

ALTAMONT ENVIRONMENTAL, INC.

ENGINEERING & HYDROGEOLOGY

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January 4, 2006

Ms. Wilma Subra
Subra Company
P.O. Box 9813
New Iberia, Louisiana 70562

Subject: Sediment Sampling and Analyses
Seven Louisiana Coast Locations

Dear Ms. Subra:

On November 19, 2005, Altamont Environmental, Inc. (Altamont) assisted Subra Company (Subra) with sediment sampling at seven locations near the coast of Louisiana. The sampling was conducted as part of an effort to assess potential contamination that may have resulted due to the affects of Hurricane Rita. Generally, the sample locations were selected where sedimentation was visible near waterways, schools, or residences.

In summary: sediments and soil were screened using samples collected on November 19, 2005 to determine whether contaminants on the surface are present as a probable result of Hurricane Rita. Using a small population of samples, this study has shown that several inorganic contaminants (metals) exist in these areas at concentrations exceeding regulatory criteria. These contaminants are primarily arsenic, barium, and potentially chromium. As with the conclusions of the two previous rounds of sampling in the wake of Hurricane Katrina, two facts remain unknown: the physical extent of these contaminants, particularly arsenic, and the associated range of concentrations. These determinations can only be made on the basis of additional research into naturally occurring concentrations of these metals, and potentially, further sampling in these areas.

This is the third of three reports based on sampling along the Gulf Coast following Hurricanes Katrina and Rita. The previous reports were dated October 6 and November 11, 2005. This report contains a description of the background, findings, and conclusions of the sampling and associated analyses.

BACKGROUND

Flooding associated with Hurricanes Katrina and Rita deposited a layer of sediment in many areas along the Gulf Coast. Following Hurricane Katrina, Subra requested assistance from Altamont with collection and analyses of sediment and surface water samples at five locations in or near New Orleans. The purpose of the sampling was to screen sediments for a wide range of organic and inorganic compounds. Water samples were also collected in some areas where standing water was still present. The sediment and water sampling was conducted on September 16, 2005. The associated report was completed on October 6, 2005.

Altamont returned to the Gulf Coast to assist Subra with additional sampling between September 30 and October 2, 2005. The 18 sample locations extended from near Mobile Bay along the coast to two small communities south of New Orleans. As in early September, the purpose of the second round of sampling was to screen sediments for a wide range of compounds, including dioxins at three locations in Mississippi. One water sample was collected where standing surface water was observed. The results were provided in a report dated November 11, 2005.

Altamont returned for the third round of sampling on November 19, 2005. Potential sample locations were evaluated in southwest Louisiana and east Texas – both of which were affected by Hurricane Rita. Sediment indicating recent deposition was not observed in the inspected areas near Port Arthur and Orange, Texas. However, seven locations were identified in Louisiana. As in all previous sampling, Subra identified general sampling areas, and Altamont selected the actual sample location within each general area.

As shown in the following text and tables, the analytical results have been compared to appropriate state (e.g., Louisiana Department of Environmental Quality (LDEQ)) and US Environmental Protection Agency (US EPA) criteria.

METHODS AND OBSERVATIONS

SAMPLE LOCATION SELECTION

Seven sample locations were selected in the previously described general areas. The approximate locations of these samples with respect to nearby landmarks are shown in Figures 1 through 8. Figure 1 provides an overview of general sample locations and the remaining figures show the actual locations relative to nearby landmarks.

Please note that aerial photographs (i.e., ©2005 Google-Mapdata; © 2004, 2005 NAVTEQ™ - Imagery; ©2005 Microsoft Corp.; and ©2005 DigitalGlobe) utilized in preparing the figures produce an image with inherent inaccuracies. These figures are intended for use only as general guides to the sampling locations.

Prior to establishing sample locations in southwest Louisiana, Altamont visually inspected several prospective locations near the west bank of Sabine Lake in east Texas. These locations were in the general vicinity of Port Arthur, Texas. In searching for sample locations, Altamont sought accumulations of sediment that due to several factors (e.g., absence of vegetation, distinct differentiation in grain size or color), indicated deposition during Hurricane Rita. Recent sedimentation was not observed in these areas.

In southwest Louisiana, Altamont established seven sample locations. Each was chosen on the following bases:

Calcasieu Parish

This vicinity was selected due to its location near where the eye of Hurricane Rita passed and the proximity of the Calcasieu Ship Channel and several large industries. Four samples were collected in this area.

