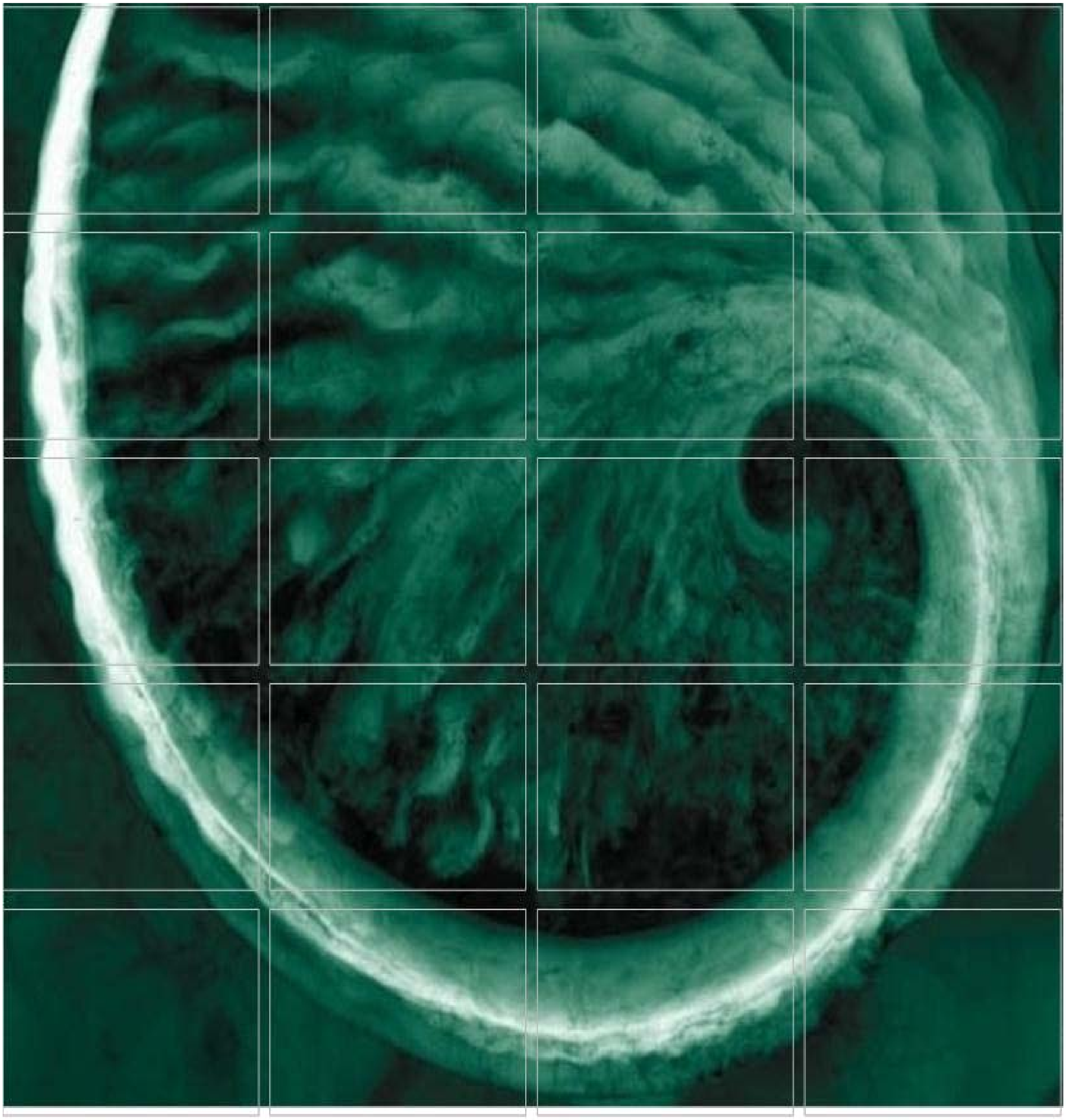

Site Investigation Report and RECAP Evaluation

East White Lake Oil and Gas Field
Vermilion Parish, Louisiana
AI# 91357

October 1, 2015

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Union Oil Company of California

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Project No. 0116008

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EXECUTIVE SUMMARY

On behalf of Union Oil Company of California (UNOCAL), this report provides a summary of the corrective action, site characterization, and risk evaluation completed at the East White Lake study area on Vermilion Parish School Board Property. The report is being provided as a component of the site remediation plan that was developed pursuant to LSA-R.S. 30:29 to evaluate and/or remediate "environmental damage" related to oilfield operations on the East White Lake site.

The property, located within a frequently inundated marsh adjacent to White Lake, is used for oil and gas exploration and production activities and for recreational activities such as fishing and hunting. The property is accessed solely by boat from Schooner Bayou and includes a series of oilfield access canals that branch to the south of Schooner Bayou. Extensive investigations of the East White Lake study area were conducted from 2006 through 2015 by Michael Pisani and Associates, Inc. (MP&A), ICON Environmental Services (ICON), and others as part of a litigation matter. The investigations included the collection and analysis of sediment, ground water, surface water, and biota (crabs and fish) from the property and vicinity. The purpose of the investigations was to evaluate the extent of potentially affected media associated with historical exploration and production operations at the site. An assessment of potential risk for constituents and concentrations reported in all media was performed in accordance with the Louisiana Department of Environmental Quality's (LDEQ's) Risk Evaluation/Corrective Action Program (RECAP) guidance document dated October 20, 2003. The assessment was performed under RECAP Management Option 3 (MO-3) guidance because MO-3 addresses all media investigated and is applicable to recreational land use of this site.

A conceptual site model and exposure pathway analysis were developed to identify potentially complete exposure pathways to be evaluated in accordance with RECAP MO-3. Current and future uses of the property were identified as industrial and recreational. Therefore, in addition to a default industrial scenario, site-specific exposure scenarios representative of Reasonable Maximum Exposure for recreational receptors were used in the development of MO-3 RECAP Standards. The scenarios were developed based upon a combination of site-specific information and LDEQ and EPA sources, consistent with the requirements of the RECAP regulation. The evaluation of the default industrial scenario meets the requirement of RECAP to ensure that properties remain suitable for commerce and industrial use.

Constituents of concern were initially identified through Screening Option analysis for sediment and ground water and were further evaluated under MO-3. RECAP does not provide relevant screening values for surface water or biota, and these media were evaluated fully under MO-3. Recommendations for site management are provided based upon results of the comprehensive MO-3 risk evaluation in accordance with RECAP.

SEDIMENT EVALUATION

Over 300 sediment samples (including all splits) were collected from approximately 100 boring locations. Data representative of current conditions, following remediation completed at a former pit area, were used in the quantitative assessment. The constituents in sediment that warranted further evaluation beyond screening included barium, lead, mercury, 2-methylnaphthalebne and hydrocarbon fractions. Based upon MO-3 evaluation, two sample locations are identified as exceeding the limiting RECAP Standards for hydrocarbon constituents in sediment: WL-3 and WL-4. For the remaining samples collected across the site from approximately 100 boring locations, maximum reported concentrations in sediment are less than RECAP Standards for industrial land use, recreational use, and for protection of ground water. The comprehensive assessment included evaluation of direct contact with near surface sediments, including those located at the base of canals, and evaluation of ground water protection for sediment at all depths (surface and subsurface).

One hydrocarbon fraction in sample WL-3 (0-2'), collected within the active Tank Battery A operational area, exceeded a recreational contact standard and was below the industrial contact standard. Concentrations reported in samples collected deeper in this location were less than the direct contact standards. The sediment samples collected at WL-3 (0-2') and WL-4 in the 4-11' and 11-12.5' intervals below ground surface (bgs) exceeded a total hydrocarbon fraction concentration of 10,000 mg/kg, which is identified in RECAP as an aesthetic standard and not a health-based standard. WL-4 is located within a former pit feature in an area that is no longer in active E&P operations (former Tank Battery B area). Samples collected deeper in the WL-3 and WL-4 locations were less than the aesthetic limit. Figure 6-2 identifies these sample locations with reported hydrocarbon fraction concentrations greater than RECAP Standards.

A corrective action plan to address the former pit, where sample location WL-4 was collected, is being provided by MP&A to the LDNR in the site remediation plan (MP&A, 2015a). The proposed action includes lateral delineation, excavation, confirmation sampling, and backfilling with clean sediments. The scope of this action will address the exceedance of RECAP Standards at WL-4. Should the ongoing operations be discontinued in the Tank Battery A area where sample WL-3 was collected, and the area made available for recreational use, the need for corrective action (and potential scope of remediation) should be addressed at that time.

GROUND WATER EVALUATION

The water well survey for the site identified no registered water supply wells beyond the site boundary within a mile of the site. Although no wells were registered on the site when the investigations began, based upon field survey information, four unregistered wells were identified on the Vermilion Parish School Board property and subsequently registered. Two wells are completed into the fresh water of the Chicot Aquifer over 400 feet deep, one private camp well north of Schooner Bayou and the oilfield central facility well south of Schooner Bayou. Two private camp wells are completed in the 40-Foot Zone north of Schooner Bayou and are used for non-potable purposes such as washing boats and flushing toilets. The water in these 40-Foot Zone wells is not palatable for drinking due to natural iron, manganese, and salt content.

The ground water zones sampled and evaluated under RECAP included a shallow Peat Zone (within upper 20 feet bgs), 40-Foot Zone, 70-Foot Zone, 90-Foot Zone, and Upper Sand of the Chicot Aquifer (at greater than 400 feet bgs). Impact above natural levels or Screening Standards by the site-related constituents chlorides, barium, strontium and/or benzene was identified in the Peat Zone and 40-Foot Zone. Limited impact by chlorides (only) was identified in the 70-Foot Zone; therefore vertical delineation of site constituents was confirmed by concentrations below Screening Standards in deeper zones.

Compliance Concentrations (i.e., maximum concentrations) of all site-related constituents were below Class 3 ground water RECAP Standard (GW3NDW) for the Peat Zone, demonstrating concentrations are protective of potential surface water receptors.

For the 40-Foot Zone, Compliance Concentrations of site-related constituents were below site-specific recreational use standards, considering the current and potential future use of ground water for non-potable purposes in a camp water supply well. Using default Class 2 (GW2) health-based standards that are based on assumed use of ground water as a primary drinking water supply (with no dilution assumed), three AOIs were identified for the COCs benzene (present in one AOI) and barium (present in all three AOIs). Additionally, chlorides exceeded the natural (background) levels in the same AOIs, and chlorides naturally exceed the aesthetic standard for drinking water. Figure 6-3 identifies the AOIs relative to default GW2 standards.

There is currently no exposure to ground water within the default AOIs, and there is no human health risk associated with the concentrations reported in the ground water samples. The exceedances of default health-based standards (benzene and barium) are reasonably delineated and no threat is identified for the non-potable supply wells that are completed in this zone (i.e., the Hebert well and abandoned Crouch well north of the AOIs and Schooner Bayou). The estimated flow direction of the 40-Foot Zone is to the west/southwest, and will be confirmed through additional monitoring proposed by MP&A. The 40-Foot Zone ground water is not a desirable drinking water source under natural conditions based on the iron, manganese and salt (chlorides) levels well above secondary drinking water standards that result in objectionable taste, color, and possibly odor.

No exceedances of health-based RECAP Standards were identified for site COCs in deeper ground water zones. Within the 70-Foot Zone, chlorides appear elevated beneath the 40-Foot Zone AOIs, and the concentrations demonstrate attenuation is occurring between the 40-Foot and 70-Foot Zones. No impact by site COCs is identified in the 90-Foot Zone or Upper Sand of the Chicot Aquifer. The Upper Sand of the Chicot Aquifer is the first naturally fresh zone of ground water beneath the site, generally expected to meet the SMCL for chlorides. Chlorides were confirmed to be below the SMCL in samples collected from this zone at the site.

SURFACE WATER EVALUATION

Surface water samples were collected from 24 locations across the study area. The maximum reported concentrations of all constituents detected in surface water samples, collected from the oilfield access canals and from locations outside of the canals along Schooner Bayou and White Lake, were less than standards developed using RECAP default methods for surface water designated NDW in the Surface Water Quality regulations. The maximum reported concentrations were also less than site-specific recreational RECAP Standards calculated in addition to the default RECAP methods. The results indicate concentrations are protective of surface water users, including the full range of primary contact and secondary contact (fishing and ingestion of fish) recreational activities.

Chlorides are not a concern for adverse effects to human health in recreational surface waters. In general, the chlorides concentrations in Schooner Bayou were higher than those in the oilfield access canals. This is consistent with the US Army Corps of Engineers monitoring of Schooner Bayou, which demonstrates tidal influence from the saltier water of Vermilion Bay.

The direct measurements of surface water conditions further confirm that the Peat Zone ground water, which was evaluated using default RECAP models, is protective of adjacent surface waters.

BIOTA (CRAB TISSUE) EVALUATION

Crabs and forage fish were collected from 13 locations within the oilfield access canals and 10 locations along Schooner Bayou and White Lake. In total, 307 crabs were collected, composited at each location separately, and analyzed for edible tissue concentrations to support human health evaluation. The biota tissue collection and analyses were performed using scientifically valid procedures consistent with Louisiana guidelines. The sampling provided representative data for edible tissues, appropriate for comparison to the screening levels (called TSLs) identified in the Louisiana guidelines. The guidelines were developed jointly by the LDHH, LDEQ, LDWF, and LDAF to determine the need for consumption advisories regarding health risks to the public who fishes recreationally and routinely at a specific water body. The mean and maximum concentrations of constituents reported in crab meat and hepatopancreas samples (i.e., edible tissue) collected within the oilfield access canals and at reference locations in Schooner Bayou and White Lake were less than TSLs developed for public health protection. The comparison to TSLs indicated concentrations are below protective levels and no human health concern is identified.

The sensitivity of the conclusions to a change in intake assumptions was examined. In particular, an increase in ingestion rate was evaluated to understand the potential effects of consumption at a rate greater than the default specified for the general Louisiana population. No change in the conclusions resulted from an increased ingestion rate selected based on relevant studies for Gulf Coast consumers. The results of the sensitivity analyses support a high level of confidence in the conclusion that reported concentrations are protective of human health, even assuming crabs are harvested solely from the study area and consumed at the expected (general population) or higher ingestion rates.

The LDHH provided an independent review of the sampling and risk assessment results, which were provided to LDHH in a prior report (ERM, 2014). In LDHH's report of March 13, 2015, the LDHH confirmed that the crab tissue samples were collected and analyzed in accordance with the Louisiana advisory Protocol and that concentrations in crab were below levels of health concern. Additionally, the LDHH reported their own collection and analysis of edible crab tissues from the East White Lake area. Based on its independent collection of crabs during November 2010 and analyses of arsenic and barium, LDHH concluded the results are protective of health and do not support the need for a consumption advisory due to concentrations in crab tissue.

RECOMMENDATIONS FOR SITE MANAGEMENT

Based on the results of the RECAP evaluation, concentrations remaining in sediment and ground water are protective of human health under current land and ground water use conditions. It is recommended that the boring locations that demonstrated exceedances of aesthetic standards for hydrocarbons be addressed to comply with RECAP requirements for total petroleum hydrocarbons. For location WL-3, located at the active Tank Battery A, it is reasonable to defer corrective action until the lines are no longer active, as no health risk is identified for the current conditions and industrial use of the area. No other corrective action for sediment is warranted for human health protection.

For the 40-Foot Zone ground water, it is recommended that the reviewing agencies consider the risk level associated with actual and hypothetical ground water use as one of multiple factors in identifying the most appropriate response plan for the site, in accordance with the RECAP regulation. Additional factors in determining the need for and scope of corrective action include site-specific characteristics, a balance of actual and potential risk, confidence in site characterization and exposure scenarios, weight of scientific evidence for exposure and toxicity, background constituent levels, and the technical and economic feasibility of remediation. This RECAP evaluation report provides the risk estimates required for agency review as well as information regarding confidence/evidence related to exposure scenarios and toxicity. The corrective action plan provided separately by MP&A addresses the factors related to technical and economic feasibility for agency consideration in adoption of an appropriate corrective action plan.

In accordance with RECAP, if required by the reviewing agencies, a conveyance notice is applicable to address assumed future ground water use in AOIs where concentrations in the 40-Foot Zone exceed health-based drinking water standards without application of a DAF.

No exceedance of health-based RECAP Standards is identified for site COCs in additional ground water zones, and therefore no corrective action is warranted for the zones. No further evaluation or corrective action is warranted for surface water or for protection of human consumption of fish and shellfish in the study area.

1.0 INTRODUCTION

This *Site Investigation and RECAP Report* provides an evaluation of site characterization data available for property owned by the Vermilion Parish School Board and referred to as the East White Lake study area (or "the site") in this report. The evaluation was performed in accordance with Louisiana's Risk Evaluation/Corrective Action Program (RECAP) under Management Option 3 (MO-3) and is being provided as a component of the site remediation plan for the property. This report is appended to the remediation plan that was developed pursuant to LSA-R.S. 30:29 to evaluate and/or remediate "environmental damage" related to oilfield operations on the East White Lake site.

The remediation plan prepared on behalf of Union Oil Company of California (UNOCAL) by Michael Pisani & Associates, Inc. (MP&A) provides the site investigation report, including details of the data collection and laboratory analyses. Descriptions of site setting, geology and hydrogeology are provided in detail in the MP&A remediation plan. For efficiency of agency review, the investigation methods and site characterization results are not repeated in full in this report, but are summarized as relevant to the risk evaluation presented herein. The scope of this RECAP report is to provide a quantitative human health risk evaluation conducted utilizing the methods and guidance of the state-specific risk-based corrective action program. An ecological evaluation checklist is also provided in accordance with RECAP, and ecological evaluation beyond the checklist is provided in a separate ecological risk evaluation (Rodgers, 2015) also appended to the remediation plan. A baseline human health risk evaluation, prepared by Gradient in accordance with EPA guidance, is also appended to the remediation plan and provides a supporting assessment to this RECAP evaluation.

The study area is located just east of White Lake in Vermilion Parish, Louisiana, within the East White Lake Oil and Gas Field. A site location map is provided as Figure 1-1. Sediment, ground water, surface water, and biota tissue sampling was conducted on the property between 2006 and 2015 by ICON Environmental Services Inc. (ICON), MP&A, and others as part of a litigation matter. This submittal is intended to identify risk-based corrective action requirements based upon the results of investigation of environmental media completed at the site by all parties. The MP&A, ICON, and biota sampling analytical results were used to conduct the evaluation under RECAP considering current and potential future land use.

In summary, this report includes the following information:

- A summary of corrective actions completed at the site to date;
- Current site characterization (i.e., site setting and use, geology and hydrogeology, etc.) based on results of the site investigations;
- A conceptual site model and exposure assessment;
- A summary and discussion of the constituents in sediment and ground water that exceed RECAP Screening Standards and warrant further Management Option evaluation;

- Presentation of the detailed, site-specific MO-3 RECAP evaluation for sediment, ground water, surface water, and biota tissue; and
- Identification of media and areas that warrant action to address exceedances of RECAP Standards.

A summary of the RECAP Forms is provided in Appendix A, with indication of where the form or equivalent information is provided in this report or the companion remediation plan.

1.1 PROJECT BACKGROUND

1.1.1 Site Operational History

The property consists of approximately 1200 acres within 0.5 miles east of White Lake, and includes a series of oilfield access canals that branch from a main bayou, Schooner Bayou. Oil and gas exploration and production activities (E&P) began on the property in 1939. A total of approximately 91 wells have been permitted on the property, and several wells are currently active. Of the active wells, three are now salt water injection wells. Current production consists of both oil and gas. Support facilities for the operations include a central facility with offices and an associated tank battery (Tank Battery A). Historical support facilities included an additional tank battery (Tank Battery B), which has been decommissioned. These site features are identified in Figure 1-2.

Historical operations may have included management of produced water through discharge to canals in the early history of the field, and the use of production pits. No open pits remain at the site today, and the site characterization presented in this report includes characterization of areas identified by investigators as pit (or potential pit) locations.

There were a very large number of flow lines that crossed the property above and below grade. Many of the inactive lines have been removed as discussed in Section 1.1.3 below.

1.1.2 Investigation History

The following summary provides a description of the general scope and timeline of investigation activities completed at the site. A more detailed description of the sampling methodologies and laboratory analytical methods is provided in Section 3.

Beginning in 2006, ICON completed an initial investigation including installation of over 30 borings within the oilfield access canals of the East White Lake study area. Samples were collected at the base of canals below the water column and from canal banks. ICON then completed over 20 additional borings in the marsh areas between the canals. Samples were collected for laboratory chemical analysis from multiple depth intervals, and all samples are collectively referred to as sediment samples because the site is frequently inundated and the moisture content in samples was higher than typical soil values, regardless of location within the canals or marshland between canals.

The collection of split samples began in 2010, when investigators on behalf of UNOCAL (MP&A) were notified of ICON's sampling plans and when MP&A initiated their own sampling at the site (with ICON generally present to split samples). The generation of split samples, with analyses provided by separate labs, provides a robust data set with a large number of samples. In 2010, ICON completed over 30 additional borings and sediment sampling within the access canals. MP&A completed borings and sediment sampling in target areas to confirm or further delineate areas of impact identified or alleged based on the earlier ICON sampling results, and to collect data specific to RECAP requirements for detailed risk evaluation (e.g., hydrocarbon fraction data, leachate data). Over 35 additional borings were completed by MP&A in 2010 for further definition of constituent occurrence and distribution.

Samples were collected in 2014 by MP&A as part of the remediation planning and implementation in the Sed-15 pit area. In January 2015, the most recent sediment sampling was completed by ICON, and split by MP&A, in eight boring locations completed on canal banks and at the active Tank Battery A facility.

Similar to the sediment investigation, the ground water investigation was initiated in 2006 when ICON completed eight monitor wells in the shallowest ground water zones at the site, specifically the Peat Zone and 40-Foot Zone. In addition, a sample was collected in 2006 from the existing facility water supply well completed at a depth of over 450 feet. The collection of split samples began in 2010 for ground water. In 2010, ICON installed and sampled three additional monitor wells in the 40-Foot Zone, and sampled three existing water supply wells completed in the 40-Foot Zone and Upper Sand of the Chicot Aquifer at camps located north of Schooner Bayou (two active and one abandoned). MP&A completed a confirmation and delineation investigation that included installation and sampling of three monitor wells and 25 temporary sampling points in zones at approximately 40 feet, 70 feet, and 90 feet below ground surface (bgs), plus resampling of the deep (over 450 feet) facility water supply well. In 2014, resampling was performed at two locations in the 40-Foot Zone, one monitor well and one camp well, and in January 2015 the most recent ground water sampling was completed in one new monitor well completed in the shallow Peat Zone.

MP&A collected over 20 surface water samples in the access canals, Schooner Bayou, and White Lake during 2010 and 2014, with ICON collecting split samples.

Omega EnviroSolutions, Inc. (OES) collected 22 blue crabs from the oilfield access canals in October 2010, and analyzed homogenized whole body samples. To provide further assessment and address deficiencies in the OES data collection for human health evaluation purposes, MP&A in coordination with Dr. John Rodgers of Clemson University, collected over 300 crabs from the site and provided separate analyses of edible tissues and remaining crab parts such as the shell.

Samples from all media were analyzed for the following constituents, in general, with the analytes for individual samples dependent upon the phase of investigation and purpose of the specific sample collection: metals, chlorides and other salt indicator parameters; volatile organic constituents including benzene, toluene, ethylbenzene, xylenes (BTEX); polycyclic aromatic hydrocarbons (PAHs); total petroleum hydrocarbons (TPH) and fractions in RECAP-specified carbon ranges; and polychlorinated biphenyls (PCBs). The analytes include those specified in RECAP Appendix D for assessment of sites potentially impacted from crude oil sources.

The full body of data collected by both investigators was reviewed for this RECAP evaluation, and usability of the data for quantitative risk assessment was determined. Following the data quality review (see Section 3), data identified as representative of site conditions from both investigators were used in the quantitative RECAP assessment. Figures showing sample locations are provided in Section 3. A listing of samples that were collected and included in the RECAP evaluation is provided in Section 5.

1.1.3 Corrective Actions Completed

Peak Energy, L.L.C. in conjunction with UNOCAL completed a site remediation program during September 2010 through June 2011 to remove abandoned or obsolete oilfield structures, equipment, pilings, and flow lines. The work included the following elements:

- Removal of Tank Battery B vessels, platform, pilings and associated lines.
- Removal of flow lines from three canal crossings (six to eight lines per crossing were cut and capped on the backside of spoil banks). Flow lines were removed from the canals, cut into manageable sizes, and transported off site for recycle or disposal.
- Removal of above-ground flow lines from marsh areas. Flow lines were cut and loaded onto a barge for off-site disposal and recycle.
- Removal of unused piles in canals, by pulling the entire pile or cutting and removing to ten feet below mudline. The removed piles were recycled or disposed offsite.
- Removal of an unused barge and compressor, which were removed, scrapped, and disposed offsite.

Documentation for the activities was provided to LDNR in a separate report (MP&A, 2015b).

MP&A completed remediation of a former pit in the Tank Battery B area during October and November 2014. The location is referred to in project documents as the Sed-15 pit area, in reference to a sediment sample location (Sed-15) that fell within the former pit area and contained elevated hydrocarbon concentrations (above 10,000 mg/kg total hydrocarbon fractions). The remediation area is identified in Figure 1-2 along with other site features. In addition, Figure 1-3 provides a detailed view of the remediation area, including sample locations that guided the extent of remediation outlined on the figure. The remediation consisted of a Statewide Order 29-B compliant closure and included the following activities:

- Obtained a Coastal Use Permit from the LDNR Office of Coastal Management and a Wetlands Permit from the U.S. Army Corps of Engineers (USCOE).
- Excavated the upper approximately two feet of clean topsoil and stockpiled onsite for use as surface fill after pit closure.
- The extent of remediation was defined by the delineation samples that were collected in several phases of investigation prior to the remediation, in the locations shown on Figure 1-3. Sample locations within the final excavation area shown on Figure 1-3 were removed and disposed. The delineation data collected outside of and beneath the removal area are included in this RECAP evaluation, as they represent current conditions.
- Performed confirmation sampling at the bottom and sidewalls of the excavation, and analyzed for Oil & Grease. Analytical results of the confirmation samples and analysis of the overburden that was reused in backfill are presented in Tables 1-1 and 1-2.
- Backfilled the excavation with a clayey soil from an offsite borrow area to within approximately 2-3 feet of the original land surface. The clean overburden was returned to the upper 2-3 feet of the excavation area to provide an organic-rich surface for the area.
- Seeded and fertilized the area for surface restoration.

The remediation was documented in a report provided by MP&A to LDNR (MP&A, 2015b).

1.2 REGULATORY CONSIDERATIONS

The RECAP regulation provides appropriate and state-specific technical guidance for risk evaluation of the media investigated at the East White Lake site, and is broadly applicable to both industrial facilities and non-industrial properties. The First Amended Memorandum of Understanding Between LDNR Office of Conservation and LDEQ[1] (February 25, 2011) identifies that remediation plans submitted to LDNR addressing sediment and surface water will be subject to LDEQ review, therefore the assessment of these media was performed in accordance with LDEQ's RECAP regulation and associated guidance.

Management Option 3 is the applicable option of RECAP, as the lower tiers of RECAP do not address media assessed for the East White Lake site including sediment, surface water, and biota tissue. For these environmental media, RECAP requires the use of MO-3 and the development of a site-specific risk evaluation (Section 2.12.6). MO-3 is also the RECAP option that provides for the development of site-specific RECAP Standards using exposure data for settings and land uses that differ from the standard industrial and residential uses, such as recreational, which is applicable to the East White Lake site.

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[1] First Amended Memorandum of Understanding Between LDNR Office of Conservation and LDEQ Regarding Approval of RECAP Groundwater Evaluation and Remediation Plans at Oilfield Sites, February 25, 2011

2.0 SITE CHARACTERIZATION

The physical features of the site are presented in this section and include surface features, geology, and hydrogeology as interpreted from the results of site investigation.

2.1 SITE SETTING

The East White Lake study area, as shown in Figure 1-1, is located in a frequently inundated natural marsh environment. Access to the property is achieved by boat via Schooner Bayou which runs east to west near the northern tip of the property. The closest boat launch is Hebert's Boat Launch located at the intersection of Schooner Bayou and LA Highway 82 just south of the bridge crossing the Intracoastal Waterway. There is no access road to the property; access is via surface water by boat.

The subject property and surrounding area are used primarily for oil and gas E&P activity and recreational fishing and hunting (primarily duck and deer). The site marsh environment supports an abundant and diverse ecological population. The system of canals and ditches that were constructed for E&P purposes provide the benefit of access and opportunity for fishing and hunting to the local population. The current property uses are consistent with historical property uses and based upon information from the current operator on site (Peak Energy, L.L.C.); industrial operations are anticipated to continue on the property for the foreseeable future.

2.2 GEOLOGY AND HYDROGEOLOGY

The geology at the site is comprised of thick multi-layered sequences of unconsolidated sediments that alternate between clay, silt, sand, and gravel (in deeper layers). Three major units are identified in the site area by the USGS: a surficial confining unit with sand, the Upper Sand of the Chicot Aquifer system at approximately 400 feet bgs, and Lower Sand of the Chicot Aquifer system at approximately 600 feet bgs. The sands and ground water contained in the surficial confining unit are identified by USGS as naturally salty within the upper 290 feet bgs. A substantial clay separates the shallow sands from the freshwaters of the Chicot Aquifer system.

The upper approximately 100 feet of soil/sediment beneath the property was sampled and classified through completion of continuously logged boreholes by MP&A and through geotechnical laboratory analysis. Boring logs and geotechnical reports are provided separately by MP&A (MP&A, 2015a), and geologic cross sections prepared by MP&A are provided in Figures 2-1 through 2-3. Continuous clays within the surficial confining unit were encountered from approximately 11 feet to 35 feet bgs. A peat layer was encountered in some locations within the upper 13 feet. The peat layer consists of wood fragments and other decayed natural organic materials. It is highly organic, naturally porous, and saturated (called Peat Zone herein). Clay is present beneath the Peat Zone.

A shallow sand layer was encountered at a depth beginning approximately 40 to 45 feet bgs. This fine sand layer is sandwiched between clay layers and the fine sand ranges in thickness from less than 5 feet to 25 feet in thickness. This sand layer is water-bearing and referred to as the 40-Foot Zone in this assessment. An underlying clay was encountered in all MP&A boreholes beneath the fine sand. Sands beneath the clay layer were water-bearing, and deeper ground water was investigated/sampled in depth intervals of approximately 72-83 feet and 97-100 feet bgs. While these intervals are not identified as separate ground water zones, for ease of discussion in this report, the sample intervals are referred to as the 70-Foot Zone and 90-Foot Zone in this evaluation.

The sands within the upper confining unit are considered to have some hydraulic communication, with intervening clay layers providing attenuation of the vertical movement of water and constituents. These zones are separated from the underlying Chicot Aquifer system by a greater than 100-foot thick clay aquitard with sand lenses, and this separation is demonstrated through the difference in natural salinity identified by the USGS studies and publications for the region.

2.3 WATER WELL SURVEY

A water well survey was completed using the LDNR database for a one-mile radius around the site in accordance with RECAP requirements, and the survey results are included in Appendix B. Six monitor wells have been completed and registered on site as part of this ongoing study. Although no wells were registered when the site investigations began, based upon field survey information, four unregistered wells were located and subsequently registered. A water supply well associated with the E&P central facility is completed to approximately 460 feet bgs. Facility personnel reported that the well water is used for non-potable purposes and the facility uses bottled water for drinking. This is the only extraction and use of groundwater occurring on the property to the south of Schooner Bayou.

Three private camp supply wells are located north of Schooner Bayou on Vermilion Parish School Board property. The Hebert well and Crouch well are completed in the 40-Foot Zone and only the Hebert well is functional. The wells in the 40-Foot Zone are reported to be used for non-potable purposes only. The Guidry well is an active well completed to approximately 519 feet bgs in the Upper Sand of the Chicot Aquifer, and no details on use of this well are available, but based on completion in the freshwater zone, use for drinking is assumed possible. The water well locations are shown in Figure 2-4.

2.4 GROUND WATER CLASSIFICATION AND CHARACTERISTICS

Site investigations included sampling of monitor wells, hydropunch points, and water supply wells completed in the Peat Zone, 40-Foot Zone, 70-Foot Zone, 90-Foot Zone, and Upper Sand of the Chicot Aquifer. The following discussion presents the ground water classification for the zones investigated based upon the criteria identified in RECAP.

2.4.1 *Peat Zone*

Based upon information provided by ICON and MP&A and gathered through well development and sampling, the Peat Zone provides less than 800 gallons per day sustainable yield from a well. An aquifer yield test was not provided by either investigator and classification is based upon field observations. The natural total dissolved solids (TDS) concentration is in the range between 1000 mg/L and 10,000 mg/L based upon sampling of Peat Zone wells at the far southern end of the Study area, outside of any suspected site-related impact (locations AB-2, AB-3). This range is consistent with expected communication between ground water and naturally brackish surface water in the canals at the site. Based upon estimated yield and measured TDS, the zone is identified as a Class 3A ground water resource under RECAP definition. The classification is supported by the water well survey which confirms no use of ground water in the Peat Zone. Ground water flow direction within the Peat Zone has not been determined, but is expected to be highly variable and influenced by surface features such as canals and tidal fluctuation.

2.4.2 *40-Foot Zone*

Based upon yield testing data provided by ICON and MP&A, the 40-Foot Zone is estimated to provide greater than 800 gallons per day sustainable yield from a well. Slug testing performed by ICON provided sufficient data for analysis in one well, MW-3R. An average hydraulic conductivity of 5.91×10^{-4} cm/sec was estimated, providing a potential yield of approximately 2700 gallons per day (MP&A, 2015a). Based upon potential yield and the measured TDS greater than 1000 mg/L, the zone is identified as a Class 2 ground water resource under RECAP definition. The USGS and other publications for the region confirm the conclusion of naturally elevated TDS in ground water to a depth of 290 feet bgs (Louisiana Geological Survey, 1961). Ground water flow direction within the 40-Foot Zone is estimated to be to the west/southwest, and will be confirmed through additional monitoring proposed by MP&A (MP&A, 2015a).

As identified in the field survey of water wells, the 40-Foot Zone is used for non-potable water supply at private camps north of Schooner Bayou. Water uses include boat washing, fish cleaning, and sanitary uses (flushing toilets). The water is not palatable due to salt, iron, and manganese content, but is useful for recreational purposes. The zone is Class 2A per RECAP definition based upon the presence of a water supply well used for a purpose other than public water supply.

2.4.3 *70-100 Foot Interval (called 70-Foot Zone and 90-Foot Zone)*

As noted in Section 2.2, the terms 70-Foot Zone and 90-Foot Zone do not refer to distinct ground water zones, but the terms are used for ease of discussion in the risk assessment based on the sampling intervals. The potential ground water yield in these intervals (sampled through hydropunch grab samples) was not evaluated in detail at the site. As a conservative approach, the ground water yield at 70 to 100 feet was assumed to be sufficient for potential water supply (i.e., greater than 800 gallons per day sustainable yield). The zone is not currently used as a ground water resource within a mile of the site based on the water well search. Based on natural TDS concentrations greater than 1000 mg/L and the assumed yield greater than 800 gallons per day, the ground water was considered a Class 2C resource under RECAP definition (Louisiana Geological Survey, 1961). In addition to documentation in the regional publications, the natural TDS for the 70-100 foot interval above 1000 mg/L was confirmed through sampling of well MW-4D at the far southern end of the study area, outside of any suspected site-related impact. A flow direction has not been identified based on the absence of permanent monitor wells in the 70-100 foot interval.

2.4.4 Upper Sand of the Chicot Aquifer

Based upon the documented use of the Upper Sand of the Chicot Aquifer, this zone was considered Class 1 for RECAP evaluation. This zone is the first fresh water zone beneath the property as documented in regional publications.

2.5 SURFACE WATER CHARACTERISTICS

Construction of Schooner Bayou in 1911 by the US Army Corps of Engineers opened the waterway to intracoastal boat traffic from Vermilion Bay to White Lake and beyond. Schooner Bayou is approximately 17 feet deep, and the access canals typically approximately 8 feet deep. Opening of Schooner Bayou has facilitated water communication between Vermilion Bay, White Lake, and the Mermentau River and exchange of both freshwater and saltwater throughout Schooner Bayou and the study area. The entire area has also been inundated by hurricane storm surges historically, which periodically contributes additional saltwater to this naturally brackish system. Because the construction of Schooner Bayou removed a portion of the clay within the upper confining unit overlying the shallow sand layers, increased surface water communication with the underlying shallow sand layers can occur (MP&A, 2015a).

The Louisiana surface water stream segment number for White Lake and the study area is Mermentau River Basin Subsegment 050703. The LDEQ-designated uses of this subsegment are primary and secondary contact recreation, fish and wildlife propagation, and agriculture (LAC 33:IX.1123). Criteria for chlorides, sulfates, and TDS are provided in the Surface Water Quality regulations for this subsegment, however the most recent LDEQ Water Quality Inventory: Integrated Report (2014) identifies this subsegment as not attaining the standards for these parameters due to natural tidal conditions. The report indicates that modification of the standards is needed to address tidal influence and has not yet been completed. The natural chlorides levels in the study area have been documented by the US Army Corps of Engineers monitoring of Schooner Bayou between the site and Vermilion Bay. The monitoring results are provided in Figures 2-5 through 2-9. Natural chlorides levels range up to between 3000 and 4000 mg/L near the East White Lake study area. No other “impairment” of the designated surface water uses, beyond the natural tidal condition, has been identified for this subsegment.

3.0 SITE INVESTIGATION SUMMARY

As briefly summarized in section 1.1.2, multiple phases of investigation were performed during the period of 2006 to 2015. Additional detail regarding site investigation methods and chemical analytical results is provided in this section, and is further supported by the separate Feasible Plan for Evaluation/Remediation prepared by MP&A (2015a). This section provides the following information:

- Description of the ICON investigation methods, based upon ICON litigation reports and as provided by MP&A based upon their oversight of the ICON field events.
- Summary of the MP&A investigation methods; additional detailed description of the field and laboratory methods is provided by MP&A in their report.
- Tabulated chemical analytical data for sediment, ground water, surface water, and biota including both ICON and MP&A results as available.
- Laboratory data quality review and recommendations for data usability in the RECAP evaluation.

Sample locations are identified in the following figures:

Figure 3-1: Sediment Sample Locations (Site-Wide)
Figure 3-2: Sediment Sample Locations (Quadrant 1)
Figure 3-3: Sediment Sample Locations (Quadrant 2)
Figure 3-4: Sediment Sample Locations (Quadrant 3)
Figure 3-5: Sediment Sample Locations (Quadrant 4)
Figure 3-6: Ground Water Sample Locations
Figure 3-7: Surface Water Sample Locations
Figure 3-8: Crab and Fish Sample Locations

3.1 ICON INVESTIGATION

The following summary of investigation methods is provided based upon the reports prepared during litigation by ICON.

3.1.1 Sediment

Sediment samples collected from the base of canals and areas of marsh that were inundated during 2006 (SS1 through SS15, AB-1 through AB-4, AB-13 through AB-15) were collected using a 2-inch diameter PVC pipe that was pushed to refusal into the basal sediment. Upon reaching the total depth, the top of the PVC pipe was capped to create a suction to retain the sample, and the pipe was withdrawn. The sample was extruded onto plastic sheeting and described by a geologist or engineer. A portion of the core was placed in a ziplock bag and the headspace was measured with an organic vapor meter (OVM). For sediment samples collected at the base of canals and in inundated marsh in 2010 (Sed1 through Sed33), a Russian Peat borer sampling tool was used. The tool provides a 2-foot long core sample, and was advanced to the desired depth in the closed position, then rotated to collect a half-cylinder core sample at multiple spots around a single location. The core samples were described by a geologist, and then homogenized in a 5-gallon bucket prior to sample collection.

Canal bank samples (B2 through B19) collected in August 2006 were collected using a Vibra-core sampler with thin-walled aluminum barrels or tubes. Cores were described by a geologist prior to sample selection based upon field screening or visual cues.

Samples from marshland at "AB" borings were collected by pushing a split-spoon core barrel ahead of a mud-rotary wash boring. The mud-rotary wash borings used surface water for drilling. The barrel was pushed to two feet deeper than the base of the mud rotary boring to collect a sample. Core samples were removed from the barrel and described by a geologist, and samples were selected by ICON for laboratory analysis.

Samples collected on canal banks and in the Tank Battery A area in January 2015 (WL-1 through WL-8) were collected using a hand auger or Vibra-core sampling barrel, although the vibrator engine was not needed to facilitate sample collection. Sediment samples were placed in laboratory provided sample jars and submitted to a LELAP-certified laboratory for analysis.

3.1.2 Ground Water

Monitoring wells installed prior to 2015 by ICON were installed in boreholes drilled using a mud-rotary wash rig with surface water drilling fluid. Wells were either 2-inch (AB-1 and AB-2) or ¾-inch diameter wells installed with 10-foot screen, filter sand, and a bentonite seal placed above the filter sand. Well WL-6, installed in the Peat Zone in 2015, was installed in a hand-augered bore hole, with a 5-foot screen. Wells were developed and sampled once field parameters stabilized. Samples were placed in laboratory provided sample jars and submitted to a LELAP-certified laboratory for analysis.

3.1.3 Laboratory Analysis

Samples were submitted by ICON to Sherry Laboratory for analysis. Split samples (beginning in 2010) were submitted by MP&A to Gulf Coast Analytical Laboratory, Baton Rouge, Louisiana (GCAL) and Sherry Laboratory (for some samples with a focus on salt and 29-B parameters). The laboratories are LELAP certified in accordance with LDEQ guidance.

Sediment and ground water samples collected by ICON and split by MP&A were analyzed for one or more of the following constituents, depending upon location, by the following methods:

- Metals [SW-846 6010B, 7010 (As), and 7470/7471 (Hg)],
- Benzene, toluene, ethylbenzene, xylenes (BTEX, SW-846 8260),
- Polycyclic aromatic hydrocarbons (PAHs, SW-846 8270C, 8310),
- Total petroleum hydrocarbons (TPH, SW-846 8015)

- Petroleum hydrocarbon fractions (TX 1005/1006 modified for RECAP carbon ranges),
- Polychlorinated biphenyls (PCBs, SW-846 8082), and
- Chlorides (SW-846 9251, SM 4500 CL E).

Some samples were also analyzed by both investigators for additional salt indicators. The laboratories provided a standard Quality Assurance/Quality Control (QA/QC) package to support data quality review in accordance with RECAP Section 2.5.

3.2 *MP&A INVESTIGATION*

Based upon review of the data from the ICON sampling events, MP&A conducted additional investigation work to supplement the initial data. The objectives of additional investigation were to complete delineation in select locations, confirm previous detections, establish site specific stratigraphy and characterize the deep soil physical properties, and gather additional data for a complete RECAP evaluation. The following sections generally summarize the investigation methods.

3.2.1 *Sediment*

Sediment samples were collected in the study area by MP&A using three collection methods: 1) Vibra-core, 2) modified Coliwasa sampler, and 3) Geoprobe for the more soil-like areas (marsh between canals, deep borings). The sampling method for each location was selected based on required analysis, depth of water, location, and target sampling interval. Within canals, sediment samples were collected from boats anchored or positioned at the desired location.

Vibra-Core Sediment Sampling. Vibra-core sampling included the use of dedicated aluminum tubes approximately 3 inches in diameter and a weighted, gas powered vibrating clamp. The length of tube was determined based on depth of water and sampling interval required. Sampling tubes were advanced vertically using the motorized vibrating head. Once the desired depth was reached, the tube was extracted. The tube was cut open and observations were recorded for the core (e.g., texture, color, consistency, odor, sheens). Samples were then collected from target intervals. In many borings, the target interval was selected based on visual or PID indications of potential impact. Samples were placed in laboratory provided sample jars and submitted to a LELAP-certified laboratory for analysis.

Modified Coliwasa sediment sampling. Dedicated, disposable Coliwasa tube samplers made of polyethylene tubing approximately one inch in diameter and 3-feet long and equipped with a syringe were used. This method was determined to be appropriate for soft, shallow subaqueous sediments (6 inches), and the samples were collected from a boat. The boat was anchored to minimize drift and maintain the desired position. The depth of water was measured with a graduated pole, and the Modified Coliwasa samplers were advanced into the sediment and extruded on a table covered with aluminum foil. Multiple pushes were made to obtain the required volume necessary for analysis. Samples were composited from the top 6-inches that were collected within a 1′ x 1′ area. Samples were placed in laboratory provided sample jars and submitted to a LELAP-certified laboratory for analysis.

Geoprobe Sampling. Samples were collected from the more elevated areas of the site and from deeper borings by Vibra-core sampling (described above) and hydraulic, dual tube direct-push technology (e.g., Geoprobe). Samples were collected in wetland areas and in deeper borings beneath the sediment in canal bottoms utilizing a Geoprobe rig operating off a liftboat and a Marsh Master. New, clean, dedicated acetate liners were used to collect samples. The liner and tubing was advanced to the desired sampling interval, then extracted. The tube was cut open and observations were recorded for the core. Samples were collected from target intervals and/or intervals selected based upon field screening methods. Samples were placed in laboratory provided sample jars and submitted to a LELAP-certified laboratory for analysis.

3.2.2 *Ground Water*

Ground water samples were collected by MP&A from three types of installations: temporary discrete sampling points, newly installed monitoring wells, and existing water supply wells.

- Depth-discrete, grab ground water samples were collected from multiple depths using a retractable 4-foot-long well screen pushed with a hydraulic Geoprobe rig operating off of a liftboat (referred to as hydropunch method).
- Monitoring wells were installed in boreholes advanced using a Geoprobe rig operating off a liftboat. Each monitoring well was constructed of ¾- or 1-inch diameter PVC casing and 10-foot long screen (0.01′ slot). A piece of four-inch diameter protective PVC casing with a slip cap was placed over each monitoring well. Well construction details are provided by MP&A in the Feasible Plan for Evaluation/Remediation (MP&A, 2015a).
- Existing water wells were sampled using the pump, lines, faucets, and all plumbing present at the time of sampling.

Samples were collected from the retractable well screens and monitoring wells with a peristaltic pump and disposable tubing. Following development (as applicable), low flow sampling protocols were followed including the measurement of field parameters. Samples were collected in laboratory provided sample jars and submitted to a LELAP-certified laboratory for analysis.

3.2.3 *Surface Water*

Surface water samples were collected from the approximate middle of the water column within oilfield access canals, Schooner Bayou, and White Lake. At each sample location, the boat was anchored to minimize drift and maintain the desired position. The depth of water, in feet, was measured with a graduated pole. A peristaltic pump and tubing were used to collect the surface water samples. The tubing intake was positioned and secured on a graduated pole at the midpoint of the water column. The pump was run to clear the tubing of any water that may have entered on the descent prior to sample collection. Water chemistry measurements (e.g., dissolved oxygen, conductivity, turbidity) were collected using cleaned, calibrated hand held instruments and recorded in log books. Samples were collected in laboratory provided sample jars with as little agitation or disturbance as possible. Samples were submitted to a LELAP-certified laboratory for analysis.

3.2.4 Laboratory Analysis

Samples were submitted by MP&A to GCAL and Sherry Laboratory for analysis. Split samples were submitted to Sherry Laboratory by ICON. Sediment, ground water, and surface water samples were analyzed for select parameters (and utilizing the methods) identified in Section 3.1.3. The laboratory provided a standard QA/QC package to support data quality review in accordance with RECAP Section 2.5.

3.3 CRAB AND FISH TISSUE STUDY

Twenty two blue crabs were collected by OES on behalf of Vermilion Parish School Board from eight locations within the oilfield access canals at the site in October 2010 and were analyzed for select constituents including metals and petroleum hydrocarbon mixtures (expressed as TPH). In response to deficiencies of the OES assessment for use in human health evaluation (e.g., whole body crab analysis), and in response to OES conclusions asserting potential human health hazards from crab consumption, investigators on behalf of UNOCAL prepared a sampling and analysis plan for collection and analysis of tissue from blue crabs and forage fish in the East White Lake study area. The *Quality Assurance Project Plan/Sampling Analysis and Assessment Plan for Crab and Forage Fish Tissue at the East White Lake Oilfield* (the "Plan") was developed in accordance with applicable EPA and Louisiana agency guidance to support evaluation of potential risk to human health and ecological receptors. The Plan was provided to the Louisiana Department of Environmental Quality (LDEQ), Louisiana Department of Health and Hospitals (LDHH), Louisiana Department of Natural Resources (LDNR), and Louisiana Department of Wildlife and Fisheries (LDWF) for review, and is included as Appendix C to this report. The Plan included well defined project objectives and measurement quality objectives and incorporated appropriate Quality Assurance procedures as recommended in the *Protocol for Issuing Public Health Advisories for Chemical Contaminants in Recreationally Caught Fish and Shellfish* ("Louisiana Protocol", LDHH *et al*., 2012), both for sampling and laboratory analysis of tissues. The objective of data collection and analysis, as identified in the Plan, was to obtain valid data that would support comparison of analyte concentrations in crab and fish tissue with appropriate risk-based standards for human health and ecological risk assessment. The crabs were collected and analyzed using methods appropriate for human health evaluation. Forage fish were collected and analyzed using methods specifically to support evaluation of ecological risk.

The sampling and analysis plan was implemented December 13, 2010 through January 10, 2011 by a field sampling team including MP&A personnel and Dr. John Rodgers of Clemson University. A detailed report of the field methods and activities, prepared by the field team members, is included in Appendix D, and was previously provided to LDEQ, LDHH, LDNR, and LDWF for review. Deviations from the work plan included the following:

- Two additional sampling locations were added while in the field based upon availability of additional traps, T-01A in the access canals and TR-03A in Schooner Bayou.
- After measuring and weighing shad fish from three sample locations, the decision was made to shift to estimating total volume of fish collected at each sample location (in lieu of individual fish measurements).
- Sample locations in White Lake were moved (but remained in White Lake) based upon rough water conditions.

The field event resulted in collection of 307 crabs at thirteen site locations in the access canals (T-01 through T-12 plus T-01A), six locations along Schooner Bayou (TR-01 through TR-05 plus TR-03A), and four locations in White Lake (TR-06 through TR-09). The locations outside of the access canals were called reference locations and were labeled "TR" for "tissue reference". Forage fish were collected at twelve of the site locations and nine of the reference locations. Crabs were collected using baited traps, and fish were collected with cast nets or trawl nets in accordance with a Scientific Collecting Permit issued by the LDWF. Additional details of the collection effort, including equipment description, dates of trap placement and collection, number and gender of crabs collected per date and location, and measurements of the crabs collected are provided in the Crab and Fish Collection Report in Appendix D. Field Forms completed to document the sampling, photographs of the sampling program, and field-measured water chemistry parameters are provided in the collection report.

In addition, crabs were purchased from commercial seafood markets to serve as reference samples, including markets in Baton Rouge, Lake Charles, New Orleans, Des Allemands, Biloxi, and Houston. The market names and addresses are identified in the Crab and Fish Collection Report. The crabs and fish were delivered on ice to Columbia Analytical Services, Inc. (CAS) for dissection and analysis of metals. Tissue samples were provided by CAS to Pace Laboratories for analysis of hydrocarbons. The tissue samples were analyzed for hydrocarbons, barium, inorganic and total arsenic, methylmercury and total mercury. The analytes were selected for analysis to be responsive to the specific assertion by OES that these constituents were elevated in the whole crab analyses in the OES report of November 2, 2010.

Consistent with Louisiana regulatory agency Protocol (LDHH *et al.*, 2012), crab meat and hepatopancreas (an organ commonly referred to as "crab fat") were analyzed separately in composite samples collected during the field study because these tissues comprise the edible tissues for human consumption. The exoskeleton (shell) and other soft tissues were analyzed to support ecological evaluation. Tissues collected from crabs in a single sample location were composited to provide sufficient volume for laboratory analysis, and to support screening analysis as recommended in the Louisiana Protocol.

3.4 *CHEMICAL ANALYTICAL RESULTS*

Chemical analytical results are summarized in tables in Appendix E. Results for split samples are provided side-by side, where available. Tabulated analytical data include the following:

- Sediment (Table E-1)
- Peat Zone Ground Water (Table E-2)
- 40-Foot Zone Ground Water (Table E-3)
- 70-Foot Zone Ground Water (Table E-4)
- 90-Foot Zone Ground Water (Table E-5)
- Upper Sand of Chicot Aquifer Ground Water (Table E-6)
- Surface Water Data (Table E-7)
- Crab Edible Tissues (Table E-8)
- Forage Fish (Table E-9)

To reduce duplication in submittals, the laboratory reports for ICON and MP&A data are not appended to this report but are incorporated by reference (ICON, 2010a, b, c; ICON, 2015; MP&A, 2015a).

3.5 *DATA QUALITY EVALUATION/ DATA USABILITY REVIEW*

A data quality review and data usability evaluation were performed for the data collected from all environmental media. The evaluation included review of features such as analytical and field methods, laboratory performance (e.g., Quality Assurance/Quality Control, QA/QC, samples and indicators), sample quantitation limits, and split sample results. In accordance with RECAP Section 2.5, the review was focused on the identification of representative (definitive) data appropriate for use in quantitative risk assessment.

Third party data validation was performed by Quality Assurance Associates, Inc. (QAA) for some of the data, and the reports provided by QAA are included in Appendix F. Review was completed by ERM for the remaining data, and results of the review are summarized below.

For the great majority of analytical results, no major deficiencies were noted that warranted rejection of the data for inclusion in the RECAP evaluation. Based on the detailed data quality review, the chemical analytical results are considered appropriately representative and useable for site characterization and quantitative risk evaluation with exceptions or qualification/limitations identified below.

3.5.1 *Sediment, Ground Water, and Surface Water*

Analytical Methods. The analyses of site samples were generally performed using RECAP-recommended analytical methods at LELAP-certified labs, and available laboratory reports indicated laboratory QA/QC was performed in accordance with SW-846 method requirements with exceptions noted in the discussion below. The following discussion also identifies limitations (e.g., interferences) affecting the analytical results and observations regarding comparability of results (split samples) from two separate laboratories.

- The use of the 29-B sample preparation method for metals analysis of sediment samples differs from the routine SW-846 preparation method by the addition of a pulverizing step before extraction and subsequent analysis of the extract for metals. This pulverizing step is not representative of exposure conditions in the natural environment. The 29-B preparation method was used by Sherry Laboratory (also called Element Laboratory) for the ICON sediment samples, while the MP&A sediment samples typically included the routine SW-846 preparation method. While this difference in sample preparation is recognized and may contribute to differences in split metals results, the subsequent analysis of extract is comparable, and data from both investigators were considered usable for the risk assessment to make best use of the data available. However, for the following samples collected in August 2006, analyses by routine SW-846 preparation method were also provided by ICON, and were used in the risk assessment in lieu of the 29-B prep method results for the same location and sample interval, because the routine SW-846 prep method is more representative for risk assessment:

Sample ID:	*Depth:*	*Sample ID:*	*Depth:*
B2 Rerun	6-8′	B10	4-7.5′
B2 Rerun	10-10.5′	B12 Rerun	3.5-5′
B3 Rerun	9-12′	B13 Rerun	3-5′
B4 Rerun	0-1′	B13 Rerun	7.5-9.5′
B4 Rerun	3-5′	B15 Rerun	4-6′
B5 Rerun	8-10′	B17 Rerun	3-6′
B8 Rerun	5.5-7′	B17 Rerun	10.5-12′
B9 Rerun	0-0.5′	B19 Rerun	6.5-9.5′
B9 Rerun	8-9′		

- ICON investigation results provided only Total Petroleum Hydrocarbon (TPH) mixture analyses expressed as TPH-GRO, TPH-DRO, and TPH-ORO. For sampling events in which MP&A was present to split samples (i.e., events beginning in 2010) and for the investigations initiated by MP&A, the majority of samples analyzed for TPH mixtures by ICON were also analyzed by fractionation methods in accordance with RECAP Appendix D. Appendix D identifies:

  > *If TPH fractionation data and TPH mixture data have both been collected at an AOI and the two data sets yield different conclusions concerning management of the AOI, then management decisions shall be based on the fractionation data since the fractionation method yields more specific information regarding the TPH constituents present and thus more accurately characterizes site conditions.*

For the sediment data, two features of the fraction data set were examined to confirm that risk evaluation performed using the available fraction data provides an appropriate representation of site risk even though fraction data are not available at every sample location: general spatial coverage and concentration range represented.

(1) Fraction data were collected from locations throughout the study area, with increased focus during delineation events on areas where elevated TPH mixture concentrations had been reported. Figure 3-9 shows the study area, locations that were sampled and analyzed for TPH mixtures only, and those that were sampled and analyzed for hydrocarbon fractions.

(2) In accordance with RECAP requirements, fractions were collected and are available for the highest hydrocarbon mixture results, including the 10 highest mixture results (total TPH-DRO plus TPH-ORO). Further, fractions are available for 18 out of the 20 highest mixture results, and 26 out of the 30 highest. Overall, TPH mixtures were analyzed in 240 sediment samples and fractions were analyzed in approximately 90 samples[2]. TPH mixtures were detected in 136 samples, and fractions were analyzed in 52 of the 136 samples with detected TPH mixtures. The upper end of the range of hydrocarbon mixture results is well represented by the fraction data set, therefore conclusions regarding the risk associated with hydrocarbon impact at the site can and should be based on the fraction analysis results in accordance with RECAP Appendix D.

In summary, the primary RECAP analysis and conclusions presented in this report for risk associated with hydrocarbons in sediment in the East White Lake study area are based upon the risk assessment completed using the fraction data. This is consistent with RECAP Appendix D and supporting guidance. Information about the assessment of hydrocarbon mixture data, specifically where fractions were unavailable, is provided for complete information, but does not provide a sound basis for remediation decisions to address health risk.

- For ground water, hydrocarbon fraction data are available for all samples in which TPH mixtures were reported as detected, with the exception of Peat Zone monitor wells completed and sampled by ICON in 2006 with no split samples (and therefore no fraction data) available. The RECAP evaluation for petroleum hydrocarbons in ground water is therefore based upon the fraction results with the exception of the Peat Zone, which is based on both.
- Split results for four mercury delineation samples in sediment differed significantly as follows:

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[2] Sample counts include all sediment data collected, inclusive of Sed-15 area.

Sample ID (depth):	*Sherry: (mg/kg-wet)*	*GCAL: (mg/kg-wet)*
SS8 (2-4')	0.18	10.1
SED6 (0-2')	5.03	0.43
Hg-MPA-07 (0.5-2')	8.77	0.18
Hg-MPA-09 (0-0.5')	3.44	0.04

The remaining split results for mercury were reasonably similar. The QA/QC for both analyses indicate the data are representative, and the splits agree that mercury is present. To address the difference in reported concentrations, the average of the split results was considered representative of exposure conditions for the location and was used in the quantitative risk assessment.

- Split sample results for arsenic in ground water are notably variable, i.e., detection by one laboratory above the reporting limit of 0.01 mg/L is routinely not confirmed by the second laboratory. Based on review of these variable results with GCAL laboratory, it is suspected that the arsenic results are affected by interference that is introduced by high dissolved solids (high salt levels) in the ground water. High dissolved solids are a known potential interference with the detection of metals by Inductively Coupled Plasma (ICP, Method 6010), which was used as the detection method for ground water analysis by both labs. This potential interference, combined with the fact that arsenic may be present naturally at values very close to the detection limit, may contribute to the poor agreement between split laboratory results. Based upon all available information, confidence in the quantitation of arsenic in ground water samples is low. It is noted that arsenic does not demonstrate the same pattern of occurrence as the other primary oilfield indicator constituents chlorides and barium, as further discussed in Section 5.
- The selenium results for split ground water samples for this site show 100% disagreement between the two separate laboratories regarding the presence of selenium: Sherry Laboratory routinely shows detection of selenium above the reporting limit (and Screening Standard). Selenium was not detected above the reporting limit in any sample analyzed by GCAL laboratory. Selenium detections in ground water were therefore not confirmed.
- Based upon low level detections of mercury in method blanks associated with the batch for some MP&A surface water samples, detections at less than 5 times the blank level were qualified as U in accordance with EPA (EPA, 2010) and RECAP data validation guidelines (see Table E-7).

Sampling Methods/Representative Samples. A requirement of the data usability review is to identify results that are representative of field conditions and true concentrations. The following observations were identified and informed the selection of data for use in the quantitative risk evaluation:

- Hydropunch sampling technology was used to collect ground water samples for delineation in the 40-Foot Zone, 70-Foot Zone, and 90-Foot Zone. This sampling methodology provides a discrete interval (grab) sample without construction of a well, and therefore allows for rapid collection of a large number of samples. The nature of the sampling methodology, without typical well development or purging, results in higher turbidity (suspended solids) as noted in the field turbidity values for the hydropunch samples, which include HP-1-T through HP-10-T, HP-1-I through HP-10-I, MW-1C, MW-4D, MW-5D, MW-6S, MW-6D, and SB-1-MW-D. Field turbidity in the samples ranged from 27.5 to over 3500 NTU, with 23 of the 25 locations having turbidity greater than 40 NTU. Based on the field turbidity results and field team visual observations, both investigators provided filtered analyses for metals in the hydropunch samples to provide results representative of ground water constituent levels (and not suspended solids). The analysis of filtered metals for the turbid samples is consistent with guidance of RECAP Appendix B Section B2.5.4 (Saar, 1997). The dissolved metals results are used in the quantitative analysis for samples collected with hydropunch methodology.
- Samples from two monitor wells, SB-2-MW and SB-3-MW, were also turbid (following purging) with field turbidity levels elevated above the target sample quality value of NTU< 40, and investigators requested dissolved analyses recognizing the elevated turbidity. The dissolved metals results for these samples were included in the quantitative risk assessment. Although three additional monitor wells had elevated field turbidity levels (AB1, AB3, and AB5), dissolved metals were not analyzed so the unfiltered sample results were used in the risk assessment.

- The following wells were sampled during more than one sampling event over the investigation history, and the most recent sample results were used in the quantitative assessment to represent current conditions (RECAP Section 2.5):
    - SB-1-MW sampled May 7, 2010, June 8, 2010, and April 21, 2014;
    - Facility well (also called WW-1 and AWW1) sampled April 3, 1995 (for chlorides and TDS only), November 11, 2006, and May 25, 2010; and
    - Hebert water well sampled September 1, 2010 and April 21, 2014.

- As noted previously, samples collected within the Tank Battery B remediation area (within the Sed-15 pit remediation area) were excluded from the risk assessment because they no longer represent site conditions. Samples excluded from quantitative analysis due to remediation include the following:
    - SED15 (0-2′ and 2-4′) collected on February 26, 2010;
    - SED-15 (0-0.5′) and a field duplicate (SED-115) collected on May 6, 2010;
    - MPA-Sed 15 (0-2′) collected on June 8, 2010; and
    - SP-MPA-05 (0-5′ and 7-9′) collected on October 6, 2010.

- Samples collected at locations Sed-1, Sed-2, and Sed-3 by ICON in February 2010 were collected off site to the east of the Vermilion Parish School Board property and were excluded from the risk evaluation.

Laboratory Performance Indicators: QA/QC samples collected included field duplicates, field blanks, laboratory-prepared method blanks, matrix spikes, and laboratory control samples. Results of QA/QC samples were reviewed and the following observations are noted.

- The Data Validation and Usability Review report prepared by QAA July 2, 2010 for sediment, surface water, and ground water samples collected by MP&A through June of 2010 is provided in full in Appendix F-1. The review concluded that there were no significant QC deficiencies, and all data were therefore considered "... technically valid and acceptable for risk assessment purposes." Some sample results were qualified with "J" qualifiers due to minor QC deviations documented in the report. Results with the J-qualifier are considered an estimated value, and are to be used in the quantitative assessment per LDEQ and EPA guidance for risk assessment. Reporting limits were identified to be below RECAP Screening Standards, and blank samples indicated no significant contamination was introduced during transport or in the laboratory.
- A data quality and usability review was conducted for sediment and ground water samples collected by ICON through June 2010, and was documented in the review summary (matrix) provided in Appendix F-2. Some sample results were qualified with "J" qualifiers due to minor QC deviations documented in the summary, and the J-qualified results are used in the quantitative assessment per LDEQ and EPA guidance for risk assessment. A single major QC issue was identified (0% recovery for MS/MSD for mercury in three ground water samples), which resulted in rejecting non-detect mercury ground water results for the following ICON samples: MW-1, MW-2, and MW-3. Valid split results are available from MP&A for these samples. All other reported sample data are considered usable for risk evaluation in accordance with RECAP. Reporting limits were identified to be below RECAP Screening Standards with the exception of PCBs for samples SED 6(0-2′) and SED 8 (0-2′), for which dilution was required to eliminate interference from non-target background. No constituents were detected in method blanks or trip blanks, indicating no contamination was introduced during transport or in the laboratory.
- For analytical data collected following June 2010 by MP&A and ICON, the data quality review conducted by ERM identified no significant deficiencies in performance indicators that warranted rejection of analytical data.

Sample Quantitation Limits. Sample quantitation limits were evaluated relative to RECAP screening and final MO-3 standards, in accordance with RECAP Section 2.5. Quantitation limits were below RECAP Screening Standards with few exceptions. Observations regarding quantitation or reporting limits are identified below.

- For sediment, as noted above, the reporting limit exceeded RECAP Screening Standards in the ICON analyses of PCBs (reported in dry weight) in SED 6(0-2′) and SED 8 (0-2′), for which dilution was required to eliminate interference from non-target background. MP&A reported the analyses of individual Arochlors for splits of these same samples in wet weight, with non-detect results at lower reporting limits, with a maximum of 0.2 mg/kg. This reporting limit is lower than the limit reported by ICON, slightly above the non-industrial Screening Standard of 0.11 mg/kg, but well below the industrial Screening Standard of 0.9 mg/kg. This reporting limit is well below an MO-3 value that would be developed for industrial or recreational land use.

- Reporting limits for PCB analyses (Arochlors) provided by ICON (with no split results) in a separate event were above Screening Standards as reported in dry weight by the lab (SED-8, SED-9, SED-11, SED-13, SED-15, SED-19, SED-24, SED-26, SED-31 all in the 0-0.5′ interval). All of the results were non-detect, and the reporting limits in wet weight are below Screening Standards with the exception of SED-9, SED-11, and SED-19. For these samples, the reporting limit is 0.4 mg/kg, which is slightly above the non-industrial Screening Standard of 0.11 mg/kg, but below the industrial Screening Standard of 0.9 mg/kg. PCBs were detected in only 1 of 14 samples analyzed for PCBs, and no significant deficiency in risk characterization is identified.
- Reporting limits for the aliphatic >C8-C10 range were elevated above Screening Standards for samples WL-3 (0-2′) and WL-4 (4-11′). Dilution of these samples was performed due to hydrocarbon concentrations present in the longer chain ranges, and these locations have been identified for further action based on concentrations in the higher ranges.
- Reporting limits for metals in sediment were below Screening Standards. With the exceptions noted above, reporting limits for organic constituents (reported in wet weight) were below Screening Standards.
- For ground water, reporting limits were below Screening Standards with the exception of Peat Zone sample WL-6, for which the reporting limits provided by MP&A (GCAL laboratory) exceeded the Screening Standards for arsenic, cadmium, and lead. The reporting limits for the split of this same sample, collected and reported by ICON, were below Screening Standards for each of these constituents.
- For the media lacking RECAP Screening Standards (surface water, biota tissue), reporting limits were below the limiting MO-3 RECAP Standards.

No significant deficiencies in site characterization or risk characterization were identified based upon sample quantitation limits.

Use of Representative Split Sample Results: Where valid split results were available based on results of this QA/QC review, the average of detected concentrations in the split results for sediment and ground water are identified in the data summary tables and used in the risk evaluation as most representative of the concentration at a location. Where a single valid result (with no split) is available, the result is used in the risk evaluation. For the few instances of one detection and one non-detect in splits for sediment, the detected value was used. For ground water, in which few constituents are detected overall and for which detected concentrations are frequently very close to the detection limit, detections were averaged with the full detection limit of the non-detect result, which conservatively assumes the constituent is present at a value equal to the reporting limit.

3.5.2 *Biota Tissue*

The data quality review for biota tissues was performed by QAA, a data validation firm with experience in assessing this matrix. The use of an experienced validation specialist was considered important as analysis of this matrix is less routine and more complex than analysis of soil and water. The full report prepared by QAA is provided in Appendix F-3.

The laboratories selected to perform the tissue analyses were selected based upon their experience specifically in analysis of biota tissues. Columbia Analytical Services, Inc (CAS) in Kelso Washington provided metals analyses, and Pace Analytical Services, Inc. (Pace) in Green Bay, Wisconsin provided the hydrocarbon analyses.

Samples were collected, processed, and analyzed according to scientifically valid, standardized procedures. The detailed QC performed in the field is documented in the *Crab and Fish Collection Report* (for field methods), and the QA/QC performed in the laboratory is documented in the laboratory reports and QAA report. The conclusions of the data quality review by QAA included the following:

- Four requested analyses could not be performed due to insufficient sample volume:
    - EWL-T-05-F-COMPOSITE_BLUEGILL was not analyzed at Pace for TPH or Lipid Content.
    - A whole body crab composite was not analyzed at Pace for hydrocarbons or Lipid Content for EWL-T-09-C.
    - EWL-TR-01-C-HEPATOPANCREAS was not analyzed at Pace for hydrocarbons or Lipid Content.
    - A whole body crab composite was not analyzed at Pace for hydrocarbons or Lipid Content for EWL-TR-06-C.
- Crabs collected from site location T-12 were received at the laboratory above target temperature and were discarded (not analyzed) per Quality Control requirement. Additional crabs, held at proper temperature, were available for analysis from this location.
- The method blanks prepared using a tuna matrix, as well as laboratory experience with biota tissue, confirmed that naturally occurring lipids in biota tissue are detected and quantified as “hydrocarbon” within the carbon range evaluated in this study. The laboratory provided analytical results in the carbon range of C8 to C40, and identified the occurrence of significant biota lipid contribution to the hydrocarbon concentration above C28, in the >C28 to C40 carbon range. The lipid material that dominates this carbon range is a natural part of biological tissue and is quantified as “TPH” because the analytical method does not distinguish biological organic material from petroleum organic material. Based upon the laboratory’s recommendation, the organic material in the >C28 to C40 range was not assessed as petroleum hydrocarbon in the primary evaluation due to the identification of this material by the laboratory as

largely or entirely biological lipids. To the extent that hydrocarbons were also present in this range, however, the concentrations reported in this range were evaluated in a sensitivity analysis provided with the MO-3 assessment.

- The method blank analyses confirmed that there are also smaller natural lipid peaks expected to occur within the C8 to C28 range that has been quantified as potential petroleum hydrocarbon. Therefore the concentrations reported as petroleum hydrocarbons and included in the risk assessment for the C8 to C28 range are potentially biased high because they include non-petroleum natural tissue organics.
- Laboratory control spike recoveries were within target range for inorganics, and within expected range for hydrocarbons in a tissue matrix per laboratory experience, which is generally lower than typical values for a soil or water matrix. Surrogate recoveries for hydrocarbon analysis were also within the expected surrogate recovery range for tissue, with the exception of three samples.
- Of over 130 tissue analyses, surrogate recovery of o-Terphenyl was below the data rejection limit for the following three samples (all reported as non-detect), indicating it is not possible to determine the presence or absence of hydrocarbon detected in these samples:

- EWL-T-01A-C-MEAT	C8-C16, C16-C28
- EWL TR-04-FISH	C8-C16
- EWL TR-09-FISH	C8-C16

  The results were rejected (i.e., R-qualified) and not used in the risk evaluation.

The fish and crab tissue data meet the requirements for definitive data as defined by LDEQ and are considered representative and usable for the purposes of quantitative risk evaluation with the exception of the three samples noted above.

4.0 CONCEPTUAL SITE MODEL AND EXPOSURE ASSESSMENT

A conceptual site model (CSM) was developed in accordance with RECAP requirements based on the available data and is presented is this section to support the human health risk evaluation under MO-3 of RECAP. A conceptual model is a tool used in risk assessment to describe relationships between chemicals and potentially exposed human receptor populations, defining the relationships between the identified sources of chemicals, the mechanisms by which the chemicals might be transported in the environment, and the means by which the receptors could come in contact with the chemicals. The CSM presented in Figure 4-1 illustrates actual and potential exposure pathways for the site. An exposure pathway is formed by the occurrence of the following components: a source of constituents; an environmental medium and transport mechanism (i.e., migration pathway); a point of exposure; a route of exposure; and a receptor population. When all five components are present, the exposure pathway is termed a complete exposure pathway. Components of the CSM are identified as follows:

- **Constituent sources** are identified based on site history and site investigation results. Source media include currently affected media that may result in the transfer of constituents to another medium.
- **Migration pathways** for the constituents of concern consider, where applicable, volatilization, fugitive dust generation/deposition, surface runoff, episodic overland flow, leaching, ground water seepage to surface water, and biota uptake.
- **Exposure points** and potential exposure points are identified by determining if and where the known and potential receptors may come in contact with an exposure medium.
- **Routes of exposure** and potential routes of exposure are identified based on the anticipated receptor activities at the exposure points.
- **Receptors** and potential receptors are identified based on current and reasonably anticipated future land use at the site.

The CSM was developed following the guidance of Section 2.7 of RECAP and confirms that the default RECAP Standards (RS) used for screening purposes are appropriate and conservative for the actual exposure conditions. Further, the CSM provides the basis for site-specific human health assessment under MO-3. The following sections provide an explanation of the CSM.

The analogous site model and exposure assessment for ecological receptors are addressed in a separate detailed ecological risk evaluation.

4.1 SOURCE MEDIA

Sources of constituents identified in environmental media at the site include the historic oil and gas E&P activities. Historic sources potentially included former pit features, releases from flow lines, discharges of produced water to canals prior to regulation of the discharge, and accidental release during hydrocarbon storage and waste management. The inorganic constituents and salt components (e.g., chlorides) that were detected and evaluated in this assessment are also present naturally. Studies have also demonstrated that atmospheric deposition from additional natural (e.g., fires) and industrial emission sources contribute to the levels of some constituents in sediment and surface water; mercury is a notable example of this (LDEQ, 2001). The long history of boat traffic through the study area also provides a source of petroleum hydrocarbons to surface water and sediment unrelated to oil and gas production.

Affected sediment is considered a potential source medium that may result in the transfer of constituents to ground water, surface water, or biota. Affected ground water is considered a potential source medium that may result in the transfer of constituents to deeper ground water zones or surface water.

4.2 MIGRATION PATHWAYS

Constituent migration pathways that are potentially relevant to the source media at the site include:

- Leaching/percolation of constituents from sediment to shallow ground water;
- Surface runoff transporting constituents from the surface sediment to surface water;
- Fugitive dust generation from surface sediment to ambient air;
- Volatilization of constituents from ground water or sediment to ambient air; and
- Lateral movement of constituents in ground water to surface water/sediment.

The potential pathways are described in more detail below, including an explanation of those identified as incomplete migration pathways at the site.

Leaching of constituents from sediment to shallow ground water is presumed to be a complete migration pathway at the site. This pathway is quantitatively evaluated using default RECAP Standards protective of ground water and site-specific leachate testing. The impact of surface runoff and overland flow to a receiving water body is evaluated by direct assessment of samples collected from surface water and biota harvested from surface water within the study area.

There is limited potential for dust generation in this wetland/marsh setting. A large proportion of the sediment samples were collected from canal bottoms and banks with high moisture content. The samples collected between canals from marshland are also high in moisture content. The samples collected from the former Tank Battery B area and the active Tank Battery A area were generally the most elevated at the site, and the surface in these areas is largely vegetated. Because of the limited potential for significant dust generation, the optional particulate emission factors relevant to dusty sites were not warranted in the RECAP Standard development. The volatile constituents BTEX were non-detect in the samples collected from sediment, therefore, vapor emissions of these constituents from sediment are not a concern for receptors at the site. The more volatile hydrocarbon fractions were also generally absent, however, the sediment-to-ambient air pathway is included in default algorithm for sediment contact evaluation. There are no enclosed structures (i.e., slab on grade construction) in the study area, and any future construction will include construction on piers due to the nature of the surface sediment. Quantitative evaluation of the enclosed structure pathways ($Soil_{es}$ and GW_{es}) is therefore not warranted.

The shallow Peat Zone is identified as Class 3 ground water with potential for discharge to adjacent surface water, and is evaluated quantitatively in accordance with RECAP for the surface water uses designated for Subsegment 050703: primary and secondary contact recreation, fish and wildlife propagation, and agriculture (LAC 33:IX.1123).

The potential for migration of constituents vertically from the shallow ground water to the deeper zones of ground water is addressed through direct evaluation of the deeper zones, including sampling completed at depths of approximately 40-50 feet, 70-80 feet, 90-100 feet, and over 400 feet bgs. Given the time that the site has been in operation (over 70 years), it is reasonable to assume that current conditions are reflective of hydraulic communication between the zones.

The limited impact by site-related constituents in the 70-Foot Zone, and absence of site-related constituents in the 90-Foot Zone and Upper Chicot Aquifer, demonstrate that vertical movement of constituents from the shallower ground water zones is mitigated/attenuated within the confining unit. The confining unit is separated from the fresh water Chicot Aquifer system by a substantial clay aquitard, and constituent migration to the Chicot Aquifer is an incomplete pathway.

4.3 EXPOSURE POINTS

Exposure media include sediment, surface water, ground water and biota under current conditions.

Sediment was evaluated as a direct contact exposure point, regardless of location on canal banks, within marshland between canals, or subaqueous in canals. In fact, contact is far less likely to occur routinely (or at all) for subaqueous sediment (e.g., beneath 8 feet of water in canals). Surface water in the canals was evaluated as a direct contact exposure point.

The Peat Zone ground water is not used for any purpose on site or in the vicinity of the site. For this Class 3 zone, surface water that receives ground water discharge is identified as the potential exposure point.

Because the 40-Foot Zone (Class 2) is used for non-potable purposes in the vicinity of the study area on Vermilion Parish School Board Property, the hypothetical future point of exposure is assumed to be throughout the site. Under current conditions, there is no exposure point within the Areas of Investigation (AOIs) identified in this zone.

The ground water zone sampled at approximately 70 and 90 feet bgs was assumed to be Class 2, with hypothetical future points of exposure assumed to be throughout the site. Under current conditions, there is no exposure point within the ground water intervals referred to as 70-Foot Zone and 90-Foot Zone on site or within a mile of the site.

For the Upper Sand of the Chicot Aquifer, defined as a Class 1 zone, the potential point of exposure is assumed to be throughout the site. Under current conditions, two water supply wells are completed in this zone, one within the study area and one north of the study area (north of Schooner Bayou on Vermilion Parish School Board Property).

The biota sampled and analyzed using methods representative for human health exposure evaluation (i.e., blue crabs) were evaluated as a direct exposure point for human ingestion.

4.4 ROUTES OF EXPOSURE

Exposure routes are ways that constituents of concern enter the body. The potential exposure routes associated with the exposure media at the site (i.e., sediment, ground water, surface water, and biota) are ingestion, dermal contact, and inhalation of volatiles released to ambient air.

Sediment: For sediment, dermal contact and incidental ingestion are the potential routes of exposure. Inhalation of constituents released to the breathing zone is assumed to occur, however, the high moisture content of the sediment and general absence of volatile constituents reduces the potential for release to the breathing zone. As a practical matter, sediment located at the bottom of the canals is not available for contact, particularly routine contact that is assumed as part of this risk evaluation. The only practical means by which this exposure would occur is excavation of material and placement at the ground surface. This hypothetical scenario is addressed in this risk assessment.

Ground water: For Class 3 ground water in the Peat Zone, assumed exposure routes at the receiving water body include fish ingestion, dermal contact, and incidental ingestion during primary contact activity.

For the 40-Foot Zone (Class 2), private camp site wells completed in the zone are reported by camp users to be used only for non-potable purposes such as boat washing, fish cleaning, and flushing toilets. The water is not palatable due to salt, iron, and manganese content, but is useful for recreational purposes. It is not useful for many household purposes (e.g., washing clothes, etc.) due to the iron and manganese content that results in discolored water and staining. Under current and expected future conditions, dermal exposure would occur during recreational camp site use as wash water. For complete information, the potential for inhalation of constituents released through indoor water use (e.g., during showering) was also considered for this analysis. In accordance with RECAP, a default Class 2 evaluation is also provided for complete information, and the assumed exposure route for default assessment is daily water ingestion during residential use of the ground water (e.g., through a domestic water supply well). In accordance with RECAP, the default assessment is protective of additional residential exposure routes, including dermal and inhalation (if applicable) exposure.

For the 70-Foot and 90-Foot Zones sampled within the Chicot Aquifer Confining Unit, there is no exposure under current conditions, as no wells are completed in these zones in the study area or within a mile of the site. The zones were assumed to be Class 2 for purposes of this risk evaluation, and the assumed exposure route for default assessment is daily water ingestion, dermal exposure, and inhalation during residential use of the ground water (e.g., through a domestic water supply well).

Wells completed within the Upper Sand of the Chicot Aquifer (Class 1) include the facility well within the study area and the Guidry camp well north of Schooner Bayou. Facility personnel identified that the facility well is used for non-potable purposes as wash water, with drinking water supplied by bottled water. The exposure route for the facility well is therefore dermal contact. It is assumed the Guidry camp well water is available for ingestion as well as non-potable purposes. In accordance with RECAP, a default Class 1 evaluation is provided for this zone, and the assumed exposure route for default assessment is daily water ingestion, dermal exposure, and inhalation during residential or industrial use of the ground water.

Surface water: Surface water contact includes dermal exposure and incidental ingestion during recreational activities. Facility personnel identified that recreational activities such as swimming and water skiing are not prevalent in the canals of the study area and are more applicable to White Lake west of the study area. However, fishing and hunting activities may result in incidental contact with the surface water. Inhalation is not a complete pathway for surface water; volatile constituents are not expected to persist and were not analyzed by either investigator in surface water.

Biota: Ingestion of seafood harvested from the site provides a potential exposure route for biota.

4.5 RECEPTORS

Current and potential future receptors that may come in contact with site media include workers involved in E&P activities, recreational and commercial fisherman, and other recreational users of the property. Recreational uses in addition to fishing include birding and hunting, primarily for duck and deer. There are no sensitive receptors such as schools, hospitals, or nursing homes within a 500-foot radius of the site. Commercial facilities associated with the E&P activities are located within the study area, and some workers are present in a 7-day-on and 7-day-off (or similar) rotation. Camps are located on Vermilion Parish School Board property north of Schooner Bayou, and are visited for recreation. The camps are not full time residences, and currently support occasional recreational activity. The site has been used in the same manner for over 75 years, and based upon the remote location accessible by boat, future use of the property can be expected to remain the same, providing recreational opportunities as well as continued E&P (commercial/industrial) activity.

4.6 *SUMMARY OF EXPOSURE PATHWAY ANALYSIS*

Based on the analysis of potential exposure pathways for the site, the human exposure scenarios that are quantitatively evaluated under MO-3 for current and future conditions in accordance with RECAP include:

- Industrial worker exposure to sediment (Sedi): exposure pathways include ingestion, dermal contact, and inhalation of volatiles released to the breathing zone.
- Recreational exposure to sediment (Sedr): exposure pathways include ingestion, dermal contact, and inhalation of volatiles released to the breathing zone.
- Sediment-to-ground water protection (SedGW3NDW): transfer of constituents to the upper water bearing zone is evaluated, considering subsequent migration of constituents to surface water.
- Class 3 ground water, Peat Zone: ground water discharge to surface water, with recreational use of surface water assumed to include primary contact, fishing, and fish ingestion (GW3NDW).
- Class 2 ground water, 40-Foot Zone (GW2): hypothetical domestic use of ground water is assumed to occur within the study area, including ingestion, dermal contact, and inhalation of volatiles released to the breathing zone. Because use of the ground water for this purpose is not occurring and is unlikely due to poor natural water quality, use of the zone for non-potable purposes (dermal contact, inhalation of volatiles released during indoor non-potable use) was also evaluated based on information available regarding actual use of ground water at camp sites.
- Class 2 ground water, 70-Foot and 90-Foot Zones (GW2): hypothetical domestic use of ground water is assumed to occur within the study area, including ingestion, dermal contact, and inhalation of volatiles released to the breathing zone.
- Upper Sand of the Chicot Aquifer (GW1): domestic use of ground water is assumed to occur within the study area, including ingestion, dermal contact, and inhalation of volatiles released to the breathing zone.
- Recreational exposure to surface water: exposure pathways include dermal contact, incidental ingestion, and biota ingestion.
- Recreational exposure to seafood (crabs) harvested from the site: exposure pathway includes ingestion of shellfish.

The exposure scenarios, including specific exposure assumptions, are defined in Section 6 (in the MO-3 assessment) to address the pathways identified above. The scenarios address both the industrial and non-industrial uses of the property, consistent with the definitions of Section 2.9 (Land Use) of RECAP. Consistent with Section 2.9.1, the industrial land use of the East White Lake site falls under North American Industry Classification System (NAICS) major group code 211 for Oil and Gas Mining. The recreational use would be described as non-industrial, consistent with RECAP Section 2.9.2. As identified in this section of RECAP, non-industrial land use is represented by a residential scenario under the lower tiers of RECAP because these tiers do not provide guidance for assessment beyond default industrial and residential exposures to soil. The site-specific recreational use is addressed under MO-3, which is in fact required to address impacts and exposure to sediment. This requirement for MO-3 evaluation of sediment recognizes that the settings and locations of sediment impact typically differ from the setting assumed in defining the default residential and industrial exposure scenarios in RECAP. As a result, the potential for exposure and the exposure patterns (e.g., frequency, duration) differ from routine soil exposures quantified in RECAP, and warrant examination on a site-specific basis.

LDEQ guidance in support of RECAP has identified that sediment RECAP Standards are to be developed under MO-3 based on the type of concern associated with the constituents present in the sediment, and has identified the following considerations.[3]

- If recreational exposure to sediment is a concern, then RECAP Standards based on ingestion and dermal contact with sediment should be developed.
- The equations for the soil RECAP Standards are recommended with input parameters appropriate to the sediment setting. Soil default parameters are recommended in the absence of sediment parameters such as ingestion rate.
- If the concern is the bioaccumulation of chemicals by biota (and fish ingestion pathway) then this pathway shall be evaluated.
- If another cross-media transfer is the concern (e.g., release to ground water), then this transport pathway should be addressed to establish a sediment RECAP Standard.

Based upon the pathways identified for the East White Lake site and the LDEQ guidance for sediment evaluation, all of these considerations are addressed in the quantitative MO-3 assessment provided in Section 6.

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[3] Frequently Asked Questions (2012), provided by LDEQ in support of RECAP.

5.0 RECAP EVALUATION METHODS AND RESULTS: SELECTION OF COCs FOR SEDIMENT AND GROUND WATER

The tiered RECAP framework for evaluating risk to human health and the environment consists of a Screening Option (SO) and three Management Options (MO-1, MO-2, and MO-3), with increasing site specificity in higher tiers. As discussed in prior sections, MO-3 is applicable to the East White Lake site to address all media investigated as well as to address the recreational land and water use.

For sediment and ground water, SO standards were used to select constituents of concern (COCs) warranting further evaluation under MO-3. The SO standards are not applicable as final standards, but provide a conservative (protective) method for identifying constituents/concentrations which warrant no further evaluation and those which warrant more site-specific evaluation. For surface water and biota, no directly applicable screening methods are provided in RECAP, and these media are evaluated under MO-3 without a screening step.

The SO standards were also used as a preliminary screen to identify the distribution of COCs in sediment and ground water, i.e., the locations and delineation of COC concentrations warranting further assessment.

5.1 SCREENING FOR SELECTION OF CONSTITUENTS OF CONCERN (COCs)

The RECAP Screening Standards (SS) were taken from RECAP Table 1 (October 20, 2003), if available, or developed in accordance with RECAP Appendix H. Using the data identified as representative (definitive) data in Section 3.5, and recognizing the availability of split sample results for a large number of sample locations, the average of split results (where available) was identified as the most representative concentration for a sample location and was used in the risk assessment. The full detection limit was used in the average for non-detect results. The side by side analytical results and averages for sediment split samples are provided in Appendix E, Table E-1. The side by side analytical results and averages for ground water split samples are provided in Appendix E, Tables E-2 through E-6.

In summary, the sediment data used in this risk assessment include over 300 samples from approximately 100 locations, with multiple depths per location. The ground water data include samples as follow:

- Eight (8) Peat Zone locations (monitor wells);
- Twenty (20) 40-Foot Zone locations (6 monitor wells, 2 water wells, 12 hydropunch points);
- Thirteen (13) 70-Foot Zone locations (hydropunch points);
- One (1) 90-Foot Zone location (hydropunch point); and
- Two (2) Upper Sand of the Chicot Aquifer locations (water wells).

5.1.1 *Sediment*

The SO standards provided in RECAP for soil are an appropriate screening tool for identifying sediment COCs because use of soil algorithms (with modification of exposure parameters) is recommended by LDEQ for sediment evaluation. The default scenarios use exposure assumptions that likely overestimate the routine sediment exposure and therefore provide a conservative screen to identify constituents of potential concern.[4] The maximum constituent concentrations reported in surface samples were compared to the industrial ($Soil_{SSi}$) and non-industrial ($Soil_{SSni}$) soil direct contact SS, and the maximum constituent concentrations reported in samples collected from all depths were also compared to ground water protection SS ($Soil_{SSGW}$). The comparisons are provided in Tables 5-1 and 5-2. Based upon the requirement identified in Section 2.8.2.1 of RECAP and guidance provided specifically for sediment evaluation, the results were expressed appropriately in wet weight for comparison to direct contact standards (Table 5-1) and dry weight for comparison to ground water protection standards (Table 5-2).[5]

The surface interval is not defined in RECAP for sediment. For soil, the surface interval is defined as the upper 15 feet "…based on the fact that future intrusive soil activities at the site may result in deeper soils being brought to the surface." (see RECAP definition of Surface Soil in Section 2.1.) For subaqueous sediment and sediment in this wetland/marsh environment, the potential for development and disturbance is limited relative to soil in an industrial or residential setting. The sediment interval available for direct contact is assumed to be within the upper three feet, consistent with the RECAP provision for surface soil which indicates "Based on site-specific conditions, the Department may require, or the Submitter may request to divide the surface soil into two intervals: (1) ground surface to 3 feet bgs; and (2) 3 feet bgs to depth of impact." This approach was used for sediment at the East White Lake site recognizing the reduced likelihood of disturbance. The samples most representative of surface sediment in the 0 to 3 feet interval were therefore identified and included in the direct contact evaluation. The sediment data included in the direct contact evaluation are identified in Table 5-3.

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[4] No adjustment of the Q/C from 0.5 acre was needed because volatile constituents are not detected in the sediment.

[5] RECAP identifies: "Typically, exposure concentrations (and the risk-based SS and RS) are based on a wet-weight concentration whereas source concentrations (and environmental fate and transport SS and RS) are based on a dry-weight concentration… For soils with a high moisture content (such as sediment), the wet-weight and dry-weight concentrations may differ significantly, therefore, the reported concentration should be adjusted to account for the percent moisture prior to calculation of the AOIC for comparison with an environmental fate and transport SS or RS." For this reason, direct contact and ground water protection evaluations are provided separately instead of identifying a single limiting SS.

Table 5-4 identifies the sediment data included in the screening evaluation for ground water protection. This screening evaluation was inclusive of all samples at all depths identified as representative in the data quality review (Section 3.5). Table 5-2 provides the comparison of maximum concentrations to the Soil$_{SSGW.}$ Inorganic constituents that exceeded the SS for ground water protection (barium, lead, mercury) were further evaluated using site-specific leachate data available for samples with maximum reported concentrations (i.e., Synthetic Precipitation Leaching Procedure, SPLP data). This site-specific ground water protection demonstration is allowed under all options of RECAP (per RECAP Appendix H), and the detailed SPLP evaluation is provided in the MO-3 assessment.

Based upon the screening evaluation using maximum concentrations, the following COCs were identified in sediment for further evaluation under MO-3 of RECAP:

Sediment Direct Contact-Industrial	Sediment Direct Contact - Non-industrial	Sediment Ground Water Protection
None	Barium	Barium
	Mercury	Lead
	Aliphatic >C10-C12	Mercury
	Aliphatic >C12-C16	2-Methylnaphthalene
	Aliphatic >C16-C35	Aliphatic >C16-C35
	Aromatic >C12-C16	Aromatic >C8-C10
	Aromatic >C16-C21	Aromatic >C10-C12
	Aromatic >C21-C35	Aromatic >C12-C16
		Aromatic >C16-C21

The maximum reported constituent concentrations in site sediment were less than screening levels for industrial direct contact, indicating concentrations in sediment at the East White Lake site are protective for potential worker contact. For the hydrocarbon fractions and two metals above non-industrial (residential) direct contact SO standards, the locations and concentrations reported above the SS are shown in Figure 5-1. Figure 5-2 identifies the locations and concentrations reported above SO ground water protection standards. For the locations with no concentrations posted in the figures, constituent concentrations were below SS. Table 5-5 provides a comprehensive summary of the constituents, concentrations, and sample locations identified in the figures, i.e., the RECAP SS exceedances . The COCs and concentrations exceeding the SS are further evaluated under MO-3 using more applicable exposure assumptions.

The supplemental examination of TPH mixture results, for locations where fraction analyses were unavailable, is provided in the uncertainty analysis. As discussed in Section 3.5.1, the hydrocarbon fractions are identified as COCs and provide the primary evaluation under RECAP.

The screening evaluation was inclusive of all detected constituents except for salt (chlorides measured in sediment), which is a non-traditional parameter per RECAP (with no screening value) that is addressed under MO-3.

5.1.2 *Ground Water*

For each of the ground water zones sampled at the East White Lake site, maximum concentrations reported in ground water were compared to the ground water SS (GW_{SS}). Table 5-6 identifies the ground water data included in the screening evaluation for ground water protection. The screening evaluation was inclusive of all detected constituents except for essential nutrients (e.g., calcium, potassium) that do not warrant risk evaluation.[6] The comparison to GW_{SS} is provided in Table 5-7. The site-related COCs identified for further assessment are discussed below.

Peat Zone. Constituents that exceeded SS in the Peat Zone samples and are identified as site-related COCs for further GW3NDW evaluation include barium, strontium, TPH-DRO and TPH-ORO. Additionally, because chlorides are elevated naturally in this environment, a SS has not been identified and chlorides are carried forward and addressed as a non-traditional parameter under MO-3. As discussed in Section 3.5.1, hydrocarbon fraction data are available for only one of the eight Peat Zone sample locations, therefore TPH mixtures for the remaining samples are further assessed for completeness.

40-Foot Zone. Constituents that exceeded SS in the 40-Foot Zone samples and are identified as site-related COCs for further GW2 evaluation include barium, strontium, and benzene. As for the Peat Zone, chlorides are carried forward and addressed as a non-traditional parameter under MO-3.

70-Foot Zone. No site-related COCs are identified above SS in the 70-Foot Zone, assumed to be GW2 for purposes of this risk evaluation. Chlorides are carried forward and addressed as a non-traditional parameter under MO-3.

90-Foot Zone. No site-related COCs are identified above SS in the 90-Foot Zone, assumed to be GW2 for purposes of this risk evaluation. Chlorides detected in this zone are within expected natural range (MP&A, 2015a), and no impact to the 90-Foot Zone is identified. This zone was sampled below the area exhibiting maximum COC concentrations in shallower intervals. No further assessment of this zone beyond screening is warranted.

Upper Sand of Chicot Aquifer. The ground water quality in the Upper Sand of the Chicot Aquifer does not exhibit impacts as a result of vertical migration of COCs, and does not exhibit any RECAP SS exceedances with the exception of naturally elevated iron and manganese. Chlorides in this zone are less than the SMCL of 250 mg/L, which provides an appropriate screening value for the fresh water Class 1 Zone. No further assessment of this zone beyond screening is warranted.

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[6] An essential nutrient is a chemical required for normal body functioning that must be obtained from a dietary source. USEPA (1989) identifies that chemicals that are essential human nutrients, toxic only at very high doses, need not be considered further in quantitative risk assessment. Examples provided by EPA include calcium, iron, magnesium, potassium, and sodium.

Table 5-8 provides a summary of the constituents that exceeded RECAP SS in at least one sample and were not identified as COCs warranting further evaluation because they are naturally occurring and available data do not indicate they are present as a result of site operations. The detailed rationale is provided in Table 5-8.

The distribution of site-related COCs is shown in the following figures by zone. Exceedances of SS are identified in the figures, where applicable. In addition, the distribution of chlorides is identified for each ground water zone sampled.

Figure 5-3	Peat Zone – Barium Concentrations
Figure 5-4	Peat Zone – Strontium Concentrations
Figure 5-5	Peat Zone – Petroleum Hydrocarbon Concentrations
Figure 5-6	Peat Zone – Chlorides Concentrations
Figure 5-7	40-Foot Zone – Barium Concentrations
Figure 5-8	40-Foot Zone – Strontium Concentrations
Figure 5-9	40-Foot Zone – Benzene Concentrations
Figure 5-10	40-Foot Zone – Chlorides Concentrations
Figure 5-11	70-Foot Zone – Chlorides Concentrations
Figure 5-12	90-Foot Zone – Chlorides Concentrations
Figure 5-13	Upper Sand of Chicot Aquifer – Chlorides Concentrations

The point by point comparison to RECAP SS is provided with the comprehensive summary of ground water data provided in tables of Appendix E.

5.2 DELINEATION AND IDENTIFICATION OF AREAS OF INVESTIGATION (AOIs)

5.2.1 Sediment

RECAP Section 2.6.1.5 identifies that the AOI for sediment shall be identified relative to analytical quantitation (detection) limits or LDEQ-approved background concentration limits. This provision is based upon the absence of RECAP-defined screening standards specific to sediment. Based upon this guidance, and the detection of COCs (e.g., barium) in all samples collected at the site, the AOI for sediment includes the full East White Lake study area. This represents a reasonable exposure area for the site because recreational activities, evaluated under MO-3 for a 30 year duration, are not limited to a single area of the site but are more likely to include receptors traversing the site for boating, fishing, or hunting purposes over the assumed period of many years.

To address the RECAP objective of achieving lateral and vertical delineation of impact at the site, the industrial SS provides a reasonable delineation standard for sediment because industrial use is applicable to the site. While the non-industrial standard was used to select COCs for site-specific assessment in the most conservative manner, the default residential scenario has no applicability to the site sediment. Comparison to the industrial SS indicates that sediment is delineated to below these levels laterally and vertically (all reported concentrations are below industrial direct contact SS). Additionally, sediment is delineated to below the recreational standards developed in Section 6, the MO-3 assessment.

Relative to ground water protection, because the uppermost water-bearing zone at the site is Class 3, the most appropriate delineation standards are the Class 3 ground water protection standards which are identified in Section 6 (Tables 6-4 and 6-5). The sediment concentrations are delineated to below Class 3 ground water protection standards (without a dilution-attenuation factor applied), consistent with RECAP Section 2.6.1.2, provision (3). No AOI is identified above the MO-3 ground water protection standards.

5.2.2 Ground Water

For ground water, preliminary AOIs are identified relative to the risk-based RECAP SS for the site-related COCs. AOIs for further evaluation are identified for the Peat Zone and 40-Foot Zone in Figures 5-14 and 5-15, and the final AOIs for these zones are identified relative to the final MO-3 ground water standards in Section 6. No AOIs are present above risk-based SS for site-related COCs in the ground water zones investigated deeper than the 40-Foot Zone.

To address the RECAP objective of achieving lateral and vertical delineation of impact at the site, the SS provide a reasonable delineation standard for Class 1 and 2 ground water zones. Figures 5-7 through 5-9 for the 40-Foot Zone demonstrate that site-related COCs are delineated laterally to below risk-based SS with the exception of barium in HP-08 on the eastern property boundary. Concentrations were vertically delineated at the 70-Foot Zone, where concentrations of site-related COCs were reported below RECAP SS. While no applicable SS is available for chlorides, the chlorides concentrations appear delineated vertically at the 90-Foot Zone, where the reported concentration falls within expected natural (background) range.

For the Class 3 ground water of the Peat Zone, the most appropriate delineation standards are the Class 3 ground water standards which are identified in Section 6 (Table 6-6). The Peat Zone ground water concentrations are delineated to below Class 3 ground water standards (without a dilution-attenuation factor applied), consistent with RECAP Section 2.6.1.2, provision (3).

6.0 *RECAP EVALUATION METHODS AND RESULTS: MANAGEMENT OPTION 3 FOR ALL MEDIA*

MO-3 of RECAP is applicable to all environmental media that have been sampled at the East White Lake study area. This section provides an assessment for sediment, ground water, surface water, and biota. The assessment addresses the receptors and exposure pathways identified in Section 4.6 based on the CSM and exposure pathway analysis. The MO-3 evaluation is presented as follows:

Section 6.1: Land Use and Exposure Assumptions
Section 6.2: Sediment Evaluation
Section 6.3: Ground Water Evaluation
Section 6.4: Surface Water Evaluation
Section 6.5: Biota (Crab Tissue) Evaluation
Section 6.6: Cumulative Risk
Section 6.7: Uncertainty Analysis

Section 7 addresses the RECAP requirement for ecological evaluation.

The components of MO-3 assessment for any environmental medium include Hazard Identification, Exposure Assessment, Toxicity Assessment and Risk Characterization. The components are addressed in this RECAP assessment as follows:

Hazard Identification: The Hazard Identification step refers to the selection of site-related COCs for quantitative risk assessment. Because relevant, conservative screening standards are available in RECAP for soil and ground water, selection of COCs in site sediment and ground water was performed and summarized in Section 5. Further assessment of the site COCs for these media is provided in Sections 6.2 and 6.3. For the remaining media, no screening standards are available in RECAP and the full assessment of detected constituents is provided under MO-3.

Exposure Assessment: The exposure assessment was provided in Section 4. Additionally, the specific intake assumptions for each receptor and exposure medium are identified in tables in this section along with rationale/references.

Toxicity Assessment: In accordance with RECAP, under MO-3, current toxicity values were identified using the EPA's recommended hierarchy of sources and using LDEQ-specific guidance for hydrocarbons. Toxicity factors include Reference Doses or Reference Concentrations for noncarcinogens, and Cancer Slope Factors or Unit Risk Factors for carcinogenic constituents. The current toxicity factors for the COCs warranting MO-3 evaluation in any medium are documented in Table 6-1 and were used in the MO-3 evaluation. For several constituents, the toxicity factors are updates to the factors provided in RECAP 2003.

Risk Characterization: Risk characterization is the integration of intake assumptions and toxicity factors to estimate carcinogenic risk and noncarcinogenic hazard levels. To develop RECAP Standards, the intake assumptions, toxicity factors, and LDEQ-defined target risk levels are combined to solve for a concentration that is protective for receptors that experience the assumed exposures.

6.1 LAND USE AND EXPOSURE ASSUMPTIONS

The current and future uses of the property include industrial and recreational use as discussed in the CSM. Section 6.3 of RECAP (*Exposure Assessment for Management Option 3*) identifies that site-specific exposure assumptions representative of a Reasonable Maximum Exposure[7] (RME) scenario for the identified receptor activity patterns shall be used in the development of MO-3 RS. The RME scenarios specific to each medium are identified in the subsequent sections, with supporting information.

RECAP Section 6.3 further clarifies the following: "The Submitter shall ensure that the property remains suitable for commerce and, at a minimum, suitable for industrial use." The industrial exposure scenario is evaluated herein and complies with this requirement of RECAP.

The identification of RME scenarios for recreational use, specific to the East White Lake site setting, as the basis for remediation standards is also consistent with the statute that required LDEQ to develop "Minimum remediation standards", i.e., the statute that initiated the development of the RECAP regulation. The statute identifies specifically (La. R.S. 30:2272.1):

> *The remediation standards shall be developed to ensure that the potential for harm to public health and safety and to the environment is minimized to acceptable levels, taking into consideration the location, the surroundings, the intended use of the property, the potential exposure to the discharge, and the surrounding ambient conditions, whether naturally occurring or man-made.*

The Statute further states the following requirements for setting remediation standards:

> *B. In developing minimum remediation standards the department shall:*
>
> *(1) Base the standards on generally accepted and peer reviewed scientific evidence or methodologies to the extent practical.*
>
> *(2) Base the standards upon reasonable assumptions of exposure scenarios as to amounts of contaminants to which humans or other receptors will be exposed, when and where those exposures will occur, and the amount of that exposure.*
>
> *(3) Avoid the use of redundant conservative assumptions. The department shall avoid to the maximum extent reasonable the use of redundant conservative assumptions by the use of parameters that provide an adequate margin of safety and which avoid the use of unrealistic conservative exposure parameters and which guidelines make use of the guidance and regulations for exposure assessment developed by the United*

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[7] RME is defined by USEPA (1989) as "the highest exposure that is reasonably expected to occur at a site."

States Environmental Protection Agency pursuant to the "Comprehensive Environmental Response, Compensation, and Liability Act of 1980", 42 U.S.C. 9601 et seq. and other statutory authorities as applicable.

(4) *Where feasible, establish the remediation standards as numeric or narrative standards setting forth acceptable levels or concentrations for particular contaminants.*

Accordingly, the exposure scenarios identified as RME in this assessment were developed based upon a combination of site-specific information and LDEQ and EPA sources. This method and the resulting scenarios comply with the intent clearly expressed in the Statute and with the requirements of the RECAP regulation under MO-3.

6.2 MO-3 SEDIMENT EVALUATION

Direct Contact: For the constituents that were identified as COCs in sediment, warranting further evaluation beyond non-industrial screening, sediment RECAP Standards (RS) were developed using the algorithms provided in Appendix H of RECAP for direct contact, with updated toxicity factors, and modifying exposure assumptions as appropriate for sediment exposure. Exposure assumptions are identified for an adult and child recreational scenario in Table 6-2, with references/rationale for the selected exposure assumptions. It is assumed that the receptors will visit the site every single weekend (104 days each year) for a duration equal to RECAP's default residential value of 30 years, i.e., assuming they reside in the area and frequent the same location for recreation. Dermal contact, sediment ingestion, and inhalation of volatiles are assumed to occur on every visit. As a conservative assessment, no modification to these exposure assumptions was made for subaqueous sediment, sampled at the base of canals that is not available for routine contact. LDEQ-provided spreadsheets were used to calculate the adult (Sedr Adult) and child (Sedr Child) recreational RS for each COC. Default chemical and physical properties provided in RECAP for the COCs were used. The Sedr values were adjusted to account for additive effects to the same target organ or system, using the additivity divisor approach of RECAP Appendix G. The final RS for the adult and child receptors are identified in Table 6-3, and the supporting RECAP calculation spreadsheets are provided in Appendix G. In the same table, the industrial RS is also identified for each constituent (calculated with updated toxicity factors), to address additivity for the COCs and to allow comparison to the recreational standards for identification of the limiting RS.

The maximum reported sediment concentrations are identified in Table 6-3 as the Area of Investigation Concentrations (AOICs), and are compared to the limiting sediment RS. It is important to note that in the assessment of human exposure, and therefore risk, the average concentration is more representative than any single sample location of the chemical concentration that would be contacted at a site over time because an individual can be expected to move throughout the area rather than remain stationary at a single sampling location. As an individual moves across an area that has a constituent present in the sediment at various concentrations, the spatially averaged constituent concentration across the area is most representative of the true exposure that occurs over time (EPA, 1989; EPA, 2002a; LDEQ RECAP, 2003). In accordance with RECAP, the 95% UCL on the mean can be used as the AOIC for soil or sediment within an AOI, however the step of calculating the mean and UCLs was not needed for this assessment because maximum reported concentrations demonstrate that reported concentrations are less than the RS and protective of recreational receptors, with a single exception. As discussed in Section 5.2.1, the AOI defined for site sediment in accordance with RECAP includes the East White Lake study area, and the maximum constituent concentrations across the entire investigation area are demonstrated to comply with the limiting risk-based RS except for a single hydrocarbon fraction at a single sample location, WL-3 (0-2′).

Aromatics >C21-C35 hydrocarbons detected at WL-3 in the surface interval exceed the recreational contact standard for the child, and are below the standards for industrial or recreational adult contact. The sample collected in a deeper interval in this location (at 4-6′ bgs) provides vertical delineation as the reported concentrations were below all sediment RS in the deeper sample. The WL-3 (0-2′) sample was collected in the active industrial area at Tank Battery A, and the area is generally not attractive or available for recreational activities (see photograph of the Tank Battery and support area in Figure 6-1). However, the analysis is provided for consideration of potential future land use.

The comparison of site data to direct contact standards indicates conditions are protective of site workers, considering maximum reported concentrations in sediment. Conditions are protective of recreational receptors with the exception of a single location within the active Tank Battery A operational area. Figure 6-2 identifies the location of the WL-3 (0-2′) sample.

Aesthetic Standard: While sediment is not subject to the same MO-1 requirements as soil, the upper bound limit of 10,000 mg/kg total fractions was considered in the sediment evaluation. This limit is an aesthetic standard and not a health-based standard; the health-based standards are those identified in Table 6-3. The aesthetic standard is identified as a potential indicator of objectionable characteristics such as odor or oily materials. Sediment samples collected in two locations exceeded a total hydrocarbon fraction concentration of 10,000 mg/kg: WL-3 (0-2′), and WL-4 in the 4-11′ and 11-12.5′ bgs intervals. Samples collected deeper in both locations were less than aesthetic limits as well as below the direct contact standards for industrial and recreational receptors. Figure 6-2 identifies the sample locations with reported hydrocarbon fraction concentrations greater than 10,000 mg/kg.

As noted above, the WL-3 (0-2′) sample was collected in the active industrial area at Tank Battery A. Boring WL-4 was located within a former pit feature near the former Tank Battery B location. This area is no longer in active E&P service. Sample location WL-5 was also collected within the same former pit feature and contained detectable hydrocarbon concentrations (but below RECAP Standards) in the same depth interval. A corrective action plan to address the former pit from which WL-4 was collected is being provided by MP&A to LDNR in the site remediation plan (MP&A, 2015a). The proposed action includes lateral delineation, excavation, and backfilling with clean sediments, similar to the remedial action taken at the Sed-15 pit area.

The maximum sediment concentrations both including and excluding the results for WL-3 (0-2′) and WL-4 (4-11′ and 11-12.5′) are summarized in Table 6-3.

Ground Water Protection: Further evaluation of COCs that exceeded ground water protection SS is based on the GW3NDW ground water classification of the uppermost water bearing zone (the Peat Zone) because the exceedances of default ground water protection SS occurred in sediments above and within the Peat Zone (the upper 12 or 13 feet of the sediment column). No exceedances of ground water protection SS were identified in sediment samples collected beneath the Peat Zone. The standards protective of GW3NDW classification were calculated for the hydrocarbon constituents (fractions, one PAH) in accordance with RECAP Appendix H (Section H.2.1.4.2) using current toxicity factors and are summarized in Table 6-4. Supporting RECAP calculation spreadsheets are provided in Appendix G. No dilution attenuation factor (DF3) was applied in developing the protective RS because the DF3 was not required to demonstrate compliance; maximum concentrations were below the standards without considering lateral dilution and attenuation. For inorganic COCs (barium, lead, mercury), site-specific leachate data (SPLP data) were collected, with a focus on addressing the maximum reported sediment concentrations in accordance with RECAP Appendix H, Section H.2.1.4.2. Table 6-5 provides a summary of the available leachate data and comparison to leachate standards developed in accordance with RECAP. Again, no dilution attenuation factor (DF3) was applied in developing the RS because the DF3 was not required to demonstrate compliance; maximum concentrations were below the leachate SS without considering lateral dilution and attenuation.

Based upon comparison to ground water protection standards, the residual COC concentrations in sediment are estimated to be protective of the uppermost water-bearing zone. These results are, in fact, consistent with the conclusions of the direct evaluation of Peat Zone ground water data and the direct evaluation of surface water data for the water bodies assumed to receive ground water discharge.

Chlorides in Sediment: Chlorides are considered a non-traditional parameter under RECAP, and LDEQ has issued guidance in the RECAP FAQs focused on evaluation of chlorides in soil and ground water. For soil (and similarly sediment), the protection of aesthetics (i.e., support of the growth of wild vegetation) and ground water protection are the focus of evaluation. The health of vegetation is addressed in the ecological risk assessment, provided separately from this report (Rodgers, 2015). The assessment identified that the ecosystem is a healthy and functioning ecosystem, with abundant, diverse, and thriving vegetation and wildlife.

The soil-to-ground water protection pathway is not identified as a concern for shallow sediment above or within the Peat Zone (classified GW3NDW), given the naturally salty designation of potential receiving surface water. Leachate data were collected by ICON using the 29B Leachate Chlorides test, with all samples collected above and within the peat zone except for one. The single sample collected deeper was SB-1 (46.5′-47.5′), and the resulting leachate concentration of chlorides was 994 mg/L. This leachate concentration is below the leachate screening level of 5000 mg/L and falls within the unimpacted reference range of chlorides for the 40 Foot Zone ground water (see discussion in Section 6.3).

6.3 *MO-3 GROUND WATER EVALUATION*

The MO-3 evaluation for ground water addresses the zones and site-related COCs identified through screening evaluation in Section 5. The assessment includes the following elements:

Peat Zone. Based upon the classification identified in accordance with RECAP, the Peat Zone is evaluated as Class 3 ground water (GW3). For Class 3 ground water, the appropriate objective is protection of the surface water body that could potentially receive discharge from the ground water zone. The RECAP methodology, outlined under MO-1 in RECAP, was therefore used to evaluate concentrations in the Peat Zone assuming discharge to the canals, which are located within the Mermentau River Basin in Subsegment 050703 (White Lake).

40-Foot Zone. Two elements of evaluation are provided for the 40-Foot Zone, which was identified as Class 2A (GW2) based upon potential yield, TDS, and the presence of wells in the vicinity of the study area. In accordance with RECAP requirements for ground water meeting the definition of GW2, a default domestic supply scenario that includes daily ingestion was evaluated. Based upon the documented use of this ground water zone and water quality that is not suitable for domestic use without treatment, the ongoing and more likely future use as a non-potable camp well (recreational) source was quantitatively evaluated using a RME scenario defined based upon available information about actual, current use.

70-Foot Zone. A single potential COC lacking an appropriate screening level, i.e., chlorides, is addressed as a non-traditional parameter under MO-3 for the 70-Foot Zone. This zone is evaluated as GW2 per RECAP in this risk evaluation.

The following observations are identified as applicable to all ground water zones, in accordance with RECAP definitions.

- The impacted ground water is in declining conditions. The likely historical sources, including possible releases of produced water to canals and waste management in former pits, have been discontinued. Therefore constituent mass is not increasing and the source(s) of releases have been mitigated.
- There is no evidence that NAPL is present in ground water at the site.

6.3.1 *Peat Zone Ground Water Evaluation*

The RECAP methodology identified in Appendix H was used to evaluate concentrations in the peat zone assuming discharge to the adjacent canals in the East White Lake study area (see Section H1.2.2.3). The LDEQ-designated uses of surface water at the site (Subsegment 050703, White Lake) include primary and secondary contact recreation, fish and wildlife propagation, and agriculture (LAC 33:IX.1123). Because the surface water is not identified as a drinking water resource, GW3NDW is the appropriate ground water classification for the zone in accordance with RECAP.

The Point of Compliance (POC) for Class 3 ground water is a sampling location as near to the source as feasible. The POCs for this assessment were assumed to be the locations of maximum reported concentrations of each COC in the Peat Zone. The Point of Exposure (POE) is assumed to be the point of discharge to the nearest downgradient canal, in accordance with RECAP. Whether the exceedances of SS in the Peat Zone ground water are considered a single or multiple potential AOIs as outlined in Section 5.2.2, the evaluation of maximum concentration reported anywhere on site provides a conservative assessment addressing all detected concentrations.

The development of RS for the Peat Zone is presented in Table 6-6, along with comparison to the site concentrations. The GW3NDW values for the COCs were taken from Table 3 of RECAP or, if updated toxicity factors were available, calculated in accordance with RECAP Appendix H, Section H1.2.2.3 as required by RECAP MO-3. Supporting RECAP calculation spreadsheets are provided in Appendix G. Use of a dilution attenuation factor with the GW3NDW values is appropriate under the Management Options of RECAP, however, this step was unnecessary for the Peat Zone evaluation. The maximum reported concentration of each COC was identified as the exposure concentration, or Compliance Concentration, in accordance with RECAP Section 2.8.3, and the maximum concentrations are less than the RS without application of a DF3. This comparison demonstrates that the reported concentrations in the Peat Zone ground water comply with GW3NDW RECAP Standards and are protective of surface water and its users, assuming no attenuation or dilution occurs during migration or discharge to the surface water (which is not a realistic assumption).

For chlorides, the surface water quality standard identified in LAC 33:IX for the White Lake subsegment is 250 mg/L, however, the chlorides concentration is naturally elevated above this standard in surface water (as well as ground water) in this area. The natural chlorides documented by US Army Corps of Engineers monitoring of Schooner Bayou near the East White Lake study area include seasonal high values between 3000 and 4000 mg/L chlorides (see Section 2.5 and Figures 2-5 through 2-9). The LDEQ Water Quality Inventory: Integrated Report (2014) identifies this segment as not attaining the standard of 250 mg/L for chlorides due to natural conditions, and indicates that modification of the standard is needed due to the segment receiving tidal influence that was not accounted for when standards were initially identified. Based upon the permanence of Schooner Bayou and the tidal influence through Vermilion Bay (which is an estuarine water body), it is expected that the study area would be designated as estuarine, for which chlorides limits do not apply. Therefore, a surface water quality standard (and a GW3NDW standard) cannot be identified. Alternatively, surface water samples were collected throughout the East White Lake study area during site investigations, and a direct evaluation of the surface water data is provided as part of this MO-3 risk assessment.

6.3.2 *40-Foot Zone Ground Water Evaluation*

<u>Default GW2 Assessment:</u> The RECAP methodology identified in Appendix H, Section H1.2.2.2 was used to provide a default GW2 evaluation for the 40-Foot Zone, for which the assumed exposure scenario is domestic use of the water including ingestion of 2 L/day for 365 days per year with a duration of 30 years (i.e., use as a primary residential drinking water source). The POC for Class 2 ground water is a sampling location as near to the source as feasible, and for this assessment was assumed to be the location of maximum reported concentration for each COC in the preliminary AOIs identified for the 40-Foot Zone (Section 5.2.2). The POE for Class 2 ground water is generally defined as a location at the downgradient property boundary in the absence of an on-site exposure point. However, based upon the potential for installation of non-potable wells at various locations across the Vermilion Parish School Board property, and for complete information, it was assumed that a well may be completed and POE established anywhere on the property, and specifically within the AOIs. At present, as discussed in the CSM, there are no wells completed south of Schooner Bayou or in areas (AOIs) affected by site COCs within this zone. The evaluation of direct exposure to site COCs is hypothetical.

The development of GW2 RS is presented in Table 6-7, along with comparison to the site concentrations. The GW2 values for the metals and benzene were identified in Table 3 of RECAP. The value for strontium was developed in accordance with RECAP Appendix H (calculations are provided in Appendix G of this report). No dilution attenuation factor (DF2) was applied to address attenuation between the POC and hypothetical POE. The maximum reported concentrations of the COCs in each preliminary AOI were identified as Compliance Concentrations and compared to the RS. Two POC values are shown for the SB-1-MW AOI because the sampling locations are immediately adjacent, with MW-1 last sampled in 2010 and SB-1-MW sampled more recently in 2014. The concentrations above the GW2 RS, and the resulting estimated AOIs are identified in Figure 6-3. COCs reported above health-based RS include benzene in a single AOI (SB-1-MW/MW-1), and barium in two additional locations/AOIs (SB-3-MW/MW-3 and HP-08). While HP-08 is identified as a potential AOI for barium in Figure 6-3 for complete information, barium was detected marginally above the GW2 RS (2.17 mg/L vs. a standard of 2 mg/L) at this location in only one of three samples analyzed. Two additional split sample results for the same sampling event at this location (total barium analyses) did not identify barium above 2 mg/L. The AOIs are delineated to below GW2 standards laterally and vertically by surrounding hydropunch sampling results, with the exception of the HP-08 location, where sampling was not completed east of the location.

Although evaluated as a potential drinking water source based strictly on classification, it is recognized that the 40-Foot Zone ground water is not a desirable drinking water source under natural conditions. The natural concentrations of iron, manganese and salt (chlorides) are well above secondary drinking water standards and would require treatment to address objectionable taste, color, and possibly odor and to meet standards for use as drinking water.

The water supply wells at the perimeter of the East White Lake study area provide an indication of chlorides concentrations present in ground water unimpacted by site activities. Samples collected from water supply wells north of Schooner Bayou[8] and from monitor well AB-1 south of the study area contained no indication of impact with site COCs and had reported chlorides concentrations ranging from 555 mg/L to 1600 mg/L (including all sample dates and split samples). The range of concentrations reported in these wells was considered a reference for the review of chlorides levels in the 40-Foot Zone. Based on comparison to this reference range, chlorides were identified as elevated in the AOIs at SB-1-MW/MW-1 and SB-3-MW/MW-3, along with the other site COCs. Chlorides also appear potentially elevated in the hydropunch sample location HP-02.

While this evaluation is provided in accordance with RECAP definitions for Class 2 ground water, it is important to note that there is currently no exposure to the ground water within the AOIs, and there is no human health risk associated with any concentrations reported in the ground water samples. There is clear delineation of the exceedances of health-based standards (benzene and barium) with the possible exception of HP-08 and no threat to the non-potable supply wells that are completed in this zone in the vicinity (i.e., the Hebert well and abandoned Crouch well north of the AOIs and Schooner Bayou). The estimated flow direction of the 40-Foot Zone is to the west/southwest.

Site-Specific Scenario Evaluation: Based on the site setting and low likelihood of ground water use that is consistent with the default assessment, the current use of ground water in the area was evaluated as the more likely potential future use (if any) of this zone. Future water wells are more likely to access the abundant, fresher supply of water available within the Chicot Aquifer, similar to the Guidry camp well and facility well. A site-specific evaluation that examines reasonable maximum beneficial use of the 40-Foot Zone was performed, based on information provided by water well users and other locals who frequent the study area for recreation.

Based on the exposure assessment provided in Section 4, exposure assumptions are identified for an adult and child recreational scenario in Table 6-8, with references/rationale for the selected exposure assumptions. Consistent with the scenario identified for recreational sediment exposure, it is assumed that the receptors will visit the site every single weekend (104 days each year) for a duration equal to RECAP's default residential duration of 30 years. Dermal contact with ground water used as wash water (e.g., for boats, traps, fish) is assumed to occur on every visit. The Risk Assessment Information System (RAIS) online Preliminary Remediation Goal (PRG) calculator, which provides the flexibility to address site-specific scenarios, was used to develop the adult and child recreational RS for exposure to ground water for each COC. The PRG calculator uses the most current EPA risk calculation methods and is recommended by LDEQ for use under MO-3. Default chemical and physical properties provided in the RAIS PRG calculator for the COCs and current toxicity factors were used as inputs to the calculator. The potential for additive effects to the same target organ or system was considered, and no adjustment to

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[8] P. Hebert well sampled in 2010 and 1014, A. Crouch well sampled in 2010

the standards was required. The final RS for the adult and child receptors are identified in Table 6-7, and the supporting calculations are provided in Appendix G. Recognizing that the inhalation of volatile constituents, such as benzene, during indoor water uses can sometimes provide a limiting standard, an additional calculation was performed to identify a RECAP Standard for a shower scenario for the volatile COC benzene. While indoor shower use has not been specifically identified for the existing camp wells, the scenario is provided for conservative assessment and complete information. This scenario also incorporates incidental ingestion, and the resulting RECAP Standard is included in Table 6-7.

The maximum reported concentrations of the COCs in each preliminary AOI were identified as Compliance Concentrations and compared to the limiting recreational RS, in accordance with RECAP. The concentrations are below the site-specific RS, indicating concentrations are protective of recreational ground water users assuming hypothetical placement of a camp supply well directly within the AOIs defined relative to GW2 default standards.

6.3.3 70-Foot Zone Ground Water Evaluation

Maximum reported constituent concentrations in the 70-Foot Zone were less than RECAP SS (Section 5.1.2), indicating concentrations of the site-related COCs are less than health-based standards. In the absence of a screening level, chlorides were retained for further evaluation. The zone was assumed to be Class 2 (GW2) for purposes of this MO-3 evaluation, although no wells are completed in the zone within a mile of the site. The chlorides distribution for this zone is shown in Figure 5-11, and shows the highest concentrations are in the monitor well locations completed beneath three shallow AOIs: SB-1D beneath SB-1-MW/MW-1; MW-5D beneath SB-3-MW/MW-3; and HP-MPA-02-I beneath HP-MPA-02-T. The concentrations in the 70-Foot Zone in these locations demonstrate attenuation between the 40-foot Zone and 70-Foot Zone (see Figures 5-10 and 5-11), with concentrations in the 70-Foot Zone less than two to three times the reference concentrations observed in unimpacted perimeter locations (MW-4D, MW-6D, HP-MPA-10-I).

As noted previously, the naturally elevated salt levels in ground water in this site location results in chlorides concentrations well above the SMCL of 250 mg/L. The natural (background) levels in the 70-Foot Zone appear to be two to three times the SMCL, the aesthetic benchmark for drinking water.

No impact to ground water deeper than 70 feet bgs has been identified at the East White Lake study area.

6.4 MO-3 SURFACE WATER EVALUATION

Site-specific RS were developed for surface water under MO-3 in accordance with RECAP Section 2.12.6. The bases for the MO-3 evaluation include the promulgated surface water quality standards for human health protection and related RECAP guidance. In addition, this assessment includes development of MO-3 RS protective of a site-specific recreational exposure scenario consistent with the exposure assessment provided in Section 4.

In accordance with RECAP, the surface water uses of primary contact recreation (swimming), secondary contact recreation (fishing and seafood ingestion), and fish and wildlife propagation are addressed in the development of the GW3NDW standard, with no dilution-attenuation factor applied. Therefore, health-protective standards for surface water consistent with RECAP guidance were developed in accordance with RECAP Appendix H, Section H1.2.2.3 items (1) and (2). The RECAP method includes the use of promulgated numeric criteria for human health protection from the Surface Water Quality regulations (LAC 33:IX.1113), if available. In the absence of promulgated criteria for a specific constituent, the RECAP method identifies appropriate risk-based standards assuming incidental water ingestion during swimming and ingestion of fish harvested from the water body. The surface water RS derived using this default RECAP method (using the LDEQ-provided spreadsheet) with current toxicity factors and bioconcentration factors are identified in Table 6-9. Supporting RECAP calculation spreadsheets are provided in Appendix G.

An additional site-specific evaluation was performed consistent with MO-3 of RECAP. A recreational exposure scenario was used to develop RS protective of direct human contact considering Reasonable Maximum Exposure to surface water during recreational fishing and hunting activities for an adult and a child receptor. Exposure assumptions are identified for an adult and child recreational scenario in Table 6-10, with references/rationale for the selected exposure assumptions. Consistent with the scenario identified for recreational sediment exposure, it is assumed that the receptors will visit the site every single weekend (104 days each year) for a duration equal to RECAP's default residential duration of 30 years. Water recreation activities including skiing and swimming do not generally occur on the property in the oilfield canals due to obstructions and limited canal sizes, but occur instead in the open areas of White Lake west of the study area. However, dermal contact with surface water was assumed to occur on every visit during fishing or hunting. The RAIS online PRG calculator, which provides the flexibility to address site-specific scenarios, was used to develop the adult and child recreational RS for exposure to surface water for each COC. Default chemical and physical properties provided in the RAIS PRG calculator for the COCs were used with current toxicity factors as inputs to the calculator. The potential for additive effects to the same target organ or system were addressed in the development of the standards. The final recreational RS for the adult and child receptors are identified in Table 6-9, and the supporting calculations are provided in Appendix G.

Surface water samples were collected from the oilfield access canals on the property as well as from some locations outside of the canals along Schooner Bayou and White Lake, for a total of 24 surface water sample locations (plus duplicates). Samples outside of the access canals were labeled as "Bkg" to distinguish them from samples within the oilfield canals, however, all data were included in the quantitative risk evaluation. The samples were analyzed for metals, hydrocarbon mixtures (TPH-DRO and TPH-ORO), and PAHs. The maximum reported concentrations of all constituents detected in surface water were identified as exposure concentrations and compared to the RECAP NDW RS and the site-specific recreational RS (Table 6-9). The maximum reported concentrations are below both RS, indicating concentrations are protective of surface water users, including the full range of primary and secondary contact recreational activities.

The reported chlorides concentrations are not a concern for adverse effects to human health in surface water. In general, the chlorides concentrations in Schooner Bayou were higher than those in the oilfield access canals. This is consistent with the US Army Corps of Engineers monitoring of Schooner Bayou, which demonstrates tidal influence from the saltier water of Vermilion Bay.

6.5 MO-3 BIOTA (CRAB TISSUE) EVAUATION

Biota tissue samples collected and analyzed from the East White Lake site were evaluated under MO-3 in accordance with RECAP Sections 2.12.6 and 6.0. Based upon the recommendation of LDEQ, the human health evaluation was conducted in accordance with current state-specific guidance developed jointly by the Louisiana Departments of Environmental Quality, Health and Hospitals (LDHH), Wildlife and Fisheries (LDWF), and Agriculture and Forestry (LDAF):

- Protocol for Issuing Public Health Advisories for Chemical Contaminants in Recreationally Caught Fish and Shellfish ("Louisiana Protocol", LDHH et al., 2012)
- Tissue Screening Level Guidelines for Issuance of Public Health Advisories for Selected Contaminants and Supporting Documentation ("TSL Guidelines",LDEQ et al., 2012)

These guidance documents were completed following publication of RECAP in 2003 and provide current evaluation methods, which are not addressed in any detail in RECAP.

The elements of the biota evaluation for the East White Lake site include the site-specific assessment conducted in accordance with the guidance cited above (including sensitivity analyses of critical exposure assumptions) and a separate study of blue crab tissue concentrations completed by the LDHH. The LDHH completed their study following receipt of information provided by investigators on behalf of Plaintiffs and Defendants in the lawsuit of Vermilion Parish School Board vs. UNOCAL and others. For completeness, the LDHH study is provided as an attachment to this RECAP report.

6.5.1 Site-Specific Biota Assessment

As described in Section 3.5.2 and Appendix D, samples of blue crabs and forage fish were collected in the East White Lake study area and vicinity in accordance with applicable EPA and Louisiana agency guidance. The crab tissue data are suitable for use in the human health risk assessment, and the forage fish were collected and analyzed using methods (i.e., whole body analysis) specific to ecological risk evaluation. The ecological risk assessment is provided separately from this report (Rodgers, 2015).

The field event conducted in December 2010 through January 2011 resulted in collection of 307 crabs, providing composite samples appropriate for risk evaluation at thirteen site locations and ten reference locations. The sample locations are identified in Figure 3-8, with reference locations collected in Schooner Bayou just north of the oilfield canals and in White Lake. In addition, crabs were purchased from commercial seafood markets to serve as reference samples, including markets in Baton Rouge, Lake Charles, New Orleans , Des Allemands, Biloxi, and Houston. The purpose of the samples identified as reference locations, in Schooner Bayou, White Lake, and from seafood markets, was to support an understanding of the occurrence of target analytes (and associated risk) in crabs collected near the study area but outside of the oilfield canals and also across the Gulf Coast region. The tissue samples were analyzed for hydrocarbons, barium, inorganic and total arsenic, methylmercury and total mercury. Analyses that distinguish inorganic from total arsenic and methylmercury from total mercury are important to providing a detailed, accurate human health evaluation given that potential toxicity differs for the various arsenic and mercury compounds. The analytical results for each location are summarized in Appendix E, Table E-8. The laboratory reports for biota samples are provided in Appendix L of this report.

The measured constituent concentrations in edible tissues of blue crabs were compared to Louisiana tissue screening levels (TSLs). The TSLs are a first step in determining whether a particular contaminant is present in edible species at such levels that a water body requires issuing an advisory regarding health risks to the public who fishes there recreationally. Additional steps beyond screening are triggered when the mean constituent levels in edible tissue samples from a water body exceed the TSL, and no further assessment is generally warranted for mean levels below the TSLs (Louisiana Protocol, LDHH et al., 2012). The TSLs therefore provide threshold concentrations that are identified as protective of human health, analogous to a RECAP Standard for sediment or ground water.

The TSL Guidelines provide a published TSL for methylmercury and guidance for calculation of TSLs for additional constituents. Using the recommended default algorithms and exposure factors, TSLs were calculated for inorganic arsenic, total barium, total mercury, and hydrocarbons. The default exposure assumptions provided in the TSL Guidelines are summarized in Table 6-11, and include an adult consuming 30 grams per day (g/day) of blue crab tissues harvested from the East White Lake area, for 365 days per year for 30 years. This equates to four eight-ounce meals per month for 30 years. The default consumption rate for hepatopancreas is 7.5 g/day, which equates to 2 ounces of hepatopancreas with the weekly crab meat meal. Intake factors are identified for an adult and a child receptor, and because the adult intake factors result in the more limiting TSLs, they are presented as the final TSLs in the TSL Guidelines and herein.[9] The detailed TSL calculations for all constituents are provided in Appendix G. LDHH, the agency with primary responsibility for applying the TSLs and determining the need for public health advisories, has emphasized that the TSLs are developed to address a single species assuming harvest occurs consistently from the same recreational fishing area. Therefore, the TSLs developed in this risk evaluation are based upon the assumption that blue crabs

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[9] The default child consumption rate is 15 g/day edible tissue for 365 days per year, and no default rate is specified for hepatopancreas.

harvested specifically/solely from the East White Lake study area will be consistently consumed at the designated ingestion rate for a duration of 30 years.

Current toxicity factors provided by EPA and the LDEQ RECAP (for hydrocarbons) were used to develop the TSLs for constituents other than methylmercury (because the TSL for methylmercury is provided in the Guidelines based upon current factors). The calculations for TSL development are provided in Appendix G. For arsenic, toxicity factors are provided by EPA for inorganic arsenic, which is the potentially toxic component. No toxicity factors are recommended by EPA or LDEQ for total arsenic. In fish and shellfish in particular, a large number of studies have been conducted to understand arsenic occurrence and toxicity. Studies have shown that arsenic in the edible parts of fish and shellfish is predominantly present as the arsenic-containing organic compound arsenobetaine, commonly called fish arsenic. Arsenobetaine has been shown to be metabolically inert and nontoxic in multiple studies and is not generally considered a threat to human health. Inorganic arsenic, although a minor component of the total arsenic content of fish and shellfish when compared to arsenobetaine, is the potentially toxic component and the focus of fish tissue analysis and risk assessment (USEPA, 2000). The findings in the East White Lake study are consistent with widely conducted studies that show inorganic arsenic comprises a small proportion of total arsenic in edible tissues: site-specific values include less than 3% in meat and 5% in hepatopancreas (average of site and reference locations). In contrast to arsenic, the organic form of mercury, methylmercury, has the greater potential toxicity than inorganic (or total) mercury. Methylmercury comprises 52% of total mercury in crab meat and 55% in crab hepatopancreas in site-specific samples (average of site and reference locations).

For petroleum hydrocarbons, the toxicity factors provided in RECAP for relevant carbon ranges were used to develop TSLs. As noted in the data quality review in Section 3.5.2, the organic material in the following carbon ranges was quantified as petroleum hydrocarbons, acknowledging that there may be some contribution of natural biological lipids to these carbon ranges as well: C8-C16, and >C16-C28. The quantitation of hydrocarbons in separate ranges above and below C16 allows assignment of toxicity factors applicable to these discrete ranges, and best estimation of the site-specific risk considering the actual measured distribution of organic carbon material. Because the laboratory method does not distinguish aliphatic versus aromatic composition in the tissue, a conservative assumption was made that the compounds are 50% aromatic for the purpose of assigning toxicity factors. [10]

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[10] For reference, the large body of site sediment data (approximately 90 samples analyzed for fractions) indicate that detected hydrocarbons in sediment are comprised of over 90% aliphatic compounds, and less than 10% aromatic.

Crab meat and hepatopancreas (or crab fat), the edible tissues for human consumption, were analyzed separately in composite samples, consistent with Louisiana regulatory agency Protocol.[11] The concentrations reported in both crab meat and crab fat were compared to the TSLs, recognizing that some individuals in regional and local populations will consume both tissues. To support evaluation of the various consumption preferences, the reported concentrations were evaluated relative to the TSLs in three ways:

a. Edible tissue concentration (ETC), assuming ingestion of a combination of meat and hepatopancreas, proportional to the quantity of each tissue present (i.e., approximately 80-85% meat and 15-20% hepatopancreas);

b. Meat concentration, assuming an individual's consumption is comprised entirely of crab meat; and

c. Hepatopancreas concentration, assuming ingestion in accordance with the recommended assumption specifically for hepatopancreas provided in the *Protocol for Issuing Public Health Advisories for Chemical Contaminants in Recreationally Caught Fish and Shellfish* (LDEQ et al., 2012).

For the first evaluation, the representative edible concentration for a given sample location was identified as follows assuming that consumption of crabs can include ingestion of a combination of meat (body muscle and claw meat) and hepatopancreas:

ETC = (meat concentration) (percent edible tissue comprised of meat) +
(hepatopancreas concentration) (percent edible tissue comprised of hepatopancreas)

The meat generally comprised approximately 80 to 85% of the edible tissue, and hepatopancreas approximately 15 to 20% in crabs collected from the site, and the sample-specific percentages were used in the identification of ETCs. The evaluation of ETC concentrations relative to TSLs based upon the default ingestion assumptions recommended by the joint Louisiana agencies is considered the primary evaluation of human health risk because it is reasonable to assume that ingestion would include some amount of both tissues.

As specified in the TSL Guidelines, the mean concentration of each constituent in edible fish/shellfish tissue was compared to the constituent-specific TSL value. The mean tissue concentrations were calculated separately for the site, reference, and market sample locations and were compared to the TSLs for each constituent. The supporting guidance provided in the Louisiana Protocol indicates: "An arithmetic mean of contaminant concentration in wet weight is obtained for each species. The arithmetic mean contaminant concentration is

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[11] "For example, edible tissue of crabs typically includes all leg and claw meat, back shell meat, and body cavity meat. The crab hepatopancreas (also known as crab fat, butter, mustard, tomally, and green gland) may be included for analysis as determined by the eating habits of the local population or subpopulations of concern. The crab hepatopancreas will be analyzed separately to enable the evaluation of health risks associated with consuming these tissues." (LDHH et al., 2012)

used to represent the exposure concentration for edible fish/shellfish and is used in the screening and advisory process." LDHH personnel further confirmed the use of the mean remains the applicable and current methodology (LDHH, 2015). The comparison of mean ETC, meat, and hepatopancreas concentrations to TSLs is provided in Table 6-12.

The mean ETC concentrations of all constituents analyzed are below their respective TSLs in site, reference, and market samples. Further, none of the ETC concentrations of any constituents in individual samples exceed the TSLs developed in accordance with applicable guidelines.

The comparison of meat concentrations directly to TSLs, assuming that crab ingestion may be comprised of crab meat only for some individuals, indicates that the mean concentrations of the metals and hydrocarbons are below their respective TSLs in site, reference, and market samples. Additionally, none of the reported constituent concentrations in meat for individual samples exceed the TSLs in reference samples, site samples, or market samples. It is noted that no detectable hydrocarbon in crab meat is identified at the study site; the reported concentrations for both the C8-C16 and >C16-C28 carbon ranges in crab meat were non-detect in all site samples and reference samples. Detectable hydrocarbon (>C16-C28 range) was reported in crab meat in three of six market samples.

The comparison of hepatopancreas concentrations directly to TSLs specific to hepatopancreas ingestion per the Louisiana Protocol (LDHH *et al*., 2012) indicates that the mean concentrations of metals and hydrocarbons are below their respective TSLs in site, reference, and market samples. Additionally, none of the individual hepatopancreas constituent concentrations reported for individual samples exceed the TSLs.

The potential for additive effects of the noncarcinogenic constituents was evaluated, including all detected metals and TPH. In accordance with the TSL guidelines (LDEQ *et al*., 2012), the total hazard index was calculated for each target organ/critical effect that is potentially affected by more than one constituent detected in crab tissue samples. Hazard Indices were calculated for ETC using average and maximum reported concentrations of TPH and metals (calculation provided in Table 6-12), and no potential human health concern is identified, i.e., Hazard Indices are less than 1. In addition, carcinogenic risk for the single carcinogen, inorganic arsenic, is within target risk range (LDEQ et al., 2012), as demonstrated by arsenic levels less than the TSL. The additive effects were also evaluated for consumption of meat and hepatopancreas, and no potential human health concern is identified.

Based upon the analyses conducted in accordance with the guidelines of the joint Louisiana agencies, no human health concern is identified. The total noncarcinogenic Hazard Indices and the carcinogenic risk for the constituents evaluated are within target risk range (LDEQ *et al*., 2012), indicating no further evaluation or corrective action is warranted for human consumption of fish/shellfish in the study area.

6.5.2 *Sensitivity Analyses*

Shellfish Consumption Rate: The TSLs are based on default exposure assumptions identified by the Louisiana agencies as broadly applicable and protective. The consumption rate was selected by the LDHH as a conservative value for the general population (typical consumer) intake of a particular seafood species from the specific water body under study. It is noted the LDHH has identified that fish and shellfish consumption advisories issued to date, including those in coastal Louisiana and Vermilion Parish, have identified and utilized the default exposure assumptions as appropriate and protective.[12] The TSL Guidelines note that TSLs can be developed using site-specific exposure data if available, reliable, and validated. The recommended sources for site specific consumption rates include EPA guidance documents, local validated consumption surveys, and creel surveys (Protocol, LDEQ et al. 2012). No site-specific studies of consumption habits for the East White Lake location were identified, however, directly relevant studies for coastal Louisiana consistent with the agency-recommended sources were identified and used to select a high end shellfish consumption rate to provide a sensitivity analysis. The most relevant studies and conclusions include the following:

- **US EPA, April 2014, *Estimated Fish Consumption Rates for the U.S. Population and Selected Subpopulations (NHANES 2003-2010).*** This resource provides fish and shellfish consumption rates, for use by EPA in developing water quality criteria, based upon a very large body of survey data. The National Health and Nutrition Examination Survey (NHANES) is a long standing continuous survey of nutritional habits in the U.S. for which the data are compiled periodically. This study represents the most recent publication compiling fish consumption rates across the U.S. This publication is particularly relevant because it is a recognized, statistically robust, vetted survey that includes information for fish and shellfish separately and for the subpopulation identified as Gulf of Mexico Coastal residents. The survey of this subpopulation included coastal areas of Louisiana, Mississippi, Alabama, Florida, and Texas. The survey reports the following total shellfish consumption rates for the coastal population of adults 21 years and older, considering consumption from all seafood sources (i.e., recreational harvest and market purchases):

Total Shellfish Consumption

50th Percentile of Population	*90th Percentile of Population*	*95th Percentile of Population*	*99th Percentile of Population*
4.8 g/day	20.1 g/day	28.4 g/day	48.6 g/day

The results indicate that 5% of the population is estimated to consume more than 28.4 g/day, and only 1% of the population is estimated to consume more than 48.6 g/day of total shellfish (crabs, shrimp, oysters) from all sources. The reported values support the LDHH's selection of 30

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[12] Personal communication with LDHH personnel, 2011 and 2014.

g/day consumption rate from a single recreational fishing area (e.g., solely from East White Lake) as conservative for general population consumption. The EPA has identified that protection of the general population is represented by the 90th percentile of a total "per capita" fish consumption distribution. EPA has identified the 99th percentile of a per capita fish consumption distribution as a reasonable estimate for subsistence consumption rate, where such populations are present (USEPA, 2013). No subsistence population has been identified in the site location.

- **Lincoln et al., 2011, *Fish Consumption and Mercury Exposure Among Louisiana Recreational Anglers.*** This resource was published by independent researchers who conducted a survey of over 500 Louisiana fishermen. The research protocol and survey instrument were reviewed and approved by the Harvard School of Public Health. Based upon survey responses, the following fish and shellfish consumption information was identified. The overall consumption of combined finfish and shellfish included 55 g/day or less for 98% of the population (percentage calculated from Table 1). This consumption was comprised of approximately 60% finfish and 40% shellfish, and approximately 64% of all meals came from recreational sources. Based upon this survey, therefore, the following total shellfish ingestion rate from recreational sources was estimated:

  55 g/day x 40% shellfish x 64% recreational = **14 g/day Total Shellfish**

  Crab consumption, specifically, was identified as comprising 10% of all meals, therefore a consumption rate specifically for recreationally caught crab is even lower at 3.5 g/day for 98% of the fishermen population. An examination of the consumption rate for the remaining 2% of the population indicates the following for total shellfish consumption:

  129 g/day x 40% shellfish x 64% recreational = **33 g/day Total Shellfish**

  The consumption rate specifically for recreationally caught crab is estimated at 8.3 g/day for 2% of the fishermen population identified as the high end consumers. These consumption values reported by Lincoln et al. for Louisiana fishermen support the LDHH's selection of 30 g/day consumption rate from a single recreational fishing area (e.g., solely from East White Lake) as conservative for average and even high end consumption.

Based on the relevant studies, an increased ingestion rate for edible crab tissue of two times the agency-recommended default ingestion rate (i.e., 30 x 2 = 60 g/day) was considered highly conservative and was evaluated to test the sensitivity of the risk assessment conclusions to an increase in consumption rate.[13] The rate of 60 g/day was used to develop alternate TSLs, and the ETC, meat and hepatopancreas concentrations were compared to the alternate TSLs. The detailed TSL calculations are provided in Appendix G. No change to the conclusions of the primary assessment is identified, considering this increased ingestion rate for ETC and separately for meat and hepatopancreas. That is, the mean concentrations of metals and hydrocarbons are below their respective TSLs for ETC, meat, and hepatopancreas in site, reference, and market samples (Table 6-13). In fact, concentrations of the constituents reported in individual samples (ETC, meat, and hepatopancreas) are below the alternate TSL developed assuming twice the agency-recommended ingestion rate. When additive effects are considered in accordance with the applicable guidelines, no potential human health concern is identified; Hazard Indices are less than 1 and estimated carcinogenic risk is within target risk range.

The sensitivity analysis provides increased confidence in the conclusion that reported concentrations are protective of human health assuming crabs are harvested solely from the study area and consumed at the expected and even higher ingestion rates.

Hydrocarbon Range: Because the laboratory identified that TPH reported in the carbon range above C28 reflects the natural organic matter (lipids) in biological tissue, with no distinguishable petroleum hydrocarbon in the chromatograms, the range of potential petroleum hydrocarbon recommended for use in risk evaluation was the full range up to C28. As a sensitivity analysis and to provide additional information, the concentrations in the >C28 to C40 range were examined relative to the TSLs for the higher range hydrocarbons (i.e., the TSL was compared to >C16 to C40 concentration in addition to the >C16 to C28 concentration addressed in the primary assessment) (Table 6-14). No change to the conclusions of the primary assessment is identified, considering the potential presence of petroleum hydrocarbon components in the >C28 range. That is, the mean concentrations of organic material in the >C16 to C40 range are below the TSLs for ETC, meat, and hepatopancreas in site, reference, and market samples. Additionally, the ETC, meat, and hepatopancreas concentrations of >C16 to C40 organics reported in individual samples are below the TSL developed assuming the agency-recommended default fish and shellfish consumption pattern. Further, the mean ETC, meat, and hepatopancreas concentrations of the constituents, as well as individual sample concentrations, are below the alternate TSL developed assuming twice the agency-recommended ingestion rate.

Forage Fish: Forage fish were collected and analyzed using methods which support evaluation of ecological risk: whole body samples of shad and blue gill were processed and analyzed according to scientifically valid, standard

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[13] Additional relevant studies which support this conclusion include Dellenbarger et al., 1993 (survey of 1100 households in Houma); LDWH, 2009 (Louisiana Recreational Fisherman survey report); Anderson and Rice, 1993 (survey of 400 New Orleans residents); Wilson et al., 2015 (survey of Vietnamese shrimping community in New Orleans East).

procedures. Based upon data quality review completed by QAA, the fish tissue data were confirmed to meet the requirements for representative, definitive data as defined by LDEQ with the exception of two hydrocarbon fraction results that were R-qualified in reference samples (Appendix E, Table E-9). While the fish tissue data do not generally represent species and sizes that are relevant for human consumption, bluegill are consumed by some populations, and ingestion can be evaluated by comparing the available fish tissue data to the TSLs. The mean fish tissue concentrations of metals and hydrocarbons (C8-C16 and >C16-C28 carbon ranges) are below their respective TSLs in site and reference samples (see comparison provided in Table 6-15). Additionally, none of the concentrations of any constituents in individual samples exceed the TSLs developed in accordance with the Louisiana guidelines. The mean fish tissue concentrations of the constituents, as well as individual sample concentrations, are also below the alternate TSL developed assuming twice the agency-recommended ingestion rate for fish or shellfish.

6.5.3 *LDHH Crab Collection and Evaluation*

The comprehensive results of the crab and forage fish sampling and analysis program, and the comparison of edible tissue results for crab to TSLs were previously reported to LDEQ, LDHH, LDNR, and LDWF in a report dated March 6, 2014 (ERM, 2014). The LDHH provided an independent review of the results in a report of March 13, 2015, and concurred with the conclusions, which have been presented (i.e., repeated) herein as part of this RECAP assessment for ease of agency review. The LDHH report of March 13, 2015 also provided a review of blue crab data collected in October 2010 on behalf of the Vermilion Parish School Board by Omega EnviroSolutions, Inc., OES, and the results of crab sampling and analyses performed by the LDHH in November 2010. The complete LDHH report is provided in Appendix H.

The LDHH report identified the following conclusions:

- OES sampling methodology, laboratory analysis and data evaluation are not consistent with the human health advisory development process. October 2010 OES data are inadequate to support a consumption advisory for the East White Lake sampling areas.
- The ERM-reported crab tissue samples were collected and analyzed in accordance with the Louisiana advisory Protocol. Reported constituent concentrations detected in crabs from the East White Lake areas of interest are below levels of health concern; no potential human health hazards are identified.
- The November 2010 LDHH crab tissue data were collected to further characterize edible crab portions from the areas of interest. Sampling was conducted by LDHH in accordance with the Louisiana advisory Protocol, and analyses were performed for total arsenic and barium. Mean concentrations were below respective TSLs. Although speciation methodology was not available at the time of laboratory analyses to quantify inorganic arsenic content, LDHH data do not support the need for a consumption advisory due to barium and arsenic concentrations in crab tissue.

6.5.4 LDEQ Mercury Monitoring Program – Biota Data Collection

As part of the Louisiana Mercury Program (also known as the Mercury Initiative) started by the LDEQ in 1994, the collection and analysis of fish tissues for mercury have been conducted by LDEQ in water bodies across the state. Initial sample collection was focused on problematic water bodies such as the Ouachita River, and the program was subsequently expanded to include sampling of all popular recreational fishing locations such as the White Lake area. Samples of various fish species were collected from the White Lake water segment near the East White Lake study area in 1998, 2003, 2004, and 2008. Fish species collected and analyzed included bowfin, drum, crappie, bass, and catfish. Composite samples were analyzed for total mercury, and the results were used by LDEQ and LDHH to examine the need for public health consumption advisories. The results are publicly available and are summarized in Appendix I.[14] All individual sample results were less than or equal to the mercury TSL of 0.7 mg/kg, and all species average concentrations were less than the TSL. No consumption advisories have been issued for the White Lake study area based on the available data.

6.6 CUMULATIVE RISK

In accordance with Section 6.5 of RECAP, which addresses the application of MO-3 RECAP Standards, cumulative exposures were addressed in addition to comparison of the individual constituent levels to RECAP Standards. Additivity was appropriately addressed in the development of RECAP Standards for the individual media, including sediment, ground water, surface water, and crab tissue in accordance with RECAP and LDHH guidance. Exposure to multiple media has been addressed in two ways:

- Summation of the carcinogenic risks and noncarcinogenic hazards estimated as the ratio of site concentrations to final MO-3 RECAP Standards, and
- Through comprehensive baseline risk evaluation prepared by Dr. Barbara Beck of Gradient in accordance with EPA guidance (the "forward" calculation of risk completed in the baseline assessment readily supports a cumulative risk calculation).

Summation of RECAP MO-3 Estimates. The cumulative noncarcinogenic hazard was estimated by calculating the ratio of AOIC or Compliance Concentration to limiting MO-3 standard (prior to additivity adjustment) for each constituent in each exposure medium to provide Hazard Quotients, and then summing the Hazard Quotients for constituents (in all exposure media) affecting the same target organ/system. The resulting values are organ-specific Hazard Indices.

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[14] http://www.deq.louisiana.gov/portal/tabid/2733/Default.aspx

The calculation is provided in Table 6-16, and includes the following Reasonable Maximum Exposures: direct contact with sediment, recreational contact with wash water from wells completed in the 40-Foot Zone (dermal, shower inhalation), recreational contact with surface water, and ingestion of shellfish (crabs) harvested from the East White Lake study area. The estimated noncarcinogenic Hazard Indices (HIs) for organs/systems affected by more than one constituent and multiple media are as follows:

Target Organ/System	HI
Skin	0.02
Kidney	0.7
Immune System	0.1
Liver	0.3
Blood/Hematologic.	0.2
Bone	0.002
Body Weight	0.1
Neurological/CNS	0.2

The cumulative, multi-media HIs are less than the target value of 1. This evaluation demonstrates that when the most detailed HI approach is used for hazard estimation (instead of the simplified additive divisor approach), all reported concentrations including those at WL-3 are estimated to be protective of Reasonable Maximum Exposures, including both industrial and recreational.

The cumulative cancer risk was also estimated by calculating the ratio of AOIC or Compliance Concentrations to the limiting MO-3 standard for each carcinogenic constituent in each exposure medium, and multiplying by the target risk used for MO-3 development (Table 6-17). This provides a cancer risk estimate for each constituent, which was then summed to include all carcinogenic constituents across all exposure media. The resulting value is a cumulative carcinogenic risk estimate of $5x10^{-6}$, which falls within the target range identified in RECAP.

The conclusions regarding cumulative hazard and risk are consistent with the conclusions of the baseline risk assessment conducted by Gradient and summarized below. A risk calculation was not performed for the 40-Foot Zone hypothetical scenario of drinking or domestic use. The standards identified for this scenario (default GW2) are MCLs, and exceedance of the MCLs is presumed non-compliant for the assumed hypothetical scenario.

<u>Comprehensive Baseline Risk Evaluation, Gradient 2015.</u> Cumulative risk estimates were identified in the Gradient report using EPA risk assessment guidelines for the following site-specific exposures:

- Recreational contact with sediment (ingestion, dermal contact);
- Recreational contact with 40-Foot Zone ground water (dermal, inhalation of volatiles);
- Ground water ingestion from Upper Sand of Chicot Aquifer;
- Recreational contact with surface water (dermal); and
- Consumption of crabs.

For the adult recreational receptor, cumulative risk estimates were:
Risk = $7x10^{-6}$
HI = 0.8 (maximum target organ-specific value)

For the child recreational receptor (11-16 years), cumulative risk estimates were:
Risk = $1x10^{-6}$
HI = 0.8 (maximum target organ-specific value)

For the Industrial Worker, and assuming crab consumption as well, cumulative risk estimates were:
Risk = $8x10^{-6}$
HI = 0.9 (maximum target organ-specific value)

The total cumulative cancer risk estimates provided by Gradient for the East White Lake study area fall within the target risk range identified by LDEQ and EPA. The target organ-specific cumulative noncarcinogenic Hazard Indices for site-related hazards are less than the target of 1.

6.7 UNCERTAINTY ANALYSIS

Risk assessment inherently involves uncertainties due to the assumptions that must be made regarding complex chemical behavior in the environment and in biological systems, as well as assumptions regarding events that will occur in the future. Assumptions are made based on the best available information and regulatory agency guidance. Generally, these assumptions err on the side of conservatism with the objective of supporting decisions that are protective of human health. Risk assessments are not intended to determine actual risks to an individual receptor associated with exposure to COCs in the environment. Rather, risk assessment is a means of estimating the upper bound probability that an adverse health effect may occur in a receptor at some point in the future as a result of the nature and magnitude of exposure assumed in the assessment. Because there are multiple conservative assumptions used in the process, risk-based standards (i.e., the RECAP Standards) are lower than the threshold limit of adverse health effects.

This section discusses sources of uncertainty that have the greatest potential impact on this site-specific risk assessment, efforts to minimize uncertainties when possible, and how uncertainties may affect the risk characterization.

Site Characterization: The goal of a sampling program is to collect data which will represent the nature, extent, and magnitude of chemical constituents present in the media of concern. The amount of data collected in a sampling program and the placement of sample locations can affect the results of the exposure point concentration calculation when statistical inference is made about the entire affected area based upon the sample data. Many of the samples (e.g., sediment, biota) were collected in areas where waste management activities were believed to have occurred, and sample selection was biased towards locations and intervals that appeared to be most impacted based on visual, olfactory, and instrument reading cues. Potential exposure was estimated in this risk evaluation using maximum reported concentrations, as a simplifying and conservative approach. Statistical averaging was not performed for the primary evaluation presented in Sections 5 and 6, except for biota. For biota, both average and maximum concentrations were examined and demonstrated to comply with the risk-based standards. The combination of biased sampling and use of maximum reported concentrations to demonstrate compliance with RECAP Standards provides a high level of confidence in the conclusion that realistic exposure levels at the site are protective of health. The large number of samples available to characterize sediment and crabs, in particular, at the site also provides increased confidence in the conclusions regarding potential human health risk. Split sampling of sediment, surface water, and ground water provided increased opportunity to closely examine the representativeness of individual results.

The COCs identified as site-related are consistent with those expected for oil and gas E&P sites, including metals (barium and mercury) and hydrocarbon components. In a sediment environment that is naturally rich in organic material, distinguishing hydrocarbons from organic non-petroleum material is more challenging than in other environments. For this reason, the use of hydrocarbon fraction analyses is important and most representative for this site.

Hydrocarbon Mixture Risk Evaluation: As discussed in Section 3.5.1, hydrocarbon fraction analyses were used in the primary evaluation of risk for the site. The hydrocarbon mixture results (TPH-GRO, DRO, ORO) include naturally occurring organic matter and polar non-hydrocarbons (e.g., hydrocarbon degradation products) in addition to petroleum hydrocarbons in the reported concentrations (Lundegard and Sweeney, 2004; Zemo et al., 2103). In addition, the mixture results provide no specific information about the composition (e.g., aromatic, aliphatic) of the mixture, and therefore limited ability to assign an appropriate toxicity factor. The combination of uncertainties in compound identity, concentration, and toxicity standard results in a low level of confidence for making risk management decisions based on TPH-GRO, DRO, and ORO results. The utility of the fractionation approach is its ability to quantify tighter ranges as well as aliphatic and aromatic composition of all forms of petroleum products, whether fresh or weathered. This enables the risk assessor to assign appropriate toxicity factors to the site-specific composition of hydrocarbons.

In sediment, hydrocarbon fraction data were not available for all sediment sample locations where TPH mixtures were detected, but fractions were available for 52 of the 136 samples with detected TPH mixtures. Fraction analyses were focused on the upper end of the TPH mixture range, and are available for 26 of the 30 locations with highest mixture concentrations. Consistent with LDEQ implementation of RECAP, sampling and analysis of the highest TPH locations for fractions provides an appropriate, defensible basis for risk characterization at the site. The following information regarding risk evaluation for TPH mixtures where fraction data were unavailable is provided solely for supplemental and complete information.

Considering the reported TPH concentrations where fraction data were not collected, the maximum reported TPH concentrations in sediment were as follows:

Constituent	**Max Concentration in 0-3 Foot Interval (mg/kg-wet)**	**Max Concentration All Depths (mg/kg-dry)**
TPH-GRO	ND (50)	ND(70.6 to 177)
TPH-DRO	2550 Sed-120 (0-6")	14300 Sed-120 (0-6")
TPH-ORO	1450 Sed-120 (0-6")	8150 Sed-120 (0-6")

Reported concentrations exceeded the TPH-DRO industrial direct contact screening standard of 510 mg/kg in three locations, and non-industrial (residential) screening standard of 65 mg/kg in 24 locations in the surface sediment interval (Table 6-18 lists the samples exceeding screening standards, warranting further evaluation). Reported concentrations exceeded the TPH-ORO non-industrial (residential) screening standard of 180 mg/kg in 14 locations in the surface sediment interval (Table 6-18). MO-3 RECAP Standards were identified for TPH-DRO and TPH-ORO, for both industrial and recreational land use, as the lowest fraction standard within the DRO and ORO ranges identified in Table 6-3. When the sediment concentrations are compared to MO-3 RECAP Standards (Table 6-18), no reported TPH results exceeded the final industrial standards and a single location exceeded the limiting (child) recreational standards of 1100 mg/kg for TPH-DRO and 1150 mg/kg for TPH-ORO: sample Sed-120 (0-6"). This sample location is the same as Sed-30, and hydrocarbon fraction data are available for Sed-30 (0-2'): the fraction results were less than both industrial and recreational standards.

Reported concentrations exceeded the TPH-DRO SoilGW3NDW standard (protective for the shallow Peat Zone) of 6100 mg/kg in two sample locations: AB-13 (4-6') and Sed-120 (0-6"). All other TPH-DRO and ORO results were below their respective ground water protection standards, without application of a dilution-attenuation factor. Fraction data available for other samples with similar or higher TPH mixture concentrations demonstrated compliance with the SoilGW3NDW standards protective for the shallow Peat Zone, and the conclusions based upon the large body of fraction data provide the more site-specific analysis.

PAHs: PAHs are identified in RECAP Appendix D as indicator constituents for crude oil range petroleum hydrocarbons. PAHs were analyzed in a subset of surface water and sediment samples, and reported concentrations were below health-based standards as demonstrated in Sections 5 and 6. Sediment is the primary medium of focus for PAHs in this environment because of the hydrophilic nature of these compounds and the organic rich sediment. ICON selected 11 samples from 5 boring locations for PAH analysis during the initial sampling completed in 2006 (see Appendix E, Table E-1). Based upon results of ICON's initial sampling and analysis for TPH mixtures (specifically DRO and ORO), MP&A returned to sampling locations that represented a range of mixture results to collect additional samples and analyze for the PAH indicators. To support analysis in the interval relevant to ecological receptors as well as humans, samples were collected in the 0-6" interval and included locations of highest TPH results available. The range of TPH-DRO and ORO results that triggered the selection of the sample locations included in this sampling program are identified below.

Location	TPH-DRO (mg/kg-wet)	TPH-ORO (mg/kg-wet)
Sed-8	108	96.4
Sed-9	57.4	103
Sed-11	337	260
Sed-15	50300	21800
Sed-19	2350	798

Location	TPH-DRO (mg/kg-wet)	TPH-ORO (mg/kg-wet)
Sed-24	297	294
Sed-26	10900	4770
Sed-31	1480	668
Sed-120**	7700	4180

Values are ICON results for 0-2 ft bgs samples collected by ICON February 2010
** Location Sed-30

The reported PAH concentrations are provided in Appendix E, Table E-1. The concentrations were evaluated through screening (Section 5) and MO-3 (Section 6) assessment, and maximum reported concentrations in sediment were less than RECAP Standards for industrial land use, recreational use, and for protection of ground water.

Exposure Scenarios: Assumptions that express Reasonable Maximum Exposure for an industrial worker and for a recreational visitor were used in this risk assessment. The industrial exposure scenario uses default assumptions and addresses contact with sediment 5 days per week for a duration of 25 years. This is a highly conservative scenario for sediment exposure. The recreational scenario includes a site visitation frequency that is consistent with available information regarding current use, and consistent with or higher than exposures assumed in recreational scenarios approved by LDEQ and EPA Region 6 for other relevant sites. To the extent that a greater frequency of visitation is possible, the Margin of Exposure (MOE) evaluation provided in the report of Dr. Barbara Beck demonstrates that greater exposure than has been assumed in the recreational exposure scenario is not estimated to result in significant human health risk (Gradient, 2015). The margin of safety is a factor of more than 10 to over a million when site chemical intake levels are compared to levels known to result in adverse effects in test species (see discussion below under Toxicity Assessment).

Exposure Concentrations: The inherent assumption in identifying a single concentration as the RECAP Standard is that an individual will experience intake in the same manner, containing the same chemical concentration, every day of the exposure scenario. Particularly in scenarios involving long-term exposure periods like the 25 year (industrial) and 30 year (recreational) durations assumed for this site, it is unrealistic to assume that the individual would be exposed uniformly to the maximum reported value.

Additionally, from scientific studies it is known that the concentration of a chemical that is measured in the environment is not entirely bioavailable (e.g., EPA has recognized reduced bioavailability of metals in soil and sediment, such as 0.6 availability for arsenic). Because RECAP identifies a default bioavailability factor of 100%, this conservative assumption was used for all COCs, for all media, in the RECAP assessment. This approach overestimates the exposure that occurs, particularly for sediment; as a result, the estimated RECAP Standards are lower than levels that would also be protective if bioavailability were considered.

Dry Weight Exposure Concentrations Compared to Direct Contact Standards: RECAP provides specific guidance for use of wet weight data in comparison to direct contact standards. This method was confirmed by LDEQ for sediment risk evaluations previously submitted and approved under RECAP MO-3.[15] EPA requires use of dry weight concentrations for evaluation of the direct contact pathway. For complete information, the direct contact evaluation was also performed using the dry weight results, and changing no other factors (see Table 5-3 for list of samples included). The results of the screening assessment indicate the maximum concentration of one additional metal (arsenic) exceeds the non-industrial (residential) screening standard and warrants further evaluation under MO-3 (see Appendix K, Table K-1 for screening results). All other COCs for MO-3 evaluation remain the same.

MO-3 RECAP Standards are identified for the constituents exceeding screening standards in Appendix K Table K-2, for both industrial and recreational land use, using the same scenarios identified previously for the wet weight assessment. The reported sediment concentrations (in dry weight) are compared to the limiting MO-3 RECAP Standards in Table K-2, and cumulative hazard is calculated using the target organ Hazard Index approach identified in Appendix G of RECAP.

Arsenic exceeds the MO-3 standard of 12 mg/kg in the following locations in dry weight units:

B2 (2-4′)	13.8 mg/kg	SS7 (1.4-2.5′)	21.5 mg/kg
B19 (1-2.5′)	15.4 mg/kg	AB13 (0-3′)	12.9 mg/kg
SS7 (0-1.4′)	22 mg/kg	AB-13 (0-3′)	17.6 mg/kg (resample)

Further evaluation is therefore performed for arsenic to determine if the average concentration across the AOI differs from the state-specific background level of 12 mg/kg. The average concentration in the surface interval was calculated using the data within and between the oilfield access canals, south of Schooner

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[15] RECAP Management Option 3 Report Bayou Trepagnier Operable Unit 2, prepared by URS Corporation November 20, 2009 (Revision 2)

Bayou (excluding data collected from Schooner Bayou and White Lake) (calculation provided in Table K-3). The average arsenic concentration (6.4 mg/kg-dry) is less than 12 mg/kg, indicating concentrations are no different from the state-specific background level on average, and concentrations comply with the RECAP Standard in accordance with RECAP Section 2.13.

No exceedances of additional MO-3 standards are identified in Table K-2. Therefore, the dry weight assessment results in no additional areas for corrective action relative to the wet weight assessment.

Toxicity Assessment: Toxicity factors used in the risk assessment are primarily derived from laboratory animal studies that were extrapolated to allow for evaluation of human effects. Although animal study data are derived from rigorous scientific experiments, there are a number of uncertainties involved in the use of these data for human effects. These include treatment of benign tumors as malignant, use of the most sensitive species and sex, and high dose to low dose extrapolation. The toxicological models that are used in the derivation of reference doses and slope factors include application of factors to address the uncertainty and to reduce the likelihood that human risk will be underestimated. These factors are intended to err on the side of caution in identifying constituent levels that may be associated with potential human health effects.

Dr. Beck has provided an analysis of the Margin of Exposure (MOE), also referred to as the margin of protection, which compares estimated chemical intake at the site to doses identified in the underlying toxicity studies as resulting in observed adverse effects (Gradient, 2015). The larger the MOE, the safer the margin of protection for site concentrations. The MOE analysis demonstrates that plausible exposures at the site are not estimated to result in adverse health effects based upon the supporting toxicological studies. Alternatively, exposures beyond plausible scenarios would be required to reach intake levels equivalent to those identified as resulting in adverse effects in test species. This kind of analysis increases confidence in the conclusion that site concentrations are protective of potential human receptors under Reasonable Maximum Exposure assumptions.

A potential source of underestimation of risk is unquantified synergistic effects for multiple constituents, for which toxicological data are unavailable for risk evaluation. However, where applicable, potential additive effects have been addressed in this risk evaluation.

Summary: Although all risk assessments involve uncertainty, the risk assessment conducted for the East White Lake study area was prepared utilizing risk protocols that attempt to reduce uncertainty in as many areas as possible. As a matter of practice and policy, subjective decisions for assigning risk assessment factors generally included a choice on the conservative end of the range of potential values. Site-specific information was used where possible in combination with LDEQ and EPA guidance. The evaluation provided in this risk assessment reflects Reasonable Maximum Exposure to the best of the submitter’s knowledge, and incorporates a reasonable degree of conservatism. As a result of the combination of conservative assumptions, risk assessments (and RECAP assessments) generally overestimate exposure and risk. EPA study has indicated that the net result of compounded conservatism in risk evaluation is an estimation of risk that, in all likelihood, is one or more orders of magnitude higher than the actual risk. For this purpose, EPA emphasizes that it should be explicitly stated that the procedures used for cancer risk assessment represent a "plausible upper limit to the risk ... [and that] the true value of the risk is unknown and may be as low as zero" (EPA, 1989)." With this in mind, this risk assessment has attempted to utilize assumptions that will not underestimate risk yet will represent risk within the plausible range, such that the results are meaningful and assist in making informed risk-based decisions regarding use and management of the site.

7.0 ECOLOGICAL RISK EVALUATION

In accordance with guidance presented in Section 7.0 of RECAP (2003), an ecological screening checklist was completed to determine the need for ecological risk evaluation considering the site setting, physical features, and media affected with site-related constituents. The ecological checklist (RECAP Form 18) is provided in Appendix J.

The checklist screening results included a recommendation to complete further ecological evaluation based upon location of the site and detected constituents within a wetland area. The detailed assessment is presented in a separate report and included the following components, in general:

- Multiple site inspections and characterizations,
- Information from investigations conducted in 2010 to 2015 regarding the wildlife, vegetation, and sediments,
- Analysis of wetland functions and services provided by the site,
- Screening-Level Ecological Risk Assessment (SLERA),
- Site-specific Baseline Ecological Risk Assessment (BERA), and
- An intensive study of crabs and forage fish to measure potential bioaccumulation of elements from the site.

The ecological risk evaluation identified the following conclusions: the vegetation in the East White Lake study area is growing vigorously and does not exhibit any diagnostic symptoms of exposure or adverse effects due to oil and gas E&P activities. The property is providing significant wildlife habitat as would also be expected for wetlands in this area. There is evidence of healthy wildlife and game animals, and no evidence of adverse effects on wildlife from past or ongoing E&P activities. Based on observations and field sampling, ecological populations have not been adversely affected.

The structural components of this ecosystem (e.g. plants and animals) are abundant, diverse, and in good health. Services expected for property in this area (water storage, soil stabilization) are being provided. Wetlands in the East White Lake study area are providing valuable functions and services for both wildlife and people living in the vicinity.

The site-specific BERA quantitatively confirms that historical E&P activities on this site do not pose an unacceptable risk to wildlife. The various lines of evidence each independently demonstrate that no unacceptable risk exists on the property from an ecological perspective.

8.0 RECAP EVALUATION RESULTS AND RECOMMENDATIONS

A site-specific risk evaluation was performed under MO-3 of RECAP in order to fully address all media investigated at the East White Lake study area. Sediment, ground water, surface water, and biota tissue were sampled and analyzed for potential constituents of concern, and reported concentrations were compared to protective standards for human health developed in accordance with applicable guidance of RECAP and other LDEQ regulations, EPA guidance, and LDHH protocols.

Current and future uses of the property were identified as industrial and recreational based on the conceptual site model and exposure assessment. In addition to a default industrial scenario, site-specific exposure scenarios representative of Reasonable Maximum Exposure for recreational receptors were used in the development of MO-3 RS. The scenarios were developed based upon a combination of site-specific information and LDEQ and EPA sources, consistent with the requirements of the RECAP regulation. The evaluation of the default industrial scenario meets the requirement of RECAP to ensure that properties remain suitable for commerce and industrial use.

The results of the risk assessment and recommendations for further action are summarized below.

8.1 SEDIMENT EVALUATION

Two sample locations are identified as exceeding the limiting RECAP Standards for hydrocarbon constituents in sediment: WL-3 and WL-4. For the remaining samples collected across the site from over 100 boring locations, maximum reported concentrations in sediment are less than RS for industrial land use, recreational use, and for protection of ground water. The comprehensive assessment included evaluation of direct contact with near surface sediments, including those located at the base of canals, and evaluation of ground water protection for sediment at all depths (surface and subsurface).

One hydrocarbon fraction in sample WL-3 (0-2′), collected within the active Tank Battery A operational area, exceeded a recreational contact standard[16] and was below the industrial contact standard. Concentrations reported in samples collected deeper in this location were less than the direct contact standards. The sediment samples collected at WL-3 (0-2′) and WL-4 in the 4-11′ and 11-12.5′ bgs intervals exceeded a total hydrocarbon fraction concentration of 10,000 mg/kg, which is identified in RECAP as an aesthetic standard and not a health-based standard. WL-4 is located within a former pit feature in an area that is no longer in active E&P operations (former Tank Battery B area). Samples collected deeper in the WL-3 and WL-4 locations were less than the aesthetic limit. Figure 6-2 identifies these sample locations with reported hydrocarbon fraction concentrations greater than RECAP Standards.

A corrective action plan to address the former pit, where sample location WL-4 was collected, is being provided by MP&A to LDNR in the site remediation plan (MP&A, 2015a). The proposed action includes lateral delineation, excavation,

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[16] Standard developed using the simpler additive divisor approach.

confirmation sampling, and backfilling with clean sediments. The scope of this action will address the exceedance of RS at WL-4. Should ongoing operations be discontinued in the Tank Battery A area where sample WL-3 was collected, and the area made available for recreational use, the need for corrective action (and potential scope of remediation) should be addressed at that time. Under current site conditions and operations, hydrocarbon concentrations at the WL-3 location are protective of the industrial workers.

8.2 *GROUND WATER EVALUATION*

The ground water zones sampled and evaluated under RECAP included a shallow Peat Zone, 40-Foot Zone, 70-Foot Zone, 90-Foot Zone, and Upper Sand of the Chicot Aquifer (at greater than 400 feet bgs). Compliance Concentrations (i.e., maximum concentrations) of all AOIs/COCs were below Class 3 ground water RS (GW3NDW) for the Peat Zone, demonstrating concentrations are protective of potential surface water receptors.

For the 40-Foot Zone, Compliance Concentrations of site COCs were below site-specific recreational use standards, considering the current and potential future use of ground water for non-potable purposes in a camp water supply well. Using default Class 2 (GW2) health-based standards that are based on assumed use of ground water as a primary drinking water supply (with no dilution assumed), three AOIs were identified for the COCs benzene (present in one AOI) and barium (present in all three AOIs). Additionally, chlorides exceeded the natural (background) levels in the same AOIs, and chlorides naturally exceed the aesthetic standard for drinking water. Figure 6-3 identifies the AOIs relative to default GW2 standards.

There is currently no exposure to ground water within the default AOIs, and there is no human health risk associated with the concentrations reported in the ground water samples. The exceedances of default health-based standards (benzene and barium) are reasonably delineated and no threat is identified for the non-potable supply wells that are completed in this zone (i.e., the Hebert well and abandoned Crouch well north of the AOIs and Schooner Bayou). The estimated flow direction of the 40-Foot Zone is to the west/southwest, and will be confirmed through additional monitoring proposed by MP&A. The 40-Foot Zone ground water is not a desirable drinking water source under natural conditions based on the iron, manganese and salt (chlorides) levels well above secondary drinking water standards that result in objectionable taste, color, and possibly odor.

No exceedances of health-based RS are identified for site COCs in deeper ground water zones. Within the 70-Foot Zone, chlorides appear elevated beneath AOIs of the 40-Foot Zone, but the concentrations demonstrate attenuation relative to the 40-Foot Zone. No impact by site COCs is identified in the 90-Foot Zone or Upper Sand of the Chicot Aquifer. The Upper Sand of the Chicot Aquifer is the first naturally fresh zone of ground water beneath the site, generally expected to meet the SMCL for chlorides. Chlorides were confirmed to be below the SMCL in samples collected from this zone at the site.

8.3 SURFACE WATER EVALUATION

The maximum reported concentrations of all constituents detected in surface water samples, collected from the oilfield access canals and from locations outside of the canals along Schooner Bayou and White Lake, were less than standards developed using RECAP default methods for surface water designated NDW in the Surface Water Quality regulations. The maximum reported concentrations were also less than site-specific recreational RS calculated in addition to the default RECAP methods. The results indicate concentrations are protective of surface water users, including the full range of primary contact and secondary contact (fishing and ingestion of fish) recreational activities.

Chlorides are not a concern for adverse effects to human health in recreational surface waters. In general, the chlorides concentrations in Schooner Bayou were higher than those in the oilfield access canals. This is consistent with the US Army Corps of Engineers monitoring of Schooner Bayou, which demonstrates tidal influence from the saltier water of Vermilion Bay.

The conclusions of this surface water evaluation, using direct measurements of surface water conditions, confirm the conclusions for Peat Zone ground water which indicated that concentrations of COCs detected in the Peat Zone were estimated to be protective of adjacent surface waters based on the default RECAP models.

8.4 BIOTA (CRAB TISSUE) EVALUATION

The mean and maximum concentrations of constituents reported in crab meat and hepatopancreas samples collected within the oilfield access canals and reference locations along Schooner Bayou and White Lake were less than screening levels developed for public health protection in accordance with state-specific tissue screening level guidelines. The guidelines were developed jointly by the LDHH, LDEQ, LDWF, and LDAF to determine the need for consumption advisories regarding health risks to the public who fishes recreationally and routinely at a specific water body. The biota tissue collection and analyses were performed using scientifically valid procedures consistent with Louisiana guidelines and provided representative data for edible tissues, appropriate for comparison to the screening levels, called TSLs. The comparison to TSLs indicated concentrations are below protective levels and no human health concern is identified.

The sensitivity of the conclusions to a change in intake assumptions was examined. In particular, an increase in ingestion rate was evaluated to understand the potential effects of consumption at a rate greater than the default specified for the general Louisiana population. No change in the conclusions resulted from an increased ingestion rate consistent with relevant studies for Gulf Coast consumers. The results of the sensitivity analyses support a high level of confidence in the conclusion that reported concentrations are protective of human health, even assuming crabs are harvested solely from the study area and consumed at the expected (general population) or higher ingestion rates.

The LDHH provided an independent review of the sampling and risk assessment results, which were provided to LDHH in a prior report (ERM, 2014). In LDHH's report of March 13, 2015, the LDHH confirmed that the crab tissue samples were collected and analyzed in accordance with the Louisiana advisory Protocol and that concentrations in crab were below levels of health concern. Additionally, the LDHH reported its own collection and analysis of edible crab tissues from the East White Lake area. Based on collection of crabs during November 2010 and analyses of arsenic and barium, LDHH concluded the results are protective of health and do not support the need for a consumption advisory due to concentrations in crab tissue.

8.5 ECOLOGICAL EVALUATION

An ecological risk evaluation was performed and is presented separately from this RECAP report addressing protection of human health. The conclusions of the ecological risk assessment indicate that there is evidence of healthy wildlife and game animals in the East White Lake study area, and based on observations and field sampling, ecological populations have not been adversely affected.

The structural components of this ecosystem (e.g. plants and animals) are abundant, diverse, and in good health. Wetlands in the East White Lake study area are providing valuable functions and services for both wildlife and people living in the vicinity.

The site-specific BERA quantitatively confirms that historical E&P activities on this site do not pose an unacceptable risk to wildlife. The various lines of evidence each independently demonstrate that no unacceptable risk exists on the property from an ecological perspective.

8.6 SITE RANKING

A site ranking value was selected from the information provided in the LDEQ RECAP guidance and the *Standard Guide for Risk-Evaluation/Corrective Action at Petroleum Release Sites* (ASTM E 1739-95). The site ranking is intended to provide information on the urgency (or the limited urgency) of response action for protection of human health and the environment. A ranking value of 3 is appropriate considering the risk assessment results for sediment, ground water, surface water, and edible crab tissue (1=immediate threat; 4= no demonstrable threat).

The ranking of 3 is identified for the following reasons:

- A single shallow sediment sample contained a concentration above the recreational direct contact standard. The sample is located in an actively operating industrial area, and the concentration is below industrial standards.
- Exceedances of aesthetic standards for hydrocarbons in two boring locations do not pose a health risk. Corrective action has been proposed for the location that is outside of active E&P operations areas.
- Constituent concentrations above default, health-based RECAP Standards occur in ground water in the 40-Foot Zone. There is no use of ground

water within the AOIs and no threat of impact to the existing water well users north of the AOIs. Existing water use is for non-potable purposes at recreational camps, e.g., as wash water. It is likely that future use of this zone, if any, would be similar given natural conditions that make the water unpalatable. Concentrations within the AOIs are protective for such non-potable use.

- Constituent concentrations in surface water are less than water quality standards and RS protective of the full range of recreational uses as designated in the Louisiana Water Quality regulations.
- Constituent concentrations in edible crab tissues are below screening levels protective of human health.

8.7 RECOMMENDATIONS FOR SITE MANAGEMENT

Based on the results of the RECAP evaluation, concentrations remaining in sediment and ground water are protective of human health under current land and ground water use conditions. It is recommended that the boring locations that demonstrated exceedances of aesthetic standards for hydrocarbons be addressed to comply with RECAP requirements for total petroleum hydrocarbons. For location WL-3, located at the active Tank Battery A, it is reasonable to defer corrective action until the lines are no longer active, as no health risk is identified for the current industrial use of the area. No other corrective action for sediment is warranted for human health protection.

For the 40-Foot Zone ground water, it is recommended that the reviewing agencies consider the risk level associated with actual and hypothetical ground water use as one of multiple factors in identifying the most appropriate response plan for the site, in accordance with the RECAP regulation. Additional factors in determining the need for and scope of corrective action include site-specific characteristics, a balance of actual and potential risk, confidence in site characterization and exposure scenarios, weight of scientific evidence for exposure and toxicity, background constituent levels, and the technical and economic feasibility of remediation. This RECAP evaluation report provides the risk estimates required for agency review as well as information regarding confidence/evidence related to exposure scenarios and toxicity. The corrective action plan provided separately by MP&A addresses the factors related to technical and economic feasibility for agency consideration in adoption of an appropriate corrective action plan.

In accordance with RECAP, if required by the reviewing agencies, a conveyance notice is applicable to address assumed future ground water use in AOIs where concentrations in the 40-Foot Zone exceed health-based drinking water standards without application of a DAF.

No exceedance of health-based RECAP Standards is identified for site COCs in additional ground water zones, and therefore no corrective action is warranted for the zones. No further evaluation or corrective action is warranted for surface water or for protection of human consumption of fish and shellfish in the study area.

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Tables

Project No. 0116008
UNOCAL
Vermilion Parish, Louisiana

Environmental Resources Management Southwest, Inc.
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TABLE 1-1

CONFIRMATION SAMPLE RESULTS FOR SED-15 AREA PIT CLOSURE

East White Lake Oil and Gas Field
Vermilion Parish, Louisiana

Sample ID	Sample Date	Oil & Grease (%)
Canal Bottom Comp	11/24/2014	0.62
Topsoil N Comp	11/24/2014	0.48
Topsoil S Comp	11/24/2014	0.31
NE Area Comp	12/1/2014	0.26
S Bottom Comp	11/22/2014	<0.05
S Wall Comp	11/22/2014	0.22
N Bottom Comp	11/21/2014	<0.05
E Wall Comp	11/20/2014	0.51

Notes:
Sediment samples collected by MP&A.

TABLE 1-2

OVERBURDEN/BACKFILL SOURCE SAMPLES
SED-15 AREA PIT CLOSURE

East White Lake Oil and Gas Field
Vermilion Parish, Louisiana

Sample ID ***Sample Date*** ***Sampled By***	$\text{Soil}_{\text{SSni}}$ (mg/kg)	$\text{Soil}_{\text{SSGW}}$ (mg/kg)	Backfill 1 11/20/2014 MP&A (mg/kg)	Backfill 2 11/20/2014 MP&A (mg/kg)	Backfill3 11/20/2014 MP&A (mg/kg)
Metals (mg/kg)					
Arsenic	12	100	3.29	4.84	6.42
Barium	550	2000	154	65.4	115
Barium, total true	-	-	196	165	545
Cadmium	3.9	20	ND (0.26)	ND (0.25)	ND (0.27)
Chromium	12000	100	9.65	8.85	10.3
Lead	400	100	7.68	10	9.44
Mercury	2.3	4	ND (0.10)	ND (0.10)	ND (0.10)
Selenium	39	20	ND (1.04)	ND (1.01)	ND (1.06)
Silver	39	100	ND (0.26)	ND (0.25)	ND (0.27)
Zinc	2300	2800	28.6	27.8	25.3
Hydrocarbons (mg/kg, except O&G)					
Oil & Grease (%)	-	-	ND (0.05)	ND (0.05)	ND (0.05)
Salt					
Electrical Conductivity (mmhos/cm)	-	-	0.16	0.1	0.41
ESP (%)	-	-	1.5	1.7	1
SAR	-	-	1.49	1.94	1.53
Soluble Calcium (meq/L)	-	-	ND (1.00)	ND (1.00)	1.83
Soluble Magnesium (meq/L)	-	-	ND (1.00)	ND (1.00)	1.23
Soluble Sodium (meq/L)	-	-	ND (1.00)	ND (1.00)	1.9
Other					
CEC (meq/100g)	-	-	16.1	16.1	21.9
Percent Moisture (%)	-	-	16.0	16.6	19.2
pH (S.U.)	-	-	6.82	6.73	7.23

Notes:
ND (##) - Not detected, detection limit in parentheses

TABLE 5-1

SEDIMENT (0-3 FT)
COMPARISON TO RECAP DIRECT CONTACT SCREENING STANDARDS

East White Lake Oil and Gas Field
Vermilion Parish, Louisiana

Constituents (a)	Soil$_{SSni}$ (b) (mg/kg)	Soil$_{SSi}$ (c) (mg/kg)	Maximum (0-3') (d) (mg/kg-wet)	Location of Maximum Concentration
Metals				
Arsenic	12	12	8.23	SS7 (1.4-2.5')
Barium	550	14,000	**5170**	SS7 (1.4-2.5')
Cadmium	3.9	100	2.2	WL-3 (0-2')
Chromium	12000	310,000	17.8	SS11 (0-2.5')
Lead	400	1,400	88.3	WL-3 (0-2')
Mercury	2.3	61	**4.47**	Hg-MPA-07 (0.5-2')
Selenium	39	1,000	0.60	SED24 (0-2')
Strontium (e)	4700	120,000	129	SS7 (1.4-2.5')
Zinc	2300	61,000	1260	WL-3 (0-2')
Volatile Organic Compounds (VOCs)				
Benzene	1.5	3.1	ND (0.04)	-
Ethylbenzene	160	230	ND (0.25)	-
Toluene	68	470	ND (0.25)	-
Xylenes	18	120	ND (0.75)	-
Semi-Volatile Organic Compounds (SVOCs)				
Benzo(b)fluoranthene	0.62	2.9	0.019	SED-9 (0-0.5')
Chrysene	62	290	0.021	SED-9 (0-0.5')
Fluoranthene	220	2900	0.5	SS7 (1.4-2.5')
Fluorene	280	5400	0.65	SS7 (1.4-2.5')
Indeno(1,2,3-cd)pyrene	0.62	2.9	0.095	SED-9 (0-0.5')
2-Methylnaphthalene	22	170	2.03	SS7 (1.4-2.5')
Phenanthrene	2100	43000	1.87	SS7 (1.4-2.5')
TPH - Fractions (f)				
Aliphatics >C06-C8	1200	8000	ND (15)	-
Aliphatics >C08-C10	120	880	ND (15)	-
Aliphatics >C10-C12	230	2000	**353**	WL-3 (0-2')
Aliphatics >C12-C16	370	3800	**2500**	WL-3 (0-2')
Aliphatics >C16-C35	7100	10000	**7110**	WL-3 (0-2')
Aromatics >C08-C10	65	510	ND (10)	-
Aromatics >C10-C12	120	1100	74	WL-3 (0-2')
Aromatics >C12-C16	180	2100	**403**	WL-3 (0-2')
Aromatics >C16-C21	150	1700	**1070**	WL-3 (0-2')
Aromatics >C21-C35	180	2500	**1370**	WL-3 (0-2')
Polychlorinated Biphenyls (PCBs)				
Total PCBs	0.11	0.90	ND (0.033-0.42)	-

Notes:

Per RECAP 2003, concentrations are expressed in mg/kg wet weight for this exposure pathway.

ND - Nondetect at the detection limit, or range of detection limits, shown in parentheses.

TPH - Total Petroleum Hydrocarbons.

A **bold and boxed** value indicates that the maximum reported concentration exceeds a screening standard for the respective constituent and is identified as a site-related COC subject to further evaluation under a higher Management Option.

(a) Constituents in this table include constituents detected in sediment and indicator constituents for petroleum hydrocarbons (e.g., BTEX, PAHs).

(b) Soil$_{SSni}$ = RECAP Screening Option Standard from Table 1 of RECAP 2003 for soil protective of nonindustrial land use.

(c) Soil$_{SSi}$ = RECAP Screening Option Standard from Table 1 of RECAP 2003 for soil protective of industrial land use.

(d) The maximum reported concentration in sediment samples most representative of surface sediment in the 0 to 3 foot interval (remediated areas excluded). The samples included in the direct contact evaluation are summarized in Table 5-3. Detections in split sample results from two separate laboratories (as submitted by ICON and MP&A) were averaged when valid data were available from both laboratories, and the detected value was used when one detection was reported.

(e) Value not provided in RECAP; the risk-based values were calculated in accordance with Appendix H of RECAP 2003 (see Appendix G).

(f) RECAP identifies 10,000 mg/kg as an aesthetic limit for TPH in soil; this is not specifically addressed for sediment. The aesthetic guideline is not a health based limit.

TABLE 5-2

SEDIMENT (ALL DEPTHS)
COMPARISON TO RECAP GROUND WATER PROTECTION SCREENING STANDARDS

East White Lake Oil and Gas Field
Vermilion Parish, Louisiana

Constituents (a)	Soil$_{SSGW}$ (b) (mg/kg)	Maximum (c) (mg/kg-dry)	Location of Maximum Concentration
Metals (Total)			
Arsenic	100	39	B2 (10-10.5')
Barium	2000	**15700**	SS7 (0-1.4')
Cadmium	20	3.45	B12 (6.5-7.5')
Chromium	100	25.1	SS11 (0-2.5')
Lead	100	**125**	WL-3 (0-2')
Mercury	4	**14.22**	SS8 (2-4')
Selenium	20	2.2	SED32 (4-6')
Strontium (d)	44000	459	AB13 (0-3')
Zinc	2800	1780	WL-3 (0-2')
Volatile Organic Compounds (VOCs)			
Benzene	0.051	ND (0.0565-0.141)	-
Ethylbenzene	19	ND (0.353-0.883)	-
Toluene	20	ND (0.353-0.883)	-
Xylenes	150	ND (1.06-2.65)	-
Semi-Volatile Organic Compounds			
Benzo(b)fluoranthene	220	0.0625	SED-9 (0-0.5')
Chrysene	76	0.069	SED-9 (0-0.5')
Fluoranthene	1200	1.3	SS7 (1.4-2.5')
Fluorene	230	1.69	SS7 (1.4-2.5')
Indeno(1,2,3-cd)pyrene	9.2	0.313	SED-9 (0-0.5')
2-Methylnaphthalene	1.7	**5.29**	SS7 (1.4-2.5')
Phenanthrene	660	4.87	SS7 (1.4-2.5')
TPH - Fractions (e)			
Aliphatics C6-C8	10000	626	WL-4 (11-12.5')
Aliphatics >C8-C10	5300	632	WL-4 (11-12.5')
Aliphatics >C10-C12	10000	699	WL-4 (11-12.5')
Aliphatics >C12-C16	10000	3950	WL-4 (11-12.5')
Aliphatics >C16-C35	10000	**12600**	SED28 (0-2')
Aromatics >C8-C10	65	**281**	WL-4 (11-12.5')
Aromatics >C10-C12	100	**480**	WL-4 (4-11')
Aromatics >C12-C16	200	**2660**	WL-4 (11-12.5')
Aromatics >C16-C21	2100	**3230**	WL-4 (4-11')
Aromatics >C21-C35	10000	3090	WL-4 (4-11')
PCBs			
Total PCBs	19	0.248	SED7 (4-6')

Notes:

Per RECAP 2003 and related FAQ guidance, concentrations are expressed in mg/kg dry weight for sediment for this transport pathway.

A **bold and boxed** value indicates that the maximum reported concentration exceeds a screening standard for the respective constituent and is identified as a site-related COC subject to further evaluation under a higher Management Option.

(a) Constituents in this table include constituents detected in sediment and indicator constituents for petroleum hydrocarbon BTEX, PAHs).

(b) Soil$_{SSGW}$ = RECAP Screening Option Standard for soil protective of ground water, from Table 1 of RECAP 2003.

(c) The maximum reported concentration in representative sediment samples collected from any depth throughout the study area (remediated areas excluded). Samples were collected to a maximum depth of 20 feet bgs, and were more soil-like at the deepest depths. The samples included in the evaluation of migration from sediment to ground water are summarized in Table 5-4. Detections in split sample results from two separate laboratories (as submitted by ICON and MP&A) were averaged when valid data were available from both laboratories, and the detected value was used when one detection was reported.

(d) Value not provided in RECAP; the risk-based values were calculated in accordance with Appendix H of RECAP 2003 (see Appendix G).

(e) RECAP identifies 10,000 mg/kg as an aesthetic limit for TPH in soil; this is not specifically addressed for sediment. The aesthetic guideline is not a health based limit.

TABLE 5-3

SEDIMENT DATA INCLUDED IN DIRECT CONTACT QUANTITATIVE EVALUATION

East White Lake Oil and Gas Field
Vermilion Parish, Louisiana

ICON 2006

Sample	Depth Interval	Sample Date
SS1	0-2.1'	25-Apr-06
SS1	2.1-2.5'	25-Apr-06
SS2	0-1'	25-Apr-06
SS2	1-1.5'	25-Apr-06
SS3	0-0.6'	25-Apr-06
SS3	0.6-2.2'	25-Apr-06
SS3	2.2-2.6'	25-Apr-06
SS4	0-0.6'	26-Apr-06
SS4	0.6-2.7'	26-Apr-06
SS5	0-2.15'	26-Apr-06
SS6	0-1.65'	26-Apr-06
SS6	1.65-2.5'	26-Apr-06
SS7	0-1.4'	26-Apr-06
SS7	1.4-2.5'	26-Apr-06
SS8	0-1.9'	27-Apr-06
SS8	1.9-2.3'	27-Apr-06
SS9	0-1.7'	27-Apr-06
SS9	1.7-3.2'	27-Apr-06
SS10	0-1.5'	27-Apr-06
SS10	1.5-2.5'	27-Apr-06
SS11	0-2.5'	27-Apr-06
SS12	0-3.7'	27-Apr-06
SS13	0-1'	28-Apr-06
SS13	1-2.75'	28-Apr-06
SS14	0-0.8'	28-Apr-06
SS14	0.8-1.7'	28-Apr-06
SS15	0-3'	28-Apr-06
AB1	0-3'	13-Nov-06
AB2	0-3'	13-Nov-06
AB3	0-3'	13-Nov-06
AB4	0-3'	13-Nov-06
AB5	0-6'	13-Nov-06
AB13	0-3'	13-Nov-06
AB14	0-3'	13-Nov-06
AB15	0-6'	13-Nov-06
B2	2-4'	8-Aug-06
B4	0-1'	9-Aug-06
B5	0-1.5'	9-Aug-06
B6	1.5-3'	9-Aug-06
B9	0-0.5'	9-Aug-06
B9	0.5-3.5'	9-Aug-06
B10	1.5-4'	9-Aug-06
B12	0-1.5'	10-Aug-06
B14	0-1'	10-Aug-06
B17	0-3'	10-Aug-06
B18	2-4'	10-Aug-06
B19	1-2.5'	10-Aug-06
B21	0-2'	10-Aug-06

ICON/MPA 1Q 2010 Splits[1]

Sample	Depth Interval	Sample Date
SS-08	0-2'	26-Feb-10
SS-10	0-2'	26-Feb-10
SED-4	0-2'	25-Feb-10
SED-5	0-2'	25-Feb-10
SED-6	0-2'	25-Feb-10
SED-7	0-2'	25-Feb-10
SED-8	0-2'	25-Feb-10
SED-9	0-2'	25-Feb-10
SED-10	0-2'	25-Feb-10
SED-11	0-2'	25-Feb-10
SED-12	0-2'	25-Feb-10
SED-13	0-2'	26-Feb-10
SED-14	0-2'	26-Feb-10
SED-16	0-2'	26-Feb-10
SED-17	0-2'	26-Feb-10
SED-18	0-2'	26-Feb-10
SED-19	0-2'	26-Feb-10
SED-20	0-2'	26-Feb-10
SED-21	0-2'	26-Feb-10
SED-22	0-2'	26-Feb-10
SED-23	0-2'	2-Mar-10
SED-24	0-2'	2-Mar-10
SED-25	0-2'	2-Mar-10
SED-26	0-2'	2-Mar-10
SED-27	0-2'	2-Mar-10
SED-28	0-2'	2-Mar-10
SED-29	0-2'	2-Mar-10
SED-30	0-2'	2-Mar-10
SED-31	0-2'	1-Mar-10
SED-32	0-2'	1-Mar-10
SED-33	0-2'	1-Mar-10

MPA August 2010

Sample	Depth Interval	Sample Date
AB-13	0-3'	Aug-10
AB-14	0-3'	Aug-10
AB-13-SO-E	0-3'	Aug-10

ICON/MPA January 2015 Splits[1]

Sample	Depth Interval	Sample Date
WL-1	0-2'	5-Jan-15
WL-2	0-2'	5-Jan-15
WL-3	0-2'	6-Jan-15
WL-4	0-2'	6-Jan-15
WL-5	0-2'	6-Jan-15
WL-6	0-2'	6-Jan-15
WL-7	0-2'	6-Jan-15
WL-8	0-2'	6-Jan-15

MPA/ICON May 2010 Splits[1]

Sample	Depth Interval	Sample Date
SED-8	0-0.5'	6-May-10
SED-9	0-0.5'	5-May-10
SED-11	0-0.5'	6-May-10
SED-13	0-0.5'	6-May-10
SED-19	0-0.5'	6-May-10
SED-24	0-0.5'	5-May-10
SED-26	0-0.5'	5-May-10
SED-120**	0-0.5'	7-May-10
SED-31	0-0.5'	5-May-10
MPA-AB-13	0-3'	19-May-10
SED-BK-01	0-0.5'	10-May-10
SED-BK-02	0-0.5'	10-May-10
SED-BK-03	0-0.5'	10-May-10
SED-BK-04	0-0.5'	10-May-10
SED-BK-05	0-0.5'	11-May-10
SED-BK-06	0-0.5'	10-May-10
SED-BK-07	0-0.5'	11-May-10
SED-BK-08	0-0.5'	11-May-10
SED-BK-09	0-0.5'	11-May-10
SED-BK-10	0-0.5'	19-May-10
SED-BK-11	0-0.5'	19-May-10

MPA Delineation Samples

Sample	Depth Interval	Sample Date
MPA-Sed 15-N	0-2'	8-Jun-10
MPA-Sed-15-W	0-2'	8-Jun-10
MPA-Sed-15-W-2	0-2'	8-Jun-10
MPA-Sed-15-E	0-2'	8-Jun-10
MPA-Sed-15-E-2	0-2'	8-Jun-10

MPA/ICON Former Pit Delineation Samples[1]

Sample	Depth Interval	Sample Date
SP-MPA-01[2]	0-0.5'; 0.5-2'	5 and 6-Oct-10
SP-MPA-02[2]	0-0.5'; 0.5-2'	5-Oct-10
SP-MPA-03[2]	0-0.5'; 0.5-2'	5-Oct-10
SP-MPA-04[2]	0-0.5'; 0.5-2'	6-Oct-10

MPA/ICON Mercury Assessment Samples[1]

Sample	Depth Interval	Sample Date
Hg-MPA-01	0-0.5'; 0.5-2'	6-Oct-10
Hg-MPA-02	0-0.5'; 0.5-2'	6-Oct-10
Hg-MPA-03	0-0.5'; 0.5-2'	6-Oct-10
Hg-MPA-04	0-0.5'; 0.5-2'	6-Oct-10
Hg-MPA-05[2]	0-0.5'; 0.5-2'	6-Oct-10
Hg-MPA-06	0-0.5'; 0.5-2'	7-Oct-10
Hg-MPA-07	0-0.5'; 0.5-2'	7-Oct-10
Hg-MPA-08	0-0.5'; 0.5-2'	7-Oct-10
Hg-MPA-09	0-0.5'; 0.5-2'	7-Oct-10
Hg-MPA-09dup	0.5-2'	7-Oct-10

Notes:

** SED-120 is the same location as SED-30

For purposes of evaluating direct contact with sediment, the samples most representative of surface sediment in the 0 to 3 foot interval were identified.

The samples and intervals listed are those for which chemical analytical data useful for human health risk evaluation are available and were used in the risk evaluation.

Locations AB-1 through AB-4 and locations Sed-BK-1 through Sed-BK-11 likely represent conditions unimpacted by site E&P activities. However, for completeness, the reported constituent levels in these locations were not used to exclude any site locations or concentrations from the quantitative risk evaluation, and therefore they are included in the data set for risk evaluation.

[1] Detections in split sample results from two separate laboratories (as submitted by ICON and MP&A) were averaged when valid data were available from both

[2] No ICON Split Collected

The following samples were located in the area that has been remediated as part of the SED-15 Pit Closure, and have been excluded from the quantitative risk evaluation:

Sample	Depth Interval	Sample Date
SED-15	0-2	26-Feb-10
SED-15	0-0.5	6-May-10
SED-115* [2]	0-0.5	6-May-10
MPA-Sed 15	0-2'	8-Jun-10
SP-MPA-05	0-5'	5-Oct-10

* SED-115 is a duplicate of SED-15

TABLE 5-4

SEDIMENT DATA INCLUDED IN GROUND WATER PROTECTION QUANTITATIVE EVALUATION

East White Lake Oil and Gas Field
Vermilion Parish, Louisiana

ICON 2006

Sample	Depth Interval	Sample Date
SS1	0-2.1; 2.1-2.5	25-Apr-06
SS2	0-1; 1-1.5	25-Apr-06
SS3	0-0.6; 0.6-2.2; 2.2-2.6	25-Apr-06
SS4	0-0.6; 0.6-2.7; 2.7-3.8	26-Apr-06
SS5	0-2.15	26-Apr-06
SS6	0-1.65; 1.65-2.5	26-Apr-06
SS7	0-1.4; 1.4-2.5; 2.5-3.5	26-Apr-06
SS8	0-1.9; 1.9-2.3	27-Apr-06
SS9	0-1.7; 1.7-3.2; 3.2-3.7	27-Apr-06
SS10	0-1.5; 1.5-2.5	27-Apr-06
SS11	0-2.5; 2.5-3.4; 3.4-3.7	27-Apr-06
SS12	0-3.7	27-Apr-06
SS13	0-1; 1-2.75; 2.75-3.2	28-Apr-06
SS14	0-0.8; 0.8-1.7	28-Apr-06
SS15	0-3; 3-3.25	28-Apr-06
B2	2-4; 4-6; 6-8; 10-10.5	8-Aug-06
B3	4-7; 9-12	9-Aug-06
B4	0-1; 3-5; 5-8	9-Aug-06
B5	0-1.5; 4-5.5; 8-10	9-Aug-06
B6	1.5-3; 3-10.5	9-Aug-06
B7	4-5; 8-11	9-Aug-06
B8	5.5-7; 9.5-11.5	9-Aug-06
B9	0-0.5; 0.5-3.5; 8-9	9-Aug-06
B10	1.5-4, 4-7.5	9-Aug-06
B12	0-1.5; 3.5-5; 6.5-7.5	10-Aug-06
B13	3-5; 7.5-9.5	10-Aug-06
B14	0-1; 4-8	10-Aug-06
B15	4-6; 8-11.5	10-Aug-06
B17	0-3; 3-6; 8.5-10.5; 10.5-12	10-Aug-06
B18	2-4; 4-5; 7.5-10; 10-11.5	10-Aug-06
B19	1-2.5; 2.5-4; 4-6.5; 6.5-9.5	10-Aug-06
B20	3-4.5; 7.5-10	10-Aug-06
B21	0-2; 2-4	10-Aug-06
AB1	0-3; 3-6; 6-8; 12-14	13-Nov-06
AB2	0-3; 3-6; 4-6; 10-12	13-Nov-06
AB3	0-3; 3-6; 4-6; 8-10	13-Nov-06
AB4	0-3; 3-6; 4-6; 10-12	13-Nov-06
AB5	0-6; 4-6; 10-12;14-16;18-20	13-Nov-06
AB6	8-10; 12-14	3-Nov-06
AB7	6-8; 10-12	3-Nov-06
AB8	6-8; 10-12; 14-16	6-Nov-06
AB9	6-8; 12-14; 18-20	6-Nov-06
AB10	4-6; 12-14; 14-16	6-Nov-06
AB11	4-6; 6-8;16-18	6-Nov-06
AB12	6-8; 12-14	7-Nov-06
AB13	0-3; 3-6; 4-6; 8-10; 10-12	13-Nov-06
AB14	0-3; 3-6; 4-6; 8-10	13-Nov-06
AB15	0-6; 4-6; 12-14	13-Nov-06
AB16	4-6; 8-10; 10-12; 12-14	7-Nov-06
AB18	4-6; 10-12; 12-14	8-Nov-06
AB19	4-6; 8-10; 12-14	8-Nov-06
AB20	6-8; 10-12; 14-16; 16-18	8-Nov-06
AB21	4-6; 6-8; 8-10; 12-14	8-Nov-06
AB22	4-6; 6-8; 12-14; 16-18	8-Nov-06

ICON/MPA 1Q 2010 Splits[1]

Sample	Depth Interval	Sample Date
SS-08	0-2, 2-4	26-Feb-10
SS-10	0-2, 2-4	26-Feb-10
SED4	0-2	25-Feb-10
SED5	0-2	25-Feb-10
SED6	0-2	25-Feb-10
SED7	0-2, 2-4, 4-6	25-Feb-10
SED8	0-2; 2-4	25-Feb-10
SED9	0-2; 2-4	25-Feb-10
SED10	0-2; 2-4	25-Feb-10
SED11	0-2; 2-4	25-Feb-10
SED12	0-2; 2-4; 4-6	25-Feb-10
SED13	0-2; 2-4	26-Feb-10
SED14	0-2; 2-4	26-Feb-10
SED16	0-2	26-Feb-10
SED17	0-2; 2-4	26-Feb-10
SED18	0-2; 2-4	26-Feb-10
SED19	0-2; 2-4	26-Feb-10
SED20	0-2; 2-4	26-Feb-10
SED21	0-2; 2-4; 4-6; 6-8	26-Feb-10
SED22	0-2; 2-4	26-Feb-10
SED23	0-2; 2-4	2-Mar-10
SED24	0-2; 2-4	2-Mar-10
SED25	0-2; 2-4	2-Mar-10
SED26	0-2; 2-4	2-Mar-10
SED27	0-2; 2-4	2-Mar-10
SED28	0-2; 2-4	2-Mar-10
SED29	0-2; 2-4	2-Mar-10
SED30	0-2; 2-4	2-Mar-10
SED31	0-2; 2-4; 4-6	1-Mar-10
SED32	0-2; 2-4; 4-6	1-Mar-10
SED33	0-2; 2-4; 4-6	1-Mar-10

MPA August 2010

Sample	Depth Interval	Sample Date
AB-5a	4-5.5	Aug-10
AB-5 SO-NE	4-6	Aug-10
AB-5 SO-NW	4-6	Aug-10
AB-6	8-10	Aug-10
AB-8	6-8	Aug-10
AB-8 SO-S	6-8	Aug-10
AB-13	0-3	Aug-10
AB-13-SO-E	0-3	Aug-10
AB-14	0-3	Aug-10
AB-15	4-5.5	Aug-10

ICON/MPA January 2015 Splits[1]

Sample	Depth Interval	Sample Date
WL-1	0-2; 2-4; 6-8; 9-13	5-Jan-15
WL-2	0-2; 2-4; 8-10; 14-16	5-Jan-15
WL-3	0-2; 4-6/4-8; 10-13	6-Jan-15
WL-4	0-2; 2-4; 4-11; 11-12.5	6-Jan-15
WL-5	0-2, 2-13	6-Jan-15
WL-6	0-2; 4-6; 8-10; 10-13	6-Jan-15
WL-7	0-2; 2-4; 4-6; 6-8	6-Jan-15
WL-8	0-2; 2-4; 4-6; 6-9	6-Jan-15

MPA/ICON May 2010 Splits[1]

Sample	Depth Interval	Sample Date
SED-8	0-0.5	6-May-10
SED-9	0-0.5	5-May-10
SED-11	0-0.5	6-May-10
SED-13	0-0.5	6-May-10
SED-19	0-0.5	6-May-10
SED-24	0-0.5	5-May-10
SED-26	0-0.5	5-May-10
SED-120**	0-0.5	7-May-10
SED-31	0-0.5	5-May-10
MPA-AB5 (A)	4-6	19-May-10
MPA-AB5 (B)	4-6	19-May-10
MPA-AB5 (C)	4-6	19-May-10
MPA-AB-6	8-10	19-May-10
MPA-AB-8	6-8	19-May-10
MPA-AB-13	0-3	19-May-10
SED-BK-01	0-0.5'	10-May-10
SED-BK-02	0-0.5'	10-May-10
SED-BK-03	0-0.5'	10-May-10
SED-BK-04	0-0.5'	10-May-10
SED-BK-05	0-0.5'	11-May-10
SED-BK-06	0-0.5'	10-May-10
SED-BK-07	0-0.5'	11-May-10
SED-BK-08	0-0.5'	11-May-10
SED-BK-09	0-0.5'	11-May-10
SED-BK-10	0-0.5'	19-May-10
SED-BK-11	0-0.5'	19-May-10

MPA Delineation Samples

Sample	Depth Interval	Sample Date
MPA-Sed 15-N	0-2	8-Jun-10
MPA-Sed-15-W	0-2	8-Jun-10
MPA-Sed-15-W-2	0-2	8-Jun-10
MPA-Sed-15-E	0-2	8-Jun-10
MPA-Sed-15-E-2	0-2	8-Jun-10

MPA/ICON Mercury Assessment Samples[1]

Sample	Depth Interval	Sample Date
Hg-MPA-01	0-0.5; 0.5-2; 5-7	6-Oct-10
Hg-MPA-02	0-0.5; 0.5-2; 5-7	6-Oct-10
Hg-MPA-03	0-0.5; 0.5-2; 4-6	6-Oct-10
Hg-MPA-04	0-0.5; 0.5-2; 3-5	6-Oct-10
Hg-MPA-05[2]	0-0.5; 0.5-2; 6-8	6-Oct-10
Hg-MPA-06	0-0.5; 0.5-2; 5-6	7-Oct-10
Hg-MPA-07	0-0.5; 0.5-2; 6.5-7	7-Oct-10
Hg-MPA-08	0-0.5; 0.5-2; 7.5-8	7-Oct-10
Hg-MPA-09	0-0.5; 0.5-2; 6-7	7-Oct-10
Hg-MPA-09dup	0.5-2	7-Oct-10

MPA/ICON Former Pit Delineation Samples[1]

Sample	Depth Interval	Sample Date
SP-MPA-01[2]	0-0.5; 0.5-2; 2-4.3; 4.3-4.7; 8-9	5 and 6-Oct-10
SP-MPA-02[2]	0-0.5; 0.5-2; 3-4; 4-5	5-Oct-10
SP-MPA-02a[2]	3-5, 7-8	6-Oct-10
SP-MPA-03[2]	0-0.5; 0.5-2; 4-6; 9-10	5-Oct-10
SP-MPA-04[2]	0-0.5; 0.5-2; 5-7; 9-10	6-Oct-10

Notes:
** SED-120 is the same location as SED-30
The samples and intervals listed are those for which chemical analytical data useful for human health risk evaluation are available and were used in the risk evaluation.
Locations AB-1 through AB-4 and locations Sed-BK-1 through Sed-BK-11 likely represent conditions unimpacted by site E&P activities. However, for completeness, the reported constituent levels in these locations were not used to exclude any site locations or concentrations from the quantitative risk evaluation, and therefore they are included in the data set for risk evaluation.

