

Health Consultation

DELATTE METALS
GROUNDWATER EVALUATION
TANGIPAHOA PARISH, LOUISIANA
EPA FACILITY ID# LAD052510344

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Prepared by:

Louisiana Department of Health and Hospitals
Office of Public Health
Section of Environmental Epidemiology and Toxicology
Under 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
CREG	Cancer Risk Evaluation Guide
EMEG	Environmental Media Evaluation Guide
EPA	Environmental Protection Agency
ft-bgs	Feet Below Ground Surface
GIS	Geographic Information Systems
LDEQ	Louisiana Department of Environmental Quality
LDHH	Louisiana Department of Health and Hospitals
LDTOD	Louisiana Department of Transportation and Development
MCL	Maximum Contaminant Level
mg/kg/day	Milligrams per Kilograms per Day
mg/L	Milligrams per Liter
MRL	Minimal Risk Level
NPL	National Priorities List
O&M	Operations and Maintenance
OPH	Office of Public Health
PBR	Permeable Reactive Barrier
PPM	Parts per million
RECAP	Risk Evaluation Corrective Action Program
RMEG	Reference Dose Media Evaluation Guide
ROD	Record of Decision
SEET	Section of Environmental Epidemiology and Toxicology
SF	Slope Factor
S.U.	Standard Unit
WBZ	Water Bearing Zone

Summary and Statement of Issues

INTRODUCTION

From May 31-June 2, 2011 and August 22-24, 2011, U.S. Environmental Protection Agency (EPA) contractors collected groundwater samples from 26 monitoring wells and 5 water wells at the Delatte Metals site, located in Tangipahoa Parish, Louisiana. The Delatte Metals site is currently in operations and maintenance status with routine groundwater monitoring.

In cooperation with EPA, Louisiana Department of Health and Hospitals/Office of Public Health/Section of Environmental Epidemiology and Toxicology (LDHH/OPH/SEET) evaluated the most recent groundwater data available for the Delatte Metals site to determine whether the site poses potential harm to public health through contact with contaminated groundwater.

CONCLUSION

SEET concludes that contact with the groundwater will not harm people's health.

BASIS FOR DECISION

Groundwater from the three onsite water bearing zones is not being used as a drinking water source. There is no current exposure pathway between groundwater contaminants in these zones and the local population. A perimeter fence and adequate signage describing site conditions deem the site public access restricted. One water well located beneath the third water bearing zone (Regan well) contains arsenic levels above health based comparison values; however, it is not present at levels that would present an unacceptable cancer risk.

NEXT STEPS

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

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

FOR MORE INFORMATION

If you have further concerns about the site, you can call SEET at 1-888-293-7020 and ask for information about the Delatte Metals site.

Background

Site Description and History

The Delatte Metals site is 19 acres in size and is located at 19113 Weinberger Road in Tangipahoa Parish about 2.5 miles southeast of Ponchatoula, Louisiana. The site encompasses the entire Delatte Metals property, which ceased operations in 1993, a portion of the inactive North Ponchatoula Battery Company, which moved its operation adjacent to the Delatte Metals property between 1972 and 1978, and impacted off-site areas. Similar operations were performed at the Delatte Metals property and the Ponchatoula Battery Company, generating the same types of wastes, so they were merged into a single site for remedial activities. Spent lead-acid batteries were cut open and the acid was drained into unlined holding ponds. The battery casings were discarded on site. Lead was recovered from the acid and smelted to produce lead ingots for sale [1].

The site is bounded by Weinberger Road followed by residences to the south, drainage ditches and residences to the north and east and Selser's Creek and a residence to the west. Initial investigations at the site indicated the presence of heavy metals including lead, arsenic, and cadmium. Both facilities shared a drainage pathway along the northern tributary of Selser's Creek, where lead and cadmium releases were observed and documented [1].

There are three distinct and local water bearing zones (WBZ) located at the site, ranging from ground surface to approximately 100 feet below ground surface (ft-bgs) [1]. The first WBZ is 5-15 ft-bgs and classified as a Class 3B unusable shallow groundwater aquifer. Currently nine monitor wells are screened in the first WBZ. The second WBZ ranges between 15 and 40 ft-bgs at various locations and is classified as a Class 2C potential domestic water supply aquifer. Thirteen monitor wells are screened in this zone. During remedial action activities, the third local WBZ (Class 1B drinking water aquifer) was encountered between 58 and 62 ft-bgs, extending to the maximum depth of the site borings (100 ft-bgs). There are currently four monitor wells screened in this zone [1].

