2016 Remedial Action Annual Effectiveness Report

Alcoa (Point Comfort)/Lavaca Bay Superfund Site

March 2017





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LIST OF ACRONYMS AND ABBREVIATIONS

µg/g	micrograms per gram
CAB	Community Advisory Board
CAPA	Chlor-Alkali Process Area
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CD	Consent Decree
CDF	confined disposal facility
cm	centimeter
DHg	dissolved mercury
DNAPL	dense non-aqueous phase liquid
ECC	Eastern Causeway Cove
EE/CA	Engineering Evaluation/Cost Analysis
ESD	Explanation of Significant Differences
GPA	Gypsum Placement Area
HRWC	High Resolution Water Column
meHg	methylmercury
m/s	meters per second
mg/kg	milligrams per kilogram
MS3	Mainland Shoreline No. 3
NOAA	National Oceanic and Atmospheric Administration
OMMP	Operation, Maintenance and Monitoring Plan
PAH	polycyclic aromatic hydrocarbon
PCO	Point Comfort Operations
PCOR	Preliminary Close Out Report
PHg	particulate mercury
ppm	parts per million
psf	pounds per square foot
RAAER	Remedial Action Annual Effectiveness Report

RAO	remedial action objective
RDR	Remedial Design Report
RI	Remedial Investigation
ROD	Record of Decision
Site	Alcoa (Point Comfort)/Lavaca Bay Superfund Site
SOW	Statement of Work
TCEQ	Texas Commission on Environmental Quality
THg	total mercury
TOC	total organic carbon
TSS	total suspended solid
USEPA	U.S. Environmental Protection Agency

1 INTRODUCTION

1.1 Objective

This 2016 Remedial Action Annual Effectiveness Report (RAAER) for the Alcoa (Point Comfort)/Lavaca Bay Superfund Site (Site) in Point Comfort, Texas, satisfies the requirements of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Consent Decree (CD)/Statement of Work (SOW) between Alcoa, the United States of America, and the State of Texas, entered in the United States District Court, Southern District, on the effective date of March 1, 2005 (United States et al. 2005).

The objective of the RAAER is to create an integrated assessment of the progress towards achieving overall Site remediation goals using results from all monitoring performed after the lodging of the CD (United States et al. 2005).

1.2 Consent Decree and Statement of Work Requirements for the RAAER

Per the SOW attached to the CD (United States et al. 2005), the RAAER needs to adhere to the following guidelines:

> …shall be prepared to evaluate the effectiveness of the RA [Remedial Action] including, but not limited to, an evaluation of the performance of the hydraulic control system at CAPA, natural recovery of sediments in Lavaca Bay, trends in fish/shellfish tissue values, and an evaluation of O&M activities. In preparing the report, Settling Defendants shall use the O&M [Operation and Maintenance] and Performance Monitoring data collected and any data collected during construction of the remedy. The Annual Effectiveness Report shall be submitted to EPA in accordance with the schedule contained in the Remedial Action Work Plan. (p. 7-1)

The Remedial Action Work Plan (Alcoa 2005) specifies that the RAAER be submitted by March 31 of the year following the completion of each monitoring program.

The SOW attached to the CD states that the specific topics to be discussed in the RAAER include the following:

- Site information;
- Media description;
- Treatment system description;

- Treatment system performance;
- Observations and lessons learned; and
- Verification that Site conditions have not changed and there have been no land use or property development changes that may affect the remedial action.

1.3 Site Information and Overview

This section provides relevant background information, including previous response actions, the U.S. Environmental Protection Agency (USEPA) five-year review process, reporting, and public outreach information. In addition to those topics, provided below is a summary of relevant Site information regarding facility operations, Alcoa, and project staffing that occurred in 2016.

- Due to market conditions and other factors, Alcoa initiated curtailment of the Point Comfort facility during the time period of June and July 2016. The facility has remained in a curtailed state since then.
- On September 8, 2016, notification was provided to USEPA and Texas Commission on Environmental Quality (TCEQ) regarding the change in Alcoa's Project Coordinator.
- A company restructuring for Alcoa Inc. became effective on November 1, 2016. Alcoa Inc. separated into two independent, publicly traded companies. The legal entity Alcoa Inc. has been renamed Arconic Inc. The spin-off company, which is named Alcoa Corporation, is comprised of the primary products business units. The owner of the Site is Alcoa World Alumina LLC, a subsidiary of Alcoa Corporation. The Point Comfort facility is an entity within Alcoa Corporation, which has assumed implementation of all components of the CD and is managing the response action work going forward.

1.3.1 Site Definition

The Site is defined in the CD (United States et al. 2005) as follows: [1]

> …the Alcoa/Lavaca Bay Superfund Site, generally consisting of the Plant, Dredge Island, Formosa Tract, and portions of Lavaca Bay, Cox Bay, Cox Creek, Cox Cove, Cox Lake (Cox Creek, Cox Cove, and Cox Lake are also known as Huisache Creek, Cove and Lake) and western Matagorda Bay located in Calhoun County, Texas, and areas containing hazardous substances depicted generally on the map attached as Appendix C. (p. 11)

[1] Note: the map referenced in the quotation from the CD (United States et al. 2005) is not presented with this report.

Although all areas of the Site were investigated during the Remedial Investigation (RI), the risk assessments indicated that only certain parts of Lavaca Bay, Dredge Island, and two areas on the Plant/Mainland (the Chlor-Alkali Process Area [CAPA] and the Witco Area) required development of remedial action objectives (RAOs) and subsequent remediation. This RAAER presents monitoring information that reflects the effects of both the completed response actions and ongoing activities:

- Stabilization of Dredge Island (completed as a non-time critical removal action prior to the USEPA's Record of Decision [ROD]);
- Removal of CAPA sediment and sediment near Dredge Island (completed as a treatability study prior to the ROD);
- Extraction and treatment of groundwater at the CAPA (initiated as a treatability study prior to the ROD and continuing as an ongoing remedial action pursuant to the CD);
- Dredging of the Witco Channel (performed as part of routine Plant maintenance prior to the ROD);
- Installation of a soil cap at the CAPA with institutional controls to manage exposure to soil (completed prior to the ROD);
- Removal of Building R-300 at the CAPA (completed prior to the ROD);
- Natural recovery of sediments (ongoing activity);
- Institutional controls to manage exposure to finfish and shellfish (ongoing activity)
- Installation of a dense non-aqueous phase liquid (DNAPL) containment system (slurry wall vertical barrier) at the Witco Area (installed in 2006);
- Installation of soil caps at the Witco Area with institutional controls to manage exposure to soil (installed in 2006); and
- Dredging of the Witco Marsh (completed in 2006).

The CD (United States et al. 2005) specifies certain performance monitoring activities to evaluate the effectiveness of the remedy. The scopes of each of these monitoring activities are contained in the Remedial Design Reports (RDRs) and Operation, Maintenance and Monitoring Plans (OMMPs) attached to the CD. The following CD documents govern operation, maintenance, and monitoring for currently completed or ongoing activities:

- CAPA RDR and OMMP (Appendix A);
- Lavaca Bay Sediment Remediation and Long-Term OMMP (Appendix H);
- Lavaca Bay Finfish and Shellfish OMMP (Appendix I);
- Dredge Island OMMP (Appendix D);
- CAPA Soils RDR and OMMP (Appendix F);
- Witco Tank Farm DNAPL Containment System RDR and OMMP (Appendix B); and
- Witco Area Soils RDR and OMMP (Appendix G).

As discussed below, additional activities have been performed in response to the first Five-Year Review Report by the USEPA (2011).

The RDRs and OMMPs provide detailed descriptions of the performance monitoring that is summarized in this RAAER. Although the general scopes of the relevant OMMPs are described subsequently, the reader is directed to the RDR and OMMP documents for specific details about each monitoring program.

1.3.2 Previous Remedial Activities

The USEPA issued the first Five-Year Review Report in June 2011 (USEPA 2011). To address key findings from that review, the following recommendations and follow-up actions were identified and completed:

- Develop a plan to perform a focused, additional remedial measure in the area of the Dredge Island Stabilization Project in order to assess whether the rate of finfish and shellfish tissue recovery can be accelerated.
- Assess the statistical design of the marsh sediment monitoring program to determine whether the number and placement of samples can be modified to better capture the variability in sediment concentrations and to improve the understanding of temporal trends.
- Evaluate a smaller core sample interval closer to the sediment surface for future sediment sampling to provide more useful information about where and how methylmercury (meHg) enters the food web.
- Address the following issues related to the Dredge Island Stabilization Project:
  - Erosion of the interior side slops of the confined disposal facility (CDF) caused by wave action of water in the CDF
  - Erosion of the unvegetated areas of the exterior side-slopes
  - Possible damage to the northeast decant structure below the mud line
  - Corrosion of metal portions of the decant structures
  - Vegetation within the stone armor on the exterior side-slopes.

1.3.3 Discussion of Explanation of Significant Differences and Preliminary Close Out Report

On May 23, 2007, the USEPA published a notice that an Explanation of Significant Differences (ESD) had been signed for the Site. The ESD (USEPA 2007a) indicated that enhanced natural recovery north of Dredge Island was no longer a necessary component of remedial action for the Site. Alcoa was to continue monitoring mercury levels in fish and marsh sediment on an annual basis and report the results in the annual RAAER. The agencies will review each RAAER to determine if the remedy continues to be protective of human health and the environment.

The Preliminary Close Out Report (PCOR) for the Site was signed by USEPA on July 23, 2007 (USEPA 2007b). The PCOR documents that all construction activities required by the ROD (USEPA 2001) have been completed.

1.3.4 Discussion of the Second (2016) Five-Year Review Process

The USEPA prepared the Second Five-Year Review Report (USEPA 2016) during the first half of 2016 after reviewing various aspects of the Site Remedy to determine its current and future protectiveness. The five-year review process included a site visit at Point Comfort Operations (PCO) on February 10, 2016, during which Alcoa plant and remediation representatives provided USEPA and TCEQ status updates on the following: 1) plant curtailment activities and schedule; 2) actions taken to advise the community as the curtailment progressed; and 3) the continuity plan for all ongoing programs required by the CD (United States et al. 2005). A community meeting was hosted by Point Comfort facility personnel on March 2, 2016, to provide USEPA an opportunity to describe the five-year regulatory review process and the impacts of facility curtailment on USEPA oversight of the remediation projects.

USEPA published the Second Five-Year Review Report (USEPA 2016), determining:

> …that the remedy for the Alcoa (Point Comfort)/Lavaca Bay Superfund Site is protective of human health and the environment in the short term. A determination of the long-term protectiveness of the remedy for the Alcoa (Point Comfort)/Lavaca Bay Superfund Site Alcoa (Point Comfort)/Lavaca Bay Superfund Site cannot be made at this time until further information is obtained. This five-year review report specifies the actions that need to be taken for EPA to determine the long-term remedy protectiveness. (cover letter to USEPA 2016)

The following actions were identified in the Second Five-Year Report (USEPA 2016) as needing to be completed to provide sufficient information for USEPA to make a determination of long-term remedy protectiveness:

- Conduct studies to evaluate site-specific marsh conditions where enhanced methylation and uptake can occur (*Final Lavaca Bay Methylation Special Study – Phase 2, Study 4*, Alcoa 2016a);
- Undertake studies to evaluate whether additional uptake pathways cause mercury levels in red drum in the Closed Area to remain elevated (*Final Lavaca Bay Methylation Special Study – Phase 2, Study 4*, Alcoa 2016a);
- Carry out a study to understand sediment and mercury transport from the Witco and Alcoa channels and Witco Cut to the area north of Dredge Island (*Final Report on Lavaca Bay High Resolution Water Column Monitoring Program*, Alcoa 2016b);

- Conduct a high-resolution water column sampling program in the vicinity of the Alcoa and Witco channels and Mainland Shoreline No. 3 (MS3) to evaluate dissolved and particulate mercury (PHg) levels (*Final Report on Lavaca Bay High Resolution Water Column Monitoring Program*, Alcoa 2016b);
- Further characterize mercury concentrations in near-shore and at-depth sediments
- Utilize results from the above actions to update and refine the Site conceptual model and incorporate the results of the studies into a response action plan that, once implemented, would reduce mercury levels in red drum (*Witco Channel and Harbor Dredging and MS3 Excavation – Response Action Plan [Alcoa 2016c] and Causeway Cove Response Action Plan Addendum* [Alcoa 2016d]).

These actions and monitoring programs required by the CD (United States et al. 2005) were developed and scheduled in 2016. Programs implemented in 2016 are reported either in the documents noted above or this RAAER.

1.3.5 Community Outreach Process

With USEPA concurrence, Alcoa developed a membership list for a Community Advisory Board (CAB) with an intent for the new panel to reflect current Calhoun County demographics. In addition to the March 2, 2016, plant-sponsored community meeting, the first meeting of the new CAB (which was the twentieth post-CD community meeting) was held on November 29, 2016, at the Point Comfort facility. Approximately 30 people attended the meeting, including the USEPA Remediation Project Manager, Alcoa personnel and contractors, members of the community, state and federal elected officials, and state regulators. USEPA presented a general description of CERCLA activities at the Site, and Alcoa provided updates on the plant's curtailment and remediation activities to date. Alcoa will coordinate the second CAB meeting in May 2017 to review the progress of the remediation response actions.

2 2016 ROUTINE OPERATION AND MAINTENANCE AND PERFORMANCE MONITORING PROGRAMS

2.1 CAPA Groundwater Extraction and Treatment System

The CAPA groundwater extraction and treatment system began full-scale operation in May 1998. The primary system components are four groundwater extraction wells, an air stripper that removes volatile organic compounds from the groundwater, and a series of carbon vessels that remove mercury. Ancillary piping, filters, pumps, tanks, and other elements comprise the rest of the system. The objective of the groundwater extraction system is to provide hydraulic control of that portion of the dissolved mercury (DHg) plume that was believed to contribute more than 98% of the mercury mass flux from Zone B groundwater to Lavaca Bay prior to groundwater control. A treatability test conducted in 1997 and 1998 indicated that an aggregate extraction rate of approximately 10 gallons per minute from the four extraction wells creates a cone of depression that extends parallel to the shoreline along the line of wells.

The system has operated continuously since 1998, with only minor interruptions for maintenance or troubleshooting or during power interruptions at the PCO facility. Detailed information for the CAPA groundwater extraction and treatment system, including the results of investigations and system design, is provided in the CAPA Focused Investigation Data Report (Alcoa 1998) and CAPA Groundwater Treatability Study Data Report (Alcoa 1999).

Operations, maintenance, and monitoring were conducted in 2016 in accordance with the CAPA Groundwater RDR and OMMP (Appendix A of the CD [United States et al. 2005]). The various maintenance activities, operational checks, and sampling requirements are summarized in Table 3-3 of the RDR and OMMP. No non-routine maintenance activities were conducted at the CAPA in 2016.

The discharge standards for the system effluent are shown in Table 3-1 of the RDR and OMMP. A summary of the CAPA groundwater extraction and treatment system performance for 2016 is provided in Section 3.2 of this report.

2.2 CAPA Offshore Surface Water Sampling

As discussed in the 2006 RAAER (Alcoa 2007a), the performance objective for this component of the OMMP was achieved in 2006, and it is no longer part of the annual monitoring program.

2.3 Site Inspections

2.3.1 CAPA Soil Cap Inspections

Soils contaminated with mercury greater than the applicable risk-based values were identified during the RI at the CAPA. These soils were generally associated with the area to the west of the former Building R-300 and encompassed an area of approximately 1.8 acres. The RAO for CAPA soils was to reduce the future exposure potential of site workers to mercury in soils at the CAPA. A clay/gravel cap was installed, which was graded for stormwater drainage, and the stormwater management structures were modified to collect only surface runoff. The grading objective was met by compaction of a clay sub-grade over the entire area, from approximately several inches thick at the perimeter to 1.2 feet thick at the center. Six inches of crushed limestone material was then placed over the compacted clay sub-grade. To limit usage of the area by Plant and contractor personnel, 3-by-6-feet warning signs were placed on the north and west sides of the capped area. In addition, memorandums are distributed to Plant employees to inform workers of the upgrades made to the area, the restrictions on the capped area, and the disciplinary actions for not complying with the restrictions. Additional information is contained in the CAPA Soils RDR and OMMP (Appendix F of the CD).

An inspection and maintenance program was developed for the capped area, as described in the RDR and OMMP (Appendix F of the CD). This program consists of quarterly inspections and maintenance, as required. The main components of the inspection are:

- Cap integrity (e.g., signs of vehicular traffic, burrowing, erosion);
- Vegetation growth;
- Signage integrity (e.g., upright and legible);
- Storm drains free of debris; and
- No equipment or waste storage.

All items noted on the inspections are corrected as soon as practicable.

2.3.2 Witco Area Inspections

The containment of DNAPL-containing polycyclic aromatic hydrocarbons (PAHs) and the capping of PAH-impacted soils at the Witco Area were components of the remedy as described in the CD. DNAPL and sediments/soil visibly contaminated with PAHs have been observed at several locations at the Witco Area during previous investigations. In addition, surface soils in portions of the Witco Area exhibited elevated concentrations of PAHs that exceeded RAOs associated with potential on-site worker exposure to surface soils. Additional information is contained in the Former Witco Area DNAPL Containment System and Witco Area Soils RDR and OMMPs.

Response action activities were performed during the period of March 8 to December 29, 2006, that included the following:

- Construction of a new drainage channel, including the removal of visually impacted sediments;
- Construction of a 100-foot-long slurry wall;
- Construction of a soil cap in the former tank farm area; and
- Removal of an oil/water separator and construction of a soil cap in the former processing area.

A Construction Completion Report (Alcoa 2007b) was submitted in June 2007, and operations and maintenance activities were initiated in July 2007 as follows:

- Quarterly inspections (for 2 years, annually thereafter) of the drainage channel;
- Quarterly inspections of the soil caps at the former tank farm and oil/water separator;
- Placement of signage regarding prohibition of activities at the site (a management memorandum was developed and distributed at the facility);
- Inspections of the DNAPL collection sump (monthly for 6 months, quarterly thereafter until 2 years after construction, frequency to be reviewed at that time based on findings); and
- Removal of any DNAPL that collects in the sump.

Memorandums are distributed to Plant employees to inform workers of upgrades made to the area, the capped area restrictions, and the disciplinary actions for not complying with the restrictions.

2.3.3 Dredge Island Inspections

An Engineering Evaluation/Cost Analysis (EE/CA) for a non-time critical removal action was conducted by Alcoa for the Dredge Island in 1997 (Alcoa 1997). A streamlined risk evaluation, prepared as part of the EE/CA, indicated that mercury from Dredge Island could enter Lavaca Bay via erosion of mercury-contaminated soils. Based on that finding, the EE/CA documented the selection of a removal action that would minimize the potential of the release of mercury from the island due to either uncontrolled erosion during normal storm events or due to the effects of more intense storms (e.g., hurricanes).

The removal action was conducted between 1998 and 2001, and is referred to as the Dredge Island Stabilization Project. The project included relocating the contents of the Dredge Materials Placement Areas that contained elevated levels of mercury (approximately 523,000 cubic yards) into the Gypsum Placement Areas (GPAs). In addition, the containment dikes surrounding the GPAs were raised so that they would not be overtopped during a 100-year storm event (i.e., a storm event that has a probability of occurring once within 100 years). Those activities required increasing 10,700 linear feet of dike to an approximate elevation of 30 feet mean sea level. As part of this work, most of the marshes on the north

end of the island were removed. Erosion protection and runoff control structures were also installed on the island. The final design and as-built drawings for the Dredge Island Stabilization Project are contained in the *Dredge Island Removal Action Plan, Volume 4 – Phase 1 Dredge Island Stabilization Completion Report* (Alcoa 2002).

The performance objective for the Dredge Island Stabilization Project was to interrupt the potential direct exposure pathway of contaminants in soils and sediments from Dredge Island as a result of a significant storm event or uncontrolled erosion during stormwater runoff. The removal action and reconfiguration of Dredge Island was designed to achieve this objective through engineering means. The remaining tasks for Alcoa include preservation of the integrity of the reconfigured island through periodic inspections and maintenance and/or repairs, as needed.

The requirements provided in the OMMP for Dredge Island include inspection of the following primary components:

- The access bridge from the mainland to the northern shore of Dredge Island;
- The 10,500 lineal feet of the Alcoa CDF containment dikes;
- The storm protection on the Alcoa CDF dike exterior, including the armor layer, under-layer, and dike toe protection;
- The gravel erosion protection on the exterior dike slopes above the armor protections and the interior dike slopes above 26.5 feet (National Geodetic Vertical Datum 1929);
- The 25-foot-long concrete emergency spillway;
- The two dredge decant structures, including the discharge structures;
- The two water stops installed in the Calhoun Port Authority (previously called the Calhoun County Navigation District) CDF dikes; and
- The road on the Alcoa CDF dikes.

All items noted on the inspections are corrected as soon as practicable.

The access bridge was damaged during Hurricane Claudette in 2003, and subsequent Dredge Island inspections have not included detailed inspections of the bridge. However, Alcoa continues to maintain signage and navigational lighting to prevent access to, and collision with, the bridge.

2.4 Routine Lavaca Bay Sediment Monitoring

A key factor in the success of the Lavaca Bay remedy is the reduction of sediment mercury concentrations through targeted sediment removal efforts, capping, and natural recovery. The purpose of the sediment monitoring program is to verify that source control and remedial measures have been effective in reducing sediment mercury concentrations to acceptable levels.

As described in the Lavaca Bay Sediment Remediation and Long-Term OMMP (Appendix H of the CD [United States et al. 2005]), the sediment monitoring program was designed to evaluate surface sediment mercury concentrations from open water and marsh areas within the Closed Area. The boundaries of the Closed Area are defined in the Texas Department of State Health Services' order against the taking of finfish and shellfish for consumption. The open water sediment sampling protocol has been modified over time to improve its utility. The changes are documented below as well as in prior RAAERs. The sample depth intervals and monitoring parameters are summarized in Table 2.4-1.

The CD requires that the open water sediment monitoring program be performed until a mean mercury concentration of less than 0.5 milligrams per kilogram (mg/kg; i.e., parts per million [ppm]) dry weight is measured in the Closed Area in two consecutive years (United States et al. 2005). This occurred in 2004 and 2005 when average concentrations of 0.293 ppm and 0.276 ppm, respectively, were measured in surface open water sediment samples from the Closed Area (Alcoa 2006). Thus, the performance objective of the open water sediment monitoring program established in the CD has been met. However, Alcoa has elected to continue monitoring the northern half of the open water sediment sampling grid (Figure 2.4-1) on a voluntary basis as part of its ongoing effort to better understand trends in fish tissue concentrations in the Closed Area of Lavaca Bay. In 2009, Alcoa decided to adjust the open water sediment monitoring from annually to even-numbered years. However, as part of an expanded sampling effort, open water sediment samples in the northern half of the sediment sampling grid (i.e., samples matching the even-year routine sampling) were collected in 2015. In 2016, Alcoa modified the program in the western CC and west of Dredge Island by dropping sampling locations that have exhibited consistent recovery. Alcoa also conducted a supplemental open water sediment sampling program that focused on better delineating mercury concentration patterns within the Eastern Causeway Cove (ECC), as described in Section 4.1.1.

The CD states that the objective of the marsh performance standard is to attain an average mercury concentration in each marsh of less than 0.25 mg/kg dry weight. Monitoring is to occur annually until the remediation goals are met for two consecutive events. If the marsh sediment monitoring data attain the remediation goal for two consecutive annual events in a given marsh, monitoring of that marsh is complete, even if monitoring of other marshes continues. All monitored marshes have met the performance standard. However, marshes other than 11 and 14 are currently monitored on a voluntary annual basis in an ongoing effort to better understand and report on trends of mercury concentrations in fish tissue in the northern part of the Closed Area of Lavaca Bay (Figures 2.4-2a through 2.4-2c).

The marsh sediment sampling protocol has also been modified over time to improve its utility. Based on a review of the 2007 supplemental data presented in the Amended 2007 RAAER (Alcoa 2008), measurements of meHg and total organic carbon (TOC) were added to the analytical suite for the 2008 and subsequent marsh monitoring programs. The changes are documented in the 2012 RAAER

(Alcoa 2013) as well as prior RAAERs. The sample depth intervals and monitoring parameters for annual marsh sediment are summarized in Table 2.4-1.

2.5 Routine Finfish and Shellfish Monitoring

The purpose of the Lavaca Bay Finfish and Shellfish OMMP (Appendix I of the CD [United States et al. 2005]) is to collect and evaluate data to determine whether the remediation goals established in the CD have been met. As discussed in Section 3.6.2, a rigorous statistical approach is used to compare the mercury concentrations of Closed Area and Adjacent Open Area red drum tissue samples and to determine when the remediation goal has been met.

The Lavaca Bay Finfish and Shellfish OMMP (Appendix I of the CD [United States et al. 2005]) provides for the collection of information to assess short-term trends (either increasing, decreasing, or static) in tissue recovery and to qualitatively evaluate remedy effectiveness. The OMMP states that increasing trends, based on multiple annual events, indicate that the sediment remediation efforts are not effective at reducing tissue concentrations and would warrant consideration of additional remedial measures (Appendix I of the CD [United States et al. 2005]). Decreasing trends, also based on multiple annual events, indicate that the sediment remedies are having the desired effects, subject to quantitative confirmation by statistical comparison of Closed Area and Adjacent Open Area red drum tissue samples. Static or fluctuating trends indicate that multiple parameters are influencing tissue concentrations, and further monitoring, and possible consideration, of additional remedial measures, may be necessary.

During the fall 2016 monitoring event, Alcoa collected 30 red drum from ten sampling stations (three fish per station) in the Closed Area and 31 red drum from ten sampling stations in the Adjacent Open Area (Figures 2.5-1 and 2.5-2). Four fish were processed from Adjacent Open Area station LVB-5839, and three fish each were processed from the remaining nine stations.

Routine annual monitoring also includes the collection of juvenile blue crab samples from established shoreline marsh stations in the Closed Area and Adjacent Open Area. During the 2016 annual monitoring event, 30 juvenile blue crab samples were collected from ten marsh stations in the Adjacent Open Area, and 30 juvenile blue crab samples were collected from ten marsh stations in the Closed Area (Figures 2.5-1 and 2.5-2). The 20 stations sampled during the 2016 monitoring event were the same stations monitored during 2015.

3 ROUTINE MONITORING RESULTS

3.1 Verification of Site Conditions and Land Use

Site conditions and land uses within the Site remain consistent with those described in the ROD (USEPA 2001). The Texas Department of State Health Services' order against the taking of finfish and shellfish within the Closed Area remains current. Alcoa curtailed aluminum refining operations at the facility in 2016. The action of the curtailment will not affect future land use at the facility, which will remain industrial in nature, but it has reduced marine operations in Lavaca Bay near the facility.

As described in the 2013 RAAER (Alcoa 2014), industrial development projects at and adjacent to the Calhoun Port Authority harbor (known as the Point Comfort harbor) have been proposed in the past. These projects have included the widening and deepening of the Matagorda Ship Channel and other liquefied natural gas and energy-related projects. Discussion of these projects with the various stakeholder entities indicated the potential for project-related dredging activities to occur within the footprint of areas known to contain buried sediments with residual mercury contamination associated with the Site.

3.2 CAPA Groundwater Extraction and Treatment System

Primary monitoring results for the CAPA groundwater extraction and treatment system are provided in Appendix A, Tables 1 through 5. Selected potentiometric data are shown on Appendix A, Figures 1 through 4. Potentiometric contours for areas near Lavaca Bay utilize a surface water elevation for Lavaca Bay measured at a tidal gauge (gauge CA Bay) located south of the recovery wells. In other words, contouring assumes that Lavaca Bay is in hydraulic connection with Zone B, as has been demonstrated previously due to the deep dredging of the Alcoa Channel. Graphs showing concentrations of mercury and carbon tetrachloride in samples from the recovery wells over time are provided in Appendix A, Figures 5 and 6. Concentrations of mercury and carbon tetrachloride in samples from the recovery wells have decreased over time since the groundwater extraction and treatment system has been operating. Field records and logs from system operational checks and maintenance activities are kept in project binders and maintained in the project filing system.

Data collected from the treatment system indicate that it is operating efficiently and as designed. Hydraulic control has been achieved and is effectively reducing the potential for migration of mercury-impacted groundwater in Zone B west of former Building R-300 to Lavaca Bay. This conclusion is based on evaluation of potentiometric surfaces created from water-level data collected from pumping and observation wells located at the CAPA. Concentrations of mercury and volatile organic compounds in system effluent samples were all less than the discharge standards listed in the RDR and OMMPs. Therefore, all performance standards were met during 2016.

3.3 CAPA Offshore

The performance objective for this component of the OMMP was achieved in 2006, and it is no longer part of the annual monitoring program.

3.4 Site Inspections

3.4.1 Dredge Island Inspections

Dredge Island inspections were conducted quarterly throughout 2016, and inspection records are provided in Appendix B1. The inspections indicate that the island is in stable condition and performance objectives are met. Interior side-slope erosion caused by wave action within the CDF continues to be the most significant maintenance issue, but no repairs are required at this time.

Inspections and maintenance will continue at the frequency described in the RDR and OMMPs.

3.4.2 CAPA Soil Cap Inspections

Quarterly inspections were conducted during 2016 as required by the RDRs and OMMPs. Inspection records are contained in Appendix B2. The most common maintenance issue is the presence of vegetation, which is controlled to maintain cap integrity.

Inspections and maintenance will continue at the frequency described in the RDR and OMMPs.

3.4.3 Witco Area Inspections

Inspections were conducted at the Witco Area in 2016 as required by the RDRs and OMMPs. Inspection records are contained in Appendix B3.

Conclusions of the 2016 inspections are as follows:

- No DNAPL has been observed in the collection sump since its installation. Several methods have been used to detect the presence of DNAPL, including the use of an interface probe, a weighted bailer, and weighted rope (to check for visual evidence of dark or oily substances).
- The soil caps are functioning well and no damage has been observed. Mowing is performed on a regular basis.

Inspections and maintenance will continue at the frequency described in the RDR and OMMPs.

3.5 Sediment Trends and Observations

3.5.1 Spatial and Temporal Trends in Total Mercury Sediment Concentrations from the Open Water Closed Area

The long-term sediment monitoring program includes the collection of samples from open water and marsh sediment within the Closed Area. Open water sampling has focused in the northern part of the Closed Area since 2004.[2] Additional sampling was conducted in 2016 to investigate an anomalously high mercury concentration found at station SMP0048 (near the mooring dolphins) during the annual sediment sampling. A sampling grid was established around station SMP0048 to determine whether the high concentration indicated an area of elevated concentrations (Appendix C6). The additional sampling found no evidence of an area of elevated mercury concentration and showed that the initial station SMP0048 sample was not representative of mercury levels in the area. The average concentration of the 12 confirmation sediment samples at SMP0048 was therefore used in the sediment trend analyses.

Figure 1 in Appendix C1 shows the spatial distribution of mercury results for 2016. Starting in the Alcoa Channel and moving counterclockwise, the sediments east of Dredge Island have concentrations that range from 0.18 to 0.55 mg/kg, with an average of 0.37 mg/kg. The three Witco Harbor stations have similar concentrations, with an average of 0.40 mg/kg. The open water sediment concentrations are comparable in the Causeway Cove area, with concentrations ranging from 0.21 to 0.60 mg/kg and an average of 0.39 mg/kg. Along the north and west shoreline (not including the marsh data) of Dredge Island, concentrations are slightly lower, with an average of 0.28 mg/kg. Concentrations are similar west of Dredge Island, with a range of 0.2 to 0.41 mg/kg and an average of about 0.3 mg/kg.

To assess temporal trends in the open water sediment mercury concentrations, the Closed Area was divided into the ten sub-areas shown on Figure 3.5-1. As discussed in Section 2.4, the West Open Water, Causeway Cove West, and West Dredge Island sub-areas were not sampled in 2016. Surface sediment sampling depths have been modified over time (Table 2.4-1). Temporal trend analyses include samples from 0 to 2 centimeter (cm) and 0 to 5 cm depths because total mercury (THg) concentrations do not show significant variability over this depth range.

Figures 3.5-2a, b, and c show trends in the surface sediment mercury concentrations for the Closed Area sub-areas. No marsh data are included in this analysis, and the trends observed in the marshes are discussed separately below. Most of the sub-areas have been recovering at half-times,[3] ranging from 9

[2] Sampling locations which have exhibited consistent recovery were in the western Causeway Cove were dropped from the routine sampling program in 2016, as discussed in Section 2.4

[3] Half-time is the time required for the average mercury concentration to decrease to half of its initial value. Half-times are calculated for a best fit line through the data assuming an exponential decay. The half-time is equivalent to log(2) divided by the mercury decay constant for each sub-area.

to 16 years. This includes Alcoa Channel, Witco Channel, Witco Harbor, MS3, North of Dredge Island, and Causeway Cove East. The western sub-areas (West Open Water, Causeway Cove West, and Northwest of Dredge Island) have longer recovery half-times, which is due to the lower starting concentrations in these areas (concentrations are closer to background concentrations that the eastern sub-areas). Temporal trends in the West Dredge Island sub-area are variable and influenced by outliers as discussed in prior RAAERs.

3.5.2 Spatial and Temporal Trends in Total and Methylmercury Sediment Concentrations from Marshes

3.5.2.1 Total Mercury Patterns in Marsh Sediments

Eight marshes were sampled in 2016 (Marshes 1, 2, 3, 5, 6, 7, 15, and 19) to assess THg, meHg, and TOC concentrations. The results are shown in Appendix C1. All marshes met the RAO of less than 0.25 mg/kg THg for two consecutive years in 2015 (Alcoa 2016).[4] In 2016, Marshes 5, 6, 7, and 19 had average THg concentrations that exceeded 0.25 mg/kg (Table 3.5-1).

3.5.2.2 Methylmercury Patterns in Marsh Sediments

The surficial marsh sediment meHg concentrations measured in the fall 2016 are shown on Figure 3.5-3. The highest concentrations occurred in Causeway Cove Marshes 2 and 3 and MS3 Marshes 5, 6, and 7. Examining these same data normalized for organic carbon[5] (Figure 3.5-4) shows consistently elevated concentrations in Causeway Cove Marshes 1, 2, and 3. USEPA has approved Alcoa's work plans for 2017 to remove Causeway Cove Marshes 1, 2, and 3; the Witco Marsh; and the entire MS3 area (including marshes).

3.6 Routine Finfish and Shellfish Monitoring Results

This section provides an evaluation of red drum mercury monitoring data, including a review of temporal trends and a statistical comparison of mean red drum concentrations in the Closed and Adjacent Open Areas.

[4] Outliers in the datasets had been removed for the RAO assessment. They were identified using the Dixon-Q test, which is appropriate for small datasets. The dataset for each marsh was tested within each year for outliers, with a Q-table level of confidence of 99%.

[5] Carbon-normalizing the marsh mercury concentrations provides insight to the relative importance of the different marshes as sources of mercury to the food web. The dose at the base of the food web is defined by the carbon-normalized concentrations because consumption is linked to carbon abundance.

3.6.1 Closed Area Red Drum Trends

Mean mercury concentrations in red drum tissue samples collected during each fall monitoring event since 1997 are provided in Table 3.6-1, and box-and-whisker plots[6] of the data are shown on Figure 3.6-1. Each year includes a wide range of concentrations, and there is considerable overlap among the years.

The geographic distribution of 2016 red drum mercury concentrations is illustrated on Figure 3.6-2. The highest concentrations were mostly found in the Alcoa and Witco channels and in Causeway Cove. This pattern holds when multiple years are grouped, as shown on Figure 3.6-3 for 2010 to 2016 and on Figure 3.6-4 for 2002 to 2016. The robustness of this geographic pattern indicates that the greatest exposure occurs in the channel areas and Causeway Cove, and it is likely that this exposure accounts for the higher Closed Area average concentration in comparison to the Adjacent Open Area average concentration. This correlates with the finding that the highest mercury concentration in juvenile blue crabs occurs in the channel area from MS3 north to Causeway Cove (Section 3.6.4). Those areas have contained excellent fish and crab habitat, probably produce an abundance of prey, and therefore attract and sustain predatory fish better than areas where prey items are less abundant.

Closed Area red drum mercury concentrations show no consistent trend over the last 14 years (Figure 3.6-5). Year-to-year variability likely reflects the variability of non-sediment-related factors such as diet, bioenergetics, movement, and intermixing of sub-populations. Such factors probably account for the low mean mercury concentration of the Closed Area red drum samples (0.75 mg/kg) relative to prior years. The lack of a long-term trend indicates the year to year variability in the diet of these fish, as diet is the dominant source of mercury found in red drum.

To provide a perspective on how the Closed Area red drum mercury concentrations compare to those of the Adjacent Open Area, the 2016 average concentration at each capture station in the Closed Area is shown as a ratio to the average of all samples from the Adjacent Open Area (Figure 3.6-6). Ratios in the range of 2 to 3 are characteristic of locations along the eastern Closed Area from Causeway Cove south through the Alcoa Channel. Lower ratios are characteristic of more southern and western locations. The locations on the west side of Dredge Island are similar to the Adjacent Open Area.

[6] Box-and-whisker plots were used to display the distribution of concentrations obtained each year and show the median—the range between the 25th and 75th percentile highest values (defined by the box and called the Interquartile Range [IQR])—and the highest and lowest values that fall inside limits defined by 1.5 times the IQR plus or minus the 75th or 25th percentile values (shown by the whiskers). Values beyond those limits are displayed as individual points. The median and mean values are displayed as the horizontal bar and the black diamond within the boxes, respectively.

3.6.2 Statistical Comparison of Mean Red Drum Mercury Concentrations in the Closed and Adjacent Open Areas

In accordance with the methods prescribed in the OMMP, statistical analyses were conducted to evaluate whether to reject the hypothesis that in 2016 the Closed Area red drum mercury concentrations reached levels statistically indistinguishable from the red drum mercury concentrations in the Adjacent Open Area. The hypothesis is stated as follows:

$$\text{Null Hypothesis: } [Hg_{Closed}] = [Hg_{Open}] \text{ or } [Hg_{Closed}] - [Hg_{Open}] = 0$$

$$\text{Alternative Hypothesis: } [Hg_{Closed}] > [Hg_{Open}] \text{ or } [Hg_{Closed}] - [Hg_{Open}] > 0$$

To support the test, the OMMP specifies the following:

- Sample up to 30 red drum each from the Adjacent Open Area and Closed Area for mercury analysis. Due to logistical constraints, this target number may not be achievable. As long as the total sample sizes from each area are reasonably close to the target, the statistical test can accommodate the variability from the ideal target sample size.
- Evaluate assumptions of normality using normal quantile plots and a Kolmogorov-Smirnov goodness-of-fit test. Evaluate equality of variance using a Bartlett test.
  - Transformations to the data should be made as appropriate. If the data are better fitted to a log-normal distribution, a logarithmic transformation may be appropriate prior to conducting the means testing. Quantile plots and a Kolmogorov-Smirnov goodness-of-fit test will be used to determine whether the untransformed or transformed data are more appropriate for use in the means test.
- If data are normally distributed, conduct a parametric means test (t-test). If the data are not normally distributed, conduct a non-parametric means test (Wilcoxon/Mann-Whitney or equivalent).
- Conduct a post-hoc power analysis using the variance, mean differences, and sample size from the data to establish the event-specific decision error rates.
  - If necessary, discuss deviations from the statistical test assumptions.
  - For years that $[Hg_{Closed}] > [Hg_{Open}]$, the post-hoc power analysis will not inform decision-making.
  - For years when $[Hg_{Closed}] = [Hg_{Open}]$, the post-hoc power analysis will provide the probability that a false positive error might have been made. To ensure that a Type II error has not been made when the null hypothesis is not rejected, statistical test assumptions should be met and the test power should be greater than 95%.

Sixty-one red drum tissue samples were analyzed for mercury in 2016—30 from the Closed Area and 31 from the Adjacent Open Area (Appendix D1). The conformance of the distributions of the two sample sets with a theoretical normal probability distribution was evaluated visually and statistically.

Cumulative probability plots of the sample sets are shown on Figure 3.6-7 using arithmetic (left) and log scales (right) for the data. Closed Area results indicate a relatively straight line below 0.4 micrograms per gram (µg/g) THg with a sharper slope at concentrations greater than 0.4 µg/g. Adjacent Open Area results plot as a reasonably straight line for both scales. Goodness-of-fit tests (Shapiro-Wilk and Kolmogorov-Smirnov) indicate that the Adjacent Open Area and Closed Area are not similarly distributed. Adjacent Open Area data better track a normal distribution, and the Closed Area data better track a log-normal distribution.

The equality of the variance of the Adjacent Open Area and Closed Area was assessed using a Levene test, which is a modern replacement for the Bartlett test. This test rejected the hypothesis of equal variance ($p = 2.4 \times 10^{-7}$).

Because the Closed Area sample set does not conform to a normal distribution, the hypothesis of equal means was evaluated using the non-parametric Mann-Whitney U test in addition to a t-test. Both tests reject the null hypothesis of equal means and indicate that the mean of the Closed Area samples is higher than the mean of the Adjacent Open Area samples (Table 3.6-2; $p<0.001$). The RAO of having mean mercury concentrations in the Closed Area and the Adjacent Open Area be comparable has not been achieved.

3.6.3 Juvenile Blue Crab Recovery

Juvenile blue crabs are monitored to evaluate recovery. They are useful in this regard because they reflect exposure conditions in the vicinity of where they are captured and they respond rapidly to changes in exposure. Moreover, they are an important prey item for red drum and provide an understanding of mercury concentration trends in likely red drum prey.

3.6.4 Temporal and Spatial Trends in Juvenile Blue Crab Averages

Box-and-whisker plots of the annual juvenile blue crab data of the Closed Area (Figure 3.6-8) show downward trends evident in narrowing distributions and declining median and maximum values. The 2016 Closed Area data exhibit a mean of 0.12 mg/kg, which is about half of the value characteristic of the period from 2006 to 2011 and approximately twice the 2016 mean for the Adjacent Open Area. Unlike the 2016 Closed Area average red drum concentrations, the average mercury content of juvenile blue crab samples from the Closed Area in 2016 did not decrease relative to the 2015 data (Table 3.6-1). This is further evidence that factors such as diet, bioenergetics, movement, and intermixing of

sub-populations play an important role in red drum mercury concentrations measured in the Closed Area (Section 3.6-1).

Mercury concentrations in juvenile blue crab exhibit a geographic pattern, as shown on Figure 3.6-9. The highest concentrations are found in Causeway Cove marshes, north of Dredge Island, near Witco Harbor, and around MS3. Areas containing the highest THg concentrations of juvenile blue crab coincide with areas containing the highest red drum concentrations, as discussed in Section 3.6.1. In 2016, the lowest THg concentration in juvenile blue crabs (less than 0.1 ppm THg) was found in the southern part of the Closed Area.

Ratios between 2016 Closed Area blue crab concentrations and the 2016 Adjacent Open Area-wide average provide a perspective of the geographic pattern (Figure 3.6-10). The highest ratios are in the corridor from Causeway Cove to MS3 and Marsh 19. These ratios, which mostly fall between 3 and 4, are above the ratios for red drum discussed in Section 3.6.1 and shown on Figure 3.6-6. Further south and west, the ratios tend to be lower. The lowest ratio was found in the Point Comfort harbor.

The geographic pattern in juvenile blue crab concentrations suggests that temporal trends may exhibit a pattern that is not evident when tracking the Closed Area as a whole. Therefore, trends at individual stations were examined.

3.6.5 Trends at Individual Juvenile Blue Crab Stations

Juvenile blue crab within the Closed Area show low or declining mercury concentration trends at most stations (Figures 3.6-11a through 3.6-11d). However, the Witco Harbor, Marsh 19, and Marshes 1 and 2 stations remain relatively high, with mercury concentrations near 0.2 mg/kg, and show little to no decline in recent years.

Juvenile blue crab mercury data collected in the vicinity of Marsh 15 (near the former Marsh 14 area), while showing a slight increase in concentration since the initial removal of Marsh 14, are significantly lower than in years prior to the Marsh 14 removal in 2013 (Figure 3.6-11c). The step change in concentrations indicates a benefit due to remediation of the adjacent Marsh 14 and illustrates the rapid response of juvenile blue crab to changes in exposure.

4 SUPPLEMENTAL 2016 STUDY RESULTS

Field studies were conducted in fall 2016 to further investigate factors that may be influencing mercury bioaccumulation and to further characterize certain areas identified during 2015 fall and 2016 spring annual and supplemental monitoring.

The work consisted of the following activities:

- Increased density sampling of ECC sediments
- Sediment sampling at Closed Area annual shellfish sampling locations
- Sediment sampling and probing along the Witco Channel western slope
- Marsh removal sediment characterization
- Water column sampling in ECC
- Assessing resuspension in Causeway Cove using LANDSAT images
- Cataloging of red drum gut content
- Bathymetry survey in the Witco and Causeway Cove areas
- Measuring ECC sediment geotechnical properties

4.1 Supplemental Sediment Monitoring

Additional sediment data were deemed necessary to address uncertain conditions relevant to planned remediation or to understanding the potential need for future remediation. Those conditions include the following:

- The spatial extent of higher surface sediment mercury concentrations in the eastern half of Causeway Cove indicated by annual sediment monitoring results;
- The degree to which local sediment mercury concentrations correlate with mercury levels in monitored Juvenile Blue Crab;
- Mercury concentrations in sediment and porewater in marshes targeted for removal; and
- The degree to which sediments on the western edge of the planned Witco Channel dredging have elevated mercury concentrations.

4.1.1 Results of Increased Sampling Density for Eastern Causeway Cove Sediments

Surface sediments were sampled at 59 supplemental locations[7] in the ECC to provide a sampling density of approximately 1 location per acre. A detailed description of the methods for collecting the sediment samples is provided in Appendix C3. Mercury concentrations at the additional locations (Appendix C3, Figure 1) were assessed in conjunction with routine sampling data to delineate areas of high and low concentration within Causeway Cove.

Increased sampling density allowed for interpolation of surface sediment THg concentrations in Causeway Cove (Figure 4.1-1). The highest concentrations (0.5 to 0.9 mg/kg) are found in the center of Causeway Cove in the deepest water depths (Appendix F). Concentrations decline moving towards the oyster reefs and the marsh shorelines, with pockets containing elevated mercury levels continuing to the west. Areas of low THg are found along the shorelines of Marshes 2 and 3, with the lowest levels found to the north along the Marsh 1 shoreline.

4.1.2 Results of Sediment Sampling at Closed Area Annual Shellfish Sampling Locations

As described in the *Fall 2016 Study Plan* (Alcoa 2016e), surficial sediment samples were collected at each Closed Area annual shellfish sampling location to help quantify the current relationship between sediment and prey item mercury concentrations. The paired sample locations include three stations monitored as part of the annual marsh sediment sampling program (Marshes 1 and 2/CLO5802, Marsh 15/LVB5504, and Marsh 19/CLO5803). The remaining seven shellfish monitoring locations (CLO5814, CLO5815, CLO5900, CLO6802, LVB5508, LVB5513, and LVB5517) are not included in the annual marsh sediment sampling program, and three supplemental surficial sediment samples were collected at each of these locations. The locations of the sampling locations and the study results are provided in Appendix C2.

Concentrations of THg and organic carbon normalized meHg in sediment do not correlate well with juvenile blue crab mercury concentrations (R^2 of 0.12 and 0.24, respectively). Concentrations of meHg in sediment, however, have a higher correlation with juvenile blue crab mercury concentrations (R^2 of 0.52; Figure 4.1-2).

[7] Fifty-six locations were sited in the text of the *Fall 2016 Work Plan* (Alcoa 2016e). When the sampling plan was implemented, 59 locations were sampled, 3 of which were outside the area of interest. All results are reported in Appendix C3.

Over narrow sediment concentration ranges (e.g., 0.3 to 0.4 nanograms per gram dry weight meHg), juvenile blue crab concentrations vary by factors of 2 to 3 (Figure 4.1-2). This indicates that although there is a general relationship between meHg sediment concentrations and juvenile blue crab concentrations in the Closed Area in the 2016 fall dataset, variability precludes the use of colocated meHg sediment concentrations to predict mercury concentrations in juvenile blue crabs. Declining meHg concentrations in sediment after the spring peak methylation period likely confound this relationship.

4.1.3 Results of Sediment Sampling along the Witco Channel Western Slope

Ten sediment core locations were sited along the western shore of the Witco Channel. Cores were collected to a depth of 6 feet or refusal and segmented into 0 to 2 cm, 2 cm to 6 inch, and 6 inch intervals thereafter. Core segments were analyzed for THg and TOC. A detailed description of the methods used to collect the sediment samples is provided in Appendix C4.

Core refusal within the top 6 inches of sediment was encountered at six of the locations (Appendix C4, Figure 1). The only locations with penetration depths greater than 6 inches were immediately north and south of the confluence of the cooling water intake channel and the Witco Channel and at the mouth of the Witco Harbor. Probing was conducted near the intake channel locations to determine the western extent of soft sediment (Appendix C5, Figure 1).

The THg concentrations were higher in subsurface than surface samples at all locations. Surface concentrations ranged from 0.1 to 0.4 mg/kg, with the highest levels measured at the northernmost location near Witco Harbor. The three cores with recovery greater than 36 inches had similar subsurface THg patterns, with concentrations increasing in deeper sediments and the highest levels (0.8 to 1.5 mg/kg) found in the 36- to 42-inch segment. The highest THg level (2.1 mg/kg) was found in the deepest segment (6 to 11 inches) of WWC-009 collected near Witco Harbor.

4.1.4 Results of Marsh Removal Sediment Characterization

Ten sediment samples were collected in Marshes 1, 2, and 3 in December 2016 to evaluate the mercury concentrations in underlying marsh sediments. Sample depths were targeted at elevations expected to be near or at the post-response action sediment surface. A detailed description of the methods used to collect the sediment samples is provided in *Consent Decree for CERCLA Response Actions and Response Costs Quarterly Report No. 36, Attachment A* (Alcoa 2017).

Mercury concentrations in all samples were below the 0.25 mg/kg marsh THg RAO. The maximum sediment THg concentration of 0.145 mg/kg was found in the northernmost sample of Marsh 1. All other samples were below 0.02 mg/kg.

A porewater sediment sample was collected during the sediment characterization sampling to determine the water volume in the sediments proposed for excavation. The sample was sited above the waterline near location CM-003 in Marsh 1 (Appendix G, Figure 1) to provide a representative example of low water marsh conditions. A detailed description of the methods used to collect the sample and analytical results are provided in Appendix G.

4.2 Supplemental Surface Water Monitoring

Water column monitoring conducted May through July 2016 as part of the High Resolution Water Column (HRWC) study provided quantitative information about mercury and total suspended solids (TSS) transport patterns within the Alcoa and Witco channels and into Causeway Cove (Alcoa 2016b). This work was supplemented by the analysis of remote sensing data and additional water column monitoring conducted to provide the following:

- A more detailed understanding of where mercury and resuspended sediment are sources to the water column, and
- Additional data for evaluations of potential future remedial alternatives.

Additional water column monitoring consisted of grab samples at 11 locations within the Witco Cut and ECC during four flood tide events (Appendix E, Figures 1 to 4) from October through December 2016. Samples were analyzed for THg, DHg, PHg, and TSS. A detailed description of the methods used to collect the samples is provided in Appendix E.

The remote sensing work involved the use of satellite imagery (LANDSAT) collected by the U.S. Geological Survey to examine turbidity patterns and thus resuspension patterns within Causeway Cove. Wind data collected by the National Oceanic and Atmospheric Administration (NOAA) were used in conjunction with the LANDSAT imagery to examine wind-driven resuspension impacts and to assess localized areas of resuspension. A detailed description of methods employed in the remote sensing analysis is provided in Appendix H.

4.2.1 Results of 2016 Water Column Sampling in East Causeway Cove

Sampling events were grouped by the following wind classifications determined during the HRWC study (Alcoa 2016b):

- Low wind condition: 0 to 3.5 meters per second (m/s)
  - Event 4 (December 21, 2016) – calm conditions
  - Event 3 (December 13, 2016) – 3.8 m/s average wind

        - Event 3 average winds are just above the limit for the low wind category, but results indicate similar resuspension patterns as observed during low wind events conducted during the spring 2016 sampling
- Intermediate wind condition: 3.5 to 7.5 m/s
    - Event 1 (October 27, 2016) – 4.7 m/s average wind
    - Event 2 (November 11, 2016) – 4.8 m/s average wind
- High wind condition: greater than 7.5 m/s
    - No sampling events during winter 2016 were conducted in high wind conditions

Wind data for each event were downloaded from the NOAA Port Lavaca weather station when data were available. Wind speeds measured at the Calhoun County, Port Lavaca, TX (PVT) weather station were used for sampling events without available NOAA data.

Wind directions differed among the sampling events: event 1 winds were from the southeast; event 2 winds were from the north; event 3 winds were from the west; and event 4 had calm conditions with no prevailing wind direction. The direction from which winds blow into Causeway Cove and along the Alcoa and Witco channels influences current patterns and the upstream-downstream relationships among the sampling stations. The impact of wind directionality on wind-driven resuspended sediment and the degree and route of transport of suspended solids are not yet fully understood.

Sampling station results were grouped by water depth and compared spatially:

- Witco Harbor (approximately 9 feet depth) to the ISCO B (mid-reef) station
- Deeper CC stations
    - HRW-008
    - HRW-014
    - HRW-011
    - HRW-012
- Shallower CC stations located closer to shore
    - HRW-015
    - HRW-013
    - ISCO A
    - HRW-010
    - HRW-009

Sampling events that occurred during low wind conditions saw similar TSS, DHg, and THg levels from Witco Harbor (HRW-016) to the mid-reef entrance (ISCO B) to CC, consistent with findings during the HRWC study (Figure 4.2-1, bottom two panels; Figure 4.2-2b, top and bottom panel). Slightly more variability is seen in the TSS and DHg results for event 3 than event 4, suggesting that localized wind-

driven resuspension may have begun. Particulate concentrations were more varied throughout the sampling area, indicating an exchange of sediments over variable higher and lower concentration areas through settling and resuspension by tidal currents (Figure 4.2-2b, middle panel).

During intermediate wind events, consistent with HRWC findings, TSS patterns indicate greater resuspension occurs in Causeway Cove than at the deeper Witco Harbor station (Figure 4.2-1, top two panels). Similarly, mercury concentrations increase moving from locations in the Harbor through the mid-reef entrance into Causeway Cove (Figure 4.2-2a, top two panels). For both events, DHg levels are elevated compared to low wind conditions, but are fairly consistent inside of Causeway Cove with the exception of localized high concentrations resulting from unknown factors (Figure 4.2-2a, bottom panel).

The THg and PHg concentration patterns within Causeway Cove differ for events 1 and 2, possibly due to the influence of the prevailing wind direction. During event 1, TSS levels are consistently elevated at the central and southern stations, and decrease slightly at the northern stations (Figure 4.2-1, top panel). Similarly, event 1 THg and PHg levels are the most elevated over the central, deeper water stations within Causeway Cove where the highest THg surface sediment concentrations (0.7 to 0.9 mg/kg) are found (Figure 4.2-2a, top two panels). Elevated PHg concentrations persist to the eastern most station near Marsh 1 (ISCO A) and the northern shallow water stations (HRW-010 and HRW-09), likely indicative of a counterclockwise circulation. During event 2, PHg concentrations are fairly consistent across Causeway Cove. The highest THg is seen at the westernmost stations (HRW-008 and HRW-009), coincident to the highest TSS levels.

4.2.2 Results of Assessing Resuspension in Causeway Cove using LANDSAT Images

LANDSAT satellites record an image of the Lavaca Bay region approximately once per week. All available images from 2012 to 2016 were downloaded and processed. Twenty-six of these were found to have less than 20% cloud cover and were evaluated for turbidity conditions. Eleven of the 26 images were excluded from analysis as they were taken during, or recently after, high freshwater inflows into Lavaca Bay that introduced high turbidity that masks any wind-driven signal. A review of the turbidity-wind response within Causeway Cove for individual wind categories for the remaining days is provided in Appendix H.

Wind data from NOAA and PVT indicate that for those days for which LANDSAT imagery exists, winds primarily blow from a southern or northern direction into Lavaca Bay, with similar frequency. Eastern and variable winds occur less commonly, with only 4 of the 26 imagery days experiencing winds from these directionalities.

Turbidity patterns in Causeway Cove indicate that winds below 4 m/s, regardless of direction, generate little resuspension. Above 4 m/s, wind-generated wave action begins to resuspend surface sediments initially along the shorelines and the oyster reefs and spreading westward into the deeper, open water area.

Northern and eastern winds generate less turbidity than southerly winds overall, indicating that the Causeway Cove shoreline and causeway peninsula act as a buffer against the wind. Southern winds appear to have the strongest resuspension potential above 5 m/s, generating widespread turbidity throughout Causeway Cove and possibly Witco Channel.

4.3 Supplemental Finfish Monitoring

4.3.1 Results of 2016 Gut Content Survey

The 2016 gut content survey provided qualitative information about the biota consumed by red drum and contributed to the assessment of spatial and seasonal trends in the red drum diet. The contents of the stomachs of each red drum collected and processed for the 2016 annual monitoring study were removed, sorted, and identified as possible.

Legal-sized red drum (508 to 711 millimeters in total length) were collected from established sample stations in the Closed and Adjacent Open areas and processed by Benchmark Ecological Services, Inc., at the clean laboratory in the Alcoa PCO facility. Red drum were collected for the annual monitoring effort between September 22, 2016, and December 6, 2016. A detailed description of the methods for collecting red drum is provided in Appendix D1. Detailed results of the gut content survey are provided in Appendix D2.

Based on the results for 2016, the following observations can be made:

- Juvenile blue crabs were the dominant species in the guts of fish collected from Adjacent Open Area marshes;
- Sand eels and hardhead catfish were the most common prey items from Closed Area reef gut contents;
- Hardhead catfish and juvenile blue crabs were the most common prey items from Closed Area marshes;
- Ten of 30 red drum collected in the Closed Area and 12 of 31 collected in the Adjacent Open Area had empty guts; and
- This is the first gut content survey to find hardhead catfish as a major component of the Red Drum diet.

4.4 Bathymetry Determinations

4.4.1 Bathymetry Survey in the Causeway Cove Area

Mercury concentrations in ECC sediment are higher than concentrations in nearby portions of the Closed Area (Alcoa 2016a, 2016b). Bathymetric surveys were conducted within Causeway Cove and select adjacent marshes to increase the understanding of the topography and provide data to assist in delineation for potential remedial actions. Detailed descriptions of the methods employed in the surveys and data collected are provided in Appendix F.

4.5 Geotechnical Testing

Geotechnical analysis of sediment samples and measurements of in situ sediment properties within Causeway Cove was conducted to assess sediment stability and strength. Thirty of the 59 supplemental sediment sampling locations in the southeastern Causeway Cove (Section 4.1.1) were selected for geotechnical testing. At each location, samples of the top 10 cm of sediment were collected and analyzed for grain size and plastic and liquid limits (Atterberg Limits). Vane shear testing at each location was performed at three depths: surface, 1 foot below mudline, and 2 feet below mudline. Detailed descriptions of the methods employed in the Atterberg Limit sample collection and vane shear testing are provided in Appendix C3.

4.5.1 Results of East Causeway Cove Sediment Geotechnical Studies

Grain size and Atterberg Limit analyses of surface sediments revealed a pattern of predominantly fat clay with high plasticity indexes (i.e., clays susceptible to compaction and expansion) in the southwest corner of the ECC, transitioning to leaner clays with moderate to low plasticity indexes (clays less susceptible to compaction) moving towards Marsh 1, and sandier sediments towards Marsh 3 (Appendix C3, Table 2 and Figure 2). Coarser materials with low plasticity indexes exist near the eastern channel within the oyster reefs and contain high percentages of shell, silty sands, and gravel.

Sediment shear strength trends show a similar pattern in at-mudline surface sediments. Sediments tested in the southwest corner of the ECC had predominantly low shear strengths less than 5 psf (pounds per square foot; Appendix C3, Figure 3a). Moving north and east, sediment shear strengths increase but are still low (predominantly less than 20 psf) as the leaner clay and sandy materials are encountered. Near the eastern oyster reef channel, surface shear strengths were the highest at greater than 50 psf.

One foot below the mudline, the sediment shear strengths increase with all but one station on the far western side of the ECC (ECC-003) having peak shear strengths greater than 10 psf (Appendix C3, Figure 3b). The sediments in the center of the ECC at the deepest water depths still have low peak shear strengths below 20 psf. Sediment strengths increase to the northwest, northeast, and south, with

measurements greater than 20 psf. The vane shear test was unable to be conducted at station ECC-047 due to an abundance of shell hash in the sediment, which prevented penetration of the vane rod.

At the deepest testing depth, 2 feet below the mudline, sediment strengths at all but two locations in the center of the ECC increase to above 20 psf (Appendix C3, Figure 3c). Testing locations with strengths greater than 50 psf exist in the northwest, northeast, and southeast corners of the ECC. Shear strengths greater than 20 psf throughout the majority of the ECC indicate that the area has fairly strong shear strengths at this depth and low-stability areas are not likely to be present.

Plasticity index and shear strength results indicate that surface sediments (0 to less than 1 foot) are unstable, highly susceptible to compaction, and unlikely to be load bearing. Sediments with shear strengths less than 20 psf are generally recognized to require special consideration for capping, as the placement of cap material would result in consolidation and possible movement of the underlying sediment layer (ITRC 2014). Peak shear strengths in the ECC increase with depth; deeper than 2 feet below the mudline, sediments appear relatively stable.

5 CONCLUSIONS

5.1 Comparison to Performance Standards

Monitoring data collected in 2016 support the following conclusions:

- The CAPA groundwater extraction and treatment system continues to effectively control the discharge of mercury to Lavaca Bay from groundwater beneath CAPA.
- The 2016 inspections of Dredge Island continue to indicate that the island is in stable condition and performance objectives are met.
- No significant maintenance issues were noted for the CAPA soil cap.
- Inspections of the Witco Area indicate no DNAPL accumulation and soil caps are functioning well.
- Temporal trends seen in open water sediment from the Closed Area indicate that natural recovery is occurring.
- Elevated meHg and organic-normalized meHg concentrations were observed in Causeway Cove and MS3 marshes, similar to data collected in prior years. The USEPA approved Alcoa's work plans to remove these marshes during 2017 response actions.
- The mean concentration of mercury measured in Closed Area red drum in 2016 (0.75 mg/kg) represent the lowest mean concentration measured in the CD monitoring program, but may likely reflect variations in non-sediment-related factors such diet, bioenergetics, movement, and intermixing of sub-populations.
- The mean concentration of mercury measured in the Adjacent Open Area red drum in 2016 is similar to the mean concentrations from prior years.
- The mean concentration of mercury measured in juvenile blue crab during 2016 is similar to prior mean values for the Closed Area and Adjacent Open Area.
- The concentrations of mercury in the 2016 red drum samples from the Closed Area remain statistically elevated relative to concentrations of red drum samples collected from the Adjacent Open Area. Restrictions for the Closed Area remain.

5.2 Planned 2017 Response Actions

In 2017, Alcoa will implement the work scopes presented in the USEPA-approved Witco Channel and Harbor Dredging and MS3 Excavation – Response Action Plan (Alcoa 2016c) and the Causeway Cove Response Action Plan Addendum (Alcoa 2016d).

Public outreach efforts were renewed in 2016 and are expected to continue throughout the duration of the project as directed by the USEPA.

5.3 Continued Monitoring

Monitoring activities for 2017 are planned in accordance with established schedules. Implementation schedules may be adjusted and sampling modifications may be proposed based on response action completion dates. Notification will be provided to the USEPA for approval.

5.4 Summary of Overall Remedy Effectiveness

Completed and ongoing remedial activities and natural recovery processes have resulted in downward trends in open water and marsh sediment mercury concentrations in many parts of the Closed Area. Overall, a significant degree of sediment recovery has occurred since the RI sampling was performed in 1996.