Calcasieu Ship Channel/Moss Lake (SS-1)

This area was selected due to its location along the Calcasieu Ship Channel between Calcasieu and Moss Lakes. The sample was collected from a drainage ditch along the south side of Burton Shipyard Road, near its terminus at Burton Landing. Sediment at the sample location was present within the roadside drainage ditch. It was not observed more widely in this area. Figure 2 shows the approximate location of SS-1.

Calcasieu Ship Channel/Bayou D'Inde (SS-2)

This area was selected north of SS-1 along a tributary to Bayou D'Inde that crosses beneath Bayou D'Inde Pass Road (which is also known as Prather Road). Bayou D'Inde is itself a tributary to Prien Lake. The Calcasieu Ship Channel crosses Bayou D'Inde between Prien Lake and the sample location. The sample was collected from the bank of a waterway within a wooded swamp approximately one mile southwest of the PPG Industries, Inc. facility. The sample was collected from the south bank of the tributary, on the west side of Bayou D'Inde Pass Road. Figure 3 shows the approximate location of SS-2.

Westlake/Mossville Elementary School (SS-3)

Mossville Elementary School is located approximately one-half mile west of the intersection of Old Spanish Trail and V.C.M. Plant Road (i.e., Vinyl Chloride Monomer Plant Road) near Westlake, Louisiana. The sample was collected from the west side of a drainage ditch along the north side of Old Spanish Trail. Little or no recently deposited sediment was visible. Figure 4 shows the approximate location of SS-3.

Calcasieu Lake/Deatonville (SS-4)

This area was selected due to its location near the northeastern shore of Calcasieu Lake. The sample was collected some 20 feet west of Louisiana Highway 384 (also known as Big Lake Road) south of the intersection of Lake View Drive. The sample location was approximately 500 feet northeast of the lake. A layer of sediment some three to four inches thick was observed. Figure 5 shows the approximate location of SS-4.

Cameron Parish

This vicinity was selected due to its location near where the eye of Hurricane Rita passed and the proximity of the Calcasieu Ship Channel and the Gulf of Mexico. Two samples were collected in this area.

Cameron (SS-5)

The sample area was selected near the eastern edge of the commercial and residential areas that comprise Cameron. The actual sample location was approximately one-quarter mile east of the Parish Courthouse. Hurricane winds demolished most street signs in the area; however, the sample location appeared to be in a school zone at the intersection of Parish Road 3134 and LA 82. The sample was collected from a drainage ditch north and west of the intersection. Sediment was not observed beyond the edge of the drainage ditch. Figure 6 shows the approximate location of SS-5.

Creole (SS-6)

This area was selected due to the proximity of the Gulf of Mexico and the presence of an extensive layer of sediment. The sample was collected approximately 150 feet northeast of the intersection of LA 27 and LA 82. Sediment in the area was approximately one to two inches thick. Figure 7 shows the approximate location of SS-6.

Vermilion Parish

One sample location was selected in Vermillion Parish to access sediment quality east of the path taken by the eye of Hurricane Rita.

Kaplan/Pecan Island (SS-7)

The sample area was selected between White Lake and Vermilion Bay, some 12 miles north of the Gulf of Mexico. The actual sample location was some 25 miles south of Kaplan, near the western edge of the highway to Pecan Island. The sample was collected approximately 20 feet west of LA 82. Darkness prevented assessing the extent of sediment in the area.

SAMPLE COLLECTION

Altamont restricted sediment sampling to the apparent layer of recently deposited material. All samples were collected from undisturbed areas within public rights-of-way.

In most cases, the sediment layer was visibly distinct from the native soil. Altamont observed the following exceptions: SS-3 and SS-5. At these locations, sediments were either not present or so thinly deposited that they were indistinct from soil that was in-place prior to the hurricane.

