Health Consultation

Gulf Coast Vacuum Services

Review of 2011 Groundwater Monitoring Data

Abbevile

Vermilion Parish, Louisiana

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Prepared by

Louisiana Department of Health and Hospitals
Office of Public Health
Section of Environmental Epidemiology and Toxicology
Under a Cooperative Agreement With the
U.S. Department of Health and Human Services
Agency for Toxic Substances and Disease Registry

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List of Acronyms

ATSDR	Agency for Toxic Substances and Disease Registry
COC	contaminant of concern
CREG	cancer risk evaluation guide
EMEG	environmental media evaluation guide
EPA	Environmental Protection Agency
ft bgs	feet below ground surface
LDEQ	Louisiana Department of Environmental Quality
LDHH	Louisiana Department of Health and Hospitals
OPH	Office of Public Health
PAHs	polycyclic aromatic hydrocarbons
ppm	parts per million
SEET	Section of Environmental Epidemiology and Toxicology
US EPA	United States Environmental Protection Agency

Summary and Statement of Issues

INTRODUCTION

The Gulf Coast Vacuum Services site in Abbeville, LA operated from 1969 to 1984 as a trucking terminal and disposal facility for materials generated from oil and gas exploration and production. Due to wastes spilled and disposed of onsite during its operation, the site was placed on the National Priorities List (NPL) on March 31, 1989. Remedial activities were completed at the site in March 2000, and the site was deleted from the NPL on July 23, 2001. Groundwater monitoring is conducted annually at the site as part of the operation and maintenance phase of the Superfund process.

Through our cooperative agreement with the Agency for Toxic Substances and Disease Registry (ATSDR), the Louisiana Department of Health and Hospitals/Office of Public Health/Section of Environmental Epidemiology and Toxicology (LDHH/OPH/SEET) has evaluated groundwater samples collected for the Annual 2011 Groundwater Monitoring Report to determine whether residual contaminants in groundwater under the site pose harm to public health.

CONCLUSION

Groundwater at the Gulf Coast Vacuum Services site poses no harm to public health.

BASIS FOR DECISION

Under current site conditions, no routes of exposure exist between residual groundwater contaminants of concern at the Gulf Coast Vacuum Services site and the public.

NEXT STEPS

If geological conditions at the site alter or if new evidence suggests that the groundwater at the site is entering the public water supply, groundwater contaminants at the Gulf Coast Vacuum Services site should be reevaluated.

The information produced within this health consultation will be made available to the community members and stakeholders in Abbeville, LA.

FOR MORE INFORMATION

If you have further concerns about the Gulf Coast Vacuum Services site, questions may be directed to DHH/OPH/SEET at 1-888-293-7020.

Background and Site History

The Gulf Coast Vacuum Services site (Figure A-1) is located on Parish Road P-7-31, approximately 2.5 miles southwest of the city of Abbeville, LA and 1.5 miles west of the Vermilion River. The 12.8 acre site is bounded to the north and west by pastureland and to the east and south by the D.L. Mud Superfund site [1]. The LeBoeuf Canal runs along the eastern and southern boundaries of the site; the canal used to flow to the Vermilion River but is now bermed, no longer drains to the river, and only contains water after a rainstorm. Local ditches drain the northen part of the site and flow into the Coulee Galleque stream, which eventually flows into the Abbeville Canal and to the Vermilion River [2]. The primary land uses near the site are residential and agricultural, with neighboring land used as pasture for grazing cattle and for production of crops such as rice, sugarcane, and soybean [1].

From 1969 to 1984, the Gulf Coast Vacuum site operated as a vacuum truck terminal and disposal facility for materials and wastes generated from oil and gas exploration and production. From September 1969 to May 1975, the site was part of a 25.56-acre parcel of land owned and operated by Lafayette Highway Equipment Sales and Services, Inc. The parcel was then purchased and operated by Gulf Coast Pre-Mix Mud Services, Inc. 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's name changed to G.H. Fluid Services. In October 1980, 12.78 acres of the original parcel were conveyed to Gulf Coast Vacuum Services; the remaining portion of the parcel is now known as the D.L. Mud Site. Gulf Coast Vacuum Services owned and operated the site until 1984, when it declared bankruptcy [1].

During the site's operation, vacuum trucks were rinsed out into several on-site pits, including the West Pit and Washout Pit (see Figure A-1). Various tanks held raw and waste material, and spillage and illegal disposal of contaminated waste also occurred on the site surface soils [1, 2].