Underneath the three local WBZs identified at the Delatte Metals site are three regional aquifers: The Shallow Aquifer (also known as the Upland Terrace Aquifer), the Ponchatoula Aquifer (which is subdivided into two units: the upper and lower Ponchatoula Aquifers), and the Tchefuncte Aquifer [1]. Five water wells are also being sampled from below the third water bearing zone at the site.

The Delatte Metals site was proposed for addition to the United States Environmental Protection Agency's (EPA) list of hazardous waste sites, also known as the National Priorities List (NPL) on July 28, 1998. It was finalized in January 1999. Elevated levels of lead and other metals were found both on and off site. The Record of Decision (ROD) was signed in September 2000, which included immobilization of principal threat wastes in the soil to eliminate the source of contamination for sediment, surface water and ground water; offsite disposal to transport immobilized wastes to a disposal facility; permeable treatment walls to neutralize the acidity of the shallow ground water and limit the migration of dissolved metals; institutional controls for deed notices to inform the public of site conditions; and ground water monitoring to ensure the effectiveness of the selected remedy [2]. Remedial action began in November 2002 and was

completed in September 2003. The site was deleted from the NPL August 8, 2005 and is currently in operation and maintenance (O & M) status, receiving routine monitoring of the groundwater to ensure the protectiveness of the EPA remedial actions [2].

Demographics

The Delatte Metals site is located in Tangipahoa Parish, Louisiana. Census 2010 population data records a parish population of 121,097. The largest ethnic group in that parish at that time was Caucasian (66.2%), followed by African American (30.3%). Seventy-nine point two percent (79.2%) of the population age 25 or older in 2010 had earned at least a high school diploma. The median household income in 2009 was \$37,238 with 20.5% of persons living below poverty level [3].

Approximately 645 residents live within one mile of the site. Weinberger Road is south of the facility area, and south of Weinberger Road is a residential neighborhood. Selsers Creek is west of the facility and west of Selsers Creek is residential property, undeveloped land, and farmland [2].

Discussion

Environmental Data

The most recent quarterly groundwater samples were collected on May 31-June 2, 2011 and on August 22- 24, 2011 from a total of 26 monitoring wells and five water wells [1]. Some of the water wells were drinking water wells located at residences. The permeable reactive barrier (PRB) was also inspected for routine maintenance.

The PBR is used to neutralize the acidity of the shallow aquifer (in the first WBZ) and to limit the migration of dissolved metals into viable aquifers. The PBR was cleared by the inspection; a total of 84 cubic yards of fill was added to the PBR on March 2, 2011. Inspections will continue to be conducted on a quarterly basis.

Groundwater samples from both sampling events (May 2011 and August 2011) were analyzed for Total Metals including arsenic, cadmium, lead, manganese, nickel, thallium, and zinc via method SW6020 or SW6010. All samples were analyzed for pH levels compared to the EPA acceptable range for storm water discharge (6.0-9.0 standard units (s.u.)) and drinking water (6.5-8.5 s.u.). The first WBZ was evaluated using the storm water discharge pH range as it is classified as Groundwater Class 3B. The second and third WBZs and all water wells are Groundwater Class 1 and 2 aquifers; their pH was evaluated using the drinking water range [1]. All monitor wells in the first WBZ were below the pH range of 6.0-9.0 s.u. Monitoring wells BA-01 and BA-05 were below the pH range of 6.5-8.5 s.u. in the second WBZ. Monitoring well BB-01 (third WBZ) and water wells WW-04, North Well and South Well were all above the drinking water pH range. Table 1 in the appendix contains pH readings for each well sampled by date and water bearing zone. All monitoring wells and water wells with pH values above their respective ranges are listed in bold in Table 1.

Several wells in various water bearing zones had arsenic, cadmium, and thallium comparison values below their respective laboratory detection limits (0.004 mg/L for arsenic and 0.002 mg/L

for cadmium and thallium); SEET was unable to fully evaluate constituents at these specific locations (Appendix, highlighted areas in table 1). When future sampling is conducted to determine the hazard potential of contaminants in the monitoring and water wells, then detection levels should be modified.