Conditions at the sample locations were noted with the following observations:

- Calcasieu Parish; Moss Lake area (SS-1): sediment moist, dark brown, fine grain
- Bayou D'Inde Pass Road at Bayou D'Inde (SS-2): sediment saturated, dark brown, fine grain
- Mossville Elementary School (SS-3): little or no recently deposited sediment; soil dry, medium brown, medium grain
- Calcasieu Lake/Deatonville (SS-4): sediment moist, dark brownish-gray, fine grained
- Cameron (SS-5): little or no recently deposited sediment; soil moist, dark brown, fine grain
- Creole (SS-6): sediment light brown, fine grain
- Kaplan/Pecan Island (SS-7): sediment moist, dark brown, medium to fine grain

All samples were collected using stainless steel scoops and/or new vinyl gloves. The collected quantities of sediment were placed in new sample containers provided by Pace Analytical Services (Pace). The sample containers were then placed in coolers and covered with ice. Altamont maintained control of the

coolers throughout the sampling period. The samples were relinquished to Subra Environmental for delivery to Federal Express. The coolers were shipped for overnight delivery to the Pace laboratory in Asheville, North Carolina.

LABORATORY ANALYSES

The analyses included the following parameter suites and methods:

- Semivolatile Organic Compounds (SVOCs) by US EPA Method 8270
- The eight Resource, Conservation, and Recovery Act (RCRA) metals by various US EPA Methods in the 6000/7000 series
- Dioxins/Furans by a modified version of USEPA Method 1613B
- Microbiology by Standard Methods

Specifically however, the samples were analyzed for the parameter suites:

- SS-1: Metals, SVOCs, and Microbiology
- SS-2: Metals, SVOCs, and Microbiology
- SS-3: Metals, SVOCs, Microbiology, and Dioxins/Furans
- SS-4: Metals, SVOCs, and Microbiology
- SS-5: Metals, SVOCs, and Microbiology
- SS-6: Metals, SVOCs, and Microbiology
- SS-7: Metals, SVOCs, and Microbiology

The analytical detections are presented in Tables 1 through 3. SVOCs were not included in the tabulated summary because none were detected.

The detected concentrations were compared to Louisiana Department of Environmental Quality (LDEQ) and US Environmental Protection Agency (US EPA) criteria. The LDEQ criteria are contained in the "Louisiana Department of Environmental Quality (LDEQ) Risk Evaluation/Corrective Action Program (RECAP) Management Option 1 Soil Standards." According to the US EPA "Hurricane Response 2005" website, the LDEQ non-industrial RECAP Soil Standards are intended to be protective of long-term (i.e., 30-year) exposures to children and adults in residential settings. US EPA states that, "In cases where sample results exceed LDEQ's RECAP standards, USEPA and LDEQ will work together to determine next steps."

The US EPA criteria are described in a document titled, "US EPA Region VI Human Health Medium-Specific Screening Levels." These levels were last updated on December 22, 2005. The document states that, "*The comparison of preliminary investigation data against risk-based media concentrations*

provides for an initial evaluation for the relative environmental concern for a site or set of environmental data.” Additionally, the document contains a list of naturally occurring background levels for inorganic compounds. Although the document states that the naturally occurring “values have been compiled from technical sources and from Region 6 approved background study reports,” these documents were not identified in the list of references included with the document.

Additionally, Altamont compared concentrations of detected metals to background concentrations published by the US Geological Survey (USGS). The USGS document is titled, “Element Concentrations in Soils and Other Surficial Materials of the Conterminous United States;” Paper 1270; dated 1984.

The analytical detections, in some cases compared to regulatory criteria, are summarized by the following statements:

Metals

- Arsenic, barium, chromium, and lead were identified in all seven samples.
- Mercury was identified in all samples except the one collected in the Calcasieu Ship Channel/Moss Lake area (SS-1). None of the mercury concentrations exceeded Louisiana Department of Environmental Quality (LDEQ) or US Environmental Protection Agency (US EPA) criteria. Only one of the mercury detections exceeded the EPA Region VI background level of 0.1 milligram per kilogram (mg/kg). This sample (SS-2) was collected from a tributary of Bayou D’Inde.
- Lead was detected in all seven samples. Although six of the seven concentrations exceeded US EPA Region VI background concentrations, none exceeded the US EPA or LDEQ residential soil criteria.
- Arsenic exceeded LDEQ and US EPA criteria at all seven locations. The US EPA Screening Level for arsenic is 0.39 mg/kg. The detected concentrations ranged between 1.8 and 9.5 mg/kg. The US EPA Screening Levels state that naturally occurring arsenic may be identified at concentrations up to 16.7 mg/kg.
- Barium was detected in all samples. However, the sample collected in Vermilion Parish (SS-7) contained barium at a concentration of 4,100 mg/kg. This concentration exceeded all other detections by a factor between approximately eight and 40. The US EPA background concentration for barium in Region VI is listed as 430 mg/kg.
- Chromium exceeded the LDEQ, but not US EPA, criterion for hexavalent chromium at two locations, Calcasieu Ship Channel/Bayou D’Inde (SS-2) and Creole (SS-6). These concentrations were 39 and 23 mg/kg, respectively. The LDEQ does not have a criterion for total chromium, which was the analyzed compound. However, the LDEQ standards for trivalent and hexavalent chromium are 12,000 and 23 mg/kg, respectively. To be conservative, Altamont compared the detected concentration to the more stringent standard for hexavalent chromium. The US EPA background concentration for chromium in Region VI is listed as 38 mg/kg.