A citizen's complaint drew the United States Environmental Protection Agency's (EPA's) attention to the site in June 1980. Preliminary sampling by EPA revealed the presence of chemicals related to crude oil, salt, water, and drilling mud oil. A layer of oil emulsion averaging 1 inch in thickness was also observed in the West Pit. The main contaminants onsite that were considered to pose an "imminent and substantial endangerment to human health or the environment" included carcinogenic polycyclic aromatic hydrocarbons (PAHs) and benzene in sludges; arsenic and barium in surface soils; and barium, cadmium, chromium, and mercury in groundwater [2].

The site was placed on the NPL on March 31, 1989. EPA began cleanup activities onsite in March 1990 to prevent the off-site migration of contaminated liquid. In consultation with the Louisiana Department of Environmental Quality (LDEQ), EPA signed a Record of Decision (ROD) for the site on September 30, 1992 and an amended ROD on May 5, 1995. The RODs identified remedial activities to protect public health and the environment from contaminants at the site, including the following:

- pumping and on-site treatment of contaminated rainwater in the West Pit and Washout Pit;
- excavation of sludge and soil from the Washout Pit, consolidating the sludge and soil into the West Pit covering the West Pit, and backfilling the Washout Pit with clean soil;

- on-site biological treatment of organic-contaminated sludges and soils, and tank contents;
- stabilization or incineration and on-site disposal of the treated residuals from the biological treatment, with construction of a clay cover over the inorganic-contaminated soil and sediment;
- on-site stabilization and disposal of soils contaminated with metals;
- institutional controls such as fencing around the site perimeter and land use restrictions; and
- long-term monitoring of groundwater to ensure that contamination is lessened through the process of natural attenuation and that no human contact with the contaminated groundwater occurs [2].

Quarterly groundwater monitoring was conducted at the site from 1997 through 2001, semiannual monitoring was conducted from 2002 through 2004, and the frequency was reduced to annual monitoring in 2005 [2]. As part of site cleanup, a French drain collection system was constructed in the West Pit for recovery of organic material that may have affected the shallow groundwater. One drain was installed above the pit's liner to collect leachate and stormwater, and one drain was installed below the liner to collect groundwater. The two French drains were initially sampled at the same frequency as the groundwater monitoring wells. Sampling of the drain located above the liner ceased at the end of 2003 because it was determined that the liner prevents migration of moisture from the pit into the environment. Sampling of the drain below the liner will continue on the same schedule as the monitoring wells [2, 3].

Following the completion of remedial actions and site reviews at the Gulf Coast Vacuum Services site, the EPA approved a final closeout for the site in March 2000, and the site was deleted from the NPL on July 23, 2001. Further assessment activities were conducted by EPA at the site following Hurricanes Katrina and Rita in 2005 to evaluate the continued effectiveness of the remedial actions. SEET performed an evaluation of groundwater sampled during these assessments and concluded that the storms did not cause significant physical damage to the site or cause site contaminants to be introduced into pathways where harmful exposures could occur; therefore exposure to groundwater contaminants detected at the site was unlikely and posed no harm to public health [4].

The Vermilion Parish Police Jury currently holds a land use agreement that allows them to operate a maintenance shop at the site [5]. The maintenance shop stores diesel fuel and used oil onsite, but these activities are not believed to create new potentials for risk exposures at the site [2, 5]. The water used at the maintenance shop comes from an on-site water supply well; according to the Police Jury, water from this well is used for washing vehicles and is not used as a drinking water source [2].

Groundwater monitoring continues to be conducted annually at the site as part of the operation and maintenance phase of the Superfund process. Samples are analyzed for arsenic, barium, cadmium, and chromium. The monitoring parameters originally also called for analysis of benzene, toluene, ethylbenzene, xylenes, and mercury; however, EPA approved removing these chemicals from the list of analytes after they were not detected in 17 sampling events [2]

The most recent round of annual groundwater monitoring was performed in November 2011 and is summarized in the "Annual 2011 Groundwater Monitoring Report" prepared for the Gulf

Coast Vacuum Services Potentially Responsible Party Group. The annual 2011 report compares the most recent levels of arsenic, barium, cadmium, and chromium detected in groundwater sampled from the site to historical levels reported in previous documents and states that none of the monitoring wells has shown a trend of significant increases in contaminant concentrations over time. The report concludes that "based on a review of the 2002 through 2011 groundwater data, it appears that the remedy at the site (natural attenuation) is working" [3]. SEET has evaluated the groundwater data collected in November 2011 to determine whether any residual contaminants remaining in groundwater under the site pose harm to public health.

