3.0), the EPA RA (Section 4.0), the five-year review process (Section 5.0) and findings (Section 6.0), the technical assessment of the site (Section 7.0), issues identified (Section 8.0), and recommendations and follow-up activities (Section 9.0). The report also provides a protectiveness statement (Section 10.0) and discusses the next review (Section 11.0). Appendices A and B list documents reviewed and present a site visit report, respectively.

2.0 SITE CHRONOLOGY

Table 1 presents a chronology of events for the GCVS site. Additional historical information for the site is available on line at: http://www.epa.gov/earth1r6/6sf/pdffiles/gulf-cst.pdf (EPA 2002).

3.0 BACKGROUND

This section discusses the site's physical characteristics, land and resource use near the site, the history of site contamination, the initial response to the site, and the basis for the response.

3.1 PHYSICAL CHARACTERISTICS

The GCVS site is located approximately three miles southwest of Abbeville, Vermilion Parish, Louisiana, on Parish Road P-7-31, also called Junuis Road. The site covers approximately 12.8 acres and is bounded to the north and west by pastureland and to the east and south by the D.L. Mud Superfund site (see Figure 1) (EPA 2000). Approximately 2,600 people live within 3 miles of the site, and approximately 10 residences are located less than 0.5 mile from the site boundary.

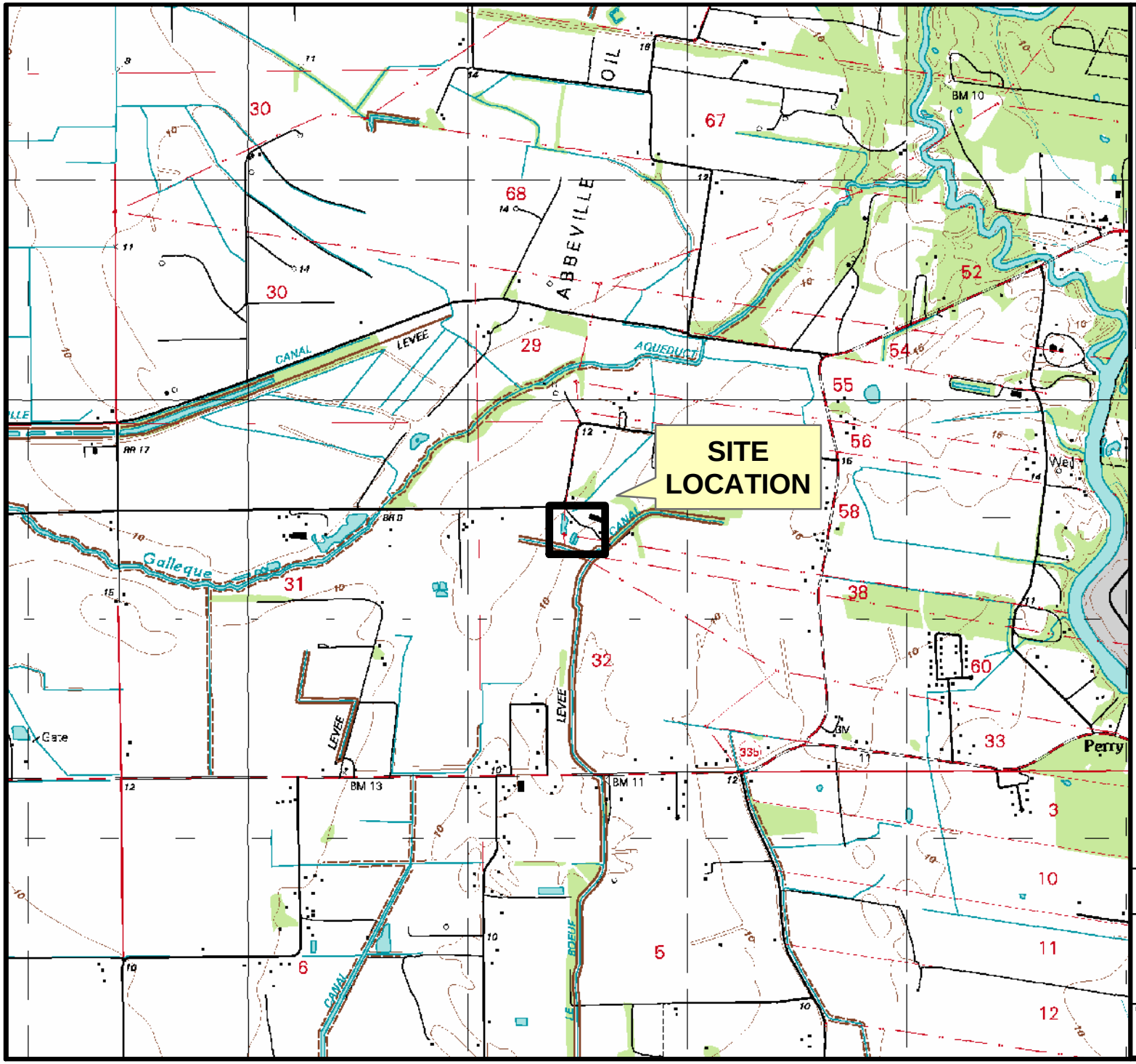
The site is located in the low-lying flatland of the Atlantic Gulf Coastal Plain. The surface elevation at the site varies from 14 feet above mean sea level at the southeastern boundary and 8 feet above mean sea level at the northwestern boundary. LeBoeuf Canal, which runs along the eastern and southern boundaries of the site, drains the southern portion of the site. The LeBoeuf Canal used to flow to the Vermilion River, which is located approximately 1.5 miles east of the site, but the canal is currently bermed and does not drain to the river. The LeBoeuf Canal only contains water after a rainstorm. Local ditches that flow into the Coulee Galleque drain the northern portion of the site. The Coulee Galleque drain eventually flows into the Abbeville Canal and to the Vermilion River (EPA 1992d).

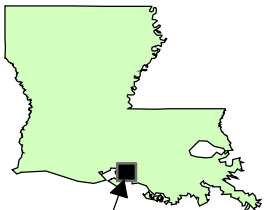
TABLE 1

CHRONOLOGY OF SITE EVENTS

Date	Event
June 27, 1980	Site discovery
July 1980	Preliminary assessment
September 1980	Preliminary sampling inspection
July 1985	Detailed sampling inspection
1987	Expanded site inspection
1988	Hazard Ranking System scoring
June 1988	Proposed for inclusion on NPL
1988 and 1989	NPL responsible party search
March 31, 1989	Final NPL listing
March through May 1990	First emergency removal action
March 1991	Second emergency removal action
April 1992	Third emergency removal action
1990 to 1992	RI/FS performed
September 30, 1992	RODs issued for OU-1 and OU-2
December 11, 1992	Unilateral administrative order issued for OU-2
January 1994	OU-2 RA completed
May 5, 1995	ROD amendment issued for OU-1
June 5, 1995	Consent decree for OU-1
April 1997	Remedial action work plan/final design report for OU-1
September 1998	First five-year review of OU-1 and OU-2 remedial actions
June 1999	RA report for OU-1
September 1999	Preliminary close out report
March 2000	Final closeout report
July 2001	NPL delisting
July 2002	Completion of long-term monitoring plan
July 2003	First Semiannual 2002 Ground Water Monitoring Report
July 2003	Second Semiannual 2002 Ground Water Monitoring Report
August 2003	Final Ground Water Statistics Report

Notes:
EPA U.S. Environmental Protection Agency
NPL National Priorities List
OU Operable unit
RI/FS Remedial investigation and feasibility study
RA Remedial action
ROD Record of Decision
Source: ARCADIS 2003c, EPA 1992c, 1992d, 2002; TermoRetec Consulting Corporation 1999





N

0 1,000 2,000
Feet

GULF COAST VACUUM SERVICES
VERMILION PARISH, LOUISIANA

FIGURE 1
SITE LOCATION

FIVE-YEAR PLAN

PREPARED FOR: EPA BY: Tetra Tech EM Inc.

The following five geologic units have been identified beneath the GCVS site from the surface downward:

1. Upper Clay Unit
2. Silty Clay I Unit
3. Alluvium Unit
4. Silty Clay II Unit
5. Upper Chicot Aquifer Unit

The Upper Clay Unit consists of clays with low permeability that overlay the entire site to a depth of up to 20 feet below ground surface (bgs) in areas. The Silty Clay I Unit consists of silty to sandy clay with intervals of more permeable sandy silt and silty sand. The Silty I Unit ranges in thickness from approximately 20 feet thick in the northern and western portions of the site to 5 feet or less in the eastern portions of the site. The Alluvium Unit consists of a sequence of alternating layers and lenses of fine-grained sands and silts that were also deposited by the ancient meander of the Vermilion River. The Silty Clay II Unit consists of low permeability clays and silty clays that were deposited around the periphery of an ancient meander of the Vermilion River. The Silty Clay II Unit is considerably thicker beneath the northern and western areas of the site. The Upper Chicot Aquifer Unit consists of fine- to medium-grained sands that become cleaner with depth. The top of the Upper Chicot Aquifer Unit is encountered at shallower depths beneath the eastern portion of the site (ARCADIS Geraghty & Miller [ARCADIS] 2003b).

According to the most recent ground water monitoring report, ground water in the Silty Clay I/Alluvium Unit flows from two highest water elevations at the northern and southwestern portions of the site to the center of the site. Ground water then flows northwesterly off-site, with the exception of ground water from the eastern portion of southwestern corner of the site, which appears to flow easterly (ARCADIS 2003c). Ground water in the Upper Chicot Aquifer flows to the northwest (EPA 1992c).

3.2 LAND AND RESOURCE USE

The primary land uses near the site are agricultural and residential. No significant future change in land use near the site has been projected. Agricultural land is predominantly used as pasture land for grazing cattle and for rice, sugarcane, and soybean crop production. Ten residences are located within 0.5 mile of the site on Parish Road P-7-31 and Route 335, with the nearest resident on the southeast site boundary. These residents are outside the corporate limits of Abbeville and use ground water for drinking water and irrigation (EPA 2000). Residential well depths typically range from 80 to 230 feet bgs, which is in the Upper Chicot Aquifer (EPA 1992d).

Surface water near the GCVS site consists of two primary channels that collect runoff from the site: the LeBoeuf Canal and the Coulee Galleque. The LeBoeuf Canal is bermed and contains water only after rain events. The Coulee Galleque eventually flows to the Vermilion River and supports aquatic life including aquatic invertebrates and fish. The Vermilion River is used for recreational purposes including swimming, fishing, and water skiing. Many homes are located on the riverbanks (EPA 1992a; EPA 1992d).

3.3 HISTORY OF CONTAMINATION

The GCVS site was a vacuum truck and oilfield drilling mud plant operation from approximately 1969 to 1984. Lafayette Highway Equipment Sales and Services, Inc., owned and operated a 25.562-acre parcel that included the GCVS site and surrounding property from September 1969 to May 1975. Gulf Coast Pre-Mix Mud Services, Inc., owned and operated the parcel until January 1979 when it merged with Gulf Coast Pre-Mix Trucking, Inc., and was renamed as G.H. Drilling Fluid, Inc. In August 1979, the facility was renamed again to G.H. Fluid Services. G.H. Fluid Services owned and operated the site until October 1980 when it conveyed 12.78 acres to GCVS. The remaining portion of the parcel is now known as the D.L. Mud site. GCVS owned and operated the site until 1984 when it declared bankruptcy. GCVS and its predecessors used the property as a trucking terminal and disposal facility for materials and wastes generated from oil and gas exploration and production. Vacuum trucks were rinsed out in several on-site pits including the West Pit and Washout Pit, which are shown on Figure 2. Various tanks held raw and waste material. Unpermitted disposal of contaminated material and waste also occurred on the site surface soils (EPA 1992d).

A citizen's complaint through the Vermilion Association for Protection of the Environment led to site identification by EPA on June 27, 1980 (EPA 1992d). As a result, EPA conducted various preliminary assessments and sampling activities as shown in Table 1. Preliminary sampling results revealed the presence of compounds characteristic of crude oil, salt water, and drilling mud oil in the water and soil on the GCVS site. In addition, a layer of oil emulsion, averaging 1 inch in thickness, was observed in the West Pit (Roy F. Weston, Inc. 1985).

The main contaminants at the site that posed an imminent and substantial endangerment to human health or the environment were organic compounds such as benzene and carcinogenic polynuclear aromatic hydrocarbons (PAH) and metals such as arsenic and barium. Table 2 lists the contaminants that were detected during the remedial investigation/feasibility study (RI/FS) in various site media above human health-based standards (EPA 2000).

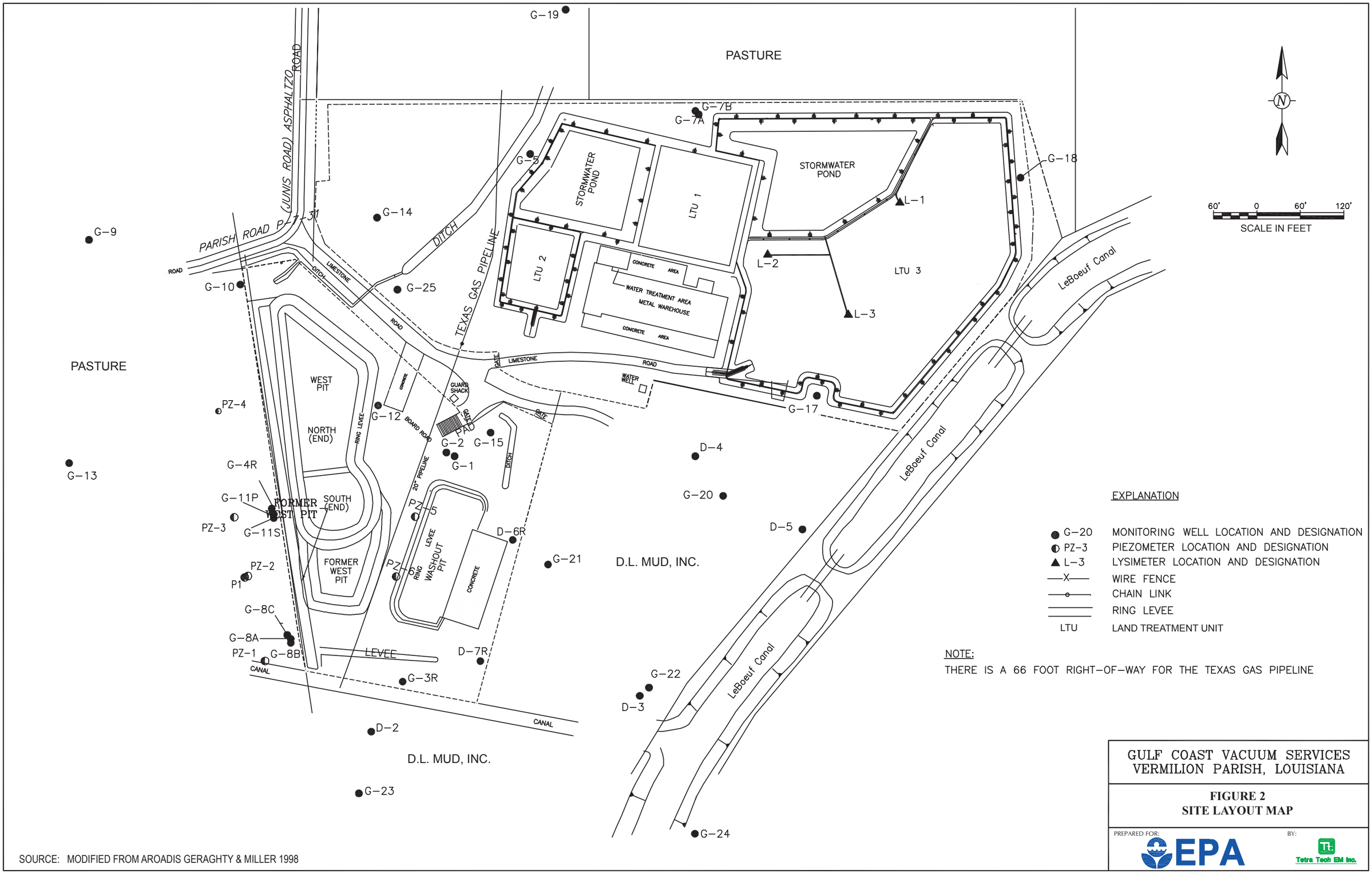
TABLE 2

CONTAMINANTS OF CONCERN

Media	Contaminant	Concentration Range
Surface Soils	Arsenic	2.3 to 56.7 mg/kg
	Barium	480 to 21,400 mg/kg
Sludges	Carcinogenic PAHs	0.09 to 7.5 mg/kg
	Benzene	7 to 529 mg/kg
Ground water	Barium	ND to 5,550 µg/L
	Cadmium	ND to 210 µg/L
	Chromium	ND to 2,580 µg/L
	Mercury	ND to 4.6 µg/L

Notes:

µg/L Micrograms per liter
mg/kg Milligrams per kilogram
ND Non-detect
PAH Polynuclear aromatic hydrocarbon



EXPLANATION

G-20	MONITORING WELL LOCATION AND DESIGNATION
PZ-3	PIEZOMETER LOCATION AND DESIGNATION
L-3	LYSIMETER LOCATION AND DESIGNATION
—X—	WIRE FENCE
—o—	CHAIN LINK
═══	RING LEVEE
LTU	LAND TREATMENT UNIT

NOTE:
THERE IS A 66 FOOT RIGHT-OF-WAY FOR THE TEXAS GAS PIPELINE

SOURCE: MODIFIED FROM AROADIS GERAGHTY & MILLER 1998

GULF COAST VACUUM SERVICES
VERMILION PARISH, LOUISIANA

FIGURE 2
SITE LAYOUT MAP

PREPARED FOR: EPA

BY: Tetra Tech EM Inc.