First WBZ:

Groundwater samples were collected from nine monitoring wells in the unused shallow Class 3B aquifer. Arsenic was detected above the Agency for Toxic Substances and Disease Registry's (ATSDR) Cancer Risk Evaluation Guide (CREG) of 0.00002 milligrams per liter (mg/L) at every monitoring well location on varying dates. Several monitoring wells in the first WBZ reported metal detections above health based comparison values for cadmium (0.001 mg/L), lead (0.015 mg/L), manganese (0.5 mg/L), and nickel (0.2 mg/L) (Appendix , Table 1). Health-based comparison values and their usage in the screening process are explained further in the Appendix.

Second WBZ:

Thirteen monitoring wells were sampled from the second WBZ which ranges between 15 and 40 ft-bgs and is classified as a potential domestic water supply aquifer. Arsenic, cadmium, lead and manganese were detected above health based comparison values at various monitoring well locations (within this WBZ) and on different dates (Appendix, Table 1).

Third WBZ and Water Wells:

A total of nine groundwater samples were collected in the third WBZ and drinking water well locations (Appendix, Table 1 and Figure 1). Arsenic was detected above health based comparison values (0.00002 mg/L) at three monitoring well locations in the third WBZ and at one water well location. The third WBZ and the water wells are Class 1B drinking water aquifers.

Exposure Pathways

SEET evaluated the environmental and human components that lead to exposure in order to determine whether a child or adult would be exposed to contaminants detected in sampled media from the Delatte Metals site. An exposure pathway contains the following five elements: a source of contamination, transport through some kind of environmental medium, a point of exposure, a route of exposure, and a receptor population. ATSDR categorizes an exposure pathway as a completed or potential exposure pathway if the exposure pathway cannot be eliminated. Completed pathways require that the five elements exist and indicate that exposure to a contaminant has occurred in the past, is presently occurring, or will occur in the future. Potential pathways, however, indicate that exposure to a contaminant could have occurred in the past, could be occurring now, or could 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.

According to the Louisiana Department of Environmental Quality's (LDEQ) Risk Evaluation/Corrective Action Program (RECAP) analysis of hydrology and water quality, the first onsite WBZ is considered Class 3B (a source of a moderate quantity of water, with total dissolved solids concentration greater than 10,000 milligrams per liter (mg/L); the second WBZ is Class 2C (a source that could potentially supply drinking water in sufficient quantity for a domestic water supply, but since it has a total dissolved solids concentration between 1,000 mg/L and 10,000 mg/L, it is not of sufficient drinking water quality); and the third WBZ is Class 1B (a source that could potentially or currently does supply drinking water to a domestic water supply and has less than 1,000 mg/L total dissolved solids) [4]. The first WBZ appears to be discontinuous and does not extend across the entire Delatte Metals site, while the second and third WBZs appear to be confined and relatively continuous across the entire site.

An inventory of the registered water wells located within a one mile radius of the Delatte Metals site was cited in the 2000 ROD. The registered water well inventory revealed that 34 water wells were registered within a one mile radius. Twenty-two of the wells were installed in the Shallow Aquifer (also known as the Upland Terrace Aquifer) beneath the third WBZ, while the remaining 12 wells were installed in the Upper Ponchatoula Aquifer. All of the wells are used for domestic purposes, and all are active except one [4]. Furthermore, in 2000, a door-to-door survey was conducted within a 0.5 mile radius of the Delatte Metals site to identify wells that may not have been registered with the Louisiana Department of Transportation and Development (LDOTD). Of the 38 households contacted, all of the households owned or used an adjacent water well with depths ranging from 35 to 600 feet deep. Thirty-three of the households reported using their well for drinking water purposes, while the remaining five are used for agricultural purposes. All water wells installed for drinking water purposes draw from the Shallow Aquifer or deeper and do not utilize the three onsite water bearing zones [4].

SEET geographic information systems (GIS) staff generated an updated map of water wells within a one-mile radius of the Delatte Metals site (Appendix, Figure 2). The number of water wells remains the same, including the five water wells that lie under the three onsite WBZs.