Demographics

Census 2010 results reported a population of 12,257 in Abbeville, LA. The largest ethnic group reported for the city was Caucasian (50%), followed by African-American (41%), Asian (5.2%), those identifying themselves as belonging to 2 or more races (2.0%), and American Indian and Alaska Native (0.3%). Three point one percent (3.1%) of the population identified themselves as Hispanic or Latino. Sixty-seven point eight percent (67.8%) of the population age 25 years or older had earned at least a high school diploma. The median household income was $30,021 [6]. The largest employers were in the educational, health, and social services industry; retail trade; and agriculture, forestry, fishing and hunting, and mining [7].

Approximately 2,600 Abbeville residents live within 3 miles of the Gulf Coast Vacuum site. Ten residences are located within 0.5 mile of the site on Junius Road and Route 335, outside of Abbeville's corporate limits. The nearest residence is located on the southeast site boundary [1]. The closest school to the site is located approximately 2.55 miles away from the site's eastern boundary [8].

Discussion

Data Used

The annual 2011 groundwater monitoring event was conducted from November 9 – 11, 2011. Groundwater was sampled from sixteen monitoring wells onsite that receive water from two water-bearing units identified under the site (see Figure A-2):

- Monitoring wells D-6R, D-7R, G-3R, G-4R, G-7A, G-8C, G-9, G-10, G-13, G-14, G-15, G-18, and G-19 draw water from the Silty Clay I/Alluvium Unit.
- Monitoring wells G-7B, G-8B, and G-25 draw water from the Upper Chicot Aquifer Unit.

These wells are monitored because of their proximity to historical sources of contamination or as down gradient wells (G-9, G-13, G-18, and G-19) [2]. An additional down gradient well, G-17, was not sampled because it did not contain an adequate amount of water during the November

2011 sampling event. Groundwater well samples were analyzed for total metal concentrations of arsenic, barium, cadmium, and chromium [3].

A groundwater sample was also collected from the French drain beneath the site's former West Pit. This groundwater sample was analyzed for total petroleum hydrocarbons as oil range organics (TPH-ORO) [3].

Exposure Pathways

An exposure pathway consists of five elements: a source of contamination, transport through an environmental medium (air, water, or soil), a point of exposure, a route of human exposure (ingestion, dermal exposure, or inhalation), and a population. Completed pathways require that all five necessary elements exist and that exposure to a contaminant has occurred in the past, is presently occurring, or will occur in the future. An exposure pathway can be eliminated if at least one of the five elements is missing and will never be present.

Residents within a 3-mile radius of the site (approximately 2,600 people) obtain drinking water from private wells, which also provide water for irrigation [1] (see Figure A-3). These wells draw water from the Abbeville unit of the Chicot Aquifer System, a system which underlies a large portion of southwest Louisiana and serves as the principal source of groundwater supply within the Abbeville area. Residential well depths range from 80 to 230 feet below ground surface (ft bgs). The monitoring wells from which site groundwater samples were collected draw water from depths of up to only 40 ft bgs [2]. Four monitoring wells in particular, wells G-3R, G-4R, G-7B, and G-25 were identified in the EPA's "Third Five-Year Review Report for the Gulf Coast Vacuum Services Superfund Site" as exhibiting groundwater contaminant concentrations "above current MCLs"; the report noted that no off-site domestic use of groundwater had been observed near these four wells [5].

Five geologic units have been identified beneath the site (from the surface downward):

- the Upper Clay Unit
- the Silty Clay I Unit
- the Alluvium Unit
- the Silty Clay II Unit
- the Upper Chicot Aquifer Unit.

Two of these units, the Silty Clay I unit and the Alluvium Unit, form the water bearing unit within which the majority of the site's groundwater monitoring wells are screened. Ranging from depths of 12 to 22 ft bgs, the Silty Clay I Unit runs from 20 feet thick to less than 5 feet thick (below the eastern portion of the site). Below it lies the Alluvium Unit's alternating layers of fine-grained sands and silts. The less permeable Silty Clay II Unit is thick beneath the northern and western areas of the site but absent beneath the extreme eastern portions of the site. There is evidence of a possible connection between the Silty Clay I/Alluvium Unit and the sandy Upper Chicot Aquifer Unit in the eastern portion of the site where the Silty Clay II unit is absent [2, 9].

Groundwater under the site flows from the two highest elevations at the northern and southwestern portions of the site to the center, where it then flows northwesterly off-site, except

for in a low area under the former washout pit, from which groundwater appears to flow easterly [2, 3]. Based on analytical data collected over time from the monitoring wells at the site, no sustainable plume of contamination has been identified within any of the groundwater units. Therefore, off-site migration of contamination is not considered to be a concern [10].