3.4 INITIAL RESPONSE

Based on results from preliminary assessments and sampling, EPA included GCVS on the National Priorities List (NPL) in March 1989 and started remedial investigation (RI) activities in 1990 that lasted until 1992. During the RI, EPA conducted three removal actions at the GCVS site. The EPA Emergency Response Branch conducted the first removal action because EPA observed leakage of oily rainwater from the West Pit and the Washout Pit during a site survey conducted in March 1990. In addition, the fence surrounding the pits was damaged allowing unrestricted access. On March 20, 1990, EPA began cleanup activities to prevent the off-site migration of contaminated liquid. During the removal, a secondary containment levee was constructed along the west side of the West Pit. Water from the Washout Pit was pumped out and the wastewater was treated through a sand filter and activated carbon filter. Treated wastewater was discharged to on-site ditches in accordance with limits established by the LDEQ. In addition, fences were repaired and constructed along the west side of the West Pit (EPA 1990).

The EPA conducted a second removal action from February 15 through March 1, 1991 in response to observations made by EPA during a site visit in December 19, 1990 (EPA 1991b). During the site visit, the following conditions were observed: (1) rainwater that had accumulated in the West Pit was overflowing; (2) rainwater in the secondary containment levee that was constructed during the first removal action was close to overflowing; and, (3) the fence surrounding the pit area needed repair (EPA 1991a). On February 4, 1991, EPA collected samples of surface water (rainwater) from the overflowing pits, and on February 15, 1991, EPA mobilized to the site. The surface water was contaminated with metals, volatile organic compounds, and various hydrocarbons. The removal action involved pumping, treating, and discharging wastewaters from the West Pit and the Washout Pit. Treatment consisted of sand and activated carbon filtration, similar to the first removal action. Treated water was discharged on-site in accordance with state-recommended discharge criteria. A new fence was constructed around the Washout Pit and the West Pit to further restrict site access and to replace the previous barbed-wire fence (EPA 1991b, 1992d).

The EPA conducted the third removal action from April 6 through April 15, 1992 (EPA 1992b) in response to observations made by EPA during a site visit in March 1992. During the site visit, the following conditions were observed: (1) a number of holes were observed in the fence surrounding the pit area, thus allowing unrestricted access; (2) rainwater in the West Pit was overflowing; (3) rainwater in the Washout Pit was in danger of overflowing; (4) oily rainwater was leaking from the Washout Pit; and, (5) a floating layer of contaminated organic material was present in the pits (EPA 1992a). On April 6, 1992, EPA mobilized to the site. Water from the pits was treated by a sand and activated carbon filtration system and discharged on site in accordance with state-recommended discharge criteria (EPA 1992b).

3.5 BASIS FOR RESPONSE

Based on the data collected during the RI, it was determined that if the remedies selected in the Records of Decision (ROD) were not implemented, hazardous substances could be released from the GCVS site and endanger public health, welfare, or the environment. The most significant threats included: (1) the risk of carcinogenic effects for a current trespasser exposed to the pit sludges with carcinogenic PAHs and arsenic; (2) the risk of carcinogenic and non-carcinogenic effects for an off-site resident exposed to arsenic in ground water; and, (3) the risk of carcinogenic and non-carcinogenic effects for a future on-site resident exposed to soils with carcinogenic PAHs and various metals (EPA 1992c, 1992d).

4.0 REMEDIAL ACTION

This section discusses the selected remedy, remedy implementation, operation and maintenance (O&M), O&M costs, and progress made at the site since the last five-year review.

4.1 SELECTED REMEDY

The EPA, in consultation with LDEQ, signed two RODs on September 30, 1992. The ROD for OU-2, the interim source control, addressed the short-term, immediate exposure risks associated with rainwater overflow from the pits. The ROD for OU-1, the final source action, addressed long-term environmental and human health risks associated with contaminated soil, sludge, and ground water. The ROD for OU-1 was amended on May 2, 1995, to change the technology for treating organic-contaminated material. Details of the remedial action objectives (RAO) and the selected remedies for each OU are discussed in the following paragraphs. OU-2 is discussed before OU-1 because OU-2 is an interim action that took place before OU-1.

The RAOs established in the ROD for OU-2, the interim source control action, are as follows (EPA 1992d):

- Prevent oral and dermal human exposures and environmental exposure to accumulated pit rainwater;
- Prevent contamination of adjacent soils due to overflow of the Washout and West Pits; and,

- Prevent migration of contaminated rainwater to the ground water.

The remedy selected in the ROD for OU-2 includes the following (EPA 1992d):

- Pumping and on-site treatment and discharge of the accumulated contaminated rainwater in the Washout Pit and West Pit;
- Excavating the sludge and soil from the Washout Pit and consolidating the sludge and soil into the West Pit;
- Placing an impermeable synthetic membrane over the consolidated material in the West Pit; and,
- Backfilling the Washout Pit with clean soil.

Table 3 shows the cleanup goals for pit sludge and associated soil. In addition to these cleanup goals, the OU-2 ROD specified that maximum concentrations of previously unidentified compounds in pit sludge and associated soil must correspond to a risk of 10^{-6} (or less assuming it is consistent with a reasonable maximum exposure [RME]) for carcinogenic compounds and a hazard index (HI) less than or equal to 1 for noncarcinogenic compounds (EPA 1992d).

The RAOs established in the ROD for OU-1, the final source action, are as follows (EPA 1992c):

- Minimize potential human exposures by way of ingestion, inhalation, or direct contact with contaminants found in the contaminated pit sludge and associated soil, tank contents, buried pits, and site soil and sediment;
- Reduce the potential for the soil and sludge to act as a continued source of ground water contamination; and,
- Prevent human exposure to contaminated ground water.

The remedy selected in the ROD for OU-1 consisted of the following components (EPA 1992c):

- On-site incineration followed by on-site stabilization of (if necessary), disposal of, and construction of a clay cover, over the ash of the organic and inorganic-contaminated pit sludge and associated soil and tank contents;
- On-site stabilization of, disposal of, and construction of a clay cover over inorganic-contaminated site soil and sediment; and,
- Institutional controls and long-term ground water monitoring.

TABLE 3

CLEANUP GOALS FOR SLUDGE AND ASSOCIATED SOILS FOR OU-2

Contaminant of Concern	Cleanup Goal (mg/kg)	Basis
Arsenic	16	Upper background limit
Barium	5,400	Non-carcinogenic exposure limit (HI = 1)
Benzene	0.66	Carcinogenic exposure limit (risk = 10^{-6})
Total Carcinogenic PAHs[a]	3	Region 6
Total Non-Carcinogenic PAHs	HI = 1	Region 6

Notes:

[a] The cleanup goal for carcinogenic PAHs is based on the benzo(a)pyrene equivalent. Benzo(a)pyrene equivalent is calculated by the following equation: 0.1 (Benzo(a)anthracene) + 0.01 (chrysene) + 0.1 (Benzo(b)fluoranthene) + 0.01 (Benzo(k)fluoranthene) + (Benzo(a)pyrene) + 0.1 (Indeno(1,2,3-cd)Pyrene + (Benzo(a,h)anthracene) where (compound) is the concentration of that compound.

HI Hazard Index
mg/kg Milligram per kilogram
PAH Polynuclear aromatic hydrocarbon

Source: EPA 1992d and 1995

Table 4 shows cleanup goals and performance standards for pit sludge and associated soil, aboveground tank contents, and site soil and sediment. Performance standards are the concentrations that indicate whether treated material meets the RAOs. In addition to the cleanup goals in Table 4, the maximum concentrations of previously unidentified compounds or tentatively identified compounds must correspond to a cumulative risk less than 10^{-4} (assuming it is consistent with the RMEs) for carcinogenic compounds and a HI less than 1 for noncarcinogenic compounds (EPA 1995). The ROD and ROD amendment for OU-1 also identify contingency cleanup goals for ground water, which only apply if a contingency remedy for ground water is implemented (EPA 1992c, EPA 1995). A contingency RA has not been implemented because ground water monitoring data do not show an increasing trend and an imminent risk of potential human ingestion has not occurred. Therefore, ground water cleanup goals do not apply at this time.

The 1992 ROD also specifies that for ground water, if concentrations significantly rise or a risk of imminent exposure surfaces, contingency measures will be implemented. Thirty years may be required before decreasing contaminant levels are observed (EPA 1992c).

On May 5, 1995, the ROD for OU-1 was amended to include the following (EPA 1995):

- On-site biological treatment of organic-contaminated pit sludges (surface and buried) and associated soil and tank contents;
- Contingency incineration of biological treatment residuals that do not meet treatment standards; incineration was not implemented (ThermoRetec Consulting Corporation [ThermoRetec] 1999);
- Stabilization and on-site disposal of the successfully treated residuals from the biotreatment as required to meet performance standards for inorganic compounds and capping with a 2-foot compacted clay cover;
- On-site stabilization and disposal of the site soils contaminated with metals in the east and west site fields and in the northeast area and capping with a 2-foot compacted clay cover;
- Institutional controls (deed notices); and,
- Long-term monitoring of ground water, to make certain that through the process of natural attenuation the contamination is lessened and that no human contact with the contaminated ground water occurs.

TABLE 4

CLEANUP GOALS AND PERFORMANCE STANDARDS FOR PIT SLUDGE AND ASSOCIATED SOIL, ABOVEGROUND TANK CONTENTS, AND SITE SOIL AND SEDIMENT AT OU-1

PREVIOUSLY IDENTIFIED COMPOUNDS OF CONCERN	CLEANUP GOAL	PERFORMANCE STANDARD
ORGANIC COMPOUNDS		
Volatiles		
Benzene	0.66 mg/kg	0.66 mg/kg
Carcinogenic PAHs		
Benzo(a)pyrene equivalent[a]	3.0 mg/kg	3.0 mg/kg
Noncarcinogenic PAHs		
Naphthalene	1,100 mg/kg	1,100 mg/kg
2-Methylnaphthalene	8,000 mg/kg	8,000 mg/kg
Acenaphthylene	16,500 mg/kg	16,500 mg/kg
Acenaphthene	8,000 mg/kg	8,000 mg/kg
Dibenzofuran	8,000 mg/kg	8,000 mg/kg
Fluorene	11,000 mg/kg	11,000 mg/kg
Phenanthrene	8,000 mg/kg	8,000 mg/kg
Anthracene	82,000 mg/kg	82,000 mg/kg
Fluoranthene	11,000 mg/kg	11,000 mg/kg
Pyrene	8,000 mg/kg	8,000 mg/kg
Benzo(g,h,i)perylene	8,000 mg/kg	8,000 mg/kg
PCB	1 mg/kg	1 mg/kg
PCB (covered with at least 12 inches of soil)	10 mg/kg	10 mg/kg
INORGANIC COMPOUNDS		
Arsenic	16 mg/kg	NA
Barium	5,400 mg/kg	NA
TCLP		
Arsenic	NA	5 mg/L
Barium	NA	100 mg/L
Cadmium	NA	1 mg/L
Chromium	NA	5 mg/L
Lead	NA	5 mg/L
Mercury	NA	0.2 mg/L
Selenium	NA	1 mg/L
Silver	NA	5 mg/L
MCL (modified TCLP)		
Arsenic	NA	0.05 mg/L
Barium	NA	2 mg/L
Cadmium	NA	0.005 mg/L
Chromium	NA	0.1 mg/L
Lead[b]	NA	0.015 mg/L
Mercury	NA	0.002 mg/L
Selenium	NA	0.05 mg/L
Silver[c]	NA	0.1 mg/L

TABLE 4 (Continued)

CLEANUP GOALS AND PERFORMANCE STANDARDS FOR PIT SLUDGE AND ASSOCIATED SOIL, ABOVEGROUND TANK CONTENTS, AND SITE SOIL AND SEDIMENT AT OU-1

Notes:

[a] Benzo(a)pyrene equivalent calculated by the following equation: 0.1 (Benzo(a)anthracene) + 0.01 (chrysene) + 0.1 (Benzo(b)fluoranthene) + 0.01 (Benzo(k)fluoranthene) + (Benzo(a)pyrene) + 0.1 (Indeno(1,2,3-cd)Pyrene)+ (Benzo(a,h)anthracene) where (compound) is the concentration of that compound.

[b] Lead action level

[c] Secondary action level

MCL	Maximum contaminant level
mg/kg	Milligram per kilogram
mg/L	Milligram per liter
NA	Not applicable
PAH	Polynuclear aromatic hydrocarbons
PCB	Polychlorinated biphenyl
TCLP	Toxicity Characteristic Leaching Procedure

4.2 REMEDY IMPLEMENTATION

This section discusses remedy implementation for each ROD: OU-2, interim source control, and OU-1, final source action.

4.2.1 Interim Source Control

A group of 13 potentially responsible parties (PRP) was ordered by a December 11, 1992, Unilateral Administrative Order (UAO) to implement the OU-2 ROD. The group of PRPs completed the work in two phases. The first phase began in March 1993 and included the initial removal, treatment, and discharge of rainwater contained in the West Pit, Washout Pit, and the secondary containment areas at the site. The goal of the first phase was to alleviate the potential for overflow of the pits and subsequent release of constituents at the site. The second phase included the following activities:

- Treatment and discharge of additional accumulated rainfall at the site;
- Segregation, removal, and reuse of a floating paraffin layer within the West Pit;
- Excavation and transfer of sludge and associated soil from the Washout Pit to the West Pit;
- Placement of a 3-foot thick compacted clay liner within the bottom of the Washout Pit; and,
- Placement of a 60-millimeter high-density polyethylene (HDPE) liner over the consolidated material in the West Pit.

OU-2 RA activities ended in January 1994 (ThermoRetec 1999). Project completion was documented in an RA certification report dated January 1994 and a final construction report dated March 14, 1994. During RA activities, approximately 2 million gallons of water were treated and discharged. Approximately 2,100 cubic yards of contaminated soil were moved from the Washout Pit to the West Pit (EPA 2000). Approximately 149,800 gallons of paraffin present in the West and Washout Pits were processed and transported off site for use as an alternate fuel. The OU-2 RA was conducted in accordance with the OU-2 ROD, UAO statement of work, and OU-2 Work Plan (EPA 2000). However, with EPA approval, the work was conducted with the following slight variations (Geraghty & Miller, Inc. 1995):

- The ROD called for segregation of the paraffin layer on the West Pit, but the RA included processing, transportation, and off-site use of the paraffin as an alternate fuel.

- The ROD called for backfilling the Washout Pit after excavation, but the RA included installing a 3-foot clay liner at the bottom of the pit, so that the pit could be used as a treatment or disposal cell in the final design.

The EPA also approved the following activities that were conducted but were not specified in the OU-2 ROD (Geraghty & Miller, Inc. 1995):

- Emptying, cleaning, and removing all drums that originally contained investigation-derived wastes;
- Stabilization and off-site disposal of certain solid wastes;
- Removal, decontamination, and on-site storage of a portion of the concrete pad adjacent to the Washout Pit; and,
- Plugging and abandoning two of three on-site water wells.

4.2.2 Final Source Action

A consent decree between EPA and the 13-member PRP group was entered in Federal district court on June 5, 1995, for the final source action. During 1995 and 1996, the PRP group conducted pre-design investigation and sampling activities to further characterize site soil and sludge and performed treatability testing (Geraghty & Miller, Inc. 1995; ThermoRetec 1999). A full-scale remedy demonstration testing was conducted after the pre-design studies. A biological land treatment demonstration was conducted on site during the summer of 1996, followed by a stabilization treatment demonstration in April 1997. The success of the stabilization process depended on the additive used to immobilize the contaminants. The stabilization demonstration was not successful until the additive was changed from Type I Portland cement to ferrous sulfate. The EPA approved the stabilization method using ferrous sulfate in August 1997. The EPA approved the RA work plan and final design report in April 1997, while field demonstrations were being completed (ThermoRetec 1999).