[1] Detections in split sample results from two separate laboratories (as submitted by ICON and MP&A) were averaged when valid data were available from both laboratories.

[2] No ICON Split Collected

The following samples were located in the area that has been remediated as part of the SED-15 Pit Closure, and have been excluded from the quantitative risk evaluation:

Sample	Depth Interval	Sample Date
SED15	0-2; 2-4	26-Feb-10
MPA-Sed 15	6.5-8.5	8-Jun-10
SED-15	0-0.5	6-May-10
SED-115* [2]	0-0.5	6-May-10
SP-MPA-05	0-5; 7-9	5-Oct-10

* SED-115 is a duplicate of SED-15

TABLE 5-5

SUMMARY OF CONSTITUENT CONCENTRATIONS AND LOCATIONS THAT EXCEED RECAP SCREENING STANDARDS

East White Lake Oil and Gas Field
Vermilion Parish, Louisiana

Residential Direct Contact Screening
Sediment (0-3') COCs > Soilssni (wet weight)

Sample	Depth	Date	mg/kg-wet
Barium		***Soilssni =***	***550***
B2	2-4	8-Aug-06	815
SS3	0-0.6	25-Apr-06	597
	0.6-2.2	25-Apr-06	948
	2.2-2.6	25-Apr-06	555
SS5	0-2.15	26-Apr-06	3170
SS7	0-1.4	26-Apr-06	4440
	1.4-2.5	26-Apr-06	5170
SS11	0-2.5	27-Apr-06	1950
SS12	0-3.7	27-Apr-06	1100
SED11	0-2'	25-Feb-10	566
SED19	0-2'	26-Feb-10	1270
Mercury		***Soilssni =***	***2.3***
SED6	0-2'	25-Feb-10	2.73
Hg-MPA-07 (0.5-2)	0.5-2'	7-Oct-10	4.47
WL-3	(0-2)	6-Jan-15	4.23
Aliphatic >C10-C12		***Soilssni =***	***230***
WL-3	(0-2)	6-Jan-15	353
Aliphatic >C12-C16		***Soilssni =***	***370***
WL-3	(0-2)	6-Jan-15	2500
Aliphatic >C16-C35		***Soilssni =***	***7100***
WL-3	(0-2)	6-Jan-15	7110
Aromatic >C12-C16		***Soilssni =***	***180***
WL-3	(0-2)	6-Jan-15	403
Aromatic >C16-C21		***Soilssni =***	***150***
SED26	0-2'	2-Mar-10	161
SED28	0-2'	2-Mar-10	290
WL-3	(0-2)	6-Jan-15	1070
Aromatic >C21-C35		***Soilssni =***	***180***
SED28	0-2'	2-Mar-10	433
SED29	0-2'	2-Mar-10	183
SED30	0-2'	2-Mar-10	215
WL-3	(0-2)	6-Jan-15	1370

Ground Water Protection Screening
Sediment (all depths) COCs > Soilssgw (dry weight)

Sample	Depth	Date	mg/kg-dry
Barium		***Soilssgw =***	***2000***
B2	2-4	8-Aug-06	3590
SS3	0.6-2.2	25-Apr-06	2330
SS5	0-2.15	26-Apr-06	7450
SS7	0-1.4	26-Apr-06	15700
	1.4-2.5	26-Apr-06	13500
	2.5-3.5	26-Apr-06	3780
SS11	0-2.5	27-Apr-06	2750
	2.5-3.4	27-Apr-06	2170
SS12	0-3.7	27-Apr-06	2030
SED17	2-4'	26-Feb-10	2160
SED19	0-2'	26-Feb-10	3750
Lead		***Soilssgw =***	***100***
SS5	0-2.15	26-Apr-06	117
SS7	1.4-2.5	26-Apr-06	117
WL-3	0-2'	6-Jan-15	125
Mercury		***Soilssgw =***	***4***
SS8	2-4'	26-Feb-10	14.2
SED6	0-2'	25-Feb-10	7.59
Hg-MPA-07	0.5-2'	7-Oct-10	8.52
Hg-MPA-09	0-0.5'	7-Oct-10	5.57
WL-3	0-2'	6-Jan-15	5.94
WL-3	(4-6)/(4-8)	6-Jan-15	5.99
2-Methylnaphthalene		***Soilssgw =***	***1.7***
SS7	1.4-2.5	6-Apr-26	5.29
Aliphatics >C16-C35		***Soilssgw =***	***10,000***
SED28	0-2'	2-Mar-10	12600
Aliphatic >C8-C10		***Soilssgw =***	***65***
WL-4	(4-11)	1/6/2015	176
	(11-12.5)	1/6/2015	281
WL-5	(2-13)	1/6/2015	83.4
Aromatic >C10-C12		***Soilssgw =***	***100***
WL-4	(4-11)	1/6/2015	480
	(11-12.5)	1/6/2015	407
WL-5	(2-13)	1/6/2015	169
Aromatic >C12-C16		***Soilssgw =***	***200***
SED26	0-2'	2-Mar-10	273
SED28	0-2'	2-Mar-10	790
WL-3	(0-2)	1/6/2015	534
	(4-6)/(4-8)	1/6/2015	870
WL-4	(2-4)	1/6/2015	410
	(4-11)	1/6/2015	2360
	(11-12.5)	1/6/2015	2660
WL-5	(2-13)	1/6/2015	938
Aromatic >C16-C21		***Soilssgw =***	***2100***
WL-4	(4-11)	1/6/2015	3230
	(11-12.5)	1/6/2015	2700

Notes:
Detections in split sample results from two separate laboratories (as submitted by ICON and MP&A) were averaged when valid data were available from both laboratories.

TABLE 5-6
GROUND WATER DATA INCLUDED IN QUANTITATIVE EVALUATION

East White Lake Oil and Gas Field
Vermilion Parish, Louisiana

ICON 2006

Boring ID	Screened Interval (ft. bgs)	Date
Peat Zone		
AB2[4]	11-21	10-Nov-06
AB3[4]	10-20	10-Nov-06
AB5	12-22	13-Nov-06
AB6	8-18	10-Nov-06
AB6DUP	8-18	10-Nov-06
AB7	10-20	13-Nov-06
AB15	8-18	13-Nov-06
AB19	8-18	10-Nov-06
40-Foot Zone		
AB1 [3]	40-50	10-Nov-06
Upper Sand of Chicot Aquifer		
AWW1	400	10-Nov-06

ICON/MPA 1Q 2010 Splits[2]

Boring ID	Screened Interval (ft. bgs)	Date
40-Foot Zone		
MW1	44-54	5-Mar-10
MW50 **	44-54	5-Mar-10
MW-2/MW-2R	42-52	5-Mar-10
MW-3/MW-3R	37.5-47.5	5-Mar-10

CON January 2015 Splits

Boring ID	Screened Interval (ft. bgs)	Date
Peat Zone		
WL-6	8.5-13	7-Jan-15

MPA/ICON May 2010 Splits[2]

Boring ID	Screened Interval (ft. bgs)	Date
Upper Sand of Chicot Aquifer		
WW-1	400	25-May-10
40-Foot Zone		
MW-6S	47-50	12-May-10
SB-1-MW-S	44-54	7-May-10
SB-1-MW-S	44-54	8-Jun-10
SB-2-MW-S	42-52	11-May-10
SB-3-MW-S	37-47	12-May-10
SB-3-MW-SD *	37-47	12-May-10
70-Foot Zone		
MW-4D[5]	75-77	12-May-10
MW-5D	75-77	12-May-10
MW-6D[5]	75-77	12-May-10
SB-1-MW-D	72-74	6-May-10
90-Foot Zone		
MW-1C	97-100	13-May-10

MPA 2014

Boring ID	Screened Interval (ft. bgs)	Date
40-Foot Zone		
Hebert[3]	TD 41	21-Apr-14
SB-1 MPA (same as SB-1-MW-S)	44-54	21-Apr-14
EWL dup***	44-54	21-Apr-14

ICON/MPA Sept/Oct 2010 Splits[2]

Sample ID	Screened Interval (ft. bgs)	Date
Upper Sand of Chicot Aquifer		
J. Guidry Well	TD 519	1-Sep-10
40-Foot Zone		
Purvis Hebert Well[3]	TD 41	1-Sep-10
Purvis Hebert (dup)[3]	TD 41	1-Sep-10
A. Crouch Well[3]	TD 34	1-Sep-10
HP-MPA-01-T	42-45	29-Sep-10
HP-MPA-02-T	42-45	29-Sep-10
HP-MPA-03-T	42-45	30-Sep-10
HP-MPA-04-T	42-45	30-Sep-10
HP-MPA-05-T	42-45	30-Sep-10
HP-MPA-06-T	42-45	30-Sep-10
HP-MPA-07-T	42-45	01-Oct-10
HP-MPA-08-T	42-45	01-Oct-10
HP-MPA-09-T	42-45	01-Oct-10
HP-MPA-10-T	42-45	01-Oct-10
70-Foot Zone		
HP-MPA-02-I	72-75	29-Sep-10
HP-MPA-03-I	72-75	04-Oct-10
HP-MPA-04-I	80-83	04-Oct-10
HP-MPA-05-I	72-75	06-Oct-10
HP-MPA-06-I	72-75	06-Oct-10
HP-MPA-07-I	72-75	05-Oct-10
HP-MPA-08-I	72-75	05-Oct-10
HP-MPA-09-I	72-75	06-Oct-10
HP-MPA-10-I[5]	72-75	06-Oct-10

Notes:
* Duplicate of SB-3-MW-S
** Duplicate of MW1
*** Duplicate of SB-1 MPA
TD is an estimated total depth; screened interval not available.
In accordance with RECAP, the most recent sampling results were used in the RECAP assesment for wells that were sampled more than once over time: WW1 (also called facility well and AWW1), Hebert well, and SB-1-MW-S. The older sampling dates, not used in the current assessment, are identified in this table with gray shading.

[2] Split sample results from two separate laboratories (as submitted by ICON and MP&A) were averaged when valid data were available from both laboratories.

[3] Locations AB-1, Hebert well, and Crouch well likely represent conditions of the 40-Foot Zone unimpacted by site E&P activities. For completeness, the reported constituent levels in these locations were not used to exclude any site locations or concentrations from the quantitative risk evaluation, but the results are used as a reference range for interpreting results for naturally occurring constituents.

[4] Locations AB-2 and AB-3 likely represent conditions of the Peat Zone unimpacted by site E&P activities. For completeness, the reported constituent levels in these locations were not used to exclude any site locations or concentrations from the quantitative risk evaluation, but the results are used as a reference range for interpreting results for naturally occurring constituents.

[5] Locations MW-4D, MW-6D, and HP-MPA-10-I likely represent conditions of the 70-Foot Zone unimpacted by site E&P activities. For completeness, the reported constituent levels in these locations were not used to exclude any site locations or concentrations from the quantitative risk evaluation, but the results are used as a reference for interpreting results for naturally occurring constituents.

TABLE 5-7

GROUND WATER
COMPARISON TO RECAP SCREENING STANDARDS

East White Lake Oil and Gas Field
Vermilion Parish, Louisiana

		Maximum Reported Concentrations in Ground Water (mg/L) (c)				
Constituents (a)	GWss (b)	Peat Zone	40-Foot Zone	70-Foot Zone	90-Foot Zone	Upper Sand of Chicot Aquifer
Metals (dissolved)						
Arsenic	0.01	<0.1	**0.0145**	**0.0215**	<0.01	-
Barium	2	**10.8**	**6.06**	1.67	1.01	-
Cadmium	0.005	<0.1	<0.005	<0.005	<0.005	-
Chromium	0.1	<0.1	<0.01	0.0258	<0.01	-
Iron	0.3 (e)	**16.7**	**14**	**12**	**4.51**	-
Lead	0.015	<0.1	<0.015	<0.0125	<0.01	-
Manganese	0.05 (e)	**5.12**	**2.9**	**0.63**	**0.21**	-
Mercury	0.002	<0.0002	<0.002	<0.0002	<0.0002	-
Selenium	0.05	-	**0.072 (f)**	**0.0688**	0.0355	-
Strontium (d)	2.2	**18.4**	**6.84**	1.42	0.824	-
Zinc	1.1	<2	0.09	0.188	<0.01	-
Metals (total)						
Arsenic	0.01	**0.025**	**0.021**	(g)	(g)	<0.01
Barium	2	**12.0**	**14.8**	(g)	(g)	0.74
Cadmium	0.005	0.002	0.001	(g)	(g)	<0.005
Chromium	0.1	<0.055	<0.01	(g)	(g)	<0.01
Iron	0.3 (e)	**18.1**	**68.9**	(g)	(g)	**1.08**
Lead	0.015	0.011	0.0125	(g)	(g)	<0.015
Manganese	0.05 (e)	**5.37**	**4.3**	(g)	(g)	**0.082**
Mercury	0.002	<0.0002	<0.0002	(g)	(g)	<0.0002
Selenium	0.05	**0.058**	**0.077 (f)**	(g)	(g)	<0.04
Strontium (d)	2.2	**17.9**	**13.9**	(g)	(g)	0.54
Zinc	1.1	1.01	0.113	(g)	(g)	0.31
TPH Fractions						
Aliphatic >C10-C12	0.15	<0.15	<0.15	<0.15	<0.15	<0.15
Aliphatic >C12-C16	0.15	<0.15	<0.15	<0.15	<0.15	<0.15
Aliphatic >C16-C35	7.3	<0.15	<0.15	<0.15	<0.15	<0.15
Aliphatic >C8-C10	0.15	<0.15	<0.15	<0.15	<0.15	<0.15
Aliphatic C6-C8	3.2	<0.15	<0.15	<0.15	<0.15	<0.15
Aromatic >C10-C12	0.15	<0.15	<0.15	<0.15	<0.15	<0.15
Aromatic >C12-C16	0.15	<0.15	<0.15	<0.15	<0.15	<0.15
Aromatic >C16-C21	0.15	<0.15	<0.15	<0.15	<0.15	<0.15
Aromatic >C21-C35	0.15	<0.15	<0.15	<0.15	<0.15	<0.15
Aromatic >C8-C10	0.15	<0.15	<0.15	<0.15	<0.15	<0.15
TPH - Mixtures (f)						
TPH-GRO	0.15	<0.15	See Fractions	See Fractions	See Fractions	See Fractions
TPH-DRO	0.15	**0.477**	See Fractions	See Fractions	See Fractions	See Fractions
TPH-ORO	0.15	**0.405**	See Fractions	See Fractions	See Fractions	See Fractions
Volatile Organic Compounds						
Benzene	0.005	0.005	**0.029**	0.00343	<0.005	<0.005
Ethylbenzene	0.7	<0.005	<0.005	<0.005	<0.005	<0.005
Toluene	1	<0.00875	0.00882	0.0105	<0.0075	<0.0075
Xylenes	10	<0.0413	<0.05	<0.03	<0.03	<0.03
Chloride	NA (h)	17350	9900	1370	944	194

TABLE 5-7

GROUND WATER
COMPARISON TO RECAP SCREENING STANDARDS

East White Lake Oil and Gas Field
Vermilion Parish, Louisiana

Notes:

Concentrations expressed in mg/L.

TPH - Total Petroleum Hydrocarbons.

- Not analyzed

Essential elements that are generally not considered toxic to humans (i.e. calcium, magnesium, potassium, sodium) are not included in the risk evaluation for ground water.

A **bold** value indicates that the maximum reported concentration exceeds a screening standard for the respective constituent. See Table 5-8 for additional discussion on these constituents and selection of site-related COCs.

A **bold and boxed** value indicates that the maximum reported concentration exceeds a screening standard for the respective constituent and is identified as a site-related COC subject to further evaluation under a higher Management Option.

(a) Constituents shown in this table include detected constituents and indicator constituents for petroleum hydrocarbons (e.g., BTEX).

(b) GW_{SS} = RECAP Screening Standard from Table 1 of RECAP 2003.

(c) Maximum reported concentrations in ground water samples collected in each respective zone. The samples included in the risk evaluation are summarized in Table 5-6. Split sample results from two separate laboratories (as submitted by ICON and MP&A) were averaged when valid data were available from both laboratories. A proxy value equal to the sample quantitation limit was used for non-detect results in the average of split samples. For locations where samples were collected in multiple events over time, the most recent sample data were used to represent current conditions at that location.

(d) Value not provided in RECAP; the risk-based values were calculated in accordance with Appendix H of RECAP 2003 (see Appendix G).

(e) EPA Secondary Maximum Contaminant Level (SMCL), a non-enforceable guideline for public water systems addressing undesirable aesthetic effects such as taste, color, and odor.

(f) RECAP Appendix D states that "If TPH fractionation data and TPH mixture data have both been collected at an AOI and the two data sets yield different conclusions about management of the AOI, then management decisions shall be based on the fractionation data since the fractionation method yields more specific information regarding the TPH constituents present and thus more accurately characterizes site conditions." Adequate TPH-Fraction data were available and used for the assessment of all zones in accordance with this guidance except for the Peat Zone, where fraction data were available for only 1 of 8 sample locations. Therefore, TPH mixtures were assessed in addition to fractions in the Peat Zone.

(g) All samples from this zone were collected with hydropunch methodology. Filtered samples (i.e., dissolved results) were therefore collected and are used in the risk evaluation.

(h) Because chlorides naturally exceed 250 mg/L in the sands of the Chicot Aquifer Confining Unit, a screening standard is not identified for the Peat Zone, the 40-Foot Zone, 70-Foot Zone, or 90-Foot Zone. The EPA Secondary Maximum Contaminant Level (SMCL) for chlorides of 250 mg/L is applicable to the Upper Sand of the Chicot Aquifer.

Table 5-8
SUMMARY OF GROUND WATER CONSTITUENTS NOT IDENTIFIED AS SITE-RELATED COCs
East White Lake Oil and Gas Field
Vermilion Parish, Louisiana

Peat Zone	
Arsenic	• Split sample results are not available for the Peat Zone with the exception of monitor well WL-6 sampled in 2015, for which results from both investigators showed arsenic was non-detect. Confirmation data are therefore not available for any of the arsenic detections reported in the Peat Zone. • Arsenic was detected in 4 of 8 locations, including monitor well AB-2 (at 0.015 mg/L) located in the Peat Zone to the south outside of any impacted area (see Figures 5-3 through 5-6 for AB-2 location relative to COC screening standard exceedances). • Arsenic occurrence does not show a relationship of higher concentrations with the primary indicator COCs, barium and chlorides, which are clearly the prevalent COCs present as a result of E&P activities at the site. Arsenic was not detected in the well with highest concentrations of barium and chlorides in the Peat Zone, WL-6.
Iron and Manganese	• Iron and manganese are naturally elevated in ground water in this site location, as documented in independent studies by the USGS and Louisiana Geological Survey. Additionally, these constituents are not E&P-related contaminants.
Selenium	• Selenium was analyzed and detected in a single well in the Peat Zone by Sherry Laboratory, and no split result was available. (See additional discussion for 40-Foot Zone)
40-Foot Zone	
Arsenic	• Split sample results for arsenic in the 40-Foot Zone are notably variable, i.e., detection by one laboratory above the reporting limit of 0.01 mg/L is routinely not confirmed by the second laboratory. Based on review of these variable results with GCAL laboratory, it is suspected that the arsenic results are affected by interference that is introduced by high dissolved solids (high salt levels) in the ground water. High dissolved solids are a known potential interference with the detection of metals by Inductively Coupled Plasma (ICP, Method 6010), which was used as the detection method for ground water analysis by both labs. This potential interference, combined with the fact that arsenic may be present naturally at values very close to the detection limit, may contribute to the poor agreement between split laboratory results. • Arsenic was detected above the reporting limit of 0.01 mg/L in 6 of 20 locations, and the detection was not confirmed by the split result in 4 of the locations. • The monitor well AB-1 located in the 40-Foot Zone to the south outside of any impacted area contained an arsenic level of 0.021 mg/L (see Figures 5-7 through 5-10 for AB-1 location relative to screening standard exceedances). • Arsenic occurrence does not show a relationship of higher concentrations with the primary indicator COCs, barium, chlorides, and benzene, which are clearly the COCs present as a result of E&P activities at the site. Therefore, arsenic occurrence does not appear related to the same sources as the E&P-related COCs. • Arsenic was not detected in any representative samples from POC wells for the 40-Foot Zone AOIs (the wells most affected with site related constituents), specifically wells SB-1-MW and MW-1, SB-3-MW and MW-3, HP-MPA-02-T, and HP-MPA-08-T.
Iron and Manganese	• Iron and manganese are naturally elevated in ground water in this site location, as documented in independent studies by the USGS. Additionally, these constituents are not E&P-related contaminants.

Table 5-8
SUMMARY OF GROUND WATER CONSTITUENTS NOT IDENTIFIED AS SITE-RELATED COCs
East White Lake Oil and Gas Field
Vermilion Parish, Louisiana

Selenium	• Split sample results for selenium indicate 100% disagreement regarding detection of selenium, with appropriate detection limits (below screening standards) by both laboratories. Selenium is only detected by Sherry Laboratory, and is not typically a COC for E&P sites.
70-Foot Zone	
Arsenic	• Similar to the 40-Foot Zone, split sample results for arsenic are notably variable. Arsenic was detected above the reporting limit of 0.01 mg/L in representative samples (i.e., filtered hydropunch samples) in 4 of 13 locations, and the detection was not confirmed by the split results in any location. • Arsenic occurrence does not show a relationship of higher concentrations with the only indicator COC in the 70-Foot Zone, chlorides. Arsenic was not detected in the representative samples (either split) from the location with maximum chlorides concentration: SB-1D.
Iron and Manganese	• Iron and manganese are naturally elevated in ground water in this site location, as documented in independent studies by the USGS and Louisiana Geological Survey. Additionally, these constituents are not E&P-related contaminants.
Selenium	• Similar to the 40-Foot Zone, split sample results for selenium indicate 100% disagreement regarding detection of selenium, which was only detected by Sherry Laboratory.
90-Foot Zone and Upper Sand of Chicot Aquifer	
Iron and Manganese	• Iron and manganese are naturally elevated in ground water in this site location, as documented in independent studies by the USGS and Louisiana Geological Survey. Additionally, these constituents are not E&P-related contaminants.

TABLE 6-1

TOXICITY FACTORS FOR SITE CONSTITUENTS OF CONCERN (COCs)

East White Lake Oil and Gas Field
Vermilion Parish, Louisiana

NONCARCINOGENIC TOXICITY FACTORS AND TARGET ORGANS

Chemical	Chronic Oral Reference Dose (RfDo) (mg/kg-day)	Toxicity Source	RfDo Target Organs	Chronic Inhalation Reference Concentration (RfC) (mg/m3)	Chronic Inhalation Reference Dose (RfDi) (mg/kg-day)	Toxicity Source	RfC Target Organs	Fish Bioconcentration Factor (BCF) (L/kg)	BCF Source
Metals									
Arsenic, Inorganic	3.0E-04	IRIS	Skin, Vascular	0.000015	4.3E-06	Cal EPA	NA	300	RAIS (RESRAD)
Barium	2.0E-01	IRIS	Kidney	0.0005	1.4E-04	HEAST	Fetus	4	RAIS (RESRAD)
Cadmium	5.0E-04	IRIS	Urinary	0.00001	2.9E-06	ATSDR	Renal	200	RAIS (RESRAD)
Chlorides	(a)	-	-	(a)	(a)	-	-	-	-
Chromium(III), Insoluble Salts	1.5E+00	IRIS	NA	-	-	-	-	200	RAIS (RESRAD)
Lead	(b)	-	-	(b)	(b)	-	-	-	-
Mercury (Mercuric Chloride)	3.0E-04	IRIS	Immune System	0.0003	8.6E-05	IRIS	Neurological	1000	RAIS (RESRAD)
Methyl Mercury	1.0E-04	IRIS	Neurological	-	-	-	-	1000	RAIS (RESRAD)
Selenium	5.0E-03	IRIS	Integument (hair, skin, nails), Dental, Hematological, CNS	0.02	5.7E-03	Cal EPA	NA	200	RAIS (RESRAD)
Strontium	6.0E-01	IRIS	Bone	-	-	-	-	60	RAIS (RESRAD)
Zinc	3.0E-01	IRIS	Blood	-	-	-	-	1000	RAIS (RESRAD)
Organics									
Acenaphthene	6.0E-02	IRIS	Liver	-	-	-	-	755	RAIS (EPI)
Benzene	4.0E-03	IRIS	Blood	0.03	8.6E-03	IRIS	Blood	4.27	RAIS (EPI)
Methylnaphthalene, 2-	4.0E-03	IRIS	Lungs	-	-	-	-	74.7	RAIS (EPI)
Aliphatics >C10-C12	1.0E-01	RECAP	Liver, Hematological	-	3.0E-01	RECAP	Liver, Hematological	0 (f)	RECAP
Aliphatics >C12-C16	1.0E-01	RECAP		-	3.0E-01	RECAP		0 (f)	RECAP
Aliphatics >C16-C35	2.0E+00	RECAP	Liver	-	2.0E+00	RECAP	Liver	0 (f)	RECAP
Aromatics >C8-C10	4.0E-02	RECAP	Decreased Body Weight	-	6.0E-02	RECAP	Decreased Body Weight	0 (f)	RECAP
Aromatics >C10-C12	4.0E-02	RECAP		-	6.0E-02	RECAP		0 (f)	RECAP
Aromatics >C12-C16	4.0E-02	RECAP		-	6.0E-02	RECAP		0 (f)	RECAP
Aromatics >C16-C21	3.0E-02	RECAP	Kidney	-	3.0E-02	RECAP	Kidney	0 (f)	RECAP
Aromatics >C21-C35	3.0E-02	RECAP		-	3.0E-02	RECAP		0 (f)	RECAP
TPH-DRO	(c)	RECAP	Kidney, Liver, Hematological System, Decreased Body Weight	-	(c)	RECAP	Kidney, Liver, Hematological System, Decreased Body Weight	0 (f)	RECAP
TPH-ORO	(d)	RECAP	Kidney, Liver	-	(d)	RECAP	Kidney, Liver	0 (f)	RECAP
TPH >C8-C16	7.0E-02	(e)	Liver, Hematological System, Decreased Body Weight	-	-	-	-	0 (f)	RECAP
TPH >C16-C28	1.0E+00	(e)	Kidney, Liver	-	-	-	-	0 (f)	RECAP

Notes:

- Not available or not applicable

RAIS - Risk Assessment Information System

(a) Chloride is considered a non-traditional parameter per RECAP, with no applicable toxicity factors. Chlorides are evaluated under MO-3.

(b) Health risks associated with exposure to inorganic lead are not assessed using the traditional risk assessment methodology based on the use of toxicity values (RfD, RfC, SF). Rather, lead exposure is assessed using the Integrated Exposure Uptake Biokinetic Model (IEUBK) (pub. #9285.7-15-2, PB93-963511) or the Adult Lead Cleanup Level Model.

(c) The RECAP Standard (RS) for TPH-DRO is selected as the minimum of RS for aliphatic and aromatic fractions in the >C8-C35 range (RECAP, 2003).

(d) The RECAP Standard (RS) RS for TPH-ORO is selected as the minimum of the aliphatic >C16-C35 and aromatic >C21-C35 fractions (RECAP, 2003).

(e) Tissue Screening Level (TSL) calculated using weighted toxicity value from RECAP (2003) (i.e., oral reference dose, RfD) assuming 50% aliphatics and 50% aromatics.
TPH>C8-C16: 0.07 mg/kg-day is the average of the RfDs provided in RECAP for aliphatic and aromatic hydrocarbons within this range.
TPH>C16-C28: 1.0 mg/kg-day is the average of the RfDs provided in RECAP for aliphatic and aromatic hydrocarbons within this range.

(f) Per RECAP (2003), no bioconcentration factor is warranted for this constituent.

TABLE 6-1

TOXICITY FACTORS FOR SITE CONSTITUENTS OF CONCERN (COCs)

East White Lake Oil and Gas Field
Vermilion Parish, Louisiana

CARCINOGENIC TOXICITY FACTORS

Chemical	**Oral Slope Factor (SFo) (mg/kg-day)-1**	**Toxicity Source**	**Inhalation Unit Risk (IUR) (µg/m3)-1**	**Inhalation Slope Factor (SFi) (mg/kg-day)-1**	**Toxicity Source**
Metals					
Arsenic, Inorganic	1.50E+00	IRIS	4.30E-03	1.51E+01	IRIS
Barium	-	-	-	-	-
Cadmium	-	-	1.80E-03	6.30E+00	IRIS
Chlorides	(a)	-	(a)	(a)	-
Chromium(III), Insoluble Salts	-	-	-	-	-
Lead	(b)	-	(b)	(b)	-
Mercury (Mercuric Chloride)	-	-	-	-	-
Methyl Mercury	-	-	-	-	-
Selenium	-	-	-	-	-
Strontium	-	-	-	-	-
Zinc	-	-	-	-	-
Organics					
Acenaphthene	-	-	-	-	-
Benzene	5.50E-02	IRIS	7.80E-06	2.73E-02	IRIS
Methylnaphthalene, 2-	-	-	-	-	-
Aliphatics >C10-C12	-	-	-	-	-
Aliphatics >C12-C16	-	-	-	-	-
Aliphatics >C16-C35	-	-	-	-	-
Aromatics >C8-C10	-	-	-	-	-
Aromatics >C10-C12	-	-	-	-	-
Aromatics >C12-C16	-	-	-	-	-
Aromatics >C16-C21	-	-	-	-	-
Aromatics >C21-C35	-	-	-	-	-
TPH-DRO	-	-	-	-	-
TPH-ORO	-	-	-	-	-
TPH >C8-16	-	-	-	-	-
TPH >C16-28	-	-	-	-	-

Notes:

(a) Chloride is considered a non-traditional parameter per RECAP, with no applicable toxicity factors. Chlorides are evaluated under MO-3.

(b) Health risks associated with exposure to inorganic lead are not assessed using the traditional risk assessment methodology based on the use of toxicity values (RfD, RfC, SF). Rather, lead exposure is assessed using the Integrated Exposure Uptake Biokinetic Model (IEUBK) (pub. #9285.7-15-2, PB93-963511) or the Adult Lead Cleanup Level Model.

(c) The RECAP Standard (RS) for TPH-DRO is selected as the minimum of RS for aliphatic and aromatic fractions in the >C8-C35 range (RECAP, 2003).

(d) The RECAP Standard (RS) RS for TPH-ORO is selected as the minimum of the aliphatic >C16-C35 and aromatic >C21-C35 fractions (RECAP, 2003).

(e) Tissue Screening Level (TSL) calculated using weighted toxicity value from RECAP (2003) (i.e., oral reference dose, RfD) assuming 50% aliphatics and 50% aromatics.
TPH>C8-C16: 0.07 mg/kg-day is the average of the RfDs provided in RECAP for aliphatic and aromatic hydrocarbons within this range.
TPH>C16-C28: 1.0 mg/kg-day is the average of the RfDs provided in RECAP for aliphatic and aromatic hydrocarbons within this range.

(f) Per RECAP (2003), no bioconcentration factor is warranted for this constituent

TABLE 6-2

EXPOSURE ASSUMPTIONS FOR RECREATIONAL EXPOSURE TO SEDIMENT

East White Lake Oil and Gas Field
Vermilion Parish, Louisiana

Parameter	**Symbol**	**Value**	**Units**	**Source/Description**
Ingestion Pathway				
Sediment Ingestion Rate:	IR_s			
Adult Recreational		50	mg/day	RECAP Default, Adult Industrial
Child Recreational		150	mg/day	Upper bound value estimate; for reference, recommended central tendency values are 50 mg/day for outdoor soil or 100 mg/day for outdoor soil + indoor dust, from Table ES-1 of the EPA's Child-specific Exposure Factors Handbook (2008).
Inhalation Pathway				
Exposure Time:	Ti			
Adult Recreational		9.47E+08	sec	Based on 30 year ED
Child Recreational		1.58E+08	sec	Based on 5 year ED
Inhalation Rate:	IRA			
Adult Recreational		20	m^3/day	RECAP Default, Adult
Child Recreational		20	m^3/day	RECAP Default, Adult used for conservative evalaution of adolescent
Volatilization Factor	VF_s	chemical-specific	m^3/kg	Calculated in accordance with RECAP Appendix H.
Dermal Absorption Pathway				
Sediment-to-Skin Adherence Factor	AF			
Adult Recreational		0.2	mg/cm^2	RECAP Default, Adult Industrial
Child Recreational		6.31	mg/cm^2	Weighted average for child playing in sediment for hands, arms, and feet from Table ES-1 of the EPA's Child-specific Exposure Factors Handbook (2008).
Dermal Absorption	ABS	chemical-specific	unitless	RECAP Default values, RECAP Appendix H.
Skin Surface Area:	SA			
Adult Recreational		6910	cm^2	Arms, hands, and feet assumed to be in contact with sediment. Surface Areas are 95% percentile values for males from Table 7-12 of the EPA's Exposure Factors Handbook (EPA, 2011).
Child Recreational		4080	cm^2	Arms, hands, and feet assumed to be in contact with sediment. Age-specific surface areas from Table 7-2 of the Child-Specific Exposure Factors Handbook (EPA, 2008)
General Parameters				
Exposure Frequency:	EF			
Adult Recreational		104	days/yr	2 days per week for 52 weeks. This frequency assumes regular visitation for hunting and fishing throughout the year, and assumes sediment ingestion and dermal contact during each visit. Alternatively, this equates to daily visitation for over 3 months of the year. This value is consistent with (or more conservative than) the following relevant sources and EPA or LDEQ-approved assessments: (a) U.S. Census Bureau and U.S. Fish and Wildlife data collection, provided in National Survey of Fishing, Hunting, and Wildlife Associated Recreation: Louisiana: average days for fishing in La= 22; average days for hunting = 19; average days for wildlife watching = 13 (b) LDWF Louisiana Recreational Fisherman and Health Advisory Survey Report 2008 identified fishermen visit a favorite fishing location up to 23 times per year on average, based on a survey of over 1500 (c) Bayou Trepagnier MO-3 RECAP Evaluation (2009, AI# 44765): recreational fishing and hunting EF = 52 days per year (d) EPA Region 6 risk evaluation for Sabine Lake directly west of White Lake and very similar setting to White Lake, although more accessible than East White Lake study area (see Superfund Record of Decision, Palmer Barge Line Superfund Site, Port Arthur, Jefferson County, Texas, September 2005): recreational receptor, direct contact EF= 100 days/year (e) EPA Region 6 Baseline Human Health Risk Assessment for Calcasieu Lake, 2002 (prepared by CDM on behalf of Region 6 EPA), AI# 7443: recreational fishing and swimming EF= 48 to 60 days/year

TABLE 6-2

EXPOSURE ASSUMPTIONS FOR RECREATIONAL EXPOSURE TO SEDIMENT

East White Lake Oil and Gas Field
Vermilion Parish, Louisiana

Parameter	**Symbol**	**Value**	**Units**	**Source/Description**
Child Recreational		104	days/yr	See prior summary for adult receptor.
Exposure Duration:	ED			
Adult Recreational		30	yrs	RECAP Default, upper bound value for residence in one location
Child Recreational		5	yrs	Age specific. Adolescent years 11-16 identified as age with increased likelihood of contacting sediment in canal bottoms and marshland, specifically at a consistent frequency of weekly. In addition, the larger body surface area for this child age range results in higher exposure estimates than a younger child. The 0-6 year old is not reasonably expected to contact canal bottom sediments.
Body Weight:	BW			
Adult Recreational		70	kg	RECAP Default, Adult
Child Recreational		59.3	kg	Average of 50th percentile body weights for children aged 11 through 16 from the Exposure Factors Handbook (EPA, 2011).
Averaging Time:				
Carcinogenic effects	AT_c	25,550	days	RECAP Default, Carcinogens (70 years time 365 days/yr)
Non-Carcinogenic effects, adult	AT_n	10,950	days	(ED yrs * 365 days/yr)
Non-Carcinogenic effects, child	AT_n	1,825	days	(ED yrs * 365 days/yr)
Target Risk	TR	1.00E-06	unitless	RECAP Default
Target Hazard Quotient	THQ	1	unitless	RECAP Default

Notes:

Chemical/physical properties from RECAP (2003).

EPA (2008). Child-Specific Exposure Factors Handbook (Final Report). EPA/600/R-06/096F.
EPA (2011). Exposure Factors Handbook. EPA/600/R-090/52F.
U.S. Department of the Interior, U.S. Fish and Wildlife Service, and U.S. Department of Commerce, U.S. Census Bureau. (2013). National Survey of Fishing, Hunting, and Wildlife-Associated Recreation: Louisiana, FHW/11-LA(RV). Revised December 2013.
Louisiana Department of Wildlife and Fisheries for LDHH (2009). Louisiana Recreational Fisherman and Health Survey Report. LDHH Award No 48629.
URS Corporation (2009). RECAP Management Option 3 Report. Bayou Trepagnier Operable Unit 2. AI 44765.
EPA (2005). Record of Decision Palmer Barge Line Superfund Site, Port Arthur, Jefferson County, Texas. US EPA Region 6. September 2005.
CDM (2002). Draft Final Human Health Risk Assessment for Calcasieu Estuary, Lake Charles, Louisiana. Prepared for EPA Region 6.

TABLE 6-3

SEDIMENT
COMPARISON TO MO-3 DIRECT CONTACT STANDARDS

East White Lake Oil and Gas Field
Vermilion Parish, Louisiana

Nonindustrial Direct Contact COCs (a)	Sed$_r$ Adult (b)	Sed$_r$ Child (b)	Industrial Soil$_i$ (c)	Additivity Divisor (d)	Final Sed$_r$ Adult (e)	Final Sed$_r$ Child (e)	Final Industrial Soil$_i$ (e)	Soil$_{sat}$ (f)	Limiting RS (g)	AOIC (mg/kg-wet) (h)	
										Maximum Sediment Concentration	**Maximum excluding WL-3 & WL-4**
Metals											
Barium	980,000	280,000	409,000	2	490,000	140,000	204,500	NA	140,000	5,170	5,170
Mercury	1,500	420	610	1	1,500	420	610	NA	420	4.47	4.47
TPH - Fractions (i)											
Aliphatics >C10-C12	51,000	17,000	20,000	2	25,500	8,500	10,000	NA	8,500	353	110
Aliphatics >C12-C16	98,000	32,000	38,000	2	49,000	16,000	19,000	NA	16,000	2,500	362
Aliphatics >C16-C35	1,400,000	130,000	690,000	2	700,000	65,000	345,000	NA	65,000	7,110	2,690
Aromatics >C12-C16	55,000	18,000	21,000	1	55,000	18,000	21,000	NA	18,000	403	169
Aromatics >C16-C21	30,000	2,200	17,000	2	15,000	1,100	8,500	NA	1,100	1,070	290
Aromatics >C21-C35	38,000	2,300	25,000	2	19,000	1,150	12,500	NA	1,150	**1,370**	433

Notes:
Concentrations in milligrams per kilogram (mg/kg) wet weight
MO-3 - Management Option 3 under RECAP
RS - RECAP Standard
COC - Constituent of Concern
AOIC - Area of Investigation Concentration
TPH - Total Petroleum Hydrocarbons
NA - Not Applicable
Sedr - site-specific RECAP Standard for sediment protective of human health for recreational land use.
A **bold** value indicates that the reported concentration exceeds the Limiting RS for the respective constituent.

(a) Constituents with concentrations above the RECAP Soil$_{SSni}$ in sediment samples representative of the 0 to 3 foot interval were included for further evaluation under MO-3 (screening evaluation provided in Table 5-1). See Table 5-3 for a list of sediment samples collected by ICON and MP&A used in the quantitative evaluation.

(b) Sediment RS were developed using the algorithms provided in Appendix H of RECAP for direct contact (per RECAP FAQ guidance), with updated toxicity factors, and modifying exposure assumptions as appropriate for sediment exposure. Exposure assumptions are identified for an adult and child recreational scenario in Table 6-2, with references/rationale for the selected exposure assumptions. Exposure pathways include ingestion, dermal contact, and inhalation of volatiles released to the breathing zone.

(c) RECAP standard protective of industrial land use, calculated in accordance with Appendix H of RECAP (2003), using default industrial exposure parameters provided in RECAP with current toxicity factors (as identified in Table 6-1).

(d) Additivity divisor for non-carcinogenic effects on the same target organ/ system applied in accordance with Appendices D and G of RECAP (2003). Target organs are identified as follows:

Barium - Kidney Effects
Mercury - Immune system
Aliphatics >C8-C16 - Liver, Hematological Effects
Aliphatics >C16-C35 - Liver
Aromatics >C8-C16 - Decreased Body Weight
Aromatics >C16-C35 - Kidney

(e) Final RS - Initial RS divided by additivity divisor.

(f) Soilsat - Soil saturation concentration (RECAP Table 2)

(g) The limiting RS is the minimum of the Final Sedr adult, Sedr child, and Industrial Soili.

(h) The AOIC is the maximum reported concentration (after split results were averaged) in samples most representative of surface sediment in the 0 to 3 foot interval. Sediment samples included in the direct contact evaluation are summarized in Table 5-3. Maximum concentrations excluding WL-3 and WL-4 are also provided.

(i) RECAP identifies 10,000 mg/kg as an aesthetic limit for TPH in soil (this is not specifically addressed for sediment). This value is not a health based limit (health based limits are shown in this table), but indicates potential for colored or oily and odorous soil. WL-3 and WL-4 are the only locations with total TPH fraction resuls greater than 10,000 mg/kg.

TABLE 6-4

SEDIMENT
COMPARISON TO MO-3 GROUND WATER PROTECTION STANDARDS

East White Lake Oil and Gas Field
Vermilion Parish, Louisiana

Ground Water Protection Sediment COCs (a)	$\text{Soil}_{\text{GW3NDW}}$ (b) (mg/kg)	**AOIC (Maximum Concentration) (c) (mg/kg-dry)**
Semi-Volatile Organic Compounds		
2-Methylnaphthalene	48	5.29
TPH - Fractions		
Aliphatics >C16-C35	1.2E+11 (d,e)	12570
Aromatics >C8-C10	6100	281
Aromatics >C10-C12	9600	480
Aromatics >C12-C16	19,000 (d)	2660
Aromatics >C16-C21	45,000 (d)	3230

Notes:

Per RECAP 2003 and related FAQ guidance, concentrations are expressed in mg/kg dry weight for sediment for this transport pathway.

MO-3 - Management Option 3 under RECAP
COC - Constituent of Concern
AOIC - Area of Investigation Concentration
TPH - Total Petroleum Hydrocarbons

(a) Constituents with concentrations above the RECAP SoilSSGW in sediment samples collected from all depths were included for further evaluation under MO-3 (screening evaluation provided in Table 5-2). See Table 5-4 for a list of sediment samples collected by ICON and MP&A used in the quantitative evaluation.

(b) SoilGW3NDW = RECAP Standard for soil protective of ground water, calculated in accordance with Appendix H of RECAP (2003) using current toxicity factors and bioconcentration factors. The NDW designation is based on the uses designated in the Surface Water Quality regulations (LAC Title 33, Part IX, Subpart I, Chapter 11) for Segment 050703 (White Lake).

(c) The AOIC is the maximum concentration (after split results were averaged). See Table 5-4 for the list of samples included in the evaluation.

(d) RECAP identifies 10,000 mg/kg as an aesthetic limit for TPH in soil (this is not specifically addressed for sediment). This value is not a health based limit (health based limits are shown in this table), but indicates potential for colored or oily and odorous soil. WL-3 and WL-4 are the only locations with total TPH greater than 10,000 mg/kg.

(e) A value of 1,000,000 mg/kg (one million parts per million) is a physical upper limit of soil constituent content, and indicates that the constituent is not a human health concern by this pathway at any concentration in soil.

TABLE 6-5

SEDIMENT
COMPARISON OF SPLP DATA TO LEACHATE STANDARDS PROTECTIVE OF GROUND WATER

East White Lake Oil and Gas Field
Vermilion Parish, Louisiana

		Sediment Concentration (mg/kg-dry)				**SPLP Concentration (b) (mg/L)**		
Sample ID/Depth (a)	Sample Date	MPA	ICON	Average	Corresponding SPLP Sample ID/Depth (a)	MPA	ICON	Average
Barium	**Soil$_{SSGW}$ = 2000 mg/kg**				**SPLP RS = GW$_{3NDW}$ (83 mg/L) * 20 = 1660 mg/L**			
SS-5 (0-2.15')	4/26/2006	-	7450	7450	SPLP-2 (1-3')	0.89	0.0883	0.489
SS-7 (0-1.4')	4/26/2006	-	15700	15700	SPLP-3 (1-3')	1.39	0.149	0.77
SS-11 (0-2.5')	4/27/2006	-	2750	2750	SPLP-1 (1-3')	1.07	0.0573	0.564
Lead	**Soil$_{SSGW}$ = 100 mg/kg**				**SPLP RS = GW$_{3NDW}$ (0.05 mg/L) * 20 = 1.0 mg/L**			
SS-5 (0-2.15')	4/26/2006	-	117	117 (b)	SPLP-2 (1-3')	1.65	<0.0100	0.83
SS-7 (0-1.4')	4/26/2006	-	67.5	67.5	SPLP-3 (1-3')	0.15	<0.0100	0.08
Mercury	**Soil$_{SSGW}$ = 4 mg/kg**				**SPLP RS = GW$_{3NDW}$ (0.002 mg/L) * 20 = 0.04 mg/L**			
SS-8 (2-4')	2/26/2010	28	0.47	14.2	SPLP-4 (2-4')	<0.0002	-	<0.0002

Notes:
-- Not Analyzed
SPLP - Synthetic Precipitation Leaching Procedure.
Soil$_{SSGW}$ - default RECAP Screening Standard for soil for the protection of ground water.
GW$_{3NDW}$ - Ground Water Class 3 Non-Drinking Water RECAP Standard calculated in accordance with Appendix H of RECAP (2003) using current toxicity factors and bioconcentration factors. Note that the default DFSummers is used in this analysis, however barium and mercury leachate concentrations are less than the GW3NDW standard with no DF applied. For lead, three samples of the hundreds collected exceeded the screening standard, and were laterally delineated; the source areas for lead defined by the screening standard are less than 0.5 acre.

SPLP RS - RECAP Standard for SPLP; SPLP results are compared to the ground water RS (GW3NDW) multiplied by a default factor of 20 per RECAP (2003). GW3NDW values based on current toxicity factors and bioconcentration factors were used.

(a) Sample locations with highest reported metal concentrations in exceedance of the initial RECAP Screening Standard for the protection of ground water (Soil$_{SSGW}$) were revisited, and samples were collected for leachate (SPLP) analysis.

(b) SPLP results are compared to the appropriate ground water standard multiplied by a default Summer's DF of 20, to account for dilution of the constituent as it moves from the soil column into the ground water, in accordance with Appendix H of RECAP (2003). Split leachate sample results from two separate laboratories (as submitted by ICON and MP&A) were averaged for the evaluation, where available. A proxy value equal to the sample quantitation limit was used for non-detect results in the average of split samples.

(c) The lead concentration reported at SS-5 (0-2.15') (117 mg/kg-dry) is similar to the maximum reported lead concentration of 125 mg/kg-dry at WL-3 (0-2'), for which remedial action has been proposed. The concentration reported at SS-5 (117 mg/kg), for which SPLP results are available, is the maximum concentration for locations that are not included in the remediation plan.

TABLE 6-6

PEAT ZONE GROUND WATER
COMPARISON TO CLASS 3 RECAP STANDARDS

East White Lake Oil and Gas Field
Vermilion Parish, Louisiana

Peat Zone GW COCs (a)	GW_{3NDW} (b)	**Compliance Concentrations (Maximum) in the Peat Zone (c)**	
Metals		***Dissolved***	***Total***
Barium	83	10.8	12.0
Strontium	33	18.4	17.9
Chloride	NS (d)	-	17,350
TPH - Mixtures			
TPH-DRO	24	-	0.477
TPH-ORO	24	-	0.405

Notes:
Concentrations expressed in mg/L.
TPH - Total Petroleum Hydrocarbons
NS - No standard

(a) Site-related constituents with concentrations in Peat Zone ground water samples above the RECAP GW_{SS} were included for further evaluation under MO-3. See Table 5-6 for a list of ground water samples collected by ICON and MP&A used in the quantitative evaluation.

(b) GW3NDW = RECAP Standard for Class 3 Ground Water, calculated in accordance with Appendix H of RECAP (2003) using current toxicity values and bioconcentration factors (as summarized in Table 6-1).

(c) Compliance Concentration is the maximum reported concentration in the Peat Zone (after split results were averaged).

(d) No standard is applicable, as the chlorides standard currently listed in the Surface Water Quality Standard (LAC Title 33, Part IX, Subpart I, Chapter 11) for Segment 050703 (White Lake) requires modification per the Louisiana Water Quality Inventory: Integrated Report (LDEQ, 2014). The standard of 250 mg/L requires modification because the chlorides concentration is naturally elevated above this standard in surface water (as well as ground water) in this area due to tidal influence.

TABLE 6-7

40-FOOT ZONE GROUND WATER
COMPARISON TO DEFAULT AND SITE-SPECIFIC MO-3 STANDARDS

East White Lake Oil and Gas Field
Vermilion Parish, Louisiana

Constituents (a)	**Default RECAP Standard GW2 (b)**	Child Recreational GW RS (c)	Adult Recreational GW RS (c)	Shower Inhalation Scenario GW RS (d)	**Limiting Recreational GW RS (e)**	**Compliance Concentration in the 40-Foot Zone (f)**	
SB-1-MW AOI (g)						MW-1	SB-1-MW
Benzene	0.005	0.347	0.0404	0.0442	0.0404	0.029	0.015
Barium (dissolved)	2	357	249	-	249	-	3.52
Barium (total)	2	357	249	-	249	14.8	3.32
Strontium (dissolved)	22	15,300	10,700	-	10700	-	-
Strontium (total)	22	15,300	10,700	-	10700	13.9	5.42
Chloride	555-1600 (i)	NS (j)	NS (j)	NS (j)	NS (j)	9370	3120
SB-3-MW AOI						SB-3-MW	
Barium (dissolved)	2	357	249	-	249	6.06	
Barium (total)	2	357	249	-	249	7.96 (h)	
Strontium (dissolved)	22	15,300	10,700	-	10700	6.84	
Strontium (total)	22	15,300	10,700	-	10700	8.42 (h)	
Chloride	555-1600 (i)	NS (j)	NS (j)	NS (j)	NS (j)	7160	
HP MPA-8 AOI						HP MPA-8	
Barium (dissolved)	2	357	249	-	249	2.17	
Chloride	555-1600 (i)	NS (j)	NS (j)	NS (j)	NS (j)	1510	

Notes:
Concentrations expressed in mg/L
- Not applicable
RS - RECAP Standard
See Table 5-6 for a list of ground water samples collected by ICON and MP&A used in the quantitative evaluation.

(a) Constituents determined to be site-related with concentrations above the RECAP GW_{SS} were included for further evaluation under MO-3.

(b) GW2 = RECAP Standard for Class 2 Ground Water, from Table 3 of RECAP 2003, prior to application of a dilution attenuation factor (DAF).

(c) Management Option 3 RECAP Standard developed to express Reasonable Maximum Exposure, assuming dermal contact with ground water used as wash water (recreational scenario). Exposure parameters with references are tabulated separately (Table 6-8).

(d) Management Option 3 RECAP Standard developed to express Reasonable Maximum Exposure, assuming inhalation of volatile COCs from ground water used for showering. Exposure parameters with references are tabulated separately (Table 6-8).

(e) Limiting RECAP Standard is the minimum of the site-specific MO-3 RS for ground water (recreational adult, recreational child, and shower scenario).

(f) Compliance Concentration is the maximum reported concentration in the AOI (after split results were averaged). For location SB-1-MW, where samples were collected in multiple events over time, the most recent sample data were used to represent current conditions.

(g) Two POC values are shown for the SB-1-MW AOI because the sampling locations are immediately adjacent, with MW-1 last sampled in 2010 and SB-1-MW sampled more recently in 2014.

(h) Value shown is from the adjacent sample location, MW-3, because the unfiltered (total) results for SB-3-MW were not considered representative (due to turbid samples).

(i) Because the natural levels of chlorides exceed the SMCL, an alternative GW2 RECAP standard is appropriate for chlorides. Chlorides reported in unimpacted locations collected north of Schooner Bayou and at location AB-1 in the 40-Foot Zone are provided as reference values: 555 -1600 mg/L.

(j) No standard applicable (NS): constituent is not toxic via dermal exposure route.

TABLE 6-8

EXPOSURE ASSUMPTIONS FOR RECREATIONAL EXPOSURE TO GROUND WATER

East White Lake Oil and Gas Field
Vermilion Parish, Louisiana

Parameter	**Symbol**	**Recreational Scenario Value**	**Shower Scenario Value**	**Units**	**Source/Description**
Ingestion Pathway					
Incidental Ingestion Rate:	IRw				
Adult		NA	0.089	L/day	RECAP Default
Child		NA	0.089	L/day	RECAP Default
Inhalation Pathway					
Shower Inhalation Exposure Time:	ETiw				
Adult		NA	0.71	hr	RAIS Default, EPA, 2004 (RAGS Part E, Exhibit 3-2)
Child		NA	0.71	hr	RAIS Default, EPA, 2004 (RAGS Part E, Exhibit 3-2)
Inhalation Rate:	IRA				
Adult		NA	20	m^3/day	Incorporated into the RfC
Child		NA	20	m^3/day	Incorporated into the RfC
Andelman Volatilization Factor	K	NA	0.5	L/m^3	Default, EPA, 1991 (RAGS Part B)
Dermal Absorption Pathway					
Dermal Exposure Time:	ETiww				
Adult		2	NA	hr	Assumes 2 hours with skin immersed during washing boats, traps, fish, etc.
Child		2	NA	hr	Assumes 2 hours with skin immersed during washing boats, traps, fish, etc.
Skin Surface Area:	SA				
Adult		6910	NA	cm^2	Arms, hands, and feet assumed to be in contact with sediment. Surface Areas are 95% percentile values for males from Table 7-12 of the EPA's Exposure Factors Handbook (EPA, 2011).
Child		4080	NA	cm^2	Arms, hands, and feet assumed to be in contact with sediment. Age-specific surface areas from Table 7-2 of the Child-Specific Exposure Factors Handbook (EPA, 2008)
General Parameters					
Exposure Frequency:	EF				
Adult		104	104	days/yr	See summary provided in Table 6-2 for sediment.
Child		104	104	days/yr	See summary provided in Table 6-2 for sediment.
Exposure Duration:	ED				
Adult		30	30	yrs	RECAP Default, residential
Child		5	5	yrs	Age specific. Adolescent years 11-16 identified as age with increased likelihood of fishing and hunting, specifically at a consistent frequency of weekly. In addition, the larger body surface area for this child age range results in higher exposure estimates than a younger child.
Body Weight:	BW				
Adult		70	70	kg	RECAP Default, adult
Child		59.3	59.3	kg	Average of 50th percentile body weights for children aged 11 through 16 from the Exposure Factors Handbook (EPA, 2011).
Averaging Time:					
Carcinogenic effects	AT_c	25,550	25,550	days	RECAP Default, Carcinogens (70 years time 365 days/yr)
Non-Carcinogenic effects, adult	AT_n	10,950	10,950	days	(ED yrs * 365 days/yr)
Non-Carcinogenic effects, child	AT_n	1,825	1,825	days	(ED yrs * 365 days/yr)
Target Risk	TR	1.00E-06	1.00E-06	unitless	RECAP Default
Target Hazard Quotient	THQ	1	1	unitless	RECAP Default

Notes:
Chemical/physical properties from RAIS PRG Calculator
EPA (July 2004). Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment). EPA/540/R/99/005. July 2004.
EPA (December 1991), Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part B, Development of Risk-Based Preliminary Remediation Goals), EPA/540/R-92/003. December 1991.
EPA (2008). Child-Specific Exposure Factors Handbook (Final Report). EPA/600/R-06/096F.
EPA (2011). Exposure Factors Handbook. EPA/600/R-090/52F.

TABLE 6-9

SURFACE WATER
COMPARISON TO MO-3 STANDARDS

East White Lake Oil and Gas Field
Vermilion Parish, Louisiana

Constituents (a)	**Health-Based NDW SW RS (b)**	Adult Recreational SW RS (c)	Child Recreational SW RS (c)	Target Organs (d)	Additive Divisor (e)	Final Adult Recreational SW RS (f)	Final Child Recreational SW RS (f)	**Limiting Recreational SW RS (g)**	**Maximum Detected Concentration (h)**	
Metals									*Dissolved*	*Total*
Arsenic	0.05	0.014	0.12	Skin, Vascular	-	0.014	0.12	0.014	0.014	0.013
Barium	83	124	179	Kidney	3	41	60	41	1.1	1.23
Cadmium	0.01	0.22	0.32	Urinary	1	0.22	0.32	0.22	0.00086	0.00021
Chromium (h)	26	173	249	NA	1	170	250	170	0.0051	0.0075
Lead (i)	0.05	-	-	NA	-	-	-	-	0.0088	0.021
Mercury (j)	0.002	0.19	0.27	Immune System	1	0.19	0.27	0.19	0.00012	0.00007
Selenium	0.086	44.4	63.8	Integument (hair, skin, nails), Dental, Hematological, CNS	3	11	16	11	0.032	0.054
Strontium	33	5330	7650	Bone	1	5300	7700	5300	1.66	1.74
Zinc	5	4440	6380	Blood	3	1100	1600	1100	0.023	0.13
Polycyclic Aromatic Hydrocarbons (PAH)										
Acenaphthene (k)	0.28	5.01	7.19	Liver	3	1.7	2.4	1.7	-	0.000131
Total Petroleum Hydrocarbons (TPH) (l)										
TPH-DRO (m)	24	-	-	Kidney, Liver, Hematological, Body Weight	-	-	-	-	-	1.34
TPH-ORO (n)	24	-	-	Kidney, Liver	-	-	-	-	-	1.11
Chlorides (o)	-	-	-	NA	-	-	-	-	-	3690

TABLE 6-9

SURFACE WATER
COMPARISON TO MO-3 STANDARDS

East White Lake Oil and Gas Field
Vermilion Parish, Louisiana

Notes:
Concentrations expressed in mg/L
CNS - Central Nervous System
SW RS - Surface Water RECAP Standard
NDW - Non-Drinking Water
NA - Not available or not applicable
- RS not developed, see note assigned to each constituent below

(a) Site-specific MO-3 RS were developed for site-related constituents detected in surface water samples listed in Table E-7, as applicable. Essential elements that are generally not considered toxic to humans (i.e. calcium, iron, magnesium, manganese, potassium, and sodium) are not included in the evaluation of surface water.

(b) Ground Water 3 Non-Drinking Water (GW3NDW) Standards calculated in accordance with Appendix H of RECAP (2003) are considered protective of recreational use of surface water without a dilution factor applied. Pathways include incidental ingestion of surface water and consumption of fish caught from the surface water. Current toxicity values and fish bioconcentration factors (BCFs) were used for all constituents.

(c) Site-Specific Recreational Surface Water Standards for adult and child receptors were developed to express Reasonable Maximum Exposure, assuming contact with surface water during recreational fishing and hunting. Exposure parameters and references are tabulated separately (Table 6-10).

(d) Target organs associated with each detected constituent that elicits noncarcinogenic effects. Target organs are associated with the reference doses used in this evaluation and were obtained from RAIS, with the exception of selenium and TPH, which were provided by RECAP.

(e) Additive divisor for non-carcinogenic effects on the same target organ.

(f) The final adult and child recreational MO-3 RS for surface water is the lower of the carcinogenic RS and the noncarcinogenic RS divided by the additive divisor.

(g) Maximum detected concentration from surface water samples and splits collected in May 2010 from access canals on the property (SW-01 through SW-07, SW-09 (and its field duplicate, SW-109), SW-10, SW-20), surface water samples and splits collected in May 2010 from locations outside of the canals along Schooner Bayou/White Lake (SW-BK-01 through SW-BK-11), and surface water samples collected in November 2014 from the canal near the SED15 Pit area before initiation of remediation activities (SW-1 through SW-3). Dissolved (filtered) concentrations are most appropriate for assessment of metals in accordance with Louisiana surface water quality regulations. Total metals concentrations provided for completeness of information.

(h) Chromium (III), insoluble salts was assumed for selection and development of RS.

(i) A site-specific surface water standard for lead could not be developed using standard risk algorithms, because lead exposure is evaluated using a biokinetic model and risk is interpreted in terms of blood lead concentration rather than a Hazard Quotient. Drinking water standard provided as a conservative reference.

(j) Mercuric chloride was assumed for development of surface water RS.

(k) Acenaphthene was only detected in a single surface water sample out of 22 analyzed for PAHs (MPA sample SW-BK-06).

(l) RECAP does not provide data for TPH to support development of standards for dermal exposure to surface water.

(m) TPH-DRO was reported in a single surface water sample out of 22 analyzed for TPH, with no fraction data available (ICON sample SW-20).

(n) TPH-ORO was reported in two surface water samples out of 22, with no fraction data available [ICON samples SW-20 (1.11 mg/L) and SW-10 (0.173 mg/L)].

(o) No standard is applicable, as the chlorides standard currently listed in the Surface Water Quality Standard (LAC Title 33, Part IX, Subpart I, Chapter 11) for Segment 050703 (White Lake) requires modification per the Louisiana Water Quality Inventory: Integrated Report (LDEQ, 2014). The standard of 250 mg/L requires modification because the chlorides concentration is naturally elevated above this standard in surface water (as well as ground water) in this area due to tidal influence.

TABLE 6-10

EXPOSURE ASSUMPTIONS FOR RECREATIONAL EXPOSURE TO SURFACE WATER

East White Lake Oil and Gas Field
Vermilion Parish, Louisiana

Parameter	**Symbol**	**Value**	**Units**	**Source/Description**
Dermal Absorption Pathway				
Dermal Exposure Time:	ETiww			
Adult Recreational		4	hr	Assumes 4 hours with skin immersed during fishing, crabbing, or hunting
Child Recreational		4	hr	Assumes 4 hours with skin immersed during fishing, crabbing, or hunting
Skin Surface Area:	SA			
Adult Recreational		6910	cm^2	Arms, hands, and feet assumed to be in contact with sediment. Surface Areas are 95% percentile values for males from Table 7-12 of the EPA's Exposure Factors Handbook (EPA, 2011).
Child Recreational		4080	cm^2	Arms, hands, and feet assumed to be in contact with sediment. Surface Areas from Table 7-2 of the Child-Specific Exposure Factors Handbook (EPA, 2008)
General Parameters				
Exposure Frequency:	EF			
Adult Recreational		104	days/yr	See summary provided in Table 6-2 for sediment.
Child Recreational		104	days/yr	See summary provided in Table 6-2 for sediment.
Exposure Duration:	ED			
Adult Recreational		30	yrs	RECAP Default, residential
Child Recreational		5	yrs	Age specific. Adolescent years 11-16 identified as age with increased likelihood of surface water contact during fishing and hunting, specifically at a consistent frequency of weekly. In addition, the larger body surface area for this child age range results in higher exposure estimates than a younger child.
Body Weight:	BW			
Adult Recreational		70	kg	RECAP Default, adult
Child Recreational		59.3	kg	Average of 50th percentile body weights for children aged 11 through 16 from the Exposure Factors Handbook (EPA, 2011).
Averaging Time:				
Carcinogenic effects	AT_c	25,550	days	RECAP Default, Carcinogens (70 years time 365 days/yr)
Non-Carcinogenic effects, adult	AT_n	37,960	days	(ED yrs * 365 days/yr)
Non-Carcinogenic effects, child	AT_n	37,960	days	(ED yrs * 365 days/yr)
Target Risk	TR	1.00E-06	unitless	RECAP Default
Target Hazard Quotient	THQ	1	unitless	RECAP Default

Notes:
Chemical/physical properties from RAIS PRG Calculator
EPA (2008). Child-Specific Exposure Factors Handbook (Final Report). EPA/600/R-06/096F.
EPA (2011). Exposure Factors Handbook. EPA/600/R-090/52F.

TABLE 6-11

EXPOSURE ASSUMPTIONS FOR SHELLFISH INGESTION

East White Lake Oil and Gas Field
Vermilion Parish, Louisiana

Parameter	Symbol	Value	Units	Source/Description
Biota Ingestion Pathway				
Shellfish Ingestion Rate:	IR_f			
Adult- all edible tissue		30	g/day	Based on four 8-ounce meals per month, every month. Default per LDEQ et al., 2012. TSL Guidelines . Value represents consumption rate for edible tissue of a single species harvested from the same water body over exposure duration.
Adult- hepatopancreas		7.5	g/day	Default per LDHH et al., 2012. Protocol for Issuing Advisories
Child		15	g/day	Four 4-ounce meals per month, every month. Default per LDHH et al., 2012. Protocol for Issuing Advisories
General Parameters				
Exposure Frequency:	EF			
Adult		365	days/yr	Default per LDEQ et al., 2012. TSL Guidelines
Child		365	days/yr	Default per LDHH et al., 2012. Protocol for Issuing Advisories
Exposure Duration:	ED			
Adult		30	yrs	Default per LDEQ et al., 2012. TSL Guidelines, based upon USEPA default value for residence in a single location.
Child		6	yrs	Default per LDHH et al., 2012. Protocol for Issuing Advisories, based upon USEPA default value.
Body Weight:	BW			
Adult		70	kg	Default per LDEQ et al., 2012. TSL Guidelines, based upon USEPA default value for residence in a single location.
Child		35	kg	Default per LDHH et al., 2012. Protocol for Issuing Advisories, based upon USEPA default value.
Averaging Time:				
Carcinogenic effects	AT_c	25,550	days	Default per LDEQ et al., 2012. TSL Guidelines, Carcinogens (70 years time 365 days/yr)
Non-Carcinogenic effects, adult	AT_n	10,950	days	(ED yrs * 365 days/yr)
Non-Carcinogenic effects, child	AT_n	2,190	days	(ED yrs * 365 days/yr)
Target Risk	TR	1.00E-04	unitless	Default per LDEQ et al., 2012. TSL Guidelines. Selected by LDHH to balance risk from exposure and nutritional benefits of fish consumption, per LDHH. The following rationale is provided by Ratard, 1993: "The level of 1 x 10-4 has been carefully selected to provide some balance to the process: the multistage model used does not estimate the actual cancer risk, but the upperbound limits of the risk... The combination of these very conservative assumptions with a 10-6 or even a 10-5 risk level would lead to extremely low concentrations that could not be reasonably justified."
Target Hazard Quotient	THQ	1	unitless	Default per LDEQ et al., 2012. TSL Guidelines

Notes:

Louisiana Dept. of Environmental Quality (LDEQ); Louisiana, Dept. of Health and Hospitals (LDHH); Louisiana, Dept. of Wildlife and Fisheries (LDWF); Louisiana, Dept. of Agriculture and Forestry (LDAF) (2012). Tissue Screening Level Guidelines for Issuance of Public Health Advisories for Selected Contaminants and Supporting Documentation.

LDHH, LDEQ, LDAF, and LDWF (2012). Protocol for Issuing Public Health Advisories for Chemical Contaminants in Recreationally Caught Fish and Shellfish.

Ratard, Raoult, Eric T. Baumgartner, and Louis Trachtman (1993). How to Interpret Fish Consumption Advisories. *Journal of Louisiana State Medical Society* , Volume 145, June, 1993.

TABLE 6-12

CRAB EDIBLE TISSUE
COMPARISON TO TISSUE SCREENING LEVELS (TSLs)

East White Lake Oil and Gas Field
Vermilion Parish, Louisiana

Evaluation of Crab Edible Tissue Concentrations (ETCs)									
				Crab Edible Tissue Concentration (HP & Meat) (a,b)					
	Default TSLs (e)			**Site**		**Reference**		**Market**	
Constituent	**TSLnc**	**TSLc**	**Target Organs (d)**	**Average**	**Max**	**Average**	**Max**	**Average**	**Max**
TPH (c)									
TPH >C8-16	160	---	**liver,** hematological system, decreased BW	16	48.4	17	40.3	21	71.3
TPH >C16-28	2400	---	**liver, kidney**	49	148	44	85	43	79.8
Metals									
Arsenic, inorganic	0.7	0.36	skin, vascular	0.011	0.016	0.013	0.016	0.015	0.023
Barium	470	---	**kidney**	9.2	14	11	16	1.5	3.1
Mercury, total	0.7	---	autoimmune	0.069	0.091	0.062	0.092	0.036	0.049
Methyl Mercury	0.23	---	developmental neuro-psychological impairment	0.039	0.061	0.028	0.052	0.018	0.027
				Hazard Indices (d)					
			Kidney	**0.04**	**0.09**	**0.04**	**0.07**	**0.02**	**0.04**
			Liver	**0.1**	**0.4**	**0.1**	**0.3**	**0.2**	**0.5**

Evaluation of Crab Meat Concentrations									
				Crab Meat Concentrations (b)					
	Crab Meat TSLs (e)			**Site**		**Reference**		**Market**	
Constituent	**TSLnc**	**TSLc**	**Target Organs (d)**	**Average**	**Max**	**Average**	**Max**	**Average**	**Max**
TPH (c)									
TPH >C8-16	160	---	**liver,** hematological system, decreased BW	NC	13.9 U	NC	8.7 U	NC	16.2 U
TPH >C16-28	2400	---	**liver, kidney**	NC	13.9 U	NC	8.7 U	6.7	8.1 J
Metals									
Arsenic, inorganic	0.7	0.36	skin, vascular	0.0032	0.0065 J	0.0039	0.0090 J	0.0076	0.014 J
Barium	470	---	**kidney**	6.7	12	8.4	14	1.3	2.5
Mercury, total	0.7	---	autoimmune	0.077	0.10	0.068	0.11	0.039	0.054
Methyl Mercury	0.23	---	developmental neuro-psychological impairment	0.043	0.069	0.032	0.061	0.019	0.029
				Hazard Indices (d)					
			Kidney	**0.01**	**0.03**	**0.02**	**0.03**	**0.01**	**0.01**
			Liver	**NA**	**NA**	**NA**	**NA**	**0.003**	**0.003**

TABLE 6-12

CRAB EDIBLE TISSUE
COMPARISON TO TISSUE SCREENING LEVELS (TSLs)

East White Lake Oil and Gas Field
Vermilion Parish, Louisiana

Evaluation of Crab Hepatopancreas (HP) Concentrations

				Crab Hepatopancreas Concentrations (b)					
	Crab HP TSLs (e)		**Target**	**Site**		**Reference**		**Market**	
Constituent	**TSLnc**	**TSLc**	**Organs (d)**	**Average**	**Max**	**Average**	**Max**	**Average**	**Max**
TPH (c)									
TPH >C8-16	650	---	**liver,** hematological system, decreased BW	69	242	80	188	93	311
TPH >C16-28	9500	---	**liver, kidney**	249	856	226	393	215	351
Metals									
Arsenic, inorganic	2.8	1.5	skin, vascular	0.047	0.079	0.054	0.066	0.049	0.072
Barium	1900	---	**kidney**	21	32	24	33	2.9	6.1
Mercury, total	2.8	---	autoimmune	0.034	0.045	0.033	0.056	0.022	0.042
Methyl Mercury	0.93	---	developmental neuro-psychological impairment	0.021	0.039	0.014	0.024	0.0089	0.015
				Hazard Indices (d)					
			Kidney	**0.04**	**0.1**	**0.04**	**0.06**	**0.02**	**0.04**
			Liver	**0.1**	**0.5**	**0.1**	**0.3**	**0.2**	**0.5**

Notes:

Concentrations in mg/kg-wet weight

U = Result was reported as not detected by the laboratory (i.e., less than the MDL, defined by the laboratory as the "Adjusted Method Detection Limit"); value shown is the MDL. One-half the detection limit was used to calculate Edible Tissue Concentrations (ETCs) in accordance with the Louisiana Protocol, so ETCs with U are calculated from one-half detection limits for non-detect meat and hepatopancreas results.

J = Laboratory qualifier indicating that the reported value is an estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

NA = HI not calculated when data for the relevant constituents are all nondetect.

NC = Not calculated; for datasets that were completely nondetect, an average concentration was not calculated.

(a) Edible Tissue Concentration (ETC) - for each composite crab sample, the ETC was calculated as the sum of the mass-weighted TPH concentrations for crab meat and hepatopancreas, using sample-specific tissue weight (mass) data reported by the laboratory for meat and hepatopancreas as follows:

ETC = (concentration in meat) x (% edible tissue comprised of meat) + (concentration in hepatopancreas) x (% edible tissue comprised of hepatopancreas).

(b) For datasets with all results reported as nondetect, an average concentration was not calculated (NC), and the highest detection limit was used to represent the maximum nondetect result. For datasets comprised of both detects and nondetects, one-half detection limit was used for determining the average concentration for the dataset, and the highest detected value (including J-flagged) was used as the maximum.

(c) TSL calculated using weighted toxicity value assuming 50% aliphatics and 50% aromatics.

(d) Hazard Indices calculated for target organs associated with more than one detected constituent.

(e) TSLs were calculated using the algorithms provided in the *Tissue Screening Level Guidelines for Issuance of Public Health Advisories for Selected Contaminants* (LDEQ et al., 2012). For evaluation of ETCs and crab meat, the TSLs were calculated using default parameters. For evaluation of hepatopancreas, the TSLs were calculated using a hepatopancreas-specific ingestion rate identified in the *Protocol for Issuing Public Health Advisories for Chemical Contaminants in Recreationally Caught Fish and Shellfish* (LDHH et al., 2012).

TABLE 6-13

SENSITIVITY ANALYSIS
COMPARISON OF CRAB EDIBLE TISSUE CONCENTRATIONS TO TSLs AT 60 G/DAY INGESTION RATE

East White Lake Oil and Gas Field
Vermilion Parish, Louisiana

Evaluation of Crab Edible Tissue Concentrations (ETCs)									
				Crab Edible Tissue Concentration (HP & Meat) (a,b)					
	Default TSLs (e)			**Site**		**Reference**		**Market**	
Constituent	**TSLnc**	**TSLc**	**Target Organs (d)**	**Average**	**Max**	**Average**	**Max**	**Average**	**Max**
TPH (c)									
TPH >C8-16	82	---	**liver,** hematological system, decreased BW	16	48.4	17	40.3	21	71.3
TPH >C16-28	1200	---	**liver, kidney**	49	148	44	85	43	79.8
Metals									
Arsenic, inorganic	0.35	0.18	skin, vascular	0.011	0.016	0.013	0.016	0.015	0.023
Barium	230	---	**kidney**	9.2	14	11	16	1.5	3.1
Mercury, total	0.35	---	autoimmune	0.069	0.091	0.062	0.092	0.036	0.049
Methyl Mercury	0.12	---	developmental neuro-psychological impairment	0.039	0.061	0.028	0.052	0.018	0.027
				Hazard Indices (d)					
			Kidney	**0.1**	**0.2**	**0.1**	**0.1**	**0.04**	**0.1**
			Liver	**0.2**	**0.7**	**0.2**	**0.6**	**0.3**	**0.9**

Evaluation of Crab Meat Concentrations									
				Crab Meat Concentrations (b)					
	Crab Meat TSLs (e)			**Site**		**Reference**		**Market**	
Constituent	**TSLnc**	**TSLc**	**Target Organs (d)**	**Average**	**Max**	**Average**	**Max**	**Average**	**Max**
TPH (c)									
TPH >C8-16	82	---	**liver,** hematological system, decreased BW	NC	13.9 U	NC	8.7 U	NC	16.2 U
TPH >C16-28	1200	---	**liver, kidney**	NC	13.9 U	NC	8.7 U	6.7	8.1 J
Metals									
Arsenic, inorganic	0.35	0.18	skin, vascular	0.0032	0.0065 J	0.0039	0.0090 J	0.0076	0.014 J
Barium	230	---	**kidney**	6.7	12	8.4	14	1.3	2.5
Mercury, total	0.35	---	autoimmune	0.077	0.10	0.068	0.11	0.039	0.054
Methyl Mercury	0.12	---	developmental neuro-psychological impairment	0.043	0.069	0.032	0.061	0.019	0.029
				Hazard Indices (d)					
			Kidney	**0.03**	**0.1**	**0.0**	**0.1**	**0.01**	**0.02**
			Liver	**NA**	**NA**	**NA**	**NA**	**0.006**	**0.007**

TABLE 6-13

SENSITIVITY ANALYSIS
COMPARISON OF CRAB EDIBLE TISSUE CONCENTRATIONS TO TSLs AT 60 G/DAY INGESTION RATE

East White Lake Oil and Gas Field
Vermilion Parish, Louisiana

Evaluation of Crab Hepatopancreas (HP) Concentrations									
				Crab Hepatopancreas Concentrations (b)					
	Crab HP TSLs (e)		**Target**	**Site**		**Reference**		**Market**	
Constituent	**TSLnc**	**TSLc**	**Organs (d)**	**Average**	**Max**	**Average**	**Max**	**Average**	**Max**
TPH (c)									
TPH >C8-16	325	---	**liver,** hematological system, decreased BW	69	242	80	188	93	311
TPH >C16-28	4750	---	**liver, kidney**	249	856	226	393	215	351
Metals									
Arsenic, inorganic	1.4	0.75	skin, vascular	0.047	0.079	0.054	0.066	0.049	0.072
Barium	950	---	**kidney**	21	32	24	33	2.9	6.1
Mercury, total	1.4	---	autoimmune	0.034	0.045	0.033	0.056	0.022	0.042
Methyl Mercury	0.465	---	developmental neuro-psychological impairment	0.021	0.039	0.014	0.024	0.0089	0.015
				Hazard Indices (d)					
			Kidney	**0.1**	**0.2**	**0.1**	**0.1**	**0.05**	**0.08**
			Liver	**0.3**	**0.9**	**0.3**	**0.7**	**0.3**	**1.0**

Notes:

Concentrations in mg/kg-wet weight

U = Result was reported as not detected by the laboratory (i.e., less than the MDL, defined by the laboratory as the "Adjusted Method Detection Limit"); value shown is the MDL. One-half the detection limit was used to calculate Edible Tissue Concentrations (ETCs) in accordance with the Louisiana Protocol, so ETCs with U are calculated from one-half detection limits for non-detect meat and hepatopancreas results.

J = Laboratory qualifier indicating that the reported value is an estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

NA = HI not calculated when data for the relevant constituents are all nondetect.

NC = Not calculated; for datasets that were completely nondetect, an average concentration was not calculated.

(a) Edible Tissue Concentration (ETC) - for each composite crab sample, the ETC was calculated as the sum of the mass-weighted TPH concentrations for crab meat and hepatopancreas, using sample-specific tissue weight (mass) data reported by the laboratory for meat and hepatopancreas as follows:
ETC = (concentration in meat) x (% edible tissue comprised of meat) + (concentration in hepatopancreas) x (% edible tissue comprised of hepatopancreas).

(b) For datasets with all results reported as nondetect, an average concentration was not calculated (NC), and the highest detection limit was used to represent the maximum nondetect result. For datasets comprised of both detects and nondetects, one-half detection limit was used for determining the average concentration for the dataset, and the highest detected value (including J-flagged) was used as the maximum.

(c) TSL calculated using weighted toxicity value assuming 50% aliphatics and 50% aromatics.

(d) Hazard Indices calculated for target organs associated with more than one detected constituent.

(e) TSLs were calculated using the algorithms provided in the *Tissue Screening Level Guidelines for Issuance of Public Health Advisories for Selected Contaminants* (LDEQ et al., 2012). For evaluation of ETCs and crab meat, the TSLs were calculated using default parameters. For evaluation of hepatopancreas, the TSLs were calculated using a hepatopancreas-specific ingestion rate identified in the *Protocol for Issuing Public Health Advisories for Chemical Contaminants in Recreationally Caught Fish and Shellfish* (LDHH et al., 2012).

TABLE 6-14

SENSITIVITY ANALYSIS
COMPARISON OF CRAB HYDROCARBON >C28 TO C40 RANGE CONCENTRATIONS TO TSLs

East White Lake Oil and Gas Field
Vermilion Parish, Louisiana

		Meat (mg/kg-wet weight)					**Hepatopancreas (mg/kg-wet weight)**					**Edible Tissue Concentration (HP & Meat) (mg/kg-wet weight) [b]**				
	Sample ID [a]	**TPH (C8-C16)**		**TPH (C16-28)**		**Estimated TPH (C16-C40) [d]**	**TPH (C8-C16)**		**TPH (C16-28)**		**Estimated TPH (C16-C40) [d]**	**TPH (C8-C16)**		**TPH (C16-28)**		**Estimated TPH (C16-C40) [d]**
	Default TSL	**160**		**2400**		**2400**	**650**		**9500**		**9500**	**160**		**2400**		**2400**
	2x Default TSL	**82**		**1200**		**1200**	**325**		**4750**		**4750**	**82**		**1200**		**1200**
Site	EWL-T-01A-C	4.5	UR	4.5	UR	13.1	21.6	U	59.4		456	NA		NA		82.9
	EWL-T-01-C	9.4	U	9.4	U	159	70.3		167		428.7	15.8		32.2		205
	EWL-T-02-C	5	U	5	U	142	22.2	U	90.8		461	3.96	U	17.5		196
	EWL-T-03-C [c]	13.9	U	13.9	U	108	242		242		627.5	48.4		48.3		200
	EWL-T-04-C	5.5	U	5.5	U	110	5.8	U	9.9	J	45	2.77	U	3.91		99.5
	EWL-T-05-C	5.1	U	5.1	U	121	136	U	856		3207	13.7	U	148		649
	EWL-T-06-C	8	U	8	U	49.1	34.1	U	174		806	6.14	U	31.8		173
	EWL-T-07-C	6.5	U	6.5	U	133	47.1		101		464.9	10.8		20.1		190
	EWL-T-08-C	5	U	5	U	51.3	90		300		651	15.3		46.1		139
	EWL-T-09-C	6.7	U	6.7	U	164	54	U	209		1202	7.54	U	39.8		348
	EWL-T-10-C [c]	12.6	U	12.6	U	139.5	142		314		734	30.9		62.1		247
	EWL-T-11-C	12.9	U	12.9	U	226	111		443		989	24.3		81.2		357
	EWL-T-12-C	4.4	U	4.4	U	79.2	60.6	J	277		685	12.9		52.4		190
	Average [e]	**NC**		**NC**		**115**	**69**		**249**		**827**	**16**		**49**		**237**
Reference	EWL-TR-01-C	8.7	U	8.7	U	200	NA		NA		NA	NA		NA		NA
	EWL-TR-02-C	4.7	U	4.7	U	20.1	61.1		143		507.9	14.1		30.5		118
	EWL-TR-03A-C	5.2	U	5.2	U	154	135		305		664	27		58.3		248
	EWL-TR-03-C	4.9	U	4.9	U	51.6	34.3	U	145		740	5.19	U	29		180
	EWL-TR-04-C	4.6	U	4.6	U	95.4	91.6		262		670.4	15.3		40		179
	EWL-TR-05-C	4.8	U	4.8	U	122	53.9	U	82	J	505	7.19	U	17.9		197
	EWL-TR-06-C	7.4	U	7.4	U	128	21.7	U	144		585	4.96	U	28.5		209
	EWL-TR-07-C	4.8	U	4.8	U	72.6	85.5		302		924.5	15.4		49.2		206
	EWL-TR-08-C	5.0	U	5.0	U	142	188		254		568	40.3		53.8		229
	EWL-TR-09-C	5.2	U	5.2	U	166	100		393		790	23.2		85		298
	Average [e]	**NC**		**NC**		**115**	**80**		**226**		**662**	**17**		**44**		**207**
Market	EWL-BIL-C	3.5	U	4.4	J	96.3	22.4	U	140		772	3.27	U	26.2		205
	EWL-BR-C	9.6	U	9.6	U	135	23.7	U	241		611	6.2	U	51.6		229
	EWL-DES-C	5.6	U	8.1	J	123.5	22.7	U	88.1		431	3.54	U	15.1		150
	EWL-HOU-C	5.3	U	7.5	J	104.0	28.4	U	174		732	4.08	U	28.1		182
	EWL-LC-C [c]	16.2	U	16.2	U	220	310.5		351		837.5	71.3		79.8		349
	EWL-NO-C	14.4	U	14.4	U	192	197		298		532	38.8		55.6		249
	Average [e]	**NC**		**6.7**		**145**	**93**		**215**		**653**	**21**		**43**		**227**

TABLE 6-14

SENSITIVITY ANALYSIS
COMPARISON OF CRAB HYDROCARBON >C28 TO C40 RANGE CONCENTRATIONS TO TSLs

East White Lake Oil and Gas Field
Vermilion Parish, Louisiana

Notes:

U = Result was reported as not detected by the laboratory (i.e., less than the MDL, defined by the laboratory as the "Adjusted Method Detection Limit"); value shown is the MDL (shaded cells).

J = Laboratory qualifier indicating that the reported value is an estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

UR = Surrogate recovery identified as less than 10%; therefore, this non-detect result is considered not reliable for use in quantitative analysis.

NA = Edible Tissue Concentration could not be calculated due to unavailable meat or hepatopancreas data (either due to insufficient hepatopancreas sample to analyze TPH or R-qualified results).

NC = Not calculated; for datasets that were completely nondetect, an average concentration was not calculated.

(a) Consistent with Louisiana regulatory agency Protocol (LDHH et al., 2012), crab meat and hepatopancreas were analyzed separately in composite samples collected during the field study (December 2010 through January 2011). These tissues comprise the edible tissues for regular human consumption.

(b) Edible Tissue Concentration (ETC) - for each composite crab sample, the ETC was calculated as the sum of the mass-weighted TPH concentrations for crab meat and hepatopancreas, using sample-specific tissue weight (mass) data reported by the laboratory for meat and hepatopancreas as follows:

ETC = (concentration in meat) x (% edible tissue comprised of meat) + (concentration in hepatopancreas) x (% edible tissue comprised of

In accordance with Louisiana regulatory agency guidance for treatment of nondetect results in tissues (LDHH et al, 2012), one-half the detection limit was used for non-detect results to calculate Edible Tissue Concentrations (ETCs) , so ETCs with U are calculated from one-half detection limits for non-detect meat or hepatopancreas results.

(c) Duplicate samples were prepared by the sample preparation laboratory (Columbia Analytical Services, Inc.) as separate aliquots from the same composite homogenized tissue (i.e., meat or hepatopancreas), where one aliquot is considered the parent and the other is labeled as a laboratory duplicate. The concentrations listed in this table, and used in the risk assessment, represent the average concentration from the parent sample and the duplicate. Since the tissue weight data was obtained from the composite homogenized tissue, the tissue weights are equal for the parent sample and duplicate.

(d) TPH (C16-40) was estimated by subtracting the concentration of TPH (C8-16) from the concentration of TPH (C8-40).

(e) For averaging datasets comprised of both nondetect values and detections, one-half detection limits were used to represent concentrations of nondetect results in accordance with Louisiana regulatory agency guidance for treatment of nondetect results in tissues (LDHH et al, 2012).

TABLE 6-15

SENSITIVITY ANALYSIS
COMPARISON OF FORAGE FISH TISSUE CONCENTRATIONS TO TSLs

East White Lake Oil and Gas Field
Vermilion Parish, Louisiana

	TSLs			**Forage Fish Whole Body Concentrations (a)**			
	Default IRF (b)		**Target**	**Site**		**Reference**	
Constituent	**TSLnc**	**TSLc**	**Organs (d)**	**Average**	**Max**	**Average**	**Max**
TPH (c)							
TPH >C8-16	160	---	**liver,** hematological system, decreased BW	NC	30 U	NC	45 U
TPH >C16-28	2400	---	**liver, kidney**	33	106	20	61
Metals							
Arsenic, inorganic	0.7	0.36	skin, vascular	0.085	0.11	0.089	0.16
Barium	470	---	**kidney**	17	20	12	20
Mercury, total	0.7	---	autoimmune	0.021	0.094	0.018	0.055
Methyl Mercury	0.23	---	developmental neuro-psychological impairment	0.012	0.078	0.011	0.041
				Hazard Indices (e)			
			Kidney	**0.05**	**0.09**	**0.03**	**0.07**
			Liver	**0.01**	**0.04**	**0.008**	**0.03**

	TSLs			**Forage Fish Whole Body Concentrations (a)**			
	2x Default IRF (b)		**Target**	**Site**		**Reference**	
Constituent	**TSLnc**	**TSLc**	**Organs (d)**	**Average**	**Max**	**Average**	**Max**
TPH (c)							
TPH >C8-16	82	---	**liver,** hematological system, decreased BW	NC	30 U	NC	45 U
TPH >C16-28	1200	---	**liver, kidney**	33	106	20	61
Metals							
Arsenic, inorganic	0.35	0.18	skin, vascular	0.085	0.11	0.089	0.16
Barium	230	---	**kidney**	17	20	12	20
Mercury, total	0.35	---	autoimmune	0.021	0.094	0.018	0.055
Methyl Mercury	0.12	---	developmental neuro-psychological impairment	0.012	0.078	0.011	0.041
				Hazard Indices (e)			
			Kidney	**0.1**	**0.2**	**0.07**	**0.1**
			Liver	**0.03**	**0.09**	**0.02**	**0.05**

TABLE 6-15

SENSITIVITY ANALYSIS
COMPARISON OF FORAGE FISH TISSUE CONCENTRATIONS TO TSLs

East White Lake Oil and Gas Field
Vermilion Parish, Louisiana

Notes:

Concentrations in mg/kg-wet weight

U = Result was reported as not detected by the laboratory (i.e., less than the MDL, defined by the laboratory as the "Adjusted Method Detection Limit"); value shown is the MDL.

NC = Not calculated; for datasets that were completely nondetect, an average concentration was not calculated.

(a) For datasets with all results reported as nondetect, an average concentration was not calculated (NC), and the highest detection limit was used to represent the maximum nondetect result. For datasets comprised of both detects and nondetects, one-half detection limit was used for determining the average concentration for the dataset in accordance with Louisiana Protocol, and the highest detected value was used as the maximum.

(b) TSLs were calculated using the algorithms provided in the *Tissue Screening Level Guidelines for Issuance of Public Health Advisories for Selected Contaminants* (LDEQ et al., 2012). In addition to the default fish ingestion rate provided in this guidance, twice the default ingestion rate was evaluated as a sensitivity analysis.

(c) TSL calculated using weighted toxicity value assuming 50% aliphatics and 50% aromatics.

(d) Target organs for noncarcinogenic effects obtained from RECAP (LDEQ, 2003) for TPH and EPA's IRIS for metals.

(e) Hazard Indices calculated for target organs associated with more than one detected constituent.

TABLE 6-16

CUMULATIVE HAZARD INDEX CALCULATIONS

East White Lake Oil and Gas Field
Vermilion Parish, Louisiana

	Multiple Media HI (b)		SEDIMENT DIRECT CONTACT			40-FOOT ZONE GROUND WATER			SURFACE WATER			CRAB EDIBLE TISSUE		
COCs (a)	RME Scenario	Target Organs (c)	Sediment DC LRS (d)	AOIC Maximum Conc. (e)	Sediment (Max) HQ	40-FT GW LRS (f)	CC Maximum Conc. (g)	GW HQ	SW LRS (h)	Maximum Conc. (i)	SW HQ	Default TSLs (j)	Site ETC (k)	Crab ETC HQ
Metals														
Arsenic	0.021	Skin, Vascular	--	--	--	--	--	--	2.67	0.014	0.0052	0.7	0.011	0.016
Barium	0.11	Kidney	280,000	5,170	0.018	249	14.8	0.059	124	1.1	0.0089	470	9.2	0.02
Cadmium	0.0039	Urinary	--	--	--	--	--	--	0.22	0.00086	0.0039	--	--	--
Chromium	0.000029	NA	--	--	--	--	--	--	173	0.0051	0.000029	--	--	--
Lead (l)	NA	NA	--	--	--	--	--	--	-	0.0088	NA	--	--	--
Mercury	0.11	Immune System	420	4.47	0.011	--	--	--	0.19	0.00012	0.00063	0.7	0.069	0.099
Methyl Mercury	0.17	Neurological	--	--	--	--	--	--	--	--	--	0.23	0.039	0.17
Selenium	0.00073	Integument (hair, skin, nails), Dental, Hematological, CNS	--	--	--	--	--	--	44	0.032	0.00073	--	--	--
Strontium	0.0016	Bone	--	--	--	10700	13.9	0.0013	5330	1.66	0.00031	--	--	--
Zinc	0.0000052	Blood	--	--	--	--	--	--	4440	0.023	5.2E-06	--	--	--
BTEX														
Benzene	0.0076	Blood	--	--	--	3.8	0.029	0.0076	--	--	--	--	--	--
PAH														
Acenaphthene	0.000026	Liver	--	--	--	--	--	--	5.01	0.000131	0.000026	--	--	--
TPH - Fractions (m)														
Aliphatics >C10-C12	0.021	Liver, Hematological	17,000	353	0.021	--	--	--	--	--	--	--	--	--
Aliphatics >C12-C16	0.078		32,000	2,500	0.078	--	--	--	--	--	--	--	--	--
Aliphatics >C16-C35	0.055	Liver	130,000	7,110	0.055	--	--	--	--	--	--	--	--	--
Aromatics >C12-C16	0.022	Decreased BW	18,000	403	0.022	--	--	--	--	--	--	--	--	--
Aromatics >C16-C21	0.49	Kidney	2,200	1,070	0.49	--	--	--	--	--	--	--	--	--
Aromatics >C21-C35	0.6		2,300	1,370	0.6	--	--	--	--	--	--	--	--	--
TPH														
TPH > C8-16	0.1	Liver, Hematological, Decreased BW	--	--	--	--	--	--	--	--	--	160	16	0.1
TPH >C16-28	0.02	Lliver, Kidney	--	--	--	--	--	--	--	--	--	2400	49	0.02

Target Organ-Specific HIs (n)		
Target Organ	**HI**	**COCs**
Skin	0.02	arsenic, selenium
Kidney	0.7	barium, aromatics >C16-35, TPH>C16-28
Immune System	0.1	mercury
Liver	0.3	acenaphthene, aliphatics >C10-16, aliphatics >C16-35, TPH>C8-16, TPH>C16-28
Blood/Hematologic.	0.2	selenium, zinc, benzene, aliphatics >C10-16, TPH>C8-16
Bone	0.002	strontium
Body Weight	0.1	aromatics >C12-16, TPH>C8-16
Neurological/CNS	0.2	methyl mercury, selenium

TABLE 6-16

CUMULATIVE HAZARD INDEX CALCULATIONS

East White Lake Oil and Gas Field
Vermilion Parish, Louisiana

Notes:

HQ - Hazard Quotient, equal to the Area of Investigation Concentration (AOIC) or Compliance Concentration (CC) for each Constituent of Concern (COC) divided by the applicable risk based standard.

RME - Reasonable Maximum Exposure
LRS - Limiting RECAP Standard
DC - Direct Contact

(a) COCs - Constituents of Concern include those constituents evaluated under Management Option 3 (MO-3) in sediment, 40-Foot Zone ground water, surface water, and crab.
(b) Multiple Media Hazard Index (HI) is the sum of the HQs for each COC in each medium where it warranted evaluation under MO-3.
(c) Target organs associated with each detected constituent that elicits noncarcinogenic effects. Target organs are associated with the reference doses used in this evaluation and were obtained from RAIS, with the exception of selenium and TPH, which were provided by RECAP.
(d) Limiting recreational RECAP Standard for direct contact with sediment, prior to adjusting for additive effects (from Table 6-3).
(e) Maximum reported concentrations in sediment across the site in the 0-3 foot interval (from Table 6-3).
(f) Limiting recreational RECAP Standard for the 40-Foot Zone ground water (from Table 6-7).
(g) Maximum concentration in the 40-Foot Zone ground water, considering all AOIs and both dissolved and total metals (from Table 6-7).
(h) Limiting recreational RECAP Standard for surface water (from Table 6-9).
(i) Maximum reported concentrations in surface water, using dissolved metals concentrations (from Table 6-9).
(j) Default Tissue Screening Levels (TSLs) calculated using the default LDHH crab consumption scenario (30 g/day) for edible tissues (from Table 6-12).
(k) Average Edible Tissue Concentration (ETC) considering crabs collected on site (from Table 6-12).
(l) Based on lead's mechanism of toxicity, EPA considers it inappropriate to develop a RfD for lead. Risk-based standards for lead are developed using toxicokinetic models based on acceptable blood lead levels in sensitive receptor populations. Therefore, lead is not included in the assessment for additive health effects.
(m) Per RECAP (2003), when accounting for additivity for the TPH fractions, the following fractions should be treated as individual COCs: aliphatics C>6-C8, aliphatics C>8-C16, aliphatics C>16-C35, aromatics C>8-C16, and aromatics C>16-C35.
(n) Target organ specific HIs were calculated by summing the multiple-media HIs from COCs affecting each respecitve target organ. Target organs affected by more than one COC or more than one medium were included. For TPH fractions that are considered a single COC for the pupose of addressing additive effects, the larger HI was used to represent that range in calculating the target organ specific HI.

TABLE 6-17

CUMULATIVE RISK CALCULATIONS

East White Lake Oil and Gas Field
Vermilion Parish, Louisiana

COCs (a)	Multiple Media Risk (b)	40-FOOT ZONE GROUND WATER			SURFACE WATER			CRAB EDIBLE TISSUE		
		GW LRS (c)	CC Maximum Conc. (d)	GW Risk	SW LRS (e)	Maximum Conc. (f)	SW Risk	Default TSLs (g)	Site ETC (h)	Crab ETC Risk
Metals										
Arsenic	4.1E-06	--	--	--	1.4E-02	1.4E-02	1.0E-06	3.6E-01	1.1E-02	3.1E-06
BTEX										
Benzene	7.2E-07	4.0E-02	2.9E-02	7.2E-07	--	--	--	--	--	--

Total Risk	5E-06

Notes:

Risk - equal to the Area of Investigation Concentration (AOIC) or Compliance Concentration (CC) for each Constituent of Concern (COC) divided by the applicable risk based standard, and multiplied by the target risk used in developing the standard: 10^{-6} for all media except crab, and 10^{-4} for crab per LDHH guidance.

LRS - Limiting RECAP Standard

(a) COCs - Constituents of Concern include those carcinogenc constituents that warranted evaluation under Management Option 3 (MO-3) in sediment (none) , 40-Foot Zone ground water, surface water, and crab.

(b) Multiple Media Risk is the sum of risk for each COC in each medium where it warranted evaluation under MO-3.

(c) Limiting recreational RECAP Standard for the 40-Foot Zone ground water (from Table 6-7).

(d) Maximum concentration in the 40-Foot Zone ground water, considering all AOIs and both dissolved and total metals (from Table 6-7).

(e) Limiting recreational RECAP Standard for surface water (from Table 6-9).

(f) Maximum reported concentrations in surface water, using dissolved metals concentrations (from Table 6-9).

(g) Default Tissue Screening Levels (TSLs) calculated using the default LDHH crab consumption scenario (30 g/day) for edible tissues (from Table 6-12).

(h) Average Edible Tissue Concentration (ETC) considering crabs collected on site (from Table 6-12).

TABLE 6-18

SUMMARY OF TPH MIXTURE CONCENTRATIONS AND LOCATIONS THAT EXCEED RECAP SCREENING STANDARDS

East White Lake Oil and Gas Field
Vermilion Parish, Louisiana

Industrial Direct Contact Screening - Sediment (0-3')

TPH-DRO		**Soilssi =**	**510**
		MO-3 Soili =	**2550**
Samples (a)	**Depth**	**Date**	**mg/kg-wet**
SS7	1.4-2.5	26-Apr-06	678
SED-26	0-6"	5-May-10	696
SED-120*	0-6"	7-May-10	2550

MO-3 Ground Water Protection - Sediment (all depths)

TPH-DRO		**SoilGW3NDW =**	**6100**
Samples (c)	**Depth**	**Date**	**mg/kg-dry**
AB13	4-6	7-Nov-06	8400
SED-120*	0-6"	7-May-10	14300

Residential Direct Contact Screening - Sediment (0-3')

TPH-DRO		**Soilssni =**	**65**
		MO-3 Soili =	**2550**
		MO-3 Recr LRS =	**1100**
Samples (b)	**Depth**	**Date**	**mg/kg-wet**
B2	2-4	8-Aug-06	233
B4	0-1	9-Aug-06	440
B5	0-1.5	9-Aug-06	112
SS2	0-1	25-Apr-06	107
SS5	0-2.15	26-Apr-06	78.6
SS7	0-1.4	26-Apr-06	109
	1.4-2.5	26-Apr-06	678
SS11	0-2.5	27-Apr-06	231
SS12	0-3.7	27-Apr-06	223
SED4	0-2'	25-Feb-10	287
SED5	0-2'	25-Feb-10	96.8
SED6	0-2'	25-Feb-10	196
SED7	0-2'	25-Feb-10	163
SED8	0-2'	25-Feb-10	108
SED-8	0-6"	6-May-10	134
SED10	0-2'	25-Feb-10	122
SED11	0-2'	25-Feb-10	337
SED12	0-2'	25-Feb-10	216
SED16	0-2'	26-Feb-10	70.8
SED17	0-2'	26-Feb-10	314
SED20	0-2'	26-Feb-10	112
SED21	0-2'	26-Feb-10	138
SED22	0-2'	26-Feb-10	128
SED24	0-2'	2-Mar-10	297
SED-26	0-6"	5-May-10	696
SED-120 (c)	0-6"	7-May-10	**2550**

TPH-ORO		**Soilssni =**	**180**
		MO-3 Soili =	**12500**
		MO-3 Recr LRS =	**1150**
Samples (b)	**Depth**	**Date**	**mg/kg-wet**
B2	2-4	8-Aug-06	191
B4	0-1	9-Aug-06	347
SS7	1.4-2.5	26-Apr-06	190
SS11	0-2.5	27-Apr-06	224
SS12	0-3.7	27-Apr-06	254
SED4	0-2'	25-Feb-10	366
SED6	0-2'	25-Feb-10	565
SED7	0-2'	25-Feb-10	316
SED11	0-2'	25-Feb-10	260
SED12	0-2'	25-Feb-10	194
SED17	0-2'	26-Feb-10	193
SED24	0-2'	2-Mar-10	294
SED-26	0-6"	5-May-10	425
SED-120 (d)	0-6"	7-May-10	**1450**

Notes:

Bold and boxed concentrations indicate exceedance of the MO-3 LRS.

This assessment considers the reported TPH mixture concentrations where fraction data were not collected

TPH - total petroleum hydrocarbons: diesel range organics (DRO) and oil range organics (ORO)

MO-3 - RECAP Management Option 3

SoilSSi = RECAP Screening Option Standard from Table 1 of RECAP 2003 for soil protective of industrial land use.

SoilSSni = RECAP Screening Option Standard from Table 1 of RECAP 2003 for soil protective of nonindustrial land use.

MO-3 Soili - RECAP standard calculated for sediment using the default industrial adult exposure assumptions for direct contact with soil.

MO-3 Recr LRS - Recreational Limiting RECAP Standard is the lowest of the MO-3 Sediment RS for the recreational adult and child, calculated using direct contact soil algorithms from Appendix H of RECAP (2003). The child recreational scenario is limiting.

SoilGW3NDW = RECAP Standard for soil protective of ground water, calculated in accordance with Appendix H of RECAP (2003).

(a) Samples with concentrations > Soilssi (wet weight)

(b) Samples with concentrations > Soilssni (wet weight)

(c) Samples with concentrations > SoilGW3NDW (dry weight)

(d) SED-120 was collected from the same sample location as Sed-30, and hydrocarbon fraction data available for Sed-30 (0-2’) were less than both industrial and recreational standards.

Figures

Project No. 0116008
UNOCAL
Vermilion Parish, Louisiana

Environmental Resources Management Southwest, Inc.
3838 North Causeway Boulevard, Suite 3000
Metairie, Louisiana 70002
(504) 831-6700

Figure 1-1
Site Location

East White Lake Oil & Gas Field
Vermilion Parish, Louisiana

MICHAEL PISANI & ASSOCIATES, INC.
Environmental Consulting Services
Baton Rouge, Louisiana New Orleans, Louisiana Houston, Texas

Designed: JCS	Drawn: DAM	Checked: LRC	Date: 9/30/2015	Project: 07-47

Legend

🟨 Site Feature

Source: 2013 USDA Ortho

Figure 1-2
Site Features

East White Lake Oil & Gas Field
Vermilion Parish, Louisiana

MICHAEL PISANI & ASSOCIATES, INC.
Environmental Consulting Services
Baton Rouge, Louisiana New Orleans, Louisiana Houston, Texas

Designed: JCS	Drawn: DAM	Checked: LRC	Date: 9/30/2015	Project: 07-47

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Legend

▭ Final Excavation Limits

● Sediment Delineation (MPA-Sed-15-)

▲ MPA 2014 Delineation Samples (DEL-)

● MPA Sample (SP-)

0 25 50 75 100
Feet

N

Figure 1-3
Sed-15 Pit Remediation Area

East White Lake Oil & Gas Field
Vermilion Parish, Louisiana

MICHAEL PISANI & ASSOCIATES, INC.
Environmental Consulting Services
Baton Rouge, Louisiana New Orleans, Louisiana Houston, Texas

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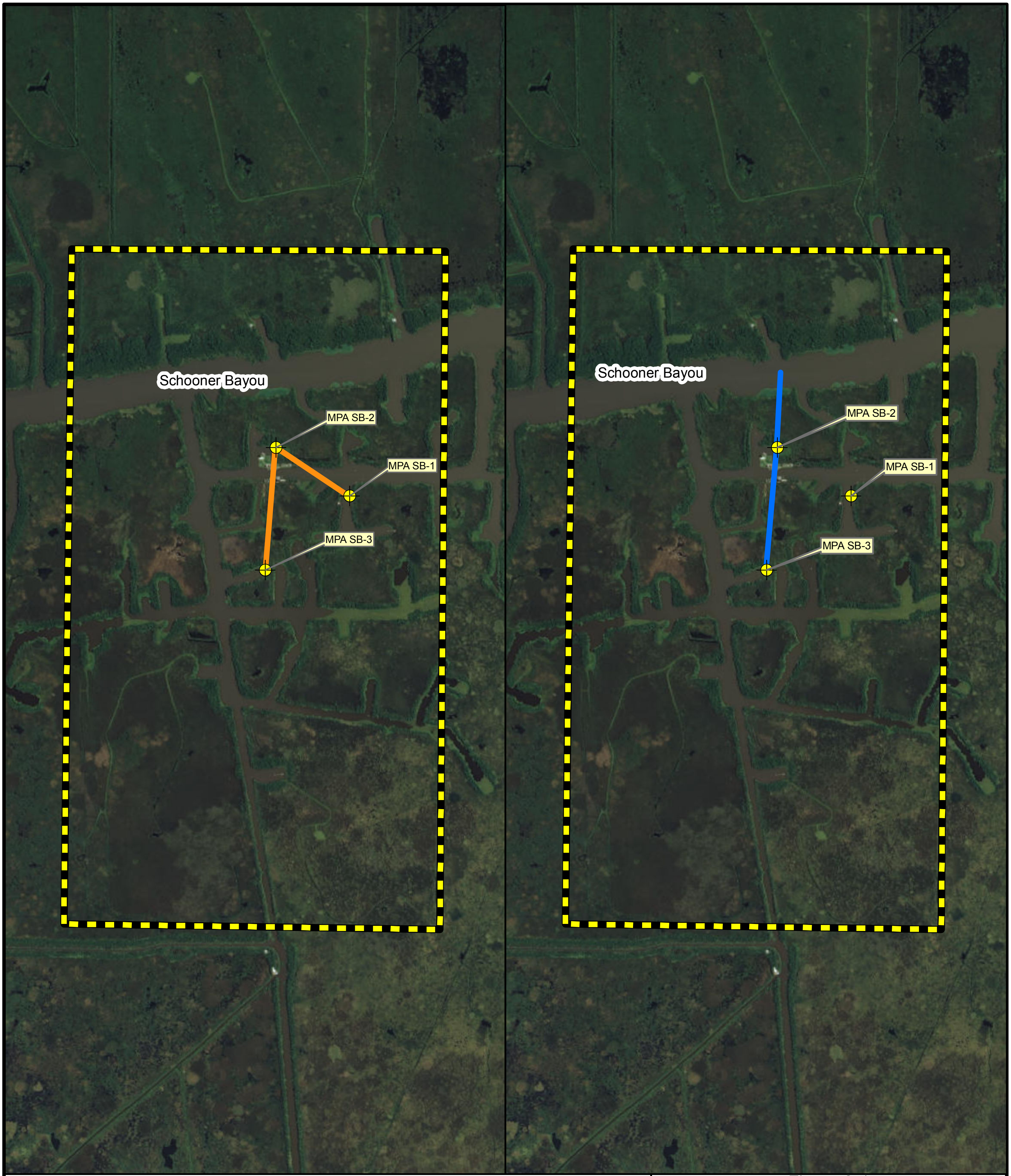


Legend

▨ Section 16 Township 15 S Range 01 E
━ West-East Cross Section Location
━ South-North Cross Section Location
⊕ MP&A Well Location

0 500 1,000 1,500 2,000
Feet

N

Figure 2-1
Geologic Cross Section Locations

East White Lake Oil & Gas Field
Vermilion Parish, Louisiana

MICHAEL PISANI & ASSOCIATES, INC.
Environmental Consulting Services
Baton Rouge, Louisiana New Orleans, Louisiana Houston, Texas

Designed: JCS	Drawn: DAM	Checked: LRC	Date: 9/30/2015	Project: 07-47

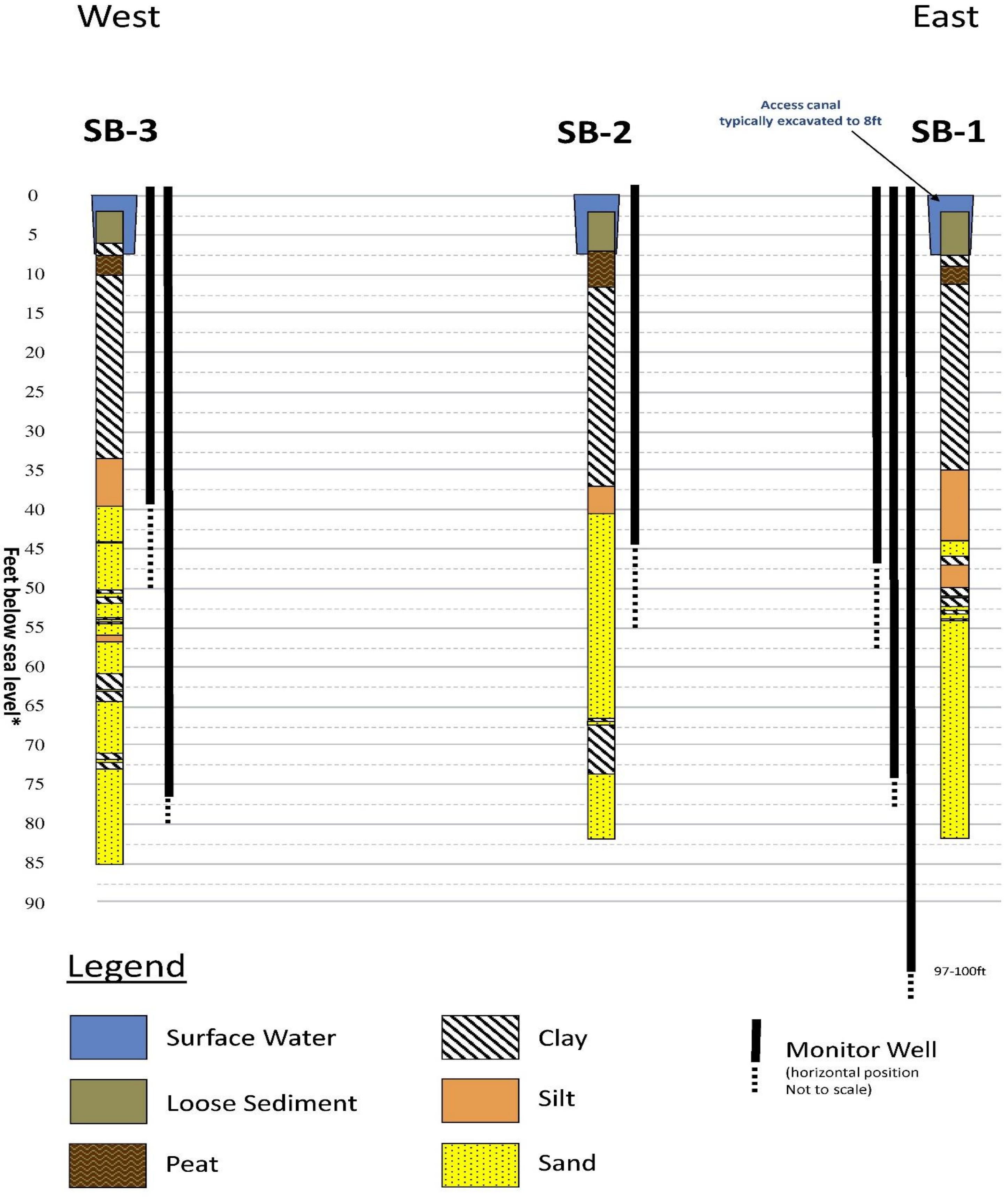


Figure 2-2
Geologic Cross Section A (W-E)

East White Lake Oil & Gas Field
Vermilion Parish, Louisiana

MICHAEL PISANI & ASSOCIATES, INC.

Environmental Consulting Services
Baton Rouge, Louisiana New Orleans, Louisiana Houston, Texas

Designed: JCS
Drawn: DAM
Checked: LRC
Date: 9/30/2015
Project: 07-47

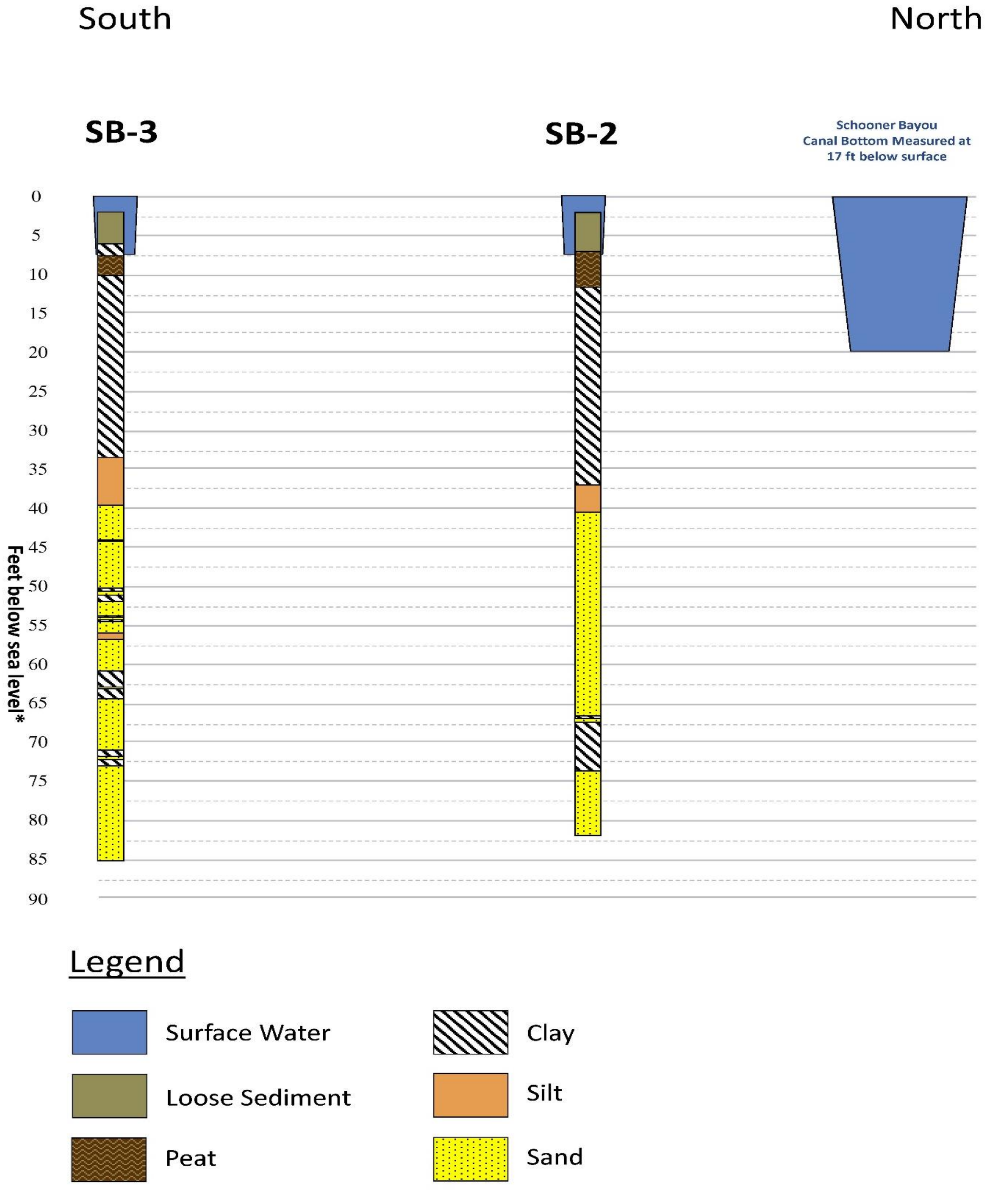


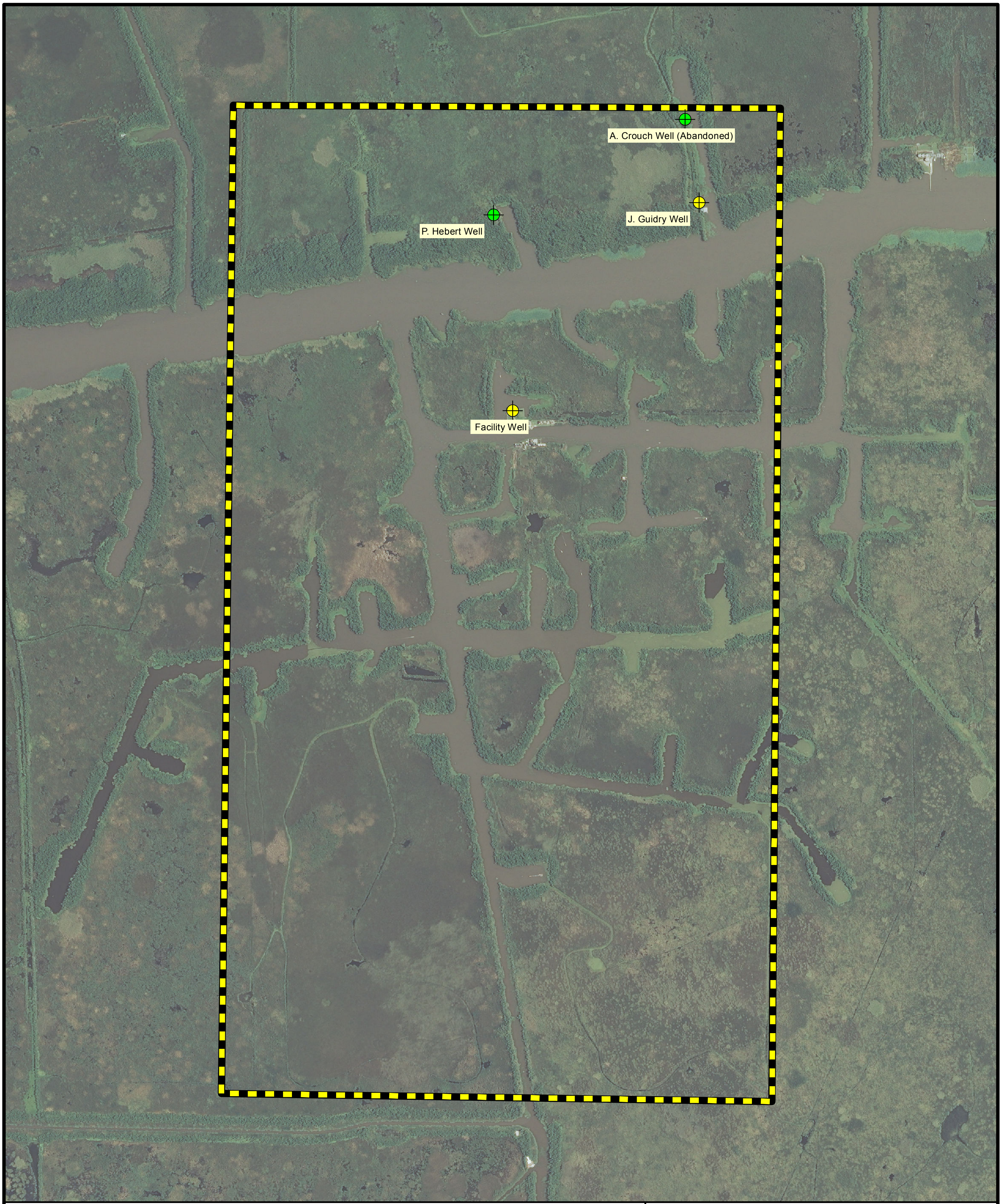
Figure 2-3
Geologic Cross Section B (S-N)

East White Lake Oil & Gas Field
Vermilion Parish, Louisiana

MICHAEL PISANI & ASSOCIATES, INC.

Environmental Consulting Services
Baton Rouge, Louisiana New Orleans, Louisiana Houston, Texas

Designed: JCS	Drawn: DAM	Checked: LRC	Date: 9/30/2015	Project: 07-47



Legend

▨ Section 16 Township 15 S Range 01 E

Water Well Zone

⊕ 40-Foot Zone

⊕ Upper Sand of the Chicot Aquifer

0 250 500 750 1,000 Feet

N

Basemap Source: USDA 2013 Ortho

Figure 2-4
Water Well Locations

East White Lake Oil & Gas Field
Vermilion Parish, Louisiana

MICHAEL PISANI & ASSOCIATES, INC.

Environmental Consulting Services
Baton Rouge, Louisiana New Orleans, Louisiana Houston, Texas

Designed: JCS | Drawn: DAM | Checked: LRC | Date: 9/30/2015 | Project: 07-47

Source: Esri, i-cubed, USDA, USGS, AEX, GeoEye, Getmapping, Aerogrid, IGN, IGP, and the GIS User Community

Legend

🟨 Property Line (Section 16)

● US Army Corps of Engineers Surface Water Monitoring Station

Figure 2-5
US Army Corps of Engineers
Surface Water Monitoring Locations

East White Lake Oil & Gas Field
Vermilion Parish, Louisiana

MICHAEL PISANI & ASSOCIATES, INC.
Environmental Consulting Services
Baton Rouge, Louisiana New Orleans, Louisiana Houston, Texas

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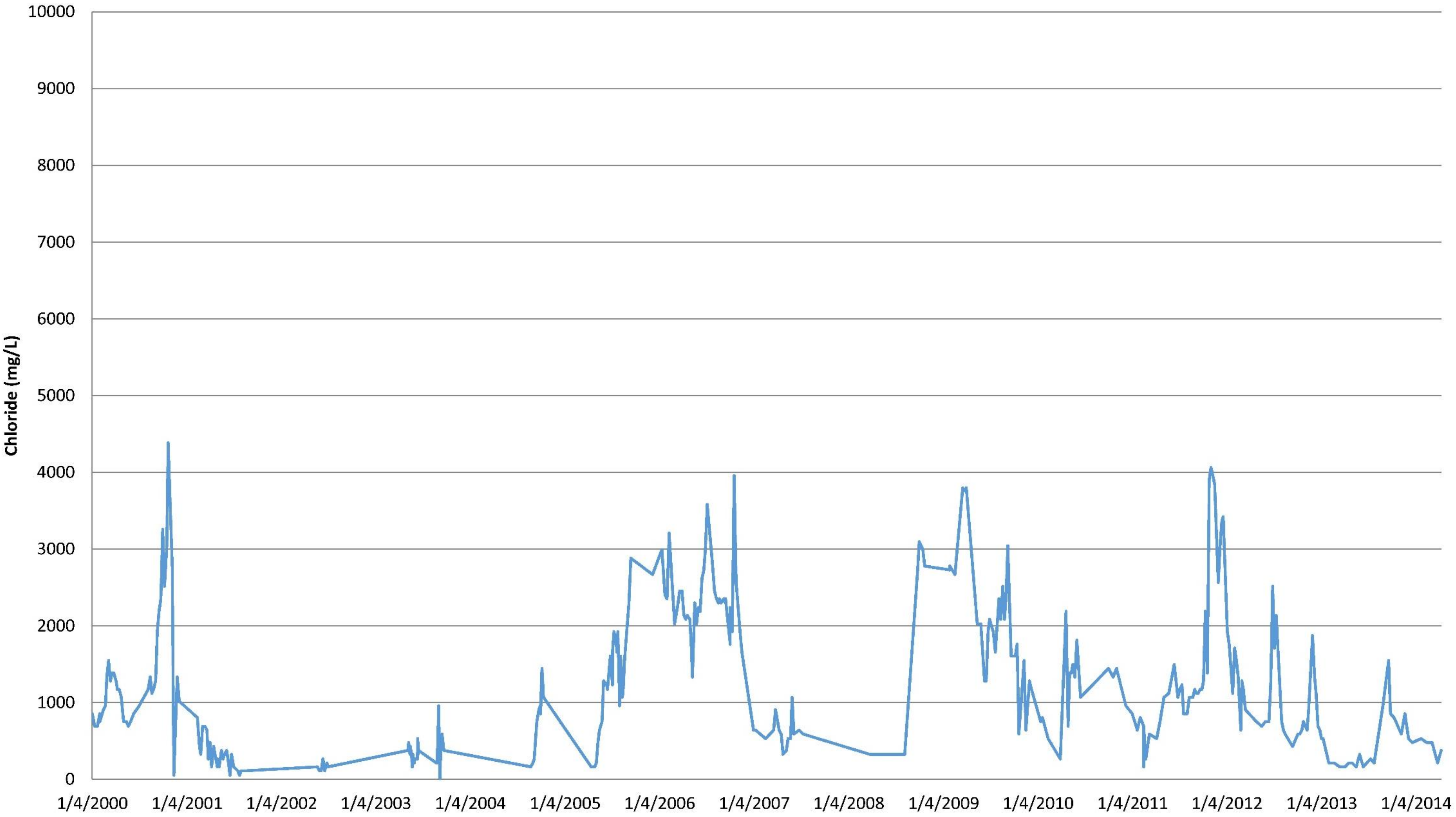

Figure 2-6

USACoE - S10 Green's Canal Chloride Trend Chart

East White Lake Oil & Gas Field
Vermilion Parish, Louisiana

MICHAEL PISANI & ASSOCIATES, INC.
Environmental Consulting Services
Baton Rouge, Louisiana New Orleans, Louisiana Houston, Texas

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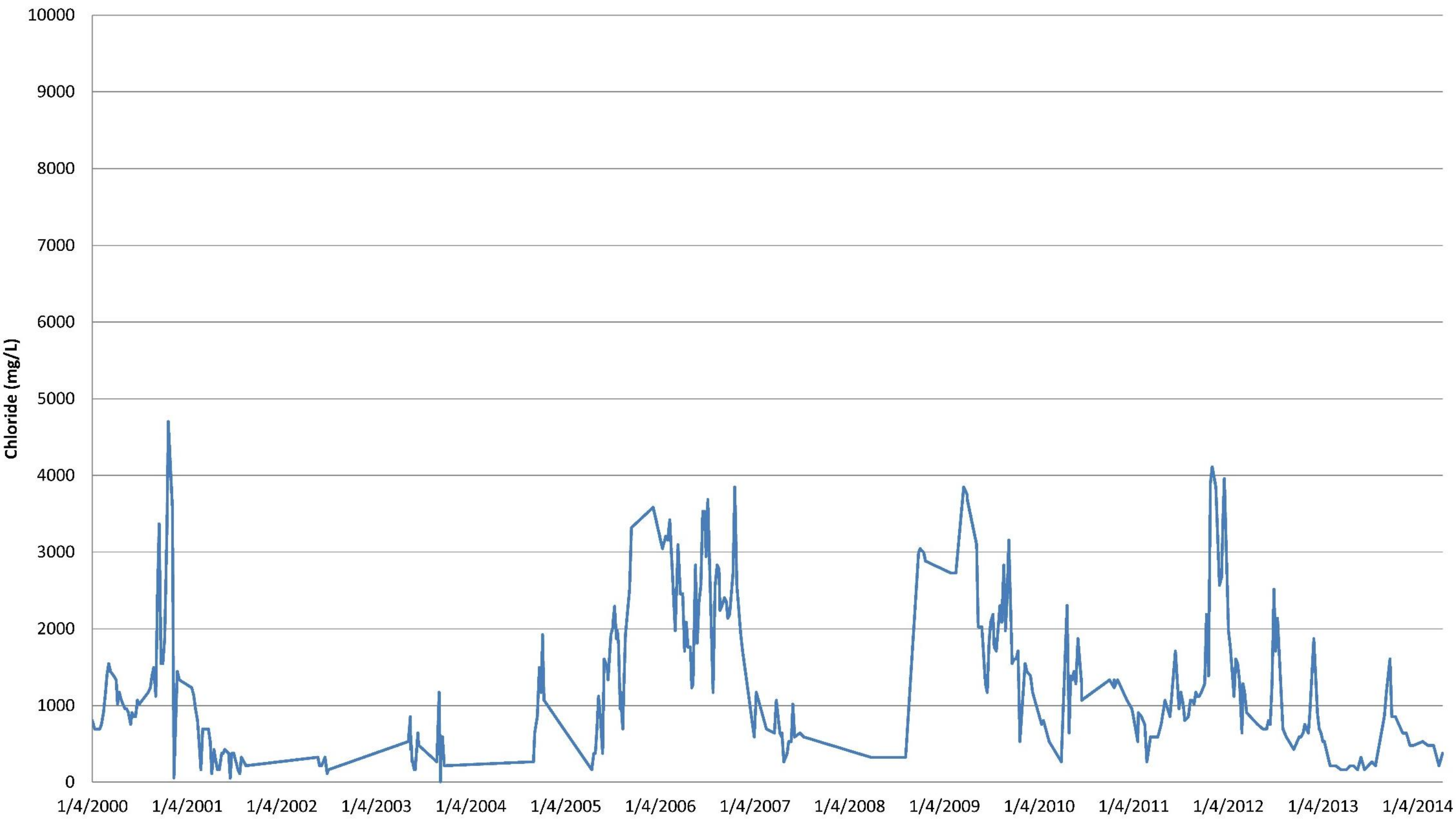

Figure 2-7
USACoE - S9 Green's Canal Chloride Trend Chart

East White Lake Oil & Gas Field
Vermilion Parish, Louisiana

MICHAEL PISANI & ASSOCIATES, INC.
Environmental Consulting Services
Baton Rouge, Louisiana New Orleans, Louisiana Houston, Texas

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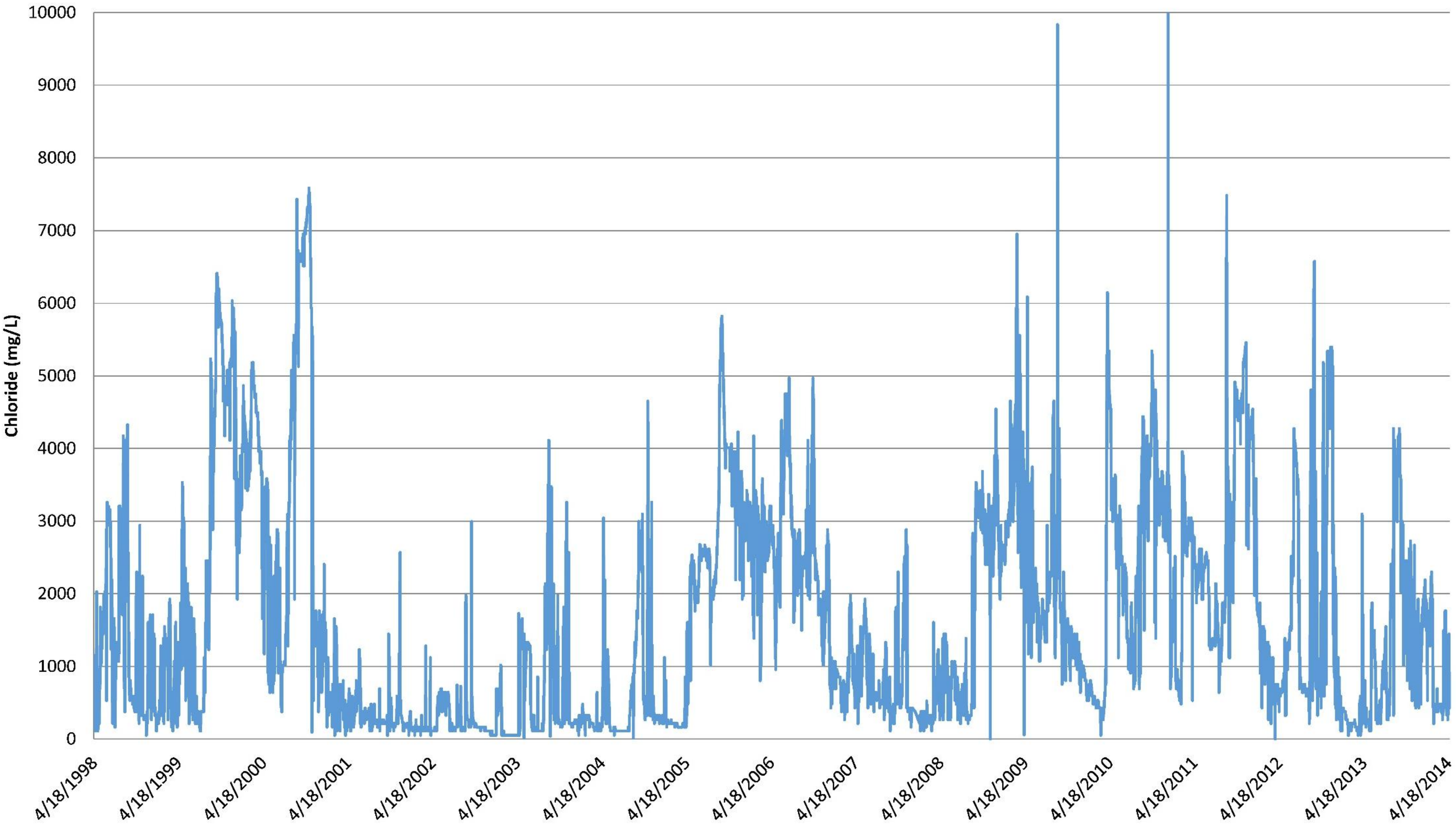

Figure 2-8
USACoE - S3 Schooner Bayou Control
Structure (East) Chloride Trend Chart
East White Lake Oil & Gas Field
Vermilion Parish, Louisiana

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Environmental Consulting Services
Baton Rouge, Louisiana New Orleans, Louisiana Houston, Texas

Designed: JCS	Drawn: MMH	Checked: LRC	Date: 9/30/2015	Project: 07-47

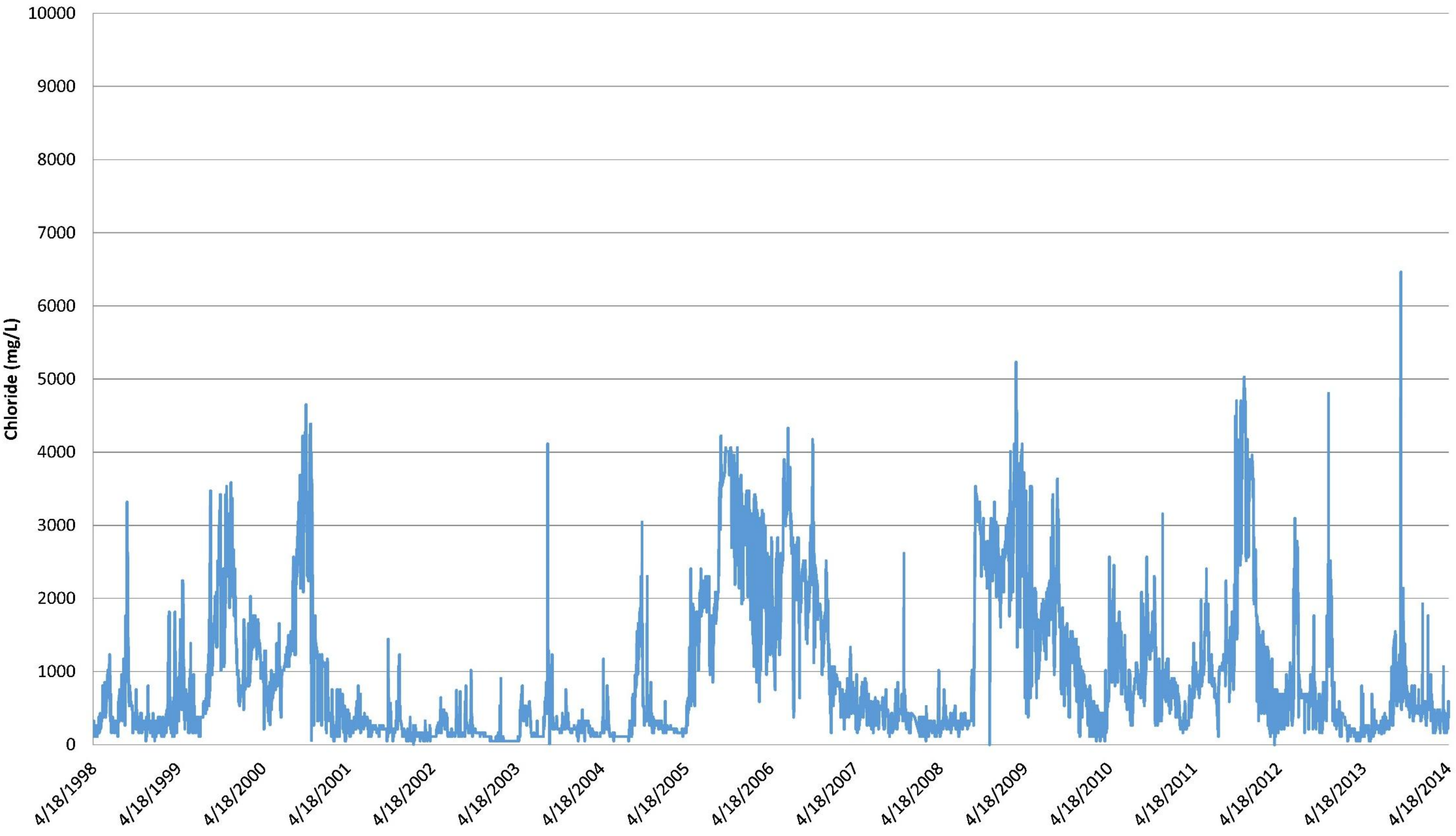

Figure 2-9
USACoE - S2 Schooner Bayou Control
Structure (West) Chloride Trend Chart
East White Lake Oil & Gas Field
Vermilion Parish, Louisiana

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Environmental Consulting Services
Baton Rouge, Louisiana New Orleans, Louisiana Houston, Texas

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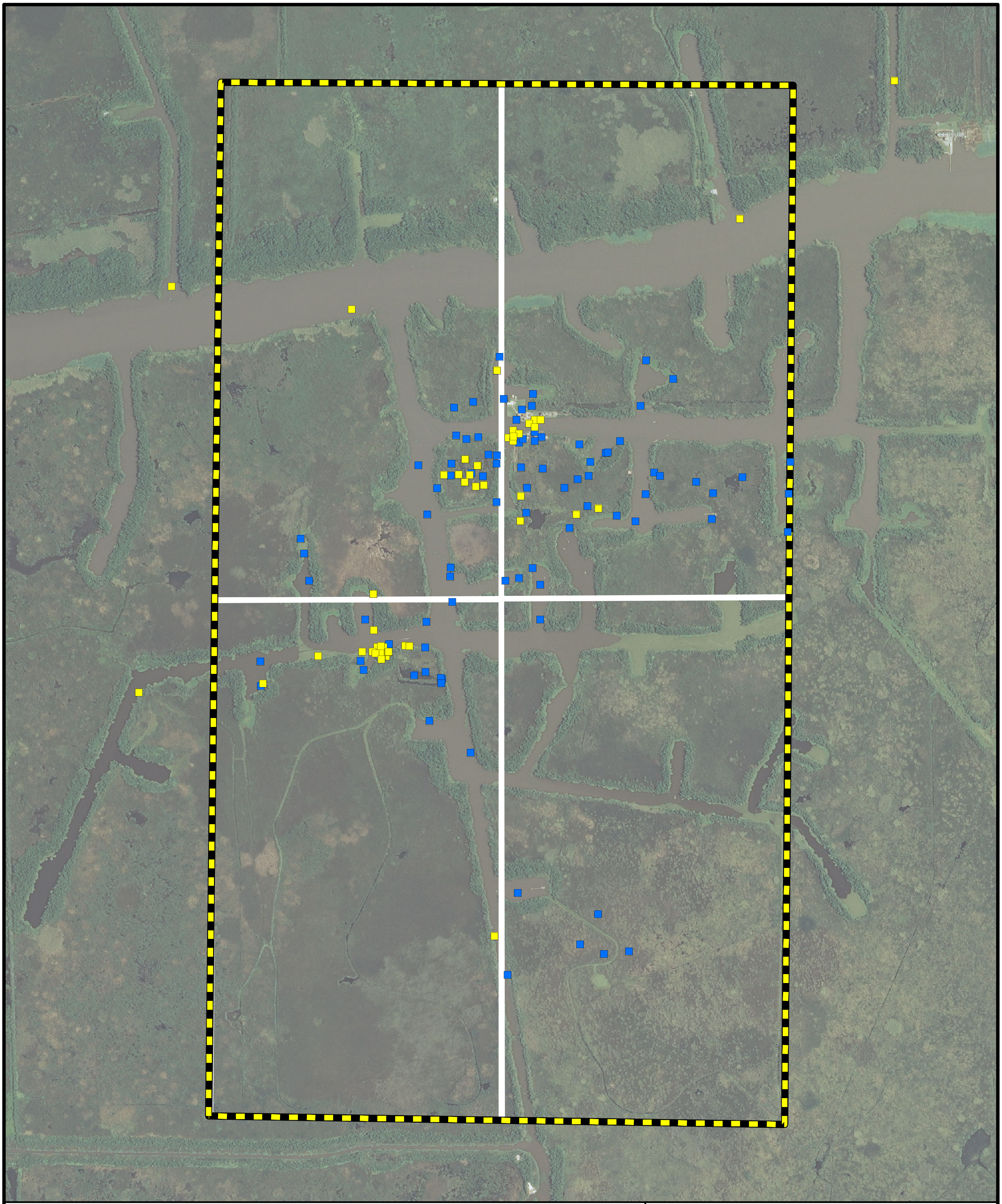


Legend

▨ Section 16 Township 15 S Range 01 E

🟦 ICON Sample Locations

🟨 MP&A Sample Locations

0 500 1,000 1,500 2,000

Feet

N

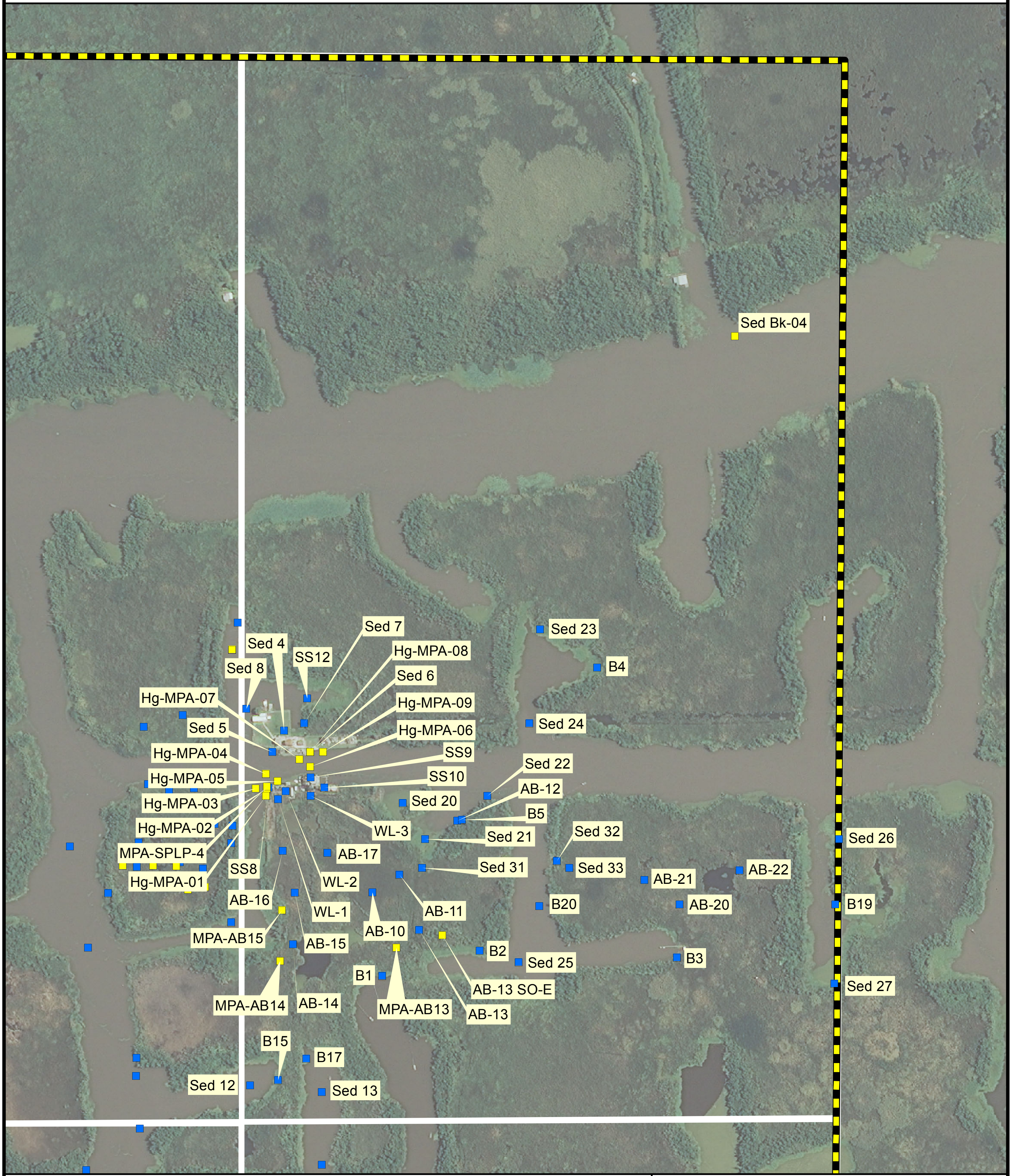
Figure 3-1
Sediment Sample Locations (Site-Wide)

East White Lake Oil & Gas Field
Vermilion Parish, Louisiana

MICHAEL PISANI & ASSOCIATES, INC.

Environmental Consulting Services
Baton Rouge, Louisiana New Orleans, Louisiana Houston, Texas

Designed: JCS	Drawn: DAM	Checked: LRC	Date: 9/30/2015	Project: 07-47



0 150 300 450 600

Feet

N

Legend

▨ Section 16 Township 15 S Range 01 E

🟦 ICON Sample Locations

🟨 MP&A Sample Locations

Figure 3-2
Sediment Sample Locations (Quadrant 1)

East White Lake Oil & Gas Field
Vermilion Parish, Louisiana

MICHAEL PISANI & ASSOCIATES, INC.

Environmental Consulting Services
Baton Rouge, Louisiana New Orleans, Louisiana Houston, Texas

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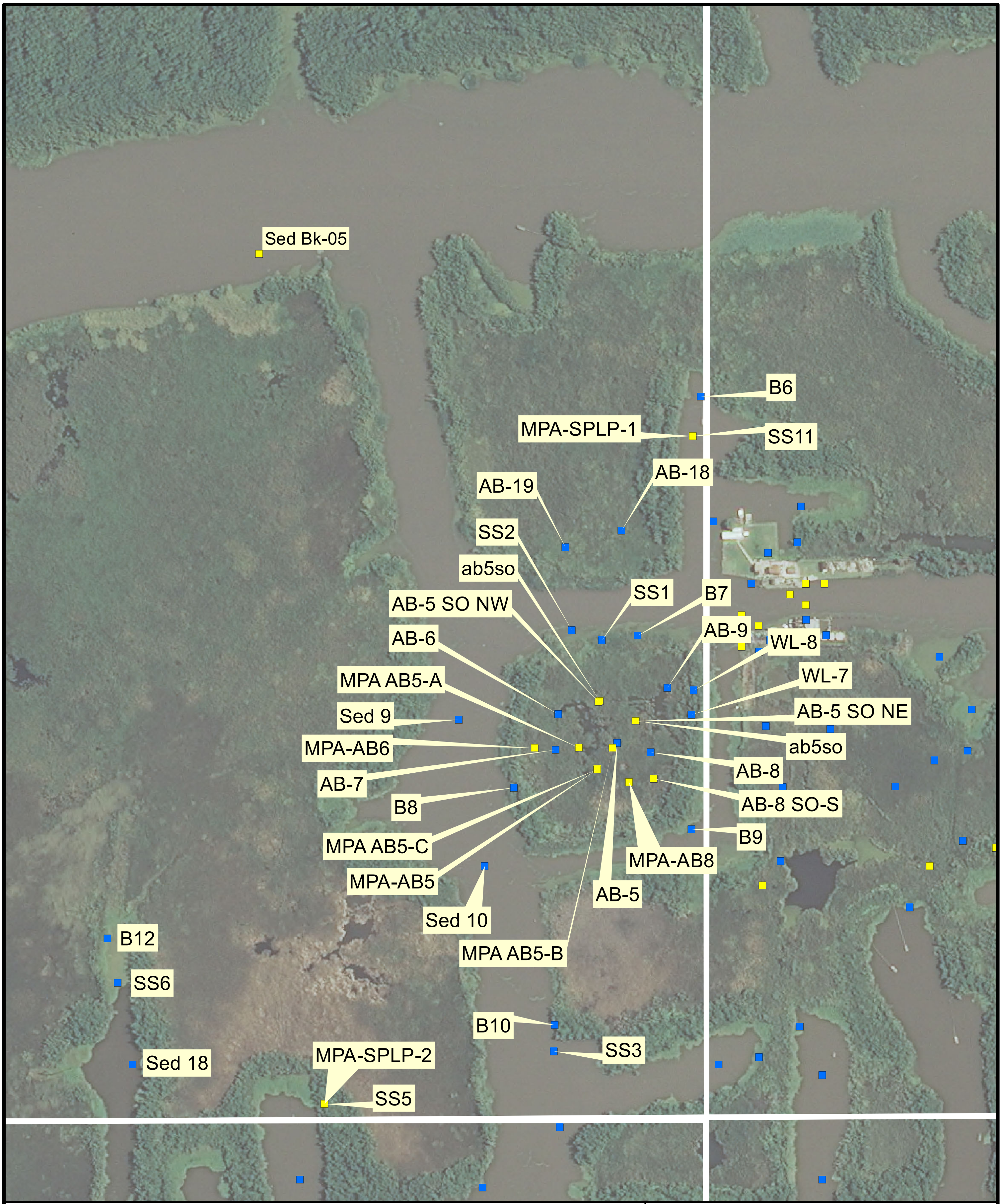

Legend

- ▨ Section 16 Township 15 S Range 01 E
- 🟦 ICON Sample Locations
- 🟨 MP&A Sample Locations

0 150 300 450 600

Feet

N

Figure 3-3
Sediment Sample Locations (Quadrant 2)

East White Lake Oil & Gas Field
Vermilion Parish, Louisiana

MICHAEL PISANI & ASSOCIATES, INC.

Environmental Consulting Services
Baton Rouge, Louisiana New Orleans, Louisiana Houston, Texas

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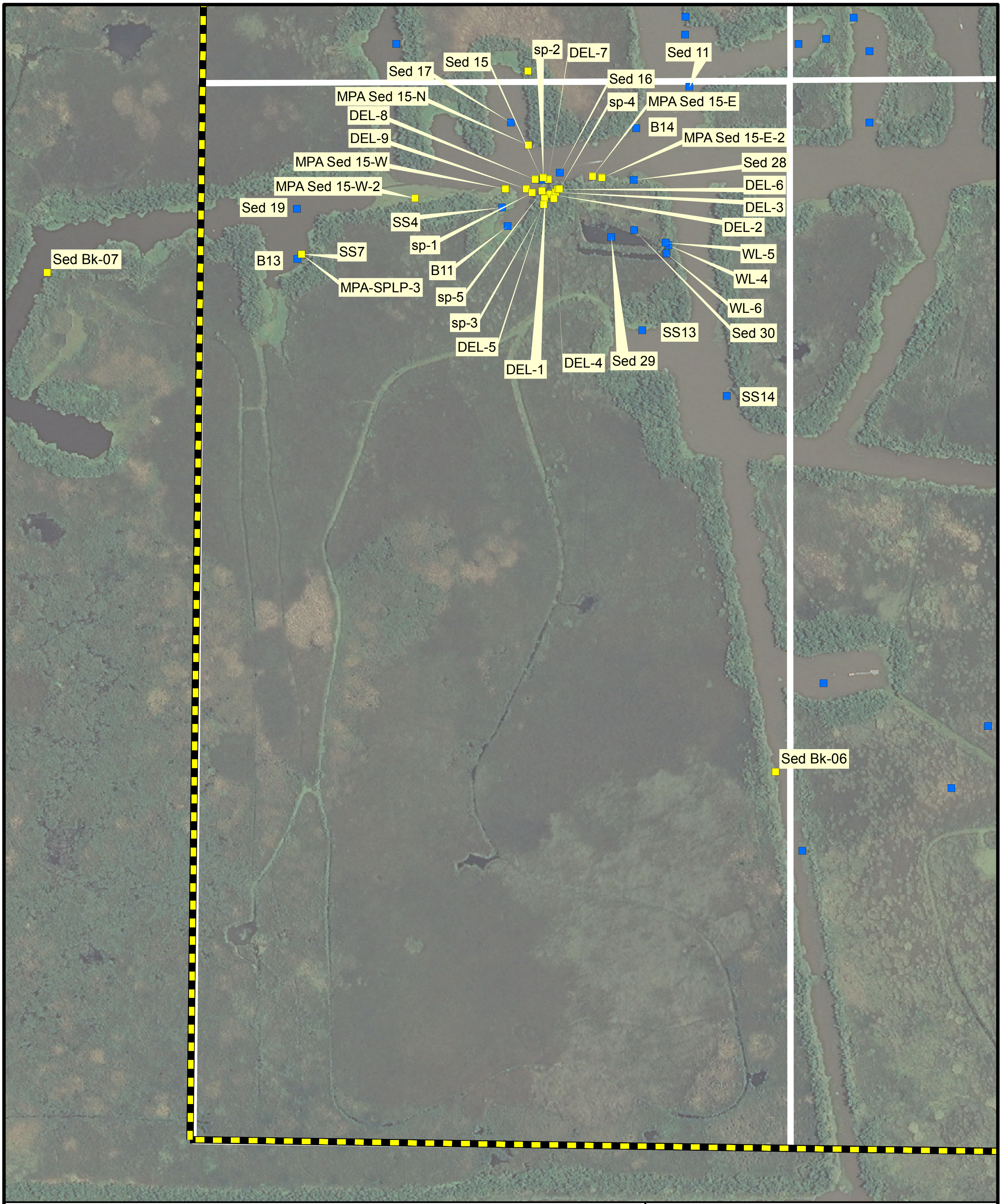


Legend

▨ Section 16 Township 15 S Range 01 E

🟦 ICON Sample Locations

🟨 MP&A Sample Locations

0 150 300 450 600
Feet

N

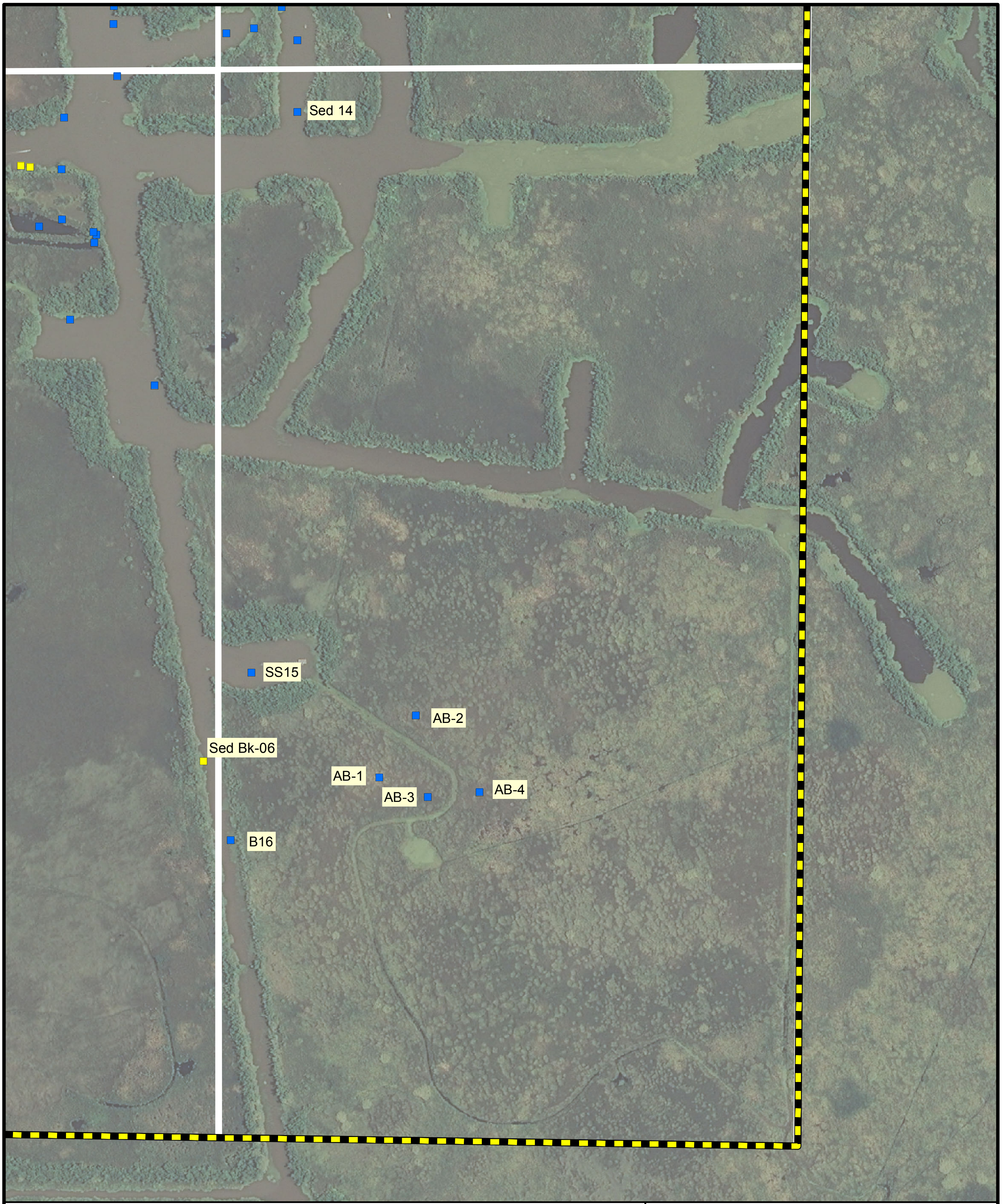
Figure 3-4
Sediment Sample Locations (Quadrant 3)

East White Lake Oil & Gas Field
Vermilion Parish, Louisiana

MICHAEL PISANI & ASSOCIATES, INC.

Environmental Consulting Services
Baton Rouge, Louisiana New Orleans, Louisiana Houston, Texas

Designed: JCS	Drawn: DAM	Checked: LRC	Date: 9/30/2015	Project: 07-47



Legend

▨ Section 16 Township 15 S Range 01 E

🟦 ICON Sample Locations

🟨 MP&A Sample Locations

0 150 300 450 600

Feet

N

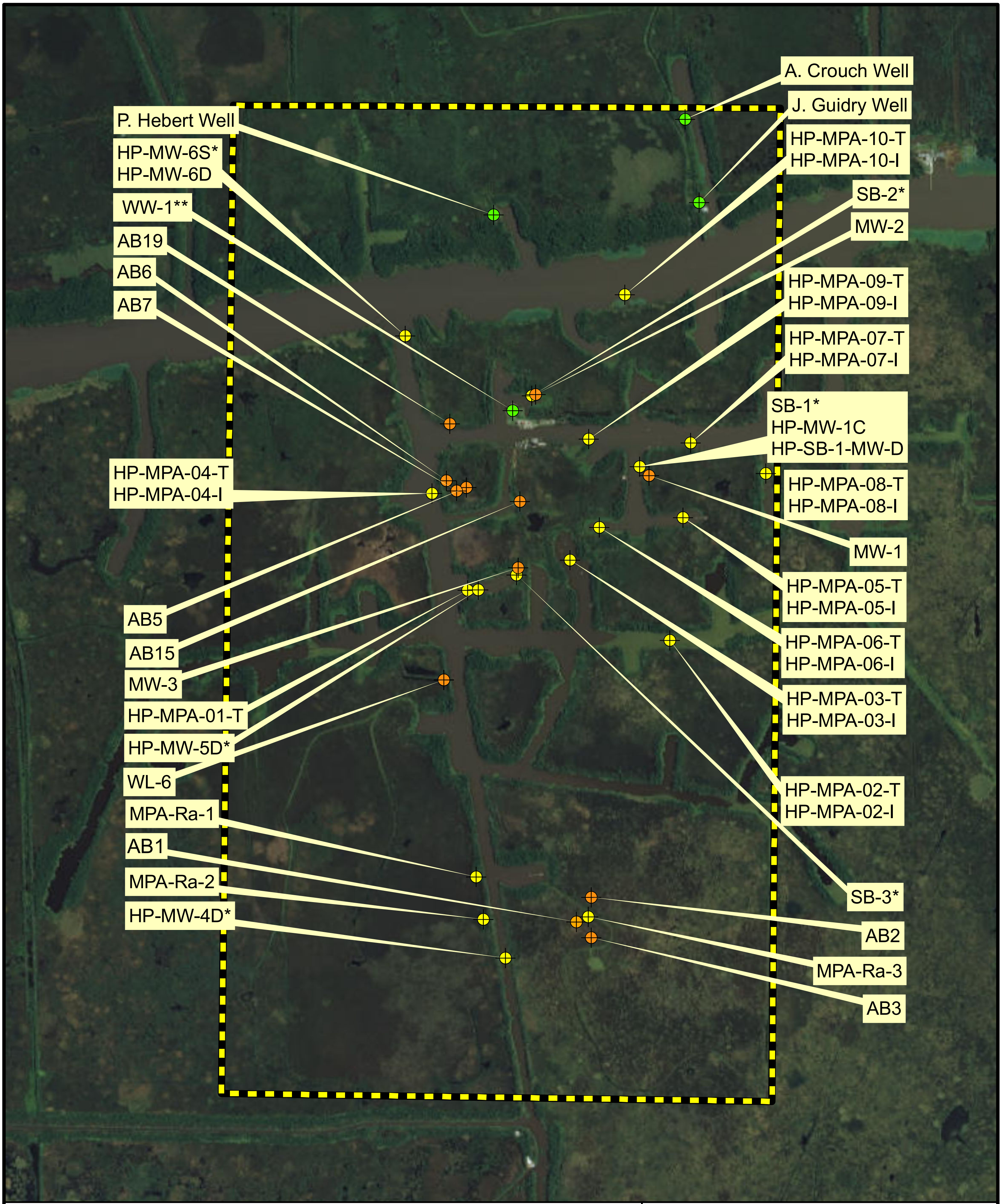
Figure 3-5
Sediment Sample Locations (Quadrant 4)

East White Lake Oil & Gas Field
Vermilion Parish, Louisiana

MICHAEL PISANI & ASSOCIATES, INC.

Environmental Consulting Services
Baton Rouge, Louisiana New Orleans, Louisiana Houston, Texas

Designed: JCS	Drawn: DAM	Checked: LRC	Date: 9/30/2015	Project: 07-47



Legend

▨ Section 16 Township 15 S Range 01 E

⊕ MP&A Sample Location

⊕ ICON Sample Location

⊕ Existing Water Well; Upper Sand of Chicot Aquifer

* Soil borings identified as MPA-SB-#
** Also referred to as AWW1

Source: 2013 Aerial from ESRI

0 250 500 750 1,000
Feet

N

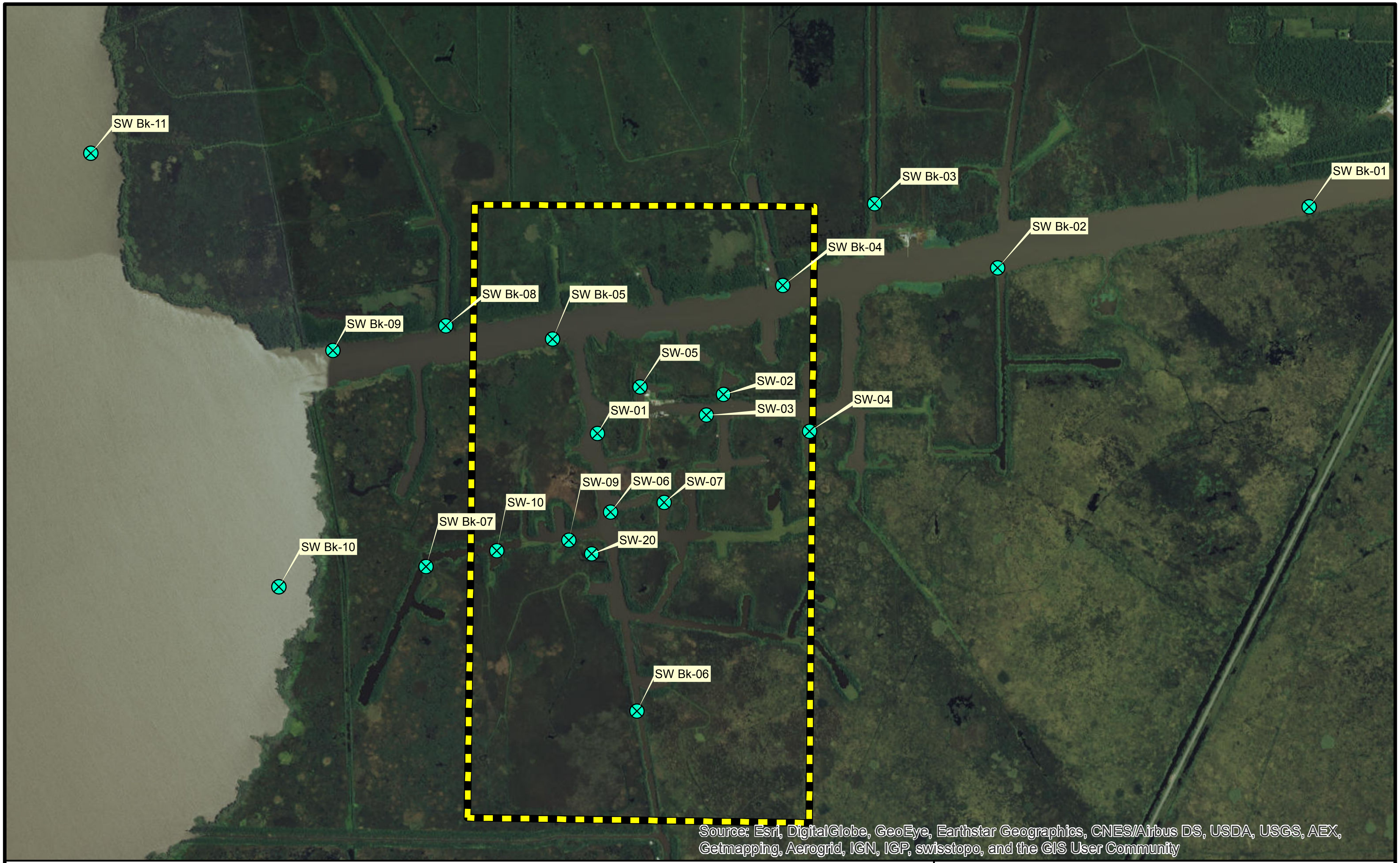
Figure 3-6
Ground Water Sample Locations

East White Lake Oil & Gas Field
Vermilion Parish, Louisiana

MICHAEL PISANI & ASSOCIATES, INC.

Environmental Consulting Services
Baton Rouge, Louisiana New Orleans, Louisiana Houston, Texas

Designed: JCS	Drawn: DAM	Checked: LRC	Date: 9/30/2015	Project: 07-47



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Legend

▨ Section 16 Township 15 S Range 01 E

⊗ MP&A/ICON Surface Water Sample Location

Figure 3-7
Surface Water Sample Locations

East White Lake Oil & Gas Field
Vermilion Parish, Louisiana

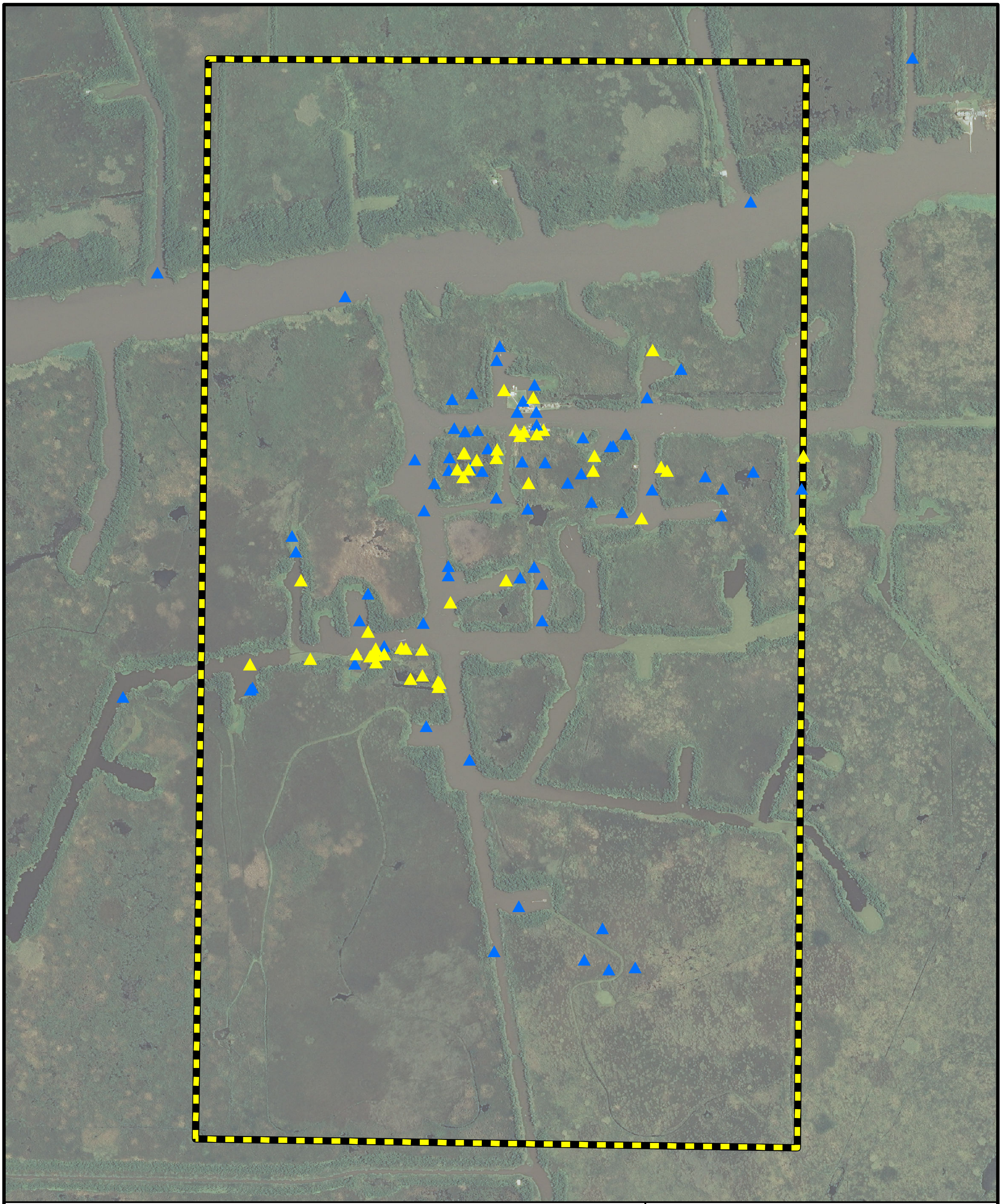
MICHAEL PISANI & ASSOCIATES, INC.
Environmental Consulting Services
Baton Rouge, Louisiana New Orleans, Louisiana Houston, Texas

Designed: JCS	Drawn: DAM	Checked: LRC	Date: 9/30/2015	Project: 07-47

Figure 3-8
Crab and Fish Sampling Locations
East White Lake Oil and Gas Field
Vermilion Parish, Louisiana

MICHAEL PISANI & ASSOCIATES, INC.
Environmental Management & Engineering Services
Houston, Texas New Orleans, Louisiana Baton Rouge, Louisiana

Designed: HRC	Drawn: HRC	Checked: MEP	Date:03/11/2012	Project: 07-47



Legend

▨ Section 16 Township 15 S Range 01 E

Sediment Sample Locations with TPH Data

- ▲ Location of samples analyzed only for TPH Mixtures
- ▲ Location of samples analyzed for hydrocarbon fractions

Notes:
1. Boring/sample locations include both ICON and MP&A sample locations.
2. Locations generally represent multiple samples, collected from multiple depth intervals of the boring.

Figure 3-9
Locations of Hydrocarbon Fraction Analyses in Sediment

East White Lake Oil & Gas Field
Vermilion Parish, Louisiana

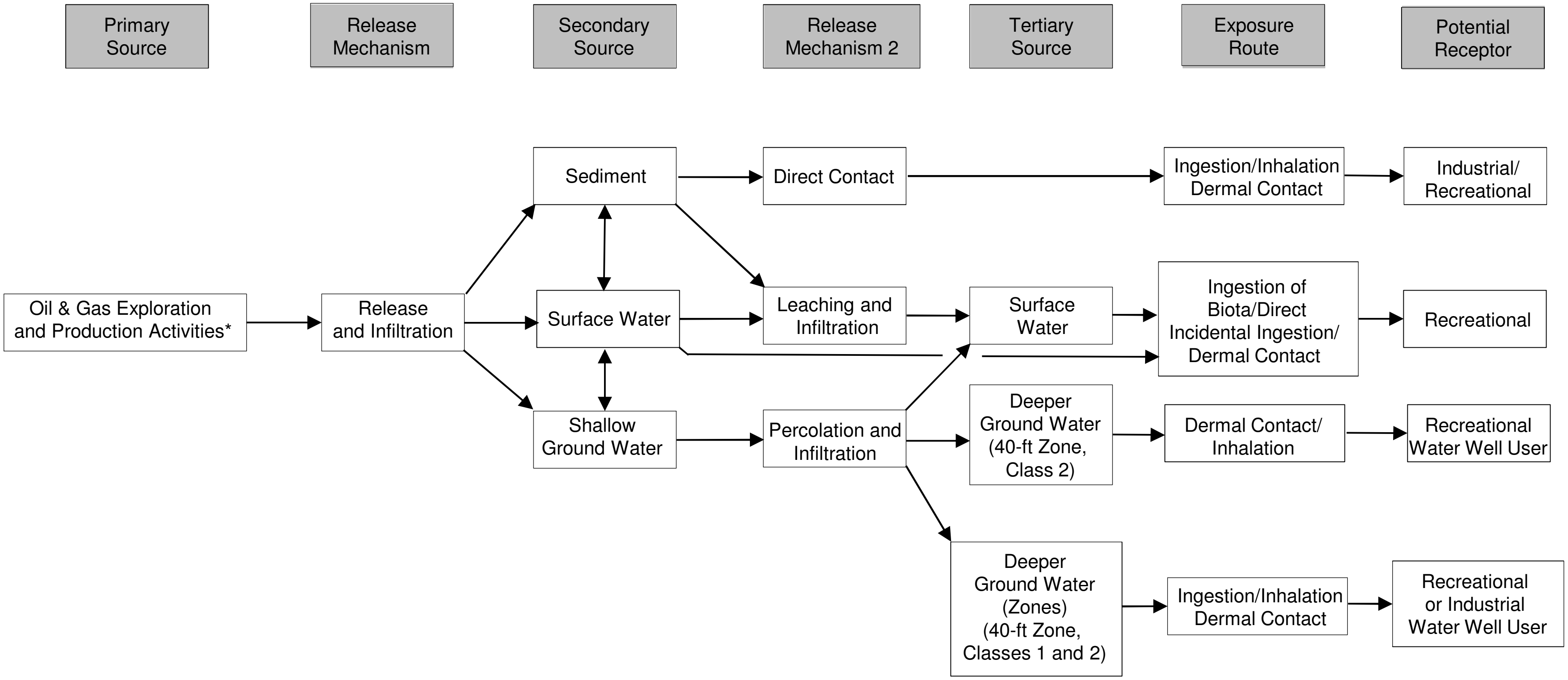
MICHAEL PISANI & ASSOCIATES, INC.
Environmental Consulting Services
Baton Rouge, Louisiana New Orleans, Louisiana Houston, Texas

Designed: JCS	Drawn: DAM	Checked: LRC	Date: 9/30/2015	Project: 07-47

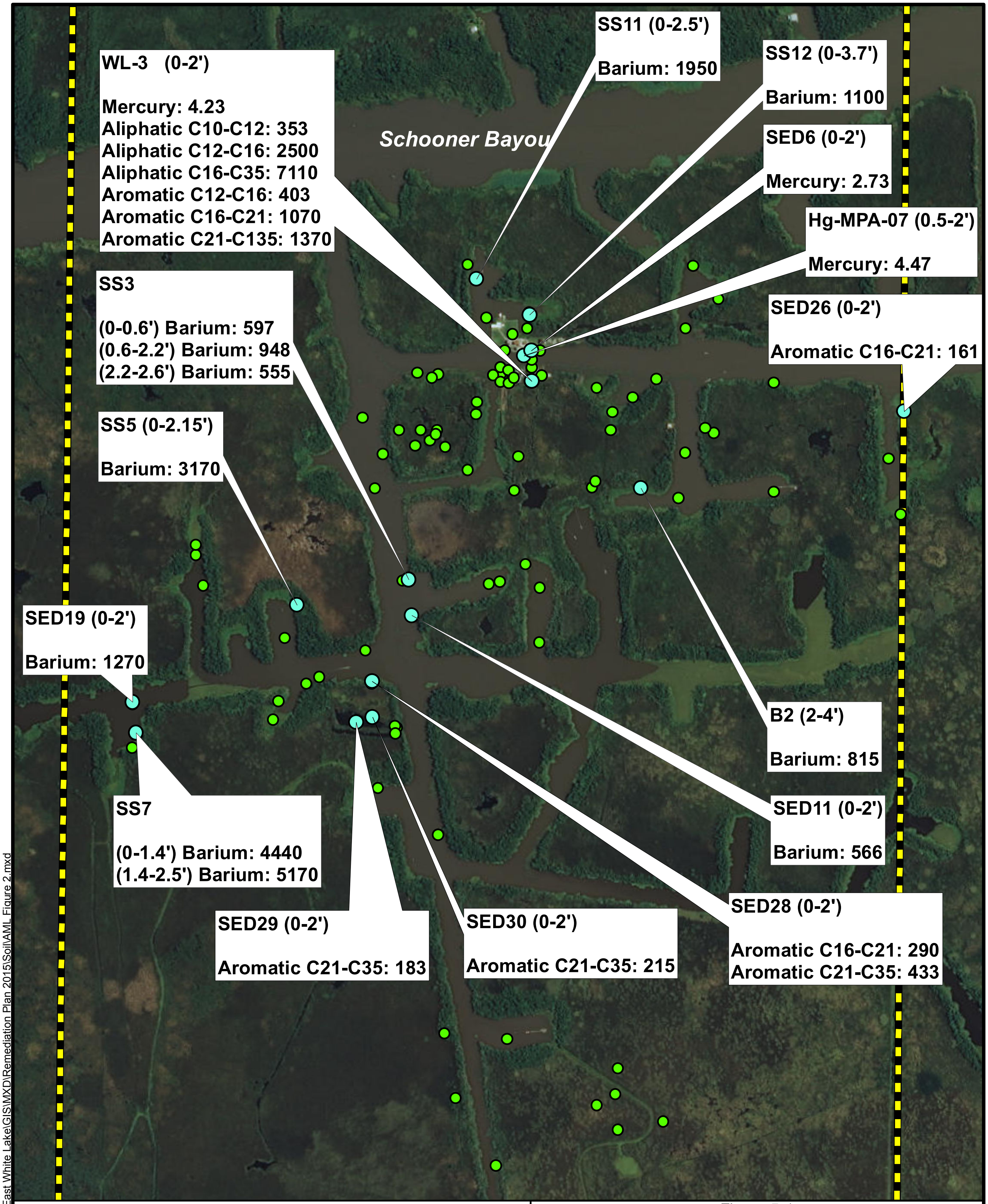
Figure 4-1

Conceptual Site Model

East White Lake Field
Vermilion Parish, Louisiana



* Former pit features, releases from flow lines, discharge of produced water to canals prior to regulation of the discharge, and accidental release during hydrocarbon storage and waste management.



Legend

▨ Section 16 Township 15 S Range 01 E

● Soil Exceedance Location

● Soil Sample Location

0 200 400 600 800

Feet

N

Notes:
1. Results are the average of ICON and MPA split results, where available (mg/kg-wet).

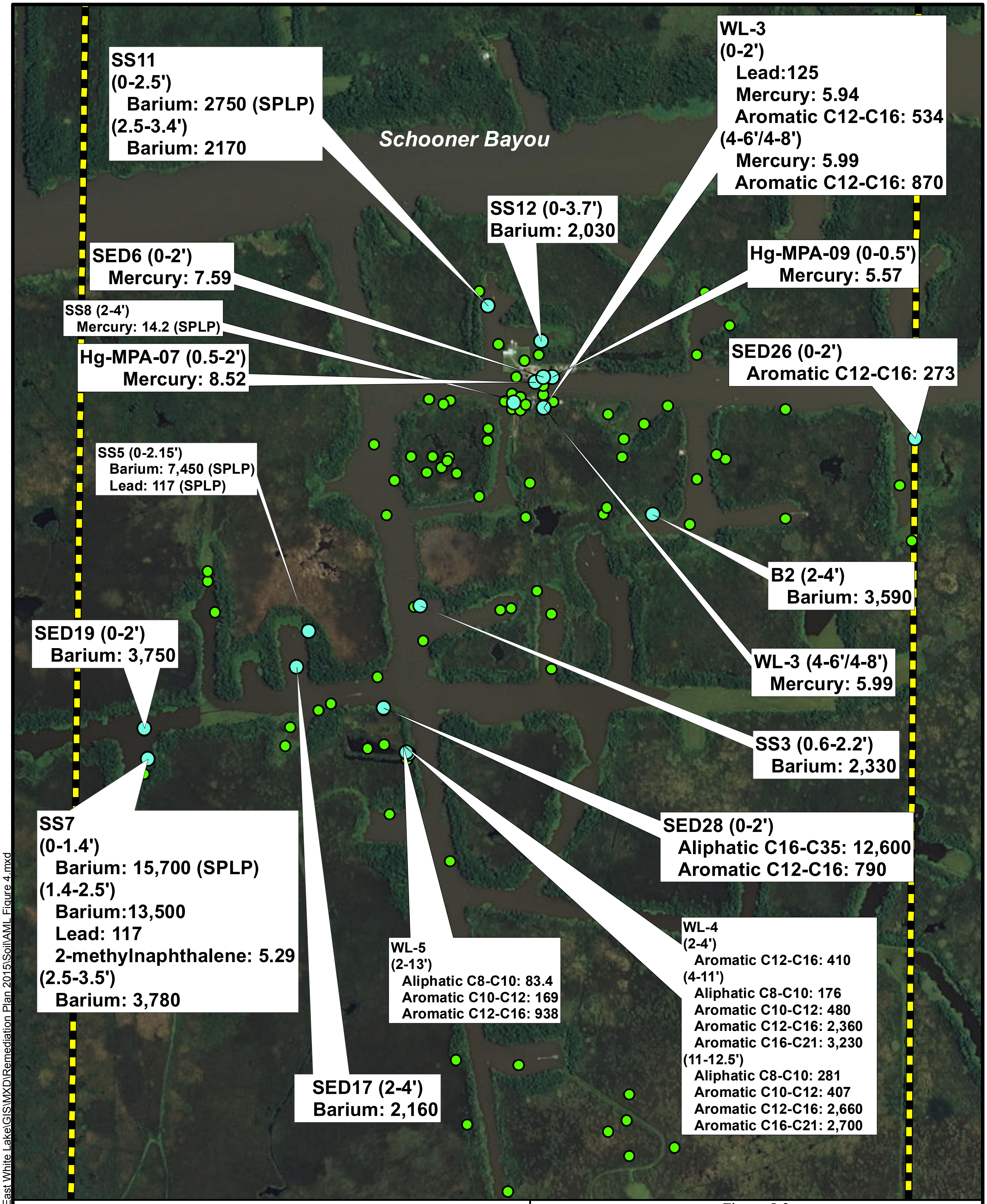
Source: 2013 Aerial from ESRI

Figure 5-1
Sediment Constituent Concentrations Above
Non-Industrial Direct Contact Screening Standards
East White Lake Field
Vermillion Parish, Louisiana

Michael Pisani & Associates Inc.
Environmental Consulting Services
Baton Rouge LA New Orleans LA Houston TX

Designed: AL	Drawn: TC	Checked: LRC	Date: 9/30/2015	Project: 07-47

Document Path: Z:\07-47 VPSB East White Lake\GIS\MXD\Remediation Plan 2015\Soil\AML Figure 2.mxd



Legend

- ▨ Section 16 Township 15 S Range 01 E
- ● Soil Exceedance Location
- ● Soil Sample Location

0 200 400 600 800
Feet

N

Notes:
1. Results are the average of ICON and MPA split results, where available (mg/kg-dry).

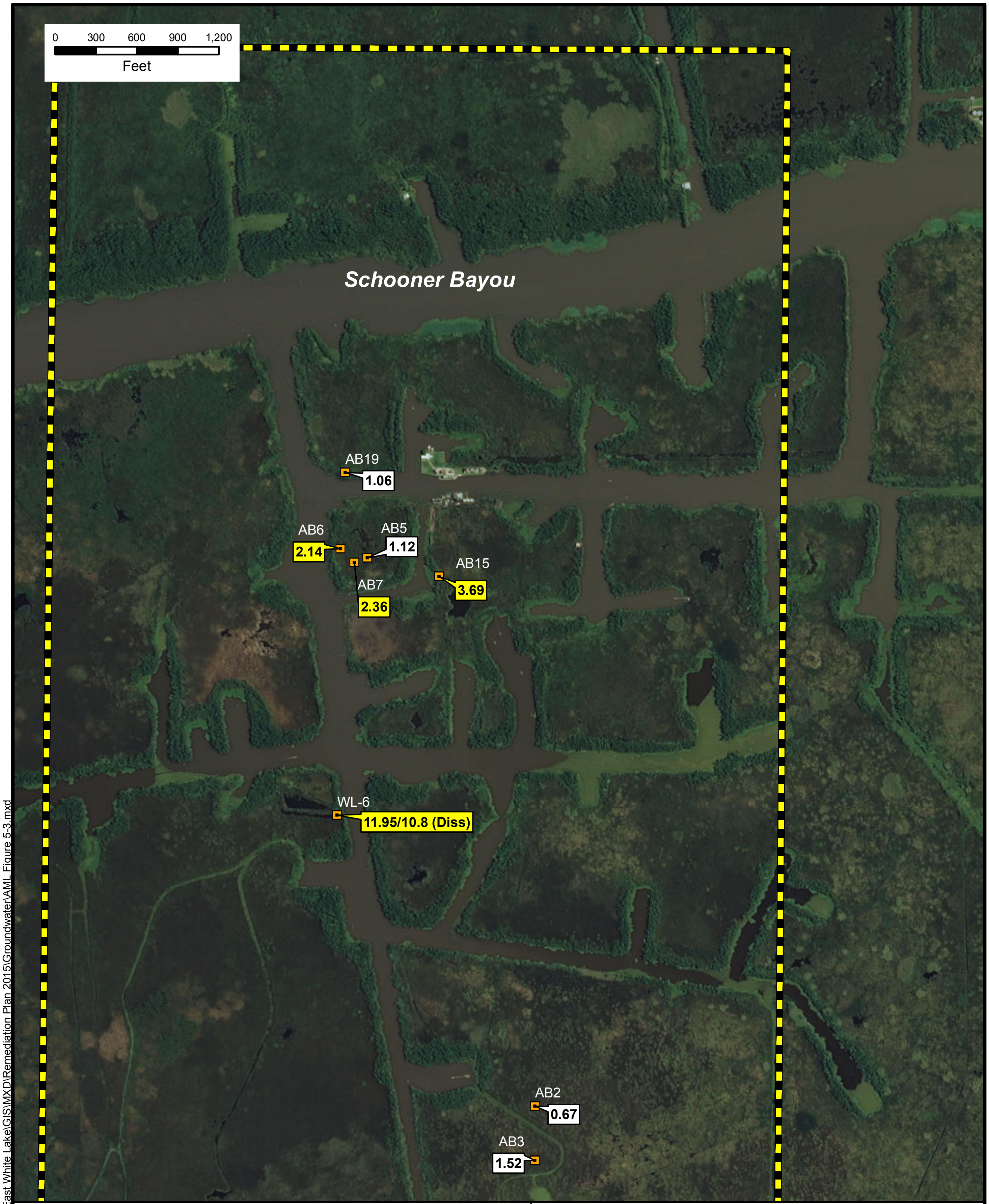
Source: 2013 Aerial from ESRI

Figure 5-2
Sediment Constituent Concentrations Above Groundwater Protection Screening Standards
East White Lake Field
Vermillion Parish, Louisiana

Michael Pisani & Associates Inc.
Environmental Consulting Services
Baton Rouge LA New Orleans LA Houston TX

Designed: AL	Drawn: TC	Checked: LRC	Date: 9/30/2015	Project: 07-47

Document Path: Z:\07-47 VPSB East White Lake\GIS\MXD\Remediation Plan 2015\Soil\AML Figure 4.mxd



Legend

▨ Section 16 Township 15 S Range 01 E

GWSS=2 mg/L

Groundwater Zone

▣ Peat

Source: 2013 Aerial (ESRI)

Notes:
1. Highlighted values exceed RECAP ground water screening standard (GWSS)
2. Results posted are the average of ICON and MP&A split results in mg/L
3. Where duplicate samples were collected, maximum value is shown
4. (Diss) refers to dissolved results

Figure 5-3
Peat Zone – Barium Concentrations

East White Lake Field
Vermillion Parish, Louisiana

Michael Pisani & Associates Inc.
Environmental Consulting Services
Baton Rouge LA New Orleans LA Houston TX

Designed: AL	Drawn: TC	Checked: LRC	Date: 9/18/2015	Project: 07-47

Document Path: Z:\07-47 VPSB East White Lake\GIS\MXD\Remediation Plan 2015\Groundwater\AML Figure 5-3.mxd

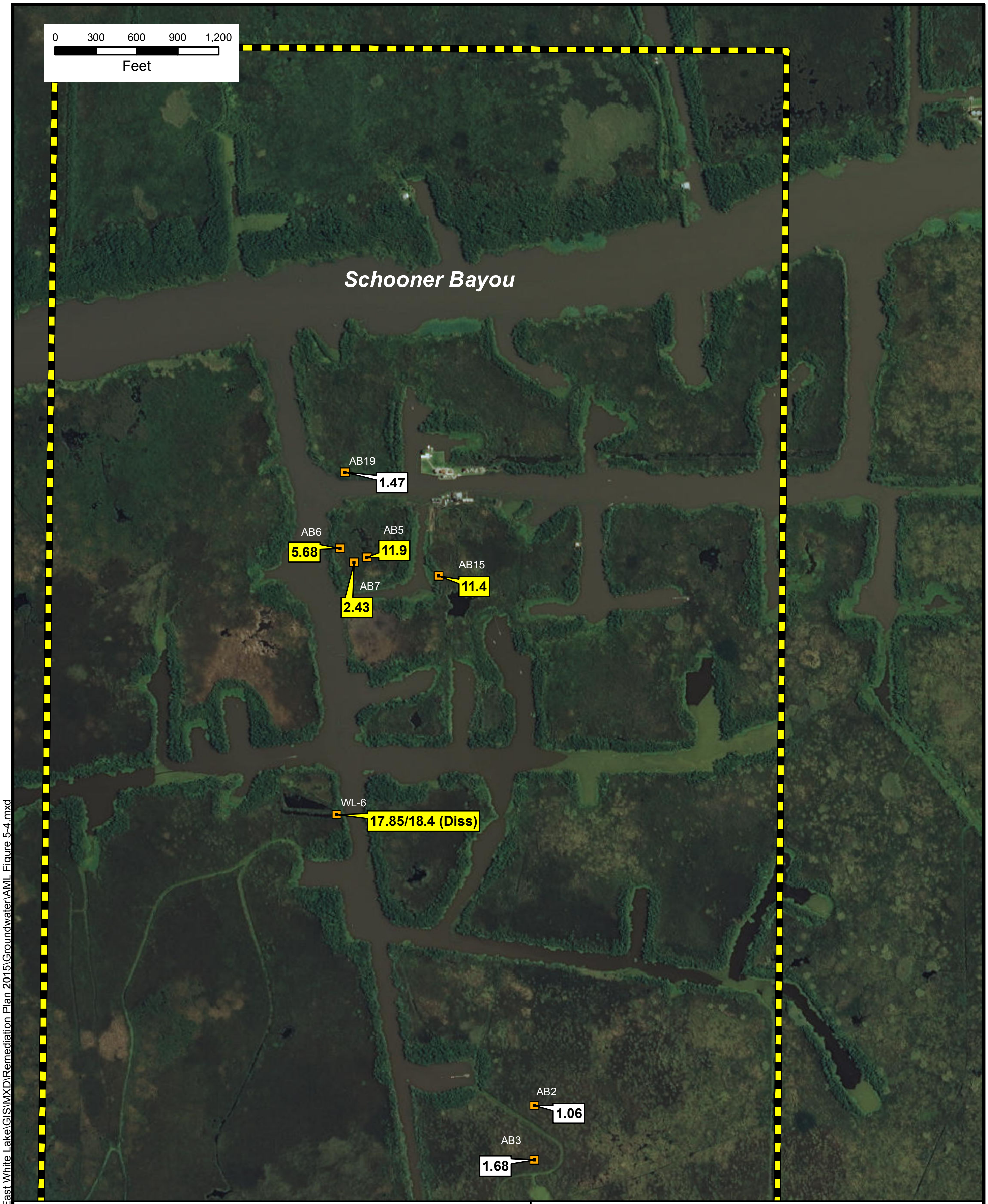


Figure 5-4
Peat Zone – Strontium Concentrations

East White Lake Field
Vermillion Parish, Louisiana

Legend

▨ Section 16 Township 15 S Range 01 E

GWSS=2.2 mg/L

Groundwater

▣ Peat

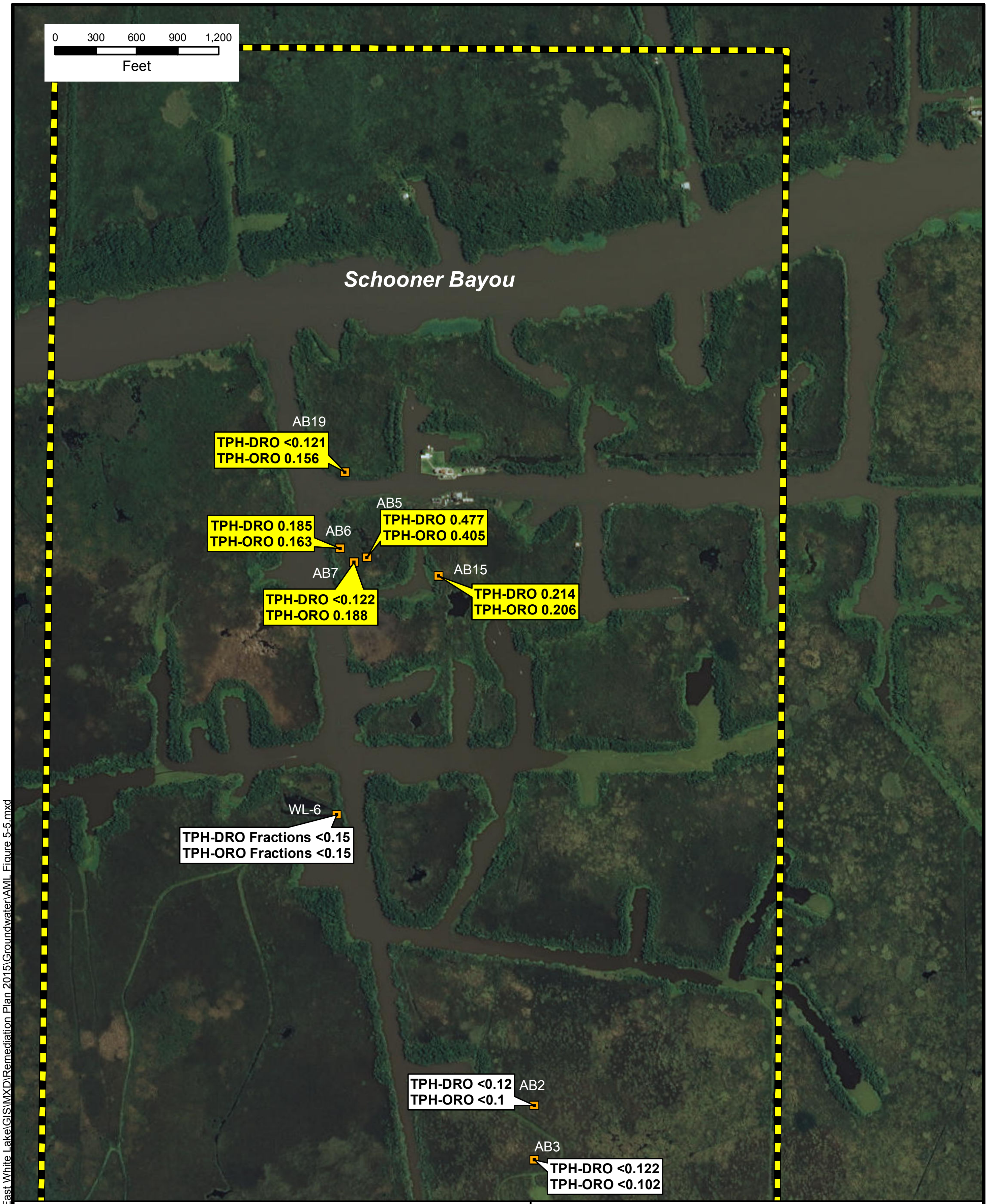
Source: 2013 Aerial (ESRI)

Notes:
1. Highlighted values exceed RECAP ground water screening standard (GWSS)
2. Results posted are the average of ICON and MP&A split results in mg/L
3. Where duplicate samples were collected, maximum value is shown
4. (Diss) refers to dissolved results

Michael Pisani & Associates Inc.
Environmental Consulting Services
Baton Rouge LA New Orleans LA Houston TX

Designed: AL	Drawn: TC	Checked: LRC	Date: 9/18/2015	Project: 07-47

Document Path: Z:\07-47 VPSB East White Lake\GIS\MXD\Remediation Plan 2015\Groundwater\AML Figure 5-4.mxd



Legend

▨ Section 16 Township 15 S Range 01 E

GWSS=0.15 mg/L

Groundwater

▣ Peat

Source: 2013 Aerial (ESRI)

Notes:
1. Highlighted values exceed RECAP ground water screening standard (GWSS)
2. Results posted are the average of ICON and MP&A split results in mg/L
3. Where duplicate samples were collected, maximum value is shown

Figure 5-5

Peat Zone – Petroleum Hydrocarbon Concentrations

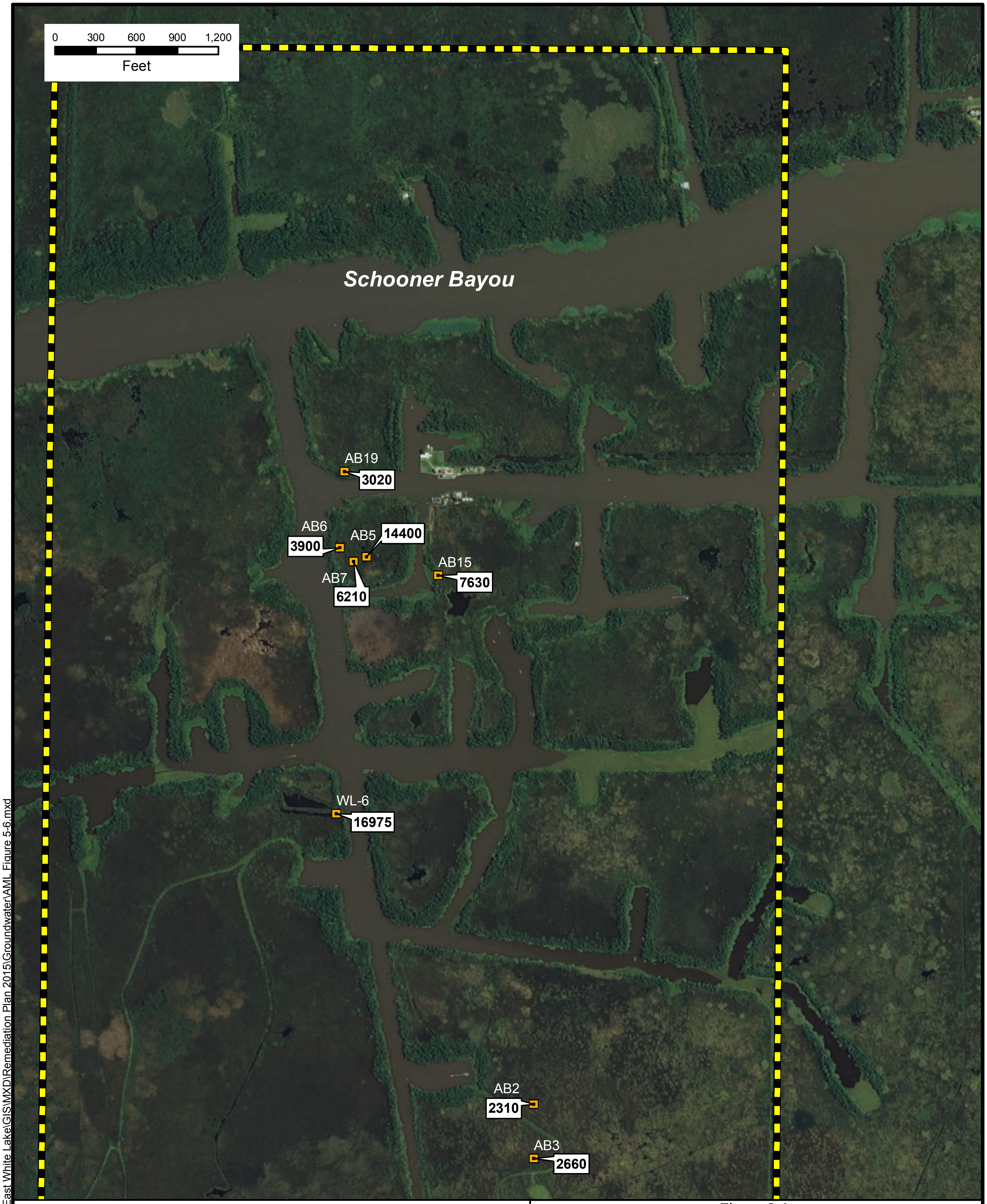
East White Lake Field
Vermillion Parish, Louisiana

Michael Pisani & Associates Inc.