Evaluation Process

The evaluation process used to assess groundwater samples collected from the Gulf Coast Vacuum Services site monitoring wells is described in Appendix B. Contaminant concentrations were initially screened using comparison values (CVs) appropriate for their media. These conservative screening values are only used to determine which environmental contaminants need further evaluation. CVs are not used to predict adverse human health effects. Contaminant concentrations that exceeded CVs are identified as contaminants of concern (COCs) and are listed in bold red text in the table.

Health Effects Evaluation

Eleven milligrams per liter (mg/L) of oil range organics were detected in the groundwater sample collected from the French drain. However, the French drain is part of a collection system constructed in the West Pit for recovery of organic material. This water would not be accessed as part of a public or private water supply. Groundwater that collects in the French drain system therefore poses no harm to public health.

Arsenic was identified as a COC in groundwater sampled from monitoring well G-4R, and barium and cadmium were identified as COCs in groundwater sampled from monitoring well G-3R. However, monitoring wells G-3R and G-4R are wells near which off-site domestic use of groundwater had not been observed, and historical data from the site's monitoring wells has indicated that off-site migration of contamination has not been occurring [5, 10]. The public is unlikely to come into contact with contamination from these wells or other monitoring wells at the site. Groundwater from the site therefore poses no harm to public health. If geological conditions at the site alter or if new evidence suggests that the groundwater at the site is entering the public water supply, groundwater contaminants at the Gulf Coast Vacuum Services site should be reevaluated.

Child Health Considerations

The physical differences between children and adults demand special emphasis in assessing public health hazards. Children may be at greater risk than are adults from exposures to hazardous substances. Children play outdoors and engage in hand-to-mouth behaviors that increase their exposure potential. Children are shorter than adults and breathe dust, soil, and vapors close to the ground. A child's lower body weight and higher intake rate result in a greater

dose of hazardous substance per unit of body weight. If toxic exposure levels are high enough during critical growth stages, the developing body systems of children can sustain permanent damage.

Because there is currently no exposure pathway between groundwater contaminants of concern at the Gulf Coast Vacuum Services site and the public, groundwater at the site poses no harm to children's health.

Conclusions

SEET and ATSDR are committed to addressing community concerns about the risks involved in exposure to environmental contaminants. Our agencies are committed to providing the residents of Abbeville, LA with the best science-based information available to keep the community safe.

Under current site conditions, no routes of exposure exist between residual groundwater contaminants of concern at the Gulf Coast Vacuum Services site and the public. Groundwater at the site therefore poses no harm to public health. If geological conditions at the site alter or if new evidence suggests that the groundwater at the site is entering the public water supply, groundwater contaminants at the Gulf Coast Vacuum Services site should be reevaluated.

If you have further concerns about the Gulf Coast Vacuum Services facility, questions may be directed to DHH/OPH/SEET at 1-888-293-7020.

Recommendations

SEET will be available to assess any additional samples collected from Gulf Coast Vacuum Services site or to reassess the current data following any changes in usage of or access to the site.

Public Health Action Plan

The information produced within this health consultation will be disseminated to the community members and stakeholders in Abbeville, LA.

Report Preparation

This Gulf Coast Vacuum Services Review of 2011 Groundwater Monitoring Data Health Consultation was prepared by the Louisiana Department of Health and Hospitals under a cooperative agreement with the federal Agency for Toxic Substances and Disease Registry (ATSDR).

Author
Rosalind M. Green, Sc.D.
Environmental Health Scientist Coordinator
Louisiana Department of Health and Hospitals (LA DHH)
Office of Public Health (OPH)
Section of Environmental Epidemiology and Toxicology (SEET)