Average mercury concentrations of red drum measured in the Closed Area continue to exhibit significant inter-annual fluctuations. These fluctuations are likely related to factors such as variations in diet, bioenergetics, movement, and intermixing of sub-populations. The mercury concentrations of red drum collected in the Closed Area remain statistically elevated relative to red drum collected in the Adjacent Open Area.

Post-response actions in 2017 monitoring of sediment and tissue will document the overall remedy effectiveness after source areas and uptake mechanisms are removed.

6 REFERENCES

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TABLES

Table 2.4-1
Summary of Annual Sediment Monitoring Protocols

Year of Sample Collection	Date of RAAER	Open Water Sediment Sample Depth Interval		Marsh Sediment Sample Depth Interval		Open Water Sediment Analytes		Marsh Sediment Analytes	
		0 – 5 cm	0 – 2 cm	0 – 5 cm	0 – 2 cm	Hg	Hg, meHg, TOC	Hg	Hg, meHg, TOC
Fall 2005	March 2006	X		X		X		X	
Fall 2006	March 2007	X		X		X		X	
Fall 2007	March 2008	X		X		X		X	
Fall 2008	March 2009	X		X					X
Fall 2009	March 2010			X					X
Fall 2010	March 2011	X		X		X			X
Fall 2011	March 2012		X		X		X		X
Fall 2012	March 2013	X	X		X		X		X
N/A	March 2014								
Fall 2014	March 2015	X			X	X		X	
Fall 2015	March 2016		X		X		X		X
Fall 2016	March 2017		X		X		X		X

Notes:
Detailed sampling protocol provided in Appendix C1.
cm = centimeter
Hg = mercury
meHg = methylmercury
N/A = not applicable
TOC = total organic carbon

Table 3.5-1

Summary of Marsh Sediment Mercury Concentrations

Marsh	2004	2005	2006	2007	2008	2009	2010	2011	2012	2014	2015	2016
Marshes 1 & 2	0.263	0.495										
Marsh 1			0.111	0.153	0.097	0.112	0.113	0.131	0.094	0.098	0.098	0.164
Marsh 2			0.066	0.064	0.084	0.073	0.081	0.064	0.062	0.062	0.035	0.061
Marsh 3	0.279	0.298	0.129	0.211	0.111	0.155	0.148	0.116	0.132	0.093	0.064	0.056
Marsh 5	0.644	0.495	0.367	0.275	0.375	0.399	0.405	0.286	0.200	0.231	0.124	0.267
Marsh 6	N.A.	0.337	0.377	0.386	0.748	0.422	0.384	0.300	0.219	0.188	0.178	0.281
Marsh 7	0.625	0.347	0.297	0.279	0.422	0.391	0.219	0.381	0.308	0.139	0.207	0.549
Marsh 11	0.019	0.021	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Marsh 14	0.626	0.587	1.050	0.909	1.260	1.109	0.535	0.719	N.A.	Removed	Removed	Removed
Marsh 15	0.943	0.273	0.369	0.327	0.418	0.374	0.440	0.480	0.287	0.034	0.022	0.046
Marsh 19	0.447	0.478	0.126	0.214	0.155	0.201	0.210	0.353	2.055	0.095	0.068	0.421

Notes:

Concentrations are milligrams per kilogram (mg/kg) dry weight.

Marsh locations are shown in Appendix C1.

Basic data are provided in Appendix C1.

Remediation goal is 0.25 mg/kg measured in two consecutive years (Highlighted green if < 0.25 mg/kg).

Text is red if outliers were removed (details in text of annual RAAER).

Marshes 1 and 2 were sampled as a single marsh in 2004 and 2005, but beginning in 2006, they are sampled separately.

N.A. = not analyzed

Table 3.6-1
Summary of Red Drum and Juvenile Blue Crap Tissue Data 1997-2016

Red Drum Sampling Event	Closed Area		Adjacent Open Area	
	Number of Samples	Mean HG (mg/kg ww)	Number of Samples	Mean HG (mg/kg ww)
4Q 1997	34	1.41	27	0.51
2001 Annual	30	1.33	15	0.49
2002 Annual	22	1.03	8	0.64
2003 Annual	29	1.09	30	0.48
2004 Annual	29	0.76	32	0.47
2005 Annual	30	0.87	36	0.48
2006 Annual	30	1.17	30	0.43
2007 Annual	30	1.29	30	0.65
2008 Annual	30	0.9	30	0.40
2009 Annual	30	0.85	30	0.38
2010 Annual	30	0.88	30	0.38
2011 Annual	30	1.17	30	0.33
2012 Annual	30	1.06	30	0.40
2014 Annual	29	1.06	28	0.40
2015 Annual	30	1.32	30	0.42
2016 Annual	30	0.75	30	0.37
Juvenile Blue Crab Sampling Event	**Number of Samples**	**Mean HG (mg/kg ww)**	**Number of Samples**	**Mean HG (mg/kg ww)**
4Q 1997	49	0.59	27	0.19
2001 Annual	33	0.48	16	0.22
2002 Annual	71	0.26	26	0.11
2003 Annual	30	0.25	30	0.07
2004 Annual	31	0.14	30	0.07
2005 Annual	27	0.22	30	0.05
2006 Annual	30	0.21	30	0.08
2007 Annual	30	0.18	30	0.08
2008 Annual	30	0.16	30	0.06
2009 Annual	30	0.22	30	0.09
2010 Annual	30	0.23	30	0.09
2011 Annual	30	0.17	30	0.06
2012 Annual	30	0.14	30	0.06
2014 Annual	30	0.18	30	0.07
2015 Annual	30	0.10	30	0.04
2016 Annual	30	0.12	30	0.05

Notes:

Hg = mercury

mg/kg ww = milligrams per kilogram wet weight

Table 3.6-2
Summary of 2016 Red Drum Tissue Mercury Results

Area	Sample Size	Mean HG (mg/kg ww)[1]	Standard Deviation
Closed	30	0.75	0.442
Adjacent Open	31	0.37	0.093

Notes:

1 = Basic data are presented in Appendix D1.

HG = mercury

mg/kg ww = milligrams per kilogram wet weight

FIGURES



N

0 575 1,150

Feet

2016 RAAER

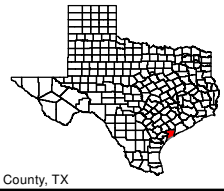
2016 Routine Open Water Sediment Sampling Locations

Routine Open Water Sediment Locations

Location ID

Notes

2015 DOQQ (Point Comfort Quad) Calhoun County, Texas



Calhoun County, TX

Prepared for Alcoa Corporation

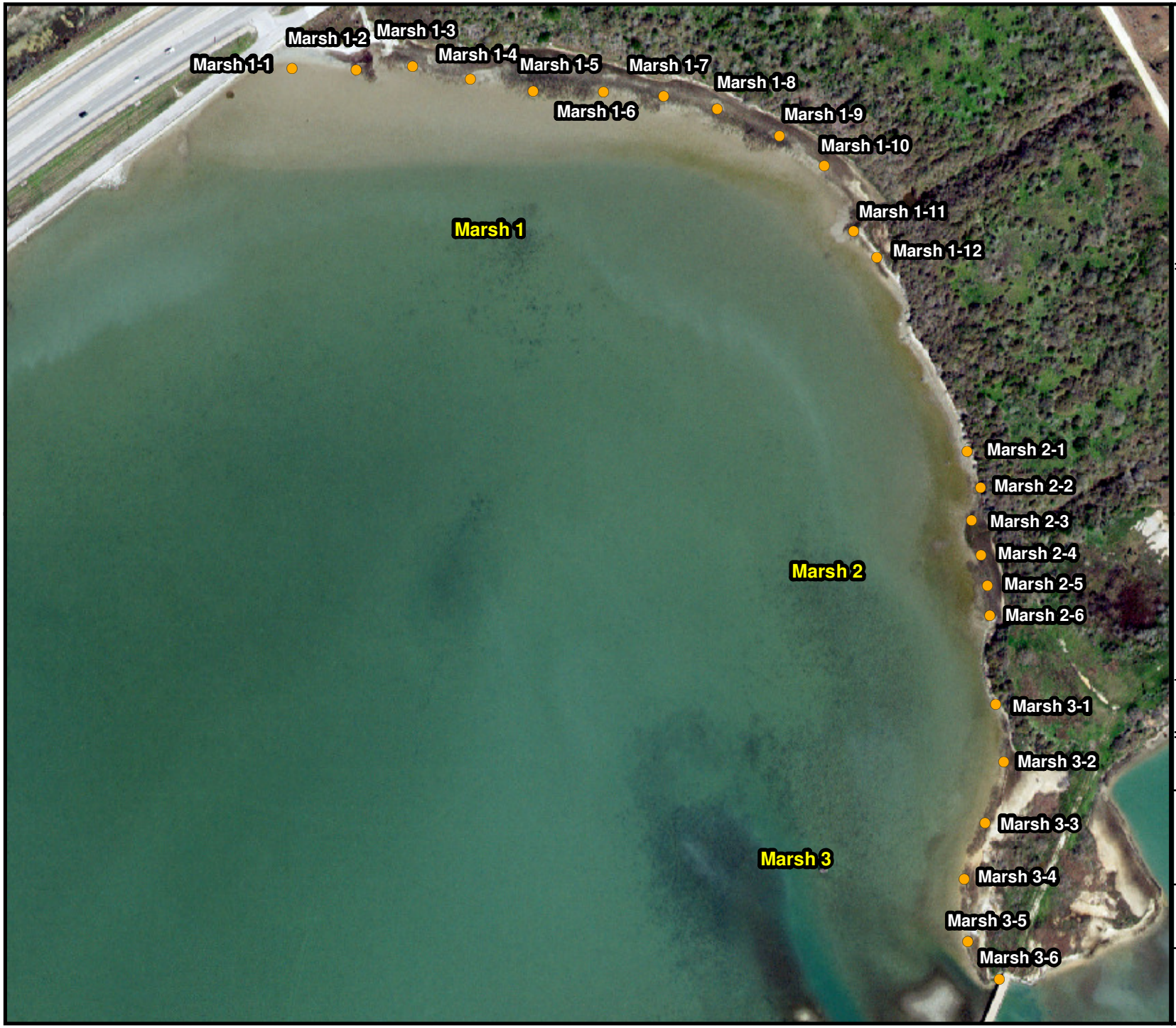
BESI Benchmark Ecological Services, Inc.

Project: 98003-086-002

Date: 1/12/17

Figure 2.4-1

M:\98003\087\2016 RAAER\arc\Openwater2016.mxd



N

0 100 200 400 Feet

Legend

- Marsh Sample Station
- ## Marsh Sample Station ID
- ## Marsh ID

Notes

2015 DOQQ (Point Comfort Quad)
Calhoun County, Texas

2016 RAAER

2016 Routine Marsh Sediment Monitoring Locations: Marshes 1, 2, and 3

Prepared for Alcoa Corporation

BESI Benchmark Ecological Services, Inc.

Project: 98003-086-002

Date: 01/04/2017

Figure 2.4-2a

M:\98003\087\2016 RAAER\arcMarsh_16_stations123_Hg.2.mxd



N

0 75 150 300 Feet

Legend

Routine Marsh Sediment Locations

Location ID

Marsh ID

Notes

2015 DOQQ (Point Comfort Quad)
Calhoun County, Texas

2016 RAAER

2016 Routine Marsh Sediment Monitoring Locations: Marshes 5, 6, and 7

Prepared for Alcoa Corporation

BESI Benchmark Ecological Services, Inc.

Project: 98003-086-002

Date: 01/04/2017

Figure 2.4-2b

M:\98003\087\2016 RAAER\arc\marsh_16_stations567_Hg.mxd



N

0 100 200 400 Feet

Legend

- Routine Marsh Sediment Locations
- ## Location ID
- ## Marsh ID

Notes

2015 DOQQ (Point Comfort Quad)
Calhoun County, Texas

2016 RAAER

2016 Routine Marsh Sediment Monitoring Locations: Marshes 15 and 19

Prepared for
Alcoa Corporation

BESI Benchmark Ecological Services, Inc.

Project: 98003-086-002
Date: 01/04/2017

Figure 2.4-2c

M:\98003\087\2016 RAAER\arc\Marsh_16_stations1519_hg.mxd



N

0 1,000 2,000 Feet

Legend

- Closed Area Red Drum Locations
- Closed Area Juvenile Blue Crab Locations
- Zone Boundaries
- Closed Area
- ## Location ID

Notes

2015 DOQQ (Point Comfort Quad)
Calhoun County, Texas

2016 RAAER

2016 Routine Closed Area Finfish and Shellfish Sampling Locations

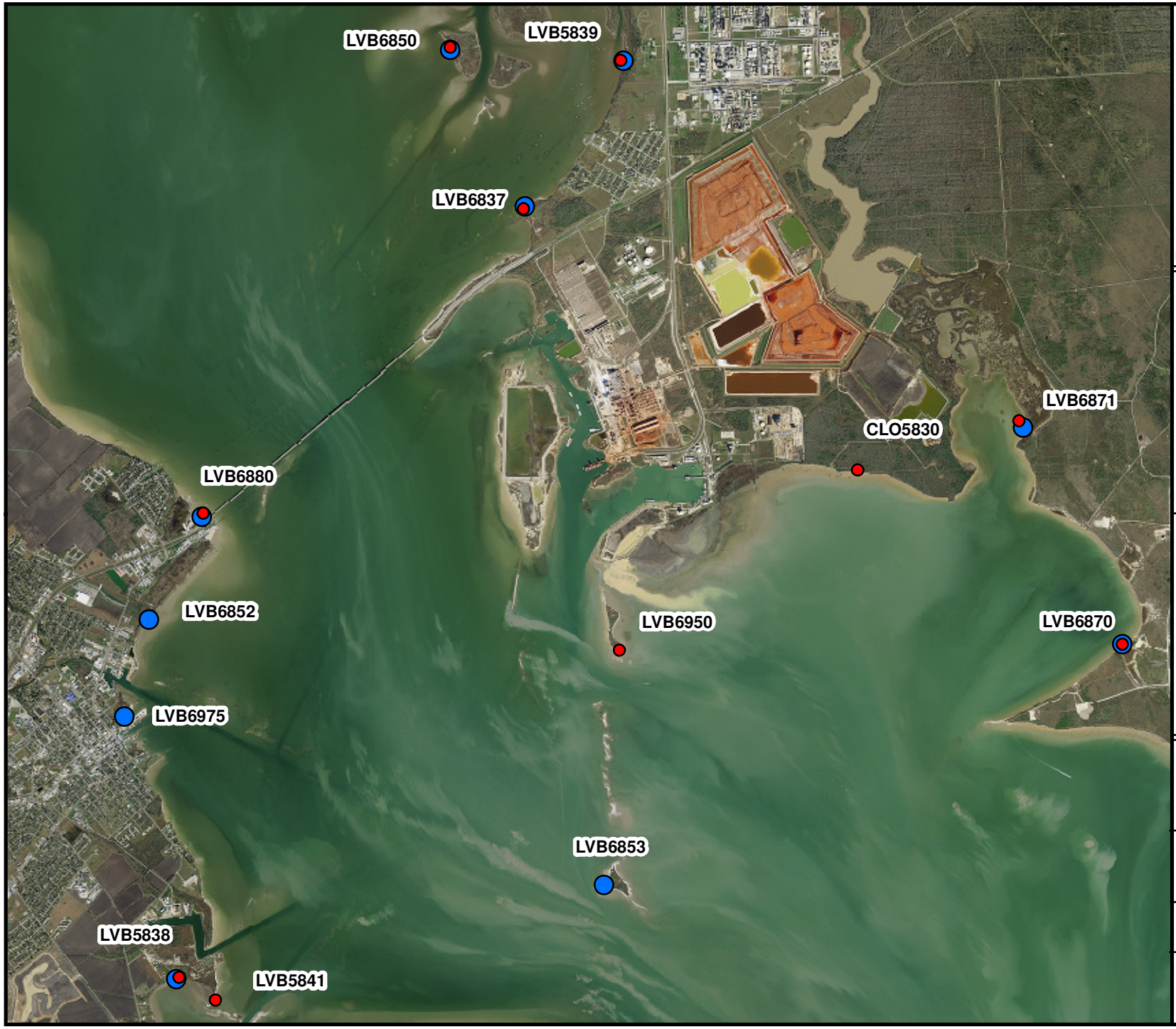
Prepared for Alcoa Corporation

BESI Benchmark Ecological Services, Inc.

Project: 98003-086-002
Date: 01/04/2017

Figure 2.5-1

M:\98003\087\2016 RAAER\arc\Marsh_16_stations1519_hg.mxd



N

0 0.75 1.5 Miles

Legend

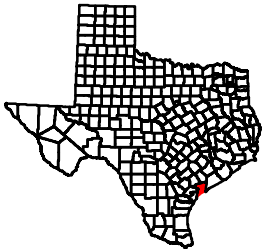
Open Area Red Drum Locations

Open Area Juvenile Blue Crab Locations

Location ID

Notes

2009 0.5m DOQQ (Point Comfort)
Calhoun County, Texas



2016 RAAER

2016 Routine Adjacent Open Area Finfish and Shellfish Sampling Locations

Prepared for Alcoa Corporation

BESI Benchmark Ecological Services, Inc.

Project: 98003-086-001

Date: 09/01/2016

Figure 2.5-2

M:\98003\087\2016 RAAER\arc\adj_rdr_16.mxd





Sediment Sub Group Areas

0 500 1,000 Feet

2016 RAAER

Closed Area Sediment Sub-areas

Prepared for Alcoa Corporation

ANCHOR QEA

Date: 01/17/2017

Figure 3.5-1

\\orcas\GIS\Jobs\Alcoa_0002\Lavaca_Bay\Maps\2016_02\SedimentSubGroups.mxd jsfox 1/17/2017 11:18:48 AM

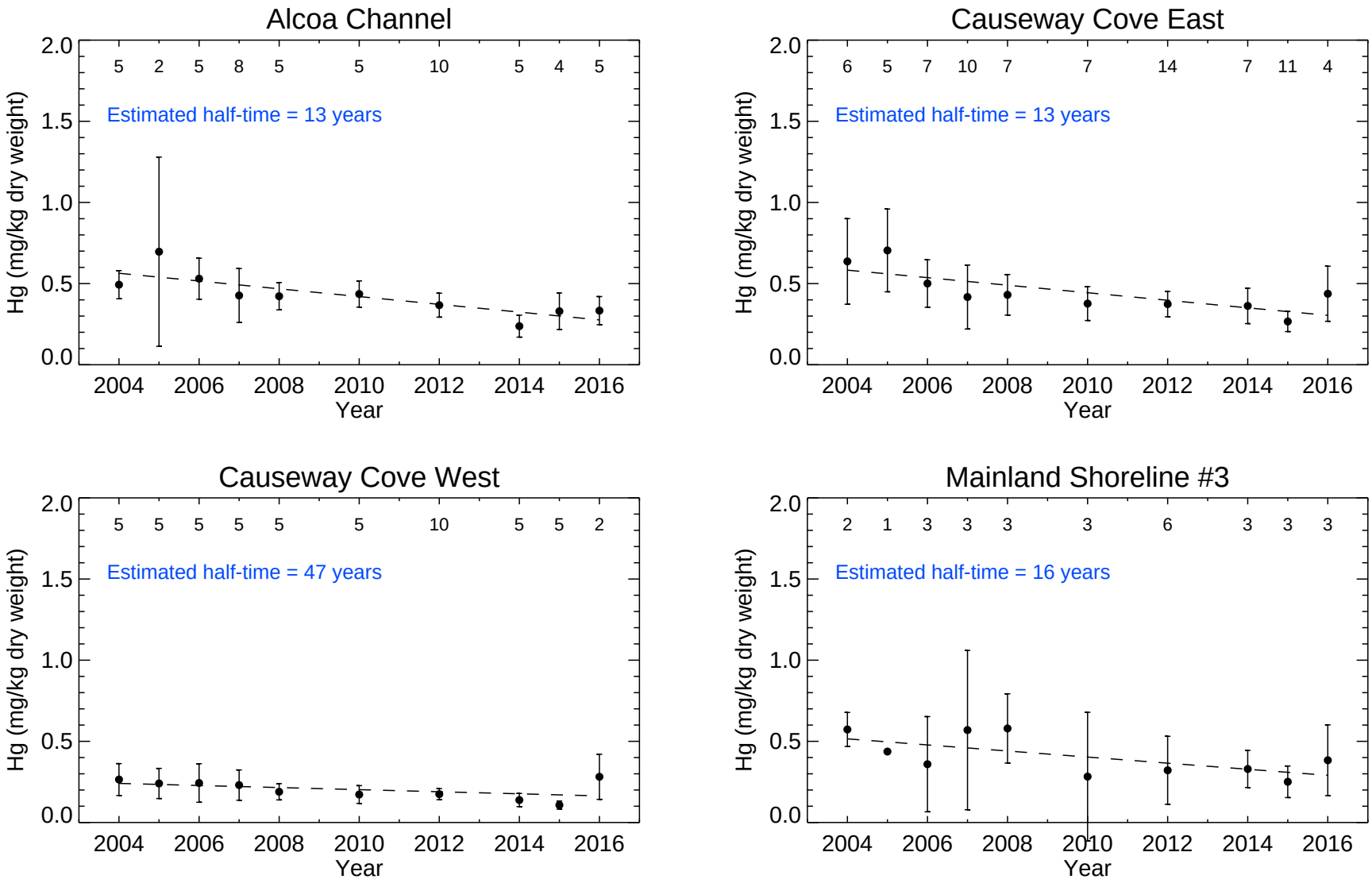


Figure 3.5-2a

Closed Area Open-water Sediment Sub-area Total Mercury Trends

Notes: Non-detect values set to MDL. Surface samples 0-2 cm and 0-5 cm included in averaging. Values at the top of the panel represent number of data points for each year. Outliers excluded from averaging: 2.88 mg/kg Hg in Alcoa Channel in 2015 and 1.25 mg/kg Hg in Northwest of Dredge Island in 2014. 3 low-concentration stations and 1 low-concentration station were removed from Causeway Cove West and West Dredge Island sub-area sampling respectively. West-Open Water stations were removed from sampling. Half-time = -log(2) / regression slope.

Prepared for Alcoa Corporation

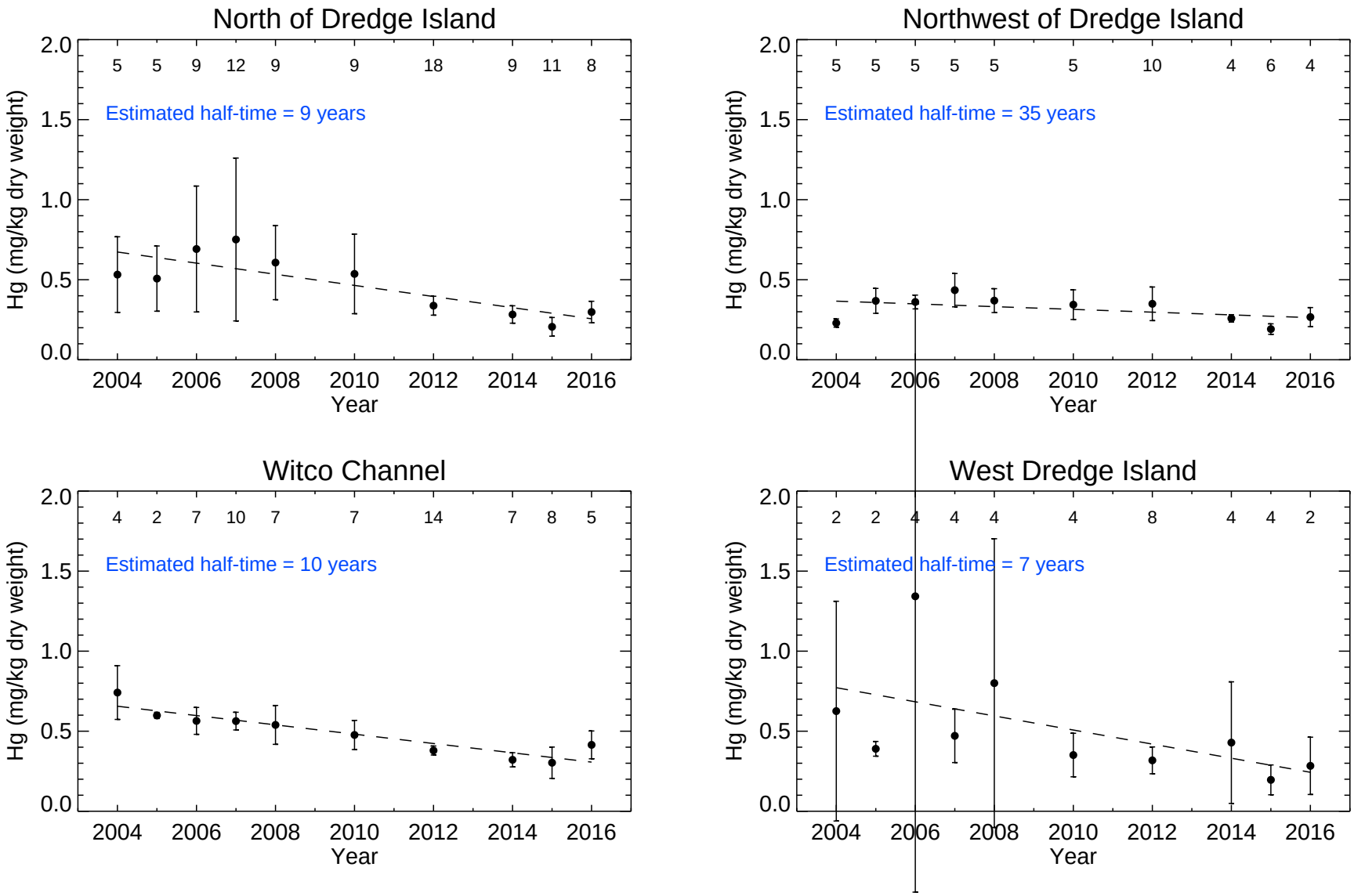
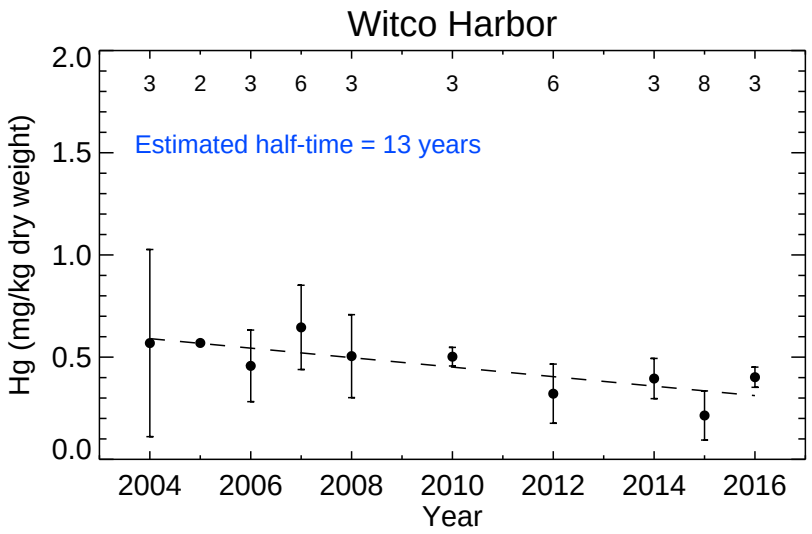


Figure 3.5-2b

Closed Area Open-water Sediment Sub-area Total Mercury Trends

Notes: Non-detect values set to MDL. Surface samples 0-2 cm and 0-5 cm included in averaging. Values at the top of the panel represent number of data points for each year. Outliers excluded from averaging: 2.88 mg/kg Hg in Alcoa Channel in 2015 and 1.25 mg/kg Hg in Northwest of Dredge Island in 2014. 3 low-concentration stations and 1 low-concentration station were removed from Causeway Cove West and West Dredge Island sub-area sampling respectively. West-Open Water stations were removed from sampling. Half-time = -log(2) / regression slope.

Prepared for Alcoa Corporation



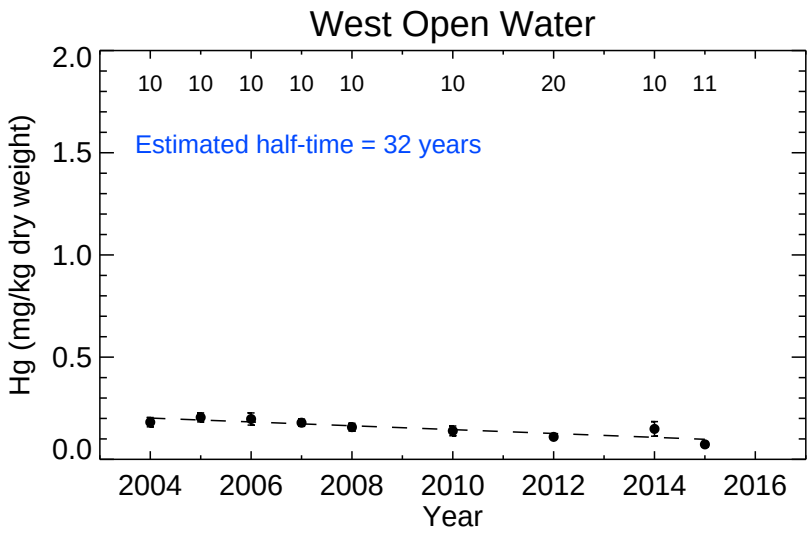
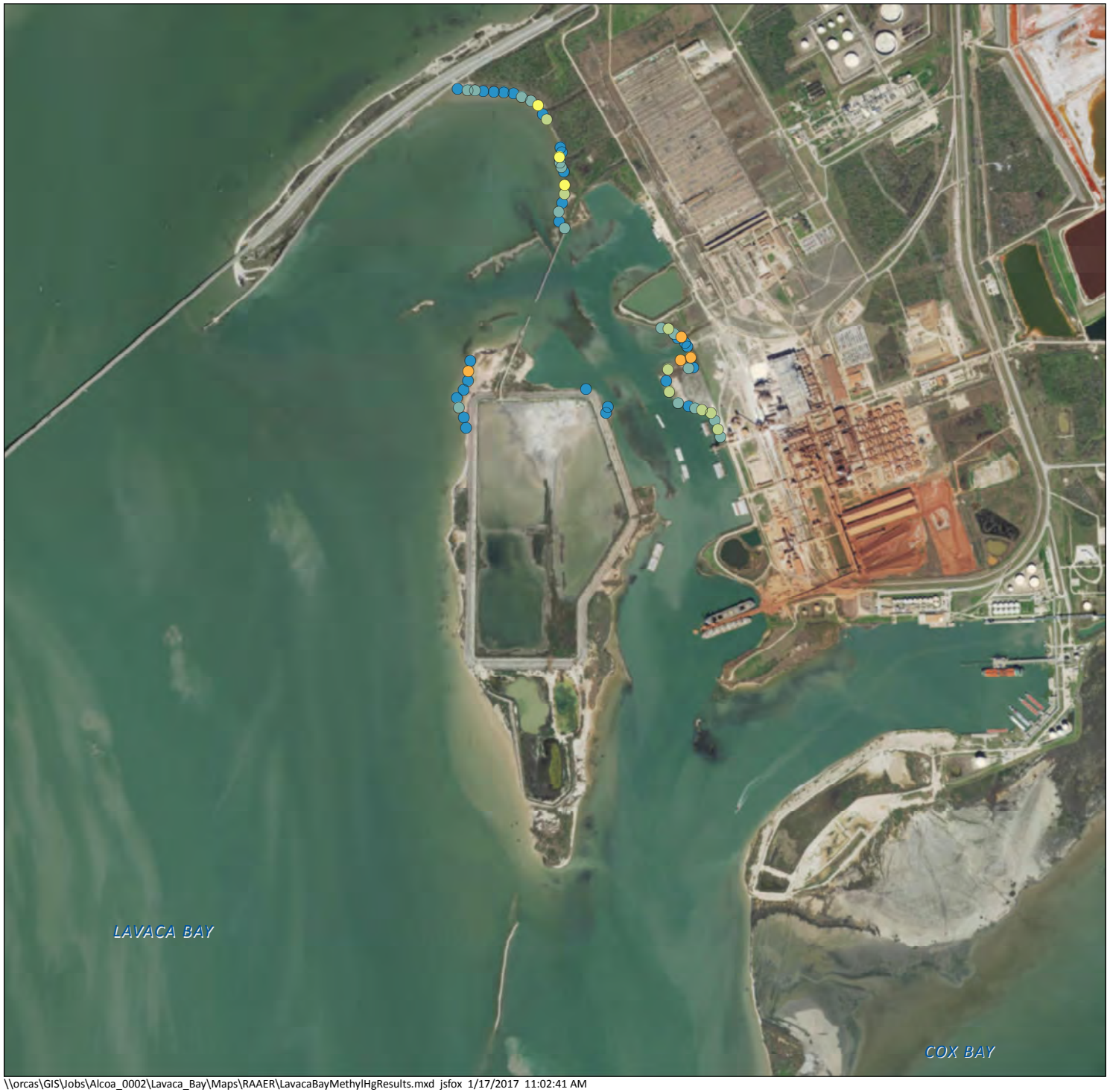


Figure 3.5-2c

Closed Area Open-water Sediment Sub-area Total Mercury Trends

Notes: Non-detect values set to MDL. Surface samples 0-2 cm and 0-5 cm included in averaging. Values at the top of the panel represent number of data points for each year. Outliers excluded from averaging: 2.88 mg/kg Hg in Alcoa Channel in 2015 and 1.25 mg/kg Hg in Northwest of Dredge Island in 2014. 3 low-concentration stations and 1 low-concentration station were removed from Causeway Cove West and West Dredge Island sub-area sampling respectively. West-Open Water stations were removed from sampling. Half-time = -log(2) / regression slope.

Prepared for Alcoa Corporation





Methylmercury Sediment Concentration (0-2 cm; ng/g)

- 0.01 - 0.25
- 0.26 - 0.50
- 0.51 - 0.75
- 0.76 - 1.00
- 1.01 - 2.00
- 2.01 - 3.00
- 3.01 - 3.00

0 1,000 2,000 Feet

NOTES:
Methylmercury results in sediment are shown in ng/g dry weight

2016 RAAER

Methylmercury in Surface (0-2 cm) Sediment in the Closed Area (2016)

Prepared for Alcoa Corporation

ANCHOR QEA

Date: 01/17/2017

Figure 3.5-3

\\orcas\GIS\Jobs\Alcoa_0002\Lavaca_Bay\Maps\RAAER\LavacaBayMethylHgResults.mxd jsfox 1/17/2017 11:02:41 AM





Methylmercury per grams TOC (0-2 cm)

- 0 - 25
- 26 - 50
- 51 - 100
- 101 - 200
- 201 - 300
- 301 - 400
- > 400

0 1,000 2,000 Feet

NOTES:
Methylmercury results in sediment are shown in ng/g dry weight

2016 RAAER

Organic Carbon Normalized Methylmercury in Surface (0-2cm) Sediment in the Closed Area (2016)

Prepared for Alcoa Corporation

ANCHOR QEA

Date: 01/17/2017

Figure 3.5-4

\\orcas\GIS\Jobs\Alcoa_0002\Lavaca_Bay\Maps\RAAER\LavacaBayMethylHgResults.mxd jsfox 1/17/2017 11:10:11 AM

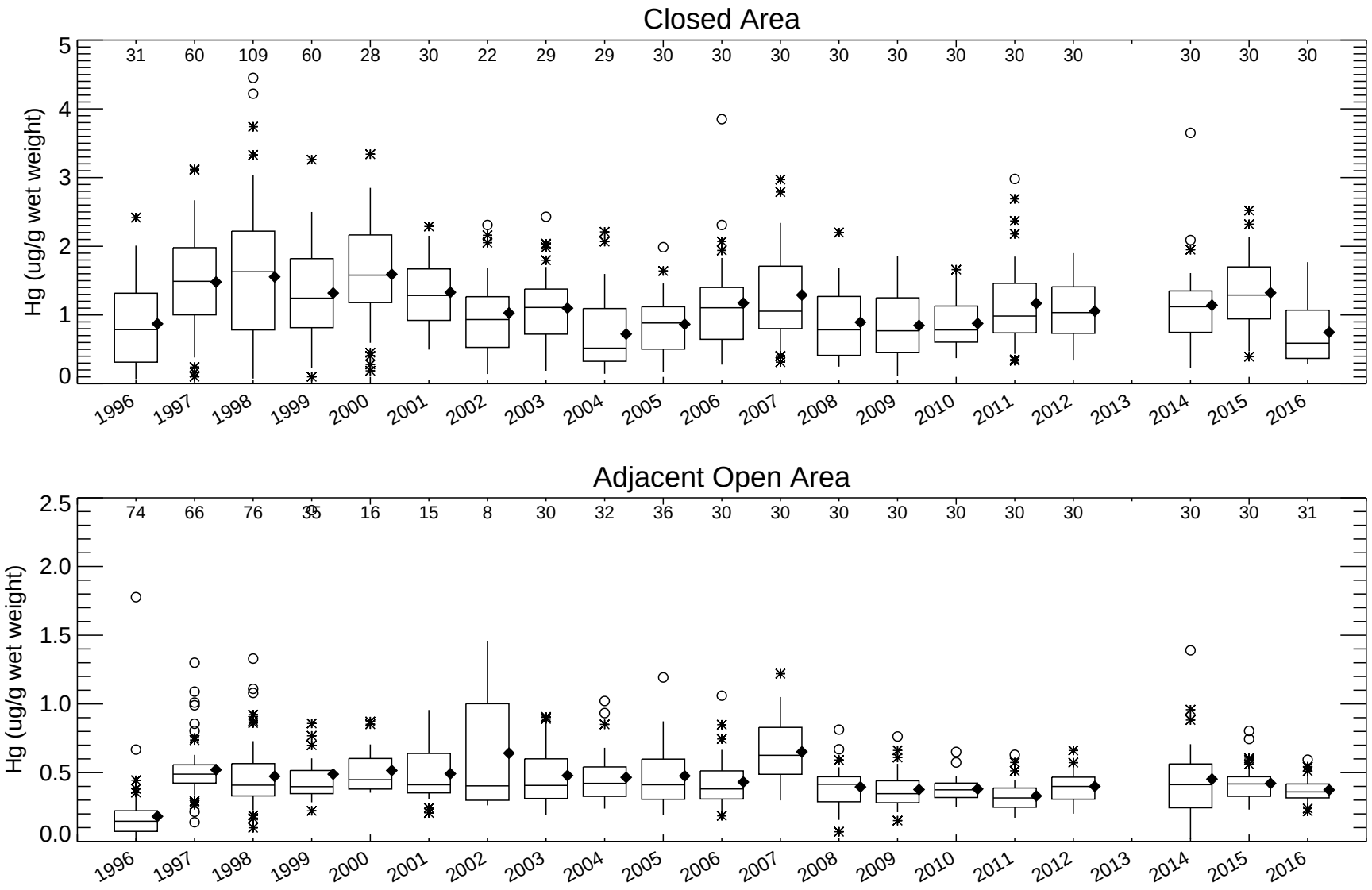


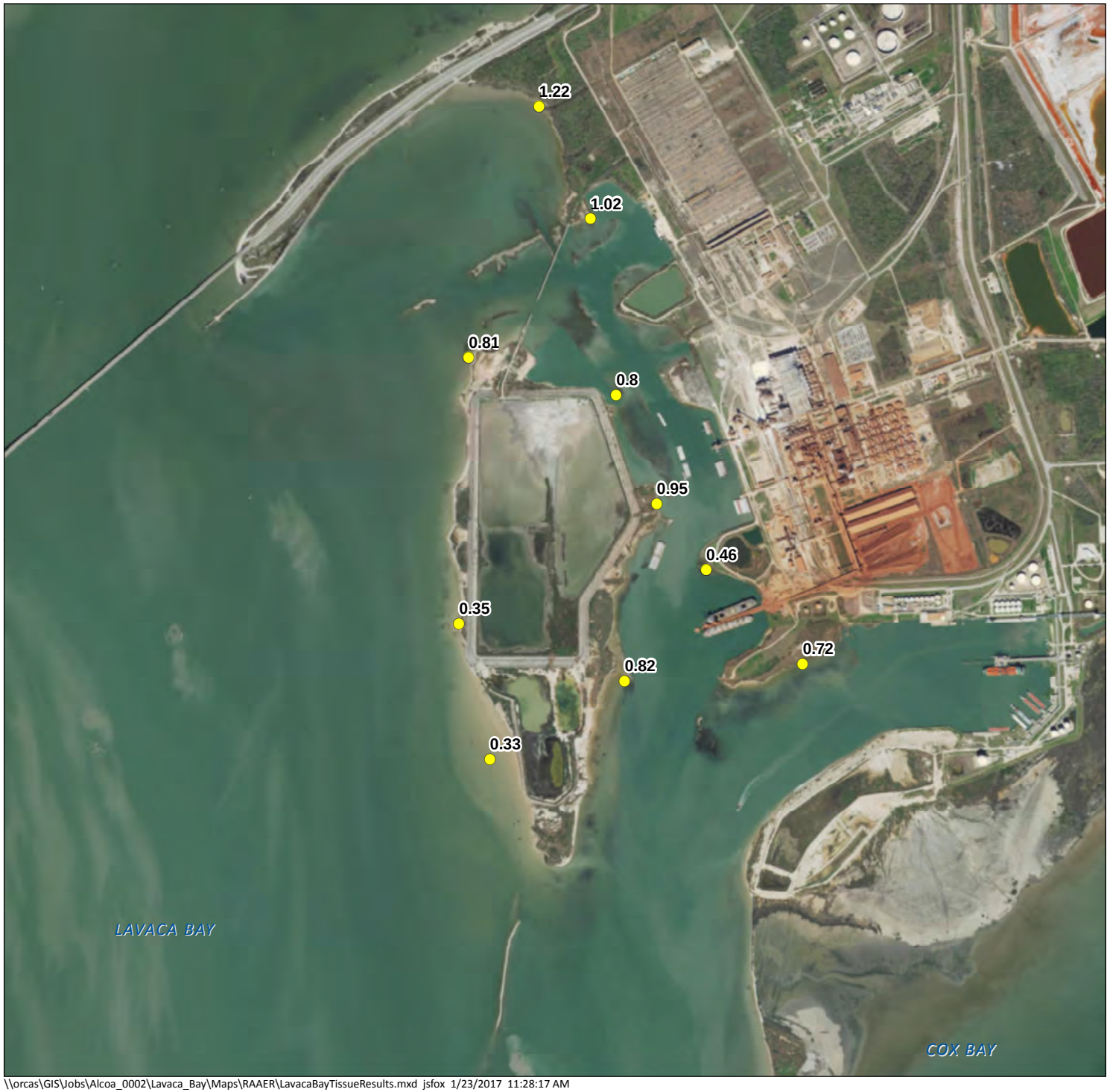
Figure 3.6-1

Lavaca Bay Red Drum Tissue Mercury Concentrations by Year, 1996-2016

Prepared for Alcoa Corporation

ANCHOR QEA

CF - \\austin2\Austin\D_drive\Projects\Alcoa\Lavaca_Bay\Analysis\Hg_Trends\tissue_trend_analysis_boxplots_w2016data.pro
Mon Mar 06 11:24:05 2017





Red Drum Stations (2016)

0 1,000 2,000 Feet

NOTES:
Total mercury (Hg) results are shown in ug/g wet weight

2016 RAAER

Closed Area Average Red Drum Total Hg (2016)

Prepared for Alcoa Corporation

ANCHOR QEA

Date: 01/23/2017

Figure 3.6-2

\\orcas\GIS\Jobs\Alcoa_0002\Lavaca_Bay\Maps\RAAER\LavacaBayTissueResults.mxd jsfox 1/23/2017 11:28:17 AM





Red Drum Stations

0 1,000 2,000 Feet

NOTES:
Total mercury (Hg) results are shown in ug/g wet weight

2016 RAAER

Average Red Drum Total Hg 2010-2016

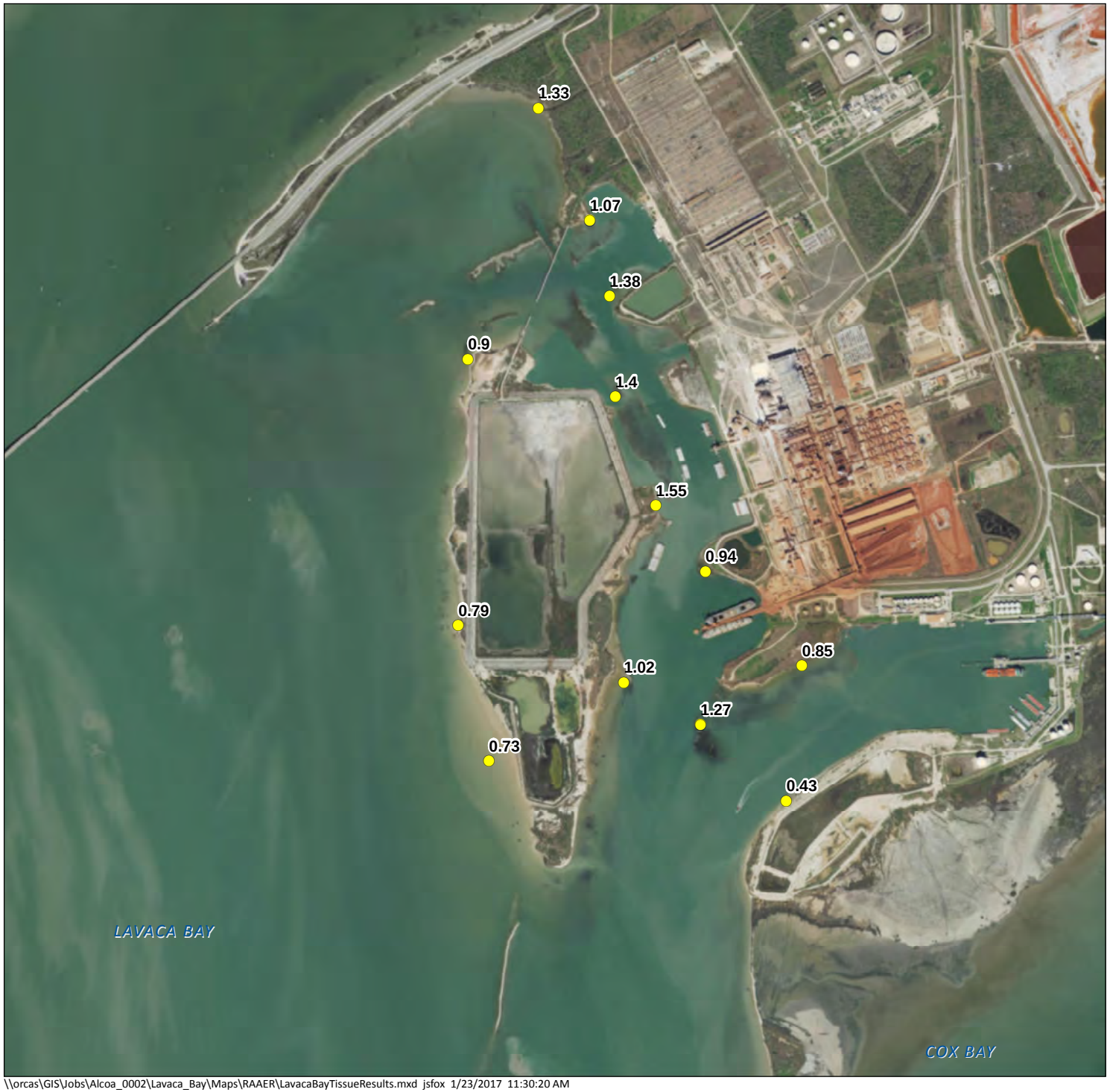
Prepared for Alcoa Corporation

ANCHOR QEA

Date: 01/23/2017

Figure 3.6-3

\\orcas\GIS\Jobs\Alcoa_0002\Lavaca_Bay\Maps\RAAER\LavacaBayTissueResults.mxd jsfox 1/23/2017 11:29:39 AM





Red Drum Stations

0 1,000 2,000 Feet

NOTES:
Total mercury (Hg) results are shown in ug/g wet weight

2016 RAAER

Average Red Drum Total Hg 2002-2016

Prepared for Alcoa Corporation

ANCHOR QEA

Date: 01/23/2017

Figure 3.6-4

\\orcas\GIS\Jobs\Alcoa_0002\Lavaca_Bay\Maps\RAAER\LavacaBayTissueResults.mxd jsfox 1/23/2017 11:30:20 AM

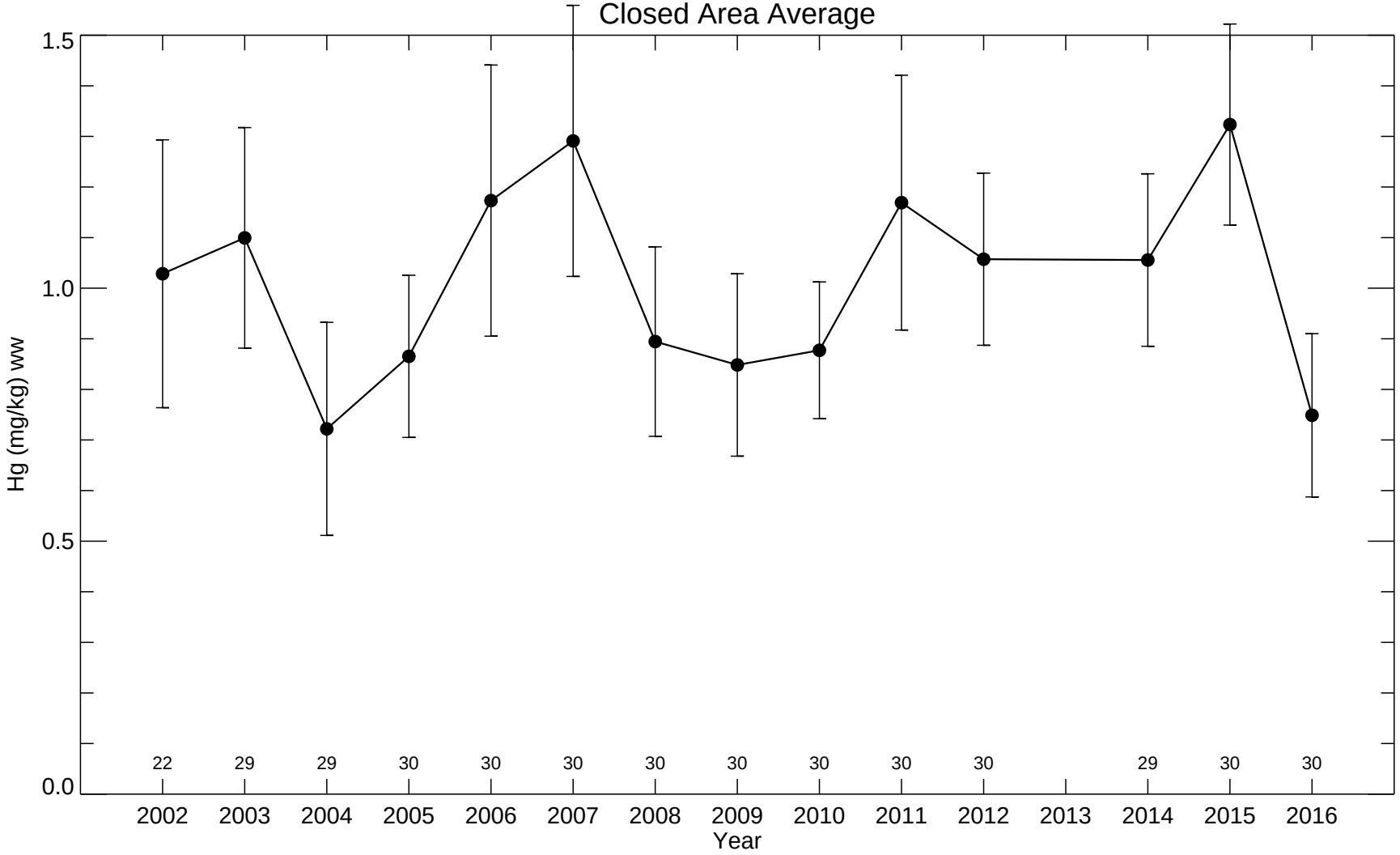


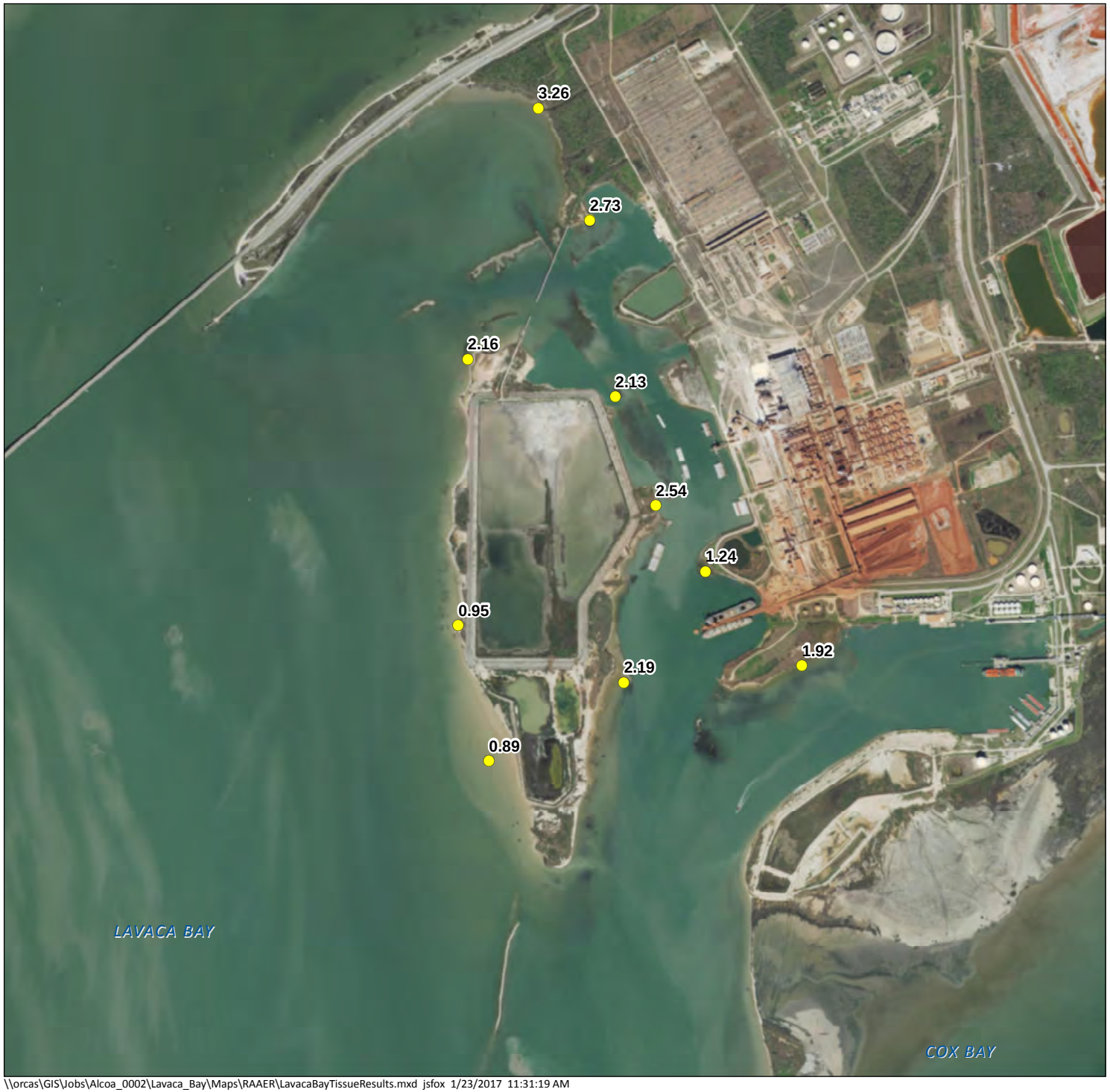
Figure 3.6-5

Lavaca Bay Red Drum Mercury Concentrations in Closed Area

Notes: Values at bottom of panel represent number of samples. One 3.65 mg/kg outlier in 2014 removed.
Error bars represent 2 standard errors
Prepared for Alcoa Corporation

ANCHOR QEA

sm - \\iris\woodcliff\Projects\ALCOA\Lavaca_Bay\Analysis\Hg_Trends\tissue_temporals.pro
Wed Jan 18 10:45:25 2017





Red Drum Stations

0 1,000 2,000 Feet

NOTES:
Total mercury (Hg) results are shown in ug/g wet weight

2016 RAAER

Ratio of Closed Area Red Drum Station 2016 Average to Average in Adjacent Open Area

Prepared for Alcoa Corporation

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Date: 01/23/2017

Figure 3.6-6

\\orcas\GIS\Jobs\Alcoa_0002\Lavaca_Bay\Maps\RAAER\LavacaBayTissueResults.mxd jsfox 1/23/2017 11:31:19 AM

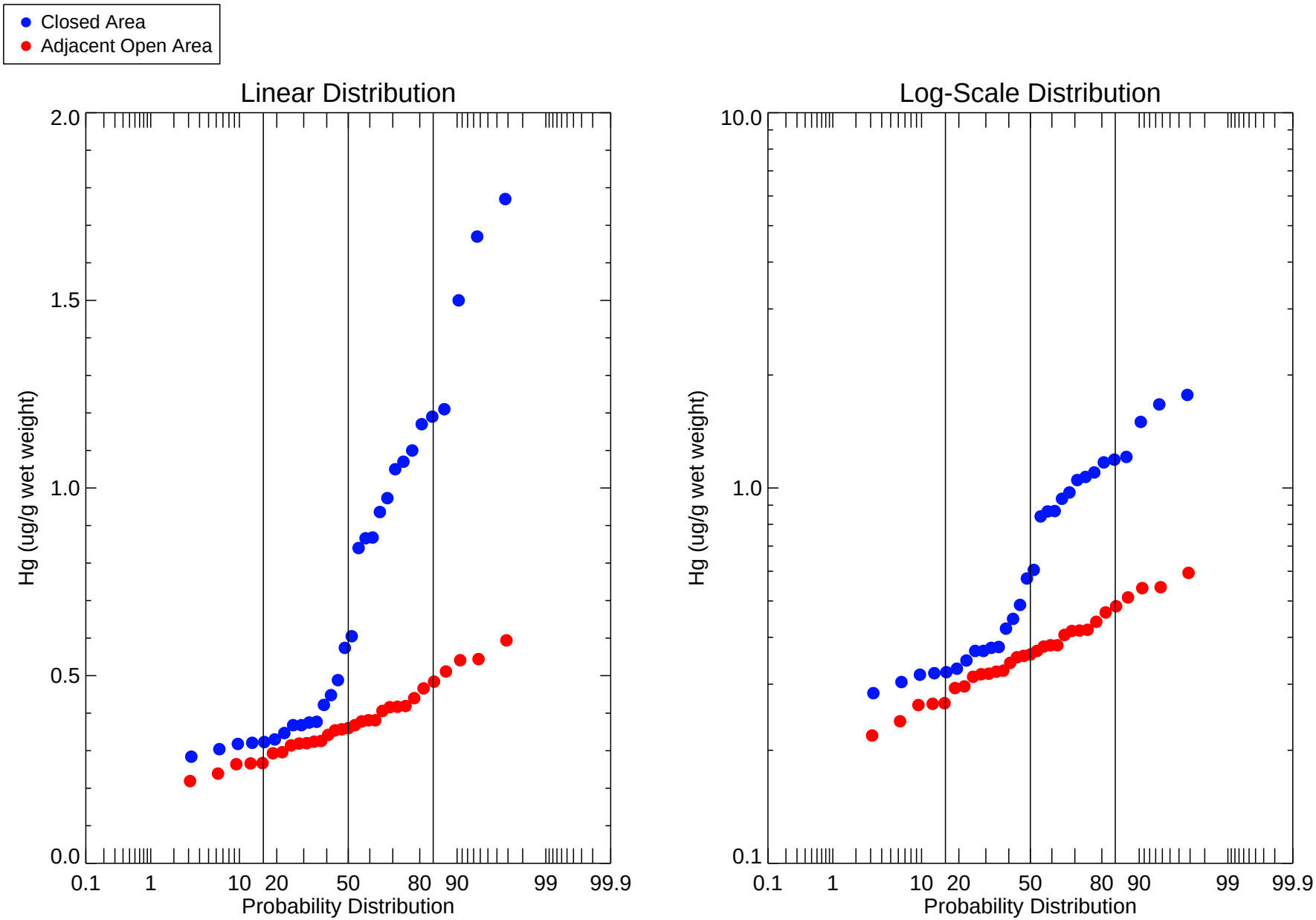


Figure 3.6-7

Lavaca Bay 2016 Red Drum Mercury Distributions

Prepared for Alcoa Corporation

ANCHOR QEA

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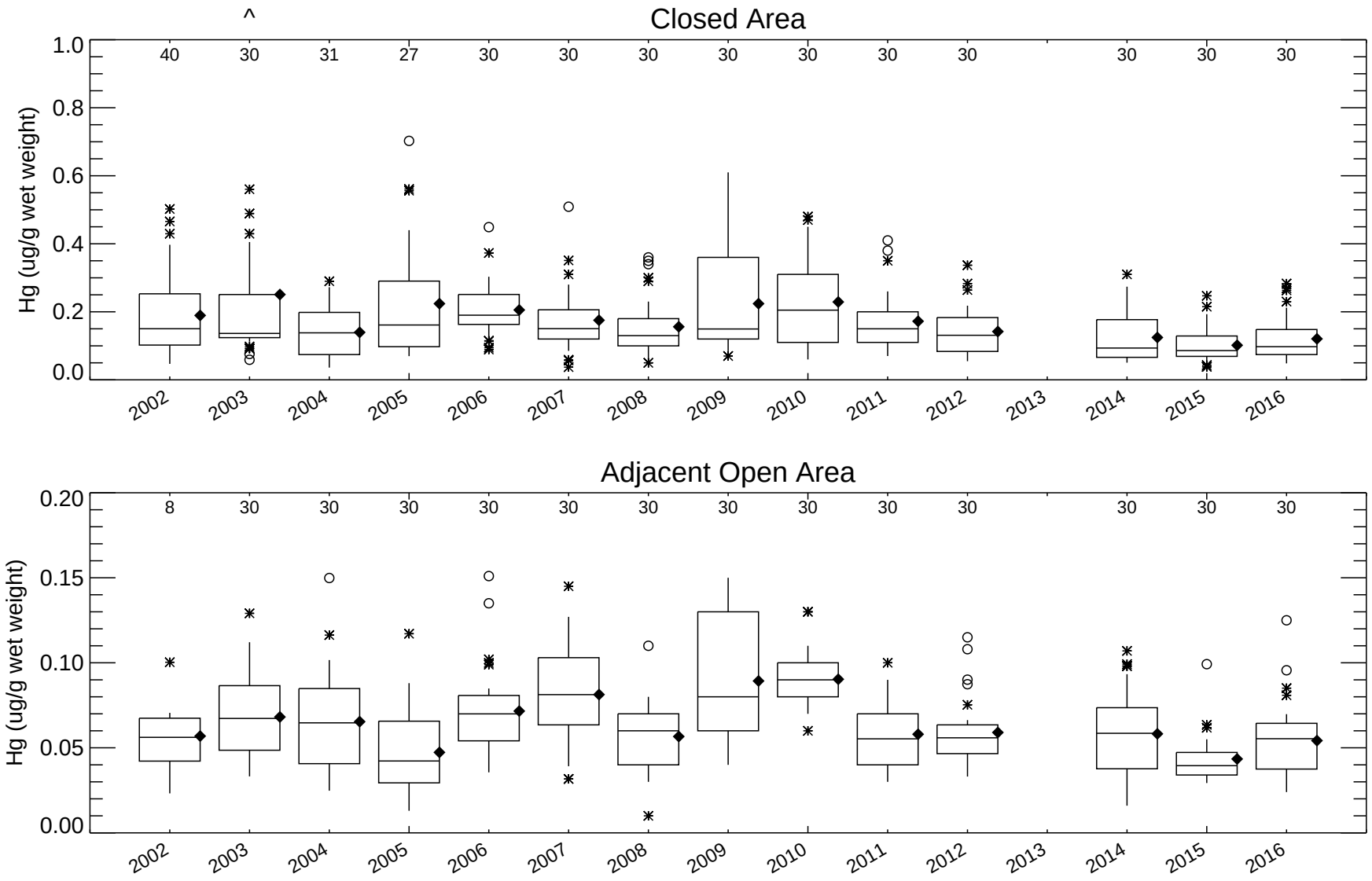