As previously mentioned, samples were collected from five water wells (underneath the 3WBZs) in the immediate vicinity of the Delatte Metals site (Appendix, Table 1). Arsenic was detected above the ATSDR CREG of 0.00002 mg/L at the Regan water well. Arsenic is classified by EPA as a human carcinogen. SEET estimated the adult cancer risk for ingestion of arsenic in drinking water from the Regan well. Carcinogenic risk was calculated by multiplying the adult exposure dose over a lifetime by the arsenic cancer slope factor (SF) of $1.5 \text{ E}+00 \text{ (mg/kg/day)}^{-1}$. Evaluation of potential carcinogenic risk due to a lifetime (70 year) exposure to arsenic using standard default values (2 liters of water per day, 70 kilograms body weight) indicates that arsenic at a maximum detected concentration of 0.001 mg/L presents a cancer risk of $4.29 \text{ E}-05$, or 4.29 excess cancers per 100,000 people. This is below EPA's predicted cancer rate of 1 excess cancer per 10,000 people (1×10^{-4}).

Groundwater from the three WBZs is not being used as a drinking water source. There is no current exposure pathway between groundwater contaminants in these zones and the local population. A perimeter fence and adequate signage describing site conditions deem the site public access restricted. One water well located beneath the third WBZ (Regan well) contains arsenic levels above the ATSDR CREG; however, it is not present at levels that would present an unacceptable cancer risk. The third WBZ is confined and continuous across the Delatte Metals

site. Arsenic is a naturally occurring element and can be found at varying levels throughout the world. In Louisiana, the average background for arsenic is 12 parts per million (ppm). Elevated levels of arsenic in groundwater from the Regan well may or may not be site-related.

Child Health Considerations

In communities faced with air, water, or food contamination, the many physical differences between children and adults demand special emphasis. Children could be at greater risk than are adults from certain kinds of exposure to hazardous substances. Children play outdoors and sometimes engage in hand-to-mouth behaviors that increase their exposure potential. Children are shorter than are adults; this means they breathe dust, soil, and vapors close to the ground. A child's lower body weight and higher intake rate results 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. Finally, children are dependent on adults for access to housing, for access to medical care, and for risk identification. Thus adults need as much information as possible to make informed decisions regarding their children's health. SEET found no harm to children living near the Delatte Metals site.

Conclusions

SEET concludes that ingestion of groundwater from the Delatte Metals site is not expected to harm people's health. Groundwater is not used as a drinking water source from the three onsite water bearing zones. All water wells installed for drinking water purposes draw from the Shallow Aquifer or deeper, and do not utilize the three onsite water bearing zones. Arsenic concentrations in one of the water wells, the Regan well, were detected at levels that are not expected to present an unacceptable cancer risk.

Recommendations

SEET recommends that the Delatte Metals site continue to undergo routine monitoring of the groundwater to ensure the protectiveness of the EPA remedial actions. Particular attention should be given to monitoring of the Regan water well.

Several wells in various water bearing zones had arsenic, cadmium, and thallium comparison values below the laboratory detection limit (Appendix, highlighted areas in table 1). When future sampling is conducted to determine the hazard potential of contaminants in the monitoring and water wells, then detection levels should be modified.

Public Health Action Plan

The information produced within this health consultation will be disseminated by SEET to the public repositories, community members and stakeholders within Tangipahoa Parish, Louisiana.

REPORT PREPARATION

This Health Consultation for the Delatte Metals Site was prepared by the Louisiana Department of Health and Hospitals, Office of Public Health, Section of Environmental Epidemiology and Toxicology (LDHH/OPH/SEET) under a cooperative agreement with the federal Agency for Toxic Substances and Disease Registry (ATSDR).

Author:

Darcie Olexia, MSPH
Public Health Assessor / Environmental Health Scientist
Louisiana Department of Health and Hospitals (LDHH)
Office of Public Health (OPH)
Section of Environmental Epidemiology and Toxicology (SEET)

Geographic Information Systems (GIS):

Kate Streva, MNS, Environmental Health Scientist/GIS Analyst, LDHH/OPH/SEET

State Reviewers:

Kathleen Aubin, MSPH, Environmental Health Scientist Supervisor, LDHH/OPH/SEET
Shannon Soileau, MS, Environmental Health Scientist Manager, LDHH/OPH/SEET
Luann White, PhD, DABT, Toxicology Consultant, Tulane University School of Public Health and Tropical Medicine

ATSDR Reviewers:

Jeff Kellam, ATSDR/DCHI/CB
Technical Project Officer

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1. SEMS, Inc. Delatte Metals Superfund Site, Operation and Maintenance Report Third Quarter 2011. October 28, 2011.
2. Environmental Protection Agency Region 6. Fact Sheet for the Delatte Metals Superfund Site, Tangipahoa Parish, Louisiana. December 2011.
3. U.S. Census Bureau, Tangipahoa Parish, Louisiana State and County Quick Facts. Generated by Darcie Olexia. Accessed 12 January 2012 at URL: <http://quickfacts.census.gov/>
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Appendix

DRAFT

Screening Process

Health based comparison values (CVs) were used to determine which samples needed further evaluation. CVs are not used to predict health effects or to set clean-up levels. Contaminants with media concentrations above a health based comparison value do not necessarily represent a health threat, but are selected for further evaluation. Contaminants with media concentrations below a health based comparison value are unlikely to be associated with illness and are not evaluated further.

The Agency for Toxic Substances and Disease Registry's (ATSDR) Environmental Media Evaluation Guide (EMEG), Reference Dose Media Evaluation Guide (RMEG) and Cancer Risk Evaluation Guide (CREG) were used as CVs in this evaluation. EMEGs are estimated contaminant concentrations that are unlikely to cause adverse non-carcinogenic health effects. EMEGs are calculated by using ATSDR's Minimal Risk Level (MRL), which is also an estimate of daily exposure to contaminants that are unlikely to cause adverse non-cancer health effects. If no MRL is available to derive an EMEG, ATSDR develops an RMEG using EPA's reference dose. Like EMEGs, RMEGs represent concentrations of substances to which humans may be exposed without experiencing adverse health effects. CREGs are media-specific comparison values that are used to identify concentrations of cancer-causing substances that are unlikely to result in an increase of cancer rates in an exposed population. Cancer risk comparison values used in this health consultation are based on ATSDR's CREG and EPA's chemical specific cancer slope factors (SF). CREGs are media-specific CVs used to identify concentration of cancer-causing substances that are unlikely to result in an increase of cancer rates in an exposed population. SF's represent an estimated lifetime risk of one excess cancer in 10,000 (1×10^{-4}) people exposed for a lifetime of 70 years in duration.

EPA's Maximum Contaminant Levels (MCLs) were also used as CVs in this evaluation. An MCL is an enforceable drinking water regulation that is the maximum permissible level of contaminant in water that is delivered to the free-flowing outlet of the ultimate user of a public water system.

Ground Water Ingestion Exposure Dose Equation

Exposure doses from ingestion of ground water can be calculated as follows:

$$D = (C \times IR \times EF \times CF) / BW$$

Where,

D= exposure dose (mg/kg/day)
C= contaminant concentration (mg/kg)
IR= daily drinking water intake rate (L/day)
EF= exposure factor (unitless)
CF= conversion factor (10^{-6} kg/mg)
BW= body weight (kg)

Default Ground Water Intake Rates:

2 L/day – adult
1 L/day – child

Quantitative Screening Analysis for Carcinogenic Risk

Cancer risk from ingestion of ground water can be calculated as follows:

$$\text{Cancer risk} = D \times CSF$$

Where,

D= exposure dose (mg/kg/day)
CSF= cancer slope factor ($[\text{mg/kg/day}]^{-1}$)

Source: Agency for Toxic Substances and Disease Registry. Public Health Assessment Guidance Manual (Update). Atlanta: U.S. Department of Health and Human Services, Public Health Service; January 2005.

**Table 1: Quarterly Groundwater Monitoring Results in milligrams per liter (mg/L).
Delatte Metals Site, Tangipahoa Parish, Louisiana. May and August 2011.**