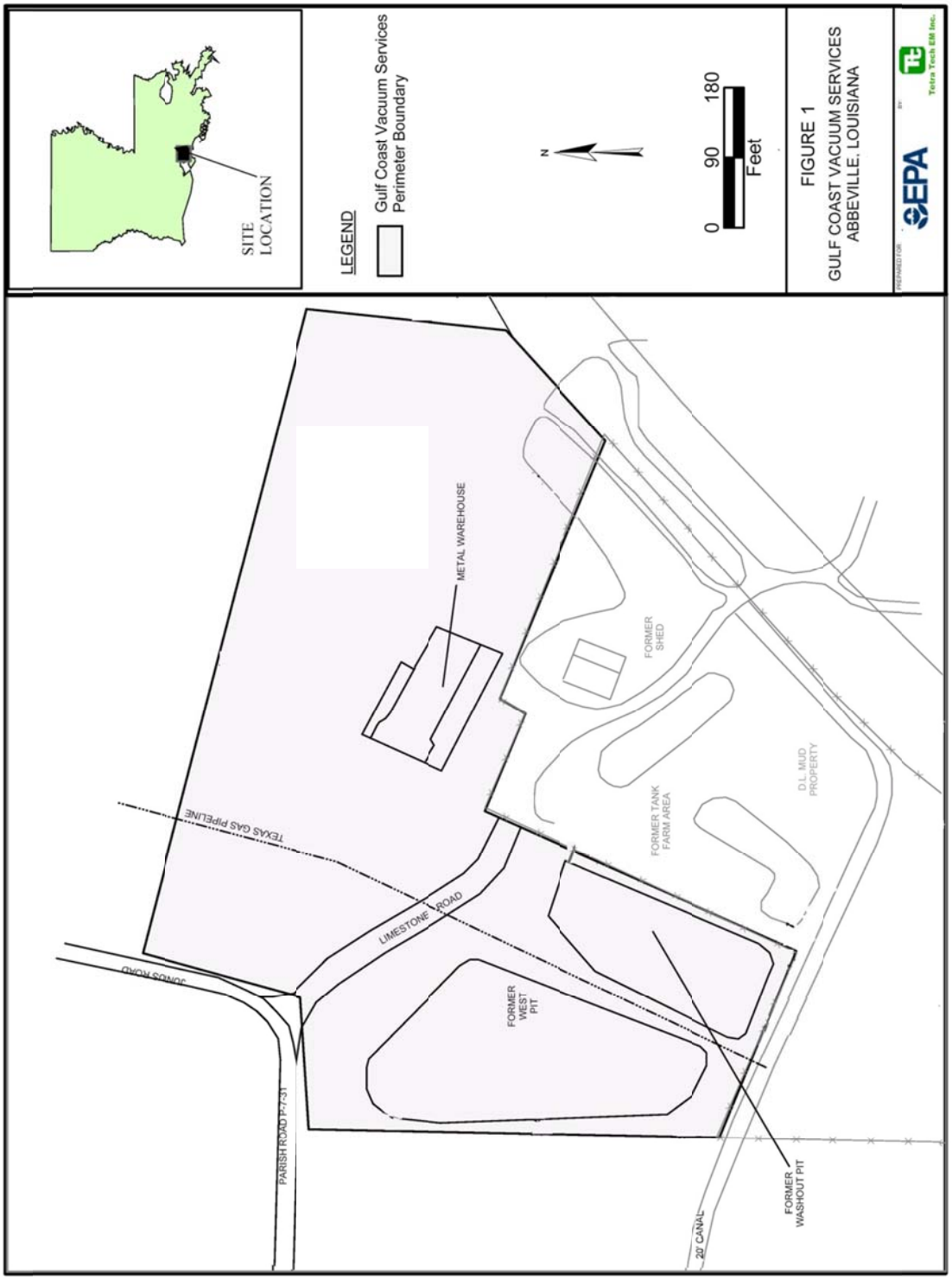
State Reviewers
Kathleen Aubin, M.S.P.H., LA DHH/ OPH/SEET, (PI, Appletree Grant)
Shannon Soileau, M.S., LA DHH/ OPH/SEET
Luann White, Ph.D., D.A.B.T., Toxicology Consultant, Tulane School of Public Health and Tropical Medicine