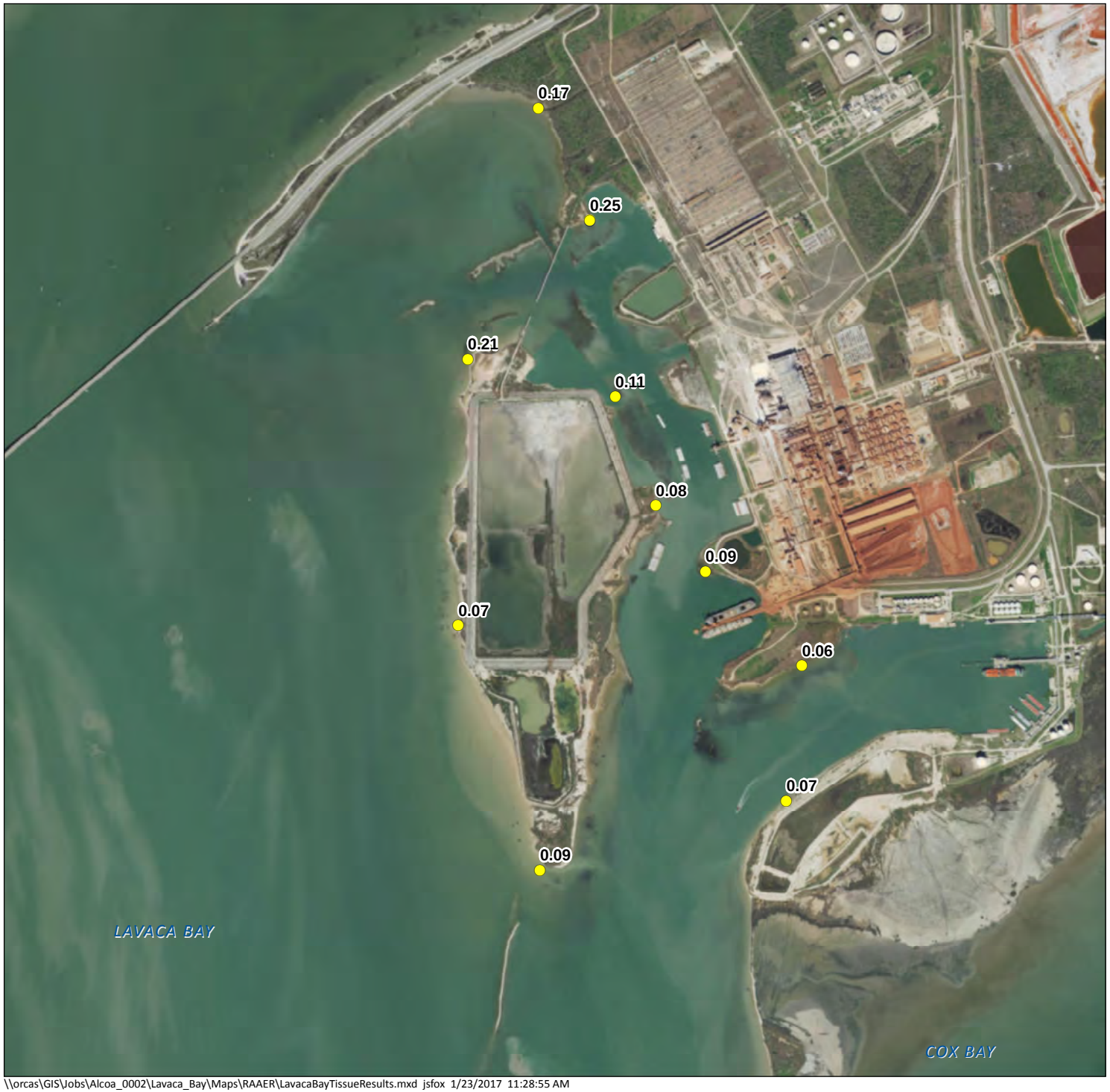
Figure 3.6-8

Lavaca Bay Juvenile Blue Crab Mercury Concentrations by Year, 2002-2016

Prepared for Alcoa Corporation

ANCHOR QEA

CF - \\austin2\Austin\D_drive\Projects\Alcoa\Lavaca_Bay\Analysis\Hg_Trends\tissue_trend_analysis_boxplots_w2016data.pro
Mon Mar 06 11:24:05 2017





Juvenile Blue Crab Stations (2016)

0 1,000 2,000 Feet

NOTES:
Total mercury (Hg) results are shown in ug/g wet weight

2016 RAAER

Closed Area Average Juvenile Blue Crab Total Hg (2016)

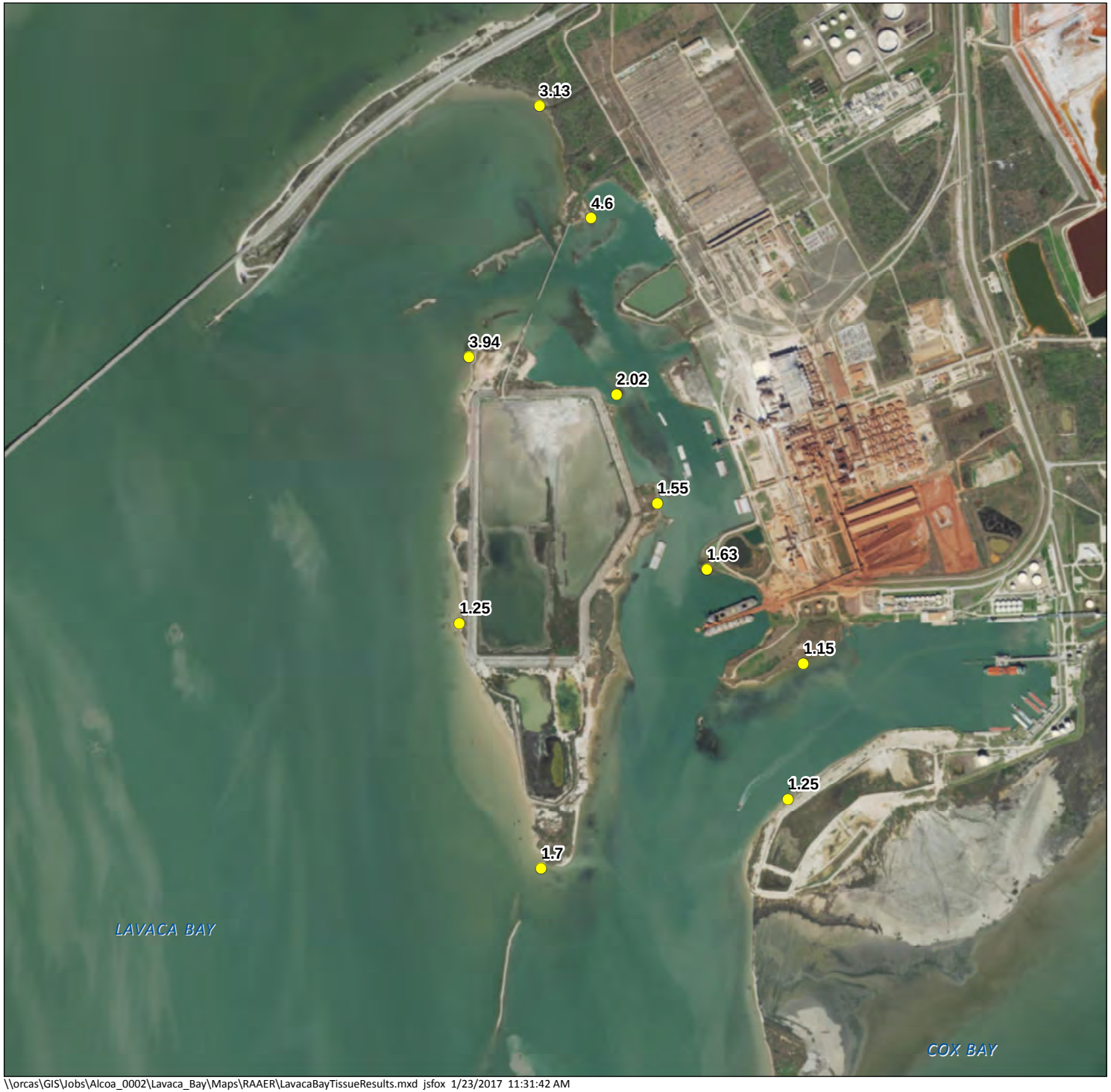
Prepared for Alcoa Corporation

ANCHOR QEA

Date: 01/23/2017

Figure 3.6-9

\\orcas\GIS\Jobs\Alcoa_0002\Lavaca_Bay\Maps\RAAER\LavacaBayTissueResults.mxd jsfox 1/23/2017 11:28:55 AM





Juvenile Blue Crab Stations

0 1,000 2,000 Feet

NOTES:
Total mercury (Hg) results are shown in ug/g wet weight

2016 RAAER

Ratio of Closed Area Juvenile Blue Crab Station 2016 Average to Average in Adjacent Open Area

Prepared for Alcoa Corporation

ANCHOR QEA

Date: 01/23/2017

Figure 3.6-10

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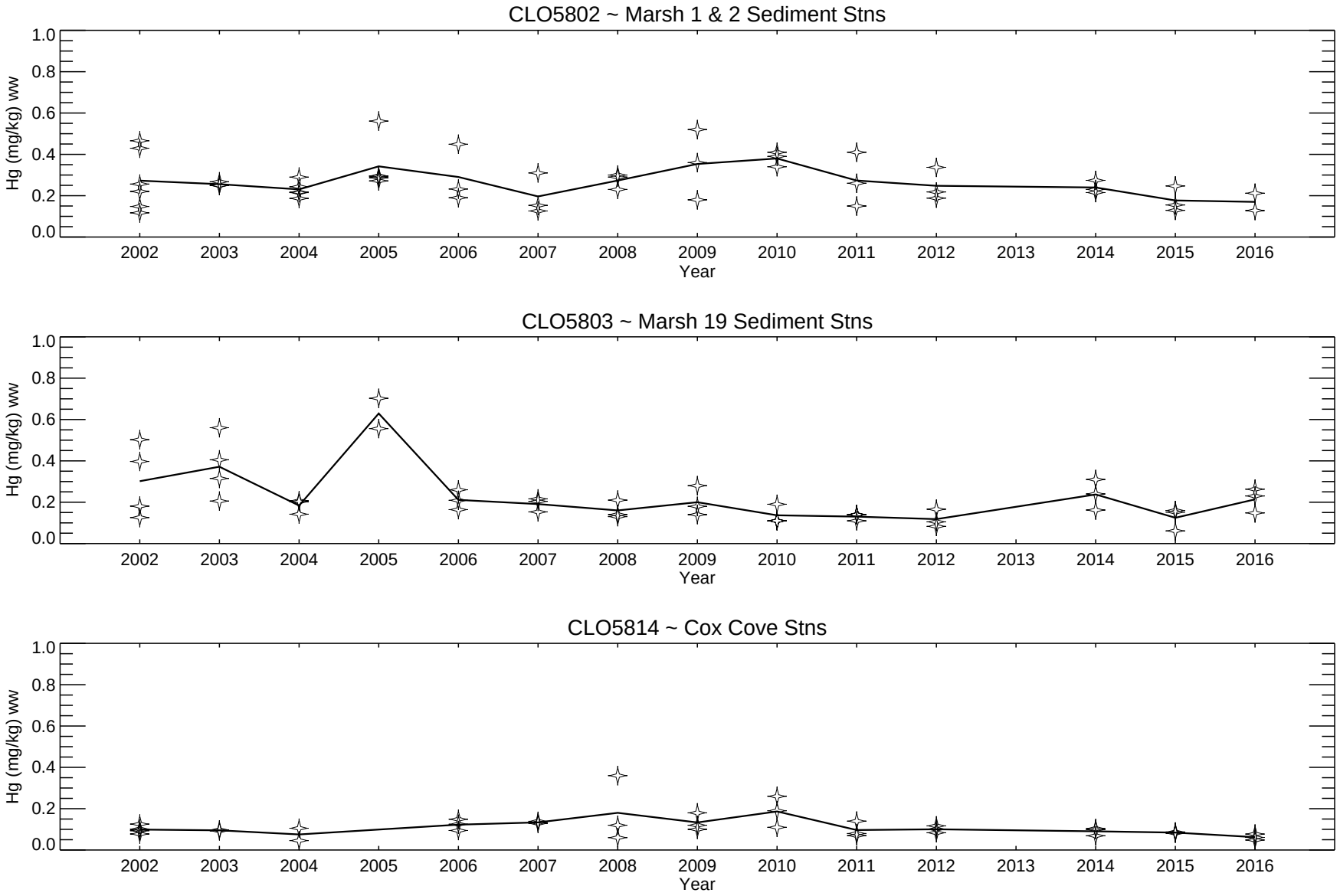


Figure 3.6-11a

Closed Area Blue Crab Mercury Trends by Station

Notes: Average sample concentration plotted as straight line underlying individual sample concentrations.
Prepared for Alcoa Corporation

ANCHOR QEA

CF - \\iris\Woodcliff\Projects\ALCOA\Lavaca_Bay\Analysis\Hg_Trends\bluecrab_temporals_wnewdata.pro
Mon Mar 06 11:29:08 2017

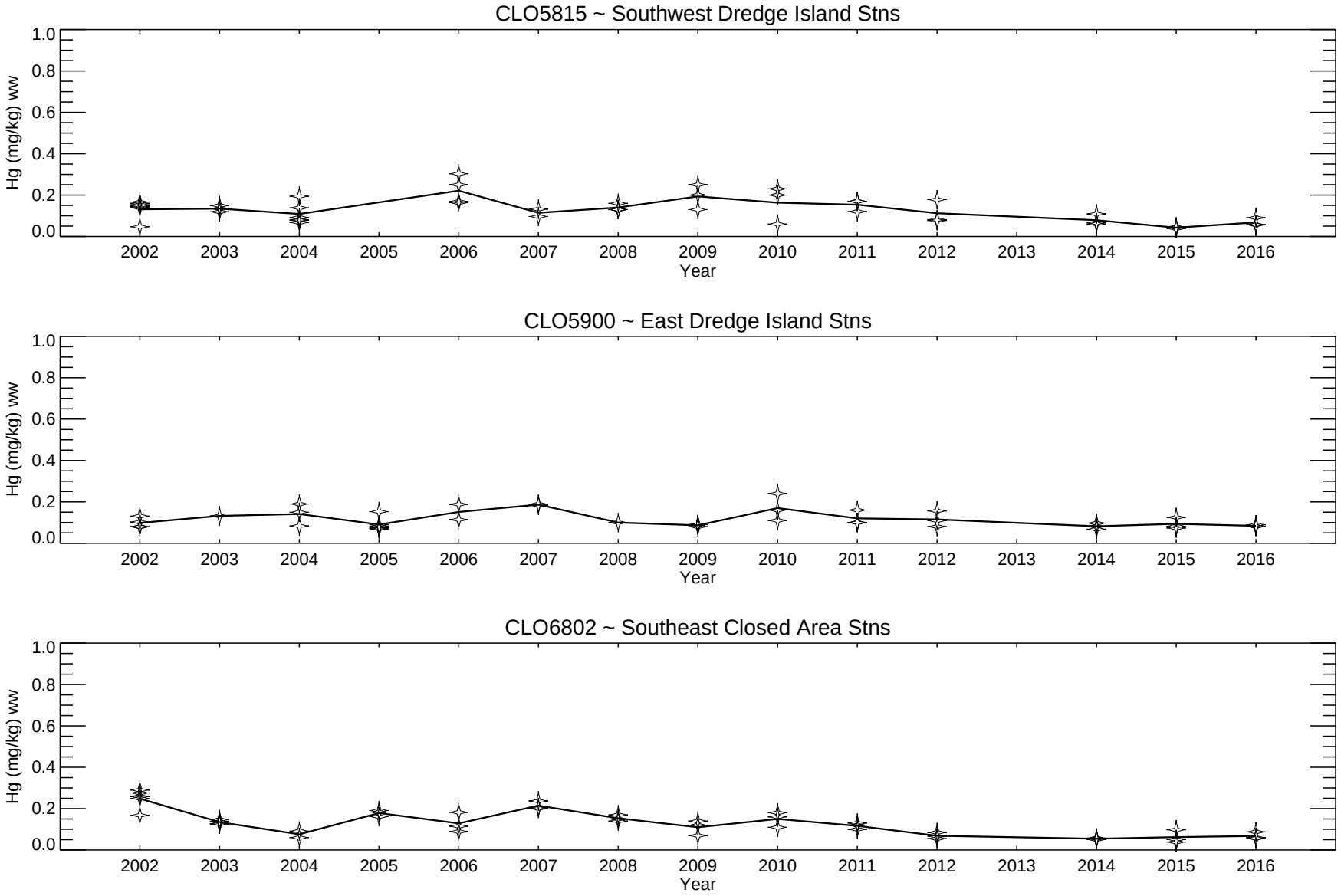


Figure 3.6-11b

Closed Area Blue Crab Mercury Trends by Station

Notes: Average sample concentration plotted as straight line underlying individual sample concentrations.
Prepared for Alcoa Corporation

ANCHOR QEA

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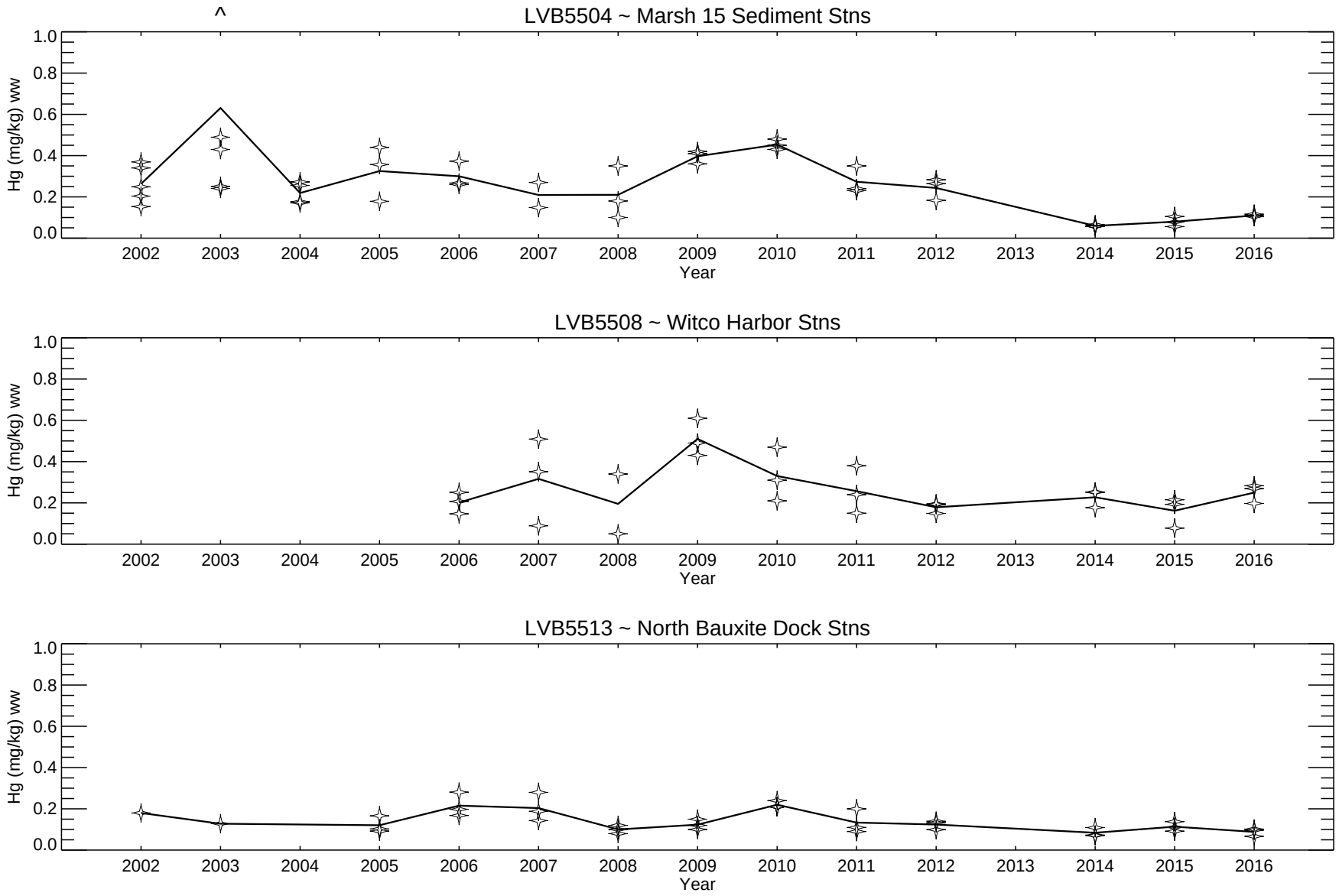


Figure 3.6-11c

Closed Area Blue Crab Mercury Trends by Station

Notes: Average sample concentration plotted as straight line underlying individual sample concentrations.
Prepared for Alcoa Corporation

ANCHOR QEA

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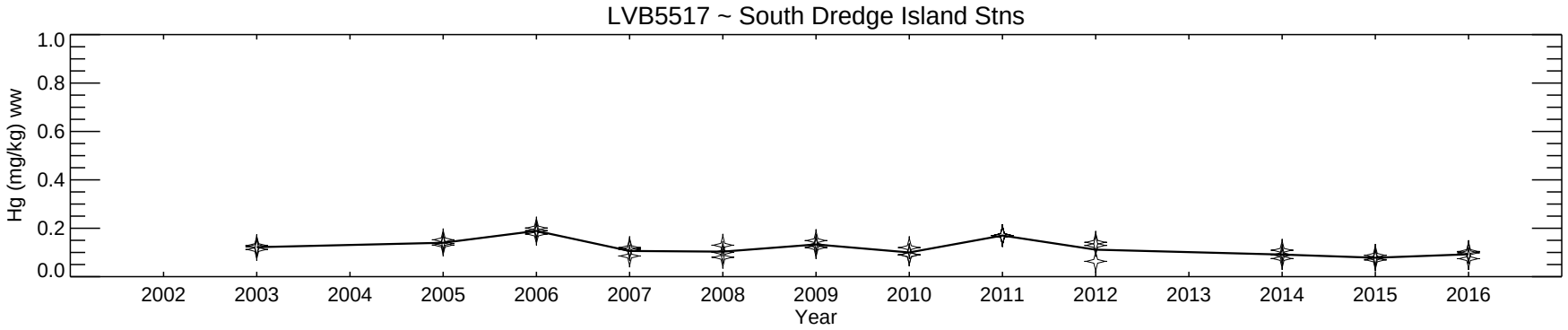


Figure 3.6-11d

Closed Area Blue Crab Mercury Trends by Station

Notes: Average sample concentration plotted as straight line underlying individual sample concentrations.
Prepared for Alcoa Corporation

ANCHOR QEA

CF - \\iris\Woodcliff\Projects\ALCOA\Lavaca_Bay\Analysis\Hg_Trends\bluecrab_temporals_wnewdata.pro
Mon Mar 06 11:29:08 2017





Sample Locations

2016 Total Hg Results

(mg/kg-dry wt)

- 0.10 - 0.29
- 0.3 - 0.49
- 0.5 - 0.69
- 0.7 - 0.89

0 200 400 Feet

NOTES:
Inverse distance weighted (IDW) interpolation of the total Hg results from the 2016 sampling event.

2016 RAAER

Eastern Causeway Cove 2016 Surface Sediment Total Mercury Interpolation

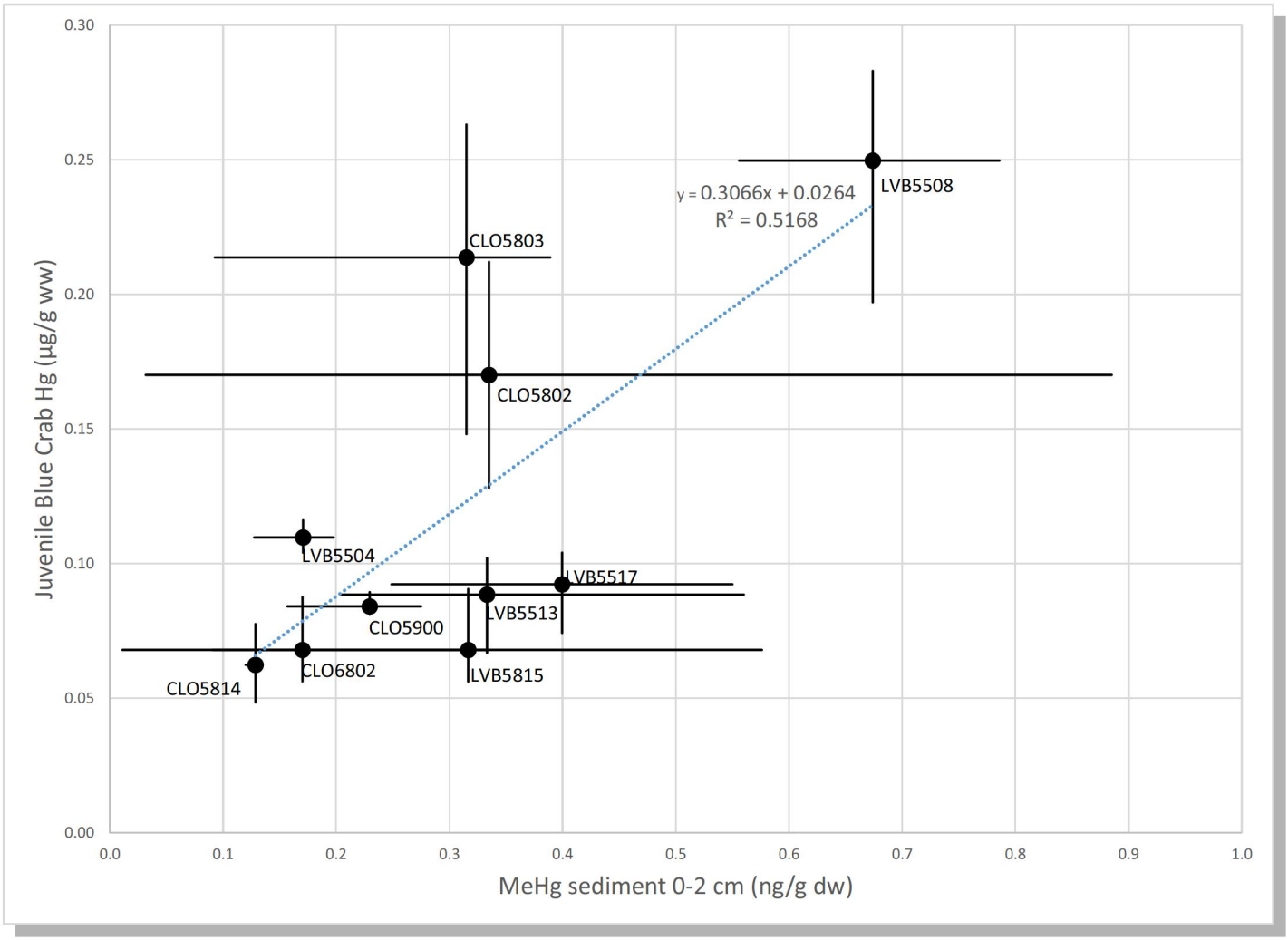
Prepared for Alcoa Corporation

ANCHOR QEA

Date: 01/30/2017

Figure 4.1-1

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NOTES:

1. Sediment data are reported in Appendix C-2.
2. Tissue data are reported in Appendix D-1.
3. Locations of sampling stations shown on Figure 3 of Appendix D-1.
4. Error bars represent maximum and minimum values at each location.

ALCOA
POINT COMFORT OPERATIONS

FIGURE 4.1-2

RELATIONSHIP OF MERCURY IN JUVENILE BLUE CRAB TO MEHG IN COLLOCATED MARSH SEDIMENT SAMPLES, FALL 2016

PROJECT: 114-021858	DATE: 3/3/2017	
REV: 0	BY: AAM	CHECKED: JCM

TETRA TECH
complex world, clear solutions

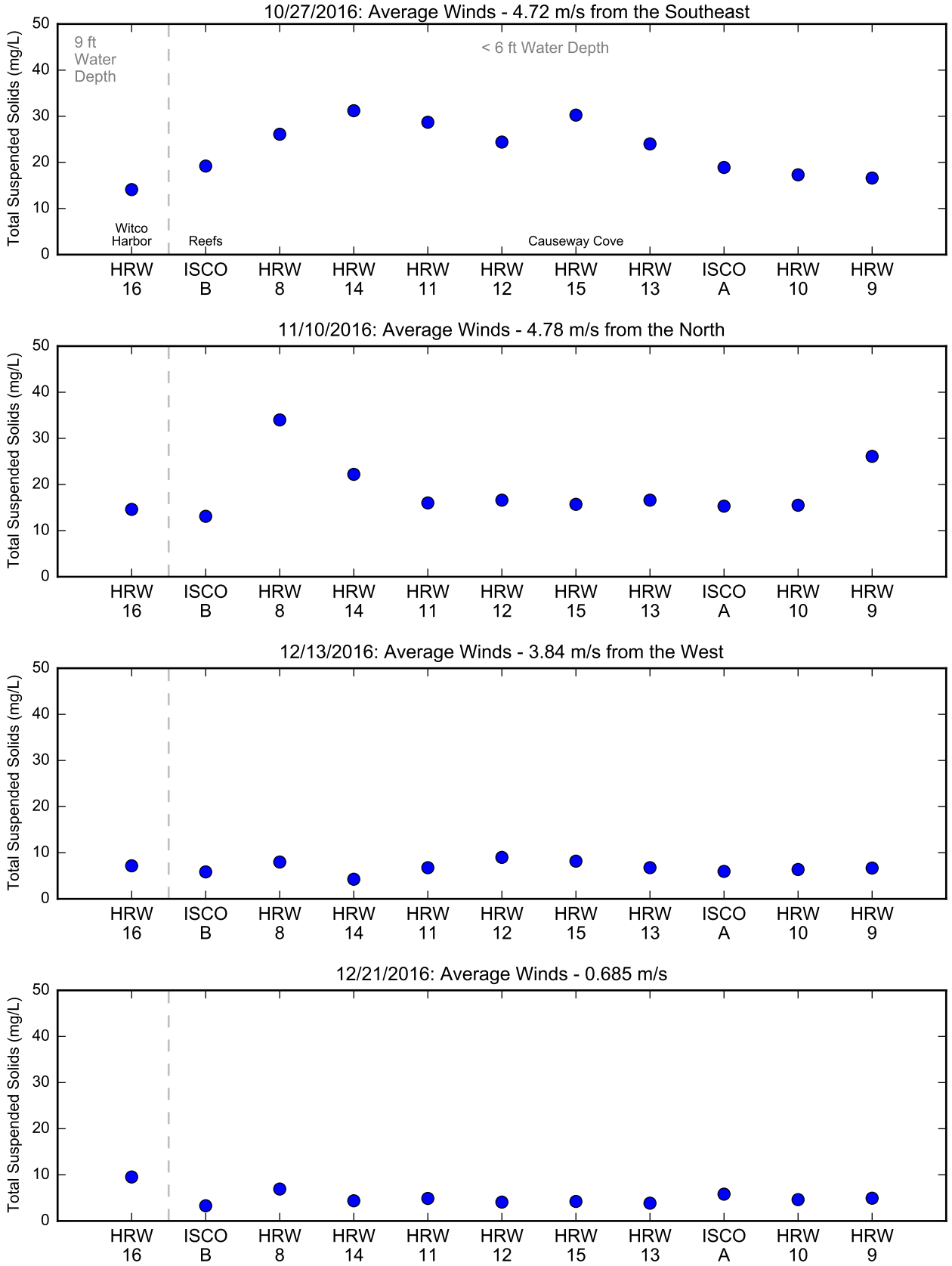


Figure 4.2-1

Fall 2016 Sampling Event TSS Concentrations

Notes: Wind data from NOAA Port Lavaca weather station when available.
Wind data from PKV weather station for days without NOAA data.
Prepared for Alcoa Corporation

ANCHOR QEA

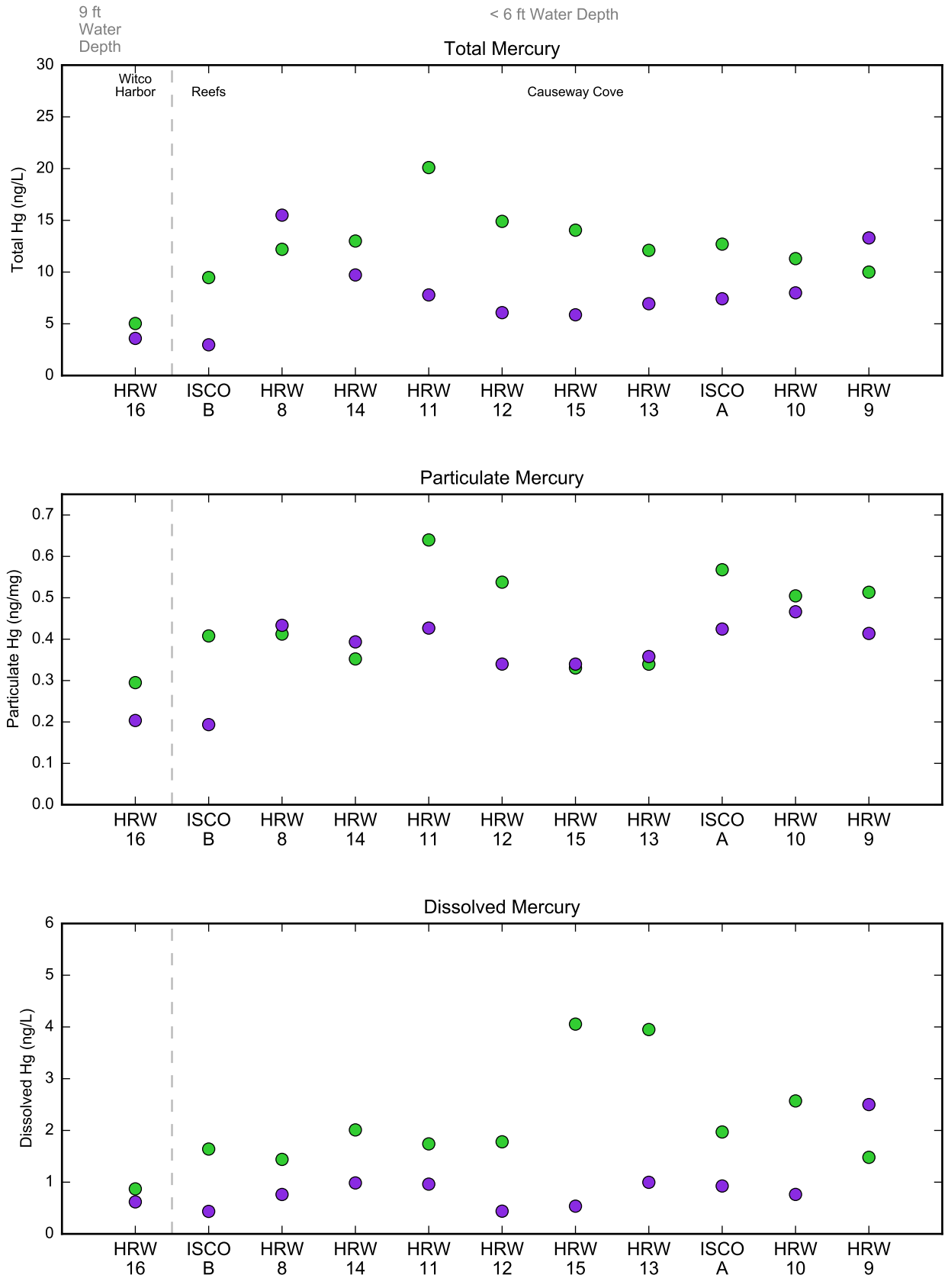


Figure 4.2-2a

Fall 2016 Events 1 and 2 Mercury Concentrations

Notes: Wind data from NOAA Port Lavaca weather station when available.
Wind data from PKV weather station for days without NOAA data.
Prepared for Alcoa Corporation

ANCHOR QEA

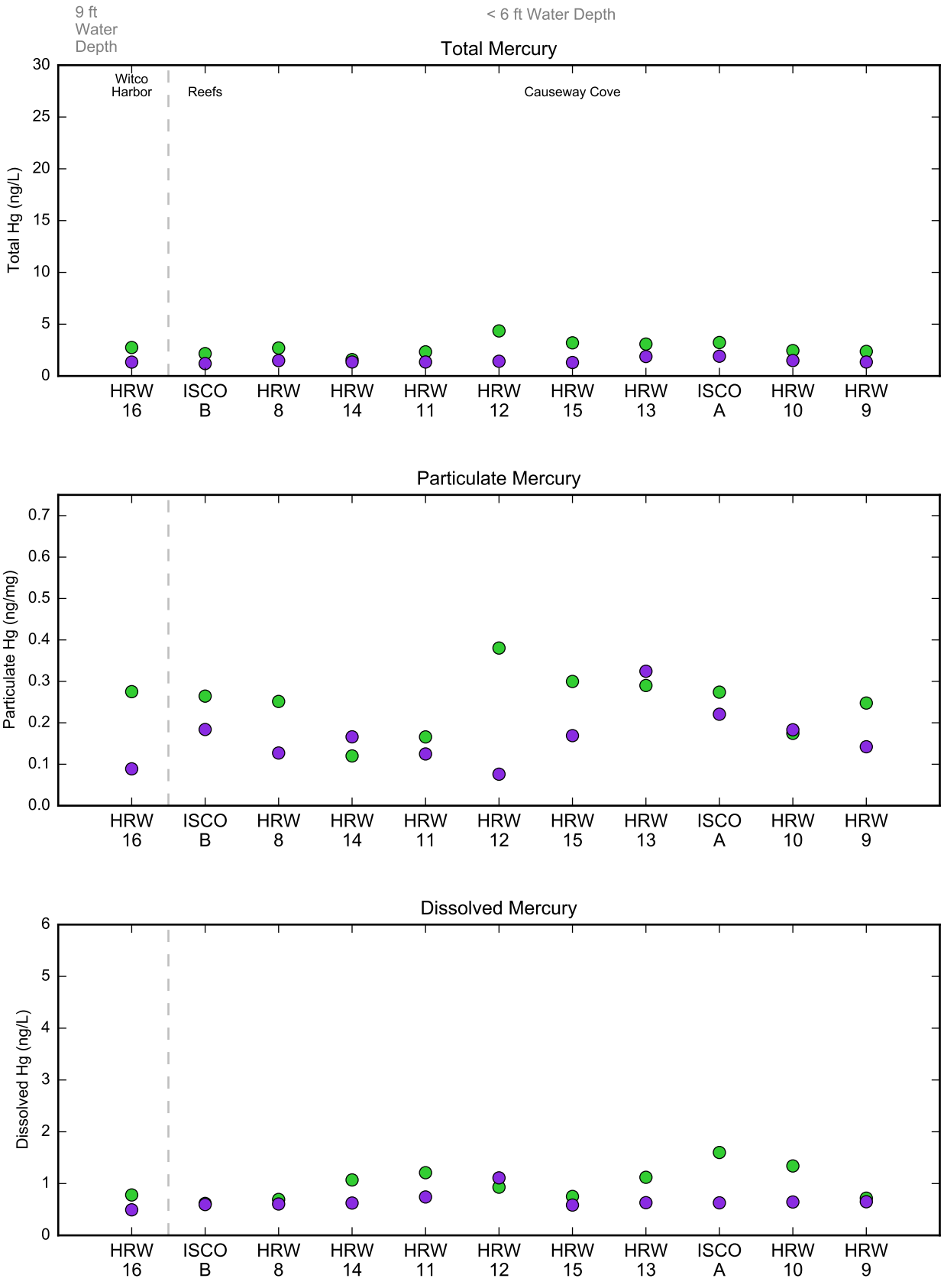


Figure 4.2-2b

Fall 2016 Events 3 and 4 Mercury Concentrations

Notes: Wind data from NOAA Port Lavaca weather station when available.
Wind data from PKV weather station for days without NOAA data.
Prepared for Alcoa Corporation

ANCHOR QEA

CF - \\austin2\austin\D_drive\Projects\Alcoa\Lavaca_Bay\Analysis\RAAER_2016\CC_Wind\3Panel_Spatial_Comparison.py 1/30/2017 17:20:15

APPENDIX A
CAPA GROUNDWATER AND SURFACE WATER DATA

Table 1
CAPA Groundwater Treatment System
Analytical Results
Treatment System Effluent

Sample Tap	Date	Analytical Results (mg/L)[1,2]																		pH	Comments
		Mercury			Carbon Tetrachloride			Chloroform			Methylene Chloride			Tetrachloroethene			Trichloroethene				
		Q[3]	Result	Flag[4]	Q	Result	Flag	Q	Result	Flag	Q	Result	Flag	Q	Result	Flag	Q	Result	Flag		
Treated Groundwater Discharge Standards (mg/L)[5]			**0.01**			**0.38**			**0.325**			**NA[6]**			**0.164**			**NA**		**6.0 - 9.0**	
ST-C[7]	5/18/98		0.0019		<	0.001		<	0.001		<	0.001		<	0.001		<	0.001			
	5/29/98		0.00035		<	0.001		<	0.001		<	0.002		<	0.001		<	0.001			
	6/4/98		0.00021		<	0.001		<	0.001		<	0.002		<	0.001		<	0.001			
	6/9/98																			7.00	
	6/10/98		0.00041		<	0.001		<	0.001		<	0.002		<	0.001		<	0.001			
	6/18/98		0.00021		<	0.001		<	0.001		<	0.002		<	0.001		<	0.001			
	6/24/98		0.00027		<	0.001		<	0.001		<	0.002		<	0.001		<	0.001			
	7/1/98		0.00017			0.00041	J	<	0.001		<	0.002		<	0.001		<	0.001			
	7/1/98		0.0009																		Duplicate
	7/2/98																			5.17	
	7/8/98		0.00016		<	0.001		<	0.001		<	0.002		<	0.001		<	0.001		5.20	
	7/15/98		0.00018		<	0.001		<	0.001		<	0.002		<	0.001		<	0.001		6.00	
	7/22/98		0.00027		<	0.001		<	0.001		<	0.002		<	0.001		<	0.001			
	7/28/98		0.00042		<	0.001		<	0.001		<	0.002		<	0.001		<	0.001		6.45	
	8/5/98		0.00047		<	0.001		<	0.001		<	0.002		<	0.001		<	0.001		6.42	
	8/12/98		0.00042		<	0.001		<	0.001		<	0.002		<	0.001		<	0.001		6.52	
	8/19/98		0.00075		<	0.001		<	0.001		<	0.002		<	0.001		<	0.001			
	8/25/98		0.00052		<	0.001		<	0.001		<	0.002		<	0.001		<	0.001		6.86	
	9/2/98		-0.0007	J	<	0.001		<	0.001		<	0.002		<	0.001		<	0.001		6.73	
	9/9/98		0.00027	J	<	0.001		<	0.001		<	0.002		<	0.001		<	0.001		6.82	
	9/16/98		0.0010		<	0.001		<	0.001		<	0.002		<	0.001		<	0.001			
	9/23/98		0.0010		<	0.001		<	0.001		<	0.002		<	0.001		<	0.001		7.10	
	10/1/98		0.00076		<	0.001		<	0.001		<	0.002		<	0.001		<	0.001			
	10/7/98		0.00090		<	0.001		<	0.001		<	0.002		<	0.001		<	0.001		7.12	
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	10/28/98		0.00050		<	0.001		<	0.001		<	0.002		<	0.001		<	0.001		6.31	
	11/4/98		0.00053		<	0.001		<	0.001		<	0.002		<	0.001		<	0.001		6.41	
	11/11/98		0.00007		<	0.001		<	0.001		<	0.002		<	0.001		<	0.001		6.45	
	11/18/98		0.00045		<	0.001		<	0.001		<	0.002		<	0.001		<	0.001		6.56	
	11/24/98		0.00012	J	<	0.001		<	0.001		<	0.002		<	0.001		<	0.001		6.51	
	12/2/98		0.00034		<	0.001		<	0.001		<	0.002		<	0.001		<	0.001		6.64	
	12/9/98		0.00038		<	0.001		<	0.001		<	0.002		<	0.001		<	0.001		6.85	
	12/16/98		0.00070		<	0.001		<	0.001		<	0.002		<	0.001		<	0.001		6.89	
	12/22/98		0.0010		<	0.001		<	0.001		<	0.002		<	0.001		<	0.001		6.92	
	12/29/98		0.0008			0.00028	J	<	0.001		<	0.002		<	0.001		<	0.001		5.53	
	1/6/99		0.00073		<	0.001		<	0.001		<	0.002		<	0.001		<	0.001		6.03	
	1/13/99		0.00033	J	<	0.001		<	0.001			0.00008	J	<	0.001		<	0.001		5.74	
	1/20/99																				
	1/26/99		0.00048		<	0.001		<	0.001		<	0.002		<	0.001		<	0.001		5.70	
	2/3/99		0.00058		<	0.001		<	0.001			0.001	J		0.00029	J	<	0.001		7.08	
	2/17/99		0.00078	J	<	0.001		<	0.001			0.0012	J		0.00036	J	<	0.001		7.13	
	2/24/99		0.00128		<	0.001		<	0.001			0.0019	J		0.00037	J	<	0.001		6.63	
	3/5/99		0.00159		<	0.001		<	0.001			0.0018	J		0.00036	J	<	0.001		6.65	
	3/10/99		0.00116		<	0.001		<	0.001			0.0017	J	<	0.001		<	0.001		6.68	
	3/17/99		0.00064		<	0.001		<	0.001		<	0.002		<	0.001		<	0.001		7.08	
	3/24/99		0.00002	J	<	0.001		<	0.001			0.0016	J		0.000042	J	<	0.001		7.06	
	4/1/99		0.00023	J	<	0.001			0.00027	J		0.0022			0.00014	J	<	0.001		6.96	
	4/6/99		0.00020	J	<	0.001		<	0.001			0.0019	J	<	0.001		<	0.001		6.87	
	4/13/99		0.00070	J	<	0.001			0.00075	J		0.002	J	<	0.001		<	0.001		6.98	
	4/21/99		0.00120		<	0.001			0.00104			0.0018	J	<	0.001		<	0.001		6.98	
	4/28/99		0.00110		<	0.001			0.00224		<	0.002			0.00037	J	<	0.001		6.97	
	5/5/99		0.00066		<	0.001			0.00363		<	0.002			0.00029	J	<	0.001		7.00	
	5/12/99		0.00143			0.00065	J		0.00644		<	0.002		<	0.001		<	0.001		7.15	
	5/19/99		0.00169			0.00039	J		0.00482			0.00076	J	<	0.001		<	0.001		6.82	
	5/26/99		0.00135			0.00131			0.00884			0.00051	J	<	0.001		<	0.001		7.25	
	6/2/99		0.00201			0.00261			0.01224			0.00046	J	<	0.001		<	0.001		6.93	
	6/9/99		0.00181			0.00915			0.01922			0.000302	J	<	0.001		<	0.001		7.02	
	6/16/99		0.00148			0.01192			0.02667			0.00022	J	<	0.001		<	0.001		6.92	

Table 1
CAPA Groundwater Treatment System
Analytical Results
Treatment System Effluent

Sample Tap	Date	Analytical Results (mg/L)[1,2]																		pH	Comments
		Mercury			Carbon Tetrachloride			Chloroform			Methylene Chloride			Tetrachloroethene			Trichloroethene				
		Q[3]	Result	Flag[4]	Q	Result	Flag	Q	Result	Flag	Q	Result	Flag	Q	Result	Flag	Q	Result	Flag		
Treated Groundwater Discharge Standards (mg/L)[5]			**0.01**			**0.38**			**0.325**			**NA[6]**			**0.164**			**NA**		**6.0 - 9.0**	
ST-C	6/23/99		0.00228			0.0214			0.03472			0.000117	J	<	0.001		<	0.001		7.23	
Continued	6/30/99		0.00076			0.01999			0.03766		<	0.002		<	0.001		<	0.001		6.68	
	7/14/99																			7.04	
ST-A	7/22/99																			7.82	Carbon change out
	7/28/99																			7.82	
	8/4/99																			7.23	
	8/11/99																			7.51	
	8/18/99																			6.92	
	8/25/99		0.00086			0.004364			0.000146	J	<	0.002		<	0.001		<	0.001		6.94	
	9/1/99		0.00014	J		0.00486		<	0.001		<	0.002		<	0.001		<	0.001		6.95	
	9/8/99		0.000425	J		0.003008		<	0.001		<	0.002		<	0.001		<	0.001		7.21	
	9/15/99		0.00043	J		0.002892			0.000185	J	<	0.002		<	0.001		<	0.001		7.06	
	9/22/99		0.00089			0.002616			0.000152	J	<	0.002		<	0.001		<	0.001		7.21	
	9/29/99		0.00006	J		0.003224		<	0.001		<	0.002		<	0.001		<	0.001		7.27	
	10/6/99		0.00018	J		0.002757			0.000408		<	0.002		<	0.001		<	0.001		7.49	
	10/13/99		0.00021	J		0.00291			0.000788	J	<	0.002		<	0.001		<	0.001		7.36	
	10/20/99		0.00059			0.00136			0.001111		<	0.002		<	0.001		<	0.001		7.28	
	10/27/99		0.00033	J		0.003327			0.00275		<	0.002		<	0.001		<	0.001		7.22	
	11/3/99		0.00002	J		0.003567			0.004421		<	0.002		<	0.001		<	0.001		7.61	
	11/10/99		0.00118	J		0.003112			0.00622		<	0.002		<	0.001		<	0.001		7.50	
	11/17/99		0.00089	J		0.004599			0.009552		<	0.002		<	0.001		<	0.001		7.65	
	11/23/99		0.00062	J		0.007814			0.012587		<	0.002		<	0.001		<	0.001		7.22	
	12/2/99		0.00072	J		0.012289			0.016635		<	0.002		<	0.001		<	0.001		7.14	
	12/8/99		0.00072	J		0.011109			0.017479		<	0.002		<	0.001		<	0.001		7.33	
	12/15/99		0.00041	J		0.014068			0.013601		<	0.002		<	0.001		<	0.001		7.37	
	12/22/99		0.00040	J		0.01353			0.013122		<	0.002		<	0.001		<	0.001		7.40	
	12/29/99		0.00013	J		0.010233			0.016454		<	0.002		<	0.001		<	0.001		7.00	
	1/5/00		0.00074	J		0.021707			0.025836		<	0.002		<	0.001		<	0.001		7.41	
	1/12/00		0.00011	J		0.035346			0.036077		<	0.002		<	0.001		<	0.001		7.38	
	1/19/00		0.00061	J		0.062926			0.048082		<	0.002		<	0.001		<	0.001		7.06	
	1/26/00		0.00044	J		0.07067			0.042044		<	0.002		<	0.001		<	0.001		6.86	
	2/2/00		0.00010	J		0.115509			0.052529		<	0.002		<	0.001		<	0.001		6.82	
	2/9/00		0.00014	J		0.155503			0.059467		<	0.002		<	0.001		<	0.001		7.01	
	2/16/00		0.00016	J		0.177621			0.060686		<	0.002		<	0.001		<	0.001		6.80	
	2/24/00		0.00097			0.00194		<	0.001		<	0.002		<	0.001		<	0.001		7.66	
ST-B	3/3/00		0.00026	J	<	0.001		<	0.001		<	0.002		<	0.001		<	0.001		8.90	Carbon change out
	3/9/00		0.00011	J	<	0.001		<	0.001		<	0.002		<	0.001		<	0.001		7.20	
	3/15/00		0.00034	J	<	0.001		<	0.001		<	0.002		<	0.001		<	0.001		7.70	
	3/22/00		0.00002	J	<	0.001		<	0.001		<	0.002		<	0.001		<	0.001		7.10	
	3/29/00		0.00030	J	<	0.001		<	0.001		<	0.002		<	0.001		<	0.001		7.05	
	4/4/00		0.00030		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		6.58	
	4/12/00		0.00060			0.008		<	0.001		<	0.005		<	0.001		<	0.001		7.10	
	4/19/00	<	0.00020		<	0.001		<	0.001		<	0.005			0.004		<	0.001		7.06	
	4/26/00	<	0.00020		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		7.60	
	5/3/00	<	0.00020		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		6.57	
	5/10/00	<	0.00040		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		6.49	
	5/17/00	<	0.00040		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		6.55	
	5/24/00		0.00110		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		6.45	
	5/31/00	<	0.00020		<	0.001			0.003		<	0.005		<	0.001		<	0.001		6.80	
	6/7/00	<	0.00020			0.01			0.005		<	0.005		<	0.001		<	0.001		6.87	
	6/14/00	<	0.00020		<	0.001			0.011		<	0.005		<	0.001		<	0.001			
	6/21/00		0.00030		<	0.001			0.019		<	0.005		<	0.001		<	0.001			
	6/29/00	<	0.00020			0.01			0.022		<	0.005		<	0.001		<	0.001			
	7/6/00		0.00020			0.013			0.029		<	0.005		<	0.001		<	0.001		6.75	
	7/12/00	<	0.00040			0.012			0.026		<	0.005		<	0.001		<	0.001		6.57	
	7/19/00	<	0.00020			0.02			0.032		<	0.005		<	0.001		<	0.001		7.05	
	7/26/00	<	0.00020			0.026			0.041		<	0.005		<	0.001		<	0.001		6.58	
	8/2/00		0.00030			0.038			0.037		<	0.005		<	0.001		<	0.001		6.35	
	8/9/00		0.00020			0.055			0.042		<	0.005		<	0.001		<	0.001			

Table 1
CAPA Groundwater Treatment System
Analytical Results
Treatment System Effluent

Sample Tap	Date	Analytical Results (mg/L)[1,2]																		pH	Comments
		Mercury			Carbon Tetrachloride			Chloroform			Methylene Chloride			Tetrachloroethene			Trichloroethene				
		Q[3]	Result	Flag[4]	Q	Result	Flag	Q	Result	Flag	Q	Result	Flag	Q	Result	Flag	Q	Result	Flag		
Treated Groundwater Discharge Standards (mg/L)[5]			**0.01**			**0.38**			**0.325**			**NA[6]**			**0.164**			**NA**		**6.0 - 9.0**	
ST-B	8/16/00		0.00030			0.07			0.05		<	0.005		<	0.001		<	0.001		6.41	
Continued	8/23/00		0.00030			0.076			0.051		<	0.005		<	0.001		<	0.001		6.80	
	8/29/00		0.00020			0.095			0.052		<	0.005		<	0.001		<	0.001		6.43	
ST-C	9/6/00		0.00580		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		8.43	Carbon change out
	9/12/00	<	0.00100		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		7.91	
	9/19/00	<	0.00020		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		8.27	
	9/27/00		0.00100		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		7.12	
	10/3/00	<	0.00020		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		6.97	
	10/11/00	<	0.00020		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		7.21	
	10/18/00		0.00020		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		6.88	
	10/25/00		0.00020		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		6.95	
	11/1/00		0.00030		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		7.13	
	11/8/00		0.00030		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		7.18	
	11/15/00		0.00020		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		7.40	
	11/21/00		0.00040		<	0.001			0.001		<	0.005		<	0.001		<	0.001		7.36	
	11/28/00		0.00040		<	0.001			0.002		<	0.005		<	0.001		<	0.001		7.01	
	12/6/00		0.00040		<	0.001			0.002		<	0.005		<	0.001		<	0.001		7.56	
	12/13/00		0.00030			0.001			0.002		<	0.005		<	0.001		<	0.001		6.98	
	12/20/00		0.00040			0.002			0.003		<	0.005		<	0.001		<	0.001		7.34	
	12/27/00		0.00030			0.003			0.004		<	0.005		<	0.001		<	0.001		7.64	
	1/3/01		0.00020			0.003			0.003		<	0.005		<	0.001		<	0.001		7.14	
	1/10/01		0.0004			0.007			0.005		<	0.005		<	0.001		<	0.001		7.20	
	1/17/01		0.0004			0.011			0.006		<	0.005		<	0.001		<	0.001		7.48	
	1/24/01		0.00030			0.014			0.007		<	0.005		<	0.001		<	0.001		7.27	
	1/30/01		0.00040			0.018			0.008		<	0.005		<	0.001		<	0.001		7.29	
	2/6/01		0.00030			0.021			0.009		<	0.005		<	0.001		<	0.001		7.30	
	2/14/01		0.00040			0.026			0.01		<	0.005		<	0.001		<	0.001		7.36	
	2/22/01		0.00030			0.032			0.011		<	0.005		<	0.001		<	0.001		7.40	
	2/28/01		0.00030			0.033			0.011		<	0.005		<	0.001		<	0.001		7.38	
	3/7/01		0.00630			0.039			0.013		<	0.005		<	0.001		<	0.001		7.48	
	3/15/01		0.00040			0.071			0.02		<	0.005		<	0.001		<	0.001		7.16	
	3/21/01		0.00040			0.087			0.023		<	0.005		<	0.001		<	0.001		6.89	
	3/28/01		0.00040			0.087			0.02		<	0.005		<	0.001		<	0.001		6.79	
	4/4/01		0.00050			0.12			0.025		<	0.005		<	0.001		<	0.001		6.54	
	4/11/01		0.00040			0.14			0.03		<	0.005		<	0.001		<	0.001		7.49	
ST-A	4/19/01	<	0.00020			0.001		<	0.001		<	0.005		<	0.001		<	0.001		8.98	Carbon change out
	4/26/01	<	0.00020			0.0001		<	0.001		<	0.005		<	0.001		<	0.001		8.71	
	5/2/01	<	0.00020		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		6.80	
	5/9/01		0.00020		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		7.08	
	5/16/01	<	0.00020		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		6.95	
	5/23/01	<	0.00020			0.001		<	0.001		<	0.005		<	0.001		<	0.001		6.90	
	5/30/01	<	0.00020			0.001		<	0.001		<	0.005		<	0.001		<	0.001		6.92	
	6/7/01	<	0.00020		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		7.05	
	6/13/01	<	0.00020			0.001		<	0.001		<	0.005		<	0.001		<	0.001		6.85	
	6/20/01	<	0.00020			0.002		<	0.001		<	0.005		<	0.001		<	0.001		7.04	
	6/27/01	<	0.00020			0.002		<	0.001		<	0.005		<	0.001		<	0.001		6.94	
	7/3/01	<	0.00020			0.001		<	0.001		<	0.005		<	0.001		<	0.001		6.96	
	7/11/01	<	0.00020			0.001		<	0.001		<	0.005		<	0.001		<	0.001		6.94	
	7/17/01	<	0.00200			0.001		<	0.001		<	0.005		<	0.001		<	0.001			
	7/25/01	<	0.00020			0.18			0.01		<	0.005		<	0.001		<	0.001		6.99	
	8/1/01	<	0.00020			0.001		<	0.001		<	0.005		<	0.001		<	0.001		7.01	
	8/9/01	<	0.00020			0.001		<	0.001		<	0.005		<	0.001		<	0.001		6.93	
	8/15/01		0.00020			0.001			0.002		<	0.005		<	0.001		<	0.001		6.80	
	8/21/01	<	0.00020			0.001			0.003		<	0.005		<	0.001		<	0.001		6.90	
	8/30/01		0.00030			0.001			0.004		<	0.005		<	0.001		<	0.001		6.96	
	9/5/01		0.00020			0.002			0.005		<	0.005		<	0.001		<	0.001		6.98	
	9/14/01	<	0.00020			0.003			0.009		<	0.005		<	0.001		<	0.001			
	9/21/01	<	0.00020			0.005			0.012		<	0.005		<	0.001		<	0.001		6.94	
	9/24/01		0.00020			0.006			0.012		<	0.005		<	0.001		<	0.001		6.98	

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Sample Tap	Date	Analytical Results (mg/L)[1,2]																		pH	Comments
		Mercury			Carbon Tetrachloride			Chloroform			Methylene Chloride			Tetrachloroethene			Trichloroethene				
		Q[3]	Result	Flag[4]	Q	Result	Flag	Q	Result	Flag	Q	Result	Flag	Q	Result	Flag	Q	Result	Flag		
Treated Groundwater Discharge Standards (mg/L)[5]			**0.01**			**0.38**			**0.325**			**NA[6]**			**0.164**			**NA**		**6.0 - 9.0**	
ST-A Continued	10/1/01	<	0.00020			0.006			0.01		<	0.005		<	0.001		<	0.001		7.01	
	10/9/01	<	0.00100			0.006			0.011		<	0.005		<	0.001		<	0.001		6.91	
	10/15/01	<	0.00100			0.008			0.011		<	0.005		<	0.001		<	0.001		6.94	
	10/22/01	<	0.00020			0.009			0.013		<	0.005		<	0.001		<	0.001		7.44	
	10/29/01		0.00050			0.014			0.013		<	0.005		<	0.001		<	0.001		7.03	
	11/5/01	<	0.00100			0.16			0.015		<	0.005		<	0.001		<	0.001		7.07	
	11/12/01	<	0.00100			0.019			0.015		<	0.005		<	0.001		<	0.001		7.51	
	11/20/01	<	0.00100			0.015			0.012		<	0.005		<	0.001		<	0.001		7.73	
	11/28/01		0.00100			0.014			0.011		<	0.005		<	0.001		<	0.001		7.30	
	12/4/01	<	0.00100			0.02			0.013		<	0.005		<	0.001		<	0.001		7.49	
	12/10/01		0.00020			0.022			0.013		<	0.005		<	0.001		<	0.001		7.44	
	12/21/01		0.00020			0.038			0.015		<	0.005		<	0.001		<	0.001		7.26	
	12/27/01		0.00030			0.046			0.015		<	0.005		<	0.001		<	0.001		7.21	
	1/2/02	<	0.00020			0.0039			0.014		<	0.005		<	0.001		<	0.001		7.20	
	1/7/02	<	0.00020			0.038			0.013		<	0.005		<	0.001		<	0.001		7.20	
	1/14/02		0.00030			0.055			0.17		<	0.005		<	0.001		<	0.001		7.14	
	1/21/02		0.00020			0.066			0.017		<	0.005		<	0.001		<	0.001		7.18	
	1/29/02		0.00030			0.066			0.017		<	0.005		<	0.001		<	0.001		7.11	
	2/4/02	<	0.00020			0.066			0.016		<	0.005		<	0.001		<	0.001		7.11	
	2/11/02	<	0.00020			0.069			0.014		<	0.005		<	0.001		<	0.001		7.15	
ST-B	2/21/02		0.07500		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		8.11	Carbon change out
	2/25/02		0.03100		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		7.69	
	3/4/02	<	0.00020		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		7.32	
	3/11/02	<	0.00020		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		7.17	
	3/18/02	<	0.00020		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		7.14	
	3/25/02	<	0.00020		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		7.07	
	4/2/02	<	0.00100		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		7.09	
	4/8/02	<	0.00100		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		7.07	
	4/15/02		0.02200		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		7.08	
	4/22/02		0.00100		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		7.11	
	4/30/02	<	0.00100		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		6.92	
	5/6/02		0.04800		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		6.98	
	5/13/02		0.14		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		7.03	
	5/20/02	<	0.0002		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		7.10	
	5/29/02	<	0.00020		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		7.14	
	6/3/02	<	0.00020		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		7.11	
	6/10/02	<	0.00020		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		7.02	
	6/18/02		0.00020		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		7.10	
	6/24/02		0.00030		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		7.07	
	7/1/02	<	0.00020		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		7.05	
	7/8/02		0.00030		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		7.13	
	7/15/02		0.00040		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		7.02	
	7/23/02		0.00020		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		7.10	
	7/29/02		0.00050		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		7.00	
	8/5/02		0.00050		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001			
	8/12/02	<	0.00020		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		8.16	
	8/19/02	<	0.00020		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		7.10	
	8/26/02		0.00030		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		7.04	
	9/3/02	<	0.00020		<	0.001			0.001		<	0.005		<	0.001		<	0.001		7.16	
	9/11/02	<	0.00020		<	0.001			0.001		<	0.005		<	0.001		<	0.001		7.04	
	9/16/02	<	0.00020		<	0.001			0.002		<	0.005		<	0.001		<	0.001		7.06	
	9/23/02	<	0.00020		<	0.001			0.003		<	0.005		<	0.001		<	0.001		6.96	
	9/30/02	<	0.00020			0.002			0.005		<	0.005		<	0.001		<	0.001		6.99	
	10/8/02	<	0.00020			0.002			0.006		<	0.005		<	0.001		<	0.001			
	10/15/02	<	0.00020			0.002			0.006		<	0.005		<	0.001		<	0.001			
	10/22/02		0.00020			0.005			0.008		<	0.005		<	0.001		<	0.001		6.77	
	10/28/02		0.00040			0.008			0.01		<	0.005		<	0.001		<	0.001		7.13	
	11/4/02		0.00060			0.009			0.011		<	0.005		<	0.001		<	0.001		7.07	
	11/13/02	<	0.00020			0.013			0.011		<	0.005		<	0.001		<	0.001		6.80	