Environmental Consulting Services
Baton Rouge LA New Orleans LA Houston TX

Designed: AL	Drawn: TC	Checked: LRC	Date: 9/22/2015	Project: 07-47

Document Path: Z:\07-47 VPSB East White Lake\GIS\MXD\Remediation Plan 2015\Groundwater\AML Figure 5-5.mxd



Legend

▨ Section 16 Township 15 S Range 01 E

Groundwater

▣ Peat

Source: 2013 Aerial (ESRI)

Notes:
1. Results posted are the average of ICON and MP&A split results in mg/L
2. Where duplicate samples were collected, maximum value is shown

N

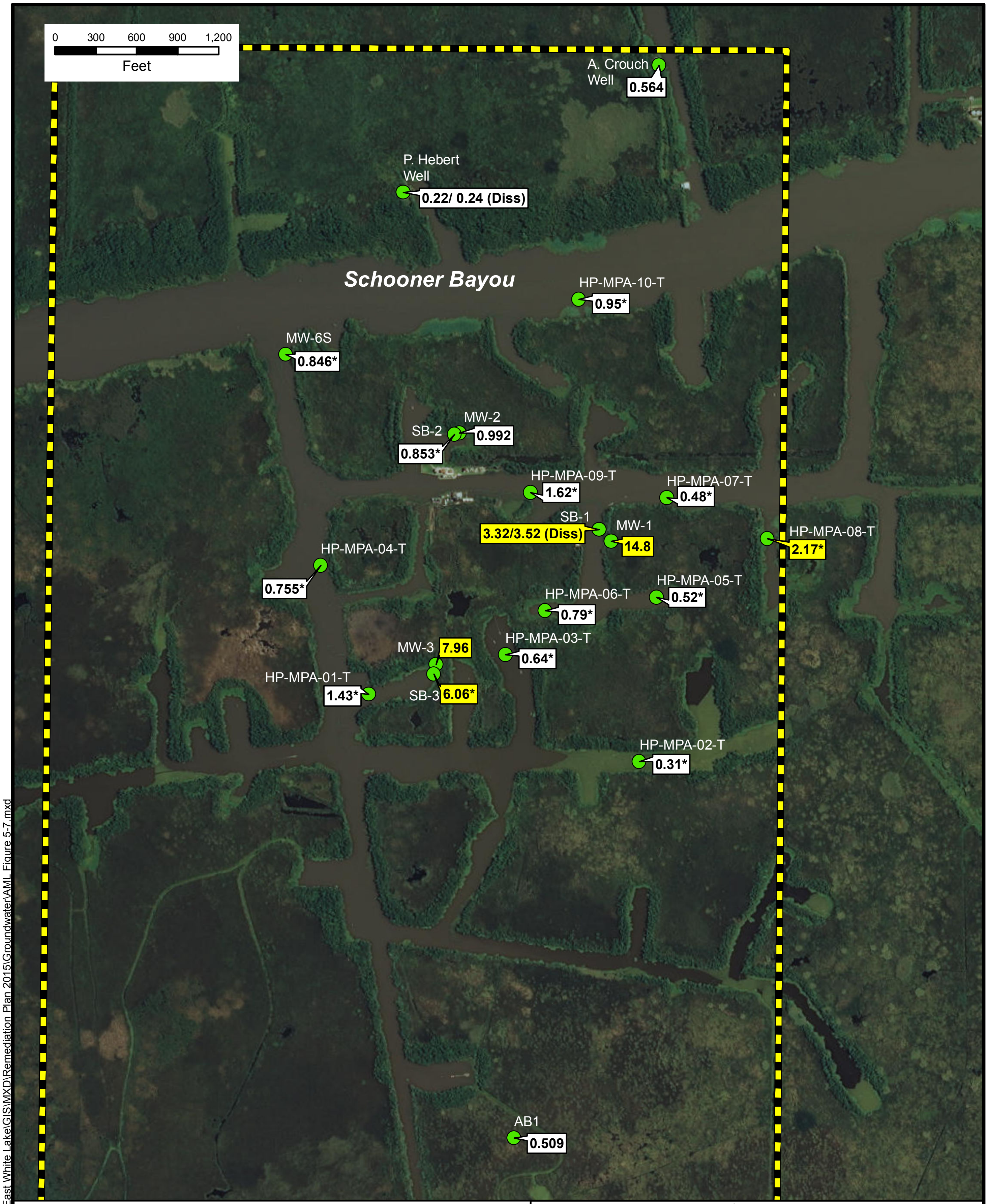
Figure 5-6
Peat Zone – Chlorides Concentrations

East White Lake Field
Vermillion Parish, Louisiana

Michael Pisani & Associates Inc.
Environmental Consulting Services
Baton Rouge LA New Orleans LA Houston TX

Designed: AL	Drawn: TC	Checked: LRC	Date: 9/18/2015	Project: 07-47

Document Path: Z:\07-47 VPSB East White Lake\GIS\MXD\Remediation Plan 2015\Groundwater\AML Figure 5-6.mxd



Legend

▨ Section 16 Township 15 S Range 01 E

GWSS=2 mg/L

Groundwater Zone

● 40ft

Source: 2013 Aerial (ESRI)

Notes:
1. Highlighted values exceed RECAP ground water screening standard (GWSS)
2. Results posted are the average of ICON and MP&A split results in mg/L
3. Where duplicate samples were collected, maximum value is shown
4. (Diss) refers to dissolved results
5. * refers to filtered samples due to turbididty

N

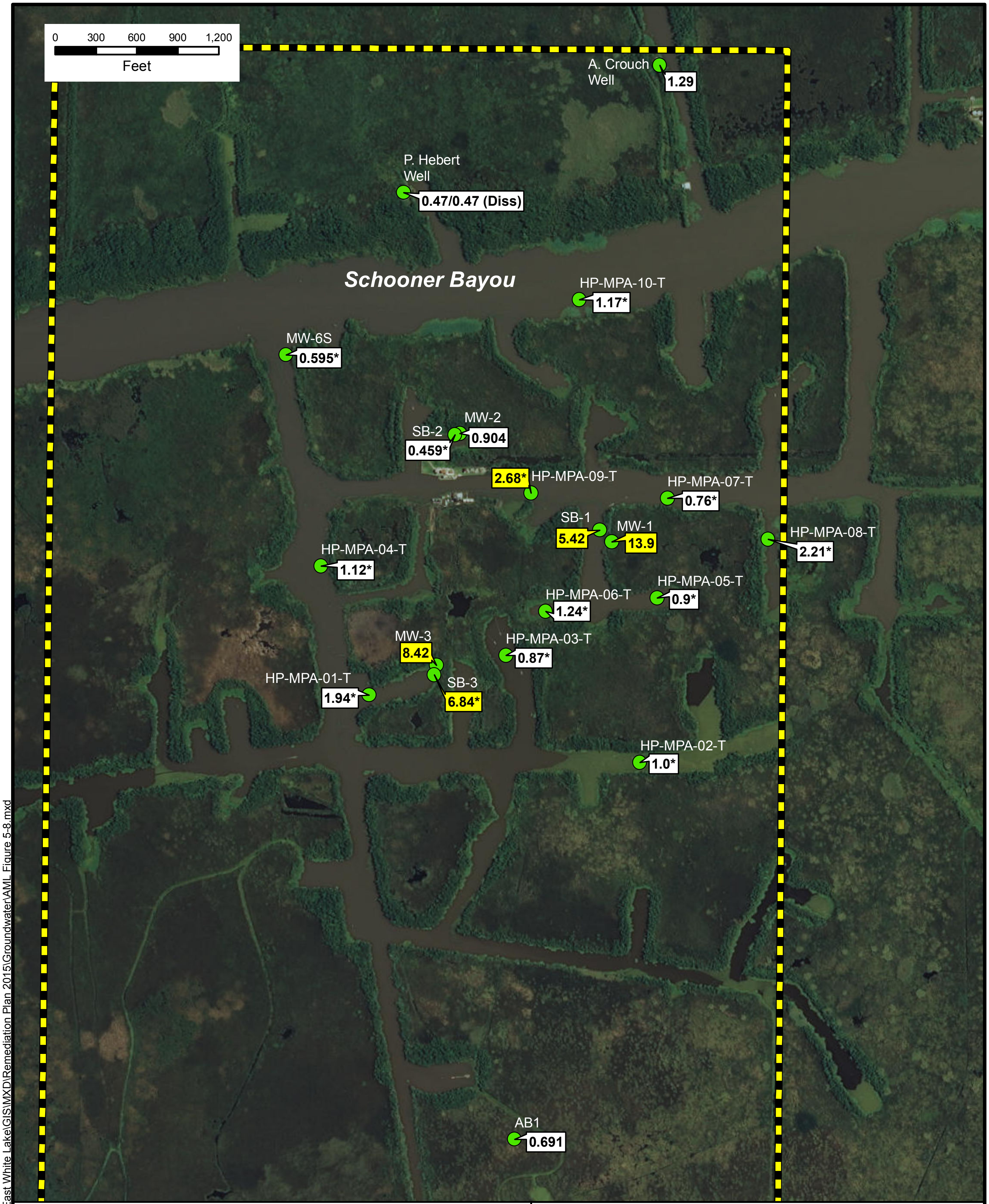
Figure 5-7
40-Foot Zone – Barium Concentrations

East White Lake Field
Vermillion Parish, Louisiana

Michael Pisani & Associates Inc.
Environmental Consulting Services
Baton Rouge LA New Orleans LA Houston TX

Designed: AL	Drawn: TC	Checked: LRC	Date: 9/18/2015	Project: 07-47

Document Path: Z:\07-47 VPSB East White Lake\GIS\MXD\Remediation Plan 2015\Groundwater\AML Figure 5-7.mxd



Document Path: Z:\07-47 VPSB East White Lake\GIS\MXD\Remediation Plan 2015\Groundwater\AML Figure 5-8.mxd

Legend

▨ Section 16 Township 15 S Range 01 E

GWSS=2.2 mg/L

Groundwater

● 40ft

Source: 2013 Aerial (ESRI)

Notes:
1. Highlighted values exceed RECAP ground water screening standard (GWSS)
2. Results posted are the average of ICON and MP&A split results in mg/L
3. Where duplicate samples were collected, maximum value is shown
4. (Diss) refers to dissolved results
5. * refers to filtered samples due to turbididty

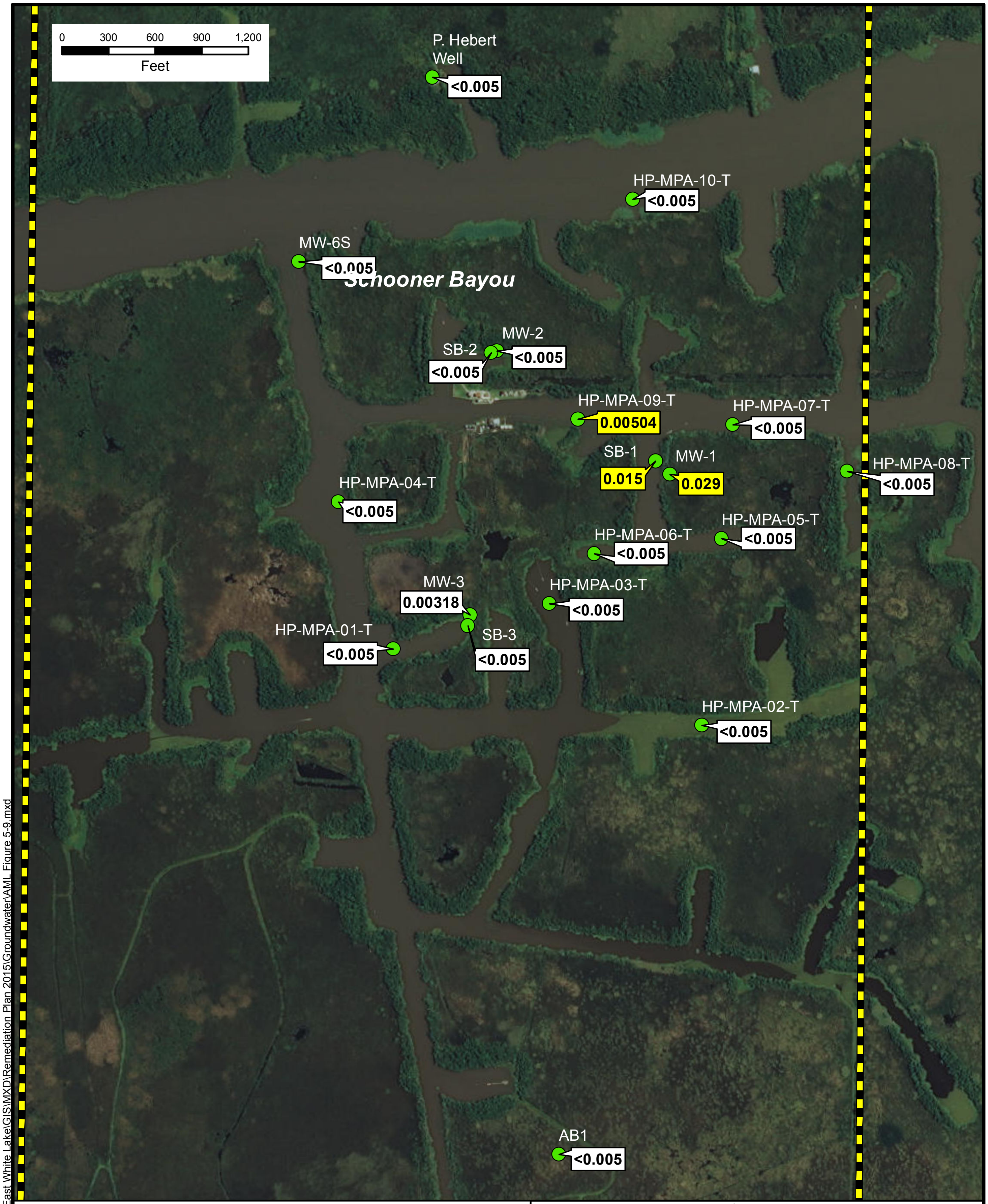
N

Figure 5-8
40-Foot Zone – Strontium Concentrations

East White Lake Field
Vermillion Parish, Louisiana

Michael Pisani & Associates Inc.
Environmental Consulting Services
Baton Rouge LA New Orleans LA Houston TX

Designed: AL	Drawn: TC	Checked: LRC	Date: 9/18/2015	Project: 07-47



Legend

▨ Section 16 Township 15 S Range 01 E

GWSS=0.005 mg/L

Ground... Zone

● 40ft

Notes:
1. Highlighted values exceed RECAP ground water screening standard (GWSS)
2. Results posted are the average of ICON and MP&A split results in mg/L
3. Where duplicate samples were collected, maximum value is shown

Source: 2013 Aerial (ESRI)

N

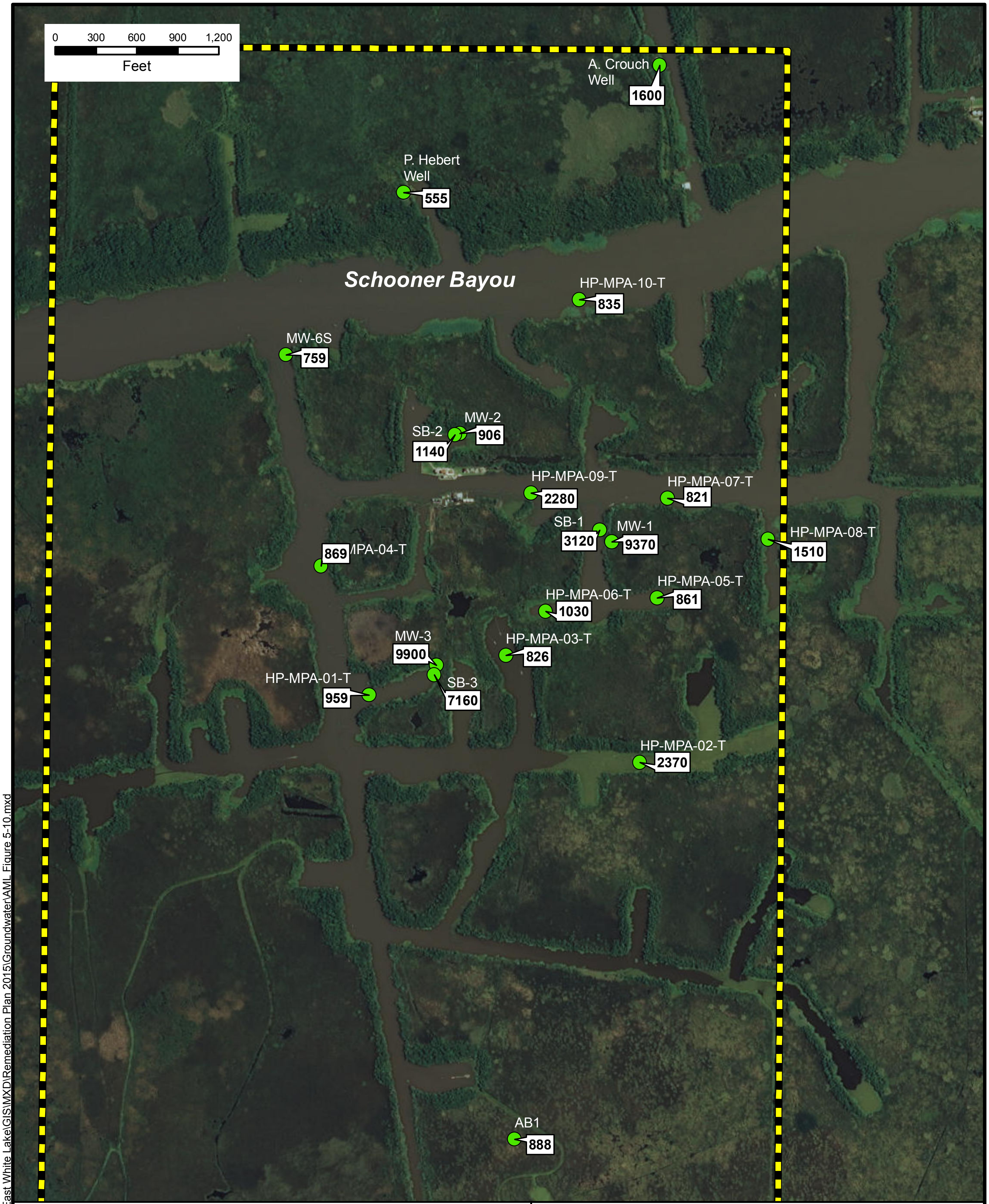
Figure 5-9
40-Foot Zone – Benzene Concentrations

East White Lake Field
Vermillion Parish, Louisiana

Michael Pisani & Associates Inc.
Environmental Consulting Services
Baton Rouge LA New Orleans LA Houston TX

Designed: AL	Drawn: TC	Checked: LRC	Date: 9/30/2015	Project: 07-47

Document Path: Z:\07-47 VPSB East White Lake\GIS\MXD\Remediation Plan 2015\Groundwater\AML Figure 5-9.mxd



Legend

▨ Section 16 Township 15 S Range 01 E

Groundwater

● 40ft

Source: 2013 Aerial (ESRI)

Notes:
1. Results posted are the average of ICON and MP&A split results in mg/L
2. Where duplicate samples were collected, maximum value is shown

N

Figure 5-10
40-Foot Zone – Chlorides Concentrations

East White Lake Field
Vermillion Parish, Louisiana

Michael Pisani & Associates Inc.
Environmental Consulting Services
Baton Rouge LA New Orleans LA Houston TX

Designed: AL	Drawn: TC	Checked: LRC	Date: 9/18/2015	Project: 07-47

Document Path: Z:\07-47 VPSB East White Lake\GIS\MXD\Remediation Plan 2015\Groundwater\AML Figure 5-10.mxd

Legend

▨ Section 16 Township 15 S Range 01 E

Groundwater Zone

🟦 70ft

Source: 2013 Aerial (ESRI)

Notes:
1. Results posted are the average of ICON and MP&A split results in mg/L

N

Figure 5-11
70-Foot Zone – Chlorides Concentrations

East White Lake Field
Vermillion Parish, Louisiana

Michael Pisani & Associates Inc.
Environmental Consulting Services
Baton Rouge LA New Orleans LA Houston TX

Designed: AL	Drawn: TC	Checked: LRC	Date: 9/18/2015	Project: 07-47

Document Path: Z:\07-47 VPSB East White Lake\GIS\MXD\Remediation Plan 2015\Groundwater\AML Figure 5-11.mxd

Legend

▨ Section 16 Township 15 S Range 01 E

Groundwater

◆ 90ft

Source: 2013 Aerial (ESRI)

Notes:
1. Results posted are the average of ICON and MP&A split results in mg/L

N

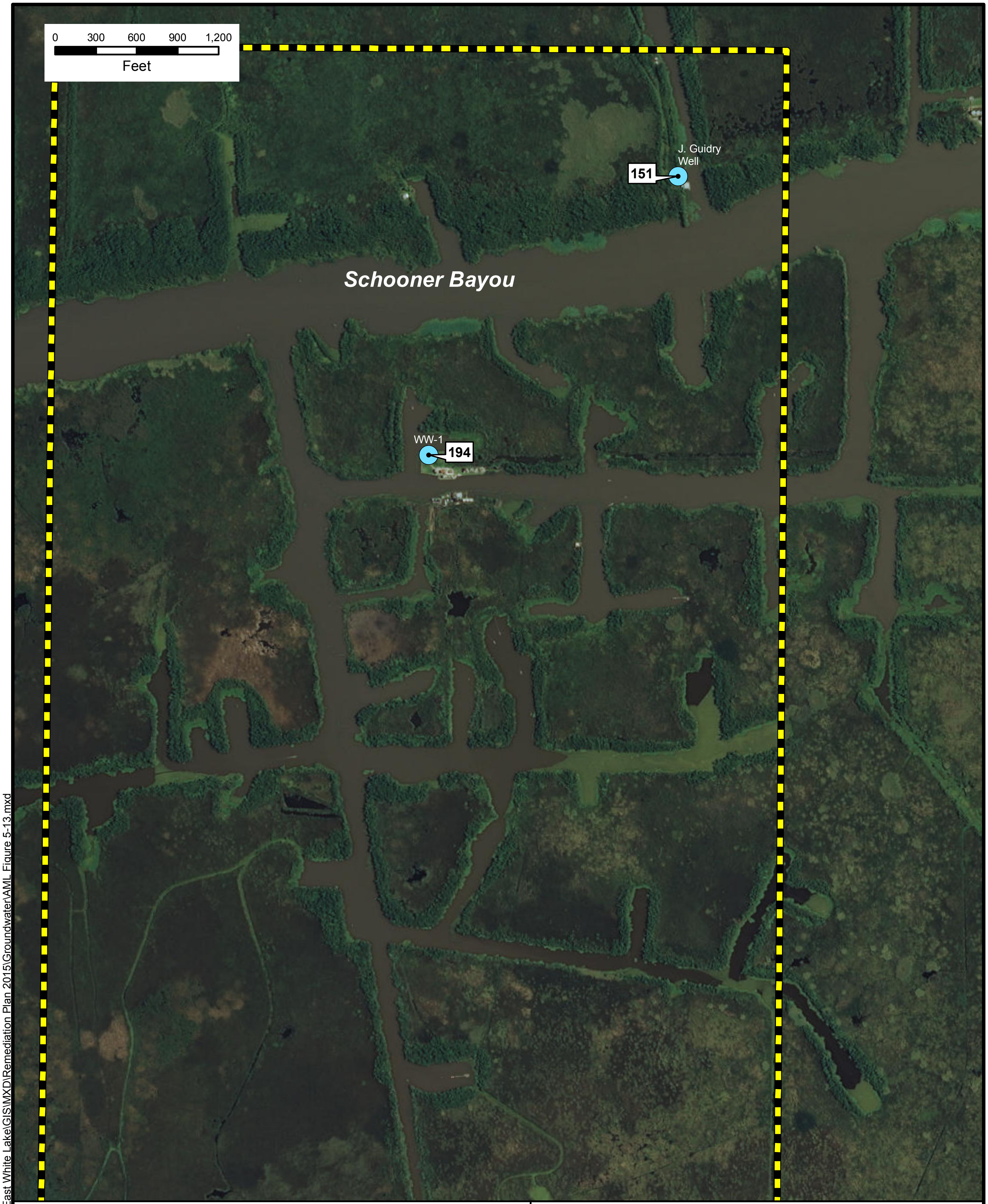
Figure 5-12
90-Foot Zone – Chlorides Concentrations

East White Lake Field
Vermillion Parish, Louisiana

Michael Pisani & Associates Inc.
Environmental Consulting Services
Baton Rouge LA New Orleans LA Houston TX

Designed: AL	Drawn: TC	Checked: LRC	Date: 9/18/2015	Project: 07-47

Document Path: Z:\07-47 VPSB East White Lake\GIS\MXD\Remediation Plan 2015\Groundwater\AML Figure 5-12.mxd



Legend

▨ Section 16 Township 15 S Range 01 E

Water Well

Groundwater Zone

● Chicot

Notes:
1. Results posted are the average of ICON and MP&A split results in mg/L
2. Most recent sampling result (2010) shown for WW-1 (Facility Well)

Source: 2013 Aerial (ESRI)

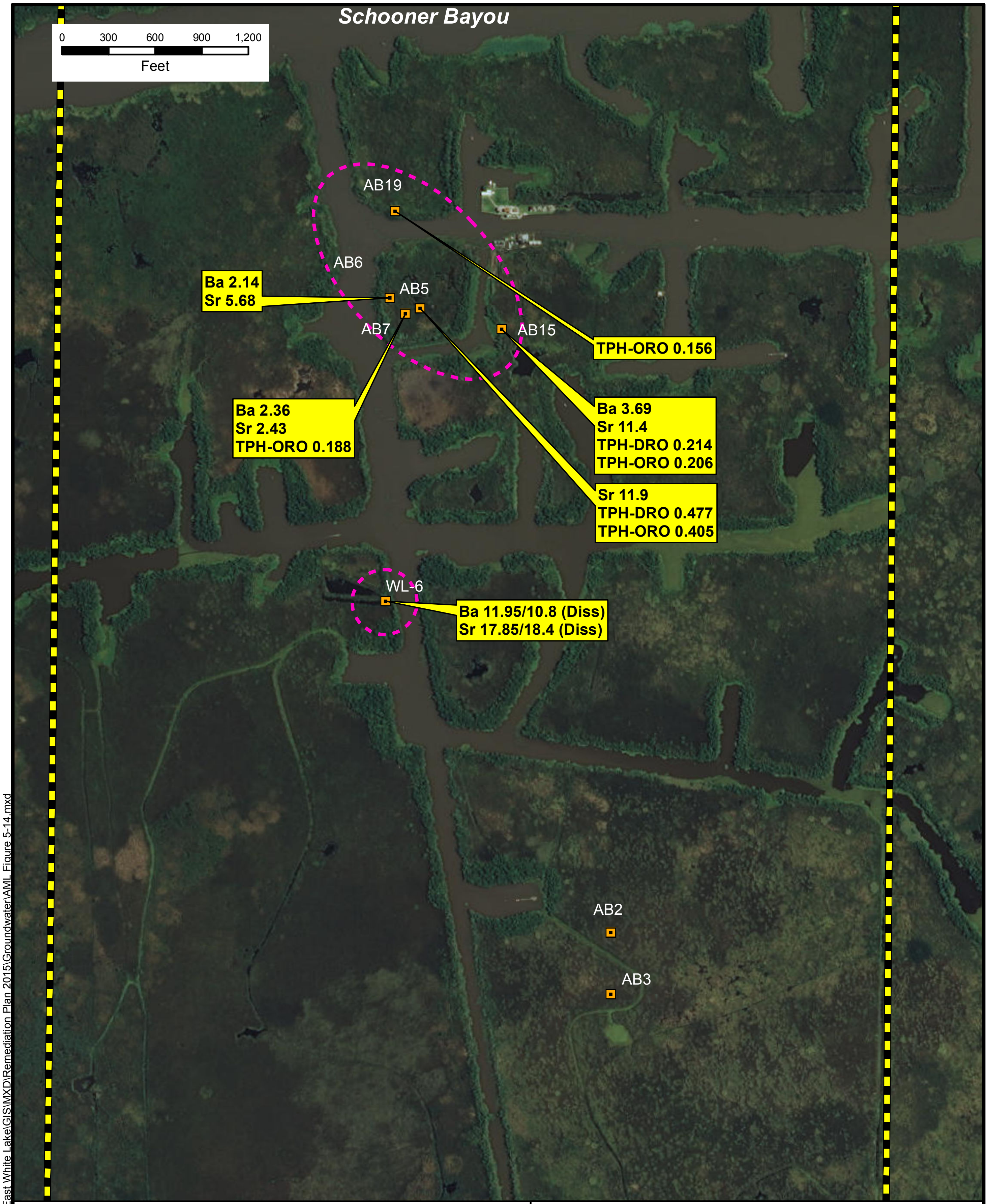
Figure 5-13
Upper Sand of Chicot Aquifer – Chlorides Concentrations

East White Lake Field
Vermillion Parish, Louisiana

Michael Pisani & Associates Inc.
Environmental Consulting Services
Baton Rouge LA New Orleans LA Houston TX

Designed: AL	Drawn: TC	Checked: LRC	Date: 9/30/2015	Project: 07-47

Document Path: Z:\07-47 VPSB East White Lake\GIS\MXD\Remediation Plan 2015\Groundwater\AML Figure 5-13.mxd



Legend

▨ Section 16 Township 15 S Range 01 E

▭ Area of Investigation

Monitoring Well Location

Groundwater Zone

▣ Peat

Notes:
1. Highlighted values exceed RECAP ground water screening standard (GWSS)
2. Results posted are the average of ICON and MP&A split results in mg/L
3. Where duplicate samples were collected, maximum value is shown
4. (Diss) refers to dissolved results

Source: 2013 Aerial (ESRI)

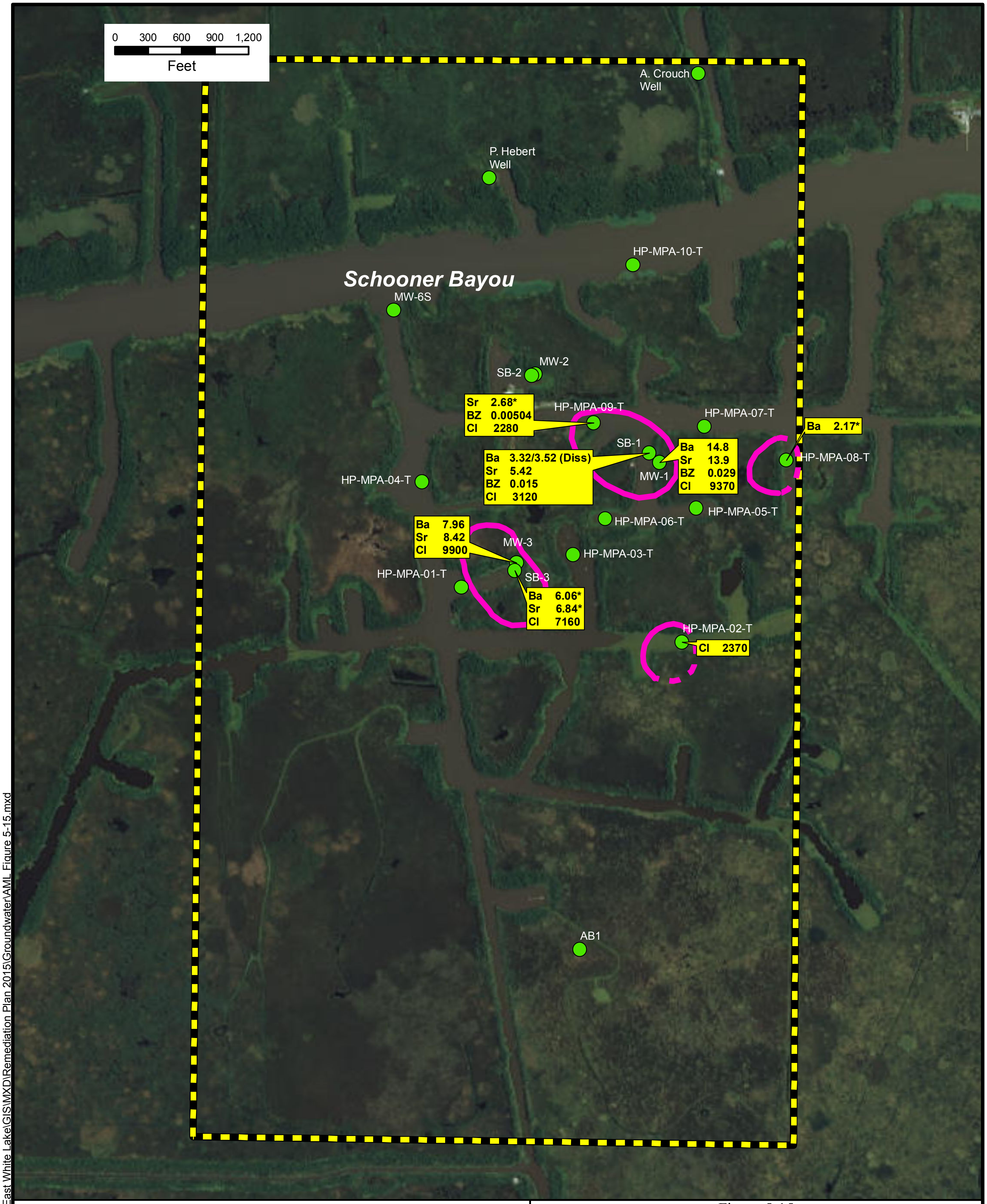
N

Figure 5-14
Preliminary AOIs for
Peat Zone Ground Water - Screening Level
East White Lake Field
Vermillion Parish, Louisiana

Michael Pisani & Associates Inc.
Environmental Consulting Services
Baton Rouge LA New Orleans LA Houston TX

Designed: AL	Drawn: TC	Checked: LRC	Date: 9/30/2015	Project: 07-47

Document Path: Z:\07-47 VPSB East White Lake\GIS\MXD\Remediation Plan 2015\Groundwater\AML Figure 5-14.mxd



Document Path: Z:\07-47 VPSB East White Lake\GIS\MXD\Remediation Plan 2015\Groundwater\AML Figure 5-15.mxd

Legend

▨	Section 16 Township 15 S Range 01 E
▭	Area of Investigation

Monitoring Well

Groundwater Zone

●	40ft

Notes:
1. Highlighted values exceed RECAP ground water screening standard (GWSS)
2. Results posted are the average of ICON and MP&A split results in mg/L
3. Where duplicate samples were collected, maximum value is shown
4. (Diss) refers to dissolved results
5. * refers to filtered samples due to turbididty

Source: 2013 Aerial (ESRI)

N

Figure 5-15
Preliminary AOIs for 40-Foot Zone Ground Water – Screening Level

East White Lake Field
Vermillion Parish, Louisiana

Michael Pisani & Associates Inc.

Environmental Consulting Services
Baton Rouge LA New Orleans LA Houston TX

Designed: AL	Drawn: TC	Checked: LRC	Date: 9/30/2015	Project: 07-47

Note 1: Photo provided in ICON report of January 15, 2015.

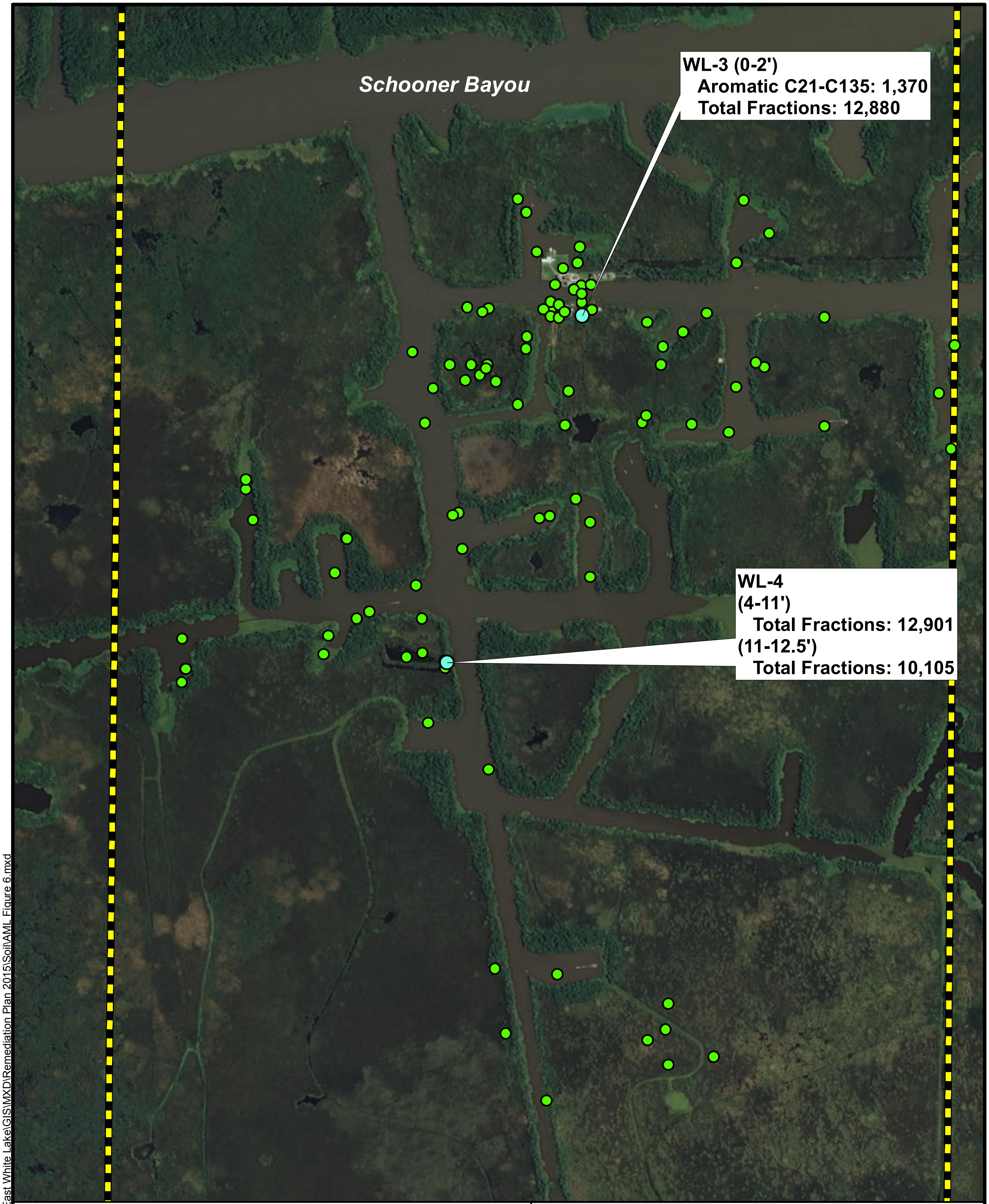
Figure 6-1
Photograph of Tank Battery A and Boring Location WL-3 Area

East White Lake Oil & Gas Field
Vermilion Parish, Louisiana

MICHAEL PISANI & ASSOCIATES, INC.

Environmental Consulting Services
Baton Rouge, Louisiana New Orleans, Louisiana Houston, Texas

Designed: JCS	Drawn: DAM	Checked: LRC	Date: 9/30/2015	Project: 07-47



Legend

▨ Section 16 Township 15 S Range 01 E

● Soil Exceedance Location

● Soil Sample Location

0 200 400 600 800
Feet

N

Notes:
1. Units are in average mg/kg-wet
2. Samples analyzed for different parameters based on designated sampling event.

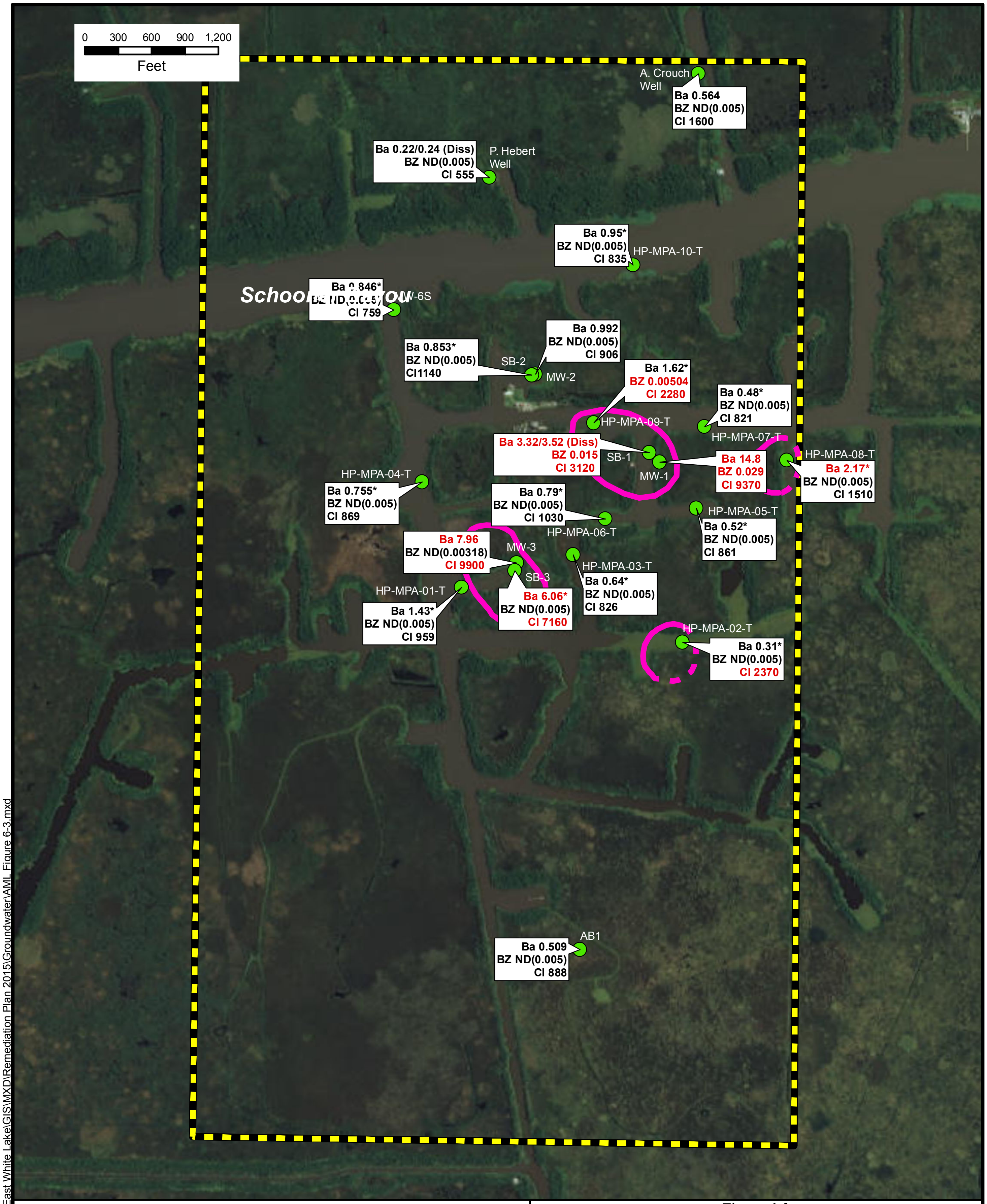
Source: 2013 Aerial from ESRI

Figure 6-2
Sediment Locations and Concentrations
Above Final MO-3 RECAP Standards
East White Lake Field
Vermillion Parish, Louisiana

Michael Pisani & Associates Inc.
Environmental Consulting Services
Baton Rouge LA New Orleans LA Houston TX

Designed: AL	Drawn: TC	Checked: LRC	Date: 9/30/2015	Project: 07-47

Document Path: Z:\07-47 VPSB East White Lake\GIS\MXD\Remediation Plan 2015\Soil\AML Figure 6.mxd



Document Path: Z:\07-47 VPSB East White Lake\GIS\MXD\Remediation Plan 2015\Groundwater\AML Figure 6-3.mxd

Legend

▨ Section 16 Township 15 S Range 01 E

🟪 AOI

Monitoring Well

Groundwater Zone

● 40ft

Notes:
1. Concentrations in red exceed GW2 RECAP Standard
2. Results posted are the average of ICON and MP&A split results in mg/L
3. Where duplicate samples were collected, maximum value is shown
4. (Diss) refers to dissolved results
5. * refers to filtered samples due to turbididty

Source: 2013 Aerial (ESRI)

N

Figure 6-3

40-Foot Zone Ground Water AOIs Exceeding Default GW2 RECAP Standards

East White Lake Field
Vermillion Parish, Louisiana

Michael Pisani & Associates Inc.

Environmental Consulting Services
Baton Rouge LA New Orleans LA Houston TX

Designed: AL	Drawn: TC	Checked: LRC	Date: 9/30/2015	Project: 07-47

Summary of RECAP Forms

Appendix A

Project No. 0116008
UNOCAL
Vermilion Parish, Louisiana

Environmental Resources Management Southwest, Inc.
3838 North Causeway Boulevard, Suite 3000
Metairie, Louisiana 70002
(504) 831-6700

RECAP FORM SUMMARY

Form	Title/Content	Location of Information
RECAP FORM 1	Submittal Summary	Executive Summary
RECAP FORM 2	Analytical Data Summary	Sample by sample chemical analytical results provided in Appendix E of the RECAP report.
RECAP FORM 3	Analytical Data Evaluation	Provided in Appendix F of the RECAP Report.
RECAP FORM 4	Sampling Information Summary	Provided in Section 3.0 and Appendix E of the RECAP report.
RECAP FORM 5	Groundwater Monitoring Well Characteristics	Provided in the MP&A Feasible Plan for Evaluation/Remediation, to which this report is appended. Well completion information (e.g., screen depths) is also provided in Table 5-6 of this RECAP report.
RECAP FORM 6	Groundwater Monitoring Well Sampling Event Summary	Provided in Section 3.0 of this RECAP report and in the MP&A Feasible Plan for Evaluation/Remediation, to which this report is appended.
RECAP FORM 7	Site-Specific Environmental Fate and Transport Data Summary	Not Applicable
RECAP FORM 8	Chemical-Specific Data Summary	RECAP default values were used for chemical and physical properties as shown in Appendix G, in the RECAP Standard development input/output tables. Toxicity values are identified in Table 6-1 for Management Option 3 (MO-3). For MO-3 scenarios evaluated using the RAIS PRG calculator, default values for chemical and physical properties provided in RAIS were used.

Form	Title/Content	Location of Information
RECAP FORM 9	Management Option 3 Site-Specific Exposure Data Summary	MO-3 Exposure data are provided in the following tables in the RECAP report: Table 6-2 Exposure Assumptions for Recreational Exposure to Sediment Table 6-8 Exposure Assumptions for Recreational Exposure to Ground Water Table 6-10 Exposure Assumptions for Recreational Exposure to Surface Water Table 6-11 Exposure Assumptions for Shellfish Ingestion
RECAP FORM 10	Screening Option Summary for Soil	See Section 5.1.1 and Tables 5-1 through 5-5 of the RECAP report.
RECAP FORM 11	Management Option 1 Summary for Soil 0-15 ft bgs	Not Applicable
RECAP FORM 12	Management Option 1 Summary for Soil > 15 ft bgs	Not Applicable
RECAP FORM 13	Management Option 2 or 3 Summary for Soil 0-15 ft bgs	See Section 6.2 and Tables 6-2 through 6-5 of the RECAP Report.
RECAP FORM 14	Management Option 2 or 3 Summary for Soil > 15 ft bgs	See Table 6-4 of the RECAP report.
RECAP FORM 15	Screening Option Summary for Groundwater	See Section 5.1.2 and Tables 5-6 through 5-8 of the RECAP report.
RECAP FORM 16	Management Option 1 Summary for Groundwater	Not Applicable
RECAP FORM 17	Management Option 2 or 3 Summary for Groundwater	See Section 6.3 and Tables 6-6 through 6-8 of the RECAP Report.
RECAP FORM 18	Ecological Checklist	Completed, and provided in Appendix J of this RECAP report

Water Well Survey Results

Appendix B

Project No. 0116008
UNOCAL
Vermilion Parish, Louisiana

Environmental Resources Management Southwest, Inc.
3838 North Causeway Boulevard, Suite 3000
Metairie, Louisiana 70002
(504) 831-6700

LDOTD Water Well Registry, Search Completed September 2015

Wells located within 2 mile radius
of Latitude 29°43'53" and Longitude 92°'22'02"

TOWNSHIP	RANGE	PARISH_NAME	OWNERS_NAME	LOCAL_WELL_NUM	OWNERS_NUM	DRILLERS_NAME	WELL_DEPTH	DESCRIPTION	CASING_DIAMETER	DATE_COMPLETED	WATER_LEVEL	DATE_MEASURED	LATITUDE	LONGITUDE	Well Distance Ft
15S	01E	VERMILION	VERMILLION PARISH SCHOOL BOARD	12456Z	MW-3	WALKER-HILL(CO)ENVIRONMENTAL, INC.	49	Monitor	1	5/27/2010			294353	922201	88.14
15S	01E	VERMILION	VERM SCHOOL BRD	12371Z	MW-3R	ICON	46	Monitor	0.75	10-Apr	0.5	4/23/2010	294352	922202	100.98
15S	01E	VERMILION	PEAK OPERATING COMPANY	12991Z	WW-1 (CREW FACILITY)	ICON ENVIRONMENTAL SERVICES, INC	460	Domestic	4				294408	922202	1514.78
15S	01E	VERMILION	VERM SHOOL BOAR	12369Z	MW-1	ICON	53	Monitor	0.75	10-Apr	1.6	4/23/2010	294402	922148	1532.5
15S	01E	VERMILION	VERMILLION PARISH SCHOOL BOARD	12454Z	MW-1	WALKER-HILL(CO)ENVIRONMENTAL, INC.	54	Monitor	1	5/27/2010			294403	922147	1663.6
15S	01E	VERMILION	VERMILLION PARISH SCHOOL BOARD	12455Z	MW-2	WALKER-HILL(CO)ENVIRONMENTAL, INC.	49	Monitor	1	5/27/2010			294410	922200	1725.77
15S	01E	VERMILION	VERM SCHOOL BOA	12370Z	MW-2R	ICON	45	Monitor	0.75	10-Apr	1.2	4/23/2010	294411	922201	1819.87
15S	01E	VERMILION	VERMILLION PARISH SCHOOL BOARD	12988Z	VPSB-1 (HEBERT)	ICON ENVIRONMENTAL SERVICES, INC	41	Domestic	2				294428	922205	3544.35
15S	01E	VERMILION	VERMILLION PARISH SCHOOL BOARD	12990Z	VPSB-3 (JAMES GUIDRY)	ICON ENVIRONMENTAL SERVICES, INC	519	Domestic	4				294429	922142	4040.24
15S	01E	VERMILION	VERMILLION PARISH SCHOOL BOARD	12989Z	VPSB-2 (CROUCH)	ICON ENVIRONMENTAL SERVICES, INC	34	Domestic	2		3	2010	294437	922143	4748.39

Quality Assurance Project Plan/Sampling Analysis and Assessment Plan for Crab and Forage Fish Tissue at the East White Lake Oilfield

Appendix C

Project No. 0116008
UNOCAL
Vermilion Parish, Louisiana

Environmental Resources Management Southwest, Inc.
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Environmental
Resources
Management

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ERM

December 6, 2010

Mr. Chris Piehler, Administrator
Louisiana Department of Environmental Quality
Office of Environmental Compliance, Inspection Division
602 North Fifth Street
Baton Rouge, LA 70802

Mr. Glenn Cambre
Louisiana Department of Health and Hospitals
628 North 4th Street
Baton Rouge, Louisiana 70802

Mr. James H. Welsh
Commissioner of Conservation
Louisiana Department of Natural Resources (LDNR)
617 North Third Street, Ninth Floor
Baton Rouge, Louisiana 70802

Mr. Robert Barham
Secretary
Louisiana Department of Wildlife and Fisheries
2000 Quail Dr.
Baton Rouge, La 70808

RE: Quality Assurance Project Plan/Sampling Analysis and Assessment
Plan for Crab and Forage Fish Tissue -- East White Lake Oilfield,
Vermilion Parish, Louisiana
Vermilion Parish School Board Property, Section 16 T15S, R01E

Dear Madame and Sirs:

Enclosed please find a Quality Assurance Project Plan/Sampling Analysis and Assessment Plan for Crab and Forage Fish Tissue at the East White Lake Oilfield, Vermilion Parish, Louisiana (the "Plan"). This plan has been prepared on behalf of UNOCAL in response to questions that have been raised regarding whether the historic oil and gas operations in this field have adversely impacted the crabs in the area.

In summary, pursuant to this Plan the project team will collect and analyze tissue from blue crabs and forage fish in the East White Lake Oilfield, certain reference sites identified in the Plan, and, for crab, seafood markets in the region. The tissue will be analyzed for arsenic (inorganic and total), total barium, mercury (methylmercury and total) and total petroleum hydrocarbons. We will provide a summary of the field sampling and analytical results to the agencies upon completion.

We plan to start setting crab traps on Monday, December 13, 2010, with fishing and crab collection to occur in the following days. You or your representatives are welcome to observe or participate in the collection process. In the meantime, should you have any questions or comments on the attached plan, please feel free to contact me.

Sincerely,

Environmental Resources Management Southwest, Inc.

Angela M. Levert

Angela M. Levert
Senior Associate

cc: John Rodgers
David Lingle
Barbara Beck

Enclosures

QUALITY ASSURANCE PROJECT PLAN AND SAMPLING ANALYSIS AND ASSESSMENT PLAN FOR CRAB AND FORAGE FISH TISSUE – EAST WHITE LAKE OIL AND GAS FIELD VERMILLION PARISH, LOUISIANA

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PROJECT SUMMARY

This Quality Assurance Project Plan (QAPP) and Sampling Analysis and Assessment Plan (SAP) for crab and forage fish tissue was prepared for the East White Lake Oil and Gas Field, Vermilion Parish, Louisiana. Based on recent blue crab tissue analysis (of whole animal samples), conducted on behalf of the landowner, questions have been raised concerning concentrations of arsenic, barium, mercury, and total petroleum hydrocarbons in the crabs in this area. Previous sampling and analyses of surface water and sediments from the area did not indicate that concentrations of these constituents of concern (COCs) posed a risk to human health or the environment. In order to address the questions raised by the recent tissue sampling, this study has been carefully designed to obtain accurate data to evaluate potential human health and ecological risks due to these COCs. Samples of crabs and forage fish will be collected from locations in the East White Lake Oil and Gas Field, nearby reference locations in Schooner Bayou and White Lake, as well as fish markets in the region (blue crabs only). Composite samples from the site, reference locations, and markets will be analyzed under a rigorous quality assurance/quality control (QA/QC) program.

A. PROJECT MANAGEMENT

1.0 Sampling, Analysis and Assessment Protocol - Purpose

The purpose of this document is to present a sampling and analysis plan and Quality Assurance Project Plan to measure concentrations of COCs (arsenic, barium, mercury, and total petroleum hydrocarbons [TPH]) in tissues of blue crabs (*Callinectes sapidus*) and forage fish (e.g., mosquito fish [*Gambusia affinis*]; topminnows [*Fundulus* spp.]) collected from the East White Lake Oil and Gas Field (Site) and reference locations. Laboratory analysis of COC concentrations in blue crabs from Louisiana markets in the region will also be performed. The overall objective of this study is to measure tissue concentrations of these COCs to evaluate potential exposures to:

- Blue crabs and forage fish, as well as wildlife (e.g., birds and mammals) that consume them; and
- Humans that consume blue crabs.

The laboratory analyses will be performed on a tissue-specific basis (blue crabs) and whole-body basis (forage fish) to support both the human health and ecological risk assessments. In addition to the above COCs, tissue lipid and moisture contents will also be analyzed in the laboratory.

The Site, located in Section 16, Township 15 South, Range 1 East in Vermillion Parish, Louisiana (Figure 1), is about five miles southwest of Forked Island in an area of intermediate marsh (Brupbacher et al. 1973, Visser et al. 2000; Sasser et al. 2007-8). The areas of interest are the canals and waterways within the East White Lake Oil and Gas Field, located on the eastern side of White Lake, south of Schooner Bayou. The specific area is primarily an intermediate marsh system, which is protected by water control structures operated by the United States Army Corps of Engineers. This property has been used since approximately 1935 for oil and gas exploration and production. Approximately 85 wells have been drilled since initiation of the lease, although currently, only approximately 10 shut-in productive, 8 active producing, and 2 active injection wells remain. This study will serve to provide accurate information to follow up previous or ongoing studies in the area.

2.0 Project Management Overview

This document describes the quality assurance (QA) and quality control (QC) procedures that will be used to determine COC concentrations in blue crab and/or forage fish tissue from the Site, reference locations, and Louisiana markets in the region. The QAPP was prepared consistent with the documents, *EPA Requirements for Quality Assurance Project Plans*, EPA QA/R-5 (USEPA 2001) and *EPA Guidance for Quality Assurance Project Plans*, EPA QA/G-5 (USEPA 2002b), *Protocol for Issuing Public Health Advisories for Chemical Contaminants in Recreationally Caught Fish and Shellfish* (LDHH et al. 2010), and *Protocol for Issuing Health Advisories and Bans Based on Chemical Contamination of Fish/Shellfish in Louisiana* (LDHH et al. 1997). The collection methods, procedures and protocols follow the guidelines and recommendations of *Guidance for Assessing Chemical Contaminant Data for Use in Fish Advisories, Volume1: Fish Sampling and Analysis*, Third Edition (USEPA 2000a).

3.0 Project Organization

This document was developed by Dr. John Rodgers in collaboration with Dr. Barbara Beck, Angela Levert, and David Lingle. Dr. Rodgers (Project Manager) will coordinate and schedule the field work, including collection of blue crab and forage fish, and submission of those organisms to Columbia Analytical Services, Inc, (CAS) of Kelso, Washington for processing and analytical testing for arsenic, barium, mercury, lipid content, and moisture content. CAS will provide tissue aliquots to Gulf Coast Analytical Laboratories, Inc. (GCAL) of Baton Rouge, Louisiana for TPH analysis. Angela Levert will serve as the project quality assurance officer. Analytical results will be used by Dr. Barbara Beck and David Lingle in support of the human health and ecological risk assessments, respectively.

4.0 Problem Definition and Background

A previous study (Barbee 2010) has indicated the presence of arsenic, mercury, barium, and TPH in some whole body crab samples from the East White Lake Oil and Gas Field. The authors of this document have identified significant concerns regarding the design and interpretation of that previous study. A more comprehensive and thorough study is therefore being initiated. The information gathered from this study will be used to assess potential human health and ecological risks that these may pose. Blue crabs are omnivores (consuming both plant and animal tissues) and range somewhat in their search for food and during reproduction. Blue crabs are a food source for both human and ecological receptors. Forage (prey) fish spend their entire life in a relatively small area of a waterbody or wetland and they can be important indicators of local water and sediment quality. Forage fish also serve as food for higher trophic level ecological receptors. A rigorous analysis of both blue crabs and forage fish tissue is therefore being conducted to address the conclusions previously presented by Barbee (2010).

5.0 Project Description

The overall objective of this study is to measure tissue concentrations of COCs to evaluate potential exposures to:

- Blue crabs and forage fish, as well as wildlife that consume them; and
- Humans that consume blue crabs.

As part of this study, COC concentrations in blue crab and forage fish tissues collected from the Site (Figure 2) will be compared to tissue concentrations from reference locations (Figure 3) and Louisiana markets in the region (blue crabs only).

Details of the sampling plan are found in Section 9 of this document. The study involves synoptic sampling of blue crabs and forage fish from twelve (12) locations in the East White Lake Oil and Gas Field and nine (9) reference locations (five [5] in Schooner Bayou and four [4] in White Lake). Nine of the twelve Site sample locations correspond to the locations previously considered by Barbee (2010). Samples will be collected and managed by experienced personnel. Tissue samples will be analyzed by CAS (arsenic, barium, mercury, lipid content, and moisture content) and GCAL (TPH). The study targets blue crabs and forage fish that are caught and consumed by the public and predators. The goal is to collect sufficient blue crabs and forage fish to meet the tissue requirements of the laboratories.

6.0 Quality Objectives and Criteria for Measurement Data

6.1 Project Quality Objectives

The results from this study will allow project scientists to evaluate the extent to which certain COCs (arsenic, barium, mercury, and TPH) are present in blue crabs and forage fish samples from the Site and reference locations as well as market samples (blue crabs only). Sources of uncertainty inherent to the study are due to the following: 1) sampling specific species from each site; 2) limited information on the variability in analyte concentrations in blue crabs and forage fish; 3) unknown field exposures of blue crabs and forage fish; 4) compositing the samples; and 5) variability in the laboratory analysis process. The quality objectives of this project are related to the blue crab and forage fish tissue collection methods and to the laboratory procedures. Methods and procedures for the collection of blue crab and forage fish tissue described in this document are intended to reduce the magnitude and sources of uncertainty (and their frequency of occurrence) by applying the following approaches:

- use of standardized sample collection and handling procedures; and

- use of experienced scientists to perform the sample collection and handling activities.

The following approaches are intended to measure the measurement quality objectives as they relate to laboratory procedures:

- One (1) laboratory blank per batch, with a batch being up to 20 samples;
- One matrix spike (MS) and matrix spike duplicate (MSD) pair per batch; and
- One laboratory control sample per batch of known quality and concentration for laboratory comparison.

6.2 Measurement Quality Objectives

Measurement quality objectives (MQOs) are quantitative statistics that are used to interpret the degree of acceptability or utility of the data to the user for the intended purpose. The following defines the criteria for this study:

Precision

Precision is a measure of internal method consistency or variability in sample results. It is generally attributed to sampling activities and/or laboratory analysis. It can be expressed either as a range, a standard deviation or percentage of the mean of the measurements (relative range or relative standard deviation). In order to control for field-related variability, sampling activities will be standardized by adherence to the procedures and methods described in this sampling plan, and field sampling will be conducted by experienced professionals (this will also help prevent *bias*). For this study, because samples must be composited and subdivided in a strictly controlled, clean laboratory environment, duplicate composite samples will be prepared for approximately 10% of the samples to be analyzed. These duplicates are labeled with unique separate numbers and analyzed with the routine samples. The results from these duplicate samples are used to assess variability arising from sample compositing, aliquoting, and laboratory analysis processes. The study MQO requirements for analytical precision are that results from 90% of these duplicate composite samples agree within 50% relative percent difference (RPD) for values greater than 5 times the minimum level of quantification and that 90% of these duplicate composite samples agree within 100% RPD for values less than 5 times the minimum level. RPD is calculated as follows:

Relative Percent Difference	RPD	abs $\left(\frac{(x_1 - x_2)}{(x_1 + x_2)/2}\right)$ x 100

Where:

X_1 is the first measurement; and
X_2 is the duplicate measurement.

In addition to the duplicate composite samples, the laboratory will also employ a suite of laboratory quality control measures (initial precision and recovery samples, matrix spike and matrix spike duplicate samples) that provide information about the precision associated with various components of the analytical process. Other quality control elements and associated requirements may be described in more detail in the laboratory's Quality Assurance Project Plan. The results will be provided to the project scientists for interpretation and development of their reports. Major criteria for laboratory data are summarized in Tables 1 and 2.

Bias

Bias is systematic and consistent distortion of a measurement process that causes errors in one direction. Bias within the sampling and processing is controlled by training of field personnel and of the sample preparation procedures in the laboratory and by adherence to protocols. Bias within the analytical process is measured by preparing and analyzing field samples spiked with COCs of interest (matrix spike samples) or by analyzing standard reference materials (SRMs) containing the analytes of interest to verify that the procedure is in control for the tissue matrix. Potential interferences can be addressed within the laboratory by dilution of samples or by additional cleanup steps, where appropriate.

Accuracy

Accuracy is the measure of the combination of bias and precision of an analytical procedure. It reflects the closeness of a measured, observed value to a true value. Accuracy is inferred from recovery data determined by sample spiking and/or analyses of reference standards. Accuracy requirements are summarized in Tables 1 and 2.

Percent recovery for a laboratory matrix is calculated using the following equation:

Percent Recovery	%R	$\frac{x_{meas}}{x_{true}}$ x 100

Percent recovery for a sample matrix is calculated using the following equation:

Percent Recovery	%R	$\frac{\begin{pmatrix}\text{value of} & & \text{value of}\\ \text{spiked} & - & \text{unspiked}\\ \text{sample} & & \text{sample}\end{pmatrix}}{\text{value of added spike}}$ x 100

Analytical Sensitivity

Analytical sensitivity is included in the laboratory's Quality Assurance Project Plan and is reported to the project scientists in terms of the method detection limits and the minimum levels that are used to define the sensitivity of each measurement process. MQO requirements for detectability are presented in Table 3.

Representativeness

Representativeness expresses the degree to which data accurately and precisely represent a characteristic of a population, parameter, variations at a sampling site, a process condition or an environmental condition. In order to achieve this, a sufficient number of representative samples are planned for collection. Preservation of the representativeness of the collected samples is assured by adhering to the sample handling protocols for storage, preservation and transportation, as described in this document. Proper documentation records that the protocols were followed and sample identification and integrity were assured.

Comparability

The objective of this parameter is to assure that data developed during this investigation are either directly comparable, or comparable with defined limitations, to literature data or other applicable criteria. Comparability is dependent on the proper design of the sampling plan and adherence to accepted sampling techniques, standard operating procedures and quality assurance guidelines. In order to fulfill the objectives of this study, all samples will be collected and prepared according to the procedures described in this project plan and any associated standard operating procedures. These procedures are consistent with the recommendations of U.S. EPA's *Guidance for Assessing Chemical Contaminant Data for Use in Fish Advisories, Volume I: Fish Sampling and Analysis,* Third Edition (USEPA 2000a). The procedures for this study are also consistent with the National Study of Chemical Residues in Lake Fish Tissue, conducted by the USEPA Office of Water, Office of Science and Technology and Engineering and Analysis Division (USEPA 2000c). All field personnel involved with sampling have adequate training, appropriate experience and will use this protocol for sample collection.

Completeness

Completeness is a measure of the amount of valid data collected and deemed to be acceptable for use in the study, as compared to the amount of data expected to be obtained. Three measures of completeness are defined:

1) Sampling completeness, defined as the number of valid samples collected relative to the number of samples planned for collection;
2) Analytical completeness, defined as the number of valid sample measurements relative to the number of valid samples collected; and
3) Overall completeness, defined as the number of valid sample measurements relative to the number of samples planned for collection.

The sampling and analytical completeness goal in this study is to obtain valid measurements from 90% of the valid samples collected. In case this percentage is lower than 90%, the effects on the study conclusions and recommendations will be re-evaluated during data analysis. Blue crab and forage fish tissue specimen archives will be kept frozen, in labeled vials, for 6 months, at the laboratory.

7.0 Special Training Requirements

The field sampling team will consist of experienced personnel, all of whom are trained on all field procedures detailed in this protocol. This protocol and any requisite standard operating procedures will be distributed to all personnel involved in the field activities. Project orientation sessions will be coordinated by the project manager, who also will provide instructions on all the field sampling and sample handling activities. Skills required of the laboratory analysts performing work for this study are described in the laboratory's Quality Assurance Project Plan.

8.0 Documentation and Records

Thorough documentation of all field sample collection and handling activities is necessary for proper processing in the laboratory, for ensuring data integrity and, ultimately, for interpretation of study results. Field sample collection and handling will be documented in writing (for each sampling site) using the following forms and labels:

- Field Record data sheet that contains information about each sample and site;
- Sample Identification Label that accompanies and identifies each sample or labeled vials;
- Chain of Custody Form that provides tracking information for all samples; and
- Sample Preparation Record Form for each composite sample which will be prepared by the laboratory.

The Field Record data sheet will document the sampling date, time, sampling crew names, sampling site location/description and sample description, length or dimensions of each specimen, and the method of sample collection. The field record data sheet also will contain a unique tracking code for tracking each sample. The code will follow the format:

- The initial code for the project (EWL);
- Date of collection (MM-DD-YY);
- Sampling site identification code (letters and site number);
- Sample type identification code (C = crab; F = forage fish); and
- Numbering order of samples (001, 002, etc.).

Field record forms will be completed by the personnel in the field. All entries will be made in ink, with no erasures. If an incorrect entry is made, the information will be crossed out with a single strike mark and initialed and dated by the recorder. Two copies will be made of this form, one for the project scientists and one for the project manager. The originals will be kept in a project-dedicated binder.

Chain of custody forms will accompany each container of samples and will document sample identity (coincide with information on the field record), sampler relinquishment name, date and time and project manager receipt date and time. The field personnel responsible for quality control will also be responsible for the delivery of the samples to the laboratory. A sample preparation record form will be completed at the laboratory, for each site, and it includes information on every composite sample. It includes the name of the persons preparing the composite samples; information about the crab or fish included in each composite sample; composite sample number; the weight of each composite sample; any general comments or remarks. The table describing the compositing scheme, i.e., which tissues make up each composite sample, will be attached to the sample preparation record, and will also be kept in the project-dedicated binder. If any changes are necessary during the sample collection and handling activities, a note will be made in the field record form, and the project manager will be notified as soon as practical, preferably prior to the change actually occurring. Every effort will be made for the project manager to be accessible, either by being on site or by cellular telephone.

8.1 Analytical Laboratory Records

The analytical laboratory will be required to submit summary reports of all analytical results in electronic format and hard copy. The laboratory will be required to provide a data package with QA/QC documentation as specified in the LDEQ Risk Evaluation/Corrective Action Program (RECAP) Section 2.4, at a minimum, which allows for evaluation relative to the requirements for *definitive data* per RECAP. The laboratory reports should include a description of any problems encountered and comments on the performance of any part of a method. The results should be reported consistently in regard to reporting units (e.g., µg analyte/Kg wet weight).

B. DATA AQUISITION

9.0 Sampling Design

9.1 Rationale for Selection of Sample Locations or Sites

Blue crabs and/or forage fish will be collected if possible from the following locations:

- Twelve (12) locations in the East White Lake Oil and Gas Field (Figure 2). Nine of the twelve Site locations (T1 through T9) correspond to locations previously considered by Barbee (2010);
- Nine (9) reference locations (five [5] in Schooner Bayou and four [4] in White Lake; Figure 3);
- Market samples from locations in the region to determine the concentrations of COCs in crabs from commercial sources for comparative purposes.

Sufficient sampling locations are included in this study to permit valid comparisons and evaluations if blue crabs or forage fish are not caught at some locations. Sampling locations presented in Figures 2 and 3 are approximate and will be determined in the field using GPS equipment and consideration of local conditions such as flows and available habitat.

9.2 Rationale for Selection of Parameters

The COCs chosen for this study (arsenic, barium, mercury, and TPH) were measured in whole body crab samples from the Site in a previous study and cited by Barbee (2010) as containing concentrations of concern. Among other difficulties with the Barbee (2010) study, the crabs were analyzed as homogenized intact (shells and all) organisms. The COCs of concern as noted by Barbee are naturally occurring elements or compounds and have a variety of sources in coastal Louisiana. This study is intended to accurately measure concentrations of these COCs in blue crabs and forage fish.

Sixteen polycyclic aromatic hydrocarbons (PAHs) were previously analyzed in Site surface waters and sediment in May 2010. The PAHs are from RECAP Table D-1: acenaphthene, acenaphthylene, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, 2-methylnaphthalene, naphthalene, phenanthrene, and pyrene. PAH results for all ten surface water samples locations were below the associated laboratory reporting limits (which ranged from <0.0000091 mg/L to <0000536 mg/L). PAH detections in the co-located sediment samples were primarily non-detect, with detections limited to 5 PAHs at three locations at concentrations well below 1 mg/kg-dry weight. Given the very limited detections of PAHs in sediments (and none in surface water), this SAP focuses on TPH analysis for evaluation of petroleum hydrocarbons in blue crab and forage fish tissues.

9.3 Sample Size

CAS and GCAL have minimum tissue (mass) requirements per composite for laboratory analysis of COCs, lipid content, and moisture content. The preferred total mass of homogenized wet tissue for analytical testing by CAS and GCAL is 50-60 grams (25-30 grams minimum).

9.4 Sample Types

To meet the study objective, this study will include samples of blue crabs (*Callinectes sapidus*) and forage fish (e.g., mosquito fish [*Gambusia affinis*]; topminnows [*Fundulus* spp.]) from the area. Samples of the crabs will be analyzed to provide data for both human health and ecological risk assessment.

Each blue crab will be separated into the following four components (and weighed) by CAS:

- Meat from the body and claws;
- Hepatopancreas;
- Other soft tissues (gills, heart, intestine, testes, and eyestalks); and
- Exoskeleton.

The human health risk assessment will use the analytical results (and respective weights) of the meat and hepatopancreas. The ecological risk assessment will use the analytical results (and respective weights) of all four components listed above to derive a whole-body crab concentration. The preferred total mass of homogenized wet tissue for analytical testing by CAS and GCAL is 50-60 grams (25-30 grams minimum).

Samples of forage fish will be analyzed as intact fish (whole body). Similar for crabs, forage fish will be composited to achieve adequate mass for accurate analyses (i.e., 50-60 grams preferred; 25-30 grams minimum). Fish will be composited within species if the variability of catch across the sampling sites requires use of more than one species

(*Guidance for Assessing Chemical Contaminant Data for Use in Fish Advisories, Volume 1: Fish Sampling and Analysis, Second Edition* [USEPA 2000a]). If the sampling crew is unable to collect all forage fish needed to prepare the composite sample on the same day, and the organisms used in the same composite sample will be collected on different days (no more than 1 week apart), individual fish will be frozen until all the organisms to be included in the composite sample are available for shipment to CAS. Since freezing the crabs prior to compositing makes dissection problematic, crabs will not be frozen prior to shipment to CAS. Crab samples will also be collected from commercial markets in Louisiana to assess the concentrations of the COCs. Water samples at the sites will be analyzed for standard field parameters (pH, temperature, conductivity, salinity, dissolved oxygen, turbidity). Field notes will be collected regarding weather, sampling effort, and other parameters that may be important for interpreting the results.

9.5 Sampling Period

Sampling will be conducted during December of 2010 to January of 2010 since water and weather conditions are conducive to safe and efficient field sampling, and blue crabs and forage fish are not spawning.

9.6 Evaluation of Objective

The analyte concentrations will be compared with appropriate screening values for human health (LA DEQ 2010) and ecological receptors.

10.0 Sampling Methods

10.1 Target Species

To meet the study objective, this study will include samples of blue crabs (*Callinectes sapidus*) and forage fish (e.g., mosquito fish (*Gambusia affinis*); topminnows [*Fundulus* spp.]).

10.2 Composite Sampling

The blue crab and forage fish tissues will be composited by CAS to minimize the opportunity for cross-contamination. The forage fish are prepared as whole body composites. Composite samples are effective for estimating average tissue concentrations of COCs in target species populations, and compositing ensures adequate sample mass for analysis of all target COCs. The preferred total mass of homogenized wet tissue (blue crab or forage fish) for analytical testing by CAS and GCAL is 50-60 grams (25-30 grams minimum). If insufficient tissue mass is able to be collected, CAS or GCAL will be consulted to identify the appropriate analytical strategy. Method modifications may include modified extraction techniques (e.g. adjusting the final extract volume), using a lower concentration for the lowest standard in the initial calibration, or adjusting the amount of extract injected into the instrument.

10.3 Sample Collection Methods

Collection methods for blue crabs and forage fish can be divided into two categories, passive and active. Passive collection methods for blue crabs include crab traps or pots. Passive collection devices (e.g., crab traps or pots) must be checked frequently to ensure a limited time lag between crab entrapment and sample preparation/preservation. For forage fish, active collection methods will involve sampling devices including seines and trawls. Although active collection requires greater fishing effort, it is usually more efficient than passive collection for covering a large number of sites and catching the number of individuals needed from each site for tissue analysis. The active collection methods generally require more field personnel and more complex equipment than passive collection methods.

Sampling for this study will involve an array of both active and passive gear to ensure collection of the desired target numbers of crabs and forage fish. Selection of the most appropriate gear type(s) for a particular sampling site will be at the discretion of the sampling team leader (Rodgers). A local contractor will be responsible for providing crab and forage fish sampling gear and sampling vessels. It is important that the sampling vessel(s) and equipment be clean and in good condition. Appropriate license or collection permits will be obtained prior to sampling, and sampling will be conducted in compliance with pertinent existing regulations. The analytical laboratory will provide sample packaging and shipping supplies.

10.4 Equipment and Supply List for Crab and Forage Fish Tissue Sampling

A list of equipment and expendable supplies is provided in Table 4. Sample collection, packaging, and shipment methods are presented in Section 11 of this document.

As soon as crabs or forage fish are obtained via active collection methods, or removed from passive collection devices, the species will be identified. Nontarget species collected in this study will be returned to the water. Individuals of the selected target species (blue crabs and forage fish) will be rinsed in ambient water to remove any foreign material from the external surface, will be handled using clean nitrile gloves, and placed in clean holding containers (livewell, buckets, etc.) to prevent contamination. Each blue crab and forage fish will be measured to determine length and width or total body length (mm), respectively. For blue crabs, data obtained will include sex, length, width and wet weight, For forage fish, maximum body length should be measured, i.e., the length from the anterior-most part of the fish to the tip of the longest caudal finray (when the lobes of the caudal fin are depressed dorsoventrally). When sufficient numbers of the target species have been identified to make up a suitable composite sample, the species name, specimen lengths, and all other site and sampling information should be recorded on the Field Record Form. The field objective is for sampling teams to obtain representative composite samples for both crabs and forage fish from each sample location. Each composite must consist of all the same species, and the composite must be able to deliver 50-60 grams (25-30 grams minimum) of tissue for chemical analysis.

11.0 Sample Handling and Custody Requirements

11.1 Sample Handling

Clean nitrile gloves will be worn during the entire sample handling process, beginning with removing the crabs and fish from the sampling gear. After individuals of the selected target species are rinsed in ambient water and the species and size are determined, each of the fish found to be suitable for the composite sample will be individually wrapped in extra heavy-duty aluminum foil (provided as solvent-rinsed, oven-baked sheets). A Sample Identification Label will be prepared for each aluminum foil-wrapped specimen. Each foil-wrapped fish will be placed into a plastic bag (i.e., heavy duty food grade plastic bag), and sealed with a plastic cable tie. The completed Sample Identification Label will be affixed to the cable tie, and the entire specimen package will be "double-bagged" (i.e., placed inside a large plastic bag with all the specimens of the same species from that site and sealed with another cable tie). Once packaged, samples should be immediately placed on ice for shipment. If samples will be carried back to a laboratory or other facility to be frozen before shipment (forage fish only), wet ice can be used to transport wrapped and bagged fish samples in the coolers to that laboratory or facility. If possible, all of the specimens in a composite sample should be kept together in the same shipping container (ice chest) for transport. Sampling Teams have the option, depending on site logistics, of:

- Shipping the samples packed on ice (in sufficient quantities to keep samples cold for up to 48 hours), via priority overnight delivery service (i.e., Federal Express), so that they arrive at the laboratory within less than 24 hours from the time of sample collection; or

- Freezing the forage fish (but not blue crab) within 24 hours of collection, and storing the frozen fish until shipment within 1 week of sample collection (frozen fish will subsequently be packed on dry ice and shipped to the laboratory via priority overnight delivery service to arrive within less than 24 hours from time of shipment).

The time of sample collection, relinquishment by the sample team, and time of their arrival at the laboratory must be recorded on the Chain-of-Custody Form. The field sampling teams should avoid shipping samples for weekend or holiday delivery to the laboratory unless prior plans for such a delivery have been agreed upon with the laboratory.

11.2 Sample Integrity

A critical requirement of this study is maintenance of sample integrity from the time of collection to the shipment and arrival at the final destination. Sample integrity will be maintained by preventing the loss of COCs that might be present in the sample and by taking precautions to avoid possible introduction of contaminants during handling. The loss of COCs can be prevented in the field by ensuring that the sample collected remains intact. Once a sample is collected, sample integrity will be maintained through careful and controlled sample handling, storage, and preservation procedures. Preventable sources of extraneous contamination can include the sampling gear, oils and greases on boats, spilled fuel, skin contact, contact with soil or sand, boat motor exhaust, and other potential sources. Potential sources should be identified before the onset and during sample collection, and appropriate measures should be taken to minimize or eliminate them. Examples of preventative measures include the following:

- Collection nets should be free of any potential contaminants.
- The use of tarred collection nets is prohibited.
- Boats should be positioned so that engine exhaust does not fall on the deck area where samples are being handled.
- Ice chests and other sample storage containers should be cleaned with detergent and rinsed with clean water prior to use.
- Samples should not be placed directly on ice, but should be stored inside foil, plastic bags, and plastic garbage bags first.
- Proper gloves (clean nitrile gloves) should be used when handling samples.

11.3 Custody Requirements

Each sample will be identified and tracked with a unique numbering scheme as described in Section 8.0. The same unique number will be used in all documentation including the Field Record Form, the Sample Identification Label, and the Sample Preparation Record Form. Detailed information about the samples collected in the field and about the collection location will be recorded on the Field Record Form. Two copies will be made of this form: one will accompany the samples to the laboratory and one copy will be kept in a project-dedicated binder.

As soon as possible following collection, the sampling team will begin the process of identifying, labeling, packaging, and storing the sample(s). Each sample will be identified and tracked with a unique numbering scheme as described in Section 8.0. This composite code will identify each sample on all documentation and records including the following:

- Field Record Form,
- Sample Identification Label, and
- Chain-of-Custody Form.

Each sample will be labeled by affixing a Sample Identification Label as per the instructions in Section 8.0. All sample label entries will be made with black indelible ink. The sample label will accompany each sample throughout the chain-of-custody. Each sample label will include the following information:

- project name (EWL Tissue Study),
- site identification (number),
- sample number (01 through 06),
- composite code (as in Section 8.0),

- date of sample (month/day/year),
- time of collection (military time),
- preservative used (on ice or frozen), and
- collector's name (field team leader).

Detailed documentation of the samples collected in the field (for shipment to the laboratory) and information about the collection location will be recorded on a Field Record Form. One form must be completed for each sample composite. A copy of the form (Section 8.0) will be retained by the sampler, and another copy will be included with sample shipment to the laboratory. All entries will be made in black ink and no erasures will be made. Each form will have the proper entry requirements, which includes the following information:

- composite code (as per Section 8.0),
- sampling date (month/day/year),
- time of collection (military time),
- collection method (e.g., cast net),
- collector's name (printed and signed),
- collector's affiliation, address, and telephone number,
- site name,
- site number (location of site sampled),
- sample type (e.g., crab),
- estimated maximum depth (meters), and
- length (mm) and width (mm) of each specimen (if applicable).

All samples and composites will be transferred to the receiving laboratory under chain of custody. The Chain-of-Custody Form will act as a record of sample shipment and a catalog of the contents of each shipment (coinciding with information on the field record). The forms will be produced and copied as needed with one copy retained by the sampler and one for shipment to the laboratory. The Chain-of-Custody Form shipped will be placed in a waterproof plastic bag and sealed inside the shipping container. All Chain-of-Custody Form entries will be made in black ink and will include:

- the Project Manager's name, address and telephone number (refer to the QAPP cover page),
- sampler's name and telephone number,
- project name (EWL Tissue Study),
- page number (e.g., 1 of 1),
- sample location,
- collection date and time,
- composite code and sample number,
- preservative (ice [crab and forage fish] or frozen [forage fish only]),
- number of containers,
- type of analysis required (arsenic, barium, mercury, TPH, lipids; and moisture content),

- sampler’s signature, sample date, and time,
- sampler relinquishment date and time,
- laboratory recipient signature, and
- laboratory receipt date and time.

Immediately following the packing of each shipping container, each container (ice chest) will be secured with packaging tape and sealed with a Chain-of-Custody Label. The Chain-of-Custody Label must contain the signature of the sampler and the date and time written in ink. The seal must be affixed such that the shipping container cannot be opened without breaking the seal (e.g., label adhered across the ice chest latch), so as to protect and document the integrity of the contents from field to laboratory.

12.0 Analytical Methods Requirements

Composite samples will be analyzed for Total Arsenic, Inorganic Arsenic, Total Barium, Total Mercury, Methylmercury, and TPH. The analytical laboratories CAS and GCAL will conduct the analyses, using EPA methods. The results will be reported in parts per million or parts per billion, as wet weight. Analytical methods and specific method requirements are addressed by the Quality Assurance Project Plans and Standard Operating Procedures developed by the laboratories and in conjunction with requirements presented in this study plan. Lipids will also be analyzed for the composite samples. Percent moisture (wet weight and dry weight) will also be measured and reported for composite tissue samples.

Samples will be shipped under chain of custody to CAS for processing and analytical testing of metals, lipid content, and moisture content. CAS will ship tissue aliquots to GCAL for TPH analysis. Samples will be analyzed for total petroleum hydrocarbons using the Texas 1005 (Total Petroleum Hydrocarbons) and potentially Texas 1006 methods. For both analyses, the extract step described in Section 8.2 or Section 8.3 of the Texas 1006 (Characterization of NC6 to NC35 Petroleum Hydrocarbons in Environmental Samples) method will be performed. The laboratory will use the reporting protocols specified in the Texas 1005 method modified to reflect RECAP-recommended ranges for total petroleum hydrocarbons.

Sample processing and analytical testing and methods are within the scope of this QAPP. Sample processing involves dissection and compositing of the requisite tissues: 1) crabs – meat, hepatopancreas, soft tissue, and shell (exoskeleton); 2) forage fish – whole body.

Analytical testing of tissue samples for will follow standard methods:

- Total Arsenic - SW 6020;
- Inorganic Arsenic – EPA 1632A;
- Total Barium – SW 6020;
- Total Mercury – EPA 1631;
- Methylmercury – EPA 1630;
- TPH – Texas 1005/1006.

13.0 Quality Control Requirements

Data quality is addressed, in part, by consistent performance of valid procedures documented in this study plan as well as those routinely employed by the analytical laboratory. It is enhanced by experience and training of project staff and documentation of project activities. This Quality Assurance Project Plan (QAPP) will be distributed to all project scientists for review, and, in turn, to sampling personnel involved in implementation of the project's field work as well as to the analytical laboratory. The project manager will ensure that personnel have the Quality Assurance Project Plan and that an orientation and training session is undertaken by all involved.

14.0 Instrument/Equipment Testing, Inspection, and Maintenance Requirements

All field equipment will be inspected prior to sampling activities to ensure that proper use requirements are met (e.g., boats are operating correctly, nets are without defects, pH and other field meters properly calibrated). Inspection of field equipment will occur well in advance of the field operation to allow time for replacement or repair of defective equipment, and the field team will be equipped with proper backup equipment to prevent lost time on site. One member of the field team will gather and inspect all equipment on the equipment and supply list (Table 4) prior to the sampling event. All pH and other meters used by field teams will be calibrated according to the manufacturer's operating instructions, on a daily basis, while in use. Careful and thorough planning will be necessary to ensure the efficient and effective completion of the field sample collection task. A checklist of field equipment and supplies is provided in Table 4 of this document. It will be the responsibility of the field team to gather and inspect the necessary sampling gear prior to the sampling event and to inspect the sample packaging and shipping supplies. Defective packaging and shipping supplies (e.g., torn or damaged bags) will be discarded, and, if necessary, the field team will obtain replacement supplies.

15.0 Data Acquisition Requirements (Non-direct Measurements)

Non-direct measurements will include identification and/or verification of each sample location (i.e., latitude and longitude). Coordinates of the sample sites will be provided as decimal degrees or conventional degrees, minutes, and seconds.

16.0 Data Management

Samples will be documented and tracked via Sample Identification Labels, Field Record Forms, and Chain-of-Custody Forms (Section 8.0). Diligence of the Field Sampling Team in completion of the proper records will be essential. The field team leader will be responsible for reviewing all completed field forms. Any corrections should be noted, initialed, and dated by the reviewer. As mentioned in Section 8.0, Field Record Forms and Chain-of-Custody Forms will each be prepared in the field. The sampler will retain one copy each of the Field Record and Chain-of-Custody Forms, and the original copies will be delivered to the laboratory with the samples. Shipment of samples to the laboratory must be conducted by a delivery service that provides constant tracking of shipments (e.g., Federal Express). Laboratory sample log-in and data management procedures are beyond the scope of this QAPP and are covered by the laboratory QAPP. The laboratory will retain one copy of each Field Record Form and Chain-of- Custody Form. All form copies associated with this project will be maintained in a project file during the active phase of the project, and for a period of 6 months following completion of the project (unless otherwise directed). Upon completion of sampling activities, a field collection effort summary will be developed (i.e., a detailed listing of all sampling participants, sampling locations, and specimens collected) based on information recorded by all Sampling Teams on the Field Record Forms. Project data will be stored by project scientists, and will be copied to disks for archive for two years after project completion (unless otherwise directed). All data entries will be checked for errors in transcription and computer input by a minimum of two persons. If there is any indication that requirements for sample integrity or data quality have not been met, the project scientists will be notified immediately (with an accompanying explanation of the problems encountered).

C. ASSESSMENT / OVERSIGHT

17.0 Assessment and Response Actions

The project manager will be on-call throughout the duration of the sampling effort. In the event that quality problems or other difficulties arise in the field, the project manager will contact the quality assurance officer, attempt to resolve the difficulty, and determine the appropriate corrective action to be taken. The project manager will have the authority to stop work on the project if problems affecting data quality are identified that will require extensive efforts to resolve.

18.0 Reports to Project Scientists and the Study Sponsor

A summary of the work conducted will be prepared. The report will contain summaries of the field sampling and analytical results. Subsequent reports may be produced by the project scientists and others based on the results from this study.

D. DATA VALIDATION AND USABILITY

19.0 Data Review, Validation and Verification Requirements

All field record forms and chain of custody forms will be reviewed by the project manager for completeness and correctness. Data will be entered and assessed by comparing entered data with the original forms. The project manager will determine whether to accept, reject or qualify the entered data. A report will then be prepared for submittal to the project scientists.

20.0 Validation and Verification Methods

The project manager will conduct a review of the laboratory's data results and reports, verifying that methods and protocols were followed. A data quality review will be performed by qualified personnel experienced in data validation. The data quality and data usability review will be conducted based upon guidance provided in RECAP Sections 2.4 and 2.5, the USEPA Risk Assessment Guidance for Superfund (1989), and other relevant guidance. The data evaluation will include a review of analytical methods; QA/QC documentation; laboratory performance on matrix spikes, surrogate recoveries, and laboratory control samples; QC blank results (e.g. field, method, and rinsate); sample quantification limits and duplicate analyses. Specific deficiencies in the data, if any, will be identified, qualified as appropriate, and discussed in the report as they relate to data usability for exposure assessment and risk characterization.

21.0 Reconciliation with Data Quality Objectives

As soon as possible following completion of the sample collection and analyses for this project, precision, accuracy and completeness measures will be assessed by the project manager and compared with the criteria discussed in previous sections of this QAPP. This will represent the final determination of whether the data collected are of the correct type, quantity and quality to support the intended use for this project. Any problems encountered in meeting the performance criteria (or uncertainties and limitations in the use of the data) will be discussed with the project scientists, and will be reconciled, if possible.

22.0 LITERATURE CITED AND REVIEWED

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Tables

Table 1
Quality Control Performance Criteria

Quality Control Parameter	Total Arsenic; Total Barium	Inorganic Arsenic	Total Mercury	Methylmercury	Total Petroleum Hydrocarbons
Method	**SW 6020**	**EPA 1632A**	**EPA 1631**	**EPA 1630**	**Texas 1005/1006**
Method Quantitation Limit (MQL)	0.5 mg/kg (Arsenic) 0.05 mg/kg (Barium)	0.030 mg/kg	0.001 mg/kg	0.010 mg/kg	Not Available
Holding Times	Freeze or freeze-dry tissues (store at room temperature); holding time indefinite	Freeze or freeze-dry tissues (store at room temperature); holding time indefinite	Freeze or freeze-dry tissues (store at room temperature); holding time indefinite	Freeze or freeze-dry tissues (store at room temperature); holding time indefinite	Freeze, hold up to one year; extract within 24 hours of thawing
Equipment Blank	Daily per matrix and equipment type <MQL	Daily per matrix and equipment type <MQL	Daily per matrix and equipment type <MQL	Daily per matrix and equipment type <MQL	Daily per matrix and equipment type <MQL
Field Duplicate	1 every 10 samples ≤50 RPD if results greater than 5x MQL	1 every 10 samples ≤50 RPD if results greater than 5x MQL	1 every 10 samples ≤50 RPD if results greater than 5x MQL	1 every 10 samples ≤50 RPD if results greater than 5x MQL	1 every 10 samples ≤50 RPD if results greater than 5x MQL
Instrument Tune/Calibration	See Table 2	See Table 2	See Table 2	See Table 2	See Table 2
Preparation (Laboratory) Blank	Daily per digestion batch (maximum 20 samples) per matrix < ± MQL	Daily per digestion batch (maximum 10 samples) per matrix < ± MQL	Three per batch (maximum 20 samples) per matrix < ± MQL	Three per batch (maximum 20 samples) per matrix < ± MQL	Daily per digestion batch (maximum 20 samples) per matrix < MQL
Initial Calibration and Continuing Calibration Blank	Analyze immediately after each ICV and CCV < ± MDL	Analyze immediately after each ICV and CCV < ± MDL	NA (See bubble blanks below)	NA	NA
Surrogate	NA	NA	NA	NA	70 – 130 % Recovery 1-Chlorooctane or trifluoromethylbenzene (nC_6 to nC_{12}) 1-Chlorooctadecane, 2-fluorobiphenyl or o-terphenyl ($>nC_{12}$)
Matrix Spike (MS) / Matrix Spike Duplicate (MSD)	One per 20 samples per matrix 70 – 130 %Recovery ≤50 RPD if results greater than 5x MQL	One per 10 samples per matrix 50-150% Recovery (1632 Table 2) ≤50 RPD if results greater than 5x MQL	One per 10 samples per matrix 70 - 130 %Recovery ≤50 RPD if results greater than 5x MQL	One per 10 samples per matrix 65 – 135 %Recovery ≤50 RPD if results greater than 5x MQL	One per 20 samples per matrix 60 – 140 %Recovery ≤50 RPD if results greater than 5x MQL
Internal Standard Area	Each sample > 70-120% recovery.	NA	NA	NA	NA
Laboratory Control Sample (LCS) or Ongoing Precision and Recovery (OPR)	Daily per digestion batch per matrix 80 – 120 %Recovery	Daily per digestion batch (maximum 20 samples per matrix (1632 section 9.7.1) 50-150% Recovery (1632 Table 2)	Daily per digestion batch per matrix; Analyze at beginning and end of batch or each 12-hour shift 77 - 123 %Recovery	Daily per digestion batch per matrix; Analyze at end of batch or each 12-hour shift 67 - 133 %Recovery	Daily per extraction batch per matrix 60 - 140 %Recovery 25 RPD for LCSD
Identification Criteria	NA	NA	NA	NA	Within retention time windows
Confirmation Analysis	NA	NA	NA	NA	Gas chromatography/ mass spectrometry
Other	NA	QCS quarterly; Mean of three analyses within 10% of QCS value	Additional blanks: 3 system blanks or 3 bubbler blanks	QCS with each batch analyzed in the middle of the batch	The response factor for nC_{35} is ≥ the response factor for nC_{28}; Aliphatic and aromatic fractionation check per batch of silica gel (< 10 – 20% crossover) and 60-140% recovery

CCV – continuing calibration verification
ICV – initial calibration verification
MDL – method detection limit
MQL – method quantitation limit
NA – Not applicable
QCS – Quality control sample (independent source)

Table 2

Calibration Procedures Summary

		Calibration Summary	
Parameter Measured	**Method Description[1]**	**Activity**	**Requirements**
Metals (Arsenic and Barium)	SW 6020	Initial Calibration	Blank and single point standardization as per method 6020.
		Initial calibration Verification (ICV)	Analyze mid-level calibration standard. The %R for each analyte must be 90-110%.
		Continuing Calibration Verification (CCV)	Analyze mid-level calibration verification standard every 10 samples. The %R must be 90-110% of the true value.
		Interference Tests	Analyze interference check standard at the beginning of every analytical run. The %R for each analyte must be 80-120% of the true value.
Mercury (Total)	EPA 1631	Initial Calibration	Analyze a minimum of a blank and five concentrations. The acceptance criteria are a maximum %RSD (≤15%) criteria and recovery of the lowest standard is in the 75 – 125% range.
		Initial Calibration Verification	Analyze a mid-level calibration standard. The %R for each analyte must be 77-123% (QCS)
		Calibration Verification	See OPR requirements
Inorganic Arsenic	EPA 1632	Initial Calibration	Analyze a minimum of a blank and three concentrations (one at ML and one at upper range). Maximum %RSD (≤25%) criteria before any investigative samples are analyzed.
		Initial Calibration Verification	Analyze a mid-level calibration standard. The %R for each analyte must be 80-120% (Method 1632 Table 2).
		Calibration Verification	Analyze a mid-level calibration verification standard every 10 samples. The %R must be 76-116% of the true value.
Methyl Mercury	EPA 1630	Initial Calibration	Analyze a minimum of a blank and five concentrations prepared using distillation procedure. The acceptance criteria are a maximum %RSD (≤15%) criteria and recovery of the lowest standard is in the 65 – 135% range.
		Calibration Verification	See QCS requirements
Total Petroleum Hydrocarbons	Texas 1005 / 1006	Initial Calibration	Analyze minimum five concentrations for each analyte. Maximum %RSD (≤25%) or minimum correlation coefficient (0.995) criteria before any investigative samples are analyzed. A calibration curve must be prepared for any compound for which the %RSD is greater than 25%. Take corrective action when criteria not met. The lowest calibration standard establishes the MQL based on laboratory standard operating procedures for initial volume of sample and final volume of extract.
		Calibration Verification	Verify calibration curve daily, every 24 hours, or every 20 samples, whichever is more frequent, with a check standard. Maximum %D ≤25%.

CCC – Calibration check compound
CCV – Continuing Calibration Verification
ICV – Initial Calibration Verification
MQL – Method Quantitation Limit
NA – Not applicable
RPD – Relative percent difference
RRF – Relative Response Factor
%D – Percent Difference
%RSD – Percent Relative Standard Deviation
SPCC – System performance check compound

Table 3
Laboratory Methods

Parameter	CAS No	Method	MQL
Total Arsenic	7440-38-2	SW 6020	0.04 mg/kg DW
Inorganic Arsenic	7440-38-2	EPA 1632A	0.03 mg/kg DW
Total Barium	7440-39-3	SW 6020	0.05 mg/kg DW
Total Mercury	7439-97-6	EPA 1631	0.001 mg/kg DW
Methylmercury	22967-92-6	EPA 1630	0.010 mg/kg DW
Total Petroleum Hydrocarbons	NA	TX 1005/1006	N/A

MQL – Method Quantitation Limit (Method Detection Limit [MDL] for Total Arsenic).

Table 4
Equipment and Supply List for Crab and Forage Fish Tissue Sampling

1. Sampling vessel (including boat, motor, trailer, oars, gas, and all required safety equipment)
2. Nets - (including trawls and/or seines, hoop or castnets)
3. Crab Traps and /or Pots (several per sampling site)
4. Coast Guard-approved personal floatation devices
5. Maps of sampling areas, sites and access routes
6. Global Positioning System (GPS) unit
7. pH meter (including associated calibration supplies)
8. Livewell and/or buckets
9. Measuring board (millimeter scale)
10. Ice chests
11. Aluminum foil (solvent-rinsed and baked)
12. Heavy-duty food grade polyethylene bags
14. Large plastic bags
15. Knife or scissors
16. Clean nitrile gloves
17. Field Record Forms
18. Sample Identification Labels
19. Chain-of-Custody Forms
20. Chain-of-Custody Labels
21. Scientific collection permit or fishing license
22. Ice
23. Black ballpoint pens and/or waterproof markers
24. Clipboard
25. Packing/strapping tape
26. Overnight courier airbill and laboratory shipping address
27. Plastic cable ties
28. Plastic bubble-wrap
29. First aid kit and emergency telephone numbers

Figures

Legend

▨ Section 16

USGS High Resolution State Orthoimagery
for the Louisiana Coastal Area, 2008

Title:
Site Location Map

Project:
Crab and Forage Fish Tissue Sampling
East White Lake Oil and Gas Field
Vermilion Parish, Louisiana

Drawn By:	Date:	Project No.:	Figure:
KPL	11/24/10		1

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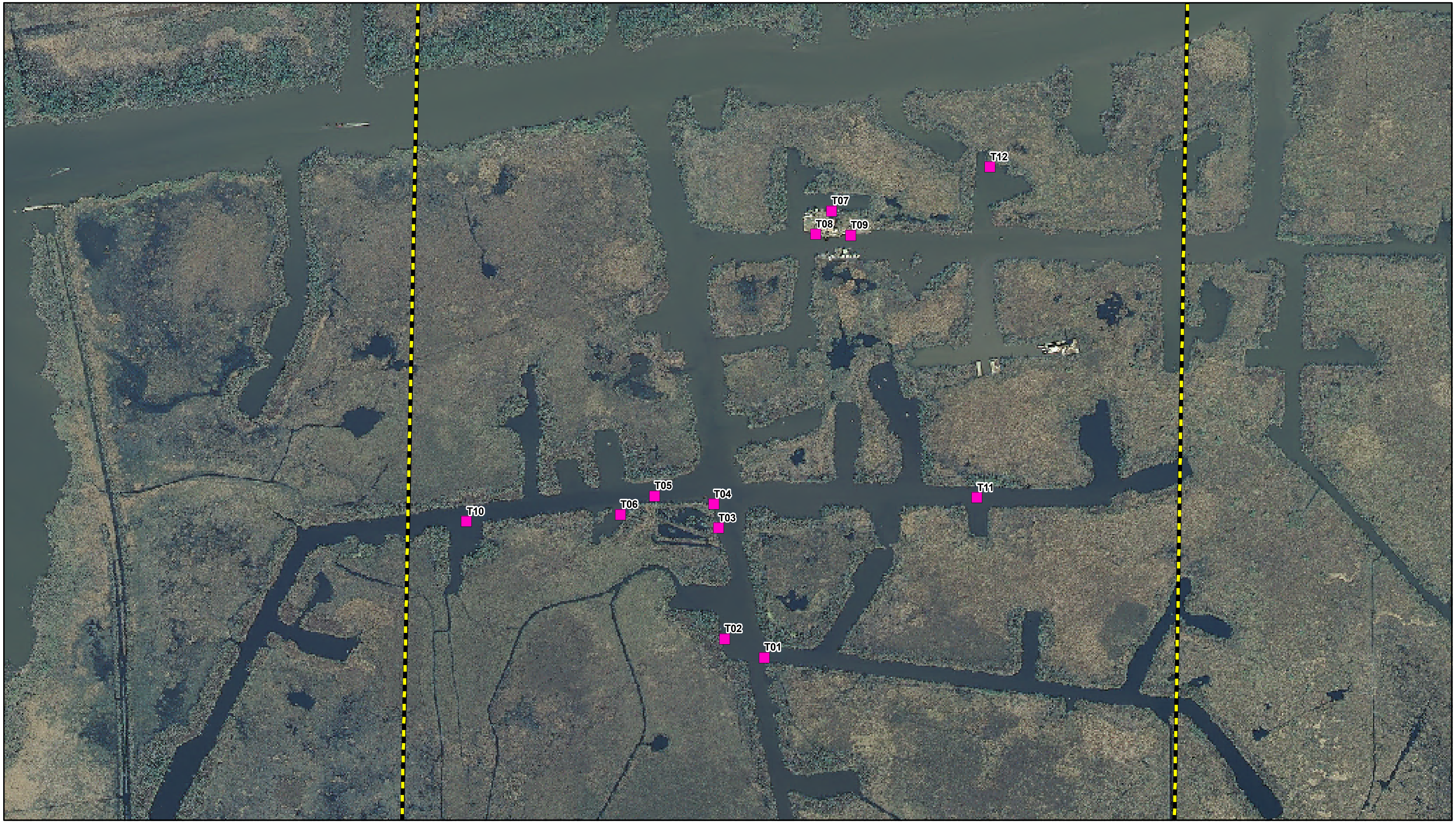

Legend

🟪 Proposed Site Tissue Sample Locations

▭ Section 16

USGS High Resolution State Orthoimagery
for the Louisiana Coastal Area, 2008

0 375 750 1,500 Feet

N E S W

Title: Proposed Site Tissue Sample Locations			
Project: Crab and Forage Fish Tissue Sampling East White Lake Oil and Gas Field Vermilion Parish, Louisiana			
Drawn By: KPL	Date: 11/24/10	Project No.:	Figure: 2

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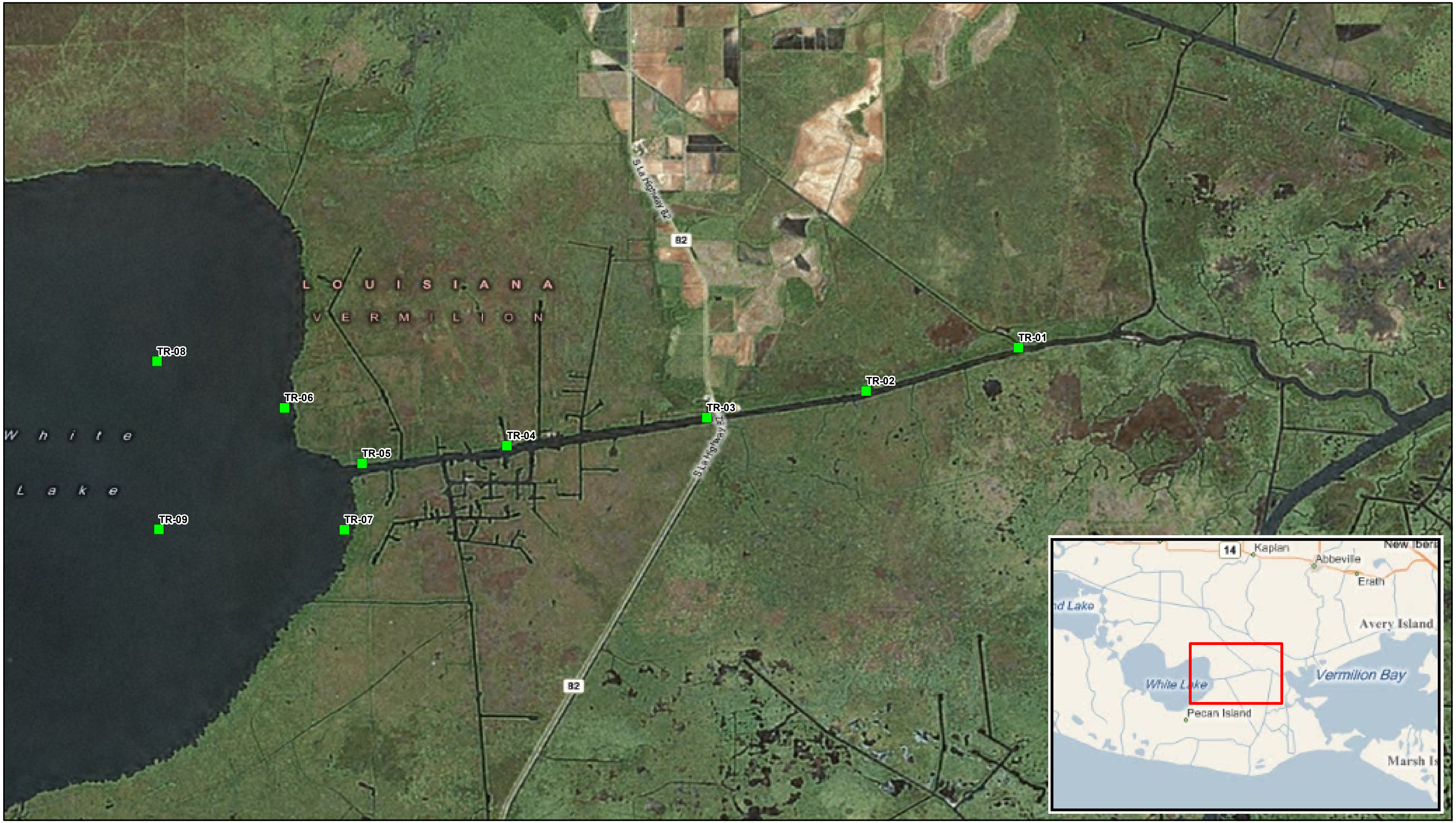

Legend

🟩 Proposed Reference Tissue Sample Locations

NAIP 2007 Imagery

0 0.5 1 2 Miles

N
W E
S

Title: Proposed Reference Tissue Sample Locations

Project: Crab and Forage Fish Tissue Sampling
East White Lake Oil and Gas Field
Vermilion Parish, Louisiana

Drawn By: KPL
Date: 12/01/10
Project No.:
Figure: 3

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Crab and Fish Collection Report

Appendix D

Project No. 0116008
UNOCAL
Vermilion Parish, Louisiana

Environmental Resources Management Southwest, Inc.
3838 North Causeway Boulevard, Suite 3000
Metairie, Louisiana 70002
(504) 831-6700

Crab and Fish Collection Report

Section 16 T 15S R 01E

East White Lake Oil and Gas Field
Vermilion Parish, Louisiana

February 27, 2014

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Crab and Fish Collection Report

Section 16 T 15S R 01E

East White Lake Oil and Gas Field
Vermilion Parish, Louisiana

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Executive Summary

In December 2010 and January 2011, fish and crabs were collected from 23 locations in the White Lake water shed. The project team included Dr. John Rodgers, Patrick Ritchie, and Dr. Helen Connelly. The site is located in Section 16, Township 15 South, Range 1 East in Vermilion Parish, Louisiana, about five miles southwest of Forked Island.

Crabs and fish were collected from 13 locations in the vicinity of the East White Lake Oil and Gas Field, from six reference locations in Schooner Bayou Canal, and from four reference locations in White Lake. Cast netting for fish was attempted at 15 locations and trawl netting for fish was accomplished at 17 locations. Crabs were collected by crab traps from all 23 locations. A total of 307 blue crabs (*Callinectes sapidus*) were collected from all locations and shad forage fish *(Dorosoma cepedianum)* were collected from all locations. Sufficient numbers of crabs and fish were collected from all locations to meet minimum lab requirements for tissue analysis.

All samples collected were documented and shipped under chain of custody overnight on ice each day of the collection project to Columbia Analytical Labs in Kelso, Washington for preparation and for analyses. Samples arrived at the lab in a good condition and acceptable for analysis.

Records of the sampling event such as field notes, field record forms, and photos are included and described in this report. Methods and procedures used during the sampling event were in accordance with the December 2010 sampling plan *Quality Assurance Project Plan/Sampling Analysis and Assessment Plan for Crab and Forage Fish Tissue*, which is attached as an appendix to this document. Presentation and evaluation of the laboratory results are presented in a separate report under separate cover by others.

Crab and Fish Collection Report

Section 16 T 15S R 01E

East White Lake Oil and Gas Field
Vermilion Parish, Louisiana

1.0 Introduction

This report documents the methods and materials used to collect crabs and fish in a sampling event that occurred in December 2010/January 2011. Crabs and fish were collected during the sampling event from the White Lake water shed including the East White Lake Oil and Gas Field in Vermilion Parish, Louisiana. Collected crabs and fish were sent to an independent commercial laboratory for preparation and analyses. The analytical results of the tissue analysis are not included in this report but are presented in a separate report by others.

Crabs and fish were collected from canals in the East White Lake Oil and Gas Field, from Schooner Bayou Canal as a reference location, from White Lake as a reference location, and from retail fish markets in the Gulf Coast region for analyses. Crabs and fish were collected according to a protocol outlined in a *Quality Assurance Project Plan/Sampling Analysis and Assessment Plan for Crab and Forage Fish Tissue* dated December 6, 2010 that was prepared specifically for this sampling event (Appendix A).

1.1 Site Location

The site, located in Section 16, Township 15 South, Range 1 East in Vermilion Parish, Louisiana (Figure 1), is about five miles southwest of Forked Island. The areas of interest are the canals and waterways located on the eastern side of White Lake, including Section 16 of the East White Lake Oil and Gas Field.

1.2 Target Species

Blue crabs (*Callinectes sapidus*) and small forage fish such as shad (*Dorosoma cepedianum*) were collected as the target species for the tissue study. December 2010 and January 2011 was a good time to collect these organisms because they do not spawn at that time.

1.3 Project Team

Blue crabs and forage fish were collected by a field team that included Dr. John Rodgers (project director and project manager), Patrick Ritchie, and Dr. Helen Connelly.

1.4 Analytical Laboratory

Samples were shipped to Columbia Analytical Services, Inc., (CAS) of Kelso, Washington for sample preparation and analytical testing. Tissue analytical results are not presented in this report.

1.5 Sampling Location Plan

Crabs and fish were collected from 23 locations (Figure 2) in the White Lake water shed. Twelve sampling locations were described in the plan for Section 16 of the East White Lake Oil and Gas Field canals area and one additional location was added during field collection. These twelve locations are T-01 through T-12 (T is for “tissue”) and the additional location is T-01A (Figure 3).

Crabs and fish were collected from five reference locations described in the plan in Schooner Bayou Canal and at one additional sampling location, which was added during field collection. These sampling locations are TR-01 through TR-05 (TR is for “tissue reference”) and the additional location is TR-03A (Figure 4).

Crabs and fish were collected from four reference locations in White Lake. These locations are TR-06 through TR-09 (Figure 4).

Crabs were purchased from six retail fish markets in the Gulf Coast region:

Baton Rouge Area:
Addis Seafood
7926 6th Street
Addis, Louisiana 70710

Des Allemands Area:
Cajun Crab Connection
123 West Bayou Road
Des Allemands, Louisiana 70030

Lake Charles Area:
Dugas Landing
700 Joe Dugas Road
Hackberry, Louisiana 76045

Biloxi Area:
Desporte & Sons Seafood
1075 Division Street
Biloxi, Mississippi 39530

New Orleans Area:
Fisherman’s Cove Seafood
3201 Williams Boulevard
Kenner, Louisiana 70065

Houston Area:
Hong Kong Food Market
11205 Bellaire Boulevard
Houston, TX 77072

Purchased crabs from retail markets were packaged on ice and shipped to the analytical laboratory.

2.0 Project Goals

The purpose for collecting crabs and fish during the December 2010/January 2011 sampling event was to provide biological tissue for analyses. The four daily goals for the field team during the crab and fish collection event were as follows:

1. *Collect sufficient numbers of crabs and fish:* The field team needed to collect enough crabs and fish from each sampling location to send the laboratory the amount of biological tissue required to do the analyses.

2. *Accurately record and document the crab and fish collection event:* The field team needed to accurately record and document the events, facts, activities and details of the samples collected. This documentation record provides support for conclusions that will be made later concerning the analytical results.

3. *Deliver samples to the laboratory of acceptable quality for analysis:* The field team needed to collect, package and ship the crabs and fish according to protocol so that the samples would arrive at the laboratory in acceptable condition. This would ensure that the end result of the data collection effort is a set of analytical results that is considered of acceptable quality to the scientific and academic community.

4. *Follow the written sampling plan:* The field team needed to follow the written plan for field methods and procedures and use best professional judgment, based on education, training and experience to alter the protocol when field conditions warranted change.

Efforts, procedures, and protocols followed to accomplish these goals are presented in subsequent sections of this report.

3.0 Project Goal 1: Collect Sufficient Numbers of Crabs and Fish

It was a project goal to collect enough crabs and fish from each sampling location to send the laboratory the amount of biological tissue they required to do analytical testing. The limiting factor in every organism collection study is the ability to collect sufficient numbers of samples. The following sections describe the field team's successful collection methods for both fish and crabs.

3.1 Crab Collection Method

The field team successfully collected crabs using crab traps at all sampling locations.

At the beginning of the project, the crab traps were loaded onto the boat by seasoned local contract fisherman, Julian Gajan. Gajan drove the boat with the field team and the baited crab traps to each predetermined sample location, directed by the team with sampling maps. Once a sampling location was selected by the field team, based on the sample location map in the plan, the GPS coordinates were identified by the field team using a DeLorme Earthmate PN-40 GPS and recorded in the field logbook.

At each location, Gajan would throw the crab trap into the water, and it would remain there to be checked for crabs in the next days. A weight attached to the bottom of the crab trap anchored the trap in place. Each crab trap had an identifiable marker buoy that marked the trap as part of the project.

All traps used were constructed according to Louisiana Department of Wildlife and Fisheries (LDWF) regulations. The crab traps are wire mesh boxes approximately 30 inches by 30 inches by 15 inches with hinged lids. The wire mesh resembles chicken wire with 1.5-inch square openings. The crab trap has an entrance for crabs and a bait box inside containing catfish parts but no way for a larger crab to exit the trap. The crab trap has small exit holes to let small crabs escape.

To collect the crabs from the trap, Gajan would lift the crab trap up to the side ledge of the boat using a hooked gaffe. The crabs were removed by opening a hinged lid on top of the trap that had been secured by a bungee cord. The crabs were shaken out of the trap or removed with clean tongs.

Immediately upon being collected, the crabs were counted and recorded on the field record forms as male or female and then put into labeled clean five-gallon buckets. The buckets were labeled with the sample location ID (e.g. T-02) and each bucket had a small amount of ambient water in it with a loosely applied lid.

At each location where crabs were collected, water chemistry data was measured using an In-Situ Troll 9500 that had been calibrated that day using In-Situ Inc., Quik Cal Solution. Ambient water chemistry measurements taken at each location included: rugged dissolved oxygen (RDO), temperature, pH, conductivity, oxidation reduction potential (ORP), turbidity, depth, and time of collection. Water chemistry data was recorded in the field logbook and on the field record form. Table 1 lists the water chemistry data collected during the project.

Crab traps were checked at each location approximately every day or two until enough crabs were collected from the location to satisfy the laboratory requirement of approximately five crabs per location. Some traps had enough crabs after being checked once, other traps accumulated fewer crabs, and had to be checked and harvested more than once (Table 2). All crab traps in the White Lake reference locations only had to be checked once to collect a sufficient number of crabs. Crab traps in the site canals and in Schooner Bayou Canal had to be checked anywhere from one time to five times in order to collect a sufficient number of crabs. Once sufficient numbers of crabs were collected, the trap was removed, unless the location was utilized by Gajan for his commercial fishing.

Figure 5 and Table 2 show the numbers of crabs collected per location. The number of crabs collected per location ranged from five crabs (TR-06 and T-09) to 28 crabs (T-02). A total of 307 crabs were collected from all 23 sampling locations during the collection project.

3.2 Fish Collection Methods

Three different methods were attempted for collecting a sufficient amount of fish. The first two methods tested did not capture enough fish quickly enough; the last method tested was extremely successful. The three methods tested for collecting fish included (in order): cast net, hoop net on the bottom of the waterway, and trawling nets pulled through the water by a trawling boat.

3.2.1 Cast Net

The first fish collection method attempted, throwing a cast net, was labor intensive and only captured small numbers of fish for any one cast. The cast net used in this project was a synthetic circular net with a four foot radius and small weights around its outside edge. Gajan would stand in the boat and throw the net by hand so that it would fall in a circular pattern on the surface of the water and then sink. After the net settled, he pulled a cord attached to the net's weighted edge so that the net would form a bag. Some fish were caught as the net was pulled by hand back to the boat.

Cast netting for fish was attempted at 15 locations, and resulted in enough fish at six locations to collect and ship for analysis. The method, although somewhat successful, was unpredictable and time consuming.

3.2.2 Hoop Net

The second method attempted for capturing fish was by staking a hoop net to the bottom surface of the waterway. The hoop net, when set up, takes on the shape of a column or a tube. The net has a series of hoops spaced along the length of the net to keep it open, with a second net inside that has a narrow entrance for fish. The net is staked to the bottom of the bayou and bait is placed in the closed end of the net. Fish swim in to eat the bait but cannot exit the net. The fish can be collected when the net is lifted out of the water.

The hoop nets tested in this project were effective in capturing larger fish such as catfish but were not effective in capturing the smaller forage fish that were the target species for collection.

3.2.3 Trawling Net

The third and final method tested for collecting fish was by dragging nets through the water from a trawling boat. This method was very successful and was used for collecting fish at a total of 17 locations, including locations in the canals, the lake and in Schooner Bayou.

The field team and two local fishermen successfully used a double-rigged trawling boat to collect fish at each location attempted. The boat had rigid booms with nets extending from both sides of the boat. When the boat moved forward, the booms were lowered into the water to drag mesh trawl nets. Fish entered the wide open end of the cone shaped net, and then accumulated in the tail end of the net, which tapered to a narrow end. The tail end of the trawling net, filled with fish, was pulled onto the boat by an attached line. The full end of the net, kept closed by a rope, was released to dump fish into a collection basket or onto a sorting table in the back of the boat.

The trawling boat was navigated to each sampling location by using the GPS coordinates for each location where crabs had already been collected. The nets were lowered into the water and dragged for approximately 200 yards. The net containing fish was brought onto the boat and the field team sorted the fish by throwing back into the water all fish by-catch and shad that were smaller than seven centimeters long. The fish were collected into labeled clean five-gallon buckets with a small amount of ambient water and a loosely applied lid. Fish were immediately put on ice at the landing, and then weighed and measured or packaged for shipping to the laboratory. Field record forms that documented the location, time, and quantity of fish collected were completed for each fish sampling location. Table 3 shows a summary of the fish collection effort.

3.4 Collection Effort

The sampling team worked ten days in order to collect a sufficient number of crabs and fish to satisfy the requirements for tissue analyses. This involved checking crab traps a total of 51 times, attempting to cast net for fish at 15 locations and trawling for fish at 17 locations. Table 4 is an activity log that shows the effort required to collect fish and crabs for the project.

3.5 Collecting Sufficient Quantity of Samples for the Laboratory

The field team had a goal of providing the laboratory with sufficient crab and fish tissue to perform analyses. The guidance in the plan was that each sample composite consist of the same species, and the composite must be able to deliver 50 to 60 grams (25 to 30 grams minimum) of tissue for chemical analysis.

The analytical laboratory, Columbia Analytical Services (CAS) provided their preferred and minimum tissue mass requirement for the project.

4.0 Project Goal 2: Accurately Record and Document the Crab and Fish Collection Event

The accurate record that is generated during the sampling effort is important because it becomes the document of information that supports the analytical results. The following section describes the written documentation generated by the field team to record the events that occurred while collecting crabs and fish. The field sampling event was documented by these records generated in the field: field logbook, digital photography, field record forms, labeling of samples, and chain of custody.

4.1 Field Logbook

The field logbook was used to record the sequence and times of events that occurred each day of the sampling project. Water chemistry measurements, crab and fish counts and measurements, GPS coordinates, and field efforts are recorded in the field logbook. The field logbook has been scanned and saved in electronic format (Appendix B).

4.2 Digital Photography

Sampling efforts and events were photographed and saved in electronic format and are reproduced in a photo log at the end of this document. Photographs were made of the field team collecting, weighing, and measuring crabs and fish, and of the habitat and general appearance of the surrounding ecosystem. Notes were made in the field logbook of photos taken. The photo log is attached as Appendix C.

4.3 Field Record Forms

Field record forms were filled out for each sample location where crabs or fish were collected. The field team began filling out the field record form on the boat while the samples were being collected.

Each time crabs or fish were successfully collected a field record form was initiated. The form includes the sample location ID, time, date, collection method (such as trap or net), GPS coordinates, estimated maximum water depth, sample type (such as crabs or fish), date the trap was set, type of bait used, a count or estimate of volume of crabs or fish collected, determination of gender (crabs only), and any comments. For sampling locations being visited for the first time, water chemistry measurements were recorded on the field record form including: rugged dissolved oxygen (RDO) (mg/L), temperature (°C), pH, conductivity (µS/cm), oxygen reducing potential (ORP) (V), turbidity (NTU), and depth (ft). The field record form was initiated on the boat when the samples were collected, and completed at the landing where weights and measurements could be taken and recorded. The field record form was copied and one copy accompanied the samples to the laboratory in a sealed plastic bag. The other copy has been scanned and saved in electronic format. The information recorded on the field record form was also recorded in ink in the project field logbook. The field record forms are attached as Appendix D.

4.4 Labeling Samples and Recording Measurements

At each location where crabs or fish were collected, crabs or fish collected from that location were put into a clean five-gallon bucket dedicated to that sample location and type of sample (crab or fish). The bucket was labeled using indelible ink with the sample location ID and the time. The information recorded on the labeled bucket was also recorded on the field record form and in the field logbook (see previous Section 4.1 on Field Logbook and Section 4.3 on Field Record Forms).

4.4.1 Labeling Fish Samples and Recording Measurements

Immediately upon returning to the landing, the fish from each labeled bucket were processed one sample location bucket at a time. For the first three locations where fish were collected (TR-02, TR-03, and TR-04), 20 to 30 fish per location were measured for length (maximum body length was measured from the anterior-most part of the fish to the tip of the longest caudal fin) and width, and weighed on a tabletop digital scale by a field team member wearing clean nitrile gloves. These fish measurements were recorded in the field logbook and on the field record form that had already been prepared in the field for that sample location. The weighing and measuring process for the fish from these first three locations proved to be time consuming due to the number of forage fish collected, and the team made a judgment call to estimate volumes of forage fish rather than to weigh and measure each individual fish.

For the 20 other sampling locations from which fish were collected, the field record forms were filled out with an estimate of total volume of fish rather than a measured length and width for each individual fish. All fish from a single sample location were recorded on the field record form that had been filled out in the field for that sample ID location, as well as in the field logbook.

To package fish for shipping, all fish from one sample location were wrapped in foil with their bodies touching the non-shiny or dull side of heavy duty aluminum foil. The exterior of the foil packet of fish was labeled with indelible ink with the project name (EWL Tissue Study), the site ID number, the letter F for fish, the date of sample (month/day/year), the time of collection (military time), and the collector's initials. The labeled foil fish packet was placed inside of a heavy duty plastic zip locked freezer bag and the plastic freezer bag was also labeled in indelible ink with the same label information that was on the foil packet of fish (project name, site ID number, the letter F for fish, date, time, and collector's initials). The labeled packet of fish was placed immediately on ice in a clean ice chest along with the field record form and the chain of custody, which were sealed inside of a plastic zip lock bag to protect against getting wet. Upon arriving at the Fed Ex location to ship the fish to the laboratory, the ice was replaced with dry ice, so that the fish were shipped frozen.

4.4.2 Labeling Crab Samples and Recording Measurements

Immediately upon returning to the landing, the crabs from each labeled bucket were processed one sample location bucket at a time by field team members wearing clean nitrile gloves. One field team member would get a crab out of the bucket and call out the sample location ID and whether the crab was male or female. Another field team member would weigh the crab on a tabletop digital scale, measure the crab's length (the lateral distance across the carapace from tip of spine to tip of spine) and width, and call out these measurements. Another team member would record the measurements on the field record form that had been filled out in the field for that sample ID location, as well as in the field logbook. The crab, now recorded was placed on ice in a clean cooler dedicated to one sample location. The ice was double bagged in heavy duty zip locked baggies so that excess water would not drown the crabs, and the crabs would arrive alive at the laboratory. The field record form and the chain of custody were placed inside of a sealed Ziplock® baggie and placed in the cooler with the crabs from one location.

4.4.3 Recorded Crab Weights and Measurements

Table 2 is a summary of average crab weights and measurements documented in this collection project. The crabs collected in White Lake and in the East White Lake Oil and Gas Field canals were generally larger crabs and the crabs collected in Schooner Bayou were generally smaller crabs by comparison. Figure 6 is a map showing the average weight of crabs collected by location.

A calculation was done that combined crab weight, length and width, and is described as crab fullness. It is average crab weight divided by the length times the width of the crab [gm/(cm x cm)]. This metric showed that the crabs in all habitats were of similar fullness. The crabs collected in the Lake and in the vicinity of the East White Lake Oil and Gas Field were of the same average fullness (1.9 gm/cm^2) and the crabs from Schooner Bayou Canal had slightly lower average fullness of 1.8 gm/cm^2. Figure 7 shows the average crab fullness by location.

Table 5 shows the length, width, weight and gender of each crab collected during the project.

4.5 Chain of Custody

A completed chain of custody accompanied the crabs and fish that were shipped overnight to Columbia Analytical Services Laboratory in Kelso, Washington. The chain of custody was copied, scanned and saved electronically for each shipment that left Fed-Ex in Lafayette, Louisiana during the sampling event.

The chain of custody listed each sample location ID that was shipped on a given day for all sample locations shipped, using this format: project name (EWL), Sample ID number, and C for crab or F for fish. Also recorded on the chain of custody were the sampling date, sampling time, project manager signature (John Rodgers), date of shipping, time of shipping, analytical methods required, and any comments.

The completed chain of custody was placed along with the field record form inside of a Ziplock$^{®}$ baggie inside of the ice chest and the whole ice chest was wrapped many times with packing tape. Appendix E has the chain of custody forms from the project and corrections made to the chain of custody.

5.0 Project Goal 3: Deliver Samples to the Laboratory of Acceptable Quality for Analysis

Field efforts were directed towards collecting, packaging and shipping the samples in such a way that the samples would be of sufficient quantity and of acceptable quality to be analyzed and the results usable for scientific risk assessment. Steps were taken to ensure this quality of data from the time the samples were collected to the time the samples arrived at the laboratory.

5.1 Quality Assurance Project Plan/Sampling Analysis and Assessment Plan for Crab and Forage Fish Tissue

The field efforts to achieve the ultimate goal of usable analytical results were numerous and were directed by the *Quality Assurance Project Plan/Sampling Analysis and Assessment Plan for Crab and Forage Fish Tissue* dated December 6, 2010 and prepared specifically for this sampling event. The plan for achieving quality in sampling and analysis is attached to this document as Appendix A.

The attached plan document (Appendix A) describes the quality assurance (QA) and quality control (QC) procedures to be used to determine COC concentrations in blue crab and/or forage fish tissue from the site, reference locations, and retail fish markets in the region. The QAPP was prepared consistent with the following documents: *EPA Requirements for Quality Assurance Project Plans*, EPA QA/R-5 (USEPA 2001) and *EPA Guidance for Quality Assurance Project Plans*, EPA QA/G-5 (USEPA 2002b), and *Protocol for Issuing Public Health Advisories for Chemical Contaminants in Recreationally Caught Fish and Shellfish* (LDHH et al. 2011). The collection methods, procedures and protocols follow the guidelines and recommendations of *Guidance for Assessing Chemical Contaminant Data for Use in Fish Advisories, Volume1: Fish Sampling and Analysis*, Third Edition (USEPA 2000a).

5.1.1 Contamination

Protecting against contamination is part of any protocol for generating acceptable data. Steps were taken during the sampling event to avoid introducing contaminants to the samples during handling. Some of the steps taken to prevent contamination included:

- Rinsing the fish and crabs collected in a small amount of ambient water.
- Placing samples in clean holding buckets, one dedicated bucket per location, to prevent contamination.
- Sealing the shipping container to prevent introduction of contaminants during travel from the field to the laboratory.
- Placing lids on the samples after collection.

- Cleaning ice chests and five gallon buckets with detergent and rinsing with clean water prior to use.

- Placing samples in foil and plastic bags, prior to placing them on ice.

5.1.2 Integrity

The effort to generate data of acceptable quality and to maintain sample integrity began at the time the samples were collected to the shipment and arrival at the laboratory. Sample integrity was maintained to prevent the loss of any COCs that might be present in the sample. The loss of COCs was prevented by some of the following actions:

- Ensuring that once collected, the fish and crabs remained intact without breaks or tears.

- Shipping crabs on sufficient quantities of ice to keep them cold for up to 48 hours, via priority overnight delivery service, so that they arrived at the laboratory within less than 24 hours from the time of sample collection.

- Shipping fish on dry ice via priority overnight delivery service to arrive at the laboratory within less than 24 hours from time of shipment.

- Shipping samples by Federal Express, which provides constant tracking of shipments.

5.1.3 Documentation

Field efforts directed towards the end result of acceptable analytical data included documentation of field sample collection and handling. Documentation demonstrates data integrity and allows for accurate interpretation of results. Some of the documentation efforts to achieve acceptable data quality included:

- Recording the time of all sample collection, relinquishment by the sample team, and time of sample arrival at the laboratory on the chain of custody Form.

- Documenting all sample collection and handling in writing

- Making any corrections to written documents and initialing and dating the corrections.

- Generating chain of custody forms and field record forms that have coinciding data and sample identification so that accuracy can be verified.

5.1.4 Instrumentation

Practical steps to ensure collecting valid data included following equipment procedures and being prepared with the appropriate supplies:

- All field equipment was inspected prior to sampling.
- The discrete water measurements meter and other instruments used by the field team were calibrated according to the manufacturer's operating instructions, on a daily basis.
- Field supplies and equipment were assembled prior to the sampling event and supplemented as needed (Table 6).

6.0 Project Goal 4: Follow the Written Sampling Plan

Following a standardized sample collection and handling procedures reduces the magnitude and sources of uncertainty and their frequency of occurrence. The field team followed the procedures outlined in the plan and made decisions to deviate from the plan only when necessary.

6.1 Standard Procedure

The field team used standardized sample collection and handling procedures. The field sampling team consisted of experienced personnel trained on all field procedures detailed in the plan. The field team worked together to ensure that the field sampling and sample handling activities were in accordance with the plan.

6.2 Deviating from Standard Procedure

When necessary, the field team made decisions to deviate from the written protocol. These events are listed below:

- Two additional sample locations were authorized in the field by Dr. Rodgers. They were TR-03A in the Schooner Bayou Canal and T-01A in the East White Lake Oil and Gas Field canals.

- After measuring and weighing shad fish from three locations, the decision was made to cease measuring individual fish and shift to estimating total volume of fish collected.

7.0 References

Louisiana Department of Health and Hospitals, Louisiana Department of Environmental Quality, Louisiana Department of Agriculture and Forestry and Louisiana Department of Wildlife and Fisheries. Protocol for Issuing Public Health Advisories for Chemical Contaminants in Recreationally Caught Fish and Shellfish Chemical Contamination of Fish and Shellfish in Louisiana. May 2011.

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U.S. EPA. 2000c. National Study of Chemical Residues in Lake Fish Tissue QAPP Final.

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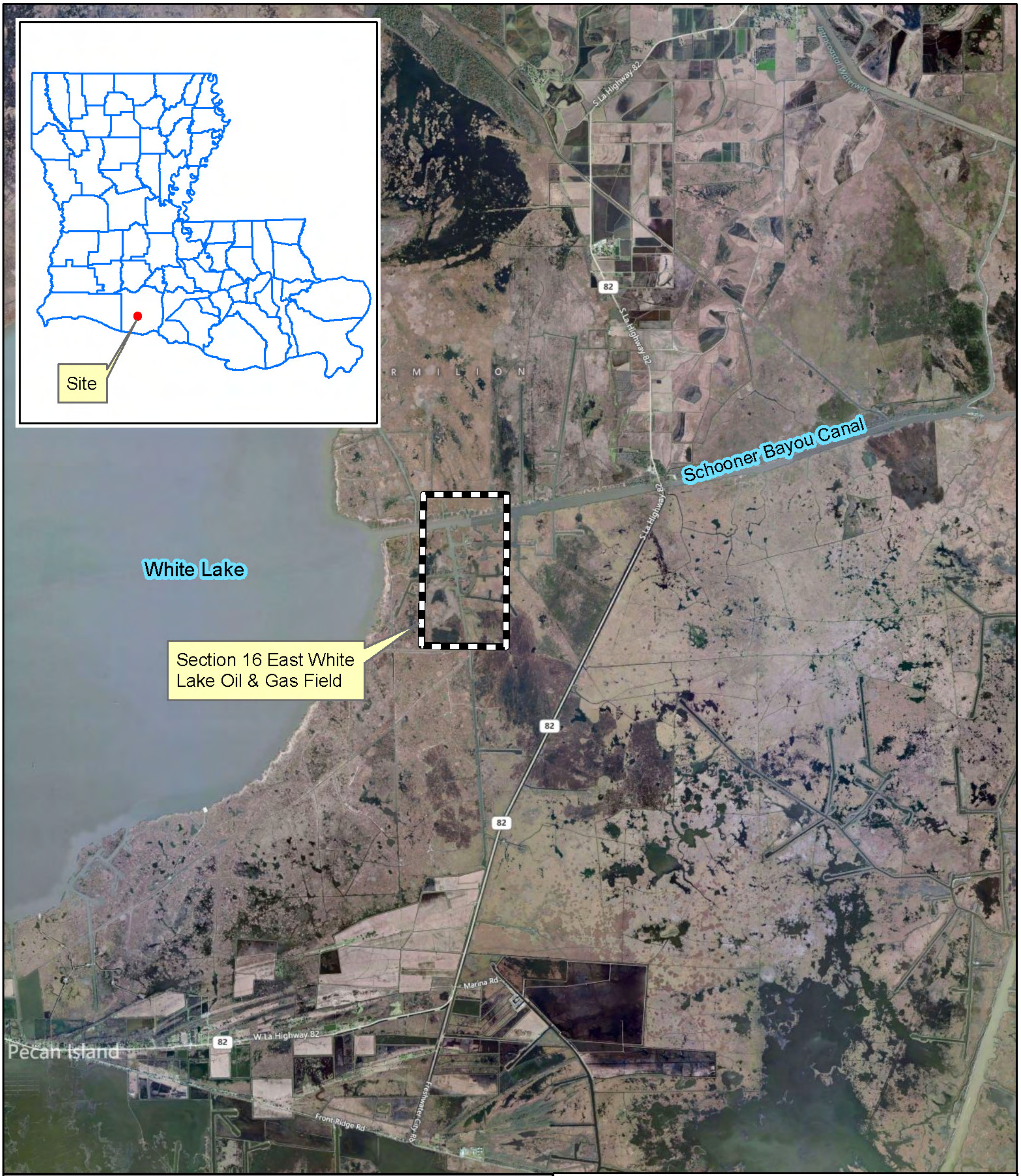
U.S. EPA. 2002a. Quality Assurance Report for the National Study of Chemical Residues in Lake Fish Tissue: Year 1 Analytical Data. United States Environmental protection Agency, Office of Water, Office of Science and Technology, Engineering and Analysis Division. 38 pp.

U.S. EPA. 2002b. Guidance for Quality Assurance Project Plans, EPA QA/G-5 (USEPA 2002).

Figures

East White Lake Oil and Gas Field
Vermilion Parish, Louisiana



Bing Maps hybrid basemap via ArcGIS Online.

Figure 1
Site Location
Crab & Fish Collection Report
East White Lake Field, Vermilion Parish, LA

MICHAEL PISANI & ASSOCIATES, INC.
Environmental Consulting Services
Houston, Texas New Orleans, Louisiana Baton Rouge, Louisiana

Designed: JRB	Drawn: JRB	Checked:	Date: 3/19/2012	Project: 07-47

● Crab and Fish Sampling Locations

0 2,500 5,000 10,000
Feet

N

Figure 2
Crab and Fish Sampling Locations
East White Lake Oil and Gas Field
Vermilion Parish, Louisiana

MICHAEL PISANI & ASSOCIATES, INC.
Environmental Management & Engineering Services
Houston, Texas New Orleans, Louisiana Baton Rouge, Louisiana

Designed: HRC	Drawn: HRC	Checked: MEP	Date:03/11/2012	Project: 07-47

● East White Lake Oil and Gas Field Site Locations

0 500 1,000 2,000
Feet

N

Figure 3
Site Sampling Locations
East White Lake Oil and Gas Field
Vermilion Parish, Louisiana

MICHAEL PISANI & ASSOCIATES, INC.
Environmental Management & Engineering Services
Houston, Texas New Orleans, Louisiana Baton Rouge, Louisiana

Designed: HRC	Drawn: HRC	Checked: MEP	Date:03/15/2012	Project: 07-47

● Reference Sampling Locations

Figure 4
Reference Sampling Locations
East White Lake Oil and Gas Field
Vermilion Parish, Louisiana

MICHAEL PISANI & ASSOCIATES, INC.
Environmental Management & Engineering Services
Houston, Texas New Orleans, Louisiana Baton Rouge, Louisiana

Designed: HRC	Drawn: HRC	Checked: MEP	Date:03/11/2012	Project: 07-47

Number of Crabs Collected per Location

- ● 5
- ● 6 - 11
- ● 12 - 13
- ● 14 - 15
- ● 16 - 18
- ● 19 - 28

0 2,000 4,000 8,000 12,000 Feet

N

Figure 5
Number of Crabs Collected per Location
East White Lake Oil and Gas Field
Vermilion Parish, Louisiana

MICHAEL PISANI & ASSOCIATES, INC.
Environmental Management & Engineering Services
Houston, Texas New Orleans, Louisiana Baton Rouge, Louisiana

Designed: HRC	Drawn: HRC	Checked: MEP	Date:03/15/2012	Project: 07-50

Average Crab Weight (gm)

- ● 167 - 175
- ● 176 - 200
- ● 201 - 208
- ● 209 - 227
- ● 228 - 240
- ● 241 - 251

0 2,000 4,000 8,000 12,000
Feet

N

Figure 6
Average Crab Weight by Location
East White Lake Oil and Gas Field
Vermilion Parish, Louisiana

MICHAEL PISANI & ASSOCIATES, INC.
Environmental Management & Engineering Services
Houston, Texas New Orleans, Louisiana Baton Rouge, Louisiana

Designed: HRC
Drawn: HRC
Checked: MEP
Date:03/15/2012
Project: 07-47

Average Crab Fullness (gm/cm2)

● 1.6 ● 1.8 ● 2.0

● 1.7 ● 1.9

Figure 7
Average Crab Fullness per Location
East White Lake Oil and Gas Field
Vermilion Parish, Louisiana

Michael Pisani & Associates, Inc.
Environmental Management & Engineering Services
Houston, Texas New Orleans, Louisiana Baton Rouge, Louisiana

Designed: HRC | Drawn: HRC | Checked: MEP | Date:03/15/2012 | Project: 07-47

Tables

East White Lake Oil and Gas Field
Vermilion Parish, Louisiana

Table 1

Water Chemistry Measurements

East White Lake Oil and Gas Field
Vermilion Parish, Louisiana

Site ID	Date	Time	Water Sample Depth [ft]	Temp [C]	pH [pH]	Cond [µS/cm]	Turb [NTU]	RDO [mg/L]	ORP [V]
T-01A	12/15/2010	1237	2.200	11.33	7.09	2871	367.0	9.24	0.16
T-01	12/20/2010	1236	1.000	12.15	7.40	3930	51.3	7.48	0.05
T-02	12/20/2010	1228	1.100	12.58	7.50	3946	48.1	8.37	0.11
T-02	12/21/2010	1104	1.100	13.84	7.40	4019	45.2	8.05	0.01
T-03	12/16/2010	1238	2.000	13.81	7.41	3154	70.1	9.45	0.09
T-04	12/16/2010	1237	1.200	13.61	7.47	3120	110.0	9.27	0.13
T-04	12/20/2010	1222	1.000	12.35	7.45	3965	45.9	8.05	0.14
T-05	12/20/2010	1208	1.100	12.11	7.46	3170	46.4	9.48	0.12
T-05	12/21/2010	1033	1.300	13.40	7.26	3512	46.5	8.95	0.07
T-06	12/16/2010	1215	1.000	13.79	7.25	3145	65.6	9.32	0.26
T-06	12/20/2010	1204	1.170	12.57	7.48	3185	48.2	9.83	0.13
T-07	12/21/2010	1018	1.100	12.97	6.91	2856	88.1	9.12	0.22
T-08	12/20/2010	1147	1.500	11.81	7.53	2768	95.2	9.72	0.15
T-09	12/16/2010	1143	1.500	12.73	6.82	2673	233.0	12.29	0.2
T-10	12/20/2010	1157	1.300	12.34	7.44	3200	48.5	9.30	0.18
T-11	12/21/2010	1053	1.300	13.49	7.41	3358	59.0	8.64	0.02
T-12	12/20/2010	1128	0.890	11.77	7.72	2755	92.3	9.29	0.18
TR-01	12/15/2010	1126	1.400	9.84	6.76	2523	52.0	11.56	0.21
TR-02	12/20/2010	1120	1.900	10.74	7.02	5239	18.2	7.25	0.19
TR-03A	12/14/2010	1507	1.000	8.84	7.49	2303	134.0	11.03	0.19
TR-03	12/20/2010	1107	1.000	11.66	6.99	2944	52.1	11.72	0.22
TR-04	12/14/2010	1450	1.400	9.89	7.45	2361	154.0	10.97	0.19
TR-05	12/14/2010	1440	0.833	8.81	7.50	2263	137.0	11.30	0.22
TR-06	12/14/2010	1347	0.910	8.60	7.40	2267	110.0	11.21	0.24
TR-07	12/14/2010	1350	1.170	8.56	7.44	2249	177.5	11.42	0.21
TR-08	12/14/2010	1425	1.600	8.75	7.44	2243	165.0	11.42	0.24
TR-09	12/14/2010	1400	0.500	8.47	7.44	2198	179.0	11.35	0.18

Notes:
Readings obtained using the In-Situ Troll 9500
Daily calibration conducted using In-Situ Inc, Quik Cal Solution

Table 2
Summary of Crab Measurements

East White Lake Field
Vermilion Parish, LA

	SCHOONER BAYOU CANAL REFERENCE LOCATIONS							EAST WHITE LAKE REFERENCE LOCATIONS					FORMER OIL AND GAS CANALS													
Crab Habitat	**BAYOU**							**LAKE**					**CANALS**													
Sample Location ID	**TR-01**	**TR-02**	**TR-03**	**TR-03A**	**TR-04**	**TR-05**	**Totals and Averages for TR-01 through TR-05 (BAYOU)**	**TR-06**	**TR-07**	**TR-08**	**TR-09**	**Totals and Averages for TR-06 through TR-09 (LAKE)**	**T-01**	**T-01A**	**T-02**	**T-03**	**T-04**	**T-05**	**T-06**	**T-07**	**T-08**	**T-09**	**T-10**	**T-11**	**T-12**	**Totals and Averages for T-01 through T-12 (CANALS)**
Total Number of Crabs Collected per Location	11	15	14	12	18	11	**81**	5	11	10	11	**37**	11	15	28	17	12	17	18	14	13	5	17	8	14	**189.0**
Number of Times Trap Was Checked per Location (1)	2	5	3	1	3	1	**15**	1	1	1	1	**4**	2	1	3	2	2	3	2	4	3	1	3	3	3	**32**
Average Crab Weight (gm)	207.0	169.0	171.0	186.0	207.0	235.0	**194.0**	231.0	240.0	218.0	245.0	**233.5**	206.0	223.0	222.0	214.0	228.0	210.0	204.0	212.0	255.0	184.0	212.0	226.0	190.0	**216**
Average Crab Width (cm)	16.0	15.1	15.4	16.0	15.8	18.0	**16.0**	16.2	17.2	17.3	17.5	**17.1**	15.6	16.6	16.5	16.4	15.8	16.0	15.9	16.2	17.0	16.2	15.9	16.5	15.4	**16.2**
Average Crab Length (cm)	7.0	6.4	6.5	6.7	6.7	7.3	**6.7**	7.1	7.1	7.2	7.5	**7.3**	6.8	7.2	7.1	6.9	7.1	6.9	6.8	7.1	7.3	6.8	6.9	7.2	6.6	**7.0**
Average Crab Fullness (gm/cm^2)	1.8	1.7	1.6	1.7	1.9	1.8	**1.8**	2.0	1.9	1.7	1.8	**1.9**	1.9	1.9	1.9	1.9	2.0	1.9	1.9	1.8	2.0	1.6	1.9	1.9	1.8	**1.9**

(1) Crab traps were checked and harvested for crabs until a minimum of 5 crabs were collected, as required for lab tissue analysis

(2) "Crab fullness" combines crab size and weight, and is calculated as (crab weight in grams)/(crab length x crab width in centimeters)

gm - gram
cm - centimeter
(gm/cm)^2 - gram per centimeter squared

Table 3
Fish Collection Data

East White Lake Field
Vermilion Parish, Louisiana

Fish Sampling Location	Fish Collection Date	Time Collected	Method of Collection	Type of Fish	Volume Collected or Number Collected
TR-01	12/15/10	11:26	Hoop net	*Lepomis macrochirus*	4
TR-02	12/21/10	13:15	Cast net	*Dorosoma cepedianum*	22
TR-03	12/21/10	14:00	Cast net	*Dorosoma cepedianum*	30
TR-04	12/21/10	14:20	Cast net	*Dorosoma cepedianum*	12
TR-04A	12/21/10	14:20	Cast net	*Lepomis macrochirus*	2
TR-05	1/4/11	9:30	Trawling net	*Dorosoma cepedianum*	1/2 bucket
TR-06	1/4/11	9:45	Trawling net	*Dorosoma cepedianum*	approximately 50
TR-07	1/4/11	10:50	Trawling net	*Dorosoma cepedianum*	1/2 bucket
TR-08	1/4/11	10:05	Trawling net	*Dorosoma cepedianum*	1/4 bucket
TR-09	1/4/11	10:28	Trawling net	*Dorosoma cepedianum*	not recorded
T-01	1/5/11	12:30	Trawling net	*Dorosoma cepedianum*	1/8 of bucket
T-02	1/5/11	12:30	Trawling net	*Dorosoma cepedianum*	1/8 of bucket
T-03	1/5/11	13:30	Trawling net	*Dorosoma cepedianum*	1/4 of bucket
T-04	1/5/11	13:40	Trawling net	*Dorosoma cepedianum*	not recorded
T-05	1/5/11	13:20	Trawling net	*Dorosoma cepedianum*	1/4 of bucket
T-06	1/5/11	13:50	Trawling net	*Dorosoma cepedianum*	1/4 of bucket
T-07	1/5/11	15:10	Trawling net	*Dorosoma cepedianum*	1/3 of bucket
T-08	1/5/11	15:05	Trawling net	*Dorosoma cepedianum*	1/3 of bucket
T-09	1/5/11	14:55	Trawling net	*Dorosoma cepedianum*	1/2 of bucket
T-10	1/5/11	13:55	Trawling net	*Dorosoma cepedianum*	1/2 of bucket
T-11	1/5/11	14:05	Trawling net	*Dorosoma cepedianum*	1/4 of bucket
T-12	1/5/11	14:45	Trawling net	*Dorosoma cepedianum*	1/4 of bucket

Notes:

Lepomis machrochirus - bream/bluegill
Dorosoma cepedianum - shad
A 5-gallon bucket was used for collection and measuring when referencing bucket volume

Table 4
Field Activity Log

East White Lake Field
Vermilion Parish, Louisiana

Date	Field Personel	Photograph procedures and sampling area	Set crab traps at sample locations	Calibrate water quality instrument and record water chemistry	Field planning and safety meeting Assemble supplies and equipment	Check traps for crabs and re-bait traps	Collect crabs from traps	Check hoop net for fish	Collect fish from cast net or hoop net	Weigh/measure/package crabs/fish/bait for shipping	Collect fish by trawlling from boat	Additional activities conducted	Complete field documentation and chain of custody forms - Ship samples overnight to lab
12/13/10	Gajan, Helen, Patrick, Mitchell	√	Set crab traps at TR-01 through TR-09, and T-01 through T-12		√				Tested cast net technique at 2 locations chosen by Gajan and at locations T-07, T-08, T-02, T-06, T-10, and TR-05 and TR-04			Recorded GPS coordinates of all crab trap locatioins	
12/14/10	Gajan, Helen, Patrick, John	√		Recorded water chemistry at locations: TR-01, TR-02, TR-03, TR-03A, TR-04, TR-05, TR-06, TR-07, TR-08, TR-09	√	Checked traps for crabs at locations: TR-01, TR-02, TR-03, TR-03A, TR-04 (twice), TR-05, TR-06, TR-07, TR-08, and TR-09	Collected crabs at locations: TR-03A, TR-04, TR-05, TR-06, TR-07, TR-08, and TR-09			√		Picked John up from the airport	Recorded and shipped crabs from locations: TR-03A, TR-04, TR-05, TR-06, TR-07, TR-08, and TR-09
12/15/10	Gajan, Helen, Patrick, John	√		Recorded water chemistry at locations TR-01, TR-02, T-01A	√	Checked traps for crabs at locations TR-01, TR-02, T-01A		Checked hoop net for fish at location TR-01	Collected a bream fish at location TR-01	√			Recorded and shipped crabs from locations: TR-01 and T-01A, fish from TR-01, and catfish bait
12/16/10	Gajan, Helen, Patrick, John	√	Set hoop nets at locations: T-07, between T-05 and T-06, and T-12	Recorded water chemistry at locations T-09, T-06, T-04, T-03	√	Checked traps for crabs at locations T-12, T-09, T-08, T-07, T-05, T-06, T-10, T-04, T-03, T-02, T-01, T-11, and TR-02	Collected crabs from T-09, T-06, T-04, and T-03			√		Had lunch on barge	Recorded and shipped crabs from locations: T-03, T-04, T-06, and T-09
12/20/10	Gajan, Helen, Patrick, John	√		Measured water chemistry at locations: TR-03, TR-02, T-12, 08, 10, 06, 05, 04, 02, 01	√√ (two meetings)	Checked traps for crabs at: TR-03, TR-02, T-12, 08, 07, 10, 06, 05, 11, 04, 02, 01	Collected crabs from locations: TR-03, TR-02, T-12, 08, 10, 06, 05, 04, 02, 01			√			Recorded and shipped crabs from locations: TR-03, TR-02, T-12, T-08, T-10, T-06, T-05, T-04, T-02, and T-01
12/21/10	Gajan, Helen, Patrick, John	√		Recorded water chemistry at locations: T-07, T-05, T-11, T-02	√	Checked traps for crabs at: T-07, T-05, T-11, and T-02	Collected crabs from locations: T-07, T-05, T-11, and T-02	Checked hoop nets for fish at T-12 and T-09	Collected fish from TR-02, TR-03, TR-04, and TR-04A, and T-02 and T-05	√			Recorded and shipped crabs from locations: T-02, T-05, T-07, T-11 and fish from locations TR-02, TR-03, TR-04, TR-04A, T-02, T-05
1/3/11	Gajan, Helen, Patrick, John	√			√	Checked traps for crabs at: TR-02, TR-03, TR-04 and T-03,T-07, T-08, T-10, and T-12	Collected crabs from locations: TR-02, TR-03, TR-04 and T-03, T-07, T-08, T-10, and T-12			√			Recorded and shipped crabs from locations: TR-02, TR-03, TR-04 and T-03, T-07, T-08, T-10, and T-12
1/4/11	Gajan, Helen, Patrick, John, Robert	√			√						Collected fish by trawling nets at locations: TR-05, TR-06, TR-08, TR-09, and TR-07	Suspended fish trawling to update scientific fish collection permit with Louisiana Department of Wildlife and Fisheries	
1/5/11	Helen, Patrick, John, Robert, Deckhand	√			√					√	Collected fish by trawling nets at locations: T-01, T-02, T-05, T-03, T-04, T-06, T-10, T-11, T-12, T-09, T-08, and T-07	Obtained updated scientific fish collection permit from Louisiana Department of Wildlife and Fisheries	
1/6/11													Shipped fish collected at locations: T-01, T-02, T-05, T-03, T-04, T-06, T-10, T-11, T-12, T-09, T-08, T-07, and TR-05, TR-06, TR-08, TR-09, and TR-07

GPS coordinates were measured using a handheld DeLorme Earthmate PN-40
Field personnel included Helen Connelly (Michael Pisani & Associates), Patrick Ritchie (Michael Pisani & Associates), John Rodgers (Clemson University), Julian Gajan (fisherman), Mitchell (deckhand), Robert (trawling boat captain)
Weight of crabs and fish was measured using a digital tabletop scale in grams
Water chemistry measurements were made using an In-Situ Troll 9500. Daily calibration was performed using In-Situ Inc, Quik Cal Solution. Measurements included: RDO, Temp, pH, Conductivity, ORP, Turbidity, Depth, and Time

Table 5
Crab Counts and Measurements

East White Lake Field
Vermilion Parish, Louisiana

Crab Sampling Location	Crab Collection Date	Gender (M/F)	Length (cm)	Width (cm)	Weight (gm)	Fullness [Weight/(length x width)] (gm/cm^2)
TR-01	12/15/10	M	7.0	17.0	258	2.2
	12/15/10	M	7.5	16.0	243	2.0
	12/15/10	M	7.0	14.5	162	1.6
	12/15/10	M	6.0	13.5	125	1.5
	12/15/10	F	7.5	17.5	209	1.6
	12/15/10	M	7.5	17.0	267	2.1
	12/15/10	M	7.5	17.0	213	1.7
	12/15/10	M	7.5	17.0	211	1.7
	12/15/10	M	6.5	16.0	202	1.9
	12/15/10	M	5.5	13.0	101	1.4
	12/15/10	M	8.0	17.0	283	2.1
TR-01 - Totals and Averages		11	7.0	16.0	207	1.8
TR-02	12/20/10	M	6.0	14.0	146	1.7
	12/20/10	M	6.5	14.5	172	1.8
	12/20/10	M	6.0	14.5	160	1.8
	12/20/10	M	7.0	16.5	217	1.9
	12/20/10	M	6.5	15.5	204	2.0
	01/03/11	M	6.0	13.5	143	1.8
	01/03/11	F	6.0	15.0	128	1.4
	01/03/11	F	7.5	17.0	186	1.5
	01/03/11	M	5.5	13.0	116	1.6
	01/03/11	F	7.5	18.0	201	1.5
	01/03/11	M	6.5	15.0	174	1.8
	01/03/11	M	7.5	18.5	256	1.8
	01/03/11	M	6.0	14.0	148	1.8
	01/03/11	F	6.0	15.0	139	1.5
	01/03/11	M	5.5	12.5	139	2.0
TR-02 - Totals and Averages		15	6.4	15.1	169	1.7
TR-03	12/20/10	M	6.0	14.5	135	1.6
	12/20/10	F	6.0	15.5	108	1.2
	12/20/10	M	6.5	15.0	162	1.7
	12/20/10	F	6.0	13.5	124	1.5
	12/20/10	F	6.0	14.5	121	1.4
	12/20/10	F	6.5	17.0	194	1.8
	12/20/10	M	8.5	20.0	383	2.3
	01/03/11	M	7.5	17.5	138	1.1
	01/03/11	M	7.5	15.0	318	2.8
	01/03/11	F	5.5	13.0	107	1.5
	01/03/11	F	6.0	14.5	135	1.6
	01/03/11	F	7.5	18.0	229	1.7
	01/03/11	M	6.0	13.0	118	1.5
	01/03/11	M	6.0	15.0	127	1.4
TR-03 - Totals and Averages		14	6.5	15.4	171	1.6

Table 5
Crab Counts and Measurements

East White Lake Field
Vermilion Parish, Louisiana

Crab Sampling Location	Crab Collection Date	Gender (M/F)	Length (cm)	Width (cm)	Weight (gm)	Fullness [Weight/(length x width)] (gm/cm^2)
TR-03A	12/14/10	M	8.0	17.0	298	2.2
	12/14/10	M	6.0	14.5	141	1.6
	12/14/10	F	6.0	15.5	146	1.6
	12/14/10	F	7.0	17.0	181	1.5
	12/14/10	M	5.5	14.0	152	2.0
	12/14/10	M	7.0	16.0	209	1.9
	12/14/10	F	7.0	19.0	191	1.4
	12/14/10	M	6.5	16.0	201	1.9
	12/14/10	M	6.0	14.5	149	1.7
	12/14/10	F	6.0	14.5	132	1.5
	12/14/10	F	7.0	16.5	167	1.4
	12/14/10	M	8.0	18.0	259	1.8
TR-03A - Totals and Averages		12	6.7	16.0	186	1.7
TR-04	12/14/10	M	6.0	16.0	167	1.7
	12/14/10	M	8.0	20.0	305	1.9
	12/14/10	M	5.5	14.0	122	1.6
	12/14/10	M	5.5	13.5	116	1.6
	12/14/10	M	6.0	12.5	127	1.7
	12/14/10	M	5.5	13.5	118	1.6
	12/14/10	M	6.0	15.0	161	1.8
	12/14/10	F	6.0	13.0	98	1.3
	01/03/11	M	8.5	19.0	424	2.6
	01/03/11	M	8.0	20.0	403	2.5
	01/03/11	M	5.5	13.0	130	1.8
	01/03/11	M	6.5	13.5	149	1.7
	01/03/11	M	7.5	17.5	291	2.2
	01/03/11	F	7.5	19.0	267	1.9
	01/03/11	F	7.5	17.0	219	1.7
	01/03/11	F	7.5	18.0	224	1.7
	01/03/11	F	6.5	15.0	125	1.3
	01/03/11	M	7.5	15.5	274	2.4
TR-04 - Totals and Averages		18	6.7	15.8	207	1.9
TR-05	12/14/10	M	7.0	17.0	262	2.2
	12/14/10	F	7.5	18.5	127	0.9
	12/14/10	F	7.0	18.0	189	1.5
	12/14/10	F	7.0	17.0	194	1.6
	12/14/10	F	8.0	20.0	344	2.2
	12/14/10	F	8.0	18.5	289	2.0
	12/14/10	M	8.0	19.5	373	2.4
	12/14/10	F	6.0	15.5	134	1.4
	12/14/10	M	7.5	18.5	273	2.0
	12/14/10	M	7.0	17.5	227	1.9
	12/14/10	F	7.0	18.0	172	1.4
TR-05 - Totals and Averages		11	7.3	18.0	235	1.8

Table 5
Crab Counts and Measurements

East White Lake Field
Vermilion Parish, Louisiana

Crab Sampling Location	Crab Collection Date	Gender (M/F)	Length (cm)	Width (cm)	Weight (gm)	Fullness [Weight/(length x width)] (gm/cm^2)
TR-06	12/14/10	M	7.5	16.5	269	2.2
	12/14/10	M	7.0	16.0	232	2.1
	12/14/10	F	7.5	17.0	222	1.7
	12/14/10	M	6.5	15.0	179	1.8
	12/14/10	M	7.0	16.5	253	2.2
TR-06 - Totals and Averages		5	7.1	16.2	231	2.0
TR-07	12/14/10	M	7.5	17.0	288	2.3
	12/14/10	M	7.5	18.0	258	1.9
	12/14/10	M	6.5	16.5	186	1.7
	12/14/10	F	7.5	19.5	256	1.8
	12/14/10	M	7.5	17.5	283	2.2
	12/14/10	M	8.0	18.0	323	2.2
	12/14/10	F	6.5	16.0	162	1.6
	12/14/10	M	7.5	18.0	254	1.9
	12/14/10	M	8.5	20.0	358	2.1
	12/14/10	F	5.5	14.5	128	1.6
	12/14/10	M	6.0	14.0	140	1.7
TR-07 - Totals and Averages		11	7.1	17.2	240	1.9
TR-08	12/14/10	F	7.0	16.5	187	1.6
	12/14/10	M	6.5	16.0	187	1.8
	12/14/10	F	7.5	18.0	228	1.7
	12/14/10	F	6.5	17.5	147	1.3
	12/14/10	F	7.0	16.5	207	1.8
	12/14/10	F	8.5	19.5	292	1.8
	12/14/10	M	7.5	17.5	217	1.7
	12/14/10	M	8.0	18.5	302	2.0
	12/14/10	M	6.0	14.5	152	1.7
	12/14/10	M	7.5	18.0	263	1.9
TR-08 - Totals and Averages		10	7.2	17.3	218	1.7
TR-09	12/14/10	F	7.5	18.0	231	1.7
	12/14/10	M	8.0	19.0	293	1.9
	12/14/10	F	7.0	16.0	199	1.8
	12/14/10	F	7.0	17.0	174	1.5
	12/14/10	M	7.5	17.0	279	2.2
	12/14/10	F	8.0	19.0	298	2.0
	12/14/10	F	7.5	17.5	221	1.7
	12/14/10	F	9.0	18.5	347	2.1
	12/14/10	M	6.5	15.0	143	1.5
	12/14/10	M	7.0	15.5	173	1.6
	12/14/10	M	8.0	19.5	339	2.2
TR-09 - Totals and Averages		11	7.5	17.5	245	1.8

Note: One female crab was dead and not shipped from TR-06 on 12/14/10. A total of 5 crabs were shipped from TR-06 on 12/14/10.

Table 5
Crab Counts and Measurements

East White Lake Field
Vermilion Parish, Louisiana

Crab Sampling Location	Crab Collection Date	Gender (M/F)	Length (cm)	Width (cm)	Weight (gm)	Fullness [Weight/(length x width)] (gm/cm^2)
T-01	12/20/10	M	7.0	16.0	171	1.5
	12/20/10	M	6.5	14.5	180	1.9
	12/20/10	M	6.5	14.0	177	1.9
	12/20/10	M	7.0	16.5	234	2.0
	12/20/10	M	7.5	17.0	255	2.0
	12/20/10	M	7.0	16.5	222	1.9
	12/20/10	M	7.5	18.0	273	2.0
	12/20/10	M	7.0	16.0	213	1.9
	12/20/10	M	5.5	12.0	139	2.1
	12/20/10	F	6.0	14.5	148	1.7
	12/20/10	M	7.5	16.5	253	2.0
TR-01 - Totals and Averages		11	6.8	15.6	206	1.9
T-01A	12/15/10	M	6.5	14.0	186	2.0
	12/15/10	M	7.0	16.0	219	2.0
	12/15/10	M	7.0	16.5	175	1.5
	12/15/10	M	7.5	17.0	263	2.1
	12/15/10	M	7.0	17.0	205	1.7
	12/15/10	M	7.5	18.0	240	1.8
	12/15/10	M	7.0	15.5	213	2.0
	12/15/10	M	7.0	16.0	234	2.1
	12/15/10	F	7.5	18.5	219	1.6
	12/15/10	M	7.0	15.0	205	2.0
	12/15/10	M	6.5	15.0	181	1.9
	12/15/10	M	6.5	16.0	197	1.9
	12/15/10	M	8.0	18.0	294	2.0
	12/15/10	M	7.5	18.0	247	1.8
	12/15/10	F	8.0	18.5	263	1.8
T-01A - Totals and Averages		15	7.2	16.6	223	1.9
T-02	12/20/10	M	5.5	13.0	115	1.6
	12/20/10	M	7.5	16.0	258	2.2
	12/20/10	F	8.0	18.0	276	1.9
	12/20/10	M	6.5	16.0	180	1.7
	12/20/10	M	7.0	16.0	229	2.0
	12/20/10	M	7.0	18.0	238	1.9
	12/20/10	M	7.5	19.0	276	1.9
	12/20/10	M	6.5	15.5	174	1.7
	12/20/10	M	6.5	15.0	196	2.0
	12/20/10	M	7.0	17.5	244	2.0
	12/20/10	M	7.5	16.0	284	2.4
	12/21/10	M	6.0	14.5	129	1.5
	12/21/10	M	7.5	16.0	232	1.9
	12/21/10	M	8.0	19.0	328	2.2
	12/21/10	M	7.0	16.5	219	1.9
	12/21/10	M	7.0	16.5	212	1.8
	12/21/10	M	7.5	18.0	246	1.8
	12/21/10	M	7.5	17.0	270	2.1
	12/21/10	M	6.5	15.5	145	1.4
	12/21/10	M	6.5	16.0	179	1.7
	12/21/10	M	7.0	16.5	213	1.8
	12/21/10	M	8.0	18.5	238	1.6
	12/21/10	M	7.0	15.0	186	1.8
	12/21/10	M	8.0	18.0	292	2.0
	12/21/10	M	6.5	16.0	207	2.0
	12/21/10	M	7.0	15.0	168	1.6
	12/21/10	M	7.5	16.0	211	1.8
	12/21/10	M	8.0	17.0	260	1.9
T-02 - Totals and Averages		28	7.1	16.5	222	1.9

Table 5
Crab Counts and Measurements

East White Lake Field
Vermilion Parish, Louisiana

Crab Sampling Location	Crab Collection Date	Gender (M/F)	Length (cm)	Width (cm)	Weight (gm)	Fullness [Weight/(length x width)] (gm/cm^2)
T-03	12/16/10	M	6.5	15.5	178	1.8
	12/16/10	M	7.0	15.0	212	2.0
	12/16/10	M	7.0	16.0	194	1.7
	12/16/10	M	5.5	13.5	130	1.8
	12/16/10	M	6.0	13.5	156	1.9
	01/03/11	M	7.0	17.0	195	1.6
	01/03/11	M	7.5	18.0	249	1.8
	01/03/11	M	6.5	15.0	201	2.1
	01/03/11	F	7.5	19.0	263	1.8
	01/03/11	M	6.5	15.5	183	1.8
	01/03/11	M	7.5	17.5	261	2.0
	01/03/11	M	7.0	17.5	229	1.9
	01/03/11	M	6.5	14.5	168	1.8
	01/03/11	F	7.5	18.5	203	1.5
	01/03/11	M	7.0	16.0	287	2.6
	01/03/11	F	7.5	18.5	265	1.9
	01/03/11	F	8.0	19.0	268	1.8
T-03 - Totals and Averages		17	6.9	16.4	214	1.9
T-04	12/16/10	M	7.0	16.0	201	1.8
	12/16/10	M	7.5	17.5	289	2.2
	12/16/10	M	6.5	14.5	172	1.8
	12/16/10	M	6.5	15.0	182	1.9
	12/16/10	M	8.0	18.0	298	2.1
	12/20/10	M	6.0	11.5	176	2.6
	12/20/10	M	6.5	13.5	148	1.7
	12/20/10	M	7.0	16.5	281	2.4
	12/20/10	M	7.5	16.0	237	2.0
	12/20/10	M	7.5	17.5	239	1.8
	12/20/10	M	7.5	15.5	209	1.8
	12/20/10	M	8.0	18.0	301	2.1
T-04 - Totals and Averages		12	7.1	15.8	228	2.0
T-05	12/20/10	F	7.5	18.5	217	1.6
	12/20/10	M	7.0	16.0	211	1.9
	12/20/10	M	6.5	14.5	151	1.6
	12/20/10	M	7.0	17.0	262	2.2
	12/20/10	M	7.5	17.5	251	1.9
	12/20/10	M	8.5	20.0	362	2.1
	12/20/10	M	6.0	13.5	169	2.1
	12/20/10	M	5.5	13.0	127	1.8
	12/21/10	M	6.5	15.0	174	1.8
	12/21/10	M	6.5	14.0	173	1.9
	12/21/10	M	7.0	15.5	188	1.7
	12/21/10	M	8.0	18.0	292	2.0
	12/21/10	F	7.5	17.5	227	1.7
	12/21/10	M	6.5	14.5	161	1.7
	12/21/10	M	6.5	15.0	177	1.8
	12/21/10	M	7.0	16.5	211	1.8
	12/21/10	M	7.0	16.0	222	2.0
T-05 - Totals and Averages		17	6.9	16.0	210	1.9

Table 5
Crab Counts and Measurements

East White Lake Field
Vermilion Parish, Louisiana

Crab Sampling Location	Crab Collection Date	Gender (M/F)	Length (cm)	Width (cm)	Weight (gm)	Fullness [Weight/(length x width)] (gm/cm^2)
T-06	12/16/10	M	7.0	16.0	214	1.9
	12/16/10	M	6.5	16.0	199	1.9
	12/16/10	M	6.5	14.5	139	1.5
	12/16/10	M	7.0	17.5	221	1.8
	12/16/10	M	6.5	16.0	193	1.9
	12/16/10	F	7.0	15.5	184	1.7
	12/16/10	M	7.0	16.5	233	2.0
	12/16/10	M	6.5	14.0	198	2.2
	12/20/10	M	6.5	14.5	178	1.9
	12/20/10	M	7.0	17.0	192	1.6
	12/20/10	M	8.0	16.5	298	2.3
	12/20/10	M	7.0	15.5	172	1.6
	12/20/10	M	7.0	16.5	215	1.9
	12/20/10	M	8.0	19.5	309	2.0
	12/20/10	M	6.5	14.5	174	1.8
	12/20/10	M	6.0	14.0	167	2.0
	12/20/10	M	6.0	15.0	154	1.7
	12/20/10	M	6.5	16.5	231	2.2
T-06 - Totals and Averages		18	6.8	15.9	204	1.9
T-07	12/21/10	M	7.0	15.0	191	1.8
	12/21/10	F	7.0	16.0	171	1.5
	12/21/10	M	7.0	15.5	197	1.8
	12/21/10	M	8.0	18.0	275	1.9
	12/21/10	M	7.5	17.5	240	1.8
	01/03/11	M	8.0	19.0	297	2.0
	01/03/11	M	6.5	15.0	166	1.7
	01/03/11	M	8.0	17.5	288	2.1
	01/03/11	M	7.0	16.5	226	2.0
	01/03/11	M	6.0	14.0	132	1.6
	01/03/11	M	7.0	16.0	210	1.9
	01/03/11	M	6.0	14.5	156	1.8
	01/03/11	M	7.0	16.0	246	2.2
	01/03/11	F	7.5	16.0	167	1.4
T-07 - Totals and Averages		14	7.1	16.2	212	1.8
T-08	12/20/10	M	7.0	17.5	264	2.2
	12/20/10	M	7.5	17.0	287	2.3
	12/20/10	M	7.0	16.0	224	2.0
	12/20/10	F	7.0	16.5	214	1.9
	12/20/10	F	6.5	16.0	171	1.6
	01/03/11	M	7.5	16.0	208	1.7
	01/03/11	M	8.0	18.0	256	1.8
	01/03/11	M	8.0	18.5	352	2.4
	01/03/11	M	7.5	15.0	254	2.3
	01/03/11	M	8.0	19.0	351	2.3
	01/03/11	M	6.5	15.5	196	1.9
	01/03/11	M	7.0	17.5	240	2.0
	01/03/11	M	7.5	18.0	296	2.2
T-08 - Totals and Averages		13	7.3	17.0	255	2.0

Table 5
Crab Counts and Measurements

East White Lake Field
Vermilion Parish, Louisiana

Crab Sampling Location	Crab Collection Date	Gender (M/F)	Length (cm)	Width (cm)	Weight (gm)	Fullness [Weight/(length x width)] (gm/cm^2)
T-09	12/16/10	M	7.0	16.0	227	2.0
	12/16/10	M	7.0	16.0	138	1.2
	12/16/10	M	7.0	17.0	223	1.9
	12/16/10	M	6.0	14.5	127	1.5
	12/16/10	F	7.0	17.5	203	1.7
T-09 - Totals and Averages		5	6.8	16.2	184	1.6
T-10	12/20/10	M	7.5	18.0	286	2.1
	12/20/10	M	7.0	16.5	234	2.0
	12/20/10	M	6.5	13.5	161	1.8
	12/20/10	M	7.5	17.5	284	2.2
	12/20/10	M	6.0	15.5	155	1.7
	01/03/11	M	8.0	18.5	293	2.0
	01/03/11	M	7.0	14.5	195	1.9
	01/03/11	M	6.0	15.0	157	1.7
	01/03/11	M	7.0	14.5	220	2.2
	01/03/11	M	7.0	16.0	224	2.0
	01/03/11	M	7.0	16.0	196	1.8
	01/03/11	M	6.5	15.0	192	2.0
	01/03/11	M	8.0	17.0	289	2.1
	01/03/11	M	6.5	16.0	205	2.0
	01/03/11	M	6.5	14.5	187	2.0
	01/03/11	M	7.0	17.5	207	1.7
	01/03/11	F	6.0	15.0	125	1.4
T-10 - Totals and Averages		17	6.9	15.9	212	1.9
T-11	12/21/10	M	7.0	15.5	169	1.6
	12/21/10	M	7.0	16.5	201	1.7
	12/21/10	M	6.5	14.0	167	1.8
	12/21/10	M	7.0	17.0	220	1.8
	12/21/10	M	8.0	18.0	304	2.1
	12/21/10	M	7.5	18.0	266	2.0
	12/21/10	M	7.5	17.5	269	2.0
	12/21/10	M	7.0	16.0	228	2.0
T-11 - Totals and Averages		8	7.2	16.5	226	1.9
T-12	12/20/10	M	6.5	15.0	178	1.8
	12/20/10	M	6.0	14.5	135	1.6
	12/20/10	M	7.0	16.0	231	2.1
	01/03/11	M	8.0	19.0	357	2.3
	01/03/11	M	7.0	16.5	249	2.2
	01/03/11	M	6.5	15.0	202	2.1
	01/03/11	M	7.0	15.5	178	1.6
	01/03/11	M	6.5	14.5	182	1.9
	01/03/11	M	6.0	14.5	130	1.5
	01/03/11	M	7.0	16.0	214	1.9
	01/03/11	M	6.0	15.0	131	1.5
	01/03/11	M	7.0	15.0	198	1.9
	01/03/11	M	6.0	14.0	154	1.8
	01/03/11	F	6.0	14.5	124	1.4
T-12 - Totals and Averages		14	6.6	15.4	190	1.8

Table 6
Equipment Supply List for Crab and Forage Fish Tissue Sampling

East White Lake Field
Vermilion Parish, Louisiana

1 Sampling boat for collecting crabs (including boat, motor, oars, gas, and all required safety equipment)
2 Trawling boat for collecting fish (including boat, motor, oars, gas, and all required safety equipment)
3 Nets - (including trawls, hoop nets or cast nets)
3 Crab Traps
4 Coast Guard-approved personal floatation devices
5 Maps of sampling areas, sites and access routes
6 Global Positioning System (GPS) unit/batteries
7 pH meter (including associated calibration supplies)
8 Livewell and/or buckets
9 Metric ruler
10 Ice chests
11 Heavy duty aluminum foil
12 Heavy-duty food grade polyethylene bags
13 Large plastic bags
14 Knife or scissors
15 Clean nitrile gloves
16 Field Record Forms
17 Chain-of-Custody Forms
18 Scientific collection permit or fishing license
19 Ice
20 Dry ice
21 Black ballpoint pens and/or waterproof markers
22 Clipboard
23 Packing/strapping tape
24 Overnight courier airbill and laboratory shipping address
25 First aid kit and emergency telephone numbers
26 Tongs for picking up crabs
27 Hooked gaffe for picking traps up out of the water
28 Digital camera/batteries

Quality Assurance Plan/Sampling Analysis and Assessment Plan for Crab and Forage Fish Tissue

Appendix A

East White Lake Oil and Gas Field
Vermilion Parish, Louisiana

Environmental
Resources
Management

3838 North Causeway Boulevard
Suite 2725
Metairie, Louisiana 70002
(504) 831-6700
(504) 831-6742 (fax)

ERM

December 6, 2010

Mr. Chris Piehler, Administrator
Louisiana Department of Environmental Quality
Office of Environmental Compliance, Inspection Division
602 North Fifth Street
Baton Rouge, LA 70802

Mr. Glenn Cambre
Louisiana Department of Health and Hospitals
628 North 4th Street
Baton Rouge, Louisiana 70802

Mr. James H. Welsh
Commissioner of Conservation
Louisiana Department of Natural Resources (LDNR)
617 North Third Street, Ninth Floor
Baton Rouge, Louisiana 70802

Mr. Robert Barham
Secretary
Louisiana Department of Wildlife and Fisheries
2000 Quail Dr.
Baton Rouge, La 70808

RE: Quality Assurance Project Plan/Sampling Analysis and Assessment
Plan for Crab and Forage Fish Tissue -- East White Lake Oilfield,
Vermilion Parish, Louisiana
Vermilion Parish School Board Property, Section 16 T15S, R01E

Dear Madame and Sirs:

Enclosed please find a Quality Assurance Project Plan/Sampling Analysis and Assessment Plan for Crab and Forage Fish Tissue at the East White Lake Oilfield, Vermilion Parish, Louisiana (the "Plan"). This plan has been prepared on behalf of UNOCAL in response to questions that have been raised regarding whether the historic oil and gas operations in this field have adversely impacted the crabs in the area.

In summary, pursuant to this Plan the project team will collect and analyze tissue from blue crabs and forage fish in the East White Lake Oilfield, certain reference sites identified in the Plan, and, for crab, seafood markets in the region. The tissue will be analyzed for arsenic (inorganic and total), total barium, mercury (methylmercury and total) and total petroleum hydrocarbons. We will provide a summary of the field sampling and analytical results to the agencies upon completion.

We plan to start setting crab traps on Monday, December 13, 2010, with fishing and crab collection to occur in the following days. You or your representatives are welcome to observe or participate in the collection process. In the meantime, should you have any questions or comments on the attached plan, please feel free to contact me.

Sincerely,

Environmental Resources Management Southwest, Inc.

Angela M. Levert

Angela M. Levert
Senior Associate

cc: John Rodgers
David Lingle
Barbara Beck

Enclosures

QUALITY ASSURANCE PROJECT PLAN AND SAMPLING ANALYSIS AND ASSESSMENT PLAN FOR CRAB AND FORAGE FISH TISSUE – EAST WHITE LAKE OIL AND GAS FIELD VERMILLION PARISH, LOUISIANA

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PROJECT SUMMARY

This Quality Assurance Project Plan (QAPP) and Sampling Analysis and Assessment Plan (SAP) for crab and forage fish tissue was prepared for the East White Lake Oil and Gas Field, Vermilion Parish, Louisiana. Based on recent blue crab tissue analysis (of whole animal samples), conducted on behalf of the landowner, questions have been raised concerning concentrations of arsenic, barium, mercury, and total petroleum hydrocarbons in the crabs in this area. Previous sampling and analyses of surface water and sediments from the area did not indicate that concentrations of these constituents of concern (COCs) posed a risk to human health or the environment. In order to address the questions raised by the recent tissue sampling, this study has been carefully designed to obtain accurate data to evaluate potential human health and ecological risks due to these COCs. Samples of crabs and forage fish will be collected from locations in the East White Lake Oil and Gas Field, nearby reference locations in Schooner Bayou and White Lake, as well as fish markets in the region (blue crabs only). Composite samples from the site, reference locations, and markets will be analyzed under a rigorous quality assurance/quality control (QA/QC) program.

A. PROJECT MANAGEMENT

1.0 Sampling, Analysis and Assessment Protocol - Purpose

The purpose of this document is to present a sampling and analysis plan and Quality Assurance Project Plan to measure concentrations of COCs (arsenic, barium, mercury, and total petroleum hydrocarbons [TPH]) in tissues of blue crabs (*Callinectes sapidus*) and forage fish (e.g., mosquito fish [*Gambusia affinis*]; topminnows [*Fundulus* spp.]) collected from the East White Lake Oil and Gas Field (Site) and reference locations. Laboratory analysis of COC concentrations in blue crabs from Louisiana markets in the region will also be performed. The overall objective of this study is to measure tissue concentrations of these COCs to evaluate potential exposures to:

- Blue crabs and forage fish, as well as wildlife (e.g., birds and mammals) that consume them; and
- Humans that consume blue crabs.

The laboratory analyses will be performed on a tissue-specific basis (blue crabs) and whole-body basis (forage fish) to support both the human health and ecological risk assessments. In addition to the above COCs, tissue lipid and moisture contents will also be analyzed in the laboratory.

The Site, located in Section 16, Township 15 South, Range 1 East in Vermillion Parish, Louisiana (Figure 1), is about five miles southwest of Forked Island in an area of intermediate marsh (Brupbacher et al. 1973, Visser et al. 2000; Sasser et al. 2007-8). The areas of interest are the canals and waterways within the East White Lake Oil and Gas Field, located on the eastern side of White Lake, south of Schooner Bayou. The specific area is primarily an intermediate marsh system, which is protected by water control structures operated by the United States Army Corps of Engineers. This property has been used since approximately 1935 for oil and gas exploration and production. Approximately 85 wells have been drilled since initiation of the lease, although currently, only approximately 10 shut-in productive, 8 active producing, and 2 active injection wells remain. This study will serve to provide accurate information to follow up previous or ongoing studies in the area.

2.0 Project Management Overview

This document describes the quality assurance (QA) and quality control (QC) procedures that will be used to determine COC concentrations in blue crab and/or forage fish tissue from the Site, reference locations, and Louisiana markets in the region. The QAPP was prepared consistent with the documents, *EPA Requirements for Quality Assurance Project Plans*, EPA QA/R-5 (USEPA 2001) and *EPA Guidance for Quality Assurance Project Plans*, EPA QA/G-5 (USEPA 2002b), *Protocol for Issuing Public Health Advisories for Chemical Contaminants in Recreationally Caught Fish and Shellfish* (LDHH et al. 2010), and *Protocol for Issuing Health Advisories and Bans Based on Chemical Contamination of Fish/Shellfish in Louisiana* (LDHH et al. 1997). The collection methods, procedures and protocols follow the guidelines and recommendations of *Guidance for Assessing Chemical Contaminant Data for Use in Fish Advisories, Volume1: Fish Sampling and Analysis*, Third Edition (USEPA 2000a).

3.0 Project Organization

This document was developed by Dr. John Rodgers in collaboration with Dr. Barbara Beck, Angela Levert, and David Lingle. Dr. Rodgers (Project Manager) will coordinate and schedule the field work, including collection of blue crab and forage fish, and submission of those organisms to Columbia Analytical Services, Inc, (CAS) of Kelso, Washington for processing and analytical testing for arsenic, barium, mercury, lipid content, and moisture content. CAS will provide tissue aliquots to Gulf Coast Analytical Laboratories, Inc. (GCAL) of Baton Rouge, Louisiana for TPH analysis. Angela Levert will serve as the project quality assurance officer. Analytical results will be used by Dr. Barbara Beck and David Lingle in support of the human health and ecological risk assessments, respectively.

4.0 Problem Definition and Background

A previous study (Barbee 2010) has indicated the presence of arsenic, mercury, barium, and TPH in some whole body crab samples from the East White Lake Oil and Gas Field. The authors of this document have identified significant concerns regarding the design and interpretation of that previous study. A more comprehensive and thorough study is therefore being initiated. The information gathered from this study will be used to assess potential human health and ecological risks that these may pose. Blue crabs are omnivores (consuming both plant and animal tissues) and range somewhat in their search for food and during reproduction. Blue crabs are a food source for both human and ecological receptors. Forage (prey) fish spend their entire life in a relatively small area of a waterbody or wetland and they can be important indicators of local water and sediment quality. Forage fish also serve as food for higher trophic level ecological receptors. A rigorous analysis of both blue crabs and forage fish tissue is therefore being conducted to address the conclusions previously presented by Barbee (2010).

5.0 Project Description

The overall objective of this study is to measure tissue concentrations of COCs to evaluate potential exposures to:

- Blue crabs and forage fish, as well as wildlife that consume them; and
- Humans that consume blue crabs.

As part of this study, COC concentrations in blue crab and forage fish tissues collected from the Site (Figure 2) will be compared to tissue concentrations from reference locations (Figure 3) and Louisiana markets in the region (blue crabs only).

Details of the sampling plan are found in Section 9 of this document. The study involves synoptic sampling of blue crabs and forage fish from twelve (12) locations in the East White Lake Oil and Gas Field and nine (9) reference locations (five [5] in Schooner Bayou and four [4] in White Lake). Nine of the twelve Site sample locations correspond to the locations previously considered by Barbee (2010). Samples will be collected and managed by experienced personnel. Tissue samples will be analyzed by CAS (arsenic, barium, mercury, lipid content, and moisture content) and GCAL (TPH). The study targets blue crabs and forage fish that are caught and consumed by the public and predators. The goal is to collect sufficient blue crabs and forage fish to meet the tissue requirements of the laboratories.

6.0 Quality Objectives and Criteria for Measurement Data

6.1 Project Quality Objectives

The results from this study will allow project scientists to evaluate the extent to which certain COCs (arsenic, barium, mercury, and TPH) are present in blue crabs and forage fish samples from the Site and reference locations as well as market samples (blue crabs only). Sources of uncertainty inherent to the study are due to the following: 1) sampling specific species from each site; 2) limited information on the variability in analyte concentrations in blue crabs and forage fish; 3) unknown field exposures of blue crabs and forage fish; 4) compositing the samples; and 5) variability in the laboratory analysis process. The quality objectives of this project are related to the blue crab and forage fish tissue collection methods and to the laboratory procedures. Methods and procedures for the collection of blue crab and forage fish tissue described in this document are intended to reduce the magnitude and sources of uncertainty (and their frequency of occurrence) by applying the following approaches:

- use of standardized sample collection and handling procedures; and

- use of experienced scientists to perform the sample collection and handling activities.

The following approaches are intended to measure the measurement quality objectives as they relate to laboratory procedures:

- One (1) laboratory blank per batch, with a batch being up to 20 samples;
- One matrix spike (MS) and matrix spike duplicate (MSD) pair per batch; and
- One laboratory control sample per batch of known quality and concentration for laboratory comparison.

6.2 Measurement Quality Objectives

Measurement quality objectives (MQOs) are quantitative statistics that are used to interpret the degree of acceptability or utility of the data to the user for the intended purpose. The following defines the criteria for this study:

Precision

Precision is a measure of internal method consistency or variability in sample results. It is generally attributed to sampling activities and/or laboratory analysis. It can be expressed either as a range, a standard deviation or percentage of the mean of the measurements (relative range or relative standard deviation). In order to control for field-related variability, sampling activities will be standardized by adherence to the procedures and methods described in this sampling plan, and field sampling will be conducted by experienced professionals (this will also help prevent *bias*). For this study, because samples must be composited and subdivided in a strictly controlled, clean laboratory environment, duplicate composite samples will be prepared for approximately 10% of the samples to be analyzed. These duplicates are labeled with unique separate numbers and analyzed with the routine samples. The results from these duplicate samples are used to assess variability arising from sample compositing, aliquoting, and laboratory analysis processes. The study MQO requirements for analytical precision are that results from 90% of these duplicate composite samples agree within 50% relative percent difference (RPD) for values greater than 5 times the minimum level of quantification and that 90% of these duplicate composite samples agree within 100% RPD for values less than 5 times the minimum level. RPD is calculated as follows:

Relative Percent Difference	RPD	$\text{abs}\left(\frac{(x_1 - x_2)}{(x_1 + x_2)/2}\right) \text{ x } 100$

Where:

X_1 is the first measurement; and
X_2 is the duplicate measurement.

In addition to the duplicate composite samples, the laboratory will also employ a suite of laboratory quality control measures (initial precision and recovery samples, matrix spike and matrix spike duplicate samples) that provide information about the precision associated with various components of the analytical process. Other quality control elements and associated requirements may be described in more detail in the laboratory's Quality Assurance Project Plan. The results will be provided to the project scientists for interpretation and development of their reports. Major criteria for laboratory data are summarized in Tables 1 and 2.

Bias

Bias is systematic and consistent distortion of a measurement process that causes errors in one direction. Bias within the sampling and processing is controlled by training of field personnel and of the sample preparation procedures in the laboratory and by adherence to protocols. Bias within the analytical process is measured by preparing and analyzing field samples spiked with COCs of interest (matrix spike samples) or by analyzing standard reference materials (SRMs) containing the analytes of interest to verify that the procedure is in control for the tissue matrix. Potential interferences can be addressed within the laboratory by dilution of samples or by additional cleanup steps, where appropriate.

Accuracy

Accuracy is the measure of the combination of bias and precision of an analytical procedure. It reflects the closeness of a measured, observed value to a true value. Accuracy is inferred from recovery data determined by sample spiking and/or analyses of reference standards. Accuracy requirements are summarized in Tables 1 and 2.

Percent recovery for a laboratory matrix is calculated using the following equation:

Percent Recovery	%R	$\frac{x_{meas}}{x_{true}}$ x 100

Percent recovery for a sample matrix is calculated using the following equation:

Percent Recovery	%R	$\frac{\begin{pmatrix}\text{value of} & & \text{value of}\\ \text{spiked} & - & \text{unspiked}\\ \text{sample} & & \text{sample}\end{pmatrix}}{\text{value of added spike}}$ x 100

Analytical Sensitivity

Analytical sensitivity is included in the laboratory's Quality Assurance Project Plan and is reported to the project scientists in terms of the method detection limits and the minimum levels that are used to define the sensitivity of each measurement process. MQO requirements for detectability are presented in Table 3.

Representativeness

Representativeness expresses the degree to which data accurately and precisely represent a characteristic of a population, parameter, variations at a sampling site, a process condition or an environmental condition. In order to achieve this, a sufficient number of representative samples are planned for collection. Preservation of the representativeness of the collected samples is assured by adhering to the sample handling protocols for storage, preservation and transportation, as described in this document. Proper documentation records that the protocols were followed and sample identification and integrity were assured.

Comparability
The objective of this parameter is to assure that data developed during this investigation are either directly comparable, or comparable with defined limitations, to literature data or other applicable criteria. Comparability is dependent on the proper design of the sampling plan and adherence to accepted sampling techniques, standard operating procedures and quality assurance guidelines. In order to fulfill the objectives of this study, all samples will be collected and prepared according to the procedures described in this project plan and any associated standard operating procedures. These procedures are consistent with the recommendations of U.S. EPA's *Guidance for Assessing Chemical Contaminant Data for Use in Fish Advisories, Volume I: Fish Sampling and Analysis*, Third Edition (USEPA 2000a). The procedures for this study are also consistent with the National Study of Chemical Residues in Lake Fish Tissue, conducted by the USEPA Office of Water, Office of Science and Technology and Engineering and Analysis Division (USEPA 2000c). All field personnel involved with sampling have adequate training, appropriate experience and will use this protocol for sample collection.

Completeness
Completeness is a measure of the amount of valid data collected and deemed to be acceptable for use in the study, as compared to the amount of data expected to be obtained. Three measures of completeness are defined:

1) Sampling completeness, defined as the number of valid samples collected relative to the number of samples planned for collection;
2) Analytical completeness, defined as the number of valid sample measurements relative to the number of valid samples collected; and
3) Overall completeness, defined as the number of valid sample measurements relative to the number of samples planned for collection.

The sampling and analytical completeness goal in this study is to obtain valid measurements from 90% of the valid samples collected. In case this percentage is lower than 90%, the effects on the study conclusions and recommendations will be re-evaluated during data analysis. Blue crab and forage fish tissue specimen archives will be kept frozen, in labeled vials, for 6 months, at the laboratory.

7.0 Special Training Requirements

The field sampling team will consist of experienced personnel, all of whom are trained on all field procedures detailed in this protocol. This protocol and any requisite standard operating procedures will be distributed to all personnel involved in the field activities. Project orientation sessions will be coordinated by the project manager, who also will provide instructions on all the field sampling and sample handling activities. Skills required of the laboratory analysts performing work for this study are described in the laboratory's Quality Assurance Project Plan.

8.0 Documentation and Records

Thorough documentation of all field sample collection and handling activities is necessary for proper processing in the laboratory, for ensuring data integrity and, ultimately, for interpretation of study results. Field sample collection and handling will be documented in writing (for each sampling site) using the following forms and labels:

- Field Record data sheet that contains information about each sample and site;
- Sample Identification Label that accompanies and identifies each sample or labeled vials;
- Chain of Custody Form that provides tracking information for all samples; and
- Sample Preparation Record Form for each composite sample which will be prepared by the laboratory.

The Field Record data sheet will document the sampling date, time, sampling crew names, sampling site location/description and sample description, length or dimensions of each specimen, and the method of sample collection. The field record data sheet also will contain a unique tracking code for tracking each sample. The code will follow the format:

- The initial code for the project (EWL);
- Date of collection (MM-DD-YY);
- Sampling site identification code (letters and site number);
- Sample type identification code (C = crab; F = forage fish); and
- Numbering order of samples (001, 002, etc.).

Field record forms will be completed by the personnel in the field. All entries will be made in ink, with no erasures. If an incorrect entry is made, the information will be crossed out with a single strike mark and initialed and dated by the recorder. Two copies will be made of this form, one for the project scientists and one for the project manager. The originals will be kept in a project-dedicated binder.

Chain of custody forms will accompany each container of samples and will document sample identity (coincide with information on the field record), sampler relinquishment name, date and time and project manager receipt date and time. The field personnel responsible for quality control will also be responsible for the delivery of the samples to the laboratory. A sample preparation record form will be completed at the laboratory, for each site, and it includes information on every composite sample. It includes the name of the persons preparing the composite samples; information about the crab or fish included in each composite sample; composite sample number; the weight of each composite sample; any general comments or remarks. The table describing the compositing scheme, i.e., which tissues make up each composite sample, will be attached to the sample preparation record, and will also be kept in the project-dedicated binder. If any changes are necessary during the sample collection and handling activities, a note will be made in the field record form, and the project manager will be notified as soon as practical, preferably prior to the change actually occurring. Every effort will be made for the project manager to be accessible, either by being on site or by cellular telephone.

8.1 Analytical Laboratory Records

The analytical laboratory will be required to submit summary reports of all analytical results in electronic format and hard copy. The laboratory will be required to provide a data package with QA/QC documentation as specified in the LDEQ Risk Evaluation/Corrective Action Program (RECAP) Section 2.4, at a minimum, which allows for evaluation relative to the requirements for *definitive data* per RECAP. The laboratory reports should include a description of any problems encountered and comments on the performance of any part of a method. The results should be reported consistently in regard to reporting units (e.g., µg analyte/Kg wet weight).

B. DATA AQUISITION

9.0 Sampling Design

9.1 Rationale for Selection of Sample Locations or Sites

Blue crabs and/or forage fish will be collected if possible from the following locations:

- Twelve (12) locations in the East White Lake Oil and Gas Field (Figure 2). Nine of the twelve Site locations (T1 through T9) correspond to locations previously considered by Barbee (2010);
- Nine (9) reference locations (five [5] in Schooner Bayou and four [4] in White Lake; Figure 3);
- Market samples from locations in the region to determine the concentrations of COCs in crabs from commercial sources for comparative purposes.

Sufficient sampling locations are included in this study to permit valid comparisons and evaluations if blue crabs or forage fish are not caught at some locations. Sampling locations presented in Figures 2 and 3 are approximate and will be determined in the field using GPS equipment and consideration of local conditions such as flows and available habitat.

9.2 Rationale for Selection of Parameters

The COCs chosen for this study (arsenic, barium, mercury, and TPH) were measured in whole body crab samples from the Site in a previous study and cited by Barbee (2010) as containing concentrations of concern. Among other difficulties with the Barbee (2010) study, the crabs were analyzed as homogenized intact (shells and all) organisms. The COCs of concern as noted by Barbee are naturally occurring elements or compounds and have a variety of sources in coastal Louisiana. This study is intended to accurately measure concentrations of these COCs in blue crabs and forage fish.

Sixteen polycyclic aromatic hydrocarbons (PAHs) were previously analyzed in Site surface waters and sediment in May 2010. The PAHs are from RECAP Table D-1: acenaphthene, acenaphthylene, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, 2-methylnaphthalene, naphthalene, phenanthrene, and pyrene. PAH results for all ten surface water samples locations were below the associated laboratory reporting limits (which ranged from <0.0000091 mg/L to <0000536 mg/L). PAH detections in the co-located sediment samples were primarily non-detect, with detections limited to 5 PAHs at three locations at concentrations well below 1 mg/kg-dry weight. Given the very limited detections of PAHs in sediments (and none in surface water), this SAP focuses on TPH analysis for evaluation of petroleum hydrocarbons in blue crab and forage fish tissues.

9.3 Sample Size

CAS and GCAL have minimum tissue (mass) requirements per composite for laboratory analysis of COCs, lipid content, and moisture content. The preferred total mass of homogenized wet tissue for analytical testing by CAS and GCAL is 50-60 grams (25-30 grams minimum).

9.4 Sample Types

To meet the study objective, this study will include samples of blue crabs (*Callinectes sapidus*) and forage fish (e.g., mosquito fish [*Gambusia affinis*]; topminnows [*Fundulus* spp.]) from the area. Samples of the crabs will be analyzed to provide data for both human health and ecological risk assessment.

Each blue crab will be separated into the following four components (and weighed) by CAS:

- Meat from the body and claws;
- Hepatopancreas;
- Other soft tissues (gills, heart, intestine, testes, and eyestalks); and
- Exoskeleton.

The human health risk assessment will use the analytical results (and respective weights) of the meat and hepatopancreas. The ecological risk assessment will use the analytical results (and respective weights) of all four components listed above to derive a whole-body crab concentration. The preferred total mass of homogenized wet tissue for analytical testing by CAS and GCAL is 50-60 grams (25-30 grams minimum).

Samples of forage fish will be analyzed as intact fish (whole body). Similar for crabs, forage fish will be composited to achieve adequate mass for accurate analyses (i.e., 50-60 grams preferred; 25-30 grams minimum). Fish will be composited within species if the variability of catch across the sampling sites requires use of more than one species

(*Guidance for Assessing Chemical Contaminant Data for Use in Fish Advisories, Volume 1: Fish Sampling and Analysis, Second Edition* [USEPA 2000a]). If the sampling crew is unable to collect all forage fish needed to prepare the composite sample on the same day, and the organisms used in the same composite sample will be collected on different days (no more than 1 week apart), individual fish will be frozen until all the organisms to be included in the composite sample are available for shipment to CAS. Since freezing the crabs prior to compositing makes dissection problematic, crabs will not be frozen prior to shipment to CAS. Crab samples will also be collected from commercial markets in Louisiana to assess the concentrations of the COCs. Water samples at the sites will be analyzed for standard field parameters (pH, temperature, conductivity, salinity, dissolved oxygen, turbidity). Field notes will be collected regarding weather, sampling effort, and other parameters that may be important for interpreting the results.

9.5 Sampling Period

Sampling will be conducted during December of 2010 to January of 2010 since water and weather conditions are conducive to safe and efficient field sampling, and blue crabs and forage fish are not spawning.

9.6 Evaluation of Objective

The analyte concentrations will be compared with appropriate screening values for human health (LA DEQ 2010) and ecological receptors.

10.0 Sampling Methods

10.1 Target Species

To meet the study objective, this study will include samples of blue crabs (*Callinectes sapidus*) and forage fish (e.g., mosquito fish (*Gambusia affinis*); topminnows [*Fundulus* spp.]).

10.2 Composite Sampling

The blue crab and forage fish tissues will be composited by CAS to minimize the opportunity for cross-contamination. The forage fish are prepared as whole body composites. Composite samples are effective for estimating average tissue concentrations of COCs in target species populations, and compositing ensures adequate sample mass for analysis of all target COCs. The preferred total mass of homogenized wet tissue (blue crab or forage fish) for analytical testing by CAS and GCAL is 50-60 grams (25-30 grams minimum). If insufficient tissue mass is able to be collected, CAS or GCAL will be consulted to identify the appropriate analytical strategy. Method modifications may include modified extraction techniques (e.g. adjusting the final extract volume), using a lower concentration for the lowest standard in the initial calibration, or adjusting the amount of extract injected into the instrument.

10.3 Sample Collection Methods

Collection methods for blue crabs and forage fish can be divided into two categories, passive and active. Passive collection methods for blue crabs include crab traps or pots. Passive collection devices (e.g., crab traps or pots) must be checked frequently to ensure a limited time lag between crab entrapment and sample preparation/preservation. For forage fish, active collection methods will involve sampling devices including seines and trawls. Although active collection requires greater fishing effort, it is usually more efficient than passive collection for covering a large number of sites and catching the number of individuals needed from each site for tissue analysis. The active collection methods generally require more field personnel and more complex equipment than passive collection methods.

Sampling for this study will involve an array of both active and passive gear to ensure collection of the desired target numbers of crabs and forage fish. Selection of the most appropriate gear type(s) for a particular sampling site will be at the discretion of the sampling team leader (Rodgers). A local contractor will be responsible for providing crab and forage fish sampling gear and sampling vessels. It is important that the sampling vessel(s) and equipment be clean and in good condition. Appropriate license or collection permits will be obtained prior to sampling, and sampling will be conducted in compliance with pertinent existing regulations. The analytical laboratory will provide sample packaging and shipping supplies.

10.4 Equipment and Supply List for Crab and Forage Fish Tissue Sampling

A list of equipment and expendable supplies is provided in Table 4. Sample collection, packaging, and shipment methods are presented in Section 11 of this document.

As soon as crabs or forage fish are obtained via active collection methods, or removed from passive collection devices, the species will be identified. Nontarget species collected in this study will be returned to the water. Individuals of the selected target species (blue crabs and forage fish) will be rinsed in ambient water to remove any foreign material from the external surface, will be handled using clean nitrile gloves, and placed in clean holding containers (livewell, buckets, etc.) to prevent contamination. Each blue crab and forage fish will be measured to determine length and width or total body length (mm), respectively. For blue crabs, data obtained will include sex, length, width and wet weight, For forage fish, maximum body length should be measured, i.e., the length from the anterior-most part of the fish to the tip of the longest caudal finray (when the lobes of the caudal fin are depressed dorsoventrally). When sufficient numbers of the target species have been identified to make up a suitable composite sample, the species name, specimen lengths, and all other site and sampling information should be recorded on the Field Record Form. The field objective is for sampling teams to obtain representative composite samples for both crabs and forage fish from each sample location. Each composite must consist of all the same species, and the composite must be able to deliver 50-60 grams (25-30 grams minimum) of tissue for chemical analysis.

11.0 Sample Handling and Custody Requirements

11.1 Sample Handling

Clean nitrile gloves will be worn during the entire sample handling process, beginning with removing the crabs and fish from the sampling gear. After individuals of the selected target species are rinsed in ambient water and the species and size are determined, each of the fish found to be suitable for the composite sample will be individually wrapped in extra heavy-duty aluminum foil (provided as solvent-rinsed, oven-baked sheets). A Sample Identification Label will be prepared for each aluminum foil-wrapped specimen. Each foil-wrapped fish will be placed into a plastic bag (i.e., heavy duty food grade plastic bag), and sealed with a plastic cable tie. The completed Sample Identification Label will be affixed to the cable tie, and the entire specimen package will be "double-bagged" (i.e., placed inside a large plastic bag with all the specimens of the same species from that site and sealed with another cable tie). Once packaged, samples should be immediately placed on ice for shipment. If samples will be carried back to a laboratory or other facility to be frozen before shipment (forage fish only), wet ice can be used to transport wrapped and bagged fish samples in the coolers to that laboratory or facility. If possible, all of the specimens in a composite sample should be kept together in the same shipping container (ice chest) for transport. Sampling Teams have the option, depending on site logistics, of:

- Shipping the samples packed on ice (in sufficient quantities to keep samples cold for up to 48 hours), via priority overnight delivery service (i.e., Federal Express), so that they arrive at the laboratory within less than 24 hours from the time of sample collection; or

- Freezing the forage fish (but not blue crab) within 24 hours of collection, and storing the frozen fish until shipment within 1 week of sample collection (frozen fish will subsequently be packed on dry ice and shipped to the laboratory via priority overnight delivery service to arrive within less than 24 hours from time of shipment).

The time of sample collection, relinquishment by the sample team, and time of their arrival at the laboratory must be recorded on the Chain-of-Custody Form. The field sampling teams should avoid shipping samples for weekend or holiday delivery to the laboratory unless prior plans for such a delivery have been agreed upon with the laboratory.

11.2 Sample Integrity

A critical requirement of this study is maintenance of sample integrity from the time of collection to the shipment and arrival at the final destination. Sample integrity will be maintained by preventing the loss of COCs that might be present in the sample and by taking precautions to avoid possible introduction of contaminants during handling. The loss of COCs can be prevented in the field by ensuring that the sample collected remains intact. Once a sample is collected, sample integrity will be maintained through careful and controlled sample handling, storage, and preservation procedures. Preventable sources of extraneous contamination can include the sampling gear, oils and greases on boats, spilled fuel, skin contact, contact with soil or sand, boat motor exhaust, and other potential sources. Potential sources should be identified before the onset and during sample collection, and appropriate measures should be taken to minimize or eliminate them. Examples of preventative measures include the following:

- Collection nets should be free of any potential contaminants.
- The use of tarred collection nets is prohibited.
- Boats should be positioned so that engine exhaust does not fall on the deck area where samples are being handled.
- Ice chests and other sample storage containers should be cleaned with detergent and rinsed with clean water prior to use.
- Samples should not be placed directly on ice, but should be stored inside foil, plastic bags, and plastic garbage bags first.
- Proper gloves (clean nitrile gloves) should be used when handling samples.

11.3 Custody Requirements

Each sample will be identified and tracked with a unique numbering scheme as described in Section 8.0. The same unique number will be used in all documentation including the Field Record Form, the Sample Identification Label, and the Sample Preparation Record Form. Detailed information about the samples collected in the field and about the collection location will be recorded on the Field Record Form. Two copies will be made of this form: one will accompany the samples to the laboratory and one copy will be kept in a project-dedicated binder.

As soon as possible following collection, the sampling team will begin the process of identifying, labeling, packaging, and storing the sample(s). Each sample will be identified and tracked with a unique numbering scheme as described in Section 8.0. This composite code will identify each sample on all documentation and records including the following:

- Field Record Form,
- Sample Identification Label, and
- Chain-of-Custody Form.

Each sample will be labeled by affixing a Sample Identification Label as per the instructions in Section 8.0. All sample label entries will be made with black indelible ink. The sample label will accompany each sample throughout the chain-of-custody. Each sample label will include the following information:

- project name (EWL Tissue Study),
- site identification (number),
- sample number (01 through 06),
- composite code (as in Section 8.0),

- date of sample (month/day/year),
- time of collection (military time),
- preservative used (on ice or frozen), and
- collector's name (field team leader).

Detailed documentation of the samples collected in the field (for shipment to the laboratory) and information about the collection location will be recorded on a Field Record Form. One form must be completed for each sample composite. A copy of the form (Section 8.0) will be retained by the sampler, and another copy will be included with sample shipment to the laboratory. All entries will be made in black ink and no erasures will be made. Each form will have the proper entry requirements, which includes the following information:

- composite code (as per Section 8.0),
- sampling date (month/day/year),
- time of collection (military time),
- collection method (e.g., cast net),
- collector's name (printed and signed),
- collector's affiliation, address, and telephone number,
- site name,
- site number (location of site sampled),
- sample type (e.g., crab),
- estimated maximum depth (meters), and
- length (mm) and width (mm) of each specimen (if applicable).

All samples and composites will be transferred to the receiving laboratory under chain of custody. The Chain-of-Custody Form will act as a record of sample shipment and a catalog of the contents of each shipment (coinciding with information on the field record). The forms will be produced and copied as needed with one copy retained by the sampler and one for shipment to the laboratory. The Chain-of-Custody Form shipped will be placed in a waterproof plastic bag and sealed inside the shipping container. All Chain-of-Custody Form entries will be made in black ink and will include:

- the Project Manager's name, address and telephone number (refer to the QAPP cover page),
- sampler's name and telephone number,
- project name (EWL Tissue Study),
- page number (e.g., 1 of 1),
- sample location,
- collection date and time,
- composite code and sample number,
- preservative (ice [crab and forage fish] or frozen [forage fish only]),
- number of containers,
- type of analysis required (arsenic, barium, mercury, TPH, lipids; and moisture content),

- sampler's signature, sample date, and time,
- sampler relinquishment date and time,
- laboratory recipient signature, and
- laboratory receipt date and time.

Immediately following the packing of each shipping container, each container (ice chest) will be secured with packaging tape and sealed with a Chain-of-Custody Label. The Chain-of-Custody Label must contain the signature of the sampler and the date and time written in ink. The seal must be affixed such that the shipping container cannot be opened without breaking the seal (e.g., label adhered across the ice chest latch), so as to protect and document the integrity of the contents from field to laboratory.

12.0 Analytical Methods Requirements

Composite samples will be analyzed for Total Arsenic, Inorganic Arsenic, Total Barium, Total Mercury, Methylmercury, and TPH. The analytical laboratories CAS and GCAL will conduct the analyses, using EPA methods. The results will be reported in parts per million or parts per billion, as wet weight. Analytical methods and specific method requirements are addressed by the Quality Assurance Project Plans and Standard Operating Procedures developed by the laboratories and in conjunction with requirements presented in this study plan. Lipids will also be analyzed for the composite samples. Percent moisture (wet weight and dry weight) will also be measured and reported for composite tissue samples.

Samples will be shipped under chain of custody to CAS for processing and analytical testing of metals, lipid content, and moisture content. CAS will ship tissue aliquots to GCAL for TPH analysis. Samples will be analyzed for total petroleum hydrocarbons using the Texas 1005 (Total Petroleum Hydrocarbons) and potentially Texas 1006 methods. For both analyses, the extract step described in Section 8.2 or Section 8.3 of the Texas 1006 (Characterization of NC6 to NC35 Petroleum Hydrocarbons in Environmental Samples) method will be performed. The laboratory will use the reporting protocols specified in the Texas 1005 method modified to reflect RECAP-recommended ranges for total petroleum hydrocarbons.

Sample processing and analytical testing and methods are within the scope of this QAPP. Sample processing involves dissection and compositing of the requisite tissues: 1) crabs – meat, hepatopancreas, soft tissue, and shell (exoskeleton); 2) forage fish – whole body.

Analytical testing of tissue samples for will follow standard methods:

- Total Arsenic - SW 6020;
- Inorganic Arsenic – EPA 1632A;
- Total Barium – SW 6020;
- Total Mercury – EPA 1631;
- Methylmercury – EPA 1630;
- TPH – Texas 1005/1006.

13.0 Quality Control Requirements

Data quality is addressed, in part, by consistent performance of valid procedures documented in this study plan as well as those routinely employed by the analytical laboratory. It is enhanced by experience and training of project staff and documentation of project activities. This Quality Assurance Project Plan (QAPP) will be distributed to all project scientists for review, and, in turn, to sampling personnel involved in implementation of the project's field work as well as to the analytical laboratory. The project manager will ensure that personnel have the Quality Assurance Project Plan and that an orientation and training session is undertaken by all involved.

14.0 Instrument/Equipment Testing, Inspection, and Maintenance Requirements

All field equipment will be inspected prior to sampling activities to ensure that proper use requirements are met (e.g., boats are operating correctly, nets are without defects, pH and other field meters properly calibrated). Inspection of field equipment will occur well in advance of the field operation to allow time for replacement or repair of defective equipment, and the field team will be equipped with proper backup equipment to prevent lost time on site. One member of the field team will gather and inspect all equipment on the equipment and supply list (Table 4) prior to the sampling event. All pH and other meters used by field teams will be calibrated according to the manufacturer's operating instructions, on a daily basis, while in use. Careful and thorough planning will be necessary to ensure the efficient and effective completion of the field sample collection task. A checklist of field equipment and supplies is provided in Table 4 of this document. It will be the responsibility of the field team to gather and inspect the necessary sampling gear prior to the sampling event and to inspect the sample packaging and shipping supplies. Defective packaging and shipping supplies (e.g., torn or damaged bags) will be discarded, and, if necessary, the field team will obtain replacement supplies.

15.0 Data Acquisition Requirements (Non-direct Measurements)

Non-direct measurements will include identification and/or verification of each sample location (i.e., latitude and longitude). Coordinates of the sample sites will be provided as decimal degrees or conventional degrees, minutes, and seconds.

16.0 Data Management

Samples will be documented and tracked via Sample Identification Labels, Field Record Forms, and Chain-of-Custody Forms (Section 8.0). Diligence of the Field Sampling Team in completion of the proper records will be essential. The field team leader will be responsible for reviewing all completed field forms. Any corrections should be noted, initialed, and dated by the reviewer. As mentioned in Section 8.0, Field Record Forms and Chain-of-Custody Forms will each be prepared in the field. The sampler will retain one copy each of the Field Record and Chain-of-Custody Forms, and the original copies will be delivered to the laboratory with the samples. Shipment of samples to the laboratory must be conducted by a delivery service that provides constant tracking of shipments (e.g., Federal Express). Laboratory sample log-in and data management procedures are beyond the scope of this QAPP and are covered by the laboratory QAPP. The laboratory will retain one copy of each Field Record Form and Chain-of- Custody Form. All form copies associated with this project will be maintained in a project file during the active phase of the project, and for a period of 6 months following completion of the project (unless otherwise directed). Upon completion of sampling activities, a field collection effort summary will be developed (i.e., a detailed listing of all sampling participants, sampling locations, and specimens collected) based on information recorded by all Sampling Teams on the Field Record Forms. Project data will be stored by project scientists, and will be copied to disks for archive for two years after project completion (unless otherwise directed). All data entries will be checked for errors in transcription and computer input by a minimum of two persons. If there is any indication that requirements for sample integrity or data quality have not been met, the project scientists will be notified immediately (with an accompanying explanation of the problems encountered).

C. ASSESSMENT / OVERSIGHT

17.0 Assessment and Response Actions

The project manager will be on-call throughout the duration of the sampling effort. In the event that quality problems or other difficulties arise in the field, the project manager will contact the quality assurance officer, attempt to resolve the difficulty, and determine the appropriate corrective action to be taken. The project manager will have the authority to stop work on the project if problems affecting data quality are identified that will require extensive efforts to resolve.

18.0 Reports to Project Scientists and the Study Sponsor

A summary of the work conducted will be prepared. The report will contain summaries of the field sampling and analytical results. Subsequent reports may be produced by the project scientists and others based on the results from this study.

D. DATA VALIDATION AND USABILITY

19.0 Data Review, Validation and Verification Requirements

All field record forms and chain of custody forms will be reviewed by the project manager for completeness and correctness. Data will be entered and assessed by comparing entered data with the original forms. The project manager will determine whether to accept, reject or qualify the entered data. A report will then be prepared for submittal to the project scientists.

20.0 Validation and Verification Methods

The project manager will conduct a review of the laboratory's data results and reports, verifying that methods and protocols were followed. A data quality review will be performed by qualified personnel experienced in data validation. The data quality and data usability review will be conducted based upon guidance provided in RECAP Sections 2.4 and 2.5, the USEPA Risk Assessment Guidance for Superfund (1989), and other relevant guidance. The data evaluation will include a review of analytical methods; QA/QC documentation; laboratory performance on matrix spikes, surrogate recoveries, and laboratory control samples; QC blank results (e.g. field, method, and rinsate); sample quantification limits and duplicate analyses. Specific deficiencies in the data, if any, will be identified, qualified as appropriate, and discussed in the report as they relate to data usability for exposure assessment and risk characterization.

21.0 Reconciliation with Data Quality Objectives

As soon as possible following completion of the sample collection and analyses for this project, precision, accuracy and completeness measures will be assessed by the project manager and compared with the criteria discussed in previous sections of this QAPP. This will represent the final determination of whether the data collected are of the correct type, quantity and quality to support the intended use for this project. Any problems encountered in meeting the performance criteria (or uncertainties and limitations in the use of the data) will be discussed with the project scientists, and will be reconciled, if possible.

22.0 LITERATURE CITED AND REVIEWED

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Tables

Table 1
Quality Control Performance Criteria

Quality Control Parameter	Total Arsenic; Total Barium	Inorganic Arsenic	Total Mercury	Methylmercury	Total Petroleum Hydrocarbons
Method	**SW 6020**	**EPA 1632A**	**EPA 1631**	**EPA 1630**	**Texas 1005/1006**
Method Quantitation Limit (MQL)	0.5 mg/kg (Arsenic) 0.05 mg/kg (Barium)	0.030 mg/kg	0.001 mg/kg	0.010 mg/kg	Not Available
Holding Times	Freeze or freeze-dry tissues (store at room temperature); holding time indefinite	Freeze or freeze-dry tissues (store at room temperature); holding time indefinite	Freeze or freeze-dry tissues (store at room temperature); holding time indefinite	Freeze or freeze-dry tissues (store at room temperature); holding time indefinite	Freeze, hold up to one year; extract within 24 hours of thawing
Equipment Blank	Daily per matrix and equipment type <MQL	Daily per matrix and equipment type <MQL	Daily per matrix and equipment type <MQL	Daily per matrix and equipment type <MQL	Daily per matrix and equipment type <MQL
Field Duplicate	1 every 10 samples ≤50 RPD if results greater than 5x MQL	1 every 10 samples ≤50 RPD if results greater than 5x MQL	1 every 10 samples ≤50 RPD if results greater than 5x MQL	1 every 10 samples ≤50 RPD if results greater than 5x MQL	1 every 10 samples ≤50 RPD if results greater than 5x MQL
Instrument Tune/Calibration	See Table 2	See Table 2	See Table 2	See Table 2	See Table 2
Preparation (Laboratory) Blank	Daily per digestion batch (maximum 20 samples) per matrix < ± MQL	Daily per digestion batch (maximum 10 samples) per matrix < ± MQL	Three per batch (maximum 20 samples) per matrix < ± MQL	Three per batch (maximum 20 samples) per matrix < ± MQL	Daily per digestion batch (maximum 20 samples) per matrix < MQL
Initial Calibration and Continuing Calibration Blank	Analyze immediately after each ICV and CCV < ± MDL	Analyze immediately after each ICV and CCV < ± MDL	NA (See bubble blanks below)	NA	NA
Surrogate	NA	NA	NA	NA	70 – 130 % Recovery 1-Chlorooctane or trifluoromethylbenzene (nC_6 to nC_{12}) 1-Chlorooctadecane, 2-fluorobiphenyl or o-terphenyl (>nC_{12})
Matrix Spike (MS) / Matrix Spike Duplicate (MSD)	One per 20 samples per matrix 70 – 130 %Recovery ≤50 RPD if results greater than 5x MQL	One per 10 samples per matrix 50-150% Recovery (1632 Table 2) ≤50 RPD if results greater than 5x MQL	One per 10 samples per matrix 70 - 130 %Recovery ≤50 RPD if results greater than 5x MQL	One per 10 samples per matrix 65 – 135 %Recovery ≤50 RPD if results greater than 5x MQL	One per 20 samples per matrix 60 – 140 %Recovery ≤50 RPD if results greater than 5x MQL
Internal Standard Area	Each sample > 70-120% recovery.	NA	NA	NA	NA
Laboratory Control Sample (LCS) or Ongoing Precision and Recovery (OPR)	Daily per digestion batch per matrix 80 – 120 %Recovery	Daily per digestion batch (maximum 20 samples per matrix (1632 section 9.7.1) 50-150% Recovery (1632 Table 2)	Daily per digestion batch per matrix; Analyze at beginning and end of batch or each 12-hour shift 77 - 123 %Recovery	Daily per digestion batch per matrix; Analyze at end of batch or each 12-hour shift 67 - 133 %Recovery	Daily per extraction batch per matrix 60 - 140 %Recovery 25 RPD for LCSD
Identification Criteria	NA	NA	NA	NA	Within retention time windows
Confirmation Analysis	NA	NA	NA	NA	Gas chromatography/ mass spectrometry
Other	NA	QCS quarterly; Mean of three analyses within 10% of QCS value	Additional blanks: 3 system blanks or 3 bubbler blanks	QCS with each batch analyzed in the middle of the batch	The response factor for nC_{35} is ≥ the response factor for nC_{28}; Aliphatic and aromatic fractionation check per batch of silica gel (< 10 – 20% crossover) and 60-140% recovery

CCV – continuing calibration verification
ICV – initial calibration verification
MDL – method detection limit
MQL – method quantitation limit
NA – Not applicable
QCS – Quality control sample (independent source)

Table 2

Calibration Procedures Summary

		Calibration Summary	
Parameter Measured	**Method Description[1]**	**Activity**	**Requirements**
Metals (Arsenic and Barium)	SW 6020	Initial Calibration	Blank and single point standardization as per method 6020.
		Initial calibration Verification (ICV)	Analyze mid-level calibration standard. The %R for each analyte must be 90-110%.
		Continuing Calibration Verification (CCV)	Analyze mid-level calibration verification standard every 10 samples. The %R must be 90-110% of the true value.
		Interference Tests	Analyze interference check standard at the beginning of every analytical run. The %R for each analyte must be 80-120% of the true value.
Mercury (Total)	EPA 1631	Initial Calibration	Analyze a minimum of a blank and five concentrations. The acceptance criteria are a maximum %RSD (≤15%) criteria and recovery of the lowest standard is in the 75 – 125% range.
		Initial Calibration Verification	Analyze a mid-level calibration standard. The %R for each analyte must be 77-123% (QCS)
		Calibration Verification	See OPR requirements
Inorganic Arsenic	EPA 1632	Initial Calibration	Analyze a minimum of a blank and three concentrations (one at ML and one at upper range). Maximum %RSD (≤25%) criteria before any investigative samples are analyzed.
		Initial Calibration Verification	Analyze a mid-level calibration standard. The %R for each analyte must be 80-120% (Method 1632 Table 2).
		Calibration Verification	Analyze a mid-level calibration verification standard every 10 samples. The %R must be 76-116% of the true value.
Methyl Mercury	EPA 1630	Initial Calibration	Analyze a minimum of a blank and five concentrations prepared using distillation procedure. The acceptance criteria are a maximum %RSD (≤15%) criteria and recovery of the lowest standard is in the 65 – 135% range.
		Calibration Verification	See QCS requirements
Total Petroleum Hydrocarbons	Texas 1005 / 1006	Initial Calibration	Analyze minimum five concentrations for each analyte. Maximum %RSD (≤25%) or minimum correlation coefficient (0.995) criteria before any investigative samples are analyzed. A calibration curve must be prepared for any compound for which the %RSD is greater than 25%. Take corrective action when criteria not met. The lowest calibration standard establishes the MQL based on laboratory standard operating procedures for initial volume of sample and final volume of extract.
		Calibration Verification	Verify calibration curve daily, every 24 hours, or every 20 samples, whichever is more frequent, with a check standard. Maximum %D ≤25%.