References

1. United States Environmental Protection Agency. Fact Sheet: Gulf Coast Vacuum Services, Vermilion Parish, Abbeville, Louisiana. EPA ID# LAD980750137. 2012 Nov 21. Accessed 27 Nov 2012 at: http://www.epa.gov/region6/6sf/pdffiles/gulf-coast-la.pdf
2. United States Environmental Protection Agency, Region 6. Third Five-Year Report, First Addendum, for the Gulf Coast Vacuum Services Site, Abbeville, Vermilion Parish, Louisiana. 2009 Jul. Accessed 28 Nov 2012 at: http://www.epa.gov/superfund/sites/fiveyear/f2008060003295.pdf
3. ARCADIS U.S., Inc. Gulf Coast Vacuum Services Potentially Responsible Party Group: Annual 2011 Groundwater Monitoring Report, Gulf Coast Vacuum Services Site, Abbeville, Louisiana, Agency Interest No. 4805. Baton Rouge: 14 May 2012.
4. Green, Rosalind M. Health Consultation: Hurricane Response Sampling Assessment for Gulf Coast Vacuum Services. Atlanta: U.S. Department of Health and Human Services, Public Health Service, ATSDR; 2006 Sep 26.
5. United States Environmental Protection Agency, Region 6. Third Five-Year Review Report for the Gulf Coast Vacuum Services Superfund Site, Abbeville, Vermilion Parish, Louisiana. 2008 Aug. Accessed 07 Dec 2012 at: http://www.epa.gov/region6/6sf/louisiana/gc_vacuum/la_gc_vacuum_3rd-5yr_review.pdf
6. United States Census Bureau. State & County Quickfacts: Abbeville (city), Louisiana. Accessed 28 Nov 2012 at: http://quickfacts.census.gov/qfd/states/22/2200100.html
7. United States Census Bureau. State & County Quickfacts: Abbeville city, Louisiana Quicklinks. American Community Survey: Economic Characteristics. Accessed 28 Nov 2012 at: http://quickfacts.census.gov/qfd/states/22/2200100lk.html
8. **Google Earth.** LA Earth Overlay. 29°57’29.25” N and 92°11’03.33” W. Accessed 28 Nov 2012.
9. ARCADIS. Gulf Coast Vacuum Services Potentially Responsible Party Group: Annual 2007 Groundwater Monitoring Report, Abbeville, Louisiana, Agency Interest No. 4805. Baton Rouge: 5 Mar 2008.
10. United States Environmental Protection Agency, Region 6. Second Five-Year Review Report for the Gulf Coast Vacuum Services Superfund Site, Abbeville, Vermilion Parish, Louisiana. 2003 Sep. Accessed 3 Dec 2012 at: http://www.epa.gov/superfund/sites/fiveyear/f03-06002.pdf