Table 1
CAPA Groundwater Treatment System
Analytical Results
Treatment System Effluent

Sample Tap	Date	Analytical Results (mg/L)[1,2]																		pH	Comments
		Mercury			Carbon Tetrachloride			Chloroform			Methylene Chloride			Tetrachloroethene			Trichloroethene				
		Q[3]	Result	Flag[4]	Q	Result	Flag	Q	Result	Flag	Q	Result	Flag	Q	Result	Flag	Q	Result	Flag		
Treated Groundwater Discharge Standards (mg/L)[5]			**0.01**			**0.38**			**0.325**			**NA[6]**			**0.164**			**NA**		**6.0 - 9.0**	
ST-B	11/20/02		0.00030			0.017			0.011		<	0.005		<	0.001		<	0.001		6.73	
Continued	11/25/02		0.00020			0.018			0.013		<	0.005		<	0.001		<	0.001		6.91	
	12/2/02	<	0.00020			0.02			0.014		<	0.005		<	0.001		<	0.001		6.95	
	12/9/02	<	0.00020			0.027			0.014		<	0.005		<	0.001		<	0.001		7.20	
ST-C	12/16/02	<	0.00020		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		7.91	Carbon change out
	12/23/02	<	0.00020		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		7.22	
	1/3/03	<	0.00020		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		7.13	
	1/6/03	<	0.00020		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		7.04	
	1/14/03	<	0.00020		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		7.21	
	1/22/03	<	0.00020		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		7.43	
	1/27/03	<	0.00020		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		7.15	
	2/3/03		0.00020		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		7.10	
	2/11/03	<	0.00020		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		7.22	
	2/18/03		0.00020		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		7.04	
	2/24/03	<	0.00020		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		7.15	
	3/3/03	<	0.00020		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		7.11	
	3/10/03	<	0.00020		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		7.17	
	3/18/03		0.00030		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001			
	3/24/03	<	0.00020		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		7.20	
	4/3/03	<	0.00020		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		6.88	
	4/8/03	<	0.00020		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		7.15	
	4/15/03		0.00060		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		7.12	
	4/22/03	<	0.00020		<	0.001			0.001		<	0.005		<	0.001		<	0.001		6.61	
	4/29/03	<	0.00020		<	0.001			0.001		<	0.005		<	0.001		<	0.001		7.12	
	5/5/03	<	0.00020		<	0.001			0.002		<	0.005		<	0.001		<	0.001		7.01	
	5/13/03	<	0.00020		<	0.001			0.002		<	0.005		<	0.001		<	0.001			
	5/19/03	<	0.00020		<	0.001			0.003		<	0.005		<	0.001		<	0.001		7.10	
	5/28/03	<	0.00020		<	0.001			0.003		<	0.005		<	0.001		<	0.001		7.24	
	6/2/03	<	0.00020		<	0.001			0.004		<	0.005		<	0.001		<	0.001		7.21	
	6/9/03		0.00060		<	0.001			0.004		<	0.005		<	0.001		<	0.001		6.97	
	6/17/03		0.00040		<	0.001			0.005		<	0.005		<	0.001		<	0.001		6.84	
	6/23/03		0.00030		<	0.001			0.005		<	0.005		<	0.001		<	0.001		7.06	
	6/30/03	<	0.00020		<	0.001			0.005		<	0.005		<	0.001		<	0.001		7.14	
	7/8/03	<	0.00020		<	0.001			0.005		<	0.005		<	0.001		<	0.001		7.04	
	7/14/03	<	0.00020		<	0.001			0.005		<	0.005		<	0.001		<	0.001		7.03	
	7/21/03	<	0.00020		<	0.001			0.006		<	0.005		<	0.001		<	0.001		7.14	
	7/28/03	<	0.00020			0.001			0.007		<	0.005		<	0.001		<	0.001		7.12	
	8/5/03	<	0.00020			0.003			0.008		<	0.005		<	0.001		<	0.001		6.99	
	8/11/03	<	0.00020			0.003			0.008		<	0.005		<	0.001		<	0.001		6.93	
	8/20/03	<	0.00020			0.006			0.011		<	0.005		<	0.001		<	0.001		7.10	
	8/29/03	<	0.00020			0.006			0.01		<	0.005		<	0.001		<	0.001		7.24	
	9/1/03	<	0.00020			0.006			0.01		<	0.005		<	0.001		<	0.001		8.61	
	9/8/03	<	0.0002			0.011			0.009		<	0.005		<	0.001		<	0.001		6.89	
	9/17/03	<	0.0002			0.011			0.009		<	0.005		<	0.001		<	0.001		6.95	
	9/22/03	<	0.00020			0.016			0.01		<	0.005		<	0.001		<	0.001		6.90	
	9/29/03	<	0.00020			0.017			0.01		<	0.005		<	0.001		<	0.001		6.88	
	10/6/03	<	0.00020			0.025			0.013		<	0.005		<	0.001		<	0.001		6.98	
	10/13/03	<	0.00020			0.027			0.011		<	0.005		<	0.001		<	0.001		6.92	
	10/20/03	<	0.00020			0.03			0.011		<	0.005		<	0.001		<	0.001		7.00	
	10/27/03	<	0.00020			0.033			0.01		<	0.005		<	0.001		<	0.001		7.00	
	11/3/03	<	0.00020			0.041			0.012		<	0.005		<	0.001		<	0.001		6.97	
	11/11/03		0.00030			0.036			0.01		<	0.005		<	0.001		<	0.001		6.68	
	11/17/03	<	0.00020			0.046			0.011		<	0.005		<	0.001		<	0.001		6.70	
	11/25/03	<	0.00020			0.036			0.008		<	0.005		<	0.001		<	0.001		6.95	
ST-A	12/2/03		0.00140		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		7.01	Carbon change out
	12/8/03		0.00170		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		7.04	
	12/15/03		0.00140		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		6.73	
	12/22/03		0.00200		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		6.95	
	1/1/04		0.00220		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		6.90	

Table 1
CAPA Groundwater Treatment System
Analytical Results
Treatment System Effluent

Sample Tap	Date	Analytical Results (mg/L)[1,2]																		pH	Comments
		Mercury			Carbon Tetrachloride			Chloroform			Methylene Chloride			Tetrachloroethene			Trichloroethene				
		Q[3]	Result	Flag[4]	Q	Result	Flag	Q	Result	Flag	Q	Result	Flag	Q	Result	Flag	Q	Result	Flag		
Treated Groundwater Discharge Standards (mg/L)[5]			**0.01**			**0.38**			**0.325**			**NA[6]**			**0.164**			**NA**		**6.0 - 9.0**	
ST-A Continued	1/7/04		0.00150		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		6.97	
	1/13/04		0.00220		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		6.86	
	1/21/04		0.00180		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		6.85	
	1/27/04		0.00140		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		6.90	
	2/4/04		0.00170		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		6.88	
	2/10/04		0.00140		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		6.89	
	2/17/04		0.00100		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		6.87	
	2/23/04		0.00100		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		6.88	
	3/1/04		0.00080		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		6.88	
	3/8/04		0.00030		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		7.10	
	3/19/04	<	0.00020			0.001		<	0.001		<	0.005		<	0.001		<	0.001		6.32	
	3/22/04	<	0.00020		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		6.74	
	4/2/04	<	0.00020		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		6.87	
	4/5/04	<	0.00020		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		7.18	
	4/12/04		0.00060		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		7.00	
	4/20/04	<	0.00020		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		6.72	
	5/5/04	<	0.00020		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		6.68	
	5/10/04		0.00040		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		6.56	
	5/20/04		0.00030		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		6.83	
	5/24/04	<	0.00020		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		7.15	
	6/1/04	<	0.00020		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		6.82	
	6/8/04		0.00050		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		6.80	
	6/14/04		0.00070		<	0.005		<	0.005		<	0.05		<	0.005		<	0.005		6.67	
	6/22/04		0.00070		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		6.87	
	6/30/04		0.00130		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		6.77	
	7/7/04		0.00140		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		6.92	
	7/13/04		0.00060		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		7.00	
	7/22/04		0.00100		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		6.70	
	7/27/04		0.00060		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		6.86	
	8/2/04		0.00100		<	0.005		<	0.005		<	0.05		<	0.005		<	0.005		6.89	
	8/10/04		0.00120		<	0.005		<	0.005		<	0.05		<	0.005		<	0.005		6.73	
	8/18/04		0.00150		<	0.005		<	0.005		<	0.05		<	0.005		<	0.005		6.68	
	8/25/04		0.00150		<	0.005		<	0.005		<	0.05		<	0.005		<	0.005		6.60	
	9/3/04		0.00120		<	0.005		<	0.005		<	0.05		<	0.005		<	0.005		6.78	
	9/8/04		0.00140		<	0.005		<	0.005		<	0.05		<	0.005		<	0.005		6.79	
	9/13/04		0.00040		<	0.005		<	0.005		<	0.05		<	0.005		<	0.005		6.82	
	9/20/04		0.00070		<	0.005		<	0.005		<	0.05		<	0.005		<	0.005		6.80	
	9/27/04		0.00120		<	0.001			0.002		<	0.005		<	0.001		<	0.001		6.88	
	10/6/04		0.00170			0.001			0.002		<	0.005		<	0.001		<	0.001		6.83	
	10/11/04		0.00100			0.001			0.002		<	0.005		<	0.001		<	0.001		7.02	
	10/21/04		0.00050			0.001			0.002		<	0.005		<	0.001		<	0.001		6.79	
	10/26/04	<	0.00020		<	0.005		<	0.005		<	0.05		<	0.005		<	0.005		6.73	
	11/1/04		0.00210			0.001			0.002		<	0.005		<	0.001		<	0.001		6.77	
	11/8/04		0.00120			0.002			0.003		<	0.005		<	0.001		<	0.001		6.71	
	11/15/04		0.00160			0.003			0.004		<	0.005		<	0.001		<	0.001		6.52	
	11/22/04		0.00160			0.004			0.003		<	0.005		<	0.001		<	0.001		7.03	
ST-B	11/29/04		0.00130		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		7.35	Carbon change out
	12/8/04		0.00070		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		7.80	
	12/13/04		0.00090		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		7.13	
	12/20/04		0.00130		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		6.95	
	12/28/04		0.00080		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		6.87	
	1/3/05		0.0022		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		7.69	
	1/11/05		0.003		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		8.66	
	1/17/05		0.0003		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		6.73	
	1/25/05		0.0005		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		7.14	
	2/1/05		0.0002		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		6.60	
	2/9/05		0.0003		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		7.00	
	2/14/05		0.0002		<	0.005		<	0.005		<	0.005		<	0.005		<	0.005		6.94	
	2/21/05		0.0004		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		6.91	

Table 1
CAPA Groundwater Treatment System
Analytical Results
Treatment System Effluent

Sample Tap	Date	Analytical Results (mg/L)[1,2]																		pH	Comments
		Mercury			Carbon Tetrachloride			Chloroform			Methylene Chloride			Tetrachloroethene			Trichloroethene				
		Q[3]	Result	Flag[4]	Q	Result	Flag	Q	Result	Flag	Q	Result	Flag	Q	Result	Flag	Q	Result	Flag		
Treated Groundwater Discharge Standards (mg/L)[5]			**0.01**			**0.38**			**0.325**			**NA[6]**			**0.164**			**NA**		**6.0 - 9.0**	
ST-B	2/28/05		0.0002		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		6.98	
Continued	3/7/05		0.00028		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		7.08	
	3/14/05	B	0.00013		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		7.05	
	3/21/05	<	0.0002		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		6.84	
	3/29/05		0.00029		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		7.15	
	4/5/05		0.00023		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		6.87	
	4/11/05		0.00033		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		6.84	
	4/19/05	<	0.0002		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		6.72	
	4/27/05	B	0.0002		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		7.12	
	5/2/05	B	0.0002		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		7.14	
	5/9/05		0.00051		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		6.90	
	5/16/05	B	0.00026		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		6.71	
	5/24/05		0.00051		<	0.001		J	0.0002		<	0.005		<	0.001		<	0.001		6.83	
	5/30/05		0.00074		<	0.001		J	0.0002		<	0.005		<	0.001		<	0.001		6.83	
	6/6/05		0.00035		<	0.001		J	0.0004		<	0.005		<	0.001		<	0.001		6.88	
	6/13/05	<	0.0002	B	<	0.001		J	0.0004		<	0.005		<	0.001		<	0.001		7.00	
	6/23/05	<	0.0002		<	0.001		J	0.0003		<	0.005		<	0.001		<	0.001		6.40	
	6/27/05		0.0005		J	0.0002		J	0.0006		<	0.005		<	0.001		<	0.001		7.82	
ST-C	7/7/05	<	0.0002		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		7.40	Carbon change out 6/29/05
	7/11/05		0.00032		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		8.07	
	7/18/05	<	0.0002		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		7.82	
	7/25/05		0.00037		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		6.85	
	8/2/05	<	0.0002		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		6.82	
	8/9/05	B	0.00014		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		6.36	
	8/15/05	<	0.0002		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		7.68	
	8/23/05	<	0.0002		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		7.89	
	8/29/05	<	0.0002		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		7.80	
	9/6/05	<	0.0002		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		6.90	
	9/13/05		0.00065		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		6.77	
	9/20/05	<	0.0002		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		6.59	
	9/30/05	<	0.0002		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		6.76	
	10/4/05	<	0.0002		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		6.91	
	10/12/05	<	0.0002		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		6.68	
	10/17/05	<	0.0002		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		6.77	
	10/25/05	<	0.0002		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		6.78	
	11/2/05	B	0.00011		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		6.79	
	11/9/05	B	0.00018		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		6.56	
	11/14/05		0.0004		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		6.82	
	11/23/05	<	0.0002		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		6.77	
	11/29/05	<	0.0002		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		6.68	
	12/5/05	<	0.0001		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		6.55	
	12/16/05	<	0.0001		<	0.001		<	0.001		J	0.0005		<	0.001		<	0.001		6.75	
	12/19/05	<	0.0001		<	0.001		<	0.001		J	0.0002		<	0.001		<	0.001		7.60	
	12/28/05	<	0.0001	Y	<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		7.60	
	1/5/06	B	0.0001		<	0.001		<	0.001		J	0.0002		<	0.001		<	0.001		6.63	
	1/10/06	B	0.0001		<	0.001		<	0.001		J	0.0003		<	0.001		<	0.001		6.68	
	1/17/06		0.0002		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		6.82	
	1/25/06	B	0.00017		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		6.89	
	1/31/06		0.00024		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		6.79	
	2/6/06	<	0.0002		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		6.85	
	2/13/06	<	0.0002		<	0.001		<	0.001		<	0.005		<	0.001		<	0.001		6.78	
	2/24/06	J	0.00019		<	0.0002		<	0.0002		<	0.0002		<	0.0002		<	0.0002		6.42	
	2/27/06	<	0.0001		<	0.0002		<	0.0002		<	0.0002		<	0.0002		<	0.0002		7.36	
	3/6/06	<	0.0001		H, <	0.0001		H, <	0.0002		H, <	0.0002		H, <	0.0002		H, <	0.0002		6.75	
	3/13/06		0.00057		<	0.0002		<	0.0002		<	0.0002		<	0.0002		<	0.0002		6.77	
	3/20/06		0.00032		<	0.0002		<	0.0002		<	0.0002		<	0.0002		<	0.0002		7.00	
	3/27/06	<	0.0001		<	0.0002		<	0.0002		<	0.0002		<	0.0002		<	0.0002		6.66	
	4/3/06	J	0.00018		<	0.0002		<	0.0002		<	0.0002		<	0.0002		<	0.0002		7.23	
	4/11/06	<	0.00013		<	0.00025		<	0.0002		<	0.00053		<	0.0002		<	0.00032		6.86	

Table 1
CAPA Groundwater Treatment System
Analytical Results
Treatment System Effluent

Sample Tap	Date	Analytical Results (mg/L)[1,2]																		pH	Comments
		Mercury			Carbon Tetrachloride			Chloroform			Methylene Chloride			Tetrachloroethene			Trichloroethene				
		Q[3]	Result	Flag[4]	Q	Result	Flag	Q	Result	Flag	Q	Result	Flag	Q	Result	Flag	Q	Result	Flag		
Treated Groundwater Discharge Standards (mg/L)[5]			**0.01**			**0.38**			**0.325**			**NA[6]**			**0.164**			**NA**		**6.0 - 9.0**	
ST-C	4/18/06	<	0.00013		<	0.00025		<	0.0002		<	0.00053		<	0.0002		<	0.00032		6.40	
Continued	4/25/06	<	0.00013		<	0.00025		<	0.0002		<	0.00053		<	0.0002		<	0.00032		6.76	
	5/3/06	<	0.00013		<	0.00025		<	0.0002		<	0.00053		<	0.0002		<	0.00032		6.30	
	5/11/06		0.00052		<	0.00025		<	0.0002		<	0.00053		<	0.0002		<	0.00032		6.86	
	5/17/06		0.00038		<	0.00025		<	0.0002		<	0.00053		<	0.0002		<	0.00032		6.82	
	5/22/06	<	0.00013		<	0.00025		<	0.0002		<	0.00053		<	0.0002		<	0.00032		7.06	
	5/30/06	J	0.00015		<	0.00025		<	0.0002		<	0.00053		<	0.0002		<	0.00032		6.95	
	6/5/06	<	0.00013		<	0.00025		<	0.0002		<	0.00053		<	0.0002		<	0.00032		7.14	
	6/12/06	B	0.00038		<	0.00025		J	0.00026		<	0.00053		<	0.0002		<	0.00032		6.81	
	6/23/06	J	0.00016		<	0.00025		J	0.00039		<	0.00053		<	0.0002		<	0.00032		6.97	
	6/27/06	J	0.00018		<	0.00025		<	0.0002		<	0.00053		<	0.0002		<	0.00032		7.24	
	7/6/06	<	0.00013		<	0.00025		J	0.00048		<	0.00053		<	0.0002		<	0.00032		6.96	
	7/11/06	<	0.00013		<	0.00025		J	0.00053		<	0.00053		<	0.0002		<	0.00032		6.96	
	7/17/06	<	0.00013		<	0.00025			0.001		<	0.00053		<	0.0002		<	0.00032		7.01	
	7/24/06	B	0.00028		<	0.00025			0.001		<	0.00053		<	0.0002		<	0.00032		6.81	
	7/31/06		0.00026		J	0.00031			0.0017		<	0.00053		<	0.0002		<	0.00032		6.90	
	8/7/06		0.00022		J	0.00042			0.0017		<	0.00053		<	0.0002		<	0.00032		6.98	
	8/16/06	<	0.00013		J	0.0007			0.0024		<	0.00053		<	0.0002		<	0.00032		6.64	
	8/23/06	J	0.00018		J	0.00069			0.0026		<	0.00053		<	0.0002		<	0.00032		6.80	
	8/29/06	<	0.00013		J	0.00088			0.0029		<	0.00053		<	0.0002		<	0.00032		6.73	
	9/6/06	J	0.00017		J	0.00057			0.0022		<	0.00053		<	0.0002		<	0.00032		6.77	
	9/13/06	J	0.00017		J	0.00095			0.0027		<	0.00053		<	0.0002		<	0.00032		6.58	
	9/18/06	<	0.00013			0.001			0.0033		<	0.00053		<	0.0002		<	0.00032		6.94	
	9/26/06	<	0.00013			0.0015			0.0038		<	0.00053		<	0.0002		<	0.00032		6.88	
	10/3/06	<	0.00013			0.0017			0.0037		<	0.00053		<	0.0002		<	0.00032		6.78	
	10/9/06		0.00046			0.0015			0.0031		<	0.00053		<	0.0002		<	0.00032		6.88	
	10/17/06		0.00022		J	0.00084			0.0026		<	0.00053		<	0.0002		<	0.00032		6.58	
	10/24/06		0.00026			0.0013			0.0038		<	0.00053		<	0.0002		<	0.00032		7.06	
	11/2/06		0.00024			0.0016			0.0036		<	0.00053		<	0.0002		<	0.00032		6.67	
	11/8/06	<	0.00013			0.0015			0.004		<	0.00053		<	0.0002		<	0.00032		7.04	
	11/15/06	<	0.00013			0.0014		B	0.0035		<	0.00053		<	0.0002		<	0.00032		6.78	
	11/21/06	<	0.00013			0.0016			0.0031		<	0.00053		<	0.0002		<	0.00032		7.00	
	11/27/06		0.00034			0.0019			0.0039		<	0.00053		<	0.0002		<	0.00032		7.26	
	12/5/06		0.00071			0.0021			0.0034		<	0.00053		<	0.0002		<	0.00032		6.67	
	12/14/06	<	0.00013			0.0027			0.0037		<	0.00053		<	0.0002		<	0.00032		6.93	
	12/20/06		0.00022			0.0032			0.0034		<	0.00053		<	0.0002		<	0.00032		7.08	
	12/27/06		0.00051			0.0029			0.003		<	0.00053		<	0.0002		<	0.00032		7.04	
	1/2/07	<	0.00013			0.0026			0.0026		<	0.00053		<	0.0002		<	0.00032		6.70	
	1/11/07	<	0.00013			0.0029			0.003		<	0.00053		<	0.0002		<	0.00032		6.88	
	1/18/07	J	0.00016			0.0023			0.0022		<	0.00053		<	0.0002		<	0.00032		6.40	
	1/25/07		0.00023			0.0026			0.0025		<	0.00053		<	0.0002		<	0.00032		6.58	
	2/1/07	<	0.00013			0.0023			0.0023		<	0.00053		<	0.0002		<	0.00032		6.63	
	2/8/07		0.00025			0.003			0.0028		<	0.00053		<	0.0002		<	0.00032		6.70	
	2/13/07		0.00023			0.0026			0.0023		<	0.00053		<	0.0002		<	0.00032		6.90	
	2/20/07		0.00035			0.0045			0.0032		<	0.00053		<	0.0002		<	0.00032		6.96	
	3/1/07	<	0.00013			0.0036			0.0029		<	0.00053		<	0.0002		<	0.00032		6.65	
	3/8/07	<	0.00013			0.0039			0.0032		<	0.00053		<	0.0002		<	0.00032		6.58	
	3/16/07	<	0.00013			0.003			0.0027		<	0.00053		<	0.0002		<	0.00032		6.61	
	3/19/07	<	0.00013			0.0034			0.0032		<	0.00053		<	0.0002		<	0.00032		6.56	
	3/27/07	<	0.00013			0.0026			0.0026		<	0.00053		<	0.0002		<	0.00032		6.86	
	4/3/07	<	0.00013			0.0045			0.0031		<	0.00053		<	0.0002		<	0.00032		6.40	
	4/12/07	<	0.00013			0.0036			0.0025		<	0.00053		<	0.0002		<	0.00032		6.36	
	4/19/07	<	0.00013			0.0042			0.0024		<	0.00053		<	0.0002		<	0.00032		6.29	
	4/24/07	J	0.00013			0.005			0.0031		<	0.00053		<	0.0002		<	0.00032		6.30	
	5/1/07	<	0.00013			0.0051			0.0026		<	0.00053		<	0.0002		<	0.00032		6.80	
	5/10/07	<	0.00013			0.0032			0.0025		<	0.00053		<	0.0002		<	0.00032		6.63	
	5/18/07	<	0.00013			0.0032			0.0023		<	0.00053		<	0.0002		<	0.00032		6.50	
	5/25/07	B	0.00033			0.0038			0.0029		<	0.00053		<	0.0002		<	0.00032		5.49	
	5/31/07	B	0.00073			0.0047			0.0022		<	0.00053		<	0.0002		<	0.00032		6.51	

Table 1
CAPA Groundwater Treatment System
Analytical Results
Treatment System Effluent

Sample Tap	Date	Analytical Results (mg/L)[1,2]																		pH	Comments
		Mercury			Carbon Tetrachloride			Chloroform			Methylene Chloride			Tetrachloroethene			Trichloroethene				
		Q[3]	Result	Flag[4]	Q	Result	Flag	Q	Result	Flag	Q	Result	Flag	Q	Result	Flag	Q	Result	Flag		
Treated Groundwater Discharge Standards (mg/L)[5]			**0.01**			**0.38**			**0.325**			**NA[6]**			**0.164**			**NA**		**6.0 - 9.0**	
ST-C	6/6/07		0.00031			0.0039			0.0021		<	0.00053		<	0.0002		<	0.00032		6.32	
Continued	6/15/07		0.00038			0.0058			0.0022		<	0.00053		<	0.0002		<	0.00032		6.19	
	6/21/07		0.00038			0.0066			0.0024		<	0.00053		<	0.0002		<	0.00032		6.90	
	6/25/07	<	0.00013			0.0056			0.0025		<	0.00053		<	0.0002		<	0.00032		6.87	
	7/6/07		0.00027			0.0053			0.0019		<	0.00053		<	0.0002		<	0.00032		6.88	
	7/11/07		0.0002			0.0055			0.0021		<	0.00053		<	0.0002		<	0.00032		6.89	
ST-A	7/20/07		0.00096		<	0.00025		<	0.0002		<	0.001		<	0.0002		<	0.00032		7.32	Carbon change out 7/16/07
	7/23/07		0.00027		<	0.00025		<	0.0002		<	0.001		<	0.0002		<	0.00032		6.82	
	7/30/07		0.00027		<	0.00025		<	0.0002		<	0.001		<	0.0002		<	0.00032		7.38	
	8/6/07	<	0.00013		<	0.00025		<	0.0002		<	0.001		<	0.0002		<	0.00032		6.48	
	8/13/07	<	0.00013		<	0.00025		<	0.0002		<	0.001		<	0.0002		<	0.00032		6.93	
	8/20/07	<	0.00013		<	0.00025		<	0.0002		<	0.001		<	0.0002		<	0.00032		6.38	
	8/29/07	<	0.00013		<	0.00025		<	0.0002		<	0.001		<	0.0002		<	0.00032		6.93	
	9/5/07	<	0.00013		<	0.00025		<	0.0002		<	0.001		<	0.0002		<	0.00032		6.92	
	9/12/07	<	0.00013		<	0.00025		<	0.0002		<	0.001		<	0.0002		<	0.00032		6.93	
	9/20/07	J	0.00019		<	0.00025		<	0.0002		<	0.001		<	0.0002		<	0.00032		6.19	
	9/26/07		0.00021		<	0.00025		<	0.0002		<	0.001		<	0.0002		<	0.00032		6.78	
	10/1/07	J	0.00014		<	0.00025		<	0.0002		<	0.001		<	0.0002		<	0.00032		6.78	
	10/10/07	<	0.00013		<	0.00025		<	0.0002		<	0.001		<	0.0002		<	0.00032		6.78	
	10/18/07	<	0.00013		<	0.00025		<	0.0002		<	0.001		<	0.0002		<	0.00032		6.78	
	10/25/07	<	0.00013		<	0.00025		<	0.0002		<	0.001		<	0.0002		<	0.00032		6.97	
	10/29/07	<	0.00013		<	0.00025		<	0.0002		<	0.001		<	0.0002		<	0.00032		6.65	
	11/7/07	<	0.00013		<	0.00025		<	0.0002		<	0.001		<	0.0002		<	0.00032		6.20	
	11/16/07	<	0.00013		<	0.00025		<	0.0002		<	0.001		<	0.0002		<	0.00032		5.98	
	11/19/07	<	0.00013		<	0.00025		<	0.0002		<	0.001		<	0.0002		<	0.00032		6.81	
	11/29/07	<	0.00013		<	0.00025		<	0.0002		<	0.001		<	0.0002		<	0.00032		6.28	
	12/3/07	<	0.00013		<	0.00025		<	0.0002		<	0.001		<	0.0002		<	0.00032		6.30	
	12/11/07	<	0.00013		<	0.00025		<	0.0002		<	0.001		<	0.0002		<	0.00032		6.38	
	12/17/07	<	0.00013		<	0.00025		<	0.0002		<	0.001		<	0.0002		<	0.00032		6.66	
	12/26/07	<	0.00013		<	0.00025		<	0.0002		<	0.001		<	0.0002		<	0.00032		6.38	
	1/3/08	J	0.0014		<	0.00025		<	0.0002		<	0.001		<	0.0002		<	0.00032		6.99	
	1/9/08	<	0.00013		<	0.00025		<	0.0002		<	0.001		<	0.0002		<	0.00032		6.20	
	1/14/08	<	0.00013		<	0.00025		<	0.0002		<	0.001		<	0.0002		<	0.00032		6.35	
	1/23/08	<	0.00013		<	0.00025		<	0.0002		<	0.001		<	0.0002		<	0.00032		6.43	
	2/1/08		0.00027		<	0.00025		<	0.0002		<	0.001		<	0.0002		<	0.00032		6.22	
	2/7/08		0.00023		<	0.00025		<	0.0002		<	0.001		<	0.0002		<	0.00032		6.47	
	2/13/08		0.00031	B	<	0.00025		<	0.0002		<	0.001		<	0.0002		<	0.00032		6.22	
	2/22/08	<	0.00013		<	0.00025		<	0.0002		<	0.001		<	0.0002		<	0.00032			
	2/27/08		0.00024		<	0.00025		<	0.0002		<	0.001		<	0.0002		<	0.00032		5.68	
	3/5/08	<	0.00013		<	0.00025		<	0.0002		<	0.001		<	0.0002		<	0.00032		7.47	
	3/11/08	<	0.00013		<	0.00025		<	0.0002		<	0.001		<	0.0002		<	0.00032		6.38	
	3/20/08	<	0.00013		<	0.00025		<	0.0002		<	0.001		<	0.0002		<	0.00032		6.33	
	3/26/08	<	0.00013		<	0.00025		<	0.0002		<	0.001		<	0.0002		<	0.00032		6.60	
	4/4/08	<	0.00013		<	0.00025		<	0.0002		<	0.001		<	0.0002		<	0.00032		6.68	
	4/10/08	J	0.00017		<	0.00025		<	0.0002		<	0.001		<	0.0002		<	0.00032		6.65	
	4/18/08	<	0.00013		<	0.00025		<	0.0002		<	0.001		<	0.0002		<	0.00032		6.49	
	4/24/08		0.00027		<	0.00025		<	0.0002		<	0.001		J,B	0.00089		<	0.00032		6.32	
	4/28/08		0.00022		<	0.00025		<	0.0002		<	0.001		J,B	0.00049		<	0.00032		6.33	
	5/8/08		0.00021		<	0.00025		J	0.00038		<	0.001		<	0.0002		<	0.00032		6.56	
	5/15/08	J	0.00019		<	0.00025		J	0.00048		<	0.001		<	0.0002		<	0.00032		6.35	
	5/22/08		0.00021		<	0.00025		J	0.00061		<	0.001		<	0.0002		<	0.00032		6.19	
	5/28/08	<	0.00013		<	0.00025		J	0.00071		<	0.001		<	0.0002		<	0.00032		6.05	
	6/4/08	<	0.00013		<	0.00025		<	0.0002		<	0.001		<	0.0002		<	0.00032		6.96	
	6/11/08	<	0.00013		<	0.00025		J	0.00097		<	0.001		<	0.0002		<	0.00032		6.88	
	6/20/08	<	0.00013		<	0.00025			0.0011		<	0.001		<	0.0002		<	0.00032		6.88	
	6/27/08		0.00049		<	0.00025			0.0012		<	0.001		<	0.0002		<	0.00032		6.76	
	7/2/08	<	0.00013		<	0.00025			0.0013		<	0.001		<	0.0002		<	0.00032		6.75	
	7/8/08	J	0.00016		<	0.00025			0.0013		<	0.002		<	0.0002		<	0.00032		6.75	
	7/14/08		0.00033		<	0.00025			0.0014		<	0.002		<	0.0002		<	0.00032		7.07	

Table 1
CAPA Groundwater Treatment System
Analytical Results
Treatment System Effluent

Sample Tap	Date	Analytical Results (mg/L)[1,2]																		pH	Comments
		Mercury			Carbon Tetrachloride			Chloroform			Methylene Chloride			Tetrachloroethene			Trichloroethene				
		Q[3]	Result	Flag[4]	Q	Result	Flag	Q	Result	Flag	Q	Result	Flag	Q	Result	Flag	Q	Result	Flag		
Treated Groundwater Discharge Standards (mg/L)[5]			**0.01**			**0.38**			**0.325**			**NA[6]**			**0.164**			**NA**		**6.0 - 9.0**	
ST-A	7/22/08	J	0.00016		<	0.00025		<	0.0002		<	0.002		<	0.0002		<	0.00032		6.88	
Continued	7/31/08	<	0.00013			0.0011			0.0016		<	0.002		<	0.0002		<	0.00032		6.74	
	8/4/08		0.00021		J	0.00083			0.0021		<	0.002		<	0.0002		<	0.00032		6.74	
	8/11/08	<	0.00013			0.0011			0.0019		<	0.002		<	0.0002		<	0.00032		6.34	
	8/21/08		0.00026			0.0018			0.002		<	0.002		<	0.0002		<	0.00032		6.74	
	8/25/08		0.00028			0.0036			0.0018		<	0.002		<	0.0002		<	0.00032		6.55	
	9/4/08		0.00051			0.033			0.0033		<	0.002		<	0.0002		<	0.00032		6.77	
	9/8/08		0.00038			0.057			0.005		<	0.002		<	0.0002		<	0.00032		6.74	
	9/19/08	<	0.00013			0.065			0.0071		<	0.002		<	0.0002		<	0.00032		6.67	
	9/25/08	<	0.00013			0.09			0.0089		<	0.002		<	0.0002		<	0.00032		6.93	
ST-B	10/3/08		0.00072			0.0017		<	0.0002		<	0.002		<	0.0002		<	0.00032		6.64	Carbon change out 10/2/08
	10/9/08		0.00086		J	0.00096		<	0.0002		<	0.002		<	0.0002		<	0.00032		6.64	
	10/13/08		0.00091		J	0.00059		<	0.0002		<	0.002		<	0.0002		<	0.00032		7.01	
	10/22/08		0.00071		J	0.00062		<	0.0002		<	0.002		<	0.0002		<	0.00032		6.95	
	10/27/08		0.00093		<	0.00025		<	0.0002		<	0.002		<	0.0002		<	0.00032		6.95	
	11/6/08		0.00048		J	0.0007		<	0.0002		<	0.002		<	0.0002		<	0.00032		6.93	
	11/14/08		0.00038		<	0.00025		<	0.0002		<	0.002		<	0.0002		<	0.00032		6.44	
	11/21/08		0.00027		J	0.00043		<	0.0002		<	0.002		<	0.0002		<	0.00032		6.93	
	11/26/08		0.00055		<	0.00025		<	0.0002		<	0.002		<	0.0002		<	0.00032		6.66	
	12/3/08		0.00032		<	0.00025		<	0.0002		<	0.002		<	0.0002		<	0.00032		6.77	
	12/11/08		0.00029		J	0.00044		<	0.0002		<	0.002		<	0.0002		<	0.00032		6.60	
	12/19/08		0.00025		<	0.00025		<	0.0002		<	0.002		<	0.0002		<	0.00032		6.90	
	12/22/08		0.00033		<	0.00025		<	0.0002		<	0.002		<	0.0002		<	0.00032		7.01	
	12/31/08		0.00022		<	0.00025		<	0.0002		<	0.002		<	0.0002		<	0.00032		6.84	
	1/7/09		0.000419		U	0.0005		U	0.0005		J	0.00076		U	0.0006		U	0.0005		6.70	ALS Laboratory Group (2009)
	1/13/09		0.00026		U	0.0005		U	0.0005		U	0.0005		U	0.0006		U	0.0005		6.97	
	1/23/09		0.00119		U	0.0005		U	0.0005		U	0.0005		U	0.0006		U	0.0005		6.97	
	1/29/09		0.000288		U	0.0005		U	0.0005		U	0.0005		U	0.0006		U	0.0005		7.07	
	2/4/09		0.000282		U	0.0005		U	0.0005		U	0.0005		U	0.0006		U	0.0005		7.04	
	2/10/09	J	0.00009		U	0.0005		U	0.0005		U	0.0005		U	0.0006		U	0.0005		6.72	
	2/19/09	J	0.000091		U	0.0005		U	0.0005		U	0.0005		U	0.0006		U	0.0005		6.59	
	2/26/09	J	0.000079		U	0.0005		U	0.0005		U	0.0005		U	0.0006		U	0.0005		6.98	
	3/4/09	J	0.0016		J	0.0017		U	0.0005		U	0.0005		U	0.0006		U	0.0005		6.77	
	3/10/09	J	0.00012		J	0.0022		J	0.00069		U	0.0005		U	0.0006		U	0.0005		6.90	
	3/19/09	J	0.000057		J	0.0025		J	0.00079		U	0.0005		U	0.0006		U	0.0005		6.60	
	3/26/09	J	0.000191		U	0.0005		J	0.0013		U	0.0005		U	0.0006		U	0.0005		6.65	
	4/2/09		0.000213			0.0072		J	0.0018		U	0.0005		U	0.0006		U	0.0005		7.11	
	4/7/09	J	0.000196			0.0074		J	0.0018		U	0.0005		U	0.0006		U	0.0005		6.61	
	4/17/09	J	0.000155			0.0099		J	0.0024		U	0.0005		U	0.0006		U	0.0005		6.75	
	4/23/09		0.00021			0.014		J	0.0031		U	0.0005		U	0.0006		U	0.0005		6.67	
	5/1/09	J	0.000045			0.012		J	0.0032		U	0.0005		U	0.0006		U	0.0005		6.72	
	5/5/09	J	0.000151			0.015		J	0.0034		U	0.0005		U	0.0006		U	0.0005		7.18	
	5/15/09	J	0.00017			0.019		J	0.0044		U	0.0005		U	0.0006		U	0.0005		6.90	
	5/21/09		0.000357			0.023		J	0.0041		U	0.0005		U	0.0006		U	0.0005		7.16	
	5/29/09		0.000266			0.018		J	0.0044		U	0.0005		U	0.0006		U	0.0005		7.01	
	6/1/09		0.000251			0.025			0.0051		U	0.0005		U	0.0006		U	0.0005		6.98	
	6/8/09		0.000379			0.031			0.0056		U	0.0005		U	0.0006		U	0.0005		6.87	
	6/18/09		0.000284			0.03			0.0059		U	0.0005		J	0.00065		U	0.0005		7.13	
	6/22/09		0.000222			0.03			0.0059		U	0.0005		U	0.0006		U	0.0005		7.20	
ST-C	7/3/09	U	0.000042		U	0.0005		U	0.0005		U	0.0005		U	0.0006		U	0.0005		7.94	
	7/9/09	U	0.000042		U	0.0005		U	0.0005		U	0.0005		U	0.0006		U	0.0005		7.40	
	7/15/09	U	0.000042		U	0.0005		U	0.0005		U	0.0005		U	0.0006		U	0.0005		6.95	
	7/22/09	J	0.000074		U	0.0005		U	0.0005		U	0.0005		U	0.0006		U	0.0005		6.93	
	7/31/09	J	0.000065		U	0.0005		U	0.0005		U	0.0005		U	0.0006		U	0.0005		7.05	
	8/7/09	J	0.000074		U	0.0005		U	0.0005		U	0.0005		U	0.0006		U	0.0005		7.03	
	8/13/09	J	0.000082		U	0.0005		U	0.0005		U	0.0005		U	0.0006		U	0.0005		7.59	

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Sample Tap	Date	Analytical Results (mg/L)[1,2]																		pH	Comments
		Mercury			Carbon Tetrachloride			Chloroform			Methylene Chloride			Tetrachloroethene			Trichloroethene				
		Q[3]	Result	Flag[4]	Q	Result	Flag	Q	Result	Flag	Q	Result	Flag	Q	Result	Flag	Q	Result	Flag		
Treated Groundwater Discharge Standards (mg/L)[5]			**0.01**			**0.38**			**0.325**			**NA[6]**			**0.164**			**NA**		**6.0 - 9.0**	
ST-C	8/20/09	J	0.000096		U	0.0005		U	0.0005		U	0.0005		U	0.0006		U	0.0005		7.38	
Continued	8/26/09	J	0.000094		U	0.0005		U	0.0005		U	0.0005		U	0.0006		U	0.0005		7.40	
	9/3/09	J	0.000111		U	0.0005		U	0.0005		U	0.0005		U	0.0006		U	0.0005		7.18	
	9/11/09	J	0.00014		U	0.0005		U	0.0005		U	0.0005		U	0.0006		U	0.0005		7.09	
	9/15/09	J	0.000158		U	0.0005		U	0.0005		U	0.0005		U	0.0006		U	0.0005		7.20	
	9/25/09	J	0.000126		U	0.0005		U	0.0005		U	0.0005		U	0.0006		U	0.0005		7.36	
	10/1/09	J	0.000127		U	0.0005		U	0.0005		U	0.0005		U	0.0006		U	0.0005		6.93	
	10/6/09	J	0.000188		U	0.0005		U	0.0005		U	0.0005		U	0.0006		U	0.0005		6.76	
	10/16/09	J	0.000096		U	0.0005		U	0.0005		U	0.0005		U	0.0006		U	0.0005		6.90	
	10/22/09	J	0.00014		U	0.0005		U	0.0005		U	0.0005		U	0.0006		U	0.0005		7.04	
	10/28/09	J	0.000176		U	0.0005		U	0.0005		U	0.0005		U	0.0006		U	0.0005		6.99	
	11/4/09	J	0.000156		J	0.0027		U	0.0005		U	0.0005		U	0.0006		U	0.0005		7.00	
	11/10/09	J	0.000106		U	0.0005		J	0.0005		U	0.0005		U	0.0006		U	0.0005		7.09	
	11/16/09	J	0.000122		U	0.0005		J	0.00061		U	0.0005		U	0.0006		U	0.0005		6.99	
	11/24/09	J	0.000132		U	0.0005		J	0.00065		U	0.0005		U	0.0006		U	0.0005		7.05	
	11/30/09	J	0.000165		J	0.0027		J	0.00091		U	0.0005		U	0.0006		U	0.0005		6.97	
	12/8/09	J	0.00014		J	0.0015		J	0.0011		U	0.0005		U	0.0006		U	0.0005		7.04	
	12/15/09	J	0.00014		U	0.005		J	0.0013		U	0.0005		U	0.0006		U	0.0005		7..05	
	12/21/09	J	0.000096			0.0052		J	0.0014		U	0.0005		U	0.0006		U	0.0005		6.97	
	12/28/09	J	0.000165		J	0.0045		J	0.0016		U	0.0005		U	0.0006		U	0.0005		7.17	
	1/5/10	J	0.000096			0.0063		J	0.0017		U	0.0005		U	0.0006		U	0.0005		7.08	
	1/12/10	J	0.000131			0.0116		J	0.0046		J	0.002		U	0.0006		U	0.0005		6.42	
	1/19/10	J	0.000131			0.0069		J	0.0026		U	0.0005		U	0.0006		U	0.0005		6.18	
	1/25/10	J	0.000092		J	0.0039		J	0.0018		U	0.0005		U	0.0006		U	0.0005		6.38	
	2/1/10	J	0.000139			0.013		J	0.0037		U	0.0005		U	0.0006		U	0.0005		7.73	
	2/11/10	J	0.000141			0.033			0.0076		U	0.0005		U	0.0006		U	0.0005		6.60	
	2/17/10	J	0.000144			0.036			0.0082		U	0.0005		U	0.0006		U	0.0005		7.32	
	2/22/10	J	0.000108			0.032			0.0089		U	0.0005		U	0.0006		U	0.0005		6.77	
	3/2/10	J	0.000145			0.038			0.0083		U	0.0005		U	0.0006		U	0.0005		7.03	
	3/10/10	J	0.00016			0.044			0.009		U	0.0005		U	0.0006		U	0.0005		6.39	
ST-A	3/17/10	U	0.000042		U	0.0005		U	0.0005		U	0.0005		U	0.0006		U	0.0005		8.14	Carbon change out
	3/22/10	U	0.000042		U	0.0005		U	0.0005		U	0.0005		U	0.0006		U	0.0005		8.46	
	3/31/10	U	0.000042		U	0.0005		U	0.0005		U	0.0005		U	0.0006		U	0.0005		7.03	
	4/6/10	J	0.000084		U	0.0005		U	0.0005		U	0.0005		U	0.0006		U	0.0005		7.20	
	4/12/10	U	0.000042		U	0.0005		U	0.0005		U	0.0005		U	0.0006		U	0.0005		7.63	
	4/22/10	U	0.000042		U	0.0005		U	0.0005		U	0.0005		U	0.0006		U	0.0005		7.44	
	4/28/10	J	0.000083		U	0.0005		U	0.0005		U	0.0005		U	0.0006		U	0.0005		6.87	
	5/4/10	J	0.000043		U	0.0005		U	0.0005		U	0.0005		U	0.0006		U	0.0005		6.62	
	5/10/10	J	0.000081		U	0.0005		J	0.00078		U	0.0005		U	0.0006		U	0.0005		6.75	
	5/20/10	U	0.000042		U	0.0005		J	0.0014		J	0.00077		U	0.0006		U	0.0005		6.58	
	5/24/10	J	0.000149		U	0.0005		U	0.0005		U	0.0005		U	0.0006		U	0.0005		6.76	
	6/2/10	U	0.000042		U	0.0005		J	0.0017		U	0.0005		U	0.0006		U	0.0005		7.02	
	6/7/10	J	0.000066		J	0.0043		J	0.0019		U	0.0005		U	0.0006		U	0.0005		7.00	
	6/14/10	J	0.000088		J	0.0011		J	0.0021		U	0.0005		U	0.0006		U	0.0005		7.28	
	6/23/10	J	0.000159		J	0.0025		J	0.0032		U	0.0005		U	0.0006		U	0.0005		6.71	
	7/1/10	U	0.000042		J	0.0032		J	0.0044		U	0.0005		U	0.0006		U	0.0005		6.51	
	7/6/10	J	0.000049			0.066		J	0.0042		U	0.0005		U	0.0006		U	0.0005		6.48	
	7/12/10	U	0.000042			0.0061			0.0055		U	0.0005		U	0.0006		U	0.0005		6.99	
	7/22/10	J	0.000092			0.0084			0.007		U	0.0005		U	0.0006		U	0.0005		7.64	
	7/26/10	J	0.000069			0.0085			0.0071		U	0.0005		U	0.0006		U	0.0005		7.61	
	8/2/10	J	0.000069			0.015			0.0076		U	0.0005		U	0.0006		U	0.0005		7.40	
	8/12/10	U	0.000042			0.012			0.0081		U	0.0005		U	0.0006		U	0.0005		6.39	
	8/18/10	J	0.000078			0.016			0.0082		U	0.0005		U	0.0006		U	0.0005		6.51	
	8/23/10	J	0.00008			0.021			0.0096		U	0.0005		U	0.0006		U	0.0005		6.79	
	8/30/10	J	0.000075			0.02			0.0096		U	0.0005		U	0.0006		U	0.0005		6.85	
	9/8/10	U	0.000042			0.021			0.0092		U	0.0005		U	0.0006		U	0.0005		6.34	Carbon change out 9/10/10
ST-C	9/14/10	U	0.000042		U	0.0005		U	0.0005		U	0.0005		U	0.0006		U	0.0005		8.53	
	9/20/10	J	0.000043		U	0.0005		U	0.0005		U	0.0005		J	0.0011		U	0.0005		7.37	
	9/27/10	U	0.000042		U	0.0005		U	0.0005		U	0.0005		U	0.0006		U	0.0005		8.12	

Table 1
CAPA Groundwater Treatment System
Analytical Results
Treatment System Effluent

Sample Tap	Date	Analytical Results (mg/L)[1,2]																		pH	Comments
		Mercury			Carbon Tetrachloride			Chloroform			Methylene Chloride			Tetrachloroethene			Trichloroethene				
		Q[3]	Result	Flag[4]	Q	Result	Flag	Q	Result	Flag	Q	Result	Flag	Q	Result	Flag	Q	Result	Flag		
Treated Groundwater Discharge Standards (mg/L)[5]			**0.01**			**0.38**			**0.325**			**NA[6]**			**0.164**			**NA**		**6.0 - 9.0**	
ST-C Continued	10/4/10	U	0.000042		U	0.0005		U	0.0005		U	0.0005		U	0.0006		U	0.0005		7.15	
	10/12/10	U	0.000042		U	0.0005		U	0.0005		U	0.0005		U	0.0006		U	0.0005		7.13	
	10/18/10		0.000439		U	0.0005		U	0.0005		U	0.0005		U	0.0006		U	0.0005		7.18	
	10/28/10	J	0.000043		U	0.0005		U	0.0005		U	0.0005		U	0.0006		U	0.0005		6.86	
	11/4/10	U	0.000042		U	0.0005		U	0.0005		U	0.0005		U	0.0006		U	0.0005		7.62	
	11/8/10	U	0.000042		U	0.0005		U	0.0005		U	0.0005		U	0.0006		U	0.0005		7.15	
	11/15/10	J	0.000048		U	0.0005		U	0.0005		U	0.0005		U	0.0006		U	0.0005		7.43	
	11/23/10	U	0.000042		U	0.0005		U	0.0005		U	0.0005		U	0.0006		U	0.0005		6.33	
	11/29/10	U	0.000042		U	0.0005		U	0.0005		U	0.0005		U	0.0006		U	0.0005		6.96	
	12/6/10	J	0.000043		U	0.0005		U	0.0005		U	0.0005		U	0.0006		U	0.0005		7.11	
	12/14/10	U	0.000042		U	0.0005		U	0.0005		U	0.0005		U	0.0006		U	0.0005		6.83	
	12/21/10	J	0.000075		U	0.0005		U	0.0005		U	0.0005		U	0.0006		U	0.0005		6.88	
	12/28/10	J	0.000061		U	0.0005		U	0.0005		U	0.0005		U	0.0006		U	0.0005		4.78	
	1/3/11	U	0.000042		U	0.0005		U	0.0005		U	0.0005		U	0.0006		U	0.0005		7.16	
	1/13/11	U	0.000042		U	0.0005		U	0.0005		U	0.0005		U	0.0006		U	0.0005		6.86	
	1/17/11	U	0.000042		U	0.0005		U	0.0005		U	0.0005		U	0.0006		U	0.0005		7.78	
	1/24/11	U	0.000042		U	0.0005		U	0.0005		U	0.0005		U	0.0006		U	0.0005		7.53	
	1/31/11	U	0.000042		U	0.0005		U	0.0005		U	0.0005		U	0.0006		U	0.0005		7.51	
	2/7/11	J	0.000058		U	0.0005		U	0.0005		U	0.0005		U	0.0006		U	0.0005		6.58	
	2/14/11	J	0.000052		U	0.0005		U	0.0005		U	0.0005		U	0.0006		U	0.0005		7.63	
	2/24/11	U	0.000042		U	0.0005		U	0.0005		U	0.0005		U	0.0006		U	0.0005		7.79	
	3/1/11	J	0.000057		U	0.0005		U	0.0005		U	0.0005		U	0.0006		U	0.0005		8.36	
	3/11/11	U	0.000042		U	0.0005		U	0.0005		U	0.0005		U	0.0006		U	0.0005		7.80	
	3/18/11	J	0.000060		U	0.0005		U	0.0005		U	0.0005		U	0.0006		U	0.0005		7.66	
	3/25/11	J	0.000054		U	0.0005		U	0.0005		U	0.0005		U	0.0006		U	0.0005		7.10	
	4/1/11	J	0.000084		U	0.0005		U	0.0005		U	0.0005		U	0.0006		U	0.0005		8.22	
	4/6/11	J	0.000055		U	0.0005		U	0.0005		U	0.0005		U	0.0006		U	0.0005		8.44	
	4/13/11	U	0.000042		U	0.0005		U	0.0005		U	0.0005		U	0.0006		U	0.0005		8.36	
	4/19/11	J	0.000055		U	0.0005		U	0.0005		U	0.0005		U	0.0006		U	0.0005		8.07	
	4/25/11	J	0.000076		U	0.0005		U	0.0005		U	0.0005		U	0.0006		U	0.0005		8.04	
	5/3/11	J	0.000049		U	0.0005		U	0.0005		U	0.0005		U	0.0006		U	0.0005		7.18	
	5/13/11	J	0.000045		U	0.0005		U	0.0005		U	0.0005		U	0.0006		U	0.0005		6.73	
	5/20/11	J	0.000048		U	0.0005		U	0.0005		U	0.0005		U	0.0006		U	0.0005		6.75	
	5/26/11	J	0.000047		U	0.0005		U	0.0005		U	0.0005		U	0.0006		U	0.0005		6.81	
	6/2/11	U	0.000042		U	0.0018		U	0.0010		U	0.0013		U	0.0017		U	0.0011		7.02	
	6/8/11	J	0.000060		U	0.0018		U	0.0010		U	0.0013		U	0.0017		U	0.0011		7.60	
	6/16/11	J	0.000079		U	0.0018		U	0.0010		U	0.0013		U	0.0017		U	0.0011		7.43	
	6/22/11	J	0.000084		U	0.0018		U	0.0010		U	0.0013		U	0.0017		U	0.0011		7.23	
	6/30/11	J	0.000104		U	0.0018		U	0.0010		U	0.0013		U	0.0017		U	0.0011		7.32	
	7/7/11	J	0.000078		U	0.0018		U	0.0010		U	0.0013		U	0.0017		U	0.0011		7.50	
	7/11/11	J	0.000126		U	0.0018		U	0.0010		U	0.0013		U	0.0017		U	0.0011		7.25	
	7/22/11	J	0.000092		U	0.0018		U	0.0010		U	0.0013		U	0.0017		U	0.0011		7.38	
	7/29/11	J	0.000101		U	0.0018		U	0.0010		U	0.0013		U	0.0017		U	0.0011		7.38	
	8/4/11	J	0.000079		U	0.0018		U	0.0010		U	0.0013		U	0.0017		U	0.0011		7.27	
	8/8/11	J	0.000082		U	0.0018		U	0.0010		U	0.0013		U	0.0017		U	0.0011		7.34	
	8/19/11	J	0.000104		U	0.0018		U	0.0010		U	0.0013		U	0.0017		U	0.0011		7.14	
	8/25/11	J	0.000108		U	0.0018		U	0.0010		U	0.0013		U	0.0017		U	0.0011		7.39	
	9/1/11	J	0.000077		U	0.0018		U	0.0010		U	0.0013		U	0.0017		U	0.0011		7.17	
	9/6/11	J	0.000102		U	0.0018		U	0.0010		U	0.0013		U	0.0017		U	0.0011		7.00	
	9/12/11	J	0.000110		U	0.0018		U	0.0010		U	0.0013		U	0.0017		U	0.0011		6.82	
	9/19/11		0.00195		U	0.0018		U	0.0010		U	0.0013		U	0.0017		U	0.0011		7.26	
	9/26/11	J	0.000049		U	0.0018		U	0.0010		U	0.0013		U	0.0017		U	0.0011		6.99	
	10/3/11	J	0.000084		U	0.0018		U	0.0010		U	0.0013		U	0.0017		U	0.0011		7.22	
	10/10/11	J	0.000051		U	0.0018		U	0.0010		U	0.0013		U	0.0017		U	0.0011		7.24	
	10/17/11	J	0.000091		U	0.0018		U	0.0010		U	0.0013		U	0.0017		U	0.0011		7.20	
	10/27/11	J	0.001100		U	0.0018		U	0.0010		U	0.0013		U	0.0017		U	0.0011		7.18	
	11/4/11	U	0.000042		U	0.0018		J	0.0015		U	0.0013		U	0.0017		U	0.0011		6.58	
	11/11/11	J	0.000084		U	0.0018		J	0.0013		U	0.0013		U	0.0017		U	0.0011		6.85	
	11/16/11	J	0.000071		U	0.0018		J	0.0016		U	0.0013		U	0.0017		U	0.0011		6.50	

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Analytical Results
Treatment System Effluent

Sample Tap	Date	Analytical Results (mg/L)[1,2]																		pH	Comments
		Mercury			Carbon Tetrachloride			Chloroform			Methylene Chloride			Tetrachloroethene			Trichloroethene				
		Q[3]	Result	Flag[4]	Q	Result	Flag	Q	Result	Flag	Q	Result	Flag	Q	Result	Flag	Q	Result	Flag		
Treated Groundwater Discharge Standards (mg/L)[5]			**0.01**			**0.38**			**0.325**			**NA[6]**			**0.164**			**NA**		**6.0 - 9.0**	
ST-C Continued	11/20/11	J	0.000063		U	0.0018		J	0.0017		U	0.0013		U	0.0017		U	0.0011		6.35	
	12/2/11	U	0.000042		U	0.0018		J	0.0014		U	0.0013		U	0.0017		U	0.0011		6.58	
	12/9/11	J	0.000052		U	0.0018		J	0.0014		U	0.0013		U	0.0017		U	0.0011		6.58	
	12/16/11		0.001480		U	0.0018		J	0.0015		U	0.0013		U	0.0017		U	0.0011		6.42	
	12/20/11	J	0.000048		U	0.0018		J	0.0016		U	0.0013		U	0.0017		U	0.0011		6.64	
	12/30/11	J	0.000046		U	0.0018		J	0.0013		U	0.0013		U	0.0017		U	0.0011		7.25	
	1/5/12	J	0.000113		U	0.0018		J	0.0012		U	0.0013		U	0.0017		U	0.0011		7.02	
	1/12/12	J	0.000097		U	0.0018		J	0.0010		U	0.0013		U	0.0017		U	0.0011		6.90	
	1/17/12	J	0.000150		U	0.0018		J	0.0016		U	0.0013		U	0.0017		U	0.0011		7.39	
	1/23/12	J	0.000094		U	0.0018		J	0.0015		U	0.0013		U	0.0017		U	0.0011		7.20	
	2/1/12	J	0.000138		U	0.0018		J	0.0022		U	0.0013		U	0.0017		U	0.0011		7.48	
	2/6/12	J	0.000063			0.0400		J	0.0150		U	0.0013		U	0.0017		U	0.0011		8.66	
	2/15/12	J	0.000180			0.0240		J	0.0049		U	0.0013		U	0.0017		U	0.0011		7.41	
	2/22/12	J	0.000169			0.0390			0.0063		U	0.0013		U	0.0017		U	0.0011		7.65	
	2/27/12	J	0.000152			0.0540			0.0068		U	0.0013		U	0.0017		U	0.0011		7.14	
ST-A	3/9/12	U	0.000042		U	0.0018		U	0.0010		U	0.0013		U	0.0017		U	0.0011		7.20	Carbon change out 3/8/12
	3/12/12	U	0.000042		U	0.0018		U	0.0010		U	0.0013		U	0.0017		U	0.0011		7.30	
	3/23/12	U	0.000042		U	0.0018		U	0.0010		U	0.0013		U	0.0017		U	0.0011		7.41	
	3/28/12	U	0.000042		U	0.0018		U	0.0010		U	0.0013		U	0.0017		U	0.0011		7.32	
	4/4/12	U	0.000042		U	0.0018		U	0.0010		U	0.0013		U	0.0017		U	0.0011		6.82	
	4/12/12	U	0.000042		U	0.0018		U	0.0010		U	0.0013		U	0.0017		U	0.0011		6.69	
ST-B	4/17/12	U	0.000042		U	0.0018		U	0.001		U	0.0013		U	0.0017		U	0.0011		6.74	Carbon change out 4/16/12
	4/25/12	U	0.000042		U	0.0018		U	0.001		U	0.0013		U	0.0017		U	0.0011		6.96	
	5/2/12	U	0.000042		U	0.0018		U	0.001		U	0.0013		U	0.0017		U	0.0011		6.68	
	5/10/12	U	0.000042		U	0.0018		U	0.001		U	0.0013		U	0.0017		U	0.0011		6.79	
	5/18/12	U	0.000042		U	0.0018		U	0.001		U	0.0013		U	0.0017		U	0.0011		6.68	
	5/25/12	U	0.000042		U	0.0018		U	0.001		U	0.0013		U	0.0017		U	0.0011		6.64	
	5/31/12	U	0.000042		U	0.0018		U	0.001		U	0.0013		U	0.0017		U	0.0011		6.26	
	6/6/12	U	0.000042		U	0.0018		U	0.001		U	0.0013		U	0.0017		U	0.0011		6.23	
	6/11/12	U	0.000042		U	0.0018		U	0.001		U	0.0013		U	0.0017		U	0.0011		6.62	
	6/18/12	U	0.000042		U	0.0018		U	0.001		U	0.0013		U	0.0017		U	0.0011		6.71	
	6/27/12	U	0.000042		U	0.0018		U	0.001		U	0.0013		U	0.0017		U	0.0011		6.54	
	7/2/12	J	0.000059		U	0.0018		U	0.001		U	0.0013		U	0.0017		U	0.0011		6.64	
	7/13/12	J	0.000048		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		6.62	
	7/20/12	U	0.000042		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		6.46	
	7/24/12	U	0.000042		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		6.62	
	8/2/12	U	0.000042		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		6.53	
	8/10/12	See Note 8 below			U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		6.43	
	8/15/12	U	0.000042		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		6.43	
	8/23/12	U	0.000042		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		6.28	
	8/29/12	U	0.000042		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		7.27	
	9/7/12	U	0.000042		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		7.27	
	9/13/12	U	0.000042		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		7.88	
	9/21/12	U	0.000042		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		6.36	
	9/28/12	U	0.000042		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		6.72	
	10/3/12	U	0.000042		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		6.35	
	10/10/12	U	0.000042		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		6.05	
	10/18/12	U	0.000042		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		6.16	
	10/26/12	U	0.000042		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		6.21	
	11/2/12	J	0.000056		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		6.15	
	11/8/12	U	0.000042		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		6.46	
	11/15/12	U	0.000042		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		6.67	
	11/19/12	U	0.000042		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		6.51	
	11/29/12	U	0.000042		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		7.33	
	12/6/12	U	0.000042		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		7.00	
	12/13/12	J	0.000052		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		6.59	
	12/19/12	U	0.000042		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		6.14	
	12/28/12	U	0.000042		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		6.18	
	1/3/13	U	0.000042		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		6.56	

Table 1
CAPA Groundwater Treatment System
Analytical Results
Treatment System Effluent