Remediation Technologies, Inc., performed RA activities under contract to the PRP group. Construction began on June 2, 1997. The RA activities included the following (ThermoRetec 1999, EPA 2000):

- Removing three underground storage tanks;
- Sampling five aboveground storage tanks and removing the water fraction into roll-off boxes. Oily media were also consolidated into roll-off boxes and then treated on-site along with sludge and waste liquids from the tanks. Tanks were ultimately cut apart, decontaminated, and shipped off-site for recycling;
- Constructing a land treatment unit (LTU), stormwater retention ponds, and a water treatment system;

- Excavating contaminated sludge and associated soil that remained in the Washout Pit and West Pit after OU-2 RA activities were completed to meet cleanup goals and then over-excavating to construct containment cells;

- Constructing a French drain collection system in the West Pit to recover organic material that may have affected the shallow water zone and performing a pump test in French drain in 2001;

- Biotreating 31,617 cubic yards of sludge and associated soil and stabilizing 21,274 cubic yards of site soils contaminated with metals and approximately 20,000 cubic yards of biological treatment residuals in the LTU;

- Disposing treated wastes on-site in the lined West Pit and Washout Pit containment cells;

- Constructing 2-foot thick clay covers over the West Pit and Washout Pit containment cells after treatment activities were complete. Placing a 6-inch layer of topsoil over the clay covers and establishing vegetative grass cover;

- Treating stormwater that accumulated in the retention ponds by sand and granular activated carbon filters and discharging stormwater in accordance with LDEQ discharge requirements. In addition, chemical oxygen demand and pH levels were regularly monitored to evaluate system performance; and,

- Grading the site to promote drainage and installing a 6-foot chain-link fence around the entire perimeter of the site to control access.

Confirmatory samples were collected at the excavated areas to make certain that all materials with contaminant concentrations higher than cleanup goals had been removed. In addition, performance samples were collected to make certain that the biotreatment residuals and stabilized materials met cleanup goals and performance standards (including Toxicity Characteristic Leaching Procedure [TCLP] standards). Leachate and ground water did not accumulate in the French drains, and no light nonaqueous phase liquid (LNAPL) was observed in the drains after the completion of the pump test (ARCADIS 2001c). A pre-final inspection was conducted on February 19, 1999, and a final inspection was conducted on March 11, 1999. The EPA determined that the RA was completed during the final inspection, except for the submittal of the RA report and filing of the deed notice. The PRP group submitted the RA report on June 11, 1999, and EPA approved the report on October 4, 1999. The PRP group entered a "Right of Use Agreement and Declaration of Restrictions" with the Vermilion Parish Police Jury on September 23, 1999, for the GCVS site (Vermilion Parish Police Jury 1999). The EPA approved a final closeout report for the GCVS site in March 2000.

4.3 OPERATION AND MAINTENANCE

After the construction phase of the RA was completed, the PRP group began the O&M phase. The O&M activities for the GCVS site include routine inspections and maintenance of the protective caps on the West Pit and the Washout Pit and of the perimeter fencing as well as long-term ground water monitoring. Occasional O&M associated with the French drains is also conducted. A pump test was conducted in 2001 that confirmed no LNAPL existed in the shallow ground water (ARCADIS 2001c). Since then, the French drains have been incorporated in the long-term ground water monitoring program (ARCADIS 2002).

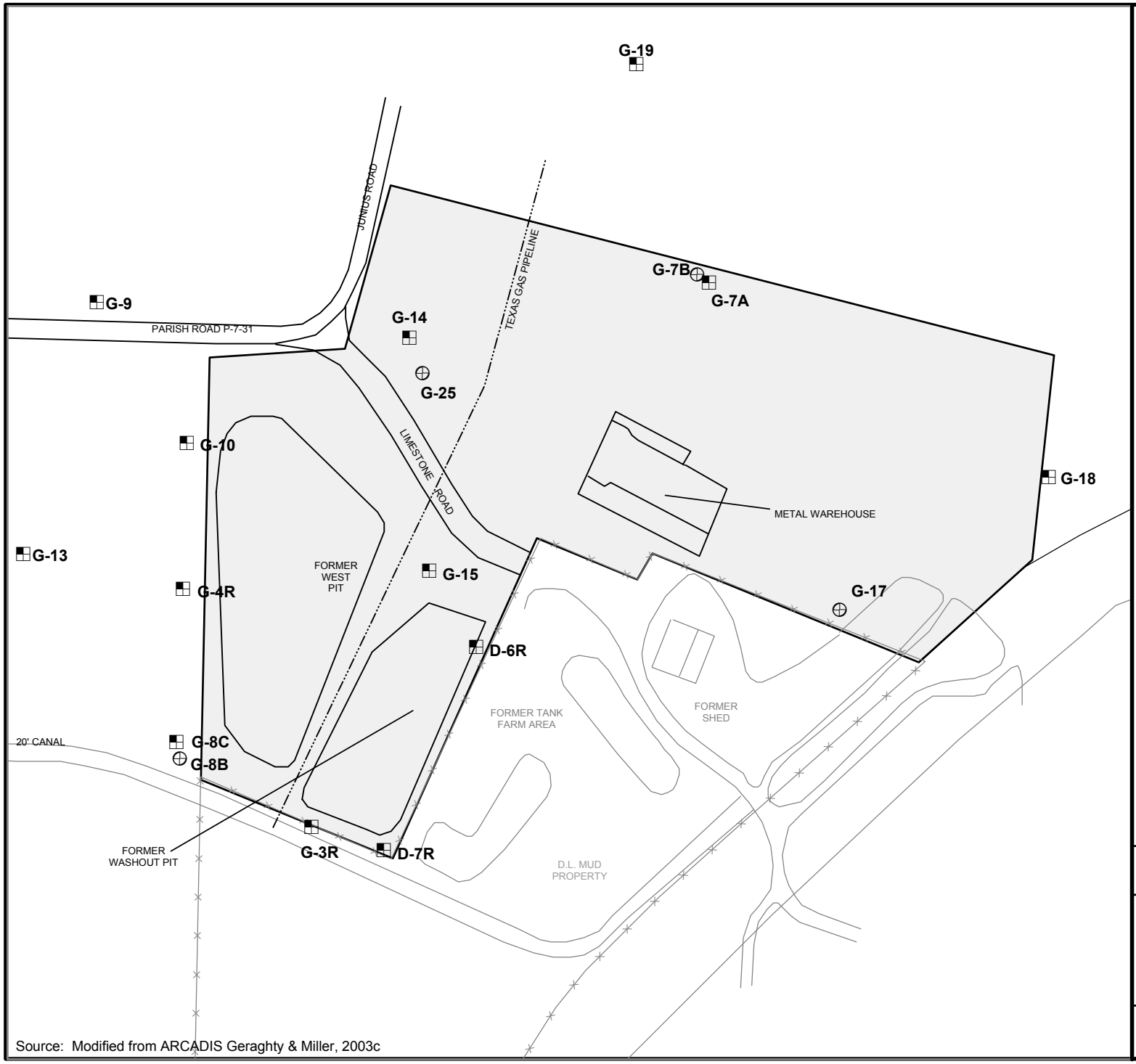
The PRP group is required to conduct yearly inspections and subsequent maintenance of the GCVS site (ARCADIS 2002). Completed site inspection forms are included in ground water monitoring reports. Dates and major finding from the first three inspections are as follows:

- **July 13, 2000.** The inspector observed areas of significant erosion, several gullies with sparse vegetation, and populated weeds on the cover at the West and Washout Pit (ARCADIS 2001a).
- **May 7, 2001.** The inspector observed vegetation on the West Pit and the Washout Pit with large weed populations. According to the inspection form, the areas of erosion observed during the 2000 inspection were repaired. However, the inspector observed signs of erosion in the same areas that had previously been repaired (ARCADIS 2001b).
- **July 2, 2002.** The inspector observed minor erosion gullies present on the West Pit cover. Except for some species of weeds, the covers appeared to be sufficiently vegetated with no significant bare spots. According to the inspection form, previous areas of erosion had been repaired (ARCADIS 2003a).

The PRP group initiated post-RA ground water monitoring in April 1997, before RA activities were completed. Quarterly monitoring was conducted from 1997 through 2001; semiannual monitoring was conducted in 2002 and is currently being conducted in 2003. The frequency of ground water monitoring will be reduced to annually in 2004 because the statistical analysis report shows that concentrations are not increasing. The proposed sampling schedule is shown in Table 5 (ARCADIS 2002).

The monitoring well network at the time of the RI consisted of 12 monitoring wells and one water supply well at the GCVS site, 10 monitoring wells on the adjacent D.L. Mud site, and 11 monitoring wells located on properties adjacent to the site. Monitoring well locations are shown on Figure 2. During the fourth quarter of 2001, EPA approved plugging and abandoning the duplicate wells (G-11P and G-8A) and wells constructed of stainless steel (G-11S, G-1, G-2, G-5, D-6, and D-7), as well as installing two replacement wells (D-6R and D-7R) and a new Upper Chicot Aquifer Unit well (G-25). Monitoring wells

are screened in the Silty Clay I/Alluvium Unit and the Upper Chicot Aquifer. The following monitoring wells are maintained because of their proximity to historical sources of contamination and solidified material: G-3R, G-4R, G-7A, G-7B, G-8B, G-8C, G-10, G-14, G-15, G-25, D-6R, and D-7R. The following monitoring wells are maintained as down gradient wells for semiannual water level measurements, and annual ground water sampling: G-9, G-13, G-17, G-18, and G-19 (ARCADIS 2002, 2003b). Figure 3 shows the current monitoring well network.



LEGEND

- Alluvium Unit Wells
- Upper Chicot Aquifer Wells
- Gulf Coast Vacuum Services Perimeter Boundary

N

0 90 180

Feet

GULF COAST VACUUM SERVICES
ABBEVILLE, LOUISIANA

FIGURE 3
CURRENT MONITORING WELL NETWORK

FIVE-YEAR REVIEW

PREPARED FOR: EPA

BY: Tetra Tech EM Inc.

08/25/03 o:\Louisiana\GCVS_3.mxd PRR G00DA.193406D6

TABLE 5

SCHEDULE FOR LONG-TERM GROUND WATER MONITORING

Year	Sampling Frequency	COMMENTS
1996	Quarterly	
1997	Quarterly	Post-RA sampling begins
1998	Quarterly	First five-year review
1999	Quarterly	
2000	Quarterly	
2001	Quarterly	
2002	Semiannual	Long-term monitoring phase begins
2003	Semiannual	Second five-year review
2004	Annual	Statistical analysis report shows concentrations are not increasing
2005	Annual	
2006	Annual	
2007	Annual	
2008	Annual	Third five-year review
Remaining years	Annual	

The long-term ground water monitoring plan also includes sampling of the two French drains that were installed at the West Pit during RA activities to recover organic material in the shallow aquifer. The French drains will be sampled at the same frequency as the monitoring wells until the end of 2003. After 2003, sampling of the French drain above the liner will cease, and sampling of the French drain below the liner will continue on the same frequency as the monitoring well sampling (ARCADIS 2002). The drain above the liner only receives moisture from the solidified wastes, which are overlaid by a clay cap. There is no exposure route as the moisture is contained within a 60-millimeter HDPE liner and is not leaching into the environment. Sampling of the upper drain will be discontinued, while sampling of the lower drain will continue to ensure that the clay cap and 60 millimeter HDPE liner are working as designed.

Samples collected from the long-term monitoring network are analyzed for arsenic, barium, cadmium, and chromium. Also, samples collected from the two French drains are analyzed for the same four contaminants and total petroleum hydrocarbons (TPH). Originally, the site's parameter list of analytes included benzene, toluene, ethylbenzene, xylenes, and mercury; however, EPA approved removing these parameters from the list of analytes after they were not detected in 17 sampling events (ARCADIS 2002). Ground water monitoring results are presented in routine ground water monitoring reports. Data trends, included in the statistical analysis report of post-RA sampling results, are discussed in Section 6.4.

4.4 OPERATION AND MAINTENANCE COSTS

No O&M cost information for the GCVS site was available for the five-year review.

4.5 PROGRESS SINCE THE LAST FIVE-YEAR REVIEW

The first five-year review was completed in September 1998. At that time, the following RA activities remained to be completed (EPA 1998):

- Biological treatment, stabilization, and containment of the final three lifts (approximately 15,000 cubic yards) of organic-contaminated material;
- Excavation, stabilization, and containment of remaining metal-contaminated material (approximately 24,000 cubic yards) located in the northern and eastern parts of the site;
- Construction of caps after treatment and containment is complete; and,
- Continued ground water monitoring and ground water modeling to determine if contaminant concentrations are decreasing.

The only recommendation in the first-five-year review was to complete the remaining RA activities listed above. The selected remedy was determined to be protective of human health and the environment during the first review (EPA 1998).

After the first five-year review was completed, remaining organic- and metal-contaminated material was treated and disposed of in the on-site disposal area. The on-site disposal area was capped, and ground water monitoring continued. The final closeout report for the GCVS site was submitted on March 2000 (EPA 2000). Ground water elevations and contaminant concentrations were monitored quarterly from the time of the first five-year review until 2001. Ground water was monitored semiannually in 2002, and the first 2003 semiannual event has been completed. On April 18, 2003, the PRP group submitted a draft statistical analysis report of post-RA ground water monitoring results to determine if contaminant concentrations are decreasing. The final statistical report was completed in August 2003 (ARCADIS 2003c).

5.0 FIVE-YEAR REVIEW PROCESS

The second five-year review for the GCVS site was directed by Katrina Coltrain, EPA Remedial Project Manager. The EPA notified the PRP Group representative, Mark R. Hendrickson of Chevron Texaco, at the start of the five-year review process. Additionally, residents of Abbeville were notified of the review through a public notice placed in the *Abbeville Meridional* on January 26, 2003. The five-year review included surveys; reviews of relevant documents, standards, and ground water monitoring data; interviews; and a site inspection conducted on January 27 and 28, 2003. The documents reviewed include but are not limited to, the following:

1. 1992 RODs for OU-1 and OU-2;
2. 1995 ROD amendment for OU-1;
3. Various memoranda and reports documenting the three removal actions that took place in March 1990, February 1991, and April 1992;
4. 1995 remedial design work plan;
5. 1998 first five-year review;
6. 1999 RA report;
7. 2000 final closeout report;
8. 2001 remedial ground water monitoring report for 1999 and 2000 quarterly events;
9. 2001 remedial ground water monitoring report for first and second 2001 quarterly events;
10. 2002 long-term ground water monitoring plan;
11. 2003 ground water monitoring reports for 2002 semiannual events; and,

12. 2003 statistical report.

Complete references for all documents reviewed are provided in Appendix A. Upon its completion, the second five-year review report will be made available at the information repository for the site, and a notice of its availability will be placed in the local newspaper.

6.0 FIVE-YEAR REVIEW FINDINGS

This section presents the findings of the second five-year review. Specifically, this section presents the findings of surveys, a site inspection, an applicable or relevant and appropriate requirements (ARAR) review, and a data review.

6.1 SURVEYS

In accordance with the community involvement requirements of the five-year review process, EPA identified key individuals to be surveyed. Completed survey forms for the following people are included in Appendix B, Exhibit C:

- Michael J, Bertrand, Vermilion Parish Police Jury;
- Mark R. Hendrickson, GCVS Steering Committee Chairman;
- Rich Johnson, LDEQ;
- Wilma Subra, Technical Assistance Group;
- Adjacent Resident, No. 1;
- Adjacent Resident, No. 2; and
- Adjacent Resident, No. 3.

No continuing or unresolved issues were discovered during the interview process. Minor issues and concerns identified during the interview are as follows:

- Information on ground water monitoring frequency and analytical results should be provided to the Vermilion Parish Police Jury. Notification of site visits should also be provided to the Police Jury.
- Oil in the French drains and residual contaminants at the site.
- Potholes along the primary site road.

6.2 SITE INSPECTION

A site inspection was conducted on January 27 and 28, 2003, to assess the condition of the site and the effectiveness of measures employed to protect human health and the environment from the contaminants still present at the site. Attendees included: (1) Katrina Coltrain of EPA; (2) Roger Lee of U.S. Geological Survey; (3) Kipper Montgomery and George Cook of Arcadis; and, (4) Sarah Babcock, Luis Vega, Ronny Matte, and Byron Trahan of Tetra Tech. The site visit report, which includes a photographic log of the inspection (Exhibit A), a site inspection checklist (Exhibit B), and site survey forms (Exhibit C), is provided in Appendix B.

No evidence of contamination was visible at the site. Most monitoring wells visually inspected were in good condition, clearly labeled, and protected from impact. The well cover on well G-15 was broken. Well G-24 was observed but is not part of the RA monitoring network and has not been sampled since 1994. The grass at the site, including that on the clay caps, appeared to be similar in type, health, and density to grass in typical areas outside the site. Large anthills were observed on the caps. Ponded areas were observed at the base of the side-slopes on the south side of the West Pit cap and the east side of the Washout Pit cap. Access restrictions including fencing and signs were in good condition, and no vandalism was observed. Several potholes were observed on the primary site road that is used by area residents.