CCC – Calibration check compound
CCV – Continuing Calibration Verification
ICV – Initial Calibration Verification
MQL – Method Quantitation Limit
NA – Not applicable
RPD – Relative percent difference
RRF – Relative Response Factor
%D – Percent Difference
%RSD – Percent Relative Standard Deviation
SPCC – System performance check compound

Table 3
Laboratory Methods

Parameter	CAS No	Method	MQL
Total Arsenic	7440-38-2	SW 6020	0.04 mg/kg DW
Inorganic Arsenic	7440-38-2	EPA 1632A	0.03 mg/kg DW
Total Barium	7440-39-3	SW 6020	0.05 mg/kg DW
Total Mercury	7439-97-6	EPA 1631	0.001 mg/kg DW
Methylmercury	22967-92-6	EPA 1630	0.010 mg/kg DW
Total Petroleum Hydrocarbons	NA	TX 1005/1006	N/A

MQL – Method Quantitation Limit (Method Detection Limit [MDL] for Total Arsenic).

Table 4

Equipment and Supply List for Crab and Forage Fish Tissue Sampling

1. Sampling vessel (including boat, motor, trailer, oars, gas, and all required safety equipment)
2. Nets - (including trawls and/or seines, hoop or castnets)
3. Crab Traps and /or Pots (several per sampling site)
4. Coast Guard-approved personal floatation devices
5. Maps of sampling areas, sites and access routes
6. Global Positioning System (GPS) unit
7. pH meter (including associated calibration supplies)
8. Livewell and/or buckets
9. Measuring board (millimeter scale)
10. Ice chests
11. Aluminum foil (solvent-rinsed and baked)
12. Heavy-duty food grade polyethylene bags
14. Large plastic bags
15. Knife or scissors
16. Clean nitrile gloves
17. Field Record Forms
18. Sample Identification Labels
19. Chain-of-Custody Forms
20. Chain-of-Custody Labels
21. Scientific collection permit or fishing license
22. Ice
23. Black ballpoint pens and/or waterproof markers
24. Clipboard
25. Packing/strapping tape
26. Overnight courier airbill and laboratory shipping address
27. Plastic cable ties
28. Plastic bubble-wrap
29. First aid kit and emergency telephone numbers

Figures

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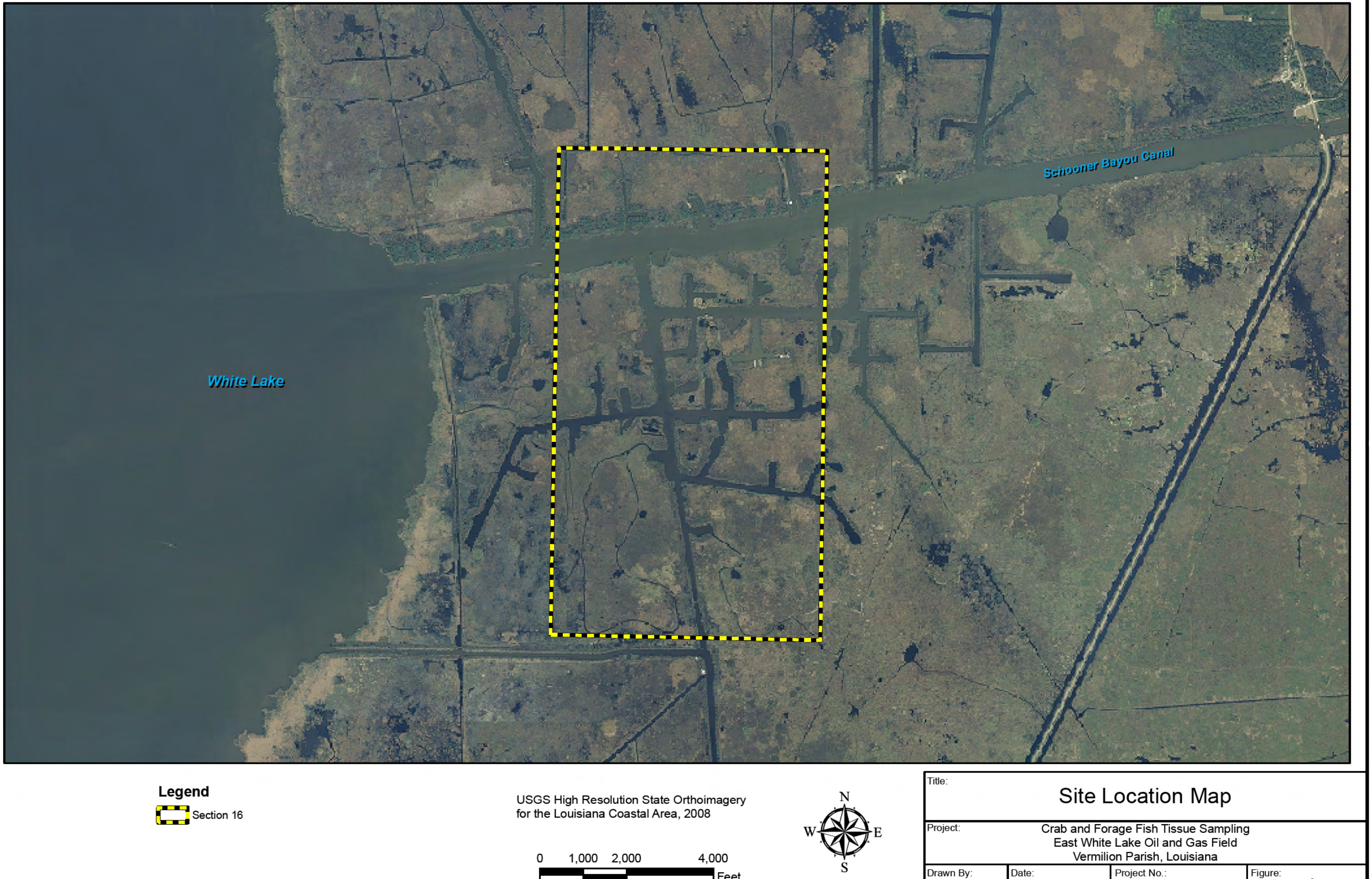

Title:
Site Location Map

Project:
Crab and Forage Fish Tissue Sampling
East White Lake Oil and Gas Field
Vermilion Parish, Louisiana

Drawn By: KPL
Date: 11/24/10
Project No.:
Figure: 1

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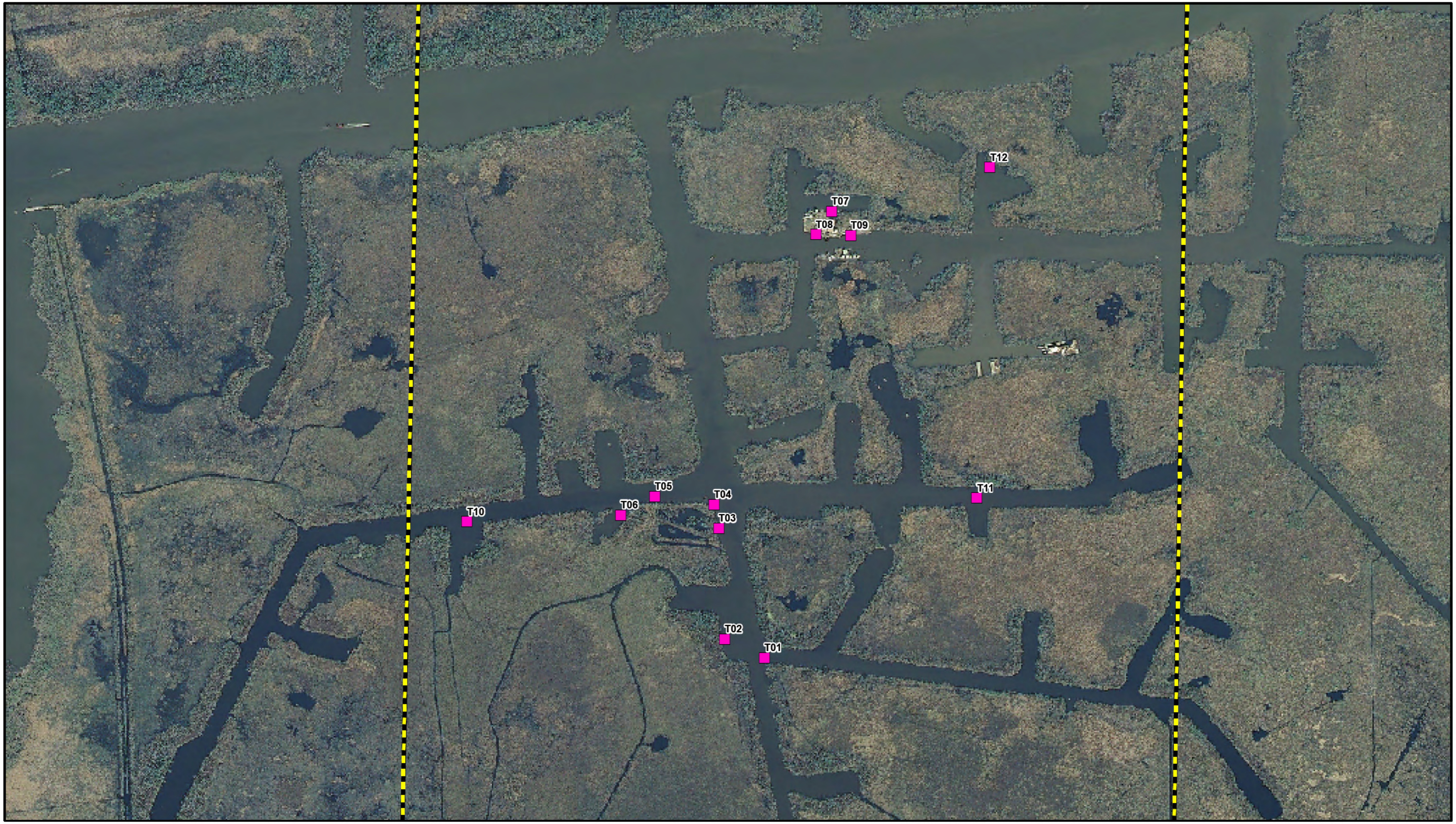

Title:
Proposed Site Tissue Sample Locations

Project:
Crab and Forage Fish Tissue Sampling
East White Lake Oil and Gas Field
Vermilion Parish, Louisiana

Drawn By:	Date:	Project No.:	Figure:
KPL	11/24/10		2

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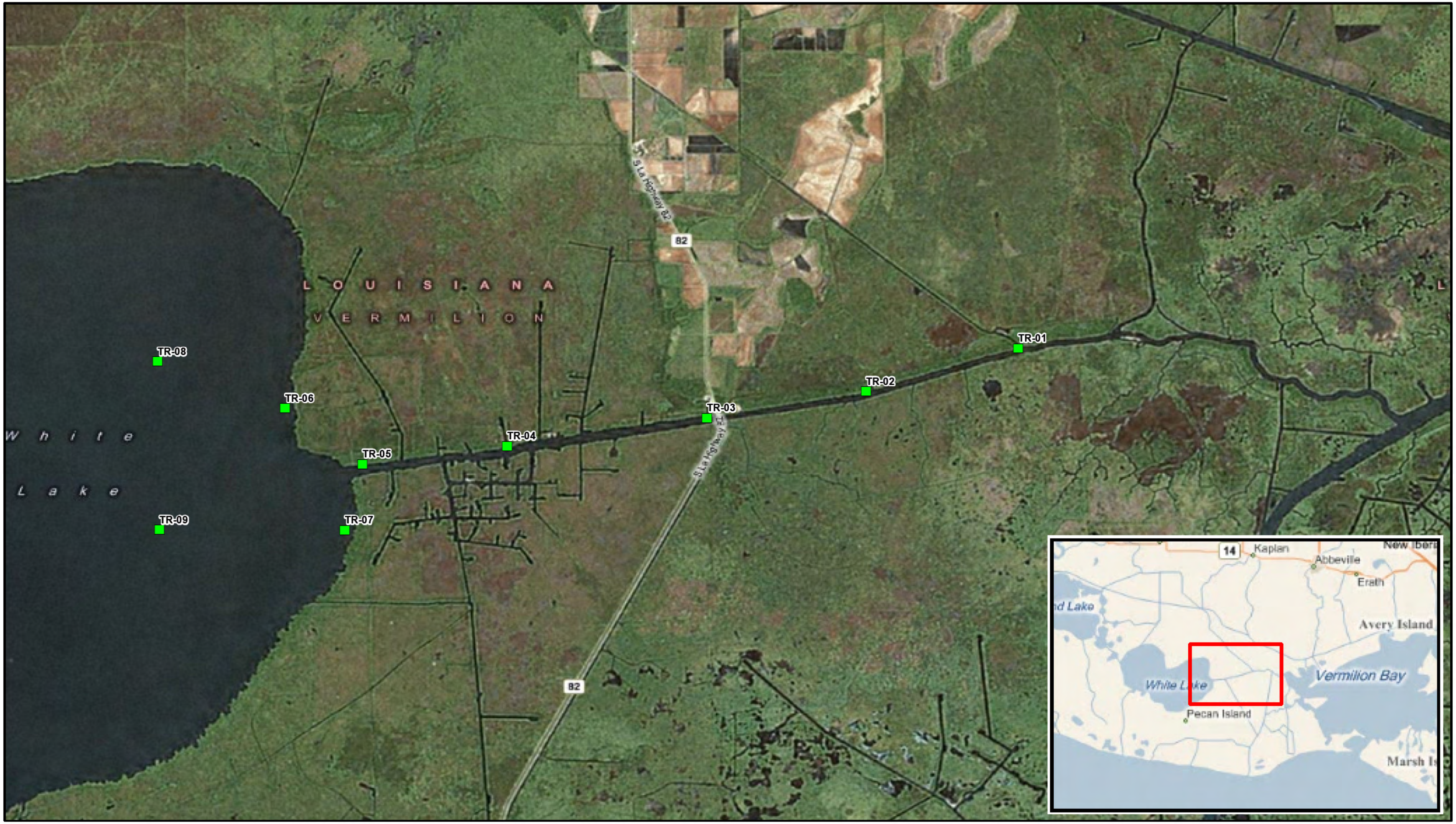


Legend

🟩 Proposed Reference Tissue Sample Locations

NAIP 2007 Imagery

0 0.5 1 2 Miles

N W E S

Title:
Proposed Reference Tissue Sample Locations

Project:
Crab and Forage Fish Tissue Sampling
East White Lake Oil and Gas Field
Vermilion Parish, Louisiana

Drawn By:	Date:	Project No.:	Figure:
KPL	12/01/10		3

Field Notes
Appendix B

East White Lake Oil and Gas Field
Vermilion Parish, Louisiana

ocation EWL Date 12-13-10

roject / Client 07-47

~~time~~
1100 head out to first
trap
on camera: 1. traps on boat
at dock 2. catfish heads/
body bait on dock 3.
~~Gajon gassing up boat~~
Gajon. Putting OUT TRAPS
time 1119 E
TR-08 15R 557563 3289 74N
time 1122
TR-09 (E) 15R 557668 (N) 3288957
(photo 4) Mitchell throwing
in trap at TR-09
time 1130
TR-07 (photo 5) mitchell at TR-07 throws
TR-07 trap 15R 557004 N 3288183
at → time pulled up trap: 4 crabs, moved it
P1 1137
TR-06 (photo 6) throws trap
at TR-06 coordinates saved in GPS
time 1142
TR-05 (photo 7+8) baiting trap
15R 559737 N 3289879

Location EWL Date 12-13-10

Project / Client 07-47

photo9 - Gajon driving to TR-04
time 1148
TR-04 15R562232 3290316
time 1153
A-01 (additional trap)
requested location by Peak
aborted, barge in the way
time 1156
T-12 15R56135 (the rest saved)
time 1158
T-09 15R561314 3289624
time 1159
T-08 15R561166 3289623
time 1201 (1201)
T-07 15R561198 3289709
time 1205
grabbing trap from P-2
one crab female - large - set
2 days ago 561017 3290021
time 1206
P-3 grabbing trap
561195 3290017, 2 crabs females
1 littleish one bigger

Location EWL Date 12-13-10

Project / Client 07-47

time 1208 to grab + throw back
P-4 1 little male
561391 3290032
time 1210
P-5 to grab trap + throw back
2 big 1 medium
561556 3290064
(photo 10 + 11) Gajon
(photo 12 Patrick)
time 1216
T-10 (photo 13) (Patrick)
(photo 14) facing east spoil banks
560451 3288906
time 1220
T-06 560781 3288964
time 1222
T-05 560869 3288990
time 1223
T-04 560982 3288975
time 1225
T-03 561008 3288828
time 1227
T-01 561094 3288605

Location EWL Date 12-13-10

Project / Client 07-47

time 1229
T-02 561094 3288612
time 1238 saved in GPS
T-11 56 32
225-281 4451 Gary Barbee
time 1308
TR-03 564930 . 3290761
2 crabs thrown back
pot new bait
time 1317
TR-02 rebaited filled
with crabs (approx 15 crabs)
567210 3291154
(photo 15 + 16) Helen pulling
time 1325 + full trap
TR-01 (photos 17, 18, 19) Patrick
pulling trap, 4 crabs, rebait
569363 3291889
try to cast net for fish

Location EWL Date 12-13-10

Project / Client 07-47 Trying Casting
time 1341 (photos 20, 21, 22, 23) casting net
cast net for fish,
location chosen by
Gajon - caught
poagie + shad, 3 casts
24 fish, 2" - 4" long
569363 3291889
time 1351
at TR-02 to try casting
net (24, 25 photos) 1st cast
nothing 2nd cast → 1 shrimp
3rd cast - nothing
time 1522 (after lunch)
3 quart baggies of
catfish bait heads/parts
using nitrile gloves)
B-01, B-02, B-03
(bait 1, 2, 3) → then into 1
2 gallon time 1528
collected from bait
ice chest on boat →
bait used for crab
traps

Location EWL Date 12-13-10

Project / Client 07-47.

looking for fish

time 1542
1st throw net at T-07
one little mud minnow
2nd throw - none
3rd throw - none

time 1545 P-6
1st throw net - 1 minnow
2nd throw - 2 shrimp
3rd throw - 1shrimp
GPS - 561216 32896[illegible]81

time 1551
near T-08
1st cast - nothing
2nd cast - nothing
3rd cast - nothing
time 1556
near T-02
1st cast - 1 Hoagie
2nd cast - nothin
3rd cast - 1 mullet 1 hoagie

P-7 561022 328675

Location EWL Date 12-13-10

Project / Client 07-47

time 1601
near T-06
1st cast - nothing
2nd cast - 1 shrimp, 1 shiner
3rd cast - nothing

time 1607
near T-10
1st cast - nothing
2nd cast - nothing
3rd cast - 7" mullet
4th cast - nothing

time 1620 P-8
between TR-5 and TR-4
1st cast - 1 minnow
2nd cast - nothing
3rd cast - 2 mullets
4th cast - nothing
5th cast -
GPS 8
560975 3289963
summary of 12/13 drove 7-9^3
9^3-4^3 worked 4^3-5^3 drove
to abbeville, 5^3-8^3 eat/bed

Location EWL Date 12-14-10

Project / Client 07-47

6:45 AM meeting for today
pick
dry ice for catfish
pick up ice on way back
from Lafayette
pick up John Redgers
Patrick 1140 time
calibrating water quality
instrumentation
time 1228 - head out in boat
near TR-01 no crabs
time 1241
Field Record Form
I'll duplicate here what's
on Fld Rcd Form
TR-01 C EWL 12-14-10
crab trap
RDO 15.01 mg/L Temp 9.18
pH 7.25 Cond uS/cm 2353
ORP mV .21 Turb NTU 120.7
Depth feet 1.3 Time 1253

Location EWL Date 12-14-10

Project / Client 07-47

trying to collect crabs w/ Redgers

TR-02

RDO	Temp	pH	Cond	ORP	Turb	Depth	Time
11,32	8.84	7.34	2283	.21	133.3	1.5	1311

collected 1 female crab

TR-03 → 0 crabs

RDO	temp	pH	Cond	ORP	Turb	Depth	Time
11.14	8.87	7.37	2284	0.20	135.8	0.91	1323

TR-04 0 crabs collected

RDO	temp	pH	Cond	ORP	Turb	Depth	Time
10.82	9.6	7.39	2329	.18	141	1.46	1332

Location EWL Date 12.14-10

Project / Client 07-47

(photo 24) crabs at TR-06

time 1333 head out to lake to collect crabs from location with crabs

crabs total TR-06 + 2 crabs (males)

+1 male + 3 (2 females, 1 male)

RDO	temp	pH	Cond	ORP	Turb	Depth	Time
11.21	8.6	7.40	2267	0.24	110	6.91	1347

10 crabs TR-07 (photo 25) big lake crabs

RDO	temp	pH	Cond	ORP	Turb	Depth	Time
11.42	8.56	7.44	2249	0.21	177.5	1.17	1350

Location EWL Date 12-14-10

Project / Client 07-47

10 crabs (photo 26) crabs

TR-09

RDO	temp	pH	Cond	ORP	Turb	Depth	Time
11.35	8.47	7.44	2198	0.18	179	0.5	1400

11 crabs TR-08 (photo 27 photo 28) crabs

RDO	temp	pH	cond	ORP	Turb	Depth	Time
11.42	8.75	7.44	2243	0.24	165	1.6	1425

11 crabs TR-065 ite

RDO	temp	pH	cond	ORP	Turb	Depth	Time
11.30	8.81	7.50	2263	0.22	137	0.833	1440

Location EWL Date 12-14-10

Project / Client 07-47

1 sac o lait
1 perch

2 traps empty

note: fish chopique intrap

3 crabs **TR-04**

RDo	temp	pH	Cond	ORP	turb	Depth	HC time ~~time~~
10.97	9.89	7.45	2361	,19	154	1.4	1450

white perch baggie
TR-04 - collected
as per Rodgers
TR-04 catfish

} one Bucket

1 bream

12 crabs **TR-03A** new location 563786 3290526 (GPS)

RDO	temp	pH	cond	ORP	turb	depth	time
~~0.19~~ 11.03	8.84	7.49	2303	0,19	134	1'	1507

put bream in a
TR-03A separate
bucket

photo 28
bream
+ Rodgers

Location EWL Date 12-14-10

Project / Client 07-47

TR-03A

cm length	cm width	wt	gender ~~M/F~~
8	17	298	M
6	14.5	141	M
6	15.5	146	F
7	17	181	F
5,5	14	152	M
7	16	209	M
7	19	191	F
6.5	16	201	M
6	14,5	149	M
6	14.5	132	F
7	16.5	167	F
8	18	259	

Location EWL Date 12-14-10

Project / Client 07-47

TR-04

lngt	width	wt	gender
6	16	167	M
8	20	305	M
5.5	14	122	F
5.5	13.5	116	M
6	12.5	127	M
5.5	13.5	118	M
6	15	161	M
6	13	98	F

TR-05

7	17	262	M
7.5	18.5	127	F
7	18	189	F
7	17	194	F
8	20	344	F
8	18.5	289	F
8	19.5	373	M
6	15.5	134	F
7.5	18.5	273	M
7	17.5	227	M
7	18	172	F

Location EWL Date 12-14-10

Project / Client 07-47

TR-06

length	width	wt	gender
7.5	16.5	269	M
7	16	232	M
7.5	17	222	F
6.5	15	179	M
			F
7	16.5	253	M

TR-07

7.5	17	288	M
7.5	18	258	M
6.5	16.5	186	M
7.5	19.5	256	F
7.5	17.5	283	M
8	18	323	M
6.5	16	162	F
7.5	18	254	M
8.5	20	358	M
5.5	14.5	128	F
6	14	140	M

Location EWL Date 12-14-10

Project / Client 07-47

TR-08

length	width	wt	Gender
7	16.5	187	F
6.5	16	187	M
7.5	7	228	F
6.5	17.5	147	F
7	16.5	207	F
8.5	19.5	292	F
7.5	17.5	217	M
8	18.5	302	M
6	14.5	152	M
7.5	18	263	M

14 hours to bill
6:45 - 8:45
getty supplies, crabbing, processing
shipping, recording

Location EWL Date 12-14-10

Project / Client 07-47

TR-09

length	width	wt	gender
7.5	18	231	F
8	19	293	M
7	16	199	F
7	17	174	F
7.5	17	279	M
8	19	298	F
7.5	17.5	221	F
9	18.5	347	F
6.5	15	143	M
7	15.5	173	M
8	19.5	339	M

7 locations

TOTAL count: 68 crabs

12 ✓
8 ✓
11 ✓
5 ✓
11 ✓
10 ✓

68

20
47
67

Location EWL Date 12-15-10

Project / Client 07-47

for myself
~~7:30 organizational mtg~~
8:00 planning meeting

Heading out 1114

TR-01 1/2 mile from Schooner Bayou locks

RDO	Temp	pH	Cond	ORP	Turb	Depth	Tim
11.56	9.84	6.76	2523	0.21	52	1.4	1126

1st crab trap - no crabs
checking for fish here
hoop net bream + catfish
(photo 29+30 bream/catfish
saw two recreational
fishermen at TR-01

Location EWL Date 12-15-10

Project / Client 07-47

TR-02

RDo	Temp	pH	Cond	ORP	Turb	Depth	T

no crabs,
chick tomorrow

TR-01A 15 crabs

RDo	temp	pH	Cond	ORP	Turb	Depth	Tim
9.24	11.33	7.09	2871	0.16	367	2.2	1237

T-04, T-03, T-05
Barbee set traps
where sediments were
~~Stu~~ stirred up. Gajan
saw 20 traps all in
one area

Location EWL Date 12-15-10

Project / Client 07-47

TR-04 too big - one catfish

Sample Preparation 1354

T-01A

length	width	wt	gender
6.5	14	186	M
7	16	219.	M
7	16.5	175	M
7.5	17	263	M
7	17	205	M
7.5	18	240	M
7.5	18.5	234	M
7	15	205	M
6.5	15	181	M
6.5	16	197	M
8	18	294	M
8	18	247	M
8	14.5	263	F

Location EWL Date 12-15-10

Project / Client 07-47

TR-01

length	width	wt	gender
7	17	258	M
7.5	16	243	M
7	14.5	162	M
6	13.5	125	M
7.5	17.5	209	F
7.5	17	267	M
7.5	17	213	M
7.5	17	211	M
6.5	16	202	M
5.5	13	101	M
8	17	283	M

TR-01 bream

length	width	wt	gender
14	7	55	
4.5	5.5	63	
13	5	41	
12.5	5	45	

Location EWL Date 12-15-10

Project / Client 07-47

Heading off to Fed Ex
to ship 2 crab locations
1 fish + 1 bait 1544
12 hr day

Location EWL Date 12-16-10

Project / Client 07-47

Heading out to set fish
nets at 1041
(photo 29 mtg Aaron's Dad
Gay, Patrick → fish
net locations)

main north-south canal
is "Stelly Canal"
on way to T-12

check T-12 for crabs
one crab, put him back
(still in trap) to try to get
more crabs, rebaited @ 1100
Set out net at T-12 @ 1110
(photo 30 + 31 lunch, + barge
lunch) w/ Max on ~~bar~~ barge

T-9 check crab trap
5 crabs!

DO	temp	pH	cond	ORP	Turb	Depth	Time
12.24	12.73	6.82	2672	.2	233	1.5	1143

Location EWL Date 12-16-10

Project / Client 07-47

approaching
- T-08
  2 crabs, put them back
  to try for more
- putting fish net trap in
  at 1153 near T-07
- checking crab trap
  at T-07 – one crab,
  put him back
- putting a fish net trap time
  between T-5 and T-6 at 1206
- one crab @ T-05 @ 1214
  put it back
- checking T-06 for crabs

(photo 32 crabs at T-6)

Location EWL Date 12-16-10

Project / Client 07-47

T-06 time 1215

8 crabs!

RDO	temp	pH	Cond	ORP	Turb	Depth	Time
9,32	13,79	7.25	3145	.26	65,6	1.0	1215

heading to check T-10
3 crabs, left them
time 1226

Checking T-04 5 crabs
time 1237

RDO	temp	pH	cond	ORP	Turb	Depth	Time
9,27	13,61	7,47	3120	0.13	110	1.2	1237

checking T-03 5 crabs
time 1238

RDO	temp	pH	Cond	ORP	Turb	Depth	Time
9,45	13.81	741	3154	.09	70,1	2	1238

Location EWL Date 12-16-10

Project / Client 07-47

checking T-02
2 crabs - throw it
back time 1242

---

check T-01 2 crabs)
leave them there
to try to collect more
time 1253

---

check T-11
no crabs time 1257

---

checking TR-02
1 crab, threw back
in time: 1319

Location EWL Date 12-16-10

Project / Client 07-47

to package +

T-03 5 crabs)

length	width	weight	
6.5	15.5	178	M
7	15	212	M
7	16	194	M
5.5	13.5	130	M
6	13.5	156	M

T-04 5 crabs

length	width	weight	
7	16	201	M
7.5	17.5	289	M
6.5	14.5	172	M
6.5	15	182	M
8	18	298	M

Location CWL Date 12-16-10

Project / Client 07-47

T-06

8 crabs

length	width	wt	
7	16	214	M
6.5	16	199	M
6.5	14.5	139	M
7	17.5	221	M
6.5	16	193	M
7	15.5	184	F
7	16.5	233	M
6.5	14	198	M

T-09

length	width	wt	gender
7	16	227	M
7	16	138	M
7	17	223	M
6	14.5	127	M
7	17.5	203	F

Location Date

Project / Client

Location EWL Date 12-16-10

Project / Client 07-47

T-06

length	width	wt	8 crabs
7	16	214	M
6.5	16	199	M
6.5	14.5	139	M
7	17.5	221	M
6.5	16	193	M
7	15.5	184	F
7	16.5	233	M
6.5	14	198	M

T-09

length	width	wt	gender
7	16	227	M
7	16	138	M
7	17	223	M
6	14.5	127	M
7	17.5	203	F

1891-4989-1 Fed Exsender

Location EWL Date 12-20-10

Project / Client 07-47

0700

Headed out 7:00 AM from BTR, planning meeting Stelly's Grocery (complete)

CRABS

TR-01	~~[illegible]~~	11
02	5	
03A	12 + (7)	
04	8 + 7	
05	11 + 8	
06	6	
07	10	
08	11	
09	10	
T-01A	15 + 11	
02	11	
03	5	
04	5	
05	8	
06	8 + 10	
⓪⑦ 07	5	
08	5	
09	5	
10	5	
⑪	4	
⑫	3	

FISH

TR-01	4

Location EWL Date 12-20-10

Project / Client 07-47

1100 heading out

checking TR-03 no crabs

time 1104

heading to time 1107

TR-03 within 100yds

7 crabs

RDO	temp	pH	cond	ORP	Turb	Dpth	time
11.72	11.66	6.99	2944	.22	52.1	1.0	1107

2M + 1M

1F, 1F, 1F, 1M

heading to time 1120

TR-02

5 crabs males

RDO	temp	pH	Cond	ORP	Turb	Depth	Tim
7.25	10.74	7.02	5239	0.19	18.2	1.9	1120

Location EWL Date 12/20/10

Project / Client 07-47

Boom deployed near barge, sheen, odor

~~near~~

time 1128

T-12 3 crabs 2 males 1 female

RDO	temp	pH	cond	ORP	turb	Depth	time
9.29	11.77	7.72	2755	0.18	92.3	0.89	1128

☆ (check this again if possible)

T-08 5 crabs

time 1147

RDO	temp	pH	cond	ORP	turb	Depth	time
9.72	11.81	7.53	2768	0.15	95.21	.5	1147

T-07 - just 2 crabs

RDO

left it, put out another traps

☆ (check again)

Location EWL Date 12-20-10
Project / Client 07-47

head to T-10 5 males
time 1157

RDO	temp	pH	Cond	ORP	turb	Depth	Time
9.30	12.34	7.44	3200	.18	48.5	1.3	1157

T-6 time 1204 10 crabs

RDO	temp	pH	Cond	ORP	turb	Depth	time
9.83	12.57	7.48	3185	0.13	48.2	1.17	1204

T-5 time 1208 8 crabs
7 male
1 female

RDO	temp	pH	cond	ORP	turb	Depth	time
9.48	12.11	7.46	3170	0.12	46.4	1.1	1208

Location EWL Date 12-20-10
Project / Client 07-47

T-11 2 crabs left them

time 1222 7 crabs
T-04

RDO	temp	pH	cond	ORP	turb	Depth	time
8.05	12.35	7.45	3965	.14	45.9	1.0	1222

T-02 1228 11 crabs 1 Female

RDO	temp	pH	cond	ORP	turb	Depth	time
8.37	12.58	7.5	3946	0.11	48.1	1.1	1228

T-01 time 1236 11 crabs 1 Fem

RDO	temp	pH	cond	ORP	turb	depth	time
7.48	12.15	7.4	3930	0.05	51.3	1.0	1236

Location EWL Date 12-20-10

Project / Client 07-47

weighing, measuring processing

TR-02

length	wid	wt	Gendr
6	14	146	M
6.5	14.5	172	↓
6	14.5	160	
7	16.5	217	
6.5	15.5	204	

TR-03

6	14.5	135	M
6	15.5	108	F
6.5	15	162	M
6	13.5	124	F
6	14.5	121	F
6.5	17	194	F
8.5	20	383	M

Location EWL Date 12-20-10

Project / Client 07-47

T-01

length	width	wt	Gender
7	16	171	M
6.5	14.5	180	M
6.5	14	177	M
7	16.5	234	M
7.5	17	255	M
7	16.5	222	M
7.5	18	273	M
7	16	213	M
5.5	12	139	M
6	14.5	148	F
7.5	16.5	253	M

T-02

5.5	13	115	M
7.5	16	258	M
8	18	276	F
6.5	16	180	M
7	16	229	M
7	18	238	M
7.5	19	276	M
6.5	15.5	174	M
6.5	15	196	M
7	17.5	244	M
7.5	16	284	M

Location EWL Date 12-20-10

Project / Client 07-47

T-04

length	width	weight	gender
6	11.5	176	M
6.5	13.5	148	M
7	16.5	281	M
7.5	16	237	M
7.5	17.5	239	M
7.5	15.5	209	M
8	18	301	M

T-05

7.5	18.5	217	F
7	16	211	M
6.5	14.5	151	M
7	17	262	M
7.5	17.5	251	M
8.5	20	362	M
6	13.5	169	M
5.5	13	127	M

Location EWL Date 12-20-10

Project / Client 07-47

T-06

length	width	wt	gender
6.5	14.5	178	M
7	17	192	M
8	16.5	298	M
7	15.5	172	M
7	16.5	215	M
8	19.5	309	M
6.5	14.5	174	M
6	14	167	M
6	15	154	M
6.5	16.5	231	M

T-08

		264	M
7.5	17	287	M
7	16	224	M
7	16.5	214	F
6.5	16	171	F

Location EWL Date 12-20-10

Project / Client 07-47

T-10

length	width	wt	gendr
7.5	18	286	M
7	16.5	234	M
6.5	13.5	161	M
7.5	17.5	284	M
6	15.5	155	M

T-12

6.5	15	178	M
6	14.5	135	M
7	16	231	M

Shipped crabs
planning meeting
ice chest from Academy
back by 9:00
14 hour day

Location EWL Date 12-21-10

Project / Client 07-47

time 0958 T-12
checking net
catfish, a red fish, no bream (lots of fish)
no crabs

time 1011 checking net at T-9
(photo 33 + 34 at T-9
lots of fish)

T-#7 time 1018 5crabs
②+ female males
+2 crabs - ② males
(+1)

RDO	temp	pH	cond	ORP	turb	Depth	Time
9.12	12.97	6.91	2856	.22	88.1	1.1	1018

Location EWL Date 12-21-10

Project / Client 07-47

T-05 time 1033

3 crabs → 3 males

1 bluegill + 5 crabs males

RDO	temp	pH	cond	orp	turb	depth	time
8.95	13.4	7.26	3512	.07	46.5	1.3	1033

time 1053 T-11

4 crabs - males

+ 4 crabs - males

RDO	temp	pH	cond	ORP	turb	depth	time
8.64	13.49	7.41	3358	.02	59	1.3	1053

time 1104 T-0~~#~~2

sac-o-lait - 1 +7 crabs mals

RDO	temp	pH	cond	ORP	turb	depth	time
8.05	13.84	7.4	4019	.01	45.2	1.1	1104

+10 more 17 crabs

Location EWL Date 12-21-10

Project / Client 07-47

time 1118

T-02 measure + weigh

length	width	wt	Gender
6	14.5	129	M
7.5	16	232	M
8	19	328	M
7	16.5	219	M
7	16.5	212	M
7.5	18	246	M
7.5	17	270	M
6.5	15.5	145	M
6.5	16	179	M
7	16.5	213	
8	18.5	238	
7	15	186	
8	18	292	
6.5	16	207	
7	15	168	
7.5	16	211	
		260	

Location EWL Date 12-21-10

Project / Client 07-47

T-05

length	width	wt	Gender
6.5	15	174	M
6.5	14	173	M
7	15.5	188	M
8	18	292	M
7.5	17.5	227	F
6.5	14.5	161	M
6.5	15	177	M
7	16.5	211	M
7	16	222	M

T-07

7	15	191	M
7	16	171	F
7	15.5	197	M
8	18	275	M
7.5	17.5	240	M

Location EWL Date 12-21-10

Project / Client 07-47

T-11

length	width	wt	Gender
7	15.5	169	M
7	16.5	201	M
6.5	14	167	M
7	17	220	M
8	18	304	M
7.5	18	266	M
7.5	17.5	269	M
7	16	228	M

T-05 bluegill

length	width	wt
13.5	7	47

T-02 sac o lait

Location EWL Date 12-21-10

Project / Client 07-47

small fish

TR-02

length cm	width cm	wt
3	10	14gms
3	9.5	8
2.5	7.5	11
2.5	8	7
3	10	11
2.5	7.5	5
3	10	11
2.5	9	7
2.5	9	6
2.5	9	7
2	7.5	4
2.5	10.5	11
2.5	8	4
2	7.5	4
3	10.5	16
2	7	5
2	7	5
2.5	8.5	6
2.5	8	8

Location EWL Date 12-21-10

Project / Client 07-47

SHAD

length	width	wt
2.5	8.5	9
2.5	8.5	8
2	8	6

TR-03

2.5	8	11
2.5	8	7
2 ~~3~~	8.5	8
2.5	8.5	~~8.5~~ 7
3	11	12
2	9.5	7
2.5	9	8
3	11	14
2.5	10	9
3	11	13
2.5	10	10
2.5	9	7
2.5	9.5	8
2.5	10	9
2.5	9.5	7
2.5	9.5	7

Location EWL Date 12-21-10

Project / Client 07-47

TR-03 con't

length	width	wt
2.5	10	7
2	9	7
2.5	9.5	~~9~~6
2.5	9	7
3	10	8
3	11	12
3	11	12
2.5	9.5	7
2.5	10	10
3	10.5	10
2.5	10	9
3	10.5	9
2.5	9.5	9

SHAD

TR-04

2	9	7
2.5	9	12
2.5	9	7
2	8	7
2	8	7
2	8	6
2	8	4
2.5	9	5

Location EWL Date 12-21-10

Project / Client 07-47

TR-04 con't

length	width	wt
2.5	9	7
2.5	9	6
2	8.5	4
2	8	5
2	8	5
2	8	3
2.5	9	5
2	8	4
2	8	5
2.5	9	9
2	8.5	5
3	10	8
2.5	9	6
2	8	5
2.5	9	7
2.5	8.5	6

Location EWL Date 01-03-11

Project / Client 07-47

AM
crabs collected
John + Patrick

TR-02	10	
-03	7	
-04	10	
T-03	12	
-07	9	
-08	8	
-10	12	
-12	11	

head to Lafayette
to ship crabs
lt ~~0314~~ 1514
2 hours preparations
in morning
left BTR at noon
worked till 7:00
9 hrs worked

Location EWL Date 01-04-11

Project / Client 07-47

meeting 0700
head out in boat 0905
heading to TR-05 (photos)
nets in water 0930
collected lots fish: SHAD, catfish + mullet
Shad trawled 200 yds 2½ gallon
lots of fish - kept ½ bucket

move to TR-06
0945 trawled 200yds
smaller number of
fish, kept shad (about 50)
threw back catfish
and mosquito fish

head to TR-08
1005
lots of SHAD and
large catfish
filled ¼ of bucket
w/SHAD, 6 diff
species

Location EWL Date 1-4-11

Project / Client 07-47

Head to TR-09

1028

lots of fish

collected SHAD

threw back lots

of catfish perch

+ one small crab

---

head to TR-07

1050

lots of SHAD

head to canals

1/2 bucket of fish

WLF phone

763-3554

paused fishing to

complete collection

permit. Worked

till 4:00 meeting

w/ WLF

7:00- 4:00 9 hour day

Location EWL Date 1-5-11

Project / Client 07-47

$ 35.64 11.28 gallons

fuel - no rec't

from pump 0940

1000 - headed over the to

WLF to try to get

permit phoned +

waiting to hear from

Manual Ruiz

Spoke to Manuel @

10:51, he has the document

on his bosses desk,

waiting to be signed

1055 - Signed!

Head to Landing

@ 1331 waiting at Stelly

for John to call

head out 1425

Location EWL Date 1-5-11

Project / Client 07-47

while I was out:

1230 T-01 barnacles on log fish SHAD
1230 T-02 fish - SHAD + mos fish, catfish, crab
1320 T-05
1330 T-03
1340 T-04
1350 T-06
1355 T-10
1405 T-11

8 stations: SHAD!

heading out to T-12
T-7, 8, 9

Moving to T-12
time 1445
photos at T-12 Sheen
collected SHAD
~ 80 fish

Location EWL Date 1-5-11

Project / Client ~~07~~ 07-47

moving to T-7, 8, 9

T-09
time 1455 photo
tons of SHAD John

T-08 15-05 - time
photos John
fish - SHad, catfish

T-07 1510 - time
SHAD - no photo here

on way to T-09
to check crabs
time 1525
need small boat for
crab traps

Location EWL Date 1-5-11

Project / Client 07-47

beginning to process
fish at landing

T-08
1/3 of 5 gallon bucket
wrapped in foil
See record forms

T-03 TR-07
T-07 TR-05
T-08 TR-08
SHAD TR-06
TR-09

processed all
fish locations

Shipped TR-5, 6, 7, 89
+ T-1, 2, 3, 4, 5. 6, 7, 8
9, 10, 11, 12

Location Date

Project / Client

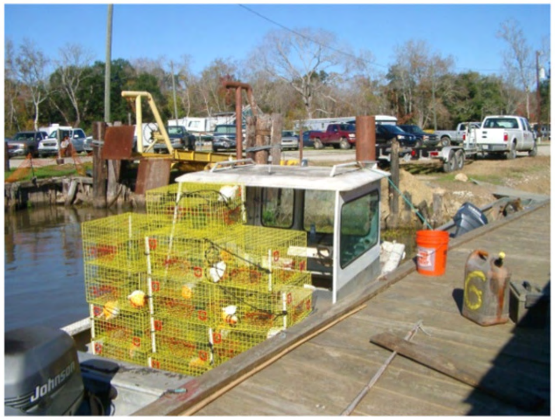
Photo Log
Appendix C

East White Lake Oil and Gas Field
Vermilion Parish, Louisiana

Photo Journal
Crabbing and Fishing
East White Lake

12/13/2010 – 01/05/2011

Day 1
Setting Crab Traps/Cast Netting for Fish
(12/13/10)



IMGP2905: Crab traps on boat at Little Prairie Landing

IMGP2906:Catfish heads/bodies to be used for baiting crab traps

IMGP2907: Gajan adding fuel to the boat

Newly constructed platform with heater treater

Day 1
Setting Crab Traps/Cast Netting for Fish
(12/13/10)

PC130002: Newly constructed platform with heater treater

PC130003: Newly constructed platform with heater treater and flowlines

IMGP2909: Mitchell throwing in a crab trap at location TR-07

IMGP2910: Mitchell throwing in a crab trap at location TR-06

Day 1
Setting Crab Traps/Cast Netting for Fish
(12/13/10)

IMGP2911: Mitchell baiting a crab trap at location TR-05

IMGP2912: Mitchell baiting a crab trap at location TR-05

PC130004: Oil and gas field canals, former location of elevated vessel

PC130005: Oil and gas field canals, former location of elevated vessel

Day 1
Setting Crab Traps/Cast Netting for Fish
(12/13/10)

IMGP2914: Gajan, boat captain and crab fisherman, on the boat

IMGP2915: Gajan driving the boat towards location TR-04

IMGP2916: Patrick with handheld DeLorme Earthmate PN-40 GPS, used to identify location coordinates

IMGP2917: Patrick taking coordinates at location T-10 with handheld DeLorme GPS

Day 1
Setting Crab Traps/Cast Netting for Fish
(12/13/10)

IMGP2918: Oil and gas field canals, former location of elevated vessel

PC130006: Canal south of Schooner Bayou to ICON background location

PC130007: Canal south of Schooner Bayou to ICON background location

PC130008: Cast net and box with catfish bait

Day 1
Setting Crab Traps/Cast Netting for Fish
(12/13/10)

PC130009: Cast net, box of catfish bait

PC130010: Chevron dock facility

IMGP2919: Helen pulling crab trap into the boat at location TR-02

IMGP2920: Helen pulling crab trap into the boat at location TR-02

Day 1
Setting Crab Traps/Cast Netting for Fish
(12/13/10)

IMGP2921: Crabs collected in wire mesh trap at location TR-02

IMGP2922:Patrick pulling crab trap onto the boat at location TR-01

IMGP2923: Patrick pulling crab trap onto the boat at location TR-01

IMGP2924: Patrick rebaiting crab trap at location TR-01

Day 1
Setting Crab Traps/Cast Netting for Fish
(12/13/10)

IMGP2925:Gajan casting net for fish at a test location chosen by him

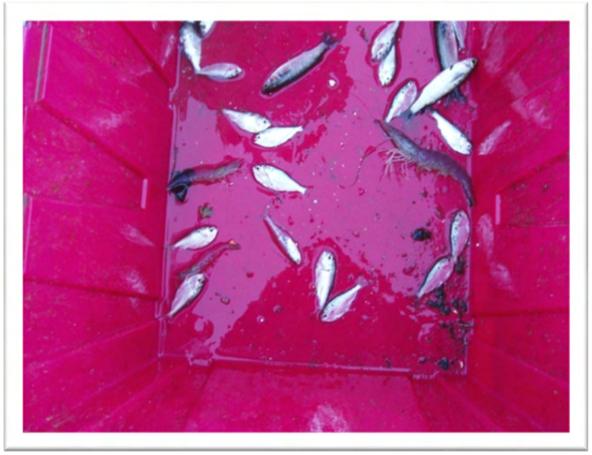
IMGP2926: Gajan pulling fishing cast net out of water at a test location chosen by him

IMGP2927: Gajan throwing cast net out to collect fish at a test location chosen by him

IMGP2928: Gajan bringing cast net with fish in it onto the boat

Day 1
Setting Crab Traps/Cast Netting for Fish
(12/13/10)

IMGP2929: Gajan checking cast net for fish at location TR-02



PC130011: Fish collected by cast net at location T-10

PC130012: Jug line/trout line between TR-04 and TR-05

PC130013: Jug line/trout line between TR-04 and TR-05

Day 1
Setting Crab Traps/Cast Netting for Fish
(12/13/10)

PC130014: Contents of cast net between TR-04 and TR- 06

PC130015: Oil and gas canal near TR-04

Day 2
Collecting/Weighing/Measuring/Shipping Crabs
(12/14/2010)

IMGP2930: Crabs fromTR-06 in basket prior to being moved to holding bucket

IMGP2931: Crab from location TR-07 held with tongs by Patrick

IMGP2933:John counting crabs and identifying their gender

IMGP2934: Crabs collected at location TR-09 in holding basket on boat

Day 2
Collecting/Weighing/Measuring/Shipping Crabs
(12/14/2010)

IMGP2935: Buckets/lids labeled by location to hold crabs once counted and gender identified

IMGP2937: Crabs collected at location TR-08 in a holding basket on the boat

IMGP2938: Catfish and bream collected at location TR-03A in a holding basket on the boat

IMGP2939: John holding a bream fish collected at TR-03A

Day 2
Collecting/Weighing/Measuring/Shipping Crabs
(12/14/2010)

IMGP2940: Patrick weighing female crab on a digital scale at Little Prarie Landing

Day 3
Collecting, Measuring and Shipping Crabs/Fish
(12/15/2010)

PC150016: Gajan pulling crab trap out of the water at TR-01

PC150017: Pulling hoop net out of the water at TR-1

PC150018: Checking hoop net at TR-01

PC150019: Returning hoop net to bottom at TR-01

Day 3
Collecting, Measuring and Shipping Crabs/Fish
(12/15/2010)

PC150020: Checking hoop net at TR-01

PC150021: Fish in hoop net at TR-01

PC150022: Hoop net partially out of water at TR-01

PC150023: Fish in hoop net at TR-01

Day 3
Collecting, Measuring and Shipping Crabs/Fish
(12/15/2010)


PC150024: Fish collected from hoop net at TR-01


PC150025: Helen and John looking at hoop net at TR-01

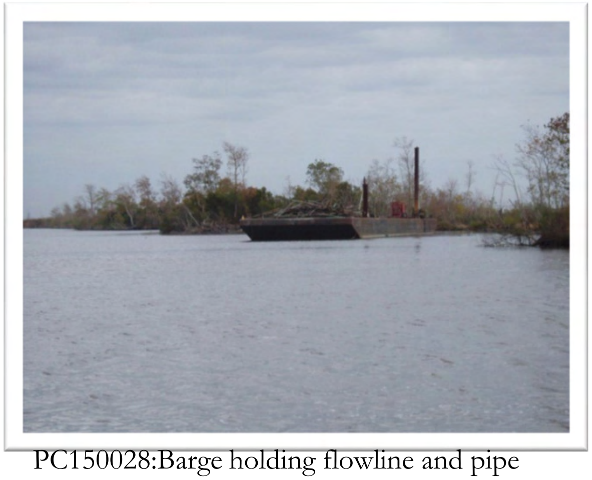

PC150026: Contents of hoop net at TR-01


IMGP2941: Bream and catfish collected by hoop net at location TR-01

Day 3
Collecting, Measuring and Shipping Crabs/Fish
(12/15/2010)

IMGP2942: Bream and catfish collected by hoop net at location TR-01

PC150027: Barge holding flowline and pipe removal debris



PC150028:Barge holding flowline and pipe removal debris

PC150029: Newly constructed platform with heater

Day 3
Collecting, Measuring and Shipping Crabs/Fish
(12/15/2010)

PC150030: Newly constructed platform with heater

PC150031: Crane/barge/tug used for flowline pipe removal

PC150032: Crane/barge/tug used for flowline pipe removal

PC150033: New signs posted by Vermilion Parish School Board restricting hunting and fishing

Day 3
Collecting, Measuring and Shipping Crabs/Fish
(12/15/2010)

PC150034: New signs posted by Vermilion Parish School Board restricting hunting and fishing

PC150035: Crane/barge/tug used for flowline pipeline removal

PC150036: Crane/barge/tug used for flowline pipeline removal

PC150037: Crane/barge/tug used for flowline pipeline removal

Day 3
Collecting, Measuring and Shipping Crabs/Fish
(12/15/2010)

PC150038: Crane/barge/tug used for flowline pipeline removal

PC150039: Crane/barge/tug used for flowline/pipeline removal

PC150040: Crane/barge/tug used for flowline/pipeline removal

PC150041: Long stick on barge conducting flowline/pipeline removal

Day 3
Collecting, Measuring and Shipping Crabs/Fish
(12/15/2010)

PC150042: Long stick on barge conducting flowline/pipeline removal

PC150043: Crane on barge conducting flowline/pipeline removal

IMGP2943: Crabs collected from location TR-01A in holding basket on boat

IMGP2944: Patrick onshore

Day 3
Collecting, Measuring and Shipping Crabs/Fish
(12/15/2010)

IMGP2945: Patrick and John at weighing and measuring station at Little Prairie Landing

Day 4
Photographing Waterways
Collecting/Measuring/Shipping Crabs
(12/16/20)

PC160044: Little Prairie Boat Landing

PC160045: Little Prairie Boat Landing

PC160046: Crab trap location at T-12

PC160047: Crab trap location at T-12

Day 4
Photographing Waterways
Collecting/Measuring/Shipping Crabs
(12/16/20)

PC160048: Gajan baiting hoop nets at T-12

PC160049: Gajan baiting hoop nets at T-12

PC160050: Gajan baiting hoop nets at T-12

PC160051: Gajan setting hoop net at T-12

Day 4
Photographing Waterways
Collecting/Measuring/Shipping Crabs
(12/16/20)

PC160052: Gajan setting hoop net at T-12

PC160053: Gajan setting hoop net at T-12

PC160054: Gajan setting hoop net at T-12

PC160055: Gajan setting hoop net at T-12

Day 4
Photographing Waterways
Collecting/Measuring/Shipping Crabs
(12/16/20)

IMGP2946: Patrick and Gajan getting on barge to have lunch with Max Hungerford

PC160056: Peak central facility tank battery

IMGP2947: Hoop nets stacked on boat

PC160057: Inspecting crab trap at T-05

Day 4
Photographing Waterways
Collecting/Measuring/Shipping Crabs
(12/16/20)

PC160058: Traveling to T-07 location

PC160059: Traveling to T-07 location

PC160060: Traveling to T-07 location

PC160061: Collecting crab trap at T-07 location

Day 4
Photographing Waterways
Collecting/Measuring/Shipping Crabs
(12/16/20)

PC160062: Collecting crab trap at T-07 location

PC160063: Gajan setting hoop nets at T-07 location

IMGP2949: The barge near location T-07

PC160066: Approaching crab trap at T-02 location

Day 4
Photographing Waterways
Collecting/Measuring/Shipping Crabs
(12/16/20)

PC160067: Approaching crab trap at T-02 location

PC160068: Approaching crab trap at location T-02

PC160070: Collecting crab trap at T-02 location

IMG_0465: Helen recording number of crabs collected at location T-06

Day 4
Photographing Waterways
Collecting/Measuring/Shipping Crabs
(12/16/20)

PC160071: Oil and Gas Field Canal

IMGP2950: Crabs collected in trap from location T-06

IMGP2951: Patrick with large crab at weighing and measuring station at Little Prairie Landing

Day 5
Collecting/Measuring/Shipping Crabs
Recording Water Chemistry
(12/20/10)

IMG_0466: Patrick holding large crab at location TR-03

IMG_0467: Helen holding large crab at location T-05

PC200072: Barge traveling down Schooner Bayou

Day 6
Hoop Netting Fish and Collecting Crabs
Shipping Crabs and Fish
(12/21/10)

IMGP2956: Fish captured in hoop net at location T-09

IMGP2957: Gajan bringing hoop net onto boat to check for fish at location T-10

IMGP2958: Patrick measuring length and width of shad fish at measuring station at Little Prairie Landing

IMGP2959: Shad fish in five gallon bucket at measuring station at Little Prairie Landing

Day 6
Hoop Netting Fish and Collecting Crabs
Shipping Crabs and Fish
(12/21/10)

PC210073: Collecting hoop net from T-11 location

PC210074: Gajan collecting hoop net at T-11

PC210075: Fish in hoop net at T-11

PC210076: Fish in hoop net at T-11

Day 6
Hoop Netting Fish and Collecting Crabs
Shipping Crabs and Fish
(12/21/10)

PC210077: Collecting hoop net at T-11

Day 7
Collecting and Shipping Crabs
Photographing Waterways
(01/03/11)

P1030078: Wildlife

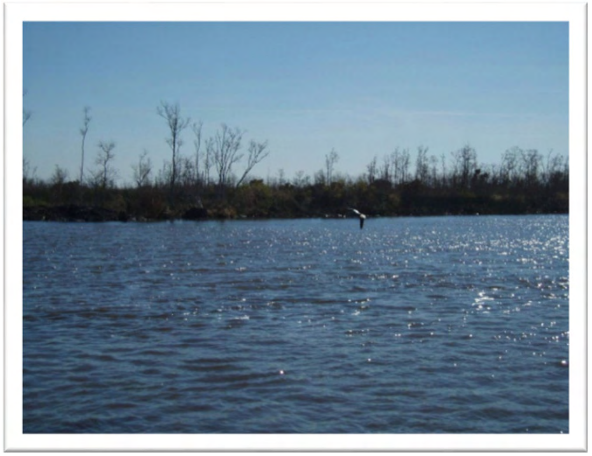
P1030079: Wildlife

P1030080: Wildlife

P1030081: Wildlife

Day 7
Collecting and Shipping Crabs
Photographing Waterways
(01/03/11)

P1030082: Wildlife



P1030083: Wildlife

P1030084: Wildlife

P1030085: Wildlife

Day 7
Collecting and Shipping Crabs
Photographing Waterways
(01/03/11)

P1030086: Wildlife

Day 8
Collecting Shad Fish by Trawling
(01/04/11)

P1040087: Double rigged trawling boat docked at Little Prairie Landing

P1040088: Double rigged trawling oat docked at Little Prairie Landing

IMG_0479: Detail of fish sorting table at back of trawling boat

IMG_0480: Gajan at back of trawling boat with fishing nets not in the water

Day 8
Collecting Shad Fish by Trawling
(01/04/11)

IMG_0481: Gajan at back of trawling boat with fishing nets not in the water

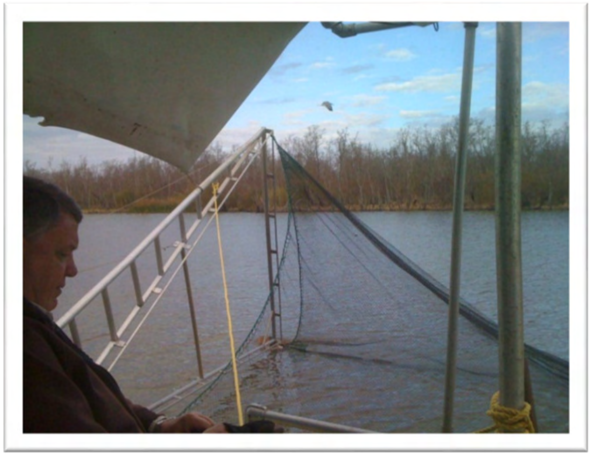
IMG_0482: Gajan at back of trawling boat with fishing nets not in the water

IMG_0483: Patrick and John near table for fish collection/sorting, nets not in the water

IMG_0484: Nets being lowered into the water at location TR-05 on the trawling boat

Day 8
Collecting Shad Fish by Trawling
(01/04/11)

IMG_0485: Pulling trawling nets through the water at location TR-05



IMG_0486: Trawling net, attached to boom, being dragged through the water at location TR-05.

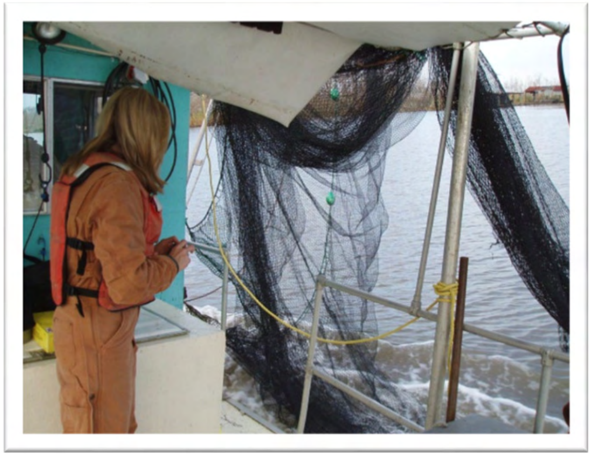
IMG_0487: Submerged net on extended boom being pulled through water at location TR-05

IMG_0488: Raising net out of water at location TR-05

Day 8
Collecting Shad Fish by Trawling
(01/04/11)

IMG_0489: Releasing fish collected in trawling net at location TR-05 to collection basket

IMG_0490: Basket of fish collected by trawling net at location TR-05



P1040089: Trawling nets being lowered into the water

P1040090: Boat captain setting trawling nets

Day 8
Collecting Shad Fish by Trawling
(01/04/11)

P1040091: Trawling net dragging in water

P1040092: Pulling trawling net through the water at TR-05

IMG_0491: Birds following fishing boat on Schooner Bayou Canal

P1040093: Helen watching trawling

Day 8
Collecting Shad Fish by Trawling
(01/04/11)

P1040094: Helen and boat captain

P1040095: Boat captain setting nets

P1040096: Pulling trawling nets through the water at TR-06

P1040097: Pulling nets through the water at TR-06

Day 8
Collecting Shad Fish by Trawling
(01/04/11)

P1040098: John observing trawling at TR-06

P1040099: Pulling trawling nets through the water at TR-06

IMG_0492: Bow of trawling fishing boat near location TR-06

IMG_0493: Trawling nets out of water/extended from sides of boat on booms near location TR-06

Day 8
Collecting Shad Fish by Trawling
(01/04/11)

P1040100: Wildlife

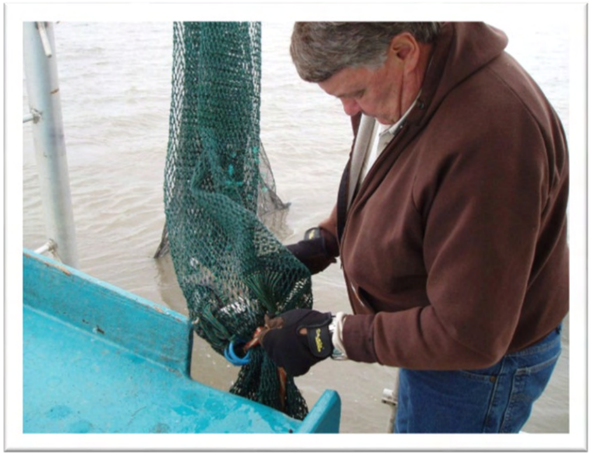
P1040101: Fish in bottom of net

P1040102: John pulling the trawling net in

P1040103: Catch from trawling at TR-06

Day 8
Collecting Shad Fish by Trawling
(01/04/11)

P1040104: Wildlife



P1040105: John releasing the tail end of the net

P1040106: Wildlife

P1040107: Helen and John sorting the catch at TR-09

Day 8
Collecting Shad Fish by Trawling
(01/04/11)

P1040108: Helen and John sorting the catch at TR-09

IMG_0494: Releasing fish captured in nets at location TR-09 to sorting table

IMG_0495: Detail of sorting table, fish collection basket, and nets on trawling boat

P1040109: Packaging shad for shipping in aluminum foil

Day 9
Collecting Fish in Trawling Nets/Shipping to Lab
(01/05/11)

IMGP2961:Cows and pasture near Little Prairie Landing

IMGP2962: Cow, oak trees and pasture near Little Prairie Landing

IMGP2963: Visible sheen on water surface at location T-12

IMGP2964: Lowering trawling nets into the water at location T-12

Day 9
Collecting Fish in Trawling Nets/Shipping to Lab
(01/05/11)

IMGP2965: Dragging trawling nets through the water at location T-12

IMGP2966: Passing a fishing boat at location T-12

IMGP2967: Captain piloting the boat. Boom is visible through the window on the starboard side of the boat

IMGP2968: Captain in the wheelhouse steering the boat

Day 9
Collecting Fish in Trawling Nets/Shipping to Lab
(01/05/11)

IMGP2969: John guiding trawling net out of the water at location T-12

IMGP2970: John untying the rope that holds fish in the net at location T-12

IMGP2971: John emptying fish from the trawling net onto the sorting table

IMGP2972: The full end of the trawling net, closed by a rope looped through rings and tied with a knot that is secure, but easily released to dump the catch.

Day 9
Collecting Fish in Trawling Nets/Shipping to Lab
(01/05/11)

IMGP2973: Fish released from trawling net onto sorting table

IMGP2974: Peak facility facing east

IMGP2975: Pulling trawling nets out of the water with in the background

IMGP2976: Emptying fish from trawling net onto sorting table with in the background

Day 9
Collecting Fish in Trawling Nets/Shipping to Lab
(01/05/11)

IMGP2977: John releasing fish from trawling net to sorting table

IMGP2978: John releasing fish from trawling net to sorting table

IMGP2979: Fish to be sorted: shad shorter than 7.0 cm and all catfish and mosquito fish are thrown back into the water

IMGP2980: Close up of fish before being sorted

Day 9
Collecting Fish in Trawling Nets/Shipping to Lab
(01/05/11)

IMGP2981: Peak facility

IMGP2982: On Schooner Bayou Canal heading back to Little Prairie Landing

IMGP2983: Sunlight on Schooner Bayou

Field Record Forms
Appendix D

East White Lake Oil and Gas Field
Vermilion Parish, Louisiana

Field Record Form: 07-47 East White Lake (VPSB)

Sampling Site Identification Code: T - 01A

Sample Type ([✓ C] / F)
C = crab F = forage fish

Project Initial Code: EWL

Sampling Date: 12-15-10

Collection Method(s): crab trap

Collector Name (print and sign): J. Rodgers, P. Ritchie, H. Connelly

Affiliation: Clemson University (864) 650-0210

Address: Department of Forestry and Natural Resources

Site Location

Parish: Vermilion

Latitude: 561094

Longitude: 3288605

Site Name: Schooner Bayou

Site Description: Bayou

Water Body Description: Bayou

Estimated Maximum Water Depth: ______ (meters) / 20 (feet)

RDO mg/L	Temp C	pH	Cond µS/cm	ORP ~~m~~V	Turb NTU	Depth feet	Time
9.24	11.33	7.09	2871	0.16	367	2.2	1237

Notes: 400 yards south of T-01 on main N-S Bayou on School board property near the pilings

Sample Description

Species: callinectes sapidus

Total # of Individuals: 15

HC 12/15/10 HC 12/15/10

Specimen Composite Code	Length cm ~~(mm)~~	Width cm ~~(mm)~~	Weight (grams)	Date/Time Trap Set	Date/Time Trap Pulled	Type of Bait	Sex	Additional Comments
C	6.5	14	186	12/08/10/0900	12/15/10/1237	catfish	M	
C	7	16	219	12/08/10/0900	12/15/10/1237	catfish	M	missing claw
C	7	16.5	175	12/08/10/0900	12/15/10/1237	catfish	M	
C	7.5	17	263	12/08/10/0900	12/15/10/1237	catfish	M	
C	7	17	205	12/08/10/0900	12/15/10/1237	catfish	M	missing claw
C	7.5	18	240	12/08/10/0900	12/15/10/1237	catfish	M	
C	7	15.5	213	12/08/10/0900	12/15/10/1237	catfish	M	
C	7	16	234	12/08/10/0900	12/15/10/1237	catfish	M	
C	7.5	18.5	219	12/08/10/0900	12/15/10/1237	catfish	F	missing claw
C	7	15	205	12/08/10/0900	12/15/10/1237	catfish	M	
C	6.5	15	181	12/08/10/0900	12/15/10/1237	catfish	M	
C	6.5	16	197	12/08/10/0900	12/15/10/1237	catfish	M	
C	8	18	294	12/08/10/0900	12/15/10/1237	catfish	M	
C	7.5	18	24	12/08/10/0900	12/15/10/1237	catfish	M	miss. claw.
C	8	18.5	263	12/08/10/0900	12/15/10/1237	catfish	F	

Notes:

Field Record Form: 07-47 East White Lake (VPSB)

Sampling Site Identification Code: I - 01
Project Initial Code: EWL
Sampling Date: 12-20-10
Collection Method(s): crab trap
Collector Name (print and sign): P. Ritchie, H. Connelly
Affiliation: Clemson University (864) 650 0210
Address: Dept Forestry + Natural Resources

Sample Type ([✓ C] / F)
C = crab F = forage fish

Site Location

Parish: Vermilion

Latitude: 561094
Longitude: 3288605
Site Name: EWL Field
Site Description: Canal
Water Body Description: canal
Estimated Maximum Water Depth: ______ (meters) / 20 (feet)

RDO mg/L	Temp C	pH	Cond µS/cm	ORP mV	Turb NTU	Depth feet	Time
7.48	18.15	7.4	3930	0.05	51.3	1.0	1236

Notes:

Sample Description

Species: callinectes sapidus
Total # of Individuals: 11

HC12/20/10 HC12/20/10

Specimen Composite Code	Length cm ~~(mm)~~	Width cm ~~(mm)~~	Weight (grams)	Date/Time Trap Set	Date/Time Trap Pulled	Type of Bait	Sex	Additional Comments
C	7	16	171	12/13/10/1227	12/20/10/1236	catfish	M	one claw
C	6.5	14.5	180	12/13/10/1227	12/20/10/1236	catfish	M	
C	6.5	14	177	12/13/10/1227	12/20/10/1236	catfish	M	
C	7	16.5	234	12/13/10/1227	12/20/10/1236	catfish	M	
C	7.5	17	255	12/13/10/1227	12/20/10/1236	catfish	M	
C	7	16.5	222	12/13/10/1227	12/20/10/1236	catfish	M	
C	7.5	18	273	12/13/10/1227	12/20/10/1236	catfish	M	
C	7	16	213	12/13/10/1227	12/20/10/1236	catfish	M	one claw
C	5.5	12	139	12/13/10/1227	12/20/10/1236	catfish	M	
C	6	14.5	148	12/13/10/1227	12/20/10/1236	catfish	F	
C	7.5	16.5	253	12/13/10/1227	12/20/10/1236	catfish	M	

Notes:

Field Record Form: 07-47 East White Lake (VPSB)

Sampling Site Identification Code: T - 01
Sample Type (C / [✓ F])
C = crab F = forage fish
Project Initial Code: EWL
Sampling Date: 01-05-11
Collection Method(s): trawl
Collector Name (print and sign): J. Rodgers
Affiliation: Clemson Univ. (864) 650-0210
Address: Dept Forestry and Natural Resources

Site Location 1230
Parish: Vermilion
Latitude:
Longitude:
Site Name:
Site Description:
Water Body Description:
Estimated Maximum Water Depth: ______ (meters) / ______ (feet)

RDO mg L	Temp C	pH	Cond µS/cm	ORP mV	Turb NTU	Depth feet	Time

Notes: lat, long, etc → see previous record forms

Sample Description

Species: SHAD
Total # of Individuals: 1/8 of 5 gallon bucket

Specimen Composite Code	Length (mm)	Width (mm)	Weight (grams)	Date/Time Trap Set	Date/Time Trap Pulled	Type of Bait	Sex	Additional Comments
F					01/05/11/1230			

Notes:

Field Record Form: 07-47 East White Lake (VPSB)

Sampling Site Identification Code: I-02
Project Initial Code: EWL
Sampling Date: 12-20-10
Collection Method(s): crab trap
Collector Name (print and sign): P. Ritchie H. Connelly
Affiliation: Clemson University (864) 650-0210
Address: Dept Forestry + Natural Resources

Sample Type ([✓ C] F)
C = crab F = forage fish

Site Location

Parish: Vermilion
Latitude: 561094
Longitude: 3288612
Site Name: EWL Field
Site Description: canal
Water Body Description: canal
Estimated Maximum Water Depth: ______ (meters) / 20' (feet)

RDO mg/L	Temp C	pH	Cond µS/cm	ORP ~~m~~V	Turb NTU	Depth feet	Time
8.37	12.58	7.5	3946	0,11	48.1	1.1	1228

Notes:

Sample Description

Species: callinectes sapidus
Total # of Individuals: 11

HC 12/20/10 HC 12/20/10

Specimen Composite Code	Length cm ~~(mm)~~	Width cm ~~(mm)~~	Weight (grams)	Date/Time Trap Set	Date/Time Trap Pulled	Type of Bait	Sex	Additional Comments
C	5.5	13	115	12/13/10/1229	12/20/10/1228	catfish	M	
C	7.5	16	258	12/13/10/1229	12/20/10/1228	catfish	M	
C	8	18	276	12/13/10/1229	12/20/10/1228	catfish	F	
C	6.5	16	180	12/13/10/1229	12/20/10/1228	catfish	M	
C	7	16	229	12/13/10/1229	12/20/10/1228	catfish	M	one claw
C	7	18	238	12/13/10/1229	12/20/10/1228	catfish	M	
C	7.5	19	276	12/13/10/1229	12/20/10/1228	catfish	M	one claw
C	6.5	15.5	174	12/13/10/1229	12/20/10/1228	catfish	M	
C	6.5	15	196	12/13/10/1229	12/20/10/1228	catfish	M	
C	7	17.5	244	12/13/10/1229	12/20/10/1228	catfish	M	
C	7.5	16	284	12/13/10/1229	12/20/10/1228	catfish	M	

Notes:

Field Record Form: 07-47 East White Lake (VPSB)

Sampling Site Identification Code: T - 02
Project Initial Code: EWL
Sampling Date: 12 - 21 - 10
Collection Method(s): net
Collector Name (print and sign): P. Ritchie, H. Connelly, J. Rodgers
Affiliation: Clemson University (864) 650 - 0210
Address: Dept Forestry + Natural Resources

Sample Type ([✓ C] / F)
C = crab F = forage fish

Site Location

Parish: Vermilion
Latitude: 561094
Longitude: 3288612
Site Name: EWL Field
Site Description: canal
Water Body Description: canal
Estimated Maximum Water Depth: ____ (meters) / 20' (feet)

RDO mg/L	Temp C	pH	Cond µS/cm	ORP mV	Turb NTU	Depth feet	Time
8.05	13.84	7.4	4019	0.01	45.2	1.1	1104

Notes:

Sample Description

Species: Callinectes sapidus
Total # of Individuals: 7 + 10 = 17

HC 12/21/10 HC 12/21/10

Specimen Composite Code	Length cm ~~(mm)~~	Width cm ~~(mm)~~	Weight (grams)	Date/Time Trap Set	Date/Time Trap Pulled	Type of Bait	Sex	Additional Comments
C	6	~~129~~ 14.5	129	12/13/10/1228	12/21/10/1104	catfish	M	
C	7.5	16	232	12/13/10/1228	12/21/10/1104	catfish	M	
C	8	19	328	12/13/10/1228	12/21/10/1104	catfish	M	
C	7	16.5	219	12/13/10/1228	12/21/10/1104	catfish	M	
C	7	16.5	212	12/13/10/1228	12/21/10/1104	catfish	M	
C	7.5	18	246	12/13/10/1228	12/21/10/1104	catfish	M	
C	7.5	17	270	12/13/10/1228	12/21/10/1104	catfish	M	
C	6.5	15.5	145	12/13/10/1228	12/21/10/1104	catfish	M	
C	6.5	16	179	12/13/10/1228	12/21/10/1104	catfish	M	
C	7	16.5	213	12/13/10/1228	12/21/10/1104	catfish	M	
C	8	18.5	238	12/13/10/1228	12/21/10/1104	catfish	M	one claw
C	7	15	186	12/13/10/1228	12/21/10/1104	catfish	M	
C	8	18	292	12/13/10/1228	12/21/10/1104	catfish	M	
C	6.5	16	207	12/13/10/1228	12/21/10/1104	catfish	M	
C	7	15	168	12/13/10/1228	12/21/10/1104	catfish	M	
C	7.5	16	211	12/13/10/1228	12/21/10/1104	catfish	M	
C	8	17	260	12/13/10/1228	12/21/10/1104	catfish	M	

Notes:

Field Record Form: 07-47 East White Lake (VPSB)

Sampling Site Identification Code: T - 02
Project Initial Code: EWL
Sampling Date: 01-05-11
Collection Method(s): trawl
Collector Name (print and sign): J. Rodgers
Affiliation: Clemson University (864) 650-0210
Address: Dept Forestry + Natural Resources

Sample Type (C / [✓ F])
C = crab F = forage fish

Site Location 1230

Parish: Vermilion

Latitude:

Longitude:

Site Name:

Site Description:

Water Body Description:

Estimated Maximum Water Depth: ______ (meters) / ______ (feet)

RDO mg/L.	**Temp** C	**pH**	**Cond** µS/cm	**ORP** ~~m~~V	**Turb** NTU	**Depth** feet	**Time**

Notes: lat, long, etc → see previous record forms

Sample Description

Species: SHAD

Total # of Individuals: 1/8 5gallon bucke

Specimen Composite Code	**Length (mm)**	**Width (mm)**	**Weight (grams)**	**Date/Time Trap Set**	**Date/Time Trap Pulled**	**Type of Bait**	**Sex**	**Additional Comments**
F					01/05/11/1230			

Notes:

Field Record Form: 07-47 East White Lake (VPSB)

Sampling Site Identification Code: T-03
Sample Type ([✓ C] F)
C = crab F = forage fish
Project Initial Code: EWL
Sampling Date: 12-16-10
Collection Method(s): crab trap
Collector Name (print and sign): J. Rodgers, P. Ritchie, H. Connelly
Affiliation: Clemson University (864) 650-0210
Address: Dept Forestry and Natural Resources

Site Location

Parish: Vermilion
Latitude: 561068
Longitude: 3288828
Site Name: EWL
Site Description: EWL field
Water Body Description: canal
Estimated Maximum Water Depth: ______ (meters) / 7' (feet)

RDO mg/L	Temp C	pH	Cond µS/cm	ORP mV	Turb NTU	Depth feet	Time
9.45	13.81	7.41	3154	0.09	70.1	2	1238

Notes:

Sample Description

Species: callinectes sapidus
Total # of Individuals: 5

HC 12/16/10 HC 12/16/10

Specimen Composite Code	Length ~~(mm)~~ cm	Width ~~(mm)~~ cm	Weight (grams)	Date/Time Trap Set	Date/Time Trap Pulled	Type of Bait	Sex	Additional Comments
C	6.5	15.5	178	12/13/10/1227	12/16/10/1238	catfish	M	one claw
C	7	15	212	12/13/10/1227	12/16/10/1238	catfish	M	one claw
C	7	16	194	12/13/10/1227	12/16/10/1238	catfish	M	one claw
C	5.5	13.5	130	12/13/10/1227	12/16/10/1238	catfish	M	
C	6	13.5	156	12/13/10/1227	12/16/10/1238	catfish	M	

Notes:

JHR
PWR

Field Record Form: 07-47 East White Lake (VPSB)

Sampling Site Identification Code: ____ - T03
Sample Type (C / F)
[✓ C] = crab F = forage fish
Project Initial Code: EWL
Sampling Date: 01-03-11
Collection Method(s): trap
Collector Name (print and sign): John Rodgers John H Rodgers Jr.
Affiliation: Clemson University (864) 650-0210
Address: Dept. of Forestry and Natural Resources

Site Location 1133
Parish: Vermilion

Latitude: ____
Longitude: ____
Site Name: T-03
Site Description: ____
Water Body Description: ____
Estimated Maximum Water Depth: ____ (meters) / ____ (feet)

RDO mg/L	Temp C	pH	Cond µS/cm	ORP mV	Turb NTU	Depth feet	Time

Notes: lat, long, site name, etc → see previous field record forms

Sample Description

Species: Callinectes sapidus
Total # of Individuals: 12

Specimen Composite Code	Length (mm)	Width (mm)	Weight (grams)	Date/Time Trap Set	Date/Time Trap Pulled	Type of Bait	Sex	Additional Comments
C	17	7	195	12/29/10/0900	01/03/11/1133	catfish	M	
C	18	7.5	249				M	
C	15	6.5	201				M	
C	19	7.5	263				F	
C	15.5	6.5	183				M	
C	17.5	7.5	261				M	missing claw
C	17.5	7.0	229				M	
C	14.5	6.5	168				M	
C	18.5	7.5	203				F	
C	16	7	237				M	
C	18.5	7.5	265				F	
C	19	8	268	↓	↓	↓	F	

Notes: ____

Field Record Form: 07-47 East White Lake (VPSB)

Sampling Site Identification Code: T - 03

Sample Type (C [✓ F])

C = crab F = forage fish

Project Initial Code: EWL

Sampling Date: 01-05-11

Collection Method(s): trawl

Collector Name (print and sign): J. Rodgers

Affiliation: Clemson Univ. (864) 650-0210

Address: Dept Forestry and Natural Resources

Site Location 1330

Parish: Vermilion

Latitude:

Longitude:

Site Name:

Site Description:

Water Body Description:

Estimated Maximum Water Depth: ______ (meters) / ______ (feet)

RDO mg L	Temp C	pH	Cond µS/cm	ORP mV	Turb NTU	Depth feet	Time

Notes: lat, long, etc → see previous records

Sample Description

Species: SHAD

Total # of Individuals: 1/4 of 5 gallon bucket

Specimen Composite Code	Length (mm)	Width (mm)	Weight (grams)	Date/Time Trap Set	Date/Time Trap Pulled	Type of Bait	Sex	Additional Comments
F					01/05/11/1330			

Notes:

Field Record Form: 07-47 East White Lake (VPSB)

Sampling Site Identification Code: I -04

Sample Type ([✓ C] F)
C = crab F = forage fish

Project Initial Code: EWL
Sampling Date: 12-16-10
Collection Method(s): crab trap
Collector Name (print and sign): J. Rodgers, P. Ritchie, H. Connelly
Affiliation: Clemson University (864) 650-0210
Address: Dept Forestry and Natural Resources

Site Location

Parish: Vermilion
Latitude: 562232
Longitude: 3290316
Site Name: EWL
Site Description: EWL field
Water Body Description: canal
Estimated Maximum Water Depth: ____ (meters) / 7' (feet)

RDO mg/L	**Temp** C	**pH**	**Cond** µS/cm	**ORP** mV	**Turb** NTU	**Depth** feet	**Time**
9.27	13.61	7.47	3120	0.13	110	1.2	1237

Notes:

Sample Description

Species: callinectes sapidus
Total # of Individuals: 5

#C 12/16/10 12/16/10

Specimen Composite Code	**Length** cm ~~(mm)~~	**Width** cm ~~(mm)~~	**Weight (grams)**	**Date/Time Trap Set**	**Date/Time Trap Pulled**	**Type of Bait**	**Sex**	**Additional Comments**
C	7	16	201	12/13/10/1153	12/16/10/1237	catfish	M	one claw
C	7.5	17.5	289	12/13/10/1153	12/16/10/1237	catfish	M	
C	6.5	14.5	172	12/13/10/1153	12/16/10/1237	catfish	M	
C	6.5	15	182	12/13/10/1153	12/16/10/1237	catfish	M	
C	8	18	298	12/13/10/1153	12/16/10/1237	Catfish	M	

Notes:

Field Record Form: 07-47 East White Lake (VPSB)

Sampling Site Identification Code: I-04
Project Initial Code: EWL
Sampling Date: 12-20-10
Collection Method(s): crab trab
Collector Name (print and sign): P. Ritchie, H. Connelly
Affiliation: Clemson University (864) 650-0210
Address: Dept Forestry + Natural Resources

Sample Type ([✓ C] / F)
C = crab F = forage fish

Site Location

Parish: Vermilion

Latitude: 560982
Longitude: 3288975
Site Name: EWL Field
Site Description: canal
Water Body Description: canal
Estimated Maximum Water Depth: ______ (meters) / 70' (feet)

RDO mg/L	Temp C	pH	Cond µS/cm	ORP ~~m~~V	Turb NTU	Depth feet	Time
8.05	12.35	7.45	3965	0.14	45.9	1.0	1222

Notes:

Sample Description

Species: callinectes sapidus
Total # of Individuals: 7

HC 12/20/10 HC 12/20/10

Specimen Composite Code	Length cm ~~(mm)~~	Width cm ~~(mm)~~	Weight (grams)	Date/Time Trap Set	Date/Time Trap Pulled	Type of Bait	Sex	Additional Comments
C	6	11,5	176	12/13/10/1223	12/20/10/1222	catfish	M	
C	6.5	13.5	148	12/13/10/1223	12/20/10/1222	catfish	M	one claw
C	7	16,5	281	12/13/10/1223	12/20/10/1222	catfish	M	
C	7.5	16	237	12/13/10/1223	12/20/10/1222	catfish	M	
C	7.5	17.5	239	12/13/10/1223	12/10/10/1222	catfish	M	
C	7.5	15,5	209	12/13/10/1223	12/20/10/1222	catfish	M	one claw
C	8	18	301	12/13/10/1223	12/20/10/1222	catfish	M	

Notes:

Field Record Form: 07-47 East White Lake (VPSB)

Sampling Site Identification Code: T - 04
Sample Type (C / [✓ F])
C = crab F = forage fish
Project Initial Code: EWL
Sampling Date: 01-05-11
Collection Method(s): trawl
Collector Name (print and sign): J. Rodger
Affiliation: Clemson University (864) 650-0210
Address: Dept Forestry + Natural Resources

Site Location 1340
Parish: Vermilion

Latitude:
Longitude:
Site Name:
Site Description:
Water Body Description:
Estimated Maximum Water Depth: ______ (meters) / ______ (feet)

RDO mg/L	**Temp** C	**pH**	**Cond** µS/cm	**ORP** mV	**Turb** NTU	**Depth** feet	**Time**

Notes: lat, long, etc → see previous record forms

Sample Description

Species: SHAD
Total # of Individuals:

Specimen Composite Code	Length (mm)	Width (mm)	Weight (grams)	Date/Time Trap Set	Date/Time Trap Pulled	Type of Bait	Sex	Additional Comments
F					01/05/11/1340			

Notes:

Field Record Form: 07-47 East White Lake (VPSB)

Sampling Site Identification Code: I-05
Sample Type ([✓ C] F)
C = crab F = forage fish
Project Initial Code: EWL
Sampling Date: 12-20-10
Collection Method(s): crab trap
Collector Name (print and sign): P. Ritchie, H. Connelly
Affiliation: Clemson University (864) 650-0210
Address: Dept Forestry + Natural Resources

Site Location

Parish: Vermilion
Latitude: 560869
Longitude: 3288990
Site Name: EWL Field
Site Description: canal
Water Body Description: canal
Estimated Maximum Water Depth: ______ (meters) / 20' (feet)

RDO mg/L	**Temp** C	**pH**	**Cond** µS/cm	**ORP** mV	**Turb** NTU	**Depth** feet	**Time**
9.48	12.11	7.46	3170	0.12	46.4	1.1	1208

Notes:

Sample Description

Species: callinectes sapidos
Total # of Individuals: 8

Specimen Composite Code	Length (mm)	Width (mm)	Weight (grams)	Date/Time Trap Set	Date/Time Trap Pulled	Type of Bait	Sex	Additional Comments
C	7.5	18.5	217	12/13/10/1222	12/20/10/1208	catfish	F	
C	7	16	211	12/13/10/1222	12/20/10/1208	catfish	M	
C	6.5	14.5	151	12/13/10/1222	12/20/10/1208	catfish	M	one claw
C	7	17	262	12/13/10/1222	12/20/10/1208	catfish	M	
C	7.5	17.5	251	12/13/10/1222	12/20/10/1208	catfish	M	one claw
C	8.5	20	362	12/13/10/1222	12/20/10/1208	catfish	M	
C	6	13.5	169	12/13/10/1222	12/20/10/1208	catfish	M	
C	5.5	13	127	12/13/10/1222	12/20/10/1208	catfish	M	

Notes:

Field Record Form: 07-47 East White Lake (VPSB)

Sampling Site Identification Code: T - 05
Sample Type ([✓ C] / F)
C = crab F = forage fish
Project Initial Code: EWL
Sampling Date: 12-21-10
Collection Method(s): net
Collector Name (print and sign): P. Ritchie, H. Connelly, J. Rodgers
Affiliation: Clemson University (864) 650-0210
Address: Dept Forestry + Natural Resources

Site Location

Parish: Vermilion
Latitude: 560869
Longitude: 328990
Site Name: EWL Field
Site Description: canal
Water Body Description: canal
Estimated Maximum Water Depth: ______ (meters) / ______ (feet)

RDO mg/L	Temp C	pH	Cond µS/cm	ORP ~~m~~V	Turb NTU	Depth feet	Time
8.95	13.4	7.26	3512	0.07	46.5	1.3	1033

Notes:

Sample Description

Species: callinectes sapidus
Total # of Individuals: 3 + 5 + 1 = 9

HC 12/21/10 HC 12/21/10

Specimen Composite Code	Length (~~mm~~ cm)	Width (~~mm~~ cm)	Weight (grams)	Date/Time Trap Set	Date/Time Trap Pulled	Type of Bait	Sex	Additional Comments
C	6.5	15	174	12/16/10/1206	12/21/10/1033	catfish	M	
C	6.5	14	173	12/16/10/1206	12/21/10/1033	catfish	M	
C	7	15.5	188	12/16/10/1206	12/21/10/1033	catfish	M	
C	8	18	292	12/16/10/1206	12/21/10/1033	catfish	M	
C	7.5	17.5	227	12/16/10/1206	12/21/10/1033	catfish	F	
C	6.5	14.5	161	12/16/10/1206	12/21/10/1033	catfish	M	
C	6.5	15	177	12/16/10/1206	12/21/10/1033	catfish	M	
C	7	16.5	211	12/16/10/1206	12/21/10/1033	catfish	M	
C	7	16	222	12/16/10/1206	12/21/10 1033	catfish	M	

Notes:

Field Record Form: 07-47 East White Lake (VPSB)

Sampling Site Identification Code: T - 05

Sample Type (C / [✓ F])

C = crab F = forage fish

Project Initial Code: EWL

Sampling Date: 01 - 05 - 11

Collection Method(s): trawl

Collector Name (print and sign): J. Rodgers

Affiliation: Clemson Univ (864) 650-0210

Address: Dept Forestry and Natural Resources)

Site Location 1320

Parish: Vermilion

Latitude:

Longitude:

Site Name:

Site Description:

Water Body Description:

Estimated Maximum Water Depth: ______ (meters) / ______ (feet)

RDO mg/L	Temp C	pH	Cond µS/cm	ORP mV	Turb NTU	Depth feet	Time

Notes: lat, long, etc → see previous record forms

Sample Description

Species: SHAD

Total # of Individuals: 1/4 of 5 gallon bucket

Specimen Composite Code	Length (mm)	Width (mm)	Weight (grams)	Date/Time Trap Set	Date/Time Trap Pulled	Type of Bait	Sex	Additional Comments
F					01/05/11/1320			

Notes:

Field Record Form: 07-47 East White Lake (VPSB)

Sampling Site Identification Code: T - 06
Project Initial Code: EWL
Sampling Date: 12-16-10
Collection Method(s): Crab trap
Collector Name (print and sign): J. Rodgers, P. Ritchie, H. Connelly
Affiliation: Clemson University (864) 650 0210
Address: Dept of Forestry and Natural Resources

Sample Type ([✓ C] / F)
C = crab F = forage fish

Site Location

Parish:

Latitude: 560781
Longitude: 328964
Site Name: EWL
Site Description: EWL field
Water Body Description: canal
Estimated Maximum Water Depth: ______ (meters) / 1' (feet)

RDO mg/L	Temp C	pH	Cond µS/cm	ORP ~~m~~V	Turb NTU	Depth feet	Time
9.32	13.79	7.25	3145	0.26	65.6	1.0	1215

Notes:

Sample Description

Species: Callinectes Sapidus
Total # of Individuals: 8

HC 12/16/10 HC 12/16/10

Specimen Composite Code	Length cm ~~(mm)~~	Width cm ~~(mm)~~	Weight (grams)	Date/Time Trap Set	Date/Time Trap Pulled	Type of Bait	Sex	Additional Comments
C	7	16	214	12/13/10/1222	12/16/10/1215	catfish	M	
C	6.5	16	199	12/13/10/1222	12/10/10/1215	catfish	M	
C	7	15.5	184	12/13/10/1222	12/16/10/1215	catfish	F	
C	6.5	14.5	139	12/13/10/1222	12/16/10/1215	catfish	M	one claw
C	7	17.5	221	12/13/10/1222	12/16/10/1215	catfish	M	one claw
C	6.5	16	193	12/13/10/1222	12/16/10/1215	catfish	M	
C	7	16.5	233	12/13/10/1222	12/16/10/1215	catfish	M	one claw
C	6.5	14	198	12/13/10/1222	12/13/10/1215	catfish	M	

Notes:

Field Record Form: 07-47 East White Lake (VPSB)

Sampling Site Identification Code: I-06

Sample Type ([✓ C] F)

C = crab F = forage fish

Project Initial Code: EWL

Sampling Date: 12-20-10

Collection Method(s): Crab trap

Collector Name (print and sign): P. Ritchie, H. Connelly

Affiliation: Clemson University (864) 650-0210

Address: Dept Forestry + Natural Resources

Site Location

Parish: Vermilion

Latitude: 560781

Longitude: 3288964

Site Name: EWL field

Site Description: canal

Water Body Description: canal

Estimated Maximum Water Depth: ______ (meters) / 20' (feet)

RDO mg/L	Temp C	pH	Cond µS/cm	ORP mV	Turb NTU	Depth feet	Time
9.83	12.57	7.48	3185	0.13	48.2	1.17	1204

Notes:

Sample Description

Species: callinectes sapidus

Total # of Individuals: 10

HC 12/20/10 HC/12/20/10

Specimen Composite Code	Length ~~(mm)~~ cm	Width ~~(mm)~~ cm	Weight (grams)	Date/Time Trap Set	Date/Time Trap Pulled	Type of Bait	Sex	Additional Comments
C	6.5	14.5	178	12/13/10/1220	12/20/10/1204	catfish	M	
C	7	17	192	12/13/10/1220	12/20/10/1204	catfish	M	one claw
C	8	16.5	298	12/13/10/1220	12/20/10/1204	catfish	M	
C	7	15.5	172	12/13/10/1220	12/20/10/1204	catfish	M	one claw
C	7	16.5	215	12/13/10/1220	12/20/10/1204	catfish	M	
C	8	19.5	309	12/13/10/1220	12/20/10/1204	catfish	M	
C	6.5	14.5	174	12/13/10/1220	12/20/10/1204	catfish	M	
C	6	14	167	12/13/10/1220	12/20/10/1204	catfish	M	
C	6	15	154	12/13/10/1220	12/20/10/1204	catfish	M	
C	6.5	16.5	231	12/13/10/1220	12/20/10/1204	catfish	M	

Notes:

Field Record Form: 07-47 East White Lake (VPSB)

Sampling Site Identification Code: T - 06
Sample Type (C / [✓ F])
C = crab F = forage fish
Project Initial Code: EWL
Sampling Date: 01-05-11
Collection Method(s): trawl
Collector Name (print and sign): J. Rodgers
Affiliation: Clemson Univ. (864) 650 0210
Address: Dept Forestry and Natural Resources

Site Location 1350
Parish: Vermilion
Latitude:
Longitude:
Site Name:
Site Description:
Water Body Description:
Estimated Maximum Water Depth: ______ (meters) / ______ (feet)

RDO mg/L	**Temp** C	**pH**	**Cond** µS/cm	**ORP** mV	**Turb** NTU	**Depth** feet	**Time**

Notes: for lat, long, etc → see previous record forms

Sample Description

Species: SHAD
Total # of Individuals: 1/4 of 5 gallon bucket

Specimen Composite Code	**Length (mm)**	**Width (mm)**	**Weight (grams)**	**Date/Time Trap Set**	**Date/Time Trap Pulled**	**Type of Bait**	**Sex**	**Additional Comments**
F					01/05/11/1350			

Notes:

Field Record Form: 07-47 East White Lake (VPSB)

Sampling Site Identification Code: I-7 ~~2~~ HC 12/21/10

Sample Type ([✓ C] / F)
C = crab F = forage fish

Project Initial Code: EWL

Sampling Date: 12-21-10

Collection Method(s): crab trap

Collector Name (print and sign): P. Ritchie, H. Connelly, J. Rodgers

Affiliation: Clemson University (864) 650-0210

Address: Dept Forestry + Natural Resources

Site Location

Parish: Vermilion

Latitude: ~~557004~~ 561198 HC 12/21/10

Longitude: ~~3288783~~ 3289709 HC 12/21/10

Site Name: EWL Field

Site Description: canal

Water Body Description: canal

Estimated Maximum Water Depth: ______ (meters) / 20' (feet)

RDO mg/L	Temp C	pH	Cond µS/cm	ORP ~~m~~V	Turb NTU	Depth feet	Time
9.12	12,97	6.91	2856	0.22	88,1	1.1	1018

Notes:

Sample Description

Species: Callinectes sapidus

Total # of Individuals: 5

Specimen Composite Code	Length cm ~~(mm)~~ HC 12/21/10	Width cm ~~(mm)~~ HC 12/21/10	Weight (grams)	Date/Time Trap Set	Date/Time Trap Pulled	Type of Bait	Sex	Additional Comments
C	7	15	191	12/13/10/1201	12/21/10/1018	catfish	M	
C	7	16	171	12/13/10/1201	12/21/10/1018	catfish	F	
C	7	15.5	197	12/13/10/1201	12/21/10/1018	catfish	M	
C	8	18	275	12/13/10/1201	12/21/10/1018	catfish	M	
C	7.5	17.5	240	12/13/10/1201	12/21/10/1018	catfish	M	

Notes:

VHK
PWR

Field Record Form: 07-47 East White Lake (VPSB)

Sampling Site Identification Code: ___-___ - T07

Sample Type (C / F)

[✓ C] = crab F = forage fish

Project Initial Code: E W L

Sampling Date: 01-03-11

Collection Method(s): trap

Collector Name (print and sign): John Rodgers John H. Rodgers Jr

Affiliation: Clemson University (864) 650-0210

Address: Dept. of Forestry and Natural Resources

Site Location T-07 1105 Parish: Vermilion

Latitude: ____________ Longitude: ____________

Site Name: ____________

Site Description: ____________

Water Body Description: ____________

Estimated Maximum Water Depth: ______ (meters) / ______ (feet)

RDO mg/L	Temp C	pH	Cond µS/cm	ORP mV	Turb NTU	Depth feet	Time

Notes: for lat, long, site name → see previous field record forms

Sample Description

Species: Callinectes sapidus Total # of Individuals: 9

Specimen Composite Code	Length (mm)	Width (mm)	Weight (grams)	Date/Time Trap Set	Date/Time Trap Pulled	Type of Bait	Sex	Additional Comments
C	19	8	297	12/29/10/0900	01/03/11/1105	catfish	M	
C	15	6.5	166	|	|	|	M	
C	17.5	8	268	|	|	|	M	
C	16.5	7	226	|	|	|	M	
C	14	6	132	|	|	|	M	
C	16	7	210	|	|	|	M	
C	14.5	6	156	|	|	|	M	
C	16	7	246	|	|	|	M	
C	16	7.5	167	↓	↓	↓	F	

Notes: ____________

Field Record Form: 07-47 East White Lake (VPSB)

Sampling Site Identification Code: T - 07

Sample Type (C / [✓ F])

C = crab F = forage fish

Project Initial Code: E W L

Sampling Date: ~~01-04-11~~ 01-05-11

Collection Method(s): trawl HC 1/5/11

Collector Name (print and sign): J, Rodgers, H, Connelly, ~~P. Ritchie~~ HC 1/5/11

Affiliation: Clemson Univ (864) 650-0210

Address: Dept Forestry and Natural Resources

Site Location 1510

Parish: Vermilion

Latitude: ______

Longitude: ______

Site Name: ______

Site Description: ______

Water Body Description: ______

Estimated Maximum Water Depth: ______ (meters) / ______ (feet)

RDO mg/L	Temp C	pH	Cond µS/cm	ORP mV	Turb NTU	Depth feet	Time

Notes: lat, long, site name, etc → see previous field record forms

Sample Description

Species: SHAD

Total # of Individuals: 1/3 of 5 gallon bucket

Specimen Composite Code	Length (mm)	Width (mm)	Weight (grams)	Date/Time Trap Set	Date/Time Trap Pulled	Type of Bait	Sex	Additional Comments
F					~~01/04/11~~	HC 1/5/11		
					01/05/11/1510			

Notes: ______

Field Record Form: 07-47 East White Lake (VPSB)

Sampling Site Identification Code: T - 08
Sample Type ([✓ C] / F)
C = crab F = forage fish
Project Initial Code: EWL
Sampling Date: 12-20-10
Collection Method(s): crab trap
Collector Name (print and sign): P. Ritchie, H. Connelly
Affiliation: Clemson University (864) 650-0210
Address: Dept Forestry + Natural Resources

Site Location

Parish: Vermilion
Latitude: 561166
Longitude: 3289623
Site Name: EWL Field
Site Description: Canal
Water Body Description: canal
Estimated Maximum Water Depth: ______ (meters) / 20' (feet)

RDO mg/L	Temp C	pH	Cond µS/cm	ORP mV	Turb NTU	Depth feet	Time
9.72	11.81	7.53	2768	0.15	95.2	1.5	1147

Notes:

Sample Description

Species: callinectes sapidus
Total # of Individuals: 5

HC 12/20/10 HC 12/20/10

Specimen Composite Code	Length cm (~~mm~~)	Width cm (~~mm~~)	Weight (grams)	Date/Time Trap Set	Date/Time Trap Pulled	Type of Bait	Sex	Additional Comments
C	7	17.5	264	12/13/10/1159	12/20/10/1147	catfish	M	
C	7.5	17	287	12/13/10/1159	12/20/10/1147	catfish	M	
C	7	16	224	12/13/10/1159	12/20/10/1147	catfish	M	
C	7	16.5	214	12/13/10/1159	12/20/10/1147	catfish	F	
C	6.5	16	171	12/13/10/1159	12/20/10/1147	catfish	F	

Notes:

JHR
PR

Field Record Form: 07-47 East White Lake (VPSB)

Sampling Site Identification Code: ____-T08
Sample Type ([✓ C] F)
C = crab F = forage fish
Project Initial Code: EWL
Sampling Date: 01-03-11
Collection Method(s): trap
Collector Name (print and sign): John Rodgers John H Rodgers Jr
Affiliation: Clemson University (864) 650-0210
Address: Dept. of Forestry and Natural Resources

Site Location 1105
Parish: Vermilion

Latitude: ______ Longitude: ______
Site Name: ______
Site Description: ______
Water Body Description: ______
Estimated Maximum Water Depth: ______ (meters) / ______ (feet)

RDO mg/L	**Temp** C	**pH**	**Cond** µS/cm	**ORP** mV	**Turb** NTU	**Depth** feet	**Time**

Notes: lat, long, site name, etc → see previous record forms

Sample Description

Species: *Callinectes sapidus*
Total # of Individuals: 8

Specimen Composite Code	Length (mm)	Width (mm)	Weight (grams)	Date/Time Trap Set	Date/Time Trap Pulled	Type of Bait	Sex	Additional Comments
C	16	7.5	208	12/21/10/0900	01/03/11/1105	catfish	M	
C	18	8	256	↓	↓	↓	M	
C	18.5	8	352	↓	↓	↓	M	
C	15	7.5	254	↓	↓	↓	M	
C	19	8	351	↓	↓	↓	M	
C	15.5	6.5	196	↓	↓	↓	M	
C	17.5	7	240	↓	↓	↓	M	
C	18	7.5	296	↓	↓	↓	M	
~~C~~								
~~C~~								
~~C~~								

HC 1/3/11

Notes: ______

Field Record Form: 07-47 East White Lake (VPSB)

Sampling Site Identification Code: T - 08

Sample Type (C / [✓ F])

C = crab F = forage fish

Project Initial Code: EWL

Sampling Date: ~~01-04-11~~ 01-05-11

Collection Method(s): trawl HC 1/5/11

Collector Name (print and sign): J. Rodgers, H. Connelly, ~~F. Ritchie~~ HC 1/5/11

Affiliation: Clemson Univ (864) 650-0210

Address: Dept Forestry and Natural Resources

Site Location 1505

Parish: Vermilion

Latitude:

Longitude:

Site Name:

Site Description:

Water Body Description:

Estimated Maximum Water Depth: ______ (meters) / ______ (feet)

RDO mg/L	Temp C	pH	Cond µS/cm	ORP mV	Turb NTU	Depth feet	Time

Notes: lat, long, site name → see previous field record forms

Sample Description

Species: SHAD

Total # of Individuals: Many individuals 1/3 of 5 gallon bucket

Specimen Composite Code	Length (mm)	Width (mm)	Weight (grams)	Date/Time Trap Set	Date/Time Trap Pulled	Type of Bait	Sex	Additional Comments
					~~01/04/11~~ HC	1/5/11		
F					01/05/11/1505			

Notes:

Field Record Form: 07-47 East White Lake (VPSB)

Sampling Site Identification Code: T-09

Sample Type ([✓ C] / F)

C = crab F = forage fish

Project Initial Code: EWL

Sampling Date: 12-16-10

Collection Method(s): crab trap

Collector Name (print and sign): J. Rodgers, P. Ritchie, H. Connelly

Affiliation: Clemson University (864) 650 0210

Address: Dept of Forestry and Natural Resources

Site Location

Parish: Vermilion

Latitude: 561314

Longitude: 3289624

Site Name: EWL

Site Description: EWL field

Water Body Description: canal

Estimated Maximum Water Depth: ______ (meters) / 7' (feet)

RDO mg/L	Temp C	pH	Cond µS/cm	ORP mV	Turb NTU	Depth feet	Time
12.29	12.73	6.82	2673	0.2	233	1.5'	1143

Notes:

Sample Description

Species: callinectes sapidus

Total # of Individuals: 5

HC 12/16/10 HC 12/16/10

Specimen Composite Code	Length cm (~~mm~~)	Width cm (~~mm~~)	Weight (grams)	Date/Time Trap Set	Date/Time Trap Pulled	Type of Bait	Sex	Additional Comments
C	7	16	227	12/13/10/1159	12/16/10/1143	catfish	M	
C	7	16	138	12/13/10/1159	12/16/10/1143	catfish	M	no claws
C	7	17	223	12/13/10/1159	12/16/10/1143	catfish	M	
C	6	14.5	127	12/13/10/1159	12/16/10/1143	catfish	M	one claw
C	7	17.5	203	12/13/10/1159	12/16/10/1143	catfish	F	one claw

Notes:

Field Record Form: 07-47 East White Lake (VPSB)

Sampling Site Identification Code: T - 09
Sample Type (C / [✓ F])
C = crab F = forage fish
Project Initial Code: EWL
Sampling Date: 01-05-11
Collection Method(s): trawl
Collector Name (print and sign): J. Rodgers, H. Connelly
Affiliation: Clemson University 864) 650-0210
Address: Dept Forestry and Natural Resources

Site Location 1455
Parish: Vermilion
Latitude:
Longitude:
Site Name:
Site Description:
Water Body Description:
Estimated Maximum Water Depth: ______ (meters) / ______ (feet)

RDO mg L	Temp C	pH	Cond µS/cm	ORP mV	Turb NTU	Depth feet	Time

Notes: lat, long, etc → see previous record forms

Sample Description

Species: SHAD
Total # of Individuals: 1/2 5 gallon bucket

Specimen Composite Code	Length (mm)	Width (mm)	Weight (grams)	Date/Time Trap Set	Date/Time Trap Pulled	Type of Bait	Sex	Additional Comments
F					01/05/11/1455			

Notes:

Field Record Form: 07-47 East White Lake (VPSB)

Sampling Site Identification Code: T - 10
Project Initial Code: EWL
Sampling Date: 12-20-10
Collection Method(s): Crab trap
Collector Name (print and sign): P. Ritchie H. Connelly
Affiliation: Clemson University, (864) 650-0210
Address: Dept Forestry + Natural Resources

Sample Type ([✓ C] / F)
[✓ C = crab] F = forage fish

Site Location

Parish: Vermilion

Latitude: 560451
Longitude: 3288906
Site Name: EWL Field
Site Description: canal
Water Body Description: canal
Estimated Maximum Water Depth: ______ (meters) / 20' (feet)

RDO mg/L	Temp C	pH	Cond µS/cm	ORP ~~m~~V	Turb NTU	Depth feet	Time
9.30	12.34	7.44	3200	0.18	48.5	1.3	1157

Notes: ______

Sample Description

Species: callinectes sapidus
Total # of Individuals: 5

HC 12/20/10 PR 12/20/10

Specimen Composite Code	Length cm (mm)	Width cm ~~(mm)~~	Weight (grams)	Date/Time Trap Set	Date/Time Trap Pulled	Type of Bait	Sex	Additional Comments
C	7.5	18	286	12/13/10/1216	12/20/10/1157	catfish	M	
C	7	16.5	234	12/13/10/1216	12/20/10/1157	catfish	M	
C	6.5	13.5	161	12/13/10/1216	12/20/10/1157	catfish	M	
C	7.5	17.5	284	12/13/10/1216	12/20/10/1157	catfish	M	
C	6	15.5	155	12/13/10/1216	12/20/10/1157	catfish	M	one claw

Notes: ______

JFIK
PR

Field Record Form: 07-47 East White Lake (VPSB)

Sampling Site Identification Code: ____ - T-10
Project Initial Code: EWL
Sampling Date: 01-03-11
Collection Method(s): trap
Collector Name (print and sign): John Rodgers John H Rodgers Jr.
Affiliation: Clemson University (___)___-____
Address: Dept. of Forestry and Natural Resources

Sample Type ([✓ C] F)
C = crab F = forage fish

Site Location 1123
Parish: Vermilion
Latitude: ______
Longitude: ______
Site Name: T-10
Site Description: T-10 EWL
Water Body Description: ______
Estimated Maximum Water Depth: ______ (meters) / ______ (feet)

RDO mg/L	Temp C	pH	Cond µS/cm	ORP mV	Turb NTU	Depth feet	Time

Notes: lat, long, site name, etc → see previous field record form

Sample Description

Species: *Callinectes sapidus*
Total # of Individuals: 12

Specimen Composite Code	Length (mm)	Width (mm)	Weight (grams)	Date/Time Trap Set	Date/Time Trap Pulled	Type of Bait	Sex	Additional Comments
C	18.5	8	293	12/29/10/0900	01/03/11/~~1100~~ 1123	catfish	M	
C	14.5	7	195				M	
C	15	6	157				M	
C	14.5	7	220				M	
C	16	7	224				M	
C	16	7	196				M	
C	15	6.5	192				M	
C	17	8	289				M	
C	16	6.5	205				M	
C	14.5	6.5	187				M	
C	17.5	7	207				M	
C	15	6	125	↓	↓	↓	F	

Notes: ______

Field Record Form: 07-47 East White Lake (VPSB)

Sampling Site Identification Code: T - 10
Sample Type (C / [✓ F])
C = crab F = forage fish
Project Initial Code: EWL
Sampling Date: 01 - 05 - 11
Collection Method(s): trawl
Collector Name (print and sign): J. Rodgers
Affiliation: Clemson Univ (864) 650-0210
Address: Dept Forestry and Natural Resources

Site Location 1355

Parish: Vermilion
Latitude:
Longitude:
Site Name:
Site Description:
Water Body Description:
Estimated Maximum Water Depth: ______ (meters) / ______ (feet)

RDO mg/L	**Temp** C	**pH**	**Cond** µS/cm	**ORP** mV	**Turb** NTU	**Depth** feet	**Time**

Notes: lat, long, etc → see previous record forms

Sample Description

Species: SHAD
Total # of Individuals: 1/2 5 gallon bucket

Specimen Composite Code	Length (mm)	Width (mm)	Weight (grams)	Date/Time Trap Set	Date/Time Trap Pulled	Type of Bait	Sex	Additional Comments
F					01/05/11/1355			

Notes:

Field Record Form: 07-47 East White Lake (VPSB)

Sampling Site Identification Code: T - 1 1
Sample Type ([✓ C] / F)
C = crab F = forage fish
Project Initial Code: EWL
Sampling Date: 12-21-10
Collection Method(s): crab trap
Collector Name (print and sign): P. Ritchie, H. Connelly, J. Rodgers
Affiliation: Clemson University (864) 650-0210
Address: Dept Forestry + Natural Resources

Site Location

Parish: Vermilion
Latitude:
Longitude:
Site Name: EWL Field
Site Description: canal
Water Body Description: canal
Estimated Maximum Water Depth: ______ (meters) / 20' (feet)

RDO mg/L	Temp C	pH	Cond µS/cm	ORP mV	Turb NTU	Depth feet	Time
8.64	13.49	7.41	3358	0.02	59	1.3	1053

Notes:

Sample Description

Species: callinectes sapidus
Total # of Individuals: 8

HC 12/21/10 HC 12/21/10

Specimen Composite Code	Length ~~(mm)~~ cm	Width ~~(mm)~~ cm	Weight (grams)	Date/Time Trap Set	Date/Time Trap Pulled	Type of Bait	Sex	Additional Comments
C	7	15.5	169	12/13/10/1238	12/21/10/1053	catfish	M	
C	7	16.5	201	12/13/10/1238	12/21/10/1053	catfish	M	one claw
C	6.5	14	167	12/13/10/1238	12/21/10/1053	catfish	M	
C	7	17	220	12/13/10/1238	12/21/10/1053	catfish	M	
C	8	18	304	12/13/10/1238	12/21/10/1053	catfish	M	
C	7.5	18	266	12/13/10/1238	12/21/10/1053	catfish	M	
C	7.5	17.5	269	12/13/10/1238	12/21/10/1053	catfish	M	
C	7	16	228	12/13/10/1238	12/21/10/1053	catfish	M	one claw

Notes:

Field Record Form: 07-47 East White Lake (VPSB)

Sampling Site Identification Code: T - 11
Project Initial Code: EWL
Sampling Date: 01-05-11
Collection Method(s): trawl
Collector Name (print and sign): J. Rodgers
Affiliation: Clemson Univ (864) 650-0210
Address: Dept Forestry and Natural Resources

Sample Type (C / [✓ F])
C = crab F = forage fish

Site Location 1405

Parish: Vermilion

Latitude:

Longitude:

Site Name:

Site Description:

Water Body Description:

Estimated Maximum Water Depth: ______ (meters) / ______ (feet)

RDO mg L	Temp C	pH	Cond µS/cm	ORP mV	Turb NTU	Depth feet	Time

Notes: lat, long, etc → see previous record sheets

Sample Description

Species: SHAD

Total # of Individuals: 1/4 of 5 gallon bucket

Specimen Composite Code	Length (mm)	Width (mm)	Weight (grams)	Date/Time Trap Set	Date/Time Trap Pulled	Type of Bait	Sex	Additional Comments
F					01/05/11/1405			

Notes:

Field Record Form: 07-47 East White Lake (VPSB)

Sampling Site Identification Code: T__-12

Sample Type ([✓ C] / F)

C = crab F = forage fish

Project Initial Code: EWL

Sampling Date: 12-20-10

Collection Method(s): crab trap

Collector Name (print and sign): P, Ritchie, H. Connelly

Affiliation: Clemson University (864) 650-0210

Address: Dept Forestry + Natural Resources

Site Location

Parish: Vermilion

Latitude: 56135

Longitude: 3289789

Site Name: EWL Field

Site Description: canal

Water Body Description: canal

Estimated Maximum Water Depth: ____ (meters) / 20' (feet)

RDO mg/L	**Temp** C	**pH**	**Cond** µS/cm	**ORP** mV	**Turb** NTU	**Depth** feet	**Time**
9.29	11.77	7.72	2755	0.18	92.3	0.89	1128

Notes: ____________________

Sample Description

Species: callinectes sapidus

Total # of Individuals: 3

HC 12/20/10 HC 12/20/10

Specimen Composite Code	**Length** cm ~~(mm)~~	**Width** cm ~~(mm)~~	**Weight** (grams)	**Date/Time Trap Set**	**Date/Time Trap Pulled**	**Type of Bait**	**Sex**	**Additional Comments**
C	6,5	15	178	12/13/10/1158	12/20/10/1128	catfish	M	
C	6	14,5	135	12/13/10/1158	12/20/10	catfish	F	
C	7	16	231	12/13/10/1158	12/20/10	catfish	M	

Notes: ____________________

JHR
PR

Field Record Form: 07-47 East White Lake (VPSB)

Sampling Site Identification Code: ____ - T-12

Sample Type ([✓ C] / F)
C = crab F = forage fish

Project Initial Code: EWL

Sampling Date: 01-03-11

Collection Method(s): trap

Collector Name (print and sign): John Rodgers John H Rodgers Jr.

Affiliation: Clemson University (864) 656-0210

Address: Dept of Forestry and Natural Resources

Site Location 1100

Parish: Vermilion

Latitude: ________

Longitude: ________

Site Name: ________

Site Description: ________

Water Body Description: ________

Estimated Maximum Water Depth: ______ (meters) / ______ (feet)

RDO mg/L	Temp C	pH	Cond µS/cm	ORP mV	Turb NTU	Depth feet	Time

Notes: for lat, long, site name, etc → see previous record forms

Sample Description

Species: Callinectes sapidus

Total # of Individuals: 11

Specimen Composite Code	Length (mm)	Width (mm)	Weight (grams)	Date/Time Trap Set	Date/Time Trap Pulled	Type of Bait	Sex	Additional Comments
C	19	8	357	12/29/10/0900	01/03/11/1100	catfish	M	
C	16.5	7	249	↓	↓	↓	M	
C	15	6.5	202	↓	↓	↓	M	
C	15.5	7	178	↓	↓	↓	M	
C	14.5	6.5	182	↓	↓	↓	M	
C	14.5	6	130	↓	↓	↓	M	
C	16	7	214	↓	↓	↓	M	
C	15	6	131	↓	↓	↓	M	
C	15	7	198	↓	↓	↓	M	
C	14	6	154	↓	↓	↓	M	
C	14.5	6	124	↓	↓	↓	F	

Notes: ________

Field Record Form: 07-47 East White Lake (VPSB)

Sampling Site Identification Code: T - 12

Sample Type (C / [✓ F])
C = crab F = forage fish

Project Initial Code: EWL

Sampling Date: 01-05-11

Collection Method(s): trawl

Collector Name (print and sign): J. Rodgers

Affiliation: Clemson University (864) 650-0210

Address: Dept Forestry + Natural Resources

Site Location 1445

Parish: Vermilion

Latitude:

Longitude:

Site Name:

Site Description:

Water Body Description:

Estimated Maximum Water Depth: ______ (meters) / ______ (feet)

RDO mg/L	Temp C	pH	Cond µS/cm	ORP ~~m~~V	Turb NTU	Depth feet	Time

Notes: lat, long, etc → see previous record forms

Sample Description

Species: SHAD

Total # of Individuals: 1/4 of 5 gallon bucket

Specimen Composite Code	Length (mm)	Width (mm)	Weight (grams)	Date/Time Trap Set	Date/Time Trap Pulled	Type of Bait	Sex	Additional Comments
F					01/05/11/1445			

Notes:

Field Record Form: 07-47 East White Lake (VPSB)

Sampling Site Identification Code: EWL - Bait

Sample Type (C / F) BAIT

C = crab F = forage fish

Project Initial Code: EWL

Sampling Date: 12 - 14 - 10

Collection Method(s): Bait for Crab Traps

Collector Name (print and sign): John Rodgers John H Rodgers Jr.

Affiliation: Clemson University (864) 650 - 0210

Address: Dept. of Forestry and Natural Resources

Site Location

Parish:

Latitude:

Longitude:

Site Name:

Site Description:

Water Body Description:

Estimated Maximum Water Depth: ______ (meters) / ______ (feet)

RDO mg/L	**Temp** C	**pH**	**Cond** µS/cm	**ORP** mV	**Turb** NTU	**Depth** feet	**Time**

Notes:

Sample Description

Species: Catfish Bait

Total # of Individuals:

Specimen Composite Code	Length (mm)	Width (mm)	Weight (grams)	Date/Time Trap Set	Date/Time Trap Pulled	Type of Bait	Sex	Additional Comments
EWL-Bait								

Notes:

Field Record Form: 07-47 East White Lake (VPSB)

Sampling Site Identification Code: T R - 0 1

Sample Type ([✓ C] F)

C = crab F = forage fish

Project Initial Code: E W L

Sampling Date: 12 - 15 - 10

Collection Method(s): crab trap

Collector Name (print and sign): J. Rodgers, P. Ritchie H. Connelly

Affiliation: Clemson University (864) 650-0210

Address: Dept. of Forestry and Natural Resources

Site Location

Parish: Vermilion

Latitude: 569363

Longitude: 329 1889

Site Name: Schooner Bayou

Site Description: Bayou

Water Body Description: Bayou

Estimated Maximum Water Depth: ______ (meters) / 20' (feet)

RDO mg/L	Temp C	pH	Cond µS/cm	ORP mV	Turb NTU	Depth feet	Time
11.56	9.84	6.76	2523	0.21	52	1.4 ft	1126

12/15/10

Notes: ____

Sample Description

Species: callinectes sapidus

HC 12/15/10

Total # of Individuals: ~~3~~ 2 + 9 = 11

HC 12/15/10 HC 12/15/10

Specimen Composite Code	Length cm ~~(mm)~~	Width cm ~~(mm)~~	Weight (grams)	Date/Time Trap Set	Date/Time Trap Pulled	Type of Bait	Sex	Additional Comments
C	7	17	258	12/10/10/1700	12/15/10/1126	catfish	M	
C	7.5	16	243	12/10/10/1700	12/15/10/1126	catfish	M	
C	7	14.5	162	12/10/10/1700	12/15/10/1126	catfish	M	one claw
C	6	13.5	125	12/10/10/1700	12/15/10/1126	catfish	M	
C	7.5	17.5	209	12/10/10/1700	12/15/10/1126	catfish	F	
C	7.5	17	267	12/10/10/1700	12/15/10/1126	catfish	M	
C	7.5	17	213	12/10/10/1700	12/15/10/1126	catfish	M	one claw
C	7.5	17	211	12/10/10/1700	12/15/10/1126	catfish	M	
C	6.5	16	202	12/10/10/1700	12/15/10/1126	catfish	M	
C	5.5	13	101	12/10/10/1700	12/15/10/1126	catfish	M	
C	6	17	283	12/10/10/1700	12/15/10/1126	catfish	M	

Notes: ____

Field Record Form: 07-47 East White Lake (VPSB)

Sampling Site Identification Code: TR-01
Project Initial Code: EWL
Sampling Date: 12-15-10
Collection Method(s): hoop net
Collector Name (print and sign): J. Rodgers, P. Ritchie, H. Connelly
Affiliation: Clemson University (864) 650-0210
Address: Dept of Forestry and Natural Resources

Sample Type (C / [✓ F])
C = crab F = forage fish

Site Location

Parish: Vermilion
Latitude: 569363
Longitude: 3291889
Site Name: Schooner Bayou
Site Description: Bayou
Water Body Description: Bayou
Estimated Maximum Water Depth: ______ (meters) / 20' (feet)

RDO mg/L	**Temp** C	**pH**	**Cond** µS/cm	**ORP** mV	**Turb** NTU	**Depth** feet	**Time**
11.56	9.84	6.76	2523	0.21	52	1.4	1126

Notes: ______

Sample Description

HC 12/15/10
Species: lepomis mac~~k~~rochirus
Total # of Individuals: 2+2

Specimen Composite Code	HC 12/15/10 **Length** cm (~~mm~~)	HC 12/15/10 **Width** cm (~~mm~~)	**Weight** (grams)	**Date/Time Trap Set**	**Date/Time Trap Pulled**	**Type of Bait**	**Sex**	**Additional Comments**
F	14	7	55	12/10/10/1700	12/15/10/1126	pogie		bream
F	14.5	5.5	63	12/10/10/1700	12/15/10/1126	pogie		
F	13	5	41	12/10/10/1700	12/15/10/1126	pogie		
F	12.5	5	45	12/10/10/1700	12/15/10/1126	pogie		

Notes: ______

Field Record Form: 07-47 East White Lake (VPSB)

Sampling Site Identification Code: TR-02
Project Initial Code: EWL
Sampling Date: 12-20-10
Collection Method(s): crab trap
Collector Name (print and sign): P. Ritchie, H. Connelly
Affiliation: Clemson University (864)650-0210
Address: Dept Forestry + Natural Resources

Sample Type ([✓ C] F)
C = crab F = forage fish

Site Location

Parish: Vermilion

Latitude: 567210
Longitude: 3291154
Site Name: Schooner Bayou
Site Description: Bayou
Water Body Description: Bayou
Estimated Maximum Water Depth: ______ (meters) / 20 (feet)

RDO mg/L	Temp C	pH	Cond µS/cm	ORP mV	Turb NTU	Depth feet	Time
7.25	10.74	7.02	5239	0.19	18.2	1.9	1120

Notes:

Sample Description

Species: callinectes Sapidus
Total # of Individuals: 5

LV 12/20/10 HC 12/20/10

Specimen Composite Code	Length ~~(mm)~~ cm	Width ~~(mm)~~ cm	Weight (grams)	Date/Time Trap Set	Date/Time Trap Pulled	Type of Bait	Sex	Additional Comments
C	6	14	146	12/13/10/1317	12/20/10/1120	catfish	M	
C	6.5	14.5	172	12/13/10/1317	12/20/10/1120	catfish	M	
C	6	14.5	160	12/13/10/1317	12/20/10/1120	catfish	M	
C	7	16.5	217	12/13/10/1317	12/20/10/1120	catfish	M	one claw
C	6.5	15.5	204	12/13/10/1317	12/20/10/1120	catfish	M	

Notes:

Field Record Form: 07-47 East White Lake (VPSB)

Sampling Site Identification Code: TR - O2
Project Initial Code: EWL
Sampling Date: 12 -21 -10
Collection Method(s): cast net
Collector Name (print and sign): J. Rodgers
Affiliation: Clemson University (864) 650 0210
Address: Dept Forestry and Natural Resources

Sample Type (C / [✓ F])
C = crab F = forage fish

Site Location

Parish: Vermilion
Latitude: 567210
Longitude: 3291154
Site Name: Schooner Bayou
Site Description: Bayou
Water Body Description: Bayou
Estimated Maximum Water Depth: ______ (meters) / 8' (feet)

RDO mg/L	Temp C	pH	Cond µS/cm	ORP mV	Turb NTU	Depth feet	Time
	See	lab	book				

Notes:

Sample Description

Species: SHAD
Total # of Individuals: 22

Specimen Composite Code	HC 12/21/10 Length cm ~~(mm)~~	HC 12/21/10 Width cm ~~(mm)~~	Weight (grams)	Date/Time Trap Set	Date/Time Trap Pulled	Type of Bait	Sex	Additional Comments
F	3	10	14	12/21/10/1315	12/21/10/1315	none		SHAD
F	3	9,5	8	↓	↓	↓		↓
F	2,5	7,5	11	↓	↓	↓		↓
F	2,5	8	7	↓	↓	↓		↓
F	3	10	11	↓	↓	↓		↓
F	2,5	7,5	5	↓	↓	↓		↓
F	3	10	11	↓	↓	↓		↓
F	2,5	9	7	↓	↓	↓		↓
F	2.5	9	6	↓	↓	↓		↓
F	2,5	9	7	↓	↓	↓		↓
F	2	7,5	4	↓	↓	↓		↓
F	2,5	10,5	11	↓	↓	↓		↓

Notes:

AHR
PR

Field Record Form: 07-47 East White Lake (VPSB)

Sampling Site Identification Code: ___ ___ - TR-02
Sample Type ([✓ C] F)
C = crab F = forage fish
Project Initial Code: E W L
Sampling Date: 01-03-11
Collection Method(s): trap
Collector Name (print and sign): John Rodgers John W Rodgers Jr.
Affiliation: Clemson Univ. (864) 650-0210
Address: Dept. of Forestry and Natural Resources

Site Location 1016
Parish: Vermilion

Latitude: ______
Longitude: ______
Site Name: ______
Site Description: ______
Water Body Description: ______
Estimated Maximum Water Depth: ______ (meters) / ______ (feet)

RDO mg/L	Temp C	pH	Cond µS/cm	ORP mV	Turb NTU	Depth feet	Time

Notes: lat, long, site name, etc → see previous field record forms

Sample Description

Species: Callinectes sapidus
Total # of Individuals: 10

Specimen Composite Code	Length (mm)	Width (mm)	Weight (grams)	Date/Time Trap Set	Date/Time Trap Pulled	Type of Bait	Sex	Additional Comments
C	13.5	6	143	12/29/10/0900	01/03/11/1016	catfish	M	
C	15	6	128				F	
C	17	7.5	186				F	
C	13	5.5	116				M	
C	18	7.5	201				F	
C	15	6.5	174				M	
C	18.5	7.5	256				M	
C	14	6	146				M	
C	15	6	139				F	
C	12.5	5.5	139	↓	↓	↓	M	

Notes: ______

Field Record Form: 07-47 East White Lake (VPSB)

Sampling Site Identification Code: TR - 03A

Sample Type [✓ C] / F

C = crab F = forage fish

Project Initial Code: EWL

Sampling Date: 12-14-10

Collection Method(s): crab traps

Collector Name (print and sign): J. Rodgers, P. Ritchie, H. Connelly

Affiliation: Clemson University (864) 650-0210

Address: Dept. of Forestry and Natural Resources

Site Location

Parish: Vermillion

Latitude: 563786

Longitude: 3290526

Site Name: Schooner Bayou

Site Description: Bayou

Water Body Description: Bayou

Estimated Maximum Water Depth: ______ (meters) / 20 (feet)

RDO mg/L	Temp C	pH	Cond µS/cm	ORP mV	Turb NTU	Depth feet	Time
11.03	8.84	7.49	2303	0.19	134	1'	1507

Notes:

Sample Description

Species: callinectes sapidus

Total # of Individuals: 12

Specimen Composite Code	HC 12/14/10 Length cm ~~(mm)~~	HC 12/14/10 Width cm ~~(mm)~~	Weight (grams)	Date/Time Trap Set	Date/Time Trap Pulled	Type of Bait	Sex	Additional Comments
C	8	17	298	12/10/10/1300	12/14/10 1507	catfish	M	
C	6	14.5	141	12/10/10/1300	12/14/10/1507	catfish	M	
C	6	15.5	146	12/10/10/1300	12/14/10/1507	catfish	F	
C	7	17 12/14/10	181	12/10/10/1300	12/14/10/1507	catfish	F	
C	5.5	14 ~~.5~~ HC	152	12/10/10/1300	12/14/10/1507	catfish	M	
C	7	16	209	12/10/10/1300	12/14/10/1507	catfish	M	
C	7	19	191	12/10/10/1300	12/14/10/1507	catfish	F	
C	6.5	16	201	12/10/10/1300	12/14/10/1507	catfish	M	
C	6	14.5	149	12/10/10/1300	12/14/10/1507	catfish	M	
C	6	14.5	132	12/10/10/1300	12/14/10/1507	catfish	F	
C	7	16.5	167	12/10/10/1300	12/14/10/1507	catfish	F	
C	8	18	259	12/10/10/1300	12/14/10/1507	catfish	HC ~~M~~ F 12/14/10	

Notes:

Field Record Form: 07-47 East White Lake (VPSB)

Sampling Site Identification Code: TB-03
Sample Type ([✓ C] / F)
C = crab F = forage fish
Project Initial Code: EWL
Sampling Date: 12-20-10
Collection Method(s): crab traps
Collector Name (print and sign): P. Ritchie, H. Connelly
Affiliation: Clemson University (864) 650-0210
Address: Dept Forestry + Natural Resources

Site Location

Parish: Vermilion
Latitude: 564930
Longitude: 3290761
Site Name: Schooner Bayou
Site Description: Bayou
Water Body Description: Bayou
Estimated Maximum Water Depth: ______ (meters) / 20' (feet)

RDO mg/L	**Temp** C	**pH**	**Cond** µS/cm	**ORP** mV	**Turb** NTU	**Depth** feet	**Time**
11.72	11.66	6.99	2944	0.22	52.1	1.0	1107

Notes: ______

Sample Description

Species: callinectes sapidus
Total # of Individuals: 7

HC 12/20/10 HC 12/20/10

Specimen Composite Code	**Length** ~~(mm)~~ cm	**Width** ~~(mm)~~ cm	**Weight** (grams)	**Date/Time Trap Set**	**Date/Time Trap Pulled**	**Type of Bait**	**Sex**	**Additional Comments**
C	6	14.5	135	12/13/10/1308	12/20/10/1107	catfish	M	
C	6	15.5	108	12/13/10/1308	12/20/10/1107	catfish	F	one claw
C	6,5	15	162	12/13/10/1308	12/20/10/1107	catfish	M	one claw
C	6	13,5	124	12/13/10/1308	12/20/10/1107	catfish	F	
C	6	14.5	121	12/13/10/1308	12/20/10/1107	catfish	F	
C	6.5	17	194	12/13/10/1308	12/20/10/1107	catfish	F	
C	8,5	20	383	12/13/10/1308	12/20/10/1107	catfish	M	

Notes: ______

Field Record Form: 07-47 East White Lake (VPSB)

Sampling Site Identification Code: TR-03
Sample Type (C [✓ F])
C = crab F = forage fish
Project Initial Code: EWL
Sampling Date: 12-21-10
Collection Method(s): cast net
Collector Name (print and sign): J. Rodgers
Affiliation: Clemson University (864) 650-0210
Address: Dept Forestry + Natural Resources

Site Location

Parish: Vermilion
Latitude: 564930
Longitude: 3290761
Site Name: Schooner Bayou
Site Description: bayou
Water Body Description: bayou
Estimated Maximum Water Depth: ____ (meters) / 8' (feet)

RDO mg/l	Temp C	pH	Cond µS/cm	ORP mV	Turb NTU	Depth feet	Time

See lab book

Notes:

Sample Description

Species: SHAD
Total # of Individuals: 30

HG 12/21/10 HG 12/21/10

Specimen Composite Code	Length cm ~~(mm)~~	Width cm ~~(mm)~~	Weight (grams)	Date/Time Trap Set	Date/Time Trap Pulled	Type of Bait	Sex	Additional Comments
F	2.5	8	11	12/21/10/1400	12/21/10/1400	none		
F	2.5	8	7	12/21/10/1400	12/21/10/1400	↓		
F	2	8.5	8	↓	↓			
F	2.5	8.5	7					
F	3	11	12					
F	2.5	9.5	8					
F	2	9.5	7.					
F	2.5	9	8.					
F	3	11	14					
F	2.5	10	9					
F	3	11	13					
F	2.5	10	10					

Notes:

Field Record Form: 07-47 East White Lake (VPSB)

Sampling Site Identification Code: ____-TR03

Sample Type ([✓ C] F)
C = crab F = forage fish

Project Initial Code: EWL

Sampling Date: 01-03-11

Collection Method(s): trap

Collector Name (print and sign): John Rodgers John H. Rodgers, Jr.

Affiliation: Clemson University (864) 650-0210

Address: Dept. of Forestry and Natural Resources

Site Location 1036

Parish: ____

Latitude: ____

Longitude: ____

Site Name: ____

Site Description: ____

Water Body Description: ____

Estimated Maximum Water Depth: ____ (meters) / ____ (feet)

RDO mg/L	Temp C	pH	Cond µS/cm	ORP ~~m~~V	Turb NTU	Depth feet	Time

Notes: for lat, long, site name, etc → see previous field record forms

Sample Description

Species: *Callinectes sapidus*

Total # of Individuals: 7

Specimen Composite Code	Length (mm)	Width (mm)	Weight (grams)	Date/Time Trap Set	Date/Time Trap Pulled	Type of Bait	Sex	Additional Comments
C	17.5	7.5	138	12/29/10/0900	01/03/11/1036	catfish	M	
C	15	7.5	318	↓	↓	↓	M	
C	13	5.5	107				F	
C	14.5	6	135				F	
C	18	7.5	229				F	
C	13	6	118				M	
C	15	6	127				M	

Notes: ____

Field Record Form: 07-47 East White Lake (VPSB)

Sampling Site Identification Code: TR-04A

Sample Type (C [✓ F])

C = crab F = forage fish

Project Initial Code: EWL

Sampling Date: 12-21-10

Collection Method(s): cast net

Collector Name (print and sign): J. Rodgers

Affiliation: Clemson University (864) 650-0210

Address: Dept Forestry + Natural Resources

Site Location

Parish: Vermilion

Latitude: 562232

Longitude: 3290316

Site Name: Schooner Bayou

Site Description: Bayou

Water Body Description: Bayou

Estimated Maximum Water Depth: ____ (meters) / 8' (feet)

RDO mg/L	Temp C	pH	Cond µS/cm	ORP mV	Turb NTU	Depth feet	Time
		See lab book					

Notes:

Sample Description

Species: lepomis macrochirus Total # of Individuals:

Specimen Composite Code	Length (mm)	Width (mm)	Weight (grams)	Date/Time Trap Set	Date/Time Trap Pulled	Type of Bait	Sex	Additional Comments
F	11,5	4,5	35	12/21/10/1420	12/21/10/1420	none		bluegill
F	15	7	76	12/21/10/1420	12/21/10/1420	none		bluegill

Notes:

Field Record Form: 07-47 East White Lake (VPSB)

Sampling Site Identification Code: TR-04
Project Initial Code: EWL
Sampling Date: 12-14-10
Collection Method(s): crab trap
Collector Name (print and sign): J. Rodgers, P. Ritchie, H. Connelly
Affiliation: Clemson University (864) 650-0218
Address: Dept. of Forestry and Natural Resources

Sample Type ([✓ C] / F)
C = crab F = forage fish

Site Location

Parish: Vermillion

Latitude: 560982
Longitude: 3288975
Site Name: ~~Wh~~ JHR 12/14/10 Schooner Bayou
Site Description: Bayou
Water Body Description: Bayou
Estimated Maximum Water Depth: ______ (meters) / 20 (feet)

RDO mg/L	Temp C	pH	Cond µS/cm	ORP mV	Turb NTU	Depth feet	Time
10,97	9,89	7.45	2361	0,19	154	1.4	1450

Notes: ______

Sample Description

Species: callinectes sapidos
Total # of Individuals: 8

Specimen Composite Code	HC 12/14/10 - Length cm ~~(mm)~~	HC 12/14/10 Width cm ~~(mm)~~	Weight (grams)	Date/Time Trap Set	Date/Time Trap Pulled	Type of Bait	Sex	Additional Comments
C	6	16	167	12/10/10/1200	12/14/10/1332	catfish	M	
C	8	20	305	12/10/10/1200	12/14/10/1332	catfish	M	
C	5.5	14	122	12/10/10/1200	12/14/10/1332	catfish	M	
C	6	13	98 ~~115~~ HC	12/10/10/1200	12/14/10/1332	catfish	F	
C	5.5	13.5	116	12/10/10/1200	12/14/10/1332	catfish	M	
C	6	12.5	127	12/10/10/1200	12/14/10/1332	catfish	M	
C	5.5	13.5	118	12/10/10/1200	12/14/10/1332	catfish	M	
C	6	15	161	12/10/10/1200	12/14/10/1332	catfish	M	
			~~98~~ HC 12/14/10					

Notes: ______

Field Record Form: 07-47 East White Lake (VPSB)

Sampling Site Identification Code: TR - 04
Sample Type (C / [✓ F])
C = crab F = forage fish
Project Initial Code: EWL
Sampling Date: 12 - 21 - 10
Collection Method(s): cast net
Collector Name (print and sign): J. Rodgers
Affiliation: clemson University (864) 650-0210
Address: Dept Forestry + Natural Resources

Site Location

Parish: Vermilion
Latitude: 562232
Longitude: 3290316
Site Name: Schooner Bayou
Site Description: Bayou
Water Body Description: Bayou
Estimated Maximum Water Depth: ______ (meters) / 8' (feet)

RDO mg/l	Temp C	pH	Cond µS/cm	ORP mV	Turb NTU	Depth feet	Time

See lab book

Notes:

Sample Description

Species: SHAD
Total # of Individuals:

Specimen Composite Code	Length ~~(mm)~~ cm HC 12/21/10	Width ~~(mm)~~ cm HC 12/21/10	Weight (grams)	Date/Time Trap Set	Date/Time Trap Pulled	Type of Bait	Sex	Additional Comments
F	2	9	7	12/21/10/1420	12/21/10/1420	none		SHAD
F	2,5	9	12	12/21/10/1420	12/21/10/1420	none		
F	2,5	9	7	12/21/10/1420	12/21/10/1420	none		
F	2	8	7	12/21/10/1420	12/21/10/1420	none		
F	2	8	7	12/21/10/1420	12/21/10/1420	none		
F	2	8	6	12/21/10/1420	12/21/10/1420	none		
F	2	8	4	12/21/10/1420	12/21/10/1420	none		
F	2,5	9	5	12/21/10/1420	12/21/10/1420	none		
F	2,5	9	7	12/21/10/1420	12/21/10/1420	none		
F	2,5	9	6	12/21/10/1420	12/21/10/1420	none		
F	2	8,5	4	12/21/10/1420	12/21/10/1420	none		
F	2	8	5	12/21/10/1420	12/21/10/1420	none		

Notes:

Field Record Form: 07-47 East White Lake (VPSB)

Sampling Site Identification Code: ____ - TR-04

Sample Type ([✓ C] F)

C = crab F = forage fish

Project Initial Code: EWL

Sampling Date: 01-03-11

Collection Method(s): trap

Collector Name (print and sign): John Rodgers John H Rodgers Jr

Affiliation: Clemson University (___) ___ - ______

Address: Dept. of Forestry and Natural Resource

Site Location 1150 AM

Parish: Vermilion

Latitude: ____________

Longitude: ____________

Site Name: ____________

Site Description: ____________

Water Body Description: ____________

Estimated Maximum Water Depth: ______ (meters) / ______ (feet)

RDO mg/L	Temp C	pH	Cond µS/cm	ORP mV	Turb NTU	Depth feet	Time

Notes: lat, long, site name, etc → see previous field record form

Sample Description

Species: *Callinectes sapidus*

Total # of Individuals: 10

Specimen Composite Code	Length (mm)	Width (mm)	Weight (grams)	Date/Time Trap Set	Date/Time Trap Pulled	Type of Bait	Sex	Additional Comments
C	19	8.5	424	12/29/10/0900	01/03/11/1150	catfish	M	
C	20	8	403	↓	↓	↓	M	
C	13	5.5	130	↓	↓	↓	M	
C	13.5	6.5	149	↓	↓	↓	M	
C	17.5	7.5	291	↓	↓	↓	M	
C	19	7.5	267	↓	↓	↓	F	
C	17	7.5	219	↓	↓	↓	F	
C	18	7.5	224	↓	↓	↓	F	
C	1.5	6.5	125	↓	↓	↓	F	
C	15.5	7.5	274	↓	↓	↓	M	

Notes: ____________

Field Record Form: 07-47 East White Lake (VPSB)

Sampling Site Identification Code: TR-05
Project Initial Code: EWL
Sampling Date: 12-14-10
Collection Method(s): Crab trap
Collector Name (print and sign): J. Rodgers, P. Ritchie, H. Connelly
Affiliation: Clemson Univ. (864) 650-0218
Address: Dept. of Forestry and Natural Resources

Sample Type ([✓ C] / F)
C = crab F = forage fish

Site Location

Parish: Vermillion

Latitude: 559737
Longitude: 3289879
Site Name: White Lake
Site Description: lake
Water Body Description: lake
Estimated Maximum Water Depth: ______ (meters) / 8 (feet)

RDO mg/L	Temp C	pH	Cond µS/cm	ORP mV	Turb NTU	Depth feet	Time
11.30	8.81	7.50	2263	.22	137	.833	1440

Notes:

Sample Description

Species: callinectes sapidus
Total # of Individuals: 11

Specimen Composite Code	HC 12/14/10 Length cm ~~(mm)~~	HC 12/14/10 Width cm ~~(mm)~~	Weight (grams)	Date/Time Trap Set	Date/Time Trap Pulled	Type of Bait	Sex	Additional Comments
C	7	17	262	12/10/10/1100	12/14/10/1440	catfish	M	
C	7.5	18.5	127	12/10/10/1100	12/14/10/1440	catfish	F	
C	7	18	189	12/10/10/1100	12/14/10/1440	catfish	F	
C	7	17	194	12/10/10/1100	12/14/10/1440	catfish	F	
C	8	20	344	12/10/10/1100	12/14/10/1440	catfish	F	
C	8	18.5	289	12/10/10/1100	12/14/10/1440	catfish	F	
C	8	19.5	373	12/10/10/1100	12/14/10/1440	catfish	M	
C	6	15.5	134	12/10/10/1100	12/14/10/1440	catfish	F	
C	7.5	18.5	273	12/10/10/1100	12/14/10/1440	catfish	M	
C	7	17.5	227	12/10/10/1100	12/14/10/1440	catfish	M	
C	7	18	172	12/10/10/1100	12/14/10/1440	catfish	F	

Notes:

Field Record Form: 07-47 East White Lake (VPSB)

Sampling Site Identification Code: T R - 0 5

Sample Type (C / F)

C = crab F = forage fish

Project Initial Code: E W L

Sampling Date: 0 1 -0 4- 1 1

Collection Method(s):

Collector Name (print and sign): John Rodgers, P. Ritchie, H. Connelly

Affiliation: Clemson Univ (864) 650-0210

Address: Dept Forestry and Natural Resources

Site Location 0930

Parish: Vermilion

Latitude:

Longitude:

Site Name:

Site Description:

Water Body Description:

Estimated Maximum Water Depth: ______ (meters) / ______ (feet)

RDO mg/L	Temp C	pH	Cond µS/cm	ORP mV	Turb NTU	Depth feet	Time

Notes: lat, long, site name → see previous field record forms

Sample Description

Species: SHAD

Total # of Individuals:

Specimen Composite Code	Length (mm)	Width (mm)	Weight (grams)	Date/Time Trap Set	Date/Time Trap Pulled	Type of Bait	Sex	Additional Comments
					01/04/11/0930			

Notes:

Field Record Form: 07-47 East White Lake (VPSB)

Sampling Site Identification Code: T R - 0 6

Sample Type ([✓ C] / F)

C = crab F = forage fish

Project Initial Code: E W L

Sampling Date: 1 2-1 4-1 0

Collection Method(s): crab trap

Collector Name (print and sign): J. Rodgers, P. Ritchie, H. Connelly

Affiliation: Clemson University, (864) 650-0210

Address: Dept. of Forestry and Natural Resources

Site Location

Parish: Vermillion

Latitude: 557004

Longitude: 3288783

Site Name:

Site Description:

Water Body Description:

Estimated Maximum Water Depth: ______ (meters) / ______ (feet)

RDO mg/L	Temp C	pH	Cond µS/cm	ORP mV	Turb NTU	Depth feet	Time
11.21	8.6	7.40	2267	0.24	110	0.91	1347

Notes:

Sample Description

5 total HC 12/14/10

Species: callinectes sapidus

Total # of Individuals: 2+3 ~~+1~~ = ~~6~~ HC 12/14/10

Specimen Composite Code	12/14/10 HC Length cm ~~(mm)~~	12/14/10 HC Width cm ~~(mm)~~	Weight (grams)	Date/Time Trap Set	Date/Time Trap Pulled	Type of Bait	Sex	Additional Comments
C	7.5	16.5	269	12/10/10/1000	12/14/10/1347	catfish	M	
C	7	16	232	12/10/10/1000	12/14/10/1347	catfish	M	
C	7.5	17	222	12/10/10/1000	12/14/10/1347	catfish	F	
C	6.5	15	179	12/10/10/1000	12/14/10/1347	catfish	M	
~~C~~							F	HC 12/14/10
C	7	16.5	253	12/10/10/1000	12/14/10/1347	catfish	M	

Notes: one female - dead thrown back

5 crabs shipped

Field Record Form: 07-47 East White Lake (VPSB)

Sampling Site Identification Code: TR - 06
Sample Type (C / [✓ F])
C = crab F = forage fish
Project Initial Code: EWL
Sampling Date: 01-04-11
Collection Method(s):
Collector Name (print and sign): J. Rodgers, H. Connelly, P. Ritchie
Affiliation: Clemson Univ (864) 650-0210
Address: Dept Forestry and Natural Resources)

Site Location 0945
Parish: Vermilion

Latitude:
Longitude:
Site Name:
Site Description:
Water Body Description:
Estimated Maximum Water Depth: ______ (meters) / ______ (feet)

RDO mg/L	Temp C	pH	Cond µS/cm	ORP mV	Turb NTU	Depth feet	Time

Notes: lat, long, site name, etc see previous field record forms

Sample Description

Species: SHAD
Total # of Individuals:

Specimen Composite Code	Length (mm)	Width (mm)	Weight (grams)	Date/Time Trap Set	Date/Time Trap Pulled	Type of Bait	Sex	Additional Comments
					01/04/11/0945			

Notes:

Field Record Form: 07-47 East White Lake (VPSB)

Sampling Site Identification Code: TR-07
Project Initial Code: EWL
Sampling Date: 12-14-10
Collection Method(s): crab trap
Collector Name (print and sign): J. Rodgers, P. Ritchie, H. Connelly
Affiliation: Clemson Univ., Dept. Forestry and Natural Resources) 864-650-0210
Address:

Sample Type ([✓ C] / F)
C = crab F = forage fish

Site Location

Parish: Vermillion

Latitude: 557004
Longitude: 3288783
Site Name: White Lake
Site Description: Lake
Water Body Description: lake
Estimated Maximum Water Depth: ______ (meters) / 7 (feet)

RDO mg/L	Temp C	pH	Cond µS/cm	ORP mV	Turb NTU	Depth feet	Time
11.42	8.86	7.44	2249	0.21	177.5	1.17	1350

Notes:

Sample Description

Species: callinectes sapidus
Total # of Individuals: ~~10~~ 11 HC 12/14/10

Specimen Composite Code	HC 12/14/10 Length cm ~~(mm)~~	HC 12/14/10 Width cm ~~(mm)~~	Weight (grams)	Date/Time Trap Set	Date/Time Trap Pulled	Type of Bait	Sex	Additional Comments
C	7.5	17	288	12/10/10/0900	12/14/10/1350	catfish	M	
C	7.5	18	258	12/10/10/0900	12/14/10/1350	Catfish	M	
C	6.5	16.5	186	12/10/10/0900	12/14/10/1350	catfish	M	
C	7.5	19.5	256	12/10/10/0900	12/14/10/1350	catfish	F	
C	7.5	17.5	283	12/10/10/0900	12/14/10/1350	catfish	M	
C	8	18	323	12/10/10/0900	12/14/10/1350	catfish	M	
C	6.5	16	162	12/10/10/0900	12/14/10/1350	catfish	~~M~~ F	HC 12/14/10
C	7.5	18	254	12/10/10/0900	12/14/10/1350	catfish	M	
C	8.5	20	358	12/10/10/0900	12/14/10/1350	catfish	M	
C	5.5	14.5	128	12/10/10/0900	12/14/10/1350	catfish	F	
C	6	14	140	12/10/10/0900	12/14/10/1350	catfish	M	

Notes:

Field Record Form: 07-47 East White Lake (VPSB)

Sampling Site Identification Code: TR-07

Sample Type (C / [✓ F])

C = crab F = forage fish

Project Initial Code: EWL

Sampling Date: 01-04 11

Collection Method(s):

Collector Name (print and sign): J. Rodgers, H. Connelly, P. Ritchie

Affiliation: Clemson University (864) 650-0210

Address: Dept Forestry + Natural Resource

Site Location 1050

Parish: Vermilion

Latitude:

Longitude:

Site Name:

Site Description:

Water Body Description:

Estimated Maximum Water Depth: ______ (meters) / ______ (feet)

RDO mg L	Temp C	pH	Cond µS/cm	ORP mV	Turb NTU	Depth feet	Time

Notes: lat, long, site name, etc → see previous field record forms

Sample Description

Species: SHAD

Total # of Individuals:

Specimen Composite Code	Length (mm)	Width (mm)	Weight (grams)	Date/Time Trap Set	Date/Time Trap Pulled	Type of Bait	Sex	Additional Comments
					01/04/11/1050			

Notes:

Field Record Form: 07-47 East White Lake (VPSB)

Sampling Site Identification Code: TR-08

Sample Type ([✓ C] / F)

C = crab F = forage fish

Project Initial Code: EWL

Sampling Date: 12-14-10

Collection Method(s): crab trap

Collector Name (print and sign): J. Rodgers, P. Ritchie, H. Connelly

Affiliation: Clemson Univ. (864) 650-0200

Address: Dept. of Forestry and Natural Resources

Site Location

Parish: Vermillion

Latitude: 557563

Longitude: 328974

Site Name: White Lake

Site Description: lake

Water Body Description: lake

Estimated Maximum Water Depth: ______ (meters) / 8 (feet)

RDO mg/L	Temp C	pH	Cond µS/cm	ORP mV	Turb NTU	Depth feet	Time
11.42	8.75	7.44	2243	0.24	165	1.6	1425

Notes:

Sample Description

Species: callinectes sapidus

Total # of Individuals: ~~11~~ 10 HC 12/14/10

Specimen Composite Code	HC 12/14/10 Length ~~(mm)~~ cm	HC 12/14/10 Width ~~(mm)~~ cm	Weight (grams)	Date/Time Trap Set	Date/Time Trap Pulled	Type of Bait	Sex	Additional Comments
C	7	16,5	187	12/10/10/0800	12/14/10/1425	catfish	F	
C	6,5	16	187	12/10/10/0800	12/14/10/1425	catfish	M	
C	7.5	18	228	12/10/10/0800	12/14/10/1425	catfish	F	
C	6,5	17,5	147	12/10/10/0800	12/14/10/1425	catfish	F	
C	7	16.5	207	12/10/10/0800	12/14/10/1425	catfish	F	
C	8.5	19.5	292	12/10/10/0800	12/14/10/1425	catfish	F	
C	7,5	17,5	217	12/10/10/0800	12/14/10/1425	catfish	M	
C	8	18,5	302	12/10/10/0800	12/14/10/1425	catfish	M	
C	6	14.5	152	12/10/10/0800	12/14/10/1425	catfish	M	
C	7,5	18	263	12/10/10/0800	12/14/10/1425	catfish	M	
							~~M~~	HC 12/14/10

Notes:

Field Record Form: 07-47 East White Lake (VPSB)

Sampling Site Identification Code: IR - 08
Sample Type (C [✓ F])
C = crab F = forage fish
Project Initial Code: EWL
Sampling Date: 01-04-11
Collection Method(s):
Collector Name (print and sign): J. Rodgers, H. Connelly, P. Ritchie
Affiliation: Clemson Univ (864) 650-0210
Address: Dept Forestry and Natural Resources

Site Location 1005
Parish: Vermilion
Latitude:
Longitude:
Site Name:
Site Description:
Water Body Description:
Estimated Maximum Water Depth: ______ (meters) / ______ (feet)

RDO mg L	Temp C	pH	Cond µS/cm	ORP mV	Turb NTU	Depth feet	Time

Notes: lat, long, site name, etc → see previous field record forms

Sample Description

Species: SHAD
Total # of Individuals:

Specimen Composite Code	Length (mm)	Width (mm)	Weight (grams)	Date/Time Trap Set	Date/Time Trap Pulled	Type of Bait	Sex	Additional Comments
					01/04/11/1005			

Notes:

Field Record Form: 07-47 East White Lake (VPSB)

Sampling Site Identification Code: TR-09
Project Initial Code: EWL
Sampling Date: 12-14-10
Collection Method(s): Crab trap
Collector Name (print and sign): J. Rodgers, P. Ritchie, H. Connelly
Affiliation: Clemson University
Address: Dept. of Forestry and Natural Resources

Sample Type ([✓ C] / F)
C = crab F = forage fish

Site Location

Parish: Vermillion
Latitude: 557668
Longitude: 3288957
Site Name: White Lake
Site Description: lake
Water Body Description: lake
Estimated Maximum Water Depth: ______ (meters) / 8 (feet)

RDO mg/L	Temp C	pH	Cond µS/cm	ORP mV	Turb NTU	Depth feet	Time
11.35	8.47	7.44	2198	0.18	179	0.5	1400

Notes:

Sample Description

Species: callinectes sapidus

Total # of Individuals: ~~10~~ 11 HC 12/14/10

Specimen Composite Code	12/14/10 HC Length cm ~~(mm)~~	HC 12/14/10 Width cm ~~(mm)~~	Weight (grams)	Date/Time Trap Set	Date/Time Trap Pulled	Type of Bait	Sex	Additional Comments
C	7.5	18	231	12/10/10 / 0700	12/14/10 / 1400	catfish	F	
C	8	19	293	12/10/10 / 0700	12/14/10 / 1400	catfish	M	
C	7	16	199	12/10/10 / 0700	12/14/10 / 1400	catfish	F	
C	7	17	174	12/10/10 / 0700	12/14/10 / 1400	catfish	F	one claw
C	7.5	17	279	12/10/10 / 0700	12/14/10 / 1400	catfish	M	
C	8	19	298	12/10/10 / 0700	12/14/10 / 1400	catfish	F	
C	7.5	17.5	221	12/10/10 / 0700	12/14/10 / 1400	catfish	F	
C	9	18.5	347	12/10/10 / 0700	12/14/10 / 1400	catfish	F	
C	6.5	15	143	12/10/10 / 0700	12/14/10 / 1400	catfish	M	
C	7	15.5	173	12/10/10 / 0700	12/14/10 / 1400	catfish	M	
C	8	19.5	339	12/10/10 / 0700	12/14/10 / 1400	catfish	M	

Notes:

Field Record Form: 07-47 East White Lake (VPSB)

Sampling Site Identification Code: TR - 09
Project Initial Code: EWL
Sampling Date: 01-04-11
Collection Method(s):
Collector Name (print and sign): J. Rodgers, H. Connelly, P. Ritchie
Affiliation: Clemson Univ (___) ___-___
Address: Dept Forestry and Natural Resources

Sample Type (C / [✓ F])
C = crab F = forage fish

Site Location 1028

Parish: Vermilion

Latitude:

Longitude:

Site Name:

Site Description:

Water Body Description:

Estimated Maximum Water Depth: _____ (meters) / _____ (feet)

RDO mg L	Temp C	pH	Cond µS/cm	ORP mV	Turb NTU	Depth feet	Time

Notes: lat, long, sitename, etc. → see previous fie

Sample Description

Species: SHAD

Total # of Individuals:

Specimen Composite Code	Length (mm)	Width (mm)	Weight (grams)	Date/Time Trap Set	Date/Time Trap Pulled	Type of Bait	Sex	Additional Comments
					01/04/11/1028			

Notes:

Chain of Custody and Chain of Custody Corrections

Appendix E

East White Lake Oil and Gas Field
Vermilion Parish, Louisiana

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Project Manager John Rodgers

CHAIN of CUSTODY

Project: EWL Tissue Study

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Method of Shipment
FedEx

Special Detection Limit/Reporting

			Matrix				Prsv.																		
Sample I.D.	Lab Sample No.	No. of Containers	Soil	Water	Air	Other Crabs	Yes	No	Sampling Date	Sampling Time	Total Arsenic - SW6020	Inorganic Arsenic - EPA 1632	Total Barium - SW6020	Total Mercury - EPA 1631	Methyl mercury - EPA 1630	TPH - Texas 1005/1006									Turn Around Time (working days)
EWLTR-03A C		1				X			12-14-10	P.M.															
EWL TR-04 C						X																			
EWL TR-05 C						X																			
EWL TR-06 C						X																			
EWL TR-07 C						X																			
EWL TR-08 C						X																			
EWL TR-09 C						X			↓	↓	↓	↓	↓	↓	↓	↓									
~~EWL~~ JHR 12/14/10																									
~~EWL~~ JHR 12/14/10																									
EWL-Bait						X			↓	↓	↓	↓	↓	↓	↓	↓									

REMARKS
Any crabs in excess of required for Composite can be analyzed as whole crab samples. Samp
ready for analysis

Sample Received Intact: Yes No

Temperature received: Ice No ice

Relinq. by sampler (Sign & Print Name) John Rodgers John H Rodgers Jr
Date 12-14-10 Time 6:45pm
Received by (Sign & Print Name)

Lab Work No.

Relinquished by
Date Time
Received by

Relinquished by
Date Time
Received by

Relinquished by
Date Time
Received by laboratory
Date Time

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Project: EWL Tissue Study

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Method of Shipment: Fed Ex

Special Detection Limit/Reporting

			Matrix				Prsv.																		
Sample I.D.	Lab Sample No.	No. of Containers	Soil	Water	Air	Other CRAB-C FISH-F	Yes	No	Sampling Date	Sampling Time	Total Arsenic SW 6020	EPA 1632A Inorganic Arsenic	Total Barium SW 6020	Total Mercury EPA 1631	Methylmercury EPA 1630	TPH Texas 1005/1006									Turn Around Time (working days)
EWL TR-01 F						X			12-15-10	1126	↓	↓	↓	↓	↓	↓									
EWL TR-01 C						X			12-15-10	1126	↓	↓	↓	↓	↓	↓									
EWL T-01A C						X			12-15-10	1237	↓	↓	↓	↓	↓	↓									
EWL bait *						X			12-14-10		↓	↓	↓	↓	↓	↓									

REMARKS

Reminder: fish are analyzed as whole body composites.
All samples ready for analysis

Sample Received Intact: Yes No

Temperature received: Ice No ice

Relinq. by sampler (Sign & Print Name) John Rodgers John H. Rodgers, Jr.	Date 12/14/10 15gr Time	Received by (Sign & Print Name)
Relinquished by	Date Time	Received by
Relinquished by	Date Time	Received by
Relinquished by	Date Time	Received by laboratory Date Time

Lab Work No.

* listed EWL bait on Chain of Custody Sheet from 12/14/10. Actually shipped bait with this group on 12/15/10 on dry ice. Bait is catfish parts.

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Special Detection Limit/Reporting

Sample I.D.	Lab Sample No.	No. of Containers	Matrix: Soil	Matrix: Water	Matrix: Air	Matrix: Other Grabs	Prsv.: Yes	Prsv.: No	Sampling Date	Sampling Time	Total Arsenic SW6020	Inorganic Arsenic EPA 1632A	Total Barium SW6020	Total Mercury EPA 1631	Methyl Mercury EPA 1630	TPH - Texas 1005/1006									Turn Around Time (working days)
EWL T-03 C		1				X			12-16-10	1143-1238	↓	↓	↓	↓	↓	↓									
EWL T-04 C		1				X																			
EWL T-06 C		1				X																			
EWL T-09 C		1				X																			

REMARKS

Sample Received Intact: Yes No

Temperature received: Ice No ice

Relinq. by sampler (Sign & Print Name) John Rodgers John H Rodgers	Date 12-16-10	Time 1530	Received by (Sign & Print Name)
Relinquished by	Date	Time	Received by
Relinquished by	Date	Time	Received by
Relinquished by	Date	Time	Received by laboratory Date Time

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Project Manager: John Rodgers

Project: EWL Tissue Study

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Method of Shipment: Fedex

Special Detection Limit/Reporting

Sample I.D.	Lab Sample No.	No. of Containers	Matrix: Soil	Water	Air	Other: CRAB	Prsv.: Yes	No	Sampling Date	Sampling Time	Total Arsenic SW6020	Inorganic Arsenic EPA 1632A	Total Barium SW6020	Total Mercury EPA 1631	Methyl Mercury EPA 1630	TPH - Texas 1005/1006									Turn Around Time (working days)
EWLT-01 C		1				X			12-20-10	1107-1236															
EWLT-02 C		1				X																			
EWLT-04 C		1				X																			
EWLT-05C		1				X																			
EWLT-06 C		1				X																			
EWLT-08C		1				X																			
EWLT-10 C		1				X																			
EWLT-12C		1				X																			
EWLTR-02C		1				X																			
EWLTR-03C		1				X			↓	↓	↓	↓	↓	↓	↓	↓									

REMARKS

CRABS from T-06 are for whole body analysis

T-12 only contains 3 crabs, please dissect and then hold for additional crabs we will ship for composite analysis

Sample Received Intact: Yes No

Temperature received: Ice No ice

Relinq. by sampler (Sign & Print Name)	Date	Time	Received by (Sign & Print Name)
John Rodgers	12-20-10		
Relinquished by	Date	Time	Received by
Relinquished by	Date	Time	Received by
Relinquished by	Date	Time	Received by laboratory Date Time

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CHAIN of CUSTODY

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Special Detection Limit/Reporting

Sample I.D.	Lab Sample No.	No. of Containers	Matrix				Prsv.		Sampling Date	Sampling Time	Total Arsenic SW6020	Inorganic Arsenic EPA 1632A	Total Barium SW 6020	Total Mercury EPA 1631	Methyl Mercury EPA 1630	TPH - Texas 1005/1006									Turn Around Time (working days)
			Soil	Water	Air	Other CRAB FISH	Yes	No																	
EWL T-02 C		1				X			12/21/10	1018-1420	↓	↓	↓	↓	↓	↓									
EWL T-05C		1				X					↓	↓	↓	↓	↓	↓									
EWL T-07C		1				X					↓	↓	↓	↓	↓	↓									
EWL T-11C		1				X					↓	↓	↓	↓	↓	↓									
EWL TR-02F						X					↓	↓	↓	↓	↓	↓									
EWL TR-03F						X					↓	↓	↓	↓	↓	↓									
EWL TR-04F						X					↓	↓	↓	↓	↓	↓									
EWL TR-04A F						X					↓	↓	↓	↓	↓	↓									

REMARKS

Sample Received Intact: Yes No

Temperature received: Ice No ice

Relinq. by sampler (Sign & Print Name) John Rodgers	Date 12/21/10	Time	Received by (Sign & Print Name)
Relinquished by	Date	Time	Received by
Relinquished by	Date	Time	Received by
Relinquished by	Date	Time	Received by laboratory / Date / Time

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Project: EWL Tissue Study

Project Manager: John Rodgers

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Fax No.:

Method of Shipment: Fed Ex

Special Detection Limit/Reporting:

			Matrix				Prsv.																		
Sample I.D.	Lab Sample No.	No. of Containers	Soil	Water	Air	Other Crabs	Yes	No	Sampling Date	Sampling Time	Total Arsenic - SW6020	Inorganic Arsenic - EPA1632A	Total Barium - SW6020	Total Mercury - EPA1631	Methylmercury - EPA1630	TPH - Texas 1005/1006									Turn Around Time (working days)
EWL-NO		1				X			12-27-10	1300	X	X	X	X	X	X									

MARKS

Sample Received Intact: Yes No

Temperature received: Ice No ice

Relinq. by sampler (Sign & Print Name)	Date	Time	Received by (Sign & Print Name)		
Patrick Ritchie	12-27-10				
Relinquished by	Date	Time	Received by		
Relinquished by	Date	Time	Received by		
Relinquished by	Date	Time	Received by laboratory	Date	Time

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Special Detection Limit/Reporting

Sample I.D.	Lab Sample No.	No. of Containers	Matrix				Prsv.		Sampling Date	Sampling Time	Total Arsenic - SW6020	Inorganic Arsenic EPA 1632A	Total Barium - SW6020	Total Mercury - EPA1631	Methylmercury - EPA 1630	TPH - Texas 1005/1006									Turn Around Time (working days)
			Soil	Water	Air	Other Crabs	Yes	No																	
EWL-BR		1				X			12-27-10		X	X	X	X	X	X									

MARKS

Sample Received Intact: Yes No

Temperature received: Ice No ice

Relinq. by sampler (Sign & Print Name)	Date Time	Received by (Sign & Print Name)	
Relinquished by	Date Time	Received by	
Relinquished by	Date Time	Received by	
Relinquished by	Date Time	Received by laboratory	Date Time

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Project: EWL Tissue Study

Project Manager: John Rodgers

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Fax No.:

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Special Detection Limit/Reporting:

Sample I.D.	Lab Sample No.	No. of Containers	Matrix Soil	Water	Air	Other Crabs	Prsv. Yes	No	Sampling Date	Sampling Time	Total Arsenic-SW6020	Inorganic Arsenic-EPA1632A	Total Barium-SW6020	Total Mercury-EPA1631		Methyl Mercury-EPA1630	TPH-Texas 1005/1006									Turn Around Time (working days)
EWL - T03 C		1				↓			1-3-11	A.M.	↓	↓	↓	↓		↓	↓									
EWL T07 C		↓				↓			↓	↓	↓	↓	↓	↓		↓	↓									
EWL T-08 C		↓				↓			↓	↓	↓	↓	↓	↓		↓	↓									
EWL T-10 C		↓				↓			↓	↓	↓	↓	↓	↓		↓	↓									
EWL T-12 C		↓				↓			↓	↓	↓	↓	↓	↓		↓	↓									
EWL TR-02 C		↓				↓			↓	↓	↓	↓	↓	↓		↓	↓									
EWL - TR-03 C		↓				↓			↓	↓	↓	↓	↓	↓		↓	↓									
~~EWL - T12 C~~ JHR 1-3-11		~~↓~~				~~↓~~			~~↓~~	~~↓~~	~~↓~~	~~↓~~	~~↓~~	~~↓~~		~~↓~~	~~↓~~									
EWL - TR04 C		↓				↓			↓	↓	↓	↓	↓	↓		↓	↓									

REMARKS: These crab samples are to complete the composite samples and to provide crabs for whole crab analyses as well as any other analyes (e.g. TPH).

Sample Received Intact: Yes No

Temperature received: Ice No ice

Relinq. by sampler (Sign & Print Name)	Date	Time	Received by (Sign & Print Name)		
John Rodgers John H. Rodgers Jr.	1-3-11	4:05 PM			
Relinquished by	Date	Time	Received by		
Relinquished by	Date	Time	Received by		
Relinquished by	Date	Time	Received by laboratory	Date	Time

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Project: EWL Tissue Study

Method of Shipment: Fed EX

Project Manager: John Rodgers

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Special Detection Limit/Reporting

			Matrix				Prsv.																		
Sample I.D.	Lab Sample No.	No. of Containers	Soil	Water	Air	Other FISH	Yes	No	Sampling Date	Sampling Time	Total Arsenic - SW6020	Inorganic Arsenic - EPA 1632A	Total Barium - SW6020	Total Mercury - EPA 1631	Methyl Mercury - EPA 1630	TPH - Texas 1005/1006									Turn Around Time (working days)
EWL TR-05						↓					↓	↓	↓	↓	↓	↓									
-06						↓					↓	↓	↓	↓	↓	↓									
-07						↓					↓	↓	↓	↓	↓	↓									
-08						↓					↓	↓	↓	↓	↓	↓									
-09						↓					↓	↓	↓	↓	↓	↓									
EWL T-01						↓					↓	↓	↓	↓	↓	↓									
-02						↓					↓	↓	↓	↓	↓	↓									
-03						↓					↓	↓	↓	↓	↓	↓									
-04						↓					↓	↓	↓	↓	↓	↓									
-05						↓					↓	↓	↓	↓	↓	↓									
-06						↓					↓	↓	↓	↓	↓	↓									
-07						↓					↓	↓	↓	↓	↓	↓									
-08						↓					↓	↓	↓	↓	↓	↓									
-09						↓					↓	↓	↓	↓	↓	↓									

REMARKS

Sample Received Intact: Yes No

Temperature received: Ice No ice

Relinq. by sampler (Sign & Print Name) John Rodgers John H. Rodgers, Jr.	Date 1-6-11 Time	Received by (Sign & Print Name)	
Relinquished by	Date Time	Received by	
Relinquished by	Date Time	Received by	
Relinquished by	Date Time	Received by laboratory	Date Time

Lab Work No.

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CHAIN of CUSTODY

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Project: EWL Tissue Study

Telephone No. 864-650-0210

Fax No.

Method of Shipment: FedEx

Special Detection Limit/Reporting

Sample I.D.	Lab Sample No.	No. of Containers	Matrix: Soil	Matrix: Water	Matrix: Air	Matrix: Other FISH	Prsv.: Yes	Prsv.: No	Sampling Date	Sampling Time	Total Arsenic-SW6020	Inorganic Arsenic-EPA1632A	Total Barium-SW6020	Total Mercury-EPA1631	Methyl Mercury-EPA1630	TPH-Texas 1005/1006	Turn Around Time (working days)
EWL T-10 F						↓					↓	↓	↓	↓	↓	↓	
EWL T-11 F						↓					↓	↓	↓	↓	↓	↓	
EWL T-12 F						↓					↓	↓	↓	↓	↓	↓	

MARKS

Sample Received Intact: Yes No

Temperature received: Ice No ice

Relinq. by sampler (Sign & Print Name): John Rodgers John H Rodgers — Date: 1-6-11 — Time:

Received by (Sign & Print Name):

Lab Work No.

Relinquished by — Date — Time — Received by

Relinquished by — Date — Time — Received by

Relinquished by — Date — Time — Received by laboratory — Date — Time

MICHAEL PISANI & ASSOCIATES, INC.
Environmental Consulting Services

13313 Southwest Freeway
Suite 221
Sugar Land, Texas 77478

1100 Poydras Street
1430 Energy Centre
New Orleans, Louisiana 70163

17431 Jefferson Highway
Suite A
Baton Rouge, Louisiana 70817

Attn: Lynda Huckestein

Re: EWL Tissue Study

Lynda,

Attached are the corrections required on the final COC, along with the necessary Field Record Forms for the EWL Tissue Study.

If you have any questions/comments, please contact Patrick Ritchie.

(504)582-2472
pmritchie@ix.netcom.com

Thank You

Field Record Form: 07-47 East White Lake (VPSB)

Sampling Site Identification Code: T - 02
Sample Type (C / [✓ F])
C = crab F = forage fish
Project Initial Code: E W L
Sampling Date: 12-21-10
Collection Method(s): Net
Collector Name (print and sign): P. Ritchie, H. Connelly, J. Rodgers
Affiliation: Clemson University (864) 650-0210
Address: Dept. of Forestry + Natural Resources

Site Location

Parish: Vermilion
Latitude: 561094
Longitude: 3288612
Site Name: EWL Field
Site Description: Canal
Water Body Description: Canal
Estimated Maximum Water Depth: ______ (meters) / 20' (feet)

RDO mg/L	Temp C	pH	Cond µS/cm	ORP mV	Turb NTU	Depth feet	Time
8.05	13.84	7.4	4019	0.01	45.2	1.1	1104

Notes:

Sample Description

Species: Blue Gill
Total # of Individuals: 1

Specimen Composite Code	Length (mm)	Width (mm)	Weight (grams)	Date/Time Trap Set	Date/Time Trap Pulled	Type of Bait	Sex	Additional Comments
F				12/13/10 1238	12/21/10 1104			

Notes: K1013947

Field Record Form: 07-47 East White Lake (VPSB)

Sampling Site Identification Code: T-05

Sample Type (C [✓ F]
(C = crab F = forage fish

Project Initial Code: EWL

Sampling Date: 12-21-10

Collection Method(s): Net

Collector Name (print and sign): P.Ritchie, H.Connelly, J.Rodgers

Affiliation: Clemson University (864) 650-0210

Address: Dept. of Forestry + Natural Resources

Site Location

Parish: Vermilion

Latitude: 560869

Longitude: 3288990

Site Name: EWL Field

Site Description: Canal

Water Body Description: Canal

Estimated Maximum Water Depth: ______ (meters) / 20' (feet)

RDO mg/l	Temp C	pH	Cond µS/cm	ORP ~~mV~~	Turb NTU	Depth feet	Time
8.95	13.4	7.26	3512	0.07	46.5	1.3	1033

Notes:

Sample Description

Species: Blue Gill

Total # of Individuals:

Specimen Composite Code	Length (mm)	Width (mm)	Weight (grams)	Date/Time Trap Set	Date/Time Trap Pulled	Type of Bait	Sex	Additional Comments
F				12/16/10 1206	12/21/10 1033			

Notes: K1013947

Columbia Analytical Services™
800.695.7222
www.caslab.com

Client: EWL Project - D. Lingle

Project Manager: John Rodgers

CHAIN of CUSTODY

Project: EWL Tissue Study

Telephone No.

Fax No.

Page 1 of 1

Method of Shipment: Fed Ex

Special Detection Limit/Reporting

Sample I.D.	Lab Sample No.	No. of Containers	Matrix				Prsv.		Sampling Date	Sampling Time	Total Arsenic - SW6020	Inorganic Arsenic - EPA1632A	Total Barium - SW6020	Total Mercury - EPA1631	Methylmercury - EPA1630	TPH - Texas 1005/1006	Turn Around Time (working days)
			Soil	Water	Air	Other Crabs	Yes	No									
EWL-NO		1				X			12-27-10	1300	X	X	X	X	X	X	

REMARKS

K1014320

Sample Received Intact: Yes No

Temperature received: Ice No ice

Relinq. by sampler (Sign & Print Name)	Date	Time	Received by (Sign & Print Name)
Patrick Ritchie	12-27-10		

Relinquished by	Date	Time	Received by

Relinquished by	Date	Time	Received by

Relinquished by	Date	Time	Received by laboratory	Date	Time

Lab Work No.

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Project Manager: John Rodgers

CHAIN of CUSTODY

Project: EWL Tissue Study

Telephone No

Fax No.

Page ___ of ___

Method of Shipment: Fed ex

Special Detection Limit/Reporting

Sample I.D.	Lab Sample No.	No. of Containers	Matrix: Soil	Matrix: Water	Matrix: Air	Matrix: Other CRAB FISH	Prsv.: Yes	Prsv.: No	Sampling Date	Sampling Time	Total Arsenic SW6020	Inorganic Arsenic EPA 1632A	Total Barium SW 6020	Total Mercury EPA 1631	Methyl Mercury EPA 1630	TPH - Texas 1005/1006	Turn Around Time (working days)
EWL T-02 C		1				X			12/21/10	1018-1420							
EWL T-05C		1				X											
EWL T-07C		1				X											
EWL T-11 C		1				X											
EWL TR-02F		1				X											
EWL TR-03F		1				X											
EWL TR-04F		1				X											
EWL TR-04A F		1				X			↓	↓	↓	↓	↓	↓	↓	↓	
EWL T-02 F		1				X			12/21/10	1018-1420	X	X	X	X	X	X	
EWL T-05 F		1				X			↓	↓	X	X	X	X	X	X	

MARKS

K1013947

Sample Received Intact: Yes No

Temperature received: Ice No ice

Relinq. by sampler (Sign & Print Name): John Rodgers
Date: 12/21/10 Time:
Received by (Sign & Print Name):

Relinquished by: Date: Time: Received by:

Relinquished by: Date: Time: Received by:

Relinquished by: Date: Time: Received by laboratory: Date: Time:

Lab Work No.

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www.caslab.com

Client: EWL Project - D. Lingle

CHAIN of CUSTODY

Page 1 of 2

Project: EWL Tissue Study

Project Manager: John Rodgers

Telephone No. 864-650-0210

Fax No.

Method of Shipment: Fed EX

Special Detection Limit/Reporting

Sample I.D.	Lab Sample No.	No. of Containers	Matrix				Prsv.		Sampling Date	Sampling Time	Total Arsenic - SW6020	Inorganic Arsenic - EPA 1632A	Total Barium - SW6020	Total Mercury - EPA 1631	Methyl Mercury - EPA 1630	TPH - Texas 1005/1006									Turn Around Time (working days)
			Soil	Water	Air	Other FISH	Yes	No																	
EWL TR-05 F		1				↓			1-4-11	930	↓	↓	↓	↓	↓	↓									
EWL TR-06 F									↓	945															
EWL TR-07 F										1050															
EWL TR-08 F										1005															
EWL TR-09 F										1028															
EWL T-01 F									1-5-11	1230															
EWL T-02 F									↓	1230															
EWL T-03 F										1330															
EWL T-04 F										1340															
EWL T-05 F										1320															
EWL T-06 F										1350															
EWL T-07 F										1510															
EWL T-08 F										1505															
EWL T-09 F										1455															

REMARKS

Packed in dry ice

Sample Received Intact: Yes No

Temperature received: Ice No ice

Relinq. by sampler (Sign & Print Name)	Date	Time	Received by (Sign & Print Name)		
John Rodgers John H. Rodgers Jr.	1-6-11	1105			
Relinquished by	Date	Time	Received by		
Relinquished by	Date	Time	Received by		
Relinquished by	Date	Time	Received by laboratory	Date	Time

Lab Work No.

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www.caslab.com

Client: EWL Project - D. Lingle

CHAIN of CUSTODY

Page 2 of 2

Project: EWL Tissue Study

Project Manager: John Rodgers

Telephone No. 864-650-0210

Fax No.

Method of Shipment: FedEx

Special Detection Limit/Reporting

Sample I.D.	Lab Sample No.	No. of Containers	Matrix Soil	Matrix Water	Matrix Air	Matrix Other FISH	Prsv. Yes	Prsv. No	Sampling Date	Sampling Time	Total Arsenic-SW6020	Inorganic Arsenic-EPA1632A	Total Barium-SW6020	Total Mercury-EPA1631	Methyl Mercury-EPA1630	TPH-Texas 1005/1006									Turn Around Time (working days)
EWL T-10 F		1				↓			1-5-11	1355	↓	↓	↓	↓	↓	↓									
EWL T-11 F						↓			↓	1405	↓	↓	↓	↓	↓	↓									
EWL T-12 F						↓			↓	1445	↓	↓	↓	↓	↓	↓									

REMARKS: Packed in dry ice

Sample Received Intact: Yes No

Temperature received: Ice No ice

Relinq. by sampler (Sign & Print Name): John Rodgers John H Rodgers — Date 1-6-11 Time 1105

Received by (Sign & Print Name):

Relinquished by — Date — Time

Received by

Relinquished by — Date — Time

Received by

Relinquished by — Date — Time

Received by laboratory — Date — Time

Lab Work No.

Scientific Fish Collection Permit
Appendix F

East White Lake Oil and Gas Field
Vermilion Parish, Louisiana

BOBBY JINDAL
GOVERNOR

State of Louisiana
DEPARTMENT OF WILDLIFE AND FISHERIES
OFFICE OF SECRETARY

ROBERT J. BARHAM
SECRETARY

SALTWATER SCIENTIFIC COLLECTING PERMIT

ISSUED TO: **John H. Rogers** PERMITTEE # **1907**
COMPANY: **Clemson University**
ADDRESS: **Department of Forestry and Natural Resources, 261 Lehotsky Hall, Clemson, SC 29634-**
ISSUE DATE: **1/5/2011** EXPIRATION DATE: **31 December 2011**

PERMITTED ACTIVITIES:

This permits the holder to take the fish listed in Attachment A of this permit, by the means and in the areas authorized in Attachment A, provided that the Region Captain of the Louisiana Department of Wildlife and Fisheries, Enforcement Division is notified in advance and shall accompany you, or direct somebody to accompany you, if he deems it necessary, when fish are taken under the authority of this permit. If electric seines, electrofishers or chemicals are to be used, it will be necessary that the District Fisheries Biologist be notified in addition to Enforcement personnel. This permit does not allow anyone to use chemicals that are not approved for use in Louisiana by other state and federal agencies or exempt permit holders from any regulations by other state or federal agencies. This permit is good in **SALTWATER** areas only does not allow the taking of oysters from private leases unless accompanied by written permission of the lease holder.

RESTRICTIONS:

(1)Gill nets must be attended to at all times with tags on each end of the net clearly identifying the owner and operator of the gear.
(2)This permit may be cancelled at any time if in the judgment of the designated authority; the permit is being used for purposes other than those for which the permit was issued. Sale of any organisms collected under this permit, or their progeny, is prohibited. No item collected under this permit may be used for human consumption. One of the permittees must be in the company of the samples at all times. This permit and Attachment A must be in possession when taking or possessing organisms under the conditions of the permit.
(3) Alligators are not permitted to be taken with this permit.
(4) Holder agrees to submit an annual report giving a detailed description and inventory of all specimens collected within 60 days following expiration of this permit to: Louisiana Department of Wildlife and Fisheries, Office of Fisheries - Permits Manager, P.O. Box 98000, Baton Rouge, LA 70898-9000. Reports are mandatory even if no collections were made during the permit year.
(5) Failure to report may result in denial of future permit requests or suspension of existing permits.
(6) See Attachment A for additional information regarding permit restrictions.

PERMIT COMPLIANCE - PERMIT IS NOT VALID UNLESS SIGNED BY PERMITTEE

I ____,
(Permittee Signature)
agree to abide by all State and Federal fish and wildlife laws and regulations, and all State and Federal laws and regulations which relate to this permit or the permitted activity, and by all other terms and conditions of this permit.

LEGAL AUTHORITY: **R.S. 56:318**
APPROVED - authority delegated by the Secretary of the Louisiana Department of Wildlife and Fisheries in memo dated 7/29/2010:

Harry Blanchet, Biologist Director: R. H. Blanchet 1/5/11

cc: Col. Winton Vidrine, Enforcement

BOBBY JINDAL
GOVERNOR

State of Louisiana
DEPARTMENT OF WILDLIFE AND FISHERIES
OFFICE OF SECRETARY

ROBERT J. BARHAM
SECRETARY

The following individuals are sub-permitted under the 2011Saltwater Scientific Collecting **Permit # 1907**, for **John H. Rogers, Jr**, Department of Forestry and Natural Resources, Clemson University, SC, issued 01/05/2011, expiring 12/31/2011. This permit allows you and all subpermittee's to use the following gears listed in Attachment A.

John H. Rogers, JR ←

Sub-Permittee's on ~~Mamretto~~ Permit #1907

ok
MR
1/5/11 LDWF

Patrick W. Richie
Helen Connelly

Legal Authority: R.S. 56:318
Approved – authority delegated by the Secretary of the Louisiana Dept. of Wildlife and Fisheries in memo dated 7/29/2010:

R. H Blanchet

Harry Blanchet
Biologist Director – MarineFisheries

Cc: Col. Winton Vidrine, Enforcement

APPLICATION FOR SCIENTIFIC COLLECTING PERMIT
Louisiana Department of Wildlife & Fisheries

APPLICATION DATE: 1-3-2011 | PERMIT # ASSIGNED LAST YEAR: (If applicable)

APPLICANT'S NAME: John H. Rodgers, Jr.

APPLICANT'S OFFICIAL TITLE/AFFILIATION: Professor, Clemson University

ADDRESS: Dept. of Forestry and Natural Resources, 261 Lehotsky Hall

CITY/STATE: Clemson, SC | ZIP CODE: 29634 | PARISH: Pickens

TELEPHONE #: 864-656-0492 | FAX #: 864-656-1034 | E-MAIL: jrodger@clemson.edu

NAMES OF PERSONNEL CONDUCTING COLLECTING: (If firearms will be used, provide Date of Birth and Social Security Number)

Patrick W. Richie
Helen Connelly

PURPOSE OF SCIENTIFIC COLLECTION: (Attach support information as appropriate)

To measure concentrations of analytes such as arsenic and barium in crab and forage fish tissue

AREA(S) WHERE COLLECTIONS WILL BE MADE:

Vermilion Parish - White Lake, Schooner Bayou and East White Lake Field (Canals).

METHOD(S) OF COLLECTION:

Trawl, Cast Net, Hoop Net/Trap, Crab Trap

TYPES AND NUMBERS OF ORGANISMS TO BE COLLECTED:

Crabs - Callinectes sapidus - ~21 stations, ~10/station
Forage Fish - bluegill, shad, mosquito fish - ~21 stations, 10-30/station

HOW WILL SPECIMENS BE DISPOSED OF? Specimens will be consumed in analyses and residual disposed at analytical laboratory.

I have been advised and do understand that by applying for and accepting a permit issued by the La. Dept. of Wildlife & Fisheries, I am being allowed to engage in an activity which would otherwise be prohibited by law or for which a permit is required. I understand that the permit is not a license and confers no property right upon me. I specifically agree to abide by all State and Federal wildlife laws and regulations, and all State and Federal laws and regulations which relate to this permit or the permitted activity, and by all other terms and conditions of this permit. I understand that the permit for which I am applying may be suspended, canceled or revoked at anytime by the La. Dept. of Wildlife & Fisheries. I agree to immediately surrender the permit issued to me upon demand made upon me by any authorized employee of the Louisiana Dept. of Wildlife & Fisheries. I understand that my failure to fully and completely comply with the laws, regulations, terms and conditions referred to herein could result in the immediate suspension, cancellation or revocation of this and other permits issued to me by the Dept. and that I may be denied future permits as a consequence of my actions. I understand and agree that any permit issued to me by the La. Dept. of Wildlife & Fisheries is in the nature of a privilege, which is being voluntarily extended to me by the Dept. and the failure on my part to cooperate fully and completely with the Dept. or its employees can result in the loss of the privilege conferred and the denial of future requests for permits. By accepting this permit, I evidence my agreement to be bound by all conditions and stipulations set forth herein.