Monitoring Well & Date	pH Standard Unit	Arsenic	Cadmium	Lead	Manganese	Nickel	Thallium	Zinc
FIRST WATER BEARING ZONE								
DW-01								
<i>May-2011</i>	5.83	0.131	0.0007	0.0003	0.257	0.002	<0.002	0.011
<i>Aug-2011</i>	5.90	1.22	0.002	0.025	0.107	<0.002	<0.002	0.005
DW-02								
<i>May-2011</i>	2.80	0.064	0.027	0.0244	11.4	0.484	<0.002	1.14
<i>Aug-2011</i>	2.98	0.073	0.024	0.0132	13.5	0.653	<0.01	1.76
DW-03								
<i>May-2011</i>	3.47	0.047	0.002	0.035	3.83	0.132	<0.002	0.153
<i>Aug-2011</i>	3.73	0.046	0.002	0.008	2.4	0.125	<0.002	0.149
MW-01								
<i>May-2011</i>	3.49	0.026	0.005	0.003	5.98	0.225	<0.002	0.243
<i>Aug-2011</i>	3.69	0.131	0.006	0.018	2.62	0.085	<0.002	0.121
MW-02								
<i>May-2011</i>	3.41	<0.004	0.111	0.001	1.37	0.054	<0.002	0.279
<i>Aug-2011</i>	3.20	0.001	0.46	0.012	1.01	0.070	0.0003	0.395
MW-06								
<i>May-2011</i>	3.82	<0.01	0.037	<0.002	2.31	0.022	<0.002	0.0818
<i>Aug-2011</i>	3.73	0.005	0.074	0.002	3.78	0.041	<0.002	0.145
PW-04								
<i>May-2011</i>	3.83	0.005	0.007	0.001	2.46	0.056	<0.002	0.128
<i>Aug-2011</i>	4.07	<0.004	0.001	0.0009	0.968	0.024	<0.002	0.0628
BA-03								
<i>May-2011</i>	3.38	0.011	0.212	0.244	3.54	0.137	<0.002	0.629
<i>Aug-2011</i>	3.79	0.001	0.063	0.073	0.638	0.021	<0.002	0.119
BA-09								
<i>May-2011</i>	3.75	0.032	0.0006	<0.002	4.29	0.192	<0.002	0.258
<i>Aug-2011</i>	3.79	0.032	<0.002	0.0004	4.26	0.196	<0.002	0.28
SECOND WATER BEARING ZONE								
DW-04								
<i>May-2011</i>	7.04	<0.004	0.0003	<0.002	0.061	<0.002	<0.002	0.001
<i>Aug-2011</i>	7.10	0.001	<0.002	0.0007	0.065	0.0005	<0.002	<0.01
MW-A								
<i>May-2011</i>	6.90	<0.004	0.0003	<0.002	0.004	0.001	<0.002	<0.01
<i>Aug-2011</i>	7.01	<0.004	0.0009	0.002	0.013	0.001	<0.002	0.032
MW-03								
<i>May-2011</i>	6.60	<0.004	0.0003	0.007	0.83	0.002	<0.002	0.006
<i>Aug-2011</i>	6.65	<0.004	0.0006	0.005	0.783	0.002	<0.002	0.007
MW-04								
<i>May-2011</i>	6.66	<0.004	0.0003	<0.002	0.007	<0.002	<0.002	0.002
<i>Aug-2011</i>	6.69	0.001	0.0006	0.003	0.036	0.002	<0.002	0.009
BA-01								
<i>May-2011</i>	5.90	<0.05	0.0004	<0.002	1.22	0.044	<0.002	0.052
<i>Aug-2011</i>	6.08	0.004	0.0009	0.00008	1.09	0.034	<0.002	0.043
Comparison Value (CV) in mg/L¹		0.00002 CREG²	0.001 EMEG³	0.015 MCL⁴	0.5 RMEG⁵	0.2 RMEG	0.002 MCL	3 EMEG