Sample Tap	Date	Analytical Results (mg/L)[1,2]																		pH	Comments
		Mercury			Carbon Tetrachloride			Chloroform			Methylene Chloride			Tetrachloroethene			Trichloroethene				
		Q[3]	Result	Flag[4]	Q	Result	Flag	Q	Result	Flag	Q	Result	Flag	Q	Result	Flag	Q	Result	Flag		
Treated Groundwater Discharge Standards (mg/L)[5]			**0.01**			**0.38**			**0.325**			**NA[6]**			**0.164**			**NA**		**6.0 - 9.0**	
ST-B Continued	1/10/13	J	0.000052		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		6.44	
	1/14/13	J	0.000046		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		6.38	
	1/25/13	U	0.000042		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		6.21	
	2/1/13	U	0.000042		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		6.25	
	2/5/13	J	0.000044		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		6.28	
	2/11/13	U	0.000042		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		6.44	
	2/18/13	J	0.000046		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		6.24	
	2/24/13	U	0.000042		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		6.45	
	3/7/13	J	0.000044		U	0.001		J	0.0013		U	0.001		U	0.001		U	0.001		6.41	
	3/15/13	J	0.000044		U	0.001		J	0.0020		U	0.001		U	0.001		U	0.001		6.36	
	3/21/13	J	0.000068		U	0.001		J	0.0023		U	0.001		U	0.001		U	0.001		7.15	
	3/27/13	J	0.000056		U	0.001		J	0.0022		U	0.001		U	0.001		U	0.001		8.08	
	4/4/13	U	0.000042		U	0.001		J	0.0033		U	0.001		U	0.001		U	0.001		7.80	
	4/11/13	U	0.000042		U	0.001		J	0.0028		U	0.001		U	0.001		U	0.001		7.29	
	4/17/13	J	0.000086		U	0.001		J	0.0039		U	0.001		U	0.001		U	0.001		7.17	
	4/26/13	J	0.000046		U	0.001		J	0.0045		U	0.001		U	0.001		U	0.001		7.15	
	5/2/13	J	0.000118		U	0.001		J	0.0046		U	0.001		U	0.001		U	0.001		7.16	
	5/9/13	J	0.000047		U	0.001		J	0.0049		U	0.001		U	0.001		U	0.001		7.15	
	5/15/13	U	0.000042		U	0.001		J	0.0045		U	0.001		U	0.001		U	0.001		7.20	
	5/23/13	U	0.000042		J	0.0012		J	0.0047		U	0.001		U	0.001		U	0.001		6.90	
	5/28/13	U	0.000042		J	0.0015		J	0.0044		U	0.001		U	0.001		U	0.001		7.13	
	6/4/13	U	0.000042		J	0.0021		J	0.0042		U	0.001		U	0.001		U	0.001		7.19	
	6/11/13	J	0.000073		J	0.0025		J	0.0037		U	0.001		U	0.001		U	0.001		7.05	
	6/19/13	J	0.000075		J	0.0032		J	0.0042		U	0.001		U	0.001		U	0.001		7.68	
	6/24/13	J	0.000074		J	0.0032		J	0.0040		U	0.001		U	0.001		U	0.001		7.15	
	7/2/13	J	0.000061		J	0.0034		J	0.0039		U	0.001		U	0.001		U	0.001		7.30	
	7/10/13	J	0.000043		J	0.0041		J	0.0037		U	0.001		U	0.001		U	0.001		6.91	
	7/16/13	J	0.000091		J	0.0048		J	0.0037		U	0.001		U	0.001		U	0.001		6.87	
	7/23/13	J	0.000061		J	0.0061		J	0.0039		U	0.001		U	0.001		U	0.001		6.81	
	8/2/13	U	0.000040		J	0.0065		J	0.0041		U	0.001		U	0.001		U	0.001		6.83	
	8/6/13	J	0.000086			0.0078		J	0.0045		U	0.001		U	0.001		U	0.001		6.68	
	8/15/13	J	0.000075			0.0086		J	0.0037		U	0.001		U	0.001		U	0.001		6.76	
	8/22/13	J	0.000074			0.0083		J	0.0042		U	0.001		U	0.001		U	0.001		6.79	
	8/26/13	J	0.000093			0.0082		J	0.0041		U	0.001		U	0.001		U	0.001		6.81	
	9/5/13	J	0.000092			0.011		J	0.0043		U	0.001		U	0.001		U	0.001		6.74	
	9/13/13	J	0.000072			0.014		J	0.0039		U	0.001		U	0.001		U	0.001		6.70	
ST-C	9/20/13	J	0.000086		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		6.84	Carbon change out 9/16/13
	9/26/13	J	0.000053		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		6.77	
	10/1/13	U	0.00004		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		6.61	
	10/7/13	U	0.00004		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		6.67	
	10/17/13	U	0.00004		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		6.43	
	10/25/13	J	0.000076		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		6.56	
	10/31/13	J	0.000059		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		6.39	
	11/7/13	J	0.000095		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		6.48	
	11/15/13	J	0.000105		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		6.44	
	11/18/13	J	0.00006		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		6.42	
	11/25/13	J	0.000057		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		6.39	
	12/5/13	J	0.000069		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		6.40	
	12/13/13	J	0.00004		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		6.43	
	12/17/13	J	0.000054		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		6.44	
	12/23/13	J	0.000052		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		6.41	
	1/3/14	J	0.000123		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		6.36	
	1/9/14	J	0.000111		U	0.0006		U	0.0006		U	0.001		U	0.0006		U	0.0005		6.26	
	1/16/14	J	0.000075		U	0.0006		U	0.0006		U	0.001		U	0.0006		U	0.0005		6.29	
	1/23/14	J	0.000081		U	0.0006		U	0.0006		U	0.001		U	0.0006		U	0.0005		6.41	
	1/26/14	J	0.00006		U	0.0006		U	0.0006		U	0.001		U	0.0006		U	0.0005		6.43	
	2/7/14	J	0.000064		U	0.0006		U	0.0006		U	0.001		U	0.0006		U	0.0005		6.40	
	2/10/14	J	0.000066		U	0.0006		U	0.0006		U	0.001		U	0.0006		U	0.0005		6.32	
	2/18/14	J	0.000047		U	0.0006		U	0.0006		U	0.001		U	0.0006		U	0.0005		6.36	

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CAPA Groundwater Treatment System
Analytical Results
Treatment System Effluent

Sample Tap	Date	Analytical Results (mg/L)[1,2]																		pH	Comments
		Mercury			Carbon Tetrachloride			Chloroform			Methylene Chloride			Tetrachloroethene			Trichloroethene				
		Q[3]	Result	Flag[4]	Q	Result	Flag	Q	Result	Flag	Q	Result	Flag	Q	Result	Flag	Q	Result	Flag		
Treated Groundwater Discharge Standards (mg/L)[5]			**0.01**			**0.38**			**0.325**			**NA[6]**			**0.164**			**NA**		**6.0 - 9.0**	
ST-C Continued	2/24/14	U	0.00004		U	0.0006		U	0.0006		U	0.001		U	0.0006		U	0.0005		6.32	
	3/4/14	U	0.00004		U	0.0006		U	0.0006		U	0.001		U	0.0006		U	0.0005		6.44	
	3/10/14	J	0.000042		U	0.0006		U	0.0006		U	0.001		U	0.0006		U	0.0005		6.37	
	3/20/14	J	0.000044		U	0.0006		U	0.0006		U	0.001		U	0.0006		U	0.0005		6.32	
	3/24/14	J	0.000062		U	0.0006		U	0.0006		U	0.001		U	0.0006		U	0.0005		6.35	
	4/3/14	J	0.000048		U	0.0006		U	0.0006		U	0.001		U	0.0006		U	0.0005		6.25	
	4/10/14	U	0.00004		U	0.0006		U	0.0006		U	0.001		U	0.0006		U	0.0005		6.25	
	4/17/14	J	0.000081		U	0.0006		U	0.0006		U	0.001		U	0.0006		U	0.0005		6.34	
	4/23/14	J	0.000086		U	0.0006		U	0.0006		U	0.001		U	0.0006		U	0.0005		6.22	
	4/29/14	J	0.000042		U	0.0005		U	0.0002		U	0.0004		U	0.0003		U	0.0002		6.25	
	5/7/14	J	0.000084		U	0.0006		U	0.0006		U	0.001		U	0.0006		U	0.0005		6.25	
	5/13/14	J	0.000058		U	0.0006		U	0.0006		U	0.001		U	0.0006		U	0.0005		6.28	
	5/22/14	J	0.000097		U	0.0006		U	0.0006		U	0.001		U	0.0006		U	0.0005		6.32	
	5/27/14	U	0.00004		U	0.0006		U	0.0006		U	0.001		U	0.0006		U	0.0005		6.27	
	6/6/14	J	0.000047		U	0.0006		U	0.0006		U	0.001		U	0.0006		U	0.0005		6.24	
	6/11/14	J	0.000067		U	0.0006		U	0.0006		U	0.001		U	0.0006		U	0.0005		6.20	
	6/19/14	J	0.000083		U	0.0006		U	0.0006		U	0.001		U	0.0006		U	0.0005		6.14	
	6/23/14	J	0.000097		U	0.0006		U	0.0006		U	0.001		U	0.0006		U	0.0005		6.36	
	6/30/14	J	0.000127		U	0.0006		J	0.0008		U	0.001		U	0.0006		U	0.0005		6.46	
	7/9/14	J	0.000055		U	0.0006		J	0.0008		U	0.001		U	0.0006		U	0.0005		6.27	
	7/15/14	J	0.000126		U	0.0006		J	0.0010		U	0.001		U	0.0006		U	0.0005		6.25	
	7/21/14	J	0.000095		U	0.0006		J	0.0011		U	0.001		U	0.0006		U	0.0005		6.91	
	7/29/14	U	0.000040		U	0.0006		J	0.0010		U	0.001		U	0.0006		U	0.0005		6.93	
	8/4/14	U	0.000040		U	0.0006		J	0.0014		U	0.001		U	0.0006		U	0.0005		7.07	
	8/15/14	J	0.000063		U	0.0006		J	0.0021		U	0.001		U	0.0006		U	0.0005		7.10	
	8/18/14	J	0.000097		J	0.00067		J	0.0026		U	0.001		U	0.0006		U	0.0005		7.21	
	8/25/14	J	0.000074		U	0.0006		J	0.0020		U	0.001		U	0.0006		U	0.0005		7.11	
	9/3/14	J	0.000107		U	0.0006		J	0.0023		U	0.001		U	0.0006		U	0.0005		6.42	
	9/12/14	J	0.000040		J	0.0013		J	0.0021		U	0.001		U	0.0006		U	0.0005		6.55	
	9/15/14	J	0.000129		U	0.0006		J	0.0007		U	0.001		U	0.0006		U	0.0005		6.39	
	9/23/14	J	0.000113		J	0.00084		J	0.0019		U	0.001		U	0.0006		U	0.0005		6.31	
	9/30/14	J	0.000102		J	0.00086		J	0.0021		U	0.001		U	0.0006		U	0.0005		6.73	
	10/8/14	J	0.000099		J	0.0009		J	0.0023		U	0.001		U	0.0006		U	0.0005		6.36	
	10/17/14	J	0.000113		J	0.00077		J	0.0018		U	0.001		U	0.0006		U	0.0005		6.34	
	10/23/14	J	0.000127		J	0.0012		J	0.0020		U	0.001		U	0.0006		U	0.0005		6.32	
	10/31/14	J	0.000091		J	0.0035		J	0.0027		U	0.001		U	0.0006		U	0.0005		6.29	
	11/3/14	J	0.000095		J	0.0039		J	0.0030		U	0.001		U	0.0006		U	0.0005		6.28	
	11/14/14	J	0.000078		J	0.0025		J	0.0028		U	0.001		U	0.0006		U	0.0005		6.28	
	11/21/14	J	0.000141		J	0.0038		J	0.0033		U	0.001		U	0.0006		U	0.0005		6.27	
	11/26/14	J	0.000100		J	0.0046		J	0.0032		U	0.001		U	0.0006		U	0.0005		6.34	
	12/4/14	J	0.000156			0.0052		J	0.0036		U	0.001		U	0.0006		U	0.0005		6.45	
	12/12/14	J	0.000152			0.0055		J	0.0037		U	0.001		U	0.0006		U	0.0005		6.27	
	12/15/14	J	0.000151			0.0056		J	0.0039		U	0.001		U	0.0006		U	0.0005		6.32	
	12/26/14	J	0.000064		J	0.0041		J	0.0034		U	0.001		U	0.0006		U	0.0005		6.37	
	12/31/14	J	0.000112		J	0.0046		J	0.0031		U	0.001		U	0.0006		U	0.0005		6.33	
	1/8/15	J	0.000113			0.0059		J	0.0033		U	0.010		U	0.0050		U	0.0050		6.20	
	1/15/15	J	0.000107			0.0063		J	0.0029		U	0.0010		U	0.00060		U	0.00050		6.19	
	1/21/15	J	0.000112			0.0058		J	0.0035		U	0.0010		U	0.00060		U	0.00050		6.22	
	1/27/15	J	0.000164			0.0086		J	0.0038		U	0.0010		U	0.00060		U	0.00050		6.16	
	2/4/15	J	0.000162			0.0094		J	0.0034		U	0.0010		U	0.00060		U	0.00050		6.08	
	2/11/15	J	0.000136			0.0098		J	0.0038		U	0.0010		U	0.00060		U	0.00050		6.28	
	2/19/15	J	0.000116			0.0096		J	0.0034		U	0.0010		U	0.00060		U	0.00050		6.38	
	2/27/15	J	0.0000520			0.0066		J	0.0027		U	0.0010		U	0.00060		U	0.00050		6.35	
	3/6/15	J	0.000139			0.011		J	0.0029		U	0.0010		U	0.00060		U	0.00050		NM[5]	pH probe not working properly
	3/10/15	J	0.000132			0.011		J	0.0030		U	0.0010		U	0.00060		U	0.00050		6.47	
	3/18/15	J	0.0000760			0.012		J	0.0038		U	0.0010		U	0.00060		U	0.00050		6.34	
	3/26/15	J	0.0000670			0.012		J	0.0035		U	0.0010		U	0.00060		U	0.00050		6.60	
	4/3/15	J	0.0000970			0.013		J	0.0036		U	0.0010		U	0.00060		U	0.00050		6.62	
	4/6/15	J	0.0001380			0.013		J	0.0036		U	0.0010		U	0.00060		U	0.00050		6.55	

Table 1
CAPA Groundwater Treatment System
Analytical Results
Treatment System Effluent

Sample Tap	Date	Analytical Results (mg/L)[1,2]																		pH	Comments
		Mercury			Carbon Tetrachloride			Chloroform			Methylene Chloride			Tetrachloroethene			Trichloroethene				
		Q[3]	Result	Flag[4]	Q	Result	Flag	Q	Result	Flag	Q	Result	Flag	Q	Result	Flag	Q	Result	Flag		
Treated Groundwater Discharge Standards (mg/L)[5]			**0.01**			**0.38**			**0.325**			**NA[6]**			**0.164**			**NA**		**6.0 - 9.0**	
ST-C Continued	4/14/15	J	0.0000400			0.012		J	0.0026		U	0.0010		U	0.00060		U	0.00050		6.37	
	4/22/15	J	0.0000840			0.015		J	0.0029		U	0.0010		U	0.00060		U	0.00050		6.53	
	4/28/15	J	0.000153			0.012		J	0.0026		U	0.0010		U	0.00060		U	0.00050		6.64	
	5/7/15	J	0.000150			0.014		J	0.0025		U	0.0010		U	0.00060		U	0.00050		6.72	
	5/13/15	J	0.000113			0.011		J	0.0023		U	0.0010		U	0.00060		U	0.00050		6.51	
	5/21/15	J	0.000104			0.011		J	0.0025		U	0.0010		U	0.00060		U	0.00050		6.67	
	5/27/15	J	0.000126			0.011		J	0.0024		U	0.0010		U	0.00060		U	0.00050		6.47	
	6/5/15	J	0.000126			0.016		J	0.0025		U	0.0010		U	0.00060		U	0.00050		6.62	
	6/12/15	J	0.0000880			0.015		J	0.0024		U	0.0010		U	0.00060		U	0.00050		7.25	
	6/19/15	J	0.000132			0.016		J	0.0023		U	0.0010		U	0.00060		U	0.00050		7.46	
	6/24/15	J	0.000155			0.017		J	0.0024		U	0.0010		U	0.00060		U	0.00050		6.82	
	7/2/15	J	0.0001440			0.015		J	0.0021		U	0.0010		U	0.00060		U	0.00050		6.67	
	7/6/15	J	0.000163		U	0.00060		J	0.0022		U	0.0010		U	0.00060		U	0.00050		6.80	
	7/15/15	J	0.0000480			0.013		J	0.0024		U	0.0010		U	0.00060		U	0.00050		NM	
	7/24/15	J	0.0000720			0.016		J	0.0022		U	0.0010		U	0.00060		U	0.00050		6.89	
	7/28/15	J	0.000101			0.015		J	0.0020		U	0.0010		U	0.00060		U	0.00050		6.88	
	8/3/15	J	0.000165			0.014		J	0.0019		U	0.0010		U	0.00060		U	0.00050		7.36	
	8/10/15		0.000233			0.014		J	0.0020		U	0.0010		U	0.00060		U	0.00050		7.50	
	8/21/15	J	0.0000640			0.013		J	0.0021		U	0.0010		U	0.00060		U	0.00050		7.28	
	8/26/15	J	0.0000610			0.013		J	0.0020		U	0.0010		U	0.00060		U	0.00050		6.52	
	9/3/15	U	0.0000400			0.013		J	0.0017		U	0.0010		U	0.00060		U	0.00050		7.45	
	9/11/15	J	0.0000820			0.014		J	0.0019		U	0.0010		U	0.00060		U	0.00050		7.13	
	9/18/15	J	0.000133			0.014		J	0.0021		U	0.0010		U	0.00060		U	0.00050		7.18	
	9/25/15	J	0.000117			0.013		J	0.0019		U	0.0010		U	0.00060		U	0.00050		7.31	
	9/29/15		0.000228			0.013		J	0.0016		U	0.0010		U	0.00060		U	0.00050		7.32	
	10/8/15	J	0.000132			0.012		J	0.0020		U	0.0010		U	0.00060		U	0.00050		7.41	
	10/16/15	J	0.000127			0.012		J	0.0014		U	0.0010		U	0.00060		U	0.00050		7.39	
	10/21/15	J	0.000141			0.012		J	0.0016		U	0.0010		U	0.00060		U	0.00050		6.70	
	10/28/15		0.000202			0.012		J	0.0012		U	0.0010		U	0.00060		U	0.00050		6.90	
	11/5/15	J	0.000175			0.015		J	0.0012		U	0.0010		U	0.00060		U	0.00050		6.76	
	11/13/15	J	0.000160			0.011		J	0.0013		U	0.0010		U	0.00060		U	0.00050		7.08	
	11/19/15	J	0.000184			0.013		J	0.0013		U	0.0010		U	0.00060		U	0.00050		6.71	
	11/23/15	J	0.000190			0.012		J	0.0012		U	0.0010		U	0.00060		U	0.00050		6.79	
	12/4/15	J	0.000136			0.012		J	0.0012		U	0.0010		U	0.00060		U	0.00050		6.65	
	12/11/15	J	0.000127			0.013		J	0.0015		U	0.0010		U	0.00060		U	0.00050		7.27	
	12/15/15	J	0.000157			0.014		J	0.0015		U	0.0010		U	0.00060		U	0.00050		7.29	
	12/23/15	J	0.000171			0.015		J	0.0011		U	0.0010		U	0.00060		U	0.00050		6.88	
	12/31/15	J	0.0000960			0.011		J	0.0012		U	0.0010		U	0.00060		U	0.00050		6.40	
	1/7/16		0.000227			0.013		J	0.0015		U	0.0010		U	0.00060		U	0.00050		7.03	
	1/13/16		0.000253			0.017		J	0.0016		U	0.0010		U	0.00060		U	0.00050		6.90	
	1/20/16		0.000266			0.014		J	0.0018		U	0.0010		U	0.00060		U	0.00050		7.00	
	1/25/16		0.000225			0.023		J	0.0014		U	0.0010		U	0.00060		U	0.00050		6.85	
	2/1/16	J	0.000160			0.022		J	0.0011		U	0.0010		U	0.00060		U	0.00050		6.64	
	2/9/16	J	0.000195			0.025		J	0.0015		U	0.0010		U	0.00060		U	0.00050		6.49	
	2/16/16	J	0.000183			0.022		J	0.0016		U	0.0010		U	0.00060		U	0.00050		6.41	
	2/25/16		0.000236			0.023		J	0.0013		U	0.0010		U	0.00060		U	0.00050		6.59	
	3/3/16	J	0.000183			0.021		J	0.0015		U	0.0010		U	0.00060		U	0.00050		7.91	
	3/11/16	J	0.000177			0.021		J	0.0015		U	0.0010		U	0.00060		U	0.00050		6.35	
	3/18/16	J	0.000155			0.025		J	0.0013		U	0.0010		U	0.00060		U	0.00050		6.39	
	3/21/16	J	0.000119			0.018		J	0.00092		U	0.0010		U	0.00060		U	0.00050		6.18	
	3/31/16	J	0.000130			0.024		J	0.0015		U	0.0010		U	0.00060		U	0.00050		8.38	
	4/8/16	J	0.000108			0.025		J	0.0012		U	0.0010		U	0.00060		U	0.00050		6.59	
	4/14/16	J	0.0000860			0.020		J	0.0006		U	0.0010		U	0.00060		U	0.00050		6.17	
	4/21/16	J	0.000179			0.022		J	0.0013		U	0.0010		U	0.00060		U	0.00050		6.32	
	4/28/16	J	0.000180			0.024		J	0.0016		U	0.0010		U	0.00060		U	0.00050		6.89	
	5/3/16		0.000209			0.019		J	0.0014		U	0.0010		U	0.00060		U	0.00050		6.33	
	5/9/16	J	0.000161			0.022		U	0.0006		U	0.0010		U	0.00060		U	0.00050		7.41	
	5/18/16	J	0.000184			0.017		J	0.0012		U	0.0010		U	0.00060		U	0.00050		6.43	
	5/23/16	J	0.000189			0.019		J	0.0012		U	0.0010		U	0.00060		U	0.00050		6.35	

Table 1
CAPA Groundwater Treatment System
Analytical Results
Treatment System Effluent

Sample Tap	Date	Analytical Results (mg/L)[1,2]																		pH	Comments
		Mercury			Carbon Tetrachloride			Chloroform			Methylene Chloride			Tetrachloroethene			Trichloroethene				
		Q[3]	Result	Flag[4]	Q	Result	Flag	Q	Result	Flag	Q	Result	Flag	Q	Result	Flag	Q	Result	Flag		
Treated Groundwater Discharge Standards (mg/L)[5]			**0.01**			**0.38**			**0.325**			**NA[6]**			**0.164**			**NA**		**6.0 - 9.0**	
ST-C	6/3/16	J	0.000147			0.021		J	0.0012		U	0.0010		U	0.00060		U	0.00050		6.61	
Continued	6/10/16		0.000228			0.020		J	0.0011		U	0.0010		U	0.00060		U	0.00050		6.54	
	6/14/16	J	0.000139			0.023		J	0.0015		U	0.0010		U	0.00060		U	0.00050		7.14	
ST-A	6/24/16	J	0.0000870		U	0.00060		U	0.00060		U	0.0010		U	0.00060		U	0.00050		7.36	Carbon change out 6/17/16
	6/30/16	J	0.0000860		U	0.00060		U	0.00060		U	0.0010		U	0.00060		U	0.00050		7.34	
	7/8/16	J	0.0001100		U	0.00060		U	0.00060		U	0.0010		U	0.00060		U	0.00050		6.98	
	7/15/16	J	0.0000870		U	0.00060		U	0.00060		U	0.0010		U	0.00060		U	0.00050		6.29	
	7/18/16	U	0.0000400		U	0.00060		U	0.00060		U	0.0010		U	0.00060		U	0.00050		6.35	
	7/26/16	U	0.0000400		U	0.00060		U	0.00060		U	0.0010		U	0.00060		U	0.00050		6.21	
	8/4/16	J	0.0000670		U	0.00060		U	0.00060		U	0.0010		U	0.00060		U	0.00050		6.00	Issues noted with pH meter
	8/8/16	J	0.0000660		U	0.00060		U	0.00060		U	0.0010		U	0.00060		U	0.00050		6.38	
	8/16/16	J	0.0000620		U	0.00060		U	0.00060		U	0.0010		U	0.00060		U	0.00050		6.21	
	8/23/16	J	0.0000600		U	0.00060		U	0.00060		U	0.0010		U	0.00060		U	0.00050		6.14	
	9/1/16	J	0.0000700		U	0.00060		U	0.00060		U	0.0010		U	0.00060		U	0.00050		6.47	
	9/9/16	U	0.0000400		U	0.00060		U	0.00060		U	0.0010		U	0.00060		U	0.00050		6.41	
	9/16/16	J	0.0000760		U	0.00060		U	0.00060		U	0.0010		U	0.00060		U	0.00050		6.57	
	9/20/16	J	0.0000450		U	0.00060		U	0.00060		U	0.0010		U	0.00060		U	0.00050		7.21	
	9/27/16	J	0.0000660		U	0.00060		U	0.00060		U	0.0010		U	0.00060		U	0.00050		6.79	
	10/6/16	U	0.0000400		U	0.00060		U	0.00060		U	0.0010		U	0.00060		U	0.00050		7.10	
	10/10/16	J	0.0000450		U	0.00060		U	0.00060		U	0.0010		U	0.00060		U	0.00050		7.32	
	10/17/16	J	0.0000830		U	0.00060		U	0.00060		U	0.0010		U	0.00060		U	0.00050		7.08	
	10/26/16	J	0.0000610		U	0.00060		U	0.00060		U	0.0010		U	0.00060		U	0.00050		6.79	
	11/1/16	J	0.0000500		U	0.00060		U	0.00060		U	0.0010		U	0.00060		U	0.00050		6.64	
	11/8/16	J	0.0000550		U	0.00060		U	0.00060		U	0.0010		U	0.00060		U	0.00050		6.45	
	11/16/16	J	0.0000440		U	0.00060		U	0.00060		U	0.0010		U	0.00060		U	0.00050		6.74	
	11/23/16	J	0.0000800		U	0.00060		U	0.00060		U	0.0010		U	0.00060		U	0.00050		6.95	
	12/2/16	J	0.0000770		U	0.00060		U	0.00060		U	0.0010		U	0.00060		U	0.00050		6.43	
	12/9/16	U	0.0000300		U	0.00060		U	0.00060		U	0.0010		U	0.00060		U	0.00050		6.61	Mislabeled on Lab Report as ST-B
	12/14/16	J	0.0000690		U	0.00060		U	0.00060		U	0.0010		U	0.00060		U	0.00050		6.34	
	12/21/16	J	0.0000810		U	0.00060		U	0.00060		U	0.0010		U	0.00060		U	0.00050		6.52	
	12/29/16	J	0.000062		U	0.00060		U	0.00060		U	0.0010		U	0.00060		U	0.00050		6.23	

NOTES:
1) mg/L - milligrams per liter
2) Grey cells indicate analyses not requested
3) Q - Qualifier
< - Not detected (ND) at a value greater than the reporting limit (RL), for data prior to 2/24/06.
< - Not detected at a value greater than the method detection limit (MDL). (MDL noted in Result column, for data 2/24/06 to 12/31/08.)
U - Not detected at a value greater than the method detection limit (MDL). (MDL noted in Result column, for data 12/31/08 to present)
B - Indicates that a value for an inorganic analysis is an estimate. Used when a compound is determined to be above the detection limit but at a concentration less than the quantitation limit of the method, for data prior to 2/24/06.
B - Indicates that the compound was found in the blank sample for both inorganic and metals analysis, for data 2/24/06 to 12/31/08.
H - Indicates a sample was prepped or analyzed beyond the specified holding time
J - Value for an organic analysis is an estimate, for data prior to 2/24/06.
J - Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value, for data 2/24/06 to present.
* - LCS or LCSD exceeds the control limits
4) Flag
B - Indicates that an analyte is present in the method blank as well as in the sample.
J - Value is an estimate; result falls within the MDL and the limit of quantitation (LQ) (Lancaster Laboratories).
Y - Used to identify a spike or spike duplicate recovery is outside the specified quality control limits
5) Treated groundwater discharge limitations recommended by the EPA in a letter dated 7/20/1998 to Mr. Ron Weddell of Alcoa.
6) NA - Not applicable
7) ST - Sample tap; sample tap either (A, B, or C) depends on arrangement of carbon canisters, which changes after each carbon change out.
8) Metals sample container was not received by laboratory.

Table 2
CAPA Groundwater Treatment System
Analytical Results
Recovery Wells

Sample Locations	Date	Analytical Results (mg/L)[1,2]																	pH	Comments
		Mercury			Carbon Tetrachloride			Chloroform			Methylene Chloride			Tetrachloroethene			Trichloroethene				
		Q[3]	Result	Flag[4]	Q	Result	Flag	Q	Result	Flag	Q	Result	Flag	Q	Result	Flag	Q	Result	Flag		
CA050B	5/18/98		3.900			52.0			1.30		<	0.5000			0.330		<	0.500			
	5/29/98		4.200			116			1.80		<	0.2000			0.340		<	0.100			
	7/1/98		4.000			125			2.10		<	0.1000			0.340		<	0.100			
	7/28/98		3.300			128			1.90		<	0.2000			0.310		<	0.100			
	8/25/98		3.400			130			2.00		<	0.2000			0.290		<	0.100			
	12/22/98		2.200			142			2.30			0.0120	J		0.240			0.004	J		
	4/28/99		1.800			89.0			1.60		<	0.2000			0.190		<	0.100			
	6/30/99		1.700			50.0			1.40		<	0.1000			0.160		<	0.050			
	10/20/99		1.520			44.3			0.93		<	0.1000			0.099		<	0.050			
	2/2/00		1.460			77.4			0.90		<	0.0500			0.110		<	0.025			
	9/27/00		0.440			40.0			1.10		<	1.0000		<	0.200		<	0.200			
	1/10/01		1.080			74.0			1.10		<	2.0000		<	0.400		<	0.400			
	5/30/01		0.940			74.0			1.10		<	2.0000		<	0.500		<	0.500			
	10/22/01		0.780			75.0			0.90		<	4.0000		<	0.800		<	0.800			
	3/25/02		0.450			14.0			0.50		<	0.5000		<	0.100		<	0.100			
	8/12/02		0.690			53.0			0.70		<	2.0000		<	0.500		<	0.500			
	1/3/03		0.700			65.0			0.70		<	2.0000		<	0.500		<	0.500			
	5/19/03		0.870			70.0			0.80		<	2.0000		<	0.400		<	0.400			
	10/6/03		0.790			64.0			0.80		<	2.0000		<	0.500		<	0.500			
	2/23/04		0.410			64.0			0.90		<	2.0000		<	0.500		<	0.500			
	7/13/04		0.710			68.0			0.80		<	2.0000		<	0.500		<	0.500			
	11/29/04		0.960			78.0			0.80		<	2.0000		<	0.400		<	0.400			
	5/16/05		0.813			34.0			0.47		<	1.0000		J	0.110		<	0.200			
	5/3/06		0.590			38.0			0.64		J,B	0.1300		J	0.140		<	0.064			
	9/20/07		1.600			69.0			0.68		<	0.4000		J	0.260		<	0.130			
	10/13/08		0.540			39.0			0.52		<	0.8000		J	0.140		<	0.120			
	7/9/09		0.503			40.0			0.42		<	0.0005			0.120			0.013			
	7/6/10		0.393			52.0			0.45		U	0.0005			0.140			0.013			
	7/22/11		0.404			35.0			0.45		U	0.0650		J	0.110		U	0.055		6.81	
	9/28/12		0.394			25.0			0.34		U	0.0250		J	0.079		U	0.025		7.00	
	9/26/13		0.350			31.0			0.33		U	0.0250		J	0.080		U	0.025		6.89	
	9/5/14		0.486			32.0		J	0.30		U	0.1000		U	0.060		U	0.050		6.65	
	9/29/15		0.604			40			0.33		U	0.050		J	0.074		U	0.025		6.82	
	9/9/16		0.396			25			0.35		U	0.010			0.074		J	0.010		6.76	
CA051B	5/18/98		0.980			73.0			1.20		<	0.5000		<	0.500		<	0.500			
	5/29/98		0.880			94.0			1.60		<	0.2000			0.110		<	0.100			
	7/1/98		0.760			79.0			1.80		<	0.2000			0.110		<	0.100			
	7/28/98		0.610			69.0			1.50		<	0.1000			0.078		<	0.050			
	8/25/98		0.540			64.0			1.60		<	0.0500			0.075			0.007	J		
	12/22/98		0.360			59.0			2.00		<	0.0200			0.083		<	0.020			
	4/28/99		0.370			37.0			1.60		<	0.0500			0.061			0.004	J		
	6/30/99		0.330			29.0			1.60			0.0050	J		0.063			0.004	J		
	10/20/99		0.342			37.2			1.50		<	0.0200			0.072			0.006	J		
	2/2/00		0.312			40.5			1.40		<	0.0200			0.060			0.005	J		
	9/27/00		0.201			21.0			1.50		<	1.0000		<	0.200		<	0.200			
	1/10/01		0.370			11.0			0.98		<	0.2000			0.060		<	0.050			
	5/30/01		0.160			12.0			1.00		<	0.5000		<	0.100		<	0.100			
	10/22/01		0.560			52.0			7.00		<	2.0000		<	0.400		<	0.400			
	3/25/02		0.045			13.0			1.20		<	0.5000		<	0.100		<	0.100			
	8/12/02		0.072			15.0			1.20		<	0.0050			0.050			0.005			
	1/3/03		0.067			5.6			0.92		<	0.0010			0.040		<	0.002			
	5/19/03		0.101			17.0			0.87		<	0.1000			0.040		<	0.020			
	10/6/03		0.096			15.0			0.90		<	0.5000		<	0.100		<	0.100			
	2/23/04		0.049			4.4			0.73		<	0.1000			0.040		<	0.020			
	7/13/04		0.040			4.3			0.83		<	0.1000			0.050		<	0.020			
	11/29/04		0.150			21.0			0.90		<	1.0000		<	0.200		<	0.200			
	5/16/05		0.116			9.7			0.73		<	0.2500		J	0.038		<	0.050			
	5/3/06		0.081			12.0			0.72		J,B	0.0520		J	0.045		<	0.016			
	9/20/07		0.130			12.0			0.75		<	0.0800		J	0.029		<	0.026			
	10/13/08		0.065			12.0			0.54		<	0.1600		J	0.035		<	0.025			
	7/9/09		0.0958			8.5			0.41		<	0.0005			0.026		J	0.0044			
	7/6/10		0.0134			1.6			0.32		U	0.0005			0.023		J	0.0067			

Table 2
CAPA Groundwater Treatment System
Analytical Results
Recovery Wells

Sample Locations	Date	Analytical Results (mg/L)[1,2]																	pH	Comments
		Mercury			Carbon Tetrachloride			Chloroform			Methylene Chloride			Tetrachloroethene			Trichloroethene				
		Q[3]	Result	Flag[4]	Q	Result	Flag	Q	Result	Flag	Q	Result	Flag	Q	Result	Flag	Q	Result	Flag		
CA051B Continued	7/22/11		0.0268			5.0			0.44		U	0.0065		J	0.025		U	0.0055		6.60	
	9/28/12		0.02040			9.8			0.36		U	0.0100		J	0.019		U	0.0100		6.71	
	9/26/13		0.00702			1.8			0.25		U	0.0010			0.020			0.0053		6.70	
	9/5/14		0.00722			1.8			0.18		U	0.0050		J	0.0079		J	0.0050		6.49	
	9/29/15		0.0367			5.1			0.34		U	0.010		J	0.019		J	0.0057		6.76	
	9/9/16		0.0103			3.1			0.32		U	0.0050		J	0.014		J	0.0059		6.71	
CA052B	5/18/98		5.800			49.0			1.80		<	0.5000			1.400		<	0.500			
	5/29/98		0.300			64.0			2.50		<	0.2000			1.800			0.092	J		
	6/24/98		0.230																		
	7/1/98		0.320			66.0			2.20		<	0.2000			1.500			0.076	J		
	7/28/98		0.240			72.0			1.60		<	0.1000			1.000			0.051			
	8/25/98		0.270			207			1.80		<	0.2000			1.200			0.062	J		
	4/28/99		0.250			34.0			1.40		<	0.1000			0.400			0.020	J		
	6/30/99		0.090			23.0			0.90		<	0.0400			0.400			0.016	J		
	10/20/99		0.870			55.1			2.30			0.0290			0.480			0.025	J		
	2/2/00		0.047			12.0			0.70			0.0013	J		0.150			0.008			
	9/27/00		0.044			25.0			1.10		<	1.0000		<	0.200		<	0.200			
	1/10/01		0.060			16.0			0.60		<	0.5000		<	0.100		<	0.100			
	5/30/01		0.031			21.0			0.80		<	0.5000			0.100		<	0.100			
	10/22/01		0.036			21.0			0.60		<	1.0000		<	0.200		<	0.200			
	3/25/02		0.024			22.0			0.60		<	1.0000		<	0.200		<	0.200			
	8/12/02		0.025			22.0			0.50		<	0.5000			0.100		<	0.100			
	1/3/03		0.025			16.0			0.60		<	0.5000			0.100		<	0.100			
	5/19/03		0.025			17.0			0.50		<	0.5000			0.100		<	0.100			
	10/6/03		0.023			18.0			0.50		<	0.5000			0.100		<	0.100			
	2/23/04		0.025			18.0			0.50		<	0.5000			0.100		<	0.100			
	7/13/04		0.018			19.0			0.40		<	0.5000			0.200		<	0.100			
	11/29/04		0.020			17.0			0.40		<	0.5000			0.100		<	0.100			
	5/16/05		0.020			12.0			0.39		<	0.5000		J	0.077		<	0.100			
	5/3/06		0.016			10.0			0.38		J,B	0.1100		J	0.079		<	0.032			
	9/20/07		0.025			13.0			0.40		<	0.0800			0.140		<	0.026			
	10/13/08		0.014			8.0			0.29		<	0.1600		J	0.056		<	0.025			
	7/9/09		0.013			10.0			0.27		<	0.0005			0.074		J	0.003			
	7/6/10		0.007			8.8			0.26		U	0.0005			0.098		J	0.003			
	7/22/11		0.006			9.9			0.30		U	0.0320		J	0.079		U	0.028		6.83	
	9/28/12		0.005			8.7			0.24		U	0.0200		J	0.070		U	0.020		6.89	
	9/26/13		0.003			8.7			0.20		U	0.0100			0.064		U	0.010		6.93	
	9/5/14		0.004			8.3			0.18		U	0.0100			0.054		U	0.005		6.76	
	9/29/15		0.00410			5.6			0.20		U	0.010			0.068		U	0.0050		7.08	
	9/9/16		0.00256			5.1			0.21		U	0.010			0.061		U	0.0050		6.92	
CA0U23B	5/18/98		3.900			88.0			2.60		<	0.5000		<	0.500		<	0.500			
	5/29/98		2.500			118			3.40			0.0400	J		0.640			0.026	J		
	7/1/98		2.400			112			3.40			0.0550	J		0.630			0.025	J		
	7/28/98		2.400			119			3.40			0.0250	J		0.620		<	0.100			
	8/25/98		2.800			124			3.40			0.0320			0.550		<	0.100			
	12/22/98		1.400			127			3.60			0.0390	J		0.790			0.044			
	4/28/99		1.200			81.0			2.80		<	0.2000			0.600		<	0.100			
	6/30/99		1.200			54.0			3.00			0.0430	J		0.590			0.031	J		
	10/20/99		0.089			23.6			0.83			0.0045	J		0.301			0.016			
	2/2/00		0.705			58.9			2.20			0.0156	J		0.472			0.026			
	9/27/00		0.780			45.0			2.00		<	1.0000			0.400		<	0.200			
	1/10/01		0.044			48.0			2.00		<	1.0000			0.400		<	0.200			
	5/30/01		0.500			25.0			0.80		<	1.0000			0.200		<	0.200			
	10/22/01		0.410			38.0			1.30		<	1.0000			0.500		<	0.200			
	3/25/02		0.220			52.0			19.00		<	2.0000			0.500		<	0.400			
	8/12/02		0.450			36.0			1.30		<	1.0000			0.400		<	0.200			
	1/3/03		0.490			44.0			1.40		<	2.0000			0.500		<	0.400			
	5/19/03		0.230			31.0			1.80		<	1.0000			0.400		<	0.200			
	10/6/03		0.260			31.0			2.20		<	1.0000			0.500		<	0.200			
	2/23/04		0.270			32.0			2.00		<	1.0000			0.600		<	0.200			
	7/13/04		0.300			36.0			1.50		<	1.0000			0.600		<	0.200			
	11/29/04		0.310			40.0			1.60		<	1.0000			0.600		<	0.200			

Table 2
CAPA Groundwater Treatment System
Analytical Results
Recovery Wells

Sample Locations	Date	Analytical Results (mg/L)[1,2]																pH	Comments
		Mercury			Carbon Tetrachloride			Chloroform			Methylene Chloride			Tetrachloroethene			Trichloroethene				
		Q[3]	Result	Flag[4]	Q	Result	Flag	Q	Result	Flag	Q	Result	Flag	Q	Result	Flag	Q	Result	Flag		
CA0U23B Continued	5/16/05		0.259			36.0			1.60		J	0.0420			0.520		J	0.064			
	5/3/06		0.140			28.0			1.70		J,B	0.1500			0.410		<	0.064			
	9/20/07		0.250			26.0			1.20		<	0.2000			0.380		J	0.076			
	10/13/08		0.140			21.0			1.10		<	0.4000			0.350		<	0.063			
	7/9/09		0.141			20.0			1.00		J	0.0036			0.310			0.039			
	7/6/10		0.123			20.0			1.20		J	0.0034			0.450			0.051			
	7/22/11		0.102			15.0			0.89		U	0.0320			0.310		J	0.031		6.77	
	9/28/12		0.085			14.0			0.77		U	0.0250			0.250		J	0.029		6.86	
	9/26/13		0.0837			14.0			0.82		U	0.0100			0.300		J	0.030		7.09	
	9/5/14		0.174			16.0			0.64		U	0.0100			0.280		J	0.036		6.67	
	9/29/15		0.172			16			0.83		U	0.050			0.30		J	0.045		6.96	
	9/9/16		0.0975			14			1.10		U	0.010			0.30		J	0.041		6.77	

NOTE:
1) mg/L - milligrams per liter
2) Grey cells indicate analyses not requested.
3) Q - Qualifier
< - Not detected (ND) at a value greater than the reporting limit (RL), for data prior to 2/24/06.
< - Not detected at a value greater than the method detection limit (MDL), MDL noted in Result column, for data 2/24/06 to 12/31/08.
U - Not detected at a value greater than the method detection limit (MDL), MDL noted in Result column, for data 12/31/08 to present.
B - Indicates that the compound was found in the blank sample for both inorganic and metals analysis, for data 2/24/06 to 12/31/08.
J - Value for an organic analysis is an estimate, for data prior to 2/24/06.
J - Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value, for data 2/24/06 to present.
4) Flag
J - Value is an estimate; result falls within the MDL and the limit of quantitation (LQ) (Lancaster Laboratories).

Table 3
CAPA Groundwater Treatment System
Analytical Results
Stripper Effluent

Sample Tap	Date	Analytical Results (mg/L)[1,2]																	pH	Comments
		Mercury			Carbon Tetrachloride			Chloform			Methylene Chloride			Tetrachloroethene			Trichloroethene			
		Q[3]	Result	Flag[4]	Q	Result	Flag	Q	Result	Flag	Q	Result	Flag	Q	Result	Flag	Q	Result	Flag	
ST-9	5/18/98					0.63			0.034			0.0016			0.002		<	0.001			
	5/29/98		1.7																	
	6/10/98		1.0																	
	6/24/98		0.6																	
	7/1/98					0.33			0.018			0.00047	J		0.00079	J	<	0.001			
	7/28/98					0.32			0.019			0.00017	J		0.00062	J	<	0.001			
	8/25/98					0.26			0.018		<	0.002			0.00062	J	<	0.001			
	9/23/98					0.17			0.013		<	0.002			0.001		<	0.001			
	10/1/98					0.29			0.021		<	0.002			0.0008	J	<	0.001			
	10/7/98					0.037			0.006		<	0.002		<	0.001		<	0.001			
	12/16/98					0.026			0.0009		<	0.002		<	0.001		<	0.001			
	2/17/99					0.146			0.00324		<	0.002			0.001		<	0.001			
	3/10/99					0.050415			0.001822		<	0.002			0.00034	J	<	0.001			
	4/6/99					0.30273			0.006957		<	0.002			0.003346		<	0.001			
	5/5/99					0.872			0.062		<	0.002			0.007			0.0004	J		
	9/1/99					0.178			0.007		<	0.002			0.000979	J	<	0.001			
	9/29/99					0.033			0.0009		<	0.002			0.000204	J	<	0.001			
	10/27/99					11.931			0.516	J	<	0.002			0.172	J	<	0.001			
	2/24/00					0.00607			0.000256	J	<	0.002		<	0.001		<	0.001			
	8/9/00				<	0.001		<	0.001		<	0.005		<	0.001		<	0.001			
	10/5/00					0.048			0.011		<	0.005		<	0.001		<	0.001			
	1/10/01					0.001		<	0.001		<	0.005		<	0.001		<	0.001			
	5/30/01					0.005			0.021		<	0.005		<	0.001		<	0.001			
	10/22/01				<	0.001		<	0.001		<	0.005		<	0.001		<	0.001			
	3/25/02				<	0.001		<	0.001		<	0.005		<	0.001		<	0.001			
	8/12/02				<	0.001			0.006		<	0.005		<	0.001		<	0.001			
	1/3/03					0.003		<	0.001		<	0.005		<	0.001		<	0.001			
	5/19/03					0.001		<	0.001		<	0.005		<	0.001		<	0.001			
	10/6/03					0.001		<	0.001		<	0.005		<	0.001		<	0.001			
	11/3/03					0.001		<	0.001		<	0.005		<	0.001		<	0.001			
	2/23/04					0.002		<	0.001		<	0.005		<	0.001		<	0.001			
	7/13/04				<	0.001		<	0.001		<	0.005		<	0.001		<	0.001			
	11/29/04					0.001		<	0.001		<	0.005		<	0.001		<	0.001			
	5/16/05					0.001		J	0.4		<	0.005		<	0.001		<	0.001			
	6/13/05		0.106	B																
	1/5/06				J	0.0007		J	0.0002		<	0.005		<	0.001		<	0.001			
	9/18/06				<	0.00025			0.001		<	0.00053		<	0.0002		<	0.00032			
	7/20/07				<	0.00025			0.0016		<	0.001		<	0.0002		<	0.00032			
	11/29/07				J	0.00042		<	0.0002		<	0.001		<	0.0002		<	0.00032			
	3/20/08				J	0.00073		<	0.0002		<	0.001		<	0.0002		<	0.00032			
	10/22/08					0.034			0.0014		<	0.002		J	0.0005		<	0.00032			
	11/26/08					0.0023		J	0.0002		<	0.002		<	0.0002		<	0.00032			
	3/4/09				J	0.0016		U	0.0005		U	0.0005		U	0.0006		U	0.0005			ALS Laboratory Group (2009)
	12/8/09				J	0.00069		U	0.0005		U	0.0005		U	0.0006		U	0.0005			
	3/10/10				U	0.0005		U	0.0005		U	0.0005		U	0.0006		U	0.0005			
	8/18/10				J	0.0038		J	0.0037		U	0.0005		U	0.0006		U	0.0005			
	8/30/10		0.18		U	0.0005		U	0.0005		U	0.0005		U	0.0006		U	0.0005		6.77	
	3/18/11		0.188		J	0.0016		U	0.0005		U	0.0005		U	0.0006		U	0.0005		8.03	
	7/29/11		0.177		U	0.0018		U	0.001		U	0.0013		U	0.0017		U	0.0011		7.8	
	3/23/12		0.142		U	0.0018		U	0.001		U	0.0013		U	0.0017		U	0.0011		7.89	
	9/28/12		0.117		J	0.0011		U	0.001		U	0.001		U	0.001		U	0.001		6.91	
	3/27/13		0.124		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		8.54	
	9/26/13		0.124		J	0.0018		U	0.001		U	0.001		U	0.001		U	0.001		7.21	
	3/24/14		0.116		J	0.00085		U	0.0006		U	0.001		U	0.0006		U	0.0005		6.56	
	9/5/14		0.155		J	0.0045		U	0.0006		U	0.001		U	0.0006		U	0.0005		6.72	
	3/10/15		0.138		U	0.00060		U	0.00060		U	0.0010		U	0.00060		U	0.00050		6.45	
	9/29/15		0.0278		J	0.0035		J	0.0013		U	0.0010		U	0.00060		U	0.00050		6.97	

Table 3
CAPA Groundwater Treatment System
Analytical Results
Stripper Effluent

Sample Tap	Date	Analytical Results (mg/L)[1,2]																pH	Comments
		Mercury			Carbon Tetrachloride			Chloform			Methylene Chloride			Tetrachloroethene			Trichloroethene				
		Q[3]	Result	Flag[4]	Q	Result	Flag	Q	Result	Flag	Q	Result	Flag	Q	Result	Flag	Q	Result	Flag		
ST-9	3/21/16		0.168		J	0.0025		U	0.00060		U	0.0010		U	0.00060		U	0.00050		7.26	
Continued	9/9/16		0.134		J	0.0014		U	0.00060		U	0.0010		U	0.00060		U	0.00050		6.95	

NOTES:
1) mg/L - milligrams per liter
2) Grey cells indicate analyses not requested.
3) Q - Qualifier
< - Not detected (ND) at a value greater than the reporting limit (RL), for data prior to 2/24/06.
< - Not detected at a value greater than the method detection limit (MDL). (MDL noted in Result column, for data 2/24/06 to 12/31/08.)
U - Not detected at a value greater than the method detection limit (MDL). (MDL noted in Result column, for data 12/31/08 to present)
J - Value for an organic analysis is an estimate, for data prior to 2/24/06.
J - Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value, for data 2/24/06 to present.
4) Flag
B - Indicates that an analyte is present in the method blank as well as in the sample.
J - Value is an estimate; result falls within the MDL and the limit of quantitation (LQ) (Lancaster Laboratories).

Table 4
CAPA Groundwater Treatment System
Recovery Well Pumping Data

Year	Month	CA050B (gal)[1]	CA051B (gal)	CA052B (gal)	CA0U23B (gal)	Total Influent (gal)
1998	June	94,940	120,650	44,346	59,007	318,943
	July	94,464	143,035	46,670	103,993	388,162
	August	82,659	123,384	0	86,436	292,479
	September	52,560	168,124	27,020	13,602	261,306
	October	148,429	106,740	0	45,082	300,251
	November	84,170	70,057	0	90,008	244,235
	December	134,556	143,925	0	140,915	419,396
	TOTAL	**691,778**	**875,915**	**118,036**	**539,043**	**2,224,772**
1999	January	56,244	58,568	38,400	57,835	211,047
	February	43,480	41,230	14,454	66,873	166,037
	March	32,402	52,900	17,521	57,332	160,155
	April	86,908	73,850	25,635	89,265	275,658
	May	52,110	43,020	30,810	53,470	179,410
	June	51,070	50,110	32,000	52,310	185,490
	July	94,520	137,330	70,210	98,850	400,910
	August	60,300	91,700	62,790	63,870	278,660
	September	54,440	84,460	55,250	61,830	255,980
	October	59,750	118,130	65,400	82,860	326,140
	November	61,620	84,320	63,950	67,910	277,800
	December	33,170	41,080	38,180	37,680	150,110
	TOTAL	**686,014**	**876,698**	**514,600**	**790,085**	**2,867,397**
	CUMULATIVE TOTAL, ALL WELLS					**5,092,169**
2000	January	63,290	84,390	71,800	77,950	297,430
	February	77,580	96,090	84,360	79,630	337,660
	March	79,810	101,600	81,090	70,760	333,260
	April	58,820	75,800	63,660	56,470	254,750
	May	90,340	67,330	76,340	74,720	308,730
	June	94,060	111,140	73,990	83,730	362,920
	July	88,230	65,640	46,950	67,490	268,310
	August	60,300	91,700	62,790	63,870	278,660
	September	37,980	84,460	55,250	61,830	239,520
	October	103,210	67,430	77,250	96,270	344,160
	November	102,960	71,210	91,510	93,480	359,160
	December	90,830	2,450	76,480	41,210	210,970
	TOTAL	**947,410**	**919,240**	**861,470**	**867,410**	**3,595,530**
	CUMULATIVE TOTAL, ALL WELLS					**8,687,699**
2001	January	106,250	57,650	83,430	88,310	335,640
	February	65,070	29,070	75,050	100,330	269,520
	March	69,460	62,430	65,310	86,790	283,990
	April	71,520	57,640	52,830	63,090	245,080
	May	120,620	79,750	81,700	52,480	334,550
	June	61,820	56,160	89,260	47,550	254,790
	July	52,500	61,180	74,640	66,440	254,760
	August	69,270	72,300	118,580	81,120	341,270
	September	44,410	49,250	77,680	77,570	248,910
	October	107,030	33,520	66,620	47,870	255,040
	November	59,710	16,210	53,650	48,180	177,750
	December	81,500	81,500	71,100	60,800	294,900
	TOTAL	**909,160**	**656,660**	**909,850**	**820,530**	**3,296,200**
	CUMULATIVE TOTAL, ALL WELLS					**11,983,899**
2002	January	98,390	36,800	95,520	61,250	291,960
	February	74,600	28,450	72,020	52,110	227,180
	March	42,770	58,080	55,110	54,960	210,920
	April	84,520	85,820	75,770	82,670	328,780
	May	50,210	49,080	68,130	70,820	238,240
	June	83,990	77,020	64,090	73,860	298,960
	July	103,700	91,110	123,550	89,760	408,120
	August	79,220	75,700	80,840	73,170	308,930
	September	68,450	67,680	65,470	57,150	258,750
	October	83,260	83,700	83,860	86,470	337,290
	November	47,870	49,790	71,700	70,480	239,840
	December	83,500	74,330	67,720	82,790	308,340
	TOTAL	**900,480**	**777,560**	**923,780**	**855,490**	**3,457,310**
	CUMULATIVE TOTAL, ALL WELLS					**15,441,209**
2003	January	84,500	58,060	51,490	73,880	267,930
	February	49,680	48,730	52,040	23,230	173,680
	March	110,080	110,650	62,330	75,600	358,660
	April	83,350	64,460	73,230	60	221,100
	May	56,140	67,810	66,560	36,000	226,510
	June	80,680	89,200	62,490	35,640	268,010
	July	91,660	93,820	96,350	39,310	321,140
	August	64,540	77,480	94,940	29,610	266,570
	September	94,950	104,220	127,540	49,560	376,270
	October	36,780	83,190	100,920	68,590	289,480
	November	231,100	38,770	88,930	58,910	417,710
	December	110,190	27,090	108,400	24,090	269,770
	TOTAL	**1,093,650**	**863,480**	**985,220**	**514,480**	**3,456,830**
	CUMULATIVE TOTAL, ALL WELLS					**18,898,039**
2004	January	129,290	55,140	128,330	4,280	317,040
	February	97,630	59,860	58,300	35,060	250,850
	March	118,330	82,990	104,600	80,830	386,750
	April	76,220	51,410	52,430	61,080	241,140
	May	46,090	57,900	43,250	44,740	191,980
	June	66,830	62,810	64,390	49,780	243,810
	July	65,080	47,690	60,780	44,380	217,930
	August	67,980	79,900	61,700	45,780	255,360
	September	16,150	98,950	71,040	51,720	237,860
	October	15,930	42,940	69,920	50,340	179,130
	November	103,390	93,870	93,770	54,780	345,810
	December	64,540	77,000	76,890	56,320	274,750
	TOTAL	**867,460**	**810,460**	**885,400**	**579,090**	**3,142,410**
	CUMULATIVE TOTAL, ALL WELLS					**22,040,449**

Table 4
CAPA Groundwater Treatment System
Recovery Well Pumping Data

Year	Month	CA050B (gal)[1]	CA051B (gal)	CA052B (gal)	CA0U23B (gal)	Total Influent (gal)
2005	January	78,750	35,700	65,760	47,560	227,770
	February	103,650	88,410	92,250	65,270	349,580
	March	95,120	47,260	78,380	51,580	272,340
	April	96,680	51,890	81,280	51,610	281,460
	May	103,370	102,640	89,680	38,940	334,630
	June	95,330	11,800	29,580	16,830	153,540
	July	64,660	54,670	56,790	18,940	195,060
	August	74,190	68,130	64,470	22,380	229,170
	September	73,810	75,280	63,620	38,040	250,750
	October	84,450	20,350	73,040	52,010	229,850
	November	125,440	18,950	99,370	38,910	282,670
	December	94,040	62,280	53,740	16,780	226,840
	TOTAL	**1,089,490**	**637,360**	**847,960**	**458,850**	**3,033,660**
	CUMULATIVE TOTAL, ALL WELLS					**25,074,109**
2006	January	91,090	65,510	62,440	67,880	286,920
	February	99,040	69,830	180	24,420	193,470
	March	82,410	69,150	40,220	50,430	242,210
	April	107,470	96,190	105,340	43,880	352,880
	May	130,240	79,280	127,530	73,690	410,740
	June	95,670	96,640	102,141	57,010	351,461
	July	114,830	110,010	131,199	67,870	423,909
	August	86,450	83,190	108,970	57,850	336,460
	September	5,190	113,640	146,870	74,010	339,710
	October	0	95,820	99,390	16,770	211,980
	November	36,240	93,710	68,760	43,920	242,630
	December	93,760	66,030	48,040	27,460	235,290
	TOTAL	**942,390**	**1,039,000**	**1,041,080**	**605,190**	**3,627,660**
	CUMULATIVE TOTAL, ALL WELLS					**28,701,769**
2007	January	56,240	73,810	0	59,320	189,370
	February	47,980	68,410	33,980	28,040	178,410
	March	41,510	41,310	34,260	33,140	150,220
	April	56,420	67,350	57,220	51,730	232,720
	May	57,130	55,440	56,500	28,740	197,810
	June	76,370	79,230	68,240	45,520	269,360
	July	86,610	70,410	43,660	31,250	231,930
	August	22,350	100,910	6,030	41,540	170,830
	September	58,700	73,050	51,800	12,340	195,890
	October	81,650	115,960	88,890	18,300	304,800
	November	17,440	77,710	80,430	50	175,630
	December	39,410	83,380	101,580	30,440	254,810
	TOTAL	**641,810**	**906,970**	**622,590**	**380,410**	**2,551,780**
	CUMULATIVE TOTAL, ALL WELLS					**31,253,549**
2008	January	75,870	85,800	71,610	48,490	281,770
	February	49,440	52,010	49,930	21,670	173,050
	March	28,360	89,270	77,750	34,140	229,520
	April	115,960	111,690	123,590	54,420	405,660
	May	61,950	65,360	97,900	43,270	268,480
	June	117,100	59,990	77,420	24,440	278,950
	July	90,450	96,410	113,900	51,380	352,140
	August	89,370	94,570	86,520	57,080	327,540
	September	77,560	88,830	37,870	56,980	261,240
	October	111,200	119,510	130,040	49,750	410,500
	November	117,320	89,360	107,970	45,400	360,050
	December	118,970	99,220	109,240	44,320	371,750
	TOTAL	**1,053,550**	**1,052,020**	**1,083,740**	**531,340**	**3,720,650**
	CUMULATIVE TOTAL, ALL WELLS					**34,974,199**
2009	January	102,620	98,940	68,640	39,400	309,600
	February	89,130	133,220	88,930	42,180	353,460
	March	89,510	97,320	84,060	44,870	315,760
	April	120,620	66,890	106,260	63,360	357,130
	May	78,350	90,300	101,380	60,280	330,310
	June	80,660	77,260	88,190	45,520	291,630
	July	91,040	100,080	98,360	53,990	343,470
	August	75,240	72,520	88,650	39,080	275,490
	September	89,350	75,160	91,560	46,250	302,320
	October	96,500	95,480	102,630	49,900	344,510
	November	113,300	99,640	111,400	52,860	377,200
	December	105,430	124,530	76,840	46,590	353,390
	TOTAL	**1,131,750**	**1,131,340**	**1,106,900**	**584,280**	**3,954,270**
	CUMULATIVE TOTAL, ALL WELLS					**38,928,469**
2010	January	52,720	57,060	56,230	38,510	204,520
	February	83,730	89,630	91,960	59,560	324,880
	March	65,750	84,780	103,060	63,970	317,560
	April	90,970	89,470	94,390	34,190	309,020
	May	61,190	68,940	84,160	55,090	269,380
	June	60,580	60,580	81,780	55,590	258,530
	July	87,350	93,790	89,940	66,060	337,140
	August	75,280	80,100	98,830	77,610	331,820
	September	78,290	68,920	82,540	28,350	258,100
	October	70,800	62,941	86,310	45,620	265,671
	November	84,990	93,090	87,220	71,100	336,400
	December	80,300	74,120	78,910	62,000	295,330
	TOTAL	**891,950**	**923,421**	**1,035,330**	**657,650**	**3,508,351**
	CUMULATIVE TOTAL, ALL WELLS					**42,436,820**

Table 4
CAPA Groundwater Treatment System
Recovery Well Pumping Data

Year	Month	CA050B (gal)[1]	CA051B (gal)	CA052B (gal)	CA0U23B (gal)	Total Influent (gal)
2011	January	78,430	71,580	92,590	63,870	306,470
	February	63,050	55,840	48,380	34,460	201,730
	March	76,350	36,750	82,880	58,020	254,000
	April	71,410	53,250	90,600	75,830	291,090
	May	99,970	12,790	82,730	51,340	246,830
	June	44,800	162,810	32,220	68,900	308,730
	July	99,970	103,510	78,120	64,040	345,640
	August	101,610	102,590	75,780	65,340	345,320
	September	98,190	95,810	81,800	66,250	342,050
	October	89,080	71,740	92,250	74,890	327,960
	November	54,220	61,580	67,800	46,580	230,180
	December	46,060	35,400	53,940	28,430	163,830
	TOTAL	**923,140**	**863,650**	**879,090**	**697,950**	**3,363,830**
	CUMULATIVE TOTAL, ALL WELLS					**45,800,650**
2012	January	62,760	58,550	77,300	55,730	254,340
	February	116,490	115,930	130,622	87,250	450,292
	March	55,560	54,010	62,618	40,490	212,678
	April	86,230	88,490	85,780	62,650	323,150
	May	127,780	127,410	117,720	80,910	453,820
	June	98,460	69,470	97,250	53,250	318,430
	July	103,630	123,240	118,450	71,570	416,890
	August	120,300	137,100	142,630	61,240	461,270
	September	91,690	97,780	61,210	55,010	305,690
	October	91,890	87,080	124,050	66,130	369,150
	November	124,220	106,210	125,230	65,740	421,400
	December	116,910	85,380	116,720	45,790	364,800
	TOTAL	**1,195,920**	**1,150,650**	**1,259,580**	**745,760**	**4,351,910**
	CUMULATIVE TOTAL, ALL WELLS					**50,152,560**
2013	January	113,370	77,990	116,270	66,770	374,400
	February	112,590	95,460	75,310	70,800	354,160
	March	98,780	92,420	96,280	66,770	354,250
	April	89,340	82,670	90,170	61,090	323,270
	May	116,300	65,810	132,000	80,830	394,940
	June	125,010	82,630	106,160	44,350	358,150
	July	121,530	84,250	108,210	62,060	376,050
	August	141,140	90,940	125,180	72,250	429,510
	September	105,950	81,600	96,240	56,930	340,720
	October	125,250	115,720	115,850	78,450	435,270
	November	107,610	83,470	90,570	62,050	343,700
	December	130,840	79,140	105,340	70,960	386,280
	TOTAL	**1,387,710**	**1,032,100**	**1,257,580**	**793,310**	**4,470,700**
	CUMULATIVE TOTAL, ALL WELLS					**54,623,260**
2014	January	145,420	88,720	122,080	78,900	435,120
	February	110,220	72,030	95,290	61,110	338,650
	March	121,620	69,560	116,190	72,990	380,360
	April	111,760	91,620	123,420	78,860	405,660
	May	104,770	78,750	117,760	76,870	378,150
	June	111,550	85,960	124,430	82,170	404,110
	July	69,490	71,810	95,010	65,810	302,120
	August	89,790	82,060	80,530	70,360	322,740
	September	121,190	62,520	130,350	83,330	397,390
	October	70,820	72,170	97,650	64,820	305,460
	November	63,310	61,890	78,490	54,850	258,540
	December	125,550	103,600	125,340	88,360	442,850
	TOTAL	**1,245,490**	**940,690**	**1,306,540**	**878,430**	**4,371,150**
	CUMULATIVE TOTAL, ALL WELLS					**58,994,410**
2015	January	97,570	64,200	93,990	66,320	322,080
	February	82,520	108,400	95,260	73,180	359,360
	March	81,380	93,950	88,580	68,370	332,280
	April	96,290	116,820	111,520	84,410	409,040
	May	88,710	100,050	91,040	71,870	351,670
	June	84,870	84,330	82,880	64,320	316,400
	July	75,060	101,030	91,420	77,630	345,140
	August	41,420	56,320	41,350	42,420	181,510
	September	25,610	75,880	44,700	53,690	199,880
	October	102,540	77,780	100,610	4,350	285,280
	November	98,660	76,390	101,330	0	276,380
	December	117,190	74,430	91,210	15,340	298,170
	TOTAL	**991,820**	**1,029,580**	**1,033,890**	**621,900**	**3,677,190**
	CUMULATIVE TOTAL, ALL WELLS					**62,671,600**
2016	January	81,730	65,050	74,410	41,710	262,900
	February	124,930	89,230	115,060	60,950	390,170
	March	128,720	86,880	126,200	66,000	407,800
	April	67,600	63,820	68,540	42,090	242,050
	May	79,010	82,910	104,460	64,400	330,780
	June	98,890	97,700	99,480	68,060	364,130
	July	78,810	69,600	81,010	46,610	276,030
	August	95,760	64,290	119,830	54,650	334,530
	September	120,380	99,660	92,060	57,510	369,610
	October	82,840	71,720	81,570	52,610	288,740
	November	105,910	91,490	60,190	62,340	319,930
	December	121,340	113,560	105,940	72,470	413,310
	TOTAL	**1,185,920**	**995,910**	**1,128,750**	**689,400**	**3,999,980**
	CUMULATIVE TOTAL, ALL WELLS					**66,671,580**