SIGNATURE OF APPLICANT: John H. Rodgers, Jr. | DATE: 1-3-2011

1-4-2011 HL 1-4-2011

1 of 5

ATTACHMENT A

Chemical Analytical Data

Appendix E

Project No. 0116008
UNOCAL
Vermilion Parish, Louisiana

Environmental Resources Management Southwest, Inc.
3838 North Causeway Boulevard, Suite 3000
Metairie, Louisiana 70002
(504) 831-6700

Table E-1
Sediment Data

East White Lake Field
Vermilion Parish, Louisiana

			Moisture Content		Arsenic				As Average		Barium				Ba Average		Cadmium				Cd Average		Chromium				Cr Average		Lead				Lead Average	
					ICON		Pisani				ICON		Pisani				ICON		Pisani				ICON		Pisani				ICON		Pisani			
Boring ID	**Core Interval (ft bgs)**	**Date**	**ICON**	**MPA**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**
B2	2-4	8-Aug-06	0.773	-	13.8	3.13	-	-	13.8	3.13	3590	815	-	-	3590	815	0.81	0.184	-	-	0.81	0.184	-	-	-	-	-	-	48	10.9	-	-	48	10.9
B2	4-6	8-Aug-06	0.779	-	7.07	1.56	-	-	7.07	1.56	717	158	-	-	717	158	0.664	0.147	-	-	0.664	0.147	-	-	-	-	-	-	36	7.96	-	-	36	7.96
B2 Rerun	6-8	8-Aug-06	0.866	-	10.6	1.42	-	-	10.6	1.42	307	41.1	-	-	307	41.1	1.07	0.143	-	-	1.07	0.143	-	-	-	-	-	-	10	1.34	-	-	10	1.34
B2 Rerun	10-10.5	8-Aug-06	0.276	-	39	28.2	-	-	39	28.2	209	151	-	-	209	151	1.12	0.811	-	-	1.12	0.811	-	-	-	-	-	-	32.3	23.4	-	-	32.3	23.4
B3	4-7	9-Aug-06	0.705	-	30	8.85	-	-	30	8.85	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B3 Rerun	9-12	9-Aug-06	0.528	-	7.55	3.56	-	-	7.55	3.56	130	61.4	-	-	130	61.4	0.489	0.231	-	-	0.489	0.231	-	-	-	-	-	-	18.4	8.68	-	-	18.4	8.68
B4 Rerun	0-1	9-Aug-06	0.784	-	10	2.16	-	-	10	2.16	631	136	-	-	631	136	0.77	0.166	-	-	0.77	0.166	-	-	-	-	-	-	28.7	6.2	-	-	28.7	6.2
B4 Rerun	3-5	9-Aug-06	0.525	-	6.7	3.18	-	-	6.7	3.18	138	65.6	-	-	138	65.6	0.447	0.212	-	-	0.447	0.212	-	-	-	-	-	-	16.7	7.93	-	-	16.7	7.93
B4	5-8	9-Aug-06	0.826	-	4.67	0.813	-	-	4.67	0.813	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B5	0-1.5	9-Aug-06	0.71	-	6.57	1.91	-	-	6.57	1.91	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B5	4-5.5	9-Aug-06	0.585	-	4.22	1.75	-	-	4.22	1.75	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B5 Rerun	8-10	9-Aug-06	0.596	-	6.23	2.52	-	-	6.23	2.52	160	64.6	-	-	160	64.6	0.458	0.185	-	-	0.458	0.185	-	-	-	-	-	-	13.4	5.41	-	-	13.4	5.41
B6	1.5-3	9-Aug-06	0.623	-	5.17	1.95	-	-	5.17	1.95	220	82.9	-	-	220	82.9	0.353	0.133	-	-	0.353	0.133	-	-	-	-	-	-	17.2	6.48	-	-	17.2	6.48
B6	3-10.5	9-Aug-06	0.466	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B7	4-5	9-Aug-06	0.56	-	8.25	3.63	-	-	8.25	3.63	141	62	-	-	141	62	0.475	0.209	-	-	0.475	0.209	-	-	-	-	-	-	16.7	7.35	-	-	16.7	7.35
B7	8-11	9-Aug-06	0.287	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B8 Rerun	5.5-7	9-Aug-06	0.562	-	7.6	3.33	-	-	7.6	3.33	175	76.7	-	-	175	76.7	0.382	0.167	-	-	0.382	0.167	-	-	-	-	-	-	17	7.45	-	-	17	7.45
B8	9.5-11.5	9-Aug-06	0.329	-	6.15	4.13	-	-	6.15	4.13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B9 Rerun	0-0.5	9-Aug-06	0.744	-	8.17	2.09	-	-	8.17	2.09	368	94.2	-	-	368	94.2	0.644	0.165	-	-	0.644	0.165	-	-	-	-	-	-	23.1	5.91	-	-	23.1	5.91
B9	0.5-3.5	9-Aug-06	0.711	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B9 Rerun	8-9	9-Aug-06	0.345	-	27.8	18.2	-	-	27.8	18.2	298	195	-	-	298	195	0.839	0.55	-	-	0.839	0.55	-	-	-	-	-	-	16.1	10.5	-	-	16.1	10.5
B10	1.5-4	9-Aug-06	0.702	-	7.19	2.14	-	-	7.19	2.14	173	51.6	-	-	173	51.6	0.306	0.0912	-	-	0.306	0.0912	12.4	3.7	-	-	12.4	3.7	13.2	3.93	-	-	13.2	3.93
B10	4-7.5	9-Aug-06	0.465	-	5.81	3.11	-	-	5.81	3.11	190	102	-	-	190	102	0.562	0.301	-	-	0.562	0.301	-	-	-	-	-	-	17.2	9.2	-	-	17.2	9.2
B12	0-1.5	10-Aug-06	0.768	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B12 Rerun	3.5-5	10-Aug-06	0.496	-	7.66	3.86	-	-	7.66	3.86	92.6	46.7	-	-	92.6	46.7	0.539	0.272	-	-	0.539	0.272	-	-	-	-	-	-	19.8	9.98	-	-	19.8	9.98
B12	6.5-7.5	10-Aug-06	0.242	-	4.88	3.7	-	-	4.88	3.7	162	123	-	-	162	123	3.45	2.62	-	-	3.45	2.62	-	-	-	-	-	-	16.4	12.4	-	-	16.4	12.4
B13 Rerun	3-5	10-Aug-06	0.527	-	4.32	2.04	-	-	4.32	2.04	125	59.1	-	-	125	59.1	0.424	0.201	-	-	0.424	0.201	-	-	-	-	-	-	16	7.57	-	-	16	7.57
B13 Rerun	7.5-9.5	18-Aug-06	0.305	-	23.1	16.1	-	-	23.1	16.1	266	185	-	-	266	185	0.734	0.51	-	-	0.734	0.51	-	-	-	-	-	-	16.5	11.5	-	-	16.5	11.5
B14	0-1	10-Aug-06	0.502	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B14	4-8	10-Aug-06	0.506	-	4.15	2.05	-	-	4.15	2.05	117	57.8	-	-	117	57.8	0.262	0.129	-	-	0.262	0.129	-	-	-	-	-	-	13.8	6.82	-	-	13.8	6.82
B15 Rerun	4-6	10-Aug-06	0.581	-	6.31	2.64	-	-	6.31	2.64	124	52	-	-	124	52	0.413	0.173	-	-	0.413	0.173	-	-	-	-	-	-	13.2	5.53	-	-	13.2	5.53
B15	8-11.5	10-Aug-06	0.481	-	7.02	3.64	-	-	7.02	3.64	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B17	0-3	10-Aug-06	0.81	-	7.75	1.47	-	-	7.75	1.47	453	86.1	-	-	453	86.1	0.236	0.0448	-	-	0.236	0.0448	11.9	2.26	-	-	11.9	2.26	12.3	2.34	-	-	12.3	2.34
B17 Rerun	3-6	10-Aug-06	0.509	-	9.6	4.71	-	-	9.6	4.71	212	104	-	-	212	104	0.344	0.169	-	-	0.344	0.169	-	-	-	-	-	-	24	11.8	-	-	24	11.8
B17	8.5-10.5	10-Aug-06	0.587	-	7.29	3.01	-	-	7.29	3.01	148	61.1	-	-	148	61.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B17 Rerun	10.5-12	10-Aug-06	0.219	-	3.2	2.5	-	-	3.2	2.5	95.4	74.5	-	-	95.4	74.5	0.215	0.168	-	-	0.215	0.168	-	-	-	-	-	-	9.75	7.61	-	-	9.75	7.61
B18	2-4	10-Aug-06	0.535	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B18	4-5	10-Aug-06	0.573	-	4.42	1.89	-	-	4.42	1.89	105	44.8	-	-	105	44.8	0.304	0.13	-	-	0.304	0.13	-	-	-	-	-	-	15.8	6.75	-	-	15.8	6.75
B18	7.5-10	10-Aug-06	0.462	-	4.67	2.51	-	-	4.67	2.51	94.9	51.1	-	-	94.9	51.1	0.295	0.159	-	-	0.295	0.159	-	-	-	-	-	-	15.6	8.39	-	-	15.6	8.39
B18	10-11.5	10-Aug-06	0.567	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B19	1-2.5	10-Aug-06	0.875	-	15.4	1.93	-	-	15.4	1.93	989	124	-	-	989	124	0.419	0.0524	-	-	0.419	0.0524	-	-	-	-	-	-	-	-	-	-	-	-
B19	2.5-4	10-Aug-06	0.839	-	15.3	2.46	-	-	15.3	2.46	234	37.7	-	-	234	37.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B19	4-6.5	10-Aug-06	0.825	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B19 Rerun	6.5-9.5	10-Aug-06	0.533	-	7.68	3.59	-	-	7.68	3.59	175	81.7	-	-	175	81.7	0.368	0.172	-	-	0.368	0.172	-	-	-	-	-	-	14.1	6.58	-	-	14.1	6.58
B20	3-4.5	10-Aug-06	0.598	-	7.31	2.94	-	-	7.31	2.94	186	74.8	-	-	186	74.8	0.373	0.15	-	-	0.373	0.15	-	-	-	-	-	-	15.5	6.23	-	-	15.5	6.23
B20	7.5-10	10-Aug-06	0.548	-	6.15	2.78	-	-	6.15	2.78	91.2	41.2	-	-	91.2	41.2	0.408	0.184	-	-	0.408	0.184	-	-	-	-	-	-	14.4	6.51	-	-	14.4	6.51
B21	0-2	10-Aug-06	0.764	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B21	2-4	10-Aug-06	0.531	-	8.27	3.88	-	-	8.27	3.88	139	65.2	-	-	139	65.2	0.353	0.166	-	-	0.353	0.166	-	-	-	-	-	-	16.9	7.93	-	-	16.9	7.93
SS1	0-2.1	25-Apr-06	0.626	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS1	2.1-2.5	25-Apr-06	0.637	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS2	0-1	25-Apr-06	0.535	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS2	1-1.5	25-Apr-06	0.789	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS3	0-0.6	25-Apr-06	0.627	-	8.79	3.28	-	-	8.79	3.28	1600	597	-	-	1600	597	-	-	-	-	-	-	17.9	6.68	-	-	17.9	6.68	28.8	10.7	-	-	28.8	10.7
SS3	0.6-2.2	25-Apr-06	0.593	-	10.9	4.44	-	-	10.9	4.44	2330	948	-	-	2330	948	-	-	-	-	-	-	16.4	6.67	-	-	16.4	6.67	27.2	11.1	-	-	27.2	11.1
SS3	2.2-2.6	25-Apr-06	0.655	-	9.61	3.32	-	-	9.61	3.32	1610	555	-	-	1610	555	-	-	-	-	-	-	7.15	2.47	-	-	7.15	2.47	13.3	4.59	-	-	13.3	4.59
SS4	0-0.6	26-Apr-06	0.75	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS4	0.6-2.7	26-Apr-06	0.688	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS4	2.7-3.8	26-Apr-06	0.831	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS5	0-2.15	26-Apr-06	0.575	-	11.4	4.85	-	-	11.4	4.85	7450	3170	-	-	7450	3170	-	-	-	-	-	-	21.8	9.27	-	-	21.8	9.27	117	49.7	-	-	117	49.7
SS6	0-1.65	26-Apr-06	0.708	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS6	1.65-2.5	26-Apr-06	0.785	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS7	0-1.4	26-Apr-06	0.717	-	22	6.23	-	-	22	6.23	15700	4440	-	-	15700	4440	-	-	-	-	-	-	20	5.66	-	-	20	5.66	67.5	19.1	-	-	67.5	19.1
SS7	1.4-2.5	26-Apr-06	0.617	-	21.5	8.23	-	-	21.5	8.23	13500	5170	-	-	13500	5170	-	-	-	-	-	-	13.3	5.09	-	-	13.3	5.09	117	44.8	-	-	117	44.8
SS7	2.5-3.5	26-Apr-06	0.663	-	9.1	3.07	-	-	9.1	3.07	3780	1270	-	-	3780	1270	-	-	-	-	-	-	8.3	2.8	-	-	8.3	2.8	20	6.74	-	-	20	6.74
SS8	0-1.9	27-Apr-06	0.567	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS8	1.9-2.3	27-Apr-06	0.531	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS8	0-2	26-Feb-10	0.64	0.639	8.12	2.92	7.89	2.85	8.01	2.89	871	314	1040	376	956	345	0.538	0.194	0.175	0.063	0.356	0.128	15.8	5.69	4.96	1.79	10.4	3.74	24.5	8.82	35.2	12.7	29.8	10.8
SS8	2-4	26-Feb-10	0.623	0.632	8.01	3.02	6.84	2.47	7.43	2.74	1010	381	1050	379	1030	380	0.534	0.201	0.36	0.13	0.447	0.166	17.1	6.45	4.04	1.46	10.6	3.95	41	15.5	26.9	9.72	34	12.6
SS9	0-1.7	27-Apr-06	0.617	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS9	1.7-3.2	27-Apr-06	0.61	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS9	3.2-3.7	27-Apr-06	0.507	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS10	0-1.5	27-Apr-06	0.596	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS10	1.5-2.5	27-Apr-06	0.378	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS10	0-2	26-Feb-10	0.672	0.698	8.03	2.63	6.52	1.97	7.28	2.3	843	277	997	301	920	289	0.519	0.17	0.311	0.094	0.415	0.132	14.7	4.82	4.64	1.4	9.67	3.11	28.3	9.28	23.3	7.04	25.8	8.16
SS10	2-4	26-Feb-10	0.606	0.623	7.29	2.87	6.66	2.51	6.97	2.69	907	357	1010	381	959	369	*<0.498*	*ND*	0.318	0.12	0.318	0.12	15.1	5.95	4.69	1.77	9.9	3.86	30.6	12.1	24.3	9.15	27.4	10.6
SS11	0-2.5	27-Apr-06	0.292	-	5.28	3.74	-	-	5.28	3.74	2750	1950	-	-	2750	1950	-	-	-	-	-	-	25.1	17.8	-	-	25.1	17.8	63.6	45	-	-	63.6	45

Table E-1
Sediment Data

East White Lake Field
Vermilion Parish, Louisiana

			Moisture Content		Arsenic				As Average		Barium				Ba Average		Cadmium				Cd Average		Chromium				Cr Average		Lead				Lead Average	
					ICON		Pisani				ICON		Pisani				ICON		Pisani				ICON		Pisani				ICON		Pisani			
Boring ID	Core Interval (ft bgs)	Date	ICON	MPA	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet
SS11	2.5-3.4	27-Apr-06	0.446	-	8.71	4.83	-	-	8.71	4.83	2170	1200	-	-	2170	1200	-	-	-	-	-	-	18.3	10.1	-	-	18.3	10.1	35.4	19.6	-	-	35.4	19.6
SS11	3.4-3.7	27-Apr-06	0.46	-	5.73	3.09	-	-	5.73	3.09	358	193	-	-	358	193	-	-	-	-	-	-	16.6	8.96	-	-	16.6	8.96	17.6	9.5	-	-	17.6	9.5
SS12	0-3.7	27-Apr-06	0.458	-	6.17	3.34	-	-	6.17	3.34	2030	1100	-	-	2030	1100	-	-	-	-	-	-	12.7	6.88	-	-	12.7	6.88	49.9	27	-	-	49.9	27
SS13	0-1	28-Apr-06	0.658	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS13	1-2.75	28-Apr-06	0.611	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS13	2.75-3.2	28-Apr-06	0.78	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS14	0-0.8	28-Apr-06	0.439	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS14	0.8-1.7	28-Apr-06	0.774	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS15	0-3	28-Apr-06	0.643	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS15	3-3.25	28-Apr-06	0.498	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB1	0-3	13-Nov-06	0.819	-	7.66	1.39	-	-	7.66	1.39	257	46.5	-	-	257	46.5	0.406	0.0735	-	-	0.406	0.0735	12.9	2.33	-	-	12.9	2.33	17.8	3.22	-	-	17.8	3.22
AB1	3-6	13-Nov-06	0.697	-	6.04	1.83	-	-	6.04	1.83	119	36.1	-	-	119	36.1	0.242	0.0733	-	-	0.242	0.0733	12.5	3.79	-	-	12.5	3.79	13.4	4.06	-	-	13.4	4.06
AB1	6-8	30-Oct-06	0.501	-	4.91	2.45	-	-	4.91	2.45	78.4	39.1	-	-	78.4	39.1	0.193	0.0963	-	-	0.193	0.0963	-	-	-	-	-	-	15.3	7.63	-	-	15.3	7.63
AB1	12-14	30-Oct-06	0.379	-	4.38	2.72	-	-	4.38	2.72	184	114	-	-	184	114	0.126	0.0784	-	-	0.126	0.0784	-	-	-	-	-	-	16	9.95	-	-	16	9.95
AB2	0-3	13-Nov-06	0.856	-	7.64	1.1	-	-	7.64	1.1	247	35.6	-	-	247	35.6	0.316	0.0455	-	-	0.316	0.0455	12.4	1.79	-	-	12.4	1.79	15.7	2.26	-	-	15.7	2.26
AB2	3-6	13-Nov-06	0.777	-	9.12	2.03	-	-	9.12	2.03	160	35.7	-	-	160	35.7	0.277	0.0618	-	-	0.277	0.0618	12.2	2.72	-	-	12.2	2.72	14	3.12	-	-	14	3.12
AB2	4-6	31-Oct-06	0.45	-	6.35	3.49	-	-	6.35	3.49	67.2	37	-	-	67.2	37	0.112	0.0616	-	-	0.112	0.0616	-	-	-	-	-	-	12.9	7.1	-	-	12.9	7.1
AB2	10-12	31-Oct-06	0.402	-	8.5	5.08	-	-	8.5	5.08	125	74.8	-	-	125	74.8	0.176	0.105	-	-	0.176	0.105	-	-	-	-	-	-	14.1	8.43	-	-	14.1	8.43
AB3	0-3	13-Nov-06	0.828	-	6.5	1.12	-	-	6.5	1.12	279	48	-	-	279	48	0.312	0.0537	-	-	0.312	0.0537	14.5	2.49	-	-	14.5	2.49	21	3.61	-	-	21	3.61
AB3	3-6	13-Nov-06	0.622	-	6.74	2.55	-	-	6.74	2.55	122	46.2	-	-	122	46.2	0.259	0.0982	-	-	0.259	0.0982	13.3	5.04	-	-	13.3	5.04	15.3	5.8	-	-	15.3	5.8
AB3	4-6	1-Nov-06	0.48	-	6.06	3.15	-	-	6.06	3.15	83.4	43.4	-	-	83.4	43.4	0.147	0.0764	-	-	0.147	0.0764	-	-	-	-	-	-	12.4	6.45	-	-	12.4	6.45
AB3	8-10	1-Nov-06	0.526	-	5.74	2.72	-	-	5.74	2.72	93.3	44.2	-	-	93.3	44.2	0.19	0.0901	-	-	0.19	0.0901	-	-	-	-	-	-	13.1	6.21	-	-	13.1	6.21
AB4	0-3	13-Nov-06	0.861	-	10	1.39	-	-	10	1.39	22.7	3.16	-	-	22.7	3.16	0.356	0.0495	-	-	0.356	0.0495	9.02	1.25	-	-	9.02	1.25	12.6	1.75	-	-	12.6	1.75
AB4	3-6	13-Nov-06	0.589	-	5.79	2.38	-	-	5.79	2.38	78.7	32.3	-	-	78.7	32.3	0.191	0.0785	-	-	0.191	0.0785	14.3	5.88	-	-	14.3	5.88	16.3	6.7	-	-	16.3	6.7
AB4	4-6	1-Nov-06	0.674	-	3.99	1.3	-	-	3.99	1.3	80.2	26.1	-	-	80.2	26.1	0.124	0.0404	-	-	0.124	0.0404	-	-	-	-	-	-	12.7	4.14	-	-	12.7	4.14
AB4	10-12	1-Nov-06	0.689	-	2.97	0.924	-	-	2.97	0.924	120	37.3	-	-	120	37.3	0.176	0.0547	-	-	0.176	0.0547	-	-	-	-	-	-	9.07	2.82	-	-	9.07	2.82
AB5	0-6	13-Nov-06	0.698	-	6.03	1.82	-	-	6.03	1.82	253	76.2	-	-	253	76.2	0.228	0.0686	-	-	0.228	0.0686	7.84	2.36	-	-	7.84	2.36	8.46	2.55	-	-	8.46	2.55
AB5	4-6	2-Nov-06	0.64	-	5.61	2.02	-	-	5.61	2.02	198	71.3	-	-	198	71.3	0.185	0.0666	-	-	0.185	0.0666	-	-	-	-	-	-	10.2	3.67	-	-	10.2	3.67
AB5	10-12	2-Nov-06	0.361	-	5.85	3.74	-	-	5.85	3.74	155	99	-	-	155	99	0.165	0.105	-	-	0.165	0.105	-	-	-	-	-	-	12.4	7.92	-	-	12.4	7.92
AB5	14-16	2-Nov-06	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB5	18-20	2-Nov-06	0.197	-	4.27	3.43	-	-	4.27	3.43	132	106	-	-	132	106	*<0.0991*	*ND*	-	-	*ND*	*ND*	-	-	-	-	-	-	15.1	12.1	-	-	15.1	12.1
AB6	8-10	3-Nov-06	0.352	-	12.6	8.16	-	-	12.6	8.16	132	85.5	-	-	132	85.5	0.199	0.129	-	-	0.199	0.129	-	-	-	-	-	-	16.3	10.6	-	-	16.3	10.6
AB6	12-14	3-Nov-06	0.212	-	9.9	7.8	-	-	9.9	7.8	205	162	-	-	205	162	0.211	0.166	-	-	0.211	0.166	-	-	-	-	-	-	11.6	9.14	-	-	11.6	9.14
AB7	6-8	3-Nov-06	0.675	-	6.34	2.06	-	-	6.34	2.06	200	65	-	-	200	65	0.16	0.052	-	-	0.16	0.052	-	-	-	-	-	-	12.3	4	-	-	12.3	4
AB7	10-12	3-Nov-06	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB8	6-8	6-Nov-06	0.762	-	11.6	2.76	-	-	11.6	2.76	301	71.6	-	-	301	71.6	0.271	0.0645	-	-	0.271	0.0645	10.9	2.59	-	-	10.9	2.59	14.1	3.36	-	-	14.1	3.36
AB8	10-12	6-Nov-06	0.498	-	10.7	5.37	-	-	10.7	5.37	150	75.3	-	-	150	75.3	0.185	0.0929	-	-	0.185	0.0929	8.58	4.31	-	-	8.58	4.31	13	6.53	-	-	13	6.53
AB8	14-16	6-Nov-06	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB9	6-8	6-Nov-06	0.643	-	8.41	3	-	-	8.41	3	342	122	-	-	342	122	0.267	0.0953	-	-	0.267	0.0953	13.7	4.89	-	-	13.7	4.89	21	7.5	-	-	21	7.5
AB9	12-14	6-Nov-06	0.344	-	6.27	4.11	-	-	6.27	4.11	120	78.7	-	-	120	78.7	0.132	0.0866	-	-	0.132	0.0866	8.41	5.52	-	-	8.41	5.52	14.6	9.58	-	-	14.6	9.58
AB9	18-20	6-Nov-06	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB10	4-6	6-Nov-06	0.537	-	3.69	1.71	-	-	3.69	1.71	88.6	41	-	-	88.6	41	*<0.10*	*ND*	-	-	*ND*	*ND*	13.4	6.2	-	-	13.4	6.2	18.4	8.52	-	-	18.4	8.52
AB10	12-14	6-Nov-06	0.341	-	3.96	2.61	-	-	3.96	2.61	75.6	49.8	-	-	75.6	49.8	*<0.0993*	*ND*	-	-	*ND*	*ND*	6.79	4.47	-	-	6.79	4.47	10.1	6.66	-	-	10.1	6.66
AB10	14-16	6-Nov-06	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB11	4-6	6-Nov-06	0.749	-	6.25	1.57	-	-	6.25	1.57	437	110	-	-	437	110	0.158	0.0397	-	-	0.158	0.0397	14.5	3.64	-	-	14.5	3.64	20.3	5.1	-	-	20.3	5.1
AB11	6-8	6-Nov-06	0.531	-	4.97	2.33	-	-	4.97	2.33	92.7	43.5	-	-	92.7	43.5	0.151	0.0708	-	-	0.151	0.0708	13.1	6.14	-	-	13.1	6.14	15.7	7.36	-	-	15.7	7.36
AB11	16-18	6-Nov-06	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB12	6-8	7-Nov-06	0.54	-	5.07	2.33	-	-	5.07	2.33	148	67.9	-	-	148	67.9	*<0.0995*	*ND*	-	-	*ND*	*ND*	14.3	6.56	-	-	14.3	6.56	15.3	7.02	-	-	15.3	7.02
AB12	12-14	7-Nov-06	0.519	-	5.05	2.43	-	-	5.05	2.43	169	81.5	-	-	169	81.5	0.156	0.0752	-	-	0.156	0.0752	7.46	3.6	-	-	7.46	3.6	12.1	5.83	-	-	12.1	5.83
AB13	0-3	13-Nov-06	0.86	-	12.9	1.81	-	-	12.9	1.81	551	77.1	-	-	551	77.1	0.447	0.0626	-	-	0.447	0.0626	7.73	1.08	-	-	7.73	1.08	8.11	1.14	-	-	8.11	1.14
AB13	3-6	13-Nov-06	0.58	-	5.48	2.3	-	-	5.48	2.3	208	87.4	-	-	208	87.4	0.265	0.111	-	-	0.265	0.111	12.2	5.12	-	-	12.2	5.12	13.3	5.59	-	-	13.3	5.59
AB13	4-6	7-Nov-06	0.75	-	6.35	1.59	-	-	6.35	1.59	422	106	-	-	422	106	0.15	0.0375	-	-	0.15	0.0375	16.8	4.2	-	-	16.8	4.2	21.9	5.48	-	-	21.9	5.48
AB13	8-10	7-Nov-06	0.559	-	10.5	4.63	-	-	10.5	4.63	148	65.3	-	-	148	65.3	0.203	0.0895	-	-	0.203	0.0895	14.1	6.22	-	-	14.1	6.22	17.7	7.81	-	-	17.7	7.81
AB13	10-12	7-Nov-06	0.59	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB14	0-3	13-Nov-06	0.628	-	5.51	2.05	-	-	5.51	2.05	200	74.4	-	-	200	74.4	0.219	0.0815	-	-	0.219	0.0815	12.8	4.76	-	-	12.8	4.76	14.4	5.36	-	-	14.4	5.36
AB14	3-6	13-Nov-06	0.694	-	7.23	2.21	-	-	7.23	2.21	551	168	-	-	551	168	0.366	0.112	-	-	0.366	0.112	19.1	5.83	-	-	19.1	5.83	23.5	7.17	-	-	23.5	7.17
AB14	4-6	7-Nov-06	0.745	-	7.68	1.96	-	-	7.68	1.96	480	122	-	-	480	122	0.246	0.0627	-	-	0.246	0.0627	14.2	3.62	-	-	14.2	3.62	20.3	5.18	-	-	20.3	5.18
AB14	8-10	7-Nov-06	0.485	-	5.24	2.7	-	-	5.24	2.7	178	91.8	-	-	178	91.8	*<0.0998*	*ND*	-	-	*ND*	*ND*	11.3	5.83	-	-	11.3	5.83	13.1	6.76	-	-	13.1	6.76
AB15	0-6	13-Nov-06	0.787	-	8.15	1.74	-	-	8.15	1.74	362	77.1	-	-	362	77.1	0.278	0.0592	-	-	0.278	0.0592	11	2.34	-	-	11	2.34	12.6	2.68	-	-	12.6	2.68
AB15	4-6	7-Nov-06	0.764	-	7.95	1.88	-	-	7.95	1.88	522	123	-	-	522	123	0.233	0.055	-	-	0.233	0.055	14.8	3.49	-	-	14.8	3.49	18.1	4.27	-	-	18.1	4.27
AB15	12-14	7-Nov-06	0.232	-	7.82	6.01	-	-	7.82	6.01	101	77.6	-	-	101	77.6	0.148	0.114	-	-	0.148	0.114	9.2	7.07	-	-	9.2	7.07	11.4	8.76	-	-	11.4	8.76
AB16	4-6	7-Nov-06	0.664	-	7.98	2.68	-	-	7.98	2.68	563	189	-	-	563	189	0.267	0.0897	-	-	0.267	0.0897	14.7	4.94	-	-	14.7	4.94	20.6	6.92	-	-	20.6	6.92
AB16	8-10	7-Nov-06	0.593	-	4.66	1.9	-	-	4.66	1.9	193	78.6	-	-	193	78.6	*<0.0992*	*ND*	-	-	*ND*	*ND*	12.2	4.97	-	-	12.2	4.97	15	6.11	-	-	15	6.11
AB16	10-12	7-Nov-06	0.695	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB16	12-14	7-Nov-06	0.254	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB18	4-6	8-Nov-06	0.802	-	8.04	1.59	-	-	8.04	1.59	375	74.3	-	-	375	74.3	0.228	0.0451	-	-	0.228	0.0451	13.9	2.75	-	-	13.9	2.75	17.7	3.5	-	-	17.7	3.5
AB18	10-12	8-Nov-06	0.356	-	26.6	17.1	-	-	26.6	17.1	254	164	-	-	254	164	0.415	0.267	-	-	0.415	0.267	8.64	5.56	-	-	8.64	5.56	14.9	9.6	-	-	14.9	9.6
AB18	12-14	8-Nov-06	0.208	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB19	4-6	8-Nov-06	0.702	-	5.97	1.78	-	-	5.97	1.78	211	62.9	-	-	211	62.9	0.107	0.0319	-	-	0.107	0.0319	12.1	3.61	-	-	12.1	3.61	13.8	4.11	-	-	13.8	4.11
AB19	8-10	8-Nov-06	0.409	-	5.18	3.06	-	-	5.18	3.06	280	165	-	-	280	165	*<0.0992*	*ND*	-	-	*ND*	*ND*	9.47	5.6	-	-	9.47	5.6	14.2	8.39	-	-	14.2	8.39
AB19	12-14	8-Nov-06	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB20	6-8	8-Nov-06	0.612	-	4.98	1.93	-	-	4.98	1.93	138	53.4	-	-	138	53.4	0.117	0.0453	-	-	0.117	0.0453	11.7	4.53	-	-	11.7	4.53	13.8	5.34	-	-	13.8	5.34
AB20	10-12	8-Nov-06	0.544	-	7.88	3.59	-	-	7.88	3.59	143	65.2	-	-	143	65.2	0.206	0.0939	-	-	0.206	0.0939	11.9	5.43	-	-	11.9	5.43	15.4	7.02	-	-	15.4	7.02
AB20	14-16	8-Nov-06	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB20	16-18	8-Nov-06	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB21	4-6	8-Nov-06	0.861	-	8.4	1.17	-	-	8.4	1.17	232	32.2	-	-	232	32.2	0.2	0.0278	-	-	0.2	0.0278	10.7	1.49	-	-	10.7	1.49	13.3	1.85	-	-	13.3	1.85
AB21	6-8	8-Nov-06	0.596	-	4.73	1.91	-	-	4.73	1.91	134	54.1	-	-	134	54.1	*<0.0992*	*ND*	-	-	*ND*	*ND*	12.2	4.93	-	-	12.2	4.93	13.3	5.37	-	-	13.3	5.37

Table E-1
Sediment Data

East White Lake Field
Vermilion Parish, Louisiana

			Moisture Content		Arsenic				As Average		Barium				Ba Average		Cadmium				Cd Average		Chromium				Cr Average		Lead				Lead Average	
					ICON		Pisani				ICON		Pisani				ICON		Pisani				ICON		Pisani				ICON		Pisani			
Boring ID	Core Interval (ft bgs)	Date	ICON	MPA	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet
AB21	8-10	8-Nov-06	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB21	12-14	8-Nov-06	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB22	4-6	8-Nov-06	0.774	-	6.73	1.52	-	-	6.73	1.52	244	55.1	-	-	244	55.1	0.188	0.0425	-	-	0.188	0.0425	12.5	2.83	-	-	12.5	2.83	14.8	3.34	-	-	14.8	3.34
AB22	6-8	8-Nov-06	0.668	-	3.64	1.21	-	-	3.64	1.21	141	47	-	-	141	47	0.117	0.039	-	-	0.117	0.039	11.3	3.76	-	-	11.3	3.76	12.6	4.2	-	-	12.6	4.2
AB22	12-14	8-Nov-06	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB22	16-18	8-Nov-06	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED4	0-2	25-Feb-10	0.614	0.406	5.42	2.09	1.58	0.94	3.5	1.52	662	256	342	203	502	229	0.594	0.229	ND	ND	0.594	0.229	16.4	6.33	5.27	3.13	10.8	4.73	22.4	8.65	11.9	7.07	17.2	7.86
SED5	0-2	25-Feb-10	0.576	0.5	4.75	2.01	6.18	3.09	5.47	2.55	216	91.6	123	61.4	169	76.5	<0.496	ND	ND	ND	ND	ND	15.3	6.49	ND	ND	15.3	6.49	15.4	6.53	14.9	7.43	15.1	6.98
SED6	0-2	25-Feb-10	0.648	0.51	8.06	2.84	3.31	1.62	5.68	2.23	522	184	227	111	374	147	1.21	0.426	2.1	1.03	1.66	0.728	24.1	8.48	3.57	1.75	13.8	5.12	55.2	19.4	18.7	9.18	37	14.3
SED7	0-2	25-Feb-10	0.696	0.686	3.93	1.19	3.47	1.09	3.7	1.14	686	209	726	228	706	218	<0.496	ND	0.0955	0.03	0.0955	0.03	19	5.78	6.91	2.17	13	3.97	19.9	6.05	21	6.59	20.4	6.32
SED7	2-4	25-Feb-10	0.619	0.601	4.72	1.8	5.36	2.14	5.04	1.97	1010	385	1250	497	1130	441	<0.498	ND	0.0977	0.039	0.0977	0.039	19.2	7.32	6.54	2.61	12.9	4.96	21.6	8.23	24.1	9.61	22.8	8.92
SED7	4-6	25-Feb-10	0.695	0.716	5.45	1.66	4.08	1.16	4.77	1.41	847	258	880	250	864	254	<0.497	ND	ND	ND	ND	ND	16.9	5.15	5.77	1.64	11.3	3.4	19.3	5.89	24.1	6.84	21.7	6.36
SED8	0-2	25-Feb-10	0.694	0.679	4	1.22	4.42	1.42	4.21	1.32	587	180	741	238	664	209	<0.497	ND	ND	ND	ND	ND	18	5.51	4.67	1.5	11.3	3.5	20.1	6.15	22.8	7.31	21.4	6.73
SED8	2-4	25-Feb-10	0.632	0.631	5.37	1.98	3.96	1.46	4.66	1.72	883	325	724	267	803	296	<0.496	ND	ND	ND	ND	ND	18.1	6.66	4.77	1.76	11.4	4.21	21.2	7.8	21.1	7.8	21.2	7.8
SED9	0-2	25-Feb-10	0.66	0.648	5.11	1.74	3.92	1.38	4.52	1.56	493	168	457	161	475	164	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED9	2-4	25-Feb-10	0.63	0.597	6.4	2.37	4.81	1.94	5.61	2.15	687	254	556	224	621	239	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED10	0-2	25-Feb-10	0.654	0.618	5.2	1.8	4.37	1.67	4.79	1.73	769	266	691	264	730	265	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED10	2-4	25-Feb-10	0.62	0.612	5.62	2.14	5.39	2.09	5.5	2.11	999	380	603	234	801	307	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED11	0-2	25-Feb-10	0.649	0.659	6.5	2.28	7.68	2.62	7.09	2.45	1260	442	2020	689	1640	566	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED11	2-4	25-Feb-10	0.632	0.632	6.54	2.41	7.96	2.93	7.25	2.67	1130	416	1350	498	1240	457	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED12	0-2	25-Feb-10	0.699	0.679	3.8	1.14	3.43	1.1	3.61	1.12	933	281	1020	326	974	303	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED12	2-4	25-Feb-10	0.668	0.716	5.93	1.97	6.97	1.98	6.45	1.97	1500	498	2000	567	1750	533	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED12	4-6	25-Feb-10	0.641	0.672	4.78	1.72	3.84	1.26	4.31	1.49	1360	488	1450	477	1410	483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED13	0-2	26-Feb-10	0.749	0.734	4.32	1.08	4.47	1.19	4.4	1.14	773	194	632	168	702	181	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED13	2-4	26-Feb-10	0.672	0.666	3.47	1.14	4.25	1.42	3.86	1.28	682	224	1140	382	913	303	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED14	0-2	26-Feb-10	0.707	0.719	3.33	0.976	3.56	1	3.44	0.988	1180	346	1020	287	1100	316	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED14	2-4	26-Feb-10	0.657	0.638	5.74	1.97	4.01	1.45	4.87	1.71	1540	528	1240	448	1390	488	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED16	0-2	26-Feb-10	0.786	0.815	5.09	1.09	5.24	0.97	5.17	1.03	270	57.8	324	60	297	58.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED17	0-2	26-Feb-10	0.68	0.697	3.31	1.06	4.42	1.34	3.87	1.2	1720	550	1730	524	1720	537	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED17	2-4	26-Feb-10	0.649	0.64	4.93	1.73	5.28	1.9	5.1	1.82	1990	698	2330	838	2160	768	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED18	0-2	26-Feb-10	0.745	0.741	5.48	1.4	6.91	1.79	6.2	1.59	1430	365	2140	554	1780	459	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED18	2-4	26-Feb-10	0.722	0.59	5	1.39	3.49	1.43	4.24	1.41	1380	384	1490	611	1440	497	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED19	0-2	26-Feb-10	0.688	0.646	4.74	1.48	4.89	1.73	4.81	1.6	2610	814	4890	1730	3750	1270	-	-	ND	ND	ND	ND	-	-	17.6	6.22	17.6	6.22	-	-	37.6	13.3	37.6	13.3
SED19	2-4	26-Feb-10	0.594	0.596	6.31	2.56	4.46	1.8	5.38	2.18	1180	479	2130	860	1650	670	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED20	0-2	26-Feb-10	0.672	0.694	5.11	1.68	4.77	1.46	4.94	1.57	686	225	804	246	745	236	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED20	2-4	26-Feb-10	0.635	0.648	5.96	2.18	5.48	1.93	5.72	2.05	846	309	807	284	826	296	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED21	0-2	26-Feb-10	0.698	0.683	3.61	1.09	3.47	1.1	3.54	1.1	578	175	486	154	532	164	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED21	2-4	26-Feb-10	0.594	0.641	4.63	1.88	4.62	1.66	4.63	1.77	1040	422	933	335	987	379	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED21	4-6	26-Feb-10	0.604	0.605	6.26	2.48	5.77	2.28	6.02	2.38	1040	412	1110	437	1070	424	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED21	6-8	26-Feb-10	0.592	0.574	5.24	2.14	3.52	1.5	4.38	1.82	1160	473	1090	465	1130	469	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED22	0-2	26-Feb-10	0.683	0.688	3.14	0.995	4.58	1.43	3.86	1.21	639	203	824	257	731	230	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED22	2-4	26-Feb-10	0.64	0.624	6.66	2.4	5.77	2.17	6.22	2.28	649	234	585	220	617	227	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED23	0-2	2-Mar-10	0.679	0.646	6.73	2.16	3.76	1.33	5.24	1.75	888	285	1230	437	1060	361	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED23	2-4	2-Mar-10	0.695	0.685	5.67	1.73	3.52	1.11	4.6	1.42	951	290	1360	429	1160	360	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED24	0-2	2-Mar-10	0.582	0.652	4.97	2.08	4.14	1.44	4.55	1.76	706	295	885	308	796	302	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED24	2-4	2-Mar-10	0.62	0.674	-	-	4.6	1.5	4.6	1.5	-	-	589	192	589	192	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED25	0-2	2-Mar-10	0.666	0.666	5.95	1.99	4.13	1.38	5.04	1.68	1070	357	1450	484	1260	421	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED25	2-4	2-Mar-10	0.699	0.677	4.66	1.4	3.68	1.19	4.17	1.3	1300	391	1790	579	1550	485	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED26	0-2	2-Mar-10	0.616	0.653	4.77	1.83	4.27	1.48	4.52	1.66	791	304	1090	377	939	340	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED26	2-4	2-Mar-10	0.78	0.773	6.51	1.11	5.29	1.2	5.9	1.15	810	138	978	222	894	180	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED27	0-2	2-Mar-10	0.729	0.721	4.95	1.34	3.3	0.92	4.12	1.13	548	149	584	163	566	156	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED27	2-4	2-Mar-10	0.682	0.697	4.97	1.58	4.13	1.25	4.55	1.42	855	272	1090	330	972	301	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED28	0-2	2-Mar-10	0.767	0.786	5.04	1.17	3.27	0.7	4.16	0.937	495	115	486	104	490	110	<0.498	ND	0.224	0.048	0.224	0.048	17.5	4.08	6.54	1.4	12	2.74	17.9	4.17	19.4	4.16	18.7	4.17
SED28	2-4	2-Mar-10	0.843	0.851	6.23	0.978	3.15	0.47	4.69	0.724	332	52.1	378	56.3	355	54.2	<0.496	ND	ND	ND	ND	ND	9.39	1.47	2.08	0.31	5.74	0.892	8.36	1.31	8.99	1.34	8.68	1.33
SED29	0-2	2-Mar-10	0.834	0.792	4.47	0.742	ND	ND	4.47	0.742	539	89.5	659	137	599	113	<0.496	ND	0.111	0.023	0.111	0.023	16.9	2.81	13.7	2.85	15.3	2.83	16.3	2.71	20.2	4.2	18.2	3.45
SED29	2-4	2-Mar-10	0.827	0.816	6.86	1.19	3.8	0.7	5.33	0.943	486	84.1	761	140	623	112	<0.496	ND	0.0457	0.0084	0.0457	0.0084	19.3	3.34	7.88	1.45	13.6	2.39	11.4	1.97	15.2	2.79	13.3	2.38
SED30	0-2	2-Mar-10	0.811	0.861	4.97	0.939	3.6	0.5	4.28	0.72	493	93.2	856	119	675	106	<0.496	ND	0.273	0.038	0.273	0.038	17	3.21	26.8	3.72	21.9	3.47	16.6	3.14	32.4	4.5	24.5	3.82
SED30	2-4	2-Mar-10	0.824	0.844	5.75	1.01	4.55	0.71	5.15	0.861	457	80.4	539	84.1	498	82.3	<0.497	ND	0.0641	0.01	0.0641	0.01	12.2	2.15	6.73	1.05	9.47	1.6	11.1	1.95	12.6	1.97	11.9	1.96
SED31	0-2	1-Mar-10	0.701	0.706	3.13	0.936	1.16	0.34	2.14	0.638	585	175	544	160	565	167	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED31	2-4	1-Mar-10	0.849	0.798	7.76	1.17	3.81	0.77	5.79	0.971	334	50.4	395	79.8	365	65.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED31	4-6	2-Mar-10	0.681	0.694	4.38	1.4	1.63	0.5	3.01	0.949	168	53.6	168	51.3	168	52.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED32	0-2	1-Mar-10	0.723	0.719	4.47	1.24	2.21	0.62	3.34	0.929	460	127	473	133	467	130	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED32	2-4	1-Mar-10	0.839	0.853	7.84	1.26	5.03	0.74	6.44	1	348	56	431	63.3	389	59.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED32	4-6	2-Mar-10	0.809	0.841	6.79	1.3	3.21	0.51	5	0.903	198	37.8	233	37.1	216	37.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED33	0-2	1-Mar-10	0.734	0.8	3.21	0.854	2.6	0.52	2.91	0.687	395	105	670	134	533	120	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED33	2-4	1-Mar-10	0.868	0.833	8.24	1.09	5.09	0.85	6.66	0.969	318	42	411	68.7	365	55.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED33	4-6	2-Mar-10	0.733	0.779	3.92	1.05	2.53	0.56	3.23	0.803	154	41.1	159	35.2	157	38.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPA-Sed 15-N	0-2	8-Jun-10	0.546 (a)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPA-Sed-15-W	0-2	8-Jun-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table E-1
Sediment Data

East White Lake Field
Vermilion Parish, Louisiana

			Moisture Content		Arsenic				As Average		Barium				Ba Average		Cadmium				Cd Average		Chromium				Cr Average		Lead				Lead Average	
					ICON		Pisani				ICON		Pisani				ICON		Pisani				ICON		Pisani				ICON		Pisani			
Boring ID	**Core Interval (ft bgs)**	**Date**	**ICON**	**MPA**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**
MPA-Sed-15-W-2	0-2	8-Jun-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPA-Sed-15-E	0-2	8-Jun-10	0.546 (a)		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPA-Sed-15-E-2	0-2	8-Jun-10	0.546 (a)		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPA-AB5 (A)	4-6	19-May-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPA-AB5 (B)	4-6	19-May-10	0.64 (a)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPA-AB5 (C)	4-6	19-May-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPA-AB-6	8-10	19-May-10	-	0.861	9.3	1.3	10.4	1.45	**9.85**	**1.37**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPA-AB8	6-8	19-May-10	-	0.772	5.28	1.2	7.5	1.71	**6.39**	**1.46**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPA-AB13	0-3	19-May-10	-	0.874	5.41	0.682	11.5	1.45	**8.46**	**1.07**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB-6	8-10	10-Aug-10	-	0.861 (a)	-	-	8.35	1.16	**8.35**	**1.16**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB-13	0-3	10-Aug-10	-	0.874 (a)	-	-	17.6	2.22	**17.6**	**2.22**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB-13 SO-E	0-3	10-Aug-10	-	0.874 (a)	-	-	10.6	1.33	**10.6**	**1.33**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB-14	0-3	10-Aug-10	-	0.628 (a)	-	-	6.29	2.34	**6.29**	**2.34**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB-8	6-8	10-Aug-10	-	0.772 (a)	-	-	7.98	1.82	**7.98**	**1.82**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB-8 SO-S	6-8	10-Aug-10	-	0.772 (a)	-	-	7.59	1.73	**7.59**	**1.73**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB-5 SO-NE	4-6	10-Aug-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB-5 SO-NW	4-6	10-Aug-10	0.64 (a)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB-5a	4-5.5	10-Aug-10	0.64 (a)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB-15	4-5.5	10-Aug-10	0.64 (a)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED-8	0-0.5	6-May-10	0.611	0.611	5.65	2.2	4.06	1.58	**4.86**	**1.89**	720	280	496	193	**608**	**237**	*<0.498*	*<0.19*	*<0.51*	*<0.2*	***ND***	***ND***	12.4	4.82	14.8	5.74	**13.6**	**5.28**	18.9	7.35	21.2	8.24	**20**	**7.8**
SED-9	0-0.5	5-May-10	0.71	0.696	3.36	0.974	6.61	2.01	**4.99**	**1.49**	455	132	671	204	**563**	**168**	*<0.498*	*<0.14*	*<0.66*	*<0.2*	***ND***	***ND***	13.8	4	13.9	4.24	**13.9**	**4.12**	19.6	5.68	20.4	6.19	**20**	**5.94**
SED-11	0-0.5	6-May-10	0.679	0.658	4.8	1.54	4.39	1.5	**4.59**	**1.52**	713	229	550	188	**631**	**208**	*<0.498*	*<0.16*	*<0.58*	*<0.2*	***ND***	***ND***	13.6	4.37	14.5	4.95	**14**	**4.66**	19.3	6.2	18.8	6.42	**19**	**6.31**
SED-13	0-0.5	6-May-10	0.756	0.725	3.11	0.759	5.02	1.38	**4.06**	**1.07**	586	143	909	250	**748**	**196**	*<0.499*	*<0.12*	*<0.73*	*<0.2*	***ND***	***ND***	15.7	3.83	18.5	5.09	**17.1**	**4.46**	18.1	4.42	22	6.06	**20.1**	**5.24**
SED-19	0-0.5	6-May-10	0.787	0.784	2.3	0.49	3.7	0.8	**3**	**0.645**	516	110	509	110	**513**	**110**	*<0.497*	*<0.11*	*<0.93*	*<0.2*	***ND***	***ND***	13.8	2.94	20.5	4.43	**17.2**	**3.68**	17	3.62	23.4	5.06	**20.2**	**4.34**
SED-24	0-0.5	5-May-10	0.689	0.666	3.15	0.98	10.5	3.5	**6.81**	**2.24**	434	135	1200	400	**816**	**267**	*<0.499*	*<0.16*	0.0257	0.0086	**0.0257**	**0.0086**	12.7	3.95	14.8	4.93	**13.7**	**4.44**	18	5.6	25.1	8.4	**21.6**	**7**
SED-26	0-0.5	5-May-10	0.705	0.686	3.28	0.968	5.13	1.61	**4.2**	**1.29**	406	120	538	169	**472**	**144**	*<0.497*	*<0.15*	*<0.64*	*<0.2*	***ND***	***ND***	11.6	3.42	17.2	5.39	**14.4**	**4.41**	16.7	4.93	23.1	7.24	**19.9**	**6.08**
SED-31	0-0.5	5-May-10	0.679	0.68	4.8	1.54	8.03	2.57	**6.42**	**2.06**	554	178	1100	351	**825**	**264**	*<0.497*	*<0.16*	0.0594	0.019	**0.0594**	**0.019**	12.9	4.14	17	5.44	**15**	**4.79**	18.5	5.94	24.8	7.92	**21.6**	**6.93**
SED-120 *	0-0.5	7-May-10	0.822	0.825	5.69	1.01	3.66	0.64	**4.67**	**0.826**	410	73	754	132	**582**	**102**	*<0.498*	*<0.0886*	0.217	0.038	**0.217**	**0.038**	9.14	1.63	35.8	6.27	**22.5**	**3.95**	8.16	1.45	34	5.95	**21.1**	**3.7**
Hg-MPA-01	0-0.5	6-Oct-10	-	0.649	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-01	0.5-2	6-Oct-10	-	0.626	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-01	5-7	6-Oct-10	-	0.536	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-02	0-0.5	6-Oct-10	-	0.727	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-02	0.5-2	6-Oct-10	-	0.638	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-02	5-7	6-Oct-10	-	0.554	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-03	0-0.5	6-Oct-10	-	0.671	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-03	0.5-2	6-Oct-10	-	0.594	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-03	4-6	6-Oct-10	-	0.569	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-04	0-0.5	6-Oct-10	-	0.678	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-04	0.5-2	6-Oct-10	-	0.481	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-04	3-5	6-Oct-10	-	0.537	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-05	0-0.5	6-Oct-10	-	0.724	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-05	0.5-2	6-Oct-10	-	0.63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-05	6-8	6-Oct-10	-	0.56	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-06	0-0.5	7-Oct-10	-	0.679	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-06	0.5-2	7-Oct-10	-	0.602	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-06	5-6	7-Oct-10	-	0.516	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-07	0-0.5	7-Oct-10	-	0.566	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-07	0.5-2	7-Oct-10	-	0.475	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-07	6.5-7	7-Oct-10	-	0.47	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-08	0-0.5	7-Oct-10	-	0.667	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-08	0.5-2	7-Oct-10	-	0.609	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-08	7.5-8	7-Oct-10	-	0.558	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-09	0-0.5	7-Oct-10	-	0.688	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-09	0.5-2	7-Oct-10	-	0.635	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-09	6-7	7-Oct-10	-	0.444	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-09dup	0.5-2	7-Oct-10	-	0.612	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-01	0-0.5	5-Oct-10	-	0.593	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-01	0.5-2	5-Oct-10	-	0.585	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-01	2-4.3	5-Oct-10	-	0.538	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-01	4.3-4.7	5-Oct-10	-	0.635	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-01	8-9	5-Oct-10	-	0.376	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-02	0-0.5	5-Oct-10	-	0.65	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-02	0.5-2	5-Oct-10	-	0.649	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-02	3-4	5-Oct-10	-	0.663	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-02	4-5	5-Oct-10	-	0.648	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-02a	3-5	6-Oct-10	-	0.718	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-02a	7-8	6-Oct-10	-	0.354	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-03	0-0.5	5-Oct-10	-	0.444	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-03	0.5-2	5-Oct-10	-	0.661	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-03	4-6	5-Oct-10	-	0.474	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-03	9-10	5-Oct-10	-	0.448	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-04	0-0.5	6-Oct-10	-	0.222	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table E-1
Sediment Data

East White Lake Field
Vermilion Parish, Louisiana

			Moisture Content		Arsenic				**As Average**		Barium				**Ba Average**		Cadmium				**Cd Average**		Chromium				**Cr Average**		Lead				**Lead Average**	
					ICON		Pisani				ICON		Pisani				ICON		Pisani				ICON		Pisani				ICON		Pisani			
Boring ID	**Core Interval (ft bgs)**	**Date**	**ICON**	**MPA**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**
SP-MPA-04	0.5-2	6-Oct-10	-	0.368	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-04	5-7	6-Oct-10	-	0.649	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-04	9-10	6-Oct-10	-	0.455	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-1	0-2	1/5/2015	0.436	0.463	3.41	1.92	4.26	2.29	3.84	2.11	319	180	251	135	285	158	0.58	0.327	0.577	0.31	0.579	0.319	14.9	8.4	15.1	8.1	15	8.25	12.5	7.05	12.6	6.74	12.6	6.9
WL-1	2-4	1/5/2015	0.488	0.516	5.21	2.67	6.49	3.14	5.85	2.91	106	54.3	99.6	48.2	103	51.3	<0.5	<0.256	<0.537	<0.26	ND	ND	14.4	7.37	15.6	7.57	15	7.47	14.4	7.37	14.6	7.07	14.5	7.22
WL-1	6-8	1/5/2015	0.755	-	5.89	1.44	-	-	5.89	1.44	181	44.3	-	-	181	44.3	<0.5	<0.123	-	-	ND	ND	10.2	2.5	-	-	10.2	2.5	9.72	2.38	-	-	9.72	2.38
WL-1	9-13	1/5/2015	0.526	0.563	4.03	1.91	4	1.75	4.02	1.83	89.9	42.6	107	46.9	98.5	44.8	<0.5	<0.237	<0.572	<0.25	ND	ND	15	7.11	12	5.25	13.5	6.18	14.8	7.02	11.1	4.86	13	5.94
WL-2	0-2	1/5/2015	0.38	0.374	<0.99	<0.614	0.911	0.57	0.911	0.57	180	112	224	140	202	126	<0.5	<0.31	<0.415	<0.26	ND	ND	12.6	7.81	12.4	7.77	12.5	7.79	15.9	9.86	11	6.89	13.5	8.38
WL-2	2-4	1/5/2015	0.455	0.543	1.59	0.867	2.8	1.28	2.2	1.07	92	50.1	105	48.2	98.5	49.2	<0.5	<0.273	<0.569	<0.26	ND	ND	13.9	7.58	16.4	7.49	15.2	7.54	14.6	7.96	15.8	7.22	15.2	7.59
WL-2	8-10	1/5/2015	0.496	0.508	6.01	3.03	7.28	3.58	6.65	3.31	87.4	44	82.3	40.5	84.9	42.3	<0.5	<0.252	<0.528	<0.26	ND	ND	15.3	7.71	16.3	8.02	15.8	7.87	15.3	7.71	16.2	7.97	15.8	7.84
WL-2	14-16	1/5/2015	0.288	0.291	4.13	2.94	4.96	3.52	4.55	3.23	160	114	144	102	152	108	<0.5	<0.356	<0.353	<0.25	ND	ND	10.6	7.55	10.2	7.24	10.4	7.4	10.5	7.48	11.9	8.46	11.2	7.97
WL-3	0-2	1/6/2015	0.363	0.245	4.11	2.62	1.07	0.81	2.59	1.72	351	224	234	177	293	201	2.7	1.72	3.54	2.67	3.12	2.2	20.6	13.1	8.99	6.79	14.8	9.95	99.9	63.6	150	113	125	88.3
WL-3	4-6/4-8	1/6/2015	0.659	0.701	4	1.36	4.85	1.45	4.43	1.41	161	54.9	178	53.1	170	54	<0.5	<0.171	<0.903	<0.27	ND	ND	10.2	3.48	10.3	3.07	10.3	3.28	15.4	5.25	13.5	4.05	14.5	4.65
WL-3	10-13	1/6/2015	0.489	0.497	3.5	1.79	4.12	2.07	3.81	1.93	91.7	46.9	95	47.8	93.4	47.4	<0.5	<0.256	<0.497	<0.25	ND	ND	13.5	6.9	14.4	7.25	14	7.08	13.8	7.05	14.5	7.3	14.2	7.18
WL-4	0-2	1/6/2015	0.542	0.532	3.15	1.44	4.25	1.99	3.7	1.72	492	225	658	308	575	267	<0.5	<0.249	<0.556	<0.26	ND	ND	12.4	5.68	13.6	6.35	13	6.02	20.3	9.3	20.7	9.7	20.5	9.5
WL-4	2-4	1/6/2015	0.503	0.5	5.12	2.54	4.48	2.24	4.8	2.39	1070	532	862	431	966	482	<0.5	<0.25	<0.5	<0.25	ND	ND	12.2	6.06	12.7	6.35	12.5	6.21	18	8.95	17.3	8.66	17.7	8.81
WL-4	4-11	1/6/2015	0.374	0.34	2.18	1.36	1.38	0.91	1.78	1.14	436	273	597	394	517	334	<0.5	<0.313	<0.409	<0.27	ND	ND	11	6.89	12.1	8	11.6	7.45	10.8	6.76	10.8	7.14	10.8	6.95
WL-4	11-12.5	1/6/2015	0.487	0.481	3.04	1.56	2.1	1.09	2.57	1.33	246	126	177	92.1	212	109	<0.5	<0.257	<0.482	<0.25	ND	ND	10.4	5.34	8.05	4.18	9.23	4.76	15.4	7.9	9.83	5.1	12.6	6.5
WL-5	0-2	1/6/2015	0.484	0.536	4.88	2.52	4.33	2.01	4.61	2.27	1070	552	1030	477	1050	515	0.57	0.294	<0.582	<0.27	0.57	0.294	13.3	6.86	11.5	5.32	12.4	6.09	20.9	10.8	18.2	8.45	19.6	9.63
WL-5	2-13	1/6/2015	0.311	0.291	1.31	0.903	1.96	1.39	1.64	1.15	328	226	357	253	343	240	<0.5	<0.345	0.381	0.27	0.381	0.27	11.3	7.79	13.2	9.33	12.3	8.56	14.9	10.3	14.5	10.3	14.7	10.3
WL-6	0-2	1/6/2015	0.492	0.51	4.29	2.18	5.69	2.79	4.99	2.49	641	326	761	373	701	350	<0.5	<0.254	<0.531	<0.26	ND	ND	11.5	5.84	12.3	6.02	11.9	5.93	15.3	7.77	18.2	8.93	16.8	8.35
WL-6	4-6	1/6/2015	0.711	0.75	5.07	1.47	5.56	1.39	5.32	1.43	226	65.3	238	59.6	232	62.5	<0.5	<0.145	<1	<0.25	ND	ND	7.93	2.29	5.36	1.34	6.65	1.82	7.64	2.21	4.72	1.18	6.18	1.7
WL-6	8-10	1/6/2015	0.551	0.515	4.8	2.16	2.91	1.41	3.86	1.79	115	51.6	99.2	48.1	107	49.9	<0.5	<0.225	<0.557	<0.27	ND	ND	11.5	5.16	11.9	5.79	11.7	5.48	11.1	4.98	10.5	5.07	10.8	5.03
WL-6	10-13	1/6/2015	0.75	0.675	5.06	1.27	7.69	2.5	6.38	1.89	223	55.8	172	55.8	198	55.8	<0.5	<0.125	<0.8	<0.26	ND	ND	8.77	2.19	12.1	3.92	10.4	3.06	8.09	2.02	9.26	3.01	8.68	2.52
WL-7	0-2	1/6/2015	-	0.235	-	-	3.49	2.67	3.49	2.67	-	-	136	104	136	104	-	-	<0.34	<0.26	ND	ND	-	-	8.29	6.34	8.29	6.34	-	-	8.88	6.79	8.88	6.79
WL-7	2-4	1/6/2015	-	0.244	-	-	2.35	1.78	2.35	1.78	-	-	114	86.2	114	86.2	-	-	<0.344	<0.26	ND	ND	-	-	9.93	7.51	9.93	7.51	-	-	6.22	4.7	6.22	4.7
WL-7	4-6	1/6/2015	-	0.738	-	-	8.63	2.26	8.63	2.26	-	-	412	108	412	108	-	-	<1.03	<0.27	ND	ND	-	-	22.3	5.85	22.3	5.85	-	-	12.4	3.24	12.4	3.24
WL-7	6-8	1/6/2015	-	0.615	-	-	5.92	2.28	5.92	2.28	-	-	262	101	262	101	-	-	<0.701	<0.27	ND	ND	-	-	8.88	3.42	8.88	3.42	-	-	7.64	2.94	7.64	2.94
WL-8	0-2	1/6/2015	-	0.296	-	-	6.14	4.32	6.14	4.32	-	-	163	115	163	115	-	-	<0.369	<0.26	ND	ND	-	-	10.2	7.15	10.2	7.15	-	-	12.4	8.72	12.4	8.72
WL-8	2-4	1/6/2015	-	0.242	-	-	3.26	2.47	3.26	2.47	-	-	127	96.3	127	96.3	-	-	<0.33	<0.25	ND	ND	-	-	9.43	7.15	9.43	7.15	-	-	7.64	5.79	7.64	5.79
WL-8	4-6	1/6/2015	-	0.383	-	-	4.47	2.76	4.47	2.76	-	-	190	117	190	117	-	-	<0.405	<0.25	ND	ND	-	-	10.7	6.61	10.7	6.61	-	-	11.5	7.08	11.5	7.08
WL-8	6-8	1/6/2015	-	0.627	-	-	3.7	1.38	3.7	1.38	-	-	303	113	303	113	-	-	<0.724	<0.27	ND	ND	-	-	8.71	3.25	8.71	3.25	-	-	16.3	6.08	16.3	6.08
SED-BK-01	0-0.5	10-May-10	0.723	0.683	4.99	1.38	1.04	0.33	3.02	0.855	897	248	155	49	526	149	<0.496	<0.137	<0.631	<0.2	ND	ND	12.6	3.49	11.5	3.66	12.1	3.58	<0.1	<0.0277	0.104	0.033	0.104	0.033
SED-BK-02	0-0.5	10-May-10	0.715	0.664	4.26	1.21	4.17	1.4	4.22	1.31	317	90.3	288	96.8	303	93.6	<0.495	<0.141	<0.595	<0.2	ND	ND	17.9	5.1	18.5	6.2	18.2	5.65	0.132	0.0376	0.0952	0.032	0.114	0.0348
SED-BK-03	0-0.5	10-May-10	0.722	0.712	2.83	0.787	4.51	1.3	3.67	1.04	319	88.7	347	100	333	94.4	<0.5	<0.139	0.0486	0.014	0.0486	0.014	17	4.73	22.3	6.41	19.7	5.57	<0.1	<0.0278	0.0799	0.023	0.0799	0.023
SED-BK-04	0-0.5	10-May-10	0.684	0.636	4.79	1.51	3.87	1.41	4.33	1.46	388	123	582	212	485	168	<0.497	<0.157	0.0989	0.036	0.0989	0.036	17.6	5.56	20.3	7.38	19	6.47	<0.1	<0.0316	0.0962	0.035	0.0962	0.035
SED-BK-05	0-0.5	11-May-10	0.779	0.675	6.32	1.4	2.37	0.77	4.35	1.09	388	85.7	388	126	388	106	<0.499	<0.11	<0.615	<0.2	ND	ND	8.21	1.81	7.85	2.55	8.03	2.18	<0.1	<0.0221	0.0769	0.025	0.0769	0.025
SED-BK-06	0-0.5	10-May-10	0.641	0.702	4.33	1.55	3.26	0.97	3.8	1.26	753	270	768	229	761	250	<0.497	<0.178	<0.671	<0.2	ND	ND	18.7	6.71	26.8	8	22.8	7.36	<0.1	<0.0359	0.094	0.028	0.094	0.028
SED-BK-07	0-0.5	11-May-10	0.796	0.771	2.16	0.441	3.93	0.9	3.05	0.671	397	81	463	106	430	93.5	<0.497	<0.101	<0.873	<0.2	ND	ND	18.6	3.79	23.1	5.28	20.9	4.54	0.185	0.0377	0.568	0.13	0.377	0.0839
SED-BK-08	0-0.5	11-May-10	0.71	0.758	5.98	1.73	4.71	1.14	5.35	1.44	313	90.8	383	92.6	348	91.7	<0.498	<0.144	<0.826	<0.2	ND	ND	17.3	5.02	24	5.82	20.7	5.42	<0.1	<0.029	0.14	0.034	0.14	0.034
SED-BK-09	0-0.5	11-May-10	0.755	0.758	9.45	2.32	8.47	2.05	8.96	2.19	231	56.6	264	63.8	248	60.2	<0.497	<0.122	<0.826	<0.2	ND	ND	11	2.7	11.4	2.77	11.2	2.74	<0.1	<0.0245	0.0826	0.02	0.0826	0.02
SED-BK-10	0-0.5	19-May-10	0.651	0.749	6.79	2.37	4.86	1.22	5.83	1.8	205	71.5	274	68.8	240	70.2	<0.499	<0.174	<0.797	<0.2	ND	ND	13.8	4.82	27.2	6.82	20.5	5.82	<0.1	<0.0349	<0.0398	<0.01	ND	ND
SED-BK-11	0-0.5	19-May-10	-	0.802	-	-	9.95	1.97	9.95	1.97	-	-	319	63.1	319	63.1	-	-	<1.01	<0.2	ND	ND	-	-	21.3	4.21	21.3	4.21	-	-	<0.0505	<0.01	ND	ND

Table E-1
Sediment Data

East White Lake Field
Vermilion Parish, Louisiana

		Mercury				Mercury Average		Selenium				Se Average		Strontium				St Average		Zinc				Zn Average		TPH-DRO				TPH-DRO Average		TPH-ORO				TPH-ORO Average		TPH-GRO	
		ICON		Pisani				ICON		Pisani				ICON		Pisani				ICON		Pisani				ICON		Pisani				ICON		Pisani				ICON	
Boring ID	**Core Interval (ft bgs)**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet
B2	2-4	-	-	-	-	-	-	<4.76	ND	-	-	ND	ND	234	53.1	-	-	234	53.1	-	-	-	-	-	-	1030	233	-	-	1030	233	841	191	-	-	841	191	-	-
B2	4-6	-	-	-	-	-	-	<4.6	ND	-	-	ND	ND	119	26.3	-	-	119	26.3	-	-	-	-	-	-	633	140	-	-	633	140	511	113	-	-	511	113	-	-
B2 Rerun	6-8	-	-	-	-	-	-	<8.31	ND	-	-	ND	ND	86.9	11.6	-	-	86.9	11.6	-	-	-	-	-	-	ND	<10	-	-	ND	ND	ND	<50	-	-	ND	ND	-	-
B2 Rerun	10-10.5	-	-	-	-	-	-	<1.64	ND	-	-	ND	ND	15.4	11.1	-	-	15.4	11.1	-	-	-	-	-	-	ND	<10	-	-	ND	ND	ND	<50	-	-	ND	ND	-	-
B3	4-7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B3 Rerun	9-12	-	-	-	-	-	-	<2.53	ND	-	-	ND	ND	34.9	16.5	-	-	34.9	16.5	-	-	-	-	-	-	ND	<10	-	-	ND	ND	ND	<50	-	-	ND	ND	-	-
B4 Rerun	0-1	-	-	-	-	-	-	<4.72	ND	-	-	ND	ND	59.3	12.8	-	-	59.3	12.8	-	-	-	-	-	-	2040	440	-	-	2040	440	1610	347	-	-	1610	347	-	-
B4 Rerun	3-5	-	-	-	-	-	-	<2.57	ND	-	-	ND	ND	40	19	-	-	40	19	-	-	-	-	-	-	ND	<10	-	-	ND	ND	ND	<50	-	-	ND	ND	-	-
B4	5-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	<10	-	-	ND	ND	ND	<50	-	-	ND	ND	-	-
B5	0-1.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	386	112	-	-	386	112	479	139	-	-	479	139	-	-
B5	4-5.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B5 Rerun	8-10	-	-	-	-	-	-	<2.86	ND	-	-	ND	ND	37.5	15.2	-	-	37.5	15.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B6	1.5-3	-	-	-	-	-	-	<3.07	ND	-	-	ND	ND	77.9	29.4	-	-	77.9	29.4	-	-	-	-	-	-	ND	<10	-	-	ND	ND	ND	<50	-	-	ND	ND	-	-
B6	3-10.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	<10	-	-	ND	ND	ND	<50	-	-	ND	ND	-	-
B7	4-5	-	-	-	-	-	-	<2.56	ND	-	-	ND	ND	69.9	30.8	-	-	69.9	30.8	-	-	-	-	-	-	ND	<10	-	-	ND	ND	ND	<50	-	-	ND	ND	-	-
B7	8-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	<10	-	-	ND	ND	ND	<50	-	-	ND	ND	-	-
B8 Rerun	5.5-7	-	-	-	-	-	-	<2.67	ND	-	-	ND	ND	57.3	25.1	-	-	57.3	25.1	-	-	-	-	-	-	ND	<10	-	-	ND	ND	ND	<50	-	-	ND	ND	-	-
B8	9.5-11.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	<10	-	-	ND	ND	ND	<50	-	-	ND	ND	-	-
B9 Rerun	0-0.5	-	-	-	-	-	-	<4.01	ND	-	-	ND	ND	64.1	16.4	-	-	64.1	16.4	-	-	-	-	-	-	51.6	13.2	-	-	51.6	13.2	ND	<50	-	-	ND	ND	-	-
B9	0.5-3.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	<10	-	-	ND	ND	ND	<50	-	-	ND	ND	-	-
B9 Rerun	8-9	-	-	-	-	-	-	<1.54	ND	-	-	ND	ND	23.4	15.3	-	-	23.4	15.3	-	-	-	-	-	-	ND	<10	-	-	ND	ND	ND	<50	-	-	ND	ND	-	-
B10	1.5-4	-	-	-	-	-	-	<2	<0.596	-	-	ND	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B10	4-7.5	-	-	-	-	-	-	<2.22	ND	-	-	ND	ND	43.8	23.4	-	-	43.8	23.4	-	-	-	-	-	-	ND	<10	-	-	ND	ND	ND	<50	-	-	ND	ND	-	-
B12	0-1.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	<10	-	-	ND	ND	ND	<50	-	-	ND	ND	-	-
B12 Rerun	3.5-5	-	-	-	-	-	-	<2.02	ND	-	-	ND	ND	49.3	24.8	-	-	49.3	24.8	-	-	-	-	-	-	ND	<10	-	-	ND	ND	ND	<50	-	-	ND	ND	-	-
B12	6.5-7.5	-	-	-	-	-	-	<1.37	ND	-	-	ND	ND	15.3	11.6	-	-	15.3	11.6	-	-	-	-	-	-	ND	<10	-	-	ND	ND	ND	<50	-	-	ND	ND	-	-
B13 Rerun	3-5	-	-	-	-	-	-	<2.44	ND	-	-	ND	ND	44	20.8	-	-	44	20.8	-	-	-	-	-	-	ND	<10	-	-	ND	ND	ND	<50	-	-	ND	ND	-	-
B13 Rerun	7.5-9.5	-	-	-	-	-	-	<1.64	ND	-	-	ND	ND	16.5	11.5	-	-	16.5	11.5	-	-	-	-	-	-	ND	<10	-	-	ND	ND	ND	<50	-	-	ND	ND	-	-
B14	0-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24.9	12.4	-	-	24.9	12.4	ND	<50	-	-	ND	ND	-	-
B14	4-8	-	-	-	-	-	-	<2.35	ND	-	-	ND	ND	44.5	22	-	-	44.5	22	-	-	-	-	-	-	ND	<10	-	-	ND	ND	ND	<50	-	-	ND	ND	-	-
B15 Rerun	4-6	-	-	-	-	-	-	<2.82	ND	-	-	ND	ND	67.8	28.4	-	-	67.8	28.4	-	-	-	-	-	-	ND	<10	-	-	ND	ND	ND	<50	-	-	ND	ND	-	-
B15	8-11.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	<10	-	-	ND	ND	ND	<50	-	-	ND	ND	-	-
B17	0-3	-	-	-	-	-	-	<1.99	<0.38	-	-	ND	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B17 Rerun	3-6	-	-	-	-	-	-	<2.31	ND	-	-	ND	ND	51.1	25.1	-	-	51.1	25.1	-	-	-	-	-	-	ND	<10	-	-	ND	ND	ND	<50	-	-	ND	ND	-	-
B17	8.5-10.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	<10	-	-	ND	ND	ND	<50	-	-	ND	ND	-	-
B17 Rerun	10.5-12	-	-	-	-	-	-	<1.45	ND	-	-	ND	ND	55.2	43.1	-	-	55.2	43.1	-	-	-	-	-	-	ND	<10	-	-	ND	ND	ND	<50	-	-	ND	ND	-	-
B18	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	<10	-	-	ND	ND	ND	<50	-	-	ND	ND	-	-
B18	4-5	-	-	-	-	-	-	<2.42	ND	-	-	ND	ND	53.1	22.7	-	-	53.1	22.7	-	-	-	-	-	-	ND	<10	-	-	ND	ND	ND	<50	-	-	ND	ND	-	-
B18	7.5-10	-	-	-	-	-	-	<2.1	ND	-	-	ND	ND	30.7	16.5	-	-	30.7	16.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B18	10-11.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	<10	-	-	ND	ND	ND	<50	-	-	ND	ND	-	-
B19	1-2.5	-	-	-	-	-	-	<1.99	<0.25	-	-	ND	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B19	2.5-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B19	4-6.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	<10	-	-	ND	ND	ND	<50	-	-	ND	ND	-	-
B19 Rerun	6.5-9.5	-	-	-	-	-	-	<2.26	ND	-	-	ND	ND	39.1	18.3	-	-	39.1	18.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B20	3-4.5	-	-	-	-	-	-	<2.73	ND	-	-	ND	ND	38.7	15.6	-	-	38.7	15.6	-	-	-	-	-	-	ND	<10	-	-	ND	ND	ND	<50	-	-	ND	ND	-	-
B20	7.5-10	-	-	-	-	-	-	<2.26	ND	-	-	ND	ND	43.5	19.7	-	-	43.5	19.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B21	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	<10	-	-	ND	ND	ND	<50	-	-	ND	ND	-	-
B21	2-4	-	-	-	-	-	-	<2.31	ND	-	-	ND	ND	47.7	22.4	-	-	47.7	22.4	-	-	-	-	-	-	ND	<10	-	-	ND	ND	ND	<50	-	-	ND	ND	-	-
SS1	0-2.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	110	41.1	-	-	110	41.1	<134	<50	-	-	ND	ND	-	-
SS1	2.1-2.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	46.4	16.8	-	-	46.4	16.8	<138	<50	-	-	ND	ND	-	-
SS2	0-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	230	107	-	-	230	107	169	78.6	-	-	169	78.6	-	-
SS2	1-1.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<47.4	<10	-	-	ND	ND	<237	<50	-	-	ND	ND	-	-
SS3	0-0.6	-	-	-	-	-	-	-	-	-	-	-	-	74.3	27.7	-	-	74.3	27.7	92.5	34.5	-	-	92.5	34.5	121	45.1	-	-	121	45.1	<134	<50	-	-	ND	ND	<134	<50
SS3	0.6-2.2	-	-	-	-	-	-	-	-	-	-	-	-	96.1	39.1	-	-	96.1	39.1	75.9	30.9	-	-	75.9	30.9	115	46.8	-	-	115	46.8	<123	<50	-	-	ND	ND	<123	<50
SS3	2.2-2.6	-	-	-	-	-	-	-	-	-	-	-	-	87.1	30	-	-	87.1	30	47.7	16.5	-	-	47.7	16.5	128	44.2	-	-	128	44.2	<145	<50	-	-	ND	ND	<145	<50
SS4	0-0.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<40	<10	-	-	ND	ND	<200	<50	-	-	ND	ND	-	-
SS4	0.6-2.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	52.6	16.4	-	-	52.6	16.4	<160	<50	-	-	ND	ND	-	-
SS4	2.7-3.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	72.3	12.2	-	-	72.3	12.2	<296	<50	-	-	ND	ND	-	-
SS5	0-2.15	-	-	-	-	-	-	-	-	-	-	-	-	140	59.5	-	-	140	59.5	174	74	-	-	174	74	185	78.6	-	-	185	78.6	<118	<50	-	-	ND	ND	<118	<50
SS6	0-1.65	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	89.2	26	-	-	89.2	26	<171	<50	-	-	ND	ND	-	-
SS6	1.65-2.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	54.3	11.7	-	-	54.3	11.7	<233	<50	-	-	ND	ND	-	-
SS7	0-1.4	-	-	-	-	-	-	-	-	-	-	-	-	231	65.4	-	-	231	65.4	111	31.4	-	-	111	31.4	386	109	-	-	386	109	553	156	-	-	553	156	<177	<50
SS7	1.4-2.5	-	-	-	-	-	-	-	-	-	-	-	-	337	129	-	-	337	129	98.1	37.6	-	-	98.1	37.6	1770	678	-	-	1770	678	496	190	-	-	496	190	<131	<50
SS7	2.5-3.5	-	-	-	-	-	-	-	-	-	-	-	-	130	43.8	-	-	130	43.8	63.1	21.3	-	-	63.1	21.3	33.7	11.4	-	-	33.7	11.4	<148	<50	-	-	ND	ND	<148	<50
SS8	0-1.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	124	53.7	-	-	124	53.7	<115	<50	-	-	ND	ND	-	-
SS8	1.9-2.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<21.3	<10	-	-	ND	ND	<107	<50	-	-	ND	ND	-	-
SS8	0-2	0.86	0.31	1.63	0.59	1.25	0.45	<2	ND	1.14	0.41	1.14	0.41	65.3	23.5	74.5	26.9	69.9	25.2	-	-	-	-	-	-	2300	829	182	65.8	1240	447	1250	450	ND	<50	1250	450	-	-
SS8	2-4	0.468	0.176	28	10.1	14.2	5.14	<1.98	ND	1.52	0.55	1.52	0.55	76.2	28.7	68.1	24.6	72.2	26.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS9	0-1.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	36.5	14	-	-	36.5	14	<131	<50	-	-	ND	ND	-	-
SS9	1.7-3.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	64.4	25.1	-	-	64.4	25.1	<128	<50	-	-	ND	ND	-	-
SS9	3.2-3.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<20.3	<10	-	-	ND	ND	<101	<50	-	-	ND	ND	-	-
SS10	0-1.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	152	61.4	-	-	152	61.4	134	54.1	-	-	134	54.1	-	-
SS10	1.5-2.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<16.1	<10	-	-	ND	ND	<80.4	<50	-	-	ND	ND	-	-
SS10	0-2	0.276	0.0905	0.152	0.046	0.214	0.0683	<1.99	ND	1.32	0.4	1.32	0.4	65.3	21.4	61.3	18.5	63.3	20	-	-	-	-	-	-	1160	379	464	140	809	260	802	263	30.6	9.23	416	136	-	-
SS10	2-4	0.368	0.145	0.318	0.12	0.343	0.132	<1.99	ND	1.46	0.55	1.46	0.55	91.8	36.2	84.6	31.9	88.2	34	-	-	-	-	-	-	4190	1650	422	159	2300	905	2160	849	36.9	13.9	1100	431	-	-
SS11	0-2.5	-	-	-	-	-	-	-	-	-	-	-	-	64.8	45.9	-	-	64.8	45.9	194	137	-	-	194	137	326	231	-	-	326	231	317	224	-	-	317	224	<70.6	<50

Table E-1
Sediment Data

East White Lake Field
Vermilion Parish, Louisiana

		Mercury				Mercury Average		Selenium				Se Average		Strontium				St Average		Zinc				Zn Average		TPH-DRO				TPH-DRO Average		TPH-ORO				TPH-ORO Average		TPH-GRO	
		ICON		Pisani				ICON		Pisani				ICON		Pisani				ICON		Pisani				ICON		Pisani				ICON		Pisani				ICON	
Boring ID	Core Interval (ft bgs)	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet
SS11	2.5-3.4	-	-	-	-	-	-	-	-	-	-	-	-	80.2	44.4	-	-	80.2	44.4	120	66.5	-	-	120	66.5	192	106	-	-	192	106	163	90.3	-	-	163	90.3	<90.3	<50
SS11	3.4-3.7	-	-	-	-	-	-	-	-	-	-	-	-	63.2	34.1	-	-	63.2	34.1	77.1	41.6	-	-	77.1	41.6	51.8	28	-	-	51.8	28	<92.6	<50	-	-	ND	ND	<92.6	<50
SS12	0-3.7	-	-	-	-	-	-	-	-	-	-	-	-	72.9	39.5	-	-	72.9	39.5	73.5	39.8	-	-	73.5	39.8	412	223	-	-	412	223	468	254	-	-	468	254	<92.3	<50
SS13	0-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<29.2	<10	-	-	ND	ND	<146	<50	-	-	ND	ND	-	-
SS13	1-2.75	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	31	12.1	-	-	31	12.1	<129	<50	-	-	ND	ND	-	-
SS13	2.75-3.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<45.5	<10	-	-	ND	ND	<227	<50	-	-	ND	ND	-	-
SS14	0-0.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<17.8	<10	-	-	ND	ND	<89.1	<50	-	-	ND	ND	-	-
SS14	0.8-1.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<44.2	<10	-	-	ND	ND	<221	<50	-	-	ND	ND	-	-
SS15	0-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<28.0	<10	-	-	ND	ND	<140	<50	-	-	ND	ND	-	-
SS15	3-3.25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24.8	12.4	-	-	24.8	12.4	<99.6	<50	-	-	ND	ND	-	-
AB1	0-3	-	-	-	-	-	-	-	-	-	-	-	-	106	19.2	-	-	106	19.2	46.4	8.4	-	-	46.4	8.4	ND	<21.5	-	-	ND	ND	ND	<22.5	-	-	ND	ND	-	-
AB1	3-6	-	-	-	-	-	-	-	-	-	-	-	-	69.9	21.2	-	-	69.9	21.2	36.9	11.2	-	-	36.9	11.2	ND	<10	-	-	ND	ND	ND	<50	-	-	ND	ND	-	-
AB1	6-8	0.075	0.0374	-	-	0.075	0.0374	<2.0	ND	-	-	ND	ND	-	-	-	-	-	-	-	-	-	-	-	-	ND	<10	-	-	ND	ND	ND	<50	-	-	ND	ND	-	-
AB1	12-14	0.0676	0.042	-	-	0.0676	0.042	<1.99	ND	-	-	ND	ND	-	-	-	-	-	-	-	-	-	-	-	-	ND	<10	-	-	ND	ND	ND	<50	-	-	ND	ND	-	-
AB2	0-3	-	-	-	-	-	-	-	-	-	-	-	-	87.2	12.6	-	-	87.2	12.6	45.9	6.61	-	-	45.9	6.61	ND	<10	-	-	ND	ND	ND	<50	-	-	ND	ND	-	-
AB2	3-6	-	-	-	-	-	-	-	-	-	-	-	-	91.2	20.3	-	-	91.2	20.3	40.1	8.94	-	-	40.1	8.94	ND	<10	-	-	ND	ND	ND	<50	-	-	ND	ND	-	-
AB2	4-6	<0.05	ND	-	-	ND	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	<10	-	-	ND	ND	ND	<50	-	-	ND	ND	-	-
AB2	10-12	<0.05	ND	-	-	ND	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	<10	-	-	ND	ND	ND	<50	-	-	ND	ND	-	-
AB3	0-3	-	-	-	-	-	-	-	-	-	-	-	-	63.9	11	-	-	63.9	11	46.8	8.05	-	-	46.8	8.05	ND	<21.5	-	-	ND	ND	ND	<22.5	-	-	ND	ND	-	-
AB3	3-6	-	-	-	-	-	-	-	-	-	-	-	-	59.8	22.7	-	-	59.8	22.7	45.9	17.4	-	-	45.9	17.4	ND	<10	-	-	ND	ND	ND	<50	-	-	ND	ND	-	-
AB3	4-6	<0.05	ND	-	-	ND	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	<10	-	-	ND	ND	ND	<50	-	-	ND	ND	-	-
AB3	8-10	<0.05	ND	-	-	ND	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	<10	-	-	ND	ND	ND	<50	-	-	ND	ND	-	-
AB4	0-3	-	-	-	-	-	-	-	-	-	-	-	-	100	13.9	-	-	100	13.9	40.9	5.69	-	-	40.9	5.69	ND	<10	-	-	ND	ND	ND	<50	-	-	ND	ND	-	-
AB4	3-6	-	-	-	-	-	-	-	-	-	-	-	-	53.2	21.9	-	-	53.2	21.9	45.8	18.8	-	-	45.8	18.8	ND	<10	-	-	ND	ND	ND	<50	-	-	ND	ND	-	-
AB4	4-6	<0.05	ND	-	-	ND	ND	<1.99	ND	-	-	ND	ND	-	-	-	-	-	-	-	-	-	-	-	-	ND	<10	-	-	ND	ND	ND	<50	-	-	ND	ND	-	-
AB4	10-12	<0.05	ND	-	-	ND	ND	<1.99	ND	-	-	ND	ND	-	-	-	-	-	-	-	-	-	-	-	-	ND	<10	-	-	ND	ND	ND	<50	-	-	ND	ND	-	-
AB5	0-6	-	-	-	-	-	-	-	-	-	-	-	-	237	71.3	-	-	237	71.3	20.4	6.14	-	-	20.4	6.14	ND	<21.0	-	-	ND	ND	ND	<25	-	-	ND	ND	-	-
AB5	4-6	<0.05	ND	-	-	ND	ND	<1.99	ND	-	-	ND	ND	-	-	-	-	-	-	-	-	-	-	-	-	2070	746	-	-	2070	746	1340	481	-	-	1340	481	-	-
AB5	10-12	0.0792	0.0506	-	-	0.0792	0.0506	<1.99	ND	-	-	ND	ND	-	-	-	-	-	-	-	-	-	-	-	-	ND	<10	-	-	ND	ND	ND	<50	-	-	ND	ND	-	-
AB5	14-16	-	-	-	-	-	-	<1.99	ND	-	-	ND	ND	-	-	-	-	-	-	-	-	-	-	-	-	ND	<10	-	-	ND	ND	ND	<50	-	-	ND	ND	-	-
AB5	18-20	<0.05	ND	-	-	ND	ND	<1.98	ND	-	-	ND	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB6	8-10	<0.05	ND	-	-	ND	ND	<1.98	ND	-	-	ND	ND	-	-	-	-	-	-	-	-	-	-	-	-	ND	<10	-	-	ND	ND	ND	<50	-	-	ND	ND	-	-
AB6	12-14	<0.05	ND	-	-	ND	ND	<1.99	ND	-	-	ND	ND	-	-	-	-	-	-	-	-	-	-	-	-	ND	<10	-	-	ND	ND	ND	<10	-	-	ND	ND	-	-
AB7	6-8	<0.05	ND	-	-	ND	ND	<1.98	ND	-	-	ND	ND	-	-	-	-	-	-	-	-	-	-	-	-	ND	<10	-	-	ND	ND	ND	<10	-	-	ND	ND	-	-
AB7	10-12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	<10	-	-	ND	ND	ND	<50	-	-	ND	ND	-	-
AB8	6-8	-	-	-	-	-	-	-	-	-	-	-	-	261	62.1	-	-	261	62.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB8	10-12	-	-	-	-	-	-	-	-	-	-	-	-	87.5	43.9	-	-	87.5	43.9	-	-	-	-	-	-	ND	<10	-	-	ND	ND	ND	<50	-	-	ND	ND	-	-
AB8	14-16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	<10	-	-	ND	ND	ND	<50	-	-	ND	ND	-	-
AB9	6-8	-	-	-	-	-	-	-	-	-	-	-	-	199	71	-	-	199	71	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB9	12-14	-	-	-	-	-	-	-	-	-	-	-	-	54	35.4	-	-	54	35.4	-	-	-	-	-	-	ND	<10	-	-	ND	ND	ND	<50	-	-	ND	ND	-	-
AB9	18-20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	<10	-	-	ND	ND	ND	<50	-	-	ND	ND	-	-
AB10	4-6	-	-	-	-	-	-	-	-	-	-	-	-	39.8	18.4	-	-	39.8	18.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB10	12-14	-	-	-	-	-	-	-	-	-	-	-	-	25.3	16.7	-	-	25.3	16.7	-	-	-	-	-	-	ND	<10	-	-	ND	ND	ND	<50	-	-	ND	ND	-	-
AB10	14-16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	<10	-	-	ND	ND	ND	<50	-	-	ND	ND	-	-
AB11	4-6	-	-	-	-	-	-	-	-	-	-	-	-	83.4	20.9	-	-	83.4	20.9	-	-	-	-	-	-	1990	499	-	-	1990	499	984	247	-	-	984	247	-	-
AB11	6-8	-	-	-	-	-	-	-	-	-	-	-	-	44.7	21	-	-	44.7	21	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB11	16-18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	<10	-	-	ND	ND	ND	<50	-	-	ND	ND	-	-
AB12	6-8	-	-	-	-	-	-	-	-	-	-	-	-	73.7	33.8	-	-	73.7	33.8	-	-	-	-	-	-	ND	<10	-	-	ND	ND	ND	<50	-	-	ND	ND	-	-
AB12	12-14	-	-	-	-	-	-	-	-	-	-	-	-	74.6	36	-	-	74.6	36	-	-	-	-	-	-	ND	<10	-	-	ND	ND	ND	<50	-	-	ND	ND	-	-
AB13	0-3	-	-	-	-	-	-	-	-	-	-	-	-	459	64.3	-	-	459	64.3	24.8	3.47	-	-	24.8	3.47	ND	<10	-	-	ND	ND	ND	<50	-	-	ND	ND	-	-
AB13	3-6	-	-	-	-	-	-	-	-	-	-	-	-	156	65.5	-	-	156	65.5	64.5	27.1	-	-	64.5	27.1	ND	<10	-	-	ND	ND	ND	<50	-	-	ND	ND	-	-
AB13	4-6	-	-	-	-	-	-	-	-	-	-	-	-	100	25	-	-	100	25	-	-	-	-	-	-	8400	2100	-	-	8400	2100	5760	1440	-	-	5760	1440	-	-
AB13	8-10	-	-	-	-	-	-	-	-	-	-	-	-	111	49	-	-	111	49	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB13	10-12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	221	90.6	-	-	221	90.6	173	70.9	-	-	173	70.9	-	-
AB14	0-3	-	-	-	-	-	-	-	-	-	-	-	-	121	45	-	-	121	45	63.9	23.8	-	-	63.9	23.8	ND	<10	-	-	ND	ND	ND	<50	-	-	ND	ND	-	-
AB14	3-6	-	-	-	-	-	-	-	-	-	-	-	-	210	64.1	-	-	210	64.1	66.4	20.3	-	-	66.4	20.3	869	265	-	-	869	265	240	73.3	-	-	240	73.3	-	-
AB14	4-6	-	-	-	-	-	-	-	-	-	-	-	-	259	66	-	-	259	66	-	-	-	-	-	-	317	80.8	-	-	317	80.8	ND	<50	-	-	ND	ND	-	-
AB14	8-10	-	-	-	-	-	-	-	-	-	-	-	-	137	70.7	-	-	137	70.7	-	-	-	-	-	-	ND	<10	-	-	ND	ND	ND	<50	-	-	ND	ND	-	-
AB15	0-6	-	-	-	-	-	-	-	-	-	-	-	-	251	53.5	-	-	251	53.5	32.2	6.86	-	-	32.2	6.86	59.6	12.7	-	-	59.6	12.7	ND	<50	-	-	ND	ND	-	-
AB15	4-6	-	-	-	-	-	-	-	-	-	-	-	-	211	49.8	-	-	211	49.8	-	-	-	-	-	-	218	51.4	-	-	218	51.4	ND	<50	-	-	ND	ND	-	-
AB15	12-14	-	-	-	-	-	-	-	-	-	-	-	-	34.2	26.3	-	-	34.2	26.3	-	-	-	-	-	-	ND	<10	-	-	ND	ND	ND	<50	-	-	ND	ND	-	-
AB16	4-6	-	-	-	-	-	-	-	-	-	-	-	-	105	35.3	-	-	105	35.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB16	8-10	-	-	-	-	-	-	-	-	-	-	-	-	113	46	-	-	113	46	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB16	10-12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	70.8	21.6	-	-	70.8	21.6	ND	<50	-	-	ND	ND	-	-
AB16	12-14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	<10	-	-	ND	ND	ND	<50	-	-	ND	ND	-	-
AB18	4-6	-	-	-	-	-	-	-	-	-	-	-	-	112	22.2	-	-	112	22.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB18	10-12	-	-	-	-	-	-	-	-	-	-	-	-	25.7	16.6	-	-	25.7	16.6	-	-	-	-	-	-	ND	<10	-	-	ND	ND	ND	<50	-	-	ND	ND	-	-
AB18	12-14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	<10	-	-	ND	ND	ND	<50	-	-	ND	ND	-	-
AB19	4-6	-	-	-	-	-	-	-	-	-	-	-	-	59.3	17.7	-	-	59.3	17.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB19	8-10	-	-	-	-	-	-	-	-	-	-	-	-	32.9	19.4	-	-	32.9	19.4	-	-	-	-	-	-	ND	<10	-	-	ND	ND	ND	<50	-	-	ND	ND	-	-
AB19	12-14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	<10	-	-	ND	ND	ND	<50	-	-	ND	ND	-	-
AB20	6-8	-	-	-	-	-	-	-	-	-	-	-	-	72	27.9	-	-	72	27.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB20	10-12	-	-	-	-	-	-	-	-	-	-	-	-	47	21.4	-	-	47	21.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB20	14-16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	<10	-	-	ND	ND	ND	<50	-	-	ND	ND	-	-
AB20	16-18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	<10	-	-	ND	ND	ND	<50	-	-	ND	ND	-	-
AB21	4-6	-	-	-	-	-	-	-	-	-	-	-	-	141	19.6	-	-	141	19.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB21	6-8	-	-	-	-	-	-	-	-	-	-	-	-	79	31.9	-	-	79	31.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table E-1
Sediment Data

East White Lake Field
Vermilion Parish, Louisiana

		Mercury				Mercury Average		Selenium				Se Average		Strontium				St Average		Zinc				Zn Average		TPH-DRO				TPH-DRO Average		TPH-ORO				TPH-ORO Average		TPH-GRO	
		ICON		Pisani				ICON		Pisani				ICON		Pisani				ICON		Pisani				ICON		Pisani				ICON		Pisani				ICON	
Boring ID	Core Interval (ft bgs)	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet
AB21	8-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	<10	-	-	ND	ND	ND	<50	-	-	ND	ND	-	-
AB21	12-14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	<10	-	-	ND	ND	ND	<50	-	-	ND	ND	-	-
AB22	4-6	-	-	-	-	-	-	-	-	-	-	-	-	163	36.8	-	-	163	36.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB22	6-8	-	-	-	-	-	-	-	-	-	-	-	-	110	36.6	-	-	110	36.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB22	12-14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	<10	-	-	ND	ND	ND	<50	-	-	ND	ND	-	-
AB22	16-18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	<10	-	-	ND	ND	ND	<50	-	-	ND	ND	-	-
SED4	0-2	0.22	0.0849	0.0438	0.026	0.132	0.0555	<1.98	ND	ND	ND	ND	ND	91.7	35.4	59.1	35.1	75.4	35.2	-	-	-	-	-	-	744	287	ND	<50	744	287	948	366	ND	<50	948	366	-	-
SED5	0-2	0.623	0.264	0.042	0.021	0.333	0.143	<1.99	ND	ND	ND	ND	ND	58.9	25	36.2	18.1	47.6	21.5	-	-	-	-	-	-	228	96.8	ND	<50	228	96.8	283	120	ND	<50	283	120	-	-
SED6	0-2	14.3	5.03	0.878	0.43	7.59	2.73	<1.98	ND	ND	ND	ND	ND	140	49.3	80.2	39.3	110	44.3	-	-	-	-	-	-	1020	360	67.1	32.9	545	196	3070	1080	100	49.1	1580	565	-	-
SED7	0-2	0.119	0.0362	0.0828	0.026	0.101	0.0311	<1.98	ND	ND	ND	ND	ND	48.3	14.7	47.1	14.8	47.7	14.7	-	-	-	-	-	-	536	163	ND	<50	536	163	1040	316	ND	<50	1040	316	-	-
SED7	2-4	0.218	0.0831	0.15	0.06	0.184	0.0715	<1.99	ND	ND	ND	ND	ND	80.4	30.6	74.4	29.7	77.4	30.2	-	-	-	-	-	-	5380	2050	737	294	3060	1170	3700	1410	235	93.6	1970	752	-	-
SED7	4-6	0.152	0.0464	0.106	0.03	0.129	0.0382	<1.99	ND	ND	ND	ND	ND	101	30.8	123	34.9	112	32.9	-	-	-	-	-	-	2800	853	602	171	1700	512	1570	478	162	46	865	262	-	-
SED8	0-2	<0.1	ND	0.0685	0.022	0.0685	0.022	<1.99	ND	ND	ND	ND	ND	51.3	15.7	48.9	15.7	50.1	15.7	-	-	-	-	-	-	353	108	ND	<50	353	108	315	96.4	ND	<50	315	96.4	-	-
SED8	2-4	0.177	0.0651	0.0759	0.028	0.126	0.0466	<1.98	ND	ND	ND	ND	ND	58.5	21.5	48	17.7	53.2	19.6	-	-	-	-	-	-	924	340	398	147	661	244	541	199	70.5	26	306	113	-	-
SED9	0-2	0.168	0.0571	0.0625	0.022	0.115	0.0396	<1.99	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-	-	-	-	169	57.4	ND	<50	169	57.4	303	103	ND	<50	303	103	-	-
SED9	2-4	0.195	0.0722	0.0769	0.031	0.136	0.0516	<1.98	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-	-	-	-	217	80.3	ND	<50	217	80.3	212	78.4	ND	<50	212	78.4	-	-
SED10	0-2	0.197	0.0682	0.0864	0.033	0.142	0.0506	<1.99	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-	-	-	-	353	122	ND	<50	353	122	410	142	ND	<50	410	142	-	-
SED10	2-4	0.15	0.057	0.0644	0.025	0.107	0.041	<1.99	ND	0.799	0.31	0.799	0.31	-	-	-	-	-	-	-	-	-	-	-	-	503	191	110	42.8	306	117	482	183	12.7	4.91	247	94	-	-
SED11	0-2	0.192	0.0674	0.085	0.029	0.139	0.0482	<1.99	ND	1.11	0.38	1.11	0.38	-	-	-	-	-	-	-	-	-	-	-	-	960	337	ND	<50	960	337	741	260	ND	<50	741	260	-	-
SED11	2-4	0.142	0.0523	0.0897	0.033	0.116	0.0426	<1.99	ND	1.06	0.39	1.06	0.39	-	-	-	-	-	-	-	-	-	-	-	-	929	342	156	57.4	543	200	723	266	ND	<50	723	266	-	-
SED12	0-2	0.128	0.0385	0.0717	0.023	0.0998	0.0308	<1.99	ND	1.53	0.49	1.53	0.49	-	-	-	-	-	-	-	-	-	-	-	-	718	216	ND	<50	718	216	645	194	ND	<50	645	194	-	-
SED12	2-4	0.207	0.0687	0.109	0.031	0.158	0.0499	<1.99	ND	1.41	0.4	1.41	0.4	-	-	-	-	-	-	-	-	-	-	-	-	3670	1220	637	181	2160	701	2050	682	131	37.1	1090	360	-	-
SED12	4-6	0.134	0.0481	0.0854	0.028	0.11	0.0381	<1.98	ND	1.16	0.38	1.16	0.38	-	-	-	-	-	-	-	-	-	-	-	-	4900	1760	521	171	2710	966	2730	979	91.2	29.9	1410	504	-	-
SED13	0-2	0.231	0.058	0.0677	0.018	0.149	0.038	<1.99	ND	1.65	0.44	1.65	0.44	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED13	2-4	<0.1	ND	0.0449	0.015	0.0449	0.015	<1.98	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED14	0-2	0.103	0.0302	0.0676	0.019	0.0853	0.0246	<1.99	ND	1.42	0.4	1.42	0.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED14	2-4	0.124	0.0425	0.0691	0.025	0.0965	0.0338	<1.99	ND	1.24	0.45	1.24	0.45	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED16	0-2	0.604	0.129	0.0865	0.016	0.345	0.0726	<1.99	ND	2.11	0.39	2.11	0.39	-	-	-	-	-	-	-	-	-	-	-	-	331	70.8	ND	<50	331	70.8	551	118	ND	<50	551	118	-	-
SED17	0-2	0.145	0.0464	0.066	0.02	0.106	0.0332	<2	ND	1.52	0.46	1.52	0.46	-	-	-	-	-	-	-	-	-	-	-	-	981	314	ND	<50	981	314	603	193	ND	<50	603	193	-	-
SED17	2-4	0.27	0.0948	0.0917	0.033	0.181	0.0639	<1.98	ND	1.58	0.57	1.58	0.57	-	-	-	-	-	-	-	-	-	-	-	-	769	270	ND	<50	769	270	496	174	ND	<50	496	174	-	-
SED18	0-2	0.15	0.0383	0.116	0.03	0.133	0.0341	<1.98	ND	1.58	0.41	1.58	0.41	-	-	-	-	-	-	-	-	-	-	-	-	1820	465	312	80.7	1070	273	1160	297	24.7	6.4	595	152	-	-
SED18	2-4	0.147	0.0409	0.0829	0.034	0.115	0.0374	<1.99	ND	1.07	0.44	1.07	0.44	-	-	-	-	-	-	-	-	-	-	-	-	2290	637	206	84.5	1250	361	1490	415	32.2	13.2	763	214	-	-
SED19	0-2	0.22	0.0686	0.209	0.074	0.215	0.0713	<1.99	ND	0.904	0.32	0.904	0.32	-	-	117	41.4	117	41.4	-	-	-	-	-	-	7530	2350	2140	758	4840	1550	2560	798	432	153	1490	476	-	-
SED19	2-4	0.193	0.0784	0.134	0.054	0.163	0.0662	<1.99	ND	1.29	0.52	1.29	0.52	-	-	-	-	-	-	-	-	-	-	-	-	2930	1190	757	306	1840	748	1380	562	58.2	23.5	721	293	-	-
SED20	0-2	0.189	0.062	0.0817	0.025	0.135	0.0435	<2	ND	1.24	0.38	1.24	0.38	-	-	-	-	-	-	-	-	-	-	-	-	341	112	ND	<50	341	112	305	100	ND	<50	305	100	-	-
SED20	2-4	<0.1	ND	0.071	0.025	0.071	0.025	<1.98	ND	1.48	0.52	1.48	0.52	-	-	-	-	-	-	-	-	-	-	-	-	521	190	ND	<50	521	190	433	158	ND	<50	433	158	-	-
SED21	0-2	<0.1	ND	0.041	0.013	0.041	0.013	<1.98	ND	1.17	0.37	1.17	0.37	-	-	-	-	-	-	-	-	-	-	-	-	457	138	ND	<50	457	138	447	135	ND	<50	447	135	-	-
SED21	2-4	<0.1	ND	0.0306	0.011	0.0306	0.011	<1.99	ND	0.864	0.31	0.864	0.31	-	-	-	-	-	-	-	-	-	-	-	-	906	368	ND	<50	906	368	719	292	ND	<50	719	292	-	-
SED21	4-6	0.14	0.0554	0.106	0.042	0.123	0.0487	<1.99	ND	1.14	0.45	1.14	0.45	-	-	-	-	-	-	-	-	-	-	-	-	1420	561	347	137	883	349	967	383	46.1	18.2	507	201	-	-
SED21	6-8	<0.1	ND	0.0869	0.037	0.0869	0.037	<1.98	ND	0.587	0.25	0.587	0.25	-	-	-	-	-	-	-	-	-	-	-	-	5150	2100	165	70.3	2660	1090	2840	1160	ND	<50	2840	1160	-	-
SED22	0-2	<0.1	ND	0.0705	0.022	0.0705	0.022	<1.99	ND	1.54	0.48	1.54	0.48	-	-	-	-	-	-	-	-	-	-	-	-	404	128	ND	<50	404	128	363	115	ND	<50	363	115	-	-
SED22	2-4	0.3	0.108	0.0638	0.024	0.182	0.066	<2	ND	1.57	0.59	1.57	0.59	-	-	-	-	-	-	-	-	-	-	-	-	339	122	ND	<50	339	122	294	106	ND	<50	294	106	-	-
SED23	0-2	<0.1	ND	0.0706	0.025	0.0706	0.025	<1.98	ND	1.61	0.57	1.61	0.57	-	-	-	-	-	-	-	-	-	-	-	-	5200	1670	1170	414	3180	1040	2830	907	311	110	1570	509	-	-
SED23	2-4	<0.1	ND	0.0635	0.02	0.0635	0.02	<1.99	ND	1.71	0.54	1.71	0.54	-	-	-	-	-	-	-	-	-	-	-	-	6950	2120	1790	563	4370	1340	3930	1200	390	123	2160	662	-	-
SED24	0-2	<0.1	ND	0.109	0.038	0.109	0.038	<1.98	ND	1.72	0.6	1.72	0.6	-	-	-	-	-	-	-	-	-	-	-	-	711	297	ND	<50	711	297	703	294	ND	<50	703	294	-	-
SED24	2-4	<0.1	ND	0.0583	0.019	0.0583	0.019	-	-	1.72	0.56	1.72	0.56	-	-	-	-	-	-	-	-	-	-	-	-	266	101	ND	<50	266	101	266	101	ND	<50	266	101	-	-
SED25	0-2	<0.1	ND	0.0778	0.026	0.0778	0.026	<1.99	ND	1.56	0.52	1.56	0.52	-	-	-	-	-	-	-	-	-	-	-	-	2980	996	253	84.4	1620	540	1580	527	25.1	8.38	801	268	-	-
SED25	2-4	0.104	0.0313	0.121	0.039	0.112	0.0352	<2	ND	1.11	0.36	1.11	0.36	-	-	-	-	-	-	-	-	-	-	-	-	1160	348	48.9	15.8	604	182	930	280	ND	<50	930	280	-	-
SED26	0-2	0.454	0.174	0.317	0.11	0.386	0.142	<1.99	ND	0.836	0.29	0.836	0.29	-	-	-	-	-	-	-	-	-	-	-	-	28400	10900	6770	2350	17600	6630	12400	4770	1010	352	6720	2560	-	-
SED26	2-4	0.393	0.0668	0.0969	0.022	0.245	0.0444	<1.99	ND	1.19	0.27	1.19	0.27	-	-	-	-	-	-	-	-	-	-	-	-	13400	2940	1320	299	7360	1620	7820	1330	255	57.9	4040	694	-	-
SED27	0-2	<0.1	ND	0.0753	0.021	0.0753	0.021	<1.98	ND	0.968	0.27	0.968	0.27	-	-	-	-	-	-	-	-	-	-	-	-	661	179	380	106	520	143	646	175	71.7	20	359	97.5	-	-
SED27	2-4	0.125	0.0398	0.0891	0.027	0.107	0.0334	<1.99	ND	1.32	0.4	1.32	0.4	-	-	-	-	-	-	-	-	-	-	-	-	1960	623	482	146	1220	385	1420	451	82.5	25	750	238	-	-
SED28	0-2	1.21	0.282	0.607	0.13	0.909	0.206	<1.99	ND	ND	ND	ND	ND	-	-	293	62.7	293	62.7	-	-	-	-	-	-	36100	8420	25300	5420	30700	6920	14400	3360	4230	906	9330	2130	-	-
SED28	2-4	0.228	0.0358	0.101	0.015	0.164	0.0254	<1.98	ND	ND	ND	ND	ND	366	57.5	417	62.1	391	59.8	-	-	-	-	-	-	3270	514	1030	153	2150	334	2240	351	70.5	10.5	1150	181	-	-
SED29	0-2	<0.1	ND	0.111	0.023	0.111	0.023	<1.98	ND	ND	ND	ND	ND	223	37	214	44.5	218	40.8	-	-	-	-	-	-	9160	1520	4950	1030	7060	1280	7770	1290	1380	287	4580	789	-	-
SED29	2-4	<0.1	ND	ND	ND	ND	ND	<1.98	ND	ND	ND	ND	ND	382	66.1	461	84.9	422	75.5	-	-	-	-	-	-	855	148	ND	<50	855	148	861	149	ND	<50	861	149	-	-
SED30	0-2	<0.1	ND	0.0791	0.011	0.0791	0.011	<1.98	ND	ND	ND	ND	ND	220	41.6	381	52.9	300	47.2	-	-	-	-	-	-	41100	7770	12700	1770	26900	4770	22100	4180	2810	390	12500	2290	-	-
SED30	2-4	<0.1	ND	ND	ND	ND	ND	<1.99	ND	ND	ND	ND	ND	320	56.3	413	64.5	367	60.4	-	-	-	-	-	-	3670	646	463	72.3	2070	359	3660	645	30.8	4.81	1850	325	-	-
SED31	0-2	0.116	0.0347	0.0374	0.011	0.0767	0.0228	<1.99	ND	0.884	0.26	0.884	0.26	-	-	-	-	-	-	-	-	-	-	-	-	4950	1480	1500	441	3230	961	2230	668	296	87	1270	378	-	-
SED31	2-4	<0.1	ND	0.0213	0.0043	0.0213	0.0043	<1.99	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-	-	-	-	3640	550	1480	299	2560	425	526	79.5	133	26.8	330	53.2	-	-
SED31	4-6	<0.1	ND	ND	ND	ND	ND	<2	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-	-	-	-	674	215	66	20.2	370	118	392	125	ND	<50	392	125	-	-
SED32	0-2	0.132	0.0366	0.0427	0.012	0.0874	0.0243	<1.99	ND	0.925	0.26	0.925	0.26	-	-	-	-	-	-	-	-	-	-	-	-	5160	1430	3220	905	4190	1170	1290	358	630	177	961	268	-	-
SED32	2-4	0.165	0.0266	0.0578	0.0085	0.111	0.0175	<1.99	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-	-	-	-	510	82.1	140	20.6	325	51.4	ND	<50	ND	<50	ND	ND	-	-
SED32	4-6	<0.1	ND	0.0314	0.005	0.0314	0.005	<1.99	ND	2.2	0.35	2.2	0.35	-	-	-	-	-	-	-	-	-	-	-	-	475	90.8	ND	<50	475	90.8	385	73.5	ND	<50	385	73.5	-	-
SED33	0-2	<0.1	ND	0.08	0.016	0.08	0.016	<1.99	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-	-	-	-	489	130	775	155	632	143	207	55.1	177	35.3	192	45.2	-	-
SED33	2-4	<0.1	ND	0.024	0.004	0.024	0.004	<1.99	ND	1.56	0.26	1.56	0.26	-	-	-	-	-	-	-	-	-	-	-	-	383	50.6	ND	<50	383	50.6	ND	<50	ND	<50	ND	ND	-	-
SED33	4-6	<0.1	ND	ND	ND	ND	ND	<1.99	ND	1.45	0.32	1.45	0.32	-	-	-	-	-	-	-	-	-	-	-	-	202	53.9	ND	<50	202	53.9	322	85.9	ND	<50	322	85.9	-	-
MPA-Sed 15-N	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	67.2	30.5	-	-	67.2	30.5	124	56.3	-	-	124	56.3	-	-
MPA-Sed-15-W	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	<20	-	-	ND	ND	ND	<50	-	-	ND	ND	-	-

Table E-1
Sediment Data

East White Lake Field
Vermilion Parish, Louisiana

		Mercury				**Mercury Average**		Selenium				**Se Average**		Strontium				**St Average**		Zinc				**Zn Average**		TPH-DRO				**TPH-DRO Average**		TPH-ORO				**TPH-ORO Average**		TPH-GRO	
		ICON		Pisani				ICON		Pisani				ICON		Pisani				ICON		Pisani				ICON		Pisani				ICON		Pisani				ICON	
Boring ID	**Core Interval (ft bgs)**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet
MPA-Sed-15-W-2	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPA-Sed-15-E	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	441	200	-	-	**441**	**200**	317	144	-	-	**317**	**144**	-	-
MPA-Sed-15-E-2	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	134	60.7	-	-	**134**	**60.7**	153	69.6	-	-	**153**	**69.6**	-	-
MPA-AB5 (A)	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*ND*	*<20*	-	-	***ND***	***ND***	*ND*	*<50*	-	-	***ND***	***ND***	-	-
MPA-AB5 (B)	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	65.8	23.7	-	-	**65.8**	**23.7**	*ND*	*<50*	-	-	***ND***	***ND***	-	-
MPA-AB5 (C)	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*ND*	*<20*	-	-	***ND***	***ND***	*ND*	*<50*	-	-	***ND***	***ND***	-	-
MPA-AB-6	8-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPA-AB8	6-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPA-AB13	0-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB-6	8-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB-13	0-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB-13 SO-E	0-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB-14	0-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB-8	6-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB-8 SO-S	6-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB-5 SO-NE	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB-5 SO-NW	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB-5a	4-5.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB-15	4-5.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED-8	0-0.5	0.121	0.0471	0.0977	0.038	**0.109**	**0.0425**	*<1.99*	*<0.77*	*<4.11*	*<1.6*	***ND***	***ND***	43.7	17	41.1	16	**42.4**	**16.5**	48.3	18.8	53	20.6	**50.6**	**19.7**	344	134	-	-	**344**	**134**	315	123	-	-	**315**	**123**	-	-
SED-9	0-0.5	*<0.1*	0.029	0.115	0.035	**0.115**	**0.032**	*<1.99*	*<0.58*	*<5.26*	*<1.6*	***ND***	***ND***	43.5	12.6	46.1	14	**44.8**	**13.3**	54.3	15.7	53.6	16.3	**54**	**16**	92.3	26.8	-	-	**92.3**	**26.8**	*<172*	*<50*	-	-	***ND***	***ND***	-	-
SED-11	0-0.5	*<0.1*	*<0.03*	0.0965	0.033	**0.0965**	**0.033**	*<1.99*	*<0.64*	*<4.68*	*<1.6*	***ND***	***ND***	45.1	14.5	44.2	15.1	**44.6**	**14.8**	51.4	16.5	51.8	17.7	**51.6**	**17.1**	200	64.2	-	-	**200**	**64.2**	208	66.8	-	-	**208**	**66.8**	-	-
SED-13	0-0.5	*<0.1*	*<0.02*	0.105	0.029	**0.105**	**0.029**	*<2.00*	*<0.49*	*<5.82*	*<1.6*	***ND***	***ND***	49.4	12.1	55.3	15.2	**52.3**	**13.6**	61.4	15	65.1	17.9	**63.2**	**16.4**	168	41	-	-	**168**	**41**	*<205*	*<50*	-	-	***ND***	***ND***	-	-
SED-19	0-0.5	0.16	0.0341	0.176	0.038	**0.168**	**0.036**	*<1.99*	*<0.42*	*<7.41*	*<1.6*	***ND***	***ND***	47.4	10.1	58.3	12.6	**52.9**	**11.3**	57.1	12.2	70.4	15.2	**63.7**	**13.7**	*<93.9*	*<20*	-	-	***ND***	***ND***	*<235*	*<50*	-	-	***ND***	***ND***	-	-
SED-24	0-0.5	*<0.1*	*<0.03*	0.111	0.037	**0.111**	**0.037**	*<1.99*	*<0.62*	*<4.79*	*<1.6*	***ND***	***ND***	41.5	12.9	68.9	23	**55.2**	**18**	50.3	15.6	62	20.7	**56.1**	**18.2**	175	54.4	-	-	**175**	**54.4**	176	54.7	-	-	**176**	**54.7**	-	-
SED-26	0-0.5	0.314	0.0926	0.159	0.05	**0.237**	**0.0713**	*<1.99*	*<0.59*	*<5.1*	*<1.6*	***ND***	***ND***	44.2	13	53.8	16.9	**49**	**15**	50.7	15	64	20.1	**57.4**	**17.5**	2360	696	-	-	**2360**	**696**	1440	425	-	-	**1440**	**425**	-	-
SED-31	0-0.5	0.115	0.0369	0.159	0.051	**0.137**	**0.044**	*<1.99*	*<0.64*	*<5*	*<1.6*	***ND***	***ND***	43.6	14	63.1	20.2	**53.4**	**17.1**	49.7	16	64.7	20.7	**57.2**	**18.3**	160	51.4	-	-	**160**	**51.4**	*<156*	*<50*	-	-	***ND***	***ND***	-	-
SED-120 *	0-0.5	*<0.1*	*<0.0178*	0.411	0.072	**0.411**	**0.072**	*<1.99*	*<0.354*	*<9.14*	*<1.6*	***ND***	***ND***	313	55.7	442	77.4	**378**	**66.6**	62.1	11.1	414	72.5	**238**	**41.8**	14300	2550	-	-	**14300**	**2550**	8150	1450	-	-	**8150**	**1450**	-	-
Hg-MPA-01	0-0.5	0.39	0.137	0.245	0.086	**0.318**	**0.111**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-01	0.5-2	0.526	0.197	0.294	0.11	**0.41**	**0.153**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-01	5-7	0.196	0.0911	0.183	0.085	**0.189**	**0.0881**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-02	0-0.5	0.281	0.0767	0.322	0.088	**0.302**	**0.0824**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-02	0.5-2	0.467	0.17	0.207	0.075	**0.337**	**0.122**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-02	5-7	*<0.1*	*<0.0446*	0.0852	0.038	**0.0852**	**0.038**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-03	0-0.5	0.203	0.0668	0.173	0.057	**0.188**	**0.0619**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-03	0.5-2	0.263	0.107	0.18	0.073	**0.222**	**0.0898**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-03	4-6	0.151	0.0649	0.153	0.066	**0.152**	**0.0655**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-04	0-0.5	0.137	0.044	0.115	0.037	**0.126**	**0.0405**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-04	0.5-2	*<0.1*	*<0.052*	0.0462	0.024	**0.0462**	**0.024**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-04	3-5	*<0.1*	*<0.0464*	0.0259	0.012	**0.0259**	**0.012**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-05	0-0.5	-	-	0.254	0.07	**0.254**	**0.07**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-05	0.5-2	-	-	0.127	0.047	**0.127**	**0.047**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-05	6-8	-	-	0.341	0.15	**0.341**	**0.15**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-06	0-0.5	0.222	0.0715	0.134	0.043	**0.178**	**0.0572**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-06	0.5-2	0.807	0.321	0.113	0.045	**0.46**	**0.183**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-06	5-6	*<0.1*	*<0.0484*	0.031	0.015	**0.031**	**0.015**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-07	0-0.5	0.204	0.0887	0.122	0.053	**0.163**	**0.0709**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-07	0.5-2	16.7	8.77	0.343	0.18	**8.52**	**4.47**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-07	6.5-7	*<0.1*	*<0.053*	0.0283	0.015	**0.0283**	**0.015**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-08	0-0.5	0.172	0.0574	0.108	0.036	**0.14**	**0.0467**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-08	0.5-2	0.304	0.119	0.716	0.28	**0.51**	**0.199**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-08	7.5-8	0.297	0.131	0.104	0.046	**0.201**	**0.0886**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-09	0-0.5	11	3.44	0.141	0.044	**5.57**	**1.74**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-09	0.5-2	0.248	0.0903	0.126	0.046	**0.187**	**0.0681**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-09	6-7	*<0.1*	*<0.0556*	0.0306	0.017	**0.0306**	**0.017**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-09dup	0.5-2	-	-	0.152	0.059	**0.152**	**0.059**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-01	0-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-01	0.5-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-01	2-4.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-01	4.3-4.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-01	8-9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-02	0-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-02	0.5-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-02	3-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-02	4-5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-02a	3-5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-02a	7-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-03	0-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-03	0.5-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-03	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-03	9-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-04	0-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table E-1
Sediment Data

East White Lake Field
Vermilion Parish, Louisiana

		Mercury				Mercury Average		Selenium				Se Average		Strontium				St Average		Zinc				Zn Average		TPH-DRO				TPH-DRO Average		TPH-ORO				TPH-ORO Average		TPH-GRO	
		ICON		Pisani				ICON		Pisani				ICON		Pisani				ICON		Pisani				ICON		Pisani				ICON		Pisani				ICON	
Boring ID	**Core Interval (ft bgs)**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet
SP-MPA-04	0.5-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-04	5-7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-04	9-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-1	0-2	0.62	0.35	0.764	0.41	0.692	0.38	<1.99	<1.12	<1.97	<1.06	ND	ND	-	-	-	-	-	-	45.2	25.5	45.1	24.2	45.2	24.9	2770	1560	-	-	2770	1560	2020	1140	-	-	2020	1140	-	-
WL-1	2-4	<0.1	<0.0512	<0.207	<0.1	ND	ND	<1.99	<1.02	<2.17	<1.05	ND	ND	-	-	-	-	-	-	73.8	37.8	75.8	36.7	74.8	37.3	114	58.6	-	-	114	58.6	129	66	-	-	129	66	-	-
WL-1	6-8	<0.1	<0.0245	-	-	ND	ND	<1.99	<0.488	-	-	ND	ND	-	-	-	-	-	-	30.4	7.45	-	-	30.4	7.45	ND	<50	-	-	ND	ND	ND	<50	-	-	ND	ND	-	-
WL-1	9-13	<0.1	<0.0474	<0.229	<0.1	ND	ND	<1.98	<0.939	<2.31	<1.01	ND	ND	-	-	-	-	-	-	64.7	30.7	41.4	18.1	53.1	24.4	ND	<50	-	-	ND	ND	ND	<50	-	-	ND	ND	-	-
WL-2	0-2	0.1	0.062	<0.16	<0.1	0.1	0.062	<1.99	<1.23	<1.68	<1.02	ND	ND	-	-	-	-	-	-	70.2	43.5	59.6	37.3	64.9	40.4	294	182	-	-	294	182	202	125	-	-	202	125	-	-
WL-2	2-4	<0.1	<0.0545	<0.219	<0.1	ND	ND	<1.98	<1.08	<2.23	<1.02	ND	ND	-	-	-	-	-	-	59.7	32.5	60.4	27.6	60.1	30.1	ND	<50	-	-	ND	ND	ND	<50	-	-	ND	ND	-	-
WL-2	8-10	<0.1	<0.0504	<0.203	<0.1	ND	ND	<1.99	<1	<2.11	<1.04	ND	ND	-	-	-	-	-	-	74.7	37.6	78.3	38.5	76.5	38.1	ND	<50	-	-	ND	ND	ND	<50	-	-	ND	ND	-	-
WL-2	14-16	<0.1	<0.0712	<0.141	<0.1	ND	ND	<1.99	<1.42	<1.41	<1	ND	ND	-	-	-	-	-	-	21.3	15.2	21.3	15.1	21.3	15.2	ND	<50	-	-	ND	ND	ND	<50	-	-	ND	ND	-	-
WL-3	0-2	4.29	2.73	7.59	5.73	5.94	4.23	<1.99	<1.27	<1.38	<1.04	ND	ND	-	-	-	-	-	-	1370	873	2190	1650	1780	1260	1220	775	-	-	1220	775	1030	656	-	-	1030	656	-	-
WL-3	4-6/4-8	1.58	0.539	10.4	3.12	5.99	1.83	<1.99	<0.679	<3.55	<1.06	ND	ND	-	-	-	-	-	-	118	40.2	113	33.7	116	37	16200	5540	-	-	16200	5540	8180	2790	-	-	8180	2790	-	-
WL-3	10-13	<0.1	<0.0511	<0.199	<0.1	ND	ND	<1.99	<1.02	<1.99	<1	ND	ND	-	-	-	-	-	-	59.9	30.6	77.1	38.8	68.5	34.7	ND	<50	-	-	ND	ND	ND	<50	-	-	ND	ND	-	-
WL-4	0-2	<0.1	<0.0497	<0.214	<0.1	ND	ND	<1.99	<0.989	<2.26	<1.06	ND	ND	-	-	-	-	-	-	51	23.4	44.4	20.8	47.7	22.1	2050	937	-	-	2050	937	1690	774	-	-	1690	774	-	-
WL-4	2-4	0.13	0.0646	<0.2	<0.1	0.13	0.0646	<1.98	<0.99	<2	<1	ND	ND	-	-	-	-	-	-	127	63.1	115	57.6	121	60.4	13100	6490	-	-	13100	6490	3400	1690	-	-	3400	1690	-	-
WL-4	4-11	<0.1	<0.0626	<0.152	<0.1	ND	ND	<1.98	<1.24	<1.64	<1.08	ND	ND	-	-	-	-	-	-	112	70.1	87.7	57.9	99.9	64	22800	14300	-	-	22800	14300	6880	4310	-	-	6880	4310	-	-
WL-4	11-12.5	<0.1	<0.0513	<0.193	<0.1	ND	ND	<1.99	<1.02	<1.93	<1	ND	ND	-	-	-	-	-	-	140	71.8	67.2	34.9	104	53.4	7680	3940	-	-	7680	3940	2200	1130	-	-	2200	1130	-	-
WL-5	0-2	<0.1	<0.0516	<0.216	<0.1	ND	ND	<1.99	<1.03	<2.31	<1.07	ND	ND	-	-	-	-	-	-	171	88.2	112	51.9	142	70.1	13800	7140	-	-	13800	7140	11600	5990	-	-	11600	5990	-	-
WL-5	2-13	<0.1	<0.0689	<0.141	<0.1	ND	ND	<1.99	<1.37	<1.44	<1.02	ND	ND	-	-	-	-	-	-	218	150	206	146	212	148	14500	10000	-	-	14500	10000	4930	3400	-	-	4930	3400	-	-
WL-6	0-2	<0.1	<0.0508	<0.204	<0.1	ND	ND	<1.98	<1.01	<2.08	<1.02	ND	ND	-	-	-	-	-	-	54.4	27.6	58.8	28.8	56.6	28.2	1070	545	-	-	1070	545	846	430	-	-	846	430	-	-
WL-6	4-6	<0.1	<0.0289	<0.4	<0.1	ND	ND	<1.99	<0.575	<4.04	<1.01	ND	ND	-	-	-	-	-	-	22.4	6.47	17.4	4.34	19.9	5.41	367	106	-	-	367	106	401	116	-	-	401	116	-	-
WL-6	8-10	<0.1	<0.0449	<0.206	<0.1	ND	ND	<1.99	<0.894	<2.23	<1.08	ND	ND	-	-	-	-	-	-	52.8	23.7	50.7	24.6	51.8	24.2	ND	<50	-	-	ND	ND	ND	<50	-	-	ND	ND	-	-
WL-6	10-13	<0.1	<0.025	<0.308	<0.1	ND	ND	<1.99	<0.498	<3.2	<1.04	ND	ND	-	-	-	-	-	-	24.9	6.23	21.3	6.92	23.1	6.58	201	50.3	-	-	201	50.3	ND	<50	-	-	ND	ND	-	-
WL-7	0-2	-	-	<0.131	<0.1	ND	ND	-	-	<1.37	<1.05	ND	ND	-	-	-	-	-	-	-	-	23.1	17.7	23.1	17.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-7	2-4	-	-	<0.132	<0.1	ND	ND	-	-	<1.36	<1.03	ND	ND	-	-	-	-	-	-	-	-	24.9	18.8	24.9	18.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-7	4-6	-	-	<0.382	<0.1	ND	ND	-	-	<4.05	<1.06	ND	ND	-	-	-	-	-	-	-	-	69.5	18.2	69.5	18.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-7	6-8	-	-	<0.26	<0.1	ND	ND	-	-	<2.83	<1.09	ND	ND	-	-	-	-	-	-	-	-	21.3	8.21	21.3	8.21	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-8	0-2	-	-	<0.142	<0.1	ND	ND	-	-	<1.45	<1.02	ND	ND	-	-	-	-	-	-	-	-	29	20.4	29	20.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-8	2-4	-	-	<0.132	<0.1	ND	ND	-	-	<1.33	<1.01	ND	ND	-	-	-	-	-	-	-	-	26.3	19.9	26.3	19.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-8	4-6	-	-	0.211	0.13	0.211	0.13	-	-	<1.62	<1.0	ND	ND	-	-	-	-	-	-	-	-	31.3	19.3	31.3	19.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-8	6-8	-	-	<0.268	<0.1	ND	ND	-	-	<2.95	<1.1	ND	ND	-	-	-	-	-	-	-	-	22.7	8.47	22.7	8.47	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED-BK-01	0-0.5	<0.1	<0.0277	0.104	0.033	0.104	0.033	<1.98	<0.548	<5.05	<1.6	ND	ND	80.5	22.3	69.4	22	75	22.2	23.4	6.48	31	9.82	27.2	8.15	72.6	20.1	-	-	72.6	20.1	208	57.7	-	-	208	57.7	-	-
SED-BK-02	0-0.5	0.132	0.0376	0.0952	0.032	0.114	0.0348	<1.98	<0.564	<4.76	<1.6	ND	ND	44.4	12.7	44.6	15	44.5	13.9	46.6	13.3	46.1	15.5	46.4	14.4	146	41.5	-	-	146	41.5	236	67.4	-	-	236	67.4	-	-
SED-BK-03	0-0.5	<0.1	<0.0278	0.0799	0.023	0.0799	0.023	<2	<0.556	<5.56	<1.6	ND	ND	37.4	10.4	45.8	13.2	41.6	11.8	48.3	13.4	58.3	16.8	53.3	15.1	100	27.8	-	-	100	27.8	190	52.8	-	-	190	52.8	-	-
SED-BK-04	0-0.5	<0.1	<0.0316	0.0962	0.035	0.0962	0.035	<1.99	<0.629	<4.4	<1.6	ND	ND	38.5	12.2	41.8	15.2	40.2	13.7	42.9	13.6	42.9	15.6	42.9	14.6	81	25.6	-	-	81	25.6	160	50.5	-	-	160	50.5	-	-
SED-BK-05	0-0.5	<0.1	<0.0221	0.0769	0.025	0.0769	0.025	<1.99	<0.44	<4.92	<1.6	ND	ND	129	28.5	84.3	27.4	107	28	19.3	4.27	21.5	6.99	20.4	5.63	<90.5	<20	-	-	ND	ND	235	52	-	-	235	52	-	-
SED-BK-06	0-0.5	<0.1	<0.0359	0.094	0.028	0.094	0.028	<1.99	<0.714	<5.37	<1.6	ND	ND	52	18.7	59.4	17.7	55.7	18.2	48.4	17.4	64.8	19.3	56.6	18.4	182	65.3	-	-	182	65.3	260	93.5	-	-	260	93.5	-	-
SED-BK-07	0-0.5	0.185	0.0377	0.568	0.13	0.377	0.0839	<1.99	<0.406	<6.99	<1.6	ND	ND	50.5	10.3	61.1	14	55.8	12.2	61.6	12.6	69	15.8	65.3	14.2	320	65.3	-	-	320	65.3	458	93.5	-	-	458	93.5	-	-
SED-BK-08	0-0.5	<0.1	<0.029	0.14	0.034	0.14	0.034	<1.99	<0.577	<6.61	<1.6	ND	ND	47.8	13.9	64.5	15.6	56.2	14.8	44.1	12.8	58.3	14.1	51.2	13.5	<69	<20	-	-	ND	ND	<172	<50	-	-	ND	ND	-	-
SED-BK-09	0-0.5	<0.1	<0.0245	0.0826	0.02	0.0826	0.02	<1.99	<0.488	<6.61	<1.6	ND	ND	84.6	20.7	84.7	20.5	84.7	20.6	29.3	7.18	16.4	3.98	22.9	5.58	<81.6	<20	-	-	ND	ND	<204	<50	-	-	ND	ND	-	-
SED-BK-10	0-0.5	<0.1	<0.0349	<0.0398	<0.01	ND	ND	<1.99	<0.695	<6.37	<1.6	ND	ND	62.8	21.9	103	25.9	82.9	23.9	43.9	15.3	205	51.4	124	33.4	<57.3	<20	-	-	ND	ND	<143	<50	-	-	ND	ND	-	-
SED-BK-11	0-0.5	-	-	<0.0505	<0.01	ND	ND	-	-	<8.08	<1.6	ND	ND	-	-	100	19.8	100	19.8	-	-	90.9	18	90.9	18	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table E-1
Sediment Data

East White Lake Field
Vermilion Parish, Louisiana

		Aliphatic C6-C8		Aliphatic >C8-C10		Aliphatic >C10-C12		Aliphatic >C12-C16		Aliphatic >C16-C35		Aromatic >C8-C10		Aromatic >C10-C12		Aromatic >C12-C16		Aromatic >C16-C21		Aromatic >C21-C35		Total PCBs				**Total PCBs Average**		Aroclor-1016				Aroclor-1221				Aroclor-1232			
		Pisani		Pisani		Pisani		Pisani		Pisani		Pisani		Pisani		Pisani		Pisani		Pisani		ICON		Pisani				ICON		Pisani		ICON		Pisani		ICON		Pisani	
Boring ID	**Core Interval (ft bgs)**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet
B2	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B2	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B2 Rerun	6-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B2 Rerun	10-10.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B3	4-7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B3 Rerun	9-12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B4 Rerun	0-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B4 Rerun	3-5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B4	5-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B5	0-1.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B5	4-5.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B5 Rerun	8-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B6	1.5-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B6	3-10.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B7	4-5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B7	8-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B8 Rerun	5.5-7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B8	9.5-11.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B9 Rerun	0-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B9	0.5-3.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B9 Rerun	8-9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B10	1.5-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B10	4-7.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B12	0-1.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B12 Rerun	3.5-5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B12	6.5-7.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B13 Rerun	3-5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B13 Rerun	7.5-9.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B14	0-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B14	4-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B15 Rerun	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B15	8-11.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B17	0-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B17 Rerun	3-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B17	8.5-10.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B17 Rerun	10.5-12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B18	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B18	4-5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B18	7.5-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B18	10-11.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B19	1-2.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B19	2.5-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B19	4-6.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B19 Rerun	6.5-9.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B20	3-4.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B20	7.5-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B21	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B21	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS1	0-2.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS1	2.1-2.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS2	0-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS2	1-1.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS3	0-0.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS3	0.6-2.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS3	2.2-2.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS4	0-0.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS4	0.6-2.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS4	2.7-3.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS5	0-2.15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS6	0-1.65	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS6	1.65-2.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS7	0-1.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS7	1.4-2.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS7	2.5-3.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS8	0-1.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS8	1.9-2.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS8	0-2	-	-	-	-	*ND*	*<15*	32.7	11.8	130	47	-	-	*ND*	*<10*	*ND*	*<15*	*ND*	*<15*	*ND*	*<15*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS8	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS9	0-1.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS9	1.7-3.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS9	3.2-3.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS10	0-1.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS10	1.5-2.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS10	0-2	-	-	-	-	*ND*	*<15*	80.5	24.3	203	61.2	-	-	*ND*	*<10*	*ND*	*<15*	*ND*	*<15*	*ND*	*<15*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS10	2-4	-	-	-	-	*ND*	*<15*	48.3	18.2	192	72.2	-	-	*ND*	*<10*	23.1	8.72	45.6	17.2	26.5	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS11	0-2.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table E-1
Sediment Data

East White Lake Field
Vermilion Parish, Louisiana

		Aliphatic C6-C8		Aliphatic >C8-C10		Aliphatic >C10-C12		Aliphatic >C12-C16		Aliphatic >C16-C35		Aromatic >C8-C10		Aromatic >C10-C12		Aromatic >C12-C16		Aromatic >C16-C21		Aromatic >C21-C35		Total PCBs				**Total PCBs Average**		Aroclor-1016				Aroclor-1221				Aroclor-1232			
		Pisani		Pisani		Pisani		Pisani		Pisani		Pisani		Pisani		Pisani		Pisani		Pisani		ICON		Pisani				ICON		Pisani		ICON		Pisani		ICON		Pisani	
Boring ID	**Core Interval (ft bgs)**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet
SS11	2.5-3.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS11	3.4-3.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS12	0-3.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS13	0-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS13	1-2.75	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS13	2.75-3.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS14	0-0.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS14	0.8-1.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS15	0-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS15	3-3.25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB1	0-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB1	3-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB1	6-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB1	12-14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB2	0-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB2	3-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB2	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB2	10-12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB3	0-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB3	3-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB3	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB3	8-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB4	0-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB4	3-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB4	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB4	10-12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB5	0-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB5	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB5	10-12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB5	14-16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB5	18-20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB6	8-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB6	12-14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB7	6-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB7	10-12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
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AB8	10-12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB8	14-16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB9	6-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB9	12-14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB9	18-20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB10	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB10	12-14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB10	14-16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB11	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB11	6-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB11	16-18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB12	6-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB12	12-14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB13	0-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB13	3-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB13	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB13	8-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB13	10-12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB14	0-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB14	3-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB14	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB14	8-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB15	0-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB15	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB15	12-14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB16	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB16	8-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB16	10-12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB16	12-14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB18	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB18	10-12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB18	12-14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB19	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB19	8-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB19	12-14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB20	6-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB20	10-12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB20	14-16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB20	16-18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB21	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB21	6-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table E-1
Sediment Data

East White Lake Field
Vermilion Parish, Louisiana

Boring ID	Core Interval (ft bgs)	Aliphatic C6-C8		Aliphatic >C8-C10		Aliphatic >C10-C12		Aliphatic >C12-C16		Aliphatic >C16-C35		Aromatic >C8-C10		Aromatic >C10-C12		Aromatic >C12-C16		Aromatic >C16-C21		Aromatic >C21-C35		Total PCBs				**Total PCBs Average**		Aroclor-1016				Aroclor-1221				Aroclor-1232			
		Pisani		Pisani		Pisani		Pisani		Pisani		Pisani		Pisani		Pisani		Pisani		Pisani		ICON		Pisani				ICON		Pisani		ICON		Pisani		ICON		Pisani	
		mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet
AB21	8-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB21	12-14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB22	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB22	6-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB22	12-14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB22	16-18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED4	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	ND	**ND**	**ND**	<0.0971	<0.0375	<0.0673	<0.04	<0.0971	<0.0375	<0.0673	<0.04	<0.0971	<0.0375	<0.0673	<0.04
SED5	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	ND	**ND**	**ND**	<0.0785	<0.0333	<0.08	<0.04	<0.0785	<0.0333	<0.08	<0.04	<0.0785	<0.0333	<0.08	<0.04
SED6	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	ND	**ND**	**ND**	<1.19	<0.419	<0.408	<0.200	<1.19	<0.419	<0.408	<0.200	<1.19	<0.419	<0.408	<0.200
SED7	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED7	2-4	-	-	-	-	16.1	6.41	152	60.5	619	247	-	-	ND	<10	ND	<15	ND	<15	ND	<15	ND	ND	ND	ND	**ND**	**ND**	<0.0979	<0.0373	<0.1	<0.04	<0.0979	<0.0373	<0.1	<0.04	<0.0979	<0.0373	<0.1	<0.04
SED7	4-6	-	-	-	-	ND	<15	58.1	16.5	556	158	-	-	ND	<10	ND	<15	ND	<15	ND	<15	0.204	0.0622	0.292	0.083	**0.248**	**0.0726**	<0.114	<0.0348	<0.141	<0.04	<0.114	<0.0348	<0.141	<0.04	<0.114	<0.0348	<0.141	<0.04
SED8	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	ND	**ND**	**ND**	<1.29	<0.395	<0.617	<0.198	<1.29	<0.395	<0.617	<0.198	<1.29	<0.395	<0.617	<0.198
SED8	2-4	-	-	-	-	ND	<15	101	37.4	333	123	-	-	ND	<10	ND	<15	ND	<15	ND	<15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED9	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED9	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED10	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED10	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED11	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED11	2-4	-	-	-	-	ND	<15	27.2	10	148	54.5	-	-	**ND**	**<10**	**ND**	**<15**	**ND**	**<15**	**ND**	**<15**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED12	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED12	2-4	-	-	-	-	ND	<15	166	47.1	616	175	-	-	**ND**	**<10**	**ND**	**<15**	**ND**	**<15**	**ND**	**<15**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
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SED13	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED13	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED14	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED14	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED16	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED17	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED17	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED18	0-2	-	-	-	-	ND	<15	44.4	11.5	183	47.3	-	-	**ND**	**<10**	**ND**	**<15**	**ND**	**<15**	**ND**	**<15**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
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SED19	0-2	-	-	-	-	18.4	6.51	262	92.7	1250	442	-	-	**ND**	**<10**	29.4	10.4	85.9	30.4	156	55.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED19	2-4	-	-	-	-	14.8	5.99	178	72	611	247	-	-	**ND**	**<10**	**ND**	**<15**	**ND**	**<15**	**ND**	**<15**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
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SED20	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED21	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED21	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED21	4-6	-	-	-	-	ND	<15	48.9	19.3	214	84.5	-	-	**ND**	**<10**	**ND**	**<15**	**ND**	**<15**	**ND**	**<15**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
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SED22	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED23	0-2	-	-	-	-	ND	<15	103	36.3	1130	400	-	-	**ND**	**<10**	20.3	7.18	96	34	185	65.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
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SED24	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED24	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED25	0-2	-	-	-	-	ND	<15	62.9	21	290	96.8	-	-	**ND**	**<10**	**ND**	**<15**	**ND**	**<15**	**ND**	**<15**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED25	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED26	0-2	-	-	-	-	90.5	31.4	816	283	2560	890	-	-	14.5	5.04	273	94.9	464	161	519	180	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED26	2-4	-	-	-	-	ND	<15	152	34.5	489	111	-	-	**ND**	**<10**	35.9	8.16	68.3	15.5	34	7.72	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED27	0-2	-	-	-	-	ND	<15	24.3	6.79	275	76.8	-	-	**ND**	**<10**	**ND**	**<15**	**ND**	**<15**	**ND**	**<15**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
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SED28	0-2	-	-	-	-	514	110	561	120	12600	2690	-	-	30.8	6.6	790	169	1360	290	2020	433	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED28	2-4	-	-	-	-	ND	<15	51.8	7.72	1110	165	-	-	**ND**	**<10**	**ND**	**<15**	**ND**	**<15**	**ND**	**<15**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED29	0-2	-	-	-	-	ND	<15	258	53.6	2250	469	-	-	**ND**	**<10**	ND	<15	290	60.4	880	183	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED29	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED30	0-2	-	-	-	-	129	17.9	2600	362	9710	1350	-	-	**ND**	**<10**	184	25.6	719	100	1550	215	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED30	2-4	-	-	-	-	ND	<15	87.8	13.7	383	59.7	-	-	**ND**	**<10**	**ND**	**<15**	**ND**	**<15**	**ND**	**<15**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED31	0-2	-	-	-	-	32.2	9.46	297	87.3	1320	389	-	-	**ND**	**<10**	**ND**	**<15**	132	38.7	205	60.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED31	2-4	-	-	-	-	110	22.3	486	98.1	941	190	-	-	**ND**	**<10**	39.4	7.95	94.6	19.1	84.7	17.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED31	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED32	0-2	-	-	-	-	93.6	26.3	915	257	2620	736	-	-	**ND**	**<10**	59.1	16.6	238	66.9	350	98.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED32	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED32	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED33	0-2	-	-	-	-	ND	<15	205	40.9	466	93.2	-	-	**ND**	**<10**	**ND**	**<15**	**ND**	**<15**	**ND**	**<15**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED33	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED33	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPA-Sed 15-N	0-2	-	-	-	-	ND	<15	ND	<10	ND	<10	-	-	ND	<10	ND	<15	ND	<15	ND	<15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPA-Sed-15-W	0-2	-	-	-	-	ND	<15	ND	<10	ND	<10	-	-	ND	<10	ND	<15	ND	<15	ND	<15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table E-1
Sediment Data

East White Lake Field
Vermilion Parish, Louisiana

		Aliphatic C6-C8		Aliphatic >C8-C10		Aliphatic >C10-C12		Aliphatic >C12-C16		Aliphatic >C16-C35		Aromatic >C8-C10		Aromatic >C10-C12		Aromatic >C12-C16		Aromatic >C16-C21		Aromatic >C21-C35		Total PCBs				**Total PCBs Average**		Aroclor-1016				Aroclor-1221				Aroclor-1232			
		Pisani		Pisani		Pisani		Pisani		Pisani		Pisani		Pisani		Pisani		Pisani		Pisani		ICON		Pisani				ICON		Pisani		ICON		Pisani		ICON		Pisani	
Boring ID	**Core Interval (ft bgs)**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet
MPA-Sed-15-W-2	0-2	-	-	-	-	ND	<15	ND	<10	ND	<10	-	-	ND	<10	ND	<15	ND	<15	ND	<15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPA-Sed-15-E	0-2	-	-	-	-	ND	<15	ND	<10	ND	<10	-	-	ND	<10	ND	<15	ND	<15	ND	<15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPA-Sed-15-E-2	0-2	-	-	-	-	ND	<15	ND	<10	ND	<10	-	-	ND	<10	ND	<15	ND	<15	ND	<15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPA-AB5 (A)	4-6	-	-	-	-	ND	<15	ND	<10	ND	<10	-	-	ND	<10	ND	<15	ND	<15	ND	<15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPA-AB5 (B)	4-6	-	-	-	-	ND	<15	ND	<10	ND	<10	-	-	ND	<10	ND	<15	ND	<15	ND	<15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPA-AB5 (C)	4-6	-	-	-	-	ND	<15	ND	<10	ND	<10	-	-	ND	<10	ND	<15	ND	<15	ND	<15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPA-AB-6	8-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPA-AB8	6-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPA-AB13	0-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB-6	8-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB-13	0-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB-13 SO-E	0-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB-14	0-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB-8	6-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB-8 SO-S	6-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB-5 SO-NE	4-6	-	-	-	-	ND	<15	ND	<10	ND	<10	-	-	ND	<10	ND	<15	ND	<15	ND	<15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB-5 SO-NW	4-6	-	-	-	-	ND	<15	ND	<10	**108**	38.7	-	-	ND	<10	ND	<15	ND	<15	ND	<15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB-5a	4-5.5	-	-	-	-	ND	<15	ND	<10	**87.8**	31.6	-	-	ND	<10	ND	<15	ND	<15	ND	<15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB-15	4-5.5	-	-	-	-	ND	<15	**45.8**	16.5	**154**	55.3	-	-	ND	<10	ND	<15	ND	<15	ND	<15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED-8	0-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	-	-	**ND**	**ND**	<0.103	<0.04	-	-	<0.103	<0.04	-	-	<0.103	<0.04	-	-
SED-9	0-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	-	-	**ND**	**ND**	<1.36	<0.4	-	-	<1.36	<0.4	-	-	<1.36	<0.4	-	-
SED-11	0-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	-	-	**ND**	**ND**	<1.24	<0.4	-	-	<1.24	<0.4	-	-	<1.24	<0.4	-	-
SED-13	0-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	-	-	**ND**	**ND**	<0.163	<0.04	-	-	<0.163	<0.04	-	-	<0.163	<0.04	-	-
SED-19	0-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	-	-	**ND**	**ND**	<1.87	<0.4	-	-	<1.87	<0.4	-	-	<1.87	<0.4	-	-
SED-24	0-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	-	-	**ND**	**ND**	<0.128	<0.04	-	-	<0.128	<0.04	-	-	<0.128	<0.04	-	-
SED-26	0-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	-	-	**ND**	**ND**	<0.134	<0.04	-	-	<0.134	<0.04	-	-	<0.134	<0.04	-	-
SED-31	0-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	-	-	**ND**	**ND**	<0.124	<0.04	-	-	<0.124	<0.04	-	-	<0.124	<0.04	-	-
SED-120 *	0-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-01	0-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-01	0.5-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-01	5-7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-02	0-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-02	0.5-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-02	5-7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-03	0-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-03	0.5-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-03	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-04	0-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-04	0.5-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-04	3-5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-05	0-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-05	0.5-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-05	6-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-06	0-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-06	0.5-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-06	5-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-07	0-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-07	0.5-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-07	6.5-7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-08	0-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-08	0.5-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-08	7.5-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-09	0-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-09	0.5-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-09	6-7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-09dup	0.5-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-01	0-0.5	ND	<15	ND	<15	ND	<15	ND	<10	ND	<10	ND	<10	ND	<10	ND	<15	ND	<15	ND	<15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-01	0.5-2	ND	<15	ND	<15	ND	<15	26	10.8	81.9	34	ND	<10	ND	<10	ND	<15	ND	<15	ND	<15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-01	2-4.3	ND	<15	ND	<15	ND	<15	187	86.3	773	357	ND	<10	ND	<10	ND	<15	ND	<15	ND	<15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-01	4.3-4.7	ND	<15	ND	<15	ND	<15	ND	<10	ND	<10	ND	<10	ND	<10	ND	<15	ND	<15	ND	<15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-01	8-9	ND	<15	ND	<15	ND	<15	ND	<10	ND	<10	ND	<10	ND	<10	ND	<15	ND	<15	ND	<15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-02	0-0.5	ND	<15	ND	<15	ND	<15	ND	<10	ND	<10	ND	<10	ND	<10	ND	<15	ND	<15	ND	<15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-02	0.5-2	ND	<15	ND	<15	ND	<15	ND	<10	ND	<10	ND	<10	ND	<10	ND	<15	ND	<15	ND	<15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-02	3-4	ND	<15	ND	<15	ND	<15	50.4	17	176	59.4	ND	<10	ND	<10	ND	<15	ND	<15	ND	<15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-02	4-5	ND	<15	ND	<15	ND	<15	295	104	974	343	ND	<10	ND	<10	ND	<15	ND	<15	ND	<15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-02a	3-5	ND	<15	ND	<15	ND	<15	121	34.1	346	97.7	ND	<10	ND	<10	ND	<15	ND	<15	ND	<15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-02a	7-8	ND	<15	ND	<15	ND	<15	ND	<10	ND	<10	ND	<10	ND	<10	ND	<15	ND	<15	ND	<15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-03	0-0.5	ND	<15	ND	<15	ND	<15	ND	<10	ND	<10	ND	<10	ND	<10	ND	<15	ND	<15	ND	<15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-03	0.5-2	<44.2	<15	<44.2	<15	<44.2	<15	ND	<10	ND	<10	ND	<10	ND	<10	<44.2	<15	<44.2	<15	<44.2	<15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-03	4-6	ND	<15	ND	<15	28.7	15.1	200	105	551	290	ND	<10	ND	<10	ND	<15	89.2	46.9	ND	<15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-03	9-10	ND	<15	ND	<15	ND	<15	ND	<10	ND	<10	ND	<10	ND	<10	ND	<15	ND	<15	ND	<15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-04	0-0.5	<19.3	<15	<19.3	<15	ND	<15	ND	<10	ND	<10	ND	<10	ND	<10	ND	<15	ND	<15	ND	<15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table E-1
Sediment Data

East White Lake Field
Vermilion Parish, Louisiana

		Aliphatic C6-C8		Aliphatic >C8-C10		Aliphatic >C10-C12		Aliphatic >C12-C16		Aliphatic >C16-C35		Aromatic >C8-C10		Aromatic >C10-C12		Aromatic >C12-C16		Aromatic >C16-C21		Aromatic >C21-C35		Total PCBs				**Total PCBs Average**		Aroclor-1016				Aroclor-1221				Aroclor-1232			
		Pisani		Pisani		Pisani		Pisani		Pisani		Pisani		Pisani		Pisani		Pisani		Pisani		ICON		Pisani				ICON		Pisani		ICON		Pisani		ICON		Pisani	
Boring ID	**Core Interval (ft bgs)**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet
SP-MPA-04	0.5-2	ND	<15	ND	<15	ND	<15	ND	<10	ND	<10	ND	<10	ND	<10	ND	<15	ND	<15	ND	<15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-04	5-7	ND	<15	ND	<15	ND	<15	162	56.9	339	119	ND	<10	ND	<10	ND	<15	ND	<15	56.1	19.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-04	9-10	ND	<15	ND	<15	ND	<15	ND	<10	ND	<10	ND	<10	ND	<10	ND	<15	ND	<15	ND	<15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-1	0-2	ND	<15	ND	<15	ND	<15	ND	<10	ND	<10	ND	<10	ND	<10	ND	<15	ND	<15	ND	<15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-1	2-4	ND	<15	ND	<15	ND	<15	ND	<10	ND	<10	ND	<10	ND	<10	ND	<15	ND	<15	ND	<15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-1	6-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-1	9-13	ND	<15	ND	<15	ND	<15	ND	<10	ND	<10	ND	<10	ND	<10	ND	<15	ND	<15	ND	<15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-2	0-2	ND	<15	ND	<15	ND	<15	101	63.3	220	138	ND	<10	ND	<10	ND	<15	ND	<15	ND	<15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-2	2-4	ND	<15	ND	<15	ND	<15	ND	<10	ND	<10	ND	<10	ND	<10	ND	<15	ND	<15	ND	<15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-2	8-10	ND	<15	ND	<15	ND	<15	ND	<10	ND	<10	ND	<10	ND	<10	ND	<15	ND	<15	ND	<15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-2	14-16	ND	<15	ND	<15	ND	<15	ND	<10	ND	<10	ND	<10	ND	<10	ND	<15	ND	<15	ND	<15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-3	0-2	ND	<150	ND	<150	468	353	3310	2500	9420	7110	ND	<20	98.5	74.4	534	403	1420	1070	1810	1370	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-3	4-6/4-8	ND	<75	ND	<75	317	94.9	2920	874	5790	1730	ND	<10	76.3	22.8	870	260	1220	365	1140	341	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-3	10-13	ND	<15	ND	<15	ND	<15	ND	<10	ND	<10	ND	<10	ND	<10	ND	<15	ND	<15	ND	<15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-4	0-2	ND	<15	ND	<15	ND	<15	ND	<10	ND	<10	ND	<10	ND	<10	ND	<15	ND	<15	ND	<15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-4	2-4	ND	<75	ND	<75	171	85.4	1360	678	3720	1860	ND	<10	43.2	21.6	410	205	680	340	570	285	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-4	4-11	471	311	ND	<300	465	307	2790	1840	6480	4280	176	116	480	317	2360	1560	3230	2130	3090	2040	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-4	11-12.5	626	325	632	328	699	363	3950	2050	6710	3480	281	146	407	211	2660	1380	2700	1400	813	422	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-5	0-2	ND	<15	ND	<15	ND	<15	325	151	1090	508	ND	<10	ND	<10	ND	<15	ND	<15	ND	<15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-5	2-13	420	298	267	189	443	314	2260	1600	3950	2800	83.4	59.1	169	120	938	665	1150	817	870	617	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-6	0-2	ND	<15	ND	<15	ND	<15	ND	<10	ND	<10	ND	<10	ND	<10	ND	<15	ND	<15	ND	<15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-6	4-6	ND	<15	ND	<15	ND	<15	ND	<10	ND	<10	ND	<10	ND	<10	ND	<15	ND	<15	ND	<15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-6	8-10	ND	<15	ND	<15	ND	<15	ND	<10	ND	<10	ND	<10	ND	<10	ND	<15	ND	<15	ND	<15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-6	10-13	ND	<15	ND	<15	ND	<15	ND	<10	ND	<10	ND	<10	ND	<10	ND	<15	ND	<15	ND	<15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-7	0-2	ND	<15	ND	<15	ND	<15	ND	<10	ND	<10	ND	<10	ND	<10	ND	<15	ND	<15	ND	<15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-7	2-4	ND	<15	ND	<15	ND	<15	ND	<10	ND	<10	ND	<10	ND	<10	ND	<15	ND	<15	ND	<15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-7	4-6	ND	<15	ND	<15	84.4	22.1	412	108	1090	286	ND	<10	ND	<10	ND	<15	81.3	21.3	ND	<15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-7	6-8	ND	<15	ND	<15	ND	<15	ND	<10	ND	<10	ND	<10	ND	<10	ND	<15	ND	<15	ND	<15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-8	0-2	ND	<15	ND	<15	ND	<15	ND	<10	ND	<10	ND	<10	ND	<10	ND	<15	ND	<15	ND	<15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-8	2-4	ND	<15	ND	<15	ND	<15	ND	<10	ND	<10	ND	<10	ND	<10	ND	<15	ND	<15	ND	<15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-8	4-6	ND	<15	ND	<15	ND	<15	133	82	256	158	19.9	12.3	ND	<10	73.6	45.4	45.9	28.3	ND	<15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-8	6-8	ND	<15	ND	<15	ND	<15	68.4	25.5	166	62	ND	<10	ND	<10	ND	<15	61.9	23.1	ND	<15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED-BK-01	0-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED-BK-02	0-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED-BK-03	0-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED-BK-04	0-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED-BK-05	0-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED-BK-06	0-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED-BK-07	0-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED-BK-08	0-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED-BK-09	0-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED-BK-10	0-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	-	-	-	-	<0.113	<0.0396	-	-	<0.0679	<0.0962	-	-	<0.1245	<0.1528	-	-
SED-BK-11	0-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table E-1
Sediment Data

East White Lake Field
Vermilion Parish, Louisiana

		Aroclor-1242				Aroclor-1248				Aroclor-1254				**Aroclor-1254 Average**		Aroclor-1260				2-Methylnaphthalene				**2-MN Average**		Acenaphthene				**Acenaphthene Average**		Acenaphthylene				**Acenaphthylene Average**	
		ICON		Pisani		ICON		Pisani		ICON		Pisani				ICON		Pisani		ICON		Pisani				ICON		Pisani				ICON		Pisani			
Boring ID	**Core Interval (ft bgs)**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**
B2	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B2	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B2 Rerun	6-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B2 Rerun	10-10.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B3	4-7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B3 Rerun	9-12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B4 Rerun	0-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B4 Rerun	3-5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B4	5-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B5	0-1.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B5	4-5.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B5 Rerun	8-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B6	1.5-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B6	3-10.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B7	4-5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B7	8-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B8 Rerun	5.5-7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B8	9.5-11.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B9 Rerun	0-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B9	0.5-3.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B9 Rerun	8-9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B10	1.5-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B10	4-7.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B12	0-1.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B12 Rerun	3.5-5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B12	6.5-7.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B13 Rerun	3-5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B13 Rerun	7.5-9.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B14	0-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B14	4-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B15 Rerun	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B15	8-11.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B17	0-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B17 Rerun	3-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B17	8.5-10.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B17 Rerun	10.5-12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B18	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B18	4-5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B18	7.5-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B18	10-11.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B19	1-2.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B19	2.5-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B19	4-6.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B19 Rerun	6.5-9.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B20	3-4.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B20	7.5-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B21	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B21	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS1	0-2.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS1	2.1-2.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS2	0-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS2	1-1.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS3	0-0.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*<0.885*	*<0.33*	-	-	***ND***	***ND***	-	-	-	-	-	-	-	-	-	-	-	-
SS3	0.6-2.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*<0.885*	*<0.36*	-	-	***ND***	***ND***	-	-	-	-	-	-	-	-	-	-	-	-
SS3	2.2-2.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*<0.957*	*<0.33*	-	-	***ND***	***ND***	-	-	-	-	-	-	-	-	-	-	-	-
SS4	0-0.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS4	0.6-2.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS4	2.7-3.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS5	0-2.15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*<0.776*	*<0.33*	-	-	***ND***	***ND***	-	-	-	-	-	-	-	-	-	-	-	-
SS6	0-1.65	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS6	1.65-2.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS7	0-1.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*<1.17*	*<0.33*	-	-	***ND***	***ND***	-	-	-	-	-	-	-	-	-	-	-	-
SS7	1.4-2.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.29	2.03	-	-	**5.29**	**2.03**	-	-	-	-	-	-	-	-	-	-	-	-
SS7	2.5-3.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*<0.979*	*<0.33*	-	-	***ND***	***ND***	-	-	-	-	-	-	-	-	-	-	-	-
SS8	0-1.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS8	1.9-2.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS8	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS8	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS9	0-1.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS9	1.7-3.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS9	3.2-3.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS10	0-1.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS10	1.5-2.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS10	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS10	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS11	0-2.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*<0.466*	*<0.33*	-	-	***ND***	***ND***	-	-	-	-	-	-	-	-	-	-	-	-

Table E-1
Sediment Data

East White Lake Field
Vermilion Parish, Louisiana

		Aroclor-1242				Aroclor-1248				Aroclor-1254				**Aroclor-1254 Average**		Aroclor-1260				2-Methylnaphthalene				**2-MN Average**		Acenaphthene				**Acenaphthene Average**		Acenaphthylene				**Acenaphthylene Average**	
		ICON		Pisani		ICON		Pisani		ICON		Pisani				ICON		Pisani		ICON		Pisani				ICON		Pisani				ICON		Pisani			
Boring ID	**Core Interval (ft bgs)**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**
SS11	2.5-3.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*<0.596*	*<0.33*	-	-	***ND***	***ND***	-	-	-	-	-	-	-	-	-	-	-	-
SS11	3.4-3.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*<0.611*	*<0.33*	-	-	***ND***	***ND***	-	-	-	-	-	-	-	-	-	-	-	-
SS12	0-3.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*<0.609*	*<0.33*	-	-	***ND***	***ND***	-	-	-	-	-	-	-	-	-	-	-	-
SS13	0-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS13	1-2.75	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS13	2.75-3.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS14	0-0.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS14	0.8-1.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS15	0-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS15	3-3.25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB1	0-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB1	3-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB1	6-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB1	12-14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB2	0-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB2	3-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB2	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB2	10-12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB3	0-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB3	3-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB3	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB3	8-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB4	0-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB4	3-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB4	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB4	10-12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB5	0-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB5	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB5	10-12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB5	14-16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB5	18-20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB6	8-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB6	12-14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB7	6-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB7	10-12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB8	6-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB8	10-12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB8	14-16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB9	6-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB9	12-14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB9	18-20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB10	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB10	12-14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB10	14-16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB11	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB11	6-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB11	16-18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB12	6-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB12	12-14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB13	0-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB13	3-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB13	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB13	8-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB13	10-12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB14	0-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB14	3-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB14	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB14	8-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB15	0-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB15	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB15	12-14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB16	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB16	8-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB16	10-12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB16	12-14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB18	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB18	10-12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB18	12-14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB19	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB19	8-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB19	12-14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB20	6-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB20	10-12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB20	14-16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB20	16-18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB21	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB21	6-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table E-1
Sediment Data

East White Lake Field
Vermilion Parish, Louisiana

		Aroclor-1242				Aroclor-1248				Aroclor-1254				**Aroclor-1254 Average**		Aroclor-1260				2-Methylnaphthalene				**2-MN Average**		Acenaphthene				**Acenaphthene Average**		Acenaphthylene				**Acenaphthylene Average**	
		ICON		Pisani		ICON		Pisani		ICON		Pisani				ICON		Pisani		ICON		Pisani				ICON		Pisani				ICON		Pisani			
Boring ID	**Core Interval (ft bgs)**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**
AB21	8-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB21	12-14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB22	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB22	6-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB22	12-14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB22	16-18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED4	0-2	*<0.0971*	*<0.0375*	*<0.0673*	*<0.04*	*<0.0971*	*<0.0375*	*<0.0673*	*<0.04*	*<0.0971*	*<0.0375*	*<0.0673*	*<0.04*	***ND***	***ND***	*<0.0971*	*<0.0375*	*<0.0673*	*<0.04*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED5	0-2	*<0.0785*	*<0.0333*	*<0.08*	*<0.04*	*<0.0785*	*<0.0333*	*<0.08*	*<0.04*	*<0.0785*	*<0.0333*	*<0.08*	*<0.04*	***ND***	***ND***	*<0.0785*	*<0.0333*	*<0.08*	*<0.04*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED6	0-2	*<1.19*	*<0.419*	*<0.408*	*<0.200*	*<1.19*	*<0.419*	*<0.408*	*<0.200*	*<1.19*	*<0.419*	*<0.408*	*<0.200*	***ND***	***ND***	*<1.19*	*<0.419*	*<0.408*	*<0.200*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED7	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED7	2-4	*<0.0979*	*<0.0373*	*<0.1*	*<0.04*	*<0.0979*	*<0.0373*	*<0.1*	*<0.04*	*<0.0979*	*<0.0373*	*<0.1*	*<0.04*	***ND***	***ND***	*<0.0979*	*<0.0373*	*<0.1*	*<0.04*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED7	4-6	*<0.114*	*<0.0348*	*<0.141*	*<0.04*	*<0.114*	*<0.0348*	*<0.141*	*<0.04*	0.204	0.0622	0.292	0.083	**0.248**	**0.0726**	*<0.114*	*<0.0348*	*<0.141*	*<0.04*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED8	0-2	*<1.29*	*<0.395*	*<0.617*	*<0.198*	*<1.29*	*<0.395*	*<0.617*	*<0.198*	*<1.29*	*<0.395*	*<0.617*	*<0.198*	***ND***	***ND***	*<1.29*	*<0.395*	*<0.617*	*<0.198*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED8	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED9	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED9	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED10	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED10	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED11	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED11	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED12	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED12	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED12	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED13	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED13	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED14	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED14	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED16	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED17	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED17	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED18	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED18	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED19	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED19	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED20	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED20	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED21	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED21	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED21	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED21	6-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED22	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED22	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED23	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED23	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED24	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED24	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED25	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED25	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED26	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED26	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED27	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED27	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED28	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED28	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED29	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED29	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED30	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED30	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED31	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED31	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED31	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED32	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED32	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED32	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED33	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED33	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED33	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPA-Sed 15-N	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPA-Sed-15-W	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table E-1
Sediment Data

East White Lake Field
Vermilion Parish, Louisiana

		Aroclor-1242				Aroclor-1248				Aroclor-1254				**Aroclor-1254 Average**		Aroclor-1260				2-Methylnaphthalene				**2-MN Average**		Acenaphthene				**Acenaphthene Average**		Acenaphthylene				**Acenaphthylene Average**	
		ICON		Pisani		ICON		Pisani		ICON		Pisani				ICON		Pisani		ICON		Pisani				ICON		Pisani				ICON		Pisani			
Boring ID	**Core Interval (ft bgs)**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**
MPA-Sed-15-W-2	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPA-Sed-15-E	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPA-Sed-15-E-2	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPA-AB5 (A)	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPA-AB5 (B)	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPA-AB5 (C)	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPA-AB-6	8-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPA-AB8	6-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPA-AB13	0-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB-6	8-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB-13	0-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB-13 SO-E	0-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB-14	0-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB-8	6-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB-8 SO-S	6-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB-5 SO-NE	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB-5 SO-NW	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB-5a	4-5.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB-15	4-5.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED-8	0-0.5	*<0.103*	*<0.04*	-	-	*<0.103*	*<0.04*	-	-	*<0.103*	*<0.04*	-	-	***ND***	***ND***	*<0.103*	*<0.04*	-	-	-	-	*<0.83*	*<0.325*	***ND***	***ND***	-	-	*<0.83*	*<0.325*	***ND***	***ND***	-	-	*<0.83*	*<0.325*	***ND***	***ND***
SED-9	0-0.5	*<1.36*	*<0.4*	-	-	*<1.36*	*<0.4*	-	-	*<1.36*	*<0.4*	-	-	***ND***	***ND***	*<1.36*	*<0.4*	-	-	-	-	*<1.07*	*<0.326*	***ND***	***ND***	-	-	*<1.07*	*<0.326*	***ND***	***ND***	-	-	*<1.07*	*<0.326*	***ND***	***ND***
SED-11	0-0.5	*<1.24*	*<0.4*	-	-	*<1.24*	*<0.4*	-	-	*<1.24*	*<0.4*	-	-	***ND***	***ND***	*<1.24*	*<0.4*	-	-	-	-	*<0.96*	*<0.327*	***ND***	***ND***	-	-	*<0.96*	*<0.327*	***ND***	***ND***	-	-	*<0.96*	*<0.327*	***ND***	***ND***
SED-13	0-0.5	*<0.163*	*<0.04*	-	-	*<0.163*	*<0.04*	-	-	*<0.163*	*<0.04*	-	-	***ND***	***ND***	*<0.163*	*<0.04*	-	-	-	-	*<1.2*	*<0.329*	***ND***	***ND***	-	-	*<1.2*	*<0.329*	***ND***	***ND***	-	-	*<1.2*	*<0.329*	***ND***	***ND***
SED-19	0-0.5	*<1.87*	*<0.4*	-	-	*<1.87*	*<0.4*	-	-	*<1.87*	*<0.4*	-	-	***ND***	***ND***	*<1.87*	*<0.4*	-	-	-	-	*<1.52*	*<0.328*	***ND***	***ND***	-	-	*<1.52*	*<0.328*	***ND***	***ND***	-	-	*<1.52*	*<0.328*	***ND***	***ND***
SED-24	0-0.5	*<0.128*	*<0.04*	-	-	*<0.128*	*<0.04*	-	-	*<0.128*	*<0.04*	-	-	***ND***	***ND***	*<0.128*	*<0.04*	-	-	-	-	*<0.97*	*<0.325*	***ND***	***ND***	-	-	*<0.97*	*<0.325*	***ND***	***ND***	-	-	*<0.97*	*<0.325*	***ND***	***ND***
SED-26	0-0.5	*<0.134*	*<0.04*	-	-	*<0.134*	*<0.04*	-	-	*<0.134*	*<0.04*	-	-	***ND***	***ND***	*<0.134*	*<0.04*	-	-	-	-	*<1.04*	*<0.328*	***ND***	***ND***	-	-	*<1.04*	*<0.328*	***ND***	***ND***	-	-	*<1.04*	*<0.328*	***ND***	***ND***
SED-31	0-0.5	*<0.124*	*<0.04*	-	-	*<0.124*	*<0.04*	-	-	*<0.124*	*<0.04*	-	-	***ND***	***ND***	*<0.124*	*<0.04*	-	-	-	-	*<1.02*	*<0.327*	***ND***	***ND***	-	-	*<1.02*	*<0.327*	***ND***	***ND***	-	-	*<1.02*	*<0.327*	***ND***	***ND***
SED-120 *	0-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*<1.89*	*<0.33*	***ND***	***ND***	-	-	*<1.89*	*<0.33*	***ND***	***ND***	-	-	*<1.89*	*<0.33*	***ND***	***ND***
Hg-MPA-01	0-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-01	0.5-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-01	5-7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-02	0-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-02	0.5-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-02	5-7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-03	0-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-03	0.5-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-03	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-04	0-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-04	0.5-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-04	3-5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-05	0-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-05	0.5-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-05	6-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-06	0-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-06	0.5-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-06	5-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-07	0-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-07	0.5-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-07	6.5-7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-08	0-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-08	0.5-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-08	7.5-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-09	0-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-09	0.5-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-09	6-7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-09dup	0.5-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-01	0-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-01	0.5-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-01	2-4.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-01	4.3-4.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-01	8-9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-02	0-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-02	0.5-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-02	3-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-02	4-5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-02a	3-5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-02a	7-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-03	0-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-03	0.5-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-03	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-03	9-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-04	0-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table E-1
Sediment Data

East White Lake Field
Vermilion Parish, Louisiana

		Aroclor-1242				Aroclor-1248				Aroclor-1254				**Aroclor-1254 Average**		Aroclor-1260				2-Methylnaphthalene				**2-MN Average**		Acenaphthene				**Acenaphthene Average**		Acenaphthylene				**Acenaphthylene Average**	
		ICON		Pisani		ICON		Pisani		ICON		Pisani				ICON		Pisani		ICON		Pisani				ICON		Pisani				ICON		Pisani			
Boring ID	**Core Interval (ft bgs)**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**
SP-MPA-04	0.5-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-04	5-7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-04	9-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-1	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-1	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-1	6-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-1	9-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-2	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-2	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-2	8-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-2	14-16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-3	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-3	4-6/4-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-3	10-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-4	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-4	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-4	4-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-4	11-12.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-5	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-5	2-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-6	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-6	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-6	8-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-6	10-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-7	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-7	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-7	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-7	6-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-8	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-8	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-8	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-8	6-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED-BK-01	0-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*<1.03*	*<0.328*	***ND***	***ND***	-	-	*<1.03*	*<0.328*	***ND***	***ND***	-	-	*<1.03*	*<0.328*	***ND***	***ND***
SED-BK-02	0-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*<0.97*	*<0.326*	***ND***	***ND***	-	-	*<0.97*	*<0.326*	***ND***	***ND***	-	-	*<0.97*	*<0.326*	***ND***	***ND***
SED-BK-03	0-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*<1.14*	*<0.327*	***ND***	***ND***	-	-	*<1.14*	*<0.327*	***ND***	***ND***	-	-	*<1.14*	*<0.327*	***ND***	***ND***
SED-BK-04	0-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*<0.896*	*<0.326*	***ND***	***ND***	-	-	*<0.896*	*<0.326*	***ND***	***ND***	-	-	*<0.896*	*<0.326*	***ND***	***ND***
SED-BK-05	0-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*<1.01*	*<0.327*	***ND***	***ND***	-	-	*<1.01*	*<0.327*	***ND***	***ND***	-	-	*<1.01*	*<0.327*	***ND***	***ND***
SED-BK-06	0-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*<1.09*	*<0.326*	***ND***	***ND***	-	-	*<1.09*	*<0.326*	***ND***	***ND***	-	-	*<1.09*	*<0.326*	***ND***	***ND***
SED-BK-07	0-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*<1.42*	*<0.325*	***ND***	***ND***	-	-	*<1.42*	*<0.325*	***ND***	***ND***	-	-	*<1.42*	*<0.325*	***ND***	***ND***
SED-BK-08	0-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*<1.35*	*<0.327*	***ND***	***ND***	-	-	*<1.35*	*<0.327*	***ND***	***ND***	-	-	*<1.35*	*<0.327*	***ND***	***ND***
SED-BK-09	0-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*<1.34*	*<0.325*	***ND***	***ND***	-	-	*<1.34*	*<0.325*	***ND***	***ND***	-	-	*<1.34*	*<0.325*	***ND***	***ND***
SED-BK-10	0-0.5	*<0.1811*	*<0.2094*	-	-	*<0.2377*	*<0.2660*	-	-	*<0.2943*	*<0.3226*	-	-	***ND***	***ND***	*<0.2943*	*<0.3226*	-	-	-	-	*<1.3*	*<0.326*	***ND***	***ND***	-	-	*<1.3*	*<0.326*	***ND***	***ND***	-	-	*<1.3*	*<0.326*	***ND***	***ND***
SED-BK-11	0-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*<1.65*	*<0.326*	***ND***	***ND***	-	-	*<1.65*	*<0.326*	***ND***	***ND***	-	-	*<1.65*	*<0.326*	***ND***	***ND***

Table E-1
Sediment Data

East White Lake Field
Vermilion Parish, Louisiana

		Anthracene				**Anthracene Average**		Benzo(a)anthracene				**B(a)A Average**		Benzo(a)pyrene				**B(a)P Average**		Benzo(b)fluoranthene				**B(b)F Average**		Benzo(k)fluoranthene				**B(k)F Average**		Chrysene				**Chrysene Average**	
		ICON		Pisani				ICON		Pisani				ICON		Pisani				ICON		Pisani				ICON		Pisani				ICON		Pisani			
Boring ID	**Core Interval (ft bgs)**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**
B2	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B2	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B2 Rerun	6-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B2 Rerun	10-10.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B3	4-7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B3 Rerun	9-12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B4 Rerun	0-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B4 Rerun	3-5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B4	5-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B5	0-1.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B5	4-5.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B5 Rerun	8-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B6	1.5-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B6	3-10.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B7	4-5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B7	8-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B8 Rerun	5.5-7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B8	9.5-11.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B9 Rerun	0-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B9	0.5-3.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B9 Rerun	8-9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B10	1.5-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B10	4-7.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B12	0-1.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B12 Rerun	3.5-5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B12	6.5-7.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B13 Rerun	3-5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B13 Rerun	7.5-9.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B14	0-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B14	4-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B15 Rerun	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B15	8-11.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B17	0-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B17 Rerun	3-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B17	8.5-10.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B17 Rerun	10.5-12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B18	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B18	4-5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B18	7.5-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B18	10-11.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B19	1-2.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B19	2.5-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B19	4-6.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B19 Rerun	6.5-9.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B20	3-4.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B20	7.5-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B21	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B21	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS1	0-2.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS1	2.1-2.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS2	0-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS2	1-1.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS3	0-0.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS3	0.6-2.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS3	2.2-2.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS4	0-0.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS4	0.6-2.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS4	2.7-3.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS5	0-2.15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS6	0-1.65	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS6	1.65-2.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS7	0-1.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS7	1.4-2.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS7	2.5-3.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS8	0-1.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS8	1.9-2.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS8	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS8	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS9	0-1.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS9	1.7-3.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS9	3.2-3.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS10	0-1.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS10	1.5-2.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS10	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS10	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS11	0-2.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table E-1
Sediment Data

East White Lake Field
Vermilion Parish, Louisiana

		Anthracene				Anthracene Average		Benzo(a)anthracene				B(a)A Average		Benzo(a)pyrene				B(a)P Average		Benzo(b)fluoranthene				B(b)F Average		Benzo(k)fluoranthene				B(k)F Average		Chrysene				Chrysene Average	
		ICON		Pisani				ICON		Pisani				ICON		Pisani				ICON		Pisani				ICON		Pisani				ICON		Pisani			
Boring ID	**Core Interval (ft bgs)**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**
SS11	2.5-3.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS11	3.4-3.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS12	0-3.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS13	0-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS13	1-2.75	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS13	2.75-3.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS14	0-0.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS14	0.8-1.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS15	0-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS15	3-3.25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB1	0-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB1	3-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB1	6-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB1	12-14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB2	0-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB2	3-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB2	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB2	10-12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB3	0-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB3	3-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
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AB3	8-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB4	0-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB4	3-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB4	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB4	10-12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB5	0-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB5	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB5	10-12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB5	14-16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB5	18-20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB6	8-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB6	12-14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB7	6-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB7	10-12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB8	6-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB8	10-12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB8	14-16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
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AB9	12-14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB9	18-20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB10	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB10	12-14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB10	14-16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB11	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
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AB11	16-18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
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AB12	12-14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB13	0-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB13	3-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB13	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB13	8-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
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AB14	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB14	8-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB15	0-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB15	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB15	12-14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB16	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB16	8-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB16	10-12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB16	12-14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB18	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB18	10-12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB18	12-14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB19	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB19	8-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB19	12-14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB20	6-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB20	10-12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB20	14-16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB20	16-18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB21	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB21	6-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table E-1
Sediment Data

East White Lake Field
Vermilion Parish, Louisiana

		Anthracene				**Anthracene Average**		Benzo(a)anthracene				**B(a)A Average**		Benzo(a)pyrene				**B(a)P Average**		Benzo(b)fluoranthene				**B(b)F Average**		Benzo(k)fluoranthene				**B(k)F Average**		Chrysene				**Chrysene Average**	
		ICON		Pisani				ICON		Pisani				ICON		Pisani				ICON		Pisani				ICON		Pisani				ICON		Pisani			
Boring ID	**Core Interval (ft bgs)**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**
AB21	8-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB21	12-14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB22	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB22	6-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB22	12-14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB22	16-18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED4	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED5	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED6	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED7	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED7	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED7	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED8	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED8	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED9	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED9	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED10	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED10	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED11	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED11	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED12	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED12	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED12	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED13	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED13	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED14	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED14	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED16	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED17	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED17	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED18	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED18	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED19	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED19	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED20	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED20	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED21	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED21	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED21	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED21	6-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED22	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED22	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED23	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED23	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED24	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED24	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED25	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED25	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED26	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED26	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED27	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED27	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED28	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED28	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED29	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED29	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED30	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED30	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED31	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED31	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED31	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED32	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED32	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED32	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED33	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED33	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED33	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPA-Sed 15-N	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPA-Sed-15-W	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table E-1
Sediment Data

East White Lake Field
Vermilion Parish, Louisiana

		Anthracene				Anthracene Average		Benzo(a)anthracene				B(a)A Average		Benzo(a)pyrene				B(a)P Average		Benzo(b)fluoranthene				B(b)F Average		Benzo(k)fluoranthene				B(k)F Average		Chrysene				Chrysene Average	
		ICON		Pisani				ICON		Pisani				ICON		Pisani				ICON		Pisani				ICON		Pisani				ICON		Pisani			
Boring ID	**Core Interval (ft bgs)**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**
MPA-Sed-15-W-2	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPA-Sed-15-E	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPA-Sed-15-E-2	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPA-AB5 (A)	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPA-AB5 (B)	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPA-AB5 (C)	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPA-AB-6	8-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPA-AB8	6-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPA-AB13	0-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB-6	8-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB-13	0-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB-13 SO-E	0-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB-14	0-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB-8	6-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB-8 SO-S	6-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB-5 SO-NE	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB-5 SO-NW	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB-5a	4-5.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB-15	4-5.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED-8	0-0.5	-	-	*<0.83*	*<0.325*	***ND***	***ND***	-	-	*<0.83*	*<0.325*	***ND***	***ND***	-	-	*<0.83*	*<0.325*	***ND***	***ND***	-	-	*<0.83*	*<0.325*	***ND***	***ND***	-	-	*<0.83*	*<0.325*	***ND***	***ND***	-	-	*<0.83*	*<0.325*	***ND***	***ND***
SED-9	0-0.5	-	-	*<1.07*	*<0.326*	***ND***	***ND***	-	-	*<1.07*	*<0.326*	***ND***	***ND***	-	-	*<1.07*	*<0.326*	***ND***	***ND***	-	-	0.0625	0.019	**0.0625**	**0.019**	-	-	*<1.07*	*<0.326*	***ND***	***ND***	-	-	0.069	0.021	**0.069**	**0.021**
SED-11	0-0.5	-	-	*<0.96*	*<0.327*	***ND***	***ND***	-	-	*<0.96*	*<0.327*	***ND***	***ND***	-	-	*<0.96*	*<0.327*	***ND***	***ND***	-	-	*<0.96*	*<0.327*	***ND***	***ND***	-	-	*<0.96*	*<0.327*	***ND***	***ND***	-	-	*<0.96*	*<0.327*	***ND***	***ND***
SED-13	0-0.5	-	-	*<1.2*	*<0.329*	***ND***	***ND***	-	-	*<1.2*	*<0.329*	***ND***	***ND***	-	-	*<1.2*	*<0.329*	***ND***	***ND***	-	-	*<1.2*	*<0.329*	***ND***	***ND***	-	-	*<1.2*	*<0.329*	***ND***	***ND***	-	-	*<1.2*	*<0.329*	***ND***	***ND***
SED-19	0-0.5	-	-	*<1.52*	*<0.328*	***ND***	***ND***	-	-	*<1.52*	*<0.328*	***ND***	***ND***	-	-	*<1.52*	*<0.328*	***ND***	***ND***	-	-	*<1.52*	*<0.328*	***ND***	***ND***	-	-	*<1.52*	*<0.328*	***ND***	***ND***	-	-	*<1.52*	*<0.328*	***ND***	***ND***
SED-24	0-0.5	-	-	*<0.97*	*<0.325*	***ND***	***ND***	-	-	*<0.97*	*<0.325*	***ND***	***ND***	-	-	*<0.97*	*<0.325*	***ND***	***ND***	-	-	*<0.97*	*<0.325*	***ND***	***ND***	-	-	*<0.97*	*<0.325*	***ND***	***ND***	-	-	0.036	0.012	**0.036**	**0.012**
SED-26	0-0.5	-	-	*<1.04*	*<0.328*	***ND***	***ND***	-	-	*<1.04*	*<0.328*	***ND***	***ND***	-	-	*<1.04*	*<0.328*	***ND***	***ND***	-	-	*<1.04*	*<0.328*	***ND***	***ND***	-	-	*<1.04*	*<0.328*	***ND***	***ND***	-	-	*<1.04*	*<0.328*	***ND***	***ND***
SED-31	0-0.5	-	-	*<1.02*	*<0.327*	***ND***	***ND***	-	-	*<1.02*	*<0.327*	***ND***	***ND***	-	-	*<1.02*	*<0.327*	***ND***	***ND***	-	-	*<1.02*	*<0.327*	***ND***	***ND***	-	-	*<1.02*	*<0.327*	***ND***	***ND***	-	-	*<1.02*	*<0.327*	***ND***	***ND***
SED-120 *	0-0.5	-	-	*<1.89*	*<0.33*	***ND***	***ND***	-	-	*<1.89*	*<0.33*	***ND***	***ND***	-	-	*<1.89*	*<0.33*	***ND***	***ND***	-	-	*<1.89*	*<0.33*	***ND***	***ND***	-	-	*<1.89*	*<0.33*	***ND***	***ND***	-	-	*<1.89*	*<0.33*	***ND***	***ND***
Hg-MPA-01	0-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-01	0.5-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-01	5-7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-02	0-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-02	0.5-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-02	5-7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-03	0-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-03	0.5-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-03	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-04	0-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-04	0.5-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-04	3-5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-05	0-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-05	0.5-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-05	6-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-06	0-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-06	0.5-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-06	5-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-07	0-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-07	0.5-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-07	6.5-7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-08	0-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-08	0.5-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-08	7.5-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-09	0-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-09	0.5-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-09	6-7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-09dup	0.5-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-01	0-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-01	0.5-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-01	2-4.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-01	4.3-4.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-01	8-9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-02	0-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-02	0.5-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-02	3-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-02	4-5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-02a	3-5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-02a	7-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-03	0-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-03	0.5-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-03	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-03	9-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-04	0-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table E-1
Sediment Data

East White Lake Field
Vermilion Parish, Louisiana

		Anthracene				**Anthracene Average**		Benzo(a)anthracene				**B(a)A Average**		Benzo(a)pyrene				**B(a)P Average**		Benzo(b)fluoranthene				**B(b)F Average**		Benzo(k)fluoranthene				**B(k)F Average**		Chrysene				**Chrysene Average**	
		ICON		Pisani				ICON		Pisani				ICON		Pisani				ICON		Pisani				ICON		Pisani				ICON		Pisani			
Boring ID	**Core Interval (ft bgs)**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**
SP-MPA-04	0.5-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-04	5-7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-04	9-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-1	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-1	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-1	6-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-1	9-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-2	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-2	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-2	8-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-2	14-16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-3	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-3	4-6/4-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-3	10-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-4	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-4	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-4	4-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-4	11-12.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-5	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-5	2-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-6	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-6	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-6	8-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-6	10-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-7	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-7	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-7	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-7	6-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-8	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-8	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-8	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-8	6-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED-BK-01	0-0.5	-	-	*<1.03*	*<0.328*	***ND***	***ND***	-	-	*<1.03*	*<0.328*	***ND***	***ND***	-	-	*<1.03*	*<0.328*	***ND***	***ND***	-	-	*<1.03*	*<0.328*	***ND***	***ND***	-	-	*<1.03*	*<0.328*	***ND***	***ND***	-	-	*<1.03*	*<0.328*	***ND***	***ND***
SED-BK-02	0-0.5	-	-	*<0.97*	*<0.326*	***ND***	***ND***	-	-	*<0.97*	*<0.326*	***ND***	***ND***	-	-	*<0.97*	*<0.326*	***ND***	***ND***	-	-	*<0.97*	*<0.326*	***ND***	***ND***	-	-	*<0.97*	*<0.326*	***ND***	***ND***	-	-	*<0.97*	*<0.326*	***ND***	***ND***
SED-BK-03	0-0.5	-	-	*<1.14*	*<0.327*	***ND***	***ND***	-	-	*<1.14*	*<0.327*	***ND***	***ND***	-	-	*<1.14*	*<0.327*	***ND***	***ND***	-	-	*<1.14*	*<0.327*	***ND***	***ND***	-	-	*<1.14*	*<0.327*	***ND***	***ND***	-	-	*<1.14*	*<0.327*	***ND***	***ND***
SED-BK-04	0-0.5	-	-	*<0.896*	*<0.326*	***ND***	***ND***	-	-	*<0.896*	*<0.326*	***ND***	***ND***	-	-	*<0.896*	*<0.326*	***ND***	***ND***	-	-	*<0.896*	*<0.326*	***ND***	***ND***	-	-	*<0.896*	*<0.326*	***ND***	***ND***	-	-	*<0.896*	*<0.326*	***ND***	***ND***
SED-BK-05	0-0.5	-	-	*<1.01*	*<0.327*	***ND***	***ND***	-	-	*<1.01*	*<0.327*	***ND***	***ND***	-	-	*<1.01*	*<0.327*	***ND***	***ND***	-	-	*<1.01*	*<0.327*	***ND***	***ND***	-	-	*<1.01*	*<0.327*	***ND***	***ND***	-	-	*<1.01*	*<0.327*	***ND***	***ND***
SED-BK-06	0-0.5	-	-	*<1.09*	*<0.326*	***ND***	***ND***	-	-	*<1.09*	*<0.326*	***ND***	***ND***	-	-	*<1.09*	*<0.326*	***ND***	***ND***	-	-	*<1.09*	*<0.326*	***ND***	***ND***	-	-	*<1.09*	*<0.326*	***ND***	***ND***	-	-	*<1.09*	*<0.326*	***ND***	***ND***
SED-BK-07	0-0.5	-	-	*<1.42*	*<0.325*	***ND***	***ND***	-	-	*<1.42*	*<0.325*	***ND***	***ND***	-	-	*<1.42*	*<0.325*	***ND***	***ND***	-	-	*<1.42*	*<0.325*	***ND***	***ND***	-	-	*<1.42*	*<0.325*	***ND***	***ND***	-	-	*<1.42*	*<0.325*	***ND***	***ND***
SED-BK-08	0-0.5	-	-	*<1.35*	*<0.327*	***ND***	***ND***	-	-	*<1.35*	*<0.327*	***ND***	***ND***	-	-	*<1.35*	*<0.327*	***ND***	***ND***	-	-	*<1.35*	*<0.327*	***ND***	***ND***	-	-	*<1.35*	*<0.327*	***ND***	***ND***	-	-	*<1.35*	*<0.327*	***ND***	***ND***
SED-BK-09	0-0.5	-	-	*<1.34*	*<0.325*	***ND***	***ND***	-	-	*<1.34*	*<0.325*	***ND***	***ND***	-	-	*<1.34*	*<0.325*	***ND***	***ND***	-	-	*<1.34*	*<0.325*	***ND***	***ND***	-	-	*<1.34*	*<0.325*	***ND***	***ND***	-	-	*<1.34*	*<0.325*	***ND***	***ND***
SED-BK-10	0-0.5	-	-	*<1.3*	*<0.326*	***ND***	***ND***	-	-	*<1.3*	*<0.326*	***ND***	***ND***	-	-	*<1.3*	*<0.326*	***ND***	***ND***	-	-	*<1.3*	*<0.326*	***ND***	***ND***	-	-	*<1.3*	*<0.326*	***ND***	***ND***	-	-	*<1.3*	*<0.326*	***ND***	***ND***
SED-BK-11	0-0.5	-	-	*<1.65*	*<0.326*	***ND***	***ND***	-	-	*<1.65*	*<0.326*	***ND***	***ND***	-	-	*<1.65*	*<0.326*	***ND***	***ND***	-	-	*<1.65*	*<0.326*	***ND***	***ND***	-	-	*<1.65*	*<0.326*	***ND***	***ND***	-	-	*<1.65*	*<0.326*	***ND***	***ND***

Table E-1
Sediment Data

East White Lake Field
Vermilion Parish, Louisiana

		Dibenz(a,h)anthracene				Db(ah)A Average		Fluoranthene				Fluoranthene Average		Fluorene				Fluorene Average		Indeno(1,2,3-cd)pyrene				Indeno Average		Naphthalene				Naphthalene Average		Phenanthrene				Phenanthrene Average	
		ICON		Pisani				ICON		Pisani				ICON		Pisani				ICON		Pisani				ICON		Pisani				ICON		Pisani			
Boring ID	**Core Interval (ft bgs)**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**
B2	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B2	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B2 Rerun	6-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B2 Rerun	10-10.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B3	4-7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B3 Rerun	9-12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B4 Rerun	0-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B4 Rerun	3-5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B4	5-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B5	0-1.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B5	4-5.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B5 Rerun	8-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B6	1.5-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B6	3-10.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B7	4-5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B7	8-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B8 Rerun	5.5-7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B8	9.5-11.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B9 Rerun	0-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B9	0.5-3.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B9 Rerun	8-9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B10	1.5-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B10	4-7.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B12	0-1.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B12 Rerun	3.5-5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B12	6.5-7.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B13 Rerun	3-5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B13 Rerun	7.5-9.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B14	0-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B14	4-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B15 Rerun	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B15	8-11.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B17	0-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B17 Rerun	3-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B17	8.5-10.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B17 Rerun	10.5-12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B18	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B18	4-5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B18	7.5-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B18	10-11.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B19	1-2.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B19	2.5-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B19	4-6.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B19 Rerun	6.5-9.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B20	3-4.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B20	7.5-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B21	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B21	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS1	0-2.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS1	2.1-2.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS2	0-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS2	1-1.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS3	0-0.6	-	-	-	-	-	-	*<0.885*	*<0.33*	-	-	***ND***	***ND***	*<0.885*	*<0.33*	-	-	***ND***	***ND***	-	-	-	-	-	-	-	-	-	-	-	-	*<0.885*	*<0.33*	-	-	***ND***	***ND***
SS3	0.6-2.2	-	-	-	-	-	-	*<0.885*	*<0.36*	-	-	***ND***	***ND***	*<0.885*	*<0.36*	-	-	***ND***	***ND***	-	-	-	-	-	-	-	-	-	-	-	-	*<0.885*	*<0.36*	-	-	***ND***	***ND***
SS3	2.2-2.6	-	-	-	-	-	-	*<0.957*	*<0.33*	-	-	***ND***	***ND***	*<0.957*	*<0.33*	-	-	***ND***	***ND***	-	-	-	-	-	-	-	-	-	-	-	-	*<0.957*	*<0.33*	-	-	***ND***	***ND***
SS4	0-0.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS4	0.6-2.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS4	2.7-3.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS5	0-2.15	-	-	-	-	-	-	*<0.776*	*<0.33*	-	-	***ND***	***ND***	*<0.776*	*<0.33*	-	-	***ND***	***ND***	-	-	-	-	-	-	-	-	-	-	-	-	*<0.776*	*<0.33*	-	-	***ND***	***ND***
SS6	0-1.65	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS6	1.65-2.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS7	0-1.4	-	-	-	-	-	-	*<1.17*	*<0.33*	-	-	***ND***	***ND***	*<1.17*	*<0.33*	-	-	***ND***	***ND***	-	-	-	-	-	-	-	-	-	-	-	-	*<1.17*	*<0.33*	-	-	***ND***	***ND***
SS7	1.4-2.5	-	-	-	-	-	-	1.3	0.498	-	-	**1.3**	**0.498**	1.69	0.647	-	-	**1.69**	**0.647**	-	-	-	-	-	-	-	-	-	-	-	-	4.87	1.87	-	-	**4.87**	**1.87**
SS7	2.5-3.5	-	-	-	-	-	-	*<0.979*	*<0.33*	-	-	***ND***	***ND***	*<0.979*	*<0.33*	-	-	***ND***	***ND***	-	-	-	-	-	-	-	-	-	-	-	-	*<0.979*	*<0.33*	-	-	***ND***	***ND***
SS8	0-1.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS8	1.9-2.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS8	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS8	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS9	0-1.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS9	1.7-3.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS9	3.2-3.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS10	0-1.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS10	1.5-2.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS10	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS10	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS11	0-2.5	-	-	-	-	-	-	*<0.466*	*<0.33*	-	-	***ND***	***ND***	*<0.466*	*<0.33*	-	-	***ND***	***ND***	-	-	-	-	-	-	-	-	-	-	-	-	*<0.466*	*<0.33*	-	-	***ND***	***ND***

Table E-1
Sediment Data

East White Lake Field
Vermilion Parish, Louisiana

		Dibenz(a,h)anthracene				**Db(ah)A Average**		Fluoranthene				**Fluoranthene Average**		Fluorene				**Fluorene Average**		Indeno(1,2,3-cd)pyrene				**Indeno Average**		Naphthalene				**Naphthalene Average**		Phenanthrene				**Phenanthrene Average**	
		ICON		Pisani				ICON		Pisani				ICON		Pisani				ICON		Pisani				ICON		Pisani				ICON		Pisani			
Boring ID	**Core Interval (ft bgs)**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**
SS11	2.5-3.4	-	-	-	-	-	-	*<0.596*	*<0.33*	-	-	***ND***	***ND***	*<0.596*	*<0.33*	-	-	***ND***	***ND***	-	-	-	-	-	-	-	-	-	-	-	-	*<0.596*	*<0.33*	-	-	***ND***	***ND***
SS11	3.4-3.7	-	-	-	-	-	-	*<0.611*	*<0.33*	-	-	***ND***	***ND***	*<0.611*	*<0.33*	-	-	***ND***	***ND***	-	-	-	-	-	-	-	-	-	-	-	-	*<0.611*	*<0.33*	-	-	***ND***	***ND***
SS12	0-3.7	-	-	-	-	-	-	*<0.609*	*<0.33*	-	-	***ND***	***ND***	*<0.609*	*<0.33*	-	-	***ND***	***ND***	-	-	-	-	-	-	-	-	-	-	-	-	*<0.609*	*<0.33*	-	-	***ND***	***ND***
SS13	0-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS13	1-2.75	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS13	2.75-3.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS14	0-0.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS14	0.8-1.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS15	0-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS15	3-3.25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB1	0-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB1	3-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB1	6-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB1	12-14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB2	0-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB2	3-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB2	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB2	10-12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB3	0-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB3	3-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB3	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB3	8-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB4	0-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB4	3-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB4	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB4	10-12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB5	0-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB5	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB5	10-12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB5	14-16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB5	18-20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB6	8-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB6	12-14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB7	6-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB7	10-12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB8	6-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB8	10-12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB8	14-16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB9	6-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB9	12-14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB9	18-20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB10	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB10	12-14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB10	14-16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB11	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB11	6-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB11	16-18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB12	6-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB12	12-14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB13	0-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB13	3-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB13	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB13	8-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB13	10-12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB14	0-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB14	3-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB14	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB14	8-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB15	0-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB15	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB15	12-14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB16	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB16	8-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB16	10-12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB16	12-14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB18	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
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AB18	12-14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB19	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB19	8-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB19	12-14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB20	6-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB20	10-12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB20	14-16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB20	16-18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB21	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB21	6-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table E-1
Sediment Data

East White Lake Field
Vermilion Parish, Louisiana

		Dibenz(a,h)anthracene				**Db(ah)A Average**		Fluoranthene				**Fluoranthene Average**		Fluorene				**Fluorene Average**		Indeno(1,2,3-cd)pyrene				**Indeno Average**		Naphthalene				**Naphthalene Average**		Phenanthrene				**Phenanthrene Average**	
		ICON		Pisani				ICON		Pisani				ICON		Pisani				ICON		Pisani				ICON		Pisani				ICON		Pisani			
Boring ID	**Core Interval (ft bgs)**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**
AB21	8-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB21	12-14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB22	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB22	6-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB22	12-14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB22	16-18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED4	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED5	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED6	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED7	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED7	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED7	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED8	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED8	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED9	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
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SED10	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED10	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED11	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED11	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED12	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
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SED12	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
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SED14	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
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SED16	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED17	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED17	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
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SED18	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED19	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED19	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED20	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED20	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED21	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED21	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED21	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED21	6-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
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SED26	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED26	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED27	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED27	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED28	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED28	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED29	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED29	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED30	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED30	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED31	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED31	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED31	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED32	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED32	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED32	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED33	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED33	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED33	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPA-Sed 15-N	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPA-Sed-15-W	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table E-1
Sediment Data

East White Lake Field
Vermilion Parish, Louisiana

		Dibenz(a,h)anthracene				**Db(ah)A Average**		Fluoranthene				**Fluoranthene Average**		Fluorene				**Fluorene Average**		Indeno(1,2,3-cd)pyrene				**Indeno Average**		Naphthalene				**Naphthalene Average**		Phenanthrene				**Phenanthrene Average**	
		ICON		Pisani				ICON		Pisani				ICON		Pisani				ICON		Pisani				ICON		Pisani				ICON		Pisani			
Boring ID	**Core Interval (ft bgs)**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**
MPA-Sed-15-W-2	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPA-Sed-15-E	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPA-Sed-15-E-2	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPA-AB5 (A)	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPA-AB5 (B)	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPA-AB5 (C)	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPA-AB-6	8-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPA-AB8	6-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPA-AB13	0-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB-6	8-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB-13	0-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB-13 SO-E	0-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB-14	0-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB-8	6-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB-8 SO-S	6-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB-5 SO-NE	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB-5 SO-NW	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB-5a	4-5.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB-15	4-5.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED-8	0-0.5	-	-	*<0.83*	*<0.325*	***ND***	***ND***	-	-	*<0.83*	*<0.325*	***ND***	***ND***	-	-	*<0.83*	*<0.325*	***ND***	***ND***	-	-	*<0.83*	*<0.325*	***ND***	***ND***	-	-	*<0.83*	*<0.325*	***ND***	***ND***	-	-	*<0.83*	*<0.325*	***ND***	***ND***
SED-9	0-0.5	-	-	*<1.07*	*<0.326*	***ND***	***ND***	-	-	*<1.07*	*<0.326*	***ND***	***ND***	-	-	*<1.07*	*<0.326*	***ND***	***ND***	-	-	0.313	0.095	**0.313**	**0.095**	-	-	*<1.07*	*<0.326*	***ND***	***ND***	-	-	*<1.07*	*<0.326*	***ND***	***ND***
SED-11	0-0.5	-	-	*<0.96*	*<0.327*	***ND***	***ND***	-	-	*<0.96*	*<0.327*	***ND***	***ND***	-	-	*<0.96*	*<0.327*	***ND***	***ND***	-	-	*<0.96*	*<0.327*	***ND***	***ND***	-	-	*<0.96*	*<0.327*	***ND***	***ND***	-	-	*<0.96*	*<0.327*	***ND***	***ND***
SED-13	0-0.5	-	-	*<1.2*	*<0.329*	***ND***	***ND***	-	-	*<1.2*	*<0.329*	***ND***	***ND***	-	-	*<1.2*	*<0.329*	***ND***	***ND***	-	-	*<1.2*	*<0.329*	***ND***	***ND***	-	-	*<1.2*	*<0.329*	***ND***	***ND***	-	-	*<1.2*	*<0.329*	***ND***	***ND***
SED-19	0-0.5	-	-	*<1.52*	*<0.328*	***ND***	***ND***	-	-	*<1.52*	*<0.328*	***ND***	***ND***	-	-	*<1.52*	*<0.328*	***ND***	***ND***	-	-	*<1.52*	*<0.328*	***ND***	***ND***	-	-	*<1.52*	*<0.328*	***ND***	***ND***	-	-	*<1.52*	*<0.328*	***ND***	***ND***
SED-24	0-0.5	-	-	*<0.97*	*<0.325*	***ND***	***ND***	-	-	*<0.97*	*<0.325*	***ND***	***ND***	-	-	*<0.97*	*<0.325*	***ND***	***ND***	-	-	*<0.97*	*<0.325*	***ND***	***ND***	-	-	*<0.97*	*<0.325*	***ND***	***ND***	-	-	0.048	0.016	**0.048**	**0.016**
SED-26	0-0.5	-	-	*<1.04*	*<0.328*	***ND***	***ND***	-	-	*<1.04*	*<0.328*	***ND***	***ND***	-	-	*<1.04*	*<0.328*	***ND***	***ND***	-	-	*<1.04*	*<0.328*	***ND***	***ND***	-	-	*<1.04*	*<0.328*	***ND***	***ND***	-	-	*<1.04*	*<0.328*	***ND***	***ND***
SED-31	0-0.5	-	-	*<1.02*	*<0.327*	***ND***	***ND***	-	-	*<1.02*	*<0.327*	***ND***	***ND***	-	-	*<1.02*	*<0.327*	***ND***	***ND***	-	-	*<1.02*	*<0.327*	***ND***	***ND***	-	-	*<1.02*	*<0.327*	***ND***	***ND***	-	-	*<1.02*	*<0.327*	***ND***	***ND***
SED-120 *	0-0.5	-	-	*<1.89*	*<0.33*	***ND***	***ND***	-	-	*<1.89*	*<0.33*	***ND***	***ND***	-	-	0.92	0.161	**0.92**	**0.161**	-	-	*<1.89*	*<0.33*	***ND***	***ND***	-	-	*<1.89*	*<0.33*	***ND***	***ND***	-	-	*<1.89*	*<0.33*	***ND***	***ND***
Hg-MPA-01	0-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-01	0.5-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-01	5-7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-02	0-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-02	0.5-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-02	5-7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-03	0-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-03	0.5-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-03	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-04	0-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-04	0.5-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-04	3-5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-05	0-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-05	0.5-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-05	6-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-06	0-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-06	0.5-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-06	5-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-07	0-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-07	0.5-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-07	6.5-7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-08	0-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-08	0.5-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-08	7.5-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-09	0-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-09	0.5-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-09	6-7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-09dup	0.5-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-01	0-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-01	0.5-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-01	2-4.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-01	4.3-4.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-01	8-9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-02	0-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-02	0.5-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-02	3-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-02	4-5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-02a	3-5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-02a	7-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-03	0-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-03	0.5-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-03	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-03	9-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-04	0-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table E-1
Sediment Data

East White Lake Field
Vermilion Parish, Louisiana

		Dibenz(a,h)anthracene				**Db(ah)A Average**		Fluoranthene				**Fluoranthene Average**		Fluorene				**Fluorene Average**		Indeno(1,2,3-cd)pyrene				**Indeno Average**		Naphthalene				**Naphthalene Average**		Phenanthrene				**Phenanthrene Average**	
		ICON		Pisani				ICON		Pisani				ICON		Pisani				ICON		Pisani				ICON		Pisani				ICON		Pisani			
Boring ID	**Core Interval (ft bgs)**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**
SP-MPA-04	0.5-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-04	5-7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-04	9-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-1	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-1	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-1	6-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-1	9-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-2	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-2	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-2	8-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-2	14-16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-3	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-3	4-6/4-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-3	10-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-4	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-4	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-4	4-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-4	11-12.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-5	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-5	2-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-6	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-6	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-6	8-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-6	10-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-7	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-7	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-7	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-7	6-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-8	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-8	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-8	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-8	6-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED-BK-01	0-0.5	-	-	*<1.03*	*<0.328*	***ND***	***ND***	-	-	*<1.03*	*<0.328*	***ND***	***ND***	-	-	*<1.03*	*<0.328*	***ND***	***ND***	-	-	*<1.03*	*<0.328*	***ND***	***ND***	-	-	*<1.03*	*<0.328*	***ND***	***ND***	-	-	*<1.03*	*<0.328*	***ND***	***ND***
SED-BK-02	0-0.5	-	-	*<0.97*	*<0.326*	***ND***	***ND***	-	-	*<0.97*	*<0.326*	***ND***	***ND***	-	-	*<0.97*	*<0.326*	***ND***	***ND***	-	-	*<0.97*	*<0.326*	***ND***	***ND***	-	-	*<0.97*	*<0.326*	***ND***	***ND***	-	-	*<0.97*	*<0.326*	***ND***	***ND***
SED-BK-03	0-0.5	-	-	*<1.14*	*<0.327*	***ND***	***ND***	-	-	*<1.14*	*<0.327*	***ND***	***ND***	-	-	*<1.14*	*<0.327*	***ND***	***ND***	-	-	*<1.14*	*<0.327*	***ND***	***ND***	-	-	*<1.14*	*<0.327*	***ND***	***ND***	-	-	*<1.14*	*<0.327*	***ND***	***ND***
SED-BK-04	0-0.5	-	-	*<0.896*	*<0.326*	***ND***	***ND***	-	-	*<0.896*	*<0.326*	***ND***	***ND***	-	-	*<0.896*	*<0.326*	***ND***	***ND***	-	-	*<0.896*	*<0.326*	***ND***	***ND***	-	-	*<0.896*	*<0.326*	***ND***	***ND***	-	-	*<0.896*	*<0.326*	***ND***	***ND***
SED-BK-05	0-0.5	-	-	*<1.01*	*<0.327*	***ND***	***ND***	-	-	*<1.01*	*<0.327*	***ND***	***ND***	-	-	*<1.01*	*<0.327*	***ND***	***ND***	-	-	*<1.01*	*<0.327*	***ND***	***ND***	-	-	*<1.01*	*<0.327*	***ND***	***ND***	-	-	*<1.01*	*<0.327*	***ND***	***ND***
SED-BK-06	0-0.5	-	-	*<1.09*	*<0.326*	***ND***	***ND***	-	-	*<1.09*	*<0.326*	***ND***	***ND***	-	-	*<1.09*	*<0.326*	***ND***	***ND***	-	-	*<1.09*	*<0.326*	***ND***	***ND***	-	-	*<1.09*	*<0.326*	***ND***	***ND***	-	-	*<1.09*	*<0.326*	***ND***	***ND***
SED-BK-07	0-0.5	-	-	*<1.42*	*<0.325*	***ND***	***ND***	-	-	*<1.42*	*<0.325*	***ND***	***ND***	-	-	*<1.42*	*<0.325*	***ND***	***ND***	-	-	*<1.42*	*<0.325*	***ND***	***ND***	-	-	*<1.42*	*<0.325*	***ND***	***ND***	-	-	*<1.42*	*<0.325*	***ND***	***ND***
SED-BK-08	0-0.5	-	-	*<1.35*	*<0.327*	***ND***	***ND***	-	-	*<1.35*	*<0.327*	***ND***	***ND***	-	-	*<1.35*	*<0.327*	***ND***	***ND***	-	-	*<1.35*	*<0.327*	***ND***	***ND***	-	-	*<1.35*	*<0.327*	***ND***	***ND***	-	-	*<1.35*	*<0.327*	***ND***	***ND***
SED-BK-09	0-0.5	-	-	*<1.34*	*<0.325*	***ND***	***ND***	-	-	*<1.34*	*<0.325*	***ND***	***ND***	-	-	*<1.34*	*<0.325*	***ND***	***ND***	-	-	*<1.34*	*<0.325*	***ND***	***ND***	-	-	*<1.34*	*<0.325*	***ND***	***ND***	-	-	*<1.34*	*<0.325*	***ND***	***ND***
SED-BK-10	0-0.5	-	-	*<1.3*	*<0.326*	***ND***	***ND***	-	-	*<1.3*	*<0.326*	***ND***	***ND***	-	-	*<1.3*	*<0.326*	***ND***	***ND***	-	-	*<1.3*	*<0.326*	***ND***	***ND***	-	-	*<1.3*	*<0.326*	***ND***	***ND***	-	-	*<1.3*	*<0.326*	***ND***	***ND***
SED-BK-11	0-0.5	-	-	*<1.65*	*<0.326*	***ND***	***ND***	-	-	*<1.65*	*<0.326*	***ND***	***ND***	-	-	*<1.65*	*<0.326*	***ND***	***ND***	-	-	*<1.65*	*<0.326*	***ND***	***ND***	-	-	*<1.65*	*<0.326*	***ND***	***ND***	-	-	*<1.65*	*<0.326*	***ND***	***ND***

Table E-1
Sediment Data

East White Lake Field
Vermilion Parish, Louisiana

		Pyrene				**Pyrene Average**		Benzene				**Benzene Average**		Ethylbenzene				**Ethylbenzene Average**		Toluene				**Toluene Average**		Xylenes				**Xylenes Average**	
		ICON		Pisani				ICON		Pisani				ICON		Pisani				ICON		Pisani				ICON		Pisani			
Boring ID	**Core Interval (ft bgs)**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**
B2	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B2	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B2 Rerun	6-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B2 Rerun	10-10.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B3	4-7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B3 Rerun	9-12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B4 Rerun	0-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B4 Rerun	3-5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B4	5-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B5	0-1.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B5	4-5.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B5 Rerun	8-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B6	1.5-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B6	3-10.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B7	4-5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B7	8-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B8 Rerun	5.5-7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B8	9.5-11.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B9 Rerun	0-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B9	0.5-3.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B9 Rerun	8-9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B10	1.5-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B10	4-7.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B12	0-1.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B12 Rerun	3.5-5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B12	6.5-7.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B13 Rerun	3-5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B13 Rerun	7.5-9.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B14	0-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B14	4-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B15 Rerun	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B15	8-11.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B17	0-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B17 Rerun	3-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B17	8.5-10.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B17 Rerun	10.5-12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B18	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B18	4-5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B18	7.5-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B18	10-11.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B19	1-2.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B19	2.5-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B19	4-6.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B19 Rerun	6.5-9.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B20	3-4.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B20	7.5-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B21	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B21	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS1	0-2.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS1	2.1-2.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS2	0-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS2	1-1.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS3	0-0.6	-	-	-	-	-	-	*<0.107*	*<0.04*	-	-	***ND***	***ND***	*<0.670*	*<0.25*	-	-	***ND***	***ND***	*<0.670*	*<0.25*	-	-	***ND***	***ND***	*<2.01*	*<0.75*	-	-	***ND***	***ND***
SS3	0.6-2.2	-	-	-	-	-	-	*<0.0983*	*<0.04*	-	-	***ND***	***ND***	*<0.614*	*<0.25*	-	-	***ND***	***ND***	*<0.614*	*<0.25*	-	-	***ND***	***ND***	*<1.84*	*<0.75*	-	-	***ND***	***ND***
SS3	2.2-2.6	-	-	-	-	-	-	*<0.116*	*<0.04*	-	-	***ND***	***ND***	*<0.725*	*<0.25*	-	-	***ND***	***ND***	*<0.725*	*<0.25*	-	-	***ND***	***ND***	*<2.17*	*<0.75*	-	-	***ND***	***ND***
SS4	0-0.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS4	0.6-2.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS4	2.7-3.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS5	0-2.15	-	-	-	-	-	-	*<0.0941*	*<0.04*	-	-	***ND***	***ND***	*<0.588*	*<0.25*	-	-	***ND***	***ND***	*<0.588*	*<0.25*	-	-	***ND***	***ND***	*<1.76*	*<0.75*	-	-	***ND***	***ND***
SS6	0-1.65	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS6	1.65-2.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS7	0-1.4	-	-	-	-	-	-	*<0.141*	*<0.04*	-	-	***ND***	***ND***	*<0.883*	*<0.25*	-	-	***ND***	***ND***	*<0.883*	*<0.25*	-	-	***ND***	***ND***	*<2.65*	*<0.75*	-	-	***ND***	***ND***
SS7	1.4-2.5	-	-	-	-	-	-	*<0.104*	*<0.04*	-	-	***ND***	***ND***	*<0.653*	*<0.25*	-	-	***ND***	***ND***	*<0.653*	*<0.25*	-	-	***ND***	***ND***	*<1.96*	*<0.75*	-	-	***ND***	***ND***
SS7	2.5-3.5	-	-	-	-	-	-	*<0.119*	*<0.04*	-	-	***ND***	***ND***	*<0.742*	*<0.25*	-	-	***ND***	***ND***	*<0.742*	*<0.25*	-	-	***ND***	***ND***	*<2.23*	*<0.75*	-	-	***ND***	***ND***
SS8	0-1.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS8	1.9-2.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS8	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS8	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS9	0-1.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS9	1.7-3.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS9	3.2-3.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS10	0-1.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS10	1.5-2.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS10	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS10	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS11	0-2.5	-	-	-	-	-	-	*<0.0565*	*<0.04*	-	-	***ND***	***ND***	*<0.353*	*<0.25*	-	-	***ND***	***ND***	*<0.353*	*<0.25*	-	-	***ND***	***ND***	*<1.06*	*<0.75*	-	-	***ND***	***ND***

Table E-1
Sediment Data

East White Lake Field
Vermilion Parish, Louisiana

		Pyrene				**Pyrene Average**		Benzene				**Benzene Average**		Ethylbenzene				**Ethylbenzene Average**		Toluene				**Toluene Average**		Xylenes				**Xylenes Average**	
		ICON		Pisani				ICON		Pisani				ICON		Pisani				ICON		Pisani				ICON		Pisani			
Boring ID	**Core Interval (ft bgs)**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**
SS11	2.5-3.4	-	-	-	-	-	-	*<0.0722*	*<0.04*	-	-	***ND***	***ND***	*<0.451*	*<0.25*	-	-	***ND***	***ND***	*<0.451*	*<0.25*	-	-	***ND***	***ND***	*<1.35*	*<0.75*	-	-	***ND***	***ND***
SS11	3.4-3.7	-	-	-	-	-	-	*<0.0741*	*<0.04*	-	-	***ND***	***ND***	*<0.463*	*<0.25*	-	-	***ND***	***ND***	*<0.463*	*<0.25*	-	-	***ND***	***ND***	*<1.39*	*<0.75*	-	-	***ND***	***ND***
SS12	0-3.7	-	-	-	-	-	-	*<0.0738*	*<0.04*	-	-	***ND***	***ND***	*<0.461*	*<0.25*	-	-	***ND***	***ND***	*<0.461*	*<0.25*	-	-	***ND***	***ND***	*<1.38*	*<0.75*	-	-	***ND***	***ND***
SS13	0-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS13	1-2.75	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS13	2.75-3.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS14	0-0.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS14	0.8-1.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS15	0-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS15	3-3.25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB1	0-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB1	3-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB1	6-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB1	12-14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB2	0-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB2	3-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB2	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB2	10-12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB3	0-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB3	3-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB3	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB3	8-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB4	0-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB4	3-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB4	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB4	10-12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB5	0-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB5	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB5	10-12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB5	14-16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB5	18-20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB6	8-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB6	12-14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB7	6-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB7	10-12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB8	6-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB8	10-12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB8	14-16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB9	6-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB9	12-14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB9	18-20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB10	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB10	12-14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB10	14-16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB11	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB11	6-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB11	16-18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB12	6-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB12	12-14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB13	0-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB13	3-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB13	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB13	8-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB13	10-12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB14	0-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB14	3-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB14	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB14	8-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB15	0-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB15	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB15	12-14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB16	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB16	8-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB16	10-12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB16	12-14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB18	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB18	10-12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB18	12-14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB19	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB19	8-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB19	12-14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB20	6-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB20	10-12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB20	14-16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB20	16-18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB21	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB21	6-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table E-1
Sediment Data

East White Lake Field
Vermilion Parish, Louisiana

		Pyrene				**Pyrene Average**		Benzene				**Benzene Average**		Ethylbenzene				**Ethylbenzene Average**		Toluene				**Toluene Average**		Xylenes				**Xylenes Average**	
		ICON		Pisani				ICON		Pisani				ICON		Pisani				ICON		Pisani				ICON		Pisani			
Boring ID	**Core Interval (ft bgs)**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**
AB21	8-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB21	12-14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB22	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB22	6-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB22	12-14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB22	16-18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED4	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED5	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED6	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED7	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED7	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED7	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED8	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED8	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED9	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED9	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED10	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED10	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED11	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED11	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED12	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED12	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED12	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED13	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED13	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED14	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED14	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED16	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED17	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED17	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED18	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED18	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED19	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED19	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED20	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED20	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED21	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED21	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED21	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED21	6-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED22	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED22	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED23	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED23	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED24	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED24	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED25	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED25	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED26	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED26	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED27	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED27	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED28	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED28	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED29	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED29	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED30	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED30	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED31	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED31	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED31	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED32	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED32	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED32	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED33	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED33	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED33	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPA-Sed 15-N	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPA-Sed-15-W	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table E-1
Sediment Data

East White Lake Field
Vermilion Parish, Louisiana

		Pyrene				**Pyrene Average**		Benzene				**Benzene Average**		Ethylbenzene				**Ethylbenzene Average**		Toluene				**Toluene Average**		Xylenes				**Xylenes Average**	
		ICON		Pisani				ICON		Pisani				ICON		Pisani				ICON		Pisani				ICON		Pisani			
Boring ID	**Core Interval (ft bgs)**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**
MPA-Sed-15-W-2	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPA-Sed-15-E	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPA-Sed-15-E-2	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPA-AB5 (A)	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPA-AB5 (B)	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPA-AB5 (C)	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPA-AB-6	8-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPA-AB8	6-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPA-AB13	0-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB-6	8-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB-13	0-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB-13 SO-E	0-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB-14	0-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB-8	6-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB-8 SO-S	6-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB-5 SO-NE	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB-5 SO-NW	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB-5a	4-5.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB-15	4-5.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED-8	0-0.5	-	-	*<0.83*	*<0.325*	***ND***	***ND***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED-9	0-0.5	-	-	*<1.07*	*<0.326*	***ND***	***ND***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED-11	0-0.5	-	-	*<0.96*	*<0.327*	***ND***	***ND***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED-13	0-0.5	-	-	*<1.2*	*<0.329*	***ND***	***ND***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED-19	0-0.5	-	-	*<1.52*	*<0.328*	***ND***	***ND***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED-24	0-0.5	-	-	*<0.97*	*<0.325*	***ND***	***ND***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED-26	0-0.5	-	-	*<1.04*	*<0.328*	***ND***	***ND***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED-31	0-0.5	-	-	*<1.02*	*<0.327*	***ND***	***ND***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED-120 *	0-0.5	-	-	*<1.89*	*<0.33*	***ND***	***ND***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-01	0-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-01	0.5-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-01	5-7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-02	0-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-02	0.5-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-02	5-7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-03	0-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-03	0.5-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-03	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-04	0-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-04	0.5-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-04	3-5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-05	0-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-05	0.5-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-05	6-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-06	0-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-06	0.5-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-06	5-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-07	0-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-07	0.5-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-07	6.5-7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-08	0-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-08	0.5-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-08	7.5-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-09	0-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-09	0.5-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-09	6-7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg-MPA-09dup	0.5-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-01	0-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-01	0.5-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-01	2-4.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-01	4.3-4.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-01	8-9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-02	0-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-02	0.5-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-02	3-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-02	4-5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-02a	3-5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-02a	7-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-03	0-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-03	0.5-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-03	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-03	9-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-04	0-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table E-1
Sediment Data

East White Lake Field
Vermilion Parish, Louisiana

		Pyrene				**Pyrene Average**		Benzene				**Benzene Average**		Ethylbenzene				**Ethylbenzene Average**		Toluene				**Toluene Average**		Xylenes				**Xylenes Average**	
		ICON		Pisani				ICON		Pisani				ICON		Pisani				ICON		Pisani				ICON		Pisani			
Boring ID	**Core Interval (ft bgs)**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**	mg/kg-dry	mg/kg-wet	mg/kg-dry	mg/kg-wet	**mg/kg-dry**	**mg/kg-wet**
SP-MPA-04	0.5-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-04	5-7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP-MPA-04	9-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-1	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-1	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-1	6-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-1	9-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-2	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-2	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-2	8-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-2	14-16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-3	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-3	4-6/4-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-3	10-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-4	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-4	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-4	4-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-4	11-12.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-5	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-5	2-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-6	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-6	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-6	8-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-6	10-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-7	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-7	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-7	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-7	6-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-8	0-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-8	2-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-8	4-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL-8	6-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED-BK-01	0-0.5	-	-	*<1.03*	*<0.328*	***ND***	***ND***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED-BK-02	0-0.5	-	-	*<0.97*	*<0.326*	***ND***	***ND***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED-BK-03	0-0.5	-	-	*<1.14*	*<0.327*	***ND***	***ND***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED-BK-04	0-0.5	-	-	*<0.896*	*<0.326*	***ND***	***ND***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED-BK-05	0-0.5	-	-	*<1.01*	*<0.327*	***ND***	***ND***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED-BK-06	0-0.5	-	-	*<1.09*	*<0.326*	***ND***	***ND***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED-BK-07	0-0.5	-	-	*<1.42*	*<0.325*	***ND***	***ND***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED-BK-08	0-0.5	-	-	*<1.35*	*<0.327*	***ND***	***ND***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED-BK-09	0-0.5	-	-	*<1.34*	*<0.325*	***ND***	***ND***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED-BK-10	0-0.5	-	-	*<1.3*	*<0.326*	***ND***	***ND***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED-BK-11	0-0.5	-	-	*<1.65*	*<0.326*	***ND***	***ND***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table E-1
Sediment Data

East White Lake Field
Vermilion Parish, Louisiana

Notes:

The following notes apply to the sediment data set provided in Table E-1.

\- Indicates parameter not analyzed for the respective sample

ND - Used in the "Average" column to indicate that a parameter was analyzed but not detected in any sample in this location

* SED-120 was collected in the same location as SED-30.

(a) Moisture content was not available for this sample. In order to facilitate conversion between wet and dry weight results, a proxy moisture content was assigned based on a sample collected from the same or a nearby location.

Sample ID	Depth	Date	Proxy MC	Source of Proxy MC	Depth	Date
MPA-Sed 15-N	0-2'	8-Jun-10	0.546	SED-15	0-2'	26-Feb-10
MPA-Sed-15-E	0-2'	8-Jun-10				
MPA-Sed-15-E-2	0-2'	8-Jun-10				
AB-6	8-10	10-Aug-10	0.861	MPA-AB-6	8-10'	19-May-10
AB-13	0-3'	10-Aug-10	0.874	MPA-AB13	0-3'	20-May-10
AB-13 SO-E	0-3'	10-Aug-10				
AB-14	0-3'	10-Aug-10	0.628	AB-14	0-3'	13-Nov-06
AB-8	6-8	10-Aug-10	0.772	MPA-AB8	6-8'	19-May-10
AB-8 SO-S	6-8	10-Aug-10				
AB-5 SO-NW	4-6'	10-Aug-10	0.64	AB-5	4-6'	2-Nov-06
AB-5a	4-5.5'	10-Aug-10				
AB-15	4-5.5'	10-Aug-10				
MPA-AB5 (B)	4-6'	19-May-10				

(b) Averages were calculated for detected parameters in split samples. For samples where a parameter was analyzed in only one of the split samples, the reported result was identified in the “average” column for that sample. For the few parameters that were reported as detected in one split and not detected in the other split, the detected result was identified in the “average” column for that sample. If both results were nondetect, no average was performed, as this was not necessary to support the selection of maximum detected concentrations used as AOICs in the risk assessment.

(c) In general, a 29-B preparation method was used by Sherry Laboratory (also called Element Laboratory) for the ICON sediment samples (i.e., drying and pulverizing the sample prior to extraction and analysis for metals), while the MP&A sediment samples typically included the routine SW-846 preparation method. For the following samples collected by ICON in August 2006, analyses by routine SW-846 preparation method were also provided by ICON, and were used in the risk assessment in lieu of the 29-B prep method results for the same location and sample interval, because the routine SW-846 prep method is more representative for risk assessment (see main text for additional information on this topic):

B2 Rerun	6-8′	B10	4-7.5′
B2 Rerun	10-10.5′	B12 Rerun	3.5-5′
B3 Rerun	9-12′	B13 Rerun	3-5′
B4 Rerun	0-1′	B13 Rerun	7.5-9.5′
B4 Rerun	3-5′	B15 Rerun	4-6′
B5 Rerun	8-10′	B17 Rerun	3-6′
B8 Rerun	5.5-7′	B17 Rerun	10.5-12′
B9 Rerun	0-0.5′	B19 Rerun	6.5-9.5′
B9 Rerun	8-9′		

(d) Samples collected within the Tank Battery B remediation area (within the Sed-15 pit remediation area) were excluded from the risk assessment because they no longer represent site conditions. Samples excluded from quantitative analysis due to remediation include the following:

- SED15 (0-2′ and 2-4′) collected on February 26, 2010;
- SED-15 (0-0.5′) and a field duplicate (SED-115) collected on May 6, 2010;
- MPA-Sed 15 (0-2′) collected on June 8, 2010; and
- SP-MPA-05 (0-5′ and 7-9′) collected on October 6, 2010.

(e) Samples collected at locations SED-1, SED-2, and SED-3 by ICON in February 2010 were collected off site to the east of the Vermilion Parish School Board property and were excluded from the risk evaluation.

(f) Sediment samples with no data useful for quantitative risk assessment were not included in this table (e.g., samples with only 29-B analyses such as oil and grease, chlorides, etc.). These samples include the following:

- Samples with the prefix "DEL"
- Several relatively deep samples collected by ICON in 2006 (samples with the prefix "AB", ranging from 6 to over 40 feet bgs).
- The following "B"-prefix samples collected by ICON in 2006: B7 (1-4'), B9 (7-8'), B20 (1-3'), B21 (6-8')

Table E-2
Peat Zone Groundwater Data
ICON and MPA Split Groundwater Sample Data - January 2015

East White Lake Field
Vermilion Parish, Louisiana

Well Type		*MW*		*MW*		*MW*		*MW*		*MW*		*MW*		*MW*		*MW*		*MW*		*MW*		*MW*		*MW*	
Sample ID		*WL-6*		*WL-6*		*WL-6*		*WL-6*		*AB2*		*AB3*		*AB5*		*AB6*		*AB6DUP*		*AB7*		*AB15*		*AB19*	
Sample Interval (ft)		*8.5-13.5'*						*8.5-13.5'*		*11-21*		*10-20*		*12-22*		*8-18*		*8-18*		*10-20*		*8-18*		*8-18*	
Sample Date		*1/7/2015*						*1/7/2015*		*11/10/2006*		*11/10/2006*		*11/13/2006*		*11/10/2006*		*11/10/2006*		*11/13/2006*		*11/13/2006*		*11/10/2006*	
Sampled By		*MPA*		*ICON*		*AVG*		*AVG*		*ICON*		*ICON*		*ICON*		*ICON*		*ICON*		*ICON*		*ICON*		*ICON*	
Parameter	**GWss**							REPRESENT		REPRESENT		REPRESENT		REPRESENT		REPRESENT		REPRESENT		REPRESENT		REPRESENT		REPRESENT	
Dissolved Metals (mg/L)																									
Arsenic	0.01	0.1	U	--		0.1	U	0.1	U	--		--		--		--		--		--		--		--	
Barium	2	10.8		--		10.8		10.8		--		--		--		--		--		--		--		--	
Cadmium	0.005	0.1	U	--		0.1	U	0.1	U	--		--		--		--		--		--		--		--	
Chromium	0.10	0.1	U	--		0.1	U	0.1	U	--		--		--		--		--		--		--		--	
Iron	0.3	16.7		--		16.7		16.7		--		--		--		--		--		--		--		--	
Lead	0.015	0.1	U	--		0.1	U	0.1	U	--		--		--		--		--		--		--		--	
Manganese	0.05	5.12		--		5.12		5.12		--		--		--		--		--		--		--		--	
Mercury	0.002	0.0002	U	--		0.0002	U	0.0002	U	--		--		--		--		--		--		--		--	
Strontium	2.2	18.4		--		18.4		18.4		--		--		--		--		--		--		--		--	
Zinc	1.1	2	U	--		2	U	2	U	--		--		--		--		--		--		--		--	
Total Metals (mg/L)																									
Arsenic	0.01	0.1	U	0.01	U	0.055	U	0.055	U	0.015		0.01	U	0.01	U	0.012		0.011		0.025		0.017		0.01	U
Barium	2	12.1		11.8		12.0		11.95		0.67		1.52		1.12		2.13		2.14		2.36		3.69		1.06	
Cadmium	0.005	0.1	U	0.005	U	0.0525	U	0.0525	U	0.001		0.001		0.002		0.001	U	0.001		0.002		0.002		0.001	
Calcium	--	764		546		655		655		--		--		--		--		--		--		--		--	
Chromium	0.10	0.1	U	0.01	U	0.055	U	0.055	U	--		--		--		--		--		--		--		--	
Iron	0.3	18.8		17.3		18.1		18.05		--		--		--		--		--		--		--		--	
Lead	0.015	0.1	U	0.01	U	0.055	U	0.055	U	0.01		0.011		0.006		0.005	U	0.005	U	0.005	U	0.005	U	0.005	U
Magnesium	--	770		584		677		677		--		--		--		--		--		--		--		--	
Manganese	0.05	5.84		4.9		5.37		5.37		--		--		--		--		--		--		--		--	
Mercury	0.002	0.0002	U	0.0002	U	0.0002	U	0.0002	U	--		--		--		--		--		--		--		--	
Potassium	--	61.1		58.2		59.7		59.65		--		--		--		--		--		--		--		--	
Selenium	0.05	--		0.058		0.058		0.058		--		--		--		--		--		--		--		--	
Sodium	--	9540		7840		8690		8690		--		--		--		--		--		--		--		--	
Strontium	2.2	17		18.7		17.9		17.85		1.06		1.68		11.9		5.68		5.39		2.43		11.4		1.47	
Zinc	1.1	2	U	0.017		1.01		1.01		--		--		--		--		--		--		--		--	
TPH Fractions (mg/L)																									
Aliphatic >C10-C12	0.15	0.15	U	--		0.15	U	0.15	U	--		--		--		--		--		--		--		--	
Aliphatic >C12-C16	0.15	0.15	U	--		0.15	U	0.15	U	--		--		--		--		--		--		--		--	
Aliphatic >C16-C35	7.3	0.15	U	--		0.15	U	0.15	U	--		--		--		--		--		--		--		--	
Aliphatic >C8-C10	0.15	0.15	U	--		0.15	U	0.15	U	--		--		--		--		--		--		--		--	
Aliphatic C6-C8	3.2	0.15	U	--		0.15	U	0.15	U	--		--		--		--		--		--		--		--	
Aromatic >C10-C12	0.15	0.15	U	--		0.15	U	0.15	U	--		--		--		--		--		--		--		--	
Aromatic >C12-C16	0.15	0.15	U	--		0.15	U	0.15	U	--		--		--		--		--		--		--		--	
Aromatic >C16-C21	0.15	0.15	U	--		0.15	U	0.15	U	--		--		--		--		--		--		--		--	
Aromatic >C21-C35	0.15	0.15	U	--		0.15	U	0.15	U	--		--		--		--		--		--		--		--	
Aromatic >C8-C10	0.15	0.15	U	--		0.15	U	0.15	U	--		--		--		--		--		--		--		--	
Hydrocarbons (mg/L)																									
TPH-GRO	0.15	--		0.15	U	0.15	U	FRACT		0.15	U	0.15	U	0.15	U	0.15	U	0.15	U	0.15	U	0.15	U	0.15	U
TPH-DRO	0.15	--		0.85		0.85		FRACT		0.12	U	0.122	U	0.477		0.185		0.171		0.122	U	0.214		0.121	U
TPH-ORO	0.15	--		0.33		0.33		FRACT		0.1	U	0.102	U	0.405		0.163		0.162		0.188		0.206		0.156	
BTEX (mg/L)																									
Benzene	0.005	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005		0.005	U	0.005	U	0.005	U	0.005	U	0.005	U
Ethylbenzene	0.7	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U
Toluene	1	0.005	U	0.01	U	0.0075	U	0.00875	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U
Xylene	10	0.015	U	0.05	U	0.0325	U	0.04125	U	0.015	U	0.015	U	0.015	U	0.015	U	0.015	U	0.015	U	0.015	U	0.015	U
Other																									
Chloride	--	18100		16600		17350		16975		2310		2660		14400		3900		3900		6210		7630		3020	
Bromide	--	22.6		22.4		22.5		22.45		--		--		--		--		--		--		--		--	
Sulfate	250	20	U	--		20	U	20	U	--		--		--		--		--		--		--		--	
Bicarbonate Alkalinity	--	295		415		355		385		--		--		--		--		--		--		--		--	
Carboante Alkalinity	--	1	U	10	U	5.5	U	7.75	U	--		--		--		--		--		--		--		--	
Turbidity (NTU)	--	3.6		--		3.6		3.6		--		--		--		--		--		--		--		--	
TDS	500	35500		32800		34150		33475		3780		3740		17200		4840		4190		7470		10300		3700	

Table E-2
Peat Zone Groundwater Data
ICON and MPA Split Groundwater Sample Data - January 2015

East White Lake Field
Vermilion Parish, Louisiana

Notes:

The following notes apply to ground water data sets provided in Tables E-2 through E-6.