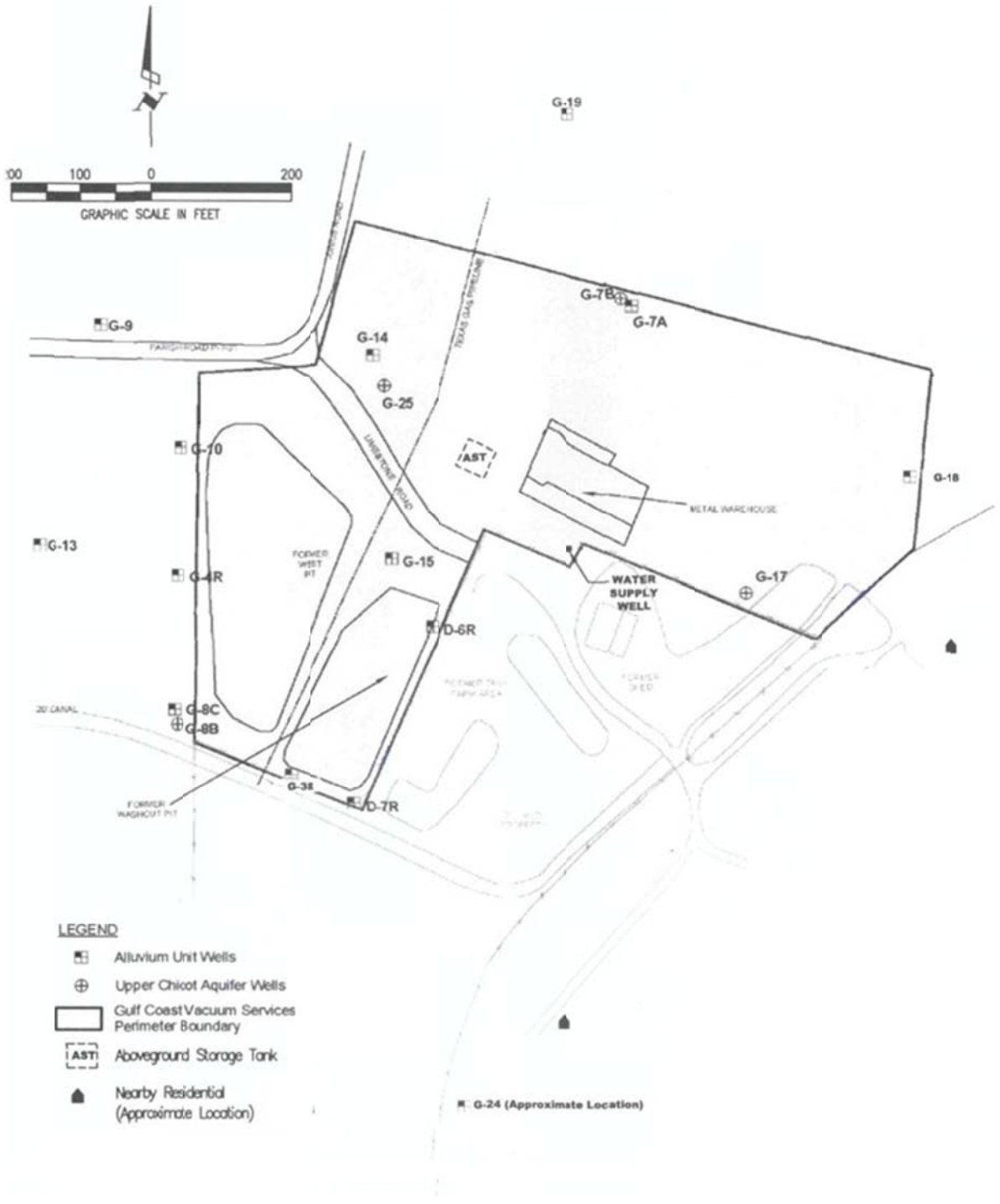
APPENDIX A: Maps

Figure A-1: The Gulf Coast Vacuum Services Facility



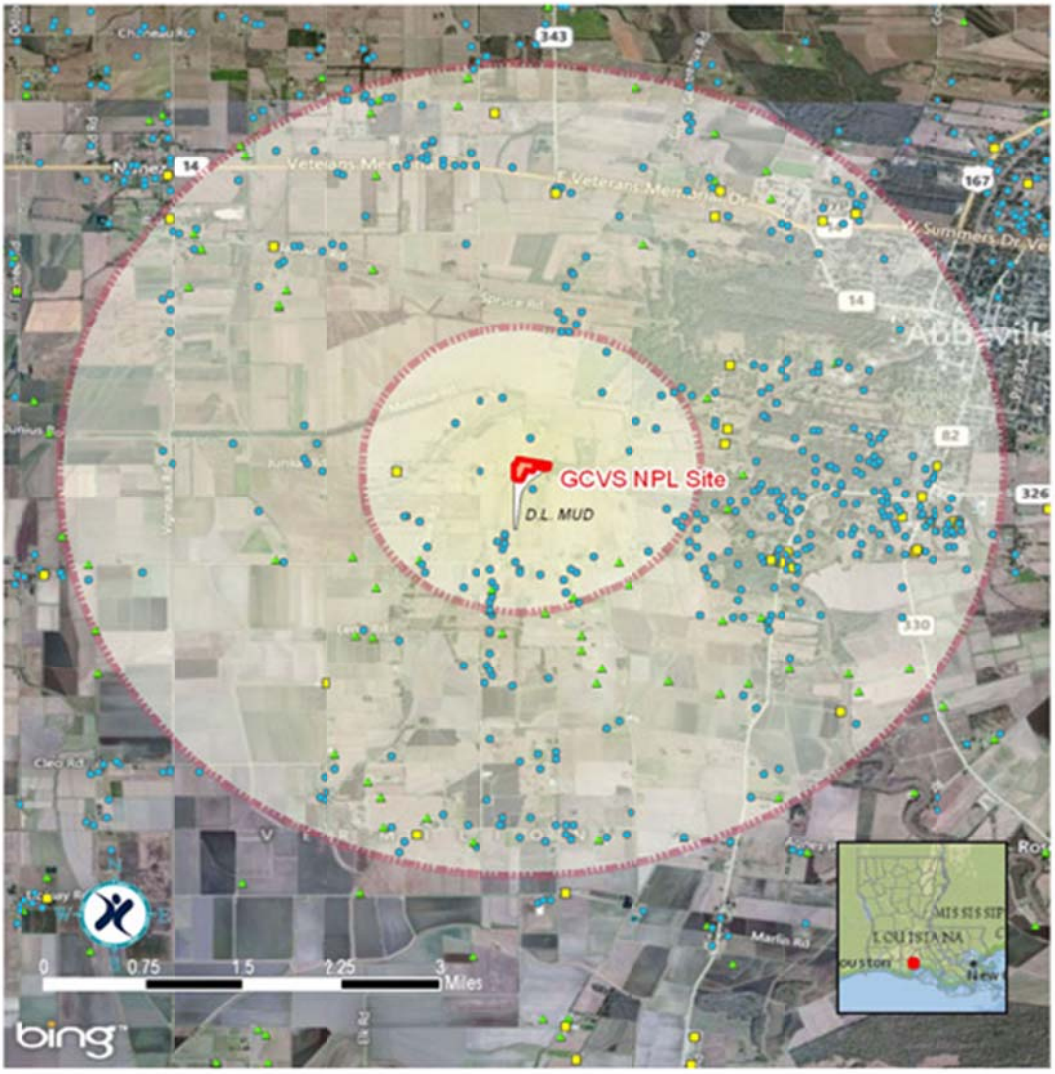
Adapted from: United States Environmental Protection Agency, Region 6. Second Five-Year Report for the Gulf Coast Vacuum Services Superfund Site, Abbeville, Vermilion Parish, Louisiana. Prepared by Tetra Tech EM Inc. Work Assignment No. 112-FR-FE-065Y. 2003 Sept.