6.3 ARAR REVIEW

The original and amended RODs identified the ARARs and supporting regulations pertaining to the GCVS site. One of the requirements of a five-year review is to determine if there are any new ARARs or standards for the site that affect the protectiveness of the remedy. Based on the ARARs review, no newly promulgated ARARs or standards for the GCVS site were identified. The original and amended ROD divided ARARs pertaining to remedial activities at the GCVS site into chemical- and action-specific categories. The original and amended RODs did not specify any location-specific ARARs, and no new location-specific ARARs apply now, based on the document review, site inspection, and site interviews. The chemical- and action-specific ARARs are discussed below.

6.3.1 Chemical-specific ARARs

Chemical-specific ARARs are usually health- or risk-based numerical values or methodologies used to determine acceptable concentrations of chemicals that may be found in or discharged to the environment. The chemical-specific ARARs specified in the original and amended ROD for the GCVS site are discussed below:

- **Identification and Listing of Hazardous Waste (Title 40 *Code of Federal Regulations* [CFR] Part 261), Subpart C – Characteristics of Hazardous Waste and Subpart D – Lists of Hazardous Wastes –** Contaminated sludges and soil were tested to determine if they were listed hazardous wastes. Sludges and soil were treated using stabilization or biological treatment. The treated sludges and soils were tested to make certain that TCLP levels were not exceeded and then the treated sludges and soils were disposed of on-site. The RA complies with this ARAR.

- **Land Disposal Restrictions 40 CFR Part 268, 40 CFR § 268.4 and Subpart D – Treatment Standards –** Soil and sludge in the West Pit and Washout Pit were hazardous waste because they exceeded the toxicity characteristic for benzene. These soils and sludges were treated using biological treatment. The RA complied with this ARAR by collecting confirmation soil samples to ensure that contaminants met all disposal requirements (i.e., toxicity characteristic for benzene). All treated soil and sludge samples met stated requirements and were disposed of on-site.

- **National Emission Standards for Hazardous Air Pollutants (40 CFR Part 61) –** These regulations were relevant and appropriate to the excavation and treatment of soils and sludges. Air monitoring conducted during RA excavation and treatment of the soil and sludges met emission standard requirements.

- **Safe Drinking Water Act Maximum Contaminant Levels (MCLs) (40 CFR part 141)** These regulations were relevant and appropriate during water discharge from any site cleanup activities. Before stormwater was discharged from the site, confirmation samples were analyzed to ensure that water quality standards were met. All samples met standards before discharge.

- **Louisiana Administrative Code 33, IX, Water Quality Regulations –** These regulations were relevant and appropriate during water discharge from any site cleanup activities. Stormwater confirmation samples were collected to ensure that Louisiana water quality regulations were met. All samples met discharge requirements.

- **Louisiana Administrative Code 33, IX, Underground Storage Tank Regulation –** These regulations were relevant and appropriate during cleanup of the underground storage tanks. Contaminated tank contents and associated soils were treated and disposed of onsite. Confirmation samples taken during the cleanup of the soils and tank contents met the Louisiana underground storage tank regulation requirements.

The primary constituents that could affect the protectiveness of the remedy if risk assessment factors have been changed are arsenic and barium in soil. In the case of a five-year review, only contaminants for which significant changes in toxicity factors reflect increased toxicity are pertinent, and then only if the selected remedy is no longer protective. The soil cleanup goal for arsenic is based on background levels and the cleanup goal for barium is based on toxicity values such as references doses and potency factors. In the case of GCVS, the toxicity factors for arsenic have not been revised since the ROD was signed in 1992, according to EPA's Integrated Risk Information System (EPA 2003a). Although the toxicity factors for barium were re-evaluated and updated in 1998 and 1999 (EPA 2003a), no changes were made to the numerical values of the toxicity factors for barium according to the EPA Superfund Technical

Support Center (EPA 2003c). Therefore, there have been no changes in toxicity factors that would affect the protectiveness of the remedy.

The original ROD specified no chemical-specific ARARs for ground water. However, it did provide for implementing contingency measures if ground water contamination significantly rises or if a risk of imminent exposure surfaces. The ground water has been monitored and the data have been analyzed. The statistical analysis indicates that ground water contaminant levels are not increasing. In addition, no imminent risk of potential human ingestion has occurred. Because contaminants show no increasing trends and there is no imminent risk of potential exposure to humans, the contingency measures are not necessary at this time. In accordance with the original ROD, there are still no chemical-specific ARARs for ground water because no contingency measures are necessary at this time.

6.3.2 Action-specific ARARs

Action-specific ARARs are usually technology- or activity-based requirements or limitations on actions or conditions taken with respect to specific substances. These requirements are triggered by the particular remedial activities that are selected to accomplish the remedy. The action-specific ARARs specified in the original and amended RODs are discussed below:

- **Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities (40 CFR Part 264) –** The amended ROD indicated that following subparts may be applicable, depending on the treatment methods used, during storage and treatment of the site wastes, as well as during the long-term monitoring of the on-site area where the treated wastes were disposed of:
    - Subpart B: General Facility Standards;
    - Subpart C: Preparedness and Prevention;
    - Subpart D: Contingency Plan and Emergency Procedures;
    - Subpart G: Closure and Post-Closure;
    - Subpart I: Use and Management of Containers;
    - Subpart J: Tank Systems;
    - Subpart K: Surface Impoundments;
    - Subpart L: Waste Piles;
    - Subpart N: Landfill; and
    - Subpart O: Incinerators.

  Subparts J, K, L, N, and O do not apply because hazardous waste was managed in an LTU and roll-off boxes and not tanks, surface impoundments, waste piles, landfills, or incinerators.

Subparts I, B, C, and D applied during treatment of hazardous waste in the LTUs and storage of waste in roll-off boxes. It appears that the RA complied with Subparts I, B, C, and D during hazardous waste treatment based on documents reviewed, the site inspection, and interviews. Compliance with Subparts I, B, C, and D was documented in the RA workplan and Remedial Design Report with the finalization of site specific plans addressing standard operating procedures, construction quality and specifications, remedial action contingencies, and equipment information. The RA complies with applicable sections of Subpart G because confirmation soil samples were collected to confirm that hazardous material did not migrate from the treatment unit, and groundwater monitoring is being and will be conducted for 30 years.

- **Standards for Owners and Operators of Hazardous Waste Treatment, Storage and Disposal Facilities Ground Water Monitoring (40 CFR § 264.117(a)(1)) –** The original ROD indicated that postclosure and monitoring requirements of this regulation were applicable. This regulation requires monitoring and maintenance of the waste containment unit, including monitoring of ground water for 30 years. Ground water has been monitored in accordance with this ARAR. In addition, the disposal area is monitored and maintained in accordance with the EPA-approved O&M plan and manual. The results of the monitoring and maintenance activities are periodically reported to EPA in accordance with the approved schedule. The RA complies with this ARAR.

No other action-specific ARARs for the GCVS site were identified during the five-year review process, and no new action-specific requirements pertaining to the site have been promulgated since 1995.

6.4 DATA REVIEW

Review of the 1999 RA report (ThermoRetec 1999) and the 2000 final closeout report (EPA 2000) for the GCVS indicates that OU-1 and OU-2 remedies are complete and cleanup goals and performance standards have been achieved. Ground water continues to be monitored at the site to determine if natural attenuation of ground water contaminants is occurring. Ground water monitoring data reviewed include monitoring results summarized in the following reports:

- "Remedial Action Ground Water Monitoring Report, Third Quarterly Sampling Event" (ARCADIS 1998);
- "Remedial Ground Water Monitoring Report (2Q99, 3Q99, 4Q99, 1Q00, 2Q00, 3Q00, 4Q00)" (ARACADIS 2001a);
- "Remedial Ground Water Monitoring Report (1Q01 and 2Q01) (ARCADIS 2001b);
- "Long-Term Ground Water Monitoring Plan" (ARCADIS 2002);
- "Remedial Ground Water Monitoring Report, First Semiannual 2002" (ARCADIS 2003a);

- "Remedial Ground Water Monitoring Report, Second Semiannual 2002" (ARACADIS 2003b); and,
- "Gulf Coast Vacuum Services Ground Water Statistics Report" (ARCADIS 2003c).

The goal of ground water monitoring of network wells is to determine if arsenic, barium, cadmium, and chromium are naturally attenuating and to make certain that ground water contamination does not migrate off-site. Originally, the site's parameter list also included benzene, toluene, ethylbenzene, xylenes, and mercury; however, EPA approved removing these parameters from the list of analytes after they were not detected in 17 sampling events (ARCADIS 2002). The EPA recommends using the following four indicators when reviewing ground water monitoring data to evaluate the performance of monitored natural attenuation (EPA 1999), which will be the focus of this discussion:

- Demonstrate that natural attenuation is occurring according to expectations;
- Detect changes in ground water environmental conditions that may reduce the efficacy of the natural attenuation processes;
- Identify any potentially toxic or mobile transformation products (not applicable to the site because no transformation products have been identified); and,
- Verify that the plume is not expanding either down gradient, laterally, or vertically (not applicable to the site because no identifiable or sustainable plume has been identified).

A statistical analysis report was prepared by the PRP group to evaluate whether natural attenuation is occurring according to expectations at the GCVS site (ARCADIS 2003c). Data from April 1998 through January 2003 were evaluated as part of the statistical analysis report and were compared to MCLs. The MCL for arsenic is 50 micrograms per liter (µg/L), for barium is 2,000 µg/L, for cadmium is 5 µg/L, and for chromium is 100 µg/L. Data were also compared to background concentrations that were collected from monitoring wells G-7A (Silty Clay I/Alluvium Unit) and G-7B (Upper Chicot Aquifer), and data trends were evaluated over time (ARCADIS 2003c).

French drain data were not included in the statistical analysis report as part of this five-year review because samples have been collected from the drains for only a few years. The drain above the liner only receives moisture from the solidified wastes, which are overlaid by a clay cap. There is no exposure route as the moisture is contained within a 60-millimeter HDPE liner and is not leaching into the environment. Sampling of the upper drain will be discontinued, while sampling of the lower drain will continue to ensure that the clay cap and 60 millimeter HDPE liner are working as designed.

The statistical analysis report concluded that all analytical results from monitoring wells in the Upper Chicot Aquifer, except well G-17, have been below MCLs since April 1998 (ARCADIS 2003c). Well G-17 has not exceeded the MCL for chromium since April 1999, and shows a decreasing trend. Although barium concentrations were below MCLs at well G-8B, barium concentrations showed an increasing trend at a probability level of 0.10. However, when a probability level of 0.05 is applied, no trend is observed. Analytical and statistical results for arsenic, barium, cadmium, and chromium are presented in Tables 6A through 6D, respectively.

The statistical analysis report concluded that most analytical results from monitoring wells in the Silty Clay I/Alluvium Unit were below MCLs. For wells with analytical results that exceeded MCLs, many had contaminant concentrations that were not significantly above background concentrations or showed a significant decrease over time. Wells with concentrations above MCLs and background concentrations and that show no trend include wells G-3R (barium), G-4R (barium), and G-14 (barium). Arsenic, barium, cadmium, and chromium concentrations at several wells were above MCLs and show no trend; however, the statistical analysis report determined that concentrations at these wells were not significantly above background concentrations. The statistical analysis report explained that the reason data at several wells showed no trend could be because natural attenuation is occurring too slowly to detect a significant decrease over a 5-year period (ARCADIS 2003c). Analytical and statistical results for arsenic, barium, cadmium, and chromium are presented in Tables 6A through 6D, respectively.

TABLE 6A

SUMMARY OF DATA TRENDS AND STATISTICAL ANALYSIS OF GROUND WATER ANALYTICAL RESULTS FOR TOTAL ARSENIC

	Apr-98	Jul-98	Oct-98	Apr-99	Jul-99	Oct-99	Jan-00	May-00	Jul-00	Nov-00	Feb-01	May-01	Aug-01	Dec-01	May-02	Nov-02	3-Jan	Statistical Summary
Silt Clay I/Alluvium Unit																		
D-6/6R	<10	<10	<10	<10	<10	<5	<5	<5	8	<5	<5	<5	<5	<5	<5	<5	<5	BMCL
D-7/7R	<10	<10	<10	<10	<10	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	BMCL
G-8A	<10	<10	<10	<10	<10	<5	<5	9	5	11	<5	<5	<5	<5	--	--	--	BMCL
G-11P	<10	<10	<10	<10	<10	<5	6	<5	7	<5	<5	<5	<5	<5	--	--	--	BMCL
G-11S	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	<5	NS	NS	--	--	--	BMCL
G-18	<10	<10	<10	<10	<10	12.3	23	19	**151**	14	20	<5	16	<5	<5	NS	<5	NSAB
G-4R	43.9	**130**	**58**	**78**	**66.5**	**58**	**110**	**160**	10	**66**	**74**	**72**	**340**	**77**	**81**	**100**	**88**	NSAB
G-8C	<10	<10	<10	<10	<10	<5	19	**68**	23	46	10	<5	<5	<5	<5	<5	<5	NSAB
G-10	<10	<10	<10	<10	<10	<5	<5	6	34	<5	<5	<5	<5	<5	<5	<5	<5	BMCL
G-13	<10	<10	<10	<10	<10	<5	31	48	**57**	28	15	<5	<5	<5	NS	<5	NS	NSAB
G-14	19.2	<10	<10	<10	18.5	11.6	**75**	**54**	<5	13.0	12	28	14	<5	<5	<5	<5	NSAB
G-3R	**59.3**	<10	<10	<10	<10	<5	<5	<5	<5	8	<5	<5	<5	<5	<5	<5	<5	NSAB
G-15	NS	NS	<10	<10	<10	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	BMCL
G-21	<10	<10	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	BMCL
G-22	<10	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	BMCL
G-9	<10	NS	NS	NS	NS	NS	NS	NS	8	NS	NS	<5	NS	NS	NS	<5	NS	BMCL
G-2	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	<5	NS	NS	--	--	--	BMCL
G-19	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	6	NS	NS	NS	<5	NS	BMCL
Upper Chicot Aquifer																		
D-2	<10	<10	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	BMCL
G-8B	<10	<10	<10	<10	5.4	5.5	6	6	5	<5	<5	5	8	9	<5	<5	<5	BMCL
G-17	<10	<10	<10	<10	<10	<5	<5	<5	NS	NS	NS	NS	NS	NS	NS	NS	NS	BMCL
G-25	*	*	*	*	*	*	*	*	*	*	*	*	*	*	<5	<5	7	BMCL
G-1	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	5	NS	NS	--	--	--	BMCL

TABLE 6A (Continued)
SUMMARY OF DATA TRENDS AND STATISTICAL ANALYSIS OF
GROUND WATER ANALYTICAL RESULTS FOR TOTAL ARSENIC

Notes:

All units provided in µg/L
Bolded results are above MCL (50 µg/L)
Average background levels for arsenic are 6.7 µg/L in the Silty Clay I/Alluvium Unit and 17 µg/L in the Upper Chicot Aquifer.