Microorganisms

- Microorganisms were identified in all seven samples.
- Promulgated standards do not exist in Louisiana for determining relative health risks caused by pathogenic microorganisms in soil or sediment.
- In the absence of applicable criteria for sediment and soil, Altamont researched similar standards for water. Protective standards have been established for microorganisms in drinking water and coastal recreational waters. The US EPA has established Maximum Contaminant Levels (MCL) for water systems, requiring that fewer than five percent of water samples test positive for Total Coliforms per month. Total Coliforms are a group of bacteria naturally present in the environment, as well as in feces. Coliform populations are used as indicators of whether other potentially harmful bacteria may be present.
- The US EPA has established a Water Quality Criterion maximum for *E. coli*. It ranges from 235 per 100 milliliters, for designated bathing beaches, to 575 per 100 milliliters, for infrequently used coastal recreation waters. Though not tested for in water, *E. coli* was detected in sediment at four locations including Calcasieu Ship Channel/Moss Lake, Calcasieu Ship Channel/Bayou D'Inde, Cameron, and Kaplan/Pecan Island (SS-1, SS-2, SS-5, and SS-7). Concentrations of *E. coli* ranged from 700 to 4,800 cfu/g. *E. coli* are intestinal bacteria indicative of recent fecal contamination and the possible presence of pathogens.
- As shown on Table 2, the microbial analytical results are presented in units of "colony forming units per gram (cfu/g). Table 2 shows that for Aerobic Plate Counts, Total Coliforms, *E. coli*, Yeast Count, and Mold Count, and *Salmonella*, the results varied up to five orders of magnitude between sample locations.

Dioxins/Furans

- One sample was analyzed for Dioxin/Furan congeners (SS-3 at Mossville Elementary). The following congeners, and totals, were identified:

Total TCDD	1,2,3,4,7,8-HxCDD	Total HpCDF
Total TCDF	1,2,3,6,7,8-HxCDD	1,2,3,4,6,7,8-HpCDD
Total PeCDF	1,2,3,7,8,9-HxCDD	Total HpCDD
Total PeCDD	Total HxCDD	OCDF
1,2,3,6,7,8-HxCDF	1,2,3,4,6,7,8-HpCDF	OCDD
Total HxCDF	1,2,3,4,7,8,9-HpCDF	

The concentrations of these congeners were converted to an equivalent concentration of the most toxic dioxin congener: 2,3,7,8-tetrachlorodibenzodioxin (2,3,7,8-TCDD). This Toxicity Equivalent (TEQ) was calculated using two commonly accepted methods: one developed by the US EPA and one developed by the World Health Organization (WHO). Each is shown on Table 3. As shown, both exceeded the US EPA Region VI Screening Level of 3.9 nanograms per kilogram.

Quality Control

As shown in Table 3, one Dioxin PCDF congener (1,2,3,6,7,8-HxCDF) was flagged due to interference with a co-eluting polychlorodiphenyl ether (PCDE). The laboratory's narrative, which is attached, indicates that the analytical process could not differentiate between PCDE and PCDF. To evaluate worst-case conditions, Altamont calculated the TEQ based on the assumption that the concentration reported as 1,2,3,6,7,8-HxCDF, was in fact 1,2,3,6,7,8-HxCDF.