Figure A-2: Monitoring Well Locations at the Gulf Coast Vacuum Services Facility



Adapted from: United States Environmental Protection Agency, Region 6. Third Five-Year Report, First Addendum, for the Gulf Coast Vacuum Services Site, Abbeville**,** Vermilion Parish, Louisiana. 2009 Jul. Accessed 28 Nov 2012 at: http://www.epa.gov/superfund/sites/fiveyear/f2008060003295.pdf

Figure A-3: Domestic, public, and industrial wells located near the Gulf Coast Vacuum Services Facility



Legend

Gulf Coast Vacuum Services (GCVS), Vermilion Parish
Deleted NPL Site (7/23/2001)

DL Mud NPL site, south of site
Deleted

1 and 3 mile buffers

Active wells within 1 and 3 miles
Count shown in parenthesis

Use Description

- domestic/household (400)
- public supply, categories: commercial (20), institution (4), public (1), rural (4) - total: 29
- farming, categories: aquaculture (7); irrigation (51); livestock (9) - total: 67

Water wells data source: Louisiana DNR SONRIS, 2012
Mapping software: ESRI ArcMap 10.1
Imagery: Microsoft Virtual Earth and National Geographic (inset)

Map Produced December 13, 2012 by the Louisiana Department of Health and Hospitals (LDHH), Section of Environmental Epidemiology & Toxicology (SEET).

LDHH SEET cannot guarantee the accuracy of the information contained on this map and expressly disclaims liability for errors and omissions in its contents.

APPENDIX B: Data Evaluation

Screening Process

Drinking water comparison values were used in the initial screening process to determine which groundwater samples needed to be closely evaluated. Comparison values are media-specific concentrations of chemicals that are used by health assessors to screen environmental contaminants for further evaluation. These values are not used as predictors of adverse health effects.

> *Environmental media evaluation guides* (EMEGs) are estimated contaminant concentrations at which noncarcinogenic health effects are unlikely. They are calculated from the Agency for Toxic Substances and Disease Registry's (ATSDR) minimal risk levels (MRLs). EMEGs apply to acute (14 days or less), intermediate (15–365 days) and chronic (365 days or more) exposures.
>
> C*ancer risk evaluation guides* are estimated contaminant concentrations that would be expected to cause no more than one additional excess cancer in 1 million exposed persons over a lifetime. CREGs are calculated from the United States Environmental Protection Agency's (EPA's) cancer slope factors (CSFs).
>
> *Maximum contaminant levels* (MCLs) are defined in the Safe Drinking Water Act as "the maximum permissible level of a contaminant in water which is delivered to any user of a public water system." MCLs are enforceable standards set by the Environmental Protection Agency (EPA) and are based closely on the levels of contaminants in drinking water below which there is no known or expected risk to health (the maximum contaminant level goal, or MCLG).

Contaminants that were not detected at concentrations above the method detection limits are identified as "non-detects" (ND). Table B-1 lists the contaminants detected in groundwater sampled from monitoring wells at the Gulf Coast Vacuum Services site.

Table B-1: Contaminants detected in groundwater sampled from the Gulf Coast Vacuum Services site, November 2011
(Contaminant concentrations exceeding their screening values are listed in bold red)

Contaminant	Range of concentrations detected (ppb*) Minimum	Maximum	Location, Maximum	CV† (ppb)	CV reference
Arsenic	ND‡	**71**	G-4R	0.023	CREG§
Barium	170	**4,600**	G-3R	2000	Child Chronic EMEG**
Cadmium	ND	**4.1**	G-3R	1	Child Chronic EMEG
Chromium	ND	16	G-3R	100	MCL††

* ppb= parts per billion
† CV = comparison value
‡ ND = not detected
§ CREG = Cancer risk evaluation guide
** EMEG = Environmental Media Evaluation Guide
†† MCL = maximum contaminant level