--	Indicates no standard in the RECAP standard column, or parameter not analyzed in the data section
U	Not detected, value is the detection limit
B	For inorganics, this qualifier indicates the result is between the Reporting Detection Limit (RDL) and Methold Detection Limit (MDL)

HP - Hydropunch sampling technology

MW - Monitoring Well

WW - Water Well

Yellow highlighting indicates a detected concentration exceeds the screening level.

Grey shading indicates the total metals results are not included in the quantitative risk evaluation (see DISS definition).

FRACT - TPH fraction data are available for this location and are utilized in lieu of TPH mixtures.

DISS - Dissolved metals, when available, were used in lieu of total metals for all HP samples and for samples with a turbidity greater than 40 NTU.

GWSS = RECAP Screening Standard from Table 1 of RECAP 2003.

AVG - represents the average of split sample results, calculated as outlined below.

REPRESENT - This column presents the constituent concentrations considered representative for each sample. When more than one sample event is available for a single location, the representative concentrations were determined as the most recent independent concentration available for each constituent. Independent concentrations were identified as the following:

- Single sample results provided by one lab, where no split sample was collected.
- If split samples were collected, the average concentration for each parameter was determined as follows:
    - Parameters with detected concentrations in both splits: the detected concentrations were averaged.
    - Parameters reported as nondetect in both splits: the detection limits were averaged and the average is considered not detected at the averaged detection limit.
    - Parameters analyzed in only one of the split samples: the result (detection or nondetect) for the parameter was identified in the “average” column for that sample.
    - Parameters that were detected in one split but not detected in the other split: the detection limit was used as a proxy concentration and averaged with the detected concentration.
    - Duplicates were considered independent samples and were not averaged with the parent samples. If a duplicate was split, the split results were averaged as outlined above.

Once the most recent, independent result was identified as outlined above, two other considerations were made:

- If TPH fractions are available, they were utilized as the most representative results. In these instances, the note “FRACT” is inserted for TPH mixture res
- Dissolved metals, when available, were used in lieu of total metals for all hydropunch (HP) samples and for samples with a turbidity greater than 40 NTU. In these instances, the note “DISS” is inserted for total metals results. Total metals results for these samples are shaded grey to indicate the results are not included in the quantitative risk evaluation.

GWss for strontium is not provided in RECAP; the risk-based values were calculated in accordance with Appendix H of RECAP 2003 (see Appendix G).

GWss for iron and manganese are not provided in RECAP; the EPA Secondary MCLs were used as the GWss for iron and manganese.

The following wells were sampled during more than one sampling event over the investigation history, and the most recent sample results were used in the quantitative assessment to represent current conditions (RECAP Section 2.5):

- SB-1-MW sampled May 7, 2010, June 8, 2010, and April 21, 2014;
- Facility well (also called WW-1 and AWW1) sampled April 3, 1995 (for chlorides only), November 11, 2006, and May 25, 2010; and
- Hebert water well sampled September 1, 2010 and April 21, 2014.

Table E-3
40-Foot Zone Groundwater Data
May 2010 Split Groundwater Analytical Results

East White Lake Field
Vermilion Parish, Louisiana

		Well type	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*
		Sample ID	*AB1*	*MW-1*	*MW-1*	*MW-1*	*MW-50 (MW-1 DUP)*	*MW-1 DUP*	*MW-1 DUP*	*MW-2R*	*MW-2*	*MW-2*	*MW-3R*	*MW-3*	*MW-3*	*SB-1-MW-S*	*SB-1-MW-S*	*SB-1-MW-S*	*SB-1-MW-S*	*SB-1-MWS (SB1-Sb)*	*SB-1-MWS (SB1-Sb)*	*SB-1*	*MPA EWL Dup (SB-1)*	*SB-1*
		Sample Interval (ft)	*40-50*	*44-54*			*44-54*			*42-52*			*37.5-47.5*			*(44-54)*			*(44-54)*			*(44-54)*	*(44-54)*	*(44-54)*
		Sample Date	*11/10/2006*	*3/5/2010*			*3/5/2010*			*3/5/2010*			*3/5/2010*			*5/7/2010*			*6/8/2010*			*4/21/2014*	*4/21/2014*	*4/21/2014*
		Sampled By	*ICON*	*MPA*	*ICON*	*AVG*	*MPA dup*	*ICON dup*	*AVG*	*MPA*	*ICON*	*AVG*	*MPA*	*ICON*	*AVG*	*MPA*	*ICON*	*AVG*	*MPA*	*ICON*	*AVG*	*MPA*	*MPA dup*	*most recent*
Parameter	**Units**	**GW SS**	**REPRESENT**			**REPRESENT**			**REPRESENT**			**REPRESENT**			**REPRESENT**									**REPRESENT**
Dissolved Metals																								
Arsenic	mg/L	0.01	--	--	--	--	--	--	--	--	--	--	--	--	--	0.01 U	--	0.01 U	--	--	--	0.01 U	--	0.01 U
Barium	mg/L	2	--	--	--	--	--	--	--	--	--	--	--	--	--	5.61	--	5.61	--	--	--	3.52	--	3.52
Cadmium	mg/L	0.005	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Calcium	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	568	--	568	--	--	--	--	--	568
Chromium	mg/L	0.1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Iron	mg/L	0.3	--	--	--	--	--	--	--	--	--	--	--	--	--	15.4	--	15.4	--	--	--	8.75	--	8.75
Lead	mg/L	0.015	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Magnesium	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	220	--	220	--	--	--	--	--	220
Manganese	mg/L	0.05	--	--	--	--	--	--	--	--	--	--	--	--	--	3.12	--	3.12	--	--	--	2.13	--	2.13
Mercury	mg/L	0.002	--	--	--	--	--	--	--	--	--	--	--	--	--	--		--			--	--	--	--
Potassium	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	10.4	--	10.4	--	--	--	--	--	10.4
Selenium	mg/L	0.05	--	--	--	--	--	--	--	--	--	--	--	--	--	0.04 U	--	0.04 U	--	--	--	--	--	0.04 U
Sodium	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1840	--	1840	--	--	--	--	--	1840
Strontium	mg/L	2.2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Zinc	mg/L	1.1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total Metals																								
Arsenic	mg/L	0.01	0.021	ND U	0.01 U	0.01 U	ND U	0.01 U	0.01 U	0.019	0.022	0.0205	ND U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	--	--	--	0.01 U	--	0.01 U
Barium	mg/L	2	0.509	13.7	15.4	14.6	14.2	15.4	14.8	1.04	0.943	0.992	6.95	8.96	7.96	5.02	4.81	4.92	--	--	--	3.32	--	3.32
Cadmium	mg/L	0.005	0.001	ND U	0.005 U	0.005 U	ND U	0.005 U	0.005 U	ND U	0.005 U	0.005 U	ND U	0.005 U	0.005 U	--	0.005 U	0.005 U	--	--	--	--	--	0.005 U
Calcium	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	520	--	520	--	--	--	358	--	358
Chromium	mg/L	0.1	--	ND U	0.01 U	0.01 U	ND U	0.01 U	0.01 U	ND U	0.01 U	0.01 U	ND U	0.01 U	0.01 U	--	0.01 U	0.01 U	--	--	--	--	--	0.01 U
Iron	mg/L	0.3	--	--	--	--	--	--	--	--	--	--	--	--	--	15.6	--	15.6	--	--	--	8.99	--	8.99
Lead	mg/L	0.015	0.007	0.0057 B	0.01 U	0.00785	0.0072	0.01 U	0.0086	ND U	0.01 U	0.01 U	0.0035 B	0.01 U	0.00675	--	0.01 U	0.01 U	--	--	--	--	--	0.01 U
Magnesium	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	201	--	201	--	--	--	148	--	148
Manganese	mg/L	0.05	--	--	--	--	--	--	--	--	--	--	--	--	--	2.96	--	2.96	--	--	--	2.01	--	2.01
Mercury	mg/L	0.002	0.0002 U	ND U	0.0002 U	0.0002 U	ND U	0.0002 U	0.0002 U	ND U	0.0002 U	0.0002 U	ND U	0.0002 U	0.0002 U	--	0.0002 U	0.0002 U	--	--	--	--	--	0.0002 U
Potassium	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	10.3	--	10.3	--	--	--	9	--	9
Selenium	mg/L	0.05	--	ND U	0.077	0.077	ND U	0.07	0.07	ND U	0.03	0.03	ND U	0.071	0.071	0.04 U	0.058	0.049	--	--	--	--	--	0.049
Sodium	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1710	--	1710	--	--	--	1260	--	1260
Strontium	mg/L	2.2	0.691	13.4	14.4	13.9	12.7	14.4	13.6	0.93	0.877	0.904	7.3	9.54	8.42	--	5.42	5.42	--	--	--	--	--	5.42
Zinc	mg/L	1.1	--	ND U	0.039	0.039	ND U	0.014	0.014	ND U	0.015	0.015	ND U	0.016	0.016	--	0.017	0.017	--	--	--	--	--	0.017
BTEX																								
Benzene	mg/L	0.005	0.005 U	0.028	0.03	0.029	0.028	0.029	0.0285	ND U	0.005 U	0.005 U	0.00136	0.005 U	0.00318	0.017	0.016	0.0165	0.015	0.014	0.0145	0.015	0.013	0.015
Ethylbenzene	mg/L	0.7	0.005 U	ND U	0.005 U	0.005 U	ND U	0.005 U	0.005 U	ND U	0.005 U	0.005 U	ND U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Toluene	mg/L	1	0.005 U	ND U	0.01 U	0.01 U	ND U	0.01 U	0.01 U	ND U	0.01 U	0.01 U	ND U	0.01 U	0.01 U	0.005 U	0.01 U	0.0075 U	0.005 U	0.01 U	0.0075 U	0.01 U	0.01 U	0.01 U
Xylene (total)	mg/L	10	0.015 U	ND U	0.05 U	0.05 U	ND U	0.05 U	0.05 U	ND U	0.05 U	0.05 U	ND U	0.05 U	0.05 U	0.01 U	0.05 U	0.03 U	0.01 U	0.05 U	0.03 U	0.05 U	0.05 U	0.05 U
TPH Mixtures																								
TPH-Gasoline Range	mg/L	0.15	0.15 U	ND U	0.15 U	0.15 U	ND U	0.15 U	0.15 U	ND U	0.15 U	0.15 U	ND U	0.15 U	0.15 U	--	0.15 U	0.15 U	--	--	--	--	--	FRAC
TPH-Diesel Range	mg/L	0.15	0.121 U	ND U	0.133 U	0.133 U	ND U	0.133 U	0.133 U	ND U	0.133 U	0.133 U	ND U	0.133 U	0.133 U	--	0.136 U	0.136 U	--	--	--	--	--	FRAC
TPH-Oil Range	mg/L	0.15	0.101 U	ND U	0.122 U	0.122 U	ND U	0.122 U	0.122 U	ND U	0.122 U	0.122 U	ND U	0.122 U	0.122 U	--	0.126 U	0.126 U	--	--	--	--	--	FRAC
TPH Fractions																								
Aliphatic >C10-C12	mg/L	0.15	--	--	--	--	--	--	--	--	--	--	--	--	--	0.15 U	--	0.15 U	--	--	--	0.15 U	--	0.15 U
Aliphatic >C12-C16	mg/L	0.15	--	--	--	--	--	--	--	--	--	--	--	--	--	0.15 U	--	0.15 U	--	--	--	0.15 U	--	0.15 U
Aliphatic >C16-C35	mg/L	7.3	--	--	--	--	--	--	--	--	--	--	--	--	--	0.15 U	--	0.15 U	--	--	--	0.15 U	--	0.15 U
Aliphatic >C8-C10	mg/L	0.15	--	--	--	--	--	--	--	--	--	--	--	--	--	0.15 U	--	0.15 U	--	--	--	0.15 U	--	0.15 U
Aliphatic C6-C8	mg/L	3.2	--	--	--	--	--	--	--	--	--	--	--	--	--	0.15 U	--	0.15 U	--	--	--	0.15 U	--	0.15 U
Aromatic >C10-C12	mg/L	0.15	--	--	--	--	--	--	--	--	--	--	--	--	--	0.15 U	--	0.15 U	--	--	--	0.15 U	--	0.15 U
Aromatic >C12-C16	mg/L	0.15	--	--	--	--	--	--	--	--	--	--	--	--	--	0.15 U	--	0.15 U	--	--	--	0.15 U	--	0.15 U
Aromatic >C16-C21	mg/L	0.15	--	--	--	--	--	--	--	--	--	--	--	--	--	0.15 U	--	0.15 U	--	--	--	0.15 U	--	0.15 U
Aromatic >C21-C35	mg/L	0.15	--	--	--	--	--	--	--	--	--	--	--	--	--	0.15 U	--	0.15 U	--	--	--	0.15 U	--	0.15 U
Aromatic >C8-C10	mg/L	0.15	--	--	--	--	--	--	--	--	--	--	--	--	--	0.15 U	--	0.15 U	--	--	--	0.15 U	--	0.15 U
Other																								
Sulfate	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	5 U	--	5 U	--	--	--	4 U	--	4 U
Bicarbonate Alkalinity	mg/L CaCO3	--	--	--	--	--	--	--	--	--	--	--	--	--	--	349	562	456	--	--	--	384	--	384
Carbonate Alkalinity	mg/L CaCO3	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1 U	10 U	5.5 U	--	--	--	1 U	--	1 U
Total Dissolved Solids	mg/L	--	1680	17000	18400	17700	17300	18100	17700	2010	1860	1940	17200	16300	16800	7780	7880	7830	--	--	--	5400	--	5400
Chloride	mg/L	--	888	9150	9580	9370	9040	9580	9310	960	852	906	9100	10700	9900	4160	5470	4820	--	--	--	3120	--	3120
Field Turbidity	NTU	--	45	--	1.9	1.9	--	1.9	1.9	--	0.68	0.68	--	0.78	0.78	--	19.6	19.6	--	--	--	--	--	19.6
Field EC	uS	--	2510		21280	21300		21280	21300		3061	3060		22720	22700	--	--	--	--	--	--	--	--	--
Field pH	SU	--	7.29		6.83	6.83		6.83	6.83		7.46	7.46		6.17	6.17	--	--	--	--	--	--	--	--	--

Table E-3
40-Foot Zone Groundwater Data
May 2010 Split Groundwater Analytical Results

East White Lake Field
Vermilion Parish, Louisiana

		Well type	MW	MW	MW	MW	MW	MW	MW	MW	MW	HP	HP	HP	HP	HP	HP	HP	HP	HP	HP	HP	HP	HP	HP	HP
		Sample ID	SB-2-MW-S	SB-2	SB-2	SB-2	SB-3-MW-S	SB-3	SB-3	SB-3-MW-SD	SB-3	MW-6S	MW-6S	MW-6S	MW-6S	HP-MPA-01-T	HP-MPA-01-T	HP-MPA-01-T	HP-MPA-01-T	HP-MPA-02-T	HP-MPA-02-T	HP-MPA-02-T	HP-MPA-02-T	HP-MPA-03-T	HP-MPA-03-T	HP-MPA-03-T
		Sample Interval (ft)	(42-52)			(42-52)	(37-47)			(37-47)	(37-47)	(47-50)			(47-50)	(42-45')			(42-45')	(42-45')			(42-45')	(42-45')		
		Sample Date	5/11/2010			5/11/2010	5/12/2010			5/12/2010	5/12/2010	5/12/2010			5/12/2010	9/29/2010			9/29/2010	9/29/2010			9/29/2010	10/4/2010		
		Sampled By	MPA	ICON	AVG	AVG	MPA	ICON	AVG	MPA dup	AVG or dup	MPA	ICON	AVG	AVG	ICON	MPA	AVG	AVG	ICON	MPA	AVG	AVG	ICON	MPA	AVG
Parameter	**Units**	**GW SS**				**REPRESENT**					**REPRESENT**				**REPRESENT**				**REPRESENT**				**REPRESENT**			
Dissolved Metals																										
Arsenic	mg/L	0.01	0.00086 B	0.01 U	0.00543	0.00543	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.0016 B	0.01 U	0.0058	0.0058	**0.014**	0.01 U	0.012	0.012	-	0.01 U	0.01 U	0.01 U	**0.014**	0.01 U	0.012
Barium	mg/L	2	1.34	0.366	0.853	0.853	6.17	4.83	5.5	6.06	6.06	0.99	0.702	0.846	0.846	1.4	1.45	1.43	1.43	-	0.31	0.31	0.31	0.59	0.69	0.64
Cadmium	mg/L	0.005		0.005 U	0.005 U	0.005 U	--	0.005 U	0.005 U	--	0.005 U	--	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	-	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Calcium	mg/L	--	187	--	187	187	834	--	834	831	834	95.7	--	95.7	95.7	200	233	217	217	-	65.8	65.8	65.8	110	131	121
Chromium	mg/L	0.1		0.01 U	0.01 U	0.01 U	--	0.01 U	0.01 U	--	0.01 U	--	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	-	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Iron	mg/L	0.3	5.77	--	5.77	5.77	14	--	14	13.9	14	7.75	--	7.75	7.75	-	9.69	9.69	9.69	-	0.57	0.57	0.57	-	3.27	3.27
Lead	mg/L	0.015		0.01 U	0.01 U	0.01 U	--	0.01 U	0.01 U	--	0.01 U	--	0.01 U	0.01 U	0.01 U	0.01 U	0.015 U	0.0125 U	0.0125 U	-	0.015 U	0.015 U	0.015 U	0.01 U	0.015 U	0.0125 U
Magnesium	mg/L	--	67.1	--	67.1	67.1	339	--	339	333	339	32.2	--	32.2	32.2	70	79.4	74.7	74.7	-	152	152	152	45	54.7	49.9
Manganese	mg/L	0.05	0.56	--	0.56	0.56	2.9	--	2.9	2.85	2.9	0.21	--	0.21	0.21	-	0.53	0.53	0.53	-	0.67	0.67	0.67	-	0.37	0.37
Mercury	mg/L	0.002			--	--		0.0002 U	0.0002 U		0.0002 U		0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.002 U	0.0011 U	0.0011 U	-	0.002 U	0.002 U	0.002 U	0.0002 U	0.002 U	0.0011 U
Potassium	mg/L	--	6.15	--	6.15	6.15	14.2	--	14.2	13.8	14.2	5.52	--	5.52	5.52	5 U	5.43	5.22	5.22	-	44.4	44.4	44.4	5.2	5.54	5.37
Selenium	mg/L	0.05	0.04 U	0.02 U	0.03 U	0.03 U	0.04 U	0.104	0.072	0.04 U	0.072	0.04 U	0.043	0.0415	0.0415	0.043	0.04 U	0.0415	0.0415	-	0.04 U	0.04 U	0.04 U	0.045	0.04 U	0.0425
Sodium	mg/L	--	544	--	544	544	2070	--	2070	2080	2080	424	--	424	424	410	477	444	444	-	1330	1330	1330	400	472	436
Strontium	mg/L	2.2	--	0.459	0.459	0.459	--	6.84	6.84	--	6.84	--	0.595	0.595	0.595	2	1.87	1.94	1.94	-	1	1	1	0.82	0.92	0.87
Zinc	mg/L	1.1	--	0.01 U	0.01 U	0.01 U	--	0.01 U	0.01 U	--	0.01 U	--	0.02	0.02	0.02	0.16	0.02 U	0.09	0.09	-	0.039	0.039	0.039	0.11	0.02 U	0.065
Total Metals																										
Arsenic	mg/L	0.01	0.0023 B	0.01 U	0.00615	DISS	0.01 U	--	0.01 U	0.01 U	DISS	0.0025 B	--	0.0025 B	DISS	--	0.01 U	0.01 U	DISS	0.01 U	0.01 U	0.01 U	DISS	--	0.01 U	0.01 U
Barium	mg/L	2	1.46	1.23	1.35	DISS	6.57	--	6.57	6.51	DISS	1.1	--	1.1	DISS	--	2.04	2.04	DISS	0.46	0.43	0.445	DISS	--	1.13	1.13
Cadmium	mg/L	0.005	--	0.005 U	0.005 U	DISS	--	--	--	--	DISS	--	--	--	DISS	--	0.005 U	0.005 U	DISS	0.005 U	0.005 U	0.005 U	DISS	--	0.005 U	0.005 U
Calcium	mg/L	--	200	--	200	DISS	880	--	880	860	DISS	97	--	97	DISS	--	228	228	DISS	66	70.1	68.1	DISS	--	145	145
Chromium	mg/L	0.1	--	0.01 U	0.01 U	DISS	--	--	--	--	DISS	--	--	--	DISS	--	0.071	0.071	DISS	0.014	0.01 U	0.012	DISS	--	0.059	0.059
Iron	mg/L	0.3	7.92	--	7.92	DISS	17.2	--	17.2	17.4	DISS	19.7	--	19.7	DISS	--	29.1	29.1	DISS	-	7.75	7.75	DISS	--	16.7	16.7
Lead	mg/L	0.015	--	0.01 U	0.01 U	DISS	--	--	--	--	DISS	--	--	--	DISS	--	0.016	0.016	DISS	0.01 U	0.015 U	0.0125 U	DISS	--	0.015 U	0.015 U
Magnesium	mg/L	--	70.3	--	70.3	DISS	357	--	357	356	DISS	33	--	33	DISS	--	80.1	80.1	DISS	140	158	149	DISS	--	59	59
Manganese	mg/L	0.05	0.61	--	0.61	DISS	3.31	--	3.31	3.28	DISS	0.36	--	0.36	DISS	--	0.78	0.78	DISS	-	0.85	0.85	DISS	--	0.53	0.53
Mercury	mg/L	0.002	--	--	--	DISS	--	--	--	--	DISS	--	--	--	DISS	--	--	--	DISS	0.0002 U	--	0.0002 U	DISS	--	--	--
Potassium	mg/L	--	6.33	--	6.33	DISS	13.8	--	13.8	13.7	DISS	6.6	--	6.6	DISS	--	7.17	7.17	DISS	35	46.4	40.7	DISS	--	6.48	6.48
Selenium	mg/L	0.05	0.04 U	0.02 U	0.03 U	DISS	0.04 U	--	0.04 U	0.04 U	DISS	0.04 U	--	0.04 U	DISS	--	0.04 U	0.04 U	DISS	0.051	0.04 U	0.0455	DISS	--	0.04 U	0.04 U
Sodium	mg/L	--	581	--	581	DISS	2240	--	2240	2250	DISS	429	--	429	DISS	--	495	495	DISS	1100	1360	1230	DISS	--	525	525
Strontium	mg/L	2.2	--	1.46	1.46	DISS	--	--	--	--	DISS	--	--	--	DISS	--	1.87	1.87	DISS	0.98	1.06	1.02	DISS	--	1.02	1.02
Zinc	mg/L	1.1	--	0.024	0.024	DISS	--	--	--	--	DISS	--	--	--	DISS	--	0.087	0.087	DISS	0.13	0.02 U	0.075	DISS	--	0.14	0.14
BTEX																										
Benzene	mg/L	0.005	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Ethylbenzene	mg/L	0.7	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Toluene	mg/L	1	0.005 U	0.01 U	0.0075 U	0.0075 U	0.005 U	0.01 U	0.0075 U	0.005 U	0.0075 U	0.005 U	0.01 U	0.0075 U	0.0075 U	0.01 U	0.00609	0.00805	0.00805	0.01 U	0.00764	0.00882	0.00882	0.01 U	0.005 U	0.0075 U
Xylene (total)	mg/L	10	0.01 U	0.05 U	0.03 U	0.03 U	0.01 U	0.05 U	0.03 U	0.01 U	0.03 U	0.01 U	0.05 U	0.03 U	0.03 U	0.05 U	0.01 U	0.03 U	0.03 U	0.05 U	0.01 U	0.03 U	0.03 U	0.05 U	0.01 U	0.03 U
TPH Mixtures																										
TPH-Gasoline Range	mg/L	0.15	--	0.15 U	0.15 U	FRAC	--	0.15 U	0.15 U	--	FRAC	--	0.15 U	0.15	FRAC	0.15 U	--	0.15 U	FRAC	0.15 U	--	0.15 U	FRAC	0.15 U	--	0.15 U
TPH-Diesel Range	mg/L	0.15	--	0.134 U	0.134 U	FRAC	--	0.134 U	0.134 U	--	FRAC	--	0.136 U	0.136	FRAC	0.15	--	0.15	FRAC	0.13 U	--	0.13 U	FRAC	0.17	--	0.17
TPH-Oil Range	mg/L	0.15	--	0.124 U	0.124 U	FRAC	--	0.124 U	0.124 U	--	FRAC	--	0.126 U	0.126	FRAC	0.12	--	0.12	FRAC	0.12 U	--	0.12 U	FRAC	0.15	--	0.15
TPH Fractions																										
Aliphatic >C10-C12	mg/L	0.15	0.15 U	--	0.15 U	0.15 U	0.15 U	--	0.15 U	0.15 U	0.15 U	0.15 U	--	0.15 U	0.15 U	-	0.15 U	0.15 U	0.15 U	-	0.15 U	0.15 U	0.15 U	-	0.15 U	0.15 U
Aliphatic >C12-C16	mg/L	0.15	0.15 U	--	0.15 U	0.15 U	0.15 U	--	0.15 U	0.15 U	0.15 U	0.15 U	--	0.15 U	0.15 U	-	0.15 U	0.15 U	0.15 U	-	0.15 U	0.15 U	0.15 U	-	0.15 U	0.15 U
Aliphatic >C16-C35	mg/L	7.3	0.15 U	--	0.15 U	0.15 U	0.15 U	--	0.15 U	0.15 U	0.15 U	0.15 U	--	0.15 U	0.15 U	-	0.15 U	0.15 U	0.15 U	-	0.15 U	0.15 U	0.15 U	-	0.15 U	0.15 U
Aliphatic >C8-C10	mg/L	0.15	0.15 U	--	0.15 U	0.15 U	0.15 U	--	0.15 U	0.15 U	0.15 U	0.15 U	--	0.15 U	0.15 U	-	0.15 U	0.15 U	0.15 U	-	0.15 U	0.15 U	0.15 U	-	0.15 U	0.15 U
Aliphatic C6-C8	mg/L	3.2	0.15 U	--	0.15 U	0.15 U	0.15 U	--	0.15 U	0.15 U	0.15 U	0.15 U	--	0.15 U	0.15 U	-	0.15 U	0.15 U	0.15 U	-	0.15 U	0.15 U	0.15 U	-	0.15 U	0.15 U
Aromatic >C10-C12	mg/L	0.15	0.15 U	--	0.15 U	0.15 U	0.15 U	--	0.15 U	0.15 U	0.15 U	0.15 U	--	0.15 U	0.15 U	-	0.15 U	0.15 U	0.15 U	-	0.15 U	0.15 U	0.15 U	-	0.15 U	0.15 U
Aromatic >C12-C16	mg/L	0.15	0.15 U	--	0.15 U	0.15 U	0.15 U	--	0.15 U	0.15 U	0.15 U	0.15 U	--	0.15 U	0.15 U	-	0.15 U	0.15 U	0.15 U	-	0.15 U	0.15 U	0.15 U	-	0.15 U	0.15 U
Aromatic >C16-C21	mg/L	0.15	0.15 U	--	0.15 U	0.15 U	0.15 U	--	0.15 U	0.15 U	0.15 U	0.15 U	--	0.15 U	0.15 U	-	0.15 U	0.15 U	0.15 U	-	0.15 U	0.15 U	0.15 U	-	0.15 U	0.15 U
Aromatic >C21-C35	mg/L	0.15	0.15 U	--	0.15 U	0.15 U	0.15 U	--	0.15 U	0.15 U	0.15 U	0.15 U	--	0.15 U	0.15 U	-	0.15 U	0.15 U	0.15 U	-	0.15 U	0.15 U	0.15 U	-	0.15 U	0.15 U
Aromatic >C8-C10	mg/L	0.15	0.15 U	--	0.15 U	0.15 U	0.15 U		0.15 U	0.15 U	0.15 U	0.15 U	--	0.15 U	0.15 U	-	0.15 U	0.15 U	0.15 U	-	0.15 U	0.15 U	0.15 U	-	0.15 U	0.15 U
Other																										
Sulfate	mg/L	--	10.6	--	10.6	10.6	2.4 B		2.4 B	5 U	2.4 B	5 U	--	5 U	5	-	5 U	5 U	5 U	-	53.9	53.9	53.9	-	5 U	5 U
Bicarbonate Alkalinity	mg/L CaCO3	--	602	300	451	451	395	382	389	385	389	474	360	417	417	570	690	630	630	200	224	212	212	380	384	382
Carbonate Alkalinity	mg/L CaCO3	--	1 U	10 U	5.5 U	5.5 U	1 U	10 U	5.5 U	1 U	5.5 U	1 U	10 U	5.5 U	5.5 U	10 U	1 U	5.5 U	5.5 U	10 U	1 U	5.5 U	5.5 U	10 U	1 U	5.5 U
Total Dissolved Solids	mg/L	--	2530	5100	3820	3820	12200	12800	12500	12000	12500	1590	1440	1520	1520	2500	2110	2310	2310	4800	4060	4430	4430	1900	1820	1860
Chloride	mg/L	--	1220	1060	1140	1140	7270	6180	6730	7160	6730	772	746	759	759	990	928	959	959	2600	2130	2370	2370	850	801	826
Field Turbidity	NTU	--	45.83	45.8	45.8	45.8	--	188.6	189	--	189	624.7	--	625	625	191	212	202	202	32.4	77	54.7	54.7	170	331	251
Field EC	uS	--	--	--	--	--	--	--	--	--	--	--	--	--	--	-	-	--	--	-	-	--	--	-	-	--
Field pH	SU	--	--	--	--	--	--	--	--	--	--	--	--	--	--	-	-	--	--	-	-	--	--	-	-	--

Table E-3
40-Foot Zone Groundwater Data
May 2010 Split Groundwater Analytical Results

East White Lake Field
Vermilion Parish, Louisiana

		Well type	*HP*		*HP*		*HP*		*HP*		*HP*		*HP*		*HP*		*HP*		*HP*		*HP*		*HP*		*HP*		*HP*		*HP*		*HP*		*HP*		*HP*		*HP*		*HP*		*HP*		*HP*	
		Sample ID	*HP-MPA-03-T*		*HP-MPA-04-T*		*HP-MPA-04-T*		*HP-MPA-04-T*		*HP-MPA-04-T*		*HP-MPA-05-T*		*HP-MPA-05-T*		*HP-MPA-05-T*		*HP-MPA-05-T*		*HP-MPA-06-T*		*HP-MPA-06-T*		*HP-MPA-06-T*		*HP-MPA-06-T*		*HP-MPA-07-T*		*HP-MPA-07-T*		*HP-MPA-07-T*		*HP-MPA-07-T*		*HP-MPA-08-T*		*HP-MPA-08-T*		*HP-MPA-08-T*		*HP-MPA-08-T*	
		Sample Interval (ft)	*(42-45')*		*(42-45')*						*(42-45')*		*(42-45')*						*(42-45')*		*(42-45')*						*(42-45')*		*(42-45')*						*(42-45')*		*(42-45')*						*(42-45')*	
		Sample Date	*9/30/2010*		*9/30/2010*						*9/30/2010*		*9/30/2010*						*9/30/2010*		*9/30/2010*						*9/30/2010*		*10/1/2010*						*10/1/2010*		*10/1/2010*						*10/1/2010*	
		Sampled By	*AVG*		*ICON*		*MPA*		*AVG*		*AVG*		*ICON*		*MPA*		*AVG*		*AVG*		*ICON*		*MPA*		*AVG*		*AVG*		*ICON*		*MPA*		*AVG*		*AVG*		*ICON*		*MPA*		*AVG*		*AVG*	
Parameter	**Units**	**GW SS**	**REPRESENT**								**REPRESENT**								**REPRESENT**								**REPRESENT**								**REPRESENT**								**REPRESENT**	
Dissolved Metals																																													
Arsenic	mg/L	0.01	0.012		0.01	U	0.01	U	0.01	U	0.01	U	-		0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.014		0.01	U	0.012		0.012		-		0.01	U	0.01	U	0.01	U
Barium	mg/L	2	0.64		0.67		0.84		0.755		0.755		-		0.52		0.52		0.52		0.72		0.86		0.79		0.79		0.47		0.49		0.48		0.48		-		2.17		2.17		2.17	
Cadmium	mg/L	0.005	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	-		0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	-		0.005	U	0.005	U	0.005	U
Calcium	mg/L	--	121		130		170		150		150		-		119		119		119		160		206		183		183		91		104		97.5		97.5		-		238		238		238	
Chromium	mg/L	0.1	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	-		0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	-		0.01	U	0.01	U	0.01	U
Iron	mg/L	0.3	3.27		-		4.5		4.5		4.5		-		1.98		1.98		1.98		-		1.93		1.93		1.93		-		2.6		2.6		2.6		-		5.25		5.25		5.25	
Lead	mg/L	0.015	0.0125	U	0.01	U	0.015	U	0.0125	U	0.0125	U	-		0.015	U	0.015	U	0.015	U	0.01	U	0.015	U	0.0125	U	0.0125	U	0.01	U	0.015	U	0.0125	U	0.0125	U	-		0.015	U	0.015	U	0.015	U
Magnesium	mg/L	--	49.9		47		62.6		54.8		54.8		-		59.8		59.8		59.8		59		77.8		68.4		68.4		44		50.4		47.2		47.2		-		104		104		104	
Manganese	mg/L	0.05	0.37		-		0.5		0.5		0.5		-		0.5		0.5		0.5		-		0.52		0.52		0.52		-		0.4		0.4		0.4		-		0.49		0.49		0.49	
Mercury	mg/L	0.002	0.0011	U	0.0002	U	0.002	U	0.0011	U	0.0011	U	-		0.002	U	0.002	U	0.002	U	0.0002	U	0.002	U	0.0011	U	0.0011	U	0.0002	U	0.002	U	0.0011	U	0.0011	U	-		0.002	U	0.002	U	0.002	U
Potassium	mg/L	--	5.37		5.1		6.01		5.56		5.56		-		7.55		7.55		7.55		5	U	5.53		5.27		5.27		5	U	4.11		4.56		4.56		-		12.9		12.9		12.9	
Selenium	mg/L	0.05	0.0425		0.034		0.04	U	0.037		0.037		-		0.04	U	0.04	U	0.04	U	0.061		0.04	U	0.0505		0.0505		0.035		0.04	U	0.0375		0.0375		-		0.04	U	0.0400	U	0.04	U
Sodium	mg/L	--	436		350		451		401		401		-		479		479		479		330		463		397		397		450		491		471		471		-		1730		1730		1730	
Strontium	mg/L	2.2	0.87		1		1.24		1.12		1.12		-		0.9		0.9		0.9		1.1		1.37		1.24		1.24		0.74		0.78		0.76		0.76		-		2.21		2.21		2.21	
Zinc	mg/L	1.1	0.065		0.1		0.02	U	0.06		0.06		-		0.02	U	0.02	U	0.02	U	0.082		0.02	U	0.051		0.051		0.092		0.02	U	0.056		0.056		-		0.02	U	0.02	U	0.02	U
Total Metals																																													
Arsenic	mg/L	0.01	DISS		--		0.01		0.01	U	DISS		0.032		0.01	U	0.021		DISS		--		0.01	U	0.01	U	DISS		--		0.01	U	0.01	U	DISS		0.019		0.01	U	0.0145		DISS	
Barium	mg/L	2	DISS		--		1.3		1.3		DISS		0.59		0.51		0.55		DISS		--		1.21		1.21		DISS		--		0.61		0.61		DISS		1.4		2.04		1.72		DISS	
Cadmium	mg/L	0.005	DISS		--		0.005	U	0.005	U	DISS		0.005	U	0.005	U	0.005	U	DISS		--		0.005	U	0.005	U	DISS		--		0.005	U	0.005	U	DISS		0.005	U	0.005	U	0.005	U	DISS	
Calcium	mg/L	--	DISS		--		198		198		DISS		97		113		105		DISS		--		202		202		DISS		--		107		107		DISS		150		223		187		DISS	
Chromium	mg/L	0.1	DISS		--		0.074		0.074		DISS		0.014		0.01	U	0.012		DISS		--		0.014		0.014		DISS		--		0.029		0.029		DISS		0.01		0.01	U	0.01		DISS	
Iron	mg/L	0.3	DISS		--		27.4		27.4		DISS		-		2.6		2.6		DISS		--		6.88		6.88		DISS		--		11.1		11.1		DISS		-		7.19		7.19		DISS	
Lead	mg/L	0.015	DISS		--		0.027		0.027	U	DISS		0.01	U	0.015	U	0.0125	U	DISS		--		0.015	U	0.015	U	DISS		--		0.015	U	0.015	U	DISS		0.01	U	0.015	U	0.0125	U	DISS	
Magnesium	mg/L	--	DISS		--		65.1		65.1		DISS		50		56.8		53.4		DISS		--		74.1		74.1		DISS		--		51.8		51.8		DISS		80		97.7		88.9		DISS	
Manganese	mg/L	0.05	DISS		--		0.86		0.86		DISS		-		0.49		0.49		DISS		--		0.6		0.6		DISS		--		0.5		0.5		DISS		-		0.47		0.47		DISS	
Mercury	mg/L	0.002	DISS		--		--		--		DISS		0.0002	U	--		0.0002	U	DISS		--		--		--		DISS		--		--		--		DISS		0.0002	U	--		0.0002	U	DISS	
Potassium	mg/L	--	DISS		--		7.57		7.57		DISS		7.1		7.53		7.32		DISS		--		5.84		5.84		DISS		--		5.19		5.19		DISS		14		12		13		DISS	
Selenium	mg/L	0.05	DISS		--		0.04	U	0.04	U	DISS		0.035		0.04	U	0.0375		DISS		--		0.04	U	0.04	U	DISS		--		0.04	U	0.04	U	DISS		0.041		0.04	U	0.0405	U	DISS	
Sodium	mg/L	--	DISS		--		482		482		DISS		390		508		449		DISS		--		457		457		DISS		--		495		495		DISS		570		1700		1140		DISS	
Strontium	mg/L	2.2	DISS		--		1.35		1.35		DISS		0.82		0.9		0.86		DISS		--		1.37		1.37		DISS		--		0.82		0.82		DISS		1.5		2.07		1.79		DISS	
Zinc	mg/L	1.1	DISS		--		0.091		0.091		DISS		0.073		0.02	U	0.0465		DISS		--		0.02	U	0.02	U	DISS		--		0.053		0.053		DISS		0.054		0.02	U	0.037		DISS	
BTEX																																													
Benzene	mg/L	0.005	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U
Ethylbenzene	mg/L	0.7	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U
Toluene	mg/L	1	0.0075	U	0.01	U	0.005	U	0.0075	U	0.0075	U	0.01	U	0.005	U	0.0075	U	0.0075	U	0.01	U	0.005	U	0.0075	U	0.0075	U	0.01	U	0.005	U	0.0075	U	0.0075	U	0.01	U	0.00577		0.00789		0.00789	
Xylene (total)	mg/L	10	0.03	U	0.05	U	0.01	U	0.03	U	0.03	U	0.05	U	0.01	U	0.03	U	0.03	U	0.05	U	0.01	U	0.03	U	0.03	U	0.05	U	0.01	U	0.03	U	0.03	U	0.05	U	0.01	U	0.03	U	0.03	U
TPH Mixtures																																													
TPH-Gasoline Range	mg/L	0.15	FRAC		0.15	U	--		0.15	U	FRAC		0.15	U	--		0.15	U	FRAC		0.15	U	--		0.15	U	FRAC		0.15	U	--		0.15	U	FRAC		0.15	U	--		0.15	U	FRAC	
TPH-Diesel Range	mg/L	0.15	FRAC		0.13	U	--		0.13	U	FRAC		0.13	U	--		0.13	U	FRAC		0.13	U	--		0.13	U	FRAC		0.13	U	--		0.13	U	FRAC		0.13	U	--		0.13	U	FRAC	
TPH-Oil Range	mg/L	0.15	FRAC		0.12	U	--		0.12	U	FRAC		0.12	U	--		0.12	U	FRAC		0.12	U	--		0.12	U	FRAC		0.12	U	--		0.12	U	FRAC		0.12	U	--		0.12	U	FRAC	
TPH Fractions																																													
Aliphatic >C10-C12	mg/L	0.15	0.15	U	-		0.15	U	0.15	U	0.15	U	-		0.15	U	0.15	U	0.15	U	-		0.15	U	0.15	U	0.15	U	-		0.15	U	0.15	U	0.15	U	-		0.15	U	0.15	U	0.15	U
Aliphatic >C12-C16	mg/L	0.15	0.15	U	-		0.15	U	0.15	U	0.15	U	-		0.15	U	0.15	U	0.15	U	-		0.15	U	0.15	U	0.15	U	-		0.15	U	0.15	U	0.15	U	-		0.15	U	0.15	U	0.15	U
Aliphatic >C16-C35	mg/L	7.3	0.15	U	-		0.15	U	0.15	U	0.15	U	-		0.15	U	0.15	U	0.15	U	-		0.15	U	0.15	U	0.15	U	-		0.15	U	0.15	U	0.15	U	-		0.15	U	0.15	U	0.15	U
Aliphatic >C8-C10	mg/L	0.15	0.15	U	-		0.15	U	0.15	U	0.15	U	-		0.15	U	0.15	U	0.15	U	-		0.15	U	0.15	U	0.15	U	-		0.15	U	0.15	U	0.15	U	-		0.15	U	0.15	U	0.15	U
Aliphatic C6-C8	mg/L	3.2	0.15	U	-		0.15	U	0.15	U	0.15	U	-		0.15	U	0.15	U	0.15	U	-		0.15	U	0.15	U	0.15	U	-		0.15	U	0.15	U	0.15	U	-		0.15	U	0.15	U	0.15	U
Aromatic >C10-C12	mg/L	0.15	0.15	U	-		0.15	U	0.15	U	0.15	U	-		0.15	U	0.15	U	0.15	U	-		0.15	U	0.15	U	0.15	U	-		0.15	U	0.15	U	0.15	U	-		0.15	U	0.15	U	0.15	U
Aromatic >C12-C16	mg/L	0.15	0.15	U	-		0.15	U	0.15	U	0.15	U	-		0.15	U	0.15	U	0.15	U	-		0.15	U	0.15	U	0.15	U	-		0.15	U	0.15	U	0.15	U	-		0.15	U	0.15	U	0.15	U
Aromatic >C16-C21	mg/L	0.15	0.15	U	-		0.15	U	0.15	U	0.15	U	-		0.15	U	0.15	U	0.15	U	-		0.15	U	0.15	U	0.15	U	-		0.15	U	0.15	U	0.15	U	-		0.15	U	0.15	U	0.15	U
Aromatic >C21-C35	mg/L	0.15	0.15	U	-		0.15	U	0.15	U	0.15	U	-		0.15	U	0.15	U	0.15	U	-		0.15	U	0.15	U	0.15	U	-		0.15	U	0.15	U	0.15	U	-		0.15	U	0.15	U	0.15	U
Aromatic >C8-C10	mg/L	0.15	0.15	U	-		0.15	U	0.15	U	0.15	U	-		0.15	U	0.15	U	0.15	U	-		0.15	U	0.15	U	0.15	U	-		0.15	U	0.15	U	0.15	U	-		0.15	U	0.15	U	0.15	U
Other																																													
Sulfate	mg/L	--	5	U	-		5	U	5	U	5	U	-		21.7		21.7		21.7		-		16.4		16.4		16.4		-		5	U	5	U	5	U	-		10.1		10.1		10.1	
Bicarbonate Alkalinity	mg/L CaCO3	--	382		460		447		454		454		360		345		353		353		320		330		325		325		450		410		430		430		420		603		512		512	
Carbonate Alkalinity	mg/L CaCO3	--	5.5	U	10	U	1	U	5.5	U	5.5	U	10	U	1	U	5.5	U	5.5	U	10	U	1	U	5.5	U	5.5	U	10	U	1	U	5.5	U	5.5	U	10	U	1	U	5.5	U	5.5	U
Total Dissolved Solids	mg/L	--	1860		2200		1660		1930		1930		2000		1680		1840		1840		2700		1920		2310		2310		1800		1570		1690		1690		3300		3090		3200		3200	
Chloride	mg/L	--	826		920		817		869		869		890		831		861		861		1100		957		1030		1030		834		808		821		821		1500		1520		1510		1510	
Field Turbidity	NTU	--	251		796		470		633		633		1748		27		888		888		275		313		294		294		226		390		308		308		27.5		28		27.8		27.8	
Field EC	uS	--	--		-		-		--		--		-		-		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
Field pH	SU	--	--		-		-		--		--		-		-		--		--		--		--		--		--		--		--		--		--		--		--		--		--	

Table E-3
40-Foot Zone Groundwater Data
May 2010 Split Groundwater Analytical Results

East White Lake Field
Vermilion Parish, Louisiana

		Well type	HP		HP		HP		HP		HP		HP		HP		HP		WW		WW		WW		WW		WW		WW		WW		WW		WW		WW	
		Sample ID	HP-MPA-09-T		HP-MPA-09-T		HP-MPA-09-T		HP-MPA-09-T		HP-MPA-10-T		HP-MPA-10-T		HP-MPA-10-T		HP-MPA-10-T				Purvis Hebert Well (in use)		Purvis Hebert Well (in use)		Purvis Hebert Well (in use)		Purvis Hebert Well (in use)		Purvis Hebert Well (in use)		A. Crouch Well (abandoned)		A. Crouch Well (abandoned)		A. Crouch Well (abandoned)		A. Crouch Well (abandoned)	
		Sample Interval (ft)	(42-45')						(42-45')		(42-45')						(42-45')		(est. 41ft)						(est. 41ft)		(est. 41 ft)		(est. 41 ft)		(est. 34ft)						(est. 34ft)	
		Sample Date	10/1/2010						10/1/2010		10/1/2010						10/1/2010		9/1/10						9/1/10		4/21/2014		4/21/2014		9/1/10						9/1/10	
		Sampled By	ICON		MPA		AVG		AVG		ICON		MPA		AVG		AVG		ICON		MPA		AVG		ICON Dup		MPA		most recent		ICON		MPA		AVG		AVG	
Parameter	**Units**	**GW SS**							REPRESENT								REPRESENT												REPRESENT								REPRESENT	
Dissolved Metals																																						
Arsenic	mg/L	0.01	-		0.01	U	0.01	U	0.01	U	0.019		0.01	U	0.0145		0.0145		--		--		--		--		0.01	U	0.01	U	--		--		--		--	
Barium	mg/L	2	-		1.62		1.62		1.62		0.88		1.02		0.95		0.95		--		--		--		--		0.24		0.24		--		--		--		--	
Cadmium	mg/L	0.005	-		0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	--		--		--		--		0.005	U	0.005	U	--		--		--		--	
Calcium	mg/L	--	-		178		178		178		120		146		133		133		--		--		--		--		--		--		--		--		--		--	
Chromium	mg/L	0.1	-		0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	--		--		--		--		0.01	U	0.01	U	--		--		--		--	
Iron	mg/L	0.3	-		3.57		3.57		3.57		-		2.11		2.11		2.11		--		--		--		--		10.9		10.9		--		--		--		--	
Lead	mg/L	0.015	-		0.015	U	0.015	U	0.015	U	0.01	U	0.015	U	0.0125	U	0.0125	U	--		--		--		--		0.015	U	0.015	U	--		--		--		--	
Magnesium	mg/L	--	-		112		112		112		42		52.7		47.4		47.4		--		--		--		--		--		--		--		--		--		--	
Manganese	mg/L	0.05	-		0.76		0.76		0.76		-		0.31		0.31		0.31		--		--		--		--		1.69		1.69		--		--		--		--	
Mercury	mg/L	0.002	-		0.002	U	0.002	U	0.002	U	0.0002	U	0.002	U	0.0011	U	0.0011	U	--		--		--		--		0.0002	U	0.0002	U	--		--		--		--	
Potassium	mg/L	--	-		18.6		18.6		18.6		5	U	5.35		5.18		5.18		--		--		--		--		--		--		--		--		--		--	
Selenium	mg/L	0.05	-		0.04	U	0.0400	U	0.04	U	0.032		0.04	U	0.0360		0.036		--		--		--		--		--		--		--		--		--		--	
Sodium	mg/L	--	-		1140		1140		1140		380		485		433		433		--		--		--		--		--		--		--		--		--		--	
Strontium	mg/L	2.2	-		2.68		2.68		2.68		1.1		1.24		1.17		1.17		--		--		--		--		0.47		0.47		--		--		--		--	
Zinc	mg/L	1.1	-		0.02	U	0.02	U	0.02	U	0.072		0.02	U	0.046		0.046		--		--		--		--		0.062		0.062		--		--		--		--	
Total Metals																																						
Arsenic	mg/L	0.01	0.019		0.01	U	0.0145		DISS		--		0.032		0.032		DISS		0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U
Barium	mg/L	2	0.66		1.59		1.13		DISS		--		1.42		1.42		DISS		0.25		0.28		0.265		0.258		0.22		0.22		0.517		0.61		0.564		0.564	
Cadmium	mg/L	0.005	0.005	U	0.005	U	0.005	U	DISS		--		0.005	U	0.005	U	DISS		0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U
Calcium	mg/L	--	70		170		120		DISS		--		185		185		DISS		--		88.6		88.6		--		61.5		61.5		--		160		160		160	
Chromium	mg/L	0.1	0.01	U	0.01	U	0.01	U	DISS		--		0.081		0.081		DISS		0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U
Iron	mg/L	0.3	-		5.92		5.92		DISS		--		34.7		34.7		DISS		--		13.5		13.5		--		10.5		10.5		--		68.9		68.9		68.9	
Lead	mg/L	0.015	0.01	U	0.015	U	0.0125	U	DISS		--		0.032		0.032		DISS		0.01	U	0.015	U	0.0125	U	0.01	U	0.015	U	0.015	U	0.01		0.015	U	0.0125		0.0125	
Magnesium	mg/L	--	88		106		97		DISS		--		59.7		59.7		DISS		--		56.3		56.3		--		41.9		41.9		--		94.5		94.5		94.5	
Manganese	mg/L	0.05	-		0.76		0.76		DISS		--		0.92		0.92		DISS		--		2.42		2.42		--		1.57		1.57		--		4.3		4.3		4.3	
Mercury	mg/L	0.002	0.0002	U	--		0.0002	U	DISS		--		--		--		DISS		--		0.0002	U	0.0002	U	--		0.0002	U	0.0002	U	--		0.0002	U	0.0002	U	0.0002	U
Potassium	mg/L	--	21		18.2		19.6		DISS		--		8.17		8.17		DISS		--		7.89		7.89		--		6.09		6.09		--		14.5		14.5		14.5	
Selenium	mg/L	0.05	0.061		0.04	U	0.0505		DISS		--		0.04	U	0.04	U	DISS		0.02	U	0.04	U	0.03	U	0.02	U	--		0.03	U	0.02	U	0.04	U	0.03	U	0.03	U
Sodium	mg/L	--	810		1410		1110		DISS		--		472		472		DISS		--		389		389		--		309		309		--		683		683		683	
Strontium	mg/L	2.2	1.2		2.57		1.89		DISS		--		1.35		1.35		DISS		0.55		0.66		0.605		0.568		0.47		0.47		1.2		1.38		1.29		1.29	
Zinc	mg/L	1.1	0.1		0.02	U	0.06		DISS		--		0.12		0.12		DISS		0.042		0.035		0.0385		0.042		0.053		0.053		0.116		0.11		0.113		0.113	
BTEX																																						
Benzene	mg/L	0.005	0.005	U	0.00508		0.00504		0.00504		0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U
Ethylbenzene	mg/L	0.7	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U
Toluene	mg/L	1	0.01	U	0.00646		0.00823		0.00823		0.01	U	0.005	U	0.0075	U	0.0075	U	0.01	U	0.005	U	0.0075	U	0.01	U	0.005	U	0.005	U	0.01	U	0.005	U	0.0075	U	0.0075	U
Xylene (total)	mg/L	10	0.05	U	0.01	U	0.03	U	0.03	U	0.05	U	0.01	U	0.03	U	0.03	U	0.05	U	0.01	U	0.03	U	0.05	U	0.01	U	0.01	U	0.05	U	0.01	U	0.03	U	0.03	U
TPH Mixtures																																						
TPH-Gasoline Range	mg/L	0.15	0.15	U	--		0.15	U	FRAC		0.15	U	--		0.15	U	FRAC		0.15	U	--		0.15	U	0.15	U	--		FRAC		0.15	U	--		0.15	U	FRAC	
TPH-Diesel Range	mg/L	0.15	0.14	U	--		0.14	U	FRAC		0.13	U	--		0.13	U	FRAC		0.136	U	--		0.136	U	0.135	U	--		FRAC		0.14	U	--		0.14	U	FRAC	
TPH-Oil Range	mg/L	0.15	0.12	U	--		0.12	U	FRAC		0.12	U	--		0.12	U	FRAC		0.126	U	--		0.126	U	0.125	U	--		FRAC		0.13	U	--		0.13	U	FRAC	
TPH Fractions																																						
Aliphatic >C10-C12	mg/L	0.15	-		0.15	U	0.15	U	0.15	U	-		0.15	U	0.15	U	0.15	U	--		0.15	U	0.15	U	--		0.15	U	0.15	U	--		0.15	U	0.15	U	0.15	U
Aliphatic >C12-C16	mg/L	0.15	-		0.15	U	0.15	U	0.15	U	-		0.15	U	0.15	U	0.15	U	--		0.15	U	0.15	U	--		0.15	U	0.15	U	--		0.15	U	0.15	U	0.15	U
Aliphatic >C16-C35	mg/L	7.3	-		0.15	U	0.15	U	0.15	U	-		0.15	U	0.15	U	0.15	U	--		0.15	U	0.15	U	--		0.15	U	0.15	U	--		0.15	U	0.15	U	0.15	U
Aliphatic >C8-C10	mg/L	0.15	-		0.15	U	0.15	U	0.15	U	-		0.15	U	0.15	U	0.15	U	--		0.15	U	0.15	U	--		0.15	U	0.15	U	--		0.15	U	0.15	U	0.15	U
Aliphatic C6-C8	mg/L	3.2	-		0.15	U	0.15	U	0.15	U	-		0.15	U	0.15	U	0.15	U	--		0.15	U	0.15	U	--		0.15	U	0.15	U	--		0.15	U	0.15	U	0.15	U
Aromatic >C10-C12	mg/L	0.15	-		0.15	U	0.15	U	0.15	U	-		0.15	U	0.15	U	0.15	U	--		0.15	U	0.15	U	--		0.15	U	0.15	U	--		0.15	U	0.15	U	0.15	U
Aromatic >C12-C16	mg/L	0.15	-		0.15	U	0.15	U	0.15	U	-		0.15	U	0.15	U	0.15	U	--		0.15	U	0.15	U	--		0.15	U	0.15	U	--		0.15	U	0.15	U	0.15	U
Aromatic >C16-C21	mg/L	0.15	-		0.15	U	0.15	U	0.15	U	-		0.15	U	0.15	U	0.15	U	--		0.15	U	0.15	U	--		0.15	U	0.15	U	--		0.15	U	0.15	U	0.15	U
Aromatic >C21-C35	mg/L	0.15	-		0.15	U	0.15	U	0.15	U	-		0.15	U	0.15	U	0.15	U	--		0.15	U	0.15	U	--		0.15	U	0.15	U	--		0.15	U	0.15	U	0.15	U
Aromatic >C8-C10	mg/L	0.15	-		0.15	U	0.15	U	0.15	U	-		0.15	U	0.15	U	0.15	U	--		0.15	U	0.15	U	--		0.15	U	0.15	U	--		0.15	U	0.15	U	0.15	U
Other																																						
Sulfate	mg/L	--	-		69.1		69.1		69.1		-		5	U	5	U	5	U	--		90		90		--		--		90		--		176		176		176	
Bicarbonate Alkalinity	mg/L CaCO3	--	230		270		250		250		460		426		443		443		--		225		225		--		177		177		--		120		120		120	
Carbonate Alkalinity	mg/L CaCO3	--	10	U	1	U	5.5	U	5.5	U	10	U	1	U	5.5	U	5.5	U	--		1	U	1	U	--		1	U	1	U	--		1	U	1	U	1	U
Total Dissolved Solids	mg/L	--	4400		4520		4460		4460		1900		1680		1790		1790		1800		1780		1790		1720		1240		1240		3400		3240		3320		3320	
Chloride	mg/L	--	2200		2350		2280		2280		820		850		835		835		824		851		838		852		555		555		1630		1570		1600		1600	
Field Turbidity	NTU	--	35.8		27		31.4		31.4		1057		>1000		1060		1060		--		--		--		--		--		--						--		--	
Field EC	uS	--	--		--		--		--		--		--		--		--		--		--		--		--		--		--						--		--	
Field pH	SU	--	--		--		--		--		--		--		--		--		--		--		--		--		--		--						--		--	

Table E-3
40-Foot Zone Groundwater Data
May 2010 Split Groundwater Analytical Results

East White Lake Field
Vermilion Parish, Louisiana

Notes:

The following notes apply to ground water data sets provided in Tables E-2 through E-6.

-- Indicates no standard in the RECAP standard column, or parameter not analyzed in the data section

U Not detected, value is the detection limit

B For inorganics, this qualifier indicates the result is between the Reporting Detection Limit (RDL) and Methold Detection Limit (MDL)

HP - Hydropunch sampling technology

MW - Monitoring Well

WW - Water Well

Yellow highlighting indicates a detected concentration exceeds the screening level.

Grey shading indicates the total metals results are not included in the quantitative risk evaluation (see DISS definition).

FRACT - TPH fraction data are available for this location and are utilized in lieu of TPH mixtures.

DISS - Dissolved metals, when available, were used in lieu of total metals for all HP samples and for samples with a turbidity greater than 40 NTU.

GWSS = RECAP Screening Standard from Table 1 of RECAP 2003.

AVG - represents the average of split sample results, calculated as outlined below.

REPRESENT - This column presents the constituent concentrations considered representative for each sample. When more than one sample event is available for a single location, the representative concentrations were determined as the most recent independent concentration available for each constituent. Independent concentrations were identified as the following:

- Single sample results provided by one lab, where no split sample was collected.
- If split samples were collected, the average concentration for each parameter was determined as follows:
    - Parameters with detected concentrations in both splits: the detected concentrations were averaged.
    - Parameters reported as nondetect in both splits: the detection limits were averaged and the average is considered not detected at the averaged detection limit.
    - Parameters analyzed in only one of the split samples: the result (detection or nondetect) for the parameter was identified in the "average" column for that sample.
    - Parameters that were detected in one split but not detected in the other split: the detection limit was used as a proxy concentration and averaged with the detected concentration.
    - Duplicates were considered independent samples and were not averaged with the parent samples. If a duplicate was split, the split results were averaged as outlined above.

Once the most recent, independent result was identified as outlined above, two other considerations were made:

- If TPH fractions are available, they were utilized as the most representative results. In these instances, the note "FRACT" is inserted for TPH mixture resu
- Dissolved metals, when available, were used in lieu of total metals for all hydropunch (HP) samples and for samples with a turbidity greater than 40 NTU. In these instances, the note "DISS" is inserted for total metals results. Total metals results for these samples are shaded grey to indicate the results are not included in the quantitative risk evaluation.

GWss for strontium is not provided in RECAP; the risk-based values were calculated in accordance with Appendix H of RECAP 2003 (see Appendix G).

GWss for iron and manganese are not provided in RECAP; the EPA Secondary MCLs were used as the GWss for iron and manganese.

The following wells were sampled during more than one sampling event over the investigation history, and the most recent sample results were used in the quantitative assessment to represent current conditions (RECAP Section 2.5):

- SB-1-MW sampled May 7, 2010, June 8, 2010, and April 21, 2014;
- Facility well (also called WW-1 and AWW1) sampled April 3, 1995 (for chlorides only), November 11, 2006, and May 25, 2010; and
- Hebert water well sampled September 1, 2010 and April 21, 2014.

Table E-4
70-Foot Zone Groundwater Data
May 2010 Split Groundwater Analytical Results

East White Lake Field
Vermilion Parish, Louisiana

		Well type	*HP*		*HP*		*HP*		*HP*		*HP*		*HP*		*HP*		*HP*		*HP*		*HP*		*HP*		*HP*		*HP*		*HP*		*HP*		*HP*	
		Sample ID	*MW-6D*		*MW-6D*		*MW-6D*		*MW-6D*		*MW-4D*		*MW-4D*		*MW-4D*		*MW-4D*		*MW-5D*		*MW-5D*		*MW-5D*		*MW-5D*		*SB-1-MW-D*		*SB-1-MW-D*		*SB-1-MW-D*		*SB-1-MW-D*	
		Sample Interval (ft)	*(75-77)*						*(75-77)*		*(75-77)*						*(75-77)*		*(75-77)*						*(75-77)*		*(72-74)*						*(72-74)*	
		Sample Date	*5/12/2010*						*5/12/2010*		*5/12/2010*						*5/12/2010*		*5/12/2010*						*5/12/2010*		*5/6/2010*						*5/6/2010*	
		Sampled By	*MPA*		*ICON*		*AVG*		*AVG*		*MPA*		*ICON*		*AVG*		*AVG*		*MPA*		*ICON*		*AVG*		*AVG*		*MPA*		*ICON*		*AVG*		*AVG*	
Parameter	**Units**	**GW SS**							**REPRESENT**								**REPRESENT**								**REPRESENT**								**REPRESENT**	
Dissolved Metals																																		
Arsenic	mg/L	0.01	0.01	U	0.01	U	0.01	U	0.01	U	0.0012	B	0.01	U	0.0056		0.0056		0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U
Barium	mg/L	2	1.14		0.836		0.988		0.988		0.62		0.465		0.543		0.543		1.09		0.821		0.956		0.956		1.81		1.53		1.67		1.67	
Cadmium	mg/L	0.005	--		0.005	U	0.005	U	0.005	U	--		0.005	U	0.005	U	0.005	U	--		0.005	U	0.005	U	0.005	U	--		0.005	U	0.005	U	0.005	U
Calcium	mg/L	--	86.1		--		86.1		86.1		112		--		112		112		140		--		140		140		188		--		188		188	
Chromium	mg/L	0.1	--		0.01	U	0.01	U	0.01	U	--		0.01	U	0.01	U	0.01	U	--		0.01	U	0.01	U	0.01	U	--		0.01	U	0.01	U	0.01	U
Iron	mg/L	0.3	4.07		--		4.07		4.07		5.84		--		5.84		5.84		5.16		--		5.16		5.16		9.28		--		9.28		9.28	
Lead	mg/L	0.015	--		0.01	U	0.01	U	0.01	U	--		0.01	U	0.01	U	0.01	U	--		0.01	U	0.01	U	0.01	U	--		0.01	U	0.01	U	0.01	U
Magnesium	mg/L	--	28.9		--		28.9		28.9		41.3		--		41.3		41.3		45.3		--		45.3		45.3		68.2		--		68.2		68.2	
Manganese	mg/L	0.05	0.14		--		0.14		0.14		0.26		--		0.26		0.26		0.27		--		0.27		0.27		0.63		--		0.63		0.63	
Mercury	mg/L	0.002	--		0.0002	U	0.0002	U	0.0002	U	--		0.0002	U	0.0002	U	0.0002	U	--		0.0002	U	0.0002	U	0.0002	U	--		--		--		--	
Potassium	mg/L	--	5.1		--		5.1		5.1		4.57		--		4.57		4.57		5.97		--		5.97		5.97		5.96		--		5.96		5.96	
Selenium	mg/L	0.05	0.04	U	0.040		0.04		0.04		0.04	U	0.040		0.04		0.04		0.04	U	0.038		0.039		0.039		0.04	U	0.053		0.0465		0.0465	
Sodium	mg/L	--	435		--		435		435		199		--		199		199		454		--		454		454		563		--		563		563	
Strontium	mg/L	2.2	--		0.550		0.55		0.55		--		0.540		0.54		0.54		--		0.861		0.861		0.861		--		1.42		1.42		1.42	
Zinc	mg/L	1.1	--		0.01	U	0.01	U	0.01	U	--		0.01	U	0.01	U	0.01	U	--		0.013		0.013		0.013		--		0.188		0.188		0.188	
Total Metals																																		
Arsenic	mg/L	0.01	0.0041	B	--		0.0041		DISS		0.0047	B	--		0.0047		DISS		0.0099	B	--		0.0099		DISS		0.017		--		0.017		DISS	
Barium	mg/L	2	1.31		--		1.31		DISS		0.79		--		0.79		DISS		1.32		--		1.32		DISS		2.11		--		2.11		DISS	
Cadmium	mg/L	0.005	--		--		--		DISS		--		--		--		DISS		--		--		--		DISS		--		--		--		DISS	
Calcium	mg/L	--	89.4		--		89.4		DISS		118		--		118		DISS		143		--		143		DISS		204		--		204		DISS	
Chromium	mg/L	0.1	--		--		--		DISS		--		--		--		DISS		--		--		--		DISS		--		--		--		DISS	
Iron	mg/L	0.3	20.3		--		20.3		DISS		20.3		--		20.3		DISS		33		--		33		DISS		44.4		--		44.4		DISS	
Lead	mg/L	0.015	--		--		--		DISS		--		--		--		DISS		--		--		--		DISS		--		--		--		DISS	
Magnesium	mg/L	--	31.4		--		31.4		DISS		44.3		--		44.3		DISS		47.9		--		47.9		DISS		75.9		--		75.9		DISS	
Manganese	mg/L	0.05	0.33		--		0.33		DISS		0.45		--		0.45		DISS		0.73		--		0.73		DISS		0.97		--		0.97		DISS	
Mercury	mg/L	0.002	--		--		--		DISS		--		--		--		DISS		--		--		--		DISS		--		--		--		DISS	
Potassium	mg/L	--	7.01		--		7.01		DISS		6.18		--		6.18		DISS		8.23		--		8.23		DISS		7.55		--		7.55		DISS	
Selenium	mg/L	0.05	0.04	U	--		0.04	U	DISS		0.04	U	--		0.04	U	DISS		0.04	U	--		0.04	U	DISS		0.04	U	--		0.04	U	DISS	
Sodium	mg/L	--	445		--		445		DISS		200		--		200		DISS		442		--		442		DISS		628		--		628		DISS	
Strontium	mg/L	2.2	--		--		--		DISS		--		--		--		DISS		--		--		--		DISS		--		--		--		DISS	
Zinc	mg/L	1.1	--		--		--		DISS		--		--		--		DISS		--		--		--		DISS		--		--		--		DISS	
BTEX																																		
Benzene	mg/L	0.005	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.00185		0.005	U	0.00343		0.00343	
Ethylbenzene	mg/L	0.7	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U
Toluene	mg/L	1	0.005	U	0.01	U	0.0075	U	0.0075	U	0.005	U	0.01	U	0.0075	U	0.0075	U	0.005	U	0.01	U	0.0075	U	0.0075	U	0.005	U	0.005	U	0.005	U	0.005	U
Xylene (total)	mg/L	10	0.01	U	0.05	U	0.03	U	0.03	U	0.01	U	0.05	U	0.03	U	0.03	U	0.01	U	0.05	U	0.03	U	0.03	U	0.01	U	0.01	U	0.01	U	0.01	U
TPH Mixtures																																		
TPH-Gasoline Range	--	--	--		0.15	U	0.15	U	FRAC		--		0.15	U	0.15	U	FRAC		--		0.15	U	0.15	U	FRAC		--		0.15	U	0.15	U	FRAC	
TPH-Diesel Range	--	--	--		0.133	U	0.133	U	FRAC		--		0.131	U	0.131	U	FRAC		--		0.135	U	0.135	U	FRAC		--		0.14	U	0.14	U	FRAC	
TPH-Oil Range	--	--	--		0.122	U	0.122	U	FRAC		--		0.121	U	0.121	U	FRAC		--		0.125	U	0.125	U	FRAC		--		0.146	U	0.146	U	FRAC	
TPH Fractions																																		
Aliphatic >C10-C12	mg/L	0.15	0.15	U	--		0.15	U	0.15	U	0.15	U	--		0.15	U	0.15	U	0.15	U	--		0.15	U	0.15	U	0.15	U	--		0.15	U	0.15	U
Aliphatic >C12-C16	mg/L	0.15	0.15	U	--		0.15	U	0.15	U	0.15	U	--		0.15	U	0.15	U	0.15	U	--		0.15	U	0.15	U	0.15	U	--		0.15	U	0.15	U
Aliphatic >C16-C35	mg/L	7.3	0.15	U	--		0.15	U	0.15	U	0.15	U	--		0.15	U	0.15	U	0.15	U	--		0.15	U	0.15	U	0.15	U	--		0.15	U	0.15	U
Aliphatic >C8-C10	mg/L	0.15	0.15	U	--		0.15	U	0.15	U	0.15	U	--		0.15	U	0.15	U	0.15	U	--		0.15	U	0.15	U	0.15	U	--		0.15	U	0.15	U
Aliphatic C6-C8	mg/L	3.2	0.15	U	--		0.15	U	0.15	U	0.15	U	--		0.15	U	0.15	U	0.15	U	--		0.15	U	0.15	U	0.15	U	--		0.15	U	0.15	U
Aromatic >C10-C12	mg/L	0.15	0.15	U	--		0.15	U	0.15	U	0.15	U	--		0.15	U	0.15	U	0.15	U	--		0.15	U	0.15	U	0.15	U	--		0.15	U	0.15	U
Aromatic >C12-C16	mg/L	0.15	0.15	U	--		0.15	U	0.15	U	0.15	U	--		0.15	U	0.15	U	0.15	U	--		0.15	U	0.15	U	0.15	U	--		0.15	U	0.15	U
Aromatic >C16-C21	mg/L	0.15	0.15	U	--		0.15	U	0.15	U	0.15	U	--		0.15	U	0.15	U	0.15	U	--		0.15	U	0.15	U	0.15	U	--		0.15	U	0.15	U
Aromatic >C21-C35	mg/L	0.15	0.15	U	--		0.15	U	0.15	U	0.15	U	--		0.15	U	0.15	U	0.15	U	--		0.15	U	0.15	U	0.15	U	--		0.15	U	0.15	U
Aromatic >C8-C10	mg/L	0.15	0.15	U	--		0.15	U	0.15	U	0.15	U	--		0.15	U	0.15	U	0.15	U	--		0.15	U	0.15	U	0.15	U	--		0.15	U	0.15	U
Other																																		
Sulfate	mg/L	--	37.8		--		37.8		37.8		5	U	--		5	U	5	U	5	U	--		5	U	5	U	5	U	--		5	U	5	U
Bicarbonate Alkalinity	mg/L CaCO3	--	588		430		509		509		328		288		308		308		364		298		331		331		356		288		322		322	
Carbonate Alkalinity	mg/L CaCO3	--	1	U	10	U	5.5	U	5.5	U	1	U	10	U	5.5	U	5.5	U	1	U	10	U	5.5	U	5.5	U	1	U	10	U	5.5	U	5.5	U
Total Dissolved Solids	mg/L	--	1500		1540		1520		1520		1230		1030		1130		1130		2110		1860		1990		1990		2800		2660		2730		2730	
Chloride	mg/L	--	598		550		574		574		447		426		437		437		944		923		934		934		1420		1310		1370		1370	
Field Turbidity	NTU	--	548.6		--		549		549		292		--		292		292		1286		--		1290		1290		--		454.7		455		455	

Table E-4
70-Foot Zone Groundwater Data
May 2010 Split Groundwater Analytical Results

East White Lake Field
Vermilion Parish, Louisiana

		Well type	*HP*		*HP*		*HP*		*HP*		*HP*		*HP*		*HP*		*HP*		*HP*		*HP*		*HP*		*HP*		*HP*		*HP*		*HP*		*HP*	
		Sample ID	*HP-MPA-02-I*		*HP-MPA-02-I*		*HP-MPA-02-I*		*HP-MPA-02-I*		*HP-MPA-03-I*		*HP-MPA-03-I*		*HP-MPA-03-I*		*HP-MPA-03-I*		*HP-MPA-04-I*		*HP-MPA-04-I*		*HP-MPA-04-I*		*HP-MPA-04-I*		*HP-MPA-05-I*		*HP-MPA-05-I*		*HP-MPA-05-I*		*HP-MPA-05-I*	
		Sample Interval (ft)	*(72-75')*						*(72-75')*		*(72-75')*						*(72-75')*		*(80-83')*						*(80-83')*		*(72-75')*						*(72-75')*	
		Sample Date	***9/29/2010***						***9/29/2010***		***10/4/2010***						***10/4/2010***		***10/4/2010***						***10/4/2010***		***10/6/2010***						***10/6/2010***	
		Sampled By	*ICON*		*MPA*		*AVG*		*AVG*		*ICON*		*MPA*		*AVG*		*AVG*		*ICON*		*MPA*		*AVG*		*AVG*		*ICON*		*MPA*		*AVG*		*AVG*	
Parameter	**Units**	**GW SS**							**REPRESENT**								**REPRESENT**								**REPRESENT**								**REPRESENT**	
Dissolved Metals																																		
Arsenic	mg/L	0.01	0.033		0.01	U	0.0215		0.0215		0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.0142		0.01	U	0.0121		0.0121	
Barium	mg/L	2	0.85		0.99		0.92		0.92		1.48		1.58		1.53		1.53		0.605		0.76		0.683		0.683		0.543		0.59		0.567		0.567	
Cadmium	mg/L	0.005	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U
Calcium	mg/L	--	94		123		109		109		160		186		173		173		97		129		113		113		83		107		95		95	
Chromium	mg/L	0.1	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.0105		0.041		0.0258		0.0258		0.01	U	0.01	U	0.01	U	0.01	U
Iron	mg/L	0.3	-		4.67		4.67		4.67				5.36		5.36		5.36		-		12		12		12		-		3.21		3.21		3.21	
Lead	mg/L	0.015	0.01	U	0.015	U	0.0125	U	0.0125	U	0.01	U	0.015	U	0.0125	U	0.0125	U	0.01	U	0.015	U	0.0125	U	0.0125	U	0.01	U	0.015	U	0.0125	U	0.0125	U
Magnesium	mg/L	--	37		45.9		41.5		41.5		54		63		58.5		58.5		36		43		39.5		39.5		33		39.1		36.1		36.1	
Manganese	mg/L	0.05	-		0.28		0.28		0.28		-		0.37		0.37		0.37		-		0.36		0.36		0.36		-		0.23		0.23		0.23	
Mercury	mg/L	0.002	0.0002	U	-		0.0002	U	0.0002	U	0.0002	U	0.0002	U	0.0002	U	0.0002	U	0.0002	U	0.0002	U	0.0002	U	0.0002	U	0.0002	U	0.0002	U	0.0002	U	0.0002	U
Potassium	mg/L	--	5	U	4.76		4.88		4.88		5	U	5.72		5.36		5.36		5.6		6.7		6.15		6.15		5	U	5.24		5.12		5.12	
Selenium	mg/L	0.05	0.034		0.04	U	0.037		0.037		0.0891		0.04	U	0.0646		0.0646		0.0699		0.04	U	0.055		0.055		0.0584		0.04	U	0.0492		0.0492	
Sodium	mg/L	--	270		352		311		311		390		445		418		418		380		449		415		415		330		387		359		359	
Strontium	mg/L	2.2	0.8		0.91		0.855		0.855		1.33		1.42		1.38		1.38		0.909		1.02		0.965		0.965		0.792		0.86		0.826		0.826	
Zinc	mg/L	1.1	0.1		0.02	U	0.06		0.06		0.0983		0.03		0.0642		0.0642		0.0358		0.081		0.0584		0.0584		0.0204		0.02	U	0.0202		0.0202	
Total Metals																																		
Arsenic	mg/L	0.01	--		0.01	U	0.01	U	DISS		--		0.01	U	0.01	U	DISS		--		0.01	U	0.01	U	DISS		--		0.01	U	0.01	U	DISS	
Barium	mg/L	2	--		1.5		1.5		DISS		--		1.8		1.8		DISS		--		1.02		1.02		DISS		--		0.7		0.7		DISS	
Cadmium	mg/L	0.005	--		0.005	U	0.005	U	DISS		--		0.005	U	0.005	U	DISS		--		0.005	U	0.005	U	DISS		--		0.005	U	0.005	U	DISS	
Calcium	mg/L	--	--		124		124		DISS		--		195		195		DISS		--		136		136		DISS		--		102		102		DISS	
Chromium	mg/L	0.1	--		0.045		0.045		DISS		--		0.063		0.063		DISS		--		0.18		0.18		DISS		--		0.031		0.031		DISS	
Iron	mg/L	0.3	--		16.3		16.3		DISS		--		18.7		18.7		DISS		--		40.9		40.9		DISS		--		11.6		11.6		DISS	
Lead	mg/L	0.015	--		0.015	U	0.015	U	DISS		--		0.015	U	0.015	U	DISS		--		0.032		0.032		DISS		--		0.015	U	0.015	U	DISS	
Magnesium	mg/L	--	--		47.4		47.4		DISS		--		67.8		67.8		DISS		--		47.1		47.1		DISS		--		39.7		39.7		DISS	
Manganese	mg/L	0.05	--		0.49		0.49		DISS		--		0.53		0.53		DISS		--		0.69		0.69		DISS		--		0.42		0.42		DISS	
Mercury	mg/L	0.002	--				--		DISS		--		0.0002	U	0.0002	U	DISS		--		0.0002	U	0.0002	U	DISS		--		--		--		DISS	
Potassium	mg/L	--	--		5.99		5.99		DISS		--		6.83		6.83		DISS		--		8.31		8.31		DISS		--		5.61		5.61		DISS	
Selenium	mg/L	0.05	--		0.04	U	0.04	U	DISS		--		0.04	U	0.04	U	DISS		--		0.04	U	0.04	U	DISS		--		0.04	U	0.04	U	DISS	
Sodium	mg/L	--	--		379		379		DISS		--		473		473		DISS		--		460		460		DISS		--		380		380		DISS	
Strontium	mg/L	2.2	--		0.97		0.97		DISS		--		1.51		1.51		DISS		--		1.05		1.05		DISS		--		0.83		0.83		DISS	
Zinc	mg/L	1.1	--		0.037		0.037		DISS		--		0.19		0.19		DISS		--		0.34		0.34		DISS		--		0.067		0.067		DISS	
BTEX																																		
Benzene	mg/L	0.005	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U
Ethylbenzene	mg/L	0.7	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U
Toluene	mg/L	1	0.01	U	0.00574		0.00787		0.00787		0.01	U	0.00774		0.00887		0.00887		0.01		0.011		0.0105		0.0105		0.01	U	0.00711		0.00856		0.00856	
Xylene (total)	mg/L	10	0.05	U	0.01	U	0.03	U	0.03	U	0.05	U	0.005	U	0.0275	U	0.0275	U	0.05	U	0.005	U	0.0275	U	0.0275	U	0.05	U	0.005	U	0.0275	U	0.0275	U
TPH Mixtures																																		
TPH-Gasoline Range	--	--	0.15	U			0.15	U	FRAC		0.15	U			0.15	U	FRAC		0.15	U			0.15	U	FRAC		0.15	U			0.15	U	FRAC	
TPH-Diesel Range	--	--	0.13	U			0.13	U	FRAC		0.13	U			0.13	U	FRAC		0.13	U			0.13	U	FRAC		0.13	U			0.13	U	FRAC	
TPH-Oil Range	--	--	0.12	U			0.12	U	FRAC		0.12	U			0.12	U	FRAC		0.12	U			0.12	U	FRAC		0.12	U			0.12	U	FRAC	
TPH Fractions																																		
Aliphatic >C10-C12	mg/L	0.15	-		0.15	U	0.15	U	0.15	U	-		0.15	U	0.15	U	0.15	U	-		0.15	U	0.15	U	0.15	U	-		0.15	U	0.15	U	0.15	U
Aliphatic >C12-C16	mg/L	0.15	-		0.15	U	0.15	U	0.15	U	-		0.15	U	0.15	U	0.15	U	-		0.15	U	0.15	U	0.15	U	-		0.15	U	0.15	U	0.15	U
Aliphatic >C16-C35	mg/L	7.3	-		0.15	U	0.15	U	0.15	U	-		0.15	U	0.15	U	0.15	U	-		0.15	U	0.15	U	0.15	U	-		0.15	U	0.15	U	0.15	U
Aliphatic >C8-C10	mg/L	0.15	-		0.15	U	0.15	U	0.15	U	-		0.15	U	0.15	U	0.15	U	-		0.15	U	0.15	U	0.15	U	-		0.15	U	0.15	U	0.15	U
Aliphatic C6-C8	mg/L	3.2	-		0.15	U	0.15	U	0.15	U	-		0.15	U	0.15	U	0.15	U	-		0.15	U	0.15	U	0.15	U	-		0.15	U	0.15	U	0.15	U
Aromatic >C10-C12	mg/L	0.15	-		0.15	U	0.15	U	0.15	U	-		0.15	U	0.15	U	0.15	U	-		0.15	U	0.15	U	0.15	U	-		0.15	U	0.15	U	0.15	U
Aromatic >C12-C16	mg/L	0.15	-		0.15	U	0.15	U	0.15	U	-		0.15	U	0.15	U	0.15	U	-		0.15	U	0.15	U	0.15	U	-		0.15	U	0.15	U	0.15	U
Aromatic >C16-C21	mg/L	0.15	-		0.15	U	0.15	U	0.15	U	-		0.15	U	0.15	U	0.15	U	-		0.15	U	0.15	U	0.15	U	-		0.15	U	0.15	U	0.15	U
Aromatic >C21-C35	mg/L	0.15	-		0.15	U	0.15	U	0.15	U	-		0.15	U	0.15	U	0.15	U	-		0.15	U	0.15	U	0.15	U	-		0.15	U	0.15	U	0.15	U
Aromatic >C8-C10	mg/L	0.15	-		0.15	U	0.15	U	0.15	U	-		0.15	U	0.15	U	0.15	U	-		0.15	U	0.15	U	0.15	U	-		0.15	U	0.15	U	0.15	U
Other																																		
Sulfate	mg/L	--	-		5	U	5	U	5	U			5	U	5	U	5	U			5	U	5	U	5	U	-		5	U	5	U	5	U
Bicarbonate Alkalinity	mg/L CaCO3	--	310		352		331		331		360		351		356		356		360		379		370		370		320		407		364		364	
Carbonate Alkalinity	mg/L CaCO3	--	10	U	1	U	5.5	U	5.5	U	10	U	1	U	5.5	U	5.5	U	10	U	1	U	5.5	U	5.5	U	10	U	1	U	5.5	U	5.5	U
Total Dissolved Solids	mg/L	--	2500		1260		1880		1880		1800		2220		2010		2010		1800		1900		1850		1850		1600		1530		1570		1570	
Chloride	mg/L	--	1300		641		971		971		820		959		890		890		820		809		815		815		760		629		695		695	
Field Turbidity	NTU	--	96		96		96		96		1351		1111		1230		1230		2119		862		1490		1490		217		285		251		251	

Table E-4
70-Foot Zone Groundwater Data
May 2010 Split Groundwater Analytical Results

East White Lake Field
Vermilion Parish, Louisiana

		Well type	HP		HP		HP		HP	
		Sample ID	HP-MPA-06-I		HP-MPA-06-I		HP-MPA-06-I		HP-MPA-06-I	
	Sample Interval (ft)		(72-75')						(72-75')	
		Sample Date	10/6/2010						10/6/2010	
		Sampled By	ICON		MPA		AVG		AVG	
Parameter	**Units**	**GW SS**							REPRESENT	
Dissolved Metals										
Arsenic	mg/L	0.01	0.0127		0.01	U	0.0114		0.0114	
Barium	mg/L	2	1		1.02		1.01		1.01	
Cadmium	mg/L	0.005	0.005	U	0.005	U	0.005	U	0.005	U
Calcium	mg/L	--	100		117		109		109	
Chromium	mg/L	0.1	0.01	U	0.01	U	0.01	U	0.01	U
Iron	mg/L	0.3	-		4.99		4.99		4.99	
Lead	mg/L	0.015	0.01	U	0.015	U	0.0125	U	0.0125	U
Magnesium	mg/L	--	37		40.6		38.8		38.8	
Manganese	mg/L	0.05	-		0.24		0.24		0.24	
Mercury	mg/L	0.002	0.0002	U	0.0002	U	0.0002	U	0.0002	U
Potassium	mg/L	--	5.1		0.0002	U	2.55		2.55	
Selenium	mg/L	0.05	0.0368		0.04	U	0.0384		0.0384	
Sodium	mg/L	--	440		491		466		466	
Strontium	mg/L	2.2	1		1		1		1	
Zinc	mg/L	1.1	0.0192		0.02	U	0.0196		0.0196	
Total Metals										
Arsenic	mg/L	0.01	--		0.013		0.013		DISS	
Barium	mg/L	2	--		1.45		1.45		DISS	
Cadmium	mg/L	0.005	--		0.005	U	0.005	U	DISS	
Calcium	mg/L	--	--		145		145		DISS	
Chromium	mg/L	0.1	--		0.21		0.21		DISS	
Iron	mg/L	0.3	--		49.8		49.8		DISS	
Lead	mg/L	0.015	--		0.028		0.028		DISS	
Magnesium	mg/L	--	--		49.6		49.6		DISS	
Manganese	mg/L	0.05	--		1.01		1.01		DISS	
Mercury	mg/L	0.002	--		0.0002	U	0.0002	U	DISS	
Potassium	mg/L	--	--		8.59		8.59		DISS	
Selenium	mg/L	0.05	--		0.04	U	0.04	U	DISS	
Sodium	mg/L	--	--		488		488		DISS	
Strontium	mg/L	2.2	--		1.1		1.1		DISS	
Zinc	mg/L	1.1	--		0.24		0.24		DISS	
BTEX										
Benzene	mg/L	0.005	0.005	U	0.005	U	0.005	U	0.005	U
Ethylbenzene	mg/L	0.7	0.005	U	0.005	U	0.005	U	0.005	U
Toluene	mg/L	1	0.01	U	0.00657		0.00829		0.00829	
Xylene (total)	mg/L	10	0.05	U	0.005	U	0.0275	U	0.0275	U
TPH Mixtures										
TPH-Gasoline Range	--	--	0.15	U			0.15	U	FRAC	
TPH-Diesel Range	--	--	0.13	U			0.13	U	FRAC	
TPH-Oil Range	--	--	0.12	U			0.12	U	FRAC	
TPH Fractions										
Aliphatic >C10-C12	mg/L	0.15	-		0.15	U	0.15	U	0.15	U
Aliphatic >C12-C16	mg/L	0.15	-		0.15	U	0.15	U	0.15	U
Aliphatic >C16-C35	mg/L	7.3	-		0.15	U	0.15	U	0.15	U
Aliphatic >C8-C10	mg/L	0.15	-		0.15	U	0.15	U	0.15	U
Aliphatic C6-C8	mg/L	3.2	-		0.15	U	0.15	U	0.15	U
Aromatic >C10-C12	mg/L	0.15	-		0.15	U	0.15	U	0.15	U
Aromatic >C12-C16	mg/L	0.15	-		0.15	U	0.15	U	0.15	U
Aromatic >C16-C21	mg/L	0.15	-		0.15	U	0.15	U	0.15	U
Aromatic >C21-C35	mg/L	0.15	-		0.15	U	0.15	U	0.15	U
Aromatic >C8-C10	mg/L	0.15	-		0.15	U	0.15	U	0.15	U
Other										
Sulfate	mg/L	--	-		5	U	5	U	5	U
Bicarbonate Alkalinity	mg/L CaCO3	--	370		457		414		414	
Carbonate Alkalinity	mg/L CaCO3	--	10	U	1	U	5.5	U	5.5	U
Total Dissolved Solids	mg/L	--	1900		2030		1970		1970	
Chloride	mg/L	--	990		851		921		921	
Field Turbidity	NTU	--	3519		441		1980		1980	

		Well type	HP		HP		HP		HP	
		Sample ID	HP-MPA-07-I		HP-MPA-07-I		HP-MPA-07-I		HP-MPA-07-I	
	Sample Interval (ft)		(72-75')						(72-75')	
		Sample Date	10/5/2010						10/5/2010	
		Sampled By	ICON		MPA		AVG		AVG	
Parameter	**Units**	**GW SS**							REPRESENT	
Dissolved Metals										
Arsenic	mg/L	0.01	0.01	U	0.01	U	0.01	U	0.01	U
Barium	mg/L	2	0.878		0.9		0.889		0.889	
Cadmium	mg/L	0.005	0.005	U	0.005	U	0.005	U	0.005	U
Calcium	mg/L	--	88		102		95		95	
Chromium	mg/L	0.1	0.0102		0.011		0.0106		0.0106	
Iron	mg/L	0.3	-		5.79		5.79		5.79	
Lead	mg/L	0.015	0.01	U	0.015	U	0.0125	U	0.0125	U
Magnesium	mg/L	--	34		37.7		35.9		35.9	
Manganese	mg/L	0.05	-		0.29		0.29		0.29	
Mercury	mg/L	0.002	0.0002	U	0.0002	U	0.0002	U	0.0002	U
Potassium	mg/L	--	5	U	4.76		4.88		4.88	
Selenium	mg/L	0.05	0.0976		0.04	U	0.0688		0.0688	
Sodium	mg/L	--	370		391		381		381	
Strontium	mg/L	2.2	0.863		0.87		0.867		0.867	
Zinc	mg/L	1.1	0.0371		0.034		0.0356		0.0356	
Total Metals										
Arsenic	mg/L	0.01	--		0.01	U	0.01	U	DISS	
Barium	mg/L	2	--		1.1		1.1		DISS	
Cadmium	mg/L	0.005	--		0.005	U	0.005	U	DISS	
Calcium	mg/L	--	--		110		110		DISS	
Chromium	mg/L	0.1	--		0.095		0.095		DISS	
Iron	mg/L	0.3	--		22.7		22.7		DISS	
Lead	mg/L	0.015	--		0.015	U	0.015	U	DISS	
Magnesium	mg/L	--	--		42.2		42.2		DISS	
Manganese	mg/L	0.05	--		0.46		0.46		DISS	
Mercury	mg/L	0.002	--		0.0002	U	0.0002	U	DISS	
Potassium	mg/L	--	--		6.06		6.06		DISS	
Selenium	mg/L	0.05	--		0.04	U	0.04	U	DISS	
Sodium	mg/L	--	--		429		429		DISS	
Strontium	mg/L	2.2	--		0.93		0.93		DISS	
Zinc	mg/L	1.1	--		0.22		0.22		DISS	
BTEX										
Benzene	mg/L	0.005	0.005	U	0.005	U	0.005	U	0.005	U
Ethylbenzene	mg/L	0.7	0.005	U	0.005	U	0.005	U	0.005	U
Toluene	mg/L	1	0.01	U	0.00757		0.00879		0.00879	
Xylene (total)	mg/L	10	0.05	U	0.005	U	0.0275	U	0.0275	U
TPH Mixtures										
TPH-Gasoline Range	--	--	0.15	U			0.15	U	FRAC	
TPH-Diesel Range	--	--	0.13	U			0.13	U	FRAC	
TPH-Oil Range	--	--	0.12	U			0.12	U	FRAC	
TPH Fractions										
Aliphatic >C10-C12	mg/L	0.15	-		0.15	U	0.15	U	0.15	U
Aliphatic >C12-C16	mg/L	0.15	-		0.15	U	0.15	U	0.15	U
Aliphatic >C16-C35	mg/L	7.3	-		0.15	U	0.15	U	0.15	U
Aliphatic >C8-C10	mg/L	0.15	-		0.15	U	0.15	U	0.15	U
Aliphatic C6-C8	mg/L	3.2	-		0.15	U	0.15	U	0.15	U
Aromatic >C10-C12	mg/L	0.15	-		0.15	U	0.15	U	0.15	U
Aromatic >C12-C16	mg/L	0.15	-		0.15	U	0.15	U	0.15	U
Aromatic >C16-C21	mg/L	0.15	-		0.15	U	0.15	U	0.15	U
Aromatic >C21-C35	mg/L	0.15	-		0.15	U	0.15	U	0.15	U
Aromatic >C8-C10	mg/L	0.15	-		0.15	U	0.15	U	0.15	U
Other										
Sulfate	mg/L	--	-		5	U	5	U	5	U
Bicarbonate Alkalinity	mg/L CaCO3	--	370		402		386		386	
Carbonate Alkalinity	mg/L CaCO3	--	10	U	1	U	5.5	U	5.5	U
Total Dissolved Solids	mg/L	--	1700		1710		1710		1710	
Chloride	mg/L	--	850		696		773		773	
Field Turbidity	NTU	--	854		497		676		676	

		Well type	HP		HP		HP		HP	
		Sample ID	HP-MPA-08-I		HP-MPA-08-I		HP-MPA-08-I		HP-MPA-08-I	
	Sample Interval (ft)		(72-75')						(72-75')	
		Sample Date	10/5/2010						10/5/2010	
		Sampled By	ICON		MPA		AVG		AVG	
Parameter	**Units**	**GW SS**							REPRESENT	
Dissolved Metals										
Arsenic	mg/L	0.01	0.01	U	0.01	U	0.01	U	0.01	U
Barium	mg/L	2	0.607		0.64		0.624		0.624	
Cadmium	mg/L	0.005	0.005	U	0.005	U	0.005	U	0.005	U
Calcium	mg/L	--	72		85.3		78.7		78.7	
Chromium	mg/L	0.1	0.01	U	0.01	U	0.01	U	0.01	U
Iron	mg/L	0.3	-		3.41		3.41		3.41	
Lead	mg/L	0.015	0.01	U	0.015	U	0.0125	U	0.0125	U
Magnesium	mg/L	--	41		46.9		44		44	
Manganese	mg/L	0.05	-		0.24		0.24		0.24	
Mercury	mg/L	0.002	0.0002	U	0.0002	U	0.0002	U	0.0002	U
Potassium	mg/L	--	8.6		0.0002	U	4.3		4.3	
Selenium	mg/L	0.05	0.0704		0.04	U	0.0552		0.0552	
Sodium	mg/L	--	390		465		428		428	
Strontium	mg/L	2.2	0.749		0.78		0.765		0.765	
Zinc	mg/L	1.1	0.0133		0.02	U	0.0167		0.0167	
Total Metals										
Arsenic	mg/L	0.01	--		0.01	U	0.01	U	DISS	
Barium	mg/L	2	--		0.89		0.89		DISS	
Cadmium	mg/L	0.005	--		0.005	U	0.005	U	DISS	
Calcium	mg/L	--	--		129		129		DISS	
Chromium	mg/L	0.1	--		0.034		0.034		DISS	
Iron	mg/L	0.3	--		31.7		31.7		DISS	
Lead	mg/L	0.015	--		0.027		0.027		DISS	
Magnesium	mg/L	--	--		66.3		66.3		DISS	
Manganese	mg/L	0.05	--		0.83		0.83		DISS	
Mercury	mg/L	0.002	--		0.0002	U	0.0002	U	DISS	
Potassium	mg/L	--	--		13.1		13.1		DISS	
Selenium	mg/L	0.05	--		0.04	U	0.04	U	DISS	
Sodium	mg/L	--	--		466		466		DISS	
Strontium	mg/L	2.2	--		0.84		0.84		DISS	
Zinc	mg/L	1.1	--		0.13		0.13		DISS	
BTEX										
Benzene	mg/L	0.005	0.005	U	0.005	U	0.005	U	0.005	U
Ethylbenzene	mg/L	0.7	0.005	U	0.005	U	0.005	U	0.005	U
Toluene	mg/L	1	0.01	U	0.00635		0.00818		0.00818	
Xylene (total)	mg/L	10	0.05	U	0.005	U	0.0275	U	0.0275	U
TPH Mixtures										
TPH-Gasoline Range	--	--	0.15	U			0.15	U	FRAC	
TPH-Diesel Range	--	--	0.13	U			0.13	U	FRAC	
TPH-Oil Range	--	--	0.12	U			0.12	U	FRAC	
TPH Fractions										
Aliphatic >C10-C12	mg/L	0.15	-		0.15	U	0.15	U	0.15	U
Aliphatic >C12-C16	mg/L	0.15	-		0.15	U	0.15	U	0.15	U
Aliphatic >C16-C35	mg/L	7.3	-		0.15	U	0.15	U	0.15	U
Aliphatic >C8-C10	mg/L	0.15	-		0.15	U	0.15	U	0.15	U
Aliphatic C6-C8	mg/L	3.2	-		0.15	U	0.15	U	0.15	U
Aromatic >C10-C12	mg/L	0.15	-		0.15	U	0.15	U	0.15	U
Aromatic >C12-C16	mg/L	0.15	-		0.15	U	0.15	U	0.15	U
Aromatic >C16-C21	mg/L	0.15	-		0.15	U	0.15	U	0.15	U
Aromatic >C21-C35	mg/L	0.15	-		0.15	U	0.15	U	0.15	U
Aromatic >C8-C10	mg/L	0.15	-		0.15	U	0.15	U	0.15	U
Other										
Sulfate	mg/L	--			30		30	U	30	
Bicarbonate Alkalinity	mg/L CaCO3	--	280		339		310		310	
Carbonate Alkalinity	mg/L CaCO3	--	10	U	1	U	5.5	U	5.5	U
Total Dissolved Solids	mg/L	--	1600		1870		1740		1740	
Chloride	mg/L	--	830		737		784		784	
Field Turbidity	NTU	--	193		88		141		141	

		Well type	HP		HP		HP		HP	
		Sample ID	HP-MPA-09-I		HP-MPA-09-I		HP-MPA-09-I		HP-MPA-09-I	
	Sample Interval (ft)		(72-75')						(72-75')	
		Sample Date	10/6/2010						10/6/2010	
		Sampled By	ICON		MPA		AVG		AVG	
Parameter	**Units**	**GW SS**							REPRESENT	
Dissolved Metals										
Arsenic	mg/L	0.01	0.01	U	0.01	U	0.01	U	0.01	U
Barium	mg/L	2	1.48		1.64		1.56		1.56	
Cadmium	mg/L	0.005	0.005	U	0.005	U	0.005	U	0.005	U
Calcium	mg/L	--	140		167		154		154	
Chromium	mg/L	0.1	0.01	U	0.01	U	0.01	U	0.01	U
Iron	mg/L	0.3	-		7.45		7.45		7.45	
Lead	mg/L	0.015	0.01	U	0.015	U	0.0125	U	0.0125	U
Magnesium	mg/L	--	46		55.8		50.9		50.9	
Manganese	mg/L	0.05	-		0.36		0.36		0.36	
Mercury	mg/L	0.002	0.0002	U	0.0002	U	0.0002	U	0.0002	U
Potassium	mg/L	--	5	U	7.16		6.08		6.08	
Selenium	mg/L	0.05	0.0754		0.04	U	0.0577		0.0577	
Sodium	mg/L	--	520		624		572		572	
Strontium	mg/L	2.2	1.23		1.37		1.3		1.3	
Zinc	mg/L	1.1	0.0289		0.02	U	0.0245		0.0245	
Total Metals										
Arsenic	mg/L	0.01	--		0.01	U	0.01	U	DISS	
Barium	mg/L	2	--		1.93		1.93		DISS	
Cadmium	mg/L	0.005	--		0.005	U	0.005	U	DISS	
Calcium	mg/L	--	--		176		176		DISS	
Chromium	mg/L	0.1	--		0.13		0.13		DISS	
Iron	mg/L	0.3	--		31.1		31.1		DISS	
Lead	mg/L	0.015	--		0.015	U	0.015	U	DISS	
Magnesium	mg/L	--	--		61		61		DISS	
Manganese	mg/L	0.05	--		0.86		0.86		DISS	
Mercury	mg/L	0.002	--		0.0002	U	0.0002	U	DISS	
Potassium	mg/L	--	--		8.99		8.99		DISS	
Selenium	mg/L	0.05	--		0.04	U	0.04	U	DISS	
Sodium	mg/L	--	--		626		626		DISS	
Strontium	mg/L	2.2	--		1.41		1.41		DISS	
Zinc	mg/L	1.1	--		0.16		0.16		DISS	
BTEX										
Benzene	mg/L	0.005	0.005	U	0.005	U	0.005	U	0.005	U
Ethylbenzene	mg/L	0.7	0.005	U	0.005	U	0.005	U	0.005	U
Toluene	mg/L	1	0.01	U	0.00822		0.00911		0.00911	
Xylene (total)	mg/L	10	0.05	U	0.005	U	0.0275	U	0.0275	U
TPH Mixtures										
TPH-Gasoline Range	--	--	0.15	U			0.15	U	FRAC	
TPH-Diesel Range	--	--	0.13	U			0.13	U	FRAC	
TPH-Oil Range	--	--	0.12	U			0.12	U	FRAC	
TPH Fractions										
Aliphatic >C10-C12	mg/L	0.15	-		0.15	U	0.15	U	0.15	U
Aliphatic >C12-C16	mg/L	0.15	-		0.15	U	0.15	U	0.15	U
Aliphatic >C16-C35	mg/L	7.3	-		0.15	U	0.15	U	0.15	U
Aliphatic >C8-C10	mg/L	0.15	-		0.15	U	0.15	U	0.15	U
Aliphatic C6-C8	mg/L	3.2	-		0.15	U	0.15	U	0.15	U
Aromatic >C10-C12	mg/L	0.15	-		0.15	U	0.15	U	0.15	U
Aromatic >C12-C16	mg/L	0.15	-		0.15	U	0.15	U	0.15	U
Aromatic >C16-C21	mg/L	0.15	-		0.15	U	0.15	U	0.15	U
Aromatic >C21-C35	mg/L	0.15	-		0.15	U	0.15	U	0.15	U
Aromatic >C8-C10	mg/L	0.15	-		0.15	U	0.15	U	0.15	U
Other										
Sulfate	mg/L	--	-		5	U	5	U	5	U
Bicarbonate Alkalinity	mg/L CaCO3	--	280		405		343		343	
Carbonate Alkalinity	mg/L CaCO3	--	10	U	1	U	5.5	U	5.5	U
Total Dissolved Solids	mg/L	--	2800		2610		2710		2710	
Chloride	mg/L	--	1500		1110		1310		1310	
Field Turbidity	NTU	--	1470		759		1110		1110	

		Well type	HP		HP		HP		HP	
		Sample ID	HP-MPA-10-I		HP-MPA-10-I		HP-MPA-10-I		HP-MPA-10-I	
	Sample Interval (ft)		(72-75')						(72-75')	
		Sample Date	10/6/2010						10/6/2010	
		Sampled By	ICON		MPA		AVG		AVG	
Parameter	**Units**	**GW SS**							REPRESENT	
Dissolved Metals										
Arsenic	mg/L	0.01	0.0255		0.01	U	0.0178		0.0178	
Barium	mg/L	2	0.717		0.78		0.749		0.749	
Cadmium	mg/L	0.005	0.005	U	0.005	U	0.005	U	0.005	U
Calcium	mg/L	--	76		96.4		86.2		86.2	
Chromium	mg/L	0.1	0.02		0.01	U	0.015		0.015	
Iron	mg/L	0.3	-		4.37		4.37		4.37	
Lead	mg/L	0.015	0.01	U	0.015	U	0.0125	U	0.0125	U
Magnesium	mg/L	--	25		30.7		27.9		27.9	
Manganese	mg/L	0.05	-		0.2		0.2		0.2	
Mercury	mg/L	0.002	0.0002	U	0.0002	U	0.0002	U	0.0002	U
Potassium	mg/L	--	6.2		8.07		7.14		7.14	
Selenium	mg/L	0.05	0.0428		0.04	U	0.0414		0.0414	
Sodium	mg/L	--	330		416		373		373	
Strontium	mg/L	2.2	0.689		0.77		0.73		0.73	
Zinc	mg/L	1.1	0.0272		0.02	U	0.0236		0.0236	
Total Metals										
Arsenic	mg/L	0.01	--		0.028		0.028		DISS	
Barium	mg/L	2	--		1.42		1.42		DISS	
Cadmium	mg/L	0.005	--		0.005	U	0.005	U	DISS	
Calcium	mg/L	--	--		132		132		DISS	
Chromium	mg/L	0.1	--		0.34		0.34		DISS	
Iron	mg/L	0.3	--		82.8		82.8		DISS	
Lead	mg/L	0.015	--		0.057		0.057		DISS	
Magnesium	mg/L	--	--		45.5		45.5		DISS	
Manganese	mg/L	0.05	--		1.74		1.74		DISS	
Mercury	mg/L	0.002	--		0.0002	U	0.0002	U	DISS	
Potassium	mg/L	--	--		11.9		11.9		DISS	
Selenium	mg/L	0.05	--		0.04	U	0.04	U	DISS	
Sodium	mg/L	--	--		383		383		DISS	
Strontium	mg/L	2.2	--		0.88		0.88		DISS	
Zinc	mg/L	1.1	--		0.35		0.35		DISS	
BTEX										
Benzene	mg/L	0.005	0.005	U	0.005	U	0.005	U	0.005	U
Ethylbenzene	mg/L	0.7	0.005	U	0.005	U	0.005	U	0.005	U
Toluene	mg/L	1	0.01	U	0.0072		0.0086		0.0086	
Xylene (total)	mg/L	10	0.05	U	0.005	U	0.0275	U	0.0275	U
TPH Mixtures										
TPH-Gasoline Range	--	--	0.15	U			0.15	U	FRAC	
TPH-Diesel Range	--	--	0.13	U			0.13	U	FRAC	
TPH-Oil Range	--	--	0.12	U			0.12	U	FRAC	
TPH Fractions										
Aliphatic >C10-C12	mg/L	0.15	-		0.15	U	0.15	U	0.15	U
Aliphatic >C12-C16	mg/L	0.15	-		0.15	U	0.15	U	0.15	U
Aliphatic >C16-C35	mg/L	7.3	-		0.15	U	0.15	U	0.15	U
Aliphatic >C8-C10	mg/L	0.15	-		0.15	U	0.15	U	0.15	U
Aliphatic C6-C8	mg/L	3.2	-		0.15	U	0.15	U	0.15	U
Aromatic >C10-C12	mg/L	0.15	-		0.15	U	0.15	U	0.15	U
Aromatic >C12-C16	mg/L	0.15	-		0.15	U	0.15	U	0.15	U
Aromatic >C16-C21	mg/L	0.15	-		0.15	U	0.15	U	0.15	U
Aromatic >C21-C35	mg/L	0.15	-		0.15	U	0.15	U	0.15	U
Aromatic >C8-C10	mg/L	0.15	-		0.15	U	0.15	U	0.15	U
Other										
Sulfate	mg/L	--	-		5	U	5	U	5	U
Bicarbonate Alkalinity	mg/L CaCO3	--	340		442		391		391	
Carbonate Alkalinity	mg/L CaCO3	--	10	U	1	U	5.5	U	5.5	U
Total Dissolved Solids	mg/L	--	1400		1520		1460		1460	
Chloride	mg/L	--	690		613		652		652	
Field Turbidity	NTU	--	3477		461		1970		1970	

Table E-4
70-Foot Zone Groundwater Data
May 2010 Split Groundwater Analytical Results

East White Lake Field
Vermilion Parish, Louisiana

Notes:

The following notes apply to ground water data sets provided in Tables E-2 through E-6.

-- Indicates no standard in the RECAP standard column, or parameter not analyzed in the data section

U Not detected, value is the detection limit

B For inorganics, this qualifier indicates the result is between the Reporting Detection Limit (RDL) and Methold Detection Limit (MDL)

HP - Hydropunch sampling technology

MW - Monitoring Well

WW - Water Well

Yellow highlighting indicates a detected concentration exceeds the screening level.

Grey shading indicates the total metals results are not included in the quantitative risk evaluation (see DISS definition).

FRACT - TPH fraction data are available for this location and are utilized in lieu of TPH mixtures.

DISS - Dissolved metals, when available, were used in lieu of total metals for all HP samples and for samples with a turbidity greater than 40 NTU.

GWSS = RECAP Screening Standard from Table 1 of RECAP 2003.

AVG - represents the average of split sample results, calculated as outlined below.

REPRESENT - This column presents the constituent concentrations considered representative for each sample. When more than one sample event is available for a single location, the representative concentrations were determined as the most recent independent concentration available for each constituent. Independent concentrations were identified as the following:

- Single sample results provided by one lab, where no split sample was collected.
- If split samples were collected, the average concentration for each parameter was determined as follows:
  - Parameters with detected concentrations in both splits: the detected concentrations were averaged.
  - Parameters reported as nondetect in both splits: the detection limits were averaged and the average is considered not detected at the averaged detection limit.
  - Parameters analyzed in only one of the split samples: the result (detection or nondetect) for the parameter was identified in the "average" column for that sample.
  - Parameters that were detected in one split but not detected in the other split: the detection limit was used as a proxy concentration and averaged with the detected concentration.
  - Duplicates were considered independent samples and were not averaged with the parent samples. If a duplicate was split, the split results were averaged as outlined above.

Once the most recent, independent result was identified as outlined above, two other considerations were made:

- If TPH fractions are available, they were utilized as the most representative results. In these instances, the note "FRACT" is inserted for TPH mixture results.
- Dissolved metals, when available, were used in lieu of total metals for all hydropunch (HP) samples and for samples with a turbidity greater than 40 NTU. In these instances, the note "DISS" is inserted for total metals results. Total metals results for these samples are shaded grey to indicate the results are not included in the quantitative risk evaluation.

GWss for strontium is not provided in RECAP; the risk-based values were calculated in accordance with Appendix H of RECAP 2003 (see Appendix G).

GWss for iron and manganese are not provided in RECAP; the EPA Secondary MCLs were used as the GWss for iron and manganese.

The following wells were sampled during more than one sampling event over the investigation history, and the most recent sample results were used in the quantitative assessment to represent current conditions (RECAP Section 2.5):

- SB-1-MW sampled May 7, 2010, June 8, 2010, and April 21, 2014;
- Facility well (also called WW-1 and AWW1) sampled April 3, 1995 (for chlorides only), November 11, 2006, and May 25, 2010; and
- Hebert water well sampled September 1, 2010 and April 21, 2014.

Table E-5
90-Foot Zone Groundwater Data
May 2010 Split Groundwater Analytical Results

East White Lake Field
Vermilion Parish, Louisiana

		Well type	*HP*		*HP*		*HP*		*HP*	
		Sample ID	*MW-1C*		*MW-1C*		*MW-1C*		*MW-1C*	
		Sample Interval (ft)	*(97-100)*						*(97-100)*	
		Sample Date	*5/13/2010*						*5/13/2010*	
		Sampled By	*MPA*		*ICON*		*AVG*		*AVG*	
Parameter	*Units*	*GW SS*							**REPRESENT**	
Dissolved Metals										
Arsenic	mg/L	0.01	0.01	U	0.01	U	0.01	U	0.01	U
Barium	mg/L	2	1.12		0.908		1.01		1.01	
Cadmium	mg/L	0.005	--		0.005	U	0.005	U	0.005	U
Calcium	mg/L	--	120		--		120		120	
Chromium	mg/L	0.1	--		0.01	U	0.01	U	0.01	U
Iron	mg/L	0.3	4.51		--		4.51		4.51	
Lead	mg/L	0.015	--		0.01	U	0.01	U	0.01	U
Magnesium	mg/L	--	42.7		--		42.7		42.7	
Manganese	mg/L	0.05	0.21		--		0.21		0.21	
Mercury	mg/L	0.002	--		0.0002	U	0.0002	U	0.0002	U
Potassium	mg/L	--	5.84		--		5.84		5.84	
Selenium	mg/L	0.05	0.04	U	0.031		0.0355		0.0355	
Sodium	mg/L	--	467		--		467		467	
Strontium	mg/L	2.2	--		0.824		0.824		0.824	
Zinc	mg/L	1.1	--		0.01	U	0.01	U	0.01	U
Total Metals										
Arsenic	mg/L	0.01	0.01	U	--		0.01	U	DISS	
Barium	mg/L	2	1.18		--		1.18		DISS	
Cadmium	mg/L	0.005	--		--		--		DISS	
Calcium	mg/L	--	124		--		124		DISS	
Chromium	mg/L	0.1	--		--		--		DISS	
Iron	mg/L	0.3	7.45		--		7.45		DISS	
Lead	mg/L	0.015	--		--		--		DISS	
Magnesium	mg/L	--	43.8		--		43.8		DISS	
Manganese	mg/L	0.05	0.24		--		0.24		DISS	
Mercury	mg/L	0.002	--		--		--		DISS	
Potassium	mg/L	--	6.03		--		6.03		DISS	
Selenium	mg/L	0.05	0.04	U	--		0.04	U	DISS	
Sodium	mg/L	--	494		--		494		DISS	
Strontium	mg/L	2.2	--		--		--		DISS	
Zinc	mg/L	1.1	--		--		--		DISS	
BTEX										
Benzene	mg/L	0.005	0.005	U	0.005	U	0.005	U	0.005	U
Ethylbenzene	mg/L	0.7	0.005	U	0.005	U	0.005	U	0.005	U
Toluene	mg/L	1	0.005	U	0.01	U	0.0075	U	0.0075	U
Xylene (total)	mg/L	10	0.01	U	0.05	U	0.03	U	0.03	U
TPH Mixtures										
TPH-Gasoline Range	--	--	--		0.15	U	0.15	U	FRAC	
TPH-Diesel Range	--	--	--		0.131	U	0.131	U	FRAC	
TPH-Oil Range	--	--	--		0.121	U	0.121	U	FRAC	
TPH Fractions										
Aliphatic >C10-C12	mg/L	0.15	0.15	U	--		0.15	U	0.15	U
Aliphatic >C12-C16	mg/L	0.15	0.15	U	--		0.15	U	0.15	U
Aliphatic >C16-C35	mg/L	7.3	0.15	U	--		0.15	U	0.15	U
Aliphatic >C8-C10	mg/L	0.15	0.15	U	--		0.15	U	0.15	U
Aliphatic C6-C8	mg/L	3.2	0.15	U	--		0.15	U	0.15	U
Aromatic >C10-C12	mg/L	0.15	0.15	U	--		0.15	U	0.15	U
Aromatic >C12-C16	mg/L	0.15	0.15	U	--		0.15	U	0.15	U
Aromatic >C16-C21	mg/L	0.15	0.15	U	--		0.15	U	0.15	U
Aromatic >C21-C35	mg/L	0.15	0.15	U	--		0.15	U	0.15	U
Aromatic >C8-C10	mg/L	0.15	0.15	U	--		0.15	U	0.15	U
Other										
Sulfate	mg/L	--	5	U	--		5	U	5	U
Bicarbonate Alkalinity	mg/L CaCO3	--	351		340		346		346	
Carbonate Alkalinity	mg/L CaCO3	--	1	U	10	U	5.5	U	5.5	U
Total Dissolved Solids	mg/L	--	2150		1820		1990		1990	
Chloride	mg/L	--	1000		888		944		944	
Field Turbidity	NTU	--	37.73		--		37.7		37.7	

Table E-5
90-Foot Zone Groundwater Data
May 2010 Split Groundwater Analytical Results

East White Lake Field
Vermilion Parish, Louisiana

Notes:

The following notes apply to ground water data sets provided in Tables E-2 through E-6.

--	Indicates no standard in the RECAP standard column, or parameter not analyzed in the data section
U	Not detected, value is the detection limit
B	For inorganics, this qualifier indicates the result is between the Reporting Detection Limit (RDL) and Methold Detection Limit (MDL)

HP - Hydropunch sampling technology

MW - Monitoring Well

WW - Water Well

Yellow highlighting indicates a detected concentration exceeds the screening level.

Grey shading indicates the total metals results are not included in the quantitative risk evaluation (see DISS definition).

FRACT - TPH fraction data are available for this location and are utilized in lieu of TPH mixtures.

DISS - Dissolved metals, when available, were used in lieu of total metals for all HP samples and for samples with a turbidity greater than 40 NTU.

GWSS = RECAP Screening Standard from Table 1 of RECAP 2003.

AVG - represents the average of split sample results, calculated as outlined below.

REPRESENT - This column presents the constituent concentrations considered representative for each sample. When more than one sample event is available for a single location, the representative concentrations were determined as the most recent independent concentration available for each constituent. Independent concentrations were identified as the following:

- Single sample results provided by one lab, where no split sample was collected.
- If split samples were collected, the average concentration for each parameter was determined as follows:
  - Parameters with detected concentrations in both splits: the detected concentrations were averaged.
  - Parameters reported as nondetect in both splits: the detection limits were averaged and the average is considered not detected at the averaged detection limit.
  - Parameters analyzed in only one of the split samples: the result (detection or nondetect) for the parameter was identified in the "average" column for that sample.
  - Parameters that were detected in one split but not detected in the other split: the detection limit was used as a proxy concentration and averaged with the detected concentration.
  - Duplicates were considered independent samples and were not averaged with the parent samples. If a duplicate was split, the split results were averaged as outlined above.

Once the most recent, independent result was identified as outlined above, two other considerations were made:

- If TPH fractions are available, they were utilized as the most representative results. In these instances, the note "FRACT" is inserted for TPH mixture resu
- Dissolved metals, when available, were used in lieu of total metals for all hydropunch (HP) samples and for samples with a turbidity greater than 40 NTU. In these instances, the note "DISS" is inserted for total metals results. Total metals results for these samples are shaded grey to indicate the results are not included in the quantitative risk evaluation.

GWss for strontium is not provided in RECAP; the risk-based values were calculated in accordance with Appendix H of RECAP 2003 (see Appendix G).

GWss for iron and manganese are not provided in RECAP; the EPA Secondary MCLs were used as the GWss for iron and manganese.

The following wells were sampled during more than one sampling event over the investigation history, and the most recent sample results were used in the quantitative assessment to represent current conditions (RECAP Section 2.5):

- SB-1-MW sampled May 7, 2010, June 8, 2010, and April 21, 2014;
- Facility well (also called WW-1 and AWW1) sampled April 3, 1995 (for chlorides only), November 11, 2006, and May 25, 2010; and
- Hebert water well sampled September 1, 2010 and April 21, 2014.

Table E-6
Upper Sand of Chicot Aquifer Groundwater Data
May 2010 Split Groundwater Analytical Results

East White Lake Field
Vermilion Parish, Louisiana

		Well type	*WW*		*WW*		*WW*		*WW*		*WW*		*WW*		*WW*		*WW*		*WW*		*WW*		*WW*		*WW*	
		Sample ID	*AWW1*		*AWW1*		*MPA WW-1*		*WW-1*		*WW-1*		*WW-1*		*J Guidry Well*		*J Guidry Well*		*J Guidry Well*		*J Guidry Well*		*J Guidry Well*		*J Guidry Well*	
		Sample Interval (ft)	*Chicot (400 ft)*		*Chicot (400 ft)*		*Chicot (400 ft)*						*Chicot (400 ft)*		*(est. 519 ft)*						*(est. 519 ft)*		*(est. 519 ft)*		*(est. 519 ft)*	
		Sample Date	*4/3/1995*		*11/14/2006*		*5/25/2010*						*5/25/2010*		*9/1/2010*						*9/1/2010*		*9/1/2010*		*9/1/2010*	
		Sampled By	*Resource Aquis. SWD Appl.*		*ICON*		*MPA*		*ICON*		*AVG*		*most recent*		*ICON*		*MPA*		*AVG*		*MPA*		*MPA*		*AVG or Max*	
Parameter	*Units*	*GWSS*											**REPRESENT**												**REPRESENT**	
Total Metals																										
Arsenic	mg/L	0.01	--		0.011		0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U
Barium	mg/L	2	--		0.431		0.47		0.432		0.451		0.451		0.64		0.78		0.71		0.73		0.74		0.74	
Cadmium	mg/L	0.005	--		0.001	U	--		0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U
Calcium	mg/L	--	--		--		49.9		--		49.9		49.9		--		72.5		72.5		68.3		70.5		72.5	
Chromium	mg/L	0.1	--		--		--		0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U
Iron	mg/L	0.3	--		--		0.75		--		0.75		0.75		--		1.08		1.08		1.02		1.01		1.08	
Lead	mg/L	0.015	--		0.005	U	--		0.01	U	0.01	U	0.01	U	0.01	U	0.015	U	0.0125	U	0.015	U	0.015	U	0.015	U
Magnesium	mg/L	--	--		--		17.7		--		17.7		17.7		--		23.8		23.8		22		22.8		23.8	
Manganese	mg/L	0.05	--		--		0.082		--		0.082		0.082		--		0.073		0.073		0.068		0.068		0.073	
Mercury	mg/L	0.002	--		--		--		--		--		--		--		0.0002	U	0.0002	U	0.0002	U	0.0002	U	0.0002	U
Potassium	mg/L	--	--		--		2.47		--		2.47		2.47		--		2.68		2.68		2.47		2.46		2.68	
Selenium	mg/L	0.05	--		--		0.04	U	0.02	U	0.03	U	0.03	U	0.02	U	0.04	U	0.03	U	0.04	U	0.04	U	0.04	U
Sodium	mg/L	--	--		--		161		--		161		161		--		117		117		109		109		117	
Strontium	mg/L	2.2	--		0.46		--		0.461		0.461		0.461		0.463		0.57		0.517		0.54		0.54		0.54	
Zinc	mg/L	1.1	--		--		--		0.022		0.022		0.022		0.247		0.32		0.284		0.31		0.26		0.31	
BTEX																										
Benzene	mg/L	0.005	--		0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U
Ethylbenzene	mg/L	0.7	--		0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U
Toluene	mg/L	1	--		0.005	U	0.005	U	0.01	U	0.0075	U	0.0075	U	0.01	U	0.005	U	0.0075	U	0.005	U	0.005	U	0.0075	U
Xylene (total)	mg/L	10	--		0.015	U	0.01	U	0.05	U	0.03	U	0.03	U	0.05	U	0.01	U	0.03	U	0.01	U	0.01	U	0.03	U
TPH Mixtures																										
TPH-Gasoline Range	mg/L	0.15	--		0.15	U	--		0.15	U	0.15	U	FRAC		0.15	U	--		0.15	U	--		--		FRAC	
TPH-Diesel Range	mg/L	0.15	--		0.839		--		0.135	U	0.135	U	FRAC		0.136	U	--		0.136	U	--		--		FRAC	
TPH-Oil Range	mg/L	0.15	--		0.447		--		0.125	U	0.125	U	FRAC		0.126	U	--		0.126	U	--		--		FRAC	
TPH Fractions																										
Aliphatic >C10-C12	mg/L	0.15	--		--		0.15	U	--		0.15	U	0.15	U	--		0.15	U	0.15	U	0.15	U	0.15	U	0.15	U
Aliphatic >C12-C16	mg/L	0.15	--		--		0.15	U	--		0.15	U	0.15	U	--		0.15	U	0.15	U	0.15	U	0.15	U	0.15	U
Aliphatic >C16-C35	mg/L	7.3	--		--		0.15	U	--		0.15	U	0.15	U	--		0.15	U	0.15	U	0.15	U	0.15	U	0.15	U
Aliphatic >C8-C10	mg/L	0.15	--		--		0.15	U	--		0.15	U	0.15	U	--		0.15	U	0.15	U	0.15	U	0.15	U	0.15	U
Aliphatic C6-C8	mg/L	3.2	--		--		0.15	U	--		0.15	U	0.15	U	--		0.15	U	0.15	U	0.15	U	0.15	U	0.15	U
Aromatic >C10-C12	mg/L	0.15	--		--		0.15	U	--		0.15	U	0.15	U	--		0.15	U	0.15	U	0.15	U	0.15	U	0.15	U
Aromatic >C12-C16	mg/L	0.15	--		--		0.15	U	--		0.15	U	0.15	U	--		0.15	U	0.15	U	0.15	U	0.15	U	0.15	U
Aromatic >C16-C21	mg/L	0.15	--		--		0.15	U	--		0.15	U	0.15	U	--		0.15	U	0.15	U	0.15	U	0.15	U	0.15	U
Aromatic >C21-C35	mg/L	0.15	--		--		0.15	U	--		0.15	U	0.15	U	--		0.15	U	0.15	U	0.15	U	0.15	U	0.15	U
Aromatic >C8-C10	mg/L	0.15	--		--		0.15	U	--		0.15	U	0.15	U	--		0.15	U	0.15	U	0.15	U	0.15	U	0.15	U
Other																										
Sulfate	mg/L	--	--		--		5	U	--		5	U	5	U	--		5	U	5	U	5	U	5	U	5	U
Bicarbonate Alkalinity	mg/L CaCO3	--	--		--		356		368		362		362		--		340		340		334		345		345	
Carbonate Alkalinity	mg/L CaCO3	--	--		--		1	U	10	U	5.5	U	5.5	U	--		1	U	1	U	1	U	1	U	1	U
Total Dissolved Solids	mg/L	--	564		553		616		663		640		640		607		604		606		582		632		632	
Chloride	mg/L	250	84		170		195		192		194		194		163		139		151		139		139		151	
Field Turbidity	NTU	--	--		8		--		--		--		--		--		--		--		--		--		--	

Table E-6
Upper Sand of Chicot Aquifer Groundwater Data
May 2010 Split Groundwater Analytical Results

East White Lake Field
Vermilion Parish, Louisiana

Notes:

The following notes apply to ground water data sets provided in Tables E-2 through E-6.

--	Indicates no standard in the RECAP standard column, or parameter not analyzed in the data section
U	Not detected, value is the detection limit
B	For inorganics, this qualifier indicates the result is between the Reporting Detection Limit (RDL) and Methold Detection Limit (MDL)

HP - Hydropunch sampling technology

MW - Monitoring Well

WW - Water Well

Yellow highlighting indicates a detected concentration exceeds the screening level.

Grey shading indicates the total metals results are not included in the quantitative risk evaluation (see DISS definition).

FRACT - TPH fraction data are available for this location and are utilized in lieu of TPH mixtures.

DISS - Dissolved metals, when available, were used in lieu of total metals for all HP samples and for samples with a turbidity greater than 40 NTU.

GWSS = RECAP Screening Standard from Table 1 of RECAP 2003.

AVG - represents the average of split sample results, calculated as outlined below.

REPRESENT - This column presents the constituent concentrations considered representative for each sample. When more than one sample event is available for a single location, the representative concentrations were determined as the most recent independent concentration available for each constituent. Independent concentrations were identified as the following:

- Single sample results provided by one lab, where no split sample was collected.
- If split samples were collected, the average concentration for each parameter was determined as follows:
    - Parameters with detected concentrations in both splits: the detected concentrations were averaged.
    - Parameters reported as nondetect in both splits: the detection limits were averaged and the average is considered not detected at the averaged detection limit.
    - Parameters analyzed in only one of the split samples: the result (detection or nondetect) for the parameter was identified in the "average" column for that sample.
    - Parameters that were detected in one split but not detected in the other split: the detection limit was used as a proxy concentration and averaged with the detected concentration.
    - Duplicates were considered independent samples and were not averaged with the parent samples. If a duplicate was split, the split results were averaged as outlined above.

Once the most recent, independent result was identified as outlined above, two other considerations were made:

- If TPH fractions are available, they were utilized as the most representative results. In these instances, the note "FRACT" is inserted for TPH mixture results.
- Dissolved metals, when available, were used in lieu of total metals for all hydropunch (HP) samples and for samples with a turbidity greater than 40 NTU. In these instances, the note "DISS" is inserted for total metals results. Total metals results for these samples are shaded grey to indicate the results are not included in the quantitative risk evaluation.

GWss for strontium is not provided in RECAP; the risk-based values were calculated in accordance with Appendix H of RECAP 2003 (see Appendix G).

GWss for iron and manganese are not provided in RECAP; the EPA Secondary MCLs were used as the GWss for iron and manganese.

The following wells were sampled during more than one sampling event over the investigation history, and the most recent sample results were used in the quantitative assessment to represent current conditions (RECAP Section 2.5):

- SB-1-MW sampled May 7, 2010, June 8, 2010, and April 21, 2014;
- Facility well (also called WW-1 and AWW1) sampled April 3, 1995 (for chlorides only), November 11, 2006, and May 25, 2010; and
- Hebert water well sampled September 1, 2010 and April 21, 2014.

Table E-7
Surface Water Data
Split Surface Water Analytical Results

East White Lake Field
Vermilion Parish, Louisiana

		SW-01		SW-02		SW-03		SW-04		SW-05		SW-06		SW-07		SW-09		SW-109*	SW-10		SW-20	
		MPA	**ICON**	**MPA**	**ICON**	**MPA**	**ICON**	**MPA**	**ICON**	**MPA**	**ICON**	**MPA**	**ICON**	**MPA**	**ICON**	**MPA**	**ICON**	**MPA**	**MPA**	**ICON**	**MPA**	**ICON**
Analytical Parameters	**Units**	**5/6/2010**	**5/6/2010**	**5/5/2010**	**5/5/2010**	**5/5/2010**	**5/5/2010**	**5/5/2010**	**5/5/2010**	**5/5/2010**	**5/5/2010**	**5/6/2010**	**5/6/2010**	**5/6/2010**	**5/6/2010**	**5/6/2010**	**5/6/2010**	**5/6/2010**	**5/6/2010**	**5/6/2010**	**5/7/2010**	**5/7/2010**
Total Metals																						
Arsenic	mg/L	<0.00079	<0.0100	<0.00079	<0.0100	<0.00079	<0.0100	<0.00079	<0.0100	0.0019 B	<0.0100	<0.00079	<0.0100	<0.00079	<0.0100	<0.00079	<0.0100	<0.00079	<0.00079	<0.0100	0.013	--
Barium	mg/L	0.28	0.284	0.29	0.285	0.3	0.262	0.27	0.245	0.29	0.265	0.39	0.346	0.45	0.413	0.42	0.378	0.41	0.38	0.345	1.23	--
Cadmium	mg/L	<0.00016	<0.00500	<0.00016	<0.00500	<0.00016	<0.00500	<0.00016	<0.00500	<0.00016	<0.00500	<0.00016	<0.00500	<0.00016	<0.00500	<0.00016	<0.00500	<0.00016	<0.00016	<0.00500	<0.00016	--
Calcium	mg/L	38.4	--	44.1	--	43.3	--	44.6	--	43.1	<0.0100	54.3	--	56.1	--	58.6	--	59.4	50.6	--	73.9	--
Chromium	mg/L	0.0026 B	<0.0100	0.0023 B	<0.0100	0.0026 B	<0.0100	0.0022 B	<0.0100	0.0025 B	<0.0100	0.0025 B	<0.0100	0.0025 B	<0.0100	0.0027 B	<0.0100	0.0027 B	0.0022 B	<0.0100	0.0075 B	--
Iron	mg/L	1.26	--	0.8	--	1.08	--	0.49	--	0.85	--	0.94	--	0.94	--	1.12	--	1.11	1.09	--	11.3	--
Lead	mg/L	<0.0015	<0.0100	<0.0015	<0.0100	<0.0015	<0.0100	<0.0015	<0.0100	<0.0015	<0.0100	<0.0015	<0.0100	<0.0015	<0.0100	<0.0015	<0.0100	<0.0015	<0.0015	<0.0100	0.021	--
Magnesium	mg/L	88.2	--	100	--	98.3	--	103	--	99.1	--	127	--	130	--	140	--	141	120	--	149	--
Manganese	mg/L	0.23	--	0.27	--	0.3	--	0.16	--	0.31	--	0.46	--	0.61	--	0.51	--	0.5	0.48	--	0.83	--
Mercury	mg/L	0.00007 U	<0.000200	0.00009 U	<0.000200	0.00007 U	<0.000200	0.00009 U	<0.000200	0.00009 U	<0.000200	0.00008 U	<0.000200	0.00008 U	<0.000200	0.00011 U	<0.000200	0.00006 U	0.00007 U	<0.000200	0.0001 U	--
Potassium	mg/L	29.2	--	33.3	--	32.7	--	34.4	--	33.1	--	38.6 JH	--	40.7	--	42.6	--	42.9	37.2	--	59.6	--
Selenium	mg/L	<0.0037	0.035	<0.0037	0.034	<0.0037	0.039	<0.0037	0.033	<0.0037	0.037	<0.0037	0.048	<0.0037	0.032	<0.0037	0.036	<0.0037	<0.0037	0.039	<0.0037	--
Sodium	mg/L	631	--	727	--	771	--	808	--	769	--	935	--	981	--	915	--	1100	917	--	1230	--
Strontium	mg/L	0.64	0.554	0.71	0.637	0.7	0.558	0.72	0.614	0.72	0.602	0.9	0.729	0.95	0.778	0.99	0.829	1.01	0.86	0.721	1.74	--
Zinc	mg/L	0.0062 B	0.017	0.0045 B	0.013	<0.004	0.015	<0.004	0.012	<0.004	0.012	<0.004	0.016	<0.004	<0.0100	<0.004	<0.0100	<0.004	<0.004	0.020	0.067	--
Dissolved Metals																						
Arsenic	mg/L	<0.00079	--	<0.00079	--	<0.00079	--	<0.00079	--	<0.00079	--	<0.00079	--	<0.00079	--	<0.00079	--	<0.00079	<0.00079	--	0.0075 B	--
Barium	mg/L	0.28	--	0.28	--	0.29	--	0.26	--	0.26	--	0.37	--	0.42	--	0.37	--	0.38	0.35	--	1.1	--
Cadmium	mg/L	0.00026 U	--	0.00027 U	--	<0.00016	--	0.00035 U	--	<0.00016	--	0.0002 U	--	0.00024 U	--	<0.00016	--	0.00027 U	<0.00016	--	<0.00016	--
Chromium	mg/L	0.0017 B	--	0.0016 B	--	0.0018 B	--	0.0017 B	--	0.0018 B	--	0.0021 B	--	0.002 B	--	0.0024 B	--	0.0022 B	0.0022 B	--	0.0051 B	--
Lead	mg/L	<0.0015	--	<0.0015	--	<0.0015	--	<0.0015	--	<0.0015	--	<0.0015	--	<0.0015	--	<0.0015	--	<0.0015	<0.0015	--	0.0088	--
Mercury	mg/L	<0.000055	--	0.00009 B	--	0.00009 B	--	0.00006 B	--	0.00007 B	--	0.0001 B	--	0.00009 B	--	0.0001 B	--	0.00006 B	0.00012 B	--	<0.000055	--
Selenium	mg/L	<0.0037	--	<0.0037	--	<0.0037	--	<0.0037	--	<0.0037	--	<0.0037	--	<0.0037	--	<0.0037	--	<0.0037	<0.0037	--	<0.0037	--
Strontium	mg/L	0.69	--	0.74	--	0.71	--	0.73	--	0.69	--	0.91	--	0.93	--	1	--	1.03	0.88	--	1.66	--
Zinc	mg/L	<0.004	--	<0.004	--	<0.004	--	<0.004	--	<0.004	--	<0.004	--	<0.004	--	0.0095 B	--	<0.004	<0.004	--	0.023	--
PAHs																						
2-Methylnaphthalene	mg/L	<0.0000519	--	<0.0000527	--	<0.0000527	--	<0.0000525	--	<0.0000514	--	<0.0000522	--	<0.0000519	--	<0.0000519	--	<0.0000519	<0.0000519	--	<0.0000514	--
Acenaphthene	mg/L	<0.0000137	--	<0.0000139	--	<0.0000139	--	<0.0000138	--	<0.0000135	--	<0.0000137	--	<0.0000137	--	<0.0000137	--	<0.0000137	<0.0000137	--	<0.0000135	--
Acenaphthylene	mg/L	<0.0000149	--	<0.0000151	--	<0.0000151	--	<0.0000151	--	<0.0000147	--	<0.000015	--	<0.0000149	--	<0.0000149	--	<0.0000149	<0.0000149	--	<0.0000147	--
Anthracene	mg/L	<0.00000918	--	<0.00000933	--	<0.00000933	--	<0.00000928	--	<0.00000909	--	<0.00000923	--	<0.00000918	--	<0.00000918	--	<0.00000918	<0.00000918	--	<0.00000909	--
Benzo(a)anthracene	mg/L	<0.0000503	--	<0.0000511	--	<0.0000511	--	<0.0000508	--	<0.0000498	--	<0.0000506	--	<0.0000503	--	<0.0000503	--	<0.0000503	<0.0000503	--	<0.0000498	--
Benzo(a)pyrene	mg/L	<0.0000137	--	<0.0000139	--	<0.0000139	--	<0.0000138	--	<0.0000135	--	<0.0000137	--	<0.0000137	--	<0.0000137	--	<0.0000137	<0.0000137	--	<0.0000135	--
Benzo(b)fluoranthene	mg/L	<0.0000328	--	<0.0000333	--	<0.0000333	--	<0.0000331	--	<0.0000324	--	<0.0000329	--	<0.0000328	--	<0.0000328	--	<0.0000328	<0.0000328	--	<0.0000324	--
Benzo(k)fluoranthene	mg/L	<0.0000223	--	<0.0000227	--	<0.0000227	--	<0.0000226	--	<0.0000221	--	<0.0000225	--	<0.0000223	--	<0.0000223	--	<0.0000223	<0.0000223	--	<0.0000221	--
Chrysene	mg/L	<0.000043	--	<0.0000436	--	<0.0000436	--	<0.0000434	--	<0.0000425	--	<0.0000432	--	<0.000043	--	<0.000043	--	<0.000043	<0.000043	--	<0.0000425	--
Dibenz(a,h)anthracene	mg/L	<0.0000195	--	<0.0000198	--	<0.0000198	--	<0.0000197	--	<0.0000193	--	<0.0000196	--	<0.0000195	--	<0.0000195	--	<0.0000195	<0.0000195	--	<0.0000193	--
Fluoranthene	mg/L	<0.0000134	--	<0.0000136	--	<0.0000136	--	<0.0000135	--	<0.0000132	--	<0.0000134	--	<0.0000134	--	<0.0000134	--	<0.0000134	<0.0000134	--	<0.0000132	--
Fluorene	mg/L	<0.0000184	--	<0.0000187	--	<0.0000187	--	<0.0000186	--	<0.0000182	--	<0.0000185	--	<0.0000184	--	<0.0000184	--	<0.0000184	<0.0000184	--	<0.0000182	--
Indeno(1,2,3-cd)pyrene	mg/L	<0.0000171	--	<0.0000174	--	<0.0000174	--	<0.0000173	--	<0.000017	--	<0.0000172	--	<0.0000171	--	<0.0000171	--	<0.0000171	<0.0000171	--	<0.000017	--
Naphthalene	mg/L	<0.0000283	--	<0.0000287	--	<0.0000287	--	<0.0000286	--	<0.000028	--	<0.0000284	--	<0.0000283	--	<0.0000283	--	<0.0000283	<0.0000283	--	<0.000028	--
Phenanthrene	mg/L	<0.0000166	--	<0.0000169	--	<0.0000169	--	<0.0000168	--	<0.0000165	--	<0.0000167	--	<0.0000166	--	<0.0000166	--	<0.0000166	<0.0000166	--	<0.0000165	--
Pyrene	mg/L	<0.0000181	--	<0.0000183	--	<0.0000183	--	<0.0000182	--	<0.0000179	--	<0.0000182	--	<0.0000181	--	<0.0000181	--	<0.0000181	<0.0000181	--	<0.0000179	--
TPH Mixtures																						
TPH-Diesel Range	mg/L	--	<0.135	--	<0.135	--	<0.134	--	<0.135	--	<0.135		<0.135		<0.134		<0.134			<0.133		1.34
TPH-Oil Range	mg/L	--	<0.125	--	<0.125	--	<0.124	--	<0.125	--	<0.135		<0.125		<0.124		<0.124			0.173		1.11
TPH-Gasoline Range	mg/L	--	--	--	--	--	--		--	--	--		--		--		--			--		--
Other Parameters																						
Chloride	mg/L	1210	1530	1330	1560	1250	1490	1420	1530	1290	1630	1610	1920	1640	2130	1870	2410	1840	1610	2200	2220	2700
Total Dissolved Solids	mg/L	2710	2580	2900	2740	2780	2670	3050	2960	2880	2660	3800	3630	3590	3260	4220	3450	4150	3520	3220	4920	4820
Suspended Solids	mg/L	--	--	--	--	--	--	--	--	--	--		--		--		--			--		--
Salinity	ppt	2.4										---		---		3.7		---	3.2	--	---	--
Hardness	mg/L	378	495	432	578	424	502	441	558	425	545	541	653	554	692	591	746	597	619	646	677	--
Bicarbonate Alkalinity	mg/L CaCO3	--	--	--	--	--	--	--	--	--	--	60 R	--	---	--	---	--	67.4	---	--	---	--
Carbonate Alkalinity	mg/L CaCO4	--	--	--	--	--	--	--	--	--	--	<0.17	--	---	--	---	--	<0.17	---	--	---	--
Sulfate	mg/L	105	--	--	--	--	--	--	--	--	--	---	--	---	--	83.9	--	---	106	--	---	--

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Table E-7
Surface Water Data
Split Surface Water Analytical Results

East White Lake Field
Vermilion Parish, Louisiana

		SW BK-01		SW BK-02		SW BK-03		SW BK-04		SW BK-05		SW BK-06		SW BK-07		SW BK-08		SW BK-09		SW BK-10		SW BK-11		SW-1 Pit Remed.	SW-2 Pit Remed.	SW-3 Pit Remed.
		MPA	ICON	MPA	ICON	MPA	ICON	MPA	ICON	MPA	ICON	MPA	ICON	MPA	ICON	MPA	ICON	MPA	ICON	MPA	ICON	MPA	ICON	MPA	MPA	MPA
Analytical Parameters	**Units**	5/10/2010	5/10/2010	5/10/2010	5/10/2010	5/10/2010	5/10/2010	5/10/2010	5/10/2010	5/11/2010	5/11/2010	5/11/2010	5/10/2010	5/11/2010	5/11/2010	5/11/2010	5/11/2010	5/11/2010	5/11/2010	5/11/2010	5/11/2010	5/11/2010	5/11/2010	11/20/2014	11/20/2014	11/20/2014
Total Metals																										
Arsenic	mg/L	<0.00079	<0.0100	<0.00079	<0.0100	<0.00079	<0.0100	<0.00079	<0.0100	<0.00079	<0.0100	0.0024 B	<0.0100	<0.00079	<0.0100	<0.00079	<0.0100	0.004 B	--	0.0035 B	--	0.0054 B	--	---	---	---
Barium	mg/L	0.3	0.282	0.31	0.276	0.3	0.279	0.32	0.297	0.31	0.301	0.43	0.375	0.44	0.415	0.34	0.315	0.31	--	0.22	--	0.25	--	---	---	---
Cadmium	mg/L	<0.00016	<0.00500	<0.00016	<0.00500	<0.00016	<0.00500	<0.00016	<0.00500	<0.00016	<0.00500	<0.00016	<0.00500	<0.00016	<0.00500	0.00021 B	<0.00500	<0.00016	--	<0.00051 B	--	<0.00056 B	--	---	---	---
Calcium	mg/L	65.8	--	71.5	--	52.8	--	66.4	--	65.9	--	97.7	--	57	--	70	--	63.2	--	24.5	--	35.7	--	---	---	---
Chromium	mg/L	0.0035 B	<.0100	0.0035 B	<0.0100	0.0027 B	<0.0100	0.0038 B	<0.0100	0.0034 B	<0.0100	0.0041 B	<0.0100	0.0026 B	<0.0100	0.0046 B	<0.0100	0.0039 B	--	0.0041 B	--	0.004 B	--	---	---	---
Iron	mg/L	0.58	--	0.7	--	0.71	--	0.94	--	0.71	--	1.55	--	1.07	--	1.76	--	1.14	--	---	--	--	--	---	---	---
Lead	mg/L	0.0017 B	<0.0100	<0.0015	<0.0100	<0.0015	<0.0100	0.0015	<0.0100	<0.0015	0.017	0.0019 B	<0.0100	<0.0015	<0.0100	0.003 B	<0.0100	0.0034 B	--	0.0058 B	--	0.0042 B	--	---	---	---
Magnesium	mg/L	157	--	166	--	126	--	161	--	156	--	244	--	138	--	162	--	152	--	52.3	--	76.2	--	---	---	---
Manganese	mg/L	0.15	--	0.23	--	0.34	--	0.29	--	0.16	--	0.88	--	0.59	--	0.25	--	0.24	--	---	--	--	--	---	---	---
Mercury	mg/L	<0.000055	<0.000200	<0.000055	<0.000200	<0.000055	<0.000200	<0.000055	<0.000200	<0.000055	<0.000200	<0.000055	<0.000200	<0.000055	<0.000200	0.00007 B	<0.000200	<0.000055	--	<0.000055	--	<0.000055	--	---	---	---
Potassium	mg/L	52	--	54.7	--	42.2	--	53.4	--	53	--	70.4	--	42.9	--	50.3	--	50.5	--	---	--	---	--	---	---	---
Selenium	mg/L	<0.0037	0.054	<0.0037	0.047	<0.0037	0.039	<0.0037	0.051	<0.0037	0.037	<0.0037	0.051	<0.0037	0.036	<0.0037	0.042	<0.0037	--	<0.0037	--	<0.0037	--	---	---	---
Sodium	mg/L	1230	--	1320	--	1050	--	1340	--	1270	--	2010	--	1080	--	1180	--	1230	--	---	--	--	--	237	244	237
Strontium	mg/L	1.04	0.980	1.13	1.09	0.85	0.788	1.09	1.00	1.04	0.989	1.65	1.52	0.96	0.898	1.03	0.903	1.05	--	0.38	--	0.52	--	---	---	---
Zinc	mg/L	0.0045 B	0.055	0.13	0.013	0.013 B	0.013	0.01 B	0.020	0.0074 B	0.033	0.0092 B	0.018	<0.004	0.022	0.0085 B	0.014	0.0076 B	--	0.013 B	--	0.0097 B	--	---	---	---
Dissolved Metals																										
Arsenic	mg/L	<0.00079	--	<0.00079	--	<0.00079	--	<0.00079	--	<0.00079	--	0.0047 B	--	0.0033 B	--	<0.00079	--	<0.00079	--	0.003 B	0.011	0.0029 B	0.014	---	---	---
Barium	mg/L	0.28	--	0.3	--	0.28	--	0.29	--	0.3	--	0.39	--	0.4	--	0.31	--	0.33	--	0.14	0.144	0.18	0.216	---	---	---
Cadmium	mg/L	<0.00016	--	<0.00016	--	<0.00016	--	<0.00016	--	<0.00016	--	<0.00016	--	<0.00016	--	<0.00016	--	<0.00016	--	0.00086 B	<0.00500	0.00078 B	<0.00500	---	---	---
Chromium	mg/L	0.0032 B	--	0.0033 B	--	0.0025 B	--	0.003 B	--	0.003 B	--	0.0036 B	--	0.0024 B	--	0.0028 B	--	0.003 B	--	0.00071 B	<0.0100	0.0011 B	<0.0100	---	---	---
Lead	mg/L	0.0023 B	--	<0.0015	--	<0.0015	--	<0.0015	--	<0.0015	--	0.0021 B	--	<0.0015	--	<0.0015	--	<0.0015	--	<0.0015	<0.0100	<0.0015	<0.0100	---	---	---
Mercury	mg/L	0.00006 B	--	<0.000055	--	<0.000055	--	0.00006 B	--	<0.000055	--	<0.000055	--	<0.000055	--	<0.000055	--	<0.000055	--	<0.000055	<0.000200	<0.000055	<0.000200	---	---	---
Selenium	mg/L	<0.0037	--	<0.0037	--	<0.0037	--	<0.0037	--	<0.0037	--	<0.0037	--	<0.0037	--	<0.0037	--	<0.0037	--	<0.0037	0.024	<0.0037	0.032	---	---	---
Strontium	mg/L	1.05	--	1.12	--	0.84	--	1.06	--	1.04	--	1.56	--	0.95	--	1.04	--	1.06	--	0.34	0.339	0.52	0.497	---	---	---
Zinc	mg/L	<0.004	--	<0.004	--	<0.004	--	<0.004	--	<0.004	--	<0.004	--	<0.004	--	<0.004	--	<0.004	--	<0.004	<0.0100	<0.004	0.011	---	---	---
PAHs																										
2-Methylnaphthalene	mg/L	<0.0000522	--	<0.0000522	--	<0.0000525	--	<0.0000519	--	<0.0000519	--	<0.0000519	--	<0.000053	--	<0.0000519	--	<0.0000519	--	<0.0000519	--	<0.0000536	--	---	---	---
Acenaphthene	mg/L	<0.0000137	--	<0.0000137	--	<0.0000138	--	<0.0000137	--	<0.0000137	--	0.000131	--	<0.000014	--	<0.0000137	--	<0.0000137	--	<0.0000137	--	<0.0000141	--	---	---	---
Acenaphthylene	mg/L	<0.000015	--	<0.000015	--	<0.0000151	--	<0.0000149	--	<0.0000149	--	<0.0000149	--	<0.0000152	--	<0.0000149	--	<0.0000149	--	<0.0000149	--	<0.0000154	--	---	---	---
Anthracene	mg/L	<0.00000923	--	<0.00000923	--	<0.00000928	--	<0.00000918	--	<0.00000918	--	<0.00000918	--	<0.00000938	--	<0.00000918	--	<0.00000918	--	<0.00000918	--	<0.00000947	--	---	---	---
Benzo(a)anthracene	mg/L	<0.0000506	--	<0.0000506	--	<0.0000508	--	<0.0000503	--	<0.0000503	--	<0.0000503	--	<0.0000514	--	<0.0000503	--	<0.0000503	--	<0.0000503	--	<0.0000519	--	---	---	---
Benzo(a)pyrene	mg/L	<0.0000137	--	<0.0000137	--	<0.0000138	--	<0.0000137	--	<0.0000137	--	<0.0000137	--	<0.000014	--	<0.0000137	--	<0.0000137	--	<0.0000137	--	<0.0000141	--	---	---	---
Benzo(b)fluoranthene	mg/L	<0.0000329	--	<0.0000329	--	<0.0000331	--	<0.0000328	--	<0.0000328	--	<0.0000328	--	<0.0000334	--	<0.0000328	--	<0.0000328	--	<0.0000328	--	<0.0000338	--	---	---	---
Benzo(k)fluoranthene	mg/L	<0.0000225	--	<0.0000225	--	<0.0000226	--	<0.0000223	--	<0.0000223	--	<0.0000223	--	<0.0000228	--	<0.0000223	--	<0.0000223	--	<0.0000223	--	<0.0000231	--	---	---	---
Chrysene	mg/L	<0.0000432	--	<0.0000432	--	<0.0000434	--	<0.000043	--	<0.000043	--	<0.000043	--	<0.0000439	--	<0.000043	--	<0.000043	--	<0.000043	--	<0.0000443	--	---	---	---
Dibenz(a,h)anthracene	mg/L	<0.0000196	--	<0.0000196	--	<0.0000197	--	<0.0000195	--	<0.0000195	--	<0.0000195	--	<0.0000199	--	<0.0000195	--	<0.0000195	--	<0.0000195	--	<0.0000201	--	---	---	---
Fluoranthene	mg/L	<0.0000134	--	<0.0000134	--	<0.0000135	--	<0.0000134	--	<0.0000134	--	<0.0000134	--	<0.0000136	--	<0.0000134	--	<0.0000134	--	<0.0000134	--	<0.0000138	--	---	---	---
Fluorene	mg/L	<0.0000185	--	<0.0000185	--	<0.0000186	--	<0.0000184	--	<0.0000184	--	<0.0000184	--	<0.0000188	--	<0.0000184	--	<0.0000184	--	<0.0000184	--	<0.0000189	--	---	---	---
Indeno(1,2,3-cd)pyrene	mg/L	<0.0000172	--	<0.0000172	--	<0.0000173	--	<0.0000171	--	<0.0000171	--	<0.0000171	--	<0.0000175	--	<0.0000171	--	<0.0000171	--	<0.0000171	--	<0.0000177	--	---	---	---
Naphthalene	mg/L	<0.0000284	--	<0.0000284	--	<0.0000286	--	<0.0000283	--	<0.0000283	--	<0.0000283	--	<0.0000289	--	<0.0000283	--	<0.0000283	--	<0.0000283	--	<0.0000292	--	---	---	---
Phenanthrene	mg/L	<0.0000167	--	<0.0000167	--	<0.0000168	--	<0.0000166	--	<0.0000166	--	<0.0000166	--	<0.000017	--	<0.0000166	--	<0.0000166	--	<0.0000166	--	<0.0000172	--	---	---	---
Pyrene	mg/L	<0.0000182	--	<0.0000182	--	<0.0000182	--	<0.0000181	--	<0.0000181	--	<0.0000181	--	<0.0000184	--	<0.0000181	--	<0.0000181	--	<0.0000181	--	<0.0000186	--	---	---	---
TPH Mixtures																										
TPH-Diesel Range	mg/L	---	<0.134		<0.131	---	<0.134		<0.135	---	<0.136		<0.135	---	<0.135	---	<0.133	---	<0.142	---	--		--	<0.13	<0.13	<0.13
TPH-Oil Range	mg/L	---	<0.124		<0.121	---	<0.124		<0.125	---	<0.126		<0.150	---	<0.125	---	<0.122	---	<0.131	---	--		--	<0.12	<0.12	<0.12
TPH-Gasoline Range	mg/L	---	--		--	---	--		--	---	--		--	---	--	---	--	---	--	---	--		--	<0.15	<0.15	<0.15
Other Parameters																										
Chloride	mg/L	2510	2910	2680	2770	2060	2060	2660	2560	2550	2340	3690	4400	2210	2410	2490	2700	2530	2910	834	852	834	1240	483	483	440
Total Dissolved Solids	mg/L	4800	4650	5080	4680	3820	3590	4840	4080	4660	4440	6580	6220	4010	3990	4720	4080	4870	3820	1530	--	1530	2330	825	895	865
Suspended Solids	mg/L									---				---		---		---		---				130	128	100
Salinity	ppt	4.5	--		--		--	4.5	--	---	--	6.3	--	---	--	---	--	---	--	---	--		--	---	---	---
Hardness	mg/L	811	--	863	--	652	--	828	--	808	--	1250	--	709	--	840	--	785	--	277	--	277	403	---	---	---
Bicarbonate Alkalinity	mg/L CaCO3		--	64.6	--		--		--	63.5	--		--	75.1	--	---	--	---	--		--		--	---	---	---
Carbonate Alkalinity	mg/L CaCO4		--	<0.17	--		--		--	<0.17	--		--	<0.17	--	---	--	---	--		--		--	---	---	---
Sulfate	mg/L	149	--		--		--	215	--		--	187	--		--	---	--	---	--		--		--	---	---	---

Table E-7
Surface Water Data
Split Surface Water Analytical Results

East White Lake Field
Vermilion Parish, Louisiana

Notes:

The following notes apply to the surface water data set provided in Table E-7.

-- Analysis not performed for this sample.

B - For inorganics, result is between Reporting Limit and Method Detection Limit

JH - bias is likely high

U - not detected based on quality control criteria. Constituent was detected in the laboratory methods blank and

< - Not detected at the method detection detection limit (MDL) shown

* SW 109 is a field duplicate of SW 09.

SW-1, SW-2, and SW-3 were collected from the canal near the SED15 Pit area before initiation of remediation activities.

TABLE E-8

CRAB EDIBLE TISSUE DATA

East White Lake Oil and Gas Field
Vermilion Parish, Louisiana

		Meat (mg/kg-wet weight)										Hepatopancreas (mg/kg-wet weight)									
	Sample ID [(a)]	**TPH (C8-C16)**		**TPH (C16-28)**		**Total Arsenic**	**Inorganic Arsenic**		**Total Barium**	**Total Mercury**	**Methyl Mercury**	**TPH (C8-C16)**		**TPH (C16-28)**		**Total Arsenic**	**Inorganic Arsenic**		**Total Barium**	**Total Mercury**	**Methyl Mercury**
Site	EWL-T-01A-C	4.5	UR	4.5	UR	0.117	0.005	U	4.92	0.0772	0.0286	21.6	U	59.4		0.677	0.03		13.8	0.0445	0.0316
	EWL-T-01-C	9.4	U	9.4	U	0.172	0.005	U	8.18	0.0899	0.0688	70.3		167		1.06	0.041		29.3	0.0377	0.0231
	EWL-T-02-C	5	U	5	U	0.164	0.005	U	8.08	0.068	0.0323	22.2	U	90.8		1.19	0.052		15.3	0.0284	0.0193
	EWL-T-03-C (c)	13.9	U	13.9	U	0.168	0.006	U	11.83	0.1035	0.0498	242		242		0.963	0.037		22.9	0.03095	0.01825
	EWL-T-04-C	5.5	U	5.5	U	0.137	0.005	U	4.83	0.0646	0.0477	5.8	U	9.9	J	0.948	0.065		15.8	0.0334	0.0171
	EWL-T-05-C	5.1	U	5.1	U	0.159	0.006	U	4.28	0.078	0.054	136	U	856		1.3	0.058		19.9	0.0341	0.0187
	EWL-T-06-C	8	U	8	U	0.17	0.006	U	4.88	0.0841	0.0497	34.1	U	174		0.913	0.035		24.5	0.0412	0.0202
	EWL-T-07-C	6.5	U	6.5	U	0.161	0.006	U	9.08	0.0707	0.046	47.1		101		1.07	0.051		21	0.0341	0.0224
	EWL-T-08-C	5	U	5	U	0.128	0.005	J	8.89	0.0689	0.0439	90		300		0.86	0.051		18.1	0.0419	0.0388
	EWL-T-09-C	6.7	U	6.7	U	0.163	0.005	U	5.55	0.0699	0.0473	54	U	209		0.879	0.036		19.9	0.0325	0.025
	EWL-T-10-C (c)	12.6	U	12.6	U	0.209	0.0065	J	4.935	0.0906	0.0348	142		314		1.23	0.0335		31.9	0.02365	0.01735
	EWL-T-11-C	12.9	U	12.9	U	0.159	0.005	U	6.47	0.0733	0.0377	111		443		1.14	0.079		19.2	0.0214	0.009
	EWL-T-12-C	4.4	U	4.4	U	0.251	0.006	U	5.13	0.058	0.0166	60.6	J	277		1.23	0.048		26.4	0.0318	0.0118
	Average [(d)]	**NC**		**NC**		**0.17**	**0.0032**		**6.7**	**0.077**	**0.043**	**69**		**249**		**1.0**	**0.047**		**21**	**0.034**	**0.021**
Reference	EWL-TR-01-C	8.7	U	8.7	U	0.209	0.006	J	6.0	0.0662	0.0391	NA		NA		1.12	0.06		19.5	0.0295	0.0236
	EWL-TR-02-C	4.7	U	4.7	U	0.177	0.005	U	5.59	0.0597	0.0323	61.1		143		0.899	0.048		17.9	0.0195	0.0141
	EWL-TR-03A-C	5.2	U	5.2	U	0.23	0.006	U	10.1	0.0953	0.0204	135		305		1.29	0.042		22.7	0.0318	0.0169
	EWL-TR-03-C	4.9	U	4.9	U	0.14	0.005	U	6.5	0.0692	0.029	34.3	U	145		0.896	0.059		23.7	0.0272	0.0152
	EWL-TR-04-C	4.6	U	4.6	U	0.162	0.006	U	8.94	0.0796	0.0403	91.6		262		0.991	0.061		33.1	0.0353	0.024
	EWL-TR-05-C	4.8	U	4.8	U	0.196	0.006	U	13.7	0.0476	0.0247	53.9	U	82	J	1.5	0.054		21.7	0.0394	0.0064
	EWL-TR-06-C	7.4	U	7.4	U	0.251	0.009	J	13.1	0.106	0.0608	21.7	U	144		1.09	0.047		27.3	0.0259	0.0126
	EWL-TR-07-C	4.8	U	4.8	U	0.299	0.006	U	4.08	0.0517	0.0254	85.5		302		1.31	0.052		24.2	0.0309	0.0093
	EWL-TR-08-C	5.0	U	5.0	U	0.202	0.006	U	6.77	0.0473	0.0257	188		254		1.78	0.066		29.8	0.0315	0.0065
	EWL-TR-09-C	5.2	U	5.2	U	0.181	0.007	U	9.46	0.0551	0.019	100		393		1.95	0.052		23.7	0.0556	0.0082
	Average [(d)]	**NC**		**NC**		**0.20**	**0.0039**		**8.4**	**0.068**	**0.032**	**80**		**226**		**1.3**	**0.054**		**24**	**0.033**	**0.014**
Market	EWL-BIL-C	3.5	U	4.4	J	1.78	0.014	J	0.477	0.0494	0.0279	22.4	U	140		3.95	0.072		1.19	0.0347	0.0148
	EWL-BR-C	9.6	U	9.6	U	1.06	0.008	J	1.08	0.032	0.0119	23.7	U	241		2.56	0.049		1.58	0.0108	0.0047
	EWL-DES-C	5.6	U	8.1	J	0.237	0.005	J	1.33	0.0173	0.0117	22.7	U	88.1		0.994	0.028		4.91	0.0098	0.00579
	EWL-HOU-C	5.3	U	7.5	J	0.989	0.008	J	1.31	0.0332	0.0292	28.4	U	174		2.15	0.036		2.61	0.0173	0.0104
	EWL-LC-C (c)	16.2	U	16.2	U	0.886	0.0075		0.893	0.05025	0.0192	310.5		351		3.15	0.0585		0.9935	0.0421	0.00925
	EWL-NO-C	14.4	U	14.4	U	0.408	0.006	U	2.5	0.0536	0.016	197		298		1.34	0.05		6.05	0.0172	0.0085
	Average [(d)]	**NC**		**6.7**		**0.89**	**0.0076**		**1.3**	**0.039**	**0.019**	**93**		**215**		**2.4**	**0.049**		**2.9**	**0.022**	**0.0089**

Notes:

U = Result was reported as not detected by the laboratory (i.e., less than the MDL, defined by the laboratory as the "Adjusted Method Detection Limit"); value shown is the MDL.

J = Laboratory qualifier indicating that the reported value is an estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

UR = Surrogate recovery identified as less than 10%; therefore, this non-detect result is considered not reliable for use in quantitative analysis.

NA = Edible Tissue Concentration could not be calculated due to unavailable meat or hepatopancreas data (either due to insufficient hepatopancreas sample to analyze TPH or R-qualified results).

NC = Not calculated; for datasets that were completely nondetect, an average concentration was not calculated.

(a) Consistent with Louisiana regulatory agency Protocol (LDHH et al., 2012), crab meat and hepatopancreas were analyzed separately in composite samples collected during the field study (December 2010 through January 2011). These tissues comprise the edible tissues for regular human consumption.

(b) Edible Tissue Concentration (ETC) - for each composite crab sample, the ETC was calculated as the sum of the mass-weighted TPH concentrations for crab meat and hepatopancreas, using sample-specific tissue weight (mass) data reported by the laboratory for meat and hepatopancreas as follows:

ETC = (concentration in meat) x (% edible tissue comprised of meat) + (concentration in hepatopancreas) x (% edible tissue comprised of hepatopancreas).

In accordance with Louisiana regulatory agency guidance for treatment of nondetect results in tissues (LDHH et al, 2012), one-half the detection limit was used for non-detect results to calculate Edible Tissue Concentrations (ETCs) , so ETCs with U are calculated from one-half detection limits for non-detect meat or hepatopancreas results.

(c) Duplicate samples were prepared by the sample preparation laboratory (Columbia Analytical Services, Inc.) as separate aliquots from the same composite homogenized tissue (i.e., meat or hepatopancreas), where one aliquot is considered the parent and the other is labeled as a laboratory duplicate. The concentrations listed in this table, and used in the risk assessment, represent the average concentration from the parent sample and the duplicate. Since the tissue weight data was obtained from the composite homogenized tissue, the tissue weights are equal for the parent sample and duplicate.

(d) For averaging datasets comprised of both nondetect values and detections, one-half detection limits were used to represent concentrations of nondetect results in accordance with Louisiana regulatory agency guidance for treatment of nondetect results in tissues (LDHH et al, 2012).

TABLE E-8

CRAB EDIBLE TISSUE DATA

East White Lake Oil and Gas Field
Vermilion Parish, Louisiana

		Edible Tissue Concentration (HP & Meat) (mg/kg-wet weight) (b)											Percentage based on Reported Tissue Weight	
	Sample ID (a)	TPH (C8-C16)		TPH (C16-28)		Total Arsenic	Inorganic Arsenic		Total Barium	Total Mercury	Methyl Mercury		Meat	HP
Site	EWL-T-01A-C	NA		NA		0.205	0.00683		6.32	0.072	0.0291		84%	16%
	EWL-T-01-C	15.8		32.2		0.322	0.00902		11.8	0.0811	0.0611		83%	17%
	EWL-T-02-C	3.96	U	17.5		0.338	0.0109		9.3	0.0613	0.0301		83%	17%
	EWL-T-03-C (c)	48.4		48.3		0.308	0.00899		13.8	0.0907	0.0442		82%	18%
	EWL-T-04-C	2.77	U	3.91		0.268	0.0126		6.6	0.0596	0.0428		84%	16%
	EWL-T-05-C	13.7	U	148		0.354	0.0124		6.95	0.0705	0.048		83%	17%
	EWL-T-06-C	6.14	U	31.8		0.292	0.00824		8.09	0.0771	0.0449		84%	16%
	EWL-T-07-C	10.8		20.1		0.318	0.0113		11.1	0.0644	0.0419		83%	17%
	EWL-T-08-C	15.3		46.1		0.235	0.0117		10.2	0.0649	0.0432		85%	15%
	EWL-T-09-C	7.54	U	39.8		0.29	0.00843		8.09	0.0633	0.0434		82%	18%
	EWL-T-10-C (c)	30.9		62.1		0.394	0.0114		9.82	0.0784	0.0316		82%	18%
	EWL-T-11-C	24.3		81.2		0.327	0.0156		8.65	0.0644	0.0328		83%	17%
	EWL-T-12-C	12.9		52.4		0.43	0.0112		9.01	0.0532	0.0157		82%	18%
	Average (d)	**16**		**49**		**0.31**	**0.011**		**9.2**	**0.069**	**0.039**		**0.83**	**0.17**
Reference	EWL-TR-01-C	NA		NA		0.369	0.0155		8.36	0.0598	0.0364		82%	18%
	EWL-TR-02-C	14.1		30.5		0.322	0.0116		8.06	0.0516	0.0287		80%	20%
	EWL-TR-03A-C	27		58.3		0.425	0.0102		12.4	0.0836	0.0198		82%	18%
	EWL-TR-03-C	5.19	U	29		0.281	0.013		9.7	0.0614	0.0264		81%	19%
	EWL-TR-04-C	15.3		40		0.282	0.0114		12.5	0.0732	0.0379		85%	15%
	EWL-TR-05-C	7.19	U	17.9		0.45	0.0129		15.3	0.046	0.0211		80%	20%
	EWL-TR-06-C	4.96	U	28.5		0.399	0.0157		15.6	0.0918	0.0523		82%	18%
	EWL-TR-07-C	15.4		49.2		0.457	0.0107		7.23	0.0484	0.0229		84%	16%
	EWL-TR-08-C	40.3		53.8		0.524	0.0159		11.5	0.0441	0.0218		80%	20%
	EWL-TR-09-C	23.2		85		0.554	0.0137		12.5	0.0552	0.0167		79%	21%
	Average (d)	**17**		**44**		**0.41**	**0.013**		**11.3**	**0.062**	**0.028**		**0.82**	**0.18**
Market	EWL-BIL-C	3.27	U	26.2		2.13	0.0233		0.591	0.047	0.0258		84%	16%
	EWL-BR-C	6.2	U	51.6		1.36	0.0161		1.18	0.0278	0.0105		80%	20%
	EWL-DES-C	3.54	U	15.1		0.303	0.007		1.64	0.0166	0.0112		91%	9%
	EWL-HOU-C	4.08	U	28.1		1.13	0.0115		1.47	0.0312	0.0269		88%	12%
	EWL-LC-C (c)	71.3		79.8		1.36	0.0182		0.914	0.0485	0.0171		79%	21%
	EWL-NO-C	38.8		55.6		0.563	0.0108		3.09	0.0475	0.0148		83%	17%
	Average (d)	**21**		**43**		**1.1**	**0.015**		**1.5**	**0.036**	**0.018**		**0.84**	**0.16**

Notes:

U = Result was reported as not detected by the laboratory (i.e., less than the MDL, defined by the laboratory as the "Adjusted Method Detection Limit"); value shown is the MDL.

J = Laboratory qualifier indicating that the reported value is an estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

UR = Surrogate recovery identified as less than 10%; therefore, this non-detect result is considered not reliable for use in quantitative analysis.

NA = Edible Tissue Concentration could not be calculated due to unavailable meat or hepatopancreas data (either due to insufficient hepatopancreas sample to analyze TPH or R-qualified results).

NC = Not calculated; for datasets that were completely nondetect, an average concentration was not calculated.

(a) Consistent with Louisiana regulatory agency Protocol (LDHH et al., 2012), crab meat and hepatopancreas were analyzed separately in composite samples collected during the field study (December 2010 through January 2011). These tissues comprise the edible tissues for regular human consumption.

(b) Edible Tissue Concentration (ETC) - for each composite crab sample, the ETC was calculated as the sum of the mass-weighted TPH concentrations for crab meat and hepatopancreas, using sample-specific tissue weight (mass) data reported by the laboratory for meat and hepatopancreas as follows:

ETC = (concentration in meat) x (% edible tissue comprised of meat) + (concentration in hepatopancreas) x (% edible tissue comprised of hepatopancreas).

In accordance with Louisiana regulatory agency guidance for treatment of nondetect results in tissues (LDHH et al, 2012), one-half the detection limit was used for non-detect results to calculate Edible Tissue Concentrations (ETCs) , so ETCs with U are calculated from one-half detection limits for non-detect meat or hepatopancreas results.

(c) Duplicate samples were prepared by the sample preparation laboratory (Columbia Analytical Services, Inc.) as separate aliquots from the same composite homogenized tissue (i.e., meat or hepatopancreas), where one aliquot is considered the parent and the other is labeled as a laboratory duplicate. The concentrations listed in this table, and used in the risk assessment, represent the average concentration from the parent sample and the duplicate. Since the tissue weight data was obtained from the composite homogenized tissue, the tissue weights are equal for the parent sample and duplicate.

(d) For averaging datasets comprised of both nondetect values and detections, one-half detection limits were used to represent concentrations of nondetect results in accordance with Louisiana regulatory agency guidance for treatment of nondetect results in tissues (LDHH et al, 2012).

TABLE E-9

FORAGE FISH TISSUE DATA

East White Lake Oil and Gas Field
Vermilion Parish, Louisiana

TPH and Metal Concentrations in Forage Fish (Whole Body; mg/kg-wet weight)

	Sample ID (a)	TPH (C8-C16)		TPH (C16-C28)		Total Arsenic		Inorganic Arsenic		Total Barium	Total Mercury	Methyl Mercury
Site	EWL T-01-F-COMPOSITE_Shac	24.1	U	24.1	U	0.644		0.106		16.4	0.0119	0.0041
	EWL T-02-F-COMPOSITE_Shad	20	U	87.2		0.629		0.1		17	0.0105	0.0029
	EWL T-03-F-COMPOSITE_Shad	22.8	U	27.2	J	0.557		0.09		15.9	0.0098	0.0031
	EWL T-04-F-COMPOSITE_Shad	17.2	U	40.3		0.614		0.103		17.1	0.0131	0.0031
	EWL T-05-F-COMPOSITE_Shad	30	U	106		0.631		0.088		19.1	0.0117	0.0031
	EWL T-06-F-COMPOSITE_Shad	10.6	U	16.5	J	0.602		0.102		16.4	0.0109	0.006
	EWL T-07-F-COMPOSITE_Shad	16.4	U	26.9	J	0.655		0.096		17	0.0102	0.0078
	EWL T-08-F-COMPOSITE_Shad	23.2	U	23.2	U	0.65		0.105		17.1	0.0097	0.0033
	EWL T-09-F-COMPOSITE_Shad	17.6	U	24.2	J	0.691		0.089		16.7	0.0104	0.0038
	EWL T-10-F-COMPOSITE_Shad	21.8	U	26.5	J	0.658		0.094		20.1	0.0125	0.0044
	EWL T-11-F-COMPOSITE_Shad	24.2	U	24.2	U	0.623		0.086		18	0.0114	0.0036
	EWL T-12-F-COMPOSITE_Shad	13.3	U	15.2	J	0.549		0.093		14.7	0.0106	0.0036
	EWL T-02-F-COMPOSITE_Bluegill	13.3	U	19	J	0.315		0.003	J	15.6	0.0941	0.0784
	EWL T-05-F-COMPOSITE_Bluegill	NA		NA		0.389		0.036		15.2	0.0659	0.0473
	Average (b)	**NC**		**33**		**0.59**		**0.085**		**17**	**0.021**	**0.012**
Reference	EWL TR-02-F-COMPOSITE_Shac	17.3	U	61.1		0.393		0.064		9.1	0.012	0.0068
	EWL TR-03-F-COMPOSITE_Shad	28.2	U	28.2	U	0.596		0.077		9.49	0.0098	0.0048
	EWL TR-04-F-COMPOSITE_Shad	5.7	UR	24.7		0.551		0.164		13.4	0.0116	0.0046
	EWL TR-05-F-COMPOSITE_Shad	44.9	U	44.9	U	0.676		0.124		13	0.0104	0.0046
	EWL TR-06-F-COMPOSITE_Shad	21.1	U	21.1	U	0.574		0.093		10.8	0.0101	0.0035
	EWL TR-07-F-COMPOSITE_Shad	27.1	U	27.1	U	0.61		0.102		11.5	0.0098	0.005
	EWL TR-08-F-COMPOSITE_Shad	28.5	U	28.5	U	0.617		0.113		11.9	0.0101	0.0045
	EWL TR-09-F-COMPOSITE_Shad	5.6	UR	16		0.621		0.111		12.1	0.0101	0.0035
	EWL TR-01-F-COMPOSITE_Bluegill	23.7	U	23.7	U	0.102	J	0.01		12.5	0.0444	0.0324
	EWL TR-04A-F-COMPOSITE_Bluegill	21.2	U	21.2	U	0.194		0.031		19.8	0.0553	0.0408
	Average (b)	**NC**		**20**		**0.49**		**0.089**		**12**	**0.018**	**0.011**

Notes:

U = Result was reported as not detected by the laboratory (i.e., less than the MDL, defined by the laboratory as the "Adjusted Method Detection Limit"); value shown is the MDL.

J = Laboratory qualifier indicating that the reported value is an estimated concentration above the adjusted method detection limit and below the adjusted

UR = Surrogate recovery identified as less than 10%; therefore, this non-detect result is considered not reliable for use in quantitative analysis.

NA = Insufficient sample to analyze TPH.

NC = Not calculated; for datasets that were completely nondetect, an average concentration was not calculated.

(a) Fish were collected during the field study (December 2010 through January 2011) in accordance with the protocol outlined in a Quality Assurance Project Plan/Sampling Analysis and Assessment Plan for Crab and Forage Fish Tissue dated December 6, 2010.

(b) For averaging datasets comprised of both nondetect values and detections, one-half detection limits were used to represent concentrations of nondetect results, as recommended in the Protocol for Issuing Public Health Advisories for Chemical Contaminants in Recreationally Caught Fish and Shellfish (“Louisiana Protocol”, LDHH et al., 2012).

Data Quality Review Documentation

Appendix F

Project No. 0116008
UNOCAL
Vermilion Parish, Louisiana

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Data Validation and Usability Review by Quality Assurance Associates, Inc., July 2, 2010

Appendix F-1

DATA VALIDATION AND USABILITY REVIEW OF CHEMICAL ANALYSIS DATA

EAST WHITE LAKE

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July 2, 2010

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1.0 PROJECT OVERVIEW AND SUMMARY

Quality Assurance Associates (QAA) completed a third party QA/QC data validation and usability review of chemical analysis data from the East White Lake site. The purpose of the validation and review is to ensure that the data is technically valid and also appropriate and reliable for use in quantitative risk assessment, including under Louisiana's Risk Evaluation/ Corrective Action Program (RECAP). The data includes sediment, soil, surface water, and groundwater samples collected by Michael Pisani and Associates (MPA) during February 2010 through June 2010 and analyzed by Gulf Coast Analytical Laboratories, Inc. (GCAL). A complete list of samples and the tests performed on each is shown in Table 1. All samples were included in the validation and review.

The following summarizes the results of the validation and usability review:

1) Analytical Methodology - The laboratory used SW-846 or other rigorous analytical methodology and is accredited in accordance with LAC, Title 33, Part I, Subpart 3 (certification number 01955). The methods are appropriate for the intended use of risk assessment per the Louisiana Department of Environmental Quality (LDEQ) and provide definitive (i.e., analyte-specific with confirmation of identity and concentration) and usable data.

2) Sample Reporting Limits – The analytical results are in ppm (mg/L for waters and mg/kg for solids) and include a Result, Method Detection Limit (MDL), and Reporting Detection Limit (RDL) for each sample. The MDL is a detection limit, which provides a measure of the concentration an instrument can detect or 'see' in a given sample. The RDL is a quantitation limit, which provides a measure of the concentration an instrument can accurately measure in a given sample. Both the MDL and RDL are adjusted for sample-specific actions such as dilution or use of a smaller aliquot size. Results for solid samples are reported on a wet-weight basis. The laboratory reported non-detects as 'ND' and detects at a concentration between the MDL and RDL as estimated (i.e., with a *B* flag for inorganics and a *J* flag for organics). Non-detects should be considered not present at or above the RDL per RECAP format. (In the EDD, the RDL is reported under the Detection_Limit column and the MDL is not reported.) Some samples required dilution due to target analyte concentrations but there are no elevated reporting limits for non-detects except for two samples. Samples SED-6 (0-2) and SED-8 (0-2) for PCB, which are all non-detect, required a 5x dilution due to sample matrix. The RDLs for all non-detects are below the limiting RECAP screening standard (GW_SS) for all groundwater samples and below the limiting screening standard (the lowest of SOIL_SSni, SOIL_SSi, and SOIL_SSGW) for all soil samples and thus can be used to demonstrate conformance with the limiting standards.

3) Blank Sample Results – The laboratory analyzed a preparation blank for every analytical batch (maximum 20 samples) and the results are all below the RDL, indicating that no significant contamination was introduced in the laboratory, except for one blank with sodium. The levels of sodium in the associated samples are well above that in the laboratory blank and thus data quality is not affected. A trip blank was shipped with the groundwater samples collected for BTEX on March 5, 2010 and on May 25, 2010. The trip blank results are all non-detect, indicating that no contamination was introduced during shipment.

4) QC Outcomes and Data Qualifiers – For all tests except two general chemistry parameters (Alkalinity and Salinity), the laboratory prepared and analyzed a Laboratory Control Sample (LCS) for every analytical batch (maximum 20 samples). Some batches also include a Laboratory Control Sample Duplicate (LCSD). LCS/LCSD allow assessment of laboratory performance. For most tests, the laboratory prepared and analyzed a Matrix Spike (MS) for every analytical batch (maximum 20 samples), generally using a sample from site. Some of these batches also include a Matrix Spike Duplicate (MSD). MS/MSD provide an indication of how the sample matrix affects method performance. Additionally, three field duplicates were collected with the samples including a sediment sample, a surface water, and a groundwater. Field duplicates allow assessment of the precision of the sampling, preparation, and analysis technique.

There are no significant QC deficiencies, and thus all data is considered technically valid and acceptable for risk assessment purposes. Some of the sample results are qualified due to minor QC deviations as shown in Table 2. Results with a data validation qualifier of *UJ* should be considered not present above the reporting limit, and the reporting limit as an estimated value. Results with a data validation qualifier of *J* should be regarded as present, and the reported concentration as an estimated value. Additionally, results with a laboratory qualifier of *B* or *J* (i.e., results between the MDL and RDL) should be considered estimates in accordance with EPA method definitions.

2.0 PROCEDURES

QAA completed the validation by examining the hardcopy data packages produced by the laboratory. The validation included QC Checks covering data comparability, accuracy, precision, representativeness, and completeness. The laboratory packages include analysis results and laboratory QC reports plus supporting raw data for select Total Petroleum Hydrocarbon (TPH) analyses. QAA examined the data for 100% of the samples to determine if the analyses meet the QC requirements for:

- Chain-of-Custody,
- Data Completeness,
- Reporting Limits,
- Sample Preservation and Holding Time,
- Blanks (Laboratory and Field),
- Laboratory Control Samples (LCS/LCSD),
- Matrix Spike Samples (MS/MSD),
- Field Duplicates (FD),
- Surrogates (SU),

Additionally, for most of the TPH analyses (as indicated in Table 1), QAA examined the data to determine if the analyses meet the QC requirements for:

- Instrument Calibration,
- Calibration Verification,
- Analyte Qualitative Identification, and
- Sample Quantitation.

A QAA Data Validation Specialist performed the examination using the results and QC reports supplied by the laboratory and data validation checklists. The validator used the following control limits based on requirements in the analytical methods and to provide a consistent approach for similar analytes, which allows the user to easily assess data quality:

- Inorganics and General Chemistry Parameters: 75-125% spike recovery and ±RDL difference (if either result < 5x RDL) or 25% RPD for laboratory duplicates. Spike recovery considered inconclusive if the unspiked sample concentration is greater than four times the amount of spike added.
- Purgeable Organics (BTEX) and Total TPH: 70-130% spike recovery and ±RDL difference (if either result < 5x RDL) or 20% RPD for laboratory duplicates. Spike recovery considered inconclusive if the unspiked sample concentration is greater than one-fourth of the amount of spike added.
- Extractable Organics (PCB, PAH) and Fractionated TPH: 60-140% spike recovery and ±RDL difference (if either result < 5x RDL) or 20% RPD for laboratory duplicates. Spike recovery considered inconclusive if the unspiked sample concentration is greater than one-fourth of the amount of spike added.
- Solid Samples: ± 3 x MQL difference (if either result < 5x RDL) or 50% RPD for field duplicates
- Aqueous Samples: ± 2 x MQL difference (if either result < 5x RDL) or 30% RPD for field duplicates

After completing the examination, the validator applied qualifying flags to any data associated with a QC deviation. The qualifiers were applied in accord with the USEPA's *National Functional Guidelines for Organic Data Review*, October 1999 and *National Functional Guidelines for Inorganic Data Review*, October 2004 (i.e., the NFG). The Data Validation Qualifiers (DVQs) are defined in Table 3.

The Project Manager then performed a usability review for the intended use of risk assessment taking into consideration the analytical methodology, laboratory reporting limits, and QC performance identified during validation. The PM consulted the USEPA's *Guidance for Data Useability in Risk Assessment, Part A* (April 1992) for guidelines on data usability.

QA oversight was provided by the Quality Assurance Manager (QAM) to insure that the validation and usability review were appropriate for this project. Findings for the validation and review are discussed below.

3.0 DATA VALIDATION RESULTS

The data set includes 104 sediment samples including one field duplicate, 71 soil samples, 5 SPLP (Synthetic Precipitation Leachate Procedure) samples, 22 surface water samples including one field duplicate, 15 groundwater samples including one field duplicate, two field MS/MSD pairs, and two trip blanks that were analyzed for various parameters as shown in Table 1. All samples were included in the validation and thus a total of 3,085 sample results were validated. The outcomes are discussed below.

3.1 COMPARABILITY

Samples were analyzed using standard EPA protocols or other rigorous methods as summarized in Table 4. All analytical results were reviewed and validated. The analytical results are considered comparable to other results similarly generated and validated.

3.2 ACCURACY

QAA evaluated the analytical accuracy of the sample results using the percent recovery (%R) results for the laboratory control samples (LCS/LCSD), matrix spikes (MS/MSD), and surrogate spikes. LCS/LCSD are prepared using a clean sample matrix (reagent water or sand) that is spiked with the analytes of interest before preparation and analysis. They provide an indication of the accuracy of the preparation and analysis technique on a sample free of matrix effects. MS/MSD are prepared using a field sample that is spiked with the analytes of interest before preparation and analysis. They provide an indication of the accuracy of the preparation and analysis technique on the given sample matrix. Surrogates are compounds similar to the analytes of interest that are added to each sample before preparation and analysis and provide an indication of accuracy for each individual sample analysis.

3.2.1 LABORATORY CONTROL SAMPLE (LCS) ACCURACY

For all tests except two general chemistry parameters (Alkalinity and Salinity), the laboratory prepared and analyzed a Laboratory Control Sample (LCS) for every analytical batch (maximum 20 samples) as required. Some batches also include a LCSD. For this data set, there are 104 LCS and 30 LCSD each with recoveries reported for one or more target analytes. The LCS or average LCS/LCSD recoveries are within the control limits except in two cases (2-methylnaphthalene and naphthalene have low recoveries for one of the four PAH-water batches). The associated samples (i.e., those prepared and/or analyzed with the LCS/LCSD) were qualified as shown in Table 5.

3.2.2 MATRIX SPIKE (MS) ACCURACY

For all tests except four general chemistry parameters (Alkalinity, Salinity, TDS, and TOC) plus TPH-water and Fractionated-TPH, the laboratory prepared and analyzed a MS for every analytical batch (maximum 20 samples). Some batches also include a MSD. For this data set, there are 96 MS and 35 MSD each with recoveries reported for one or more target analytes. At least one MS was prepared using a sample from the site for every test except PCB-solid (for which there was only one batch) as shown in Table 1. The validator used the LCS to assess accuracy for batches without a MS prepared using a sample from the site. The MS or average MS/MSD recoveries are within the control limits or the test is considered inconclusive per method protocol based on the amount of spike added except in eight cases. The associated samples (i.e., those prepared and/or analyzed with the MS/MSD and of similar matrix) were qualified as shown in Table 5. Note that the recovery for zinc in the MS prepared using SED-BK-10 is exceptionally low at 0%. A laboratory duplicate was also prepared using this sample and indicates that the sample is non-homogeneous (91 RPD), which skewed the recovery results. Thus, the low recovery is attributed to the non-homogeneous sample rather than poor method accuracy. All potentially affected samples were qualified as shown in Table 5.

3.2.3 SURROGATE (SU) RECOVERY

The laboratory spiked all samples for the applicable tests (i.e., BTEX, Fractionated TPH, PAH, PCB, and TPH) with one or more surrogates before preparation and analysis. There are 186 samples with surrogate spikes for this data set. All recoveries are within the control limits except as noted in Table 5. As shown, five samples required dilution and the surrogate was diluted out and thus the test is inconclusive, in accordance with method protocol. Additionally, for several PAH samples (SW-846 8270), only one of the three surrogates used for the analysis was outside the limits. Per the NFG, no qualifiers are warranted nor were any applied. Three TPH (TNRCC 1005) samples have high surrogate recoveries, which indicates a potential bias for detects, but all results for the samples are non-detect and thus there is no effect on data quality. Ultimately, the validator qualified four surface water PAH samples (SW-05, SW-03, SW-04, and SW-10) due to low surrogate recovery, two sediment TPH (TNRCC 1005) samples (SED-10 (2-4) and SED-11 (2-4)) due to high recovery, and one groundwater Fractionated TPH (TNRCC 1006) sample (SB-1-MW-D) due to low surrogate recovery.

3.3 PRECISION

QAA evaluated the sampling and analytical precision of the sample results using the relative percent difference (RPD) for the laboratory control sample duplicate (LCS/LCSD), matrix spike duplicate (MS/MSD), laboratory duplicate (DUP), and field duplicate (FD) pairs. LCS/LCSD are prepared using a clean sample matrix (reagent water or sand) that is spiked with the analytes of interest before preparation and analysis. They provide an indication of the precision of the preparation and analysis technique on a sample free of matrix effects. MS/MSD are prepared using a field sample that is spiked with the analytes of interest before preparation and analysis. They provide an indication of the precision of the preparation and analysis technique on the given sample matrix. FD are prepared by the sampler in the field and provide an indication of the precision of the sampling technique plus the preparation and analysis technique.

3.3.1 LABORATORY CONTROL SAMPLE DUPLICATE (LCSD) PRECISION

For BTEX, PAH, PCB, TOC, TPH, and Fractionated TPH, the laboratory prepared and analyzed a LCSD for every analytical batch (maximum 20 samples). For this data set, there are 30 LCSD each with RPDs reported for one or more target analytes. The LCS/LCSD RPDs are within the control limits except in three cases as noted in Table 5. 2-Methylnaphthalene, anthracene, and naphthalene have high RPDs, which indicates a potential bias for detects, for one of the four PAH-water batches. The results for the associated samples (i.e., those prepared and/or analyzed with the LCS/LCSD) are all non-detect, and thus there is no effect on data quality.

3.3.2 MATRIX SPIKE DUPLICATE (MSD) AND LABORATORY DUPLICATE (DUP) PRECISION

For all tests except TPH-water and Fractionated TPH, the laboratory prepared and analyzed a MSD or DUP for every analytical batch (maximum 20 samples). For this data set, there are 35 MSD each with RPDs reported for one or more target analytes. At least one MSD or DUP was prepared using a sample from the site for every test except PCB-solid (for which there was only one batch) as shown in Table 1. The validator used the LCSD to assess precision for batches without a MSD or DUP prepared using a sample from the site. The MS/MSD and DUP RPDs are within the control limits except in two cases. The associated samples (i.e., those prepared and/or analyzed with the MSD or DUP and of similar matrix) were qualified as shown in Table 5.

3.3.3 FIELD DUPLICATE (FD) PRECISION

Three field duplicates were collected with the samples including one sediment, one surface water, and one groundwater. The RPDs or differences between the results (if either result is < 5x RDL) are within the control limits for all target analytes for all three duplicates as shown in Table 6.

3.4 REPRESENTATIVENESS

QAA evaluated analytical representativeness of the sample results by verifying the data completeness, examining the custody procedures, calculating holding times, examining blanks for evidence of contamination, and comparing the actual analytical procedures to those described in the analysis methods. Additionally, QAA examined and compared the analytical results for reasonableness. QAA did not evaluate sample representativeness.

3.4.1 DATA COMPLETENESS

The data packages contain all necessary information. The validator noted that the sample date for MPA-AB13 0-3 (DRY) (21005242817) is reported as 5/20/2000 in the laboratory package instead of 5/20/2010 as shown on the custody record.

3.4.2 CHAIN-OF-CUSTODY

All samples were hand-delivered with properly executed Chain-of-Custody records, which ensures sample integrity was maintained. The validator noted some minor discrepancies on the custody records and obtained clarification from the samplers as follows:

- The Comp(osite)/Grab designation is missing or incorrect in some cases. All samples were collected as grab samples per MPA.
- There is no place on the custody record to indicate how the dissolved metals aliquots were collected. All aliquots were filtered in the field and then placed in the sample container with nitric acid preservative per MPA.

The validator also noted that several of the samples were received four or more days after collection. Per MPA, all samples remained inside the sample coolers and in the possession of the sampler after collection until transferred to the laboratory courier personnel for delivery. Frequent checks and replenishment of ice were made.

3.4.3 SAMPLE PRESERVATION AND HOLDING TIME

All samples were properly preserved and analyzed within the holding times listed in the analytical methodology. The validator noted the following regarding sample preservation and holding time:

- For laboratory work order 210051128, CaCO3 is shown as a preservative on the custody record. This aliquot was originally collected for Salinity but it was not used by the laboratory since it is not required per the analytical methodology.
- TNRCC method 1005 includes a stipulation that solid samples be frozen within two days of collection, which comes from the Texas Commission for Environmental Quality (TCEQ, formerly the TNRCC) guidance for using method SW846-5035. The guidance applies when collecting samples for volatile analysis (i.e., when samples are expected to contain lighter ends). Only >C10 hydrocarbons were requested and reported for the solid samples for this site

and thus the method 5035 recommendations (collection using a coring device and 2 days holding time before analysis or freezing) do not apply and were not used.

- The date reported as the extraction date for the Fractionated TPH (TNRCC 1006) analyses is actually the fractionation date. The TPH (TNRCC 1005) extracts were used for the fractionation, and thus the extraction date reported for the TNRCC 1005 analysis was used to determine if holding time requirements were met.

3.4.4 BLANK CONTAMINATION

The laboratory analyzed a preparation blank for every analytical batch (maximum 20 samples). There are 107 laboratory blanks for this data set. No organic compounds were detected in the laboratory blanks. As shown in Table 5, several inorganic compounds (chloride, barium, cadmium, calcium, chromium, magnesium, manganese, potassium, sodium, zinc, and mercury) were detected in the laboratory blanks. Per the NFG, sample results are not qualified if the inorganic analyte concentration in a preparation blank is less than the Contract Required Quantitation Limit (CRQL), which is equivalent to GCAL's RDL. In all but one case, the concentration in the preparation blank is below the RDL, and thus no qualifiers were applied in accord with NFG. (Other guidance documents including those for the LDEQ's RECAP and for the TCEQ's Texas Risk Reduction Program (TRRP) allow for qualification of samples if there are detectable concentrations in a preparation blank.) The sodium concentration in the preparation blank for batch 431670 is above the RDL. Sodium was detected in the associated samples (i.e., those prepared with the laboratory blank) at levels well above that in the blank (> 10x the blank concentration per the NFG), and thus no qualifiers were applied.

Additionally, two trip blanks were shipped with groundwater samples collected for BTEX: one on March 5, 2010 and one on May 25, 2010. The trip blank results are non-detect, indicating that the samples were not affected by contamination during shipment.

3.4.5 ANALYTICAL PROCEDURES

For the TPH samples with supporting raw data, the analytical procedures (instrument calibration, calibration verification, analyte qualitative identification, and sample quantitation) met the requirements in the analytical method. The validator did note the following regarding the TPH analyses:

- For some of the analyses of the aliphatic fraction for TNRCC method 1006, the printout of the chromatogram as presented in the hardcopy report indicates that the analyst selected a baseline that meets the end of the chromatographic 'hump' at a point above the forced baseline projection and before the C35 marker. The laboratory was contacted and a supervisor reviewed each chromatogram and determined that in each case, there is a flat rise in the baseline beyond the oil 'hump'. The analyst felt the oil peak ended at the point of integration. Per the analyst's experience, product ranges often shift retention times due to weathering and this was the analyst's interpretation for each analysis in question. For a conservative approach, the validator selected the chromatogram that appeared to be potentially most affected and the laboratory re-integrated the peak by drawing straight across from the beginning time baseline. The >C16-C35 Aliphatic result changed by only +5%, which is well within the inherent error of the method (+/- 25%). Thus no further action was taken and no data qualifiers were applied.

3.4.6 RESULTS ASSESSMENT

The validator compared the total metals concentration and the dissolved metals concentration for all samples with both analyses. Scientifically, the total metals concentration minus the dissolved metals concentration is expected to be greater than zero. Analytically, the inherent method error (+/-25%) may result in a negative difference. The validator calculated the difference and compared the result to 2x RDL. For the 288 pairs of results, only six pairs have a dissolved concentration greater than the total concentration and an absolute difference between the results of greater than 2x RDL. The validator qualified each of these results as shown in Table 5.

Additionally, the validator compared the total TPH as determined by TNRCC method 1005 to that determined by TNRCC method 1006. For these procedures, the laboratory extracts each sample with n-pentane and analyzes the extract to determine TPH by TNRCC method 1005. The same extract is then fractionated and the two fractions (aliphatic and aromatic) are analyzed to determine TPH by TNRCC 1006. Since the same extract is used for both analyses, a comparison of the results will show any loss or altering of TPH during the fractionation of the extract on the solid phase silica column. The validator calculated the percent recovery of TPH (1006) compared to TPH (1005) and determined if it was within 60-140%. For the 33 samples with both analyses, only three pairs have a recovery outside of the limits. The validator qualified each of these results as shown in Table 5.

3.5 COMPLETENESS

QAA evaluated completeness by comparing the total number of samples collected with the total number of samples with valid analytical data. The validator did not reject any data. The completeness is 100%.

4.0 DATA USABILITY

QAA evaluated data usability by considering the appropriateness of the analytical methods used by the laboratory, the reporting limits stated by the laboratory, and the qualifiers applied by the validator.

4.1 METHODOLOGY

The SW-846 or other rigorous methodologies employed by the laboratory are appropriate for the intended use of risk assessment, including the LDEQ's RECAP and provide definitive data per RECAP.

4.2 REPORTING LIMITS

Sample results are reported with a Method Detection Limit (MDL) and Reporting Detection Limit (RDL). The MDL is a detection limit and thus corresponds to the lowest concentration at which a target analyte can be positively identified but not necessarily accurately measured and is statistically determined by the laboratory. The RDL is a quantitation limit and thus reflects the lowest concentration at which a target analyte can be both positively identified and accurately measured. The MDLs and RDLs reported by GCAL are adjusted for sample-specific actions such as dilution or use of a smaller aliquot size, and thus are sample detection limits and sample quantitation limits, respectively. Per the RECAP, the sample quantitation limit should be less than the limiting screening standard. The RDLs for all non-detects are below the limiting screening standard (GW_SS) for all groundwater samples and below the limiting screening standard (the lowest of SOIL_SSni, SOIL_SSi, and SOIL_SSGW) for all soil samples.

4.3 QC PERFORMANCE

There are no major QC deficiencies that resulted in rejection of data, and thus all data is acceptable for risk assessment purposes. Results that are qualified with a *UJ* should be considered not present above the reporting limit, and the reporting limit as an estimated value. Results that are qualified with a *J* should be regarded as present, and the reported concentration as an estimated value.