CONCLUSIONS

Metals

- Regulatory criteria were exceeded for arsenic, barium, and chromium.
- Arsenic, which exceeded US EPA criteria in all of the samples, was the most widespread compound exceeding regulatory criteria. Information on the US EPA "Hurricane Response 2005" website suggests that all of the detected concentrations would be reasonably attributed to naturally occurring sources. However, the agency website and the US EPA Region VI Screening Levels documents do not state the basis for such an attribution. Further, the USGS, in a document titled "Geochemical Landscapes of the Conterminous United States;" Paper 1648; dated 2001; shows that naturally occurring arsenic concentrations vary widely across the Gulf Coast. Based on the limited number of samples collected as part of this project, and the absence of clear information regarding naturally occurring concentrations of arsenic, further research and, potentially sampling, would be necessary to properly describe the source of arsenic found at concentrations exceeding regulatory criteria.
- Barium was detected in all samples, but exceeded the LDEQ criterion at only one location, Vermilion Parish (SS-7). The barium concentration at SS-7 of 4,100 mg/kg was nearly an order of magnitude higher than background levels. The US EPA Region VI background concentration for barium is listed as 430 mg/kg. The USGS document referenced in this section shows background concentrations of barium on the Gulf Coast ranging from approximately 410 to 550 mg/kg. Together, these findings indicate that the barium at this location was not naturally occurring.
- Chromium marginally exceeded the LDEQ, but not the US EPA, criterion for hexavalent chromium at two locations, Calcasieu Ship Channel/Bayou D'Inde (SS-2) and Creole (SS-6). Neither concentration exceeded the much higher standard for trivalent chromium. Further research and, potentially sampling, would be necessary to determine whether the chromium was naturally occurring at these two locations.

Microorganisms

- The US EPA has not developed standards and does not require monitoring for the microbial parameters analyzed as part of this project:
 - Aerobic plate count is a general indication of the population of aerobic microorganisms present

- Total Coliforms are present in the environment as well as in the feces of all warm-blooded animals and are indicative of the potential presence of pathogens
 - *E. coli* are intestinal bacteria indicative of recent fecal contamination and the possible presence of pathogens
 - *Staphylococcus aureus* is a species of bacteria that is a leading cause of soft tissue infections and a common cause of food poisoning
 - Yeasts are microscopic fungi that can cause skin infections
 - Molds are microscopic fungi that can cause allergic reactions, asthma, and other respiratory effects
 - *Salmonella* is a type of bacteria that is a leading cause of food poisoning
- Generally, the results shown on Table 2 show that for samples collected in south Louisiana, the population ranges varied some five orders of magnitude for Total Coliforms, over two orders of magnitude for *Salmonella*, and one order of magnitude for *Staphylococcus aureus*.

Dioxins/Furans

The 2,3,7,8-TCDD TEQs for the analyzed congeners exceeded the US EPA Region VI Screening Level of 3.9 nanograms per kilogram. The TEQs were calculated using methods developed by the US EPA and the World Health Organization (WHO). In light of the fact that the laboratory identified a quality control issue regarding 1,2,3,6,7,8-HxCDF, Altamont calculated the TEQ with and without the concentration of 1,2,3,6,7,8-HxCDF. Calculated either way, the TEQ exceeds the US EPA Screening Level.

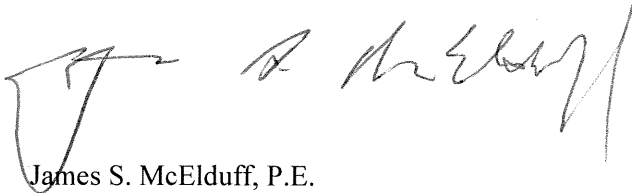
Summary

Sediments and soil were screened using samples collected on November 19, 2005 to determine whether contaminants on the surface are present as a probable result of Hurricane Rita. Using a small population of samples, this study has shown that several inorganic contaminants (metals) exist in these areas at concentrations exceeding regulatory criteria. These contaminants are primarily arsenic, barium, and potentially chromium. As with the conclusions of the two previous rounds of sampling in the wake of Hurricane Katrina, two facts remain unknown: the physical extent of these contaminants, particularly arsenic, and the associated range of concentrations. These determinations can only be made on the basis of additional research into naturally occurring concentrations of these metals, and potentially, further sampling in these areas.

Ms. Wilma Subra
January 4, 2006
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Thank you for providing Altamont the opportunity to provide these environmental services. If you have any questions or comments concerning the proposal, please contact us at your convenience.

Sincerely,

A handwritten signature in black ink, appearing to read "James S. McElduff". The signature is written in a cursive style with a large initial "J" and "M".

James S. McElduff, P.E.

Attachments: Figures 1 - 8
Tables 1 - 3
Laboratory Data Sheets