NOTE:
1) gal - gallons

Table 5
CAPA Groundwater Treatment System
Approximate Mass of Mercury Removed
Recovery Wells

Year	Month	CA050B				CA051B				CA052B				CA0U23B				Mercury Removed, All Wells
		Cumulative Flow	Mercury			Cumulative Flow	Mercury			Cumulative Flow	Mercury			Cumulative Flow	Mercury			
		(gal)[1]	Q	(mg/L)[2,3]	Flag	(lbs)[4]	(gal)	Q	(mg/L)	Flag	(lbs)	(gal)	Q	(mg/L)	Flag	(lbs)	(gal)	Q	(mg/L)	Flag	(lbs)	(lbs)
1998	June	94,940		4.200		3.328	120,650		0.880		0.886	44,346		0.300		0.111	59,007		2.500		1.231	5.56
	July	94,464		4.000		3.153	143,035		0.760		0.907	46,670		0.320		0.125	103,993		2.400		2.083	6.27
	August	82,659		3.300		2.276	123,384		0.610		0.628	0		0.240		0.000	86,436		2.400		1.731	4.64
	September	52,560		3.400		1.491	168,124		0.540		0.758	27,020		0.270		0.061	13,602		2.800		0.318	2.63
	October	148,429		3.400		4.212	106,740		0.540		0.481	0		0.270		0.000	45,082		2.800		1.053	5.75
	November	84,170		3.400		2.388	70,057		0.540		0.316	0		0.270		0.000	90,008		2.800		2.103	4.81
	December	134,556		3.400		3.818	143,925		0.540		0.649	0		0.270		0.000	140,915		2.800		3.293	7.76
	TOTAL	**691,778**				**20.67**	**875,915**				**4.62**	**118,036**				**0.30**	**539,043**				**11.81**	**37.40**
1999	January	56,244		2.200		1.033	58,568		0.360		0.176	38,400		0.270		0.087	57,835		1.400		0.676	1.97
	February	43,480		2.200		0.798	41,230		0.360		0.124	14,454		0.270		0.033	66,873		1.400		0.781	1.74
	March	32,402		2.200		0.595	52,900		0.360		0.159	17,521		0.270		0.039	57,332		1.400		0.670	1.46
	April	86,908		2.200		1.596	73,850		0.360		0.222	25,635		0.270		0.058	89,265		1.400		1.043	2.92
	May	52,110		1.800		0.783	43,020		0.370		0.133	30,810		0.250		0.064	53,470		1.200		0.535	1.52
	June	51,070		1.800		0.767	50,110		0.370		0.155	32,000		0.250		0.067	52,310		1.200		0.524	1.51
	July	94,520		1.700		1.341	137,330		0.330		0.378	70,210		0.090		0.053	98,850		1.200		0.990	2.76
	August	60,300		1.700		0.855	91,700		0.330		0.253	62,790		0.090		0.047	63,870		1.200		0.640	1.79
	September	54,440		1.700		0.772	84,460		0.330		0.233	55,250		0.090		0.041	61,830		1.200		0.619	1.67
	October	59,750		1.700		0.848	118,130		0.330		0.325	65,400		0.090		0.049	82,860		1.200		0.830	2.05
	November	61,620		1.520		0.782	84,320		0.342		0.241	63,950		0.870		0.464	67,910		0.089		0.050	1.54
	December	33,170		1.520		0.421	41,080		0.342		0.117	38,180		0.870		0.277	37,680		0.089		0.028	0.84
	TOTAL	**686,014**				**10.59**	**876,698**				**2.51**	**514,600**				**1.28**	**790,085**				**7.39**	**21.77**
	CUMULATIVE TOTAL	***1,377,792***				***31.26***	***1,752,613***				***7.14***	***632,636***				***1.58***	***1,329,128***				***19.20***	***59.17***
2000	January	63,290		1.520		0.803	84,390		0.342		0.241	71,800		0.870		0.521	77,950		0.089		0.058	1.62
	February	77,580		1.460		0.945	96,090		0.312		0.250	84,360		0.047		0.033	79,630		0.705		0.469	1.70
	March	79,810		1.460		0.972	101,600		0.312		0.265	81,090		0.047		0.032	70,760		0.705		0.416	1.69
	April	58,820		1.460		0.717	75,800		0.312		0.197	63,660		0.047		0.025	56,470		0.705		0.332	1.27
	May	90,340		1.460		1.101	67,330		0.312		0.175	76,340		0.047		0.030	74,720		0.705		0.440	1.75
	June	94,060		1.460		1.146	111,140		0.312		0.289	73,990		0.047		0.029	83,730		0.705		0.493	1.96
	July	88,230		1.460		1.075	65,640		0.312		0.171	46,950		0.047		0.018	67,490		0.705		0.397	1.66
	August	60,300		1.460		0.735	91,700		0.312		0.239	62,790		0.047		0.025	63,870		0.705		0.376	1.37
	September	37,980		1.460		0.463	84,460		0.312		0.220	55,250		0.047		0.022	61,830		0.705		0.364	1.07
	October	103,210		0.440		0.379	67,430		0.201		0.113	77,250		0.044		0.028	96,270		0.780		0.627	1.15
	November	102,960		0.440		0.378	71,210		0.201		0.119	91,510		0.044		0.034	93,480		0.780		0.609	1.14
	December	90,830		0.440		0.334	2,450		0.201		0.004	76,480		0.044		0.028	41,210		0.780		0.268	0.63
	TOTAL	**947,410**				**9.05**	**919,240**				**2.28**	**861,470**				**0.83**	**867,410**				**4.85**	**17.00**
	CUMULATIVE TOTAL	***2,325,202***				***40.30***	***2,671,853***				***9.42***	***1,494,106***				***2.40***	***2,196,538***				***24.05***	***76.17***
2001	January	106,250		1.080		0.958	57,650		0.370		0.178	83,430		0.060		0.042	88,310		0.044		0.032	1.21
	February	65,070		1.080		0.586	29,070		0.370		0.090	75,050		0.060		0.038	100,330		0.044		0.037	0.75
	March	69,460		1.080		0.626	62,430		0.370		0.193	65,310		0.060		0.033	86,790		0.044		0.032	0.88
	April	71,520		1.080		0.645	57,640		0.370		0.178	52,830		0.060		0.026	63,090		0.044		0.023	0.87
	May	120,620		1.080		1.087	79,750		0.370		0.246	81,700		0.060		0.041	52,480		0.044		0.019	1.39
	June	61,820		0.940		0.485	56,160		0.160		0.075	89,260		0.031		0.023	47,550		0.500		0.198	0.78
	July	52,500		0.940		0.412	61,180		0.160		0.082	74,640		0.031		0.019	66,440		0.500		0.277	0.79
	August	69,270		0.940		0.543	72,300		0.160		0.097	118,580		0.031		0.031	81,120		0.500		0.338	1.01
	September	44,410		0.940		0.348	49,250		0.160		0.066	77,680		0.031		0.020	77,570		0.500		0.324	0.76
	October	107,030		0.940		0.840	33,520		0.160		0.045	66,620		0.031		0.017	47,870		0.500		0.200	1.10
	November	59,710		0.780		0.389	16,210		0.560		0.076	53,650		0.036		0.016	48,180		0.410		0.165	0.65
	December	81,500		0.780		0.531	81,500		0.560		0.381	71,100		0.036		0.021	60,800		0.410		0.208	1.14
	TOTAL	**909,160**				**7.45**	**656,660**				**1.71**	**909,850**				**0.33**	**820,530**				**1.85**	**11.34**
	CUMULATIVE TOTAL	***3,234,362***				***47.75***	***3,328,513***				***11.13***	***2,403,956***				***2.73***	***3,017,068***				***25.90***	***87.51***
2002	January	98,390		0.780		0.640	36,800		0.560		0.172	95,520		0.036		0.029	61,250		0.410		0.210	1.05
	February	74,600		0.780		0.486	28,450		0.560		0.133	72,020		0.036		0.022	52,110		0.410		0.178	0.82
	March	42,770		0.780		0.278	58,080		0.560		0.271	55,110		0.036		0.017	54,960		0.410		0.188	0.75
	April	84,520		0.450		0.317	85,820		0.045		0.032	75,770		0.024		0.015	82,670		0.220		0.152	0.52
	May	50,210		0.450		0.189	49,080		0.045		0.018	68,130		0.024		0.014	70,820		0.220		0.130	0.35
	June	83,990		0.450		0.315	77,020		0.045		0.029	64,090		0.024		0.013	73,860		0.220		0.136	0.49
	July	103,700		0.450		0.389	91,110		0.045		0.034	123,550		0.024		0.025	89,760		0.220		0.165	0.61
	August	79,220		0.690		0.456	75,700		0.072		0.045	80,840		0.025		0.017	73,170		0.450		0.275	0.79
	September	68,450		0.690		0.394	67,680		0.072		0.041	65,470		0.025		0.014	57,150		0.450		0.215	0.66
	October	83,260		0.690		0.479	83,700		0.072		0.050	83,860		0.025		0.017	86,470		0.450		0.325	0.87
	November	47,870		0.690		0.276	49,790		0.072		0.030	71,700		0.025		0.015	70,480		0.450		0.265	0.59
	December	83,500		0.690		0.481	74,330		0.072		0.045	67,720		0.025		0.014	82,790		0.450		0.311	0.85
	TOTAL	**900,480**				**4.70**	**777,560**				**0.90**	**923,780**				**0.21**	**855,490**				**2.55**	**8.36**
	CUMULATIVE TOTAL	***4,134,842***				***52.45***	***4,106,073***				***12.03***	***3,327,736***				***2.94***	***3,872,558***				***28.45***	***95.87***

Table 5
CAPA Groundwater Treatment System
Approximate Mass of Mercury Removed
Recovery Wells

Year	Month	CA050B				CA051B				CA052B				CA0U23B				Mercury Removed, All Wells
		Cumulative Flow	Mercury			Cumulative Flow	Mercury			Cumulative Flow	Mercury			Cumulative Flow	Mercury			
		(gal)[1]	Q	(mg/L)[2,3]	Flag	(lbs)[4]	(gal)	Q	(mg/L)	Flag	(lbs)	(gal)	Q	(mg/L)	Flag	(lbs)	(gal)	Q	(mg/L)	Flag	(lbs)	(lbs)
2003	January	84,500		0.700		0.494	58,060		0.067		0.032	51,490		0.025		0.011	73,880		0.490		0.302	0.84
	February	49,680		0.700		0.290	48,730		0.067		0.027	52,040		0.025		0.011	23,230		0.490		0.095	0.42
	March	110,080		0.700		0.643	110,650		0.067		0.062	62,330		0.025		0.013	75,600		0.490		0.309	1.03
	April	83,350		0.700		0.487	64,460		0.067		0.036	73,230		0.025		0.015	60		0.490		0.000	0.54
	May	56,140		0.700		0.328	67,810		0.067		0.038	66,560		0.025		0.014	36,000		0.490		0.147	0.53
	June	80,680		0.870		0.586	89,200		0.101		0.075	62,490		0.025		0.013	35,640		0.230		0.068	0.74
	July	91,660		0.870		0.665	93,820		0.101		0.079	96,350		0.025		0.020	39,310		0.230		0.075	0.84
	August	64,540		0.870		0.469	77,480		0.101		0.065	94,940		0.025		0.020	29,610		0.230		0.057	0.61
	September	94,950		0.870		0.689	104,220		0.101		0.088	127,540		0.025		0.027	49,560		0.230		0.095	0.90
	October	36,780		0.790		0.242	83,190		0.096		0.067	100,920		0.023		0.019	68,590		0.260		0.149	0.48
	November	231,100		0.790		1.524	38,770		0.096		0.031	88,930		0.023		0.017	58,910		0.260		0.128	1.70
	December	110,190		0.790		0.726	27,090		0.096		0.022	108,400		0.023		0.021	24,090		0.260		0.052	0.82
	TOTAL	**1,093,650**				**7.14**	**863,480**				**0.62**	**985,220**				**0.20**	**514,480**				**1.48**	**9.45**
	CUMULATIVE TOTAL	***5,228,492***				***59.60***	***4,969,553***				***12.65***	***4,312,956***				***3.14***	***4,387,038***				***29.93***	***105.32***
2004	January	129,290		0.790		0.852	55,140		0.096		0.044	128,330		0.023		0.025	4,280		0.260		0.009	0.93
	February	97,630		0.790		0.644	59,860		0.096		0.048	58,300		0.023		0.011	35,060		0.260		0.076	0.78
	March	118,330		0.410		0.405	82,990		0.049		0.034	104,600		0.025		0.022	80,830		0.270		0.182	0.64
	April	76,220		0.410		0.261	51,410		0.049		0.021	52,430		0.025		0.011	61,080		0.270		0.138	0.43
	May	46,090		0.410		0.158	57,900		0.049		0.024	43,250		0.025		0.009	44,740		0.270		0.101	0.29
	June	66,830		0.410		0.229	62,810		0.049		0.026	64,390		0.025		0.013	49,780		0.270		0.112	0.38
	July	65,080		0.710		0.386	47,690		0.040		0.016	60,780		0.018		0.009	44,380		0.300		0.111	0.52
	August	67,980		0.710		0.403	79,900		0.040		0.027	61,700		0.018		0.009	45,780		0.300		0.115	0.55
	September	16,150		0.710		0.096	98,950		0.040		0.033	71,040		0.018		0.011	51,720		0.300		0.129	0.27
	October	15,930		0.710		0.094	42,940		0.040		0.014	69,920		0.018		0.011	50,340		0.300		0.126	0.25
	November	103,390		0.710		0.613	93,870		0.040		0.031	93,770		0.018		0.014	54,780		0.300		0.137	0.80
	December	64,540		0.960		0.517	77,000		0.150		0.096	76,890		0.020		0.013	56,320		0.310		0.146	0.77
	TOTAL	**867,460**				**4.66**	**810,460**				**0.41**	**885,400**				**0.16**	**579,090**				**1.38**	**6.61**
	CUMULATIVE TOTAL	***6,095,952***				***64.25***	***5,780,013***				***13.07***	***5,198,356***				***3.30***	***4,966,128***				***31.31***	***111.93***
2005	January	78,750		0.960		0.631	35,700		0.150		0.045	65,760		0.020		0.011	47,560		0.310		0.123	0.81
	February	103,650		0.960		0.830	88,410		0.150		0.111	92,250		0.020		0.015	65,270		0.310		0.169	1.13
	March	95,120		0.960		0.762	47,260		0.150		0.059	78,380		0.020		0.013	51,580		0.310		0.133	0.97
	April	96,680		0.960		0.775	51,890		0.150		0.065	81,280		0.020		0.014	51,610		0.310		0.134	0.99
	May	103,370		0.813		0.701	102,640		0.116		0.099	89,680		0.020		0.015	38,940		0.259		0.084	0.90
	June	95,330		0.813		0.647	11,800		0.116		0.011	29,580		0.020		0.005	16,830		0.259		0.036	0.70
	July	64,660		0.813		0.439	54,670		0.116		0.053	56,790		0.020		0.009	18,940		0.259		0.041	0.54
	August	74,190		0.813		0.503	68,130		0.116		0.066	64,470		0.020		0.011	22,380		0.259		0.048	0.63
	September	73,810		0.813		0.501	75,280		0.116		0.073	63,620		0.020		0.010	38,040		0.259		0.082	0.67
	October	84,450		0.813		0.573	20,350		0.116		0.020	73,040		0.020		0.012	52,010		0.259		0.112	0.72
	November	125,440		0.813		0.851	18,950		0.116		0.018	99,370		0.020		0.016	38,910		0.259		0.084	0.97
	December	94,040		0.813		0.638	62,280		0.116		0.060	53,740		0.020		0.009	16,780		0.259		0.036	0.74
	TOTAL	**1,089,490**				**7.85**	**637,360**				**0.68**	**847,960**				**0.14**	**458,850**				**1.08**	**9.76**
	CUMULATIVE TOTAL	***7,185,442***				***72.11***	***6,417,373***				***13.75***	***6,046,316***				***3.44***	***5,424,978***				***32.39***	***121.68***
2006	January	91,090		0.813		0.618	65,510		0.116		0.063	62,440		0.020		0.010	67,880		0.259		0.147	0.84
	February	99,040		0.813		0.672	69,830		0.116		0.068	180		0.020		0.000	24,420		0.259		0.053	0.79
	March	82,410		0.813		0.559	69,150		0.116		0.067	40,220		0.020		0.007	50,430		0.259		0.109	0.74
	April	107,470		0.813		0.729	96,190		0.116		0.093	105,340		0.020		0.017	43,880		0.259		0.095	0.93
	May	130,240		0.590		0.641	79,280		0.081		0.054	127,530		0.016		0.017	73,690		0.140		0.086	0.80
	June	95,670		0.590		0.471	96,640		0.081		0.065	102,141		0.016		0.014	57,010		0.140		0.067	0.62
	July	114,830		0.590		0.565	110,010		0.081		0.074	131,199		0.016		0.018	67,870		0.140		0.079	0.74
	August	86,450		0.590		0.426	83,190		0.081		0.056	108,970		0.016		0.015	57,850		0.140		0.068	0.56
	September	5,190		0.590		0.026	113,640		0.081		0.077	146,870		0.016		0.020	74,010		0.140		0.086	0.21
	October	0		0.590		0.000	95,820		0.081		0.065	99,390		0.016		0.013	16,770		0.140		0.020	0.10
	November	36,240		0.590		0.178	93,710		0.081		0.063	68,760		0.016		0.009	43,920		0.140		0.051	0.30
	December	93,760		0.590		0.462	66,030		0.081		0.045	48,040		0.016		0.006	27,460		0.140		0.032	0.54
	TOTAL	**942,390**				**5.35**	**1,039,000**				**0.79**	**1,041,080**				**0.15**	**605,190**				**0.89**	**7.18**
	CUMULATIVE TOTAL	***8,127,832***				***77.45***	***7,456,373***				***14.54***	***7,087,396***				***3.58***	***6,030,168***				***33.28***	***128.86***
2007	January	56,240		0.590		0.277	73,810		0.081		0.050	0		0.016		0.000	59,320		0.140		0.069	0.40
	February	47,980		0.590		0.236	68,410		0.081		0.046	33,980		0.016		0.005	28,040		0.140		0.033	0.32
	March	41,510		0.590		0.204	41,310		0.081		0.028	34,260		0.016		0.005	33,140		0.140		0.039	0.28
	April	56,420		0.590		0.278	67,350		0.081		0.046	57,220		0.016		0.008	51,730		0.140		0.060	0.39
	May	57,130		0.590		0.281	55,440		0.081		0.037	56,500		0.016		0.008	28,740		0.140		0.034	0.36
	June	76,370		0.590		0.376	79,230		0.081		0.054	68,240		0.016		0.009	45,520		0.140		0.053	0.49
	July	86,610		0.590		0.426	70,410		0.081		0.048	43,660		0.016		0.006	31,250		0.140		0.037	0.52
	August	22,350		0.590		0.110	100,910		0.081		0.068	6,030		0.016		0.001	41,540		0.140		0.049	0.23
	September	58,700		0.590		0.289	73,050		0.081		0.049	51,800		0.016		0.007	12,340		0.140		0.014	0.36
	October	81,650		1.600		1.090	115,960		0.130		0.126	88,890		0.025		0.019	18,300		0.250		0.038	1.27
	November	17,440		1.600		0.233	77,710		0.130		0.084	80,430		0.025		0.017	50		0.250		0.000	0.33
	December	39,410		1.600		0.526	83,380		0.130		0.090	101,580		0.025		0.021	30,440		0.250		0.064	0.70
	TOTAL	**641,810**				**4.33**	**906,970**				**0.73**	**622,590**				**0.10**	**380,410**				**0.49**	**5.65**
	CUMULATIVE TOTAL	***8,769,642***				***81.78***	**8,363,343**				***15.26***	***7,709,986***				***3.69***	***6,410,578***				***33.77***	***134.50***

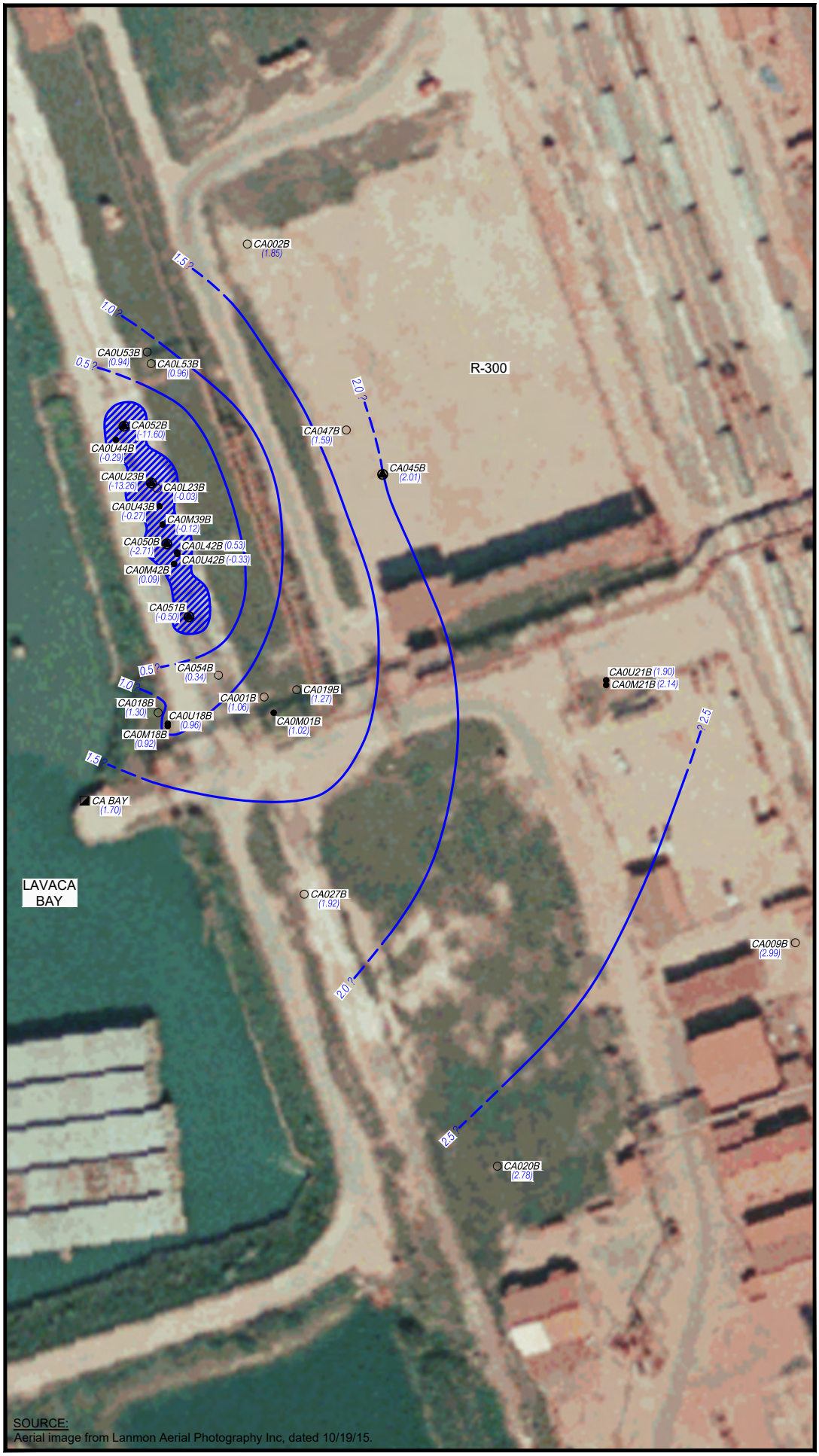
Table 5
CAPA Groundwater Treatment System
Approximate Mass of Mercury Removed
Recovery Wells

Year	Month	CA050B				CA051B				CA052B				CA0U23B				Mercury Removed, All Wells
		Cumulative Flow	Mercury			Cumulative Flow	Mercury			Cumulative Flow	Mercury			Cumulative Flow	Mercury			
		(gal)[1]	Q	(mg/L)[2,3]	Flag	(lbs)[4]	(gal)	Q	(mg/L)	Flag	(lbs)	(gal)	Q	(mg/L)	Flag	(lbs)	(gal)	Q	(mg/L)	Flag	(lbs)	(lbs)
2008	January	75,870		1.600		1.013	85,800		0.130		0.093	71,610		0.025		0.015	48,490		0.250		0.101	1.22
	February	49,440		1.600		0.660	52,010		0.130		0.056	49,930		0.025		0.010	21,670		0.250		0.045	0.77
	March	28,360		1.600		0.379	89,270		0.130		0.097	77,750		0.025		0.016	34,140		0.250		0.071	0.56
	April	115,960		1.600		1.548	111,690		0.130		0.121	123,590		0.025		0.026	54,420		0.250		0.114	1.81
	May	61,950		1.600		0.827	65,360		0.130		0.071	97,900		0.025		0.020	43,270		0.250		0.090	1.01
	June	117,100		1.600		1.564	59,990		0.130		0.065	77,420		0.025		0.016	24,440		0.250		0.051	1.70
	July	90,450		1.600		1.208	96,410		0.130		0.105	113,900		0.025		0.024	51,380		0.250		0.107	1.44
	August	89,370		1.600		1.193	94,570		0.130		0.103	86,520		0.025		0.018	57,080		0.250		0.119	1.43
	September	77,560		1.600		1.036	88,830		0.130		0.096	37,870		0.025		0.008	56,980		0.250		0.119	1.26
	October	111,200		0.540		0.501	119,510		0.065		0.065	130,040		0.014		0.015	49,750		0.140		0.058	0.64
	November	117,320		0.540		0.529	89,360		0.065		0.048	107,970		0.014		0.013	45,400		0.140		0.053	0.64
	December	118,970		0.540		0.536	99,220		0.065		0.054	109,240		0.014		0.013	44,320		0.140		0.052	0.65
	TOTAL	**1,053,550**				**10.99**	**1,052,020**				**0.97**	**1,083,740**				**0.19**	**531,340**				**0.98**	**13.14**
	CUMULATIVE TOTAL	***9,823,192***				***92.77***	***9,415,363***				***16.24***	***8,793,726***				***3.88***	***6,941,918***				***34.75***	***147.65***
2009	January	102,620		0.540		0.462	98,940		0.065		0.054	68,640		0.014		0.008	39,400		0.140		0.046	0.57
	February	89,130		0.540		0.402	133,220		0.065		0.072	88,930		0.014		0.010	42,180		0.140		0.049	0.53
	March	89,510		0.540		0.403	97,320		0.065		0.053	84,060		0.014		0.010	44,870		0.140		0.052	0.52
	April	120,620		0.540		0.544	66,890		0.065		0.036	106,260		0.014		0.012	63,360		0.140		0.074	0.67
	May	78,350		0.540		0.353	90,300		0.065		0.049	101,380		0.014		0.012	60,280		0.140		0.070	0.48
	June	80,660		0.540		0.363	77,260		0.065		0.042	88,190		0.014		0.010	45,520		0.140		0.053	0.47
	July	91,040		0.503		0.382	100,080		0.096		0.080	98,360		0.013		0.011	53,990		0.141		0.064	0.54
	August	75,240		0.503		0.316	72,520		0.096		0.058	88,650		0.013		0.010	39,080		0.141		0.046	0.43
	September	89,350		0.503		0.375	75,160		0.096		0.060	91,560		0.013		0.010	46,250		0.141		0.054	0.50
	October	96,500		0.503		0.405	95,480		0.096		0.076	102,630		0.013		0.011	49,900		0.141		0.059	0.55
	November	113,300		0.503		0.476	99,640		0.096		0.080	111,400		0.013		0.012	52,860		0.141		0.062	0.63
	December	105,430		0.503		0.443	124,530		0.096		0.100	76,840		0.013		0.009	46,590		0.141		0.055	0.61
	TOTAL	**1,131,750**				**4.92**	**1,131,340**				**0.76**	**1,106,900**				**0.13**	**584,280**				**0.69**	**6.50**
	CUMULATIVE TOTAL	***10,954,942***				***97.70***	**10,546,703**				***17.00***	***9,900,626***				***4.01***	***7,526,198***				***35.44***	***154.14***
2010	January	52,720		0.503		0.221	57,060		0.096		0.046	56,230		0.013		0.006	38,510		0.141		0.045	0.32
	February	83,730		0.503		0.351	89,630		0.096		0.072	91,960		0.013		0.010	59,560		0.141		0.070	0.50
	March	65,750		0.503		0.276	84,780		0.096		0.068	103,060		0.013		0.012	63,970		0.141		0.075	0.43
	April	90,970		0.503		0.382	89,470		0.096		0.072	94,390		0.013		0.011	34,190		0.141		0.040	0.50
	May	61,190		0.503		0.257	68,940		0.096		0.055	84,160		0.013		0.009	55,090		0.141		0.065	0.39
	June	60,580		0.503		0.254	60,580		0.096		0.048	81,780		0.013		0.009	55,590		0.141		0.065	0.38
	July	87,350		0.393		0.286	93,790		0.013		0.010	89,940		0.007		0.005	66,060		0.123		0.068	0.37
	August	75,280		0.393		0.247	80,100		0.013		0.009	98,830		0.007		0.006	77,610		0.123		0.080	0.34
	September	78,290		0.393		0.257	68,920		0.013		0.008	82,540		0.007		0.005	28,350		0.123		0.029	0.30
	October	70,800		0.393		0.232	62,941		0.013		0.007	86,310		0.007		0.005	45,620		0.123		0.047	0.29
	November	84,990		0.393		0.279	93,090		0.013		0.010	87,220		0.007		0.005	71,100		0.123		0.073	0.37
	December	80,300		0.393		0.263	74,120		0.013		0.008	78,910		0.007		0.005	62,000		0.123		0.064	0.34
	TOTAL	**891,950**				**3.31**	**923,421**				**0.41**	**1,035,330**				**0.09**	**657,650**				**0.72**	**4.53**
	CUMULATIVE TOTAL	***11,846,892***				***101.00***	***11,470,124***				***17.41***	***10,935,956***				***4.10***	***8,183,848***				***36.16***	***158.67***
2011	January	78,430		0.393		0.257	71,580		0.013		0.008	92,590		0.007		0.005	63,870		0.123		0.066	0.34
	February	63,050		0.393		0.207	55,840		0.013		0.006	48,380		0.007		0.003	34,460		0.123		0.035	0.25
	March	76,350		0.393		0.250	36,750		0.013		0.004	82,880		0.007		0.005	58,020		0.123		0.060	0.32
	April	71,410		0.393		0.234	53,250		0.013		0.006	90,600		0.007		0.005	75,830		0.123		0.078	0.32
	May	99,970		0.393		0.328	12,790		0.013		0.001	82,730		0.007		0.005	51,340		0.123		0.053	0.39
	June	44,800		0.393		0.147	162,810		0.013		0.018	32,220		0.007		0.002	68,900		0.123		0.071	0.24
	July	99,970		0.404		0.337	103,510		0.027		0.023	78,120		0.006		0.004	64,040		0.102		0.055	0.42
	August	101,610		0.404		0.343	102,590		0.027		0.023	75,780		0.006		0.004	65,340		0.102		0.056	0.42
	September	98,190		0.404		0.331	95,810		0.027		0.021	81,800		0.006		0.004	66,250		0.102		0.056	0.41
	October	89,080		0.404		0.300	71,740		0.027		0.016	92,250		0.006		0.004	74,890		0.102		0.064	0.38
	November	54,220		0.404		0.183	61,580		0.027		0.014	67,800		0.006		0.003	46,580		0.102		0.040	0.24
	December	46,060		0.404		0.155	35,400		0.027		0.008	53,940		0.006		0.003	28,430		0.102		0.024	0.19
	TOTAL	**923,140**				**3.07**	**863,650**				**0.15**	**879,090**				**0.05**	**697,950**				**0.66**	**3.92**
	CUMULATIVE TOTAL	***12,770,032***				***104.08***	***12,333,774***				***17.56***	***11,815,046***				***4.14***	***8,881,798***				***36.82***	***162.59***
2012	January	62,760		0.404		0.212	58,550		0.027		0.013	77,300		0.006		0.004	55,730		0.102		0.047	0.28
	February	116,490		0.404		0.393	115,930		0.027		0.026	130,622		0.006		0.006	87,250		0.102		0.074	0.50
	March	55,560		0.404		0.187	54,010		0.027		0.012	62,618		0.006		0.003	40,490		0.102		0.034	0.24
	April	86,230		0.404		0.291	88,490		0.027		0.020	85,780		0.006		0.004	62,650		0.102		0.053	0.37
	May	127,780		0.404		0.431	127,410		0.027		0.028	117,720		0.006		0.005	80,910		0.102		0.069	0.53
	June	98,460		0.404		0.332	69,470		0.027		0.016	97,250		0.006		0.005	53,250		0.102		0.045	0.40
	July	103,630		0.404		0.349	123,240		0.027		0.028	118,450		0.006		0.006	71,570		0.102		0.061	0.44
	August	120,300		0.404		0.406	137,100		0.027		0.031	142,630		0.006		0.007	61,240		0.102		0.052	0.50
	September	91,690		0.394		0.301	97,780		0.020		0.017	61,210		0.005		0.003	55,010		0.085		0.039	0.36
	October	91,890		0.394		0.302	87,080		0.020		0.015	124,050		0.005		0.005	66,130		0.085		0.047	0.37
	November	124,220		0.394		0.408	106,210		0.020		0.018	125,230		0.005		0.005	65,740		0.085		0.047	0.48
	December	116,910		0.394		0.384	85,380		0.020		0.015	116,720		0.005		0.005	45,790		0.085		0.032	0.44
	TOTAL	**1,195,920**				**4.00**	**1,150,650**				**0.24**	**1,259,580**				**0.06**	**745,760**				**0.60**	**4.89**
	CUMULATIVE TOTAL	***13,965,952***				***108.07***	***13,484,424***				***17.80***	***13,074,626***				***4.20***	***9,627,558***				***37.42***	***167.49***

Table 5
CAPA Groundwater Treatment System
Approximate Mass of Mercury Removed
Recovery Wells

Year	Month	CA050B				CA051B				CA052B				CA0U23B				Mercury Removed, All Wells
		Cumulative Flow	Mercury			Cumulative Flow	Mercury			Cumulative Flow	Mercury			Cumulative Flow	Mercury			
		(gal)[1]	Q (mg/L)[2,3]	Flag	(lbs)[4]	(gal)	Q (mg/L)	Flag	(lbs)	(gal)	Q (mg/L)	Flag	(lbs)	(gal)	Q (mg/L)	Flag	(lbs)	(lbs)
2013	January	113,370	0.394		0.373	77,990	0.020		0.013	116,270	0.005		0.005	66,770	0.085		0.047	0.44
	February	112,590	0.394		0.370	95,460	0.020		0.016	75,310	0.005		0.003	70,800	0.085		0.050	0.44
	March	98,780	0.394		0.325	92,420	0.020		0.016	96,280	0.005		0.004	66,770	0.085		0.047	0.39
	April	89,340	0.394		0.294	82,670	0.020		0.014	90,170	0.005		0.004	61,090	0.085		0.043	0.35
	May	116,300	0.394		0.382	65,810	0.020		0.011	132,000	0.005		0.006	80,830	0.085		0.057	0.46
	June	125,010	0.394		0.411	82,630	0.020		0.014	106,160	0.005		0.004	44,350	0.085		0.031	0.46
	July	121,530	0.394		0.400	84,250	0.020		0.014	108,210	0.005		0.005	62,060	0.085		0.044	0.46
	August	141,140	0.394		0.464	90,940	0.020		0.015	125,180	0.005		0.005	72,250	0.085		0.051	0.54
	September	105,950	0.350		0.309	81,600	0.007		0.005	96,240	0.003		0.002	56,930	0.084		0.040	0.36
	October	125,250	0.350		0.366	115,720	0.007		0.007	115,850	0.003		0.003	78,450	0.084		0.055	0.43
	November	107,610	0.350		0.314	83,470	0.007		0.005	90,570	0.003		0.002	62,050	0.084		0.043	0.36
	December	130,840	0.350		0.382	79,140	0.007		0.005	105,340	0.003		0.003	70,960	0.084		0.050	0.44
	TOTAL	**1,387,710**			**4.39**	**1,032,100**			**0.14**	**1,257,580**			**0.05**	**793,310**			**0.56**	**5.13**
	CUMULATIVE TOTAL	***15,353,662***			***112.46***	***14,516,524***			***17.93***	***14,332,206***			***4.24***	***10,420,868***			***37.98***	***172.62***
2014	January	145,420	0.350		0.425	88,720	0.007		0.005	122,080	0.003		0.003	78,900	0.084		0.055	0.49
	February	110,220	0.350		0.322	72,030	0.007		0.004	95,290	0.003		0.002	61,110	0.084		0.043	0.37
	March	121,620	0.350		0.355	69,560	0.007		0.004	116,190	0.003		0.003	72,990	0.084		0.051	0.41
	April	111,760	0.350		0.326	91,620	0.007		0.005	123,420	0.003		0.003	78,860	0.084		0.055	0.39
	May	104,770	0.350		0.306	78,750	0.007		0.005	117,760	0.003		0.003	76,870	0.084		0.054	0.37
	June	111,550	0.350		0.326	85,960	0.007		0.005	124,430	0.003		0.003	82,170	0.084		0.057	0.39
	July	69,490	0.350		0.203	71,810	0.007		0.004	95,010	0.003		0.002	65,810	0.084		0.046	0.26
	August	89,790	0.350		0.262	82,060	0.007		0.005	80,530	0.003		0.002	70,360	0.084		0.049	0.32
	September	121,190	0.486		0.492	62,520	0.007		0.004	130,350	0.004		0.004	83,330	0.174		0.121	0.62
	October	70,820	0.486		0.287	72,170	0.007		0.004	97,650	0.004		0.003	64,820	0.174		0.094	0.39
	November	63,310	0.486		0.257	61,890	0.007		0.004	78,490	0.004		0.003	54,850	0.174		0.080	0.34
	December	125,550	0.486		0.509	103,600	0.007		0.006	125,340	0.004		0.004	88,360	0.174		0.128	0.65
	TOTAL	**1,245,490**			**4.07**	**940,690**			**0.06**	**1,306,540**			**0.04**	**878,430**			**0.83**	**5.00**
	CUMULATIVE TOTAL	***16,599,152***			***116.53***	***15,457,214***			***17.99***	***15,638,746***			***4.28***	***11,299,298***			***38.81***	***177.61***
2015	January	97,570	0.486		0.396	64,200	0.007		0.004	93,990	0.004		0.003	66,320	0.174		0.096	0.50
	February	82,520	0.486		0.335	108,400	0.007		0.007	95,260	0.004		0.003	73,180	0.174		0.106	0.45
	March	81,380	0.486		0.330	93,950	0.007		0.006	88,580	0.004		0.003	68,370	0.174		0.099	0.44
	April	96,290	0.486		0.391	116,820	0.007		0.007	111,520	0.004		0.004	84,410	0.174		0.123	0.52
	May	88,710	0.486		0.360	100,050	0.007		0.006	91,040	0.004		0.003	71,870	0.174		0.104	0.47
	June	84,870	0.486		0.344	84,330	0.007		0.005	82,880	0.004		0.003	64,320	0.174		0.093	0.45
	July	75,060	0.486		0.304	101,030	0.007		0.006	91,420	0.004		0.003	77,630	0.174		0.113	0.43
	August	41,420	0.486		0.168	56,320	0.007		0.003	41,350	0.004		0.001	42,420	0.174		0.062	0.23
	September	25,610	0.604		0.129	75,880	0.037		0.023	44,700	0.004		0.002	53,690	0.172		0.077	0.23
	October	102,540	0.604		0.517	77,780	0.037		0.024	100,610	0.004		0.003	4,350	0.172		0.006	0.55
	November	98,660	0.604		0.497	76,390	0.037		0.023	101,330	0.004		0.003	0	0.172		0.000	0.52
	December	117,190	0.604		0.591	74,430	0.037		0.023	91,210	0.004		0.003	15,340	0.172		0.022	0.64
	TOTAL	**991,820**			**4.36**	**1,029,580**			**0.14**	**1,033,890**			**0.04**	**621,900**			**0.90**	**5.44**
	CUMULATIVE TOTAL	***17,590,972***			***120.90***	***16,486,794***			***18.12***	***16,672,636***			***4.32***	***11,921,198***			***39.71***	***183.05***
2016	January	81,730	0.604		0.412	65,050	0.037		0.020	74,410	0.004		0.003	41,710	0.172		0.060	0.49
	February	124,930	0.604		0.630	89,230	0.037		0.027	115,060	0.004		0.004	60,950	0.172		0.087	0.75
	March	128,720	0.604		0.649	86,880	0.037		0.027	126,200	0.004		0.004	66,000	0.172		0.095	0.77
	April	67,600	0.604		0.341	63,820	0.037		0.020	68,540	0.004		0.002	42,090	0.172		0.060	0.42
	May	79,010	0.604		0.398	82,910	0.037		0.025	104,460	0.004		0.004	64,400	0.172		0.092	0.52
	June	98,890	0.604		0.498	97,700	0.037		0.030	99,480	0.004		0.003	68,060	0.172		0.098	0.63
	July	78,810	0.604		0.397	69,600	0.037		0.021	81,010	0.004		0.003	46,610	0.172		0.067	0.49
	August	95,760	0.604		0.483	64,290	0.037		0.020	119,830	0.004		0.004	54,650	0.172		0.078	0.58
	September	120,380	0.396		0.398	99,660	0.010		0.009	92,060	0.003		0.002	57,510	0.098		0.047	0.46
	October	82,840	0.396		0.274	71,720	0.010		0.006	81,570	0.003		0.002	52,610	0.098		0.043	0.32
	November	105,910	0.396		0.350	91,490	0.010		0.008	60,190	0.003		0.001	62,340	0.098		0.051	0.41
	December	121,340	0.396		0.401	113,560	0.010		0.010	105,940	0.003		0.002	72,470	0.098		0.059	0.47
	TOTAL	**1,185,920**			**5.23**	**995,910**			**0.22**	**1,128,750**			**0.03**	**689,400**			**0.84**	**6.32**
	CUMULATIVE TOTAL	***18,776,892***			***126.13***	***17,482,704***			***18.35***	***17,801,386***			***4.35***	***12,610,598***			***40.55***	***189.37***

Notes:
1) gal - gallons
2) mg/L - milligrams per liter
3) Mercury samples collected during the month were reported as that months' concentration. If a sample was not collected during a specific month, the previous month's result was reported.
4) lbs - pounds



SOURCE:
Aerial image from Lanmon Aerial Photography Inc, dated 10/19/15.



EXPLANATION

CA018B	Well Designation
○	Monitoring Well
●	Piezometer
◭	Recovery Well
◪	Tidal Gauge
—1.5—	Estimated Potentiometric Surface Contour (Ft) C.I. = 0.5 Ft
	Area of Drawdown of Potentiometric Surface Caused by Pumping (not contoured)

STATE OF TEXAS
MATTHEW K. WICKHAM
GEOLOGY
LIC. # 5330
LICENSED PROFESSIONAL GEOSCIENTIST

0 60 120 Feet

Notes:
1. Groundwater elevations measured in pumping wells are probably influenced by well inefficiencies.
2. Groundwater elevations are corrected for salinity effects.
3. Only wells measured for water levels are shown on this figure.
4. Surface water elevation used for contouring is from tidal gauge located southwest of CAPA (CA Bay).

2016 RAAER

POTENTIOMETRIC SURFACE OF ZONE B GROUNDWATER (3/22/2016)

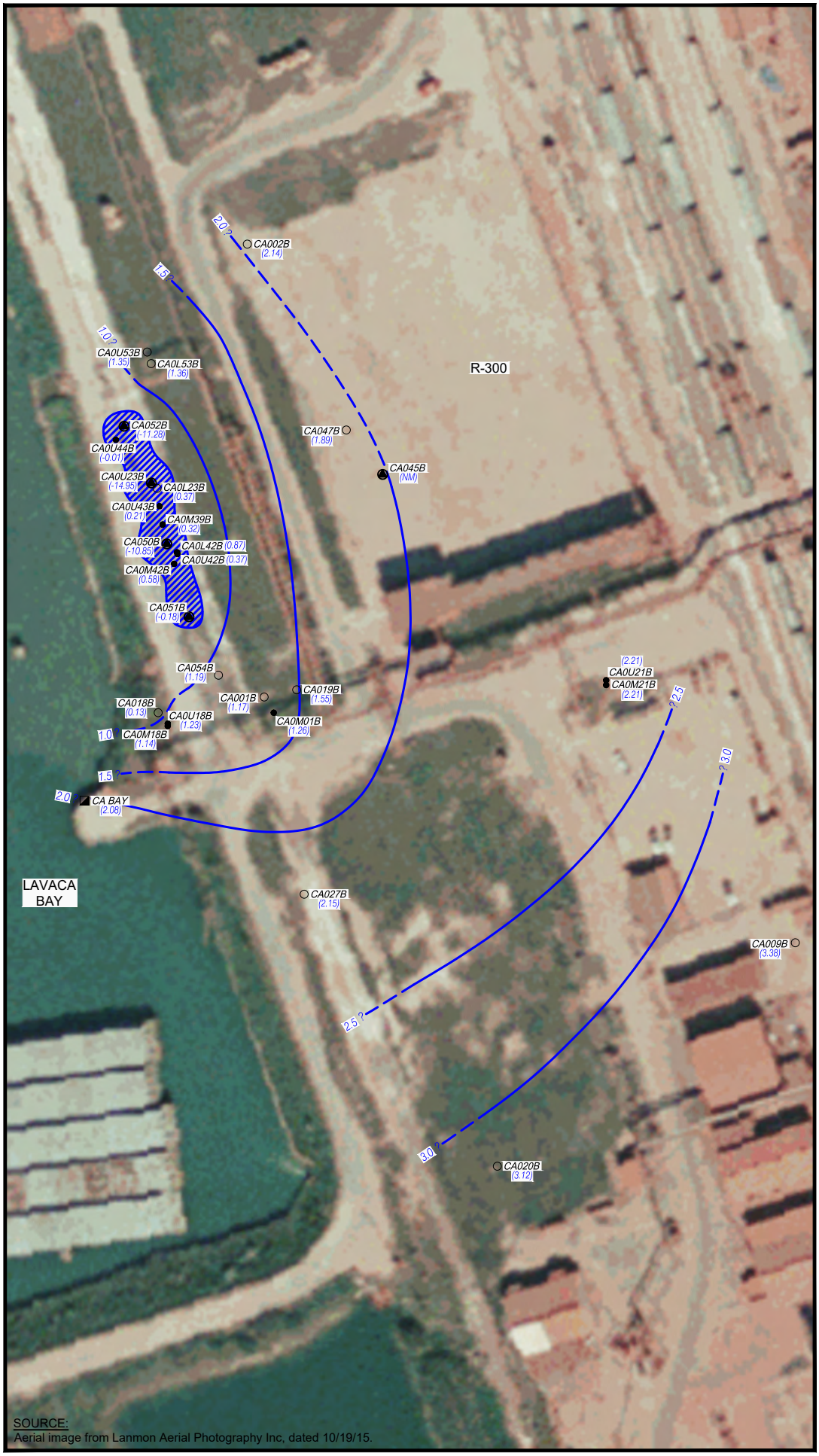
PBW
PASTOR, BEHLING & WHEELER, LLC

Project: 3423

Date: 02/21/2017

Figure 1

Prepared for
ALCOA CORPORATION



SOURCE:
Aerial image from Lanmon Aerial Photography Inc, dated 10/19/15.



EXPLANATION

CA018B	Well Designation
○	Monitoring Well
●	Piezometer
◭	Recovery Well
◪	Tidal Gauge
—1.5—	Estimated Potentiometric Surface Contour (Ft) C.I. = 0.5 Ft
	Area of Drawdown of Potentiometric Surface Caused by Pumping (not contoured)

STATE OF TEXAS
MATTHEW K. WICKHAM
GEOLOGY
LIC. # 5330
LICENSED PROFESSIONAL GEOSCIENTIST

0 60 120 Feet

Notes:
1. Groundwater elevations measured in pumping wells are probably influenced by well inefficiencies.
2. Groundwater elevations are corrected for salinity effects.
3. Only wells measured for water levels are shown on this figure.
4. Surface water elevation used for contouring is from tidal gauge located southwest of CAPA (CA Bay).

2016 RAAER

POTENTIOMETRIC SURFACE OF ZONE B GROUNDWATER (6/24/2016)

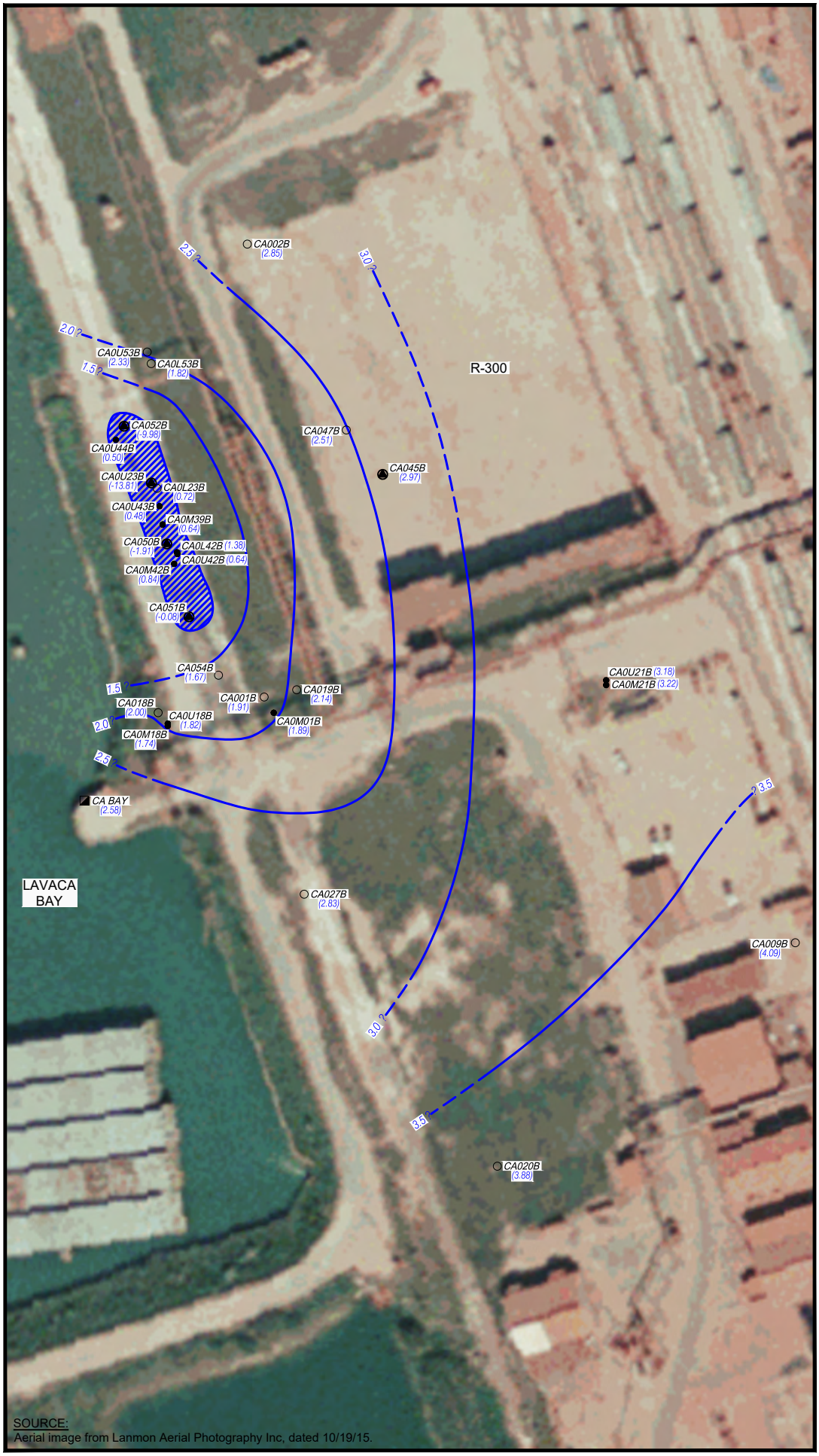
PBW
PASTOR, BEHLING & WHEELER, LLC

Project: 3423

Date: 02/21/2017

Figure 2

Prepared for
ALCOA CORPORATION



SOURCE:
Aerial image from Lanmon Aerial Photography Inc, dated 10/19/15.



EXPLANATION

CA018B	Well Designation
○	Monitoring Well
●	Piezometer
◭	Recovery Well
◪	Tidal Gauge
—1.5—	Estimated Potentiometric Surface Contour (Ft) C.I. = 0.5 Ft
▨	Area of Drawdown of Potentiometric Surface Caused by Pumping (not contoured)

STATE OF TEXAS
MATTHEW K. WICKHAM
GEOLOGY
LIC. # 5330
LICENSED
PROFESSIONAL GEOSCIENTIST

0 60 120
Feet

Notes:
1. Groundwater elevations measured in pumping wells are probably influenced by well inefficiencies.
2. Groundwater elevations are corrected for salinity effects.
3. Only wells measured for water levels are shown on this figure.
4. Surface water elevation used for contouring is from tidal gauge located southwest of CAPA (CA Bay).

2016 RAAER

POTENTIOMETRIC SURFACE OF ZONE B GROUNDWATER (9/9/2016)

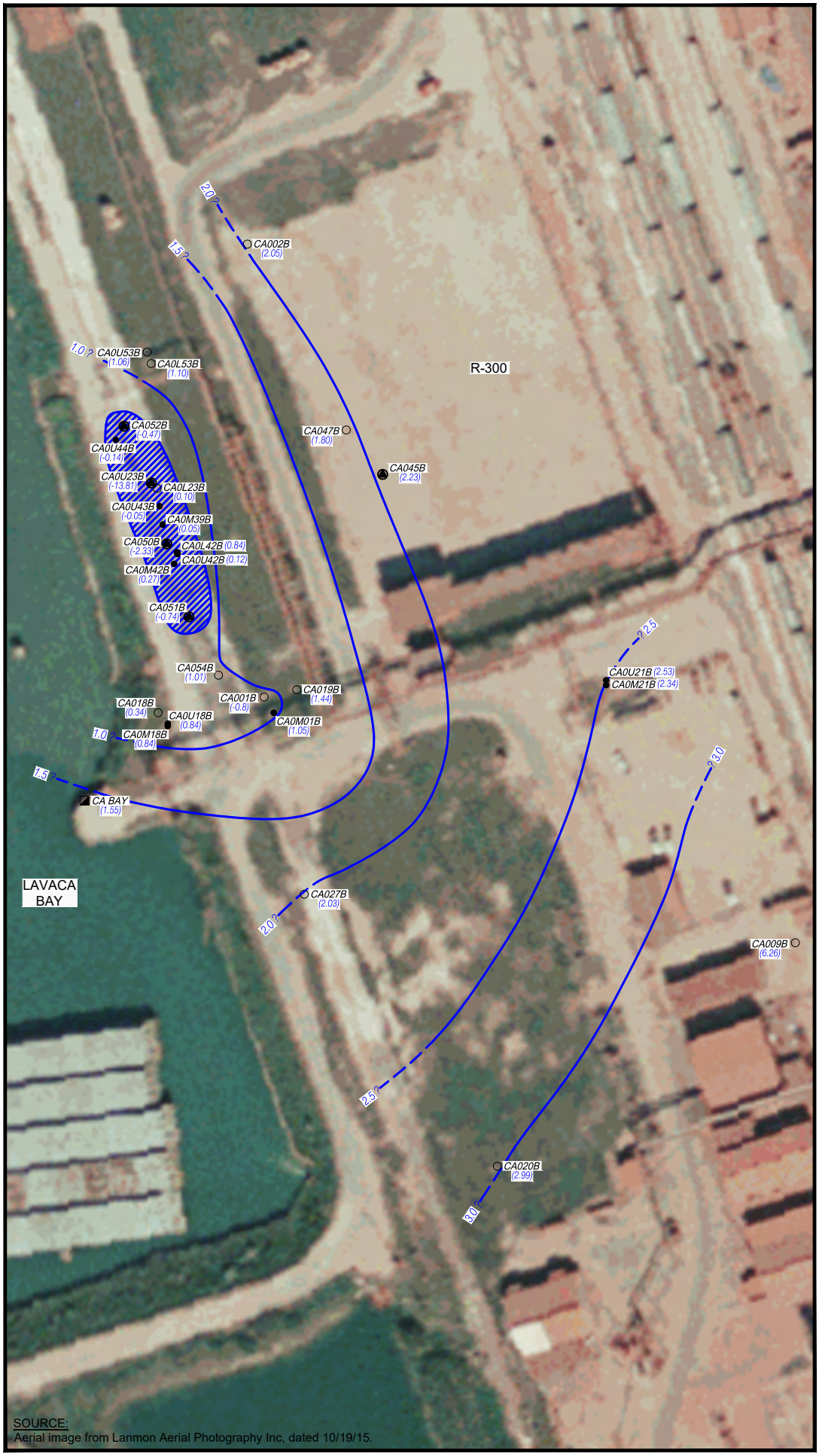
PBW
PASTOR, BEHLING & WHEELER, LLC

Project: 3423

Date: 2/21/2017

Figure 3

Prepared for
ALCOA CORPORATION



SOURCE:
Aerial image from Lanmon Aerial Photography Inc, dated 10/19/15.



EXPLANATION

CA018B	Well Designation
○	Monitoring Well
●	Piezometer
◭	Recovery Well
◪	Tidal Gauge
—1.5—	Estimated Potentiometric Surface Contour (Ft) C.I. = 0.5 Ft
▨	Area of Drawdown of Potentiometric Surface Caused by Pumping (not contoured)

STATE OF TEXAS
MATTHEW K. WICKHAM
GEOLOGY
LIC. # 5330
LICENSED PROFESSIONAL GEOSCIENTIST

0 60 120 Feet

Notes:
1. Groundwater elevations measured in pumping wells are probably influenced by well inefficiencies.
2. Groundwater elevations are corrected for salinity effects.
3. Only wells measured for water levels are shown on this figure.
4. Surface water elevation used for contouring is from tidal gauge located southwest of CAPA (CA Bay).