TABLE 1
SAMPLE SUMMARY
(SEDIMENTS)

LABORATORY ID	FIELD ID	SAMPLE DATE	TESTS PERFORMED							
21003082601	SED-1 (0-2)	2/25/10	Chloride	NA	7 ICP Metals	Mercury	NA	NA	NA	NA
21003082601MS	SED-1 (0-2)	2/25/10	Chloride	NA	NA	NA	NA	NA	NA	NA
21003082601MSD	SED-1 (0-2)	2/25/10	Chloride	NA	NA	NA	NA	NA	NA	NA
21003082602	SED-1 (2-4)	2/25/10	Chloride	NA	7 ICP Metals	Mercury	NA	NA	NA	NA
21003082603	SED-1 (4-6)	2/25/10	Chloride	NA	7 ICP Metals	Mercury	NA	NA	NA	NA
21003082604	SED-2 (0-2)	2/25/10	Chloride	NA	7 ICP Metals	Mercury	NA	NA	NA	NA
21003082604MS	SED-2 (0-2)	2/25/10	NA	NA	7 ICP Metals	Mercury	NA	NA	NA	NA
21003082604DUP	SED-2 (0-2)	2/25/10	NA	NA	7 ICP Metals	Mercury	NA	NA	NA	NA
21003082605	SED-2 (2-4)	2/25/10	Chloride	NA	7 ICP Metals	Mercury	NA	NA	NA	NA
21003082606	SED-2 (4-6)	2/25/10	Chloride	NA	7 ICP Metals	Mercury	NA	NA	NA	NA
21003082607	SED-3 (0-2)	2/25/10	Chloride	NA	7 ICP Metals	Mercury	NA	NA	NA	NA
21003082608	SED-3 (2-4)	2/25/10	Chloride	NA	7 ICP Metals	Mercury	NA	NA	NA	NA
21003082609	SED-3 (4-6)	2/25/10	Chloride	NA	7 ICP Metals	Mercury	NA	NA	NA	NA
21003082610	SED-4 (0-2)	2/25/10	Chloride	NA	7 ICP Metals	Mercury	PCB	TPH (1005)*	NA	NA
21003082610MS	SED-4 (0-2)	2/25/10	NA	NA	NA	NA	NA	TPH (1005)*	NA	NA
21003082610MSD	SED-4 (0-2)	2/25/10	NA	NA	NA	NA	NA	TPH (1005)*	NA	NA
21003082611	SED-5 (0-2)	2/25/10	Chloride	NA	7 ICP Metals	Mercury	PCB	TPH (1005)*	NA	NA
21003082612	SED-6 (0-2)	2/25/10	Chloride	NA	7 ICP Metals	Mercury	PCB	TPH (1005)*	NA	NA
21003082613	SED-7 (0-2)	2/25/10	Chloride	NA	7 ICP Metals	Mercury	NA	TPH (1005)*	NA	NA
21003082614	SED-7 (2-4)	2/25/10	Chloride	NA	7 ICP Metals	Mercury	PCB	TPH (1005)*	Frac TPH (1006)*	NA
21003082615	SED-7 (4-6)	2/25/10	Chloride	NA	7 ICP Metals	Mercury	PCB	TPH (1005)*	Frac TPH (1006)*	NA
21003082616	SED-8 (0-2)	2/25/10	Chloride	NA	7 ICP Metals	Mercury	PCB	TPH (1005)*	NA	NA
21003082617	SED-8 (2-4)	2/25/10	Chloride	NA	7 ICP Metals	Mercury	NA	TPH (1005)*	Frac TPH (1006)*	NA
21003082618	SED-9 (0-2)	2/25/10	Chloride	NA	3 ICP Metals	Mercury	NA	TPH (1005)*	NA	NA
21003082618MS	SED-9 (0-2)	2/25/10	Chloride	NA	NA	NA	NA	NA	NA	NA
21003082618MSD	SED-9 (0-2)	2/25/10	Chloride	NA	NA	NA	NA	NA	NA	NA
21003082619	SED-9 (2-4)	2/25/10	Chloride	NA	3 ICP Metals	Mercury	NA	TPH (1005)*	NA	NA

TABLE 1
SAMPLE SUMMARY
(SEDIMENTS)

LABORATORY ID	FIELD ID	SAMPLE DATE	TESTS PERFORMED							
21003082620	SED-10 (0-2)	2/25/10	Chloride	NA	3 ICP Metals	Mercury	NA	TPH (1005)*	NA	NA
21003082621	SED-10 (2-4)	2/25/10	Chloride	NA	3 ICP Metals	Mercury	NA	TPH (1005)*	NA	NA
21003082621MS	SED-10 (2-4)	2/25/10	Chloride	NA	3 ICP Metals	Mercury	NA	NA	NA	NA
21003082621MSD	SED-10 (2-4)	2/25/10	Chloride	NA	NA	NA	NA	NA	NA	NA
21003082621DUP	SED-10 (2-4)	2/25/10	NA	NA	3 ICP Metals	Mercury	NA	NA	NA	NA
21003082622	SED-11 (0-2)	2/25/10	Chloride	NA	3 ICP Metals	Mercury	NA	TPH (1005)*	NA	NA
21003082623	SED-11 (2-4)	2/25/10	Chloride	NA	3 ICP Metals	Mercury	NA	TPH (1005)*	Frac TPH (1006)*	NA
21003082624	SED-12 (0-2)	2/25/10	Chloride	NA	3 ICP Metals	Mercury	NA	TPH (1005)*	NA	NA
21003082625	SED-12 (2-4)	2/25/10	Chloride	NA	3 ICP Metals	Mercury	NA	TPH (1005)*	Frac TPH (1006)*	NA
21003082626	SED-12 (4-6)	2/25/10	Chloride	NA	3 ICP Metals	Mercury	NA	TPH (1005)*	Frac TPH (1006)*	NA
21003082627	SED-13 (0-2)	2/26/10	Chloride	NA	3 ICP Metals	Mercury	NA	NA	NA	NA
21003082628	SED-13 (2-4)	2/26/10	Chloride	NA	3 ICP Metals	Mercury	NA	NA	NA	NA
21003082629	SED-14 (0-2)	2/26/10	Chloride	NA	3 ICP Metals	Mercury	NA	NA	NA	NA
21003082630	SED-14 (2-4)	2/26/10	Chloride	NA	3 ICP Metals	Mercury	NA	NA	NA	NA
21003082631	SED-15 (0-2)	2/26/10	Chloride	NA	7 ICP Metals	Mercury	NA	TPH (1005)*	Frac TPH (1006)*	NA
21003082632	SED-15 (2-4)	2/26/10	Chloride	NA	7 ICP Metals	Mercury	NA	TPH (1005)*	Frac TPH (1006)*	NA
21003082633	SED-16 (0-2)	2/26/10	Chloride	NA	3 ICP Metals	Mercury	NA	TPH (1005)*	NA	NA
21003082634	SED-17 (0-2)	2/26/10	Chloride	NA	3 ICP Metals	Mercury	NA	TPH (1005)*	NA	NA
21003082634MS	SED-17 (0-2)	2/26/10	NA	NA	NA	NA	NA	TPH (1005)*	NA	NA
21003082634MSD	SED-17 (0-2)	2/26/10	NA	NA	NA	NA	NA	TPH (1005)*	NA	NA
21003082635	SED-17 (2-4)	2/26/10	Chloride	NA	3 ICP Metals	Mercury	NA	TPH (1005)*	NA	NA
21003082636	SED-18 (0-2)	2/26/10	Chloride	NA	3 ICP Metals	Mercury	NA	TPH (1005)*	Frac TPH (1006)*	NA
21003082637	SED-18 (2-4)	2/26/10	Chloride	NA	3 ICP Metals	Mercury	NA	TPH (1005)*	Frac TPH (1006)*	NA
21003082638	SED-19 (0-2)	2/26/10	Chloride	NA	7 ICP Metals	Mercury	NA	TPH (1005)*	Frac TPH (1006)*	NA
21003082638MS	SED-19 (0-2)	2/26/10	Chloride	NA	NA	NA	NA	NA	NA	NA
21003082638MSD	SED-19 (0-2)	2/26/10	Chloride	NA	NA	NA	NA	NA	NA	NA
21003082639	SED-19 (2-4)	2/26/10	Chloride	NA	3 ICP Metals	Mercury	NA	TPH (1005)*	Frac TPH (1006)*	NA

TABLE 1
SAMPLE SUMMARY
(SEDIMENTS)

LABORATORY ID	FIELD ID	SAMPLE DATE	TESTS PERFORMED							
21003082640	SS-08 (0-2)	2/26/10	NA	NA	7 ICP Metals	Mercury	NA	TPH (1005)*	Frac TPH (1006)*	NA
21003082641	SS-08 (2-4)	2/26/10	NA	NA	7 ICP Metals	Mercury	NA	NA	NA	NA
21003082642	SS-10 (0-2)	2/26/10	NA	NA	7 ICP Metals	Mercury	NA	TPH (1005)*	Frac TPH (1006)*	NA
21003082642MS	SS-10 (0-2)	2/26/10	NA	NA	7 ICP Metals	Mercury	NA	NA	NA	NA
21003082642DUP	SS-10 (0-2)	2/26/10	NA	NA	7 ICP Metals	Mercury	NA	NA	NA	NA
21003082643	SS-10 (2-4)	2/26/10	NA	NA	7 ICP Metals	Mercury	NA	TPH (1005)*	Frac TPH (1006)*	NA
21003082644	SED-20 (0-2)	2/26/10	Chloride	NA	3 ICP Metals	Mercury	NA	TPH (1005)*	NA	NA
21003082645	SED-20 (2-4)	2/26/10	Chloride	NA	3 ICP Metals	Mercury	NA	TPH (1005)*	NA	NA
21003082645MS	SED-20 (2-4)	2/26/10	Chloride	NA	NA	NA	NA	NA	NA	NA
21003082645MSD	SED-20 (2-4)	2/26/10	Chloride	NA	NA	NA	NA	NA	NA	NA
21003082646	SED-21 (0-2)	2/26/10	Chloride	NA	3 ICP Metals	Mercury	NA	TPH (1005)*	NA	NA
21003082647	SED-21 (2-4)	2/26/10	Chloride	NA	3 ICP Metals	Mercury	NA	TPH (1005)*	NA	NA
21003082648	SED-21 (4-6)	2/26/10	Chloride	NA	3 ICP Metals	Mercury	NA	TPH (1005)*	Frac TPH (1006)*	NA
21003082649	SED-21 (6-8)	2/26/10	Chloride	NA	3 ICP Metals	Mercury	NA	TPH (1005)*	Frac TPH (1006)*	NA
21003082650	SED-22 (0-2)	2/26/10	Chloride	NA	3 ICP Metals	Mercury	NA	TPH (1005)*	NA	NA
21003082651	SED-22 (2-4)	2/26/10	Chloride	NA	3 ICP Metals	Mercury	NA	TPH (1005)*	NA	NA
21003082652	SED-26 (0-2)	3/2/10	Chloride	NA	3 ICP Metals	Mercury	NA	TPH (1005)*	Frac TPH (1006)*	NA
21003082653	SED-26 (2-4)	3/2/10	Chloride	NA	3 ICP Metals	Mercury	NA	TPH (1005)*	Frac TPH (1006)*	NA
21003082654	SED-27 (0-2)	3/2/10	Chloride	NA	3 ICP Metals	Mercury	NA	TPH (1005)*	Frac TPH (1006)*	NA
21003082655	SED-27 (2-4)	3/2/10	Chloride	NA	3 ICP Metals	Mercury	NA	TPH (1005)*	Frac TPH (1006)*	NA
21003082656	SED-28 (0-2)	3/2/10	Chloride	NA	7 ICP Metals	Mercury	NA	TPH (1005)*	Frac TPH (1006)*	NA
21003082657	SED-28 (2-4)	3/2/10	Chloride	NA	7 ICP Metals	Mercury	NA	TPH (1005)*	Frac TPH (1006)*	NA
21003082658	SED-29 (0-2)	3/2/10	Chloride	NA	7 ICP Metals	Mercury	NA	TPH (1005)*	Frac TPH (1006)*	NA
21003082659	SED-29 (2-4)	3/2/10	Chloride	NA	7 ICP Metals	Mercury	NA	TPH (1005)*	NA	NA
21003082660	SED-30 (0-2)	3/2/10	Chloride	NA	7 ICP Metals	Mercury	NA	TPH (1005)*	Frac TPH (1006)*	NA
21003082661	SED-30 (2-4)	3/2/10	Chloride	NA	7 ICP Metals	Mercury	NA	TPH (1005)*	Frac TPH (1006)*	NA

TABLE 1
SAMPLE SUMMARY
(SEDIMENTS)

LABORATORY ID	FIELD ID	SAMPLE DATE	TESTS PERFORMED							
21003082662	SED-31 (4-6)	3/2/10	Chloride	NA	3 ICP Metals	Mercury	NA	TPH (1005)*	NA	NA
21003082662MS	SED-31 (4-6)	3/2/10	Chloride	NA	NA	NA	NA	NA	NA	NA
21003082662MSD	SED-31 (4-6)	3/2/10	Chloride	NA	NA	NA	NA	NA	NA	NA
21003082663	SED-32 (4-6)	3/2/10	Chloride	NA	3 ICP Metals	Mercury	NA	TPH (1005)*	NA	NA
21003082663MS	SED-32 (4-6)	3/2/10	NA	NA	3 ICP Metals	Mercury	NA	NA	NA	NA
21003082663DUP	SED-32 (4-6)	3/2/10	NA	NA	3 ICP Metals	Mercury	NA	NA	NA	NA
21003082664	SED-33 (4-6)	3/2/10	Chloride	NA	3 ICP Metals	Mercury	NA	TPH (1005)*	NA	NA
21003082665	SED-23 (0-2)	3/2/10	Chloride	NA	3 ICP Metals	Mercury	NA	TPH (1005)*	Frac TPH (1006)*	NA
21003082665MS	SED-23 (0-2)	3/2/10	Chloride	NA	NA	NA	NA	NA	NA	NA
21003082665MSD	SED-23 (0-2)	3/2/10	Chloride	NA	NA	NA	NA	NA	NA	NA
21003082666	SED-23 (2-4)	3/2/10	Chloride	NA	3 ICP Metals	Mercury	NA	TPH (1005)*	Frac TPH (1006)*	NA
21003082667	SED-24 (0-2)	3/2/10	Chloride	NA	3 ICP Metals	Mercury	NA	TPH (1005)*	NA	NA
21003082668	SED-24 (2-4)	3/2/10	Chloride	NA	3 ICP Metals	Mercury	NA	TPH (1005)*	NA	NA
21003082669	SED-25 (0-2)	3/2/10	Chloride	NA	3 ICP Metals	Mercury	NA	TPH (1005)*	Frac TPH (1006)*	NA
21003082670	SED-25 (2-4)	3/2/10	Chloride	NA	3 ICP Metals	Mercury	NA	TPH (1005)*	NA	NA
21003082671	SED-31 (0-2)	3/1/10	Chloride	NA	3 ICP Metals	Mercury	NA	TPH (1005)*	Frac TPH (1006)*	NA
21003082672	SED-31 (2-4)	3/1/10	Chloride	NA	3 ICP Metals	Mercury	NA	TPH (1005)*	Frac TPH (1006)*	NA
21003082673	SED-32 (0-2)	3/1/10	Chloride	NA	3 ICP Metals	Mercury	NA	TPH (1005)*	Frac TPH (1006)*	NA
21003082674	SED-32 (2-4)	3/1/10	Chloride	NA	3 ICP Metals	Mercury	NA	TPH (1005)*	NA	NA
21003082675	SED-33 (0-2)	3/1/10	Chloride	NA	3 ICP Metals	Mercury	NA	TPH (1005)*	Frac TPH (1006)*	NA
21003082675MS	SED-33 (0-2)	3/1/10	Chloride	NA	NA	NA	NA	NA	NA	NA
21003082675MSD	SED-33 (0-2)	3/1/10	Chloride	NA	NA	NA	NA	NA	NA	NA
21003082676	SED-33 (2-4)	3/1/10	Chloride	NA	3 ICP Metals	Mercury	NA	TPH (1005)*	NA	NA
21005112901	SED-9	5/5/10	Chloride	TOC	8 ICP Metals	Mercury	NA	NA	NA	PAH
21005112901MS	SED-9	5/5/10	Chloride	NA	NA	NA	NA	NA	NA	NA
21005112901DUP	SED-9	5/5/10	NA	TOC	NA	NA	NA	NA	NA	NA
21005112901MSD	SED-9	5/5/10	Chloride	NA	NA	NA	NA	NA	NA	NA

TABLE 1
SAMPLE SUMMARY
(SEDIMENTS)

LABORATORY ID	FIELD ID	SAMPLE DATE	TESTS PERFORMED							
21005112902	SED-24	5/5/10	Chloride	TOC	8 ICP Metals	Mercury	NA	NA	NA	PAH
21005112903	SED-31	5/5/10	Chloride	TOC	8 ICP Metals	Mercury	NA	NA	NA	PAH
21005112904	SED-8	5/6/10	Chloride	TOC	8 ICP Metals	Mercury	NA	NA	NA	PAH
21005112905	SED-11	5/6/10	Chloride	TOC	8 ICP Metals	Mercury	NA	NA	NA	PAH
21005112906	SED-13	5/6/10	Chloride	TOC	8 ICP Metals	Mercury	NA	NA	NA	PAH
21005112906MS	SED-13	5/6/10	NA	NA	8 ICP Metals	Mercury	NA	NA	NA	NA
21005112906DUP	SED-13	5/6/10	NA	NA	8 ICP Metals	Mercury	NA	NA	NA	NA
21005112907	SED-15	5/6/10	Chloride	TOC	8 ICP Metals	Mercury	NA	NA	NA	PAH
21005112908	SED-19	5/6/10	Chloride	TOC	8 ICP Metals	Mercury	NA	NA	NA	PAH
21005112909	SED-115(1)	5/6/10	Chloride	TOC	8 ICP Metals	Mercury	NA	NA	NA	PAH
21005112910	SED-120	5/7/10	Chloride	TOC	8 ICP Metals	Mercury	NA	NA	NA	PAH
21005112911	SED-26	5/5/10	Chloride	TOC	8 ICP Metals	Mercury	NA	NA	NA	PAH
21005140201	SED-BK-06	5/10/10	Chloride	TOC	8 ICP Metals	Mercury	NA	NA	NA	PAH
21005140201MS	SED-BK-06	5/10/10	Chloride	NA	NA	NA	NA	NA	NA	NA
21005140201MSD	SED-BK-06	5/10/10	Chloride	NA	NA	NA	NA	NA	NA	NA
21005140202	SED-BK-01	5/10/10	Chloride	TOC	8 ICP Metals	Mercury	NA	NA	NA	PAH
21005140202MS	SED-BK-01	5/10/10	NA	NA	8 ICP Metals	Mercury	NA	NA	NA	NA
21005140202DUP	SED-BK-01	5/10/10	NA	NA	8 ICP Metals	Mercury	NA	NA	NA	NA
21005140203	SED-BK-02	5/10/10	Chloride	TOC	8 ICP Metals	Mercury	NA	NA	NA	PAH
21005140204	SED-BK-03	5/10/10	Chloride	TOC	8 ICP Metals	Mercury	NA	NA	NA	PAH
21005140205	SED-BK-04	5/10/10	Chloride	TOC	8 ICP Metals	Mercury	NA	NA	NA	PAH
21005140206	SED-BK-05	5/11/10	Chloride	TOC	8 ICP Metals	Mercury	NA	NA	NA	PAH
21005140207	SED-BK-09	5/11/10	Chloride	TOC	8 ICP Metals	Mercury	NA	NA	NA	PAH
21005140208	SED-BK-07	5/11/10	Chloride	TOC	8 ICP Metals	Mercury	NA	NA	NA	PAH
21005140208MS	SED-BK-07	5/11/10	NA	NA	NA	NA	NA	NA	NA	PAH
21005140208MSD	SED-BK-07	5/11/10	NA	NA	NA	NA	NA	NA	NA	PAH
21005140209	SED-BK-08	5/11/10	Chloride	TOC	8 ICP Metals	Mercury	NA	NA	NA	PAH
21005140209DUP	SED-BK-08	5/11/10	NA	TOC	NA	NA	NA	NA	NA	NA

TABLE 1
SAMPLE SUMMARY
(SEDIMENTS)

LABORATORY ID	FIELD ID	SAMPLE DATE	TESTS PERFORMED							
21005242807	SED-BK-11	5/19/10	Chloride	TOC	8 ICP Metals	Mercury	NA	NA	NA	PAH
21005242807MS	SED-BK-11	5/19/10	NA	NA	NA	Mercury	NA	NA	NA	PAH
21005242807MSD	SED-BK-11	5/19/10	NA	NA	NA	NA	NA	NA	NA	PAH
21005242807DUP	SED-BK-11	5/19/10	NA	NA	NA	Mercury	NA	NA	NA	NA
21005242808	SED-BK-10	5/19/10	Chloride	TOC	8 ICP Metals	Mercury	NA	NA	NA	PAH
21005242808MS	SED-BK-10	5/19/10	NA	NA	8 ICP Metals	NA	NA	NA	NA	NA
21005242808DUP	SED-BK-10	5/19/10	NA	NA	8 ICP Metals	NA	NA	NA	NA	NA
21006092101	SED 15 (8-10)	6/8/10	NA	NA	NA	NA	NA	NA	Frac TPH (1006)	NA
21006092102	SED 15 W (0-2)	6/8/10	NA	NA	NA	NA	NA	NA	Frac TPH (1006)	NA
21006092103	SED 15 W 2 (0-2)	6/8/10	NA	NA	NA	NA	NA	NA	Frac TPH (1006)	NA
21006092104	SED 15 E (0-2)	6/8/10	NA	NA	NA	NA	NA	NA	Frac TPH (1006)	NA
21006092105	SED 15 E 2 (0-2)	6/8/10	NA	NA	NA	NA	NA	NA	Frac TPH (1006)	NA
21006092106	SED 15 N (0-2)	6/8/10	NA	NA	NA	NA	NA	NA	Frac TPH (1006)	NA

*Supporting raw data reviewed for this sample
NA - Not analyzed
3 ICP Metals - As,Ba,Se
7 ICP Metals - As,Ba,Cd,Cr,Pb,Se,Sr
8 ICP Metals - As,Ba,Cd,Cr,Pb,Se,Sr,Zn

(1) Field duplicate of SED-15 (21005112907)

TABLE 1
SAMPLE SUMMARY
(SOILS/SPLP)

LABORATORY ID	FIELD ID	SAMPLE DATE	TESTS PERFORMED			
21005140101	SB-1 (74-76)	5/11/10	Chloride	NA	NA	NA
21005140101MS	SB-1 (74-76)	5/11/10	Chloride	NA	NA	NA
21005140101MSD	SB-1 (74-76)	5/11/10	Chloride	NA	NA	NA
21005140102	SB-1 (78-80)	5/11/10	Chloride	NA	NA	NA
21005140103	SB-1 (62-64)	5/11/10	Chloride	NA	NA	NA
21005140104	SB-1 (66-68)	5/11/10	Chloride	NA	NA	NA
21005140105	SB-1 (70-72)	5/11/10	Chloride	NA	NA	NA
21005140106	SB-1 (42-43)	5/5/10	Chloride	NA	NA	NA
21005140107	SB-1 (13-15)	5/5/10	Chloride	NA	NA	NA
21005140108	SB-1 (58-60)	5/5/10	Chloride	NA	NA	NA
21005140109	SB-1 (62-64)	5/5/10	Chloride	NA	NA	NA
21005140110	SB-1 (46.6-47)	5/5/10	Chloride	NA	NA	NA
21005140110MS	SB-1 (46.6-47)	5/5/10	Chloride	NA	NA	NA
21005140110MSD	SB-1 (46.6-47)	5/5/10	Chloride	NA	NA	NA
21005140111	SB-1 (33-35)	5/5/10	Chloride	NA	NA	NA
21005140112	SB-1 (17-19)	5/5/10	Chloride	NA	NA	NA
21005140113	SB-1 (21-22)	5/5/10	Chloride	NA	NA	NA
21005140114	SB-1 (25-27)	5/5/10	Chloride	NA	NA	NA
21005140115	SB-1 (9-11)	5/5/10	Chloride	NA	NA	NA
21005140116	SB-1 (37-39)	5/5/10	Chloride	NA	NA	NA
21005140117	SB-1 (45.5-46)	5/5/10	Chloride	NA	NA	NA
21005140118	SB-1 (29-31)	5/5/10	Chloride	NA	NA	NA
21005140119	SB-1 (0-7)	5/5/10	Chloride	NA	NA	NA
21005140120	SB-2 (58-60)	5/10/10	Chloride	NA	NA	NA
21005140121	SB-2 (54-56)	5/10/10	Chloride	NA	NA	NA
21005140122	SB-2 (74-76)	5/10/10	Chloride	NA	NA	NA
21005140123	SB-2 (66-68)	5/10/10	Chloride	NA	NA	NA

TABLE 1
SAMPLE SUMMARY
(SOILS/SPLP)

LABORATORY ID	FIELD ID	SAMPLE DATE	TESTS PERFORMED			
21005140124	SB-2 (62-64)	5/10/10	Chloride	NA	NA	NA
21005140125	SB-2 (70-71.5)	5/10/10	Chloride	NA	NA	NA
21005140126	SB-2 (78-80)	5/10/10	Chloride	NA	NA	NA
21005140127	SB-2 (41-43)	5/7/10	Chloride	NA	NA	NA
21005140127MS	SB-2 (41-43)	5/7/10	Chloride	NA	NA	NA
21005140127MSD	SB-2 (41-43)	5/7/10	Chloride	NA	NA	NA
21005140128	SB-2 (33-35)	5/7/10	Chloride	NA	NA	NA
21005140129	SB-2 (35-36)	5/7/10	Chloride	NA	NA	NA
21005140130	SB-2 (21-23)	5/7/10	Chloride	NA	NA	NA
21005140130MS	SB-2 (21-23)	5/7/10	Chloride	NA	NA	NA
21005140130MSD	SB-2 (21-23)	5/7/10	Chloride	NA	NA	NA
21005140131	SB-2 (29-31)	5/7/10	Chloride	NA	NA	NA
21005140132	SB-2 (17-19)	5/7/10	Chloride	NA	NA	NA
21005140133	SB-2 (25-27)	5/7/10	Chloride	NA	NA	NA
21005140134	SB-2 (13-15)	5/7/10	Chloride	NA	NA	NA
21005140135	SB-2 (9-11)	5/7/10	Chloride	NA	NA	NA
21005140136	SB-2 (0-6)	5/7/10	Chloride	NA	NA	NA
21005140137	SB-3 (56-58)	5/11/10	Chloride	NA	NA	NA
21005140138	SB-3 (21-22)	5/10/10	Chloride	NA	NA	NA
21005140139	SB-3 (64-66)	5/11/10	Chloride	NA	NA	NA
21005140140	SB-3 (8-10)	5/10/10	Chloride	NA	NA	NA
21005140141	SB-3 (12-14)	5/10/10	Chloride	NA	NA	NA
21005140142	SB-3 (16-18)	5/10/10	Chloride	NA	NA	NA
21005140143	SB-3 (24-26)	5/10/10	Chloride	NA	NA	NA
21005140144	SB-3 (72-73)	5/11/10	Chloride	NA	NA	NA
21005140145	SB-3 (59-60)	5/11/10	Chloride	NA	NA	NA
21005140146	SB-3 (49-49.5)	5/10/10	Chloride	NA	NA	NA

TABLE 1
SAMPLE SUMMARY
(SOILS/SPLP)

LABORATORY ID	FIELD ID	SAMPLE DATE	TESTS PERFORMED			
21005140146MS	SB-3 (49-49.5)	5/10/10	Chloride	NA	NA	NA
21005140146MSD	SB-3 (49-49.5)	5/10/10	Chloride	NA	NA	NA
21005140147	SB-3 (68-68.5)	5/11/10	Chloride	NA	NA	NA
21005140148	SB-3 (77-78)	5/11/10	Chloride	NA	NA	NA
21005140149	SB-3 (40-42)	5/10/10	Chloride	NA	NA	NA
21005140150	SB-3 (37-38)	5/10/10	Chloride	NA	NA	NA
21005140150MS	SB-3 (37-38)	5/10/10	Chloride	NA	NA	NA
21005140150MSD	SB-3 (37-38)	5/10/10	Chloride	NA	NA	NA
21005140151	SB-3 (28-30)	5/10/10	Chloride	NA	NA	NA
21005140152	SB-3 (33-34)	5/10/10	Chloride	NA	NA	NA
21005140153	SB-3 (48-48.5)	5/10/10	Chloride	NA	NA	NA
21005140154	SB-3 (81-82)	5/11/10	Chloride	NA	NA	NA
21005140155	SB-3 (53-54)	5/11/10	Chloride	NA	NA	NA
21005140156	SB-3 (44-46)	5/10/10	Chloride	NA	NA	NA
21005140157	SB-3 (0-6)	5/10/10	Chloride	NA	NA	NA
21005142606	SB-1C (46-48)	5/13/10	Chloride	NA	NA	NA
21005142606MS	SB-1C (46-48)	5/13/10	Chloride	NA	NA	NA
21005142606MSD	SB-1C (46-48)	5/13/10	Chloride	NA	NA	NA
21005142607	SB-1C (51-52)	5/13/10	Chloride	NA	NA	NA
21005142608	SB-1C (53.5-54)	5/13/10	Chloride	NA	NA	NA
21005142609	SB-1C (54-56)	5/13/10	Chloride	NA	NA	NA
21005142610	SB-1C (58-60)	5/13/10	Chloride	NA	NA	NA
21005266601	MPA-SPLP-4	5/25/10	NA	NA	SPLP Mercury	NA
21005266601MS	MPA-SPLP-4	5/25/10	NA	NA	SPLP Mercury	NA
21005266601DUP	MPA-SPLP-4	5/25/10	NA	NA	SPLP Mercury	NA
21005266602	MPA-SPLP-5	5/25/10	NA	NA	SPLP Cr	NA
21005266602MS	MPA-SPLP-5	5/25/10	NA	NA	SPLP Cr	NA
21005266602DUP	MPA-SPLP-5	5/25/10	NA	NA	SPLP Cr	NA

TABLE 1
SAMPLE SUMMARY
(SOILS/SPLP)

LABORATORY ID	FIELD ID	SAMPLE DATE	TESTS PERFORMED			
21005242809	MPA-SPLP-1	5/20/10	NA	NA	SPLP Ba	NA
21005242809MS	MPA-SPLP-1	5/20/10	NA	NA	SPLP Ba,Pb	NA
21005242809DUP	MPA-SPLP-1	5/20/10	NA	NA	SPLP Ba,Pb	NA
21005242810	MPA-SPLP-2	5/20/10	NA	NA	SPLP Ba,Pb	NA
21005242811	MPA-SPLP-3	5/20/10	NA	NA	SPLP Ba,Pb	NA
21005242812	MPA-AB5(A) 4-6	5/19/10	NA	NA	NA	Frac TPH (1006)
21005242813	MPA-AB5(B) 4-6	5/19/10	NA	NA	NA	Frac TPH (1006)
21005242814	MPA-AB5(C) 4-6	5/19/10	NA	NA	NA	Frac TPH (1006)
21005242815	MPA-AB6 8-10 (DRY)	5/19/10	NA	Arsenic	NA	NA
21005242816	MPA-AB8 6-8 (DRY)	5/19/10	NA	Arsenic	NA	NA
21005242817	MPA-AB13 0-3 (DRY)	5/20/10	NA	Arsenic	NA	NA
21005242818	MPA-AB6 8-10 (NORMAL)	5/19/10	NA	Arsenic	NA	NA
21005242819	MPA-AB8 6-8 (NORMAL)	5/19/10	NA	Arsenic	NA	NA
21005242820	MPA-AB13 0-3 (NORMAL)	5/20/10	NA	Arsenic	NA	NA
21005242820MS	MPA-AB13 0-3 (NORMAL)	5/20/10	NA	Arsenic	NA	NA
21005242820DUP	MPA-AB13 0-3 (NORMAL)	5/20/10	NA	Arsenic	NA	NA

NA - Not analyzed

TABLE 1
SAMPLE SUMMARY
(SURFACE WATERS)

LABORATORY ID	FIELD ID	SAMPLE DATE	TESTS PERFORMED											
21005112801	SW-05	5/5/10	NA	Hardness	NA	TDS	Chloride	13 ICP Metals	7 ICP Metals-Dissolved	Arsenic	Arsenic-Dissolved	Mercury	Mercury-Dissolved	PAH
21005112801MS	SW-05	5/5/10	NA	NA	NA	NA	Chloride	NA	NA	Arsenic	NA	Mercury	Mercury-Dissolved	NA
21005112801MSD	SW-05	5/5/10	NA	NA	NA	NA	Chloride	NA	NA	NA	NA	NA	NA	NA
21005112801DUP	SW-05	5/5/10	NA	NA	NA	NA	NA	NA	NA	Arsenic	NA	Mercury	Mercury-Dissolved	NA
21005112802	SW-03	5/5/10	NA	Hardness	NA	TDS	Chloride	13 ICP Metals	7 ICP Metals-Dissolved	Arsenic	Arsenic-Dissolved	Mercury	Mercury-Dissolved	PAH
21005112803	SW-02	5/5/10	NA	Hardness	NA	TDS	Chloride	13 ICP Metals	7 ICP Metals-Dissolved	Arsenic	Arsenic-Dissolved	Mercury	Mercury-Dissolved	PAH
21005112804	SW-04	5/5/10	NA	Hardness	NA	TDS	Chloride	13 ICP Metals	7 ICP Metals-Dissolved	Arsenic	Arsenic-Dissolved	Mercury	Mercury-Dissolved	PAH
21005112804MS	SW-04	5/5/10	NA	NA	NA	NA	NA	NA	7 ICP Metals-Dissolved	NA	NA	NA	NA	NA
21005112804DUP	SW-04	5/5/10	NA	NA	NA	NA	NA	NA	7 ICP Metals-Dissolved	NA	NA	NA	NA	NA
21005112805	SW-01	5/6/10	Sulfate	Hardness	Salinity	TDS	Chloride	13 ICP Metals	7 ICP Metals-Dissolved	Arsenic	Arsenic-Dissolved	Mercury	Mercury-Dissolved	PAH
21005112805DUP	SW-01	5/6/10	NA	NA	Salinity	NA	NA	NA	NA	NA	NA	NA	NA	NA
21005112806	SW-06	5/6/10	Alkalinity	Hardness	NA	TDS	Chloride	13 ICP Metals	7 ICP Metals-Dissolved	Arsenic	Arsenic-Dissolved	Mercury	Mercury-Dissolved	PAH
21005112806MS	SW-06	5/6/10	NA	Hardness	NA	NA	NA	13 ICP Metals	NA	NA	NA	NA	NA	NA
21005112806DUP	SW-06	5/6/10	Alkalinity	Hardness	NA	NA	NA	13 ICP Metals	NA	NA	NA	NA	NA	NA

TABLE 1
SAMPLE SUMMARY
(SURFACE WATERS)

LABORATORY ID	FIELD ID	SAMPLE DATE	TESTS PERFORMED											
21005112807	SW-07	5/6/10	NA	Hardness	NA	TDS	Chloride	13 ICP Metals	7 ICP Metals-Dissolved	Arsenic	Arsenic-Dissolved	Mercury	Mercury-Dissolved	PAH
21005112807MS	SW-07	5/6/10	NA	NA	NA	NA	NA	NA	NA	NA	Arsenic-Dissolved	NA	NA	NA
21005112807DUP	SW-07	5/6/10	NA	NA	NA	NA	NA	NA	NA	NA	Arsenic-Dissolved	NA	NA	NA
21005112808	SW-10	5/6/10	Sulfate	Hardness	Salinity	TDS	Chloride	13 ICP Metals	7 ICP Metals-Dissolved	Arsenic	Arsenic-Dissolved	Mercury	Mercury-Dissolved	PAH
21005112809	SW-09	5/6/10	Sulfate	Hardness	Salinity	TDS	Chloride	13 ICP Metals	7 ICP Metals-Dissolved	Arsenic	Arsenic-Dissolved	Mercury	Mercury-Dissolved	PAH
21005112810	SW-109(1)	5/6/10	Alkalinity	Hardness	NA	TDS	Chloride	13 ICP Metals	7 ICP Metals-Dissolved	Arsenic	Arsenic-Dissolved	Mercury	Mercury-Dissolved	PAH
21005112810MS	SW-109(1)	5/6/10	NA	Hardness	NA	NA	NA	13 ICP Metals	NA	NA	NA	NA	NA	NA
21005112810DUP	SW-109(1)	5/6/10	NA	Hardness	NA	NA	NA	13 ICP Metals	NA	NA	NA	NA	NA	NA
21005112811	SW-20	5/7/10	NA	Hardness	NA	TDS	Chloride	13 ICP Metals	7 ICP Metals-Dissolved	Arsenic	Arsenic-Dissolved	Mercury	Mercury-Dissolved	PAH
21005140210	SW BK-01	5/10/10	Sulfate	Hardness	Salinity	TDS	Chloride	13 ICP Metals	7 ICP Metals-Dissolved	Arsenic	Arsenic-Dissolved	Mercury	Mercury-Dissolved	PAH
21005140210MS	SW BK-01	5/10/10	NA	Hardness	NA	NA	NA	13 ICP Metals	7 ICP Metals-Dissolved	NA	NA	NA	NA	NA
21005140210DUP	SW BK-01	5/10/10	NA	Hardness	NA	TDS	NA	13 ICP Metals	7 ICP Metals-Dissolved	NA	NA	NA	NA	NA

TABLE 1
SAMPLE SUMMARY
(SURFACE WATERS)

LABORATORY ID	FIELD ID	SAMPLE DATE	TESTS PERFORMED											
21005140211	SW BK-02	5/10/10	Alkalinity	Hardness	NA	TDS	Chloride	13 ICP Metals	7 ICP Metals-Dissolved	Arsenic	Arsenic-Dissolved	Mercury	Mercury-Dissolved	PAH
21005140211MS	SW BK-02	5/10/10	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Mercury-Dissolved	NA
21005140211DUP	SW BK-02	5/10/10	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Mercury-Dissolved	NA
21005140212	SW BK-03	5/10/10	NA	Hardness	NA	TDS	Chloride	13 ICP Metals	7 ICP Metals-Dissolved	Arsenic	Arsenic-Dissolved	Mercury	Mercury-Dissolved	PAH
21005140213	SW BK-04	5/10/10	Sulfate	Hardness	Salinity	TDS	Chloride	13 ICP Metals	7 ICP Metals-Dissolved	Arsenic	Arsenic-Dissolved	Mercury	Mercury-Dissolved	PAH
21005140214	SW BK-05	5/11/10	Alkalinity	Hardness	NA	TDS	Chloride	13 ICP Metals	7 ICP Metals-Dissolved	Arsenic	Arsenic-Dissolved	Mercury	Mercury-Dissolved	PAH
21005140214MS	SW BK-05	5/11/10	NA	NA	NA	NA	NA	NA	NA	NA	NA	Mercury	NA	NA
21005140214DUP	SW BK-05	5/11/10	NA	NA	NA	NA	NA	NA	NA	NA	NA	Mercury	NA	NA
21005140215	SW BK-06	5/11/10	Sulfate	Hardness	Salinity	TDS	Chloride	13 ICP Metals	7 ICP Metals-Dissolved	Arsenic	Arsenic-Dissolved	Mercury	Mercury-Dissolved	PAH
21005140215MS	SW BK-06	5/11/10	NA	NA	NA	NA	NA	NA	NA	Arsenic	NA	NA	NA	NA
21005140215DUP	SW BK-06	5/11/10	NA	NA	NA	NA	NA	NA	NA	Arsenic	NA	NA	NA	NA
21005140216	SW BK-07	5/11/10	Alkalinity	Hardness	NA	TDS	Chloride	13 ICP Metals	7 ICP Metals-Dissolved	Arsenic	Arsenic-Dissolved	Mercury	Mercury-Dissolved	PAH
21005140217	SW BK-08	5/11/10	NA	Hardness	NA	TDS	Chloride	13 ICP Metals	7 ICP Metals-Dissolved	Arsenic	Arsenic-Dissolved	Mercury	Mercury-Dissolved	PAH
21005140218	SW BK-09	5/11/10	NA	Hardness	NA	TDS	Chloride	13 ICP Metals	7 ICP Metals-Dissolved	Arsenic	Arsenic-Dissolved	Mercury	Mercury-Dissolved	PAH
21005140218MS	SW BK-09	5/11/10	NA	NA	NA	NA	NA	NA	NA	NA	Arsenic-Dissolved	NA	NA	NA
21005140218DUP	SW BK-09	5/11/10	NA	NA	NA	NA	NA	NA	NA	NA	Arsenic-Dissolved	NA	NA	NA

TABLE 1

SAMPLE SUMMARY

(SURFACE WATERS)

LABORATORY ID	FIELD ID	SAMPLE DATE	TESTS PERFORMED											
21005242801	SW-BK-11	5/19/10	NA	Hardness	NA	TDS	Chloride	7 ICP Metals	7 ICP Metals-Dissolved	Arsenic	Arsenic-Dissolved	Mercury	Mercury-Dissolved	PAH
21005242802	SW-BK-11 MS	5/19/10	NA	NA	NA	NA	Chloride	7 ICP Metals	NA	Arsenic	NA	Mercury	NA	NA
21005242803	SW-BK-11 MSD	5/19/10	NA	NA	NA	NA	Chloride	7 ICP Metals	NA	Arsenic	NA	Mercury	NA	NA
21005242804	SW-BK-10	5/19/10	NA	Hardness	NA	TDS	Chloride	7 ICP Metals	7 ICP Metals-Dissolved	Arsenic	Arsenic-Dissolved	Mercury	Mercury-Dissolved	PAH
21005242805	SW-BK-10 MS	5/19/10	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	PAH
21005242806	SW-BK-10 MSD	5/19/10	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	PAH

NA - Not analyzed

7 ICP Metals - Ba,Cd,Cr,Pb,Se,Sr,Zn

13 ICP Metals - Ba,Cd,Ca,Cr,Fe,Pb,Mg,Mn,K,Se,Na,Sr,Zn

(1) Field duplicate of SW-09 (21005112809)

TABLE 1
SAMPLE SUMMARY
(GROUNDWATER)

LABORATORY ID	FIELD ID	SAMPLE DATE	TESTS PERFORMED											
21003085001	MW-1	3/5/10	NA	NA	TDS	Chloride	7 ICP Metals	NA	Arsenic	NA	Mercury	BTEX	Bromide	TPH (1005)*
21003085001MS	MW-1	3/5/10	NA	NA	NA	NA	NA	NA	Arsenic	NA	NA	NA	Bromide	NA
21003085001MSD	MW-1	3/5/10	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Bromide	NA
21003085001DUP	MW-1	3/5/10	NA	NA	NA	NA	NA	NA	Arsenic	NA	NA	NA	NA	NA
21003085002	MW-2R	3/5/10	NA	NA	TDS	Chloride	7 ICP Metals	NA	Arsenic	NA	Mercury	BTEX	Bromide	TPH (1005)*
21003085003	MW-3R	3/5/10	NA	NA	TDS	Chloride	7 ICP Metals	NA	Arsenic	NA	Mercury	BTEX	Bromide	TPH (1005)*
21003085004	MW-50	3/5/10	NA	NA	TDS	Chloride	7 ICP Metals	NA	Arsenic	NA	Mercury	BTEX	Bromide	TPH (1005)*
21003085004MS	MW-50	3/5/10	NA	NA	NA	NA	7 ICP Metals	NA	NA	NA	NA	NA	NA	NA
21003085004DUP	MW-50	3/5/10	NA	NA	NA	NA	7 ICP Metals	NA	NA	NA	NA	NA	NA	NA
21003085005	TRIP BLANK	3/5/10	NA	NA	NA	NA	NA	NA	NA	NA	NA	BTEX	NA	NA
21005112701	SB-1-MW-S	5/7/10	Sulfate	Alkalinity	TDS	Chloride	8 ICP Metals	8 ICP Metals-Dissolved	Arsenic	Arsenic-Dissolved	NA	BTEX	NA	Frac TPH (1006)*
21005112701DUP	SB-1-MW-S	5/7/10	NA	Alkalinity	TDS	NA	NA	NA	NA	NA	NA	NA	NA	NA
21005112702	SB-1-MW-D	5/6/10	Sulfate	Alkalinity	TDS	Chloride	8 ICP Metals	8 ICP Metals-Dissolved	Arsenic	Arsenic-Dissolved	NA	BTEX	NA	Frac TPH (1006)*
21005140158	SB-2 MW-S	5/11/10	Sulfate	Alkalinity	TDS	Chloride	8 ICP Metals	8 ICP Metals-Dissolved	Arsenic	Arsenic-Dissolved	NA	BTEX	NA	Frac TPH (1006)*
21005140159	SB-3-MW-S	5/12/10	Sulfate	Alkalinity	TDS	Chloride	8 ICP Metals	8 ICP Metals-Dissolved	Arsenic	Arsenic-Dissolved	NA	BTEX	NA	Frac TPH (1006)*
21005140160	SB-3-MW-SD(1)	5/12/10	Sulfate	Alkalinity	TDS	Chloride	8 ICP Metals	8 ICP Metals-Dissolved	Arsenic	Arsenic-Dissolved	NA	BTEX	NA	Frac TPH (1006)*
21005142601	MW-4D	5/12/10	Sulfate	Alkalinity	TDS	Chloride	8 ICP Metals	8 ICP Metals-Dissolved	Arsenic	Arsenic-Dissolved	NA	BTEX	NA	Frac TPH (1006)*

TABLE 1
SAMPLE SUMMARY
(GROUNDWATER)

LABORATORY ID	FIELD ID	SAMPLE DATE	TESTS PERFORMED											
21005142601MS	MW-4D	5/12/10	Sulfate	NA	NA	NA	8 ICP Metals	8 ICP Metals-Dissolved	NA	NA	NA	NA	NA	NA
21005142601DUP	MW-4D	5/12/10	NA	NA	TDS	NA	8 ICP Metals	8 ICP Metals-Dissolved	NA	NA	NA	NA	NA	NA
21005142602	MW-5D	5/12/10	Sulfate	Alkalinity	TDS	Chloride	8 ICP Metals	8 ICP Metals-Dissolved	Arsenic	Arsenic-Dissolved	NA	BTEX	NA	Frac TPH (1006)*
21005142603	MW-6D	5/12/10	Sulfate	Alkalinity	TDS	Chloride	8 ICP Metals	8 ICP Metals-Dissolved	Arsenic	Arsenic-Dissolved	NA	BTEX	NA	Frac TPH (1006)*
21005142604	MW-6S	5/12/10	Sulfate	Alkalinity	TDS	Chloride	8 ICP Metals	8 ICP Metals-Dissolved	Arsenic	Arsenic-Dissolved	NA	BTEX	NA	Frac TPH (1006)*
21005142604MS	MW-6S	5/12/10	NA	NA	NA	NA	NA	NA	Arsenic	Arsenic-Dissolved	NA	NA	NA	NA
21005142604DUP	MW-6S	5/12/10	NA	NA	NA	NA	NA	NA	Arsenic	Arsenic-Dissolved	NA	NA	NA	NA
21005142605	MW-1C (97-100)	5/13/10	Sulfate	Alkalinity	TDS	Chloride	8 ICP Metals	8 ICP Metals-Dissolved	Arsenic	Arsenic-Dissolved	NA	NA	NA	NA
21005266603	MPA-WW-1	5/25/10	Sulfate	Alkalinity	TDS	Chloride	8 ICP Metals	NA	Arsenic	NA	NA	BTEX	NA	Frac TPH (1006)
21005266603MS	MPA-WW-1	5/25/10	NA	NA	NA	NA	8 ICP Metals	NA	NA	NA	NA	BTEX	NA	NA
21005266603DUP	MPA-WW-1	5/25/10	NA	Alkalinity	TDS	NA	8 ICP Metals	NA	NA	NA	NA	NA	NA	NA
21005266603MSD	MPA-WW-1	5/25/10	NA	NA	NA	NA	NA	NA	NA	NA	NA	BTEX	NA	NA
21005266604	TRIP BLANK		NA	NA	NA	NA	NA	NA	NA	NA	NA	BTEX	NA	Frac TPH (1006)

*Supporting raw data reviewed for this sample
NA - Not analyzed
7 ICP Metals - Ba,Cd,Cr,Pb,Se,Sr,Zn
8 ICP Metals - Ba,Ca,Fe,Mg,Mn,K,Na,Se

(1) Field duplicate of SB-3-MW-S (21005140159)

TABLE 2
QUALIFIED SAMPLE RESULTS

LAB ID	FIELD ID	SAMPLE DATE	SAMPLE MATRIX	ANALYTE(S)	LABORATORY RESULT	DVQ	QC OUTCOME
21005112801	SW-05	5/5/10	WATER	all PAHs	0.000101 U mg/L	UJ	low base-neutral SU recovery (59%); low base-neutral SU recovery (49%)
21005112802	SW-03	5/5/10	WATER	all PAHs	0.000104 U mg/L	UJ	low base-neutral SU recovery (55%); low base-neutral SU recovery (42%)
21005112804	SW-04	5/5/10	WATER	all PAHs	0.000103 U mg/L	UJ	low base-neutral SU recovery (55%); low base-neutral SU recovery (42%)
21005112808	SW-10	5/6/10	WATER	all PAHs	0.000102 U mg/L	UJ	low base-neutral SU recovery (59%); low base-neutral SU recovery (44%)
21005242801	SW-BK-11	5/19/10	WATER	2-Methylnaphthalene	0.000105 U mg/L	UJ	low LCS recovery (51%), passing LCSD recovery (62%)
21005242801	SW-BK-11	5/19/10	WATER	Anthracene	0.000105 U mg/L	UJ	low MS recovery (59%), low MSD recovery (56%)
21005242801	SW-BK-11	5/19/10	WATER	Benzo(k)fluoranthene	0.000105 U mg/L	UJ	low MS recovery (58%), passing MSD recovery (60%)
21005242801	SW-BK-11	5/19/10	WATER	Naphthalene	0.000105 U mg/L	UJ	low LCS recovery (54%), low LCSD recovery (48%); low MS recovery (52%), low MSD recovery (54%)
21005242804	SW-BK-10	5/19/10	WATER	2-Methylnaphthalene	0.000102 U mg/L	UJ	low LCS recovery (51%), passing LCSD recovery (62%)
21005242804	SW-BK-10	5/19/10	WATER	Anthracene	0.000102 U mg/L	UJ	low MS recovery (59%), low MSD recovery (56%)
21005242804	SW-BK-10	5/19/10	WATER	Benzo(k)fluoranthene	0.000102 U mg/L	UJ	low MS recovery (58%), passing MSD recovery (60%)
21005242804	SW-BK-10	5/19/10	WATER	Naphthalene	0.000102 U mg/L	UJ	low LCS recovery (54%), low LCSD recovery (48%); low MS recovery (52%), low MSD recovery (54%)
21003082601	SED-1 (0-2)	2/25/10	SOLID	Barium	81.2 mg/kg	J	low MS recovery (66%)
21003082602	SED-1 (2-4)	2/25/10	SOLID	Barium	24.1 mg/kg	J	low MS recovery (66%)
21003082603	SED-1 (4-6)	2/25/10	SOLID	Barium	31.1 mg/kg	J	low MS recovery (66%)
21003082604	SED-2 (0-2)	2/25/10	SOLID	Barium	76.8 mg/kg	J	low MS recovery (66%)
21003082605	SED-2 (2-4)	2/25/10	SOLID	Barium	27.9 mg/kg	J	low MS recovery (66%)
21003082606	SED-2 (4-6)	2/25/10	SOLID	Barium	40.9 mg/kg	J	low MS recovery (66%)
21003082607	SED-3 (0-2)	2/25/10	SOLID	Barium	48.2 mg/kg	J	low MS recovery (66%)
21003082608	SED-3 (2-4)	2/25/10	SOLID	Barium	23.1 mg/kg	J	low MS recovery (66%)
21003082609	SED-3 (4-6)	2/25/10	SOLID	Barium	41.2 mg/kg	J	low MS recovery (66%)
21003082610	SED-4 (0-2)	2/25/10	SOLID	Barium	203 mg/kg	J	low MS recovery (66%)
21003082611	SED-5 (0-2)	2/25/10	SOLID	Barium	61.4 mg/kg	J	low MS recovery (66%)
21003082612	SED-6 (0-2)	2/25/10	SOLID	Barium	111 mg/kg	J	low MS recovery (66%)
21003082613	SED-7 (0-2)	2/25/10	SOLID	Barium	228 mg/kg	J	low MS recovery (66%)
21003082614	SED-7 (2-4)	2/25/10	SOLID	Barium	497 mg/kg	J	low MS recovery (66%)
21003082615	SED-7 (4-6)	2/25/10	SOLID	Barium	250 mg/kg	J	low MS recovery (66%)
21003082616	SED-8 (0-2)	2/25/10	SOLID	Barium	238 mg/kg	J	low MS recovery (66%)
21003082617	SED-8 (2-4)	2/25/10	SOLID	Barium	267 mg/kg	J	low MS recovery (66%)

TABLE 2

QUALIFIED SAMPLE RESULTS

LAB ID	FIELD ID	SAMPLE DATE	SAMPLE MATRIX	ANALYTE	LABORATORY RESULT	DVQ	QC OUTCOME
21003082618	SED-9 (0-2)	2/25/10	SOLID	Barium	161 mg/kg	J	low MS recovery (66%)
21003082619	SED-9 (2-4)	2/25/10	SOLID	Barium	224 mg/kg	J	low MS recovery (66%)
21003082620	SED-10 (0-2)	2/25/10	SOLID	Barium	264 mg/kg	J	low MS recovery (66%)
21005112701	SB-1-MW-S	5/7/10	WATER	Barium	5.02 mg/L	J	dissolved conc > total conc and difference > 2xRDL
21005112701	SB-1-MW-S	5/7/10	WATER	Calcium	520 mg/L	J	dissolved conc > total conc and difference > 2xRDL
21005112701	SB-1-MW-S	5/7/10	WATER	Magnesium	201 mg/L	J	dissolved conc > total conc and difference > 2xRDL
21005112701	SB-1-MW-S	5/7/10	WATER	Manganese	2.96 mg/L	J	dissolved conc > total conc and difference > 2xRDL
21005112701	SB-1-MW-S	5/7/10	WATER	Sodium	1710 mg/L	J	dissolved conc > total conc and difference > 2xRDL
21005112801	SW-05	5/5/10	WATER	Potassium	33.1 mg/L	J	high MS recovery (133%)
21005112802	SW-03	5/5/10	WATER	Potassium	32.7 mg/L	J	high MS recovery (133%)
21005112803	SW-02	5/5/10	WATER	Potassium	33.3 mg/L	J	high MS recovery (133%)
21005112804	SW-04	5/5/10	WATER	Potassium	34.4 mg/L	J	high MS recovery (133%)
21005112805	SW-01	5/6/10	WATER	Potassium	29.2 mg/L	J	high MS recovery (133%)
21005112806	SW-06	5/6/10	WATER	Potassium	38.6 mg/L	J	high MS recovery (133%)
21005112807	SW-07	5/6/10	WATER	Potassium	40.7 mg/L	J	high MS recovery (133%)
21005140201	SED-BK-06	5/10/10	SOLID	Barium	229 mg/kg	J	high MS recovery (134%)
21005140202	SED-BK-01	5/10/10	SOLID	Barium	49 mg/kg	J	high MS recovery (134%)
21005140203	SED-BK-02	5/10/10	SOLID	Barium	96.8 mg/kg	J	high MS recovery (134%)
21005140204	SED-BK-03	5/10/10	SOLID	Barium	100 mg/kg	J	high MS recovery (134%)
21005140205	SED-BK-04	5/10/10	SOLID	Barium	212 mg/kg	J	high MS recovery (134%)
21005140206	SED-BK-05	5/11/10	SOLID	Barium	126 mg/kg	J	high MS recovery (134%)
21005140207	SED-BK-09	5/11/10	SOLID	Barium	63.8 mg/kg	J	high MS recovery (134%)
21005140208	SED-BK-07	5/11/10	SOLID	Barium	106 mg/kg	J	high MS recovery (134%)
21005140209	SED-BK-08	5/11/10	SOLID	Barium	92.6 mg/kg	J	high MS recovery (134%)
21005142602	MW-5D	5/12/10	WATER	Sodium	442 mg/L	J	dissolved conc > total conc and difference > 2xRDL
21005242807	SED-BK-11	5/19/10	SOLID	Zinc	18 mg/kg	J	low MS recovery (0%); lab DUP precision of 91 RPD
21005242808	SED-BK-10	5/19/10	SOLID	Zinc	51.4 mg/kg	J	low MS recovery (0%); lab DUP precision of 91 RPD
21005112701	SB-1-MW-S	5/7/10	WATER	Barium	5.61 mg/L	J	dissolved conc > total conc and difference > 2xRDL
21005112701	SB-1-MW-S	5/7/10	WATER	Calcium	568 mg/L	J	dissolved conc > total conc and difference > 2xRDL
21005112701	SB-1-MW-S	5/7/10	WATER	Magnesium	220 mg/L	J	dissolved conc > total conc and difference > 2xRDL
21005112701	SB-1-MW-S	5/7/10	WATER	Manganese	3.12 mg/L	J	dissolved conc > total conc and difference > 2xRDL

TABLE 2
QUALIFIED SAMPLE RESULTS

LAB ID	FIELD ID	SAMPLE DATE	SAMPLE MATRIX	ANALYTE	LABORATORY RESULT	DVQ	QC OUTCOME
21005112701	SB-1-MW-S	5/7/10	WATER	Sodium	1840 mg/L	J	dissolved conc > total conc and difference > 2xRDL
21005142602	MW-5D	5/12/10	WATER	Sodium	454 mg/L	J	dissolved conc > total conc and difference > 2xRDL
21003085001	MW-1	3/5/10	WATER	Arsenic	0.01 U mg/L	UJ	low MS recovery (66%)
21003085002	MW-2R	3/5/10	WATER	Arsenic	0.019 mg/L	J	low MS recovery (66%)
21003085003	MW-3R	3/5/10	WATER	Arsenic	0.01 U mg/L	UJ	low MS recovery (66%)
21003085004	MW-50	3/5/10	WATER	Arsenic	0.01 U mg/L	UJ	low MS recovery (66%)
21003082621	SED-10 (2-4)	2/25/10	SOLID	Mercury	0.025 mg/kg	J	laboratory DUP difference = 1.7xRDL
21003082622	SED-11 (0-2)	2/25/10	SOLID	Mercury	0.029 mg/kg	J	laboratory DUP difference = 1.7xRDL
21003082623	SED-11 (2-4)	2/25/10	SOLID	Mercury	0.033 mg/kg	J	laboratory DUP difference = 1.7xRDL
21003082624	SED-12 (0-2)	2/25/10	SOLID	Mercury	0.023 mg/kg	J	laboratory DUP difference = 1.7xRDL
21003082625	SED-12 (2-4)	2/25/10	SOLID	Mercury	0.031 mg/kg	J	laboratory DUP difference = 1.7xRDL
21003082626	SED-12 (4-6)	2/25/10	SOLID	Mercury	0.028 mg/kg	J	laboratory DUP difference = 1.7xRDL
21003082627	SED-13 (0-2)	2/26/10	SOLID	Mercury	0.018 mg/kg	J	laboratory DUP difference = 1.7xRDL
21003082628	SED-13 (2-4)	2/26/10	SOLID	Mercury	0.015 mg/kg	J	laboratory DUP difference = 1.7xRDL
21003082629	SED-14 (0-2)	2/26/10	SOLID	Mercury	0.019 mg/kg	J	laboratory DUP difference = 1.7xRDL
21003082630	SED-14 (2-4)	2/26/10	SOLID	Mercury	0.025 mg/kg	J	laboratory DUP difference = 1.7xRDL
21003082631	SED-15 (0-2)	2/26/10	SOLID	Mercury	0.28 mg/kg	J	laboratory DUP difference = 1.7xRDL
21003082632	SED-15 (2-4)	2/26/10	SOLID	Mercury	0.15 mg/kg	J	laboratory DUP difference = 1.7xRDL
21003082633	SED-16 (0-2)	2/26/10	SOLID	Mercury	0.016 mg/kg	J	laboratory DUP difference = 1.7xRDL
21003082634	SED-17 (0-2)	2/26/10	SOLID	Mercury	0.02 mg/kg	J	laboratory DUP difference = 1.7xRDL
21003082635	SED-17 (2-4)	2/26/10	SOLID	Mercury	0.033 mg/kg	J	laboratory DUP difference = 1.7xRDL
21003082636	SED-18 (0-2)	2/26/10	SOLID	Mercury	0.03 mg/kg	J	laboratory DUP difference = 1.7xRDL
21003082637	SED-18 (2-4)	2/26/10	SOLID	Mercury	0.034 mg/kg	J	laboratory DUP difference = 1.7xRDL
21003082638	SED-19 (0-2)	2/26/10	SOLID	Mercury	0.074 mg/kg	J	laboratory DUP difference = 1.7xRDL
21003082639	SED-19 (2-4)	2/26/10	SOLID	Mercury	0.054 mg/kg	J	laboratory DUP difference = 1.7xRDL
21003082640	SS-08 (0-2)	2/26/10	SOLID	Mercury	0.59 mg/kg	J	laboratory DUP difference = 1.7xRDL
21003082621	SED-10 (2-4)	2/25/10	SOLID	>C10-C28	42.8 J mg/kg	J	high SU recovery (131%); result is between MDL and RDL
21003082621	SED-10 (2-4)	2/25/10	SOLID	>C28-C35	4.91 J mg/kg	J	high SU recovery (131%); result is between MDL and RDL
21003082623	SED-11 (2-4)	2/25/10	SOLID	>C10-C28	57.4 mg/kg	J	high SU recovery (147%)
21003082642	SS-10 (0-2)	2/26/10	SOLID	>C10-C28	140 mg/kg	J	Total TPH by 1006 not within 60-140% of Total TPH by 1005 (57%)

TABLE 2

QUALIFIED SAMPLE RESULTS

LAB ID	FIELD ID	SAMPLE DATE	SAMPLE MATRIX	ANALYTE	LABORATORY RESULT	DVQ	QC OUTCOME
21003082642	SS-10 (0-2)	2/26/10	SOLID	>C28-C35	9.23 J mg/kg	J	Total TPH by 1006 not within 60-140% of Total TPH by 1005 (57%); result is between MDL and RDL
21003082653	SED-26 (2-4)	3/2/10	SOLID	>C10-C28	299 mg/kg	J	Total TPH by 1006 not within 60-140% of Total TPH by 1005 (50%)
21003082653	SED-26 (2-4)	3/2/10	SOLID	>C28-C35	57.9 mg/kg	J	Total TPH by 1006 not within 60-140% of Total TPH by 1005 (50%)
21003082658	SED-29 (0-2)	3/2/10	SOLID	>C10-C28	1030 mg/kg	J	Total TPH by 1006 not within 60-140% of Total TPH by 1005 (58%)
21003082658	SED-29 (0-2)	3/2/10	SOLID	>C28-C35	287 mg/kg	J	Total TPH by 1006 not within 60-140% of Total TPH by 1005 (58%)
21003082642	SS-10 (0-2)	2/26/10	SOLID	Aliphatic >C10-C12	15 U mg/kg	UJ	Total TPH by 1006 not within 60-140% of Total TPH by 1005 (57%)
21003082642	SS-10 (0-2)	2/26/10	SOLID	Aliphatic >C12-C16	24.3 mg/kg	J	Total TPH by 1006 not within 60-140% of Total TPH by 1005 (57%)
21003082642	SS-10 (0-2)	2/26/10	SOLID	Aliphatic >C16-C35	61.2 mg/kg	J	Total TPH by 1006 not within 60-140% of Total TPH by 1005 (57%)
21003082642	SS-10 (0-2)	2/26/10	SOLID	Aromatic >C10-C12	10 U mg/kg	UJ	Total TPH by 1006 not within 60-140% of Total TPH by 1005 (57%)
21003082642	SS-10 (0-2)	2/26/10	SOLID	Aromatic >C12-C16	15 U mg/kg	UJ	Total TPH by 1006 not within 60-140% of Total TPH by 1005 (57%)
21003082642	SS-10 (0-2)	2/26/10	SOLID	Aromatic >C16-C21	15 U mg/kg	UJ	Total TPH by 1006 not within 60-140% of Total TPH by 1005 (57%)
21003082642	SS-10 (0-2)	2/26/10	SOLID	Aromatic >C21-C35	15 U mg/kg	UJ	Total TPH by 1006 not within 60-140% of Total TPH by 1005 (57%)
21003082653	SED-26 (2-4)	3/2/10	SOLID	Aliphatic >C10-C12	15 U mg/kg	UJ	Total TPH by 1006 not within 60-140% of Total TPH by 1005 (50%)
21003082653	SED-26 (2-4)	3/2/10	SOLID	Aliphatic >C12-C16	34.5 mg/kg	J	Total TPH by 1006 not within 60-140% of Total TPH by 1005 (50%)
21003082653	SED-26 (2-4)	3/2/10	SOLID	Aliphatic >C16-C35	111 mg/kg	J	Total TPH by 1006 not within 60-140% of Total TPH by 1005 (50%)
21003082653	SED-26 (2-4)	3/2/10	SOLID	Aromatic >C10-C12	10 U mg/kg	UJ	Total TPH by 1006 not within 60-140% of Total TPH by 1005 (50%)
21003082653	SED-26 (2-4)	3/2/10	SOLID	Aromatic >C12-C16	8.16 J mg/kg	J	Total TPH by 1006 not within 60-140% of Total TPH by 1005 (50%); result is between MDL and RDL
21003082653	SED-26 (2-4)	3/2/10	SOLID	Aromatic >C16-C21	15.5 mg/kg	J	Total TPH by 1006 not within 60-140% of Total TPH by 1005 (50%)
21003082653	SED-26 (2-4)	3/2/10	SOLID	Aromatic >C21-C35	7.72 J mg/kg	J	Total TPH by 1006 not within 60-140% of Total TPH by 1005 (50%); result is between MDL and RDL
21003082658	SED-29 (0-2)	3/2/10	SOLID	Aliphatic >C10-C12	15 U mg/kg	UJ	Total TPH by 1006 not within 60-140% of Total TPH by 1005 (58%)
21003082658	SED-29 (0-2)	3/2/10	SOLID	Aliphatic >C12-C16	53.6 mg/kg	J	Total TPH by 1006 not within 60-140% of Total TPH by 1005 (58%)
21003082658	SED-29 (0-2)	3/2/10	SOLID	Aliphatic >C16-C35	469 mg/kg	J	Total TPH by 1006 not within 60-140% of Total TPH by 1005 (58%)
21003082658	SED-29 (0-2)	3/2/10	SOLID	Aromatic >C10-C12	10 U mg/kg	UJ	Total TPH by 1006 not within 60-140% of Total TPH by 1005 (58%)
21003082658	SED-29 (0-2)	3/2/10	SOLID	Aromatic >C12-C16	15 U mg/kg	UJ	Total TPH by 1006 not within 60-140% of Total TPH by 1005 (58%)
21003082658	SED-29 (0-2)	3/2/10	SOLID	Aromatic >C16-C21	60.4 mg/kg	J	Total TPH by 1006 not within 60-140% of Total TPH by 1005 (58%)
21003082658	SED-29 (0-2)	3/2/10	SOLID	Aromatic >C21-C35	183 mg/kg	J	Total TPH by 1006 not within 60-140% of Total TPH by 1005 (58%)
21005112702	SB-1-MW-D	5/6/10	WATER	all Aliphatic and Aromatic C-ranges	0.15 U mg/L	UJ	low SU recovery (56%)

TABLE 3

DATA VALIDATION QUALIFIERS (DVQs)

The DVQ replaces all flags applied by the laboratory.

U = Blank affected. The analyte was not detected substantially above the level reported in an associated laboratory and/or field blanks.

UJ = Estimated. The analyte was not detected above the reporting limit; however, the reporting limit is approximate due to exceedance of one or more QC requirements.

J = Estimated. The reported sample concentration is approximate due to exceedance of one or more QC requirements. Directional bias cannot be determined

NS = Not selected. More than one result is reported for this analyte and another result is selected for use based on QC and the reported concentration.

R = Rejected. The sample result is rejected due to serious QC deficiencies that make it impossible to verify the presence or absence of the analyte.

NOTE: For multiple deficiencies the validator applied the most severe flag. (R > U > UJ/J)

TABLE 4
METHOD SUMMARY

Test	Preparation	Analysis	Reporting
SOLIDS			
Arsenic	SW-846 3050B (acid digestion)	SW-846 7010 (Graphite furnace atomic absorption)	RDL of 0.12 mg/kg on wet-weight for 'Normal' samples and dry-weight (measured by drying sample and then digesting) for 'Dry' samples adjusted up to 5x for sample dilution; values between MDL and RDL reported with a J flag
Chloride	NA	EPA 9251 (Automated ferricyanide method)	RDL of 10 mg/kg on wet-weight adjusted up to 10x for sample dilution; values between MDL and RDL reported with a J flag
Fractionated Total Petroleum Hydrocarbons (Frac TPH)	TNRCC 1006/LA 1006 (solid phase silica column separation of TNRCC 1005 n-pentane extract)	TNRCC 1006/LA 1006 (GC-FID, quantitation with 6-point curve using gaoline/diesel fuel#2 standards and carbon markers, forced baseline projection)	3 Aliphatic/4 aromatic target C-ranges covering >C10-C35; RDL of 10-15 mg/kg on wet-weight adjusted up to 50x for sample dilution; values between MDL and RDL reported with a J flag
ICP Metals	SW-846 3050B (acid digestion)	SW-846 6010B (ICP-AES with background correction)	RDL of 0.2-1.6 mg/kg on wet-weight adjusted for sample aliquot size and up to 2-5x for dilution (barium only); values between MDL and RDL reported with a J flag
Mercury	SW-846 7471B (acid digestion and addition of potassium permanganate)	SW-846 7471B (Cold-vapor atomic absorption)	RDL of 0.01 mg/kg on wet-weight adjusted for sample aliquot size and up to 20x for dilution ; values between MDL and RDL reported with a J flag
Polynuclear Aromatic Hydrocarbons (PAH)	SW-846 3550B (ultrasonic solvent extraction and concentration)	SW-846 8270C (GC-MS, quantitation with minimum 5-point curve, internal standardization)	16 Target analytes; RDL of 0.33 mg/kg on wet-weight adjusted for sample aliquot size; values between MDL and RDL reported with a J flag
Polychlorinated Biphenyls (PCB)	SW-846 3550B (ultrasonic solvent extraction and concentration)	SW-846 8082 (GC-ECD with second column confirmation, quantitation with mininum 5-point curve)	7 Target analytes; RDL of 0.04 mg/kg on wet-weight adjusted for sample aliquot size and up to 5x for dilution ; values between MDL and RDL reported with a J flag
SPLP ICP Metals	SW-846 1312/3010A (Synthetic Precipitation Leaching Procedure, acid digestion)	SW-846 6010B (ICP-AES with background correction)	RDL of 0.003-0.01 mg/L; values between MDL and RDL reported with a J flag
SPLP Mercury	SW-846 1312/7470A (Synthetic Precipitation Leaching Procedure, acid digestion and addition of potassium permanganate)	SW-846 7470A (Cold-vapor atomic absorption)	RDL of 0.0002 mg/L; values between MDL and RDL reported with a J flag
Total Organic Carbon (TOC)	NA	EPA 9060 (Carbonaceous analyzer)	RDL of 200 mg/kg; values between MDL and RDL reported with a J flag
Total Petroleum Hydrocarbons (TPH)	TNRCC 1005/LA 1005 (n-pentane extraction with no solvent concentration or cleanup)	TNRCC 1005/LA 1005 (GC-FID, quantitation with 6-point curve using gaoline/diesel fuel#2 standards and carbon markers, forced baseline projection)	2 Target C-ranges covering >C10-C35; RDL of 50 mg/kg on wet-weight adjusted up to 100x for sample dilution; values between MDL and RDL reported with a J flag

Test	Preparation	Analysis	Reporting
WATERS			
Arsenic (Total and Diss)	SW-846 3020A (field-filtration and preservation, acid digestion)	SW-846 7010 (Graphite furnace atomic absorption)	RDL of 0.01 mg/L; values between MDL and RDL reported with a J flag
Bicarbonate/ Carbonate Alkalinity	NA	SM 2320 B (Titration method)	2 Target analytes; RDL of 1 mg/L CaCO3; values between MDL and RDL reported with a J flag
Bromide	NA	SW-846 9056/EPA 300.0 (Ion chromatography)	RDL of 0.2 mg/L adjusted up to 100x for sample dilution; values between MDL and RDL reported with a J flag
Benzene, Toluene, Ethylbenzene, Xylene (BTEX)	SW-846 5030B (ambient purge and trap of preserved sample)	SW-846 8260B (GC-MS, quantitation with minimum 5-point curve, internal standardization)	4 Target analytes; RDL of 0.005-0.1 mg/L; values between MDL and RDL reported with a J flag
Chloride	NA	SM 4500 CL E (Automated ferricyanide method)	RDL of 1 mg/L adjusted up to 200x for sample dilution; values between MDL and RDL reported with a J flag
Fractionated Total Petroleum Hydrocarbons (Frac TPH)	TNRCC 1006/LA 1006 (solid phase silica column separation of TNRCC 1005 n-pentane extract)	TNRCC 1006/LA 1006 (GC-FID, quantitation with 6-point curve using gaoline/diesel fuel#2 standards and carbon markers, forced baseline projection)	5 Aliphatic/5 aromatic target C-ranges covering C6-C35; RDL of 0.15 mg/L; values between MDL and RDL reported with a J flag
Hardness	NA	SM 2340 B (Calculation from Ca and Mg)	3 Target analytes; RDL of 0.1-0.33 mg/L; values between MDL and RDL reported with a J flag
ICP Metals (Total and Diss)	SW-846 3010A (field-filtration and preservation, acid digestion)	SW-846 6010B (ICP-AES with background correction)	RDL of 0.0027-1 mg/L adjusted up to 5x for sample dilution (sodium and strontium only); values between MDL and RDL reported with a J flag
Mercury (Total and Diss)	SW-846 7470A (field-filtration and preservation, acid digestion and addition of potassium permanganate)	SW-846 7470A (Cold-vapor atomic absorption)	RDL of 0.0002 mg/L; values between MDL and RDL reported with a J flag
Polynuclear Aromatic Hydrocarbons (PAH)	SW-846 3510C (separatory funnel liquid-liquid solvent extraction and concentration)	SW-846 8270C SIM (GC-MS Single Ion Monitoring, quantitation with minimum 5-point curve, internal standardization)	16 Target analytes; RDL of 0.0001 mg/L adjusted for sample aliquot size; values between MDL and RDL reported with a J flag
Salinity	NA	SM 2520 B (Electroconductivity method)	RDL of 2 ppt
Sulfate	NA	EPA 375.4 (Turbidimetric)	RDL of 5 mg/L adjusted up to 10x for sample dilution; values between MDL and RDL reported with a J flag
Total Diss Solids (TDS)	NA	SM 2540 C (Dried at 180 C)	RDL of 10 mg/L

Test	Preparation	Analysis	Reporting
Total Petroleum Hydrocarbons (TPH)	TNRCC 1005/LA 1005 (n-pentane extraction with no solvent concentration or cleanup)	TNRCC 1005/LA 1005 (GC-FID, quantitation with 6-point curve using gaoline/diesel fuel#2 standards and carbon markers, forced baseline projection)	3 Target C-ranges covering C6-C35; RDL of 0.15 mg/L; values between MDL and RDL reported with a J flag

EPA (Methods for Chemical Analysis of Water and Wastes)
SM (Standards Methods for the Examination of Water and Wastewater)
SW-846 (Test Methods for Evaluating Solid Waste, Physical/Chemical Methods)
TNRCC (Texas Natural Resource Conservation Commission)

Note: The laboratory diluted samples due to target analyte concentrations or sample matrix. Non-detects are reported from an undiluted analysis for all samples except two PCB samples (SED-6 (0-2) and SED-8 (0-2)).

TABLE 5
QC CHECK RESULTS

FIELD ID	LAB ID	METHOD	ANALYTE	PREP BATCH	QC BATCH	PREP DATE	ANALY DATE	MATRIX	QC COMMENT	DVQ APPLIED
LCS/LCSD ACCURACY										
LCS/LCSD		8270	2-Methylnaphthalene	432705	432841	5/26/10	5/27/10	WATER	low LCS recovery (51%), passing LCSD recovery (62%)	J/UJ to detects/NDs
LCS/LCSD		8270	Anthracene	432705	432841	5/26/10	5/27/10	WATER	passing LCS recovery (78%), low LCSD recovery (59%)	none (passing average LCS/LCSD recovery)
LCS/LCSD		8270	Naphthalene	432705	432841	5/26/10	5/27/10	WATER	low LCS recovery (54%), low LCSD recovery (48%)	J/UJ to NDs/detects
MS/MSD ACCURACY										
SW-BK-10	MS/MSD	8270	2-Methylnaphthalene	432705	432841	5/26/10	5/27/10	WATER	passing MS recovery (63%), low MSD recovery (57%)	none (passing average MS/MSD recovery)
SW-BK-10	MS/MSD	8270	Acenaphthene	432705	432841	5/26/10	5/27/10	WATER	passing MS recovery (72%), low MSD recovery (55%)	none (passing average MS/MSD recovery)
SW-BK-10	MS/MSD	8270	Anthracene	432705	432841	5/26/10	5/27/10	WATER	low MS recovery (59%), low MSD recovery (56%)	J/UJ to NDs/detects
SW-BK-10	MS/MSD	8270	Benzo(k) fluoranthene	432705	432841	5/26/10	5/27/10	WATER	low MS recovery (58%), passing MSD recovery (60%)	J/UJ to NDs/detects
SW-BK-10	MS/MSD	8270	Naphthalene	432705	432841	5/26/10	5/27/10	WATER	low MS recovery (52%), low MSD recovery (54%)	J/UJ to NDs/detects
SED-2 (0-2)	MS	SW-846 6010B	Barium	427500	427548	3/8/10	3/9/10	SOLID	low MS recovery (66%)	J / UJ to detects/NDs
SED-BK-01	MS	SW-846 6010B	Barium	431644	432227	5/14/10	5/20/10	SOLID	high MS recovery (134%)	J to detects
SED-BK-10	MS	SW-846 6010B	Zinc	432560	433334	5/25/10	6/2/10	SOLID	low MS recovery (0%)	J/UJ to detects/NDs (DUP shows significant heterogeneity)
SW-06	MS	SW-846 6010B	Potassium	431357	431478	5/11/10	5/12/10	WATER	high MS recovery (133%)	J to detects
MW-1	MS	SW-846 7010	Arsenic	427514	427603	3/9/10	3/10/10	WATER	low MS recovery (66%)	J / UJ to detects/NDs

TABLE 5

QC CHECK RESULTS

FIELD ID	LAB ID	METHOD	ANALYTE	PREP BATCH	QC BATCH	PREP DATE	ANALY DATE	MATRIX	QC COMMENT	DVQ APPLIED
SURROGATE RECOVERY										
SED-19	21005112908	8270	Nitrobenzene-d5	431363	431544	5/12/10	5/13/10	SOLID	low base-neutral SU recovery (59%)	none (only one of multiple surrogates is outside limits)
SED-BK-03	21005140204	8270	2-Fluorobiphenyl	431973	432243	5/19/10	5/20/10	SOLID	low base-neutral SU recovery (58%)	none (only one of multiple surrogates is outside limits)
SW-05	21005112801	8270	Nitrobenzene-d5	431369	431542	5/12/10	5/13/10	WATER	low base-neutral SU recovery (59%)	J / UJ to detects/NDs for base-neutral analytes (all PAHs)
SW-05	21005112801	8270	2-Fluorobiphenyl	431369	431542	5/12/10	5/13/10	WATER	low base-neutral SU recovery (49%)	J / UJ to detects/NDs for base-neutral analytes (all PAHs)
SW-03	21005112802	8270	Nitrobenzene-d5	431369	431542	5/12/10	5/13/10	WATER	low base-neutral SU recovery (55%)	J / UJ to detects/NDs for base-neutral analytes (all PAHs)
SW-03	21005112802	8270	2-Fluorobiphenyl	431369	431542	5/12/10	5/13/10	WATER	low base-neutral SU recovery (42%)	J / UJ to detects/NDs for base-neutral analytes (all PAHs)
SW-02	21005112803	8270	Nitrobenzene-d5	431369	431542	5/12/10	5/13/10	WATER	low base-neutral SU recovery (57%)	none (only one of multiple surrogates is outside limits)
SW-04	21005112804	8270	Nitrobenzene-d5	431369	431542	5/12/10	5/13/10	WATER	low base-neutral SU recovery (55%)	J / UJ to detects/NDs for base-neutral analytes (all PAHs)
SW-04	21005112804	8270	2-Fluorobiphenyl	431369	431542	5/12/10	5/13/10	WATER	low base-neutral SU recovery (42%)	J / UJ to detects/NDs for base-neutral analytes (all PAHs)
SW-01	21005112805	8270	2-Fluorobiphenyl	431369	431542	5/12/10	5/13/10	WATER	low base-neutral SU recovery (41%)	none (only one of multiple surrogates is outside limits)
SW-06	21005112806	8270	2-Fluorobiphenyl	431369	431542	5/12/10	5/13/10	WATER	low base-neutral SU recovery (52%)	none (only one of multiple surrogates is outside limits)
SW-07	21005112807	8270	2-Fluorobiphenyl	431369	431542	5/12/10	5/13/10	WATER	low base-neutral SU recovery (51%)	none (only one of multiple surrogates is outside limits)
SW-10	21005112808	8270	Nitrobenzene-d5	431369	431542	5/12/10	5/13/10	WATER	low base-neutral SU recovery (59%)	J / UJ to detects/NDs for base-neutral analytes (all PAHs)
SW-10	21005112808	8270	2-Fluorobiphenyl	431369	431542	5/12/10	5/13/10	WATER	low base-neutral SU recovery (44%)	J / UJ to detects/NDs for base-neutral analytes (all PAHs)

TABLE 5

QC CHECK RESULTS

FIELD ID	LAB ID	METHOD	ANALYTE	PREP BATCH	QC BATCH	PREP DATE	ANALY DATE	MATRIX	QC COMMENT	DVQ APPLIED
SW-109	21005112810	8270	2-Fluorobiphenyl	431474	431542	5/13/10	5/13/10	WATER	low base-neutral SU recovery (59%)	none (only one of multiple surrogates is outside limits)
SW BK-02	21005140211	8270	Nitrobenzene-d5	431881	432140	5/17/10	5/19/10	WATER	low base-neutral SU recovery (53%)	none (only one of multiple surrogates is outside limits)
SW BK-04	21005140213	8270	Nitrobenzene-d5	431881	432140	5/17/10	5/19/10	WATER	low base-neutral SU recovery (54%)	none (only one of multiple surrogates is outside limits)
SW BK-09	21005140218	8270	2-Fluorobiphenyl	431881	432140	5/17/10	5/19/10	WATER	low base-neutral SU recovery (59%)	none (only one of multiple surrogates is outside limits)
SW-BK-10 MS	21005242805	8270	Terphenyl-d14	432705	432841	5/26/10	5/27/10	WATER	low base-neutral SU recovery (58%)	none (only one of multiple surrogates is outside limits)
SW-BK-10 MSD	21005242806	8270	2-Fluorobiphenyl	432705	432841	5/26/10	5/27/10	WATER	low base-neutral SU recovery (54%)	none (only one of multiple surrogates is outside limits)
SED-10 (2-4)	21003082621	TNRCC 1005/LA 1005	o-Terphenyl	427527	427781	3/10/10	3/11/10	SOLID	high SU recovery (131%)	J to detects
SED-11 (2-4)	21003082623	TNRCC 1005/LA 1005	o-Terphenyl	427527	427781	3/10/10	3/11/10	SOLID	high SU recovery (147%)	J to detects
SED-12 (0-2)	21003082624	TNRCC 1005/LA 1005	o-Terphenyl	427527	427781	3/10/10	3/11/10	SOLID	high SU recovery (140%)	J to detects (none)
SED-15 (0-2)	21003082631	TNRCC 1005/LA 1005	o-Terphenyl	427527	427848	3/10/10	3/12/10	SOLID	none	SU diluted out
SED-15 (2-4)	21003082632	TNRCC 1005/LA 1005	o-Terphenyl	427527	427848	3/10/10	3/12/10	SOLID	none	SU diluted out
SED-28 (0-2)	21003082656	TNRCC 1005/LA 1005	o-Terphenyl	427810	428093	3/15/10	3/17010	SOLID	none	SU diluted out
MW-2R	21003085002	TNRCC 1005/LA 1005	o-Terphenyl	427931	428005	3/16/10	3/16/10	WATER	high SU recovery (132%)	J to detects (none)
MW-50	21003085004	TNRCC 1005/LA 1005	o-Terphenyl	427931	428005	3/16/10	3/16/10	WATER	high SU recovery (131%)	J to RRs (none)
SED-15 (0-2)	21003082631	TNRCC 1006/LA 1006	o-Terphenyl	428320	428686	3/23/10	3/26/10	SOLID	none	SU diluted out
SED-15 (2-4)	21003082632	TNRCC 1006/LA 1006	o-Terphenyl	428320	428686	3/23/10	3/26/10	SOLID	none	SU diluted out
SB-1-MW-D	21005112702	TNRCC 1006/LA 1006	o-Terphenyl	431974	432653	5/17/10	5/22/10	WATER	low SU recovery (56%)	J / UJ to detects/NDs

TABLE 5
QC CHECK RESULTS

FIELD ID	LAB ID	METHOD	ANALYTE	PREP BATCH	QC BATCH	PREP DATE	ANALY DATE	MATRIX	QC COMMENT	DVQ APPLIED
LCSD PRECISION										
LCSD		8270	Fluorene	431369	431542	5/12/10	5/13/10	WATER	LCS/LCSD precision of 34 RPD	J to detects (none)
LCSD		8270	2-Methylnaphthalene	432705	432841	5/26/10	5/27/10	WATER	LCS/LCSD precision of 21 RPD	J to detects (none)
LCSD		8270	Anthracene	432705	432841	5/26/10	5/27/10	WATER	LCS/LCSD precision of 27 RPD	J to detects (none)
LABORATORY DUPLICATE PRECISION										
SED-BK-10	DUP	SW-846 6010B	Zinc	432560	433334	5/25/10	6/2/10	SOLID	lab DUP precision of 91 RPD	J to detects
SED-10 (2-4)	DUP	SW-846 7471B	Mercury	427504	427539	3/9/10	3/9/10	SOLID	laboratory DUP difference = 1.7xRDL	J / UJ to detects/NDs
LABORATORY BLANKS										
Method Blank		EPA 9251	Chloride	428130	428132	3/17/10	3/19/10	SOLID	laboratory blank contamination (1.71 B mg/kg)	none (blank concentration <RDL)
Method Blank		EPA 9251	Chloride	432285	432286	5/19/10	5/20/10	SOLID	laboratory blank contamination (3.02 B mg/kg)	none (blank concentration <RDL)
Method Blank		EPA 9251	Chloride	432724	432725	5/24/10	5/25/10	SOLID	laboratory blank contamination (2.48 B mg/kg)	none (blank concentration <RDL)
Method Blank		SM 2340 B	Magnesium	431357	431478	5/11/10	5/12/10	WATER	laboratory blank contamination (0.029 B mg/L)	none (blank concentration <RDL)
Method Blank		SM 2340 B	Magnesium	431669	432180	5/14/10	5/23/10	WATER	laboratory blank contamination (0.026 B mg/L)	none (blank concentration <RDL)
Method Blank		SM 4500 CL E Chloride	Chloride	NA	432456		5/22/10	WATER	laboratory blank contamination (0.33 B mg/L)	none (blank concentration <RDL)
Method Blank		SM 4500 CL E Chloride	Chloride	NA	432688		5/25/10	WATER	laboratory blank contamination (0.26 B mg/L)	none (blank concentration <RDL)
Method Blank		SM 4500 CL E Chloride	Chloride	NA	432689		5/25/10	WATER	laboratory blank contamination (0.31 B mg/L)	none (blank concentration <RDL)

TABLE 5
QC CHECK RESULTS

FIELD ID	LAB ID	METHOD	ANALYTE	PREP BATCH	QC BATCH	PREP DATE	ANALY DATE	MATRIX	QC COMMENT	DVQ APPLIED
Method Blank		SM 4500 CL E Chloride	Chloride	NA	433005		5/28/10	WATER	laboratory blank contamination (0.31 B mg/L)	none (blank concentration <RDL)
Method Blank		SW-846 6010B	Barium	427501	427630	3/9/10	3/10/10	SOLID	laboratory blank contamination (0.053 B mg/kg)	none (blank concentration <RDL)
Method Blank		SW-846 6010B	Cadmium	427501	427630	3/9/10	3/10/10	SOLID	laboratory blank contamination (0.013 B mg/kg)	none (blank concentration <RDL)
Method Blank		SW-846 6010B	Chromium	427501	427630	3/9/10	3/10/10	SOLID	laboratory blank contamination (0.042 B mg/kg)	none (blank concentration <RDL)
Method Blank		SW-846 6010B	Barium	427512	427663	3/9/10	3/11/10	SOLID	laboratory blank contamination (0.025 B mg/kg)	none (blank concentration <RDL)
Method Blank		SW-846 6010B	Barium	431366	431454	5/11/10	5/12/10	SOLID	laboratory blank contamination (0.024 B mg/kg)	none (blank concentration <RDL)
Method Blank		SW-846 6010B	Cadmium	431366	431454	5/11/10	5/12/10	SOLID	laboratory blank contamination (0.019 B mg/kg)	none (blank concentration <RDL)
Method Blank		SW-846 6010B	Zinc	431366	431454	5/11/10	5/12/10	SOLID	laboratory blank contamination (0.16 B mg/kg)	none (blank concentration <RDL)
Method Blank		SW-846 6010B	Chromium	431644	432227	5/14/10	5/20/10	SOLID	laboratory blank contamination (0.029 B mg/kg)	none (blank concentration <RDL)
Method Blank		SW-846 6010B	Magnesium	431357	431478	5/11/10	5/12/10	WATER	laboratory blank contamination (0.029 B mg/L)	none (blank concentration <RDL)
Method Blank		SW-846 6010B	Potassium	431357	432074	5/11/10	5/18/10	WATER	laboratory blank contamination (0.095 B mg/L)	none (blank concentration <RDL)
Method Blank		SW-846 6010B	Sodium	431357	431478	5/11/10	5/12/10	WATER	laboratory blank contamination (0.75 B mg/L)	none (blank concentration <RDL)
Method Blank		SW-846 6010B	Potassium	431358	431478	5/11/10	5/12/10	WATER	laboratory blank contamination (0.068 B mg/L)	none (blank concentration <RDL)

TABLE 5
QC CHECK RESULTS

FIELD ID	LAB ID	METHOD	ANALYTE	PREP BATCH	QC BATCH	PREP DATE	ANALY DATE	MATRIX	QC COMMENT	DVQ APPLIED
Method Blank		SW-846 6010B	Sodium	431358	431564	5/11/10	5/13/10	WATER	laboratory blank contamination (0.50 B mg/L)	none (blank concentration <RDL)
Method Blank		SW-846 6010B	Magnesium	431669	432180	5/14/10	5/23/10	WATER	laboratory blank contamination (0.026 B mg/L)	none (blank concentration <RDL)
Method Blank		SW-846 6010B	Potassium	431669	432623	5/14/10	5/24/10	WATER	laboratory blank contamination (0.35 B mg/L)	none (blank concentration <RDL)
Method Blank		SW-846 6010B	Sodium	431669	432180	5/14/10	5/23/10	WATER	laboratory blank contamination (0.44 B mg/L)	none (blank concentration <RDL)
Method Blank		SW-846 6010B	Potassium	431670	432911	5/14/10	5/27/10	WATER	laboratory blank contamination (0.11 B mg/L)	none (blank concentration <RDL)
Method Blank		SW-846 6010B	Sodium	431670	432911	5/14/10	5/27/10	WATER	laboratory blank contamination (1.04 mg/L)	U to detects < 10 x BlankEquivConc (none)
Method Blank		SW-846 6010B	Barium	431818	432290	5/16/10	5/19/10	WATER	laboratory blank contamination (0.00043 B mg/L)	none (blank concentration <RDL)
Method Blank		SW-846 6010B	Calcium	431818	432290	5/16/10	5/19/10	WATER	laboratory blank contamination (0.063 B mg/L)	none (blank concentration <RDL)
Method Blank		SW-846 6010B	Potassium	431818	432290	5/16/10	5/19/10	WATER	laboratory blank contamination (0.15 B mg/L)	none (blank concentration <RDL)
Method Blank		SW-846 6010B	Manganese	432866	433375	5/28/10	6/2/10	WATER	laboratory blank contamination (0.00064 B mg/L)	none (blank concentration <RDL)
Method Blank		SW-846 6010B	Sodium	432866	433375	5/28/10	6/2/10	WATER	laboratory blank contamination (0.45 B mg/L)	none (blank concentration <RDL)
Method Blank		SW-846 6010B	Cadmium	432614	433089	5/24/10	5/29/10	WATER	laboratory blank contamination (0.00046 B mg/L)	none (blank concentration <RDL)
Method Blank		SW-846 6010B Dissolved	Cadmium	431356	431478	5/11/10	5/12/10	WATER	laboratory blank contamination (0.00025 B mg/L)	none (blank concentration <RDL)

TABLE 5
QC CHECK RESULTS

FIELD ID	LAB ID	METHOD	ANALYTE	PREP BATCH	QC BATCH	PREP DATE	ANALY DATE	MATRIX	QC COMMENT	DVQ APPLIED
Method Blank		SW-846 6010B Dissolved	Sodium	431356	431564	5/11/10	5/13/10	WATER	laboratory blank contamination (0.30 B mg/L)	none (blank concentration <RDL)
Method Blank		SW-846 6010B Dissolved	Magnesium	431819	432290	5/16/10	5/19/10	WATER	laboratory blank contamination (0.060 B mg/L)	none (blank concentration <RDL)
Method Blank		SW-846 6010B Dissolved	Manganese	431819	432290	5/16/10	5/19/10	WATER	laboratory blank contamination (0.00099 B mg/L)	none (blank concentration <RDL)
Method Blank		SW-846 6010B Dissolved	Barium	432575	433089	5/24/10	5/29/10	WATER	laboratory blank contamination (0.00031 B mg/L)	none (blank concentration <RDL)
Method Blank		SW-846 6010B Dissolved	Cadmium	432575	433089	5/24/10	5/29/10	WATER	laboratory blank contamination (0.00072 B mg/L)	none (blank concentration <RDL)
Method Blank		SW-846 7470A	Mercury	427516	427538	3/9/10	3/10/10	WATER	laboratory blank contamination (0.00006 B mg/L)	none (blank concentration <RDL)
Method Blank		SW-846 7470A	Mercury	431365	431459	5/11/10	5/12/10	WATER	laboratory blank contamination (0.00006 B mg/L)	none (blank concentration <RDL)
Method Blank		SW-846 7471B	Mercury	427504	427539	3/9/10	3/9/10	SOLID	laboratory blank contamination (0.0059 B mg/kg)	none (blank concentration <RDL)
Method Blank		SW-846 7471B	Mercury	431367	431453	5/11/10	5/12/10	SOLID	laboratory blank contamination (0.0077 B mg/kg)	none (blank concentration <RDL)
Method Blank		SW-846 7471B	Mercury	431666	431732	5/14/10	5/15/10	SOLID	laboratory blank contamination (0.0067 B mg/kg)	none (blank concentration <RDL)
RESULTS ASSESSMENT										
SB-1-MW-S	21005112701	SW-846 6010B	Barium		431478	5/11/10	5/12/10	WATER	dissolved conc > total conc and difference > 2xRDL	J to this detect
SB-1-MW-S	21005112701	SW-846 6010B Dissolved	Barium		431478	5/11/10	5/12/10	WATER	dissolved conc > total conc and difference > 2xRDL	J to this detect
SB-1-MW-S	21005112701	SW-846 6010B	Calcium		431478	5/11/10	5/12/10	WATER	dissolved conc > total conc and difference > 2xRDL	J to this detect

TABLE 5

QC CHECK RESULTS

FIELD ID	LAB ID	METHOD	ANALYTE	PREP BATCH	QC BATCH	PREP DATE	ANALY DATE	MATRI X	QC COMMENT	DVQ APPLIED
SB-1-MW-S	21005112701	SW-846 6010B Dissolved	Calcium		431478	5/11/10	5/12/10	WATER	dissolved conc > total conc and difference > 2xRDL	J to this detect
SB-1-MW-S	21005112701	SW-846 6010B	Magnesium		431478	5/11/10	5/12/10	WATER	dissolved conc > total conc and difference > 2xRDL	J to this detect
SB-1-MW-S	21005112701	SW-846 6010B Dissolved	Magnesium		431478	5/11/10	5/12/10	WATER	dissolved conc > total conc and difference > 2xRDL	J to this detect
SB-1-MW-S	21005112701	SW-846 6010B	Manganese		431478	5/11/10	5/12/10	WATER	dissolved conc > total conc and difference > 2xRDL	J to this detect
SB-1-MW-S	21005112701	SW-846 6010B Dissolved	Manganese		431478	5/11/10	5/12/10	WATER	dissolved conc > total conc and difference > 2xRDL	J to this detect
SB-1-MW-S	21005112701	SW-846 6010B	Sodium		431564	5/11/10	5/13/10	WATER	dissolved conc > total conc and difference > 2xRDL	J to this detect
SB-1-MW-S	21005112701	SW-846 6010B Dissolved	Sodium		431564	5/11/10	5/13/10	WATER	dissolved conc > total conc and difference > 2xRDL	J to this detect
MW-5D	21005142602	SW-846 6010B	Sodium		432290	5/16/10	5/19/10	WATER	dissolved conc > total conc and difference > 2xRDL	J to this detect
MW-5D	21005142602	SW-846 6010B Dissolved	Sodium		432290	5/16/10	5/19/10	WATER	dissolved conc > total conc and difference > 2xRDL	J to this detect
SS-10 (0-2)	21003082642	TNRCC 1006/LA 1006			428686	3/23/10	3/25/10	SOLID	Total TPH by 1006 not within 60-140% of Total TPH by 1005 (57%)	J/UJ to NDs/detects (1005&1006)
SED-26 (2-4)	21003082653	TNRCC 1006/LA 1006			428763	3/23/10	3/30/10	SOLID	Total TPH by 1006 not within 60-140% of Total TPH by 1005 (50%)	J/UJ to NDs/detects (1005&1006)
SED-29 (0-2)	21003082658	TNRCC 1006/LA 1006			428725	3/24/10	3/26/10	SOLID	Total TPH by 1006 not within 60-140% of Total TPH by 1005 (58%)	J/UJ to NDs/detects (1005&1006)

TABLE 6

FIELD DUPLICATE SUMMARY

ORIGINAL FIELD ID	DUPLICATE FIELD ID	SAMPLE DATE	SAMPLE MATRIX	ANALYTE	ORIGINAL RESULTS			DUPLICATE RESULTS			DIFFERENCE	RPD	2-3xRDL	PASS
SW-09	SW-109	5/6/10	WATER	2-Methylnaphthalene	0.000102	U	mg/L	0.000102	U	mg/L	0	NA	0.000204	y
SW-09	SW-109	5/6/10	WATER	Acenaphthene	0.000102	U	mg/L	0.000102	U	mg/L	0	NA	0.000204	y
SW-09	SW-109	5/6/10	WATER	Acenaphthylene	0.000102	U	mg/L	0.000102	U	mg/L	0	NA	0.000204	y
SW-09	SW-109	5/6/10	WATER	Anthracene	0.000102	U	mg/L	0.000102	U	mg/L	0	NA	0.000204	y
SW-09	SW-109	5/6/10	WATER	Benzo(a)anthracene	0.000102	U	mg/L	0.000102	U	mg/L	0	NA	0.000204	y
SW-09	SW-109	5/6/10	WATER	Benzo(a)pyrene	0.000102	U	mg/L	0.000102	U	mg/L	0	NA	0.000204	y
SW-09	SW-109	5/6/10	WATER	Benzo(b)fluoranthene	0.000102	U	mg/L	0.000102	U	mg/L	0	NA	0.000204	y
SW-09	SW-109	5/6/10	WATER	Benzo(k)fluoranthene	0.000102	U	mg/L	0.000102	U	mg/L	0	NA	0.000204	y
SW-09	SW-109	5/6/10	WATER	Chrysene	0.000102	U	mg/L	0.000102	U	mg/L	0	NA	0.000204	y
SW-09	SW-109	5/6/10	WATER	Dibenz(a,h)anthracene	0.000102	U	mg/L	0.000102	U	mg/L	0	NA	0.000204	y
SW-09	SW-109	5/6/10	WATER	Fluoranthene	0.000102	U	mg/L	0.000102	U	mg/L	0	NA	0.000204	y
SW-09	SW-109	5/6/10	WATER	Fluorene	0.000102	U	mg/L	0.000102	U	mg/L	0	NA	0.000204	y
SW-09	SW-109	5/6/10	WATER	Indeno(1,2,3-cd)pyrene	0.000102	U	mg/L	0.000102	U	mg/L	0	NA	0.000204	y
SW-09	SW-109	5/6/10	WATER	Naphthalene	0.000102	U	mg/L	0.000102	U	mg/L	0	NA	0.000204	y
SW-09	SW-109	5/6/10	WATER	Phenanthrene	0.000102	U	mg/L	0.000102	U	mg/L	0	NA	0.000204	y
SW-09	SW-109	5/6/10	WATER	Pyrene	0.000102	U	mg/L	0.000102	U	mg/L	0	NA	0.000204	y
SW-09	SW-109	5/6/10	WATER	Calcium	58.6		mg/L	59.4		mg/L	0.8	1.4	0.2	y
SW-09	SW-109	5/6/10	WATER	Hardness	591		mg/L	597		mg/L	6	1.0	0.66	y
SW-09	SW-109	5/6/10	WATER	Magnesium	140		mg/L	141		mg/L	1	0.7	0.2	y
SW-09	SW-109	5/6/10	WATER	Total Dissolved Solids	4220		mg/L	4150		mg/L	70	1.7	20	y
SW-09	SW-109	5/6/10	WATER	Chloride	1870		mg/L	1840		mg/L	30	1.6	100	y
SW-09	SW-109	5/6/10	WATER	Barium	0.42		mg/L	0.41		mg/L	0.01	2.4	0.02	y
SW-09	SW-109	5/6/10	WATER	Cadmium	0.0027	U	mg/L	0.0027	U	mg/L	0	NA	0.0054	y
SW-09	SW-109	5/6/10	WATER	Calcium	58.6		mg/L	59.4		mg/L	0.8	1.4	0.2	y
SW-09	SW-109	5/6/10	WATER	Chromium	0.0027	B	mg/L	0.0027	B	mg/L	0	NA	0.02	y

TABLE 6

FIELD DUPLICATE SUMMARY

ORIGINAL FIELD ID	DUPLICATE FIELD ID	SAMPLE DATE	SAMPLE MATRIX	ANALYTE	ORIGINAL RESULTS			DUPLICATE RESULTS			DIFFERENCE	RPD	2-3xRDL	PASS
SW-09	SW-109	5/6/10	WATER	Iron	1.12		mg/L	1.11		mg/L	0.01	0.9	0.2	y
SW-09	SW-109	5/6/10	WATER	Lead	0.008	U	mg/L	0.008	U	mg/L	0	NA	0.016	y
SW-09	SW-109	5/6/10	WATER	Magnesium	140		mg/L	141		mg/L	1	0.7	0.2	y
SW-09	SW-109	5/6/10	WATER	Manganese	0.51		mg/L	0.5		mg/L	0.01	2.0	0.03	y
SW-09	SW-109	5/6/10	WATER	Potassium	42.6		mg/L	42.9		mg/L	0.3	0.7	1	y
SW-09	SW-109	5/6/10	WATER	Selenium	0.005	U	mg/L	0.005	U	mg/L	0	NA	0.01	y
SW-09	SW-109	5/6/10	WATER	Sodium	915		mg/L	1100		mg/L	185	18.4	10	y
SW-09	SW-109	5/6/10	WATER	Strontium	0.99		mg/L	1.01		mg/L	0.02	2.0	0.1	y
SW-09	SW-109	5/6/10	WATER	Zinc	0.02	U	mg/L	0.02	U	mg/L	0	NA	0.04	y
SW-09	SW-109	5/6/10	WATER	Barium	0.37		mg/L	0.38		mg/L	0.01	2.7	0.02	y
SW-09	SW-109	5/6/10	WATER	Cadmium	0.0027	U	mg/L	0.00027	B	mg/L	0.00243	NA	0.0054	y
SW-09	SW-109	5/6/10	WATER	Chromium	0.0024	B	mg/L	0.0022	B	mg/L	0.0002	NA	0.02	y
SW-09	SW-109	5/6/10	WATER	Lead	0.008	U	mg/L	0.008	U	mg/L	0	NA	0.016	y
SW-09	SW-109	5/6/10	WATER	Selenium	0.005	U	mg/L	0.005	U	mg/L	0	NA	0.01	y
SW-09	SW-109	5/6/10	WATER	Strontium	1		mg/L	1.03		mg/L	0.03	3.0	0.1	y
SW-09	SW-109	5/6/10	WATER	Zinc	0.0095	B	mg/L	0.02	U	mg/L	0.0105	NA	0.04	y
SW-09	SW-109	5/6/10	WATER	Arsenic	0.01	U	mg/L	0.01	U	mg/L	0	NA	0.02	y
SW-09	SW-109	5/6/10	WATER	Arsenic	0.01	U	mg/L	0.01	U	mg/L	0	NA	0.02	y
SW-09	SW-109	5/6/10	WATER	Mercury	0.00011	B	mg/L	0.00006	B	mg/L	0.00005	NA	0.0004	y
SW-09	SW-109	5/6/10	WATER	Mercury	0.0001	B	mg/L	0.00006	B	mg/L	0.00004	NA	0.0004	y
SED-15	SED-115	5/6/10	SOLID	2-Methylnaphthalene	0.325	U	mg/kg	0.328	U	mg/kg	0.003	NA	0.984	y
SED-15	SED-115	5/6/10	SOLID	Acenaphthene	0.325	U	mg/kg	0.328	U	mg/kg	0.003	NA	0.984	y
SED-15	SED-115	5/6/10	SOLID	Acenaphthylene	0.325	U	mg/kg	0.328	U	mg/kg	0.003	NA	0.984	y
SED-15	SED-115	5/6/10	SOLID	Anthracene	0.325	U	mg/kg	0.328	U	mg/kg	0.003	NA	0.984	y
SED-15	SED-115	5/6/10	SOLID	Benzo(a)anthracene	0.325	U	mg/kg	0.328	U	mg/kg	0.003	NA	0.984	y

TABLE 6
FIELD DUPLICATE SUMMARY

ORIGINAL FIELD ID	DUPLICATE FIELD ID	SAMPLE DATE	SAMPLE MATRIX	ANALYTE	ORIGINAL RESULTS			DUPLICATE RESULTS			DIFFERENCE	RPD	2-3xRDL	PASS
SED-15	SED-115	5/6/10	SOLID	Benzo(a)pyrene	0.325	U	mg/kg	0.328	U	mg/kg	0.003	NA	0.984	y
SED-15	SED-115	5/6/10	SOLID	Benzo(b)fluoranthene	0.325	U	mg/kg	0.328	U	mg/kg	0.003	NA	0.984	y
SED-15	SED-115	5/6/10	SOLID	Benzo(k)fluoranthene	0.325	U	mg/kg	0.328	U	mg/kg	0.003	NA	0.984	y
SED-15	SED-115	5/6/10	SOLID	Chrysene	0.325	U	mg/kg	0.328	U	mg/kg	0.003	NA	0.984	y
SED-15	SED-115	5/6/10	SOLID	Dibenz(a,h)anthracene	0.325	U	mg/kg	0.328	U	mg/kg	0.003	NA	0.984	y
SED-15	SED-115	5/6/10	SOLID	Fluoranthene	0.325	U	mg/kg	0.328	U	mg/kg	0.003	NA	0.984	y
SED-15	SED-115	5/6/10	SOLID	Fluorene	0.325	U	mg/kg	0.328	U	mg/kg	0.003	NA	0.984	y
SED-15	SED-115	5/6/10	SOLID	Indeno(1,2,3-cd)pyrene	0.325	U	mg/kg	0.328	U	mg/kg	0.003	NA	0.984	y
SED-15	SED-115	5/6/10	SOLID	Naphthalene	0.325	U	mg/kg	0.328	U	mg/kg	0.003	NA	0.984	y
SED-15	SED-115	5/6/10	SOLID	Phenanthrene	0.325	U	mg/kg	0.328	U	mg/kg	0.003	NA	0.984	y
SED-15	SED-115	5/6/10	SOLID	Pyrene	0.325	U	mg/kg	0.328	U	mg/kg	0.003	NA	0.984	y
SED-15	SED-115	5/6/10	SOLID	Total Moisture	75.4		%	73		%	2.4	3.2	0.03	y
SED-15	SED-115	5/6/10	SOLID	Total Organic Carbon	67700		mg/kg	40800		mg/kg	26900	49.6	600	y
SED-15	SED-115	5/6/10	SOLID	Chloride	944		mg/kg	947		mg/kg	3	0.3	30	y
SED-15	SED-115	5/6/10	SOLID	Arsenic	1.66		mg/kg	1.3	B	mg/kg	0.36	NA	4.8	y
SED-15	SED-115	5/6/10	SOLID	Barium	232		mg/kg	211		mg/kg	21	9.5	1.2	y
SED-15	SED-115	5/6/10	SOLID	Cadmium	0.2	U	mg/kg	0.2	U	mg/kg	0	NA	0.6	y
SED-15	SED-115	5/6/10	SOLID	Chromium	4.42		mg/kg	4.62		mg/kg	0.2	4.4	1.2	y
SED-15	SED-115	5/6/10	SOLID	Lead	5.82		mg/kg	6.06		mg/kg	0.24	4.0	1.8	y
SED-15	SED-115	5/6/10	SOLID	Selenium	1.6	U	mg/kg	1.59	U	mg/kg	0.01	NA	4.8	y
SED-15	SED-115	5/6/10	SOLID	Strontium	16.1		mg/kg	14.3		mg/kg	1.8	11.8	1.2	y
SED-15	SED-115	5/6/10	SOLID	Zinc	18		mg/kg	17.8		mg/kg	0.2	1.1	2.4	y
SED-15	SED-115	5/6/10	SOLID	Mercury	0.041		mg/kg	0.04		mg/kg	0.001	NA	0.036	y
SB-3-MW-S	SB-3-MW-SD	5/12/10	WATER	Benzene	0.005	U	mg/L	0.005	U	mg/L	0	NA	0.01	y
SB-3-MW-S	SB-3-MW-SD	5/12/10	WATER	Ethylbenzene	0.005	U	mg/L	0.005	U	mg/L	0	NA	0.01	y

TABLE 6
FIELD DUPLICATE SUMMARY

ORIGINAL FIELD ID	DUPLICATE FIELD ID	SAMPLE DATE	SAMPLE MATRIX	ANALYTE	ORIGINAL RESULTS			DUPLICATE RESULTS			DIFFERENCE	RPD	2-3xRDL	PASS
SB-3-MW-S	SB-3-MW-SD	5/12/10	WATER	Toluene	0.005	U	mg/L	0.005	U	mg/L	0	NA	0.01	y
SB-3-MW-S	SB-3-MW-SD	5/12/10	WATER	Xylene (total)	0.01	U	mg/L	0.01	U	mg/L	0	NA	0.02	y
SB-3-MW-S	SB-3-MW-SD	5/12/10	WATER	Sulfate	2.4	B	mg/L	5	U	mg/L	2.6	NA	10	y
SB-3-MW-S	SB-3-MW-SD	5/12/10	WATER	Bicarbonate Alkalinity	395		mg/L CaCO3	385		mg/L CaCO3	10	2.6	2	y
SB-3-MW-S	SB-3-MW-SD	5/12/10	WATER	Carbonate Alkalinity	1	U	mg/L CaCO3	1	U	mg/L CaCO3	0	NA	2	y
SB-3-MW-S	SB-3-MW-SD	5/12/10	WATER	Total Dissolved Solids	12200		mg/L	12000		mg/L	200	1.7	20	y
SB-3-MW-S	SB-3-MW-SD	5/12/10	WATER	Chloride	7270		mg/L	7160		mg/L	110	1.5	200	y
SB-3-MW-S	SB-3-MW-SD	5/12/10	WATER	Barium	6.57		mg/L	6.51		mg/L	0.06	0.9	0.02	y
SB-3-MW-S	SB-3-MW-SD	5/12/10	WATER	Calcium	880		mg/L	860		mg/L	20	2.3	0.2	y
SB-3-MW-S	SB-3-MW-SD	5/12/10	WATER	Iron	17.2		mg/L	17.4		mg/L	0.2	1.2	0.2	y
SB-3-MW-S	SB-3-MW-SD	5/12/10	WATER	Magnesium	357		mg/L	356		mg/L	1	0.3	0.2	y
SB-3-MW-S	SB-3-MW-SD	5/12/10	WATER	Manganese	3.31		mg/L	3.28		mg/L	0.03	0.9	0.03	y
SB-3-MW-S	SB-3-MW-SD	5/12/10	WATER	Potassium	13.8		mg/L	13.7		mg/L	0.1	0.7	1	y
SB-3-MW-S	SB-3-MW-SD	5/12/10	WATER	Selenium	0.04	U	mg/L	0.04	U	mg/L	0	NA	0.08	y
SB-3-MW-S	SB-3-MW-SD	5/12/10	WATER	Sodium	2240		mg/L	2250		mg/L	10	0.4	10	y
SB-3-MW-S	SB-3-MW-SD	5/12/10	WATER	Barium	6.17		mg/L	6.06		mg/L	0.11	1.8	0.02	y
SB-3-MW-S	SB-3-MW-SD	5/12/10	WATER	Calcium	834		mg/L	831		mg/L	3	0.4	0.2	y
SB-3-MW-S	SB-3-MW-SD	5/12/10	WATER	Iron	14		mg/L	13.9		mg/L	0.1	0.7	0.2	y
SB-3-MW-S	SB-3-MW-SD	5/12/10	WATER	Magnesium	339		mg/L	333		mg/L	6	1.8	0.2	y
SB-3-MW-S	SB-3-MW-SD	5/12/10	WATER	Manganese	2.9		mg/L	2.85		mg/L	0.05	1.7	0.03	y
SB-3-MW-S	SB-3-MW-SD	5/12/10	WATER	Potassium	14.2		mg/L	13.8		mg/L	0.4	2.9	1	y
SB-3-MW-S	SB-3-MW-SD	5/12/10	WATER	Selenium	0.04	U	mg/L	0.04	U	mg/L	0	NA	0.08	y
SB-3-MW-S	SB-3-MW-SD	5/12/10	WATER	Sodium	2070		mg/L	2080		mg/L	10	0.5	10	y
SB-3-MW-S	SB-3-MW-SD	5/12/10	WATER	Arsenic	0.01	U	mg/L	0.01	U	mg/L	0	NA	0.02	y

TABLE 6
FIELD DUPLICATE SUMMARY

ORIGINAL FIELD ID	DUPLICATE FIELD ID	SAMPLE DATE	SAMPLE MATRIX	ANALYTE	ORIGINAL RESULTS			DUPLICATE RESULTS			DIFFERENCE	RPD	2-3xRDL	PASS
SB-3-MW-S	SB-3-MW-SD	5/12/10	WATER	Arsenic	0.01	U	mg/L	0.01	U	mg/L	0	NA	0.02	y
SB-3-MW-S	SB-3-MW-SD	5/12/10	WATER	Aliphatic >C10-C12	0.15	U	mg/L	0.15	U	mg/L	0	NA	0.3	y
SB-3-MW-S	SB-3-MW-SD	5/12/10	WATER	Aliphatic >C12-C16	0.15	U	mg/L	0.15	U	mg/L	0	NA	0.3	y
SB-3-MW-S	SB-3-MW-SD	5/12/10	WATER	Aliphatic >C16-C35	0.15	U	mg/L	0.15	U	mg/L	0	NA	0.3	y
SB-3-MW-S	SB-3-MW-SD	5/12/10	WATER	Aliphatic >C8-C10	0.15	U	mg/L	0.15	U	mg/L	0	NA	0.3	y
SB-3-MW-S	SB-3-MW-SD	5/12/10	WATER	Aliphatic C6-C8	0.15	U	mg/L	0.15	U	mg/L	0	NA	0.3	y
SB-3-MW-S	SB-3-MW-SD	5/12/10	WATER	Aromatic >C10-C12	0.15	U	mg/L	0.15	U	mg/L	0	NA	0.3	y
SB-3-MW-S	SB-3-MW-SD	5/12/10	WATER	Aromatic >C12-C16	0.15	U	mg/L	0.15	U	mg/L	0	NA	0.3	y
SB-3-MW-S	SB-3-MW-SD	5/12/10	WATER	Aromatic >C16-C21	0.15	U	mg/L	0.15	U	mg/L	0	NA	0.3	y
SB-3-MW-S	SB-3-MW-SD	5/12/10	WATER	Aromatic >C21-C35	0.15	U	mg/L	0.15	U	mg/L	0	NA	0.3	y
SB-3-MW-S	SB-3-MW-SD	5/12/10	WATER	Aromatic >C8-C10	0.15	U	mg/L	0.15	U	mg/L	0	NA	0.3	y

TABLE 1
SAMPLE SUMMARY
(SEDIMENTS)

LABORATORY ID	FIELD ID	SAMPLE DATE	TESTS PERFORMED							
21003082601	SED-1 (0-2)	2/25/10	Chloride	NA	7 ICP Metals	Mercury	NA	NA	NA	NA
21003082601MS	SED-1 (0-2)	2/25/10	Chloride	NA	NA	NA	NA	NA	NA	NA
21003082601MSD	SED-1 (0-2)	2/25/10	Chloride	NA	NA	NA	NA	NA	NA	NA
21003082602	SED-1 (2-4)	2/25/10	Chloride	NA	7 ICP Metals	Mercury	NA	NA	NA	NA
21003082603	SED-1 (4-6)	2/25/10	Chloride	NA	7 ICP Metals	Mercury	NA	NA	NA	NA
21003082604	SED-2 (0-2)	2/25/10	Chloride	NA	7 ICP Metals	Mercury	NA	NA	NA	NA
21003082604MS	SED-2 (0-2)	2/25/10	NA	NA	7 ICP Metals	Mercury	NA	NA	NA	NA
21003082604DUP	SED-2 (0-2)	2/25/10	NA	NA	7 ICP Metals	Mercury	NA	NA	NA	NA
21003082605	SED-2 (2-4)	2/25/10	Chloride	NA	7 ICP Metals	Mercury	NA	NA	NA	NA
21003082606	SED-2 (4-6)	2/25/10	Chloride	NA	7 ICP Metals	Mercury	NA	NA	NA	NA
21003082607	SED-3 (0-2)	2/25/10	Chloride	NA	7 ICP Metals	Mercury	NA	NA	NA	NA
21003082608	SED-3 (2-4)	2/25/10	Chloride	NA	7 ICP Metals	Mercury	NA	NA	NA	NA
21003082609	SED-3 (4-6)	2/25/10	Chloride	NA	7 ICP Metals	Mercury	NA	NA	NA	NA
21003082610	SED-4 (0-2)	2/25/10	Chloride	NA	7 ICP Metals	Mercury	PCB	TPH (1005)*	NA	NA
21003082610MS	SED-4 (0-2)	2/25/10	NA	NA	NA	NA	NA	TPH (1005)*	NA	NA
21003082610MSD	SED-4 (0-2)	2/25/10	NA	NA	NA	NA	NA	TPH (1005)*	NA	NA
21003082611	SED-5 (0-2)	2/25/10	Chloride	NA	7 ICP Metals	Mercury	PCB	TPH (1005)*	NA	NA
21003082612	SED-6 (0-2)	2/25/10	Chloride	NA	7 ICP Metals	Mercury	PCB	TPH (1005)*	NA	NA
21003082613	SED-7 (0-2)	2/25/10	Chloride	NA	7 ICP Metals	Mercury	NA	TPH (1005)*	NA	NA
21003082614	SED-7 (2-4)	2/25/10	Chloride	NA	7 ICP Metals	Mercury	PCB	TPH (1005)*	Frac TPH (1006)*	NA
21003082615	SED-7 (4-6)	2/25/10	Chloride	NA	7 ICP Metals	Mercury	PCB	TPH (1005)*	Frac TPH (1006)*	NA
21003082616	SED-8 (0-2)	2/25/10	Chloride	NA	7 ICP Metals	Mercury	PCB	TPH (1005)*	NA	NA
21003082617	SED-8 (2-4)	2/25/10	Chloride	NA	7 ICP Metals	Mercury	NA	TPH (1005)*	Frac TPH (1006)*	NA
21003082618	SED-9 (0-2)	2/25/10	Chloride	NA	3 ICP Metals	Mercury	NA	TPH (1005)*	NA	NA
21003082618MS	SED-9 (0-2)	2/25/10	Chloride	NA	NA	NA	NA	NA	NA	NA
21003082618MSD	SED-9 (0-2)	2/25/10	Chloride	NA	NA	NA	NA	NA	NA	NA
21003082619	SED-9 (2-4)	2/25/10	Chloride	NA	3 ICP Metals	Mercury	NA	TPH (1005)*	NA	NA

TABLE 1
SAMPLE SUMMARY
(SEDIMENTS)

LABORATORY ID	FIELD ID	SAMPLE DATE	TESTS PERFORMED							
21003082620	SED-10 (0-2)	2/25/10	Chloride	NA	3 ICP Metals	Mercury	NA	TPH (1005)*	NA	NA
21003082621	SED-10 (2-4)	2/25/10	Chloride	NA	3 ICP Metals	Mercury	NA	TPH (1005)*	NA	NA
21003082621MS	SED-10 (2-4)	2/25/10	Chloride	NA	3 ICP Metals	Mercury	NA	NA	NA	NA
21003082621MSD	SED-10 (2-4)	2/25/10	Chloride	NA	NA	NA	NA	NA	NA	NA
21003082621DUP	SED-10 (2-4)	2/25/10	NA	NA	3 ICP Metals	Mercury	NA	NA	NA	NA
21003082622	SED-11 (0-2)	2/25/10	Chloride	NA	3 ICP Metals	Mercury	NA	TPH (1005)*	NA	NA
21003082623	SED-11 (2-4)	2/25/10	Chloride	NA	3 ICP Metals	Mercury	NA	TPH (1005)*	Frac TPH (1006)*	NA
21003082624	SED-12 (0-2)	2/25/10	Chloride	NA	3 ICP Metals	Mercury	NA	TPH (1005)*	NA	NA
21003082625	SED-12 (2-4)	2/25/10	Chloride	NA	3 ICP Metals	Mercury	NA	TPH (1005)*	Frac TPH (1006)*	NA
21003082626	SED-12 (4-6)	2/25/10	Chloride	NA	3 ICP Metals	Mercury	NA	TPH (1005)*	Frac TPH (1006)*	NA
21003082627	SED-13 (0-2)	2/26/10	Chloride	NA	3 ICP Metals	Mercury	NA	NA	NA	NA
21003082628	SED-13 (2-4)	2/26/10	Chloride	NA	3 ICP Metals	Mercury	NA	NA	NA	NA
21003082629	SED-14 (0-2)	2/26/10	Chloride	NA	3 ICP Metals	Mercury	NA	NA	NA	NA
21003082630	SED-14 (2-4)	2/26/10	Chloride	NA	3 ICP Metals	Mercury	NA	NA	NA	NA
21003082631	SED-15 (0-2)	2/26/10	Chloride	NA	7 ICP Metals	Mercury	NA	TPH (1005)*	Frac TPH (1006)*	NA
21003082632	SED-15 (2-4)	2/26/10	Chloride	NA	7 ICP Metals	Mercury	NA	TPH (1005)*	Frac TPH (1006)*	NA
21003082633	SED-16 (0-2)	2/26/10	Chloride	NA	3 ICP Metals	Mercury	NA	TPH (1005)*	NA	NA
21003082634	SED-17 (0-2)	2/26/10	Chloride	NA	3 ICP Metals	Mercury	NA	TPH (1005)*	NA	NA
21003082634MS	SED-17 (0-2)	2/26/10	NA	NA	NA	NA	NA	TPH (1005)*	NA	NA
21003082634MSD	SED-17 (0-2)	2/26/10	NA	NA	NA	NA	NA	TPH (1005)*	NA	NA
21003082635	SED-17 (2-4)	2/26/10	Chloride	NA	3 ICP Metals	Mercury	NA	TPH (1005)*	NA	NA
21003082636	SED-18 (0-2)	2/26/10	Chloride	NA	3 ICP Metals	Mercury	NA	TPH (1005)*	Frac TPH (1006)*	NA
21003082637	SED-18 (2-4)	2/26/10	Chloride	NA	3 ICP Metals	Mercury	NA	TPH (1005)*	Frac TPH (1006)*	NA
21003082638	SED-19 (0-2)	2/26/10	Chloride	NA	7 ICP Metals	Mercury	NA	TPH (1005)*	Frac TPH (1006)*	NA
21003082638MS	SED-19 (0-2)	2/26/10	Chloride	NA	NA	NA	NA	NA	NA	NA
21003082638MSD	SED-19 (0-2)	2/26/10	Chloride	NA	NA	NA	NA	NA	NA	NA
21003082639	SED-19 (2-4)	2/26/10	Chloride	NA	3 ICP Metals	Mercury	NA	TPH (1005)*	Frac TPH (1006)*	NA

TABLE 1
SAMPLE SUMMARY
(SEDIMENTS)

LABORATORY ID	FIELD ID	SAMPLE DATE	TESTS PERFORMED							
21003082640	SS-08 (0-2)	2/26/10	NA	NA	7 ICP Metals	Mercury	NA	TPH (1005)*	Frac TPH (1006)*	NA
21003082641	SS-08 (2-4)	2/26/10	NA	NA	7 ICP Metals	Mercury	NA	NA	NA	NA
21003082642	SS-10 (0-2)	2/26/10	NA	NA	7 ICP Metals	Mercury	NA	TPH (1005)*	Frac TPH (1006)*	NA
21003082642MS	SS-10 (0-2)	2/26/10	NA	NA	7 ICP Metals	Mercury	NA	NA	NA	NA
21003082642DUP	SS-10 (0-2)	2/26/10	NA	NA	7 ICP Metals	Mercury	NA	NA	NA	NA
21003082643	SS-10 (2-4)	2/26/10	NA	NA	7 ICP Metals	Mercury	NA	TPH (1005)*	Frac TPH (1006)*	NA
21003082644	SED-20 (0-2)	2/26/10	Chloride	NA	3 ICP Metals	Mercury	NA	TPH (1005)*	NA	NA
21003082645	SED-20 (2-4)	2/26/10	Chloride	NA	3 ICP Metals	Mercury	NA	TPH (1005)*	NA	NA
21003082645MS	SED-20 (2-4)	2/26/10	Chloride	NA	NA	NA	NA	NA	NA	NA
21003082645MSD	SED-20 (2-4)	2/26/10	Chloride	NA	NA	NA	NA	NA	NA	NA
21003082646	SED-21 (0-2)	2/26/10	Chloride	NA	3 ICP Metals	Mercury	NA	TPH (1005)*	NA	NA
21003082647	SED-21 (2-4)	2/26/10	Chloride	NA	3 ICP Metals	Mercury	NA	TPH (1005)*	NA	NA
21003082648	SED-21 (4-6)	2/26/10	Chloride	NA	3 ICP Metals	Mercury	NA	TPH (1005)*	Frac TPH (1006)*	NA
21003082649	SED-21 (6-8)	2/26/10	Chloride	NA	3 ICP Metals	Mercury	NA	TPH (1005)*	Frac TPH (1006)*	NA
21003082650	SED-22 (0-2)	2/26/10	Chloride	NA	3 ICP Metals	Mercury	NA	TPH (1005)*	NA	NA
21003082651	SED-22 (2-4)	2/26/10	Chloride	NA	3 ICP Metals	Mercury	NA	TPH (1005)*	NA	NA
21003082652	SED-26 (0-2)	3/2/10	Chloride	NA	3 ICP Metals	Mercury	NA	TPH (1005)*	Frac TPH (1006)*	NA
21003082653	SED-26 (2-4)	3/2/10	Chloride	NA	3 ICP Metals	Mercury	NA	TPH (1005)*	Frac TPH (1006)*	NA
21003082654	SED-27 (0-2)	3/2/10	Chloride	NA	3 ICP Metals	Mercury	NA	TPH (1005)*	Frac TPH (1006)*	NA
21003082655	SED-27 (2-4)	3/2/10	Chloride	NA	3 ICP Metals	Mercury	NA	TPH (1005)*	Frac TPH (1006)*	NA
21003082656	SED-28 (0-2)	3/2/10	Chloride	NA	7 ICP Metals	Mercury	NA	TPH (1005)*	Frac TPH (1006)*	NA
21003082657	SED-28 (2-4)	3/2/10	Chloride	NA	7 ICP Metals	Mercury	NA	TPH (1005)*	Frac TPH (1006)*	NA
21003082658	SED-29 (0-2)	3/2/10	Chloride	NA	7 ICP Metals	Mercury	NA	TPH (1005)*	Frac TPH (1006)*	NA
21003082659	SED-29 (2-4)	3/2/10	Chloride	NA	7 ICP Metals	Mercury	NA	TPH (1005)*	NA	NA
21003082660	SED-30 (0-2)	3/2/10	Chloride	NA	7 ICP Metals	Mercury	NA	TPH (1005)*	Frac TPH (1006)*	NA
21003082661	SED-30 (2-4)	3/2/10	Chloride	NA	7 ICP Metals	Mercury	NA	TPH (1005)*	Frac TPH (1006)*	NA

TABLE 1
SAMPLE SUMMARY
(SEDIMENTS)

LABORATORY ID	FIELD ID	SAMPLE DATE	TESTS PERFORMED							
21003082662	SED-31 (4-6)	3/2/10	Chloride	NA	3 ICP Metals	Mercury	NA	TPH (1005)*	NA	NA
21003082662MS	SED-31 (4-6)	3/2/10	Chloride	NA	NA	NA	NA	NA	NA	NA
21003082662MSD	SED-31 (4-6)	3/2/10	Chloride	NA	NA	NA	NA	NA	NA	NA
21003082663	SED-32 (4-6)	3/2/10	Chloride	NA	3 ICP Metals	Mercury	NA	TPH (1005)*	NA	NA
21003082663MS	SED-32 (4-6)	3/2/10	NA	NA	3 ICP Metals	Mercury	NA	NA	NA	NA
21003082663DUP	SED-32 (4-6)	3/2/10	NA	NA	3 ICP Metals	Mercury	NA	NA	NA	NA
21003082664	SED-33 (4-6)	3/2/10	Chloride	NA	3 ICP Metals	Mercury	NA	TPH (1005)*	NA	NA
21003082665	SED-23 (0-2)	3/2/10	Chloride	NA	3 ICP Metals	Mercury	NA	TPH (1005)*	Frac TPH (1006)*	NA
21003082665MS	SED-23 (0-2)	3/2/10	Chloride	NA	NA	NA	NA	NA	NA	NA
21003082665MSD	SED-23 (0-2)	3/2/10	Chloride	NA	NA	NA	NA	NA	NA	NA
21003082666	SED-23 (2-4)	3/2/10	Chloride	NA	3 ICP Metals	Mercury	NA	TPH (1005)*	Frac TPH (1006)*	NA
21003082667	SED-24 (0-2)	3/2/10	Chloride	NA	3 ICP Metals	Mercury	NA	TPH (1005)*	NA	NA
21003082668	SED-24 (2-4)	3/2/10	Chloride	NA	3 ICP Metals	Mercury	NA	TPH (1005)*	NA	NA
21003082669	SED-25 (0-2)	3/2/10	Chloride	NA	3 ICP Metals	Mercury	NA	TPH (1005)*	Frac TPH (1006)*	NA
21003082670	SED-25 (2-4)	3/2/10	Chloride	NA	3 ICP Metals	Mercury	NA	TPH (1005)*	NA	NA
21003082671	SED-31 (0-2)	3/1/10	Chloride	NA	3 ICP Metals	Mercury	NA	TPH (1005)*	Frac TPH (1006)*	NA
21003082672	SED-31 (2-4)	3/1/10	Chloride	NA	3 ICP Metals	Mercury	NA	TPH (1005)*	Frac TPH (1006)*	NA
21003082673	SED-32 (0-2)	3/1/10	Chloride	NA	3 ICP Metals	Mercury	NA	TPH (1005)*	Frac TPH (1006)*	NA
21003082674	SED-32 (2-4)	3/1/10	Chloride	NA	3 ICP Metals	Mercury	NA	TPH (1005)*	NA	NA
21003082675	SED-33 (0-2)	3/1/10	Chloride	NA	3 ICP Metals	Mercury	NA	TPH (1005)*	Frac TPH (1006)*	NA
21003082675MS	SED-33 (0-2)	3/1/10	Chloride	NA	NA	NA	NA	NA	NA	NA
21003082675MSD	SED-33 (0-2)	3/1/10	Chloride	NA	NA	NA	NA	NA	NA	NA
21003082676	SED-33 (2-4)	3/1/10	Chloride	NA	3 ICP Metals	Mercury	NA	TPH (1005)*	NA	NA
21005112901	SED-9	5/5/10	Chloride	TOC	8 ICP Metals	Mercury	NA	NA	NA	PAH
21005112901MS	SED-9	5/5/10	Chloride	NA	NA	NA	NA	NA	NA	NA
21005112901DUP	SED-9	5/5/10	NA	TOC	NA	NA	NA	NA	NA	NA
21005112901MSD	SED-9	5/5/10	Chloride	NA	NA	NA	NA	NA	NA	NA

TABLE 1
SAMPLE SUMMARY
(SEDIMENTS)

LABORATORY ID	FIELD ID	SAMPLE DATE	TESTS PERFORMED							
21005112902	SED-24	5/5/10	Chloride	TOC	8 ICP Metals	Mercury	NA	NA	NA	PAH
21005112903	SED-31	5/5/10	Chloride	TOC	8 ICP Metals	Mercury	NA	NA	NA	PAH
21005112904	SED-8	5/6/10	Chloride	TOC	8 ICP Metals	Mercury	NA	NA	NA	PAH
21005112905	SED-11	5/6/10	Chloride	TOC	8 ICP Metals	Mercury	NA	NA	NA	PAH
21005112906	SED-13	5/6/10	Chloride	TOC	8 ICP Metals	Mercury	NA	NA	NA	PAH
21005112906MS	SED-13	5/6/10	NA	NA	8 ICP Metals	Mercury	NA	NA	NA	NA
21005112906DUP	SED-13	5/6/10	NA	NA	8 ICP Metals	Mercury	NA	NA	NA	NA
21005112907	SED-15	5/6/10	Chloride	TOC	8 ICP Metals	Mercury	NA	NA	NA	PAH
21005112908	SED-19	5/6/10	Chloride	TOC	8 ICP Metals	Mercury	NA	NA	NA	PAH
21005112909	SED-115(1)	5/6/10	Chloride	TOC	8 ICP Metals	Mercury	NA	NA	NA	PAH
21005112910	SED-120	5/7/10	Chloride	TOC	8 ICP Metals	Mercury	NA	NA	NA	PAH
21005112911	SED-26	5/5/10	Chloride	TOC	8 ICP Metals	Mercury	NA	NA	NA	PAH
21005140201	SED-BK-06	5/10/10	Chloride	TOC	8 ICP Metals	Mercury	NA	NA	NA	PAH
21005140201MS	SED-BK-06	5/10/10	Chloride	NA	NA	NA	NA	NA	NA	NA
21005140201MSD	SED-BK-06	5/10/10	Chloride	NA	NA	NA	NA	NA	NA	NA
21005140202	SED-BK-01	5/10/10	Chloride	TOC	8 ICP Metals	Mercury	NA	NA	NA	PAH
21005140202MS	SED-BK-01	5/10/10	NA	NA	8 ICP Metals	Mercury	NA	NA	NA	NA
21005140202DUP	SED-BK-01	5/10/10	NA	NA	8 ICP Metals	Mercury	NA	NA	NA	NA
21005140203	SED-BK-02	5/10/10	Chloride	TOC	8 ICP Metals	Mercury	NA	NA	NA	PAH
21005140204	SED-BK-03	5/10/10	Chloride	TOC	8 ICP Metals	Mercury	NA	NA	NA	PAH
21005140205	SED-BK-04	5/10/10	Chloride	TOC	8 ICP Metals	Mercury	NA	NA	NA	PAH
21005140206	SED-BK-05	5/11/10	Chloride	TOC	8 ICP Metals	Mercury	NA	NA	NA	PAH
21005140207	SED-BK-09	5/11/10	Chloride	TOC	8 ICP Metals	Mercury	NA	NA	NA	PAH
21005140208	SED-BK-07	5/11/10	Chloride	TOC	8 ICP Metals	Mercury	NA	NA	NA	PAH
21005140208MS	SED-BK-07	5/11/10	NA	NA	NA	NA	NA	NA	NA	PAH
21005140208MSD	SED-BK-07	5/11/10	NA	NA	NA	NA	NA	NA	NA	PAH
21005140209	SED-BK-08	5/11/10	Chloride	TOC	8 ICP Metals	Mercury	NA	NA	NA	PAH
21005140209DUP	SED-BK-08	5/11/10	NA	TOC	NA	NA	NA	NA	NA	NA

TABLE 1
SAMPLE SUMMARY
(SEDIMENTS)

LABORATORY ID	FIELD ID	SAMPLE DATE	TESTS PERFORMED							
21005242807	SED-BK-11	5/19/10	Chloride	TOC	8 ICP Metals	Mercury	NA	NA	NA	PAH
21005242807MS	SED-BK-11	5/19/10	NA	NA	NA	Mercury	NA	NA	NA	PAH
21005242807MSD	SED-BK-11	5/19/10	NA	NA	NA	NA	NA	NA	NA	PAH
21005242807DUP	SED-BK-11	5/19/10	NA	NA	NA	Mercury	NA	NA	NA	NA
21005242808	SED-BK-10	5/19/10	Chloride	TOC	8 ICP Metals	Mercury	NA	NA	NA	PAH
21005242808MS	SED-BK-10	5/19/10	NA	NA	8 ICP Metals	NA	NA	NA	NA	NA
21005242808DUP	SED-BK-10	5/19/10	NA	NA	8 ICP Metals	NA	NA	NA	NA	NA
21006092101	SED 15 (8-10)	6/8/10	NA	NA	NA	NA	NA	NA	Frac TPH (1006)	NA
21006092102	SED 15 W (0-2)	6/8/10	NA	NA	NA	NA	NA	NA	Frac TPH (1006)	NA
21006092103	SED 15 W 2 (0-2)	6/8/10	NA	NA	NA	NA	NA	NA	Frac TPH (1006)	NA
21006092104	SED 15 E (0-2)	6/8/10	NA	NA	NA	NA	NA	NA	Frac TPH (1006)	NA
21006092105	SED 15 E 2 (0-2)	6/8/10	NA	NA	NA	NA	NA	NA	Frac TPH (1006)	NA
21006092106	SED 15 N (0-2)	6/8/10	NA	NA	NA	NA	NA	NA	Frac TPH (1006)	NA

*Supporting raw data reviewed for this sample
NA - Not analyzed
3 ICP Metals - As,Ba,Se
7 ICP Metals - As,Ba,Cd,Cr,Pb,Se,Sr
8 ICP Metals - As,Ba,Cd,Cr,Pb,Se,Sr,Zn

(1) Field duplicate of SED-15 (21005112907)

TABLE 1
SAMPLE SUMMARY
(SOILS/SPLP)

LABORATORY ID	FIELD ID	SAMPLE DATE	TESTS PERFORMED			
21005140101	SB-1 (74-76)	5/11/10	Chloride	NA	NA	NA
21005140101MS	SB-1 (74-76)	5/11/10	Chloride	NA	NA	NA
21005140101MSD	SB-1 (74-76)	5/11/10	Chloride	NA	NA	NA
21005140102	SB-1 (78-80)	5/11/10	Chloride	NA	NA	NA
21005140103	SB-1 (62-64)	5/11/10	Chloride	NA	NA	NA
21005140104	SB-1 (66-68)	5/11/10	Chloride	NA	NA	NA
21005140105	SB-1 (70-72)	5/11/10	Chloride	NA	NA	NA
21005140106	SB-1 (42-43)	5/5/10	Chloride	NA	NA	NA
21005140107	SB-1 (13-15)	5/5/10	Chloride	NA	NA	NA
21005140108	SB-1 (58-60)	5/5/10	Chloride	NA	NA	NA
21005140109	SB-1 (62-64)	5/5/10	Chloride	NA	NA	NA
21005140110	SB-1 (46.6-47)	5/5/10	Chloride	NA	NA	NA
21005140110MS	SB-1 (46.6-47)	5/5/10	Chloride	NA	NA	NA
21005140110MSD	SB-1 (46.6-47)	5/5/10	Chloride	NA	NA	NA
21005140111	SB-1 (33-35)	5/5/10	Chloride	NA	NA	NA
21005140112	SB-1 (17-19)	5/5/10	Chloride	NA	NA	NA
21005140113	SB-1 (21-22)	5/5/10	Chloride	NA	NA	NA
21005140114	SB-1 (25-27)	5/5/10	Chloride	NA	NA	NA
21005140115	SB-1 (9-11)	5/5/10	Chloride	NA	NA	NA
21005140116	SB-1 (37-39)	5/5/10	Chloride	NA	NA	NA
21005140117	SB-1 (45.5-46)	5/5/10	Chloride	NA	NA	NA
21005140118	SB-1 (29-31)	5/5/10	Chloride	NA	NA	NA
21005140119	SB-1 (0-7)	5/5/10	Chloride	NA	NA	NA
21005140120	SB-2 (58-60)	5/10/10	Chloride	NA	NA	NA
21005140121	SB-2 (54-56)	5/10/10	Chloride	NA	NA	NA
21005140122	SB-2 (74-76)	5/10/10	Chloride	NA	NA	NA
21005140123	SB-2 (66-68)	5/10/10	Chloride	NA	NA	NA

TABLE 1
SAMPLE SUMMARY
(SOILS/SPLP)

LABORATORY ID	FIELD ID	SAMPLE DATE	TESTS PERFORMED			
21005140124	SB-2 (62-64)	5/10/10	Chloride	NA	NA	NA
21005140125	SB-2 (70-71.5)	5/10/10	Chloride	NA	NA	NA
21005140126	SB-2 (78-80)	5/10/10	Chloride	NA	NA	NA
21005140127	SB-2 (41-43)	5/7/10	Chloride	NA	NA	NA
21005140127MS	SB-2 (41-43)	5/7/10	Chloride	NA	NA	NA
21005140127MSD	SB-2 (41-43)	5/7/10	Chloride	NA	NA	NA
21005140128	SB-2 (33-35)	5/7/10	Chloride	NA	NA	NA
21005140129	SB-2 (35-36)	5/7/10	Chloride	NA	NA	NA
21005140130	SB-2 (21-23)	5/7/10	Chloride	NA	NA	NA
21005140130MS	SB-2 (21-23)	5/7/10	Chloride	NA	NA	NA
21005140130MSD	SB-2 (21-23)	5/7/10	Chloride	NA	NA	NA
21005140131	SB-2 (29-31)	5/7/10	Chloride	NA	NA	NA
21005140132	SB-2 (17-19)	5/7/10	Chloride	NA	NA	NA
21005140133	SB-2 (25-27)	5/7/10	Chloride	NA	NA	NA
21005140134	SB-2 (13-15)	5/7/10	Chloride	NA	NA	NA
21005140135	SB-2 (9-11)	5/7/10	Chloride	NA	NA	NA
21005140136	SB-2 (0-6)	5/7/10	Chloride	NA	NA	NA
21005140137	SB-3 (56-58)	5/11/10	Chloride	NA	NA	NA
21005140138	SB-3 (21-22)	5/10/10	Chloride	NA	NA	NA
21005140139	SB-3 (64-66)	5/11/10	Chloride	NA	NA	NA
21005140140	SB-3 (8-10)	5/10/10	Chloride	NA	NA	NA
21005140141	SB-3 (12-14)	5/10/10	Chloride	NA	NA	NA
21005140142	SB-3 (16-18)	5/10/10	Chloride	NA	NA	NA
21005140143	SB-3 (24-26)	5/10/10	Chloride	NA	NA	NA
21005140144	SB-3 (72-73)	5/11/10	Chloride	NA	NA	NA
21005140145	SB-3 (59-60)	5/11/10	Chloride	NA	NA	NA
21005140146	SB-3 (49-49.5)	5/10/10	Chloride	NA	NA	NA

TABLE 1
SAMPLE SUMMARY
(SOILS/SPLP)

LABORATORY ID	FIELD ID	SAMPLE DATE	TESTS PERFORMED			
21005140146MS	SB-3 (49-49.5)	5/10/10	Chloride	NA	NA	NA
21005140146MSD	SB-3 (49-49.5)	5/10/10	Chloride	NA	NA	NA
21005140147	SB-3 (68-68.5)	5/11/10	Chloride	NA	NA	NA
21005140148	SB-3 (77-78)	5/11/10	Chloride	NA	NA	NA
21005140149	SB-3 (40-42)	5/10/10	Chloride	NA	NA	NA
21005140150	SB-3 (37-38)	5/10/10	Chloride	NA	NA	NA
21005140150MS	SB-3 (37-38)	5/10/10	Chloride	NA	NA	NA
21005140150MSD	SB-3 (37-38)	5/10/10	Chloride	NA	NA	NA
21005140151	SB-3 (28-30)	5/10/10	Chloride	NA	NA	NA
21005140152	SB-3 (33-34)	5/10/10	Chloride	NA	NA	NA
21005140153	SB-3 (48-48.5)	5/10/10	Chloride	NA	NA	NA
21005140154	SB-3 (81-82)	5/11/10	Chloride	NA	NA	NA
21005140155	SB-3 (53-54)	5/11/10	Chloride	NA	NA	NA
21005140156	SB-3 (44-46)	5/10/10	Chloride	NA	NA	NA
21005140157	SB-3 (0-6)	5/10/10	Chloride	NA	NA	NA
21005142606	SB-1C (46-48)	5/13/10	Chloride	NA	NA	NA
21005142606MS	SB-1C (46-48)	5/13/10	Chloride	NA	NA	NA
21005142606MSD	SB-1C (46-48)	5/13/10	Chloride	NA	NA	NA
21005142607	SB-1C (51-52)	5/13/10	Chloride	NA	NA	NA
21005142608	SB-1C (53.5-54)	5/13/10	Chloride	NA	NA	NA
21005142609	SB-1C (54-56)	5/13/10	Chloride	NA	NA	NA
21005142610	SB-1C (58-60)	5/13/10	Chloride	NA	NA	NA
21005266601	MPA-SPLP-4	5/25/10	NA	NA	SPLP Mercury	NA
21005266601MS	MPA-SPLP-4	5/25/10	NA	NA	SPLP Mercury	NA
21005266601DUP	MPA-SPLP-4	5/25/10	NA	NA	SPLP Mercury	NA
21005266602	MPA-SPLP-5	5/25/10	NA	NA	SPLP Cr	NA
21005266602MS	MPA-SPLP-5	5/25/10	NA	NA	SPLP Cr	NA
21005266602DUP	MPA-SPLP-5	5/25/10	NA	NA	SPLP Cr	NA

TABLE 1
SAMPLE SUMMARY
(SOILS/SPLP)

LABORATORY ID	FIELD ID	SAMPLE DATE	TESTS PERFORMED			
21005242809	MPA-SPLP-1	5/20/10	NA	NA	SPLP Ba	NA
21005242809MS	MPA-SPLP-1	5/20/10	NA	NA	SPLP Ba,Pb	NA
21005242809DUP	MPA-SPLP-1	5/20/10	NA	NA	SPLP Ba,Pb	NA
21005242810	MPA-SPLP-2	5/20/10	NA	NA	SPLP Ba,Pb	NA
21005242811	MPA-SPLP-3	5/20/10	NA	NA	SPLP Ba,Pb	NA
21005242812	MPA-AB5(A) 4-6	5/19/10	NA	NA	NA	Frac TPH (1006)
21005242813	MPA-AB5(B) 4-6	5/19/10	NA	NA	NA	Frac TPH (1006)
21005242814	MPA-AB5(C) 4-6	5/19/10	NA	NA	NA	Frac TPH (1006)
21005242815	MPA-AB6 8-10 (DRY)	5/19/10	NA	Arsenic	NA	NA
21005242816	MPA-AB8 6-8 (DRY)	5/19/10	NA	Arsenic	NA	NA
21005242817	MPA-AB13 0-3 (DRY)	5/20/10	NA	Arsenic	NA	NA
21005242818	MPA-AB6 8-10 (NORMAL)	5/19/10	NA	Arsenic	NA	NA
21005242819	MPA-AB8 6-8 (NORMAL)	5/19/10	NA	Arsenic	NA	NA
21005242820	MPA-AB13 0-3 (NORMAL)	5/20/10	NA	Arsenic	NA	NA
21005242820MS	MPA-AB13 0-3 (NORMAL)	5/20/10	NA	Arsenic	NA	NA
21005242820DUP	MPA-AB13 0-3 (NORMAL)	5/20/10	NA	Arsenic	NA	NA

NA - Not analyzed

TABLE 1
SAMPLE SUMMARY
(SURFACE WATERS)

LABORATORY ID	FIELD ID	SAMPLE DATE	TESTS PERFORMED											
21005112801	SW-05	5/5/10	NA	Hardness	NA	TDS	Chloride	13 ICP Metals	7 ICP Metals-Dissolved	Arsenic	Arsenic-Dissolved	Mercury	Mercury-Dissolved	PAH
21005112801MS	SW-05	5/5/10	NA	NA	NA	NA	Chloride	NA	NA	Arsenic	NA	Mercury	Mercury-Dissolved	NA
21005112801MSD	SW-05	5/5/10	NA	NA	NA	NA	Chloride	NA	NA	NA	NA	NA	NA	NA
21005112801DUP	SW-05	5/5/10	NA	NA	NA	NA	NA	NA	NA	Arsenic	NA	Mercury	Mercury-Dissolved	NA
21005112802	SW-03	5/5/10	NA	Hardness	NA	TDS	Chloride	13 ICP Metals	7 ICP Metals-Dissolved	Arsenic	Arsenic-Dissolved	Mercury	Mercury-Dissolved	PAH
21005112803	SW-02	5/5/10	NA	Hardness	NA	TDS	Chloride	13 ICP Metals	7 ICP Metals-Dissolved	Arsenic	Arsenic-Dissolved	Mercury	Mercury-Dissolved	PAH
21005112804	SW-04	5/5/10	NA	Hardness	NA	TDS	Chloride	13 ICP Metals	7 ICP Metals-Dissolved	Arsenic	Arsenic-Dissolved	Mercury	Mercury-Dissolved	PAH
21005112804MS	SW-04	5/5/10	NA	NA	NA	NA	NA	NA	7 ICP Metals-Dissolved	NA	NA	NA	NA	NA
21005112804DUP	SW-04	5/5/10	NA	NA	NA	NA	NA	NA	7 ICP Metals-Dissolved	NA	NA	NA	NA	NA
21005112805	SW-01	5/6/10	Sulfate	Hardness	Salinity	TDS	Chloride	13 ICP Metals	7 ICP Metals-Dissolved	Arsenic	Arsenic-Dissolved	Mercury	Mercury-Dissolved	PAH
21005112805DUP	SW-01	5/6/10	NA	NA	Salinity	NA	NA	NA	NA	NA	NA	NA	NA	NA
21005112806	SW-06	5/6/10	Alkalinity	Hardness	NA	TDS	Chloride	13 ICP Metals	7 ICP Metals-Dissolved	Arsenic	Arsenic-Dissolved	Mercury	Mercury-Dissolved	PAH
21005112806MS	SW-06	5/6/10	NA	Hardness	NA	NA	NA	13 ICP Metals	NA	NA	NA	NA	NA	NA
21005112806DUP	SW-06	5/6/10	Alkalinity	Hardness	NA	NA	NA	13 ICP Metals	NA	NA	NA	NA	NA	NA

TABLE 1
SAMPLE SUMMARY
(SURFACE WATERS)

LABORATORY ID	FIELD ID	SAMPLE DATE	TESTS PERFORMED											
21005112807	SW-07	5/6/10	NA	Hardness	NA	TDS	Chloride	13 ICP Metals	7 ICP Metals-Dissolved	Arsenic	Arsenic-Dissolved	Mercury	Mercury-Dissolved	PAH
21005112807MS	SW-07	5/6/10	NA	NA	NA	NA	NA	NA	NA	NA	Arsenic-Dissolved	NA	NA	NA
21005112807DUP	SW-07	5/6/10	NA	NA	NA	NA	NA	NA	NA	NA	Arsenic-Dissolved	NA	NA	NA
21005112808	SW-10	5/6/10	Sulfate	Hardness	Salinity	TDS	Chloride	13 ICP Metals	7 ICP Metals-Dissolved	Arsenic	Arsenic-Dissolved	Mercury	Mercury-Dissolved	PAH
21005112809	SW-09	5/6/10	Sulfate	Hardness	Salinity	TDS	Chloride	13 ICP Metals	7 ICP Metals-Dissolved	Arsenic	Arsenic-Dissolved	Mercury	Mercury-Dissolved	PAH
21005112810	SW-109(1)	5/6/10	Alkalinity	Hardness	NA	TDS	Chloride	13 ICP Metals	7 ICP Metals-Dissolved	Arsenic	Arsenic-Dissolved	Mercury	Mercury-Dissolved	PAH
21005112810MS	SW-109(1)	5/6/10	NA	Hardness	NA	NA	NA	13 ICP Metals	NA	NA	NA	NA	NA	NA
21005112810DUP	SW-109(1)	5/6/10	NA	Hardness	NA	NA	NA	13 ICP Metals	NA	NA	NA	NA	NA	NA
21005112811	SW-20	5/7/10	NA	Hardness	NA	TDS	Chloride	13 ICP Metals	7 ICP Metals-Dissolved	Arsenic	Arsenic-Dissolved	Mercury	Mercury-Dissolved	PAH
21005140210	SW BK-01	5/10/10	Sulfate	Hardness	Salinity	TDS	Chloride	13 ICP Metals	7 ICP Metals-Dissolved	Arsenic	Arsenic-Dissolved	Mercury	Mercury-Dissolved	PAH
21005140210MS	SW BK-01	5/10/10	NA	Hardness	NA	NA	NA	13 ICP Metals	7 ICP Metals-Dissolved	NA	NA	NA	NA	NA
21005140210DUP	SW BK-01	5/10/10	NA	Hardness	NA	TDS	NA	13 ICP Metals	7 ICP Metals-Dissolved	NA	NA	NA	NA	NA

TABLE 1
SAMPLE SUMMARY
(SURFACE WATERS)

LABORATORY ID	FIELD ID	SAMPLE DATE	TESTS PERFORMED											
21005140211	SW BK-02	5/10/10	Alkalinity	Hardness	NA	TDS	Chloride	13 ICP Metals	7 ICP Metals-Dissolved	Arsenic	Arsenic-Dissolved	Mercury	Mercury-Dissolved	PAH
21005140211MS	SW BK-02	5/10/10	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Mercury-Dissolved	NA
21005140211DUP	SW BK-02	5/10/10	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Mercury-Dissolved	NA
21005140212	SW BK-03	5/10/10	NA	Hardness	NA	TDS	Chloride	13 ICP Metals	7 ICP Metals-Dissolved	Arsenic	Arsenic-Dissolved	Mercury	Mercury-Dissolved	PAH
21005140213	SW BK-04	5/10/10	Sulfate	Hardness	Salinity	TDS	Chloride	13 ICP Metals	7 ICP Metals-Dissolved	Arsenic	Arsenic-Dissolved	Mercury	Mercury-Dissolved	PAH
21005140214	SW BK-05	5/11/10	Alkalinity	Hardness	NA	TDS	Chloride	13 ICP Metals	7 ICP Metals-Dissolved	Arsenic	Arsenic-Dissolved	Mercury	Mercury-Dissolved	PAH
21005140214MS	SW BK-05	5/11/10	NA	NA	NA	NA	NA	NA	NA	NA	NA	Mercury	NA	NA
21005140214DUP	SW BK-05	5/11/10	NA	NA	NA	NA	NA	NA	NA	NA	NA	Mercury	NA	NA
21005140215	SW BK-06	5/11/10	Sulfate	Hardness	Salinity	TDS	Chloride	13 ICP Metals	7 ICP Metals-Dissolved	Arsenic	Arsenic-Dissolved	Mercury	Mercury-Dissolved	PAH
21005140215MS	SW BK-06	5/11/10	NA	NA	NA	NA	NA	NA	NA	Arsenic	NA	NA	NA	NA
21005140215DUP	SW BK-06	5/11/10	NA	NA	NA	NA	NA	NA	NA	Arsenic	NA	NA	NA	NA
21005140216	SW BK-07	5/11/10	Alkalinity	Hardness	NA	TDS	Chloride	13 ICP Metals	7 ICP Metals-Dissolved	Arsenic	Arsenic-Dissolved	Mercury	Mercury-Dissolved	PAH
21005140217	SW BK-08	5/11/10	NA	Hardness	NA	TDS	Chloride	13 ICP Metals	7 ICP Metals-Dissolved	Arsenic	Arsenic-Dissolved	Mercury	Mercury-Dissolved	PAH
21005140218	SW BK-09	5/11/10	NA	Hardness	NA	TDS	Chloride	13 ICP Metals	7 ICP Metals-Dissolved	Arsenic	Arsenic-Dissolved	Mercury	Mercury-Dissolved	PAH
21005140218MS	SW BK-09	5/11/10	NA	NA	NA	NA	NA	NA	NA	NA	Arsenic-Dissolved	NA	NA	NA
21005140218DUP	SW BK-09	5/11/10	NA	NA	NA	NA	NA	NA	NA	NA	Arsenic-Dissolved	NA	NA	NA

TABLE 1
SAMPLE SUMMARY
(SURFACE WATERS)

LABORATORY ID	FIELD ID	SAMPLE DATE	TESTS PERFORMED											
21005242801	SW-BK-11	5/19/10	NA	Hardness	NA	TDS	Chloride	7 ICP Metals	7 ICP Metals-Dissolved	Arsenic	Arsenic-Dissolved	Mercury	Mercury-Dissolved	PAH
21005242802	SW-BK-11 MS	5/19/10	NA	NA	NA	NA	Chloride	7 ICP Metals	NA	Arsenic	NA	Mercury	NA	NA
21005242803	SW-BK-11 MSD	5/19/10	NA	NA	NA	NA	Chloride	7 ICP Metals	NA	Arsenic	NA	Mercury	NA	NA
21005242804	SW-BK-10	5/19/10	NA	Hardness	NA	TDS	Chloride	7 ICP Metals	7 ICP Metals-Dissolved	Arsenic	Arsenic-Dissolved	Mercury	Mercury-Dissolved	PAH
21005242805	SW-BK-10 MS	5/19/10	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	PAH
21005242806	SW-BK-10 MSD	5/19/10	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	PAH

NA - Not analyzed

7 ICP Metals - Ba,Cd,Cr,Pb,Se,Sr,Zn

13 ICP Metals - Ba,Cd,Ca,Cr,Fe,Pb,Mg,Mn,K,Se,Na,Sr,Zn

(1) Field duplicate of SW-09 (21005112809)

TABLE 1
SAMPLE SUMMARY
(GROUNDWATER)

LABORATORY ID	FIELD ID	SAMPLE DATE	TESTS PERFORMED											
21003085001	MW-1	3/5/10	NA	NA	TDS	Chloride	7 ICP Metals	NA	Arsenic	NA	Mercury	BTEX	Bromide	TPH (1005)*
21003085001MS	MW-1	3/5/10	NA	NA	NA	NA	NA	NA	Arsenic	NA	NA	NA	Bromide	NA
21003085001MSD	MW-1	3/5/10	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Bromide	NA
21003085001DUP	MW-1	3/5/10	NA	NA	NA	NA	NA	NA	Arsenic	NA	NA	NA	NA	NA
21003085002	MW-2R	3/5/10	NA	NA	TDS	Chloride	7 ICP Metals	NA	Arsenic	NA	Mercury	BTEX	Bromide	TPH (1005)*
21003085003	MW-3R	3/5/10	NA	NA	TDS	Chloride	7 ICP Metals	NA	Arsenic	NA	Mercury	BTEX	Bromide	TPH (1005)*
21003085004	MW-50	3/5/10	NA	NA	TDS	Chloride	7 ICP Metals	NA	Arsenic	NA	Mercury	BTEX	Bromide	TPH (1005)*
21003085004MS	MW-50	3/5/10	NA	NA	NA	NA	7 ICP Metals	NA	NA	NA	NA	NA	NA	NA
21003085004DUP	MW-50	3/5/10	NA	NA	NA	NA	7 ICP Metals	NA	NA	NA	NA	NA	NA	NA
21003085005	TRIP BLANK	3/5/10	NA	NA	NA	NA	NA	NA	NA	NA	NA	BTEX	NA	NA
21005112701	SB-1-MW-S	5/7/10	Sulfate	Alkalinity	TDS	Chloride	8 ICP Metals	8 ICP Metals-Dissolved	Arsenic	Arsenic-Dissolved	NA	BTEX	NA	Frac TPH (1006)*
21005112701DUP	SB-1-MW-S	5/7/10	NA	Alkalinity	TDS	NA	NA	NA	NA	NA	NA	NA	NA	NA
21005112702	SB-1-MW-D	5/6/10	Sulfate	Alkalinity	TDS	Chloride	8 ICP Metals	8 ICP Metals-Dissolved	Arsenic	Arsenic-Dissolved	NA	BTEX	NA	Frac TPH (1006)*
21005140158	SB-2 MW-S	5/11/10	Sulfate	Alkalinity	TDS	Chloride	8 ICP Metals	8 ICP Metals-Dissolved	Arsenic	Arsenic-Dissolved	NA	BTEX	NA	Frac TPH (1006)*
21005140159	SB-3-MW-S	5/12/10	Sulfate	Alkalinity	TDS	Chloride	8 ICP Metals	8 ICP Metals-Dissolved	Arsenic	Arsenic-Dissolved	NA	BTEX	NA	Frac TPH (1006)*
21005140160	SB-3-MW-SD(1)	5/12/10	Sulfate	Alkalinity	TDS	Chloride	8 ICP Metals	8 ICP Metals-Dissolved	Arsenic	Arsenic-Dissolved	NA	BTEX	NA	Frac TPH (1006)*
21005142601	MW-4D	5/12/10	Sulfate	Alkalinity	TDS	Chloride	8 ICP Metals	8 ICP Metals-Dissolved	Arsenic	Arsenic-Dissolved	NA	BTEX	NA	Frac TPH (1006)*

TABLE 1
SAMPLE SUMMARY
(GROUNDWATER)

LABORATORY ID	FIELD ID	SAMPLE DATE	TESTS PERFORMED											
21005142601MS	MW-4D	5/12/10	Sulfate	NA	NA	NA	8 ICP Metals	8 ICP Metals-Dissolved	NA	NA	NA	NA	NA	NA
21005142601DUP	MW-4D	5/12/10	NA	NA	TDS	NA	8 ICP Metals	8 ICP Metals-Dissolved	NA	NA	NA	NA	NA	NA
21005142602	MW-5D	5/12/10	Sulfate	Alkalinity	TDS	Chloride	8 ICP Metals	8 ICP Metals-Dissolved	Arsenic	Arsenic-Dissolved	NA	BTEX	NA	Frac TPH (1006)*
21005142603	MW-6D	5/12/10	Sulfate	Alkalinity	TDS	Chloride	8 ICP Metals	8 ICP Metals-Dissolved	Arsenic	Arsenic-Dissolved	NA	BTEX	NA	Frac TPH (1006)*
21005142604	MW-6S	5/12/10	Sulfate	Alkalinity	TDS	Chloride	8 ICP Metals	8 ICP Metals-Dissolved	Arsenic	Arsenic-Dissolved	NA	BTEX	NA	Frac TPH (1006)*
21005142604MS	MW-6S	5/12/10	NA	NA	NA	NA	NA	NA	Arsenic	Arsenic-Dissolved	NA	NA	NA	NA
21005142604DUP	MW-6S	5/12/10	NA	NA	NA	NA	NA	NA	Arsenic	Arsenic-Dissolved	NA	NA	NA	NA
21005142605	MW-1C (97-100)	5/13/10	Sulfate	Alkalinity	TDS	Chloride	8 ICP Metals	8 ICP Metals-Dissolved	Arsenic	Arsenic-Dissolved	NA	NA	NA	NA
21005266603	MPA-WW-1	5/25/10	Sulfate	Alkalinity	TDS	Chloride	8 ICP Metals	NA	Arsenic	NA	NA	BTEX	NA	Frac TPH (1006)
21005266603MS	MPA-WW-1	5/25/10	NA	NA	NA	NA	8 ICP Metals	NA	NA	NA	NA	BTEX	NA	NA
21005266603DUP	MPA-WW-1	5/25/10	NA	Alkalinity	TDS	NA	8 ICP Metals	NA	NA	NA	NA	NA	NA	NA
21005266603MSD	MPA-WW-1	5/25/10	NA	NA	NA	NA	NA	NA	NA	NA	NA	BTEX	NA	NA
21005266604	TRIP BLANK		NA	NA	NA	NA	NA	NA	NA	NA	NA	BTEX	NA	Frac TPH (1006)

*Supporting raw data reviewed for this sample
NA - Not analyzed
7 ICP Metals - Ba,Cd,Cr,Pb,Se,Sr,Zn
8 ICP Metals - Ba,Ca,Fe,Mg,Mn,K,Na,Se

(1) Field duplicate of SB-3-MW-S (21005140159)

TABLE 2
QUALIFIED SAMPLE RESULTS

LAB ID	FIELD ID	SAMPLE DATE	SAMPLE MATRIX	ANALYTE(S)	LABORATORY RESULT	DVQ	QC OUTCOME
21005112801	SW-05	5/5/10	WATER	all PAHs	0.000101 U mg/L	UJ	low base-neutral SU recovery (59%); low base-neutral SU recovery (49%)
21005112802	SW-03	5/5/10	WATER	all PAHs	0.000104 U mg/L	UJ	low base-neutral SU recovery (55%); low base-neutral SU recovery (42%)
21005112804	SW-04	5/5/10	WATER	all PAHs	0.000103 U mg/L	UJ	low base-neutral SU recovery (55%); low base-neutral SU recovery (42%)
21005112808	SW-10	5/6/10	WATER	all PAHs	0.000102 U mg/L	UJ	low base-neutral SU recovery (59%); low base-neutral SU recovery (44%)
21005242801	SW-BK-11	5/19/10	WATER	2-Methylnaphthalene	0.000105 U mg/L	UJ	low LCS recovery (51%), passing LCSD recovery (62%)
21005242801	SW-BK-11	5/19/10	WATER	Anthracene	0.000105 U mg/L	UJ	low MS recovery (59%), low MSD recovery (56%)
21005242801	SW-BK-11	5/19/10	WATER	Benzo(k)fluoranthene	0.000105 U mg/L	UJ	low MS recovery (58%), passing MSD recovery (60%)
21005242801	SW-BK-11	5/19/10	WATER	Naphthalene	0.000105 U mg/L	UJ	low LCS recovery (54%), low LCSD recovery (48%); low MS recovery (52%), low MSD recovery (54%)
21005242804	SW-BK-10	5/19/10	WATER	2-Methylnaphthalene	0.000102 U mg/L	UJ	low LCS recovery (51%), passing LCSD recovery (62%)
21005242804	SW-BK-10	5/19/10	WATER	Anthracene	0.000102 U mg/L	UJ	low MS recovery (59%), low MSD recovery (56%)
21005242804	SW-BK-10	5/19/10	WATER	Benzo(k)fluoranthene	0.000102 U mg/L	UJ	low MS recovery (58%), passing MSD recovery (60%)
21005242804	SW-BK-10	5/19/10	WATER	Naphthalene	0.000102 U mg/L	UJ	low LCS recovery (54%), low LCSD recovery (48%); low MS recovery (52%), low MSD recovery (54%)
21003082601	SED-1 (0-2)	2/25/10	SOLID	Barium	81.2 mg/kg	J	low MS recovery (66%)
21003082602	SED-1 (2-4)	2/25/10	SOLID	Barium	24.1 mg/kg	J	low MS recovery (66%)
21003082603	SED-1 (4-6)	2/25/10	SOLID	Barium	31.1 mg/kg	J	low MS recovery (66%)
21003082604	SED-2 (0-2)	2/25/10	SOLID	Barium	76.8 mg/kg	J	low MS recovery (66%)
21003082605	SED-2 (2-4)	2/25/10	SOLID	Barium	27.9 mg/kg	J	low MS recovery (66%)
21003082606	SED-2 (4-6)	2/25/10	SOLID	Barium	40.9 mg/kg	J	low MS recovery (66%)
21003082607	SED-3 (0-2)	2/25/10	SOLID	Barium	48.2 mg/kg	J	low MS recovery (66%)
21003082608	SED-3 (2-4)	2/25/10	SOLID	Barium	23.1 mg/kg	J	low MS recovery (66%)
21003082609	SED-3 (4-6)	2/25/10	SOLID	Barium	41.2 mg/kg	J	low MS recovery (66%)
21003082610	SED-4 (0-2)	2/25/10	SOLID	Barium	203 mg/kg	J	low MS recovery (66%)
21003082611	SED-5 (0-2)	2/25/10	SOLID	Barium	61.4 mg/kg	J	low MS recovery (66%)
21003082612	SED-6 (0-2)	2/25/10	SOLID	Barium	111 mg/kg	J	low MS recovery (66%)
21003082613	SED-7 (0-2)	2/25/10	SOLID	Barium	228 mg/kg	J	low MS recovery (66%)
21003082614	SED-7 (2-4)	2/25/10	SOLID	Barium	497 mg/kg	J	low MS recovery (66%)
21003082615	SED-7 (4-6)	2/25/10	SOLID	Barium	250 mg/kg	J	low MS recovery (66%)
21003082616	SED-8 (0-2)	2/25/10	SOLID	Barium	238 mg/kg	J	low MS recovery (66%)
21003082617	SED-8 (2-4)	2/25/10	SOLID	Barium	267 mg/kg	J	low MS recovery (66%)

TABLE 2
QUALIFIED SAMPLE RESULTS

LAB ID	FIELD ID	SAMPLE DATE	SAMPLE MATRIX	ANALYTE	LABORATORY RESULT	DVQ	QC OUTCOME
21003082618	SED-9 (0-2)	2/25/10	SOLID	Barium	161 mg/kg	J	low MS recovery (66%)
21003082619	SED-9 (2-4)	2/25/10	SOLID	Barium	224 mg/kg	J	low MS recovery (66%)
21003082620	SED-10 (0-2)	2/25/10	SOLID	Barium	264 mg/kg	J	low MS recovery (66%)
21005112701	SB-1-MW-S	5/7/10	WATER	Barium	5.02 mg/L	J	dissolved conc > total conc and difference > 2xRDL
21005112701	SB-1-MW-S	5/7/10	WATER	Calcium	520 mg/L	J	dissolved conc > total conc and difference > 2xRDL
21005112701	SB-1-MW-S	5/7/10	WATER	Magnesium	201 mg/L	J	dissolved conc > total conc and difference > 2xRDL
21005112701	SB-1-MW-S	5/7/10	WATER	Manganese	2.96 mg/L	J	dissolved conc > total conc and difference > 2xRDL
21005112701	SB-1-MW-S	5/7/10	WATER	Sodium	1710 mg/L	J	dissolved conc > total conc and difference > 2xRDL
21005112801	SW-05	5/5/10	WATER	Potassium	33.1 mg/L	J	high MS recovery (133%)
21005112802	SW-03	5/5/10	WATER	Potassium	32.7 mg/L	J	high MS recovery (133%)
21005112803	SW-02	5/5/10	WATER	Potassium	33.3 mg/L	J	high MS recovery (133%)
21005112804	SW-04	5/5/10	WATER	Potassium	34.4 mg/L	J	high MS recovery (133%)
21005112805	SW-01	5/6/10	WATER	Potassium	29.2 mg/L	J	high MS recovery (133%)
21005112806	SW-06	5/6/10	WATER	Potassium	38.6 mg/L	J	high MS recovery (133%)
21005112807	SW-07	5/6/10	WATER	Potassium	40.7 mg/L	J	high MS recovery (133%)
21005140201	SED-BK-06	5/10/10	SOLID	Barium	229 mg/kg	J	high MS recovery (134%)
21005140202	SED-BK-01	5/10/10	SOLID	Barium	49 mg/kg	J	high MS recovery (134%)
21005140203	SED-BK-02	5/10/10	SOLID	Barium	96.8 mg/kg	J	high MS recovery (134%)
21005140204	SED-BK-03	5/10/10	SOLID	Barium	100 mg/kg	J	high MS recovery (134%)
21005140205	SED-BK-04	5/10/10	SOLID	Barium	212 mg/kg	J	high MS recovery (134%)
21005140206	SED-BK-05	5/11/10	SOLID	Barium	126 mg/kg	J	high MS recovery (134%)
21005140207	SED-BK-09	5/11/10	SOLID	Barium	63.8 mg/kg	J	high MS recovery (134%)
21005140208	SED-BK-07	5/11/10	SOLID	Barium	106 mg/kg	J	high MS recovery (134%)
21005140209	SED-BK-08	5/11/10	SOLID	Barium	92.6 mg/kg	J	high MS recovery (134%)
21005142602	MW-5D	5/12/10	WATER	Sodium	442 mg/L	J	dissolved conc > total conc and difference > 2xRDL
21005242807	SED-BK-11	5/19/10	SOLID	Zinc	18 mg/kg	J	low MS recovery (0%); lab DUP precision of 91 RPD
21005242808	SED-BK-10	5/19/10	SOLID	Zinc	51.4 mg/kg	J	low MS recovery (0%); lab DUP precision of 91 RPD
21005112701	SB-1-MW-S	5/7/10	WATER	Barium	5.61 mg/L	J	dissolved conc > total conc and difference > 2xRDL
21005112701	SB-1-MW-S	5/7/10	WATER	Calcium	568 mg/L	J	dissolved conc > total conc and difference > 2xRDL
21005112701	SB-1-MW-S	5/7/10	WATER	Magnesium	220 mg/L	J	dissolved conc > total conc and difference > 2xRDL
21005112701	SB-1-MW-S	5/7/10	WATER	Manganese	3.12 mg/L	J	dissolved conc > total conc and difference > 2xRDL

TABLE 2
QUALIFIED SAMPLE RESULTS

LAB ID	FIELD ID	SAMPLE DATE	SAMPLE MATRIX	ANALYTE	LABORATORY RESULT	DVQ	QC OUTCOME
21005112701	SB-1-MW-S	5/7/10	WATER	Sodium	1840 mg/L	J	dissolved conc > total conc and difference > 2xRDL
21005142602	MW-5D	5/12/10	WATER	Sodium	454 mg/L	J	dissolved conc > total conc and difference > 2xRDL
21003085001	MW-1	3/5/10	WATER	Arsenic	0.01 U mg/L	UJ	low MS recovery (66%)
21003085002	MW-2R	3/5/10	WATER	Arsenic	0.019 mg/L	J	low MS recovery (66%)
21003085003	MW-3R	3/5/10	WATER	Arsenic	0.01 U mg/L	UJ	low MS recovery (66%)
21003085004	MW-50	3/5/10	WATER	Arsenic	0.01 U mg/L	UJ	low MS recovery (66%)
21003082621	SED-10 (2-4)	2/25/10	SOLID	Mercury	0.025 mg/kg	J	laboratory DUP difference = 1.7xRDL
21003082622	SED-11 (0-2)	2/25/10	SOLID	Mercury	0.029 mg/kg	J	laboratory DUP difference = 1.7xRDL
21003082623	SED-11 (2-4)	2/25/10	SOLID	Mercury	0.033 mg/kg	J	laboratory DUP difference = 1.7xRDL
21003082624	SED-12 (0-2)	2/25/10	SOLID	Mercury	0.023 mg/kg	J	laboratory DUP difference = 1.7xRDL
21003082625	SED-12 (2-4)	2/25/10	SOLID	Mercury	0.031 mg/kg	J	laboratory DUP difference = 1.7xRDL
21003082626	SED-12 (4-6)	2/25/10	SOLID	Mercury	0.028 mg/kg	J	laboratory DUP difference = 1.7xRDL
21003082627	SED-13 (0-2)	2/26/10	SOLID	Mercury	0.018 mg/kg	J	laboratory DUP difference = 1.7xRDL
21003082628	SED-13 (2-4)	2/26/10	SOLID	Mercury	0.015 mg/kg	J	laboratory DUP difference = 1.7xRDL
21003082629	SED-14 (0-2)	2/26/10	SOLID	Mercury	0.019 mg/kg	J	laboratory DUP difference = 1.7xRDL
21003082630	SED-14 (2-4)	2/26/10	SOLID	Mercury	0.025 mg/kg	J	laboratory DUP difference = 1.7xRDL
21003082631	SED-15 (0-2)	2/26/10	SOLID	Mercury	0.28 mg/kg	J	laboratory DUP difference = 1.7xRDL
21003082632	SED-15 (2-4)	2/26/10	SOLID	Mercury	0.15 mg/kg	J	laboratory DUP difference = 1.7xRDL
21003082633	SED-16 (0-2)	2/26/10	SOLID	Mercury	0.016 mg/kg	J	laboratory DUP difference = 1.7xRDL
21003082634	SED-17 (0-2)	2/26/10	SOLID	Mercury	0.02 mg/kg	J	laboratory DUP difference = 1.7xRDL
21003082635	SED-17 (2-4)	2/26/10	SOLID	Mercury	0.033 mg/kg	J	laboratory DUP difference = 1.7xRDL
21003082636	SED-18 (0-2)	2/26/10	SOLID	Mercury	0.03 mg/kg	J	laboratory DUP difference = 1.7xRDL
21003082637	SED-18 (2-4)	2/26/10	SOLID	Mercury	0.034 mg/kg	J	laboratory DUP difference = 1.7xRDL
21003082638	SED-19 (0-2)	2/26/10	SOLID	Mercury	0.074 mg/kg	J	laboratory DUP difference = 1.7xRDL
21003082639	SED-19 (2-4)	2/26/10	SOLID	Mercury	0.054 mg/kg	J	laboratory DUP difference = 1.7xRDL
21003082640	SS-08 (0-2)	2/26/10	SOLID	Mercury	0.59 mg/kg	J	laboratory DUP difference = 1.7xRDL
21003082621	SED-10 (2-4)	2/25/10	SOLID	>C10-C28	42.8 J mg/kg	J	high SU recovery (131%); result is between MDL and RDL
21003082621	SED-10 (2-4)	2/25/10	SOLID	>C28-C35	4.91 J mg/kg	J	high SU recovery (131%); result is between MDL and RDL
21003082623	SED-11 (2-4)	2/25/10	SOLID	>C10-C28	57.4 mg/kg	J	high SU recovery (147%)
21003082642	SS-10 (0-2)	2/26/10	SOLID	>C10-C28	140 mg/kg	J	Total TPH by 1006 not within 60-140% of Total TPH by 1005 (57%)

TABLE 2

QUALIFIED SAMPLE RESULTS

LAB ID	FIELD ID	SAMPLE DATE	SAMPLE MATRIX	ANALYTE	LABORATORY RESULT	DVQ	QC OUTCOME
21003082642	SS-10 (0-2)	2/26/10	SOLID	>C28-C35	9.23 J mg/kg	J	Total TPH by 1006 not within 60-140% of Total TPH by 1005 (57%); result is between MDL and RDL
21003082653	SED-26 (2-4)	3/2/10	SOLID	>C10-C28	299 mg/kg	J	Total TPH by 1006 not within 60-140% of Total TPH by 1005 (50%)
21003082653	SED-26 (2-4)	3/2/10	SOLID	>C28-C35	57.9 mg/kg	J	Total TPH by 1006 not within 60-140% of Total TPH by 1005 (50%)
21003082658	SED-29 (0-2)	3/2/10	SOLID	>C10-C28	1030 mg/kg	J	Total TPH by 1006 not within 60-140% of Total TPH by 1005 (58%)
21003082658	SED-29 (0-2)	3/2/10	SOLID	>C28-C35	287 mg/kg	J	Total TPH by 1006 not within 60-140% of Total TPH by 1005 (58%)
21003082642	SS-10 (0-2)	2/26/10	SOLID	Aliphatic >C10-C12	15 U mg/kg	UJ	Total TPH by 1006 not within 60-140% of Total TPH by 1005 (57%)
21003082642	SS-10 (0-2)	2/26/10	SOLID	Aliphatic >C12-C16	24.3 mg/kg	J	Total TPH by 1006 not within 60-140% of Total TPH by 1005 (57%)
21003082642	SS-10 (0-2)	2/26/10	SOLID	Aliphatic >C16-C35	61.2 mg/kg	J	Total TPH by 1006 not within 60-140% of Total TPH by 1005 (57%)
21003082642	SS-10 (0-2)	2/26/10	SOLID	Aromatic >C10-C12	10 U mg/kg	UJ	Total TPH by 1006 not within 60-140% of Total TPH by 1005 (57%)
21003082642	SS-10 (0-2)	2/26/10	SOLID	Aromatic >C12-C16	15 U mg/kg	UJ	Total TPH by 1006 not within 60-140% of Total TPH by 1005 (57%)
21003082642	SS-10 (0-2)	2/26/10	SOLID	Aromatic >C16-C21	15 U mg/kg	UJ	Total TPH by 1006 not within 60-140% of Total TPH by 1005 (57%)
21003082642	SS-10 (0-2)	2/26/10	SOLID	Aromatic >C21-C35	15 U mg/kg	UJ	Total TPH by 1006 not within 60-140% of Total TPH by 1005 (57%)
21003082653	SED-26 (2-4)	3/2/10	SOLID	Aliphatic >C10-C12	15 U mg/kg	UJ	Total TPH by 1006 not within 60-140% of Total TPH by 1005 (50%)
21003082653	SED-26 (2-4)	3/2/10	SOLID	Aliphatic >C12-C16	34.5 mg/kg	J	Total TPH by 1006 not within 60-140% of Total TPH by 1005 (50%)
21003082653	SED-26 (2-4)	3/2/10	SOLID	Aliphatic >C16-C35	111 mg/kg	J	Total TPH by 1006 not within 60-140% of Total TPH by 1005 (50%)
21003082653	SED-26 (2-4)	3/2/10	SOLID	Aromatic >C10-C12	10 U mg/kg	UJ	Total TPH by 1006 not within 60-140% of Total TPH by 1005 (50%)
21003082653	SED-26 (2-4)	3/2/10	SOLID	Aromatic >C12-C16	8.16 J mg/kg	J	Total TPH by 1006 not within 60-140% of Total TPH by 1005 (50%); result is between MDL and RDL
21003082653	SED-26 (2-4)	3/2/10	SOLID	Aromatic >C16-C21	15.5 mg/kg	J	Total TPH by 1006 not within 60-140% of Total TPH by 1005 (50%)
21003082653	SED-26 (2-4)	3/2/10	SOLID	Aromatic >C21-C35	7.72 J mg/kg	J	Total TPH by 1006 not within 60-140% of Total TPH by 1005 (50%); result is between MDL and RDL
21003082658	SED-29 (0-2)	3/2/10	SOLID	Aliphatic >C10-C12	15 U mg/kg	UJ	Total TPH by 1006 not within 60-140% of Total TPH by 1005 (58%)
21003082658	SED-29 (0-2)	3/2/10	SOLID	Aliphatic >C12-C16	53.6 mg/kg	J	Total TPH by 1006 not within 60-140% of Total TPH by 1005 (58%)
21003082658	SED-29 (0-2)	3/2/10	SOLID	Aliphatic >C16-C35	469 mg/kg	J	Total TPH by 1006 not within 60-140% of Total TPH by 1005 (58%)
21003082658	SED-29 (0-2)	3/2/10	SOLID	Aromatic >C10-C12	10 U mg/kg	UJ	Total TPH by 1006 not within 60-140% of Total TPH by 1005 (58%)
21003082658	SED-29 (0-2)	3/2/10	SOLID	Aromatic >C12-C16	15 U mg/kg	UJ	Total TPH by 1006 not within 60-140% of Total TPH by 1005 (58%)
21003082658	SED-29 (0-2)	3/2/10	SOLID	Aromatic >C16-C21	60.4 mg/kg	J	Total TPH by 1006 not within 60-140% of Total TPH by 1005 (58%)
21003082658	SED-29 (0-2)	3/2/10	SOLID	Aromatic >C21-C35	183 mg/kg	J	Total TPH by 1006 not within 60-140% of Total TPH by 1005 (58%)
21005112702	SB-1-MW-D	5/6/10	WATER	all Aliphatic and Aromatic C-ranges	0.15 U mg/L	UJ	low SU recovery (56%)

TABLE 3

DATA VALIDATION QUALIFIERS (DVQs)

The DVQ replaces all flags applied by the laboratory.

U = Blank affected. The analyte was not detected substantially above the level reported in an associated laboratory and/or field blanks.

UJ = Estimated. The analyte was not detected above the reporting limit; however, the reporting limit is approximate due to exceedance of one or more QC requirements.

J = Estimated. The reported sample concentration is approximate due to exceedance of one or more QC requirements. Directional bias cannot be determined

NS = Not selected. More than one result is reported for this analyte and another result is selected for use based on QC and the reported concentration.

R = Rejected. The sample result is rejected due to serious QC deficiencies that make it impossible to verify the presence or absence of the analyte.

NOTE: For multiple deficiencies the validator applied the most severe flag. (R > U > UJ/J)

TABLE 4

METHOD SUMMARY

Test	Preparation	Analysis	Reporting
SOLIDS			
Arsenic	SW-846 3050B (acid digestion)	SW-846 7010 (Graphite furnace atomic absorption)	RDL of 0.12 mg/kg on wet-weight for 'Normal' samples and dry-weight (measured by drying sample and then digesting) for 'Dry' samples adjusted up to 5x for sample dilution; values between MDL and RDL reported with a J flag
Chloride	NA	EPA 9251 (Automated ferricyanide method)	RDL of 10 mg/kg on wet-weight adjusted up to 10x for sample dilution; values between MDL and RDL reported with a J flag
Fractionated Total Petroleum Hydrocarbons (Frac TPH)	TNRCC 1006/LA 1006 (solid phase silica column separation of TNRCC 1005 n-pentane extract)	TNRCC 1006/LA 1006 (GC-FID, quantitation with 6-point curve using gaoline/diesel fuel#2 standards and carbon markers, forced baseline projection)	3 Aliphatic/4 aromatic target C-ranges covering >C10-C35; RDL of 10-15 mg/kg on wet-weight adjusted up to 50x for sample dilution; values between MDL and RDL reported with a J flag
ICP Metals	SW-846 3050B (acid digestion)	SW-846 6010B (ICP-AES with background correction)	RDL of 0.2-1.6 mg/kg on wet-weight adjusted for sample aliquot size and up to 2-5x for dilution (barium only); values between MDL and RDL reported with a J flag
Mercury	SW-846 7471B (acid digestion and addition of potassium permanganate)	SW-846 7471B (Cold-vapor atomic absorption)	RDL of 0.01 mg/kg on wet-weight adjusted for sample aliquot size and up to 20x for dilution ; values between MDL and RDL reported with a J flag
Polynuclear Aromatic Hydrocarbons (PAH)	SW-846 3550B (ultrasonic solvent extraction and concentration)	SW-846 8270C (GC-MS, quantitation with minimum 5-point curve, internal standardization)	16 Target analytes; RDL of 0.33 mg/kg on wet-weight adjusted for sample aliquot size; values between MDL and RDL reported with a J flag
Polychlorinated Biphenyls (PCB)	SW-846 3550B (ultrasonic solvent extraction and concentration)	SW-846 8082 (GC-ECD with second column confirmation, quantitation with mininum 5-point curve)	7 Target analytes; RDL of 0.04 mg/kg on wet-weight adjusted for sample aliquot size and up to 5x for dilution ; values between MDL and RDL reported with a J flag
SPLP ICP Metals	SW-846 1312/3010A (Synthetic Precipitation Leaching Procedure, acid digestion)	SW-846 6010B (ICP-AES with background correction)	RDL of 0.003-0.01 mg/L; values between MDL and RDL reported with a J flag
SPLP Mercury	SW-846 1312/7470A (Synthetic Precipitation Leaching Procedure, acid digestion and addition of potassium permanganate)	SW-846 7470A (Cold-vapor atomic absorption)	RDL of 0.0002 mg/L; values between MDL and RDL reported with a J flag
Total Organic Carbon (TOC)	NA	EPA 9060 (Carbonaceous analyzer)	RDL of 200 mg/kg; values between MDL and RDL reported with a J flag
Total Petroleum Hydrocarbons (TPH)	TNRCC 1005/LA 1005 (n-pentane extraction with no solvent concentration or cleanup)	TNRCC 1005/LA 1005 (GC-FID, quantitation with 6-point curve using gaoline/diesel fuel#2 standards and carbon markers, forced baseline projection)	2 Target C-ranges covering >C10-C35; RDL of 50 mg/kg on wet-weight adjusted up to 100x for sample dilution; values between MDL and RDL reported with a J flag

Test	Preparation	Analysis	Reporting
WATERS			
Arsenic (Total and Diss)	SW-846 3020A (field-filtration and preservation, acid digestion)	SW-846 7010 (Graphite furnace atomic absorption)	RDL of 0.01 mg/L; values between MDL and RDL reported with a J flag
Bicarbonate/ Carbonate Alkalinity	NA	SM 2320 B (Titration method)	2 Target analytes; RDL of 1 mg/L CaCO3; values between MDL and RDL reported with a J flag
Bromide	NA	SW-846 9056/EPA 300.0 (Ion chromatography)	RDL of 0.2 mg/L adjusted up to 100x for sample dilution; values between MDL and RDL reported with a J flag
Benzene, Toluene, Ethylbenzene, Xylene (BTEX)	SW-846 5030B (ambient purge and trap of preserved sample)	SW-846 8260B (GC-MS, quantitation with minimum 5-point curve, internal standardization)	4 Target analytes; RDL of 0.005-0.1 mg/L; values between MDL and RDL reported with a J flag
Chloride	NA	SM 4500 CL E (Automated ferricyanide method)	RDL of 1 mg/L adjusted up to 200x for sample dilution; values between MDL and RDL reported with a J flag
Fractionated Total Petroleum Hydrocarbons (Frac TPH)	TNRCC 1006/LA 1006 (solid phase silica column separation of TNRCC 1005 n-pentane extract)	TNRCC 1006/LA 1006 (GC-FID, quantitation with 6-point curve using gaoline/diesel fuel#2 standards and carbon markers, forced baseline projection)	5 Aliphatic/5 aromatic target C-ranges covering C6-C35; RDL of 0.15 mg/L; values between MDL and RDL reported with a J flag
Hardness	NA	SM 2340 B (Calculation from Ca and Mg)	3 Target analytes; RDL of 0.1-0.33 mg/L; values between MDL and RDL reported with a J flag
ICP Metals (Total and Diss)	SW-846 3010A (field-filtration and preservation, acid digestion)	SW-846 6010B (ICP-AES with background correction)	RDL of 0.0027-1 mg/L adjusted up to 5x for sample dilution (sodium and strontium only); values between MDL and RDL reported with a J flag
Mercury (Total and Diss)	SW-846 7470A (field-filtration and preservation, acid digestion and addition of potassium permanganate)	SW-846 7470A (Cold-vapor atomic absorption)	RDL of 0.0002 mg/L; values between MDL and RDL reported with a J flag
Polynuclear Aromatic Hydrocarbons (PAH)	SW-846 3510C (separatory funnel liquid-liquid solvent extraction and concentration)	SW-846 8270C SIM (GC-MS Single Ion Monitoring, quantitation with minimum 5-point curve, internal standardization)	16 Target analytes; RDL of 0.0001 mg/L adjusted for sample aliquot size; values between MDL and RDL reported with a J flag
Salinity	NA	SM 2520 B (Electroconductivity method)	RDL of 2 ppt
Sulfate	NA	EPA 375.4 (Turbidimetric)	RDL of 5 mg/L adjusted up to 10x for sample dilution; values between MDL and RDL reported with a J flag
Total Diss Solids (TDS)	NA	SM 2540 C (Dried at 180 C)	RDL of 10 mg/L

Test	Preparation	Analysis	Reporting
Total Petroleum Hydrocarbons (TPH)	TNRCC 1005/LA 1005 (n-pentane extraction with no solvent concentration or cleanup)	TNRCC 1005/LA 1005 (GC-FID, quantitation with 6-point curve using gaoline/diesel fuel#2 standards and carbon markers, forced baseline projection)	3 Target C-ranges covering C6-C35; RDL of 0.15 mg/L; values between MDL and RDL reported with a J flag

EPA (Methods for Chemical Analysis of Water and Wastes)
SM (Standards Methods for the Examination of Water and Wastewater)
SW-846 (Test Methods for Evaluating Solid Waste, Physical/Chemical Methods)
TNRCC (Texas Natural Resource Conservation Commission)

Note: The laboratory diluted samples due to target analyte concentrations or sample matrix. Non-detects are reported from an undiluted analysis for all samples except two PCB samples (SED-6 (0-2) and SED-8 (0-2)).

TABLE 5
QC CHECK RESULTS

FIELD ID	LAB ID	METHOD	ANALYTE	PREP BATCH	QC BATCH	PREP DATE	ANALY DATE	MATRIX	QC COMMENT	DVQ APPLIED
LCS/LCSD ACCURACY										
LCS/LCSD		8270	2-Methylnaphthalene	432705	432841	5/26/10	5/27/10	WATER	low LCS recovery (51%), passing LCSD recovery (62%)	J/UJ to detects/NDs
LCS/LCSD		8270	Anthracene	432705	432841	5/26/10	5/27/10	WATER	passing LCS recovery (78%), low LCSD recovery (59%)	none (passing average LCS/LCSD recovery)
LCS/LCSD		8270	Naphthalene	432705	432841	5/26/10	5/27/10	WATER	low LCS recovery (54%), low LCSD recovery (48%)	J/UJ to NDs/detects
MS/MSD ACCURACY										
SW-BK-10	MS/MSD	8270	2-Methylnaphthalene	432705	432841	5/26/10	5/27/10	WATER	passing MS recovery (63%), low MSD recovery (57%)	none (passing average MS/MSD recovery)
SW-BK-10	MS/MSD	8270	Acenaphthene	432705	432841	5/26/10	5/27/10	WATER	passing MS recovery (72%), low MSD recovery (55%)	none (passing average MS/MSD recovery)
SW-BK-10	MS/MSD	8270	Anthracene	432705	432841	5/26/10	5/27/10	WATER	low MS recovery (59%), low MSD recovery (56%)	J/UJ to NDs/detects
SW-BK-10	MS/MSD	8270	Benzo(k) fluoranthene	432705	432841	5/26/10	5/27/10	WATER	low MS recovery (58%), passing MSD recovery (60%)	J/UJ to NDs/detects
SW-BK-10	MS/MSD	8270	Naphthalene	432705	432841	5/26/10	5/27/10	WATER	low MS recovery (52%), low MSD recovery (54%)	J/UJ to NDs/detects
SED-2 (0-2)	MS	SW-846 6010B	Barium	427500	427548	3/8/10	3/9/10	SOLID	low MS recovery (66%)	J / UJ to detects/NDs
SED-BK-01	MS	SW-846 6010B	Barium	431644	432227	5/14/10	5/20/10	SOLID	high MS recovery (134%)	J to detects
SED-BK-10	MS	SW-846 6010B	Zinc	432560	433334	5/25/10	6/2/10	SOLID	low MS recovery (0%)	J/UJ to detects/NDs (DUP shows significant heterogeneity)
SW-06	MS	SW-846 6010B	Potassium	431357	431478	5/11/10	5/12/10	WATER	high MS recovery (133%)	J to detects
MW-1	MS	SW-846 7010	Arsenic	427514	427603	3/9/10	3/10/10	WATER	low MS recovery (66%)	J / UJ to detects/NDs

TABLE 5

QC CHECK RESULTS

FIELD ID	LAB ID	METHOD	ANALYTE	PREP BATCH	QC BATCH	PREP DATE	ANALY DATE	MATRIX	QC COMMENT	DVQ APPLIED
SURROGATE RECOVERY										
SED-19	21005112908	8270	Nitrobenzene-d5	431363	431544	5/12/10	5/13/10	SOLID	low base-neutral SU recovery (59%)	none (only one of multiple surrogates is outside limits)
SED-BK-03	21005140204	8270	2-Fluorobiphenyl	431973	432243	5/19/10	5/20/10	SOLID	low base-neutral SU recovery (58%)	none (only one of multiple surrogates is outside limits)
SW-05	21005112801	8270	Nitrobenzene-d5	431369	431542	5/12/10	5/13/10	WATER	low base-neutral SU recovery (59%)	J / UJ to detects/NDs for base-neutral analytes (all PAHs)
SW-05	21005112801	8270	2-Fluorobiphenyl	431369	431542	5/12/10	5/13/10	WATER	low base-neutral SU recovery (49%)	J / UJ to detects/NDs for base-neutral analytes (all PAHs)
SW-03	21005112802	8270	Nitrobenzene-d5	431369	431542	5/12/10	5/13/10	WATER	low base-neutral SU recovery (55%)	J / UJ to detects/NDs for base-neutral analytes (all PAHs)
SW-03	21005112802	8270	2-Fluorobiphenyl	431369	431542	5/12/10	5/13/10	WATER	low base-neutral SU recovery (42%)	J / UJ to detects/NDs for base-neutral analytes (all PAHs)
SW-02	21005112803	8270	Nitrobenzene-d5	431369	431542	5/12/10	5/13/10	WATER	low base-neutral SU recovery (57%)	none (only one of multiple surrogates is outside limits)
SW-04	21005112804	8270	Nitrobenzene-d5	431369	431542	5/12/10	5/13/10	WATER	low base-neutral SU recovery (55%)	J / UJ to detects/NDs for base-neutral analytes (all PAHs)
SW-04	21005112804	8270	2-Fluorobiphenyl	431369	431542	5/12/10	5/13/10	WATER	low base-neutral SU recovery (42%)	J / UJ to detects/NDs for base-neutral analytes (all PAHs)
SW-01	21005112805	8270	2-Fluorobiphenyl	431369	431542	5/12/10	5/13/10	WATER	low base-neutral SU recovery (41%)	none (only one of multiple surrogates is outside limits)
SW-06	21005112806	8270	2-Fluorobiphenyl	431369	431542	5/12/10	5/13/10	WATER	low base-neutral SU recovery (52%)	none (only one of multiple surrogates is outside limits)
SW-07	21005112807	8270	2-Fluorobiphenyl	431369	431542	5/12/10	5/13/10	WATER	low base-neutral SU recovery (51%)	none (only one of multiple surrogates is outside limits)
SW-10	21005112808	8270	Nitrobenzene-d5	431369	431542	5/12/10	5/13/10	WATER	low base-neutral SU recovery (59%)	J / UJ to detects/NDs for base-neutral analytes (all PAHs)
SW-10	21005112808	8270	2-Fluorobiphenyl	431369	431542	5/12/10	5/13/10	WATER	low base-neutral SU recovery (44%)	J / UJ to detects/NDs for base-neutral analytes (all PAHs)

TABLE 5
QC CHECK RESULTS

FIELD ID	LAB ID	METHOD	ANALYTE	PREP BATCH	QC BATCH	PREP DATE	ANALY DATE	MATRIX	QC COMMENT	DVQ APPLIED
SW-109	21005112810	8270	2-Fluorobiphenyl	431474	431542	5/13/10	5/13/10	WATER	low base-neutral SU recovery (59%)	none (only one of multiple surrogates is outside limits)
SW BK-02	21005140211	8270	Nitrobenzene-d5	431881	432140	5/17/10	5/19/10	WATER	low base-neutral SU recovery (53%)	none (only one of multiple surrogates is outside limits)
SW BK-04	21005140213	8270	Nitrobenzene-d5	431881	432140	5/17/10	5/19/10	WATER	low base-neutral SU recovery (54%)	none (only one of multiple surrogates is outside limits)
SW BK-09	21005140218	8270	2-Fluorobiphenyl	431881	432140	5/17/10	5/19/10	WATER	low base-neutral SU recovery (59%)	none (only one of multiple surrogates is outside limits)
SW-BK-10 MS	21005242805	8270	Terphenyl-d14	432705	432841	5/26/10	5/27/10	WATER	low base-neutral SU recovery (58%)	none (only one of multiple surrogates is outside limits)
SW-BK-10 MSD	21005242806	8270	2-Fluorobiphenyl	432705	432841	5/26/10	5/27/10	WATER	low base-neutral SU recovery (54%)	none (only one of multiple surrogates is outside limits)
SED-10 (2-4)	21003082621	TNRCC 1005/LA 1005	o-Terphenyl	427527	427781	3/10/10	3/11/10	SOLID	high SU recovery (131%)	J to detects
SED-11 (2-4)	21003082623	TNRCC 1005/LA 1005	o-Terphenyl	427527	427781	3/10/10	3/11/10	SOLID	high SU recovery (147%)	J to detects
SED-12 (0-2)	21003082624	TNRCC 1005/LA 1005	o-Terphenyl	427527	427781	3/10/10	3/11/10	SOLID	high SU recovery (140%)	J to detects (none)
SED-15 (0-2)	21003082631	TNRCC 1005/LA 1005	o-Terphenyl	427527	427848	3/10/10	3/12/10	SOLID	none	SU diluted out
SED-15 (2-4)	21003082632	TNRCC 1005/LA 1005	o-Terphenyl	427527	427848	3/10/10	3/12/10	SOLID	none	SU diluted out
SED-28 (0-2)	21003082656	TNRCC 1005/LA 1005	o-Terphenyl	427810	428093	3/15/10	3/17010	SOLID	none	SU diluted out
MW-2R	21003085002	TNRCC 1005/LA 1005	o-Terphenyl	427931	428005	3/16/10	3/16/10	WATER	high SU recovery (132%)	J to detects (none)
MW-50	21003085004	TNRCC 1005/LA 1005	o-Terphenyl	427931	428005	3/16/10	3/16/10	WATER	high SU recovery (131%)	J to RRs (none)
SED-15 (0-2)	21003082631	TNRCC 1006/LA 1006	o-Terphenyl	428320	428686	3/23/10	3/26/10	SOLID	none	SU diluted out
SED-15 (2-4)	21003082632	TNRCC 1006/LA 1006	o-Terphenyl	428320	428686	3/23/10	3/26/10	SOLID	none	SU diluted out
SB-1-MW-D	21005112702	TNRCC 1006/LA 1006	o-Terphenyl	431974	432653	5/17/10	5/22/10	WATER	low SU recovery (56%)	J / UJ to detects/NDs

TABLE 5
QC CHECK RESULTS

FIELD ID	LAB ID	METHOD	ANALYTE	PREP BATCH	QC BATCH	PREP DATE	ANALY DATE	MATRIX	QC COMMENT	DVQ APPLIED
LCSD PRECISION										
LCSD		8270	Fluorene	431369	431542	5/12/10	5/13/10	WATER	LCS/LCSD precision of 34 RPD	J to detects (none)
LCSD		8270	2-Methylnaphthalene	432705	432841	5/26/10	5/27/10	WATER	LCS/LCSD precision of 21 RPD	J to detects (none)
LCSD		8270	Anthracene	432705	432841	5/26/10	5/27/10	WATER	LCS/LCSD precision of 27 RPD	J to detects (none)
LABORATORY DUPLICATE PRECISION										
SED-BK-10	DUP	SW-846 6010B	Zinc	432560	433334	5/25/10	6/2/10	SOLID	lab DUP precision of 91 RPD	J to detects
SED-10 (2-4)	DUP	SW-846 7471B	Mercury	427504	427539	3/9/10	3/9/10	SOLID	laboratory DUP difference = 1.7xRDL	J / UJ to detects/NDs
LABORATORY BLANKS										
Method Blank		EPA 9251	Chloride	428130	428132	3/17/10	3/19/10	SOLID	laboratory blank contamination (1.71 B mg/kg)	none (blank concentration <RDL)
Method Blank		EPA 9251	Chloride	432285	432286	5/19/10	5/20/10	SOLID	laboratory blank contamination (3.02 B mg/kg)	none (blank concentration <RDL)
Method Blank		EPA 9251	Chloride	432724	432725	5/24/10	5/25/10	SOLID	laboratory blank contamination (2.48 B mg/kg)	none (blank concentration <RDL)
Method Blank		SM 2340 B	Magnesium	431357	431478	5/11/10	5/12/10	WATER	laboratory blank contamination (0.029 B mg/L)	none (blank concentration <RDL)
Method Blank		SM 2340 B	Magnesium	431669	432180	5/14/10	5/23/10	WATER	laboratory blank contamination (0.026 B mg/L)	none (blank concentration <RDL)
Method Blank		SM 4500 CL E Chloride	Chloride	NA	432456		5/22/10	WATER	laboratory blank contamination (0.33 B mg/L)	none (blank concentration <RDL)
Method Blank		SM 4500 CL E Chloride	Chloride	NA	432688		5/25/10	WATER	laboratory blank contamination (0.26 B mg/L)	none (blank concentration <RDL)
Method Blank		SM 4500 CL E Chloride	Chloride	NA	432689		5/25/10	WATER	laboratory blank contamination (0.31 B mg/L)	none (blank concentration <RDL)

TABLE 5
QC CHECK RESULTS

FIELD ID	LAB ID	METHOD	ANALYTE	PREP BATCH	QC BATCH	PREP DATE	ANALY DATE	MATRIX	QC COMMENT	DVQ APPLIED
Method Blank		SM 4500 CL E Chloride	Chloride	NA	433005		5/28/10	WATER	laboratory blank contamination (0.31 B mg/L)	none (blank concentration <RDL)
Method Blank		SW-846 6010B	Barium	427501	427630	3/9/10	3/10/10	SOLID	laboratory blank contamination (0.053 B mg/kg)	none (blank concentration <RDL)
Method Blank		SW-846 6010B	Cadmium	427501	427630	3/9/10	3/10/10	SOLID	laboratory blank contamination (0.013 B mg/kg)	none (blank concentration <RDL)
Method Blank		SW-846 6010B	Chromium	427501	427630	3/9/10	3/10/10	SOLID	laboratory blank contamination (0.042 B mg/kg)	none (blank concentration <RDL)
Method Blank		SW-846 6010B	Barium	427512	427663	3/9/10	3/11/10	SOLID	laboratory blank contamination (0.025 B mg/kg)	none (blank concentration <RDL)
Method Blank		SW-846 6010B	Barium	431366	431454	5/11/10	5/12/10	SOLID	laboratory blank contamination (0.024 B mg/kg)	none (blank concentration <RDL)
Method Blank		SW-846 6010B	Cadmium	431366	431454	5/11/10	5/12/10	SOLID	laboratory blank contamination (0.019 B mg/kg)	none (blank concentration <RDL)
Method Blank		SW-846 6010B	Zinc	431366	431454	5/11/10	5/12/10	SOLID	laboratory blank contamination (0.16 B mg/kg)	none (blank concentration <RDL)
Method Blank		SW-846 6010B	Chromium	431644	432227	5/14/10	5/20/10	SOLID	laboratory blank contamination (0.029 B mg/kg)	none (blank concentration <RDL)
Method Blank		SW-846 6010B	Magnesium	431357	431478	5/11/10	5/12/10	WATER	laboratory blank contamination (0.029 B mg/L)	none (blank concentration <RDL)
Method Blank		SW-846 6010B	Potassium	431357	432074	5/11/10	5/18/10	WATER	laboratory blank contamination (0.095 B mg/L)	none (blank concentration <RDL)
Method Blank		SW-846 6010B	Sodium	431357	431478	5/11/10	5/12/10	WATER	laboratory blank contamination (0.75 B mg/L)	none (blank concentration <RDL)
Method Blank		SW-846 6010B	Potassium	431358	431478	5/11/10	5/12/10	WATER	laboratory blank contamination (0.068 B mg/L)	none (blank concentration <RDL)

TABLE 5
QC CHECK RESULTS

FIELD ID	LAB ID	METHOD	ANALYTE	PREP BATCH	QC BATCH	PREP DATE	ANALY DATE	MATRIX	QC COMMENT	DVQ APPLIED
Method Blank		SW-846 6010B	Sodium	431358	431564	5/11/10	5/13/10	WATER	laboratory blank contamination (0.50 B mg/L)	none (blank concentration <RDL)
Method Blank		SW-846 6010B	Magnesium	431669	432180	5/14/10	5/23/10	WATER	laboratory blank contamination (0.026 B mg/L)	none (blank concentration <RDL)
Method Blank		SW-846 6010B	Potassium	431669	432623	5/14/10	5/24/10	WATER	laboratory blank contamination (0.35 B mg/L)	none (blank concentration <RDL)
Method Blank		SW-846 6010B	Sodium	431669	432180	5/14/10	5/23/10	WATER	laboratory blank contamination (0.44 B mg/L)	none (blank concentration <RDL)
Method Blank		SW-846 6010B	Potassium	431670	432911	5/14/10	5/27/10	WATER	laboratory blank contamination (0.11 B mg/L)	none (blank concentration <RDL)
Method Blank		SW-846 6010B	Sodium	431670	432911	5/14/10	5/27/10	WATER	laboratory blank contamination (1.04 mg/L)	U to detects < 10 x BlankEquivConc (none)
Method Blank		SW-846 6010B	Barium	431818	432290	5/16/10	5/19/10	WATER	laboratory blank contamination (0.00043 B mg/L)	none (blank concentration <RDL)
Method Blank		SW-846 6010B	Calcium	431818	432290	5/16/10	5/19/10	WATER	laboratory blank contamination (0.063 B mg/L)	none (blank concentration <RDL)
Method Blank		SW-846 6010B	Potassium	431818	432290	5/16/10	5/19/10	WATER	laboratory blank contamination (0.15 B mg/L)	none (blank concentration <RDL)
Method Blank		SW-846 6010B	Manganese	432866	433375	5/28/10	6/2/10	WATER	laboratory blank contamination (0.00064 B mg/L)	none (blank concentration <RDL)
Method Blank		SW-846 6010B	Sodium	432866	433375	5/28/10	6/2/10	WATER	laboratory blank contamination (0.45 B mg/L)	none (blank concentration <RDL)
Method Blank		SW-846 6010B	Cadmium	432614	433089	5/24/10	5/29/10	WATER	laboratory blank contamination (0.00046 B mg/L)	none (blank concentration <RDL)
Method Blank		SW-846 6010B Dissolved	Cadmium	431356	431478	5/11/10	5/12/10	WATER	laboratory blank contamination (0.00025 B mg/L)	none (blank concentration <RDL)

TABLE 5
QC CHECK RESULTS

FIELD ID	LAB ID	METHOD	ANALYTE	PREP BATCH	QC BATCH	PREP DATE	ANALY DATE	MATRIX	QC COMMENT	DVQ APPLIED
Method Blank		SW-846 6010B Dissolved	Sodium	431356	431564	5/11/10	5/13/10	WATER	laboratory blank contamination (0.30 B mg/L)	none (blank concentration <RDL)
Method Blank		SW-846 6010B Dissolved	Magnesium	431819	432290	5/16/10	5/19/10	WATER	laboratory blank contamination (0.060 B mg/L)	none (blank concentration <RDL)
Method Blank		SW-846 6010B Dissolved	Manganese	431819	432290	5/16/10	5/19/10	WATER	laboratory blank contamination (0.00099 B mg/L)	none (blank concentration <RDL)
Method Blank		SW-846 6010B Dissolved	Barium	432575	433089	5/24/10	5/29/10	WATER	laboratory blank contamination (0.00031 B mg/L)	none (blank concentration <RDL)
Method Blank		SW-846 6010B Dissolved	Cadmium	432575	433089	5/24/10	5/29/10	WATER	laboratory blank contamination (0.00072 B mg/L)	none (blank concentration <RDL)
Method Blank		SW-846 7470A	Mercury	427516	427538	3/9/10	3/10/10	WATER	laboratory blank contamination (0.00006 B mg/L)	none (blank concentration <RDL)
Method Blank		SW-846 7470A	Mercury	431365	431459	5/11/10	5/12/10	WATER	laboratory blank contamination (0.00006 B mg/L)	none (blank concentration <RDL)
Method Blank		SW-846 7471B	Mercury	427504	427539	3/9/10	3/9/10	SOLID	laboratory blank contamination (0.0059 B mg/kg)	none (blank concentration <RDL)
Method Blank		SW-846 7471B	Mercury	431367	431453	5/11/10	5/12/10	SOLID	laboratory blank contamination (0.0077 B mg/kg)	none (blank concentration <RDL)
Method Blank		SW-846 7471B	Mercury	431666	431732	5/14/10	5/15/10	SOLID	laboratory blank contamination (0.0067 B mg/kg)	none (blank concentration <RDL)
RESULTS ASSESSMENT										
SB-1-MW-S	21005112701	SW-846 6010B	Barium		431478	5/11/10	5/12/10	WATER	dissolved conc > total conc and difference > 2xRDL	J to this detect
SB-1-MW-S	21005112701	SW-846 6010B Dissolved	Barium		431478	5/11/10	5/12/10	WATER	dissolved conc > total conc and difference > 2xRDL	J to this detect
SB-1-MW-S	21005112701	SW-846 6010B	Calcium		431478	5/11/10	5/12/10	WATER	dissolved conc > total conc and difference > 2xRDL	J to this detect

TABLE 5
QC CHECK RESULTS

FIELD ID	LAB ID	METHOD	ANALYTE	PREP BATCH	QC BATCH	PREP DATE	ANALY DATE	MATRIX	QC COMMENT	DVQ APPLIED
SB-1-MW-S	21005112701	SW-846 6010B Dissolved	Calcium		431478	5/11/10	5/12/10	WATER	dissolved conc > total conc and difference > 2xRDL	J to this detect
SB-1-MW-S	21005112701	SW-846 6010B	Magnesium		431478	5/11/10	5/12/10	WATER	dissolved conc > total conc and difference > 2xRDL	J to this detect
SB-1-MW-S	21005112701	SW-846 6010B Dissolved	Magnesium		431478	5/11/10	5/12/10	WATER	dissolved conc > total conc and difference > 2xRDL	J to this detect
SB-1-MW-S	21005112701	SW-846 6010B	Manganese		431478	5/11/10	5/12/10	WATER	dissolved conc > total conc and difference > 2xRDL	J to this detect
SB-1-MW-S	21005112701	SW-846 6010B Dissolved	Manganese		431478	5/11/10	5/12/10	WATER	dissolved conc > total conc and difference > 2xRDL	J to this detect
SB-1-MW-S	21005112701	SW-846 6010B	Sodium		431564	5/11/10	5/13/10	WATER	dissolved conc > total conc and difference > 2xRDL	J to this detect
SB-1-MW-S	21005112701	SW-846 6010B Dissolved	Sodium		431564	5/11/10	5/13/10	WATER	dissolved conc > total conc and difference > 2xRDL	J to this detect
MW-5D	21005142602	SW-846 6010B	Sodium		432290	5/16/10	5/19/10	WATER	dissolved conc > total conc and difference > 2xRDL	J to this detect
MW-5D	21005142602	SW-846 6010B Dissolved	Sodium		432290	5/16/10	5/19/10	WATER	dissolved conc > total conc and difference > 2xRDL	J to this detect
SS-10 (0-2)	21003082642	TNRCC 1006/LA 1006			428686	3/23/10	3/25/10	SOLID	Total TPH by 1006 not within 60-140% of Total TPH by 1005 (57%)	J/UJ to NDs/detects (1005&1006)
SED-26 (2-4)	21003082653	TNRCC 1006/LA 1006			428763	3/23/10	3/30/10	SOLID	Total TPH by 1006 not within 60-140% of Total TPH by 1005 (50%)	J/UJ to NDs/detects (1005&1006)
SED-29 (0-2)	21003082658	TNRCC 1006/LA 1006			428725	3/24/10	3/26/10	SOLID	Total TPH by 1006 not within 60-140% of Total TPH by 1005 (58%)	J/UJ to NDs/detects (1005&1006)

TABLE 6
FIELD DUPLICATE SUMMARY

ORIGINAL FIELD ID	DUPLICATE FIELD ID	SAMPLE DATE	SAMPLE MATRIX	ANALYTE	ORIGINAL RESULTS			DUPLICATE RESULTS			DIFFERENCE	RPD	2-3xRDL	PASS
SW-09	SW-109	5/6/10	WATER	2-Methylnaphthalene	0.000102	U	mg/L	0.000102	U	mg/L	0	NA	0.000204	y
SW-09	SW-109	5/6/10	WATER	Acenaphthene	0.000102	U	mg/L	0.000102	U	mg/L	0	NA	0.000204	y
SW-09	SW-109	5/6/10	WATER	Acenaphthylene	0.000102	U	mg/L	0.000102	U	mg/L	0	NA	0.000204	y
SW-09	SW-109	5/6/10	WATER	Anthracene	0.000102	U	mg/L	0.000102	U	mg/L	0	NA	0.000204	y
SW-09	SW-109	5/6/10	WATER	Benzo(a)anthracene	0.000102	U	mg/L	0.000102	U	mg/L	0	NA	0.000204	y
SW-09	SW-109	5/6/10	WATER	Benzo(a)pyrene	0.000102	U	mg/L	0.000102	U	mg/L	0	NA	0.000204	y
SW-09	SW-109	5/6/10	WATER	Benzo(b)fluoranthene	0.000102	U	mg/L	0.000102	U	mg/L	0	NA	0.000204	y
SW-09	SW-109	5/6/10	WATER	Benzo(k)fluoranthene	0.000102	U	mg/L	0.000102	U	mg/L	0	NA	0.000204	y
SW-09	SW-109	5/6/10	WATER	Chrysene	0.000102	U	mg/L	0.000102	U	mg/L	0	NA	0.000204	y
SW-09	SW-109	5/6/10	WATER	Dibenz(a,h)anthracene	0.000102	U	mg/L	0.000102	U	mg/L	0	NA	0.000204	y
SW-09	SW-109	5/6/10	WATER	Fluoranthene	0.000102	U	mg/L	0.000102	U	mg/L	0	NA	0.000204	y
SW-09	SW-109	5/6/10	WATER	Fluorene	0.000102	U	mg/L	0.000102	U	mg/L	0	NA	0.000204	y
SW-09	SW-109	5/6/10	WATER	Indeno(1,2,3-cd)pyrene	0.000102	U	mg/L	0.000102	U	mg/L	0	NA	0.000204	y
SW-09	SW-109	5/6/10	WATER	Naphthalene	0.000102	U	mg/L	0.000102	U	mg/L	0	NA	0.000204	y
SW-09	SW-109	5/6/10	WATER	Phenanthrene	0.000102	U	mg/L	0.000102	U	mg/L	0	NA	0.000204	y
SW-09	SW-109	5/6/10	WATER	Pyrene	0.000102	U	mg/L	0.000102	U	mg/L	0	NA	0.000204	y
SW-09	SW-109	5/6/10	WATER	Calcium	58.6		mg/L	59.4		mg/L	0.8	1.4	0.2	y
SW-09	SW-109	5/6/10	WATER	Hardness	591		mg/L	597		mg/L	6	1.0	0.66	y
SW-09	SW-109	5/6/10	WATER	Magnesium	140		mg/L	141		mg/L	1	0.7	0.2	y
SW-09	SW-109	5/6/10	WATER	Total Dissolved Solids	4220		mg/L	4150		mg/L	70	1.7	20	y
SW-09	SW-109	5/6/10	WATER	Chloride	1870		mg/L	1840		mg/L	30	1.6	100	y
SW-09	SW-109	5/6/10	WATER	Barium	0.42		mg/L	0.41		mg/L	0.01	2.4	0.02	y
SW-09	SW-109	5/6/10	WATER	Cadmium	0.0027	U	mg/L	0.0027	U	mg/L	0	NA	0.0054	y
SW-09	SW-109	5/6/10	WATER	Calcium	58.6		mg/L	59.4		mg/L	0.8	1.4	0.2	y
SW-09	SW-109	5/6/10	WATER	Chromium	0.0027	B	mg/L	0.0027	B	mg/L	0	NA	0.02	y

TABLE 6
FIELD DUPLICATE SUMMARY

ORIGINAL FIELD ID	DUPLICATE FIELD ID	SAMPLE DATE	SAMPLE MATRIX	ANALYTE	ORIGINAL RESULTS			DUPLICATE RESULTS			DIFFERENCE	RPD	2-3xRDL	PASS
SW-09	SW-109	5/6/10	WATER	Iron	1.12		mg/L	1.11		mg/L	0.01	0.9	0.2	y
SW-09	SW-109	5/6/10	WATER	Lead	0.008	U	mg/L	0.008	U	mg/L	0	NA	0.016	y
SW-09	SW-109	5/6/10	WATER	Magnesium	140		mg/L	141		mg/L	1	0.7	0.2	y
SW-09	SW-109	5/6/10	WATER	Manganese	0.51		mg/L	0.5		mg/L	0.01	2.0	0.03	y
SW-09	SW-109	5/6/10	WATER	Potassium	42.6		mg/L	42.9		mg/L	0.3	0.7	1	y
SW-09	SW-109	5/6/10	WATER	Selenium	0.005	U	mg/L	0.005	U	mg/L	0	NA	0.01	y
SW-09	SW-109	5/6/10	WATER	Sodium	915		mg/L	1100		mg/L	185	18.4	10	y
SW-09	SW-109	5/6/10	WATER	Strontium	0.99		mg/L	1.01		mg/L	0.02	2.0	0.1	y
SW-09	SW-109	5/6/10	WATER	Zinc	0.02	U	mg/L	0.02	U	mg/L	0	NA	0.04	y
SW-09	SW-109	5/6/10	WATER	Barium	0.37		mg/L	0.38		mg/L	0.01	2.7	0.02	y
SW-09	SW-109	5/6/10	WATER	Cadmium	0.0027	U	mg/L	0.00027	B	mg/L	0.00243	NA	0.0054	y
SW-09	SW-109	5/6/10	WATER	Chromium	0.0024	B	mg/L	0.0022	B	mg/L	0.0002	NA	0.02	y
SW-09	SW-109	5/6/10	WATER	Lead	0.008	U	mg/L	0.008	U	mg/L	0	NA	0.016	y
SW-09	SW-109	5/6/10	WATER	Selenium	0.005	U	mg/L	0.005	U	mg/L	0	NA	0.01	y
SW-09	SW-109	5/6/10	WATER	Strontium	1		mg/L	1.03		mg/L	0.03	3.0	0.1	y
SW-09	SW-109	5/6/10	WATER	Zinc	0.0095	B	mg/L	0.02	U	mg/L	0.0105	NA	0.04	y
SW-09	SW-109	5/6/10	WATER	Arsenic	0.01	U	mg/L	0.01	U	mg/L	0	NA	0.02	y
SW-09	SW-109	5/6/10	WATER	Arsenic	0.01	U	mg/L	0.01	U	mg/L	0	NA	0.02	y
SW-09	SW-109	5/6/10	WATER	Mercury	0.00011	B	mg/L	0.00006	B	mg/L	0.00005	NA	0.0004	y
SW-09	SW-109	5/6/10	WATER	Mercury	0.0001	B	mg/L	0.00006	B	mg/L	0.00004	NA	0.0004	y
SED-15	SED-115	5/6/10	SOLID	2-Methylnaphthalene	0.325	U	mg/kg	0.328	U	mg/kg	0.003	NA	0.984	y
SED-15	SED-115	5/6/10	SOLID	Acenaphthene	0.325	U	mg/kg	0.328	U	mg/kg	0.003	NA	0.984	y
SED-15	SED-115	5/6/10	SOLID	Acenaphthylene	0.325	U	mg/kg	0.328	U	mg/kg	0.003	NA	0.984	y
SED-15	SED-115	5/6/10	SOLID	Anthracene	0.325	U	mg/kg	0.328	U	mg/kg	0.003	NA	0.984	y
SED-15	SED-115	5/6/10	SOLID	Benzo(a)anthracene	0.325	U	mg/kg	0.328	U	mg/kg	0.003	NA	0.984	y

TABLE 6
FIELD DUPLICATE SUMMARY

ORIGINAL FIELD ID	DUPLICATE FIELD ID	SAMPLE DATE	SAMPLE MATRIX	ANALYTE	ORIGINAL RESULTS			DUPLICATE RESULTS			DIFFERENCE	RPD	2-3xRDL	PASS
SED-15	SED-115	5/6/10	SOLID	Benzo(a)pyrene	0.325	U	mg/kg	0.328	U	mg/kg	0.003	NA	0.984	y
SED-15	SED-115	5/6/10	SOLID	Benzo(b)fluoranthene	0.325	U	mg/kg	0.328	U	mg/kg	0.003	NA	0.984	y
SED-15	SED-115	5/6/10	SOLID	Benzo(k)fluoranthene	0.325	U	mg/kg	0.328	U	mg/kg	0.003	NA	0.984	y
SED-15	SED-115	5/6/10	SOLID	Chrysene	0.325	U	mg/kg	0.328	U	mg/kg	0.003	NA	0.984	y
SED-15	SED-115	5/6/10	SOLID	Dibenz(a,h)anthracene	0.325	U	mg/kg	0.328	U	mg/kg	0.003	NA	0.984	y
SED-15	SED-115	5/6/10	SOLID	Fluoranthene	0.325	U	mg/kg	0.328	U	mg/kg	0.003	NA	0.984	y
SED-15	SED-115	5/6/10	SOLID	Fluorene	0.325	U	mg/kg	0.328	U	mg/kg	0.003	NA	0.984	y
SED-15	SED-115	5/6/10	SOLID	Indeno(1,2,3-cd)pyrene	0.325	U	mg/kg	0.328	U	mg/kg	0.003	NA	0.984	y
SED-15	SED-115	5/6/10	SOLID	Naphthalene	0.325	U	mg/kg	0.328	U	mg/kg	0.003	NA	0.984	y
SED-15	SED-115	5/6/10	SOLID	Phenanthrene	0.325	U	mg/kg	0.328	U	mg/kg	0.003	NA	0.984	y
SED-15	SED-115	5/6/10	SOLID	Pyrene	0.325	U	mg/kg	0.328	U	mg/kg	0.003	NA	0.984	y
SED-15	SED-115	5/6/10	SOLID	Total Moisture	75.4		%	73		%	2.4	3.2	0.03	y
SED-15	SED-115	5/6/10	SOLID	Total Organic Carbon	67700		mg/kg	40800		mg/kg	26900	49.6	600	y
SED-15	SED-115	5/6/10	SOLID	Chloride	944		mg/kg	947		mg/kg	3	0.3	30	y
SED-15	SED-115	5/6/10	SOLID	Arsenic	1.66		mg/kg	1.3	B	mg/kg	0.36	NA	4.8	y
SED-15	SED-115	5/6/10	SOLID	Barium	232		mg/kg	211		mg/kg	21	9.5	1.2	y
SED-15	SED-115	5/6/10	SOLID	Cadmium	0.2	U	mg/kg	0.2	U	mg/kg	0	NA	0.6	y
SED-15	SED-115	5/6/10	SOLID	Chromium	4.42		mg/kg	4.62		mg/kg	0.2	4.4	1.2	y
SED-15	SED-115	5/6/10	SOLID	Lead	5.82		mg/kg	6.06		mg/kg	0.24	4.0	1.8	y
SED-15	SED-115	5/6/10	SOLID	Selenium	1.6	U	mg/kg	1.59	U	mg/kg	0.01	NA	4.8	y
SED-15	SED-115	5/6/10	SOLID	Strontium	16.1		mg/kg	14.3		mg/kg	1.8	11.8	1.2	y
SED-15	SED-115	5/6/10	SOLID	Zinc	18		mg/kg	17.8		mg/kg	0.2	1.1	2.4	y
SED-15	SED-115	5/6/10	SOLID	Mercury	0.041		mg/kg	0.04		mg/kg	0.001	NA	0.036	y
SB-3-MW-S	SB-3-MW-SD	5/12/10	WATER	Benzene	0.005	U	mg/L	0.005	U	mg/L	0	NA	0.01	y
SB-3-MW-S	SB-3-MW-SD	5/12/10	WATER	Ethylbenzene	0.005	U	mg/L	0.005	U	mg/L	0	NA	0.01	y

TABLE 6
FIELD DUPLICATE SUMMARY

ORIGINAL FIELD ID	DUPLICATE FIELD ID	SAMPLE DATE	SAMPLE MATRIX	ANALYTE	ORIGINAL RESULTS			DUPLICATE RESULTS			DIFFERENCE	RPD	2-3xRDL	PASS
SB-3-MW-S	SB-3-MW-SD	5/12/10	WATER	Toluene	0.005	U	mg/L	0.005	U	mg/L	0	NA	0.01	y
SB-3-MW-S	SB-3-MW-SD	5/12/10	WATER	Xylene (total)	0.01	U	mg/L	0.01	U	mg/L	0	NA	0.02	y
SB-3-MW-S	SB-3-MW-SD	5/12/10	WATER	Sulfate	2.4	B	mg/L	5	U	mg/L	2.6	NA	10	y
SB-3-MW-S	SB-3-MW-SD	5/12/10	WATER	Bicarbonate Alkalinity	395		mg/L CaCO3	385		mg/L CaCO3	10	2.6	2	y
SB-3-MW-S	SB-3-MW-SD	5/12/10	WATER	Carbonate Alkalinity	1	U	mg/L CaCO3	1	U	mg/L CaCO3	0	NA	2	y
SB-3-MW-S	SB-3-MW-SD	5/12/10	WATER	Total Dissolved Solids	12200		mg/L	12000		mg/L	200	1.7	20	y
SB-3-MW-S	SB-3-MW-SD	5/12/10	WATER	Chloride	7270		mg/L	7160		mg/L	110	1.5	200	y
SB-3-MW-S	SB-3-MW-SD	5/12/10	WATER	Barium	6.57		mg/L	6.51		mg/L	0.06	0.9	0.02	y
SB-3-MW-S	SB-3-MW-SD	5/12/10	WATER	Calcium	880		mg/L	860		mg/L	20	2.3	0.2	y
SB-3-MW-S	SB-3-MW-SD	5/12/10	WATER	Iron	17.2		mg/L	17.4		mg/L	0.2	1.2	0.2	y
SB-3-MW-S	SB-3-MW-SD	5/12/10	WATER	Magnesium	357		mg/L	356		mg/L	1	0.3	0.2	y
SB-3-MW-S	SB-3-MW-SD	5/12/10	WATER	Manganese	3.31		mg/L	3.28		mg/L	0.03	0.9	0.03	y
SB-3-MW-S	SB-3-MW-SD	5/12/10	WATER	Potassium	13.8		mg/L	13.7		mg/L	0.1	0.7	1	y
SB-3-MW-S	SB-3-MW-SD	5/12/10	WATER	Selenium	0.04	U	mg/L	0.04	U	mg/L	0	NA	0.08	y
SB-3-MW-S	SB-3-MW-SD	5/12/10	WATER	Sodium	2240		mg/L	2250		mg/L	10	0.4	10	y
SB-3-MW-S	SB-3-MW-SD	5/12/10	WATER	Barium	6.17		mg/L	6.06		mg/L	0.11	1.8	0.02	y
SB-3-MW-S	SB-3-MW-SD	5/12/10	WATER	Calcium	834		mg/L	831		mg/L	3	0.4	0.2	y
SB-3-MW-S	SB-3-MW-SD	5/12/10	WATER	Iron	14		mg/L	13.9		mg/L	0.1	0.7	0.2	y
SB-3-MW-S	SB-3-MW-SD	5/12/10	WATER	Magnesium	339		mg/L	333		mg/L	6	1.8	0.2	y
SB-3-MW-S	SB-3-MW-SD	5/12/10	WATER	Manganese	2.9		mg/L	2.85		mg/L	0.05	1.7	0.03	y
SB-3-MW-S	SB-3-MW-SD	5/12/10	WATER	Potassium	14.2		mg/L	13.8		mg/L	0.4	2.9	1	y
SB-3-MW-S	SB-3-MW-SD	5/12/10	WATER	Selenium	0.04	U	mg/L	0.04	U	mg/L	0	NA	0.08	y
SB-3-MW-S	SB-3-MW-SD	5/12/10	WATER	Sodium	2070		mg/L	2080		mg/L	10	0.5	10	y
SB-3-MW-S	SB-3-MW-SD	5/12/10	WATER	Arsenic	0.01	U	mg/L	0.01	U	mg/L	0	NA	0.02	y

TABLE 6
FIELD DUPLICATE SUMMARY

ORIGINAL FIELD ID	DUPLICATE FIELD ID	SAMPLE DATE	SAMPLE MATRIX	ANALYTE	ORIGINAL RESULTS			DUPLICATE RESULTS			DIFFERENCE	RPD	2-3xRDL	PASS
SB-3-MW-S	SB-3-MW-SD	5/12/10	WATER	Arsenic	0.01	U	mg/L	0.01	U	mg/L	0	NA	0.02	y
SB-3-MW-S	SB-3-MW-SD	5/12/10	WATER	Aliphatic >C10-C12	0.15	U	mg/L	0.15	U	mg/L	0	NA	0.3	y
SB-3-MW-S	SB-3-MW-SD	5/12/10	WATER	Aliphatic >C12-C16	0.15	U	mg/L	0.15	U	mg/L	0	NA	0.3	y
SB-3-MW-S	SB-3-MW-SD	5/12/10	WATER	Aliphatic >C16-C35	0.15	U	mg/L	0.15	U	mg/L	0	NA	0.3	y
SB-3-MW-S	SB-3-MW-SD	5/12/10	WATER	Aliphatic >C8-C10	0.15	U	mg/L	0.15	U	mg/L	0	NA	0.3	y
SB-3-MW-S	SB-3-MW-SD	5/12/10	WATER	Aliphatic C6-C8	0.15	U	mg/L	0.15	U	mg/L	0	NA	0.3	y
SB-3-MW-S	SB-3-MW-SD	5/12/10	WATER	Aromatic >C10-C12	0.15	U	mg/L	0.15	U	mg/L	0	NA	0.3	y
SB-3-MW-S	SB-3-MW-SD	5/12/10	WATER	Aromatic >C12-C16	0.15	U	mg/L	0.15	U	mg/L	0	NA	0.3	y
SB-3-MW-S	SB-3-MW-SD	5/12/10	WATER	Aromatic >C16-C21	0.15	U	mg/L	0.15	U	mg/L	0	NA	0.3	y
SB-3-MW-S	SB-3-MW-SD	5/12/10	WATER	Aromatic >C21-C35	0.15	U	mg/L	0.15	U	mg/L	0	NA	0.3	y
SB-3-MW-S	SB-3-MW-SD	5/12/10	WATER	Aromatic >C8-C10	0.15	U	mg/L	0.15	U	mg/L	0	NA	0.3	y

Data Quality and Usability Review of ICON Data, July 2010

Appendix F-2

Review of ICON-Reported Laboratory Analytical Results (Summary)

Laboratory Report	**L10030383**	**L10030003**	**L10030032**	**L10030188**
SW846 Methods	yes	yes	yes	yes
Media	GW	sediment	sediment	sediment
SQL < SS	yes	for all NDs, yes (DRO/ORO elevated, but reported conc.)	for all NDs, yes (DRO/ORO elevated, but reported conc.)	for all NDs, yes (DRO/ORO elevated, but reported conc.)
Sample Qualifiers	J/UJ, R	J/UJ	J/UJ	J/UJ
Surrogate Recovery	all good	DRO/ORO - diluted out due to dilution	all good	DRO/ORO - diluted out due to dilution
Field Blank	none	none	none	none
Trip Blank	all ND & surr recov good	NA	NA	NA
Method Blank	all ND & surr recov good	all ND & surr recov good	all ND & surr recov good	all ND & surr recov good
LCS/LCSD	all good	all good	all good	all good
MS/MSD	some recov outside acceptable limits (S) & some RPD outside acceptable limits	Ba (S+,S-), Cr (S+), Pb (S+,R), St (S+), Hg (S-,R), DRO (S+,S-), ORO (S+)	Ba (S-,S+), Hg (S-,R)	Ba (S-,S+), DRO (S+,S-)
Chain-of-Custody	yes	errors/deviations with signatures & times & bottle labels	yes	bottles mislabeled and corrected
Holding Time	yes	yes	yes	yes
Temperature	yes	yes	yes	yes

Lab Order	Lab Sample ID	Analysis Date	Analyte	QC sample type	Spike Sample Result	Spike added	Original Sample Result	%R	Method %R - Low limit (a)	Method %R - High limit (a)	%R Flag (b)	RPD	Method RPD Limit (a)	RPD Flag (b)	Avg %R	Avg %R within limits?	Is sample >4x spike	QC Sample Identified as a site sample?	Conclusion	Qualifier(s) added to data during Data Usability Evaluation (c)	Affected Samples (estimated based on analysis dates/times since batch numbers not provided for samples)
L10030032 L10030003	L10030003-41AMS	3/5/2010 15:52	Barium	MS	1037	49.61	1008	59.7	75	125	S						Yes	Yes, SS08 (2-4)	Inconclusive; unspiked sample conc is > 4x amt of spike added	NA	NA
L10030032 L10030003	L10030003-41AMS	3/5/2010 16:01	Barium	MSD	1143	49.62	1008	273	75	125	S	9.72	20		166.35	No	Yes	Yes, SS08 (2-4)			
L10030032 L10030003	L10030003-51AMS	3/4/2010 20:35	Mercury	MS	1.656	2.013	0.2998	67.4	75	125	S						No	Yes, SED22(2-4)	low %R on MS (67.4); Avg % Recov passes; MS/MSD precision of 34.5 RPD	J to detects	SED31(0-2), SED31(2-4), SED32(0-2), SED32(2-4), SED33(0-2), SED33(2-4),
L10030032 L10030003	L10030003-51AMS	3/4/2010 20:35	Mercury	MSD	2.346	2.024	0.2998	101	75	125		34.5	20	R	84.2	Yes	No	Yes, SED22(2-4)			
L10030003	L10030003-01AMS	3/5/2010 12:33	Barium	MS	494.2	49.56	428.1	133	75	125	S						Yes	Yes, SED1(0-2)	Inconclusive; unspiked sample conc is > 4x amt of spike added	NA	NA
L10030003	L10030003-01AMS	3/5/2010 12:42	Barium	MSD	487.5	49.58	428.1	120	75	125		1.38	20		126.5	No	Yes	Yes, SED1(0-2)			
L10030003	L10030003-41AMS	3/5/2010 15:52	Chromium	MS	80.74	49.61	17.09	128	75	125	S						No	Yes, SS08 (2-4)	high %R on MS (128); Avg %R passes	NA	NA
L10030003	L10030003-41AMS	3/5/2010 16:01	Chromium	MSD	69.2	49.62	17.09	105	75	125		15.4	20		116.5	Yes	No	Yes, SS08 (2-4)			
L10030003	L10030003-41AMS	3/5/2010 15:52	Lead	MS	86.03	49.61	40.96	90.8	75	125							No	Yes, SS08 (2-4)	high %R on MSD (233); MS/MSD precision of 58 RPD	J to detects	SS-10(0-2), SS-10(2-4)
L10030003	L10030003-41AMS	3/5/2010 16:01	Lead	MSD	156.4	49.62	40.96	233	75	125	S	58	20	R	161.9	No	No	Yes, SS08 (2-4)			
L10030003	L10030003-01AMS	3/5/2010 17:23	Strontium	MS	116	49.56	59.32	114	75	125							No	Yes, SED1(0-2)	high %R on MSD (135); Avg %R passes	NA	NA
L10030003	L10030003-01AMS	3/5/2010 17:27	Strontium	MSD	126	49.58	59.32	135	75	125	S	8.28	20		124.5	Yes	No	Yes, SED1(0-2)			
L10030003	L10030003-01AMS	3/3/2010 17:05	Mercury	MS	1.846	2.013	0.1392	84.8	75	125							No	Yes, SED1(0-2)	using 75-125 range, no qualifiers necessary	NA	NA
L10030003	L10030003-01AMS	3/3/2010 17:05	Mercury	MSD	1.841	2.008	0.1392	84.7	75	125		0.294	20		84.75	Yes	No	Yes, SED1(0-2)			
L10030003	L10030003-34AMS	3/5/2010 2:49	TPH-DRO	MS	482.1	100	314.2	168	70	130	S						No	Yes, SED17(0-2)	high %R on MS (168); high %R on MSD (263); avg %R > 200	J to detects	SED-17(0-2), SED-17(2-4), SED-18(0-2), SED-18(2-4), SED-19(0-2), SED-19(2-4), SS08(0-2), SS10(0-2), SS10(2-4), SED-20(0-2), SED-20(2-4), SED-21(0-2)
L10030003	L10030003-34AMS	3/5/2010 3:06	TPH-DRO	MSD	576.9	100	314.2	263	70	130	S	17.9	40		215.5	No	No	Yes, SED17(0-2)			
L10030003	L10030003-13AMS	3/6/2010 12:14	TPH-DRO	MS	234.2	100	163.3	71	70	130							No	Yes, SED 7 (0-2)	low %R on MSD (46.8)	J/UJ to detects/NDs	SED-4(0-2), SED-6(0-2), SED-7(0-2), SED-7(2-4), SED-7(4-6), SED-8(2-4)
L10030003	L10030003-13AMS	3/6/2010 12:32	TPH-DRO	MSD	210.1	100	163.3	46.8	70	130	S	10.9	40		58.9	No	No	Yes, SED 7 (0-2)			
L10030003	L10030003-17AMS	3/6/2010 12:50	TPH-ORO	MS	360.3	100	198.9	161	70	130	S						No	Yes, SED 8 (2-4)	high %R on MS (161); high %R on MSD (156)	J to detects	SED-4(0-2), SED-6(0-2), SED-7(0-2), SED-7(2-4), SED-7(4-6), SED-8(2-4)
L10030003	L10030003-17AMS	3/6/2010 13:07	TPH-ORO	MSD	354.4	100	198.9	156	70	130	S	1.66	40		158.5	No	No	Yes, SED 8 (2-4)			
L10030188	L10030181-01AMS	3/10/2010 14:14	Barium	MS	383.1	49.74	304.8	157	75	125	S						Yes	No	Inconclusive; unspiked sample conc is > 4x amt of spike added	NA	NA
L10030188	L10030181-01AMS	3/10/2010 14:17	Barium	MSD	379.6	49.74	304.8	150	75	125	S	0.915	20		153.5	No	Yes	No			
L10030188	L10030188-19AMS	3/10/2010 16:30	Barium	MS	492.5	49.75	456.6	72.2	75	125	S						Yes	Yes, SED30(2-4)	Inconclusive; unspiked sample conc is > 4x amt of spike added	NA	NA
L10030188	L10030188-19AMS	3/10/2010 16:33	Barium	MSD	494.6	49.75	456.6	76.5	75	125		0	20		74.35	No	Yes	Yes, SED30(2-4)			
L10030188	L10030188-01AMS	3/8/2010 12:31	TPH-DRO	MS	348	100	215.2	133	70	130	S						No	Yes, SED31(4-6)	high %R on MS (133); low %R on MSD (49.5); Avg %R passes	NA	NA
L10030188	L10030188-01AMS	3/8/2010 12:48	TPH-DRO	MSD	264.7	100	215.2	49.4	70	130	S	27.2	40		91.2	Yes	No	Yes, SED31(4-6)			
L10030383	L10030414-06CMS	3/10/2010 13:34	Arsenic	MS	0.6809	0.5	0.01467	133	75	125	S						No	No	high %R on MS (133.2); Avg %R passes; but MS/MSD precision of 31.8 RPD	J to detects	MW-1, MW-2R, MW-3R, BD-01 **MATRIX AFFECT IS UNCERTAIN B/C MS IS NOT A SITE SAMPLE**
L10030383	L10030414-06CMS	3/10/2010 13:37	Arsenic	MSD	0.4939	0.5	0.01467	95.8	75	125		31.8	20	R	114.4	Yes	No	No			
L10030383	L10030414-06CMS	3/10/2010 13:34	Barium	MS	1.096	0.5	0.4261	134	75	125	S						No	No	high %R on MS; Avg %R passes; but MS/MSD RPD exceeds limit	J to detects	MW-1, MW-2R, MW-3R, BD-01 **MATRIX AFFECT IS UNCERTAIN B/C MS IS NOT A SITE SAMPLE**
L10030383	L10030414-06CMS	3/10/2010 13:37	Barium	MSD	0.8946	0.5	0.4261	93.7	75	125		20.3	20	R	113.85	Yes	No	No			
L10030383	L10030414-06CMS	3/10/2010 13:34	Cadmium	MS	0.6348	0.5	0.008348	125	75	125	S						No	No	high %R on MS; Avg %R passes; but MS/MSD RPD exceeds limit	J to detects	MW-1, MW-2R, MW-3R, BD-01 **MATRIX AFFECT IS UNCERTAIN B/C MS IS NOT A SITE SAMPLE**
L10030383	L10030414-06CMS	3/10/2010 13:37	Cadmium	MSD	0.4713	0.5	0.008348	92.6	75	125		29.6	20	R	108.8	Yes	No	No			
L10030383	L10030414-06CMS	3/10/2010 13:34	Chromium	MS	0.6785	0.5	0.02835	130	75	125	S						No	No	high %R on MS; Avg %R passes; but MS/MSD RPD exceeds limit	J to detects	MW-1, MW-2R, MW-3R, BD-01 **MATRIX AFFECT IS UNCERTAIN B/C MS IS NOT A SITE SAMPLE**
L10030383	L10030414-06CMS	3/10/2010 13:37	Chromium	MSD	0.5086	0.5	0.02835	96.1	75	125		28.6	20	R	113.05	Yes	No	No			
L10030383	L10030414-06CMS	3/10/2010 13:34	Lead	MS	0.6214	0.5	0.01467	121	75	125							No	No	MS/MSD RPD exceeds limit	J to detects	MW-1, MW-2R, MW-3R, BD-01 **MATRIX AFFECT IS UNCERTAIN B/C MS IS NOT A SITE SAMPLE**
L10030383	L10030414-06CMS	3/10/2010 13:37	Lead	MSD	0.4633	0.5	0.01467	89.7	75	125		29.1	20	R	105.35	Yes	No	No			
L10030383	L10030414-06CMS	3/10/2010 13:34	Selenium	MS	0.6565	0.5	0.01626	128	75	125	S						No	No	high %R on MS; Avg %R passes; but MS/MSD RPD exceeds limit	J to detects	MW-1, MW-2R, MW-3R, BD-01 **MATRIX AFFECT IS UNCERTAIN B/C MS IS NOT A SITE SAMPLE**
L10030383	L10030414-06CMS	3/10/2010 13:37	Selenium	MSD	0.483	0.5	0.01626	93.4	75	125		30.4	20	R	110.7	Yes	No	No			
L10030383	L10030414-06CMS	3/10/2010 13:34	Zinc	MS	0.7514	0.5	0.1248	125	75	125	S						No	No	high %R on MS; Avg %R passes; but MS/MSD RPD exceeds limit	J to detects	MW-1, MW-2R, MW-3R, BD-01 **MATRIX AFFECT IS UNCERTAIN B/C MS IS NOT A SITE SAMPLE**
L10030383	L10030414-06CMS	3/10/2010 13:37	Zinc	MSD	0.5803	0.5	0.1248	91.1	75	125		25.7	20	R	108.05	Yes	No	No			

Lab Order	Lab Sample ID	Analysis Date	Analyte	QC sample type	Spike Sample Result	Spike added	Original Sample Result	%R	Method %R - Low limit (a)	Method %R - High limit (a)	%R Flag (b)	RPD	Method RPD Limit (a)	RPD Flag (b)	Avg %R	Avg %R within limits?	Is sample >4x spike	QC Sample Identified as a site sample?	Conclusion	Qualifier(s) added to data during Data Usability Evaluation (c)	Affected Samples (estimated based on analysis dates/times since batch numbers not provided for samples)
L10030383	L10030414-06CMS	3/10/2010 18:39	Strontium	MS	1.223	0.5	0.5146	142	75	125	S						No	No	high %R on MS; Avg %R passes	NA	NA
L10030383	L10030414-06CMS	3/10/2010 18:42	Strontium	MSD	1.027	0.5	0.5146	103	75	125		17.4	20		122.5	Yes	No	No			
L10030383	L10030103-06AMS	3/9/2010 9:34	Benzene	MS	14.83	5	0	297	70	130	S						No	No	high %R on MS and MSD (>200)	J to detects	MW-1, MW-2R, MW-3R, BD-01 **MATRIX AFFECT IS UNCERTAIN B/C MS IS NOT A SITE SAMPLE**
L10030383	L10030103-06AMS	3/9/2010 9:59	Benzene	MSD	14.92	5	0	298	70	130	S	0.605	20		297.5	No	No	No			
L10030383	L10030103-06AMS	3/9/2010 9:34	Xylenes, total	MS	19.85	15	0	132	70	130	S						No	No	high %R on MS and MSD	J to detects	MW-1, MW-2R, MW-3R, BD-01 **MATRIX AFFECT IS UNCERTAIN B/C MS IS NOT A SITE SAMPLE**
L10030383	L10030103-06AMS	3/9/2010 9:59	Xylenes, total	MSD	20.1	15	0	134	70	130	S	1.25	20		133	No	No	No			
L10030383	L10030341-01DMS	3/9/2010 19:57	Mercury	MS	0.01397	0.01	0.01397	0	75	125	S						No	No	zero %R on MS and MSD	J to detects / **R to NDs**	MW-1, MW-2R, MW-3R, BD-01 **MATRIX AFFECT IS UNCERTAIN B/C MS IS NOT A SITE SAMPLE (all sample results were ND; so all would be rejected)**
L10030383	L10030341-01DMS	3/9/2010 19:57	Mercury	MSD	0.01397	0.01	0.01397	0	75	125	S	0	20		0	No	No	No			
210030140	21002263202	3/4/2010 10:30	Aroclor-1260	MS	61.3	133	0	46	60	140	S						No	No	low %R on MS & MSD	J/UJ to detects/NDs	SED-4(0-2), SED-5(0-2), SED-6(0-2), SED-7(2-4), SED-7(4-6), SED-8(2-4) **MATRIX AFFECT IS UNCERTAIN B/C MS IS NOT A SITE SAMPLE**
210030140	21002263202	3/4/2010 10:48	Aroclor-1260	MSD	63.2	133	0	48	60	140	S	3	20		47	No	No	No			
210030140	LCS	3/3/2010 14:56	Aroclor-1260	LCS	139	132	0	105	60	140							No	NA	LCS/LCSD RPD exceeds limit	J to detects	SED-4(0-2), SED-5(0-2), SED-6(0-2), SED-7(2-4), SED-7(4-6), SED-8(2-4)
210030140	LCSD	3/3/2010 15:14	Aroclor-1260	LCSD	110	132	0	84	60	140		23	20	R	94.5	Yes	No	NA			
L10030032	LCS-MO	3/3/2010 5:43	TPH-ORO	LCS	208.6	300	0	69.5	70	130	S						No	NA	low %R on MS & MSD	J/UJ to detects/NDs	no samples analyzed on this date in the lab report. Possibly SED31(2-4), SED32(2-4), SED33(0-2), SED33(2-4)
L10030032	LCSD-MO	3/3/2010 6:01	TPH-ORO	LCSD	182	300	0	60.7	70	130	S	3	20		65.1	No	No	NA			

NOTES:

QC - Quality Control

%R - Percent Recovery

RPD - Relative Percent Difference

(a) Control limits based on requirements in the analytical methods (rather than those used by the laboratory) were used to provide a consistent approach for similar analytes:

Inorganics – spike recovery between 75-125% and RPD less than 25%

Purgeable Organics (BTEX) and Total TPH – spike recovery between 70-130% and RPD less than 20%

Extractable Organics (PCB) – spike recovery between 60-140% and RPD less than 20%

Spike recovery considered inconclusive if the unspiked sample concentration is greater than four (4) times the amount of spike added.