<	Less than
*	Well not yet installed
--	Well plugged and abandoned
µg/L	Micrograms per liter
BMCL	Below maximum contaminant level
MCL	Maximum contaminant level
NS	Not sampled
NSAB	Not significantly above background
NTRD	Significantly above background and no trend

Source: ARCADIS 2003b, 2003

TABLE 6B

SUMMARY OF DATA TRENDS AND STATISTICAL ANALYSIS OF GROUND WATER ANALYTICAL RESULTS FOR TOTAL BARIUM

	Apr-98	Jul-98	Oct-98	Apr-99	Jul-99	Oct-99	Jan-00	May-00	Jul-00	Nov-00	Feb-01	May-01	Aug-01	Dec-01	May-02	Nov-02	Jan-03	Statistical Summary
Silty Clay I/Alluvium Unit																		
D-6/6R	1090	1100	1000	1200	1160	1090	1000	1000	570	1100	861	1000	980	1100	470.0	510	550	BMCL
D-7/7R	495	450	420	420	414	451	420	390	**8200**	459	433	480	460	490	440.0	400	410	NSAB
G-8A	200	1100	660	1500	1530	**3400**	**9300**	**19000**	330	**4900**	**4900**	400	770	270	--	--	--	NSAB
G-11P	<200	<200	<200	1400	293	519	750	370	1400	145	299	230	280	330	--	--	--	BMCL
G-11S	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	520	NS	NS	--	--	--	BMCL
G-18	201	210	<200	230	260	372	630	440	**3400**	424	610	210	450	160	170	NS	NS	NSAB
G-4R	**2330**	**2400**	**2200**	1600	**2490**	**2150**	**2700**	**3700**	1500	**2800**	**2200**	1800	**2800**	1600	1400	1500	1300	NTRD
G-8C	773	1700	980	820	781	1200	**2100**	**16000**	580	**6500**	1800	700	1000	790	910	930	700	NSAB
G-10	599	910	600	580	838	729	970	1400	**4000**	1200	1400	780	1400	960	860	860	900	NSAB
G-13	275	260	300	290	284	316	1200	1600	**10000**	1300	919	410	300	260	NS	260	NS	NSAB
G-14	**2410**	1800	1100	1400	**4490**	**3330**	**16000**	**9600**	**5000**	**4200**	**3300**	**5700**	**3200**	1400	1400	1200	1100	NTRD
G-3R	**7060**	**2400**	**2800**	**2900**	**3530**	**3560**	**3900**	**4500**	1100	**5000**	**4200**	**4400**	**3900**	**4100**	**4200**	**4000**	**3900**	NTRD
G-15	NS	NS	1100	1200	1120	1130	1200	1300	1200	1400	1200	1500	1100	900	1000	610	880	BMCL
G-21	1720	1700	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	BMCL
G-22	423	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	BMCL
G-9	250	NS	NS	NS	NS	NS	NS	NS	520	NS	NS	210	NS	NS	NS	210	NS	BMCL
G-2	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	1400	NS	NS	--	--	--	BMCL
G-19	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	1300	NS	NS	NS	1300	NS	BMCL
Upper Chicot Aquifer																		
G-8B	899	890	880	890	920	936	880	900	960	966	952	1000	970	950	920	890	830	BMCL
G-17	868	790	880	720	945	643	940	630	440	NS	NS	NS	NS	NS	NS	NS	NS	BMCL
G-25	*	*	*	*	*	*	*	*	*	*	*	*	*	*	330	240	270	BMCL
G-1	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	300	NS	NS	--	--	--	BMCL

TABLE 6B (Continued)

SUMMARY OF DATA TRENDS AND STATISTICAL ANALYSIS OF GROUND WATER ANALYTICAL RESULTS FOR TOTAL BARIUM

Notes:
All units provided in µg/L
Bolded results are above MCL (2,000 µg/L)
Average background levels for barium are 1,162 µg/L in the Silty Clay I/Alluvium Unit and 367 µg/L in the Upper Chicot Aquifer

<	Less than
*	Well not yet installed
--	Well plugged and abandoned
µg/L	Micrograms per liter
BMCL	Below maximum contaminant level
MCL	Maximum contaminant level
NS	Not sampled
NSAB	Not significantly above background
NTRD	Significantly above background and no trend

Source: ARCADIS 2003B, 2003C

TABLE 6C

SUMMARY OF DATA TRENDS AND STATISTICAL ANALYSIS OF GROUND WATER ANALYTICAL RESULTS FOR TOTAL CADMIUM

	Apr-98	Jul-98	Oct-98	Apr-99	Jul-99	Oct-99	Jan-00	May-00	Jul-00	Nov-00	Feb-01	May-01	Aug-01	Dec-01	May-02	Nov-02	Jan-03	Statistical Summary
Silty Clay I/Alluvium Unit																		
D-6/6R	2.3	2.0	1.7	2.0	1.7	2.0	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	BMCL
D-7/7R	0.67	0.6	<0.5	<0.5	<.5	<0.5	<5	<5	**8**	<5	<5	<5	<5	<5	<5	<5	<5	NSAB
G-8A	1.9	3.2	2.9	4.1	4.8	**6.8**	**10**	**25**	**7**	**35**	5	<5	<5	<5	--	--	--	NSAB
G-11P	4.1	1.6	1.8	**9.3**	3.4	4.2	<5	**8**	**36**	<5	<5	<5	<5	<5	--	--	--	NSAB
G-11S	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	<5	NS	NS	--	--	--	BMCL
G-18	0.55	1.4	<0.5	0.6	0.69	1.6	<5	<5	**17**	<5	<5	<5	<5	<5	<5	NS	NS	NSAB
G-4R	1.9	2.8	1.5	**5.8**	**6.8**	**6.3**	**19**	**33**	<5	**8**	<5	<5	**8**	<5	<5	**18**	**17**	NSAB
G-8C	2.8	3.2	2.9	2.7	2.6	3.8	<5	**7**	<5	<5	<5	<5	<5	<5	<5	<5	NS	NSAB
G-10	1.3	**32**	<0.5	**6.4**	**15.7**	**12.8**	**58**	**50**	<5	**21**	**45**	<5	**34**	**13**	<5	<5	<5	NSAB
G-13	<0.5	<0.5	<0.5	3.6	<0.5	<0.5	<5	<5	**21**	<5	<5	<5	<5	<5	NS	<5	NS	NSAB
G-14	**72**	**11**	1.8	**6.3**	23	**6.5**	**36**	**19**	**14**	**8**	**8**	**14**	**9**	<5	<5	<5	<5	NSAB
G-3R	**19.0**	**8.5**	**5.4**	**7.8**	**9.1**	**8.8**	**9**	**13**	<5	**10**	5	5	**6**	<5	**8**	7	**8**	NSAB
G-15	NS	NS	**5.4**	3.8	**6.5**	**6.6**	**7**	**9**	**7**	**8**	**7**	**7**	**7**	<5	<5	<5	<5	NSAB
G-21	4.4	3.6	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	BMCL
G-22	1.1	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	BMCL
G-9	<.5	NS	NS	NS	NS	NS	NS	NS	<5	NS	NS	<5	NS	NS	NS	<5	NS	BMCL
G-2	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	<5	NS	NS	--	--	--	BMCL
G-19	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	**32**	NS	NS	NS	**6**	NS	NSAB
Upper Chicot Aquifer																		
D-2	<0.5	<0.5	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	BMCL
G-8B	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	BMCL
G-17	<0.5	1.8	1.2	0.5	0.56	<0.5	<5	<5	<5	NS	NS	NS	NS	NS	NS	NS	NS	BMCL
G-25	*	*	*	*	*	*	*	*	*	*	*	*	*	*	<5	<5	<5	BMCL
G-1	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	<5	NS	NS	--	--	--	BMCL

TABLE 6C (Continued)

SUMMARY OF DATA TRENDS AND STATISTICAL ANALYSIS OF GROUND WATER ANALYTICAL RESULTS FOR TOTAL CADMIUM

Notes:

All units provided in µg/L
Bolded results are above MCL (5 µg/L)
Average background levels for cadmium are 1.9 µg/L in the Silty Clay I/Alluvium Unit and 1.7 µg/L in the Upper Chicot Aquifer

<	Less than
*	Well not yet installed
--	Well plugged and abandoned
µg/L	Micrograms per liter
BMCL	Below maximum contaminant level
DECT	Significantly above background and decreasing trend
MCL	Maximum contaminant level
NS	Not sampled
NSAB	Not significantly above background
NTRD	Significantly above background and no trend

Source: ARCADIS 2003B, 2003C

TABLE 6D

SUMMARY OF DATA TRENDS AND STATISTICAL ANALYSIS OF GROUND WATER ANALYTICAL RESULTS FOR TOTAL CHROMIUM

	Apr-98	Jul-98	Oct-98	Apr-99	Jul-99	Oct-99	Jan-00	May-00	Jul-00	Nov-00	Feb-01	May-01	Aug-01	Dec-01	May-02	Nov-02	Jan-03	Statistical Summary
Silty Clay I/Alluvium Unit																		
D-6/6R	**2000**	**2200**	**150**	**2000**	**969**	**167**	32	**200**	50	81	29	100	**380**	**180**	27	<5	13	DECT
D-7/7R	**1270**	**1600**	**190**	**710**	**115**	**633**	**370**	87	36	26	21	**120**	**180**	25	<5	<5	13	NSAB
G-8A	<10	**160**	24	**150**	27.3	26.3	**190**	**410**	8	**391**	21	8	<5	<5	--	--	--	NSAB
G-11P	32.3	56	16	**1000**	6.6	36	30	14	88	<5	<5	19	8	6	--	--	--	NSAB
G-11S	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	**1000**	NS	NS	--	--	--	NSAB
G-18	21.9	37	13	**250**	15.1	56.8	69	54	**153**	41	65	51	45	<5	<5	NS	NS	NSAB
G-4R	62.2	38	57	**130**	53.3	**101**	93	**230**	40	56	34	<5	100	**120**	<5	<5	<5	NSAB
G-8C	11.6	100	**140**	<10	11.2	20.2	**120**	**250**	70	**156**	36	13	**140**	15	<5	<5	<5	NSAB
G-10	22	53	<10	100	19	29.4	33	94	**116**	39	71	<5	42	16	<5	<5	<5	NSAB
G-13	12.1	30.0	11	44	<10	14.3	**120**	**190**	**183**	**136**	61	96	19	24	NS	<5	NS	NSAB
G-14	**167**	65	<10	**230**	56	49.4	**210**	**170**	10	45	40	**220**	**220**	16	<5	<5	<5	NSAB
G-3R	**401**	25	<10	**140**	27.9	16.2	10	25	40	25	<5	7	10	23	<5	<5	<5	NSAB
G-15	NS	NS	14	<10	<10	<10	5	5	<5	<5	<5	**180**	<5	<5	<5	<5	<5	NSAB
G-21	43.5	31	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	BMCL
G-22	<10	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	BMCL
G-9	11.7	NS	NS	NS	NS	NS	NS	NS	50	NS	NS	63	NS	NS	NS	<5	NS	BMCL
G-2	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	9	NS	NS	--	--	--	BMCL
G-19	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	<5	NS	BMCL
Upper Chicot Aquifer																		
D-2	<10	12	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	BMCL
G-8B	<10	46.0	<10	<10	<10	<10	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	BMCL
G-17	**463**	66	**160**	**130**	10.9	<10	8	<5	15	NS	NS	NS	NS	NS	NS	NS	NS	NSAB
G-25	*	*	*	*	*	*	*	*	*	*	*	*	*	*	<5	<5	<5	BMCL
G-1	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	<5	NS	NS	--	--	--	BMCL

TABLE 6D (Continued)

SUMMARY OF DATA TRENDS AND STATISTICAL ANALYSIS OF GROUND WATER ANALYTICAL RESULTS FOR TOTAL CHROMIUM

Notes:
All units provided in µg/L
Bolded results are above MCL (100 µg/L)
Average background levels for chromium are 34 µg/L in the Silty Clay I/Alluvium Unit and 6.3 µg/L in the Upper Chicot Aquifer

<	Less than
*	Well not yet installed
--	Well plugged and abandoned
µg/L	Micrograms per liter
BMCL	Below maximum contaminant level
DECT	Significantly above background and decreasing trend
MCL	Maximum contaminant level
NS	Not sampled
NSAB	Not significantly above background
Source:	ARCADIS 2003b, 2003c

The statistical analysis report also compared dissolved with total metal concentrations to determine if elevated metal concentrations were a result of the inclusion of particulates in the ground water sample. The statistical analysis report concluded that the difference between dissolved and total concentrations was significant for barium, cadmium, and chromium but was not significant for arsenic. This indicates that concentrations of total metals may be overestimating the true concentration of metals in ground water (ARCADIS 2003c). To better represent ground water concentrations, the long-term ground water monitoring plan adopted sample collection techniques, such as micropurging and frequent turbidity measurements, to better minimize inclusion of particulates in the ground water samples (ARCADIS 2002).

Changes in ground water environmental conditions that may reduce the efficacy of the natural attenuation processes were not evaluated. Environmental conditions monitoring is not necessary at this time because trends in metal concentrations are sufficient to determine if natural attenuation is occurring.

No potentially toxic or mobile transformation products have been identified or are expected. Based on analytical data from site wells, the presence of an identifiable or sustainable plume has not been established.

Based on the statistical analysis report, data at several wells have exceeded MCLs for arsenic, barium, cadmium, and chromium. Of the wells that have exceeded these MCLs, only barium at well G-8B shows an increasing trend, and an increasing trend is only observed when a probability level of 0.10 is applied. No trend is observed when a probability of 0.05 is applied. Analytical results at a majority of these well show no trend, and results at only a few wells show a decreasing trend. Because a majority of the wells exceed MCLs and show no observable trends, arsenic, barium, cadmium, and chromium should continue to be monitored on an annual basis.

The most recent ground water monitoring report (ARCADIS 2003b) and the statistical analysis report (ARCADIS 2003c) were reviewed to evaluate the potential for off-site migration of contaminants. According to the most recent ground water monitoring report, which documents ground water flow after the network wells were resurveyed in May 2002, ground water in the Silty Clay I/Alluvium Unit generally flows from two highest water elevations at the northern and southwestern portions of the site to the center of the site. Ground water then flows northwest off-site, with the exception of ground water from the most southwestern portion of the site, which appears to flow easterly. Based on the statistical analysis, data from off-site wells G-4R, G-8A, G-8B, G-8C, G-9, G-10, G-13, and G-19 exceed MCLs and do not show a decreasing trend; however, analytical results at only well G-4R (barium) are

significantly above background concentrations. Based on analytical data from site wells, the presence of an identifiable or sustainable plume has not been established; therefore, off-site migration is not a concern at this time. Data show that ground water contamination is not migrating vertically because all monitoring data from the lower Upper Chicot Aquifer are below MCLs except for chromium in well G-17, which shows a decreasing trend. Barium concentrations at well G-8B show an increasing trend; however, an increasing trend is only observable when a probability level of 0.10 or higher is applied and concentrations have been below MCLs (ARCADIS 2003c).

7.0 TECHNICAL ASSESSMENT

The conclusions presented in this section support the determination that the selected remedy for the GCVS site is currently protective of human health and the environment. The EPA Guidance indicates that to assess the protectiveness of a remedy, three questions shall be answered.

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

- **RA performance** – Based on review of documents, ARARs, and the site inspection, the selected remedies for OU-1 and OU-2 have been completed in accordance with the 1992 RODs and 1995 ROD amendment. Cleanup goals and performance standards were achieved for both OUs as documented by the RA and closeout reports (ThermoRetec 1999; EPA 2000). The RA has achieved RAOs.

- **System O&M** – Yearly site inspections and routine ground water monitoring, which are the primary O&M activities associated with the implemented RA, will maintain the effectiveness of the selected remedy. Maintenance issues were identified during the five-year review site inspection and include mitigating the threat posed by fire ants and ponded and wet areas, repair of the well cover of well G-15, and plugging and abandoning well G-24. The ground water monitoring program effectively monitors potential degradation of ground water below the GCVS site. Ground water monitoring is conducted routinely in accordance with the long-term ground water monitoring plan. Based on review of ground water monitoring reports, the selected remedy effectively protects ground water. However, the recent statistical report indicates that concentrations of arsenic, barium, cadmium, chromium at several wells, some of which are located off-site and down gradient from the site, exceeded MCLs and do not show a decreasing trend. If ground water concentrations at these wells significantly rise or a risk of imminent exposure surfaces, contingency ground water remedies will be evaluated.

- **Cost of system and O&M** –Cost information was not available for the review.

- **Opportunities for optimization** – In addition to conducting maintenance activities associated with the minor issues identified during the site inspection, opportunities for optimizing the ground water monitoring program were identified after reviewing ground water monitoring reports and the statistical analysis report. Ground water monitoring data at several wells, some of which are off-site and down gradient from the site, are above MCLs and do not show a decreasing trend. Future ground water sampling at these wells should continue on an annual basis until it can be determined that concentrations

are decreasing and that natural attenuation is a sufficient remedy. Annual ground water monitoring would be sufficient to evaluate future trends in all wells.

- **Early indicators of potential issues** – As described above, data from several monitoring wells, some of which are off-site and down gradient from the site, are above MCLs and do not show a decreasing trend. The reason for no trend could be that 5 years is not enough time for natural attenuation to occur. However, future monitoring should be continued annually at those wells with concentrations above MCLs and that do not show a decreasing trend until natural attenuation is determined to be a sufficient remedy. Ponded areas at the base of cap side-slopes are also signs of potential future problems with the remedy. Ponding can lead to erosion of the cap and deteriorate its integrity.

- **Implementation of institutional controls** – Institutional controls have been implemented in accordance with the ROD. A "Right of Use Agreement and Declaration of Restrictions" was entered into with the PRPs on September 23, 1999, granting site access and restricting use.

Question B: Are the assumptions used at the time of remedy selection still valid?

- **Changes in standards and to be considered** – There have been no changes that bear on the protectiveness of the selected remedy. If a contingency ground water remedy is implemented ground water cleanup standards will require evaluation.

- **Changes in exposure pathways** – There have been no changes that bear on the protectiveness of the selected remedy.

- **Changes in toxicity and other contaminant characteristics** – There have been no changes that bear on the protectiveness of the selected remedy. Although toxicity factors for barium have been evaluated since 1992, numerical values have not changed. Toxicity factors for arsenic have not changed.

- **Changes in risk assessment methodologies** – There have been no changes that bear on the protectiveness of the selected remedy.

- **Expected progress toward meeting RAOs** – The RAOs relating to contaminated soil have been met. Institutional controls are in place to achieve the remedial objective associated with exposure to contaminated soil and ground water.

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

No other information has been identified that calls the protectiveness of the selected remedy into question.

Technical Summary

According to documents and data reviewed, the site inspection, and the interviews, the remedy is functioning as intended by the 1992 RODs and 1995 ROD amendment. There have been no changes in the physical conditions of the site that would affect the protectiveness of the remedy. The ARARs cited in the OU-1 ROD and ROD amendment have been met. There have been no changes in toxicity factors for the primary contaminants of concern, and there has been no change to the standardized risk assessment methodology that could affect the protectiveness of the remedy. There is no other information that calls into question the protectiveness of the remedy.