2016 RAAER

POTENTIOMETRIC SURFACE OF ZONE B GROUNDWATER (12/12/2016)

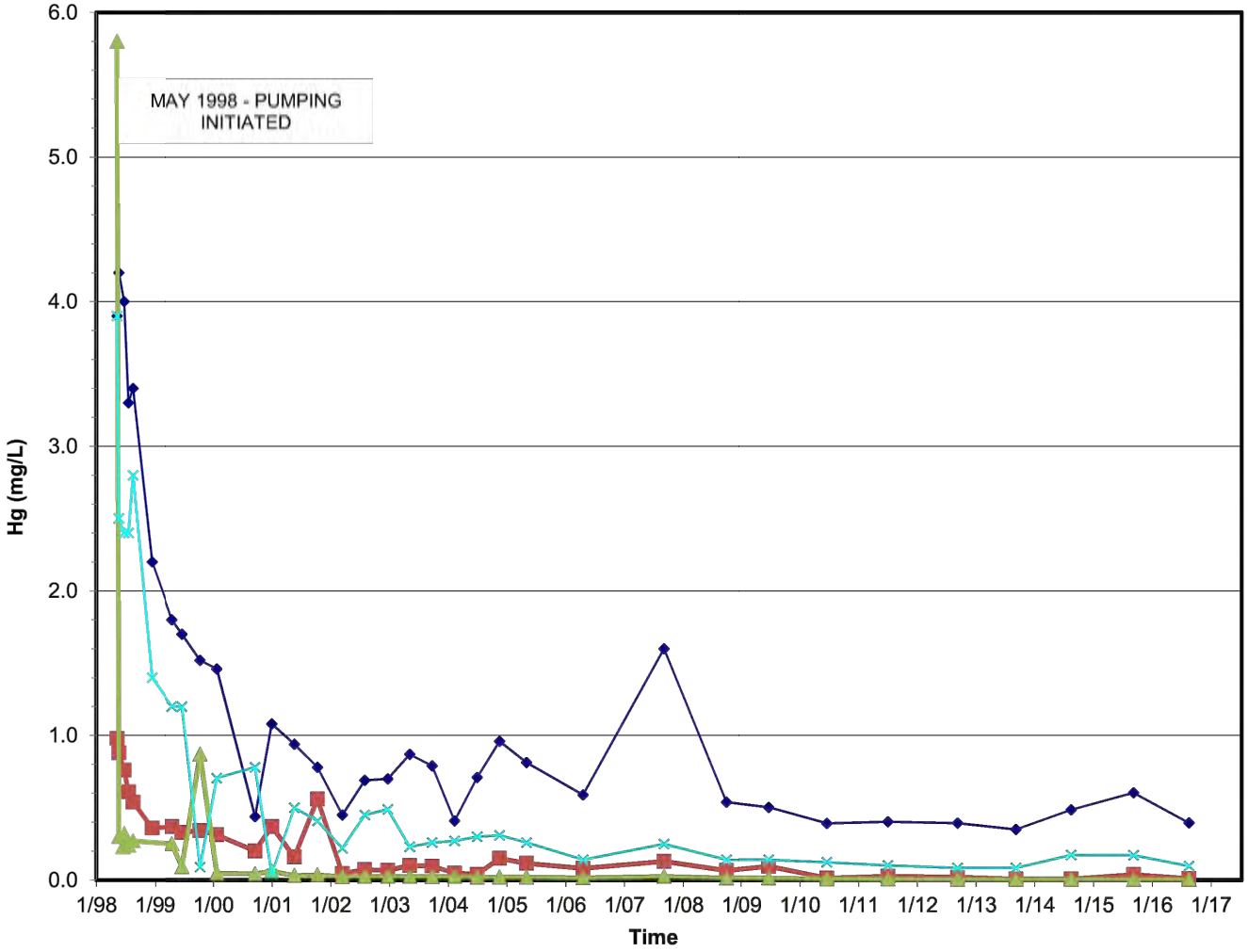
PBW
PASTOR, BEHLING & WHEELER, LLC

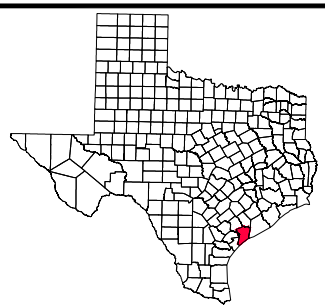
Project: 3423

Date: 2/21/2017

Figure 4

Prepared for
ALCOA CORPORATION





EXPLANATION

- CA050B
- CA051B
- CA052B
- CA0U23B

2016 RAAER

CAPA GROUNDWATER TREATMENT SYSTEM RECOVERY WELLS - ANALYTICAL RESULTS MERCURY CONCENTRATIONS vs. TIME

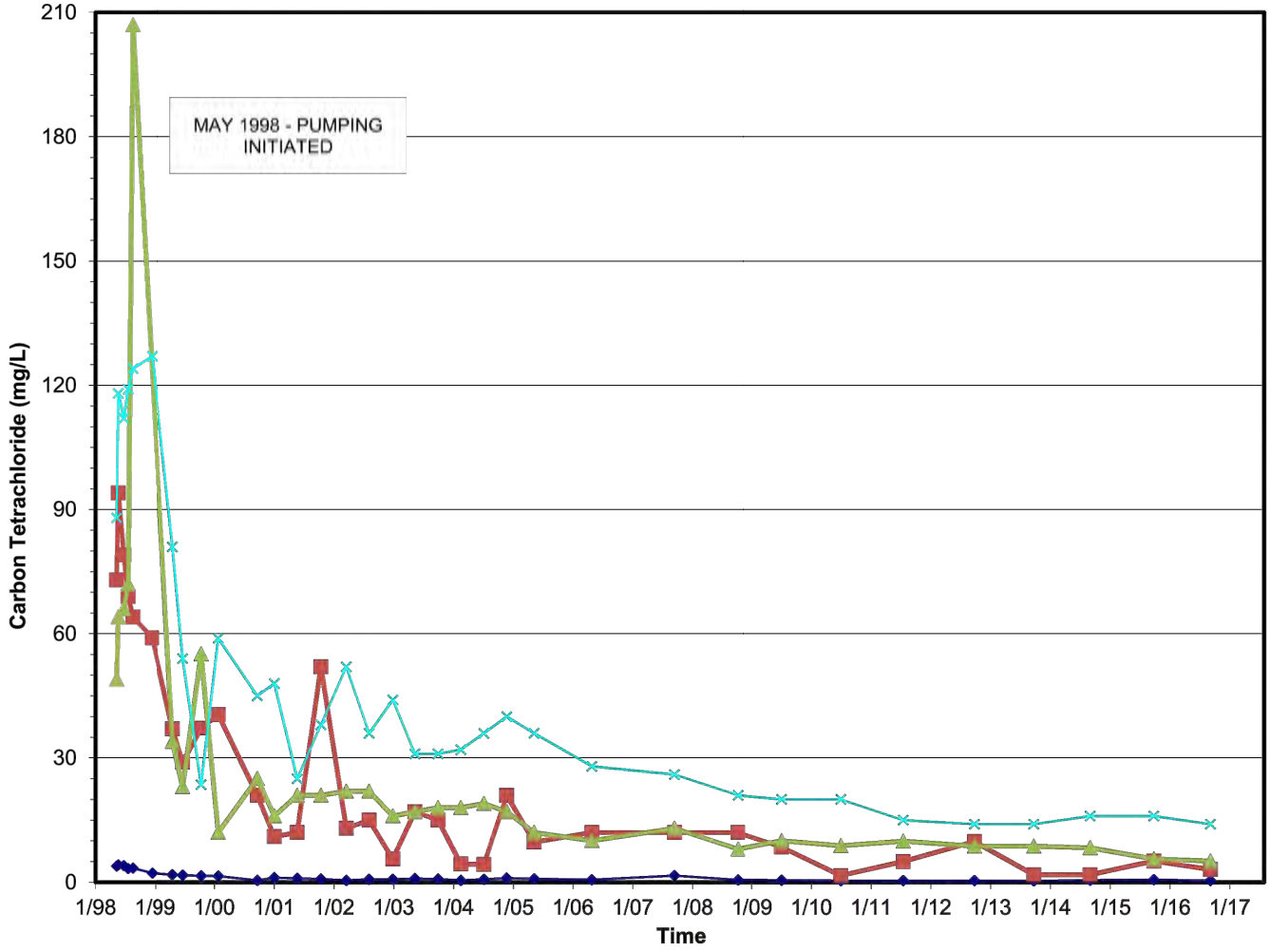
PBW
PASTOR, BEHLING & WHEELER, LLC

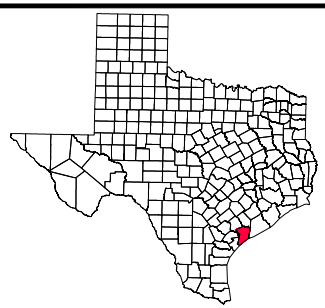
Project: 3423

Date: 02/21/2017

Figure 5

Prepared for
ALCOA CORPORATION





EXPLANATION

- CA050B
- CA051B
- CA052B
- CA0U23B

2016 RAAER

CAPA GROUNDWATER TREATMENT SYSTEM RECOVERY WELLS - ANALYTICAL RESULTS CARBON TETRACHLORIDE vs. TIME

PBW
PASTOR, BEHLING & WHEELER, LLC

Project: 3423

Date: 02/21/2017

Figure 6

Prepared for
ALCOA CORPORATION

APPENDIX B1
DREDGE ISLAND INSPECTION RECORDS

DREDGE ISLAND INSPECTION RECORD

Inspector's Name: Kevin Dworsky
Weather: Mostly Clear, Wind at 8 mph NNE
Temperature: 64° F
KBD accompanied by Benchmark Ecological Services, Inc. during the inspection.

Date: 03/28/2016 (1Q16)
Time Begin: 1030
Time End: 1200
Inspector's Signature: 

SPECIFIC ITEM TO INSPECT	TYPICAL PROBLEMS ENCOUNTERED	CONDITIONS OBSERVED NORMAL	CONDITIONS OBSERVED ABNORMAL	COMMENTS OR CORRECTIVE ACTION(S) IMPLEMENTED AND DATES
General Dredge Island	Erosion Deterioration Settling/Ponding Uplift Washouts Rodent Holes Vegetation	X X X X X X X	□ □ □ □ □ □ □	Shoreline bank cut observed near the northeast dike toe of the exterior slope. It is associated with the previous dredging event of Marsh 13. Cut does not extend to the dike cross section but future erosion could eventually chase back into the toe of the dike. This should be monitored as part of future inspections. All original vehicular signs and some of the reflectors on Island are damaged and/or knocked down. New signs have been placed in a few locations during 2011 maintenance event on the island. Some of these signs have also been knocked down by the strong winds. Minor vegetation on the road and minor vegetation along the sides of the roads, interior dikes, outer dikes, and on toes of the exterior dikes. Hard to inspect some areas of the ramps thoroughly due to healthy/heavy vegetation. Some rutting of the road and gravel of the exterior dike on the northeast side of the CDF caused by the heavy equipment used during the previous dredging event. Some trees/bushes are forming in the gravel of the inner and outer dikes and in the stone armor.
Access Bridge	Deterioration Damage Navigation Lights	□ □ □	X X X	Conditions similar to previous 4Q15 report completed by Dan Bullock of BBA. Bridge abutments severely eroded. Hazard signs indicating presence of water hazards appear in good condition. Detailed inspection of the bridge was not performed as part of this site visit.
CDF Dike	Erosion Deterioration Damage Vegetation	X X X X	□ □ □ □	Minor erosion has been noted on the interior dikes and on the access ramp in several locations. There is water inside the CDF, most of which is from recent rain events. Minor erosion observed in areas of the exterior dike side slope where the north entry ramp meets the dike. The exterior CDF dike appears to overall be in good condition. The CDF dike appears stable and there is no required action at this time, however, water levels in the CDF should be maintained as low as possible, and erosion rills on the dike's interior and exterior should continue to be monitored during quarterly inspections. Minor to moderate geomembrane exposed along the portions of the interior dike on all sides of the dike. Action in the near future may be necessary. The geomembrane component of the water stop on the CPA dike, near the Alcoa CDF station 23+00, is exposed due to severe erosion of the overlying

DREDGE ISLAND INSPECTION RECORD

				topsoil. There are also large erosion rills on the exterior of the dike. Erosion in this area currently does not appear to impact the CDF dikes but should continue to be monitored during quarterly inspections. There was no seepage noted from the top of the dike.
Stone Storm Protection	Erosion Settlement Stone Deterioration Stone Movement Fabric Exposure Damage Vegetation	X X X X X X X	□ □ □ □ □ □ □	No damage observed. Minor vegetation present in areas. There are a some large trees/bushes that are pushing through the stone armor. Due to safety concerns associated with walking on the armor stone, this inspection was conducted without traversing the stone on the exterior dike slopes. The exterior dike locations were observed via the dike crest.
Gravel Erosion Protection	Erosion Fabric Exposure Deterioration Damage	X X X X	□ □ □ □	The inside slope of the north sections of the east and west dikes have been repaired several times since the construction of the CDF due to erosion but geotextile fabric and overlying gravel erosion protection originally constructed on the interior slope was not placed as part of the work. These sections are currently showing minor to moderate erosion. Most of the remaining sections of the dikes' inside slope exhibit minor to moderate erosion and loss of gravel protection. No immediate action is required at these locations but they should continue to be monitored. Lack of geotextile and overlying gravel erosion protection on the slope interiors does not appear to be problematic as long as the water levels are kept low to prevent severe interior erosion.
Emergency Spillway	Obstructions Cracks in Concrete Deterioration Damage	X X X X	□ □ □ □	Generally good condition. Slight erosion and some cracks in the concrete. Slight erosion has occurred along the outer and inner edge of the spillway. Some localized concrete deterioration observed.
Decant Structures	Weir Board Elevation Depth of Water Obstructions Deterioration Rust/Corrosion Damage Overflow Quality (NA) Overflow Quantity Flap Gate	□ X X □ □ X □ X X	X □ □ X X □ □ □ □	As of January 2012, the North Structure will be placed under restricted access until a thorough structural and safety inspection of this structure can be performed by a qualified structural engineer. All inspections will be completed visually from the catwalk of the structure. This recommendation was made due to the severe visual corrosion of the structural I-beam sections. North Structure: Coated surfaces on structure exhibiting moderate to severe rusting and pitting on handrails. Channel iron also exhibits moderate to severe corrosion. Severe corrosion of the structural I-beam sections was observed. The majority of the structural I-beams are not visible without removal of the grates and access of the structure interior. Therefore, the interior I-beam was not observed during this inspection. Plastic around the top of structure is in good condition. There is no discharge observed coming from the North Decant Structure. The area around the structure is dry (5.30' from platform of structure.

DREDGE ISLAND INSPECTION RECORD

				Water inside of the structure was 20.40' below the top of the platform. South Structure: Several stop logs were removed to allow water to decant during the previous dredging event and have not been replaced. These boards should be replaced to prevent accidental discharge. Minor to moderate rust observed on handrails and channel iron. A section of angle iron used to guide the stop logs in the slots has broken loose from the welds and show severe corrosion. Conditions appear to have worsened since the last inspections. The plastic around the top of the structure appears to be in good condition. There is no discharge observed coming from the South Decant Structure. The water outside of the structure is 7.20' from the platform. The water inside of the structure is 17.80' from the platform. Outfall structures were only observed from the dikes.
Gravel Road	Potholes Ponding Deterioration Washouts Vegetation	X X X X X	□ □ □ □ □	Generally in good condition. Some rutting at several locations. Moderate rutting on north east side of CDF due to the heavy equipment used during the previous dredging event. There is some slight erosion on the sides of portions of the road. There are several areas of thin gravel and geomembrane exposure.
Water Stops	Erosion Membrane Exposed Deterioration Damage	□ □ X X	X X □ □	Severe erosion, fines accumulation, and geomembrane exposed at water stop on the inside CPA dike as previously reported. Moderate erosion on the exterior of the East CPA Dike. Severe erosion on the exterior of the West CPA Dike. Continue to monitor.
Reflectors Station Tags	Intact/Reflecting Intact/Legibility	□ □	X X	Some reflectors and traffic signage observed to be leaning or entirely down on the ground. If the island is to be used for vehicular traffic in the future, a more detailed review of the reflectors and traffic signage should be completed.

FIRST QUARTER 2016
DREDGE ISLAND INSPECTION PHOTO LOG

ALCOA PCO – Point Comfort, Texas



1 – Viewing east side of the North Ramp



2 – Viewing west side of the North Ramp



3 – North Ramp, viewing washout and cracking



4 – North Outer Dike, viewing damaged sign



5 – Northeast Corner Outer Dike, viewing moderate exposure of the geomembrane



6 – Northeast Corner Outer Dike, viewing west

FIRST QUARTER 2016
DREDGE ISLAND INSPECTION PHOTO LOG

ALCOA PCO – Point Comfort, Texas



7 – Northeast Corner Inner Dike, viewing west



8 – Northeast Corner Inner Dike, viewing south



9 – East Outer Dike, viewing north



10 – North Outfall



11 – North Decant Structure



12 –Intrusive trees and vegetation in exterior gravel protection

FIRST QUARTER 2016
DREDGE ISLAND INSPECTION PHOTO LOG

ALCOA PCO – Point Comfort, Texas



13 – Southeast Inner Dike, viewing southwest



14 – Southeast Outer Dike, historic seepage area



15 – Southeast Corner Outer Dike, viewing south



16 – Southeast Corner Inner Dike, viewing south



17 – Southeast Corner Inner Dike, viewing west



18 – Southeast Corner Outer Dike, viewing west

FIRST QUARTER 2016
DREDGE ISLAND INSPECTION PHOTO LOG

ALCOA PCO – Point Comfort, Texas



19 – South Dike, viewing exposed geomembrane



20 – Southwest Corner Inner Dike, viewing north



21 – Southwest Corner Outer Dike, viewing north



22 – South Outfall



23 – South Decant Structure



24 – South Decant Structure, viewing water level around the structure

FIRST QUARTER 2016
DREDGE ISLAND INSPECTION PHOTO LOG

ALCOA PCO – Point Comfort, Texas



25 – Northwest Corner Inner Dike, viewing south



26 – Northwest Corner Outer Dike, viewing south



27 – Northwest Corner of Inner Dike, panoramic view of water level in CDF



28 – Emergency Spillway, viewing minor erosion along outer edge



29 – Emergency Spillway, viewing minor deterioration of the concrete

FIRST QUARTER 2016
DREDGE ISLAND INSPECTION PHOTO LOG

ALCOA PCO – Point Comfort, Texas



30 – North Outer Dike, viewing damaged reflector



31 – East CPA Inner Dike, viewing erosion and exposure of liner



32 – East CPA Outer Dike, viewing erosion



33 – West CPA Outer Dike, viewing erosion and exposure of liner



34 – View North Decant Structure deterioration



35 – Dredge Island Access Bridge, viewing erosion between the bridge and the island

DREDGE ISLAND INSPECTION RECORD

Inspector's Name: Kevin Dworsky
Weather: Mostly Clear
Temperature: 79° F
KBD accompanied by Benchmark Ecological Services, Inc. during the inspection.

Date: 06/10/2016 (2Q16)
Time Begin: 0830
Time End: 1030
Inspector's Signature: 

SPECIFIC ITEM TO INSPECT	TYPICAL PROBLEMS ENCOUNTERED	CONDITIONS OBSERVED NORMAL	CONDITIONS OBSERVED ABNORMAL	COMMENTS OR CORRECTIVE ACTION(S) IMPLEMENTED AND DATES
General Dredge Island	Erosion	X	□	Shoreline bank cut observed near the northeast dike toe of the exterior slope. It is associated with the previous dredging event of Marsh 13. Cut does not extend to the dike cross section but future erosion could eventually chase back into the toe of the dike. This should be monitored as part of future inspections. Appears there has been little to no erosion of the area since 1Q16 inspection. All original vehicular signs and some of the reflectors on Island are damaged and/or knocked down. New signs have been placed in a few locations during 2011 maintenance event on the island. Most of these signs have also been knocked down by the strong winds as well. Very minor vegetation on the road and minor vegetation along the sides of the roads, interior dikes, outer dikes, and on toes of the exterior dikes. Hard to inspect the side slopes of the ramps thoroughly due to healthy/heavy vegetation. Some rutting of the road and gravel of the exterior dike on the northeast side of the CDF caused by the heavy equipment used during the previous dredging event. Some small trees/bushes are forming in the gravel of the inner and outer dikes and there are some larger trees/bushes in the stone armor.
	Deterioration	X	□	
	Settling/Ponding	X	□	
	Uplift	X	□	
	Washouts	X	□	
	Rodent Holes	X	□	
	Vegetation	X	□	
Access Bridge	Deterioration	□	X	Conditions similar to previous 1Q16 report. Bridge abutments severely eroded. Hazard signs indicating presence of water hazards appear in good condition. Detailed inspection of the bridge was not performed as part of this site visit.
	Damage	□	X	
	Navigation Lights	□	X	
CDF Dike	Erosion	X	□	Minor erosion has been noted on the interior dikes and on the access ramp in several locations. There is water inside the CDF, most of which is from recent rain events. Minor erosion observed in areas of the exterior dike side slope where the north entry ramp meets the dike. The exterior CDF dike appears to overall be in good condition. The CDF dike appears stable and there is no required action at this time, however, water levels in the CDF should be maintained as low as possible, and erosion rills on the dike's interior and exterior should continue to be monitored during quarterly inspections. Minor to moderate geomembrane exposed along the portions of the interior dike on all sides of the dike. Action in the near future may be necessary. The geomembrane component of the water stop on the CPA dike, near the Alcoa CDF station 23+00, is
	Deterioration	X	□	
	Damage	X	□	
	Vegetation	X	□	

DREDGE ISLAND INSPECTION RECORD

				exposed due to severe erosion of the overlying topsoil. There are also large erosion rills on the exterior of the dike. Erosion in this area currently does not appear to impact the CDF dikes but should continue to be monitored during quarterly inspections. There was no seepage noted from the top of the dike.
Stone Storm Protection	Erosion Settlement Stone Deterioration Stone Movement Fabric Exposure Damage Vegetation	X X X X X X X	□ □ □ □ □ □ □	No damage observed. Minor vegetation present in areas. There are a some large trees/bushes that are pushing through the stone armor. These trees/bushes were not part of the 2015 vegetation removal due to safety issues with workers on the stone. Due to safety concerns associated with walking on the armor stone, this inspection was conducted without traversing the stone on the exterior dike slopes. The exterior dike locations were observed via the dike crest.
Gravel Erosion Protection	Erosion Fabric Exposure Deterioration Damage	X X X X	□ □ □ □	The inside slope of the north sections of the east and west dikes have been repaired several times since the construction of the CDF due to erosion but geotextile fabric and overlying gravel erosion protection originally constructed on the interior slope was not placed as part of the work. These sections are currently showing minor to moderate erosion. Most of the remaining sections of the dikes' inside slope exhibit minor to moderate erosion and loss of gravel protection. No immediate action is required at these locations but they should continue to be monitored. Lack of geotextile and overlying gravel erosion protection on the slope interiors does not appear to be problematic as long as the water levels are kept low to prevent severe interior erosion.
Emergency Spillway	Obstructions Cracks in Concrete Deterioration Damage	X X X X	□ □ □ □	Generally good condition. Slight erosion and some cracks in the concrete. Slight erosion has occurred along the outer and inner edge of the spillway. Some localized concrete deterioration observed.
Decant Structures	Weir Board Elevation Depth of Water Obstructions Deterioration Rust/Corrosion Damage Overflow Quality (NA) Overflow Quantity Flap Gate	□ X X □ □ X □ X X	X □ □ X X □ □ □ □	As of January 2012, the North Structure will be placed under restricted access until a thorough structural and safety inspection of this structure can be performed by a qualified structural engineer. All inspections will be completed visually from the catwalk of the structure. This recommendation was made due to the severe visual corrosion of the structural I-beam sections. North Structure: Coated surfaces on structure exhibiting moderate to severe rusting and pitting on handrails. Channel iron also exhibits moderate to severe corrosion. Severe corrosion of the structural I-beam sections was observed. The majority of the structural I-beams are not visible without removal of the grates and access of the structure interior. Therefore, the interior I-beam was not observed during this inspection. Plastic around the top of structure is in good condition.

DREDGE ISLAND INSPECTION RECORD

				There is no discharge observed coming from the North Decant Structure. The area around the structure is dry (5.30' from platform of structure). Water inside of the structure was 18.90' below the top of the platform. South Structure: Several stop logs were removed to allow water to decant during the previous dredging event and have not been replaced. These boards should be replaced to prevent accidental discharge. Minor to moderate rust observed on handrails and channel iron. A section of angle iron used to guide the stop logs in the slots has broken loose from the welds and show severe corrosion. Conditions appear to have worsened since the last inspections. The plastic around the top of the structure appears to be in good condition. There is no discharge observed coming from the South Decant Structure. The water outside of the structure is 6.9' from the platform. The water inside of the structure is 17.1' from the platform. Outfall structures were only observed from the dikes and do not appear to be discharging.
Gravel Road	Potholes Ponding Deterioration Washouts Vegetation	X X X X X	□ □ □ □ □	Generally in good condition. Some rutting at several locations. Moderate rutting on north east side of CDF due to the heavy equipment used during the previous dredging event. There is some slight erosion on the sides of portions of the road. There are several areas of thin gravel and geomembrane exposure.
Water Stops	Erosion Membrane Exposed Deterioration Damage	□ □ X X	X X □ □	Severe erosion, fines accumulation, and geomembrane exposed at water stop on the inside CPA dike as previously reported. Moderate erosion on the exterior of the East CPA Dike. Severe erosion on the exterior of the West CPA Dike. Continue to monitor.
Reflectors Station Tags	Intact/Reflecting Intact/Legibility	□ □	X X	Some reflectors and traffic signage observed to be leaning or entirely down on the ground. If the island is to be used for vehicular traffic in the future, a more detailed review of the reflectors and traffic signage should be completed.

SECOND QUARTER 2016
DREDGE ISLAND INSPECTION PHOTO LOG

ALCOA PCO – Point Comfort, Texas



1 – Viewing east side of the North Ramp



2 – Viewing west side of the North Ramp



3 – North Ramp, viewing washout and cracking



4 – North Outer Dike, viewing damaged reflector



5 – Northeast Corner Outer Dike, viewing vegetation



6 – Northeast Corner Outer Dike, viewing west

SECOND QUARTER 2016
DREDGE ISLAND INSPECTION PHOTO LOG

ALCOA PCO – Point Comfort, Texas



7 – Northeast Corner Inner Dike, viewing west



8 – Northeast Corner Inner Dike, viewing south



9 – East Outer Dike, viewing north



10 – North Outfall



11 – North Decant Structure



12 –East Inner Dike - vegetation and geofabric exposure

SECOND QUARTER 2016
DREDGE ISLAND INSPECTION PHOTO LOG

ALCOA PCO – Point Comfort, Texas



13 – Southeast Inner Dike, viewing southwest



14 – Southeast Outer Dike, historic seepage area



15 – Southeast Corner Outer Dike, viewing south



16 – Southeast Corner Inner Dike, viewing south



17 – Southeast Corner Inner Dike, viewing west



18 – Southeast Corner Outer Dike, viewing west

SECOND QUARTER 2016
DREDGE ISLAND INSPECTION PHOTO LOG

ALCOA PCO – Point Comfort, Texas



19 – South Dike, viewing exposed geomembrane



20 – Southwest Corner Inner Dike, viewing north



21 – Southwest Corner Outer Dike, viewing north



22 – South Outfall



23 – South Decant Structure



24 – South Decant Structure, viewing corrosion of angle iron

SECOND QUARTER 2016
DREDGE ISLAND INSPECTION PHOTO LOG

ALCOA PCO – Point Comfort, Texas



25 – Northwest Corner Inner Dike, viewing south



26 – Northwest Corner Outer Dike, viewing south



27 – Northwest Corner Inner Dike, viewing east



28 – Northwest Corner Outer Dike, viewing east



29 – Emergency Spillway, viewing minor erosion along outer edge



30 – Emergency Spillway, viewing minor deterioration of the concrete

SECOND QUARTER 2016
DREDGE ISLAND INSPECTION PHOTO LOG

ALCOA PCO – Point Comfort, Texas



31 – Southeast Outer Dike, viewing damaged sign



32 – East CPA Inner Dike, viewing erosion and exposure of liner



33 – East CPA Outer Dike, viewing erosion



34 – West CPA Outer Dike, viewing erosion and exposure of liner



35 – View North Decant Structure deterioration



36 – Dredge Island Access Bridge, viewing erosion between the bridge and the island

DREDGE ISLAND INSPECTION RECORD

Inspector's Name: Kevin Dworsky
Weather: Cloudy, North Wind
Temperature: 72° F
KBD accompanied by Greg Logan (PBW) during the inspection.

Date: 09/27/2016 (3Q16)
Time Begin: 0900
Time End: 1100
Inspector's Signature: 

SPECIFIC ITEM TO INSPECT	TYPICAL PROBLEMS ENCOUNTERED	CONDITIONS OBSERVED NORMAL	CONDITIONS OBSERVED ABNORMAL	COMMENTS OR CORRECTIVE ACTION(S) IMPLEMENTED AND DATES
General Dredge Island	Erosion	X	□	Shoreline bank cut observed near the northeast dike toe of the exterior slope. It is associated with the previous dredging event of Marsh 13. Cut does not extend to the dike cross section but future erosion could eventually chase back into the toe of the dike. This should be monitored as part of future inspections. Appears there has been little to no erosion of the area since 2Q16 inspection. All original vehicular signs and some of the reflectors on Island are damaged and/or knocked down. New signs have been placed in a few locations during 2011 maintenance event on the island. Most of these signs have also been knocked down by the strong winds as well. Very minor vegetation on the road and minor vegetation along the sides of the roads, interior dikes, outer dikes, and on toes of the exterior dikes. Hard to inspect the side slopes of the ramps thoroughly due to healthy/heavy vegetation. Some rutting of the road and gravel of the exterior dike on the northeast side of the CDF caused by the heavy equipment used during the previous dredging event. Some small trees/bushes are forming in the gravel of the inner and outer dikes and there are some larger trees/bushes in the stone armor.
	Deterioration	X	□	
	Settling/Ponding	X	□	
	Uplift	X	□	
	Washouts	X	□	
	Rodent Holes	X	□	
	Vegetation	X	□	
Access Bridge	Deterioration	□	X	Conditions similar to previous 2Q16 report. Bridge abutments severely eroded. Hazard signs indicating presence of water hazards appear in good condition. Detailed inspection of the bridge was not performed as part of this site visit.
	Damage	□	X	
	Navigation Lights	□	X	
CDF Dike	Erosion	X	□	Minor erosion has been noted on the interior dikes and on the north access ramp in several locations. There is water inside the CDF, most of which is from recent rain events. Minor erosion observed in areas of the exterior dike side slope where the north entry ramp meets the dike. The exterior CDF dike appears to overall be in good condition. The CDF dike appears stable and there is no required action at this time, however, water levels in the CDF should be maintained as low as possible, and erosion rills on the dike's interior and exterior should continue to be monitored during quarterly inspections. Minor to moderate geomembrane exposed along the portions of the interior dike on all sides of the dike. Action in the near future may be necessary. The geomembrane component of the water stop on the CPA dike, near the Alcoa CDF station 23+00, is
	Deterioration	X	□	
	Damage	X	□	
	Vegetation	X	□	

DREDGE ISLAND INSPECTION RECORD

				exposed due to severe erosion of the overlying topsoil. There are also large erosion rills on the exterior of the dike. There are small holes that have been observed in the geomembrane. It does appear that both the inner and outer levee erosions have worsened. Erosion in this area currently does not appear to impact the CDF dikes but should continue to be monitored during quarterly inspections. There is similar geomembrane component exposure at the water stop on the west CPS dike at Station 37+00. This area is also exposed due to severe erosion of the overlying soil cover material. There are small holes that have been observed in the geomembrane. There was no seepage noted from the top of the dike.
Stone Storm Protection	Erosion Settlement Stone Deterioration Stone Movement Fabric Exposure Damage Vegetation	X X X X X X X	□ □ □ □ □ □ □	No damage observed. Minor vegetation present in areas. There are a some large trees/bushes that are pushing through the stone armor. These trees/bushes were not part of the 2015 vegetation removal due to safety issues with workers on the stone. Due to safety concerns associated with walking on the armor stone, this inspection was conducted without traversing the stone on the exterior dike slopes. The exterior dike locations were observed via the dike crest.
Gravel Erosion Protection	Erosion Fabric Exposure Deterioration Damage	X X X X	□ □ □ □	The inside slope of the north sections of the east and west dikes have been repaired several times since the construction of the CDF due to erosion but geotextile fabric and overlying gravel erosion protection originally constructed on the interior slope was not placed as part of the work. These sections are currently showing minor to moderate erosion. Most of the remaining sections of the dikes' inside slope exhibit minor to moderate erosion and loss of gravel protection. No immediate action is required at these locations but they should continue to be monitored. Lack of geotextile and overlying gravel erosion protection on the slope interiors does not appear to be problematic as long as the water levels are kept low to prevent severe interior erosion.
Emergency Spillway	Obstructions Cracks in Concrete Deterioration Damage	X X X X	□ □ □ □	Generally good condition. Slight erosion and some cracks in the concrete. Slight erosion has occurred along the outer and inner edge of the spillway. Some localized concrete deterioration observed.
Decant Structures	Weir Board Elevation Depth of Water Obstructions Deterioration Rust/Corrosion Damage Overflow Quality (NA)	□ X X □ □ X □	X □ □ X X □ □	As of January 2012, the North Structure will be placed under restricted access until a thorough structural and safety inspection of this structure can be performed by a qualified structural engineer. All inspections will be completed visually from the catwalk of the structure. This recommendation was made due to the severe visual corrosion of the structural I-beam sections.

DREDGE ISLAND INSPECTION RECORD

	Overflow Quantity Flap Gate	X X	□ □	North Structure: Coated surfaces on structure exhibiting moderate to severe rusting and pitting on handrails. Channel iron also exhibits moderate to severe corrosion. Severe corrosion of the structural I-beam sections was observed. The majority of the structural I-beams are not visible without removal of the grates and access of the structure interior. Therefore, the interior I-beam was not observed during this inspection. Plastic around the top of structure is in good condition. There is no discharge observed coming from the North Decant Structure. The area around the structure is dry (5.40' from platform of structure). Water inside of the structure was 16.25' below the top of the platform. South Structure: Several stop logs were removed to allow water to decant during the previous dredging event and have not been replaced. These boards should be replaced to prevent accidental discharge. Minor to moderate rust observed on handrails and channel iron. A section of angle iron used to guide the stop logs in the slots has broken loose from the welds and show severe corrosion. Conditions appear to have worsened since the last inspections. The plastic around the top of the structure appears to be in good condition. There is no discharge observed coming from the South Decant Structure. The water outside of the structure is 7.35' from the platform. The water inside of the structure is 17.75' from the platform. Outfall structures were only observed from the dikes and do not appear to be discharging.
Gravel Road	Potholes Ponding Deterioration Washouts Vegetation	X X X X X	□ □ □ □ □	Generally in good condition. Some rutting at several locations. Moderate rutting on north east side of CDF due to the heavy equipment used during the previous dredging event. There is some slight erosion on the sides of portions of the road. There are several areas of thin gravel and geomembrane exposure.
Water Stops	Erosion Membrane Exposed Deterioration Damage	□ □ X X	X X □ □	Severe erosion, fines accumulation, and geomembrane exposed at water stop on the inside CPA dike as previously reported. Moderate erosion on the exterior of the East CPA Dike. Severe erosion on the exterior of the West CPA Dike. Continue to monitor.
Reflectors Station Tags	Intact/Reflecting Intact/Legibility	□ □	X X	Some reflectors and traffic signage observed to be leaning or entirely down on the ground. If the island is to be used for vehicular traffic in the future, a more detailed review of the reflectors and traffic signage should be completed.

THIRD QUARTER 2016
DREDGE ISLAND INSPECTION PHOTO LOG

ALCOA PCO – Point Comfort, Texas



1 – Viewing east side of the North Ramp



2 – Viewing west side of the North Ramp



3 – North Ramp, viewing washout and cracking



4 – North Inner Dike, viewing minor erosion and geofabric exposure



5 – Northeast Corner Outer Dike, viewing vegetation



6 – Northeast Corner Outer Dike, viewing west

THIRD QUARTER 2016
DREDGE ISLAND INSPECTION PHOTO LOG

ALCOA PCO – Point Comfort, Texas



7 – Northeast Corner Inner Dike, viewing west



8 – Northeast Corner Inner Dike, viewing south



9 – East Outer Dike, viewing north



10 – North Outfall



11 – North Decant Structure



12 –East Outer Dike - vegetation at the bottom of the gravel protection and in the armor

THIRD QUARTER 2016
DREDGE ISLAND INSPECTION PHOTO LOG

ALCOA PCO – Point Comfort, Texas



13 – Southeast Inner Dike, viewing southwest



14 – Southeast Outer Dike, historic seepage area



15 – Southeast Corner Outer Dike, viewing south



16 – Southeast Corner Inner Dike, viewing south



17 – Southeast Corner Inner Dike, viewing west



18 – Southeast Corner Outer Dike, viewing west

THIRD QUARTER 2016
DREDGE ISLAND INSPECTION PHOTO LOG

ALCOA PCO – Point Comfort, Texas



19 – South Dike, viewing exposed geomembrane



20 – Southwest Corner Inner Dike, viewing north



21 – Southwest Corner Outer Dike, viewing north



22 – South Outfall



23 – South Decant Structure



24 – South Decant Structure, viewing corrosion of angle iron

THIRD QUARTER 2016
DREDGE ISLAND INSPECTION PHOTO LOG

ALCOA PCO – Point Comfort, Texas



25 – Northwest Corner Inner Dike, viewing south



26 – Northwest Corner Outer Dike, viewing south



27 – Northwest Corner Inner Dike, viewing east



28 – Northwest Corner Outer Dike, viewing east



29 – Emergency Spillway, viewing minor erosion along outer edge



30 – Emergency Spillway, viewing minor deterioration of the concrete

THIRD QUARTER 2016
DREDGE ISLAND INSPECTION PHOTO LOG

ALCOA PCO – Point Comfort, Texas



31 – Southeast Outer Dike, viewing damaged sign



32 – East CPA Inner Dike, viewing erosion and exposure of liner



33 – East CPA Outer Dike, viewing erosion



34 – West CPA Outer Dike, viewing erosion and exposure of liner



35 – View North Decant Structure deterioration



36 – Dredge Island Access Bridge, viewing erosion between the bridge and the island

THIRD QUARTER 2016
DREDGE ISLAND INSPECTION PHOTO LOG

ALCOA PCO – Point Comfort, Texas



37 – Northeast Corner Inner Dike, panoramic view



38 – Southwest Corner Inner Dike, panoramic view

SITE INSPECTION LOG

Inspector's Name: Dan Bullock, P.E. (BBA, LLC)
Weather: Clear
Temperature: Approx. 70-75 F

Daniel B. Bullock
2/8/17

STATE OF TEXAS
DANIEL B. BULLOCK
82596
REGISTERED
PROFESSIONAL ENGINEER

Inspector's Signature: Daniel B. Bullock

Inspection Date: 11-02-16
Time Begin: Approx. 9:45 a.m.
Time End: Approx. 12:45 p.m.

Sheet: 1 of 2

Specific Item to Inspect	Typical Problems Encountered	Conditions Observed		Comments or Corrective Action(s) Implemented and Dates
		Normal	Abnormal	
General Dredge Island	Erosion Deterioration Settling/Ponding Uplift Washouts Rodent Holes	☒ ☒ ☒ ☒ ☒ ☒	☐ ☐ ☐ ☐ ☐ ☐	Shoreline bank cut observed (as was last year) near northeast dike toe of exterior slope. Appears possibly associated with previous dredging. Cut does not extend to dike cross section but future erosion could eventually chase back into toe of dike. Monitor as part of future inspections. Minor erosion observed on north entry ramp, along edges of ramp crest as shown in photos. Vehicle traffic signs and reflectors need replacement/repair if island to be used for vehicular traffic – which is currently not the case.
Access Bridge	Deterioration Damage Navigation Lights	☐ ☐ ☐	☒ ☒ ☒	Conditions similar to those observed and reported in 12/19/06 and subsequent inspection reports (bridge substantially damaged/removed). Detailed inspection of bridge not performed as part of this site visit. Bridge abutments severely eroded.
CDF Dike	Erosion Deterioration Damage Vegetation	☒ ☒ ☒ ☒	☐ ☐ ☐ ☐	The geomembrane component of the water stop on the Port dike, near the Alcoa CDF Station 23+00 (east side) and Station 37+00 (west side), is exposed due to severe erosion of the overlying soil cover material (see attached photos) as noted in previous inspections. Some small (approx. 1 inch dia.) holes observed in exposed geomembrane. Erosion in these areas currently does not appear to impact the CDF dikes but should continue to be monitored during quarterly inspections. CDF dikes appear in generally good condition, with some vegetation intrusion becoming re-established as shown in photos.
Stone Storm Protection	Erosion Settlement Stone Deterioration Stone Movement Fabric Exposure Damage	☒ ☒ ☒ ☒ ☒ ☒	☐ ☐ ☐ ☐ ☐ ☐	No damage observed. Vegetation was removed in 2015 – however is becoming re-established in some areas as shown in photos, should continue to implement vegetation control program and periodic visual monitoring.
Gravel Erosion Protection	Erosion Fabric Exposure Deterioration Damage	☐ ☐ ☐ ☐	☒ ☒ ☒ ☒	The inside slopes of north dike, and north section of west and east dikes, have been repaired a couple of times (due to erosion issues) since CDF construction, but geotextile fabric and overlying gravel erosion protection originally constructed on the interior slopes were not replaced as part of the repair work. Most of the remaining sections (generally along the south) of dike inside slope areas exhibit minor erosion and loss of gravel protection, no immediate action is required at these locations but they should continue to be monitored. Lack of geotextile and overlying gravel erosion protection on slope interiors does not appear to be problematic as long as water levels are kept low to prevent interior erosion.
Emergency Spillway	Obstructions Cracks in Concrete Deterioration Damage	☒ ☒ ☒ ☒	☐ ☐ ☐ ☐	Generally good condition. Some localized, minor, surficial concrete deterioration observed.

Decant Structures	Weir Board Elevation Depth of Water Obstructions Deterioration Rust/Corrosion Damage Overflow Quality (NA) Overflow Quantity Flap Gate	☒ ☒ ☒ ☐ ☐ ☒ ☐ ☒ ☒	☐ ☐ ☐ ☒ ☒ ☐ ☐ ☐ ☐	North Structure: Severe corrosion of structural steel was observed during this limited visual inspection. Access restriction signage is in place. The majority of steel was not visible. Based on limited observation, the upper several feet of structural steel appeared in worse condition than steel at greater depths below the surface grate. Based on site observations of surface and near surface steel (see attached photos) it is recommended that personnel access to this structure beyond the access walkway, and use of the structure for operational purposes, continue to be restricted until repaired or replaced. Handrails and channel iron slots containing the stoplogs on the structure exhibit severe corrosion, per attached photos. CDF surface at decant was dry during inspection, with no on-going discharge. From deck to water surface inside structure measured 20'-0". Plastic wrap around the structure was in place. South Structure: Moderate to severe corrosion was observed in localized areas on south decant structure hand rails and channel iron slots containing the stoplogs. Conditions appear to have worsened since last annual inspection. Use of stoplogs likely difficult in areas due to corrosion of structure and broken welds (see attached photos). Additionally, given observed severe corrosion (although it appears less corroded/deteriorated than the north structure), Owner should evaluate structure for safety prior to use. Based on limited observation, the upper several feet of structural steel appeared in worse condition (exhibiting areas of severe corrosion) than steel at greater depths below the surface grate. Outside of the decant structure was dry (see photos). Inside decant structure contained approximately 2 inches of standing water in the bottom. No discharge. Plastic wrap around the structure was in place. Several stoplogs were not in place at time of inspection. *Note: Terms used for this inspection to describe corrosion observations may include "mild or minor', "moderate" or "severe" – and are not based on steel inspection standards but simply offered to provide reader relative scale of limited visual observations made during this site inspection.*
Gravel Road	Potholes Ponding Deterioration Washouts	☒ ☒ ☒ ☒	☐ ☐ ☐ ☐	Generally good condition, some minor rutting observed at various locations. Vegetation was removed in 2015 but is re-establishing in some areas as shown in photos – should continue to implement vegetation control program and continue to monitor.
Water Stops	Erosion Membrane Exposed Deterioration Damage	☐ ☐ ☒ ☒	☒ ☒ ☐ ☐	Erosion and fines accumulation observed near water stop areas. Observed in previous inspections. Appears to be associated with Port CDF dikes. Geomembrane exposed on Port CDF dike water stop areas as discussed under the CDF dike inspection item above. Continue to monitor.
Reflectors Station Tags	Intact/Reflecting Intact/Legibility	☒ ☒	☐ ☐	Some reflectors and traffic signage observed to be damaged or entirely down on the ground, if island is to be used for vehicular traffic in the future (currently it is not due to no access bridge), a more detailed review of reflectors and traffic signage should be completed.

Note:
Due to identified safety concerns associated with walking on armor stone, this inspection was conducted without traversing the stone on exterior dike slopes. Exterior dike locations were observed via dike crest or by waterside inspection from a boat.

FIGURE 4-3: Typical Inspection Log

DREDGE ISLAND SITE INSPECTION PHOTOGRAPHS
11/02/2016



North Entry Ramp (facing South)



North Exterior Slope (facing West)



North Interior Slope Near Ramp (Facing East)



North and West Dikes (facing Southwest)

DREDGE ISLAND SITE INSPECTION PHOTOGRAPHS
11/02/2016



North Dike Crest and CDF Interior (facing south)



Northwest Corner, Interior Slope (facing west)



North Dike Interior Slope, Near Ramp (facing North, minor erosion)



North Dike Interior (facing East)

DREDGE ISLAND SITE INSPECTION PHOTOGRAPHS
11/02/2016



Northeast Corner (Facing East)



East Dike and North Decant (Facing South)



North Decant



North Decant

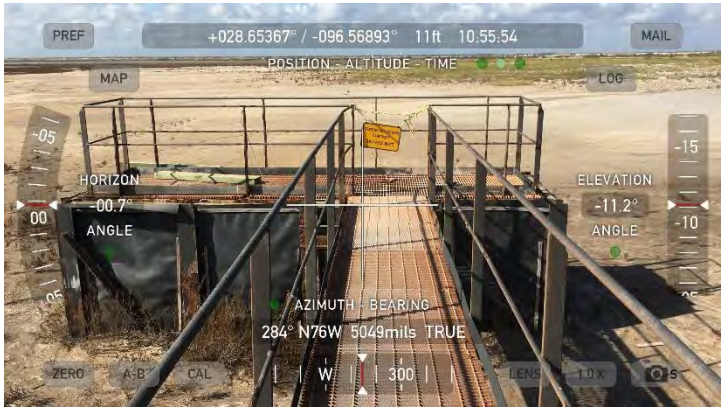
DREDGE ISLAND SITE INSPECTION PHOTOGRAPHS
11/02/2016



North Decant Outfall



North Decant



North Decant



North Decant Corrosion

DREDGE ISLAND SITE INSPECTION PHOTOGRAPHS
11/02/2016



North Decant Corrosion



North Decant Corrosion



North Decant Access Walkway



East Dike Crest (Facing North)

DREDGE ISLAND SITE INSPECTION PHOTOGRAPHS
11/02/2016



East Dike Armor Transition (Facing East)



East Dike (Facing South)



Historic Seep Locations 4 and 5 - Dry (Facing East)



East Dike (Facing South)

DREDGE ISLAND SITE INSPECTION PHOTOGRAPHS
11/02/2016



Port CDF Erosion/Exposed FML at East Water Stop – Interior Slope



South Dike Exterior Slope (Facing West)



South Dike (Facing West)



South Dike Exterior Slope (Facing East)

DREDGE ISLAND SITE INSPECTION PHOTOGRAPHS
11/02/2016



Port CDF Erosion/Exposed FML at West Water Stop – Interior Slope



West Dike, South Decant (Facing North)



West Dike Exterior Near South Decant (Facing North)



South Decant Outfall (Facing West)

DREDGE ISLAND SITE INSPECTION PHOTOGRAPHS
11/02/2016



South Decant



West Interior Dike at South Decant (Facing North)



South Decant Corrosion



South Decant Corrosion

DREDGE ISLAND SITE INSPECTION PHOTOGRAPHS
11/02/2016



South Decant Corrosion



South Decant Corrosion



South Decant Pipe Inlet



South Decant Corrosion

DREDGE ISLAND SITE INSPECTION PHOTOGRAPHS
11/02/2016



South Decant Corrosion



South Decant (Facing East)



West Dike (Facing North)



West Dike (Facing North)

DREDGE ISLAND SITE INSPECTION PHOTOGRAPHS
11/02/2016



Historic Seep 7 Location, Dry (Facing West)



West Dike, Emergency Spillway (Facing North)



West Dike, Emergency Spillway (Facing North)



West Dike Interior (Facing South)

DREDGE ISLAND SITE INSPECTION PHOTOGRAPHS
11/02/2016



Northwest Corner Interior (Facing Northeast)



Northwest Corner Interior (Facing East)



Bank Cut Near Northeast Corner of CDF



North Decant Outfall

DREDGE ISLAND SITE INSPECTION PHOTOGRAPHS
11/02/2016



Port CDF South Dike Erosion



Port CDF South Dike Erosion



Port CDF South Dike Erosion/Unsupported Outfall Pipe



South Decant Outfall

DREDGE ISLAND SITE INSPECTION PHOTOGRAPHS
11/02/2016



Damaged Bridge Section at North CDF



Damaged Bridge Section at Mainland

11-2-2016 DI Inspection

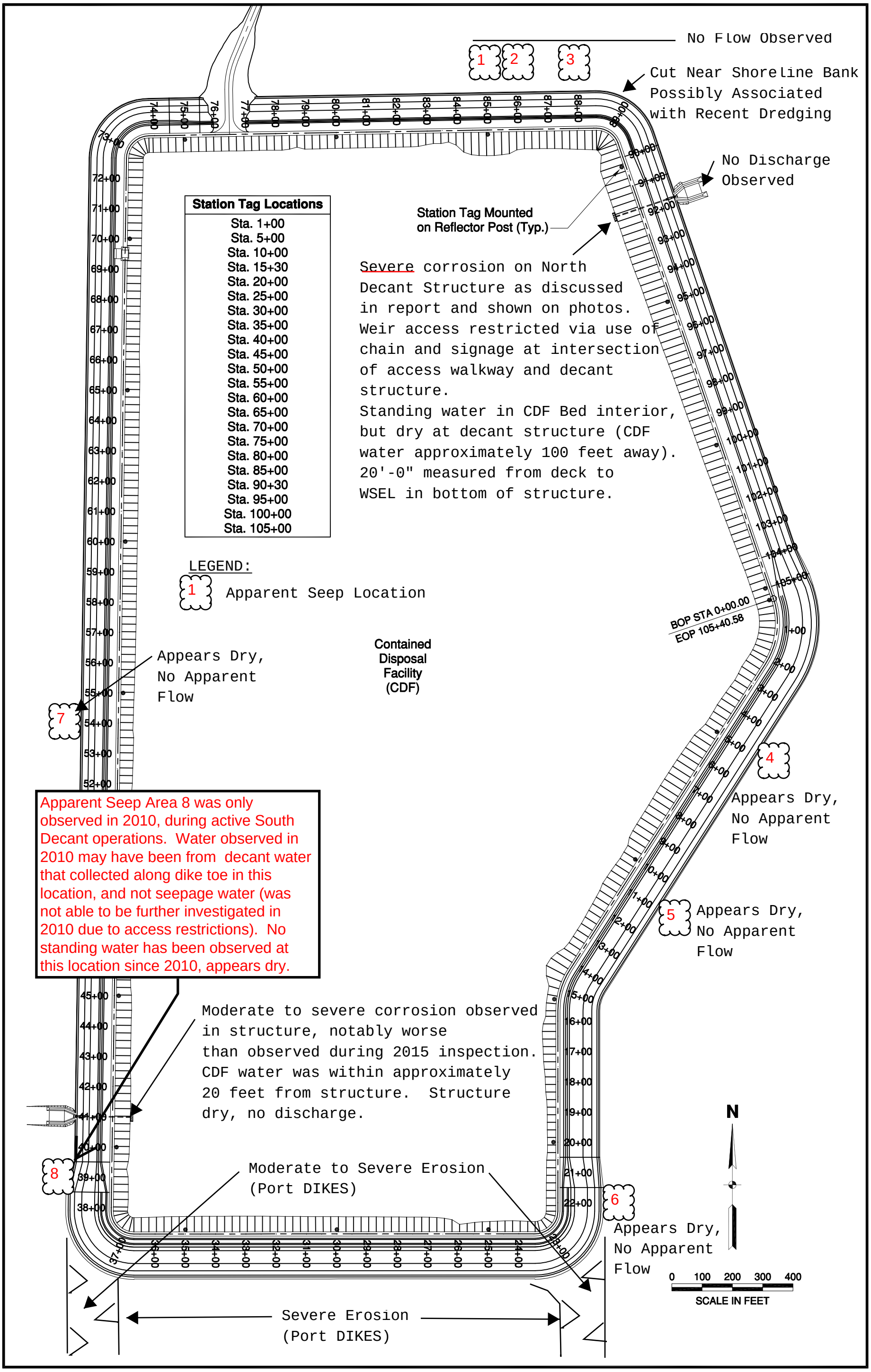


FIGURE 4-2
STATION NUMBER LOCATIONS

APPENDIX B2
CAPA CAP INSPECTION RECORDS

CAPA CAP INSPECTION RECORD

Date: 03/29/16 **Time Started:** 1030 **Time Ended:** 1115

Weather Conditions: 69°F, Overcast, Wind: 8 mph ESE

ITEM TO INSPECT	TYPICAL PROBLEMS ENCOUNTERED	CONDITIONS		COMMENTS, CORRECTIVE ACTIONS NEEDED, COORECTIVE ACTIONS IMPLEMENTED (WITH DATE)
		Normal	Abnormal	
Cap	Erosion	☑	☐	None observed.
	Settling	☑	☐	None observed.
	Ponding	☑	☐	Signs of minor ponding in various locations on the cap. Currently no standing water on the cap.
	Washouts	☑	☐	There is a buildup of soil/alumina/bauxite dust that has accumulated on the cap. Difficult to see the limestone cover in areas. Some soil/alumina/bauxite has migrated off the cap on the NW and SW corners and along the north side.
	Holes	☑	☐	None observed.
	Vehicle Ruts	☑	☐	Northeast corner continues to be driven over. Traces of vehicular activity from herbicide treatment.
	Intrusive Vegetation	☑	☐	Traces of vegetation over the cap. Vegetation on the North and West sides of the cap are beginning to extend back toward the cap.
Signage	In Place	☑	☐	Good condition.
	Legible	☑	☐	Legible.
Storm Drains	Grates	☑	☐	Good condition.
	Debris	☑	☐	Vegetation covering the west drain. Some rock debris covering the south drain by R-301.
Equipment or Wastes	Proper Storage	☑	☐	Waste/chemicals properly stored in system containment or at satellite collection stations. All equipment handling the affected groundwater is within secondary containment. No signs of leaks or potentials for release.
Extraction Wells	Controllers	☑	☐	In good working order.
	Boxes	☑	☐	Good condition.
	Electrical	☑	☐	Good condition.
	Conduit	☑	☐	Good condition.
	Transfer Piping	☑	☐	Good condition.
	Vegetation	☑	☐	Some vegetation around the wells.
Treatment System	Equipment	☑	☐	Good condition.
	Building	☐	☑	Some support members showing signs of rust and pieces of the roof are loose. There are large leaks in the roof that occur during a heavy rain storm. Several of the equipment stands are rusted at the ground. Stairway has been boarded up and access has been limited by barriers, locks, and boarded up entry ways. The satellite collection station is properly kept and inspections are completed routinely.
	Leaks	☑	☐	None observed.
	Odors	☑	☐	None observed.

Additional Comments or Observations: Cap and system is in good condition. Will need to continue to monitor the amount of material that is washing off the cap. Continue to monitor condition of building.

Recommendations: Continue to implement vegetation control. Some areas around the monitoring wells need to be mowed.

Inspector:
Kevin Dworsky

Inspectors Signature:



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FIRST QUARTER 2016
CAPA CAP INSPECTION PHOTO LOG

ALCOA PCO – Point Comfort, Texas



1 - Cap, sediment washing off of cap



2 - Cap, storm sewer drain at R-301



3 – Cap, West storm sewer drain



4 – Cap, Northwest corner storm drain



5 – Cap, North storm drain



6 – Cap, sediment washing off of cap and vegetation growth along cap boundary

FIRST QUARTER 2016
CAPA CAP INSPECTION PHOTO LOG

ALCOA PCO – Point Comfort, Texas



7 – Cap, view Southeast from Northwest corner



8 – Cap, view Southwest from Northeast corner



9 – Cap, view Northwest from Southeast corner



10 – Cap, view Northeast from Southwest corner



11 – Cap, view of damage to Northeast corner



12 – Viewing inside one of the recovery well system boxes

FIRST QUARTER 2016
CAPA CAP INSPECTION PHOTO LOG

ALCOA PCO – Point Comfort, Texas



13 – Viewing northern side of building



14 – Building, showing damaged roof on western side of building



15 – Building, viewing system



16 – Building, viewing corridor



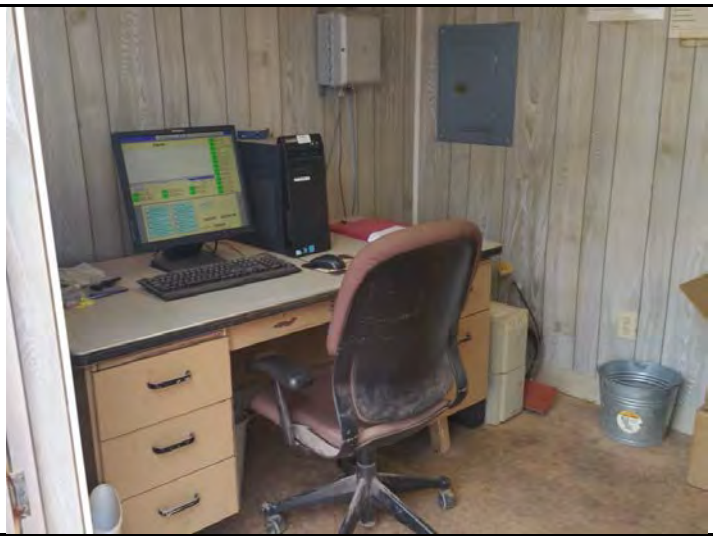
17 – Building, viewing satellite collection station



18 – Building, viewing part storage cabinets

FIRST QUARTER 2016
CAPA CAP INSPECTION PHOTO LOG

ALCOA PCO – Point Comfort, Texas



19 – Office building, viewing control portion



20 – Office building, viewing lab portion



21 – Viewing southern side of building



22 – Viewing monitoring wells between cap and recovery wells



23 – Viewing monitoring wells and recovery wells



24 – Viewing system effluent outfall

CAPA CAP INSPECTION RECORD

Date: 06/10/16 **Time Started:** 1030 **Time Ended:** 1130

Weather Conditions: 84°F, Partly Cloudy Sky

ITEM TO INSPECT	TYPICAL PROBLEMS ENCOUNTERED	CONDITIONS		COMMENTS, CORRECTIVE ACTIONS NEEDED, COORECTIVE ACTIONS IMPLEMENTED (WITH DATE)
		Normal	Abnormal	
Cap	Erosion	√		None observed.
	Settling	√		None observed.
	Ponding	√		Signs of minor ponding in various locations. Currently no standing water on the cap. There is some standing water in the northeast corner.
	Washouts	√		There is a buildup of soil/alumina/bauxite dust that has accumulated on the cap. Difficult to see the limestone cover in areas. Some soil/alumina/bauxite has migrated off the cap on the NW and SW corners and along the north side.
	Holes	√		None observed.
	Vehicle Ruts	√		Northeast corner continues to be driven over. Water ponding in this area.
	Intrusive Vegetation	√		Moderate vegetation over the cap. There is some heavy vegetation along the north and west sides that need to be addressed.
Signage	In Place	√		Good condition.
	Legible	√		Legible.
Storm Drains	Grates	√		Good condition.
	Debris	√		Vegetation covering the west drain.
Equipment or Wastes	Proper Storage	√		Waste/chemicals stored in system containment or at satellite collection stations except for one tote of acid which will be addressed. All equipment handling the affected groundwater is within secondary containment. Satellite collection area is being properly maintained and routinely inspected.
Extraction Wells	Controllers	√		In good working order.
	Boxes	√		Good condition.
	Electrical	√		Good condition.
	Conduit	√		Good condition.
	Transfer Piping	√		Good condition.
	Vegetation		√	Heavy vegetation around wells.
Treatment System	Equipment	√		Bypass hose connection is broken - repair has already been scheduled.
	Building		√	Some support members showing signs of rust and pieces of the roof are loose. There are large leaks that occur during a heavy rain storm. Stairway has been boarded up and access has been limited by barriers, locks, and boarded up entry ways.
	Leaks	√		None observed.
	Odors	√		None observed.

Additional Comments or Observations: Cap and system is in good condition. Will need to continue to monitor the amount of material is washing off the cap.

Recommendations: Vegetation control needs to be implemented immediately on the cap and a consistent vegetation schedule needs to be set to spray the cap on a routine basis. Mowing/shredding needs to be performed around the outer edge of the cap and the monitoring and recovery wells.

Inspector:

Kevin Dworsky

Inspectors Signature:



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SECOND QUARTER 2016
CAPA CAP INSPECTION PHOTO LOG

ALCOA PCO – Point Comfort, Texas



1 - Cap, soil/bauxite/alumina washed off of cap



2 - Cap, storm sewer drain at R-301



3 – Cap, West storm sewer drain



4 – Cap, Northwest corner storm drain



5 – Cap, Northwest storm drain



6 – Cap, Northeast storm drain

SECOND QUARTER 2016
CAPA CAP INSPECTION PHOTO LOG

ALCOA PCO – Point Comfort, Texas



7 – Cap, view Southeast from Northwest corner – showing soil/bauxite/alumina washing off the cap



8 – Cap, view Southwest from Northeast corner



9 – Cap, view Northwest from Southeast corner



10 – Cap, view Northeast from Southwest corner



11 – Cap, view of damage to Northeast corner



12 – Viewing vegetation on cap

SECOND QUARTER 2016
CAPA CAP INSPECTION PHOTO LOG

ALCOA PCO – Point Comfort, Texas



13 – Viewing northern side of building



14 – Building, showing damaged roof on western side of building



15 – Building, viewing system



16 – Building, viewing corridor



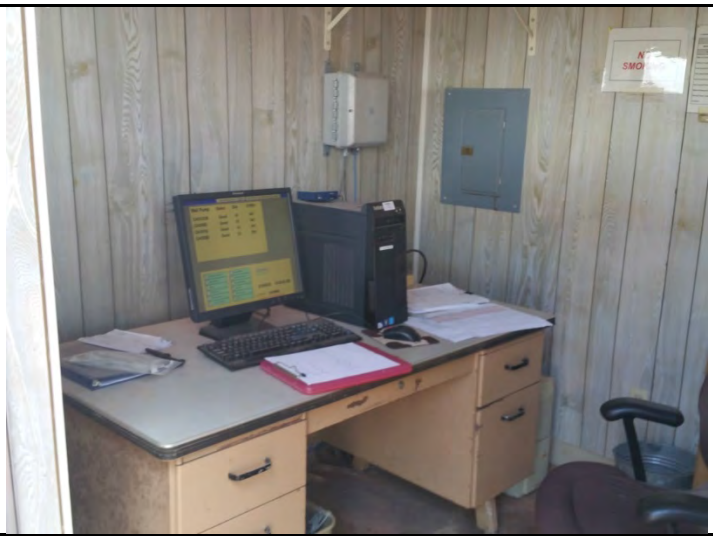
17 – Viewing inside one of the recovery well system boxes



18 – Viewing office building

SECOND QUARTER 2016
CAPA CAP INSPECTION PHOTO LOG

ALCOA PCO – Point Comfort, Texas



19 – Office building, viewing control portion



20 – Office building, viewing lab portion



21 – Viewing southern side of building



22 – Viewing monitoring wells between cap and recovery wells



23 – Viewing monitoring wells and recovery wells



24 – Viewing exhaust – new cleanout

CAPA CAP INSPECTION RECORD

Date: 09/27/16 **Time Started:** 1300 **Time Ended:** 1400

Weather Conditions: 79°F, Cloudy Sky

ITEM TO INSPECT	TYPICAL PROBLEMS ENCOUNTERED	CONDITIONS		COMMENTS, CORRECTIVE ACTIONS NEEDED, COORECTIVE ACTIONS IMPLEMENTED (WITH DATE)
		Normal	Abnormal	
Cap	Erosion	☑	☐	None observed.
	Settling	☑	☐	None observed.
	Ponding	☑	☐	Signs of minor ponding in various locations. Currently no standing water on the cap.
	Washouts	☑	☐	There is a buildup of soil/alumina/bauxite dust that has accumulated on the cap. Difficult to see the limestone cover in areas. Some soil/alumina/bauxite has migrated off the cap on the NW and SW corners and along the north side.
	Holes	☑	☐	None observed.
	Vehicle Ruts	☑	☐	Northeast corner continues to be driven over.
	Intrusive Vegetation	☑	☐	Traces of vegetation over the cap. Vegetation on the North and West sides of the cap are beginning to extend back onto the cap.
Signage	In Place	☑	☐	Good condition.
	Legible	☑	☐	Legible.
Storm Drains	Grates	☑	☐	Good condition.
	Debris	☑	☐	Large amount of vegetation covering the west drain. Some rock debris covering the south drain by R-301.
Equipment or Wastes	Proper Storage	☑	☐	Waste/chemicals properly stored in system containment or at satellite collection stations. All equipment handling the affected groundwater is within secondary containment. No signs of leaks or potentials for release.
Extraction Wells	Controllers	☑	☐	In good working order.
	Boxes	☑	☐	Good condition.
	Electrical	☑	☐	Good condition.
	Conduit	☑	☐	Good condition.
	Transfer Piping	☑	☐	Good condition.
	Vegetation	☑	☐	Some vegetation around the wells.
Treatment System	Equipment	☑	☐	Good condition.
	Building	☐	☑	Some support members showing signs of rust and pieces of the roof are loose. There are large leaks in the roof that occur during a heavy rain storm. Several of the equipment stands are rusted. Stairway has been boarded up and access has been limited by barriers, locks, and boarded up entry ways.
	Leaks	☑	☐	None observed.
	Odors	☑	☐	None observed.

Additional Comments or Observations: Cap and system is in good condition. Will need to continue to monitor the amount of material that is washing off the cap. Continue to monitor condition of building.

Recommendations: Continue to implement vegetation control. Some areas around the monitoring wells need to be mowed.