(b) Flags consistent with those used by the laboratory to identify QC results outside specifications, and defined in the laboratory reports as follows:

S - Spike Recovery outside accepted recovery limits

R - RPD outside accepted recovery limits

(c) Qualifiers were added to site sample data based on the results of the data usability evaluation:

J - Estimated. The reported sample concentration is approximate due to exceedance of one or more QC requirements.

UJ - Estimated. The analyte was not detected above the reporting limit; however, the reporting limit is approximate due to exceedance of one or more QC requirements.

R - Rejected. The sample result is rejected due to serious QC deficiencies that make it impossible to verify the presence or absence of the analyte.

(d) This table identifies QC deviations noted in the laboratory reports or identified during the data usability evaluation. The following QC elements were found to be acceptable:

1) *Preservation and Holding Times* – The samples were properly preserved and the holding times were met.

2) *Blank Samples* – No constituents were detected in any.

3) *Duplicate Samples* – A blind field duplicate (BD-01) was collected as a duplicate of MW-1 for the ground water samples (lab order L10030383). The RPD for all analytes are within acceptable limits.

Data Review Summary Memorandum for Biota Tissue by Quality Assurance Associates, Inc., March 3, 2014

Appendix F-3

Quality Assurance Associates

DATA REVIEW SUMMARY MEMO

QAA, L.L.C.

SITE:

East White Lake Oilfield
Vermilion Parish, Louisiana
Vermilion Parish School Board Property, Section 16 T15S, R01E

EVENT: Crab and Forage Fish Sampling – December 2010/ January 2011/ May 2011/ June 2011

INTENDED USE: The overall objective of the study is to measure tissue concentrations of the constituents of concern (COCs) to evaluate potential exposures to (1) blue crabs and forage fish, as well as wildlife (i.e., birds and mammals) that consume them; and (2) humans that consume blue crabs.

LABORATORIES:

Sample Processing and Metals/Lipids Testing
Columbia Analytical Services, Inc. (CAS)
Kelso, Washington
LELAP Certification #03016
Work Orders: K1013947, K1100325, K1100337, K1100338, K1100344, K1106152, K1106154, K1106157, K1106166

TPH/Lipids Testing
Pace Analytical Services, Inc. (Pace)
Green Bay, Wisconsin
LELAP Certification # 04168
Work Orders: 4046716, 4046733, 4046737, 4046750, 4046755, 4046758, 4048240, 4048241, 4048242, 4048243, 4048244, 4048329, 4048330

TESTS/ METHODS:

Total Metals (As, Ba) by PSEP/ SW846 6020
Total Metals (Hg) by EPA 1631E
Total Inorganic As by EPA 1632 Rev. A
Methyl Mercury by CAS SOP EPA 1630M
Total Lipids by EPA 3541/ NOAA (gravimetric)
Total Solids by CAS Freeze Dry

Total Petroleum Hydrocarbons (TPH) by SW846 3541/ 3620B/ 8015B Modified
Lipid Content by EPA 3541/ Pace SOP (gravimetric)

SAMPLES:

Crab samples from 13 Site locations (T-01 thru T-12 plus T-01A), 10 reference locations (TR-01 thru TR-09 plus TR-03A), and 6 market locations (BIL, BR, DES, HOU, LC, and NO)

Fish (shad) samples from 12 Site locations (T-01 thru T-12) and 8 reference locations (TR-02 thru TR-09)

Fish (bluegill) samples from 2 Site locations (T-02 and T-05) and 2 reference locations (TR-01 and TR-04A)

QAA completed a third-party review of the above chemical analysis data for conformance with the requirements regarding data validation in the Quality Assurance Project Plan/Sample Analysis and Assessment Plan for Crab and Forage Fish Tissue at the East White Lake Oilfield, Vermilion Parish, Louisiana dated December 6, 2010 (the “Plan”). The summary of the results of the data review are discussed in this memo. Sample data qualified as unusable due to exceedances of quality control criteria are listed in Table 1.

QAA completed the review using the following laboratory and project submittals:

- Field record forms;
- Chain of custody forms;
- Laboratory data results and reports; and
- Laboratory electronic data deliverables (EDD).

The data evaluation included a review of the following, using the applicable analytical method and project requirements:

- Chain-of-Custody Procedures
- Data Completeness (Field and QA/QC documentation)
- Analytical Methods
- Reporting Procedures/Limits
- Holding Time, Preservation, and Containers

- Laboratory and Field QC Blanks
- Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) Recoveries
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries
- Surrogate Recoveries
- Laboratory and Field Duplicate Precision
- Calibration Blanks/Verification
- ICP Interference Checks
- Internal Standard Areas

Additionally, for TPH, the evaluation included the following:

- Initial Calibration
- Analyte Identification
- Analyte Quantitation
- Raw Data Verification

The criteria specified in the Plan were used for the data validation as follows:

- Inorganics Spike Recovery: 70-130% for Total Arsenic, Total Barium, and Total Mercury; 50-150% for Inorganic Arsenic; and 65-135% for Methyl Mercury (and not less than 30% or data is rejected) for laboratory control samples and matrix spikes
- Inorganics Duplicate Precision: 50 RPD (if results are greater than 5x MQL) or 100 RPD (if results are less than or equal to 5x MQL) for laboratory and field duplicates
- Organics Spike Recovery: 50-150% for TPH (and not less than 10% or data is rejected) for laboratory control samples, matrix spikes, and surrogates
- Organics Duplicate Precision: 25 RPD for laboratory control sample duplicates; 50 RPD (if results greater than 5x MQL) or 100 RPD (if results less than or equal to 5x MQL) for matrix spike and field duplicates

Note: The accuracy criteria for TPH listed in Table 1 of the Plan apply for Texas method 1005/1006. The laboratory used SW846 method 8015B, which calls for historical in-house criteria. Since a database is not available for determining matrix-specific limits for TPH analysis of biological samples, the laboratory (and data reviewer) used the basic guideline limits of 50-150%.

GLOSSARY OF TERMS

The following definitions apply for terms related to analyte reporting limits:

MDL (Method Detection Limit) – the minimum concentration of an analyte that the laboratory can measure and report with 99% confidence that the analyte concentration is greater than zero. The MDL is determined by the laboratory for each analyte in a given reagent matrix (water or soil) generally using the procedures specified in 40 CFR Part 136, Appendix B. It is a measure of the concentration an instrument can detect or ‘see’ in a given reagent matrix.

SDL (Sample Detection Limit) – the MDL adjusted to reflect sample-specific actions, such as dilution or use of smaller aliquot sizes than prescribed in the analytical method, and taking into account sample characteristics, sample preparation, and analytical adjustments including dry-weight adjustments. It is a measure of the concentration an instrument can detect or ‘see’ in a given sample.

MQL (Method Quantitation Limit) – the lowest non-zero concentration standard in the laboratory’s initial calibration curve calculated using the normal aliquot sizes and final volumes prescribed in the analytical method. The MQL is a measure of the concentration an instrument can accurately measure in a typical sample.

SQL (Sample Quantitation Limit) – the MQL adjusted to reflect sample-specific actions, such as dilution or use of smaller aliquot sizes than prescribed in the analytical method, and takes into account sample characteristics, sample preparation, and analytical adjustments including dry-weight adjustments. It is a measure of the concentration an instrument can accurately measure in a given sample. Analytes with concentrations above the SDL but below the SQL, though present in the sample, may not be accurately measured and are thus flagged as estimated (J).

CHAIN-OF-CUSTODY PROCEDURES

All of the fish and crab organisms were initially received at CAS for sample processing using a custody record created in the field by the sampler (Michael Pisani & Associates, Inc.). CAS logged all of the fish into one SDG (K1013947), and the organisms were homogenized and composited by location and species. CAS assigned one sample ID per location/species and reported the results under this same SDG number.

For the crabs, CAS logged all of the organisms from one location into one SDG and assigned five sample IDs per crab (whole body, hepatopancreas, other soft tissue, meat, and exoskeleton). For each location, some or all of the crabs were dissected into four parts and then each part (either separately or for multiple crabs) was homogenized and composited to obtain the sample mass needed for testing. Each composite was then logged into two sets of four SDGs: (1) K1100325 (hepatopancreas), K1100337 (other soft tissue), K1100338 (exoskeleton), and K1100344 (meat) for the December 2010 and January 2011 samples and (2) K1106152 (hepatopancreas), K1106154 (soft tissue), K1106157 (exoskeleton), and K1106166 (meat) for the May 2011 and June 2011 samples). Aliquots of each composite were prepared and analyzed for Metals/Lipids, as requested and CAS reported the Metals/Lipids results under these eight SDGs. Additionally, aliquots of each hepatopancreas and meat composite were sent to another laboratory for TPH/Lipids testing using a custody record created by CAS. In June 2011, whole body composites (which were not analyzed by CAS) were prepared from the homogenized parts or whole organisms, as available, and aliquots were sent to another laboratory for TPH/Lipids testing using a custody record created by CAS.

All of the hepatopancreas and meat composites except those prepared for the three market crab samples collected in May 2011 and June 2011 (BIL, DES, and HOU) were first sent to Gulf Coast Analytical Laboratories, Inc. in Baton Rouge (GCAL). GCAL was originally contracted to perform the TPH analyses but due to poor method performance (as indicated by extremely low surrogate recovery), the samples were subsequently transferred to Pace Analytical Services, Inc. in Green Bay, Wisconsin (Pace) using the same custody records that were created by CAS for the composite aliquots. (Note that the samples were not assigned to sets in the same way by both laboratories. The GCAL sample no. and then the Pace sample no. are handwritten in columns on the right side of the custody record for ease of reference). The whole body composites and the hepatopancreas/meat composites for the three market crabs collected in May 2011 and June 2011 were sent directly to Pace using a custody record created by CAS.

The CAS data packages include the custody records created in the field and the Pace data packages include the custody records created by CAS for the transfer of the composite aliquots.

Proper sample custody procedures were used for each transfer and custody seals were present on each shipping container, except as follows:

- Custody seals were not used for the transfer from the field to CAS or for the transfer from GCAL to Pace. All samples were delivered by commercial courier and no evidence of sample tampering was noted by any of the laboratories.
- For Pace project no. 4046716, GCAL did not sign and date the second page of the custody record for samples 4047603001 to 4047603003. The first page is signed and dated.

Additionally, the information on the custody records is complete and agrees with that in the field documentation and laboratory reports, except as follows:

- The number of containers (or the down-arrow to indicate the same number of containers applies to each line) is missing on some of the CAS custody records. For the fish collections, the fish specimens for each location (which numbered 20-30 organisms for the shad collections) were placed in a single foil packet (rather than wrapped individually as specified in the Plan). One to four packets were placed in the shipping container. The CAS Cooler Receipt and Preservation Form lists the packets received in each container. For the crab collections, the crab specimens for each location were placed in one shipping container.
- The time of relinquishment was not entered on the CAS custody record for some transfers but the date of relinquishment is always given.
- The down-arrow for the collection date/time is missing on some of the CAS custody records. The collection date/time is also given on the Field Record Forms. Note that the collection time is arbitrary since multiple organisms were collected across a time span, and thus may vary in the laboratory reports from one composite aliquot to another or one test to another for a given location. Additionally, in order to obtain sufficient sample mass, two or three collection events were required at some locations. All sample dates listed in the laboratory reports are correct and are set to last date organisms were collected with one exception. For Pace sample no. 4048241002 (EWL-HOU-C-WHOLE BODY), the Date Collected is reported by the laboratory to be 06/20/2011. Per field documentation, the correct date is 05/23/2011, as reported for all other samples from the HOU location.
- For Pace project no. 4046733, the laboratory report incorrectly shows the Date Received as 06/08/2011 10:00. The correct date is 06/07/2011 10:00 as shown on the custody record
- For Pace project no. 4048240, the field ID for sample 4048240006 is incorrectly shown as EWL-LC-2-C-WHOLE BODY on the custody record created by CAS for transfer of the composite aliquots. The laboratory report shows the correct ID (EWL-LC-C-WHOLE BODY) per the original custody record created in the field.
- For Pace project no. 4048241, the field ID for sample 4048241004 is incorrectly shown as EWL-TR-01A-C-WHOLE BODY on the custody record created by CAS. The laboratory report shows the correct ID (EWL-T-01A-WHOLE BODY) per the original custody record created in the field.

Note: The custody records created in the field were updated by the sampler (Michael Pisani and Associates, Inc.) on 03/09/2011 to include missing sample dates for the fish collections on 01/04/2011 and 01/05/2011 and the NO market crab collection on 12/27/2010. Additionally, the sampler added the collection of bluegill fish samples at T-02 and T-05 onto the custody record for 12/21/2010 and submitted the Field Record Forms for these two collections. The 12/21/2010 updated custody record is included in the CAS crab packages (K1100325, K1100337, K1100338, and K1100344) rather than the CAS fish package (K1013947).

The reviewer also confirmed that all tests are reported as requested on the custody record and noted the following:

- CAS reported Total Lipids and Total Solids along with the Metals results for all samples per the Plan.
- Pace reported TPH and Lipid Content for all samples per the Plan. The custody record and Plan specify Texas method 1005 for TPH, since GCAL performs TPH using this method. Pace performs TPH using method SW846 8015B Modified with automated Soxhlet extraction (SW846 3541) and Florisil cleanup (SW846 3620B).
- The following analyses were not performed due to insufficient sample mass:
    - EWL-T-05-F-COMPOSITE_BLUEGILL was not analyzed at Pace for TPH or Lipid Content.
    - A whole body composite was not analyzed at Pace for TPH or Lipid Content for EWL-T-09-C.
    - EWL-TR-01-C-HEPATOPANCREAS was not analyzed at Pace for TPH or Lipid Content.
    - A whole body composite was not analyzed at Pace for TPH or Lipid Content for EWL-TR-06-C.

No data were qualified as unusable due to chain-of-custody issues.

DATA COMPLETENESS (FIELD AND QA/QC DOCUMENTATION)

The CAS data packages include Field Record Forms, which list each crab or fish that was collected and gives identifying information (length, width, weight, sex) for each organism for all collection events, except as follows:

- A Field Record Form is not available for the second collection at Site location T-05 of nine crabs (per the CAS sample processing worksheets) on 12/21/2010.
- A Field Record Form is not available for the second collection at Site location T-09 of four crabs (per the CAS Cooler Receipt and Preservation Form) on 01/10/2011.
- A Field Record Form is not available for the second collection at Site location T-12 of an unknown number of crabs on 12/22/2010. (These crabs were received above temperature and were not used as discussed in the Holding Time, Preservation, and Containers section below.)
- Field Record Forms were not used for the market locations (BIL, BR, DES, HOU, LC, and NO).
- The Field Record Form lists each fish that was collected and gives indentifying information (length, width, weight) for each organism for the collection of shad fish at reference locations TR-02, TR-03 and TR-04 and the collection of bluegill fish at reference locations TR-01 and TR-04A. Sampling team records indicate that the weighing and measuring process for the fish from these first few locations proved to be time consuming due to the number of forage fish collected (20-30 fish for shad collections), and the team modified the protocol to estimate volumes of forage fish thereafter rather than to weigh and measure each individual fish. For the remaining collections of shad and the collection of bluegill at Site locations T-02 and T-05, the Field Record Form does not include identifying information for each organism.

The laboratory data packages contain all necessary data (i.e., the analytical results, custody records, processing/preparation/analysis records, and QA/QC documentation) and the EDD contains all sample results in acceptable format, with the following deviations:

- In the CAS data package K1100334 Rev. 1, the printout does not show the right-hand columns including the units and flags (under Result Notes) for the Total Lipids results on page 520. This page was revised to show the correct sample ID for sample 02 (TR-01A corrected to T-01A as shown on the custody record). The missing information is shown on the unrevised page in the original package and in the EDD.
- For Pace project no. 4046733, the LCS results were revised on 05/23/2012 as shown in the raw data section (page 121) of the data package and confirmed by the validator using the quantitation report. Unrevised results are mistakenly reported in the QC Summary section (page 12).
- For the three market crabs collected in May 2011 and June 2011, some of the worksheets documenting the specimen dissection and tissue homogenization are not included in the laboratory data package.

No data were qualified as unusable due to data completeness issues.

ANALYTICAL METHODS

The laboratories used SW-846 or other rigorous analytical methodologies and are accredited in accordance with LAC, Title 33, Part I, Subpart 3. The methods used are those specified in the Plan (except for TPH which utilized an equivalent method as previously noted) and provide definitive data (i.e., analyte-specific with confirmation of identity and concentration) for Metals and TPH. Note: To support the objectives of health assessment identified in the Plan, the Plan authors requested that TPH reporting in the C08-C28 range also include the additional breakdown into C08-C16 and C16-C28 ranges.

REPORTING PROCEDURES/LIMITS

For CAS, the analytical results include the result, the SDL (under the MDL column on the analytical report), and the SQL (under the MRL column). Non-detects are reported as “ND”. The EDD includes the result, SDL (under the sample_quantitation_limit column header and the method_detection_limit column header), and the SQL (under the unadjusted_MQL column header). Non-detects are reported as “U”. Confirmed detects between the SDL and SQL (i.e., laboratory J-values) are reported. Metals results are reported on a wet-weight basis as specified in the Plan. All Metals analyses were performed on a freeze-dried (ground and homogenized) sample and the results were corrected based on the Total Solids.

For Pace, the analytical results include the result, the SDL (under the MDL column on the analytical report), and the SQL (under the PQL column). Non-detects are reported as less than the SDL. The EDD includes the result, SDL (under the MDL column header), and the SQL (under the EQL column header). Non-detects are reported as “U”. Confirmed detects between the SDL and SQL (i.e., laboratory J-values) are reported and TPH results are reported on a wet-weight (as received) basis as specified in the Plan.

The Plan includes detectability requirements in terms of the MQL (or MDL for Total Arsenic) for the Metals analyses. The MDLs and MQLs reported by CAS are at or below the levels in the Plan for each metal.

HOLDING TIME, PRESERVATION, AND CONTAINERS

Samples were properly preserved in the field, and prepared and analyzed within the holding times as specified in the Plan, except as follows:

- The shipment containing the fish organisms for location TR-01 collected on 12/15/2011 and the Bait sample collected on 12/14/2011 was received on 12/16/2011 at 4.3 C with an empty dry ice bag.
- The shipment containing the crab organisms for location T-12 collected on 12/22/10 was received on 12/27/10 at 8.9 C. These organisms were discarded and the composites were prepared using organisms received on 12/21/2010 and 01/04/2011 at $\leq$ 6 C.

Additionally, the validator noted the following regarding sample handling:

- All fish organisms were received at CAS within three days of collection (with 1-2 days transit time) and all organisms for a given location were collected on the same date.
- All crab organisms were received at CAS within two days of collection (shipped the same day as collected with 1-2 days transit time) and the organisms for a given location were collected on the same date or up to 25 days apart.
- There is no required holding time for Total Solids, the results of which were used to correct the CAS metals results to a wet-weight basis. All Total Solids results were determined within 50-days of collection.

No data were qualified as unusable due to holding time issues.

LABORATORY BLANKS

For all tests, the laboratories prepared one method blank per batch (maximum 20 samples) as required in the Plan. (Note that the samples were assigned to batches as received and almost every batch includes a mix of samples from Site, reference and/or market locations.) The method blanks underwent all processing, preparation, cleanup, and analysis procedures. No analytes are reported above the detection limit in the laboratory blanks, except as follows:

CAS The method blanks for a few of the batches have a low-level detect (i.e., laboratory J-values) for Total Arsenic, Total Barium, Total Mercury, or Methyl Mercury.

Pace Per laboratory standard procedure, the method blanks were prepared using a tuna matrix purchased from a grocery store. The method blanks for all batches have detections for Lipid Content at 0.43-0.53% and for TPH (C08-C40) at 77.3-139 mg/kg. The laboratory corrected the method blank results for each carbon (C)-range (using peak area subtraction) for lipid peaks in the C10-C28 range seen in the tuna matrix, and thus the results provide an indication of potential laboratory contamination for that C-range. The results for the other C-ranges provide an indication of potential laboratory contamination and/or matrix interference. The corrected method blank results indicate there was no laboratory contamination (i.e., the blank results are all non-detect) for the C10-C28 range and no laboratory contamination or matrix interference for the C08-C16 and C16-C28 ranges. In narrative comments regarding method blanks, the laboratory notes that TPH (C08-C40) was detected above the report limit due to a large lipid peak eluting around C34. The presence of TPH (C08-C40) in every method blank and the peaks present on the chromatograms indicate that C08-C40 results for organic tissue samples reflect high bias due to the presence of cholesterol/lipid peaks. Laboratory narratives for the tissue samples identify the impact of the "…large lipid peak eluting around C34."

Based upon laboratory recommendation, organic material in the range up to C28 was identified as potential petroleum hydrocarbon that can be quantified without significant impact from the cholesterol/lipid peaks naturally and ubiquitously present in the biological tissue samples; though there is potential for interference from natural (biological or other) organic material in the <C28 range based upon the uncorrected results of the method blank analyses. Additionally, there is potential for petroleum hydrocarbon occurrence in the range of C28-C40, however, this range of the chromatogram is dominated by the cholesterol/lipid peaks. The results for TPH (C08-C40) for the method blanks and samples include the C28-C40 range that is dominated by cholesterol/lipid peaks.

No data were qualified as unusable due to the presence of analytes in the laboratory blanks.

FIELD QUALITY CONTROL BLANKS

No field quality control blanks (e.g., equipment rinsate blanks) were collected with the samples.

LCS/LCSD RECOVERIES

For all applicable tests, the laboratories prepared one LCS per batch (maximum 20 samples) as required in the Plan. Additionally, for some of the TPH batches (i.e., those without an MS/MSD due to insufficient sample mass), Pace prepared an LCSD. The LCS/LCSD were spiked prior to all preparation, cleanup, and analysis procedures. Recoveries are within the project criteria, specified in Table 2 of Plan, except as follows:

CAS No exceptions found.

PACE The spike used for the LCS/LCSD is a no. 2 Diesel Fuel standard per Method 8015B. The standard is certified as covering the C10-C28 carbon range and cannot be broken into different carbon ranges. Thus, though reported for complete documentation, the TPH (C08-C16) and TPH (C16-C28) spike recoveries do not provide an accurate indication of data quality and thus were not evaluated by the validator. Per laboratory standard procedure, the LCS/LCSD for this project were prepared using a tuna matrix. The laboratory corrected the LCS/LCSD results for each C-range (using peak area subtraction) for lipid peaks in the C10-C28 range seen in the tuna matrix, and thus the recoveries provide an indication of laboratory performance for that C-range. The recoveries for the other C-ranges provide an indication of laboratory performance and/or matrix interference.

The LCS and/or LCSD for two of the eight analytical batches have a recovery for TPH (C10-C28) that is below the criteria (at 40-49%) but well above the data rejection limit of 10% for organics. The TPH (C10-C28) recoveries for the remaining six batches are within the criteria.

The recoveries for Diesel Range Organics (C08-C28) are similar to the TPH (C10-C28) recoveries, indicating minimal interference in the C08-C10 region for the tuna matrix.

The TPH (C08-C40) recoveries are all above the criteria at 175-327%, which confirms matrix interference in the C28-C40 region as expected for the cholesterol/lipid-containing tuna matrix and as evident on the LCS/LCSD chromatograms. This indicates that the results for organic tissue samples are affected by interference from cholesterol/lipid peaks present in this C-range.

Since the control spikes are prepared in a fish matrix, the recoveries were not anticipated to be such as may be expected from a blank or inert matrix.

No data were qualified as unusable based on LCS/LCSD recoveries.

MS/MSD RECOVERIES

For all applicable tests, the laboratories prepared at least one MS and/or MSD per batch (maximum 20 samples) as required in the Plan with the exception of five of the TPH batches. Insufficient sample mass was available for preparing MS/MSD for these batches and the laboratory included a LCSD in each batch instead. The MS/MSD were spiked prior to all preparation, cleanup, and analysis procedures and were prepared using samples from Site, reference, and market locations. Recoveries are within the project criteria, except as follows:

CAS The MS and MSD recoveries for Barium are outside the criteria for two of the MS/MSD (prepared using EWL-T-02-C-EXOSKELETON and EWL-T-03-C-EXOSKELETON). Due to a low spike amount relative to unspiked sample concentration, an accurate evaluation of these spike recoveries cannot be made and these data were not evaluated.

The MS recovery for Barium is above the criteria for the MS/MSD prepared using EWL-T-02-C-OTHER SOFT TISSUE and the MS recovery is slightly below the criteria for the MS/MSD prepared using EWL-T-03-C-OTHER SOFT TISSUE. The MSD recoveries are within the criteria in both cases.

The Barium recoveries for the remaining 15 MS/MSD are within the criteria.

PACE The spike used for the MS/MSD is a no. 2 Diesel Fuel standard per Method 8015B. The standard is certified as covering the C10-C28 carbon range and cannot be broken into different carbon ranges. Thus, though reported for complete documentation, the TPH (C08-C16) and TPH (C16-C28) spike recoveries do not provide an accurate indication of data quality and thus were not evaluated by the validator. Additionally, as discussed for the LCS/LCSD, cholesterol/lipid interferences for the Diesel Range Organics (C8-C28) and TPH (C08-C40) recoveries do not provide an accurate indication of data quality and thus were not evaluated.

For TPH (C10-C28), the MS recovery is above the criteria and the MSD recovery is within the criteria for the MS/MSD prepared using EWL-T-02-C-HEPATOPANCREAS. The TPH (C10-C28) recoveries for the remaining two MS/MSD (prepared with EWL-T-02-C-MEAT and EWL-T-02-F-COMPOSITE_BLUEGILL) are within the criteria. This indicates that TPH is recoverable and method performance is adequate for these sample matrices.

The validator noted that interference from cholesterol/lipid content may not be apparent from the MS/MSD recoveries since the bias would affect both the unspiked sample concentration and the spiked sample concentration (and the recovery is calculated from the difference of these two). Additionally, the validator noted that the Lipid Content (shown below) for each of the composites is near or above that of the tuna matrix used to prepare the method blanks and LCS/LCSD and the chromatograms for the composites show peaks beyond and above the unresolved “hump” similar to some of the peaks seen on the chromatograms for the method blanks and LCS/LCSD.

SAMPLE	LIPID CONTENT
Method Blanks (Tuna Matrix)	0.43-0.53%
Fish Composites	0.31-3.0%
Whole Body Crab Composites	0.13-0.85%
Hepatopancreas Crab Composites	3.2-30.6%
Meat Crab Composites	0.023-0.79%

The Lipid Content of the composite samples suggests that matrix effect can be expected, similar to that recognized in the tuna matrix.

No data were qualified as unusable based on MS/MSD recoveries.

SURROGATE RECOVERIES

Pace reported the recovery for the surrogate o-Terphenyl for each TPH analysis. The surrogate spike was added prior to all preparation, cleanup, and analysis procedures. Recoveries are within the project criteria, except as follows:

PACE The surrogate is calibrated at a single concentration (50 ug/ml on-column) with the samples being spiked to recovery at that concentration. When a sample is diluted the expected on column concentration falls outside of the calibration concentration range. Therefore when a sample is diluted, the laboratory does not evaluate the surrogate recovery because it is no longer at the calibration concentration and the recovery is defaulted to 0%. Thus, for samples requiring dilution, data quality cannot be evaluated based on surrogate recovery. However, review of the chromatogram for the absence or presence of the surrogate peak is used to check for significant problems with the extraction and analysis for that sample.

Eighty-one analyses including three method blanks, twelve LCS/LCSD, 61 composites, and five MS/MSD required dilution to bring the TPH (C08-C40), which includes the large lipid peak eluting around C34, within the range of calibration. A peak is present on the chromatogram and the data system for the analytical instrument identified the peak as within the surrogate retention time window for every diluted analysis except EWL-TR-09-C-HEPATOPANCREAS. (Note: A surrogate amount is shown on the quantitation report for diluted samples if the surrogate is identified by the data system, but this amount is not multiplied by the dilution factor.)

For the samples not requiring dilution, the surrogate recovery is evaluated and is below the data rejection limit (i.e., less than 10%) for EWL-T-01A-C-MEAT, EWL TR-04-F-COMPOSITE, and EWL TR-09-F-COMPOSITE. It is not possible to determine the absence or presence of analytes that are reported as non detect in these samples. The following results are reported as non detect in these samples and thus are not considered reliable for use in quantitative analysis (i.e., R-qualified):

EWL-T-01A-C-MEAT	Diesel Range Organics (C8-C28), TPH (C08-C16), TPH (C16-C28), TPH - Diesel (C10-C28)
EWL TR-04-F-COMPOSITE	TPH (C08-C16)
EWL TR-09-F-COMPOSITE	TPH (C08-C16)

For the remaining 50 undiluted composites, seven have a recovery below the criteria (at 10-47 %) but at or above the data rejection limit. Since the samples are a biological matrix, the recoveries were not anticipated to be as good or equivalent to those in soils. The laboratory's in-house surrogate recovery range for a soil matrix is 10% to 130%.

The validator noted that the recovery of o-Terphenyl, which is a polynuclear aromatic hydrocarbon (PAH), reflects on the overall extraction/analysis efficiency for each sample but may not represent the extraction/analysis efficiency for all types of compounds that are measured by the TPH analysis. (TPH contains a wide range of different types of compounds including PAHs but also saturated hydrocarbons, unsaturated hydrocarbons, and cycloparaffins, all of which have different polarities, solubilities, volatilities, etc.) The MS/MSD, which are spiked with No. 2 diesel fuel, provide an important indication of TPH recoverability, and laboratory performance on MS/MSD recoveries indicates that TPH is recoverable and method performance is adequate for these sample matrices.

LABORATORY DUPLICATE PRECISION

For all tests, the laboratories prepared at least one laboratory duplicate (LCSD, MSD, and/or MD). RPDs are within the project criteria, except as follows:

CAS No exceptions found.

PACE The RPD reported for TPH (C08-C40) for the MSD prepared using EWL-T-02-C-HEPATOPANCREAS is above the criteria. However, the RPD is calculated using the MS and MSD measured results and the added spike concentrations differ greatly due to a large difference in the sample mass used for the MS versus the MSD. When calculated based on the MS and MSD recoveries, the RPD is within the criteria.

No data were qualified as unusable based on LCS/LCSD or MS/MSD precision.

FIELD DUPLICATE PRECISION

Three of the thirty locations were designated in the field as duplicate locations, which meets the Plan requirement of approximately 10%. Duplicate samples were prepared by the laboratory for each of the four crab parts (hepatopancreas, other soft tissue, meat, and exoskeleton). All specimens or sub-samples thereof for the duplicate location were composited and then the composite was split by the laboratory. RPDs are within the project criteria, except as follows:

CAS The RPD for Total Barium is outside the criteria for EWL-T-03-C-DUP-MEAT and the RPD for Methyl Mercury is outside the criteria for EWL-T-03-C-DUP-MEAT and EWL-T-10-C-DUP-MEAT.

PACE The RPD for Lipid Content is outside the criteria for EWL-T-03-C-DUP-MEAT.

No data were qualified as unusable based on field duplicate precision.

OTHER COMPARISONS

The validator also compared total to partial results as part of the data review:

- The speciated metal concentrations were compared to the total metal concentrations and the speciated concentration was not found to be significantly above the total concentration, except as follows:
    - Total Inorganic Arsenic concentration is approximately five times the Total Arsenic concentration for EWL BAIT-F-COMPOSITE_CATFISH.
    - The Methyl Mercury concentrations are approximately 50% higher than the Total Mercury concentrations for EWL-T-08-C-EXOSKELETON and EWL-T-09-C-EXOSKELETON.

No data were qualified as unusable due to comparison issues.

INITIAL CALIBRATION (TPH ONLY)

No exceptions were found that affect data quality.

CALIBRATION BLANKS/VERIFICATION

CAS No exceptions were found that affect data quality.

PACE The %difference for the continuing calibration verification (CCV) standard analyzed on 06/28/2012 at 19:09 is outside the ±15% criteria at -18% for the TPH analytes and -24% for the surrogate o-Terphenyl.

No data were qualified as unusable for calibration verification issues.

ICP INTERFERENCE CHECKS

No exceptions were found.

INTERNAL STANDARD AREAS

No exceptions were found that affect data quality.

ANALYTE IDENTIFICATION (TPH ONLY)

No exceptions were found that affect data quality.

ANALYTE QUANTITATION (TPH ONLY)

No exceptions were found.

RAW DATA VERIFICATION (TPH ONLY)

No exceptions were found.

Table 1

Analytical Data Qualified as Unusable (R-flag)

Field Identification	Analyte	Qualification	Reason for Qualification
EWL-T-01A-C-MEAT	Diesel Range Organics (C8-C28)	R	Surrogate recovery less than 10%
EWL-T-01A-C-MEAT	TPH (C08-C16)	R	Surrogate recovery less than 10%
EWL-T-01A-C-MEAT	TPH (C16-C28)	R	Surrogate recovery less than 10%
EWL-T-01A-C-MEAT	TPH - Diesel (C10-C28)	R	Surrogate recovery less than 10%
EWL TR-04-F-COMPOSITE	TPH (C08-C16)	R	Surrogate recovery less than 10%
EWL TR-09-F-COMPOSITE	TPH (C08-C16)	R	Surrogate recovery less than 10%
R – Rejected; data are not usuable due to failure to meet one or more quality control criteria.			

Supporting Calculations for RECAP Standard Development

Appendix G

Project No. 0116008
UNOCAL
Vermilion Parish, Louisiana

Environmental Resources Management Southwest, Inc.
3838 North Causeway Boulevard, Suite 3000
Metairie, Louisiana 70002
(504) 831-6700

Strontium

RECAP STANDARDS FOR STRONTIUM

East White Lake Oil and Gas Field
Vermilion Parish, Louisiana

							RECAP Standards (a)					
		RfDo		REF	BCF	REF	GWSS	GW2	GW3NDW	Soil$_{SSni}$	Soil$_{SSi}$	Soil$_{SSGW}$
	CAS#	mg/kg-d	mg/kg-d		L/kg		mg/L	mg/L	mg/L	mg/kg	mg/kg	mg/kg
Strontium	7440-24-6	6.00E-01		IRIS	60	RAIS	2.2E+00	2.2E+01	3.3E+01	4.7E+03	1.2E+05	4.4E+04

Notes:

mg/kg-d = milligrams per kilogram per day

L/kg = Liters per Kilogram

mg/L = milligrams per liter

mg/kg = milligrams per kilogram

CAS# = Chemical Abstract Number

RfDo = Oral Reference Dose

IRIS = Integrated Risk Information System (USEPA)

RAIS = Risk Assessment Information System (Oak Ridge National Laboratory)

GWss = RECAP Ground Water Screening Standard

GW3NDW = Ground Water Class 3 non-drinking water RECAP Standard

Soil$_{SSi}$ = Screening Standard for soil protective of human health for industrial land use. Conservatively used for screening a recreational scenario.

Soil$_{SSGW}$ = Screening Standard for soil protective of ground water (RECAP Table 1).

BCF - bioconcentration factor

(a) RECAP Standards calculated in accordance with Appendix H of RECAP (2003). SoilSSGW calculated in accordance with USEPA Soil Screening Guidance.

Sediment Recreational Contact – RECAP Spreadsheets

RECAP SPREADSHEETS
SEDIMENT RECREATIONAL CONTACT
Child Age 11-16 Years

CHEMICAL AND PHYSICAL PARAMETERS

COMPOUND	CAS #	MOL. WT	Koc	REF	H	REF	Da	REF	Dw	REF	S	REF
		g/g-mole	cm3/g		atm-m3/mol		cm2/s		cm2/s		mg/L	
Barium	7440-39-3	137.33	********	********	********	********	********	********	********	********	********	*******
Mercury (inorganic)	7487-94-7	200.59	********	********	********	********	********	********	********	********	********	*******
Aliphatics >C10-C12	NA	160	2.51E+05	10	2.93E+00	10	1.00E-01	10	1.00E-05	10	********	*******
Aliphatics >C12-C16	NA	200	5.01E+06	10	1.27E+01	10	1.00E-01	10	1.00E-05	10	********	*******
Aliphatics >C16-C35	NA	270	6.31E+08	10	1.20E+02	10	1.00E-01	10	1.00E-05	10	********	*******
Aromatics >C12-C16	NA	150	5.01E+03	10	1.29E-03	10	1.00E-01	10	1.00E-05	10	********	*******
Aromatics >C16-C21	NA	190	1.58E+04	10	3.17E-04	10	1.00E-01	10	1.00E-05	10	********	*******
Aromatics >C21-C35	NA	240	1.26E+05	10	1.63E-05	10	1.00E-01	10	1.00E-05	10	********	*******

10. Total Petroleum Hydrocarbon Criteria Workgroup, 1996.

NOTE: See end of Table for designation of numbers and letter.

RECAP SPREADSHEETS
SEDIMENT RECREATIONAL CONTACT
Child Age 11-16 Years
CANCER SLOPE FACTORS AND REFERENCE DOSES

COMPOUND	CAS #	SF_o	REF	SF_i	REF	RfD_o	REF	RfD_i	REF	ABS
		$(mg/kg\text{-}day)^{-1}$		$(mg/kg\text{-}day)^{-1}$		mg/kg-day		mg/kg-day		unitless
Barium	7440-39-3	*******		*******		2.00E-01	I	1.43E-04	H	0
Mercury (inorganic)	7487-94-7	*******		*******		3.00E-04	I	8.57E-05	I	0
Aliphatics >C10-C12	NA	*******		*******		1.00E-01	T	3.00E-01	T	0
Aliphatics >C12-C16	NA	*******		*******		1.00E-01	T	3.00E-01	T	0
Aliphatics >C16-C35	NA	*******		*******		2.00E+00	T	2.00E+00	*	0.1
Aromatics >C12-C16	NA	*******		*******		4.00E-02	T	6.00E-02	T	0
Aromatics >C16-C21	NA	*******		*******		3.00E-02	T	3.00E-02	*	0.1
Aromatics >C21-C35	NA	*******		*******		3.00E-02	T	3.00E-02	*	0.1

I = Integrated Risk Information System (IRIS), EPA.
H = Health Effects Assessment Summary Tables (HEAST), EPA.
* = Inhalation toxicity not available, oral toxicity value used to assess inhalation exposure.
T = TPH Criteria Working Group, 1997.

NOTE: See end of Table for designation of letters and symbols.

RECAP SPREADSHEETS
SEDIMENT RECREATIONAL CONTACT
Child Age 11-16 Years

Soil properties		Management Option 1 & 2							
Revision Date: 08/04/2003									
Run date:	9/30/2015								
*****calculation inputs*****									
1.7	g/cm3		pb = dry soil bulk density						
0.358491	Lpore/Lsoil		n = total soil porosity						
0.21	Lwater/Lsoil		nw = water-filled soil porosity						
0.148491	Lair/Lsoil		na = air-filled soil porosity						
2.65	g/cm3		ps = soil particle density						
0.006	g/g		foc = fractional organic carbon in soil						
148	(ft) = L = length of the source at the water table								
148	(ft) = W = width of impacted area perpendicular to flow direction of aquifer								
0.5	Acres		AOI site area - input into Q/C equation below						
76.38527	g/m2-s per kg/m3		Q/C = inverse of mean concentration at center of square source						
Q/C Table									
site size	148*148	209*209	295*295	467*467	660*660	1143*1143			
site size	0.5 acre	1 acre	2 acre	5 acre	10 acre	30 acre			
Q/C value	76.3062	67.4304	59.872	51.4648	46.1707	39.2329			

RECAP Spreadsheets
Sediment Recreational Contact
Child Age 11-16 years

RECAP		
Management Option 3		
Default Exposure parameters		**Industrial scenario was changed to child recreational.**
*****calculation inputs*****		
1.0E-06	unitless	TR = target excess individual lifetime cancer risk
1	unitless	THQ = target hazard quotient
70	yr	ATc = averaging time-carcinogens
5	yr	ATni = averaging time-noncarcinogens, child recreational (7-16 yrs)
30	yr	ATnni = averaging time-noncarcinogens, non-industrial
6	yr	ATnc = averaging time-noncarcinogens, child
350	days/yr	EFni = exposure frequency, non-industrial
104	days/yr	EFi = exposure frequency, child recreational (7-16 yrs)
30	yr	EDni = exposure duration, non-industrial
5	yr	EDi = exposure duration, child recreational (7-16 yrs)
6	yr	EDc = exposure duration, child ages 1-6
1.6E+08	sec	Ti = exposure time, child recreational (7-16 yrs) (5 yr)
1.9E+08	sec	Tnic = exposure time, non-industrial, child (6 yr)
9.5E+08	sec	Tnia = exposure time, non-industrial, adult (30 yr)
59.3	kg	BWa = average body weight, child ages 7-16
15	kg	BWc = average body weight, child ages 1-6
114	mg-yr/kg-da	IRSadj = ingestion rate, age-adjusted, soil, (see calculation below)
11	m3-yr/kg-da	IRAadj = inhalation rate, age-adjusted (see calculation below)
360	mg-yr/kg-da	IRDadj = dermal contact rate, age-adjusted, soil (see calculation below)
1.1	L-yr/kg-day	IRWadj = ingestion rate, water, age-adjusted (see calculation below)
0.089	L/day	IRWndw = ingestion rate, water, non-drinking water (incidental)
150	mg/day	IRSi = ingestion rate, soil, child recreational (7-16 yrs)
200	mg/day	IRSc = ingestion rate, soil, child ages 1-6
10	m3/day	IRAc = inhalation rate, child ages 1-6
2	L/day	IRWa = ingestion rate, water, adult
20	m3/day	IRAa = inhalation rate, child ages 7-16
0.02	kg/day	IRF = ingestion rate, fish
2800	cm2/day	SAc = surface area of skin, child
5700	cm2/day	SAan = surface area of skin, adult, non-industrial
4080	cm2/day	SAai = surface area of skin,child recreational (7-16 yrs)
0.2	mg/cm2	AFc = adherence factor, soil-to-skin, child
0.07	mg/cm2	AFan = adherence factor, soil-to-skin, adult, non-industrial
6.31	mg/cm2	AFai = adherence factor, soil-to-skin, child recreational (7-16 yrs)
0.5	Lm3	Kw =water-to-indoor air volatilization factor
*****stop*****		

LDEQ RECAP
WORKSHEET 5
SOILi (mg/kg)
Sediment Recreational Contact
Child Age 11-16 Years

Derivation of Management Option 1 & 2 **Soil-Industrial**
Revision Date: 08/04/2003 Run date: 9/30/2015

DA = ((na^(10/3)*Da*H*41+nw^(10/3)*Dw)/n^2)/(pb*Koc*foc+nw+na*H*41)
VFi = (Q\C*1e-4*(3.14*DA*Ti)^0.5)/(2*pb*DA)

Soili-C-O = (TR*BWa*ATc*365)/(EFi*EDi*(SFo*1e-6*IRSi+SFi*(IRAa/VFi)+SFo*SAai*AFai*ABS*1e-6))
Soili-C-I = (TR*BWa*ATc*365)/(EFi*EDi*(SFo*1e-6*IRSi+SFo*SAai*AFai*ABS*1e-6))
Soili-N-O = (THQ*BWa*ATni*365)/(EFi*EDi*((IRSi/RfDo)*1e-6+(IRAa/RfDi)*(1/VFi)+(SAai/RfDo)*AFai*ABS*1e-6))
Soili-N-I = (THQ*BWa*ATni*365)/(EFi*EDi*((IRSi/RfDo)*1e-6+(SAai/RfDo)*AFai*ABS*1e-6)))

	DA	**VFi**	**Soili**	**Soili**	**Soili**	**Soili**	**min value**	**Soili**	
COMPOUND	**(cm2/s)**	**(m3/kg)**	**C-O (mg/kg)**	**C-I (mg/kg)**	**N-O (mg/kg)**	**N-I (mg/kg)**	**(C or N)**	**(mg/kg)**	
Barium	NA	NA		NA		2.77E+05	2.8E+05	2.8E+05	N
Mercury (inorganic)	NA	NA		NA		4.16E+02	4.2E+02	4.2E+02	N
Aliphatics >C10-C12	6.28E-05	6.31E+03	NA		1.72E+04		1.7E+04	1.0E+04	O,T
Aliphatics >C12-C16	1.37E-05	1.35E+04	NA		3.23E+04		3.2E+04	1.0E+04	O,T
Aliphatics >C16-C35	1.03E-06	4.93E+04	NA		1.33E+05		1.3E+05	1.0E+04	O,T
Aromatics >C12-C16	1.40E-06	4.23E+04	NA		1.79E+04		1.8E+04	1.0E+04	O,T
Aromatics >C16-C21	1.11E-07	1.50E+05	NA		2.18E+03		2.2E+03	2.2E+03	N
Aromatics >C21-C35	1.04E-09	1.55E+06	NA		2.28E+03		2.3E+03	2.3E+03	N

RECAP SPREADSHEETS
APPENDIX H: TABLE H1
SEDIMENT DIRECT CONTACT

CANCER SLOPE FACTORS AND REFERENCE DOSES

COMPOUND	**CAS #**	**SF_o**	**REF**	**SF_i**	**REF**	**RfD_o**	**REF**	**RfD_i**	**REF**	**ABS**
		$(mg/kg\text{-}day)^{-1}$		**$(mg/kg\text{-}day)^{-1}$**		**mg/kg-day**		**mg/kg-day**		**unitless**
Barium	7440-39-3	*******		*******		2.00E-01	I	1.43E-04	H	0
Mercury (inorganic)	7487-94-7	*******		*******		3.00E-04	I	8.57E-05	I	0
Aliphatics >C10-C12	NA	*******		*******		1.00E-01	T	3.00E-01	T	0
Aliphatics >C12-C16	NA	*******		*******		1.00E-01	T	3.00E-01	T	0
Aliphatics >C16-C35	NA	*******		*******		2.00E+00	T	2.00E+00	*	0.1
Aromatics >C12-C16	NA	*******		*******		4.00E-02	T	6.00E-02	T	0
Aromatics >C16-C21	NA	*******		*******		3.00E-02	T	3.00E-02	*	0.1
Aromatics >C21-C35	NA	*******		*******		3.00E-02	T	3.00E-02	*	0.1

I = Integrated Risk Information System (IRIS), EPA.
H = Health Effects Assessment Summary Tables (HEAST), EPA.
* = Inhalation toxicity not available, oral toxicity value used to assess inhalation exposure.
T = TPH Criteria Working Group, 1997.

RECAP SPREADSHEETS
APPENDIX H: TABLE H2
SEDIMENT DIRECT CONTACT

CHEMICAL AND PHYSICAL PARAMETERS

COMPOUND	**CAS #**	**MOL. WT**	**Koc**	**REF**	**H**	**REF**	**Da**	**REF**	**Dw**	**REF**	**S**	**REF**
		g/g-mole	**cm3/g**		**atm-m3/mol**		**cm2/s**		**cm2/s**		**mg/L**	
Barium	7440-39-3	137.33	********	********	********	********	********	********	********	********	********	*******
Mercury (inorganic)	7487-94-7	200.59	********	********	********	********	********	********	********	********	********	*******
Aliphatics >C10-C12	NA	160	2.51E+05	10	2.93E+00	10	1.00E-01	10	1.00E-05	10	********	*******
Aliphatics >C12-C16	NA	200	5.01E+06	10	1.27E+01	10	1.00E-01	10	1.00E-05	10	********	*******
Aliphatics >C16-C35	NA	270	6.31E+08	10	1.20E+02	10	1.00E-01	10	1.00E-05	10	********	*******
Aromatics >C12-C16	NA	150	5.01E+03	10	1.29E-03	10	1.00E-01	10	1.00E-05	10	********	*******
Aromatics >C16-C21	NA	190	1.58E+04	10	3.17E-04	10	1.00E-01	10	1.00E-05	10	********	*******
Aromatics >C21-C35	NA	240	1.26E+05	10	1.63E-05	10	1.00E-01	10	1.00E-05	10	********	*******

10. Total Petroleum Hydrocarbon Criteria Workgroup, 1996.

RECAP SPREADSHEETS
SEDIMENT DIRECT CONTACT

Soil properties		Management Option 1 & 2							
Revision Date: 08/04/2003									
Run date:	9/30/2015								
*****calculation inputs*****									
1.7	g/cm3		pb = dry soil bulk density						
0.358491	Lpore/Lsoil		n = total soil porosity						
0.21	Lwater/Lsoil		nw = water-filled soil porosity						
0.148491	Lair/Lsoil		na = air-filled soil porosity						
2.65	g/cm3		ps = soil particle density						
0.006	g/g		foc = fractional organic carbon in soil						
148	(ft) = L = length of the source at the water table								
148	(ft) = W = width of impacted area perpendicular to flow direction of aquifer								
0.5	Acres		AOI site area - input into Q/C equation below						
76.38527	g/m2-s per kg/m3		Q/C = inverse of mean concentration at center of square source						
Q/C Table									
site size	148*148	209*209	295*295	467*467	660*660	1143*1143			
site size	0.5 acre	1 acre	2 acre	5 acre	10 acre	30 acre			
Q/C value	76.3062	67.4304	59.872	51.4648	46.1707	39.2329			

RECAP WORKSHEETS
SEDIMENT RECREATIONAL CONTACT
ADULT

RECAP			
Management Option 3			
Default Exposure parameters			Industrial scenario was changed to adult recreational
*****calculation inputs*****			
1.0E-06	unitless	TR = target excess individual lifetime cancer risk	
1	unitless	THQ = target hazard quotient	
70	yr	ATc = averaging time-carcinogens	
30	yr	ATni = averaging time-noncarcinogens, adult recreational	
30	yr	ATnni = averaging time-noncarcinogens, non-industrial	
6	yr	ATnc = averaging time-noncarcinogens, child	
350	days/yr	EFni = exposure frequency, non-industrial	
104	days/yr	EFi = exposure frequency, adult recreational	
30	yr	EDni = exposure duration, non-industrial	
30	yr	EDi = exposure duration, adult recreational	
6	yr	EDc = exposure duration, child ages 1-6	
9.5E+08	sec	Ti = exposure time, adult recreational (30 yrs)	
1.9E+08	sec	Tnic = exposure time, non-industrial, child (6 yr)	
9.5E+08	sec	Tnia = exposure time, non-industrial, adult (30 yr)	
70	kg	BWa = average body weight, adult ages 7-31	
15	kg	BWc = average body weight, child ages 1-6	
114	mg-yr/kg-da	IRSadj = ingestion rate, age-adjusted, soil, (see calculation below)	
11	m3-yr/kg-da	IRAadj = inhalation rate, age-adjusted (see calculation below)	
360	mg-yr/kg-da	IRDadj = dermal contact rate, age-adjusted, soil (see calculation below)	
1.1	L-yr/kg-day	IRWadj = ingestion rate, water, age-adjusted (see calculation below)	
0.089	L/day	IRWndw = ingestion rate, water, non-drinking water (incidental)	
50	mg/day	IRSi = ingestion rate, soil, industrial	
200	mg/day	IRSc = ingestion rate, soil, child ages 1-6	
10	m3/day	IRAc = inhalation rate, child ages 1-6	
2	L/day	IRWa = ingestion rate, water, adult	
20	m3/day	IRAa = inhalation rate, adult ages 7-31	
0.02	kg/day	IRF = ingestion rate, fish	
2800	cm2/day	SAc = surface area of skin, child	
5700	cm2/day	SAan = surface area of skin, adult, non-industrial	
6910	cm2/day	SAai = surface area of skin, adult, recreational	
0.2	mg/cm2	AFc = adherence factor, soil-to-skin, child	
0.07	mg/cm2	AFan = adherence factor, soil-to-skin, adult, non-industrial	
0.2	mg/cm2	AFai = adherence factor, soil-to-skin, adult, industrial	
0.5	Lm3	Kw =water-to-indoor air volatilization factor	
*****stop*****			

RECAP SPREADSHEETS
WORKSHEET 5
SOILi (mg/kg)
SEDIMENT RECREATIONAL CONTACT
ADULT

Derivation of Management Option 1 & 2 **Soil-Industrial**
Revision Date: 08/04/2003 Run date: 9/30/2015

DA = ((na^(10/3)*Da*H*41+nw^(10/3)*Dw)/n^2)/(pb*Koc*foc+nw+na*H*41)
VFi = (Q\C*1e-4*(3.14*DA*Ti)^0.5)/(2*pb*DA)

Soili-C-O = (TR*BWa*ATc*365)/(EFi*EDi*(SFo*1e-6*IRSi+SFi*(IRAa/VFi)+SFo*SAai*AFai*ABS*1e-6))
Soili-C-I = (TR*BWa*ATc*365)/(EFi*EDi*(SFo*1e-6*IRSi+SFo*SAai*AFai*ABS*1e-6))
Soili-N-O = (THQ*BWa*ATni*365)/(EFi*EDi*((IRSi/RfDo)*1e-6+(IRAa/RfDi)*(1/VFi)+(SAai/RfDo)*AFai*ABS*1e-6))
Soili-N-I = (THQ*BWa*ATni*365)/(EFi*EDi*((IRSi/RfDo)*1e-6+(SAai/RfDo)*AFai*ABS*1e-6)))

	DA	**VFi**	**Soili**	**Soili**	**Soili**	**Soili**	**min value**	**Soili**	
COMPOUND	**(cm2/s)**	**(m3/kg)**	**C-O (mg/kg)**	**C-I (mg/kg)**	**N-O (mg/kg)**	**N-I (mg/kg)**	**(C or N)**	**(mg/kg)**	
Barium	NA	NA		NA		9.83E+05	9.8E+05	9.8E+05	N
Mercury (inorganic)	NA	NA		NA		1.47E+03	1.5E+03	1.5E+03	N
Aliphatics >C10-C12	6.28E-05	1.55E+04	NA		5.10E+04		5.1E+04	1.0E+04	O,T
Aliphatics >C12-C16	1.37E-05	3.31E+04	NA		9.76E+04		9.8E+04	1.0E+04	O,T
Aliphatics >C16-C35	1.03E-06	1.21E+05	NA		1.39E+06		1.4E+06	1.0E+04	O,T
Aromatics >C12-C16	1.40E-06	1.04E+05	NA		5.50E+04		5.5E+04	1.0E+04	O,T
Aromatics >C16-C21	1.11E-07	3.68E+05	NA		3.04E+04		3.0E+04	1.0E+04	O,T
Aromatics >C21-C35	1.04E-09	3.81E+06	NA		3.81E+04		3.8E+04	1.0E+04	O,T

RECAP SPREADSHEETS
APPENDIX H: TABLE H1
SEDIMENT DIRECT CONTACT

CANCER SLOPE FACTORS AND REFERENCE DOSES

COMPOUND	**CAS #**	**SF_o**	**REF**	**SF_i**	**REF**	**RfD_o**	**REF**	**RfD_i**	**REF**	**ABS**
		$(mg/kg\text{-}day)^{-1}$		**$(mg/kg\text{-}day)^{-1}$**		**mg/kg-day**		**mg/kg-day**		**unitless**
Barium	7440-39-3	*******		*******		2.00E-01	I	1.43E-04	H	0
Mercury (inorganic)	7487-94-7	*******		*******		3.00E-04	I	8.57E-05	I	0
Aliphatics >C10-C12	NA	*******		*******		1.00E-01	T	3.00E-01	T	0
Aliphatics >C12-C16	NA	*******		*******		1.00E-01	T	3.00E-01	T	0
Aliphatics >C16-C35	NA	*******		*******		2.00E+00	T	2.00E+00	*	0.1
Aromatics >C12-C16	NA	*******		*******		4.00E-02	T	6.00E-02	T	0
Aromatics >C16-C21	NA	*******		*******		3.00E-02	T	3.00E-02	*	0.1
Aromatics >C21-C35	NA	*******		*******		3.00E-02	T	3.00E-02	*	0.1

I = Integrated Risk Information System (IRIS), EPA.
H = Health Effects Assessment Summary Tables (HEAST), EPA.
* = Inhalation toxicity not available, oral toxicity value used to assess inhalation exposure.
T = TPH Criteria Working Group, 1997.

RECAP SPREADSHEETS

APPENDIX H: TABLE H2

SEDIMENT DIRECT CONTACT

CHEMICAL AND PHYSICAL PARAMETERS

COMPOUND	CAS #	MOL. WT	Koc	REF	H	REF	Da	REF	Dw	REF	S	REF
		g/g-mole	cm3/g		atm-m3/mol		cm2/s		cm2/s		mg/L	
Barium	7440-39-3	137.33	********	********	********	********	********	********	********	********	********	*******
Mercury (inorganic)	7487-94-7	200.59	********	********	********	********	********	********	********	********	********	*******
Aliphatics >C10-C12	NA	160	2.51E+05	10	2.93E+00	10	1.00E-01	10	1.00E-05	10	********	*******
Aliphatics >C12-C16	NA	200	5.01E+06	10	1.27E+01	10	1.00E-01	10	1.00E-05	10	********	*******
Aliphatics >C16-C35	NA	270	6.31E+08	10	1.20E+02	10	1.00E-01	10	1.00E-05	10	********	*******
Aromatics >C12-C16	NA	150	5.01E+03	10	1.29E-03	10	1.00E-01	10	1.00E-05	10	********	*******
Aromatics >C16-C21	NA	190	1.58E+04	10	3.17E-04	10	1.00E-01	10	1.00E-05	10	********	*******
Aromatics >C21-C35	NA	240	1.26E+05	10	1.63E-05	10	1.00E-01	10	1.00E-05	10	********	*******

10. Total Petroleum Hydrocarbon Criteria Workgroup, 1996.

RECAP SPREADSHEETS
SEDIMENT DIRECT CONTACT

Soil properties		Management Option 1 & 2							
Revision Date: 08/04/2003									
Run date:	9/30/2015								
*****calculation inputs*****									
1.7	g/cm3		pb = dry soil bulk density						
0.358491	Lpore/Lsoil		n = total soil porosity						
0.21	Lwater/Lsoil		nw = water-filled soil porosity						
0.148491	Lair/Lsoil		na = air-filled soil porosity						
2.65	g/cm3		ps = soil particle density						
0.006	g/g		foc = fractional organic carbon in soil						
148	(ft) = L = length of the source at the water table								
148	(ft) = W = width of impacted area perpendicular to flow direction of aquifer								
0.5	Acres		AOI site area - input into Q/C equation below						
76.38527	g/m2-s per kg/m3		Q/C = inverse of mean concentration at center of square source						
Q/C Table									
site size	148*148	209*209	295*295	467*467	660*660	1143*1143			
site size	0.5 acre	1 acre	2 acre	5 acre	10 acre	30 acre			
Q/C value	76.3062	67.4304	59.872	51.4648	46.1707	39.2329			

RECAP SPREADSHEETS
SEDIMENT DIRECT CONTACT
DEFAULT INDUSTRIAL WORKER

RECAP		
Management Option 1 & 2		
Default Exposure parameters		
*****calculation inputs*****		
1.0E-06	unitless	TR = target excess individual lifetime cancer risk
1	unitless	THQ = target hazard quotient
70	yr	ATc = averaging time-carcinogens
25	yr	ATni = averaging time-noncarcinogens, industrial (=EDi)
30	yr	ATnni = averaging time-noncarcinogens, non-industrial (=EDni)
6	yr	ATnc = averaging time-noncarcinogens, child (=EDc)
350	days/yr	EFni = exposure frequency, non-industrial
250	days/yr	EFi = exposure frequency, industrial
30	yr	EDni = exposure duration, non-industrial
25	yr	EDi = exposure duration, industrial
6	yr	EDc = exposure duration, child ages 1-6
24		EDa = exposure duration, non-industrial adult portion (EDni - EDc)
788940000	sec	Ti = exposure time, industrial (EDi in seconds)
189345600	sec	Tnic = exposure time, non-industrial, child (EDc in seconds)
946728000	sec	Tnia = exposure time, non-industrial, adult (EDni in seconds)
70	kg	BWa = average body weight, adult ages 7-31
15	kg	BWc = average body weight, child ages 1-6
114.28571	mg-yr/kg-da	IRSadj = ingestion rate, age-adjusted, soil, (see calculation below)
10.857143	m3-yr/kg-da	IRAadj = inhalation rate, age-adjusted (see calculation below)
360.8	mg-yr/kg-da	IRDadj = dermal contact rate, age-adjusted, soil (see calculation below)
1.0857143	L-yr/kg-day	IRWadj = ingestion rate, water, age-adjusted (see calculation below)
0.089	L/day	IRWndw = ingestion rate, water, non-drinking water (incidental)
50	mg/day	IRSi = ingestion rate, soil, industrial
200	mg/day	IRSc = ingestion rate, soil, child ages 1-6
10	m3/day	IRAc = inhalation rate, child ages 1-6
1	L/day	IRWc = ingestion rate, water, child
2	L/day	IRWa = ingestion rate, water, adult
20	m3/day	IRAa = inhalation rate, adult ages 7-31
100	mg/day	IRSa = ingestion rate, soil, non-industrial adult
0.02	kg/day	IRF = ingestion rate, fish
2800	cm2/day	SAc = surface area of skin, child
5700	cm2/day	SAan = surface area of skin, adult, non-industrial
3300	cm2/day	SAai = surface area of skin, adult, industrial
0.2	mg/cm2	AFc = adherence factor, soil-to-skin, child
0.07	mg/cm2	AFan = adherence factor, soil-to-skin, adult, non-industrial
0.2	mg/cm2	AFai = adherence factor, soil-to-skin, adult, industrial
0.5	Lm3	Kw =water-to-indoor air volatilization factor
*****stop*****		

RECAP SPREADSHEETS
WORKSHEET 5
SOILi (mg/kg)
DEFAULT INDUSTRIAL WORKER
(current toxicity values)

Derivation of Management Option 1 & 2 **Soil-Industrial**
Revision Date: 08/04/2003 Run date: 9/30/2015

DA = ((na^(10/3)*Da*H*41+nw^(10/3)*Dw)/n^2)/(pb*Koc*foc+nw+na*H*41)
VFi = (Q\C*1e-4*(3.14*DA*Ti)^0.5)/(2*pb*DA)

Soili-C-O = (TR*BWa*ATc*365)/(EFi*EDi*(SFo*1e-6*IRSi+SFi*(IRAa/VFi)+SFo*SAai*AFai*ABS*1e-6))
Soili-C-I = (TR*BWa*ATc*365)/(EFi*EDi*(SFo*1e-6*IRSi+SFo*SAai*AFai*ABS*1e-6))
Soili-N-O = (THQ*BWa*ATni*365)/(EFi*EDi*((IRSi/RfDo)*1e-6+(IRAa/RfDi)*(1/VFi)+(SAai/RfDo)*AFai*ABS*1e-6))
Soili-N-I = (THQ*BWa*ATni*365)/(EFi*EDi*((IRSi/RfDo)*1e-6+(SAai/RfDo)*AFai*ABS*1e-6)))

		DA	**VFi**	**Soili**	**Soili**	**Soili**	**Soili**	**min value**	**Soili**	
COMPOUND	**CAS**	**(cm2/s)**	**(m3/kg)**	**C-O (mg/kg)**	**C-I (mg/kg)**	**N-O (mg/kg)**	**N-I (mg/kg)**	**(C or N)**	**(mg/kg)**	
Barium	7440-39-3	NA	NA		NA		4.09E+05	4.1E+05	4.1E+05	N
Mercury (inorganic)	7487-94-7	NA	NA		NA		6.13E+02	6.1E+02	6.1E+02	N
Aliphatics >C10-C12	ALI_10-12	6.28E-05	1.41E+04	NA		1.96E+04		2.0E+04	1.0E+04	O,T
Aliphatics >C12-C16	ALI_12-16	1.37E-05	3.02E+04	NA		3.77E+04		3.8E+04	1.0E+04	O,T
Aliphatics >C16-C35	ALI_16-35	1.03E-06	1.10E+05	NA		6.88E+05		6.9E+05	1.0E+04	O,T
Aromatics >C12-C16	ARO_12-16	1.40E-06	9.46E+04	NA		2.14E+04		2.1E+04	1.0E+04	O,T
Aromatics >C16-C21	ARO_16-21	1.11E-07	3.36E+05	NA		1.75E+04		1.7E+04	1.0E+04	O,T
Aromatics >C21-C35	ARO_21-35	1.04E-09	3.47E+06	NA		2.52E+04		2.5E+04	1.0E+04	O,T

Sediment to Ground Water – RECAP Spreadsheets

RECAP SPREADSHEETS
APPENDIX H: TABLE H1
SEDIMENT TO GROUND WATER
CANCER SLOPE FACTORS AND REFERENCE DOSES

COMPOUND	**CAS #**	**SF_o**	**REF**	**SF_i**	**REF**	**RfD_o**	**REF**	**RfD_i**	**REF**	**ABSd**
		$(mg/kg\text{-}day)^{-1}$		**$(mg/kg\text{-}day)^{-1}$**		**mg/kg-day**		**mg/kg-day**		**unitless**
Methylnaphthalene,2-	91-57-6	*******		*******		4.00E-03	I	*******		0
Aliphatics >C16-C35	ALI_16-35	*******		*******		2.00E+00	T	2.00E+00	*	0.1
Aromatics >C8-C10	ARO_08-10	*******		*******		4.00E-02	T	6.00E-02	T	0
Aromatics >C10-C12	ARO_10-12	*******		*******		4.00E-02	T	6.00E-02	T	0
Aromatics >C12-C16	ARO_12-16	*******		*******		4.00E-02	T	6.00E-02	T	0
Aromatics >C16-C21	ARO_16-21	*******		*******		3.00E-02	T	3.00E-02	*	0.1

I = Integrated Risk Information System (IRIS), EPA.
* = Inhalation toxicity not available, oral toxicity value used to assess inhalation exposure.
T = TPH Criteria Working Group, 1997.

RECAP SPREADSHEETS
APPENDIX H: TABLE H2
SEDIMENT TO GROUND WATER

CHEMICAL AND PHYSICAL PARAMETERS

COMPOUND	**CAS #**	**MOL. WT**	**Koc**	**REF**	**H**	**REF**	**Da**	**REF**	**Dw**	**REF**	**S**	**REF**
		g/g-mole	**cm3/g**		**atm-m3/mol**		**cm2/s**		**cm2/s**		**mg/L**	
Methylnaphthalene,2-	91-57-6	142.2	2.24E+03	3	5.80E-05	3	4.80E-02	3	7.84E-06	3	2.46E+01	2
Aliphatics >C16-C35	ALI_16-35	270	6.31E+08	10	1.20E+02	10	1.00E-01	10	1.00E-05	10	********	*******
Aromatics >C8-C10	ARO_08-10	120	1.58E+03	10	1.17E-02	10	1.00E-01	10	1.00E-05	10	********	*******
Aromatics >C10-C12	ARO_10-12	130	2.51E+03	10	3.41E-03	10	1.00E-01	10	1.00E-05	10	********	*******
Aromatics >C12-C16	ARO_12-16	150	5.01E+03	10	1.29E-03	10	1.00E-01	10	1.00E-05	10	********	*******
Aromatics >C16-C21	ARO_16-21	190	1.58E+04	10	3.17E-04	10	1.00E-01	10	1.00E-05	10	********	*******

2. Superfund Chemical Data Matrix, June 1996.
3. Air Emissions Models for Waste and Wastewater, EPA-453/R-94-080A, 1994.
10. Total Petroleum Hydrocarbon Criteria Workgroup, 1996.

RECAP SPREADSHEETS
DEFAULT SOIL PROPERTIES

Soil properties		Management Option 1 & 2							
Revision Date: 08/04/2003									
Run date:	9/30/2015								
*****calculation inputs*****									
1.7	g/cm3		pb = dry soil bulk density						
0.358491	Lpore/Lsoil		n = total soil porosity						
0.21	Lwater/Lsoil		nw = water-filled soil porosity						
0.148491	Lair/Lsoil		na = air-filled soil porosity						
2.65	g/cm3		ps = soil particle density						
0.006	g/g		foc = fractional organic carbon in soil						
148	(ft) = L = length of the source at the water table								
148	(ft) = W = width of impacted area perpendicular to flow direction of aquifer								
0.5	Acres		AOI site area - input into Q/C equation below						
76.38527	g/m2-s per kg/m3		Q/C = inverse of mean concentration at center of square source						
Q/C Table									
site size	148*148	209*209	295*295	467*467	660*660	1143*1143			
site size	0.5 acre	1 acre	2 acre	5 acre	10 acre	30 acre			
Q/C value	76.3062	67.4304	59.872	51.4648	46.1707	39.2329			

RECAP SPREADSHEETS
DEFAULT EXPOSURE PARAMETERS

RECAP		
Management Option 1 & 2		
Default Exposure parameters		
*****calculation inputs*****		
1.0E-06	unitless	TR = target excess individual lifetime cancer risk
1	unitless	THQ = target hazard quotient
70	yr	ATc = averaging time-carcinogens
25	yr	ATni = averaging time-noncarcinogens, industrial (=EDi)
30	yr	ATnni = averaging time-noncarcinogens, non-industrial (=EDni)
6	yr	ATnc = averaging time-noncarcinogens, child (=EDc)
350	days/yr	EFni = exposure frequency, non-industrial
250	days/yr	EFi = exposure frequency, industrial
30	yr	EDni = exposure duration, non-industrial
25	yr	EDi = exposure duration, industrial
6	yr	EDc = exposure duration, child ages 1-6
24		EDa = exposure duration, non-industrial adult portion (EDni - EDc)
788940000	sec	Ti = exposure time, industrial (EDi in seconds)
189345600	sec	Tnic = exposure time, non-industrial, child (EDc in seconds)
946728000	sec	Tnia = exposure time, non-industrial, adult (EDni in seconds)
70	kg	BWa = average body weight, adult ages 7-31
15	kg	BWc = average body weight, child ages 1-6
114.28571	mg-yr/kg-da	IRSadj = ingestion rate, age-adjusted, soil, (see calculation below)
10.857143	m3-yr/kg-da	IRAadj = inhalation rate, age-adjusted (see calculation below)
360.8	mg-yr/kg-da	IRDadj = dermal contact rate, age-adjusted, soil (see calculation below)
1.0857143	L-yr/kg-day	IRWadj = ingestion rate, water, age-adjusted (see calculation below)
0.089	L/day	IRWndw = ingestion rate, water, non-drinking water (incidental)
50	mg/day	IRSi = ingestion rate, soil, industrial
200	mg/day	IRSc = ingestion rate, soil, child ages 1-6
10	m3/day	IRAc = inhalation rate, child ages 1-6
1	L/day	IRWc = ingestion rate, water, child
2	L/day	IRWa = ingestion rate, water, adult
20	m3/day	IRAa = inhalation rate, adult ages 7-31
100	mg/day	IRSa = ingestion rate, soil, non-industrial adult
0.02	kg/day	IRF = ingestion rate, fish
2800	cm2/day	SAc = surface area of skin, child
5700	cm2/day	SAan = surface area of skin, adult, non-industrial
3300	cm2/day	SAai = surface area of skin, adult, industrial
0.2	mg/cm2	AFc = adherence factor, soil-to-skin, child
0.07	mg/cm2	AFan = adherence factor, soil-to-skin, adult, non-industrial
0.2	mg/cm2	AFai = adherence factor, soil-to-skin, adult, industrial
0.5	Lm3	Kw =water-to-indoor air volatilization factor
*****stop*****		

RECAP SPREADSHEETS
WORKSHEET 2
GW 3NDW (mg/l)
(current toxicity factors and BCFs)

Derivation of Management Option 1, 2, & 3 **Groundwater Classification 3-Non-Drinking Water**
Revision Date: 08/04/2003 Run date: 9/30/2015

C (mg/l) GW3NDW = (TR*BWa) / (SFo*(IRWndw+BCF*IRF))
N (mg/l) GW3NDW = (THQ*RfDo*BWa) / (IRWndw+BCF*IRF)

	LAC 33:IX. 1113(HHNDW)	**LAC 33:IX. 1113(HHDW)**	**MCL**	**BCF**			**LAC(NDW) or max (LAC,MCL, (MIN C, N))**	
COMPOUND	**(mg/L)**	**(mg/L)**	**(mg/l)**	**(l/kg)**	**C (mg/l)**	**N (mg/l)**	**(mg/l)**	
Methylnaphthalene,2-				7.47E+01	NA	1.77E-01	1.8E-01	(*2)N
Aliphatics >C16-C35				0.00E+00	NA	1.57E+03	1.6E+03	(*2)N
Aromatics >C8-C10				0.00E+00	NA	3.15E+01	3.1E+01	(*2)N
Aromatics >C10-C12				0.00E+00	NA	3.15E+01	3.1E+01	(*2)N
Aromatics >C12-C16				0.00E+00	NA	3.15E+01	3.1E+01	(*2)N
Aromatics >C16-C21				0.00E+00	NA	2.36E+01	2.4E+01	(*2)N

References: Data hierarchy is based on (*1) then (*2).

(*1) Louisiana Administrative Code 33.IX.1113, Table 1 (HHNDW)

(*2) The maximum value of LAC 33.IX1113 (DW), MCL, or the minimum of human health non-drinking water criteria calculated in accordance with "Human Health Numerical Criteria Derivations for Toxic Substances", LDEQ-OWR, June 23, 1994; (N=non-carcinogen, C=carcinogen)

Notes:

BCF values from RAIS (2015) for site-specific constituents except TPH, which are from RECAP (2003).

RECAP SPREADSHEETS
WORKSHEET 6
SOILGW and SOILsat (mg/kg)
SEDIMENT TO GROUND WATER
(current toxicity values and BCFs)

Derivation of Management Option 1 & 2 **SoilGW & Soilsat**
Revision Date: 08/04/2003 Run date: 9/30/2015

SoilGW1 = DFsummers*(GW1*(pb*Koc*foc+nw+na*H*41))/(pb)
SoilGW2 = DFsummers*(GW2*(pb*Koc*foc+nw+na*H*41))/(pb)
SoilGW3NDW =DFsummers* (GW3NDW*(pb*Koc*foc+nw+na*H*41))/(pb)
SoilGW3DW =DFsummers* (GW3DW*(pb*Koc*foc+nw+na*H*41))/(pb)

Soilsat = S*(Koc*foc*pb+nw+H*41*na)/pb

COMPOUND	SoilGW1 (mg/kg)	SoilGW2 (mg/kg)	SoilGW3DW (mg/kg)	SoilGW3NDW (mg/kg)	Soilsat (mg/kg)
Methylnaphthalene,2-	4.0E+01	4.0E+01	2.1E+01	4.8E+01	NA
Aliphatics >C16-C35	5.5E+09	5.5E+09	5.1E+09	1.2E+11	NA
Aromatics >C8-C10	6.5E+01	6.5E+01	2.6E+02	6.1E+03	NA
Aromatics >C10-C12	1.0E+02	1.0E+02	4.1E+02	9.6E+03	NA
Aromatics >C12-C16	2.0E+02	2.0E+02	8.1E+02	1.9E+04	NA
Aromatics >C16-C21	2.1E+03	2.1E+03	1.9E+03	4.5E+04	NA

Ground Water Class 3 Non-Drinking Water – RECAP Spreadsheets

RECAP SPREADSHEETS
APPENDIX H: TABLE H1
GROUND WATER AND SURFACE WATER COCS
CANCER SLOPE FACTORS AND REFERENCE DOSES

COMPOUND	**CAS #**	**SF$_o$**	**REF**	**SF$_i$**	**REF**	**RfD$_o$**	**REF**	**RfD$_i$**	**REF**	**ABSd**
		(mg/kg-day)$^{-1}$		**(mg/kg-day)$^{-1}$**		**mg/kg-day**		**mg/kg-day**		**unitless**
Acenaphthene	83-32-9	*******		*******		6.00E-02	I	*******	*	0
Arsenic	7440-38-2	1.50E+00	I	1.51E+01	I	3.00E-04	I	4.30E-06	C	0.03
Barium	7440-39-3	*******		*******		2.00E-01	I	1.43E-04	H	0
Cadmium	7440-43-9	*******		6.30E+00	I	5.00E-04	I,D	2.90E-06	A	0.001
Chromium(III)	16065-83-1	*******		*******		1.50E+00	I	*******		0
Mercury (inorganic)	7487-94-7	*******		*******		3.00E-04	I	8.57E-05	I	0
Selenium	7782-49-2	*******		*******		5.00E-03	I	5.70E-03	C	0
Zinc	7440-66-6	*******		*******		3.00E-01	I	*******		0
Aliphatics C6-C8	ALI_06-08	*******		*******		5.00E+00	T	5.30E+00	T	0
Aliphatics >C8-C10	ALI_08-10	*******		*******		1.00E-01	T	2.90E-01	T	0
Aliphatics >C10-C12	ALI_10-12	*******		*******		1.00E-01	T	3.00E-01	T	0
Aliphatics >C12-C16	ALI_12-16	*******		*******		1.00E-01	T	3.00E-01	T	0
Aliphatics >C16-C35	ALI_16-35	*******		*******		2.00E+00	T	2.00E+00	*	0.1
Aromatics >C8-C10	ARO_08-10	*******		*******		4.00E-02	T	6.00E-02	T	0
Aromatics >C10-C12	ARO_10-12	*******		*******		4.00E-02	T	6.00E-02	T	0
Aromatics >C12-C16	ARO_12-16	*******		*******		4.00E-02	T	6.00E-02	T	0
Aromatics >C16-C21	ARO_16-21	*******		*******		3.00E-02	T	3.00E-02	*	0.1
Aromatics >C21-C35	ARO_21-35	*******		*******		3.00E-02	T	3.00E-02	*	0.1

I = Integrated Risk Information System (IRIS), EPA.

H = Health Effects Assessment Summary Tables (HEAST), EPA.

A = Health Effects Assessment Summary Tables Alternative, EPA Region III Risk-Based Concentration Table.

C = CalEPA (from RAIS)

* = Inhalation toxicity not available, oral toxicity value used to assess inhalation exposure.

T = TPH Criteria Working Group, 1997.

D= Dermal RfD for cadmium is 2.5E-05 mg/kg-d (based on an oral absorption efficiency of 5%; RAGS-E, EPA 1999).

Strontium	7440-24-6	*******		*******		6.00E-01	I	*******		0

RECAP		
Management Option 1 & 2		
Default Exposure parameters		
*****calculation inputs*****		
1.0E-06	unitless	TR = target excess individual lifetime cancer risk
1	unitless	THQ = target hazard quotient
70	yr	ATc = averaging time-carcinogens
25	yr	ATni = averaging time-noncarcinogens, industrial (=EDi)
30	yr	ATnni = averaging time-noncarcinogens, non-industrial (=EDni)
6	yr	ATnc = averaging time-noncarcinogens, child (=EDc)
350	days/yr	EFni = exposure frequency, non-industrial
250	days/yr	EFi = exposure frequency, industrial
30	yr	EDni = exposure duration, non-industrial
25	yr	EDi = exposure duration, industrial
6	yr	EDc = exposure duration, child ages 1-6
24		EDa = exposure duration, non-industrial adult portion (EDni - EDc)
788940000	sec	Ti = exposure time, industrial (EDi in seconds)
189345600	sec	Tnic = exposure time, non-industrial, child (EDc in seconds)
946728000	sec	Tnia = exposure time, non-industrial, adult (EDni in seconds)
70	kg	BWa = average body weight, adult ages 7-31
15	kg	BWc = average body weight, child ages 1-6
114.28571	mg-yr/kg-da	IRSadj = ingestion rate, age-adjusted, soil, (see calculation below)
10.857143	m3-yr/kg-da	IRAadj = inhalation rate, age-adjusted (see calculation below)
360.8	mg-yr/kg-da	IRDadj = dermal contact rate, age-adjusted, soil (see calculation below)
1.0857143	L-yr/kg-day	IRWadj = ingestion rate, water, age-adjusted (see calculation below)
0.089	L/day	IRWndw = ingestion rate, water, non-drinking water (incidental)
50	mg/day	IRSi = ingestion rate, soil, industrial
200	mg/day	IRSc = ingestion rate, soil, child ages 1-6
10	m3/day	IRAc = inhalation rate, child ages 1-6
1	L/day	IRWc = ingestion rate, water, child
2	L/day	IRWa = ingestion rate, water, adult
20	m3/day	IRAa = inhalation rate, adult ages 7-31
100	mg/day	IRSa = ingestion rate, soil, non-industrial adult
0.02	kg/day	IRF = ingestion rate, fish
2800	cm2/day	SAc = surface area of skin, child
5700	cm2/day	SAan = surface area of skin, adult, non-industrial
3300	cm2/day	SAai = surface area of skin, adult, industrial
0.2	mg/cm2	AFc = adherence factor, soil-to-skin, child
0.07	mg/cm2	AFan = adherence factor, soil-to-skin, adult, non-industrial
0.2	mg/cm2	AFai = adherence factor, soil-to-skin, adult, industrial
0.5	Lm3	Kw =water-to-indoor air volatilization factor
*****stop*****		

RECAP SPREADSHEETS
WORKSHEET 2
GW 3NDW (mg/l)
(current toxicity factors and BCFs)

Derivation of Management Option 1, 2, & 3 **Groundwater Classification 3-Non-Drinking Water**
Revision Date: 08/04/2003 Run date: 9/30/2015

C (mg/l) GW3NDW = (TR*BWa) / (SFo*(IRWndw+BCF*IRF))
N (mg/l) GW3NDW = (THQ*RfDo*BWa) / (IRWndw+BCF*IRF)

COMPOUND	**LAC 33:IX. 1113(HHNDW) (mg/L)**	**LAC 33:IX. 1113(HHDW) (mg/L)**	**MCL (mg/l)**	**BCF (l/kg)**	**C (mg/l)**	**N (mg/l)**	**LAC(NDW) or max (LAC,MCL, (MIN C, N)) (mg/l)**	
Acenaphthene				7.55E+02	NA	2.77E-01	2.8E-01	(*2)N
Arsenic		5.00E-02	1.00E-02	3.00E+02	7.66E-06	3.45E-03	5.0E-02	LAC(DW)
Barium			2.00E+00	4.00E+00	NA	8.28E+01	8.3E+01	(*2)N
Cadmium		1.00E-02	5.00E-03	2.00E+02	NA	8.56E-03	1.0E-02	LAC(DW)
Chromium(III)		5.00E-02	1.00E-01	2.00E+02	NA	2.57E+01	2.6E+01	(*2)N
Mercury (inorganic)		2.00E-03	2.00E-03	1.00E+03	NA	1.05E-03	2.0E-03	LAC(DW)
Selenium			5.00E-02	2.00E+02	NA	8.56E-02	8.6E-02	(*2)N
Zinc		5.00E+00		1.00E+03	NA	1.05E+00	5.0E+00	LAC(DW)
Aliphatics C6-C8				0.00E+00	NA	3.93E+03	3.9E+03	(*2)N
Aliphatics >C8-C10				0.00E+00	NA	7.87E+01	7.9E+01	(*2)N
Aliphatics >C10-C12				0.00E+00	NA	7.87E+01	7.9E+01	(*2)N
Aliphatics >C12-C16				0.00E+00	NA	7.87E+01	7.9E+01	(*2)N
Aliphatics >C16-C35				0.00E+00	NA	1.57E+03	1.6E+03	(*2)N
Aromatics >C8-C10				0.00E+00	NA	3.15E+01	3.1E+01	(*2)N
Aromatics >C10-C12				0.00E+00	NA	3.15E+01	3.1E+01	(*2)N
Aromatics >C12-C16				0.00E+00	NA	3.15E+01	3.1E+01	(*2)N
Aromatics >C16-C21				0.00E+00	NA	2.36E+01	2.4E+01	(*2)N
Aromatics >C21-C35				0.00E+00	NA	2.36E+01	2.4E+01	(*2)N
TPH-GRO (C6-C10)							3.1E+01	
TPH-DRO (C10-C28)							2.4E+01	
TPH-ORO (>C28)							2.4E+01	

References: Data hierarchy is based on (*1) then (*2).

(*1) Louisiana Administrative Code 33.IX.1113, Table 1 (HHNDW)

(*2) The maximum value of LAC 33.IX1113 (DW), MCL, or the minimum of human health non-drinking water criteria calculated in accordance with "Human Health Numerical Criteria Derivations for Toxic Substances", LDEQ-OWR, June 23, 1994; (N=non-carcinogen, C=carcinogen)

Notes:

BCF values from RAIS (2015) for site-specific constituents except TPH, which are from RECAP (2003).

ADDITIONAL COMPOUNDS								
Strontium				6.00E+01	NA	3.26E+01	3.3E+01	(*2)N

Ground Water Recreational Standard Development – RAIS Calculator

Site-Specific Adult Recreator GW RS

Modified from the Indoor Worker PRG for Tapwater Calculator

Variable	Value
TR (target cancer risk) unitless	0.000001
ED_{iw} (exposure duration) year	30
THQ (target hazard quotient) unitless	1
LT (lifetime - indoor worker) year	70
EF_{iw} (exposure frequency) day/year	104
ET_{iw} (exposure time - inhalation) hour/day	0
ET_{iww} (exposure time - dermal) hour/event	2
EV_{iw} (dermal events) event/day	1
BW_{iw} (body weight) kg	70
SA_{iw} (skin surface area) cm^2	6910
IRW_{iw} (water intake rate) L/day	0
K (volatilization factor of Andelman) L/m^3	0
AT_{iw} (averaging time) day/year	365
l_{sc} (apparent thickness of stratum corneum; used to calculate τ) cm	0.001

Output generated   20SEP2015:20:03:47

Site-Specific Adult Recreator GW RS

Modified from the Indoor Worker PRG for Tapwater Calculator

Chemical	Mutagen?	VOC?	Chronic RfD (mg/kg-day)	RfD Reference	Chronic RfC (mg/m^3)	RfC Reference	Ingestion SF (mg/kg-day)$^{-1}$	SFO Reference	Inhalation Unit Risk (ug/m^3)$^{-1}$	IUR Reference
Barium	No	No	2.00E-01	IRIS	5.00E-04	HEAST	-		-	
Benzene	No	Yes	4.00E-03	IRIS	3.00E-02	IRIS	5.50E-02	IRIS	7.80E-06	IRIS
Strontium, Stable	No	No	6.00E-01	IRIS	-		-		-	

Chemical	RAGSe GIABS (unitless)	Kp (cm/hour)	MW	pi	logds	dsclc	dsc	B	tau_event	FA	In EPD?
Barium	0.07	0.001	137.33	3.1415927	-3.569048	0.0002697	2.70E-07	0.0045072	0.6178695	1	Yes
Benzene	1	0.0149	78.11	3.1415927	-3.237416	0.0005789	5.79E-07	0.0506485	0.2879153	1	Yes
Strontium, Stable	1	0.001	87.62	3.1415927	-3.290672	0.0005121	5.12E-07	0.0036002	0.3254773	1	Yes

Chemical	Carc Absorbed dose per event (mg/cm^2-event)	Noncarc Absorbed dose per event (mg/cm^2-event)	Ingestion PRG TR=1.0E-6 (ug/L)	Dermal PRG TR=1.0E-6 (ug/L)	Inhalation PRG TR=1.0E-6 (ug/L)	Carc PRG TR=1.0E-6 (ug/L)	Ingestion PRG HQ=1 (ug/L)	Dermal PRG HQ=1 (ug/L)	Inhalation PRG HQ=1 (ug/L)	Noncarc PRG HI=1 (ug/L)
Barium	-	4.98E-01	-	-	-	-	-	2.49E+05	-	2.49E+05
Benzene	1.51E-03	1.42E-01	-	4.04E+01	-	4.04E+01	-	3.80E+03	-	3.80E+03
Strontium, Stable	-	2.13E+01	-	-	-	-	-	1.07E+07	-	1.07E+07

Output generated 20SEP2015:20:03:47

Site-Specific Child Recreator GW RS

Modified from the Indoor Worker PRG for Tapwater Calculator

Variable	Value
TR (target cancer risk) unitless	0.000001
ED_{iw} (exposure duration) year	5
THQ (target hazard quotient) unitless	1
LT (lifetime - indoor worker) year	70
EF_{iw} (exposure frequency) day/year	104
ET_{iw} (exposure time - inhalation) hour/day	0
ET_{iww} (exposure time - dermal) hour/event	2
EV_{iw} (dermal events) event/day	1
BW_{iw} (body weight) kg	59.3
SA_{iw} (skin surface area) cm^2	4080
IRW_{iw} (water intake rate) L/day	0
K (volatilization factor of Andelman) L/m ^{3}	0
AT_{iw} (averaging time) day/year	365
I_{sc} (apparent thickness of stratum corneum; used to calculate τ) cm	0.001

Output generated 20SEP2015:20:25:17

Site-Specific Child Recreator GW RS

Modified from the Indoor Worker PRG for Tapwater Calculator

Chemical	Mutagen?	VOC?	Chronic RfD (mg/kg-day)	RfD Reference	Chronic RfC (mg/m^3)	RfC Reference	Ingestion SF (mg/kg-day)$^{-1}$	SFO Reference	Inhalation Unit Risk (ug/m^3)$^{-1}$	IUR Reference
Barium	No	No	2.00E-01	IRIS	5.00E-04	HEAST	-		-	
Benzene	No	Yes	4.00E-03	IRIS	3.00E-02	IRIS	5.50E-02	IRIS	7.80E-06	IRIS
Strontium, Stable	No	No	6.00E-01	IRIS	-		-		-	

Chemical	RAGSe GIABS (unitless)	Kp (cm/hour)	MW	pi	logds	dsclc	dsc	B	tau_event	FA	In EPD?
Barium	0.07	0.001	1.37E+02	3.1415927	-3.57E+00	0.0002697	2.6974E-07	0.0045072	0.6178695	1	Yes
Benzene	1	0.0149	7.81E+01	3.1415927	-3.24E+00	0.0005789	5.79E-07	0.0506485	2.88E-01	1	Yes
Strontium, Stable	1	0.001	8.76E+01	3.1415927	-3.290672	0.0005121	5.1207E-07	0.0036002	0.3254773	1	Yes

Chemical	Carc Absorbed dose per event (mg/cm^2-event)	Noncarc Absorbed dose per event (mg/cm^2-event)	Ingestion PRG TR=1.0E-6 (ug/L)	Dermal PRG TR=1.0E-6 (ug/L)	Inhalation PRG TR=1.0E-6 (ug/L)	Carc PRG TR=1.0E-6 (ug/L)	Ingestion PRG HQ=1 (ug/L)	Dermal PRG HQ=1 (ug/L)	Inhalation PRG HQ=1 (ug/L)	Noncarc PRG HI=1 (ug/L)
Barium	-	7.14E-01	-	-	-	-	-	3.57E+05	-	3.57E+05
Benzene	1.30E-02	2.04E-01	-	3.47E+02	-	3.47E+02	-	5.46E+03	-	5.46E+03
Strontium, Stable	-	3.06E+01	-	-	-	-	-	1.53E+07	-	1.53E+07

Output generated 20SEP2015:20:25:17

Site-Specific Adult Shower Scenario GW RS

Modified from the Indoor Worker PRG for Tapwater Calculator

Variable	Value
TR (target cancer risk) unitless	0.000001
ED_{iw} (exposure duration) year	30
THQ (target hazard quotient) unitless	1
LT (lifetime - indoor worker) year	70
EF_{iw} (exposure frequency) day/year	104
ET_{iw} (exposure time - inhalation) hour/day	0.71
ET_{iww} (exposure time - dermal) hour/event	0
EV_{iw} (dermal events) event/day	1
BW_{iw} (body weight) kg	70
SA_{iw} (skin surface area) cm^2	0
IRW_{iw} (water intake rate) L/day	0.089
K (volatilization factor of Andelman) L/m ^{3}	0.5
AT_{iw} (averaging time) day/year	365
l_{sc} (apparent thickness of stratum corneum; used to calculate τ) cm	0.001

Output generated   20SEP2015:20:36:45

Site-Specific

Indoor Worker PRG for Tapwater

Chemical	Mutagen?	VOC?	Chronic RfD (mg/kg-day)	RfD Reference	Chronic RfC (mg/m^3)	RfC Reference	Ingestion SF (mg/kg-day)$^{-1}$	SFO Reference	Inhalation Unit Risk (ug/m^3)$^{-1}$	IUR Reference
Barium	No	No	2.00E-01	IRIS	5.00E-04	HEAST	-		-	
Benzene	No	Yes	4.00E-03	IRIS	3.00E-02	IRIS	5.50E-02	IRIS	7.80E-06	IRIS
Strontium, Stable	No	No	6.00E-01	IRIS	-		-		-	

Chemical	RAGSe GIABS (unitless)	Kp (cm/hour)	MW	pi	logds	dsclc	dsc	B	tau_event	FA	In EPD?
Barium	0.07	0.001	137.33	3.1415927	-3.569048	0.0002697	2.70E-07	0.0045072	0.6178695	1	Yes
Benzene	1	0.0149	78.11	3.1415927	-3.237416	0.0005789	5.79E-07	0.0506485	0.2879153	1	Yes
Strontium, Stable	1	0.001	87.62	3.1415927	-3.290672	0.0005121	5.12E-07	0.0036002	0.3254773	1	Yes

Chemical	Carc Absorbed dose per event (mg/cm^2-event)	Noncarc Absorbed dose per event (mg/cm^2-event)	Ingestion PRG TR=1.0E-6 (ug/L)	Dermal PRG TR=1.0E-6 (ug/L)	Inhalation PRG TR=1.0E-6 (ug/L)	Carc PRG TR=1.0E-6 (ug/L)	Ingestion PRG HQ=1 (ug/L)	Dermal PRG HQ=1 (ug/L)	Inhalation PRG HQ=1 (ug/L)	Noncarc PRG HI=1 (ug/L)
Barium	-	-	-	-	-	-	5.52E+05	-	-	5.52E+05
Benzene	-	-	1.17E+02	-	7.10E+01	4.42E+01	1.10E+04	-	7.12E+03	4.33E+03
Strontium, Stable	-	-	-	-	-	-	1.66E+06	-	-	1.66E+06

Output generated 20SEP2015:20:36:45

Site-Specific Child Shower Scenario GW RS

Modified from the Indoor Worker PRG for Tapwater Calculator

Variable	Value
TR (target cancer risk) unitless	0.000001
ED_{iw} (exposure duration) year	5
THQ (target hazard quotient) unitless	1
LT (lifetime - indoor worker) year	70
EF_{iw} (exposure frequency) day/year	104
ET_{iw} (exposure time - inhalation) hour/day	0.71
ET_{iww} (exposure time - dermal) hour/event	0
EV_{iw} (dermal events) event/day	1
BW_{iw} (body weight) kg	59.3
SA_{iw} (skin surface area) cm^2	0
IRW_{iw} (water intake rate) L/day	0.089
K (volatilization factor of Andelman) L/m^3	0.5
AT_{iw} (averaging time) day/year	365
l_{sc} (apparent thickness of stratum corneum; used to calculate τ) cm	0.001

Output generated 20SEP2015:21:01:12

Site-Specific Child Shower Scenario GW RS

Indoor Worker PRG for Tapwater

Chemical	Mutagen?	VOC?	Chronic RfD (mg/kg-day)	RfD Reference	Chronic RfC (mg/m^3)	RfC Reference	Ingestion SF (mg/kg-day)$^{-1}$	SFO Reference	Inhalation Unit Risk (ug/m^3)$^{-1}$	IUR Reference
Barium	No	No	2.00E-01	IRIS	5.00E-04	HEAST	-		-	
Benzene	No	Yes	4.00E-03	IRIS	3.00E-02	IRIS	5.50E-02	IRIS	7.80E-06	IRIS
Strontium, Stable	No	No	6.00E-01	IRIS	-		-		-	

Chemical	RAGSe GIABS (unitless)	Kp (cm/hour)	MW	pi	logds	dsclc	dsc	B	tau_event	FA	In EPD?
Barium	0.07	0.001	137.33	3.1415927	-3.569048	0.0002697	2.6974E-7	0.0045072	0.6178695	1	Yes
Benzene	1	0.0149	78.11	3.1415927	-3.237416	0.0005789	5.7887E-7	0.0506485	0.2879153	1	Yes
Strontium, Stable	1	0.001	87.62	3.1415927	-3.290672	0.0005121	5.1207E-7	0.0036002	0.3254773	1	Yes

Chemical	Carc Absorbed dose per event (mg/cm^2-event)	Noncarc Absorbed dose per event (mg/cm^2-event)	Ingestion PRG TR=1.0E-6 (ug/L)	Dermal PRG TR=1.0E-6 (ug/L)	Inhalation PRG TR=1.0E-6 (ug/L)	Carc PRG TR=1.0E-6 (ug/L)	Ingestion PRG HQ=1 (ug/L)	Dermal PRG HQ=1 (ug/L)	Inhalation PRG HQ=1 (ug/L)	Noncarc PRG HI=1 (ug/L)
Barium	-	-	-	-	-	-	4.68E+05	-	-	4.68E+05
Benzene	-	-	5.95E+02	-	4.26E+02	2.48E+02	9.35E+03	-	7.12E+03	4.04E+03
Strontium, Stable	-	-	-	-	-	-	1.40E+06	-	-	1.40E+06

Output generated 20SEP2015:21:01:12

Surface Water Recreational Standard Development – RAIS Calculator

Site-Specific Adult Recreator SW RS

Modified from the Indoor Worker PRG for Tapwater Calculator

Variable	Value
TR (target cancer risk) unitless	0.000001
ED_{iw} (exposure duration) year	30
THQ (target hazard quotient) unitless	1
LT (lifetime - indoor worker) year	70
EF_{iw} (exposure frequency) day/year	104
ET_{iw} (exposure time - inhalation) hour/day	0
ET_{iww} (exposure time - dermal) hour/event	4
EV_{iw} (dermal events) event/day	1
BW_{iw} (body weight) kg	70
SA_{iw} (skin surface area) cm^2	6910
IRW_{iw} (water intake rate) L/day	0
K (volatilization factor of Andelman) L/m ^{3}	0
AT_{iw} (averaging time) day/year	365
l_{sc} (apparent thickness of stratum corneum; used to calculate τ) cm	0.001

Output generated   20SEP2015:18:26:12

Site-Specific Adult Recreator SW RS

Modified from the Indoor Worker PRG for Tapwater Calculator

Chemical	Mutagen?	VOC?	Chronic RfD (mg/kg-day)	RfD Reference	Chronic RfC (mg/m^3)	RfC Reference	Ingestion SF (mg/kg-day)$^{-1}$	SFO Reference	Inhalation Unit Risk (ug/m^3)$^{-1}$	IUR Reference
Acenaphthene	No	Yes	6.00E-02	IRIS	-		-		-	
Arsenic, Inorganic	No	No	3.00E-04	IRIS	1.50E-05	CALEPA	1.50E+00	IRIS	4.30E-03	IRIS
Barium	No	No	2.00E-01	IRIS	5.00E-04	HEAST	-		-	
Cadmium (Water)	No	No	5.00E-04	IRIS	1.00E-05	ATSDR F	-		1.80E-03	IRIS
Chromium(III), Insoluble Salts	No	No	1.50E+00	IRIS	-		-		-	
Mercuric Chloride	No	No	3.00E-04	IRIS	3.00E-04	SURROGA	-		-	
Selenium	No	No	5.00E-03	IRIS	2.00E-02	CALEPA	-		-	
Strontium, Stable	No	No	6.00E-01	IRIS	-		-		-	
Zinc and Compounds	No	No	3.00E-01	IRIS	-		-		-	

Chemical	RAGSe GIABS (unitless)	Kp (cm/hour)	MW	pi	logds	dsclc	dsc	B	tau_event	FA	In EPD?
Acenaphthene	1	0.086	154.21	3.1415927	-3.663576	0.000217	2.17E-07	0.4107536	0.7681124	1	Yes
Arsenic, Inorganic	1	0.001	74.922	3.1415927	-3.219563	0.0006032	6.03E-07	0.0033291	0.2763198	1	Yes
Barium	0.07	0.001	137.33	3.1415927	-3.569048	0.0002697	2.70E-07	0.0045072	0.6178695	1	Yes
Cadmium (Water)	0.05	0.001	112.41	3.1415927	-3.429496	0.000372	3.72E-07	0.0040778	0.4480688	1	Yes
Chromium(III), Insoluble Salts	0.013	0.001	52	3.1415927	-3.0912	0.0008106	8.11E-07	0.0027735	0.2056121	1	Yes
Mercuric Chloride	0.07	0.001	271.5	3.1415927	-4.3204	0.0000478	4.78E-08	0.0063374	3.4853689	1	Yes
Selenium	1	0.001	78.96	3.1415927	-3.242176	0.0005726	5.73E-07	0.0034177	0.2910883	1	Yes
Strontium, Stable	1	0.001	87.62	3.1415927	-3.290672	0.0005121	5.12E-07	0.0036002	0.3254773	1	Yes
Zinc and Compounds	1	0.0006	65.38	3.1415927	-3.166128	0.0006821	6.82E-07	0.001866	0.24433	1	Yes

Chemical	Carc Absorbed dose per event (mg/cm^2-event)	Noncarc Absorbed dose per event (mg/cm^2-event)	Ingestion PRG TR=1.0E-6 (ug/L)	Dermal PRG TR=1.0E-6 (ug/L)	Inhalation PRG TR=1.0E-6 (ug/L)	Carc PRG TR=1.0E-6 (ug/L)	Ingestion PRG HQ=1 (ug/L)	Dermal PRG HQ=1 (ug/L)	Inhalation PRG HQ=1 (ug/L)	Noncarc PRG HI=1 (ug/L)
Acenaphthene	-	2.13E+00	-	-	-	-	-	5.01E+03	-	5.01E+03
Arsenic, Inorganic	5.53E-05	1.07E-02	-	1.38E+01	-	1.38E+01	-	2.67E+03	-	2.67E+03
Barium	-	4.98E-01	-	-	-	-	-	1.24E+05	-	1.24E+05
Cadmium (Water)	-	8.89E-04	-	-	-	-	-	2.22E+02	-	2.22E+02
Chromium(III), Insoluble Salts	-	6.93E-01	-	-	-	-	-	1.73E+05	-	1.73E+05
Mercuric Chloride	-	7.47E-04	-	-	-	-	-	1.87E+02	-	1.87E+02
Selenium	-	1.78E-01	-	-	-	-	-	4.44E+04	-	4.44E+04
Strontium, Stable	-	2.13E+01	-	-	-	-	-	5.33E+06	-	5.33E+06
Zinc and Compounds	-	1.07E+01	-	-	-	-	-	4.44E+06	-	4.44E+06

Output generated 20SEP2015:18:26:1

Site-Specific Child Recreator SW RS

Modified from the Indoor Worker PRG for Tapwater Calculator

Variable	Value
TR (target cancer risk) unitless	0.000001
ED_{iw} (exposure duration) year	5
THQ (target hazard quotient) unitless	1
LT (lifetime - indoor worker) year	70
EF_{iw} (exposure frequency) day/year	104
ET_{iw} (exposure time - inhalation) hour/day	0
ET_{iww} (exposure time - dermal) hour/event	4
EV_{iw} (dermal events) event/day	1
BW_{iw} (body weight) kg	59.3
SA_{iw} (skin surface area) cm^2	4080
IRW_{iw} (water intake rate) L/day	0
K (volatilization factor of Andelman) L/m^3	0
AT_{iw} (averaging time) day/year	365
l_{sc} (apparent thickness of stratum corneum; used to calculate τ) cm	0.001

Output generated 20SEP2015:18:42:31

Site-Specific Child Recreator SW RS

Modified from the Indoor Worker PRG for Tapwater Calculator

Chemical	Mutagen?	VOC?	Chronic RfD (mg/kg-day)	RfD Reference	Chronic RfC (mg/m^3)	RfC Reference	Ingestion SF (mg/kg-day)$^{-1}$	SFO Reference	Inhalation Unit Risk (ug/m^3)$^{-1}$	IUR Reference
Acenaphthene	No	Yes	6.00E-02	IRIS	-		-		-	
Arsenic, Inorganic	No	No	3.00E-04	IRIS	1.50E-05	CALEPA	1.50E+00	IRIS	4.30E-03	IRIS
Barium	No	No	2.00E-01	IRIS	5.00E-04	HEAST	-		-	
Cadmium (Water)	No	No	5.00E-04	IRIS	1.00E-05	ATSDR F	-		1.80E-03	IRIS
Chromium(III), Insoluble Salts	No	No	1.50E+00	IRIS	-		-		-	
Mercuric Chloride	No	No	3.00E-04	IRIS	3.00E-04	SURROGA	-		-	
Selenium	No	No	5.00E-03	IRIS	2.00E-02	CALEPA	-		-	
Strontium, Stable	No	No	6.00E-01	IRIS	-		-		-	
Zinc and Compounds	No	No	3.00E-01	IRIS	-		-		-	

Chemical	RAGSe GIABS (unitless)	Kp (cm/hour)	MW	pi	logds	dsclc	dsc	B	tau_event	FA	In EPD?
Acenaphthene	1	0.086	154.21	3.1415927	-3.663576	0.000217	2.17E-07	0.4107536	0.7681124	1	Yes
Arsenic, Inorganic	1	0.001	74.922	3.1415927	-3.219563	0.0006032	6.03E-07	0.0033291	0.2763198	1	Yes
Barium	0.07	0.001	137.33	3.1415927	-3.569048	0.0002697	2.70E-07	0.0045072	0.6178695	1	Yes
Cadmium (Water)	0.05	0.001	112.41	3.1415927	-3.429496	0.000372	3.72E-07	0.0040778	0.4480688	1	Yes
Chromium(III), Insoluble Salts	0.013	0.001	52	3.1415927	-3.0912	0.0008106	8.11E-07	0.0027735	0.2056121	1	Yes
Mercuric Chloride	0.07	0.001	271.5	3.1415927	-4.3204	0.0000478	4.78E-08	0.0063374	3.4853689	1	Yes
Selenium	1	0.001	78.96	3.1415927	-3.242176	0.0005726	5.73E-07	0.0034177	0.2910883	1	Yes
Strontium, Stable	1	0.001	87.62	3.1415927	-3.290672	0.0005121	5.12E-07	0.0036002	0.3254773	1	Yes
Zinc and Compounds	1	0.0006	65.38	3.1415927	-3.166128	0.0006821	6.82E-07	0.001866	0.24433	1	Yes

Chemical	Carc Absorbed dose per event (mg/cm^2-event)	Noncarc Absorbed dose per event (mg/cm^2-event)	Ingestion PRG TR=1.0E-6 (ug/L)	Dermal PRG TR=1.0E-6 (ug/L)	Inhalation PRG TR=1.0E-6 (ug/L)	Carc PRG TR=1.0E-6 (ug/L)	Ingestion PRG HQ=1 (ug/L)	Dermal PRG HQ=1 (ug/L)	Inhalation PRG HQ=1 (ug/L)	Noncarc PRG HI=1 (ug/L)
Acenaphthene	-	3.06E+00	-	-	-	-	-	7.19E+03	-	7.19E+03
Arsenic, Inorganic	4.76E-04	1.53E-02	-	1.19E+02	-	1.19E+02	-	3.83E+03	-	3.83E+03
Barium	-	7.14E-01	-	-	-	-	-	1.79E+05	-	1.79E+05
Cadmium (Water)	-	1.28E-03	-	-	-	-	-	3.19E+02	-	3.19E+02
Chromium(III), Insoluble Salts	-	9.95E-01	-	-	-	-	-	2.49E+05	-	2.49E+05
Mercuric Chloride	-	1.07E-03	-	-	-	-	-	2.68E+02	-	2.68E+02
Selenium	-	2.55E-01	-	-	-	-	-	6.38E+04	-	6.38E+04
Strontium, Stable	-	3.06E+01	-	-	-	-	-	7.65E+06	-	7.65E+06
Zinc and Compounds	-	1.53E+01	-	-	-	-	-	6.38E+06	-	6.38E+06

Output generated 20SEP2015:18:42:31

Biota Consumption Tissue Screening Level (TSL) Development

Tissue Screening Level (TSL) Calculations (a

Input Parameters		Value (b)
Target Risk (TR)		1.00E-04
Target Hazard Quotient (THQ)		1
Body Weight (BW) (kg)		70
Averaging Time (yr)		
Carcinogen (ATc)		70
Noncarcinogen (ATnc)		30
Exposure Frequency (EF) (d/yr)		365
Exposure Duration (yr)		30
Ingestion Rates (IRF) (g/d)		
Default, fish/shellfish	(c)	30
2x Default	(d)	60
Crab Hepatopancreas (HP)	(e)	7.5
Crab Meat	(f)	30

				Non-Carcinogenic TSLs (mg/kg) (a)				Carcinogenic TSLs (mg/kg) (a)			
		RfDo (g)	SFo (g)	Crab or Fish (k)		Crab HP	Crab Meat	Crab or Fish (k)		Crab HP	Crab Meat
				Default	2x Default			Default	2x Default		
Constituent		**mg/kg-day**	**$(mg/kg\text{-}day)^{-1}$**	**IRF**	**IRF**	**HP IRF**	**Meat IRF**	**IRF**	**IRF**	**HP IRF**	**Meat IRF**
TPH >C8-16											
TPH >C8-16 (average Aliph, Arom)	(h)	7.0E-02	---	160	82	650	160	---	---	---	---
TPH >C16-28											
TPH >C16-28, (average Aliph, Arom)	(h)	1.0E+00	---	2400	1200	9500	2400	---	---	---	---
Metals											
Arsenic, inorganic		3.0E-04	1.5E+00	0.7	0.35	2.8	0.7	0.36	0.18	1.5	0.36
Barium		2.0E-01	---	470	230	1900	470	---	---	---	---
Mercury, total		3.0E-04	---	0.7	0.35	2.8	0.7	---	---	---	---
Methyl Mercury		1.0E-04	---	0.23	0.12	0.93	0.23	---	---	---	---

Notes:

(a) TSLs were calculated using the algorithms provided by LDEQ et al. (2012).

(b) Values for input parameters taken from LDEQ et al (2012), unless otherwise noted.

(c) Default ingestion rate specific to edible tissues (typically) crab meat identified by LDHH et al. (2012).

(d) An IRF of two-times the default was used as a sensitivity analysis.

(e) Default ingestion rate specific to crab hepatopancreas identified by LDHH et al. (2012).

(f) Applicable to edible tissues of crab or fish.

(g) Toxicity values from RECAP (LDEQ, 2003) for TPH and from EPA for metals.

(h) TSL calculated using weighted toxicity value (i.e., oral reference dose, RfD) assuming 50% aliphatics and 50% aromatics:

TPH>C8-16: The RfD (0.07 mg/kg-day) is the average of the RfDs provided in RECAP for aliphatic and aromatic hydrocarbons within this range.

TPH>C16-28: The RfD (1.0 mg/kg-day) is the average of the RfDs provided in RECAP for aliphatic and aromatic hydrocarbons within this range.

References:

EPA. 2000. Guidance for Assessing Chemical Contaminant Data for Use in Fish Advisories, Vol. 2: Risk Assessment and Fish Consumption Limits, Third Ed.
LDEQ. 2003. Risk Evaluation / Corrective Action Program
LDHH et al. 2012. Protocol for Issuing Public Health Advisories for Chemical Contaminants in Recreationally Caught Fish and Shellfish.
LDEQ et al. 2012. Tissue Screening Level Guidelines for Issuance of Public Health Advisories for Selected Contaminants and Supporting Documentation.

Tissue Screening Level (TSL) Calculations, Modified for Child (a)

Input Parameters		Value (b)
Target Risk (TR)		1.00E-04
Target Hazard Quotient (THQ)		1
Child Body Weight (BW) (kg)	(c)	35
Averaging Time (yr)		
Carcinogen (ATc)		70
Noncarcinogen (ATnc)		6
Exposure Frequency (EF) (d/yr)		365
Exposure Duration (yr)		6
Ingestion Rates (IRF) (g/d)		
Default Child, fish/shellfish	(c)	15

				Non-Carcinogenic TSLs (mg/kg) (a)	Carcinogenic TSLs (mg/kg) (a)
Constituent		**RfDo (e)**	**SFo (e)**	**Crab or Fish (d) Default Child IRF**	**Crab or Fish (d) Default Child IRF**
TPH					
TPH >C8-16	(f)	7.0E-02	---	160	---
TPH >C16-28	(f)	1.0E+00	---	2400	---
Metals					
Arsenic, inorganic		3.0E-04	1.5E+00	0.7	1.8
Barium	(g)	2.0E-01	---	470	---
Mercury, total	(h)	3.0E-04	---	0.7	---
Methyl Mercury		1.0E-04	---	0.23	---

Notes:

(a) TSLs were calculated using the algorithms provided by LDEQ et al. (2012).

(b) Values for input parameters were obtained from LDEQ et al. (2012), unless otherwise noted.

(c) Child-specific parameters (i.e., body weight and fish ingestion rate) were obtained from Table 1 of LDHH et al (2012).

(e) Toxicity values from RECAP (LDEQ, 2003) for hydrocarbons and from EPA for metals.

(d) Applicable to edible tissues of crab or fish.

(f) TSL calculated using weighted toxicity value (i.e., oral reference dose, RfD) assuming 50% aliphatics and 50% aromatics:

TPH>C8-16: The RfD (0.07 mg/kg-day) is the average of the RfDs provided in RECAP for aliphatic and aromatic hydrocarbons within this range.

TPH>C16-28: The RfD (1.0 mg/kg-day) is the average of the RfDs provided in RECAP for aliphatic and aromatic hydrocarbons within this range.

As reference, in samples of sediment in which hydrocarbon fractions were detected at the site, 68 to 100% of the total concentration was aliphatic, the less toxic of the hydrocarbon types. The average aliphatic content was 93%, and average aromatic content was 7%.

(g) Toxicity value used in the TSL calculations (2.0E-01 mg/kg-day) is the current toxicity value in EPA's Integrated Risk Information System (IRIS). The toxicity value in RECAP (2003) is an outdated toxicity value (RfDo = 2.0E-01 mg/kg-day).

(h) Toxicity based on mercuric chloride and mercury salts.

References:

LDEQ. 2003. Risk Evaluation / Corrective Action Program

LDEQ et al. 2012. Tissue Screening Level Guidelines for Issuance of Public Health Advisories for Selected Contaminants and Supporting Documentation.

LDHH et al. 2012. Protocol for Issuing Public Health Advisories for Chemical Contaminants in Recreationally Caught Fish and Shellfish.

East White Lake Oil and Gas Field Seafood Sampling Evaluation Vermilion Parish, Louisiana, by Louisiana Department of Health and Hospitals, March 13, 2015

Appendix H

Project No. 0116008
UNOCAL
Vermilion Parish, Louisiana

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East White Lake Oil and Gas Field Seafood Sampling Evaluation Vermilion Parish, Louisiana

March 13, 2015

Louisiana Department of Health and Hospitals

Statement of Issues

In December 2014, the Louisiana Department of Natural Resources (LDNR) requested that the Louisiana Department of Health and Hospitals (LDHH) review data collected by Environmental Resources Management, Inc. (ERM) from the East White Lake Oil and Gas Field in Vermilion Parish, Louisiana. ERM staff collected blue crabs and forage fish in December 2010 and January 2011 from East White Lake areas of interest and reference locations on behalf of the Union Oil Company of California (UNOCAL). UNOCAL conducted oil and gas exploration and production activities in the area for approximately 55 years; currently, there are 15 active onsite oil and gas wells (operated by divested companies) that are regulated by LDNR [1]. According to the Vermilion Parish School Board, these activities have impacted their property located at Section 16 of Township 15 South, Range 01 East, in Vermilion Parish, Louisiana, within the East White Lake Oil and Gas Field.

In accordance with the *Protocol for Issuing Public Health Advisories for Chemical Contaminants in Recreationally Caught Fish and Shellfish* (February 2012) [2], LDHH has provided a review of the December 2010/January 2011 ERM data [3]. LDHH has also included a review of the October 2010 crab data prepared by Omega EnviroSolutions (OES), Inc. on behalf of the Vermillion Parish School Board [4]. OES data was provided to LDHH in November 2010 by Senator Gautreaux. In November 2010, LDHH collected blue crab samples from East White Lake areas of interest [5]; these data are also included in this evaluation.

Data Evaluation

October 2010 blue crab whole body dataset: Omega EnvironSolutions (OES), Inc.

October 16-18, 2010, contractors placed traps and collected 22 blue crabs at 9 locations throughout the East White Lake school board-owned property (Appendix A, Figure 1) [4]. Whole body samples were received at the Test America analytical laboratory (South Burlington, VT) on October 19, 2010. Individual whole crabs were homogenized and analyzed for total metals (EPA SW-846, Method 6010 B), total mercury (EPA SW-846, Method 7471 A), and total petroleum hydrocarbons (TPH) (NJ-OQA-QAM-025 New Jersey total petroleum hydrocarbons (GC)).

Table 1 below includes contaminants of concern detected in crab samples as identified by OES consultants. Based on subsistence consumption (142 grams per day) and total arsenic, barium, total mercury and TPH whole body concentration assumptions, consultants have requested the consideration of imposing a fish and shellfish consumption advisory for the East White Lake area. Recreational and commercial harvest bans were further recommended by school board consultants while regulators conduct additional sampling and risk assessment evaluations.

Crab data presented in Table 1 are based on whole body analysis. The advisory development process in Louisiana is based on analyses of edible tissues. Typically, this includes muscle tissue fillets without skin, bones, or organs. For species where organs are also considered edible, the organs may be included with the muscle tissue for analysis, and / or analyzed separately, when differences exist in population consumption habits. For example, edible tissue of crabs typically includes all leg and claw meat, back shell meat and body cavity meat. The hepatopancreas (“crab fat”) may be included for analysis as determined by the eating habits of the local population; however, it must be analyzed separately to enable the evaluation of health risks associated with consuming crabs of variable fat content.

Tissue Screening Levels (TSLs) presented in *Tissue Screening Level Guidelines for Issuance of Public Health Advisories for Selected Contaminants and Supporting Documentation (March 2012)* [6] are representative of acceptable contaminant concentrations in edible tissues of the organism. It is not appropriate to compare TSLs to data based on whole body analysis which includes non-edible tissues (i.e., crab shells). This is particularly true of inorganic constituents such as arsenic and barium that are likely to be concentrated in the non-edible shell of the blue crab.

Dataset Limitations

- Whole body sample analysis is not supported by the Louisiana advisory protocol. Advisory development is based on edible tissue only, with separate hepatopancreas analysis.
- The Louisiana advisory protocol utilizes the average constituent concentration detected in edible tissues. The data analysis in the OES report was based on the maximum detected constituent concentration, which is not representative of the concentration likely to be consumed in a meal composed of multiple crabs.
- The advisory supported consumption rate is based on the protection of the general population that consumes 30 grams per day (of a single species obtained from the same water body) for a period of 30 years. There is a lack of documentation to support the alternate subsistence crabbing ingestion rate of 142 grams per day.
- Arsenic speciation was not conducted as part of the laboratory analyses, preventing the evaluation of health risks related to inorganic arsenic portions. Over 90% of arsenic found in edible seafood tissue is present in the non-toxic organic form [7]. Whole body, non-speciated data reported in this dataset do not provide an accurate characterization of arsenic tissue concentrations from these East White Lake sampling locations.

- Arsenic reporting limits and some method detection limits were above tissue screening levels. Detection and reporting limits must be lower than the regulatory contamination limits in order to effectively evaluate risk.
- A draft TSL for barium can be calculated as outlined in the Louisiana advisory protocol. However, because the form of barium present in the crab tissue is not known, it is not appropriate to compare it to a drafted TSL. Barium is usually present in water systems as barium sulfate, an insoluble, relatively non-toxic form [8]. The literature further supports the likelihood that barium replaces calcium in shell which is composed largely of calcium carbonate [9]. Homogenized whole body sampling methodology utilized in this dataset does not provide an accurate characterization of barium tissue concentrations from these East White Lake sampling locations.
- TPH was detected in one crab described as having a black/stained plastron and upper carapace (C-5-1 location). It was assumed that the TPH detected in the crab was equally represented by three carbon fractions (C8-C16, C16-C21, C21-C35); however, laboratory documentation was not provided to support this approach. The TPH fractionation method yields more specific information regarding the TPH constituents present within a sample. Consultants calculated a TSL using an average toxicity value to represent the carbon fractions. The toxicity value used for the TSL calculation does not appear to capture both aliphatic and aromatic hydrocarbon ranges.

Table 1: OES whole body crab results in milligrams per kilogram (mg/kg). October 2010.

Sample ID	Wet weight (grams)	Length (millimeters)	Width (millimeters)	Total Arsenic	Barium	Total Mercury	Total Petroleum Hydrocarbon (C8-C40)
Recreational tissue screening level*				0.36 inorganic	466	0.7	1657
Subsistence tissue screening level*				0.147	99	0.15	350
C-1-1	154.22	63.4	141.42	0.81 U[1]	290	0.032	61 U
C-1-2	138.84	63.16	146.16	0.47 J[2]	203	0.052	33 J
C-2-1	148	66.5	144.64	0.69 J	250	0.079	58 U
C-2-2	242	74.94	159.5	0.94	234	0.15	31 J
C-2-3	171.79	64.14	150.24	0.61 J	256	0.182	41 J
C-3-1**	138.6	65.68	128.16	0.37 J	167	0.038	32 J
C-3-2	207	72.6	174.16	0.74	356	0.032	33 J
C-3-3	125.33	62.2	144.76	0.84 J	254	0.039	37 J
C-3-4	123.91	65.78	143.24	0.41 J	220	0.048	60 U
C-4-1	210	71.84	155.5	0.64 J	198	0.045	38 J
C-4-2	127	57.74	137.36	0.61 J	220	0.052	42 J
C-5-1[a]	278	80.74	178.9	0.58 J	219	0.038	370 [a]
C-6-1	126.62	62.54	141.44	0.36 J	452	0.042	59 U
C-6-2	312	83.62	186.62	0.92	241	0.059	58 U
C-6-3	177.92	67.94	141.84	0.99	154	0.034	40 J
C-6-4	132.5	59.42	135.88	0.92 J	312	0.081	40 J
C-6-5	127.74	63.46	136	0.74 J	342	0.058	58 U
C-6-6	128.38	60.3	138.72	0.85	348	0.051	36 J
C-8-1	327	86.94	194.82	0.87 J	280	0.03	57 U
C-8-2	278	78.24	175.88	0.64 J	214	0.05	55 U
C-9-1	200	68.62	161.1	0.57 J	229	0.047	58 U
C-9-2	202	70.16	169.8	0.43 J	165	0.049	35 J

** Consultant calculated; *claw was broken off on this specimen; [a]specimen plastron black and stained;

[1]J- estimated value; [2]U- non-detect

November 2010 blue crab tissue dataset: Louisiana Department of Health and Hospitals

On November 23rd and 29th, 2010, LDHH collected composite samples of at least 8 blue crabs from each of the 9 locations on the Vermillion Parish School Board property (Appendix A, Figure 2) [5]. Samples were delivered on the same day to the Office of Public Health's Central Laboratory (Metairie, LA) to be analyzed for total arsenic and barium via EPA Method 200.8 [10]. Crab composite samples were segregated into two sets for processing and analysis. Set one composited location-specific samples of 4 to 9 crabs and boiled them together using clean tap water. The tap water used for the boil was sampled prior to boiling and post boiling. After boiling, crab tissue and hepatopancreas were removed from the shell, separated, and component homogenized for frozen storage until ready to perform testing. Set two also composited location-specific samples of 4 to 9 uncooked crabs. Crab tissue and hepatopancreas were removed from the shell, separated, and component homogenized for frozen storage until ready to perform testing.

Table 2 below includes laboratory analysis results by station and contaminant. Set one testing procedures were intentionally selected to address OES consultant concerns hypothesizing liberation of crab shell contaminants during boiling and cooking. Arsenic and barium concentrations were not detected in pre-boiled water samples; post-boiled water samples were below health screening values for barium and arsenic.

Set two testing procedures were conducted according to the advisory protocol.

Mean whole body OES arsenic concentrations were 0.682 mg/kg. LDHH mean arsenic tissue concentrations were below the laboratory detection limit (0.5 mg/kg), while mean boiled and unboiled hepatopancreas concentrations ranged slightly above detection (0.447 – 0.545 mg/kg).

A draft TSL (467 mg/kg) was calculated for barium; mean barium concentrations were well below the TSL value. Overall barium concentrations from both LDHH datasets were significantly lower than values presented in OES whole body samples including non-edible shell portions.

Dataset Limitations

- Arsenic speciation was not an available operational method within the LDHH laboratory at the time of analyses. Remaining portions of each composite sample were held in frozen storage for further arsenic speciation as the laboratory obtained resources to perform the method. While the majority of arsenic found in edible seafood tissue is present in the non-toxic organic form, the percentage could not be quantified in the LDHH evaluation.

- The arsenic method detection limit (0.5 mg/kg) was less sensitive than the tissue screening level (0.36 mg/kg). Reporting and detection limits must be lower than the regulatory contamination limit, which may not always be possible for complex sample matrices.
- Tissue wet weights, precise number of crabs per composite sample, and barium laboratory detection limits were unavailable in raw data form. Dataset hold time expired and files were destroyed.
- Health screening values are media specific; tissues TSLs were used in this evaluation to screen pre and post-boil water samples.

Table 2: LDHH crab tissue, fat and water results in milligrams per kilogram (mg/kg). November 2010.

Analyte		**Station**									
		1	2	3	4	5	6	7	8	9	**Mean**
Arsenic											
Set 2	meat not boiled	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	<0.50	< 0.50
Set 1	meat boiled	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Set 2	fat not boiled	< 0.50	0.672	0.77	0.749	< 0.50	0.816	0.606	< 0.50	0.544	0.545
Set 1	fat boiled	0.634	0.593	< 0.50	0.512	< 0.50	0.72	0.565	< 0.50	< 0.50	0.447
Set 1	water pre-boiled	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	<0.001	<0.001
Set 1	water post-boiled	0.012	0.009	0.013	0.018	0.01	0.012	0.009	0.25	0.009	0.038
Barium		*	*	*	*	*	*	*	*	*	*
Set 2	meat not boiled	1.89	3.28	2.29	3.85	2.19	4.95	2.92	2.93	1.24	2.838
Set 1	meat boiled	3.86	5.55	4.88	4.77	5.85	11.2	4.71	5.45	3.39	5.518
Set 2	fat not	9.86	10.4	4.98	6.19	9.92	13.8	19.5	7.17	9.39	10.134

	boiled										
Set 1	fat boiled	13.1	8.36	4.53	6.78	11.9	20.2	16.1	8.38	8.79	10.904
Set 1	water pre-boiled	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	<0.001	<0.001
Set 1	water post-boiled	0.087	0.11	0.11	0.13	0.09	0.18	0.1	0.25	0.15	0.134

*Suspect result due to the heterogeneous nature of the sample or an uncorrected matrix effect

December 2010 / January 2011 blue crab and forage fish datasets: Environmental Resources Management (ERM)

December 13, 2010 and January 10, 2011, ERM contractors collected blue crabs at 13 locations in the East White Lake Oil and Gas Field, six reference locations in Schooner Bayou Canal and from four reference locations in White Lake (Appendix, A, Figure 3). Crab traps were checked and harvested for crabs until a minimum of five crabs per location were collected; a total of 307 crabs were collected for analysis [3]. Crabs were also purchased for analysis from commercial markets in Baton Rouge, Lake Charles, New Orleans, Des Allemands, Biloxi and Houston. Samples were received at Columbia Analytical Services, Inc. for analysis of total barium and speciated mercury and arsenic; and Pace Analytical Services, Inc. for analysis of TPH. Composite crab meat and hepatopancreas were analyzed separately in accordance with the Louisiana advisory protocol.

Forage fish were collected and analyzed as whole body samples to support the evaluation of ecological risk. According to the advisory protocol, whole body samples are not used for human health risk purposes, therefore, they were not further evaluated in this report.

Tables 3 and 4 below include laboratory analysis results by location and contaminant and comparisons of crab concentrations to default and consultant derived tissue screening levels (TSLs). Measured TPH crab meat concentrations in the C8-C16 and >C16-C28 carbon ranges were non-detect at all East White Lake and reference locations and in three of six commercial market samples. Edible tissue concentrations (ETCs) (combining meat and hepatopancreas concentrations) were calculated to include one-half the detection limit for non-detect results. Mean ETCs and hepatopancreas TPH carbon range concentrations were below consultant derived TSLs for all site, reference and commercial market samples. Consultant derived TPH TSLs were calculated using average toxicity factors provided by the Louisiana Department of Environmental Quality (LDEQ) Risk Evaluation / Corrective Action Program (RECAP) [11]. The oral reference dose was calculated by using an average of the aliphatic and aromatic hydrocarbons within each carbon range (C8-C16, >C16-C-28).

Mean inorganic arsenic and methyl mercury concentrations detected in site, reference and commercial market crab tissue were below default TSLs; mean crab hepatopancreas concentrations were detected below consultant derived TSLs using the hepatopancreas-specific default consumption rate identified in the Louisiana advisory protocol.

Mean barium concentrations detected in site, reference and commercial market crab tissue and hepatopancreas (including ETC) were also below the consultant derived TSL.

Hazard Indices were calculated to evaluate the potential for additive target organ effects for the noncarcinogenic metals and TPH carbon range crab constituents in site, reference and commercial market datasets. This process is in accordance with the Louisiana TSL guidelines; no potential human health concern was identified, i.e., all hazard indices were less than 1. Inorganic arsenic, the singular carcinogen, was within the target 1×10^{-4} cancer risk range.

Dataset Limitations

- Consultant derived TSL for TPH carbon range C8-C16 (160 mg/kg) was slightly different than LDHH’s calculation of 163 mg/kg. The hepatopancreas TSL (650 mg/kg) was also slightly different than LDHH’s calculation of 653 mg/kg. These inconsistencies do not alter the risk outcome.
- Consultant derived TSL for TPH carbon range >C16-C28 (2400 mg/kg) could not be replicated by LDHH. LDHH derived a TSL for this TPH carbon range at 2333 mg/kg. The hepatopancreas TSL (9500 mg/kg) was also different than LDHH’s calculation of 9333 mg/kg. These inconsistencies do not alter the risk outcome.
- Consultant derived TSL for barium (470 mg/kg) was slightly higher than LDHH’S TSL calculation of 466 mg/kg. The hepatopancreas TSL (1900 mg/kg) was also slightly different than LDHH’s calculation of 1867 mg/kg. These inconsistencies do not alter the risk outcome.
- The Louisiana advisory protocol assesses non-detect samples by assigning a value of zero if more than half of the contaminant specific samples are below the reporting limit. ERM data appear to assign one-half of the reporting limit for all non-detect samples, regardless of the non-detect frequency.

Table 3: ERM TPH Concentrations in Crab (mg/kg-wet weight). December 2010 / January 2011 [3].

	Sample ID	Meat				Hepatopancreas				Edible Tissue Concentration (HP & Meat) $^{(a)}$				Percentage based on Reported Tissue Weight	
		TPH (C8-C16)		TPH (C16-28)		TPH (C8-C16)		TPH (C16-28)		TPH (C8-C16)		TPH (C16-28)		Meat	HP
Site	EWL-T-01A-C	4.5	UR	4.5	UR	21.6	U	59.4		NA		NA		84%	16%
	EWL-T-01-C	9.4	U	9.4	U	70.3		167		15.8		32.2		83%	17%
	EWL-T-02-C	5	U	5	U	22.2	U	90.8		3.96	U	17.5		83%	17%
	EWL-T-03-C $^{(c)}$	13.9	U	13.9	U	242		242		48.4		48.3		82%	18%
	EWL-T-04-C	5.5	U	5.5	U	5.8	U	9.9	J	2.77	U	3.91		84%	16%
	EWL-T-05-C	5.1	U	5.1	U	136	U	856		13.7	U	148		83%	17%
	EWL-T-06-C	8	U	8	U	34.1	U	174		6.14	U	31.8		84%	16%
	EWL-T-07-C	6.5	U	6.5	U	47.1		101		10.8		20.1		83%	17%
	EWL-T-08-C	5	U	5	U	90		300		15.3		46.1		85%	15%
	EWL-T-09-C	6.7	U	6.7	U	54	U	209		7.54	U	39.8		82%	18%
	EWL-T-10-C $^{(c)}$	12.6	U	12.6	U	142		314		30.9		62.1		82%	18%
	EWL-T-11-C	12.9	U	12.9	U	111		443		24.3		81.2		83%	17%
	EWL-T-12-C	4.4	U	4.4	U	60.6	J	277		12.9		52.4		82%	18%
	Average $^{(b)}$	**NC**		**NC**		**69**		**249**		**16**		**49**		**0.83**	**0.17**
Reference	EWL-TR-01-C	8.7	U	8.7	U	NA		NA		NA		NA		82%	18%
	EWL-TR-02-C	4.7	U	4.7	U	61.1		143		14.1		30.5		80%	20%
	EWL-TR-03A-C	5.2	U	5.2	U	135		305		27		58.3		82%	18%
	EWL-TR-03-C	4.9	U	4.9	U	34.3	U	145		5.19	U	29		81%	19%
	EWL-TR-04-C	4.6	U	4.6	U	91.6		262		15.3		40		85%	15%
	EWL-TR-05-C	4.8	U	4.8	U	53.9	U	82	J	7.19	U	17.9		80%	20%
	EWL-TR-06-C	7.4	U	7.4	U	21.7	U	144		4.96	U	28.5		82%	18%
	EWL-TR-07-C	4.8	U	4.8	U	85.5		302		15.4		49.2		84%	16%
	EWL-TR-08-C	5.0	U	5.0	U	188		254		40.3		53.8		80%	20%
	EWL-TR-09-C	5.2	U	5.2	U	100		393		23.2		85		79%	21%
	Average $^{(b)}$	**NC**		**NC**		**80**		**226**		**17**		**44**		**0.82**	**0.18**
Market	EWL-BIL-C	3.5	U	4.4	J	22.4	U	140		3.27	U	26.2		84%	16%
	EWL-BR-C	9.6	U	9.6	U	23.7	U	241		6.2	U	51.6		80%	20%
	EWL-DES-C	5.6	U	8.1	J	22.7	U	88.1		3.54	U	15.1		91%	9%
	EWL-HOU-C	5.3	U	7.5	J	28.4	U	174		4.08	U	28.1		88%	12%
	EWL-LC-C $^{(c)}$	16.2	U	16.2	U	310.5		351		71.3		79.8		79%	21%
	EWL-NO-C	14.4	U	14.4	U	197		298		38.8		55.6		83%	17%
	Average $^{(b)}$	**NC**		**6.7**		**93**		**215**		**21**		**43**		**0.84**	**0.16**

Notes:

U = Result was reported as not detected by the laboratory (i.e., less than the MDL, defined by the laboratory as the "Adjusted Method Detection Limit"); value shown is the MDL.(blue shaded cells). One-half the detection limit was used to calculate Edible Tissue Concentrations (ETCs), so ETCs with U are calculated from one-half detection limits for non-detect meat and hepatopancreas results. J = Laboratory qualifier indicating that the reported value is an estimated concentration above the adjusted method detection limit and below the adjusted reporting limit. R = Surrogate recovery identified as less than 10%; therefore, this non-detect result is considered not reliable for use in quantitative analysis. NA = Edible Tissue Concentration could not be calculated due to unavailable meat or hepatopancreas data (either due to insufficient hepatopancreas sample to analyze TPH or R-qualified results). NC = Not calculated; for datasets that were completely nondetect, an average concentration was not calculated.

(a) Edible Tissue Concentration (ETC) - for each composite crab sample, the ETC was calculated as the sum of the mass-weighted TPH concentrations for crab meat and hepatopancreas, using sample-specific tissue weight (mass) data reported by the laboratory for meat and hepatopancreas as follows:

ETC = (concentration in meat) x (% edible tissue comprised of meat) + (concentration in hepatopancreas) x (% edible tissue comprised of hepatopancreas). One-half MDLs were used to represent concentrations for nondetect results.

(b) For averaging datasets comprised of both nondetect values and detections, one-half detection limits were used to represent concentrations of nondetect results.

(c) Duplicate samples were prepared by the sample preparation laboratory (Columbia Analytical Services, Inc.) as separate aliquots from the same composite homogenized tissue (i.e., meat or hepatopancreas), where one aliquot is considered the parent and the other is labeled as a laboratory duplicate. The concentrations listed in this table, and used in the risk assessment, represent the average concentration from the parent sample and the duplicate. Since the tissue weight data was obtained from the composite homogenized tissue, the tissue weights are equal for the parent sample and duplicate.

Table 4: ERM Comparison of Concentrations in Crab to Default Tissue Screening Levels (TSLs) and Calculation of the Hazard Indices [3].

Evaluation of Crab Edible Tissue Concentrations (ETCs)									
				Crab Edible Tissue Concentration (HP & Meat) (a,b)					
	Default TSLs (e)		**Target**	**Site**		**Reference**		**Market**	
Constituent	**TSLnc**	**TSLc**	**Organs (d)**	**Average**	**Max**	**Average**	**Max**	**Average**	**Max**
TPH (c)									
TPH >C8-16	160	---	**liver,** hematological system, decreased BW	16	48.4	17	40.3	21	71.3
TPH >C16-28	2400	---	**liver**, **kidney**	49	148	44	85	43	79.8
Metals									
Arsenic, inorganic	0.7	0.36	skin, vascular	0.011	0.016	0.013	0.016	0.015	0.023
Barium	470	---	**kidney**	9.2	14	11	16	1.5	3.1
Mercury, total	0.7	---	autoimmune	0.069	0.091	0.062	0.092	0.036	0.049
Methyl Mercury	0.23	---	developmental neuro-psychological impairment	0.039	0.061	0.028	0.052	0.018	0.027
				Hazard Indices (d)					
			Kidney	**0.04**	**0.09**	**0.04**	**0.07**	**0.02**	**0.04**
			Liver	**0.1**	**0.4**	**0.1**	**0.3**	**0.2**	**0.5**
Evaluation of Crab Meat Concentrations									
				Crab Meat Concentrations (b)					
	Crab Meat TSLs (e)		**Target**	**Site**		**Reference**		**Market**	
Constituent	**TSLnc**	**TSLc**	**Organs (d)**	**Average**	**Max**	**Average**	**Max**	**Average**	**Max**
TPH (c)									
TPH >C8-16	160	---	**liver,** hematological system, decreased BW	NC	13.9 U	NC	8.7 U	NC	16.2 U
TPH >C16-28	2400	---	**liver**, **kidney**	NC	13.9 U	NC	8.7 U	6.7	8.1 J
Metals									
Arsenic, inorganic	0.7	0.36	skin, vascular	0.0032	0.0065 J	0.0039	0.0090 J	0.0076	0.014 J
Barium	470	---	**kidney**	6.7	12	8.4	14	1.3	2.5
Mercury, total	0.7	---	autoimmune	0.077	0.10	0.068	0.11	0.039	0.054
Methyl Mercury	0.23	---	developmental neuro-psychological impairment	0.043	0.069	0.032	0.061	0.019	0.029
				Hazard Indices (d)					
			Kidney	**0.01**	**0.03**	**0.02**	**0.03**	**0.005**	**0.009**
			Liver	**NA**	**NA**	**NA**	**NA**	**0.003**	**0.003**

Evaluation of Crab Hepatopancreas (HP) Concentrations

	Crab HP TSLs (e)		Target	Crab Hepatopancreas Concentrations (b)					
				Site		Reference		Market	
Constituent	**TSLnc**	**TSLc**	**Organs (d)**	**Average**	**Max**	**Average**	**Max**	**Average**	**Max**
TPH (c)									
TPH >C8-16	650	---	**liver**, hematological system, decreased BW	69	242	80	188	93	311
TPH >C16-28	9500	---	**liver**, **kidney**	249	856	226	393	215	351
Metals									
Arsenic, inorganic	2.8	1.5	skin, vascular	0.047	0.079	0.054	0.066	0.049	0.072
Barium	1900	---	**kidney**	21	32	24	33	2.9	6.1
Mercury, total	2.8	---	autoimmune	0.034	0.045	0.033	0.056	0.022	0.042
Methyl Mercury	0.93	---	developmental neuro-psychological impairment	0.021	0.039	0.014	0.024	0.0089	0.015
				Hazard Indices (d)					
			Kidney	**0.04**	**0.1**	**0.04**	**0.06**	**0.02**	**0.04**
			Liver	**0.1**	**0.5**	**0.1**	**0.3**	**0.2**	**0.5**

Concentrations in mg/kg-wet weight U = Result was reported as not detected by the laboratory (i.e., less than the MDL, defined by the laboratory as the "Adjusted Method Detection Limit"); value shown is the MDL. One-half the detection limit was used to calculate Edible Tissue Concentrations (ETCs), so ETCs with U are calculated from one-half detection limits for non-detect meat and hepatopancreas results.

J = Laboratory qualifier indicating that the reported value is an estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

NA = HI not calculated when data for the relevant constituents are all nondetect. NC = Not calculated; for datasets that were completely nondetect, an average concentration was not calculated.

(a) Edible Tissue Concentration (ETC) - for each composite crab sample, the ETC was calculated as the sum of the mass-weighted TPH concentrations for crab meat and hepatopancreas, using sample-specific tissue weight (mass) data reported by the laboratory for meat and hepatopancreas as follows: ETC = (concentration in meat) x (% edible tissue comprised of meat) + (concentration in hepatopancreas) x (% edible tissue comprised of hepatopancreas). One-half MDLs were used to represent concentrations for nondetect results.

(b) For datasets with all results reported as nondetect, an average concentration was not calculated (NC), and the highest detection limit was used to represent the maximum nondetect result. For datasets comprised of both detects and nondetects, one-half detection limit was used for determining the average concentration for the dataset, and the highest detected value (including J-flagged) was used as the maximum.

(c) TSL calculated using weighted toxicity value assuming 50% aliphatics and 50% aromatics.

(d) Hazard Indices calculated for target organs associated with more than one detected constituent.

(e) TSLs were calculated using the algorithms provided in the Tissue Screening Level Guidelines for Issuance of Public Health Advisories for Selected Contaminant (LDEQ et al., 2012). For evaluation of ETCs and crab meat, the TSLs were calculated using default parameters. For evaluation of hepatopancreas, the TSLs were calculated using a hepatopancreas-specific ingestion rate identified in the Protocol for Issuing Public Health Advisories for Chemical Contaminants in Recreationally Caught Fish and Shellfish (LDHH et al., 2012).

Conclusions

As requested by LDNR, LDHH has completed a review of the December 2010/January 2011 ERM crab data collected from the East White Lake areas of interest. October 2010 OES and November 2010 LDHH datasets were also included to provide a comprehensive review of all available data.

OES sampling methodology, laboratory analysis and data evaluation approaches are not consistent with the advisory development process as detailed in the *Protocol for Issuing Public Health Advisories for Chemical Contaminants in Recreationally Caught Fish and Shellfish*. October 2010 OES data are inadequate to support a consumption advisory for the East White Lake sampling areas.

November 2010 LDHH crab tissue data was collected to further characterize edible crab portions from the OES-sampled areas of interest. Sampling was conducted in accordance with the Louisiana advisory protocol; mean arsenic and barium tissue concentrations were below their respective tissue screening level (TSL). Speciation methodology was not available at the time of laboratory analyses to quantify organic arsenic content. LDHH data do not support the need for a consumption advisory due to barium and arsenic concentrations in crab tissue.

December 2010/January 2011 ERM crab tissue samples were collected and analyzed in accordance with the Louisiana advisory protocol. Mean inorganic arsenic, methyl mercury, barium and TPH concentrations detected in site, reference and commercial market crab tissue and hepatopancreas were either non-detect or below default and consultant derived TSLs. Reported constituent concentrations detected in crabs from the East White Lake areas of interest are below levels of health concern; no potential human health hazards were identified.

References

1. Michael Pisani & Associates, Inc. Environmental Consulting Services. April 23, 2010. Site Evaluation Plan Section 16 T 15S R 01E, East White Lake Oil and Gas Field. Vermilion Parish, Louisiana.

2. Louisiana Department of Health and Hospitals, Louisiana Department of Environmental Quality, Louisiana Department of Agriculture and Forestry and Louisiana Department of Wildlife and Fisheries. February 2012. Protocol for Issuing Public Health Advisories for Chemical Contaminants in Recreationally Caught Fish and Shellfish Chemical Contamination of Fish and Shellfish in Louisiana.

3. Environmental Resources Management. March 6, 2014. Transmittal of Crab and Forage Fish Tissue Sampling. Results for Total Petroleum Hydrocarbons. East White Lake Oilfield, Vermilion Parish, Louisiana. Vermilion Parish School Board Property, Section 16 T15S, R01E.

4. Gary C. Barbee, Ph.D. Omega EnviroSolutions, Inc. Canyon, TX. November 2, 2010. Supplemental Toxicological Evaluation Report for the Vermilion Parish School Board Property, Section 16, T. 15 S. – R. 1 E., Vermilion Parish, Louisiana.

5. Louisiana Department of Health and Hospitals. Office of Public Health Central Laboratory. Laboratory Report: Total Arsenic and Barium via EPA Method 200.8. December 6, 2010. East White Lake, Vermilion Parish, Louisiana.

6. Louisiana Department of Health and Hospitals, Louisiana Department of Environmental Quality, Louisiana Department of Agriculture and Forestry and Louisiana Department of Wildlife and Fisheries. March 2012. Tissue Screening Level Guidelines for Issuance of Public Health Advisories for Selected Contaminants and Supporting Documentation.

7. Agency for Toxic Substances and Disease Registry (ATSDR). 2007. Toxicological profile for Arsenic. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

8. Agency for Toxic Substances and Disease Registry (ATSDR). 2007. Toxicological Profile for Barium and Compounds (Update). Atlanta, GA: U.S. Department of Public Health and Human Services, Public Health Service.

9. Gillikin, D., Dehairs, F., Lorrain, A., Steenmans, D., Baeyens, W., and Andre, L. Barium uptake into the shells of the common mussel (*Mytilus edulis)* and the potential for estuarine paleo-chemistry reconstruction. *Geochim. Cosmochim. Acta* 70, 2 (2006) 395-407.

10. Louisiana Department of Health and Hospitals, Louisiana Department of Environmental Quality, Louisiana Department of Agriculture and Forestry and Louisiana Department of Wildlife and Fisheries. November 24, 2010. Sampling Collection Procedure for Testing Arsenic and Barium in Crabs Using ICP-MS in the DHH/OPH Central Laboratory. Protocol.

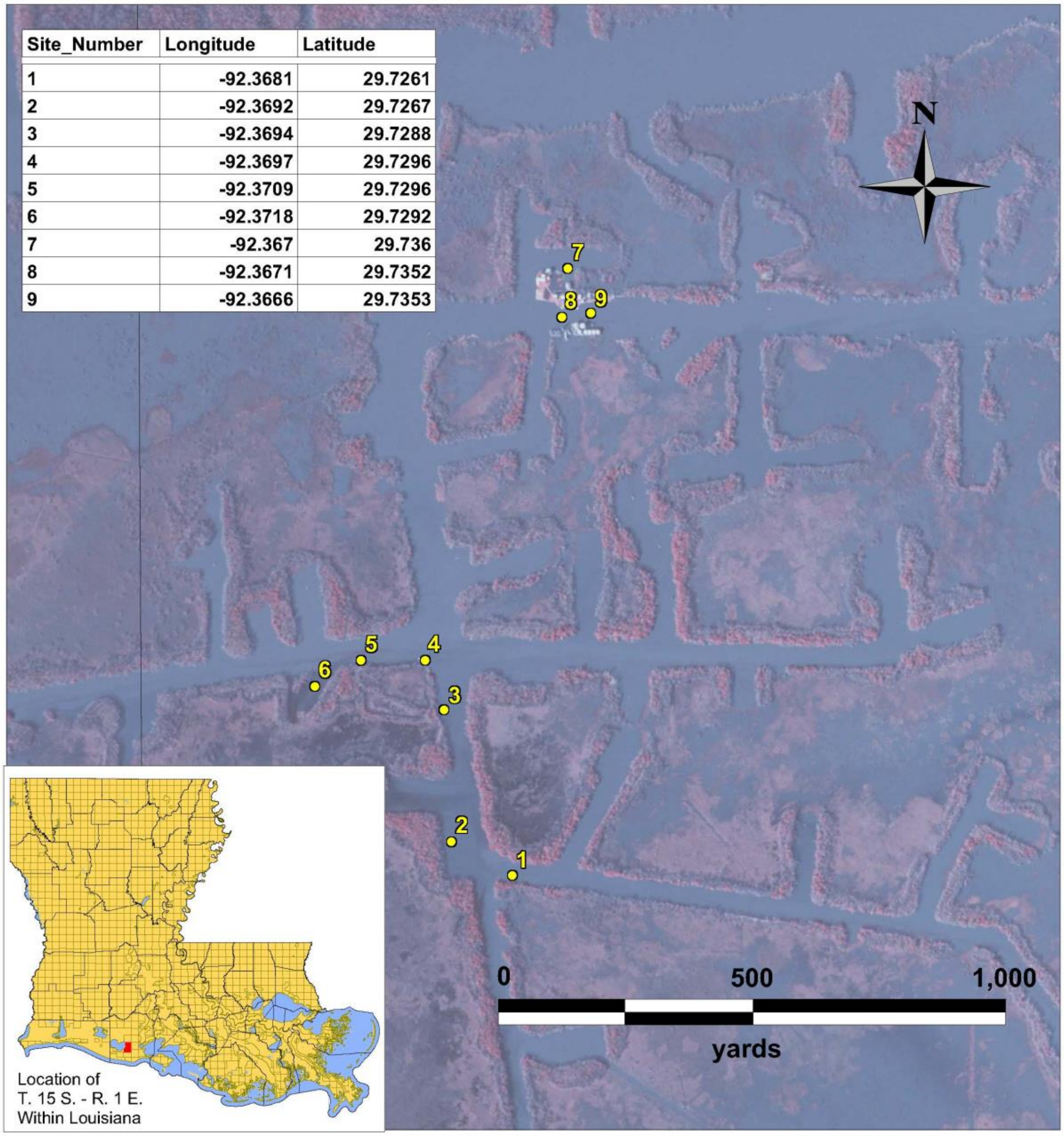
11. Louisiana Department of Environmental Quality. Risk Evaluation/Corrective Action Program (RECAP). 2003. Table D-3 Petroleum Hydrocarbon Fraction-Specific Chronic Reference Doses.

Appendix A: Figures

Figure 1: October 2010 Omega EnvironSolutions Crab Sampling Locations [4].

Figure 2: November 2010 Louisiana Department of Health and Hospitals Crab Sampling Locations [10].

Approximate Sampling Locations of the "Supplemental Toxicological Evaluation Report for the Vermilion Parish School Board Property, Section 16, T. 15 S. - R. 1 E., Vermilion Parish, Louisiana"

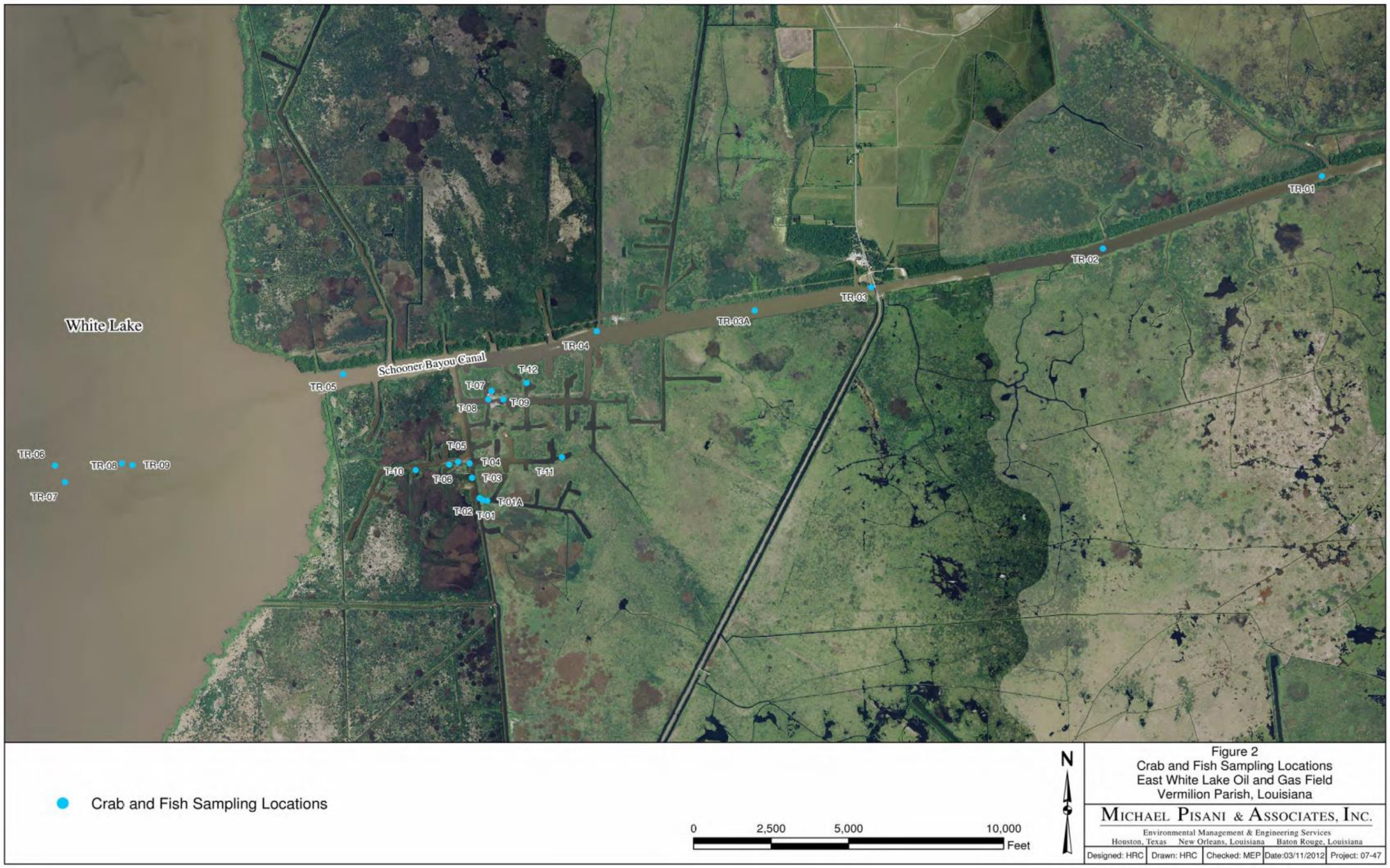


Site_Number	Longitude	Latitude
1	-92.3681	29.7261
2	-92.3692	29.7267
3	-92.3694	29.7288
4	-92.3697	29.7296
5	-92.3709	29.7296
6	-92.3718	29.7292
7	-92.367	29.736
8	-92.3671	29.7352
9	-92.3666	29.7353

Prepared on 11/18/2010 by the Louisiana Department of Health & Hospitals, Office of Public Health, Section of Environmental Epidemiology & Toxicology

The Louisiana Department of Health and Hospitals/Office of Public Health/Section of Environmental Epidemiology and Toxicology (SEET) cannot guarantee the accuracy of the information contained on this map and expressly disclaims liability for errors and omissions in its contents.

Figure 3: December 2010/January 2011 Environmental Resources Management (ERM) Crab and Fish Sampling Locations [3].



Fish Tissue Data Collected by LDEQ for Mercury Monitoring Program, Subsegment 050703 (White Lake)

Appendix I

Project No. 0116008
UNOCAL
Vermilion Parish, Louisiana

Environmental Resources Management Southwest, Inc.
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Appendix I
Fish Tissue Data Collected by LDEQ for Mercury Monitoring Program, Subsegment 050703 (White Lake)

East White Lake Oil and Gas Field
Vermilion Parish, Louisiana

Data obtained 10/22/2014, from http://www.deq.louisiana.gov/portal/tabid/2729/Default.aspx

Subsegment	Collection Date	Parameter	MDL	Result	Average Weight	Average Length	Number Of Fish	Species	Avg
LA050703_00	7/10/2008	MERCURY	0.0003	.38 ppm	1775.0 (g)	55.9 (cm)	3	BOWFIN	
LA050703_00	7/10/2008	MERCURY	0.0003	.35 ppm	(g)	71.0 (cm)	1	BOWFIN	
LA050703_00	7/10/2008	MERCURY	0.0003	.33 ppm	(g)	71.0 (cm)	1	BOWFIN	
LA050703_00	7/10/2008	MERCURY	0.0003	.23 ppm	1212.5 (g)	47.8 (cm)	2	BOWFIN	
LA050703_00	7/10/2008	MERCURY	0.0003	.57 ppm	3632.5 (g)	67.5 (cm)	2	BOWFIN	0.37
LA050703_00	7/10/2008	MERCURY	0.0003	.27 ppm	3445.0 (g)	67.3 (cm)	1	RED DRUM	
LA050703_00	7/10/2008	MERCURY	0.0003	.18 ppm	967.5 (g)	45.5 (cm)	2	RED DRUM	
LA050703_00	7/10/2008	MERCURY	0.0003	.27 ppm	1542.5 (g)	52.9 (cm)	2	RED DRUM	
LA050703_00	7/10/2008	MERCURY	0.0003	.23 ppm	1882.5 (g)	54.5 (cm)	2	RED DRUM	0.24
LA050703_00	7/10/2008	MERCURY	0.0003	.21 ppm	282.5 (g)	29.4 (cm)	2	FRESHWATER DRUM	
LA050703_00	7/10/2008	MERCURY	0.0003	.27 ppm	435.0 (g)	32.3 (cm)	2	FRESHWATER DRUM	0.24
LA050703_00	7/10/2008	MERCURY	0.0003	.26 ppm	400.0 (g)	28.5 (cm)	6	BLACK CRAPPIE	
LA050703_00	7/10/2008	MERCURY	0.0003	.3 ppm	509.0 (g)	30.6 (cm)	5	BLACK CRAPPIE	0.28
LA050703_00	7/10/2008	MERCURY	0.0003	.19 ppm	527.5 (g)	32.3 (cm)	2	LARGEMOUTH BASS	
LA050703_00	7/10/2008	MERCURY	0.0003	.27 ppm	727.5 (g)	36.3 (cm)	2	LARGEMOUTH BASS	
LA050703_00	7/10/2008	MERCURY	0.0003	.22 ppm	896.3 (g)	38.1 (cm)	4	LARGEMOUTH BASS	
LA050703_00	7/10/2008	MERCURY	0.0003	.2 ppm	362.5 (g)	28.8 (cm)	6	LARGEMOUTH BASS	
LA050703_00	7/10/2008	MERCURY	0.0003	.23 ppm	271.3 (g)	26.1 (cm)	4	LARGEMOUTH BASS	0.22
LA050703_00	7/10/2008	MERCURY	0.0003	.64 ppm	11215.0 (g)	93.3 (cm)	1	FLATHEAD CATFISH	0.64
LA050703_00	7/10/2008	MERCURY	0.0003	.2 ppm	708.8 (g)	42.0 (cm)	4	BLUE CATFISH	0.20

LA050703_00	7/12/2004	MERCURY	0.0001	.3 ppm	1690.0 (g)	51.6 (cm)	2	BOWFIN	
LA050703_00	7/12/2004	MERCURY	0.0001	.23 ppm	1690.0 (g)	51.6 (cm)	2	BOWFIN	0.27
LA050703_00	7/12/2004	MERCURY	0.0001	.28 ppm	277.5 (g)	28.3 (cm)	2	FRESHWATER DRUM	0.28
LA050703_00	7/12/2004	MERCURY	0.0001	.44 ppm	460.0 (g)	32.4 (cm)	1	WHITE CRAPPIE	0.44
LA050703_00	7/12/2004	MERCURY	0.0001	.22 ppm	191.7 (g)	22.5 (cm)	3	BLACK CRAPPIE	0.22
LA050703_00	7/12/2004	MERCURY	0.0001	.69 ppm	1030.0 (g)	40.6 (cm)	1	LARGEMOUTH BASS	
LA050703_00	7/12/2004	MERCURY	0.0001	.21 ppm	415.0 (g)	28.9 (cm)	1	LARGEMOUTH BASS	
LA050703_00	7/12/2004	MERCURY	0.0001	.47 ppm	705.0 (g)	35.4 (cm)	1	LARGEMOUTH BASS	
LA050703_00	7/12/2004	MERCURY	0.0001	.72 ppm	1180.0 (g)	42.6 (cm)	1	LARGEMOUTH BASS	0.52

Appendix I

Fish Tissue Data Collected by LDEQ for Mercury Monitoring Program, Subsegment 050703 (White Lake)

East White Lake Oil and Gas Field

Vermilion Parish, Louisiana

Data obtained 10/22/2014, from http://www.deq.louisiana.gov/portal/tabid/2729/Default.aspx

Subsegment	Collection Date	Parameter	MDL	Result	Average Weight	Average Length	Number Of Fish	Species	Avg
LA050703_00	7/12/2004	MERCURY	0.0001	.06 ppm	271.7 (g)	32.6 (cm)	3	BLUE CATFISH	
LA050703_00	7/12/2004	MERCURY	0.0001	.04 ppm	785.0 (g)	44.5 (cm)	1	BLUE CATFISH	
LA050703_00	7/12/2004	MERCURY	0.0001	.28 ppm	4930.0 (g)	73.6 (cm)	1	BLUE CATFISH	0.13
LA050703_00	7/23/2003	MERCURY	0.0001	.58 ppm	1760.0 (g)	54.4 (cm)	1	BOWFIN	
LA050703_00	7/23/2003	MERCURY	0.0001	.37 ppm	1725.0 (g)	52.7 (cm)	3	BOWFIN	
LA050703_00	7/23/2003	MERCURY	0.0001	.3 ppm	1232.5 (g)	48.0 (cm)	2	BOWFIN	
LA050703_00	7/23/2003	MERCURY	0.0001	.27 ppm	1232.5 (g)	48.0 (cm)	2	BOWFIN	0.38
LA050703_00	7/23/2003	MERCURY	0.0001	.17 ppm	1245.0 (g)	48.6 (cm)	1	RED DRUM	0.17
LA050703_00	7/23/2003	MERCURY	0.0001	.24 ppm	322.5 (g)	30.1 (cm)	2	FRESHWATER DRUM	
LA050703_00	7/23/2003	MERCURY	0.0001	.29 ppm	510.0 (g)	34.6 (cm)	1	FRESHWATER DRUM	0.27
LA050703_00	7/23/2003	MERCURY	0.0001	.17 ppm	200.0 (g)	22.7 (cm)	9	BLACK CRAPPIE	
LA050703_00	7/23/2003	MERCURY	0.0001	.17 ppm	170.0 (g)	21.3 (cm)	6	BLACK CRAPPIE	0.17
LA050703_00	7/23/2003	MERCURY	0.0001	.4 ppm	620.0 (g)	33.4 (cm)	1	LARGEMOUTH BASS	
LA050703_00	7/23/2003	MERCURY	0.0001	.41 ppm	480.0 (g)	30.9 (cm)	2	LARGEMOUTH BASS	
LA050703_00	7/23/2003	MERCURY	0.0001	.41 ppm	361.0 (g)	28.4 (cm)	5	LARGEMOUTH BASS	0.41
LA050703_00	7/23/2003	MERCURY	0.0001	.15 ppm	2510.0 (g)	59.4 (cm)	1	BLUE CATFISH	
LA050703_00	7/23/2003	MERCURY	0.0001	.13 ppm	355.0 (g)	35.0 (cm)	2	BLUE CATFISH	0.14
LA050703_00	4/2/1998	MERCURY		.33 ppm	2268.0 (g)	57.0 (cm)	1	BOWFIN	
LA050703_00	4/2/1998	MERCURY		.14 ppm	1408.0 (g)	51.1 (cm)	3	BOWFIN	0.24
LA050703_00	4/2/1998	MERCURY		.02 ppm	226.8 (g)	25.7 (cm)	4	FRESHWATER DRUM	
LA050703_00	4/2/1998	MERCURY		.04 ppm	538.7 (g)	32.4 (cm)	2	FRESHWATER DRUM	
LA050703_00	4/2/1998	MERCURY		.05 ppm	340.2 (g)	28.5 (cm)	4	FRESHWATER DRUM	0.04
LA050703_00	4/2/1998 NOT DETECTED	MERCURY		ppm	354.4 (g)	27.9 (cm)	2	WHITE CRAPPIE	
LA050703_00	4/2/1998	MERCURY		.03 ppm	559.9 (g)	32.4 (cm)	4	WHITE CRAPPIE	0.03

Appendix I
Fish Tissue Data Collected by LDEQ for Mercury Monitoring Program, Subsegment 050703 (White Lake)

East White Lake Oil and Gas Field
Vermilion Parish, Louisiana

Data obtained 10/22/2014, from http://www.deq.louisiana.gov/portal/tabid/2729/Default.aspx

Subsegment	Collection Date	Parameter	MDL	Result	Average Weight	Average Length	Number Of Fish	Species	Avg
LA050703_00	4/2/1998	MERCURY		.15 ppm	330.7 (g)	27.6 (cm)	3	BLACK CRAPPIE	
LA050703_00	4/2/1998	MERCURY		.02 ppm	237.4 (g)	24.5 (cm)	8	BLACK CRAPPIE	0.09
LA050703_00	4/2/1998	MERCURY		.07 ppm	396.9 (g)	29.1 (cm)	1	LARGEMOUTH BASS	
LA050703_00	4/2/1998	MERCURY		.18 ppm	538.7 (g)	32.8 (cm)	1	LARGEMOUTH BASS	0.13
LA050703_00	4/2/1998	MERCURY		.05 ppm	1190.7 (g)	47.3 (cm)	2	BLUE CATFISH	
LA050703_00	4/2/1998	MERCURY		.05 ppm	744.2 (g)	41.4 (cm)	4	BLUE CATFISH	
LA050703_00	4/2/1998	MERCURY		.03 ppm	500.8 (g)	37.9 (cm)	3	BLUE CATFISH	0.04

Ecological Checklist

Appendix J

Project No. 0116008
UNOCAL
Vermilion Parish, Louisiana

Environmental Resources Management Southwest, Inc.
3838 North Causeway Boulevard, Suite 3000
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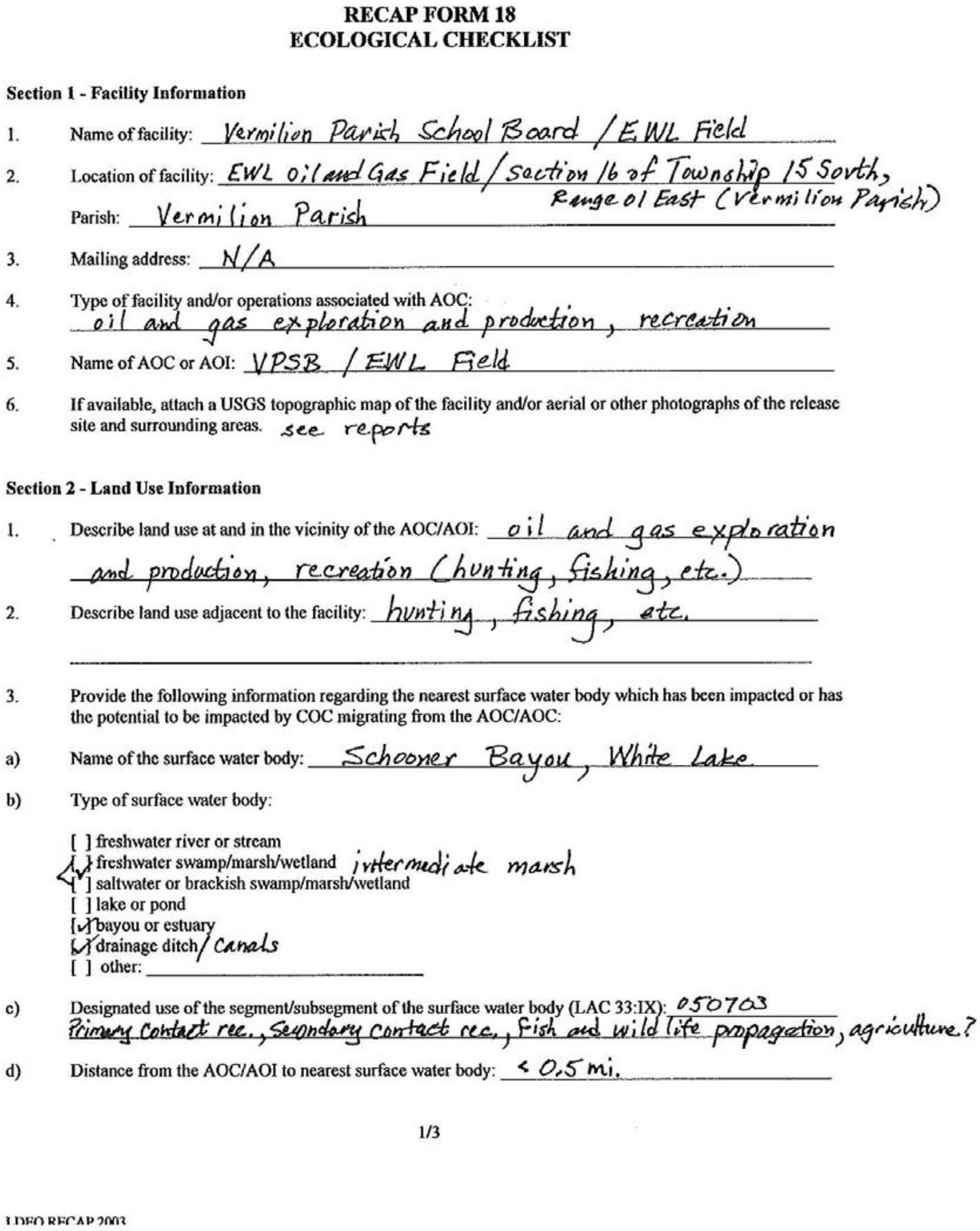
Figure 4. Ecological Checklist (Form 18, RECAP, LDEQ 2003)



RECAP FORM 18
ECOLOGICAL CHECKLIST

Section 1 - Facility Information

1. Name of facility: Vermilion Parish School Board / EWL Field

2. Location of facility: EWL oil and Gas Field / section 16 of Township 15 South, Range 01 East (Vermilion Parish)

Parish: Vermilion Parish

3. Mailing address: N/A

4. Type of facility and/or operations associated with AOC: oil and gas exploration and production, recreation

5. Name of AOC or AOI: VPSB / EWL Field

6. If available, attach a USGS topographic map of the facility and/or aerial or other photographs of the release site and surrounding areas. see reports

Section 2 - Land Use Information

1. Describe land use at and in the vicinity of the AOC/AOI: oil and gas exploration and production, recreation (hunting, fishing, etc.)

2. Describe land use adjacent to the facility: hunting, fishing, etc.

3. Provide the following information regarding the nearest surface water body which has been impacted or has the potential to be impacted by COC migrating from the AOC/AOC:

a) Name of the surface water body: Schooner Bayou, White Lake

b) Type of surface water body:

[ ] freshwater river or stream
[✓] freshwater swamp/marsh/wetland intermediate marsh
[✓] saltwater or brackish swamp/marsh/wetland
[ ] lake or pond
[✓] bayou or estuary
[✓] drainage ditch / canals
[ ] other: ______

c) Designated use of the segment/subsegment of the surface water body (LAC 33:IX): 050703
Primary contact rec., Secondary contact rec., Fish and wild life propagation, agriculture?

d) Distance from the AOC/AOI to nearest surface water body: < 0.5 mi.

4. Do any potentially sensitive environmental areas exist adjacent to or in proximity to the site, e.g., federal and state parks, national and state monuments, wetlands, etc? ☑ Yes ☐ No

If yes, explain: wetlands, intermediate marsh

Section 3 - Release Information

1. Nature of the release: oil and gas exploration and production

2. Location of the release (within the facility): see report

3. Location of the release with respect to the facility property boundaries: within boundaries

4. Constituents known or suspected have been released: oil and gas exploration and production

5. Indicate which media are known or suspected to be impacted and if sampling data are available:

☑ soil 0 - 3 feet bgs		☑ yes ☐ no	limited area
☑ soil 0 - 15 feet bgs	?	☐ yes ☐ no	
☑ soil >15 feet bgs	?	☐ yes ☐ no	
☑ groundwater	?	☐ yes ☐ no	
☑ surface water/sediment		☑ yes ☐ no	limited area

6. Has migration occurred outside the facility property boundaries? ☐ yes ☑ no no evidence

If yes, describe the designated use of the offsite land impacted: no evidence of offsite impacts.

Section 4 - Criteria for Further Assessment

If the AOI meets **all** of the criteria presented below, then typically no further ecological evaluation shall be required. If the AOI **does not** meet **all** of the criteria, then a screening level ecological risk shall be conducted. The Submitter should make the initial decision regarding whether or not a screening level ecological risk assessment is warranted based on compliance of the AOI with criteria listed below. After review of the ecological checklist and other available site information, the Department will make a final determination on the need for a screening level ecological risk assessment. If site conditions at the AOI change such that one or more of the criteria are not met, then a screening level ecological risk assessment shall be conducted. Answers shall be based on current site conditions (i.e., shall not consider future remedial actions or institutional or engineering controls).

Indicate if the AOI meets the following criteria:

(1) The area of impacted soil is approximately 5 acres or less in size (based on the AOI identified for the human health assessment) and it is not expected that the COC will migrate such that the soil AOI becomes greater than 5 acres in size. ☑ yes ☐ no

(2) There is no current release or demonstrable long-term threat of release (via runoff or groundwater discharge) of COC from the AOI to a surface water body. ☐ yes ☑ no - perhaps

(3) Recreational species, commercial species, threatened or endangered species, and/or their habitats are not currently being exposed, or expected to be exposed, to COC present at or migrating from the AOI.
[✓] yes [ ] no confirmation needed

(4) There are no obvious impacts to ecological receptors or their habitats and none are expected in the future.
[✓] yes [ ] no confirmation needed

Is further ecological evaluation required at this AOI? [✓] yes [ ] no
This determination is subject to Department concurrence.

Section 5 - Site Summary

The ecological checklist submittal shall include a site summary that presents sufficient information to verify that the AOI meets or does not meet the criteria for further assessment.

Section 6 - Submitter Information

Date: May 13-14, 2014 site inspection

Name of person submitting this checklist: John H. Rodgers, Jr.

Affiliation: Clemson University

Signature: John H. Rodgers, Jr. Date: July 24, 2015 (Form 18 completed)

Additional Preparers: N / A

Assessment of Sediment Direct Contact Using Analytical Results in Dry Weight

Appendix K

Project No. 0116008
UNOCAL
Vermilion Parish, Louisiana

Environmental Resources Management Southwest, Inc.
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TABLE K-1

SEDIMENT (0-3 FT)
COMPARISON TO RECAP DIRECT CONTACT SCREENING STANDARDS (DRY WEIGHT)

East White Lake Oil and Gas Field
Vermilion Parish, Louisiana

			Sediment 0-3' bgs	
Constituents (a)	Soil$_{SSni}$ (b)	Soil$_{SSi}$ (c)	Maximum (0-3') (d)	Location of Maximum
	(mg/kg)	(mg/kg)	(mg/kg-dry)	Concentration
Metals				
Arsenic	12	12	**22**	SS7 (0-1.4')
Barium	550	14,000	**15,700**	SS7 (0-1.4')
Cadmium	3.9	100	3.12	WL-3 (0-2')
Chromium	12000	310,000	25.1	SS11 (0-2.5')
Lead	400	1,400	125	WL-3 (0-2')
Mercury	2.3	61	**8.52**	Hg-MPA-07 (0.5-2')
Selenium	39	1,000	2.11	SED16 (0-2')
Strontium (e)	4700	120,000	459	AB13 (0-3')
Zinc	2300	61,000	1780	WL-3 (0-2')
Volatile Organic Compounds (VOCs)				
Benzene	1.5	3.1	ND (0.057-0.14)	-
Ethylbenzene	160	230	ND (0.35-0.88)	-
Toluene	68	470	ND (0.35-0.88)	-
Xylenes	18	120	ND (1.06-2.65)	-
Semi-Volatile Organic Compounds (SVOCs)				
Benzo(b)fluoranthene	0.62	2.9	0.0625	SED-9 (0-0.5')
Chrysene	62	290	0.069	SED-9 (0-0.5')
Fluoranthene	220	2900	1.3	SS7 (1.4-2.5')
Fluorene	280	5400	1.69	SS7 (1.4-2.5')
Indeno(1,2,3-cd)pyrene	0.62	2.9	0.313	SED-9 (0-0.5')
2-Methylnaphthalene	22	170	5.29	SS7 (1.4-2.5')
Phenanthrene	2100	43000	4.87	SS7 (1.4-2.5')
TPH - Fractions				
Aliphatics >C06-C8	1200	8000	ND (19.3-44.2)	-
Aliphatics >C08-C10	120	880	ND (19.3-44.2)	-
Aliphatics >C10-C12	230	2000	**514**	SED28 (0-2')
Aliphatics >C12-C16	370	3800	**3310**	WL-3 (0-2')
Aliphatics >C16-C35	7100	10000	**12600**	SED28 (0-2')
Aromatics >C08-C10	65	510	ND (12.9-29.5)	-
Aromatics >C10-C12	120	1100	98.5	WL-3 (0-2')
Aromatics >C12-C16	180	2100	**790**	SED28 (0-2')
Aromatics >C16-C21	150	1700	**1420**	WL-3 (0-2')
Aromatics >C21-C35	180	2500	**2020**	SED28 (0-2')
Polychlorinated Biphenyls (PCBs)				
Total PCBs	0.11	0.90	ND (0.079-1.87)	-

Notes:

Concentrations in milligrams per kilogram (mg/kg) dry weight

ND - Nondetect at the detection limit, or range of detection limits, shown in parentheses.

TPH - Total Petroleum Hydrocarbons.

A **bold and boxed** value indicates that the maximum reported concentration exceeds a screening standard for the respective constituent and is identified as a site-related COC subject to further evaluation under a higher Management Option.

(a) Constituents in this table include constituents detected in sediment and indicator constituents for petroleum hydrocarbons (e.g., BTEX, PAHs).

(b) Soil$_{SSni}$ = RECAP Screening Option Standard from Table 1 of RECAP 2003 for soil protective of nonindustrial land use.

(c) Soil$_{SSi}$ = RECAP Screening Option Standard from Table 1 of RECAP 2003 for soil protective of industrial land use.

(d) The maximum reported concentration in sediment samples most representative of surface sediment in the 0 to 3 foot interval (remediated areas excluded). The samples included in the direct contact evaluation are summarized in Table 5-3. Detections in split sample results from two separate laboratories (as submitted by ICON and MP&A) were averaged when valid data were available from both laboratories, and the detected value was used when one detection was reported.

(e) Value not provided in RECAP; the risk-based values were calculated in accordance with Appendix H of RECAP 2003 (see Appendix G).

TABLE K-2

SEDIMENT
COMPARISON TO MO-3 DIRECT CONTACT STANDARDS (DRY WEIGHT)

East White Lake Oil and Gas Field
Vermilion Parish, Louisiana

Nonindustrial Direct Contact COCs (a)	Sed$_r$ Adult (b)	Sed$_r$ Child (b)	Industrial Soil$_i$ (c)	Soil$_{sat}$ (d)	Limiting RS (e)	**AOIC (mg/kg-dry) (f, g)** **Maximum Sediment Concentration**	**AOIC (mg/kg-dry) (f, g)** **Further Evaluation for Arsenic: Average Concentration**
Metals							
Arsenic	12	12	12	NA	12	**22**	6.4
Barium	980,000	280,000	409,000	NA	280,000	15,700	--
Mercury	1,500	420	610	NA	420	8.52	--
TPH - Fractions							
Aliphatics >C10-C12	51,000	17,000	20,000	NA	17,000	514	--
Aliphatics >C12-C16	98,000	32,000	38,000	NA	32,000	3,310	--
Aliphatics >C16-C35	1,400,000	130,000	690,000	NA	130,000	12,600	--
Aromatics >C12-C16	55,000	18,000	21,000	NA	18,000	790	--
Aromatics >C16-C21	30,000	2,200	17,000	NA	2,200	1,420	--
Aromatics >C21-C35	38,000	2,300	25,000	NA	2,300	2,020	--
					Cumulative Evaluation:		
					Kidney HI =	0.9	
					Liver HI =	0.2	

Notes:

Concentrations in milligrams per kilogram (mg/kg) dry weight

MO-3 - Management Option 3 under RECAP

RS - RECAP Standard

COC - Constituent of Concern

AOIC - Area of Investigation Concentration

TPH - Total Petroleum Hydrocarbons

NA - Not Applicable

Sedr - site-specific RECAP Standard for sediment protective of human health for recreational land use.

A **bold** value indicates that the reported concentration exceeds the Limiting RS for the respective constituent and warrants further evaluation.

(a) Constituents with concentrations above the RECAP Soil$_{SSni}$ in sediment samples representative of the 0 to 3 foot interval were included for further evaluation under MO-3 (screening evaluation provided in Table K-1). See Table 5-3 for a list of sediment samples collected by ICON and MP&A used in the quantitative evaluation.

(b) Sediment RS were developed using the algorithms provided in Appendix H of RECAP for direct contact (per RECAP FAQ guidance), with updated toxicity factors, and modifying exposure assumptions as appropriate for sediment exposure. Exposure assumptions are identified for an adult and child recreational scenario in Table 6-2, with references/rationale for the selected exposure assumptions. Exposure pathways include ingestion, dermal contact, and inhalation of volatiles released to the breathing zone.

(c) RECAP standard protective of industrial land use, calculated in accordance with Appendix H of RECAP (2003), using default industrial exposure parameters provided in RECAP with current toxicity factors (as identified in Table 6-1).

(d) Soilsat - Soil saturation concentration (RECAP Table 2)

(e) The limiting RS is the minimum of the Sedr adult, Sedr child, and Industrial Soili.

(f) The AOIC is the maximum reported concentration (after split results were averaged) in samples most representative of surface sediment in the 0 to 3 foot interval. Sediment samples included in the direct contact evaluation are summarized in Table 5-3. Further evaluation for arsenic included the use of an average concentration as the AOIC in accordance with RECAP (2003). Sediment samples in the 0 to 3 interval (as summarized in Table 5-3) within and between the oilfield access canals (south of Schooner Bayou) were included in the arsenic average calculation; AB1 to AB4 and the SED-BK samples were excluded from the average calculation. Calculation provided in Table K-3.

(g) The Hazard Index (HI) approach was used to address additivity for non-carcinogenic effects on the same target organ/ system, in accordance with Appendices D and G of RECAP (2003). Target organs are identified in Table 6-1. For the COCs in this evaluation, the kidney and liver are affected by more than one COC. The HI is calculated as the sum of the individual Hazard Quotients (HQ) for the COCs affecting each target organ. For TPH fractions that are considered a single COC per RECAP (2003), the highest HQ was used to represent the TPH range in calculating the HI:

Kidney: Barium, Aromatics >C16-C35	Kidney HI =	0.9	= 0.056 (Ba HQ) + 0.88 [Max (Arom 16-21 HQ, Arom 21-35 HQ)]
Liver: Aliphatics >C8-16, Aliphatics >C16-35	Liver HI =	0.2	= 0.1 [Max (Alip 10-12 HQ, Alip 12-16 HQ)] + 0.1 (Alip 16-35 HQ)

TABLE K-3

AVERAGE ARSENIC CONCENTRATION IN SEDIMENT WITHIN AND BETWEEN OILFIELD ACCESS CANALS

East White Lake Oil and Gas Field
Vermilion Parish, Louisiana

Average Arsenic Concentration (mg/kg-dry) *	**6.42**

*excluding AB1 to AB4, and SED-BK samples

Boring ID	Core Interval (ft bls)	Date	mg/kg-Dry Wt.
B2	2-4	8-Aug-06	13.80
B4	0-1	9-Aug-06	10.00
B5	0-1.5	9-Aug-06	6.57
B6	1.5-3	9-Aug-06	5.17
B9	0-0.5	9-Aug-06	8.17
B-10	1.5-4	9-Aug-06	7.19
B17	0-3	10-Aug-06	7.75
B19	1-2.5	10-Aug-06	15.4
SS3	0-0.6	25-Apr-06	8.79
SS3	0.6-2.2	25-Apr-06	10.90
SS3	2.2-2.6	25-Apr-06	9.61
SS5	0-2.15	26-Apr-06	11.40
SS7	0-1.4	26-Apr-06	22.00
SS7	1.4-2.5	26-Apr-06	21.50
SS8	0-2'	26-Feb-10	8.01
SS10	0-2'	26-Feb-10	7.28
SS11	0-2.5	27-Apr-06	5.28
SS12	0-3.7	27-Apr-06	6.17
AB5	0-6'	13-Nov-06	6.03
AB13	0-3'	13-Nov-06	12.90
AB14	0-3'	13-Nov-06	5.51
AB15	0-6'	13-Nov-06	8.15
SED4	0-2'	25-Feb-10	3.50
SED5	0-2'	25-Feb-10	5.47
SED6	0-2'	25-Feb-10	5.68
SED7	0-2'	25-Feb-10	3.70
SED8	0-2'	25-Feb-10	4.21
SED9	0-2'	25-Feb-10	4.52
SED10	0-2'	25-Feb-10	4.79
SED11	0-2'	25-Feb-10	7.09
SED12	0-2'	25-Feb-10	3.61
SED13	0-2'	26-Feb-10	4.40
SED14	0-2'	26-Feb-10	3.44
SED16	0-2'	26-Feb-10	5.17
SED17	0-2'	26-Feb-10	3.87
SED18	0-2'	26-Feb-10	6.20
SED19	0-2'	26-Feb-10	4.81
SED20	0-2'	26-Feb-10	4.94
SED21	0-2'	26-Feb-10	3.54
SED22	0-2'	26-Feb-10	3.86
SED23	0-2'	2-Mar-10	5.24

TABLE K-3

AVERAGE ARSENIC CONCENTRATION IN SEDIMENT WITHIN AND BETWEEN OILFIELD ACCESS CANALS

East White Lake Oil and Gas Field
Vermilion Parish, Louisiana

Average Arsenic Concentration (mg/kg-dry) *	**6.42**

*excluding AB1 to AB4, and SED-BK samples

Boring ID	Core Interval (ft bls)	Date	mg/kg-Dry Wt.
SED24	0-2'	2-Mar-10	4.55
SED25	0-2'	2-Mar-10	5.04
SED26	0-2'	2-Mar-10	4.52
SED27	0-2'	2-Mar-10	4.12
SED28	0-2'	2-Mar-10	4.16
SED29	0-2'	2-Mar-10	4.47
SED30	0-2'	2-Mar-10	4.28
SED31	0-2'	1-Mar-10	2.14
SED32	0-2'	1-Mar-10	3.34
SED33	0-2'	1-Mar-10	2.91
MPA-AB13	0-3'	20-May-10	8.46
AB-13*	0-3'	10-Aug-10	17.6
AB-13 SO-E*	0-3'	10-Aug-10	10.6
AB-14*	0-3'	10-Aug-10	6.29
SED-8	0-6"	6-May-10	4.86
SED-9	0-6"	5-May-10	4.99
SED-11	0-6"	6-May-10	4.59
SED-13	0-6"	6-May-10	4.06
SED-19	0-6"	6-May-10	3.00
SED-24	0-6"	5-May-10	6.81
SED-26	0-6"	5-May-10	4.20
SED-31	0-6"	5-May-10	6.42
SED-120 (SED-30 locat)	0-6"	7-May-10	4.67
WL-1	(0-2)	1/5/2015	3.84
WL-2	(0-2)	1/5/2015	0.911
WL-3	(0-2)	1/6/2015	2.59
WL-4	(0-2)	1/6/2015	3.7
WL-5	(0-2)	1/6/2015	4.61
WL-6	(0-2)	1/6/2015	4.99
WL-7	0-2'	1/6/2015	3.49
WL-8	0-2'	1/6/2015	6.14

Laboratory Reports for Biota Samples

Appendix L

Project No. 0116008
UNOCAL
Vermilion Parish, Louisiana

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