8.0 ISSUES

This section describes issues associated with the GCVS site identified during the second five-year review. The issues are summarized in Table 7. A description of the issues area as follows:

1. **Broken well cover –** The well cover on well G-15 was broken according to site inspection observations.

2. **Well G-24 is not needed –** Well G-24 was observed during the site inspection but is not part of the RA monitoring network and has not been sampled since 1994.

3. **Large fire ant hills on caps –** Large fire ant hills were observed on the caps during the site inspection. Fire ants may burrow deep enough through the caps to create a conduit between the ground surface and the buried waste.

4. **Ponded areas at base of cap side-slopes –** Ponded areas were observed at the base of the side-slopes on the south side of the West Pit cap and the east side of the Washout Pit cap. These ponded areas could cause erosion and deteriorate the caps' integrity.

5. **Several potholes on primary site road –** Several potholes were observed on the primary site road used by area residents. Residents complained about road conditions during interviews.

6. **Ground water concentrations exceeded MCLs and do not show decreasing trends –** According to laboratory analytical results, arsenic, barium, cadmium, and chromium were detected in ground water at concentrations exceeding MCLs. In several RA network wells, some of which are off-site and down gradient from the site, these concentrations show no decreasing trend.

9.0 RECOMMENDATIONS AND FOLLOW-UP ACTIONS

Table 8 summarizes recommendations and follow-up actions for the GCVS site. The PRP group is responsible for conducting follow-up actions, and EPA will provide oversight.

10.0 PROTECTIVENESS STATEMENT

Based on the information available during the second five-year review, the selected remedy for the GCVS site is currently protective of human health and the environment. For the remedy to remain protective in the long-term, caps need to be maintained, ground water monitoring data need to be evaluated on a routine basis, and the deed notice needs to be enforced.

11.0 NEXT REVIEW

The GCVS site requires ongoing five-year reviews. The next review will be conducted within the next five years but no later than September 2008.

TABLE 7

ISSUES IDENTIFIED

Issue	Currently Affects Remedy Protectiveness (Yes/No)
Broken well cover	No
Well G-24 is not needed	No
Large fire ant hills on cap	No
Ponded areas at base of cap side-slopes	No
Several potholes on primary site road	No
Ground water concentrations exceeded MCLs and do not show decreasing trends	No

Notes:

MCL Maximum contaminant level

TABLE 8

RECOMMENDATIONS AND FOLLOW-UP ACTIONS

Issue	Recommendations and Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Follow-up Actions Affect Long-Term Remedy Protectiveness (Yes/No)
Broken well cover	Repair well cover on well G-15.	PRP Group	EPA	First ground water monitoring event after submittal of this report	No
Well G-24 is not needed	Plug and abandon well G-24.	PRP Group	EPA	Within 1 year of submittal of this report	No
Large fire ant hills on cap	Mitigate threat posed by fire ants.	PRP Group	EPA	Within 1 year of submittal of this report	Yes
Ponded areas at base of cap side-slopes	Provide drainage to prevent ponding and future erosion.	PRP Group	EPA	Within 1 year of submittal of this report	Yes
Several potholes on primary site road	Issues with the road maintenance should be worked out with the Vermilion Parish Police Jury, because it is the current owner of record due to the purchase of the property through tax sale.	Vermilion Parish Police Jury	None	To be determined	No
Ground water concentrations exceeded MCLs and do not show a decreasing trend Annual ground water monitoring for arsenic, barium, cadmium, and chromium should be continued for all wells. Arsenic, barium, cadmium, chromium have concentrations above MCLs in several wells and show no decreasing trend. Although chromium concentrations have been below the MCL for all wells since 2001, some wells do not show a decreasing trend. If concentrations significantly rise or a risk of imminent exposure surfaces, contingency measures will be implemented.	Annual ground water monitoring for arsenic, barium, cadmium, and chromium should be continued for all wells. Arsenic, barium, cadmium, chromium have concentrations above MCLs in several wells and show no decreasing trend. Although chromium concentrations have been below the MCL for all wells since 2001, some wells do not show a decreasing trend. If concentrations significantly rise or a risk of imminent exposure surfaces, contingency measures will be implemented.	PRP Group	EPA	First ground water monitoring event after submittal of this report	No

Notes:

MCL Maximum contaminant level
NGVD National geodetic vertical datum

APPENDIX A

DOCUMENTS REVIEWED

(Two Pages)

DOCUMENTS REVIEWED

ARCADIS Geraghty & Miller, Inc. (ARCADIS). 1998. "Remedial Action Ground Water Monitoring Report, Third Quarterly Sampling Event, Gulf Coast Vacuum Services Site, Abbeville, Louisiana." March.

ARCADIS. 2001a. "Remedial Ground Water Monitoring Report (2Q99, 3Q99, 4Q99, 1Q00, 2Q00, 3Q00, 4Q00)." March 16.

ARCADIS. 2001b. "Remedial Ground Water Monitoring Report (1Q01 and 2Q01)." August 7.

ARCADIS. 2001c. Letter Report Regarding the West Pit French Drain Test. October 14.

ARCADIS. 2002. "Long-Term Ground Water Monitoring Plan, Gulf Coast Vacuum Services Site, Abbeville, Louisiana." July 30.

ARCADIS. 2003a. "Remedial Ground Water Monitoring Report, First Semiannual 2002, Agency Interest No. 4805, Abbeville, Louisiana." March 8.

ARCADIS. 2003b. "Remedial Ground Water Monitoring Report, Second Semiannual 2002, Agency Interest No. 4805, Abbeville, Louisiana." March 10.

ARCADIS. 2003c. "Gulf Coast Vacuum Services Ground Water Statistics Report, Gulf Coast Vacuum Services Site, Abbeville, Louisiana." August ."

Geraghty & Miller, Inc. 1995. "Remedial Design Work Plan, Gulf Coast Vacuum Services Site, Abbeville, Louisiana." September.

Roy F. Weston, Inc. 1985. Letter Report Regarding Immediate Removal Assessment, Gulf Coast Vacuum Services, Abbeville, Vermilion Parish, Louisiana. From Kevin B. Jackson, Technical Assistance Team. To Pat Hammack, On-Scene Coordinator, EPA Region 9, Emergency Response Branch.

Tetra Tech EM Inc. 2003. Letter Report on Comments to the Ground Water Statistics Report for Gulf Coast Vacuum Services Site. From Ronny Matte. To Katrina Coltrain, EPA.

ThermoRetec Consulting Corporation. 1999. "Remedial Action Report, Final Source Action, Operable Unit 1, Gulf Coast Vacuum Services Superfund Site, Vermilion Parish, Louisiana." June 11.

Vermilion Parish Police Jury. 1999. Right of Use Agreement and Declaration of Restrictions between Vermilion Parish Police Jury and the Gulf Coast Vacuum Services Potential Responsible Party Group. September.

U.S. Environmental Protection Agency (EPA). 1990. Action Memorandum and After Action Report Documentation of The First Removal Action at The Gulf Coast Vacuum Services Site.

EPA. 1991a. Action Memorandum Regarding The Second Removal Action at Gulf Coast Vacuum Services. February 8.

EPA. 1991b. "Federal On-Scene Coordinator's Report, Gulf Coast Vacuum Services, NPL, Abbeville, Vermilion Parish, Louisiana." March 1.

EPA. 1992a. Action Memorandum Regarding The Third Removal Action at Gulf Coast Vacuum Services Site. March 30.

EPA. 1992b. "Federal On-Scene Coordinator's Report, Gulf Coast Vacuum Services, NPL, Abbeville, Vermilion Parish, Louisiana." April 15.

EPA. 1992c. "Superfund Record of Decision, Gulf Coast Vacuum Services (Operable Unit 1), Louisiana." EPA/ROD/R06-92/076. September 30.

EPA. 1992d. "Superfund Record of Decision, Gulf Coast Vacuum Services (Operable Unit 2), Louisiana." EPA/ROD/R06-92/075. September 30.

EPA. 1995. "Amended Record of Decision, Gulf Coast Vacuum Services, Vermilion Parish, Louisiana, Final Source Action, Operable Unit 1." May.

EPA. 1998. "Remedial Action Five-Year Review, Gulf Coast Vacuum Superfund Site, Vermilion Parish, Louisiana." September 1998.

EPA. 1999. "Use of Monitored Natural Attenuation at Superfund, RCRA Corrective Action, and Underground Storage Tank Sites." OSWER Directive 9200.4-17P. April 21.

EPA. 2000. "Final Closeout Report, Gulf Coast Vacuum Services Superfund Site, Vermilion Parish, Louisiana." March.

EPA. 2001. "Federal Register, Part VIII, Environmental Protection Agency, 40 CFR Parts 9, 141, and 142, National Primary Drinking Water Regulations; Arsenic and Clarifications to Compliance and New Source Contaminant Monitoring; Final Rule." January 22.

EPA. 2002. Overview of Gulf Coast Vacuum Services Superfund Site. On-Line Address: www.epa.gov/earth1r6/6sf/pdffiles/gulf-cst.pdf. Accessed on June 12, 2003. December 13.

EPA 2003a. Integrated Risk Information System. Available on-line at: http://www.epa.gov/iris/index.html.

EPA 2003b. Letter Report Regarding Ground Water Statistics Report for the Gulf Coast Vacuum Site. From Katrina Coltrain. To Mark Hendrickson, Texaco Incorporated. June 2.

EPA 2003c. Personal Communication Regarding Barium Toxicity Factors as Listed in the EPA IRIS file. Telephone call to Dr. Choudhury, Superfund Technical Support Center, and Shannon Garcia, Tetra Tech EM Inc. June 30.

APPENDIX B

SITE VISIT REPORT

(49 Pages)

SITE VISIT REPORT FOR SECOND FIVE-YEAR REVIEW FOR GULF COAST VACUUM SERVICES SUPERFUND SITE ABBEVILLE, VERMILION PARISH, LOUISIANA

Prepared for

United States Environmental Protection Agency
Region 6
Dallas, Texas

Contract No.	:	68-W6-0037
Work Assignment No.	:	112-FR-FE-065Y
Date Prepared	:	September 30, 2003
Prepared by	:	Tetra Tech EM Inc.
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Telephone No.	:	(214) 665-8143

CONTENTS

ACRONYMS AND ABBREVIATIONS

ARCADIS	ARCADIS Geraghty & Miller
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
EPA	U.S. Environmental Protection Agency
GCVS	Gulf Coast Vacuum Services
O&M	Operation and maintenance
OSWER	Office of Solid Waste and Emergency Response
OU	Operable unit
PRP	Potentially responsible party
RA	Remedial action
RAC	Response Action Contract
RAO	Remedial action objective
ROD	Record of decision
Tetra Tech	Tetra Tech EM Inc.

1.0 INTRODUCTION

Tetra Tech EM Inc. (Tetra Tech) received Work Assignment No. 112-FR-FE-065Y from U.S. Environmental Protection Agency Region 6 (EPA) under Response Action Contract (RAC) No. 68-W6-0037. Under this work assignment, Tetra Tech was directed to conduct a second five-year review of the remedial action (RA) implemented at the Gulf Coast Vacuum Services (GCVS) Superfund site in Abbeville, Louisiana.

Tetra Tech visited the site on January 27 and 28, 2003, to assess whether all components of the selected remedy are operating in accordance with criteria established in the 1992 Records of Decision (ROD) and 1995 ROD amendment. This report provides background information on the site, summarizes site visit activities, and presents Tetra Tech's findings. References cited are listed at the end of this text. Exhibit A contains photographs taken during the site visit, and Exhibit B contains the five-year review site visit checklist completed by Tetra Tech. In addition, Exhibit C contains surveys that document interviews that were conducted during the site inspection and throughout the five-year review process.

2.0 BACKGROUND

The GCVS site is located approximately 3 miles southwest of Abbeville, Vermilion Parish, Louisiana, on Parish Road P-7-31, also called Junuis Road. The site covers approximately 12.8 acres and is bounded to the north and west by pasture land and to the east and south by the D.L. Mud Superfund site (EPA 2000). Approximately 2,600 people live within 3 miles of the site, and approximately 10 residences are located less than 0.5 mile from the site boundary. The site is located in the low-lying flatland of the Atlantic Gulf Coastal Plain. LeBoeuf Canal, which runs along the eastern and southern boundary of the site, drains the southern portion of the site. The LeBoeuf Canal used to flow to the Vermilion River, which is located approximately 1.5 miles east of the site, but currently is bermed and does not drain to the river. The LeBoeuf Canal only contains water after a rainstorm. Local ditches that flow into the Coulee Galleque drain the northern portion of the site. The Coulee Galleque drain eventually flows into the Abbeville Canal and to the Vermilion River (EPA 1992b).

The GCVS site was put on the National Priorities List in March 1989. Following a remedial investigation and feasibility study, EPA signed two RODs for the site on September 30, 1992 (EPA 1992a, 1992b) and a ROD amendment on May 2, 1995 (EPA 1995). The remedial action objectives (RAO), selected

remedy, and implementation status for each operable unit (OU) are discussed in the following paragraphs. OU-2 is discussed before OU-1 because OU-2 is an interim action that took place before OU-1.

OU-2, Interim Source Control Action

The RAOs for OU-2 are as follows:

- Prevent oral and dermal, human and environmental exposure to accumulated pit rainwater
- Prevent contamination of adjacent soils due to overflow of the Washout and West Pits
- Prevent migration of contaminated rainwater to the ground water

The selected remedy for OU-2 includes (1) pumping and on-site treatment and discharge of the accumulated contaminated rainwater in the Washout Pit and West Pit, (2) excavating the sludge and soil from the Washout Pit and consolidating the material into the West Pit, (3) placing an impermeable synthetic membrane over the consolidated material in the West Pit, and (4) backfilling the Washout Pit with clean soil (EPA 1992b).

The RA activities began in March 1993 and concluded in January 1994 after placement of a 60-mil high-density polyethylene liner over the consolidated material in the West Pit and backfilling of the Washout Pit. No operation and maintenance (O&M) is associated with the OU-2 RA (EPA 2000).

OU-1, Final Source Action

The RAOs for OU-1, the final source action, are as follows (EPA 1992a):

- Minimize potential exposure by way of ingestion, inhalation, or direct contact with contaminants found in the contaminated pit sludge and associated soil, tank contents, buried pits, and site soil and sediment.
- Reduce the potential for the soil and sludge to act as a continued source of ground water contamination
- Prevent human exposure to contaminated ground water

The selected remedy according to the OU-1 ROD consists of the following (EPA 1992a):

- On-site incineration followed by on-site stabilization of (if necessary), disposal of, and construction of a clay cover over the ash of the organic and inorganic-contaminated pit sludge and associated soil and tank contents
- On-site stabilization of, disposal of, and construction of a clay cover over inorganic-contaminated site soil and sediment
- Institutional controls and long-term ground water monitoring

On May 5, 1995, the ROD for OU-1 was amended to include (1) on-site biological treatment of organic-contaminated pit sludge (surface and buried) and associated soil and tank contents, (2) stabilization and on-site disposal of the successfully treated residuals from the biotreatment as required to meet performance standards for inorganic compounds, (3) on-site stabilization and disposal of the site soils contaminated with metals, (4) capping with a 2-foot compacted clay cover, and (5) institutional controls, such as deed notices and long-term monitoring of ground water. The ROD amendment also included contingency incineration of biological treatment residuals that did not meet treatment standards, but incineration was not needed (EPA 1995).

Construction began on June 2, 1997, and was completed in 1999 after the site was graded to promote drainage and a 6-foot chain-link fence was installed around the entire perimeter of the site for access control. EPA approved a final closeout report for the GCVS site on March 2000 (EPA 2000).

O&M activities at the site include deed restrictions, ground water monitoring, and inspections and repair of the cap. The potentially responsible party (PRP) group entered a "Right of Use Agreement and Declaration of Restrictions" with the Vermilion Parish Police Jury on September 23, 1999, for the GCVS site. The PRP group initiated post-RA ground water monitoring in April 1997, before RA activities were complete. Quarterly monitoring was conducted from 1997 through 2001. Semiannual monitoring was conducted in 2002 and is currently being conducted in 2003. The frequency of monitoring will decrease to annually in 2004 if a statistical analysis shows that concentrations are decreasing after RA activities. Inspections of the cap have taken place annually and are documented in the routine ground water monitoring reports (ARCADIS Geraghty & Miller [ARCADIS] 2002).

Because concentrations of hazardous substances above health-based levels remain at the site, EPA must conduct a statutory review pursuant to Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 121(c) and as provided in the Office of Solid Waste and Emergency

Response (OSWER) Directive 9355.7-02, "Structure and Components of Five-Year Reviews" (May 23, 1991); OSWER Directive 9355.7-02A, "Supplemental Five-Year Review Guidance" (July 26, 1994); "Second Supplemental Five Year Review Guidance" (December 21, 1996); and OSWER Directive 9355.7-03B-P, "Comprehensive Five-Year Review Guidance" (June 2001). The site visit was conducted as part of the five-year review process.