Delatte Metals Groundwater Evaluation
Tangipahoa Parish, Louisiana

Monitoring Well & Date	pH Standard Unit	Arsenic	Cadmium	Lead	Manganese	Nickel	Thallium	Zinc
SECOND WATER BEARING ZONE								
BA-05								
<i>May-2011</i>	6.25	0.002	0.0003	<0.002	12	0.040	<0.002	0.007
<i>Aug-2011</i>	6.01	0.016	0.0009	0.0003	7.56	0.026	<0.002	0.007
BA-09A								
<i>May-2011</i>	7.01	0.001	<0.002	<0.002	0.038	<0.002	<0.002	0.003
<i>Aug-2011</i>	7.00	0.002	0.0008	0.019	0.038	0.001	<0.002	0.022
BC-03								
<i>May-2011</i>	7.04	<0.004	0.0004	<0.002	0.009	0.001	<0.002	0.002
<i>Aug-2011</i>	7.10	<0.004	<0.002	0.0001	0.024	0.001	<0.002	<0.01
BC-07								
<i>May-2011</i>	7.15	<0.004	0.0003	<0.002	0.072	0.0009	<0.002	0.005
<i>Aug-2011</i>	7.13	0.0009	0.0006	0.001	0.064	0.001	<0.002	0.004
BC-17								
<i>May-2011</i>	6.65	<0.004	0.001	0.053	0.423	0.002	<0.002	0.004
<i>Aug-2011</i>	6.81	0.002	0.001	0.026	0.42	0.002	<0.002	0.004
BC-19								
<i>May-2011</i>	6.85	<0.001	<0.002	<0.002	0.016	0.001	<0.002	0.003
<i>Aug-2011</i>	6.90	<0.004	0.0011	<0.001	0.025	0.001	<0.002	0.003
BC-21R								
<i>May-2011</i>	6.69	<0.004	0.0004	<0.002	0.019	0.001	<0.002	0.003
<i>Aug-2011</i>	6.90	<0.004	0.0007	0.0002	0.039	0.001	<0.002	0.005
BC-25								
<i>May-2011</i>	6.90	<0.004	0.0003	<0.002	0.177	0.0006	<0.002	0.003
<i>Aug-2011</i>	6.97	<0.004	0.0006	0.0002	0.196	0.0008	<0.002	0.005
THIRD WATER BEARING ZONE								
BA-03A								
<i>May-2011</i>	8.17	<0.004	0.0003	0.0006	0.034	0.0005	<0.002	<0.01
<i>Aug-2011</i>	7.90	<0.004	0.0011	0.007	0.015	0.002	<0.002	0.040
BA-05A								
<i>May-2011</i>	7.28	0.001	0.0003	<0.002	0.002	0.0005	<0.002	0.004
<i>Aug-2011</i>	7.10	0.001	0.0009	0.002	0.017	0.0006	<0.002	0.013
BB-01								
<i>May-2011</i>	9.77	0.004	<0.002	0.003	0.002	0.0007	<0.002	0.003
<i>Aug-2011</i>	9.89	0.004	<0.002	0.005	0.003	0.001	<0.002	<0.01
BA-01A								
<i>May-2011</i>	7.26	0.006	0.0003	<0.002	0.018	0.0004	<0.002	<0.01
<i>Aug-2011</i>	7.36	0.007	0.0006	0.0002	0.023	<0.002	<0.002	0.003
WATER WELLS								
Regan Well								
<i>May-2011</i>	8.30	0.001	0.0003	0.001	0.022	<0.002	<0.002	0.001
<i>Aug-2011</i>	8.36	0.001	0.0006	0.003	0.025	0.0002	<0.002	0.003
WW-04								
<i>May-2011</i>	8.81	<0.004	0.0003	<0.002	0.002	<0.002	<0.002	0.001
<i>Aug-2011</i>	8.87	<0.004	0.0006	0.00006	0.003	<0.002	<0.002	0.001
Comparison Value (CV) in mg/L¹		0.00002 CREG²	0.001 EMEG³	0.015 MCL⁴	0.5 RMEG⁵	0.2 RMEG	0.002 MCL	3 EMEG

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Monitoring Well & Date	pH Standard Unit	Arsenic	Cadmium	Lead	Manganese	Nickel	Thallium	Zinc
WATER WELLS								
WW-09								
<i>May-2011</i>	8.19	<0.001	<0.002	<0.002	0.015	<0.002	<0.002	<0.01
<i>Aug-2011</i>	8.16	<0.004	0.0006	0.0003	0.017	<0.002	<0.002	0.004
North Well								
<i>May-2011</i>	8.91	<0.004	0.0003	<0.002	0.002	<0.002	<0.002	0.001
<i>Aug-2011</i>	8.76	<0.004	0.0006	0.0009	0.003	<0.002	<0.002	0.002
South Well								
<i>May-2011</i>	8.98	<0.004	0.0003	<0.002	0.003	<0.002	<0.002	0.002
<i>Aug-2011</i>	9.05	<0.004	0.0006	0.0001	0.003	<0.002	<0.002	0.011
Comparison Value (CV) in mg/L¹		0.00002 CREG²	0.001 EMEG³	0.015 MCL⁴	0.5 RMEG⁵	0.2 RMEG	0.002 MCL	3 EMEG

Please note bold values represent concentrations detected above comparison values; highlighted values represent comparison values below the laboratory detection limit