3.0 SITE VISIT ACTIVITIES

A site visit was conducted on January 27 and 28, 2003, to assess the condition of the site and the protective measures employed to protect human health and the environment from the contaminants still present at the site.

The following key individuals identified by EPA participated in the site visit:

- Katrina Coltrain, EPA;
- Sarah Babcock, Tetra Tech;
- Luis Vega, Tetra Tech;
- Ronny Matte, Tetra Tech;
- Byron Trahan, Tetra Tech;
- Kipper Montgomery, ARCADIS;
- George Cook, ARCADIS; and
- Roger Lee, U.S. Geological Survey.

The site visit included evaluation of the condition of monitoring wells, the protective cap, postings, and site fencing. Photographs taken during the site visit are presented in Exhibit A, and the completed five-year review site visit checklist is presented in Exhibit B. The site visit is summarized below.

The weather during the site visit was sunny and cool. Evidence of recent precipitation such as ponding was observed.

Most of the monitoring wells visually inspected appeared to be in good condition and were clearly labeled. The well cover on well G-15 was broken, and well G-24 was observed but has not been sampled

since 1994. The vegetation on site, including that on the protective cap, appeared to be similar in type, health, and density to vegetation in areas in the vicinity of the site. Fire ant hills were observed in numerous locations on the cap. Ponded areas were observed at the base of the side-slopes on the south side of the West Pit cap and the east side of the Washout Pit cap. Access restrictions including fencing and signs were in good condition and no vandalism was observed. Several potholes were observed on the primary site road that is used by area residents.

4.0 FINDINGS

No evidence of contamination was visible at the site. The vegetation at the site appeared to be similar to that in typical surrounding areas. No cracking or evidence of erosion was evident on the protective cap; however, the fire anthills could reduce the integrity of the cap because and the fire ants may burrow deep enough to penetrate the cap completely and create a direct conduit between the ground surface and the buried wastes. Therefore, fire anthills should be mitigated. In addition, ponded areas were observed at the base on the south side of the West Pit landfill and the east side of the Washout Pit landfill. Drainage should be provided to mitigate the ponding because ponding can cause erosion of the cap. Most of the monitoring wells inspected appeared to be in good condition, but the well cover on well G-15 was broken and required repair. In addition, well G-24 was observed but hasn't been monitored since 1994 and should be plugged and abandoned. Site access seemed to be sufficiently restricted because no vandalism was observed and fencing and signs were in good condition. The primary site road was in poor condition and potholes should be filled.

REFERENCES

ARCADIS Geraghty & Miller. 2002. "Long-Term Ground Water Monitoring Plan, Gulf Coast Vacuum Services Site, Abbeville, Louisiana." July 30.

Office of Solid Waste and Emergency Response (OSWER). 1991. Directive 9355.7-02, "Structure and Components of Five-Year Reviews." May 23.

OSWER. 1994. Directive 9355.7-02A, "Supplemental Five-Year Review Guidance." July 26.

OSWER. 1996. Directive 9355.7-02A, "Second Supplemental Five Year Review Guidance." December 1.

U.S. Environmental Protection Agency (EPA). 1992a. "Superfund Record of Decision, Gulf Coast Vacuum Services (Operable Unit 1), Louisiana." EPA/ROD/R06-92/076. September 30.

EPA. 1992b. "Superfund Record of Decision, Gulf Coast Vacuum Services (Operable Unit 2), Louisiana." EPA/ROD/R06-92/075. September 30.

EPA. 1995. "Amended Record of Decision, Gulf Coast Vacuum Services, Vermilion Parish, Louisiana, Final Source Action, Operable Unit 1." May.

EPA. 2000. "Final Closeout Report, Gulf Coast Vacuum Services Superfund Site, Vermilion Parish, Louisiana." March.

EPA. 2001. "Comprehensive Five-Year Review Guidance." EPA540/R/01/007. June

EXHIBIT A

PHOTOGRAPHS

(13 Pages)

EXHIBIT B

SITE VISIT CHECKLIST

(11 Pages)

FIVE-YEAR REVIEW SITE VISIT CHECKLIST

I. SITE INFORMATION

Site Name: Gulf Coast Vacuum Site	**Date of Inspection:** 1/27-1/28/03
Location and Region: Abbeville, LA	**EPA ID:** LAD980750137
Agency, office, or company leading the five-year review: EPA Region 6	**Weather/temperature:** Sunny and cool; high around 50 °F

Remedy Includes: (Check all that apply)

- ☒ Landfill cover/containment
- ☒ Access controls
- ☒ Institutional controls
- ☐ Ground water pump and treatment
- ☐ Surface water collection and treatment
- ☒ Other

Attachments: ☐ Inspection team roster attached ☒ Site map attached (Figure 2 of report)

II. INTERVIEWS (Check all that apply)

1. O&M Site Manager George Cramer (Name) | Project Manager, ARCADIS (Title) | NA (Date)

Interviewed: ☐ by mail ☐ at office ☐ by phone Phone no. NA

Problems, suggestions: ☐ Report attached (Note: survey form was e-mailed to Mr. Cramer on January 30, 2003, but no response was received)

2. O&M Staff Kipper Montgomery (Name) | Field Manager, ARCADIS (Title) | NA (Date)

Interviewed: ☐ by mail ☐ at office ☐ by phone Phone no. NA

Problems, suggestions: ☐ Report attached (Note: survey form was e-mailed to Mr. Montgomery on January 30, 2003, but no response was received)

3. Local regulatory authorities and response agencies (i.e.; State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.). Fill in all that apply.

Agency Vermilion Parish Police Jury

Contact Michael Bertrand (Name) | Secretary and Treasurer (Title) | 1/28/03 (Date) | (337)898-4300 (Phone no.)

Problems, suggestions: ☒ Report attached Survey forms are in Exhibit C

Agency LDEQ

Contact Rich Johnson (Name) | State Representative (Title) | 1/27/03 (Date) | (225)765-0487 (Phone no.)

Problems, suggestions: ☒ Report attached Survey forms are in Exhibit C

4. Other interviews (optional): ☒ Report attached (in Exhibit C)

One adjacent resident were interviewed during site visit.

(Additional interviews were conducted over the phone after the site inspection and are included in Exhibit C, along with survey forms for Mr. Bertrand, Mr. Johnson, and Adjacent Resident No. 1)

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)

1. O&M Documents

☒ O&M manual (long term monitoring plan)	☒ Readily available	☐ Up to date	☐ N/A
☒ As-built drawings	☐ Readily available	☒ Up to date	☐ N/A
☒ Maintenance logs (semi-annual well inspection sheets)	☐ Readily available	☒ Up to date	☐ N/A

Remarks: ARCADIS has inspection sheets

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: At Office

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

Remarks: Available at ARCADIS office

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: LDEQ discharge permits are required for occasional discharge from French drains .

5. Gas Generation Records ☐ Readily available ☐ Up to date ☒ N/A

6. Settlement Monument Records ☐ Readily available ☐ Up to date ☒ N/A

7. Ground Water Monitoring Records ☐ Readily available ☒ Up to date ☐ N/A

8. Leachate Extraction Records ☐ Readily available ☒ Up to date ☐ N/A

9. Discharge Compliance Records

☐ Air	☐ Readily available	☐ Up to date	☒ N/A
☒ Water (effluent)	☐ Readily available	☒ Up to date	☐ N/A

Remarks: No continuous discharge; occasional discharge from French drains.

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

Remarks: _____

IV. O&M COSTS

1. O&M Organization

☐ State in-house ☐ Contractor for State ☐ PRP in-house

☒ Contractor for PRP ☐ Other _____

2. O&M Cost Records (O&M cost information not available during inspection)

☐ 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

Date	Date	Total Cost		
From _____	to _____	_____	-	☐ Breakdown attached
From _____	to _____	_____	-	☐ Breakdown attached
From _____	to _____	_____	-	☐ Breakdown attached
From _____	to _____	_____	-	☐ Breakdown attached
From _____	to _____	_____	-	☐ Breakdown attached
From _____	to _____	_____	-	☐ Breakdown attached
From _____	to _____	_____	-	☐ Breakdown attached
From _____	to _____	_____	-	☐ Breakdown attached

3. Unanticipated or Unusually High O&M Costs During Review Period

O&M cost information not available during inspection

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

A. Fencing

1. Fencing damaged ☐ Location shown on site map ☐ Gates secured ☒ N/A

Remarks: Damage at northwest corner and west side was recently fixed; no other fencing damage

B. Other Access Restrictions

1. Signs and other security measures ☐ Location shown on site map ☐ N/A

Remarks: Signs that read “no trespassing,” “all visitors must register,” “work safely,” and “authorized personnel only” on the fence on west side of site (see photograph no. 10); several other black and white no-trespassing signs along fence, one no trespassing sign at the entrance of the capped area.

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) Monitored during site inspections

Frequency Same frequency as groundwater monitoring

Responsible party/agency GCVS PRP Group Steering Committee

Contact Mark R. Hendrickson (Name) | Chairman (Title) | 9/23/99 (Date) | (713) 219-5225 (Phone no.)

Reporting is up-to-date ☒ Yes ☐ No ☐ N/A

Reports are verified by the lead agency ☒ Yes ☐ No ☐ N/A

Specific requirements in deed or decision documents have been met ☒ Yes ☐ No ☐ N/A

Violations have been reported ☐ Yes ☐ No ☒ N/A

Other problems or suggestions: ☐ Report attached

2. Adequacy ☒ ICs are adequate ☐ ICs are inadequate ☐ N/A

Remarks:

D. General

1. Vandalism/trespassing ☐ Location shown on site map ☒ No vandalism evident

Remarks:

2. Land use changes onsite ☒ N/A

Remarks:

3. Land use changes offsite ☒ N/A

Remarks:

VI. GENERAL SITE CONDITIONS

A. Roads ☒ Applicable ☐ N/A

1. Roads damaged ☐ Location shown on site map ☒ Roads adequate ☐ N/A

Remarks: Road that runs through the property is currently used by local residents that live east of the site has potholes and wet/muddy areas. Residents complained about the road during interviews. Photographs no. 21, 22, 23, and 25 show road conditions.

B. Other Site Conditions

Remarks:

VII. LANDFILL COVERS ☒ Applicable ☐ N/A

A. Landfill Surface

1. Settlement (Low spots) ☐ Location shown on site map ☐ Settlement not evident
Areal extent _____ Depth _____
Remarks: N/A

2. Cracks ☐ Location shown on site map ☒ Cracking not evident
Lengths _____ Widths _____ Depths _____
Remarks: _____

3. Erosion ☐ Location shown on site map ☒ Erosion not evident
Areal extent _____ Depth _____
Remarks: _____

4. Holes ☐ Location shown on site map ☒ Holes not evident
Areal extent _____ Depth _____
Remarks: _____

5. Vegetative Cover ☒ Grass ☒ Cover properly established ☐ No signs of stress
☐ Trees/Shrubs (indicate size and locations on a diagram) (None)
Remarks: Large ant hills across the top of caps

6. Alternative Cover (armored rock, concrete, etc.) ☒ N/A
Remarks: _____

7. Bulges ☐ Location shown on site map ☒ Bulges not evident
Areal extent _____ Depth _____
Remarks: _____

8. Wet Areas/Water Damage ☐ Wet areas/water damage not evident

☒ Wet areas	☐ Location shown on site map	☐ Areal extent _____
☒ Ponding	☐ Location shown on site map	☐ Areal extent _____
☐ Seeps	☐ Location shown on site map	☐ Areal extent _____
☐ Soft subgrade	☐ Location shown on site map	☐ Areal extent _____

Remarks: Wet areas are shown in photograph no. 8 and are on the south side of the West Pit cap, at the base of the side-slope. Ponding is shown in photograph no. 4, on the east side of Washout Pit cap at the base of the side-slope.

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, rip rap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)

1. Settlement ☐ Location shown on site map ☐ No evidence of settlement

Areal extent _____ Depth _____

Remarks: _____

2. Material Degradation ☐ Location shown on site map ☐ No evidence of degradation

Material type _____ Areal extent _____

Remarks: _____

3. Erosion ☐ Location shown on site map ☐ No evidence of erosion

Areal extent _____ Depth _____

Remarks: _____

4. Undercutting ☐ Location shown on site map ☐ No evidence of undercutting

Areal extent _____ Depth _____

Remarks: _____

5. Obstructions Type _____

☐ No obstructions ☐ Location shown on site map

Areal extent _____ Size _____

Remarks: _____

6. Excessive Vegetative Growth Type _____

☐ No evidence of excessive growth ☐ Vegetation in channels does not obstruct flow

☐ Location shown on site map Areal extent _____

Remarks: _____

D. Cover Penetrations ☒ Applicable ☐ N/A

1. Gas Vents ☐ Active ☐ Passive
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ Evidence of leakage at penetration ☐ Needs O&M ☒ N/A
Remarks: _____

2. Gas Monitoring Probes
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ Evidence of leakage at penetration ☐ Needs O&M ☒ N/A
Remarks: _____

3. Monitoring Wells (within surface area of landfill)
☐ Evidence of leakage at penetration ☐ Needs O&M ☒ N/A
Remarks: _____

4. Leachate Extraction Wells
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ Evidence of leakage at penetration ☐ Needs O&M ☐ N/A
Remarks: No extraction wells; but access pipe to French drain that collects leachate was in good condition (see Photo No. 7).

5. Settlement Monuments ☐ Located ☐ Routinely surveyed ☒ N/A
Remarks: _____

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

1. Gas Treatment Facilities
☐ Flaring ☐ Thermal destruction ☐ Collection for reuse
☐ Good condition ☐ Needs O&M
Remarks: _____

2. Gas Collection Wells, Manifolds, and Piping ☐ Good condition ☐ Needs O&M
Remarks: _____

3. Gas Monitoring Facilities (e.g., gas monitoring of adjacent homes or buildings)
☐ Good condition ☐ Needs O&M ☐ N/A
Remarks: _____

F. Cover Drainage Layer ☐ Applicable ☒ N/A

1. Outlet Pipes Inspected ☐ Functioning ☐ N/A
Remarks: _____

2. Outlet Rock Inspected ☐ Functioning ☐ N/A
Remarks: _____

G. Detention/Sedimentation Ponds ☐ Applicable ☒ N/A

1. Siltation Areal extent _____ Size _____
☐ 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: On-site vegetative growth consists of grass as shown in photograph no. 2.

_____

3. Erosion ☐ Location shown on site map ☒ Erosion not evident

Areal extent _____ Depth _____

Remarks: _____

_____

4. Discharge Structure ☒ Functioning ☐ N/A

Remarks: Surface water drainage to exiting channel (see photograph no. 2); no signs of leaching along side-slopes

_____

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. GROUND WATER/SURFACE WATER REMEDIES ☒ Applicable ☐ N/A

A. Ground Water 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: Access pipes to French drains that collect leachate above the liner and groundwater below the liner were in good condition (See Photo No. 7).

3. Spare Parts and Equipment

☐ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided

Remarks: NA

_____

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 absorbers
☐ Filters fabric
☐ 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 ground water 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 (esp. roof and doorways) ☐ Needs repair
☐ Chemicals and equipment properly stored

Remarks: _____

6. Monitoring Wells (Pump and treatment remedy)

☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ All required wells located ☐ Needs O&M ☐ N/A

Remarks: _____

D. Monitored Natural Attenuation ☒ Applicable ☐ N/A

1. Monitoring Wells (Natural attenuation remedy)

☒ Properly secured/locked ☒ Functioning ☒ Routinely sampled ☒ Good condition
☒ All required wells located ☐ Needs O&M ☐ N/A

Remarks: Minor corrosion on protective covers of several wells; broken cover on well G-15; and well G-24 is no longer sampled but has not been abandoned

X. OTHER REMEDIES

If there are remedies applied at the site that 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 goal of the remedy is to contain treated soil in two pits and monitor groundwater to determine if groundwater contaminants are naturally attenuating. Caps were in good condition, except for minor ponding at the base of side-slopes on the south side of the West Pit cap and the east side of the Washout Pit cap. Wells were in good condition, except for a broken well cover on well G-15. In addition well G-24 was observed but has not been sampled since 1994. Site roads, which are used by area residents, had several potholes.

B. Adequacy of O&M

O&M appeared to be adequate.

C. Early Indicators of Potential Remedy Failure

Minor ponding at the base of side slopes on the south side of the West Pit cap and the east side of the Washout Pit cap may lead to erosion and deterioration of the cap.

D. Opportunities for Optimization

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.