¹mg/L- milligrams per liter; ²CREG- Cancer Risk Evaluation Guide; ³EMEG- Environmental Media Evaluation Guide; ⁴MCL- Maximum Contaminant Level; ⁵RMEG- Reference Dose Media Evaluation Guide

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Figure 1: Delatte Metals facility map [1]

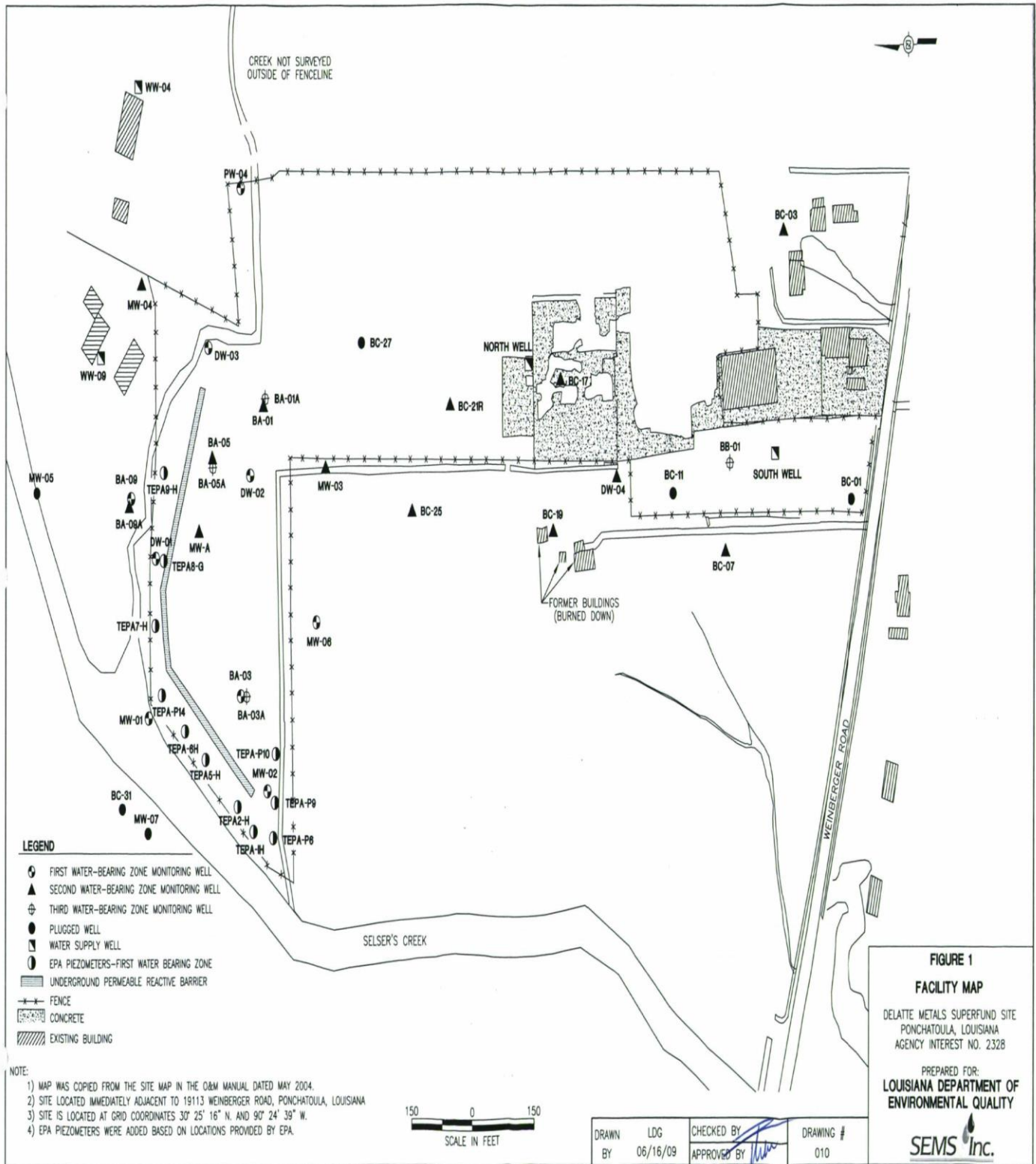


Figure 2: Active water wells within a one-mile radius of the Delatte Metals site. Generated by SEET GIS staff March 2012.