Mitigation of anthills and ponded areas, repair of well G-15; abandonment of well G-24, and road maintenance

EXHIBIT C

SURVEYS

(16 Pages)

TABLE C-1

INTERVIEW DOCUMENTATION

Name	Title/Position	Organization	Date of Interview
Michael J. Bertrand	Secretary/Treasurer	Vermilion Parish Police Jury	January 21, 2003
Mark R. Hendrickson	GCVS Steering Committee Chairman	Chevron Texaco	January 21, 2003
Rich Johnson	State Representative	LDEQ	January 27, 2003
Wilma Subra	TAG Representative	Subra Company	May 15, 2003
Adjacent Resident No. 1	Not applicable	Not applicable	February 3, 2003
Adjacent Resident No. 2	Not applicable	Not applicable	February 10, 2003
Adjacent Resident No. 3	Not applicable	Not applicable	January 21, 2003

Notes:

LDEQ Louisiana Department of Environmental Quality
GCVS Gulf Coast Vacuum Services
TAG Technical assistance grant

SUPERFUND SITE SURVEY - FORM B	
Site Name: Gulf Coast Vacuum Services	**EPA Work Assignment No.:** 112-FRFE-065Y
Subject: 5-Year Review Local Authority Survey	**Date:** January 21, 2003

Contact Made By:

Name: Katrina Coltrain	**Title:** Remedial Project Manager	**Organization:** EPA
Telephone No.: (214) 665-8143 **E-Mail:** coltrain.katrina@epa.gov	**Street Address:** 1455 Ross Avenue, Suite 1200 **City, State, Zip:** Dallas, Texas 75202	
Name: Sarah Babcock	**Title:** Project Manager	**Organization:** Tetra Tech EM Inc.
Telephone No.: (303) 382-8782 **E-Mail:**sarah.babcock@ttemi.com	**Street Address:** 1099 18th Street, Suite 1900 **City, State, Zip:** Denver, Colorado 80202	

Individual Contacted:

Name: Mr. Michael J. Bertrand	**Title:** Secretary / Treasurer	**Organization:** Vermillion Parish Police Jury
Telephone No.: (337) 898-4300 **E-Mail:** vermilionppj@yahoo.com	**Street Address:** 100 N. State St., Suite 200 **City, State, Zip:** Abbeville, LA 70510	

Survey Questions

Should you choose to respond, please return your survey in the enclosed envelope to Sarah Babcock by February 28, 2003.

1. What is your impression of the project (general sentiment)?

   The project has been satisfactorily completed.

2. Has your office conducted routine communications or activities (site visits, inspections, reporting activities, etc.) regarding the site? If so, please provide the purpose and results.

   Not at present.

   Note: The policy jury is considering utilizing the Gulf Coast site as an area barn for road maintenance equipment and supplies.

3. Have there been any complaints, violations, or other incidents related to the site requiring a response by your office? If so, please provide details of the events and the results of the responses.

   The use of road through site by adjoining landowners. Request for grading and dressing of road with material.

SUPERFUND SITE SURVEY - FORM B (Continued)	
Site Name: Gulf Coast Vacuum Services	**EPA Work Assignment No.:** 112-FRFE-065Y
Subject: 5-Year Review Local Authority Survey	**Date:** January 21, 2003

Survey Questions (Cont.)

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

   No contact with this office since closeout ceremony. No information has been provided relative to monitoring reports, etc.

5. Have there been any changes in State laws and regulations that may impact the protectiveness of the ground water or soil remedies?

   None to my knowledge. However, a state water policy commission has been established to address this matter (water policy).

6. Has the site been in compliance with permitting and reporting requirements?

   Unknown.

7. Do you have any comments, suggestions, or recommendations regarding this site's management or operation?

   Information should be provided regarding monitoring frequency and reporting of test results to the Vermilion Parish Police Jury (local governing body). Notification of any site visits, etc.

SUPERFUND SITE SURVEY - FORM C		
Site Name: Gulf Coast Vacuum Services Site		**EPA Work Assignment No.:** 112-FRFE-065Y
Subject: 5-Year Review Operation and Maintenance Survey		**Date:** January 21, 2003
Contact Made By:		
Name: Katrina Coltrain	**Title:** Remedial Project Manager	**Organization:** EPA
Telephone No.: (214) 665-8143 **E-Mail:** coltrain.katrina@epa.gov	**Street Address:** 1455 Ross Avenue, Suite 1200 **City, State, Zip:** Dallas, Texas 75202	
Name: Sarah Babcock	**Title:** Project Manager	**Organization:** Tetra Tech EM Inc.
Telephone No.: (303) 382-8782 **E-Mail:**sarah.babcock@ttemi.com	**Street Address:** 1099 18th Street, Suite 1900 **City, State, Zip:** Denver, Colorado 80202	
Individual Contacted:		
Name: Mark R. Hendrickson	**Title:** GCVS Steering Committee Chairman	**Organization:** Chevron Texaco
Telephone No.: 713-219-5225 **E-Mail Address:** Mhendrickson @ Chevrontexaco.com	**Street Address:** 5959 Corporate Drive, Room 3641 **City, State, Zip:** Houston, TX 77036	

Survey Questions

Should you choose to respond, please return your survey in postal service to Luis Vega by February 14, 2003.

1. What is your impression of the project (general sentiment)?

   The remedy has been successful and monitoring seems to indicate that there is no threat to people or the environment. The PRP relationship with the EPA and LDEQ has been good. The PRPs are anticipating a reduction of sampling frequency and associated costs as allowed in the Long Term Groundwater Monitoring Plan based on the groundwater monitoring history.

2. Please describe the on-site operation and maintenance (O&M) presence, including staff, frequency of site inspections, and O&M activities.

   Groundwater is currently being monitored and sampled semiannually by the PRPs and the EPA and the PRPs conduct an annual site inspection of the site. These are required in the Long Term Groundwater Monitoring Plan. Additionally, the PRPs arrange for mowing during the year as needed. Wells and fencing are maintained in good working order.

SUPERFUND SITE SURVEY - FORM C (Continued)	
Site Name: Gulf Coast Vacuum Services Site	**EPA Work Assignment No.:** 112-FRFE-065Y
Subject: 5-Year Review Operation and Maintenance Survey	**Date:** January 21, 2003

Survey Questions (Continued)

3. Please describe any significant changes in the O&M requirements, maintenance schedules, or sampling routines since start-up or in the last 5 years. Do they affect the protectiveness or effectiveness of the remedy?

   Groundwater sampling frequency has been reduced from quarterly to semiannually as specified in the Long Term Groundwater Monitoring Plan. The PRPs believe that this change has continued to maintain the protectiveness/effectiveness of the remedy.

4. Have there been unexpected O&M difficulties or costs at the site since start-up or in the last 5 years? If so, please provide details.

   There have been no significant unexpected O&M difficulties or costs during the past 5 years.

SUPERFUND SITE SURVEY - FORM C (Continued)	
Site Name: Gulf Coast Vacuum Services Site	**EPA Work Assignment No.:** 112-FRFE-065Y
Subject: 5-Year Review Operation and Maintenance Survey	**Date:** January 21, 2003

Survey Questions (Cont.)

5. Can you provide insight to potential O&M problems?

   No potential O&M problems are anticipated by the PRP group as groundwater continues to be monitored, the site is inspected at a regular frequency, and repairs are addressed promptly when needed.

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

   The PRP anticipates reducing the groundwater monitoring /sampling frequency based on the sampling results which indicate only minimal concentrations of contaminants of concern which are posing no threat to people or the environment.

SUPERFUND SITE SURVEY - FORM B		
Site Name: Gulf Coast Vacuum Services Site		**EPA Work Assignment No.:** 112-FRFE-065Y
Subject: 5-Year Review Local Authority Survey		**Date:** January 27, 2003
Contact Made By:		
Name: Katrina Coltrain	**Title:** Remedial Project Manager	**Organization:** EPA
Telephone No.: (214) 665-8143 **E-Mail:** coltrain.katrina@epa.gov	**Street Address:** 1455 Ross Avenue, Suite 1200 **City, State, Zip:** Dallas, Texas 75202	
Name: Sarah Babcock	**Title:** Project Manager	**Organization:** Tetra Tech EM Inc.
Telephone No.: (303) 382-8782 **E-Mail:**sarah.babcock@ttemi.com	**Street Address:** 1099 18th Street, Suite 1900 **City, State, Zip:** Denver, Colorado 80202	
Individual Contacted:		
Name: Rich Johnson	**Title:** State Representative	**Organization:** LDEQ
Telephone No.: 225-765-0487 **E-Mail:** rich_j@deq.state.la.us	**Street Address:** P.O. Box 82282 **City, State, Zip:** Baton Rouge, LA 70884-2282	

Survey Questions

Should you choose to respond, please return your survey in the enclosed envelope to Sarah Babcock by February 28, 2003.

1. What is your impression of the project (general sentiment)?

   I think the job has gone very well.

2. Has your office conducted routine communications or activities (site visits, inspections, reporting activities, etc.) regarding the site? If so, please provide the purpose and results.

   We have been on the site during most sampling events and most remedial activities.

3. Have there been any complaints, violations, or other incidents related to the site requiring a response by your office? If so, please provide details of the events and the results of the responses.

   None.

SUPERFUND SITE SURVEY - FORM B (Continued)	
Site Name: Gulf Coast Vacuum Services	**EPA Work Assignment No.:** 112-FRFE-065Y
Subject: 5-Year Review Local Authority Survey	**Date:** January 27, 2003

Survey Questions (Cont.)

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

   Yes.

5. Have there been any changes in State laws and regulations that may impact the protectiveness of the ground water or soil remedies?

   No.

6. Has the site been in compliance with permitting and reporting requirements?

   Yes

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

   No, the EPA has done an excellent job keeping LDEQ informed of any activities, and notifying us of planned actions for our information and concurrence.

SUPERFUND SITE SURVEY - FORM A		
Site Name: Gulf Coast Vacuum Services		**EPA Work Assignment No.:** 112-FRFE-065Y
Subject: 5-Year Review Background Information Survey		**Date:** May 15, 2003
Contact Made By:		
Name: Katrina Coltrain	**Title:** Remedial Project Manager	**Organization:** EPA
Telephone No.: (214) 665-8143 **E-Mail:** coltrain.katrina@epa.gov	**Street Address:** 1455 Ross Avenue, Suite 1200 **City, State, Zip:** Dallas, Texas 75202	
Name: Sarah Babcock	**Title:** Project Manager	**Organization:** Tetra Tech EM Inc.
Telephone No.: (303) 382-8782 **E-Mail:** sarah.babcock@ttemi.com	**Street Address:** 1099 18th Street, Suite 1900 **City, State, Zip:** Denver, Colorado 80202	
Individual Contacted:		
Name: Wilma Subra	**Title:** TAG Representative	**Organization:** Subra Company
Telephone No.: (337) 367-2216 **E-Mail:**	**Street Address:** P.O. Box 9813 **City, State, Zip:** New Iberia, LA 70562	

Survey Questions

Should you choose to respond, please return your survey in the enclosed envelope to Sarah Babcock by February 14, 2003.

1. What is your impression of the project (general sentiment)?

   Concern with the following:

   - Oil in groundwater that they found in French Drain which left contamination on site
   - In general, contamination left onsite was biggest concern.

2. What effect have site operations had on the surrounding community

   Not much detrimental, some dust. Citizens informed throughout process. Not much increase in traffic.

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

   Not at this time. There is some concern that when police jury bought the site at Sheriff sale, they accepted liability.

SUPERFUND SITE SURVEY - FORM A (continued)	
Site Name: Gulf Coast Vacuum Services	**EPA Work Assignment No.:** 112-FRFE-065Y
Subject: 5-Year Review Background Information Survey	**Date:** May 15, 2003

Survey Questions (Cont.)

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

   No. Neighbors would know better.

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

   Yes, throughout cleanup, but not at this time.

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

   None, except French Drain issue.

SUPERFUND SITE SURVEY - FORM A		
Site Name: Gulf Coast Vacuum Services	**EPA Work Assignment No.:** 112-FRFE-065Y	
Subject: 5-Year Review Background Information Survey	**Date:** February 3, 2003	
Contact Made By:		
Name: Katrina Coltrain	**Title:** Remedial Project Manager	**Organization:** EPA
Telephone No.: (214) 665-8143 **E-Mail:** coltrain.katrina@epa.gov	**Street Address:** 1455 Ross Avenue, Suite 1200 **City, State, Zip:** Dallas, Texas 75202	
Name: Sarah Babcock	**Title:** Project Manager	**Organization:** Tetra Tech EM Inc.
Telephone No.: (303) 382-8782 **E-Mail:** sarah.babcock@ttemi.com	**Street Address:** 1099 18th Street, Suite 1900 **City, State, Zip:** Denver, Colorado 80202	
Individual Contacted:		
Name: Adjacent Resident No. 1	**Title:** Not applicable	**Organization:** Not applicable

Survey Questions

Should you choose to respond, please return your survey in the enclosed envelope to Sarah Babcock by February 14, 2003.

1. What is your impression of the project (general sentiment)?

   No response.

2. What effect have site operations had on the surrounding community

   The in and out of traffic on the horrible road, especially after a rain. The whole crew is famous for this. Every time it rains, the crew shows up and makes road messier.

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

   Same as above, the problem with the road and pot holes

SUPERFUND SITE SURVEY - FORM A (continued)	
Site Name: Gulf Coast Vacuum Services	**EPA Work Assignment No.:** 112-FRFE-065Y
Subject: 5-Year Review Background Information Survey	**Date:** February 3, 2003

Survey Questions (Cont.)

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

   No response.

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

   We had to go on-line to get real details. If we have had any questions, we have stopped and everyone we spoke with has answered our question or directed us to answers.

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

   We would like some help with the road at least filling in the potholes. Especially since workers travel it quite often after a rain. We have lived here for over a year and workers are here quite often using the road.

SUPERFUND SITE SURVEY - FORM A		
Site Name: Gulf Coast Vacuum Services		**EPA Work Assignment No.:** 112-FRFE-065Y
Subject: 5-Year Review Background Information Survey		**Date:** February 10, 2003
Contact Made By:		
Name: Katrina Coltrain	**Title:** Remedial Project Manager	**Organization:** EPA
Telephone No.: (214) 665-8143 **E-Mail:** coltrain.katrina@epa.gov	**Street Address:** 1455 Ross Avenue, Suite 1200 **City, State, Zip:** Dallas, Texas 75202	
Name: Sarah Babcock	**Title:** Project Manager	**Organization:** Tetra Tech EM Inc.
Telephone No.: (303) 382-8782 **E-Mail:** sarah.babcock@ttemi.com	**Street Address:** 1099 18th Street, Suite 1900 **City, State, Zip:** Denver, Colorado 80202	
Individual Contacted:		
Name: Adjacent Resident No. 2	**Title:** Not applicable	**Organization:** Not applicable

Survey Questions

Should you choose to respond, please return your survey in the enclosed envelope to Sarah Babcock by February 14, 2003.

1. What is your impression of the project (general sentiment)?

   Everything seems acceptable. Had water quality checked when bought property and mercury was slightly high, but doesn't know if site has anything to do with it. As long as they are well marked, monitoring wells are fine.

2. What effect have site operations had on the surrounding community

   Never heard of anything unacceptable.

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

   Never heard of anything unacceptable.

SUPERFUND SITE SURVEY - FORM A (continued)	
Site Name: Gulf Coast Vacuum Services	**EPA Work Assignment No.:** 112-FRFE-065Y
Subject: 5-Year Review Background Information Survey	**Date:** January 27, 2003

Survey Questions (Cont.)

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

   No.

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

   No, has not received any information and does not feel well informed.

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

   No.

SUPERFUND SITE SURVEY - FORM A		
Site Name: Gulf Coast Vacuum Services	**EPA Work Assignment No.:** 112-FRFE-065Y	
Subject: 5-Year Review Background Information Survey	**Date:** January 21, 2003	
Contact Made By:		
Name: Katrina Coltrain	**Title:** Remedial Project Manager	**Organization:** EPA
Telephone No.: (214) 665-8143 **E-Mail:** coltrain.katrina@epa.gov	**Street Address:** 1455 Ross Avenue, Suite 1200 **City, State, Zip:** Dallas, Texas 75202	
Name: Sarah Babcock	**Title:** Project Manager	**Organization:** Tetra Tech EM Inc.
Telephone No.: (303) 382-8782 **E-Mail:** sarah.babcock@ttemi.com	**Street Address:** 1099 18th Street, Suite 1900 **City, State, Zip:** Denver, Colorado 80202	
Individual Contacted:		
Name: Adjacent Resident No. 3	**Title:** Not applicable	**Organization:** Not applicable

Survey Questions

Should you choose to respond, please return your survey in the enclosed envelope to Sarah Babcock by February 14, 2003.

1. What is your impression of the project (general sentiment)?

   Doesn't bother him one way or the other.

2. What effect have site operations had on the surrounding community

   Will the fence stay up permanently? Police jury may have Gulf Coast property deeded. Gravel Road is D.L. Mud/Gulf Coast owned and maintenance is up to PRPs.

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

   No

SUPERFUND SITE SURVEY - FORM A (continued)	
Site Name: Gulf Coast Vacuum Services	**EPA Work Assignment No.:** 112-FRFE-065Y
Subject: 5-Year Review Background Information Survey	**Date:** January 21, 2003

Survey Questions (Cont.)

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

   No hunters, trespassers, vandalism.

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

   Yes.

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

   Shallow well does not drink it.