Inspector:

Kevin Dworsky

Inspectors Signature:



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THIRD QUARTER 2016
CAPA CAP INSPECTION PHOTO LOG

ALCOA PCO – Point Comfort, Texas

	
1 - Cap, view Northeast from Southwest corner	2 - Cap, storm sewer drain at R-301
	
3 – Cap, West storm sewer drain	4 – Cap, Northwest corner storm drain
	
5 – Cap, North storm drain	6 – Cap, North storm drain

THIRD QUARTER 2016
CAPA CAP INSPECTION PHOTO LOG

ALCOA PCO – Point Comfort, Texas



7 – Cap, view Southeast from Northwest corner



8 – Cap, view Southwest from Northeast corner



9 – Cap, view Northwest from Southeast corner



10 – Cap, view of damage to Northeast corner



11 – Cap, current vegetation



12 – Viewing inside one of the recovery well system boxes

THIRD QUARTER 2016
CAPA CAP INSPECTION PHOTO LOG

ALCOA PCO – Point Comfort, Texas



13 – Viewing northern side of building



14 – Building, showing damaged roof



15 – Building, viewing system



16 – Building, viewing corridor



17 – Viewing monitoring wells and recovery wells



18 – Viewing system effluent outfall

THIRD QUARTER 2016
CAPA CAP INSPECTION PHOTO LOG

ALCOA PCO – Point Comfort, Texas



19 – Viewing cable/pipe rack carrying system cables to the R-301 building



20 – Viewing lab portion of the office building



21 – Panoramic view from Southwest corner of cap



22 – Building, viewing system

CAPA CAP INSPECTION RECORD

Date: 12/28/16 **Time Started:** 1605 **Time Ended:** 1650

Weather Conditions: 78°F, Mostly Clear

ITEM TO INSPECT	TYPICAL PROBLEMS ENCOUNTERED	CONDITIONS		COMMENTS, CORRECTIVE ACTIONS NEEDED, COORECTIVE ACTIONS IMPLEMENTED (WITH DATE)
		Normal	Abnormal	
Cap	Erosion	☑	☐	None observed.
	Settling	☑	☐	None observed.
	Ponding	☑	☐	Signs of minor ponding in various locations on the cap. Currently no standing water on the cap.
	Washouts	☑	☐	There is a buildup of soil/alumina/bauxite dust that has accumulated on the cap. Difficult to see the limestone cover in areas. Some soil/alumina/bauxite has migrated off the cap on the NW and SW corners and along the north side.
	Holes	☑	☐	None observed.
	Vehicle Ruts	☑	☐	Northeast corner has been compacted due to year of vehicular activity.
	Intrusive Vegetation	☑	☐	Traces of vegetation over the cap. Vegetation on the North and West sides of the cap are beginning to extend back toward the cap.
Signage	In Place	☑	☐	Good condition.
	Legible	☑	☐	Legible.
Storm Drains	Grates	☑	☐	Good condition.
	Debris	☑	☐	Vegetation covering the west drain. Some rock debris covering the south drain by R-301. Some gravel and vegetation debris on the northwest
Equipment or Wastes	Proper Storage	☑	☐	Waste/chemicals properly stored in system containment or at satellite collection stations. All equipment handling the affected groundwater is within secondary containment. No signs of leaks or potentials for release. Satellite collection station is being properly maintained and routinely
Extraction Wells	Controllers	☑	☐	In good working order.
	Boxes	☑	☐	Good condition.
	Electrical	☑	☐	Good condition.
	Conduit	☑	☐	Good condition.
	Transfer Piping	☑	☐	Good condition.
	Vegetation	☑	☐	Some vegetation around the recovery wells.
Treatment System	Equipment	☑	☐	Good condition.
	Building	☐	☑	Some support members showing signs of rust and pieces of the roof are loose. There are large leaks in the roof that occur during a heavy rain storm. Several of the equipment stands are rusted at the ground. Stairway has been boarded up and access has been limited by barriers, locks, and boarded up entry ways.
	Leaks	☑	☐	None observed.
	Odors	☑	☐	None observed.

Additional Comments or Observations: Cap and system is in good condition. Will need to continue to monitor the amount of material that is washing off the cap. Continue to monitor condition of building.

Recommendations: Vegetation control needs to be implemented immediately on the cap and a consistent vegetation schedule needs to be set to spray the cap on a routine basis. Mowing/shredding needs to be performed around the outer edge of the cap and the monitoring and recovery wells.

Inspector:

Kevin Dworsky

Inspectors Signature:



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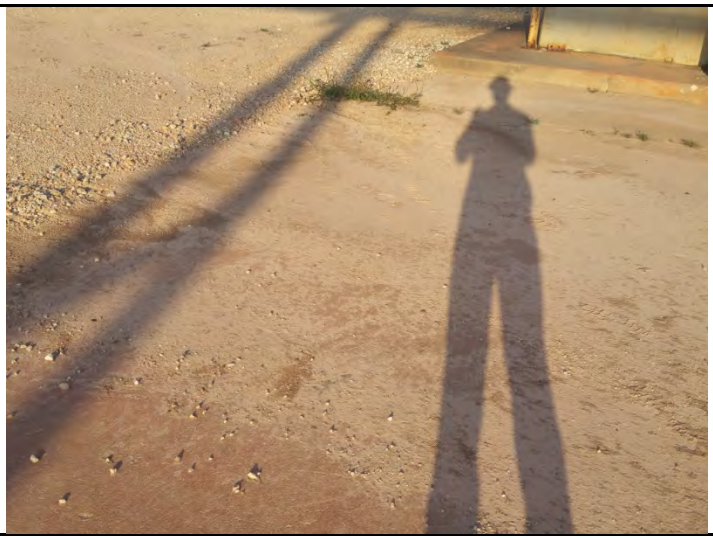
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FOURTH QUARTER 2016
CAPA CAP INSPECTION PHOTO LOG

ALCOA PCO – Point Comfort, Texas



1 - Cap, sediment washing off of cap



2 - Cap, storm sewer drain at R-301



3 – Cap, West storm sewer drain



4 – Cap, Northwest corner storm drain



5 – Cap, Northwest storm drain



6 – Cap, Northeast storm drain

FOURTH QUARTER 2016
CAPA CAP INSPECTION PHOTO LOG

ALCOA PCO – Point Comfort, Texas



7 – Cap, view Southeast from Northwest corner



8 – Cap, view Southwest from Northeast corner



9 – Cap, view Northwest from Southeast corner



10 – Cap, view Northeast from Southwest corner



11 – Cap, view of damage to Northeast corner



12 – Viewing inside one of the recovery well system boxes

FOURTH QUARTER 2016
CAPA CAP INSPECTION PHOTO LOG

ALCOA PCO – Point Comfort, Texas



13 – Viewing northern side of building



14 – Building, showing damaged roof on western side of building



15 – Building, viewing system



16 – Building, viewing corridor



17 – Building, viewing satellite collection station



18 – Viewing southern side of building

FOURTH QUARTER 2016
CAPA CAP INSPECTION PHOTO LOG

ALCOA PCO – Point Comfort, Texas



19 – Office building, viewing control portion



20 – Office building, viewing lab portion



21 – Viewing monitoring wells and recovery wells



22 – Viewing system effluent outfall



23 – Panoramic of site from Northwest corner

APPENDIX B3
WITCO INSPECTION RECORDS

WITCO AREA INSPECTION RECORD

Date: 03/29/16 **Time Started:** 0950 **Time Ended:** 1025

Weather Conditions: 68° F, Overcast, wind: 5 mph ESE

AREA	ITEM	CONDITIONS		COMMENTS, CORRECTIVE ACTIONS NEEDED, COORECTIVE ACTIONS IMPLEMENTED (WITH DATE)
		Normal	Abnormal	
Drainage Channel	Cracks in Concrete	√		Some old cracks in the new concrete channel. Lots of deterioration to the old channel.
	Obstructions	√		None observed.
	Erosion	√		None observed.
	Deterioration		√	Old portion of channel has severe deterioration.
	Washouts	√		None observed.
	Rip Rap	√		Some vegetation in the rip rap at the bay.
Soil Cap (Tank Farm)	Erosion	√		None observed.
	Settlement	√		Some areas of ponding on the cap.
	Vegetation	√		Healthy vegetation; continue with shredding of the cap.
	Intrusive Trees	√		None observed.
	Drainage/Rip Rap	√		Some vegetation within the rip rap.
	Animal Damage	√		None observed.
	Vehicle Ruts	√		Few old ruts that have been repaired.
	Damage	√		None observed.
Soil Cap (O/W Separator)	Erosion	√		None observed.
	Settlement	√		None observed.
	Vegetation	√		Healthy vegetation; continue with shredding of cap. Do not shred if the cap is wet.
	Damage	√		None observed.
Slope from Cap to Channel	Erosion	√		Traces of erosion along the top of slope.
	Slumping	√		None observed.
	Vegetation	√		Heavy vegetation in area. Continue with vegetation control.
Signage	Damage	√		Good condition
	Illegible	√		Good condition
DNAPL Collection Sump	Damage	√		Unable to place cap on sump due to location of lid.
	Product Level	√		WL in sump = 4.05' BMP, no DNAPL, 12.73' TD

Additional Comments or Observations:

Need to institute vegetative control on the rip rap from the soil cap and the rip rap at the bay. Monitor areas of ponding on the cap. Monitor slope to ensure that it does not continue to erode.

Inspector:

Kevin Dworsky

Inspectors Signature:



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FIRST QUARTER 2016
WITCO INSPECTION PHOTO LOG

ALCOA PCO – Point Comfort, Texas



1 – Tank Farm, Northeast corner, viewing Southwest



2 – Tank Farm, Northwest corner, viewing Southeast



3 – Tank Farm, Southwest corner, viewing Northeast



4 – Tank Farm, Southeast corner, viewing Northwest



5 - Slope between tank farm and drainage channel/marsh



6 - Slope between tank farm and drainage channel/marsh

FIRST QUARTER 2016
WITCO INSPECTION PHOTO LOG

ALCOA PCO – Point Comfort, Texas



7 – View of silt fence located at the bottom of the cap slope



8 – O/W Separator, East edge, viewing signage



9 – Drainage channel, view of rip rap at the bay



10 – Drainage channel, East end, viewing West



11 – Drainage channel, West end, viewing East



12 – Tank Farm, view of vegetation in the rip rap

FIRST QUARTER 2016
WITCO INSPECTION PHOTO LOG

ALCOA PCO – Point Comfort, Texas



13 – Drainage channel, view of vegetation in tank farm rip rap



14 – Drainage channel, view of vegetated channel east of the tank farm rip rap discharge



15 – Drainage channel, view of deteriorating side slope in old portion of channel



16 – O/W Separator, East end, viewing west



17 – Drainage channel, View of vegetation in the rip rap at the bay



18 – Drainage channel, view of the DNAPL collection sump

WITCO AREA INSPECTION RECORD

Date: 06/10/16 **Time Started:** 1145 **Time Ended:** 1245

Weather Conditions: 84° F, Partly Cloudy Sky

AREA	ITEM	CONDITIONS		COMMENTS, CORRECTIVE ACTIONS NEEDED, COORECTIVE ACTIONS IMPLEMENTED (WITH DATE)
		Normal	Abnormal	
Drainage Channel	Cracks in Concrete	☑	☐	Few old cracks, no new ones in new (west) portion of the channel.
	Obstructions	☑	☐	Vegetation is hanging into the new portion of the drainage channel on south channel wall.
	Erosion	☑	☐	Slight erosion underneath the inlet pipes, old.
	Deterioration	☐	☑	Old marks on concrete, cause is unknown. Areas of the east (old) drainage channel continue to deteriorate. Signs of deterioration around some of the inlet drains.
	Washouts	☑	☐	None observed.
	Rip Rap	☑	☐	Good condition.
Soil Cap (Tank Farm)	Erosion	☑	☐	None observed.
	Settlement	☑	☐	Few low areas. Cap was difficult to inspect due to healthy vegetation and wet ground conditions.
	Vegetation	☑	☐	Healthy vegetation; continue with shredding of the cap.
	Intrusive Trees	☑	☐	Some trees starting to grow along edge of rip rap.
	Drainage/Rip Rap	☑	☐	Some vegetation starting to come back. Some trees along the bottom edge of rip rap.
	Animal Damage	☑	☐	None observed.
	Vehicle Ruts	☑	☐	None observed.
	Damage	☑	☐	None observed.
Soil Cap (O/W Separator)	Erosion	☑	☐	None observed.
	Settlement	☑	☐	None observed.
	Vegetation	☑	☐	Healthy vegetation; continue with shredding of cap. Do not shred if the cap is wet.
	Damage	☑	☐	None observed.
Slope from Cap to Channel	Erosion	☑	☐	None observed.
	Slumping	☑	☐	None observed.
	Vegetation	☑	☐	Heavy vegetation in area. Continue with vegetation control.
Signage	Damage	☑	☐	Good condition
	Illegible	☑	☐	Good condition
DNAPL Collection Sump	Damage	☑	☐	Unable to place cap on sump due to location of lid.
	Product Level	☑	☐	WL in sump = 3.18' BMP, no DNAPL, 12.72' TD

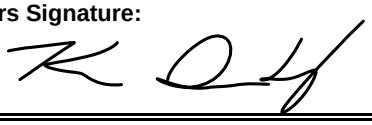
Additional Comments or Observations: The deterioration of the old portion of the drainage channel, although severe, is currently not a concern unless the flow is restricted or there are signs of seepage from the cap. Monitor wells are in good condition. Be mindful that an alligator has been sited in the marsh area of MS3.

Recommendations: Continue shredding the Witco Area and weed eating the slope. Continue to spray the rip rap going into the channel and at the bottom of the channel. Remove vegetation along the top edges of the channel. Remove the trees along the edge of the rip rap.

Inspector:

Kevin Dworsky

Inspectors Signature:



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SECOND QUARTER 2016
WITCO INSPECTION PHOTO LOG

ALCOA PCO – Point Comfort, Texas



1 – Tank Farm, Northeast corner, viewing Southwest



2 – Tank Farm, Northwest corner, viewing Southeast



3 – Tank Farm, Southwest corner, viewing Northeast



4 – Tank Farm, Southeast corner, viewing Northwest



5 – O/W Separator, viewing signage



6 – O/W Separator, East corner, viewing West

SECOND QUARTER 2016
WITCO INSPECTION PHOTO LOG

ALCOA PCO – Point Comfort, Texas



7 – Tank Farm, viewing rip rap



8 – Tank Farm, viewing intrusive trees in rip rap



9 – Drainage channel, West end of old channel, viewing east



10 – Drainage channel, viewing deterioration of old channel



11 – Drainage channel, East end of new channel, viewing west



12 – Drainage channel, west end of new channel, viewing east

SECOND QUARTER 2016
WITCO INSPECTION PHOTO LOG

ALCOA PCO – Point Comfort, Texas



13 – Drainage channel, viewing slight deterioration under inlet pipes



14 – Drainage channel, West end of new channel, view rip rap to bay



15 – Slope from cap to channel, viewing east end of slope



16 – Slope from cap to channel, viewing west end of slope



17 – Slope from cap to channel, viewing deteriorated silt fence



18 – Slope from cap to channel, viewing monitor well

WITCO AREA INSPECTION RECORD

Date: 09/27/16 **Time Started:** 1100 **Time Ended:** 1130

Weather Conditions: 75° F, Cloudy Sky, North Wind

AREA	ITEM	CONDITIONS		COMMENTS, CORRECTIVE ACTIONS NEEDED, COORECTIVE ACTIONS IMPLEMENTED (WITH DATE)
		Normal	Abnormal	
Drainage Channel	Cracks in Concrete	☑	☐	Few old cracks, no new ones in new (west) portion of the channel. Old channel continues to deteriorate.
	Obstructions	☐	☑	Vegetation is starting to hang over the sides of the new channel. No sign of obstructing the flow. The concrete sidewall of the old portion of the channel continue to slough down into the bottom of the channel. Not obstructing flow at this time. Continue to monitor.
	Erosion	☑	☐	Slight erosion underneath the inlet pipes, noted previously in reports. Signs of erosion at the end of the channel in the outfall rip rap.
	Deterioration	☐	☑	Old marks on concrete, cause is unknown. Areas of the east (old) drainage channel continue to deteriorate. Signs of deterioration around some of the inlet drains.
	Washouts	☑	☐	Signs of soil washing out around the rip rap at the end of the channel.
	Rip Rap	☑	☐	Some movement caused by washouts and erosion.
Soil Cap (Tank Farm)	Erosion	☑	☐	None observed.
	Settlement	☑	☐	Few low areas. Cap was difficult to inspect due to healthy and overgrown vegetation.
	Vegetation	☑	☐	Healthy vegetation; continue with shredding of the cap.
	Intrusive Trees	☑	☐	Some trees starting to grow along edge of rip rap and new channel.
	Drainage/Rip Rap	☑	☐	Good condition. Continue to spray and remove unwanted vegetation.
	Animal Damage	☑	☐	None observed.
	Vehicle Ruts	☑	☐	None observed.
	Damage	☑	☐	None observed.
Soil Cap (O/W Separator)	Erosion	☑	☐	Difficult to inspect due to healthy, overgrown vegetation.
	Settlement	☑	☐	None observed.
	Vegetation	☑	☐	Healthy vegetation; continue with shredding of cap. Do not shred if the cap is wet.
	Damage	☑	☐	None observed.
Slope from Cap to Channel	Erosion	☑	☐	Difficult to inspect due to healthy, overgrown vegetation.
	Slumping	☑	☐	None observed.
	Vegetation	☑	☐	Heavy vegetation in area. Continue with vegetation control.
Signage	Damage	☑	☐	Good condition
	Illegible	☑	☐	Good condition

AREA	ITEM	CONDITIONS		COMMENTS, CORRECTIVE ACTIONS NEEDED, COORECTIVE ACTIONS IMPLEMENTED (WITH DATE)
		Normal	Abnormal	
DNAPL Collection Sump	Damage	☑	☐	Unable to place cap on sump due to location of lid.
	Product Level	☑	☐	WL in sump = 3.61' BMP, no DNAPL, 12.72' TD

Additional Comments or Observations: The deterioration of the old portion of the drainage channel, although severe, is currently not a concern unless the flow is restricted or there are signs of seepage from the cap. Monitor wells are in good condition. Be mindful that an alligator has been sited in the marsh area of MS3. Will closely monitor the erosion of the soil around the rip rap at the end of the channel.

Recommendations: Continue shredding the Witco Area and weed eating the slope. Continue to spray the rip rap going into the channel and at the bottom of the channel. Remove vegetation along the top edges of the channel. Remove the trees along the edge of the channel.

Inspector:

Kevin Dworsky

Inspectors Signature:



PBW

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THIRD QUARTER 2016
WITCO INSPECTION PHOTO LOG

ALCOA PCO – Point Comfort, Texas



1 – Tank Farm, Northeast corner, viewing Southwest



2 – Tank Farm, Northwest corner, viewing Southeast



3 – Tank Farm, Southwest corner, viewing Northeast



4 – Tank Farm, Southeast corner, viewing Northwest



5 – O/W Separator, viewing signage



6 – O/W Separator, East corner, viewing West

THIRD QUARTER 2016
WITCO INSPECTION PHOTO LOG

ALCOA PCO – Point Comfort, Texas



7 – Tank Farm, viewing rip rap



8 – Drainage Channel, viewing seem between old and new channel



9 – Drainage channel, West end of old channel, viewing east



10 – Drainage channel, viewing deterioration of old channel



11 – Drainage channel, East end of new channel, viewing west



12 – Drainage channel, west end of new channel, viewing east

THIRD QUARTER 2016
WITCO INSPECTION PHOTO LOG

ALCOA PCO – Point Comfort, Texas



13 – Drainage channel, viewing slight deterioration under inlet pipes



14 – Drainage channel, West end of new channel, view rip rap to bay



15 – Drainage channel, viewing some slight movement and buildup of sediment



16 – Slope from cap to channel, viewing sump well



17 – Slope from cap to channel, viewing deteriorated silt fence



18 – Slope from cap to channel, viewing monitor well

THIRD QUARTER 2016
WITCO INSPECTION PHOTO LOG

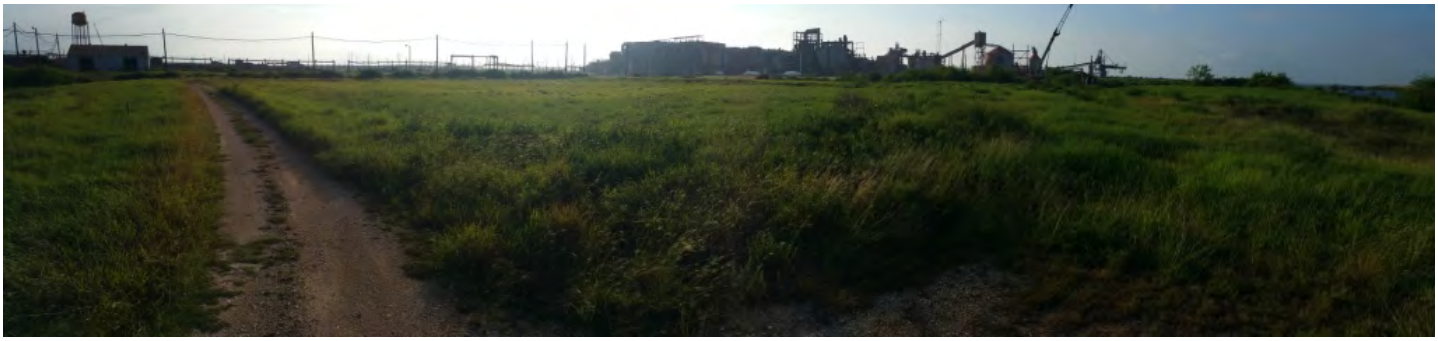
ALCOA PCO – Point Comfort, Texas



19 – Slope from cap to channel, panoramic view of slope



20 – Tank farm, panoramic view from Southeast corner



21 – Tank farm, panoramic view from Northwest corner

WITCO AREA INSPECTION RECORD

Date: 12/28/16 **Time Started:** 1520 **Time Ended:** 1555

Weather Conditions: 78° F, Mostly Clear

AREA	ITEM	CONDITIONS		COMMENTS, CORRECTIVE ACTIONS NEEDED, COORECTIVE ACTIONS IMPLEMENTED (WITH DATE)
		Normal	Abnormal	
Drainage Channel	Cracks in Concrete	☑	☐	Few old cracks, no new ones in new (west) portion of the channel. Old channel continues to deteriorate.
	Obstructions	☐	☑	Vegetation is starting to hang over the sides of the new channel. No sign of obstructing the flow. The concrete sidewall of the old portion of the channel continue to slough down into the bottom of the channel. Not obstructing flow at this time. Continue to monitor.
	Erosion	☑	☐	Slight erosion underneath the inlet pipes, noted previously in reports. Signs of minor erosion at the end of the channel in the outfall rip rap. Will continue to monitor.
	Deterioration	☐	☑	Old marks on concrete, cause is unknown. Areas of the east (old) drainage channel continue to deteriorate. Signs of deterioration around some of the inlet drains.
	Washouts	☑	☐	Signs of soil washing out around the rip rap at the end of the channel.
	Rip Rap	☑	☐	Some movement caused by washouts and erosion. Minor build-up of sediment at the discharge of the channel into the rip-rap.
Soil Cap (Tank Farm)	Erosion	☑	☐	None observed.
	Settlement	☑	☐	Few low areas. Cap was difficult to inspect due to healthy and overgrown vegetation.
	Vegetation	☑	☐	Healthy vegetation; continue with shredding of the cap.
	Intrusive Trees	☑	☐	Some trees starting to grow along edge of rip rap and new channel. Few small intrusive trees on the cap.
	Drainage/Rip Rap	☑	☐	Good condition. Continue to spray and remove unwanted vegetation.
	Animal Damage	☑	☐	None observed.
	Vehicle Ruts	☑	☐	None observed.
	Damage	☑	☐	None observed.
Soil Cap (O/W Separator)	Erosion	☑	☐	Difficult to inspect due to healthy, overgrown vegetation.
	Settlement	☑	☐	None observed.
	Vegetation	☑	☐	Healthy vegetation; continue with shredding of cap.
	Damage	☑	☐	None observed.
Slope from Cap to Channel	Erosion	☑	☐	Difficult to inspect due to healthy, overgrown vegetation.
	Slumping	☑	☐	None observed.
	Vegetation	☑	☐	Heavy vegetation in area. Continue with vegetation control. Area of dead vegetation. Will monitor closely.

AREA	ITEM	CONDITIONS		COMMENTS, CORRECTIVE ACTIONS NEEDED, COORECTIVE ACTIONS IMPLEMENTED (WITH DATE)
		Normal	Abnormal	
Signage	Damage	☑	☐	Good condition
	Illegible	☑	☐	Good condition
DNAPL Collection Sump	Damage	☑	☐	Unable to place cap on sump due to location of lid.
	Product Level	☑	☐	WL in sump = 4.10' BMP, no DNAPL, 12.72' TD

Additional Comments or Observations: The deterioration of the old portion of the drainage channel, although severe, is currently not a concern unless the flow is restricted or there are signs of seepage from the cap. Monitor wells are in good condition. Be mindful that an alligator has been sited in the marsh area of MS3. Will closely monitor the erosion of the soil around the rip rap at the end of the channel. Will monitor the sediment deposits at the end of the channel.

Recommendations: Continue shredding the Witco Area and weed eating the slope. Continue to spray the rip rap going into the channel and at the bottom of the channel. Remove vegetation along the top edges of the channel. Remove the trees along the edge of the channel. Monitor very closely the dead area at the bottom of the slope.

Inspector:

Kevin Dworsky

Inspectors Signature:



PBW

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FOURTH QUARTER 2016
WITCO INSPECTION PHOTO LOG

ALCOA PCO – Point Comfort, Texas



1 – Tank Farm, Northeast corner, viewing Southwest



2 – Tank Farm, Northwest corner, viewing Southeast



3 – Tank Farm, Southwest corner, viewing intrusive vegetation



4 – Tank Farm, Southeast corner, viewing Northwest



5 – O/W Separator, viewing signage



6 – O/W Separator, East corner, viewing West

FOURTH QUARTER 2016
WITCO INSPECTION PHOTO LOG

ALCOA PCO – Point Comfort, Texas



7 – Tank Farm, viewing rip rap



8 – Drainage Channel, viewing seem between old and new channel



9 – Drainage channel, West end of old channel, viewing east



10 – Drainage channel, viewing deterioration of old channel



11 – Drainage channel, East end of new channel, viewing west



12 – Drainage channel, west end of new channel, viewing east

FOURTH QUARTER 2016
WITCO INSPECTION PHOTO LOG

ALCOA PCO – Point Comfort, Texas



13 – Drainage channel, viewing intrusive vegetation alongside of channel



14 – Drainage channel, West end of new channel, view rip rap to bay



15 – Drainage channel, viewing some slight movement and buildup of sediment



16 – Slope from cap to channel, viewing sump well



17 – Slope from cap to channel, viewing deteriorated silt fence



18 – Slope from cap to channel, unusual dead area

FOURTH QUARTER 2016
WITCO INSPECTION PHOTO LOG

ALCOA PCO – Point Comfort, Texas



19 – Slope from cap to channel, panoramic view of slope



20 – Tank farm, panoramic view from Southeast corner



21 – Tank farm, panoramic view from Northwest corner

APPENDIX C1
LAVACA BAY ANNUAL SEDIMENT MONITORING REPORT

LAVACA BAY ANNUAL SEDIMENT MONITORING REPORT 2016

Alcoa Point Comfort Operations
Lavaca Bay Superfund Site

March 2017

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LIST OF ACRONYMS AND ABBREVIATIONS

ALS	ALS Laboratory Group/Laboratory
Battelle	Pacific Northwest National Laboratory Marine Sciences Laboratory
cm	centimeter(s)
GPS	Global Positioning System
Hg	Mercury
ID	Identification
meHg	Methylmercury
OMMP	Operation Maintenance and Monitoring Plan
RAAER	Remedial Action Annual Effectiveness Report
RAO	Remedial Action Objective
SQL	Sample Quantification Limit
TOC	Total Organic Carbon

1.0 INTRODUCTION

A key factor in the Lavaca Bay remedy is the reduction in sediment mercury concentrations through targeted sediment removal efforts, capping, enhanced natural recovery, and/or natural recovery. In accordance with the provisions of the *Lavaca Bay Sediment Remediation and Long-Term Monitoring Plan Operations, Maintenance, and Monitoring Plan (OMMP, Appendix H – to the Consent Decree/Statement of Work*, Alcoa 2005a), surface sediment within open water and marshes of the Closed Area adjacent to the Point Comfort Facility is monitored to document the effectiveness of the remedy.

The Consent Decree requires that the marsh sediment monitoring program be performed until all designated marshes have met the Remedial Action Objective (RAO) for marsh sediment (0.25 mg/kg dry weight) for two consecutive years. Every year an average total mercury concentration is calculated for each marsh and compared to the marsh sediment RAO. Monitoring will occur in each marsh until the mean mercury concentration in each is less than the RAO for two consecutive years.

The RAO for marsh sediments has been met in Marshes 1, 2, 3, 5, 6, 7, 11, 15, and 19 (all marshes). Marsh 14 and a portion of Marsh 15 were removed as part of the remediation dredge event conducted in 2013 (*Response Action Completion Report for the Activities Conducted Under the 2012 Five-Year Review Response Action Plan*, Alcoa, September 25, 2013*)*. In accordance with the Consent Decree, annual monitoring of sediments in Marsh 11 was discontinued in 2007. However, Alcoa has elected to continue annual monitoring of sediment in marshes 1, 2, 3, 5, 6, 7, 15, and 19 on a voluntary basis as part of an ongoing effort to better understand trends in tissue concentrations in the Closed Area of Lavaca Bay.

The Consent Decree requires that open water sediment monitoring be performed until a mean mercury concentration of less than 0.5 mg/kg dry weight is measured in the Closed Area in two consecutive years. As documented in the 2005 RAAER (Alcoa 2006), this occurred in 2004 and 2005 when the average concentrations of 0.293 ppm and 0.276 ppm respectively. Thus, the performance objective of the open water sediment monitoring program established in the

Consent Decree has been met. However, to date Alcoa has elected to continue monitoring Open Water sediment in the northern half of the Closed Area biennially on a voluntary basis as part of an ongoing effort to better understand trends in tissue concentrations in the Closed Area.

As in the fall 2015 sediment monitoring project, methylmercury (meHg) and total organic carbon (TOC) analyses were performed on all marsh sediment samples. In accordance with the Fall 2016 Study Plan, 14 of the 58 open water sediment monitoring locations were eliminated. These sampling locations in the western portion of the Causeway Cove open water sampling grid have exhibited generally decreasing trends, with 2015 surface total Hg concentrations less than 0.2 ppm.

1.1 PURPOSE AND SCOPE

This report documents the sampling and analytical methods and results of the 2016 annual sediment monitoring project. Detailed descriptions of the methods and procedures for this project are presented in the OMMP.

1.2 SITE DESCRIPTION

Alcoa Point Comfort Operations is located in Calhoun County, Texas, adjacent to Lavaca Bay. The portion of Lavaca Bay adjacent to the Alcoa Plant is associated with elevated mercury concentrations in fish tissue and is closed to the taking of finfish and shellfish for consumption by order of the Texas Department of State Health Services. This region is referred to as the Closed Area.

2.0 METHODS

Sediment samples for the 2016 annual sediment monitoring project were collected and processed by Benchmark Ecological Services, Inc. (Benchmark). Samples collected for total Hg and TOC were analyzed by ALS Laboratory Group (ALS) in Houston, Texas and samples collected for meHg were analyzed by Pacific Northwest National Laboratory, Marine Sciences Laboratory, operated by Battelle (Battelle) in Sequim, Washington. Open water samples were collected and processed for total Hg analysis on November 1, 2016 and November 2, 2016. Marsh monitoring

samples were collected on October 17, 18, and 19, 2016 and were analyzed for total Hg, meHg, and TOC. Validation and evaluation of the analytical results was conducted by Environmental Chemistry Services, Inc., in Houston, Texas.

2.1 SAMPLE STATIONS

Sample stations were located using coordinates provided by Alcoa. The coordinates were entered into a sub-meter Global Positioning System (GPS), and the GPS was used to position personnel over each sample station. Actual coordinates for the final locations were recorded using a sub-meter differential GPS. Open water sample locations are shown on Figure 1, and marsh sediment stations are shown on Figures 2a, 2b, 2c, 3a, 3b, 3c, 4a, 4b, and 4c.

2.2 SAMPLE COLLECTION

Open water sediment samples were collected using an Ekman sampling device. Onboard the sampling vessel, the top 2 cm of sediment were removed from the Ekman device using a clean, disposable 60 mL syringe with the lower-end of the barrel removed. The open end of the syringe barrel was placed on the surface of the sediment, and while holding the syringe piston stationary, the barrel was pushed 2 cm into the sediment sample and a 0-2 cm depth sub-sample was collected. The syringe was marked at 2 cm to ensure proper depth was attained and samples were placed in pre-cleaned, labeled, 4-oz sample jars. Three sub-samples were removed with the syringe from each Ekman device to provide the volume of sediment required for analysis. New (clean) syringes were used to collect and process each sample and each sample was thoroughly homogenized by shaking. Open water sediment samples were analyzed for total Hg by ALS.

Marsh sediment samples were collected using pre-cleaned 4-inch long polycarbonate core tubes. Core tubes were inserted into the sediment approximately 5 to 10 cm, the bottom of each core was capped by digging around the outside of the core tube and placing a cap over the bottom, and the core was removed from the sediment. Each core was processed in the field by extruding the top 2 cm of sediment and placing the sediment immediately into sample jars using a new (clean) disposable plastic spoon for each sample. Marsh sediment samples were analyzed for total Hg and TOC by ALS and meHg by Battelle.

Sample containers were labeled with the sample ID, collection date, time, and intended analysis and were placed in re-sealable plastic bags, bubble wrapped, and immediately placed in an insulated chest for storage and transport. Total Hg and TOC samples were stored with ice and meHg samples were placed on dry ice.

Sample station coordinates, sample IDs, and sample collection dates for open water stations are listed in Table 1. Sample station IDs, sample IDs, and sample collection dates for marsh stations are listed in Table 2. Chain of Custody forms were completed for all samples collected and are maintained in the project files.

Table 1 - Open Water Sediment Stations, Sample IDs, Field Data, and Results

Station ID	Easting[1]	Northing[1]	Sample ID	Date	Time	Water Depth[2] (ft)	Total Hg			% M		TOC		
							(mg/kg) dry wt	SQL[3] (mg/kg)	Flag	wt%	SQL[3] (wt%)	wt%-dry	SQL[3] (wt%-dry)	Flag
LVB0904	2748607.84	13432756.43	SMP-SE-17670	11/1/2016	13:05	7.6	0.388	0.00158		67.8	0.0100	1.24	0.0600	
SMP0017	2748602.91	13431868.98	SMP-SE-17671	11/1/2016	13:30	10.0	0.368	0.00174		71.4	0.0100	1.37	0.0600	
SMP0016	2747731.01	13432103.13	SMP-SE-17672	11/1/2016	13:40	6.5	0.450	0.00142		64.5	0.0100	1.08	0.0600	
STO0218	2747783.63	13431346.15	SMP-SE-17673	11/1/2016	14:00	5.0	0.384	0.000917		44.8	0.0100	0.694	0.0600	
SUP0119	2748164.39	13431094.78	SMP-SE-17674	11/1/2016	14:20	8.0	0.263	0.000972		47.9	0.0100	0.633	0.0600	
LVB0907	2747361.87	13430972.27	SMP-SE-17675	11/1/2016	14:30	5.5	0.386	0.00111		55.1	0.0100	0.554	0.0600	
LVB0908	2747545.77	13430781.40	SMP-SE-17676	11/1/2016	14:40	9.5	0.386	0.00148		67.7	0.0100	0.999	0.0600	
SUP0053	2747598.59	13430453.47	SMP-SE-17677	11/1/2016	14:50	9.0	0.398	0.00192		73.5	0.0100	1.10	0.0600	
SUP0122	2748135.89	13430573.43	SMP-SE-17678	11/1/2016	16:25	3.3	0.421	0.000782		35.3	0.0100	0.508	0.0600	
SUP0043	2748397.24	13430138.70	SMP-SE-17679	11/1/2016	16:35	3.0	0.534	0.000649		22.2	0.0100	0.279	0.0600	
SUP0129	2748632.06	13430042.69	SMP-SE-17680	11/1/2016	16:40	5.0	0.434	0.000889	J+	46.0	0.0100	0.653	0.0600	
SMP0040	2748586.42	13429641.29	SMP-SE-17682	11/1/2016	16:50	2.9	0.327	0.000651		25.5	0.0100	0.363	0.0600	
SMP0047	2748794.75	13428999.24	SMP-SE-17683	11/1/2016	16:55	5.5	0.223	0.000949		47.5	0.0100	0.611	0.0600	
SMP0048	2749331.96	13429051.00	SMP-SE-17684	11/1/2016	17:00	7.2	17.3	0.0176		43.9	0.0100	0.891	0.0600	
SUP0132	2748919.44	13429526.14	SMP-SE-17685	11/1/2016	17:15	5.1	0.271	0.00116		56.8	0.0100	1.19	0.0600	
LVB0911	2746232.35	13429025.10	SMP-SE-17686	11/2/2016	9:10	4.0	0.194	0.000807		36.9	0.0100	0.267	0.0600	
SUP0073	2746102.52	13429151.78	SMP-SE-17687	11/2/2016	9:15	5.0	0.373	0.000818		37.9	0.0100	0.268	0.0600	
STO0189	2746100.70	13429690.76	SMP-SE-17688	11/2/2016	9:20	5.0	0.240	0.000627		22.3	0.0100	0.117	0.0600	
SMP0038	2745296.15	13429634.85	SMP-SE-17689	11/2/2016	9:25	7.5	0.202	0.00109		55.1	0.0100	0.730	0.0600	
SMP0028	2744476.44	13430488.40	SMP-SE-17690	11/2/2016	9:30	6.5	0.230	0.00133		61.6	0.0100	0.892	0.0600	
STO0162	2745327.15	13430558.04	SMP-SE-17691	11/2/2016	9:40	6.5	0.407	0.00107		52.3	0.0100	0.647	0.0600	
LVB0909	2746297.74	13430382.74	SMP-SE-17692	11/2/2016	9:45	4.5	0.168	0.000658		26.2	0.0100	0.205	0.0600	
SUP0107	2746530.03	13430934.47	SMP-SE-17693	11/2/2016	9:50	4.0	0.212	0.000641		24.5	0.0100	0.769	0.0600	
SMP0031	2746776.77	13430794.71	SMP-SE-17694	11/2/2016	10:00	4.5	0.356	0.00106		54.2	0.0100	0.625	0.0600	
SUP0106	2746521.88	13431157.50	SMP-SE-17695	11/2/2016	10:05	5.0	0.200	0.000796		32.8	0.0100	0.443	0.0600	
SUP0110	2747165.03	13431365.66	SMP-SE-17696	11/2/2016	10:10	5.5	0.281	0.000856		42.2	0.0100	0.583	0.0600	
STO0191	2746128.48	13431348.78	SMP-SE-17698	11/2/2016	10:20	7.0	0.178	0.000782		36.3	0.0100	0.571	0.0600	
SMP0020	2745306.77	13431286.12	SMP-SE-17699	11/2/2016	10:25	6.5	0.319	0.000842		41.7	0.0100	0.443	0.0600	
STO0153	2744503.89	13431363.14	SMP-SE-17700	11/2/2016	10:30	8.5	0.316	0.000905		45.0	0.0100	0.515	0.0600	
STO0160	2745328.16	13432231.30	SMP-SE-17701	11/2/2016	10:40	7.0	0.351	0.00136		64.2	0.0100	1.06	0.0600	
SMP0014	2746163.08	13432113.75	SMP-SE-17702	11/2/2016	10:45	6.0	0.535	0.00125		59.6	0.0100	0.805	0.0600	
STO0203	2746952.02	13432200.17	SMP-SE-17703	11/2/2016	10:55	5.5	0.432	0.00135		62.3	0.0100	0.812	0.0600	
SUP0016	2747340.57	13432643.47	SMP-SE-17704	11/2/2016	11:00	4.5	0.401	0.000794		38.6	0.0100	0.885	0.0600	
SMP0009	2746973.23	13432894.30	SMP-SE-17705	11/2/2016	11:05	6.0	0.599	0.00105		51.8	0.0100	0.864	0.0600	

Table 1 - Open Water Sediment Stations, Sample IDs, Field Data, and Results

Station ID	Easting[1]	Northing[1]	Sample ID	Date	Time	Water Depth[2] (ft)	Total Hg			% M		TOC		
							(mg/kg) dry wt	SQL[3] (mg/kg)	Flag	wt%	SQL[3] (wt%)	wt%-dry	SQL[3] (wt%-dry)	Flag
STO0193	2746119.11	13433001.40	SMP-SE-17706	11/2/2016	11:15	7.0	0.531	0.000896		44.6	0.0100	0.598	0.0600	
SMP0007	2745296.13	13432885.79	SMP-SE-17707	11/2/2016	11:20	7.5	0.212	0.000646		26.7	0.0100	0.251	0.0600	
SMP0004	2746188.74	13433687.08	SMP-SE-17708	11/2/2016	11:30	6.5	0.215	0.000731		30.9	0.0100	0.284	0.0600	
STO0201	2746953.83	13433773.37	SMP-SE-17710	11/2/2016	11:38	5.5	0.253	0.000730		31.5	0.0100	0.388	0.0600	
SUP0020	2748986.63	13430786.63	SMP-SE-17711	11/2/2016	11:50	5.0	0.421	0.000841		44.0	0.0100	0.641	0.0600	
SUP0021	2749441.13	13430583.99	SMP-SE-17712	11/2/2016	11:55	7.0	0.429	0.000955		48.4	0.0100	0.807	0.0600	
LVB0917	2749204.67	13430034.16	SMP-SE-17713	11/2/2016	12:00	4.5	0.545	0.000639		25.9	0.0100	0.572	0.0600	
SMP0041	2749500.19	13429826.60	SMP-SE-17714	11/2/2016	12:10	3.0	0.176	0.000693		28.3	0.0100	0.393	0.0600	
SMP0049	2750150.62	13428607.17	SMP-SE-17715	11/2/2016	12:20	15.0	0.371	0.00138		63.4	0.0100	1.09	0.0600	
STO0223	2748581.17	13430553.78	SMP-SE-17716	11/2/2016	12:30	10.0	0.288	0.000948		47.7	0.0100	0.570	0.0600	

[1]Coordinates reported in NAD 1983 State Plane Texas South Central, Feet

[2] Water Depths are not calibrated to tidal level

[3]SQL - Sample Quantitation Limit

J+ - Matrix Spike Percent Recovery exceeded criteria of 85-115%

Table 2 - Marsh Sediment Stations, Sample IDs, and Results

Habitat	Station ID	Sample ID	Date	Total Hg				meHg			TOC	
				% M	(mg/kg) dry wt	SQL[1] (mg/kg)	Flag	% M	(ng/g) dry wt	Flag	% M	(wt%) dry wt
Marsh 1	Marsh-1-1R	SMP-SE-17600	10/17/2016	27.8	0.0970	0.000707		25.0	0.154		27.8	0.144
	Marsh-1-2R	SMP-SE-17601	10/17/2016	23.6	0.0964	0.000660		22.7	0.308		23.6	0.182
	Marsh-1-3R	SMP-SE-17602	10/17/2016	23.0	0.105	0.000659		27.0	0.407		23.0	0.202
	Marsh-1-4R	SMP-SE-17603	10/17/2016	23.1	0.0946	0.000654		22.6	0.122		23.1	0.129
	Marsh-1-5R	SMP-SE-17604	10/17/2016	27.3	0.102	0.000677		23.9	0.172		27.3	0.187
	Marsh-1-6R	SMP-SE-17605	10/17/2016	26.5	0.0816	0.000682		24.8	0.188		26.5	0.234
	Marsh-1-7R	SMP-SE-17606	10/18/2016	24.3	0.0803	0.000674		25.8	0.110		24.3	0.181
	Marsh-1-8R	SMP-SE-17607	10/18/2016	27.7	0.0812	0.000674		25.2	0.292		27.7	0.281
	Marsh-1-9R	SMP-SE-17608	10/18/2016	24.2	0.0874	0.000665		27.9	0.301		24.2	0.392
	Marsh-1-10R	SMP-SE-17609	10/18/2016	29.8	0.913	0.000708		31.2	0.820		29.8	0.727
	Marsh-1-11R	SMP-SE-17610	10/18/2016	18.6	0.110	0.000614		24.7	0.190		18.6	0.314
	Marsh-1-12R	SMP-SE-17611	10/18/2016	19.9	0.125	0.000633		22.5	0.500		19.9	0.299
					0.1645							
Marsh 2	Marsh-2-1R	SMP-SE-17612	10/18/2016	20.3	0.0203	0.000591		22.7	0.0317	J,U	20.3	0.370
	Marsh-2-2R	SMP-SE-17613	10/18/2016	23.5	0.0354	0.000642		27.6	0.227		23.5	0.602
	Marsh-2-3R	SMP-SE-17614	10/18/2016	41.2	0.143	0.000814		34.8	0.885		41.2	1.28
	Marsh-2-4R	SMP-SE-17615	10/18/2016	28.7	0.0865	0.000683		27.9	0.437		28.7	0.886
	Marsh-2-5R	SMP-SE-17616	10/18/2016	22.3	0.0545	0.000623		27.0	0.285		22.3	0.529
	Marsh-2-6R	SMP-SE-17617	10/18/2016	23.0	0.0282	0.000661		23.7	0.144		23.0	0.462
					0.0613							
Marsh 3	Marsh-3-1R	SMP-SE-17618	10/18/2016	21.6	0.0489	0.000613		21.3	0.774		21.6	0.720
	Marsh-3-2R	SMP-SE-17619	10/18/2016	34.9	0.0803	0.000734		36.9	0.655		34.9	0.499
	Marsh-3-3R	SMP-SE-17620	10/18/2016	28.8	0.0586	0.000671		30.1	0.238		28.8	0.240
	Marsh-3-4R	SMP-SE-17621	10/18/2016	28.0	0.0571	0.000676	J+	31.2	0.254	J++	28.0	0.256
	Marsh-3-5R	SMP-SE-17623	10/18/2016	33.3	0.0452	0.000730		32.1	0.186		33.3	0.464
	Marsh-3-6R	SMP-SE-17624	10/18/2016	20.0	0.0468	0.000633		18.4	0.268		20.0	1.11
					0.0562							
Marsh 5	Marsh-5-1R	SMP-SE-17625	10/18/2016	27.3	0.294	0.000702		30.8	0.409		27.3	2.46
	Marsh-5-2R	SMP-SE-17626	10/18/2016	30.4	0.347	0.000720		33.1	0.600		30.4	1.71
	Marsh-5-3R	SMP-SE-17627	10/18/2016	36.1	0.407	0.000775		33.1	0.369		36.1	1.13
	Marsh-5-4R	SMP-SE-17628	10/18/2016	35.3	0.272	0.000787		40.8	0.120		35.3	1.40
	Marsh-5-5R	SMP-SE-17661	11/01/2016	39.1	0.202	0.000806		45.7	1.38		39.1	1.26
	Marsh-5-6R	SMP-SE-17629	10/18/2016	26.4	0.0800	0.000646		24.7	0.0124	J	26.4	0.569
					0.2670							
Marsh 6	Marsh-6-1R	SMP-SE-17630	10/18/2016	37.2	0.177	0.000780		38.4	0.0240	J	37.2	1.08
	Marsh-6-2R	SMP-SE-17631	10/18/2016	60.7	0.389	0.00123		58.1	1.46		60.7	2.13
	Marsh-6-3R	SMP-SE-17632	10/18/2016	50.1	0.489	0.00101		49.6	0.0621		50.1	1.57
	Marsh-6-4R	SMP-SE-17633	10/18/2016	48.9	0.285	0.000951		50.4	0.344	J++	48.9	1.40
	Marsh-6-5R	SMP-SE-17635	10/18/2016	42.2	1.05	0.000856		45.1	1.26		42.2	1.64
	Marsh-6-6R	SMP-SE-17636	10/18/2016	30.3	0.131	0.000722		49.4	0.654		30.3	0.770
	Marsh-6-7R	SMP-SE-17637	10/18/2016	29.5	0.233	0.000686		30.4	0.237		29.5	0.593
	Marsh-6-8R	SMP-SE-17638	10/18/2016	25.7	0.210	0.000659		30.9	0.578		25.7	0.584
	Marsh-6-9R	SMP-SE-17639	10/19/2016	27.7	0.576	0.000684		32.0	0.372		27.7	0.327
	Marsh-6-10R	SMP-SE-17640	10/19/2016	31.6	0.0432	0.000741		32.6	0.0133	J	31.6	0.0904
					0.3583							

Table 2 - Marsh Sediment Stations, Sample IDs, and Results

Habitat	Station ID	Sample ID	Date	Total Hg				meHg			TOC	
				% M	(mg/kg) dry wt	SQL[1] (mg/kg)	Flag	% M	(ng/g) dry wt	Flag	% M	(wt%) dry wt
Marsh 7	Marsh-7-1R	SMP-SE-17641	10/19/2016	33.2	0.214	0.000764		33.2	0.312		33.2	0.138
	Marsh-7-2R	SMP-SE-17642	10/19/2016	31.7	1.10	0.00147		38.2	0.732		31.7	0.524
	Marsh-7-3R	SMP-SE-17643	10/19/2016	18.9	0.151	0.000590		20.9	0.308		18.9	0.886
	Marsh-7-4R	SMP-SE-17644	10/19/2016	35.7	0.449	0.000778		36.7	0.682		35.7	1.28
	Marsh-7-5R	SMP-SE-17645	10/19/2016	31.5	0.501	0.000737	J+	31.8	0.542		31.5	1.13
	Marsh-7-6R	SMP-SE-17647	10/19/2016	28.3	0.880	0.000709		27.9	0.478		28.3	0.781
					0.5492							
Marsh 15	Marsh-15-1R	NA	NA	NA	NA	NA		NA	NA		NA	NA
	Marsh-15-2R	NA	NA	NA	NA	NA		NA	NA		NA	NA
	Marsh-15-3R	NA	NA	NA	NA	NA		NA	NA		NA	NA
	Marsh-15-4R	NA	NA	NA	NA	NA		NA	NA		NA	NA
	Marsh-15-5R	SMP-SE-17656	10/19/2016	28.7	0.0362	0.000706		27.0	0.127		28.7	0.0907
	Marsh-15-6R	NA	NA	NA	NA	NA		NA	NA		NA	NA
	Marsh-15-7R	NA	NA	NA	NA	NA		NA	NA		NA	NA
	Marsh-15-8R	NA	NA	NA	NA	NA		NA	NA		NA	NA
	Marsh-15-9R	SMP-SE-17657	10/19/2016	21.6	0.0267	0.000611		23.9	0.187		21.6	0.133
	Marsh-15-10R	SMP-SE-17658	10/19/2016	25.6	0.0747	0.000685		26.6	0.198		25.6	0.677
					0.0459							
Marsh 19	Marsh-19-1R	SMP-SE-17648	10/19/2016	20.7	0.0849	0.000621		21.0	0.118		20.7	0.133
	Marsh-19-2R	SMP-SE-17649	10/19/2016	27.3	0.0327	0.000690		27.1	0.150		27.3	0.0845
	Marsh-19-3R	SMP-SE-17650	10/19/2016	32.5	1.05	0.00148		32.0	0.389		32.5	0.0722
	Marsh-19-4R	SMP-SE-17651	10/19/2016	23.8	0.0779	0.000657		23.4	0.0994		23.8	0.284
	Marsh-19-5R	SMP-SE-17652	10/19/2016	23.3	0.105	0.000664		22.9	0.139		23.3	0.120
	Marsh-19-6R	SMP-SE-17653	10/19/2016	23.9	0.272	0.000648		22.7	0.197		23.9	0.229
	Marsh-19-7R	SMP-SE-17654	10/19/2016	31.3	1.62	0.00146		33.7	1.33		31.3	0.182
	Marsh-19-8R	SMP-SE-17660	11/01/2016	15.6	0.124	0.000602		14.4	0.0928		15.6	0.182
					0.4208							

[1]SQL - Sample Quantitation Limit

J - Analyte detected below quantitation limits.

J+ - Field duplicate pair did not meet criteria of <20% Total Hg relative percent difference.

J++ - Field duplicate pair did not meet criteria of <35% MeHg relative percent difference.

U - Result less than 5 times the method blank average.

3.0 ANALYTICAL RESULTS

Sediment sample total Hg results were reported in mg/kg as dry weight, meHg results were reported as ng/g as dry weight, and TOC results were reported in weight percent as dry weight. Benchmark received all final data packages on December 7, 2016. Data validation and evaluation was completed by Environmental Chemistry Services on December 22, 2016.

Open water sediment analytical results are provided in Table 1. Marsh sediment analytical results are listed in Table 2. Analytical results for individual samples from each marsh were averaged in this report to produce the average mercury concentration for each marsh as required by the OMMP. Open water and marsh sediment analytical results are shown on the figures listed in Table 3.

Analytical results for sediment samples were validated according to the *Standard Operating Procedure Data Validation (Appendix E) in the Quality Assurance Project Plan Alcoa Point Comfort/Lavaca Bay Superfund Site* (Alcoa 2005b). All analytical results were validated and may be included in the data used to evaluate the effectiveness of the approved remedy and to meet monitoring requirements specified in the Consent Decree.

Table 3 – List of Figures Showing Open Water and Marsh Sediment Results

Project Area	Analyte	Figure ID
Open Water Stations	Total Hg	Figure 1
Marshes 1, 2, and 3	Total Hg	Figure 2a
Marshes 1, 2, and 3	meHg	Figure 2b
Marshes 1, 2, and 3	TOC	Figure 2c
Marshes 5, 6, and 7	Total Hg	Figure 3a
Marshes 5, 6, and 7	meHg	Figure 3b
Marshes 5, 6, and 7	TOC	Figure 3c
Marshes 15 and 19	Total Hg	Figure 4a
Marshes 15 and 19	meHg	Figure 4b
Marshes 15 and 19	TOC	Figure 4c

4.0 REFERENCES

Alcoa, 2005a. Appendix B. *Statement of Work for Remedial Action. Alcoa (Point Comfort) / Lavaca Bay Superfund Site. Lavaca Bay Sediment Remediation and Long-Term Monitoring Plan, Operations, Maintenance, and Monitoring Plan*. Alcoa (Point Comfort) / Lavaca Bay Superfund Site. September 2003. Appendix H.

Alcoa, 2005b. Appendix E. *Standard Operating Procedure for Data Validation. Quality Assurance Project Plan*. Alcoa (Point Comfort) / Lavaca Bay Superfund Site. August 22, 2005.

Alcoa, 2006. *2005 Remedial Action Annual Effectiveness Report*. Alcoa (Point Comfort)/Lavaca Bay Superfund Site. March 3 2006.

Alcoa, 2013. *Response Action Completion Report for the Activities Conducted Under the 2012 Five-Year Review Response Action Plan*, Alcoa, September 25, 2013. Submitted to EPA on September 26, 2013.



N

0 500 1,000

Feet

Lavaca Bay Annual Sediment Monitoring Report Fall 2016

Open Water Sample Stations and Total Hg Results

Total Hg (mg/kg - dry wt)

- 0 - 0.199
- 0.200 - 0.299
- 0.300 - 0.399
- 0.400 - 0.499
- 0.500 - 0.599
- 0.600 +

Notes

2015 DOQQ (Point Comfort Quad)

Calhoun County, TX

Prepared for Alcoa Corporation

BESI Benchmark Ecological Services, Inc.

Project: 98003-086-002

Date: 03/06/17

Figure 1

M:\98003\086\002- Sediment\Arc\OpenWater2016.mxd


Marsh 1-1
0.0970
Marsh 1-2
0.0964
Marsh 1-3
0.105
Marsh 1-4
0.0946
Marsh 1-5
0.102
Marsh 1-6
0.0816
Marsh 1-7
0.0803
Marsh 1-8
0.0812
Marsh 1-9
0.0874
Marsh 1-10
0.913
Marsh 1-11
0.110
Marsh 1-12
0.125
Marsh 1
Marsh 2-1
0.0203
Marsh 2-2
0.0354
Marsh 2-3
0.143
Marsh 2-4
0.0865
Marsh 2-5
0.0545
Marsh 2-6
0.0282
Marsh 2
Marsh 3-1
0.0489
Marsh 3-2
0.0803
Marsh 3-3
0.0586
Marsh 3-4
0.0571
Marsh 3-5
0.0452
Marsh 3-6
0.0468
Marsh 3
N
0 100 200 400
Feet
Legend
Marsh Sample Station
Marsh Sample Station ID
Marsh Total Hg Result (mg/kg- dry weight)
(0-2 cm Depth Interval)
Notes
2015 DOQQ (Point Comfort Quad)
Lavaca Bay Annual Sediment Monitoring Report Fall 2016
Marshes 1, 2 and 3 Total Hg Results
Prepared for Alcoa Corporation
BESI Benchmark Ecological Services, Inc.
Project: 98003-086-002
Date: 03/06/2017
Figure 2a
M:\98003\086\002- Sediment\Arc\Marsh_16_stations123_Hg.2.mxd


Marsh 1-1
0.154
Marsh 1-2
0.308
Marsh 1-3
0.407
Marsh 1-4
0.122
Marsh 1-5
0.172
Marsh 1-6
0.188
Marsh 1-7
0.110
Marsh 1-8
0.292
Marsh 1-9
0.301
Marsh 1-10
0.820
Marsh 1-11
0.190
Marsh 1-12
0.500
Marsh 1
Marsh 2-1
0.0317
Marsh 2-2
0.227
Marsh 2-3
0.885
Marsh 2-4
0.437
Marsh 2-5
0.285
Marsh 2-6
0.144
Marsh 2
Marsh 3-1
0.774
Marsh 3-2
0.655
Marsh 3-3
0.238
Marsh 3-4
0.254
Marsh 3-5
0.186
Marsh 3-6
0.268
Marsh 3
N
0 100 200 400
Feet
Legend
Marsh Sample Station
Marsh Sample Station ID
Marsh Methyl Hg Result (ng/g- dry weight)
(0-2 cm Depth Interval)
Notes
2015 DOQQ (Point Comfort Quad)
Lavaca Bay Annual Sediment Monitoring Report Fall 2016
Marshes 1, 2 and 3 meHg Results
Prepared for Alcoa Corporation
BESI Benchmark Ecological Services, Inc.
Project: 98003-086-002
Date: 03/06/2017
Figure 2b
M:\98003\086\002- Sediment\Arc\Marsh_16_stations123_Hg.mxd


Marsh 1-1
Marsh 1-2
Marsh 1-3
Marsh 1-4
Marsh 1-5
Marsh 1-6
Marsh 1-7
Marsh 1-8
Marsh 1-9
Marsh 1-10
Marsh 1-11
Marsh 1-12
0.144
0.182
0.202
0.129
0.187
0.234
0.181
0.281
0.392
0.727
0.314
0.299
Marsh 1
Marsh 2-1
Marsh 2-2
Marsh 2-3
Marsh 2-4
Marsh 2-5
Marsh 2-6
0.370
0.602
1.28
0.886
0.529
0.462
Marsh 2
Marsh 3-1
Marsh 3-2
Marsh 3-3
Marsh 3-4
Marsh 3-5
Marsh 3-6
0.720
0.499
0.240
0.256
0.464
1.11
Marsh 3
N
0 100 200 400
Feet
Legend
Marsh Sample Station
Marsh Sample Station ID
Marsh Sample Total Organic Carbon (wt%-dry)
(0-2 cm Depth Interval)
Notes
2015 DOQQ (Point Comfort Quad)
Lavaca Bay Annual Sediment Monitoring Report Fall 2016
Marshes 1, 2 and 3 TOC Results
Prepared for Alcoa Corporation
BESI Benchmark Ecological Services, Inc.
Project: 98003-086-002
Date: 01/04/2017
Figure 2c
M:\98003\086\002- Sediment\Arc\Marsh_16_stations123_TOC.mxd



N

0 75 150 300 Feet

Legend

- Marsh Sample Station
- ## Marsh Sample Station ID
- ## Marsh Total Hg Result (mg/kg- dry weight)

(0-2 cm Depth Interval)

Notes

2015 DOQQ (Point Comfort Quad)

Lavaca Bay Annual Sediment Monitoring Report Fall 2016

Marshes 5, 6 and 7 Total Hg Results

Prepared for Alcoa Corporation

BESI Benchmark Ecological Services, Inc.

Project: 98003-086-002

Date: 03/06/2017

Figure 3a

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N

0 75 150 300
Feet

Legend

- Marsh Sample Station
- ## Marsh Sample Station ID
- ## Marsh Methyl Hg Result (ng/g- dry weight) (0-2 cm Depth Interval)

Notes

2015 DOQQ (Point Comfort Quad)

Lavaca Bay Annual Sediment Monitoring Report Fall 2016

Marshes 5, 6 and 7 meHg Results

Prepared for Alcoa Corporation

BESI Benchmark Ecological Services, Inc.

Project: 98003-086-002

Date: 03/06/2017

Figure 3b

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N

0 75 150 300 Feet

Legend

- Marsh Sample Station
- ## Marsh Sample Station ID
- ## Marsh Sample Total Organic Carbon (wt%-dry) (0-2 cm Depth Interval)

Notes

2015 DOQQ (Point Comfort Quad)

Lavaca Bay Annual Sediment Monitoring Report Fall 2016

Marshes 5, 6 and 7 TOC Results

Prepared for Alcoa Corporation

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Project: 98003-086-002

Date: 03/06/2017

Figure 3c

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N

0 100 200 400 Feet

Legend

- Marsh Sample Station
- ## Marsh Sample Station ID
- ## Marsh Total Hg Results (mg/kg - dry weight)

Notes

2015 DOQQ (Point Comfort Quad)

Lavaca Bay Annual Sediment Monitoring Report Fall 2016

Marshes 15 and 19
Total Hg Results

Prepared for
Alcoa Corporation

BESI Benchmark Ecological Services, Inc.

Project: 98003-086-002
Date: 01/04/2017

Figure 4a

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N

0 100 200 400 Feet

Legend

- Marsh Sample Station
- ## Marsh Sample Station ID
- ## Marsh Methyl Hg Results (ng/g - dry weight)

Notes

2015 DOQQ (Point Comfort Quad)

Lavaca Bay Annual Sediment Monitoring Report Fall 2016

Marshes 15 and 19 meHg Results

Prepared for Alcoa Corporation

BESI Benchmark Ecological Services, Inc.

Project: 98003-086-002

Date: 03/06/2017

Figure 4b

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N

0 100 200 400 Feet

Legend

- Marsh Sample Station
- ## Marsh Sample Station ID
- ## Marsh Sample Total Organic Carbon (wt%-dry)

Notes

2015 DOQQ (Point Comfort Quad)

Lavaca Bay Annual Sediment Monitoring Report Fall 2016

Marshes 15 and 19 TOC Results

Prepared for Alcoa Corporation

BESI Benchmark Ecological Services, Inc.

Project: 98003-086-002

Date: 01/04/2017

Figure 4c

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APPENDIX C2
LAVACA BAY SUPPLEMENTAL SEDIMENT MONITORING REPORT; MERCURY AND METHYLMERCURY ANALYSIS OF SEDIMENTS AT CLOSED AREA ANNUAL SHELLFISH SAMPLING LOCATIONS

LAVACA BAY SUPPLEMENTAL SEDIMENT MONITORING REPORT MERCURY AND METHYLMERCURY ANALYSIS OF SEDIMENTS AT CLOSED AREA ANNUAL SHELLFISH SAMPLING LOCATIONS 2016

Alcoa Point Comfort Operations
Lavaca Bay Superfund Site

March 2017

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1.2 Site Description 3
2.0 Methods 3
2.1 Sample Stations 3
2.2 Sample Collection 3
3.0 Analytical Results 6
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LIST OF ACRONYMS AND ABBREVIATIONS

ALS	ALS Laboratory Group/Laboratory
Battelle	Pacific Northwest National Laboratory Marine Sciences Laboratory
cm	centimeter(s)
GPS	Global Positioning System
Hg	Mercury
ID	Identification
in	inch
kg	kilogram
meHg	Methylmercury
mg	milligram
OMMP	Operation Maintenance and Monitoring Plan
Oz	ounces
RAO	Remedial Action Objective
RAAER	Remedial Action Annual Effectiveness Report
SQL	Sample Quantification Limit
TOC	Total Organic Carbon
USEPA	United States Environmental Protection Agency

1.0 INTRODUCTION

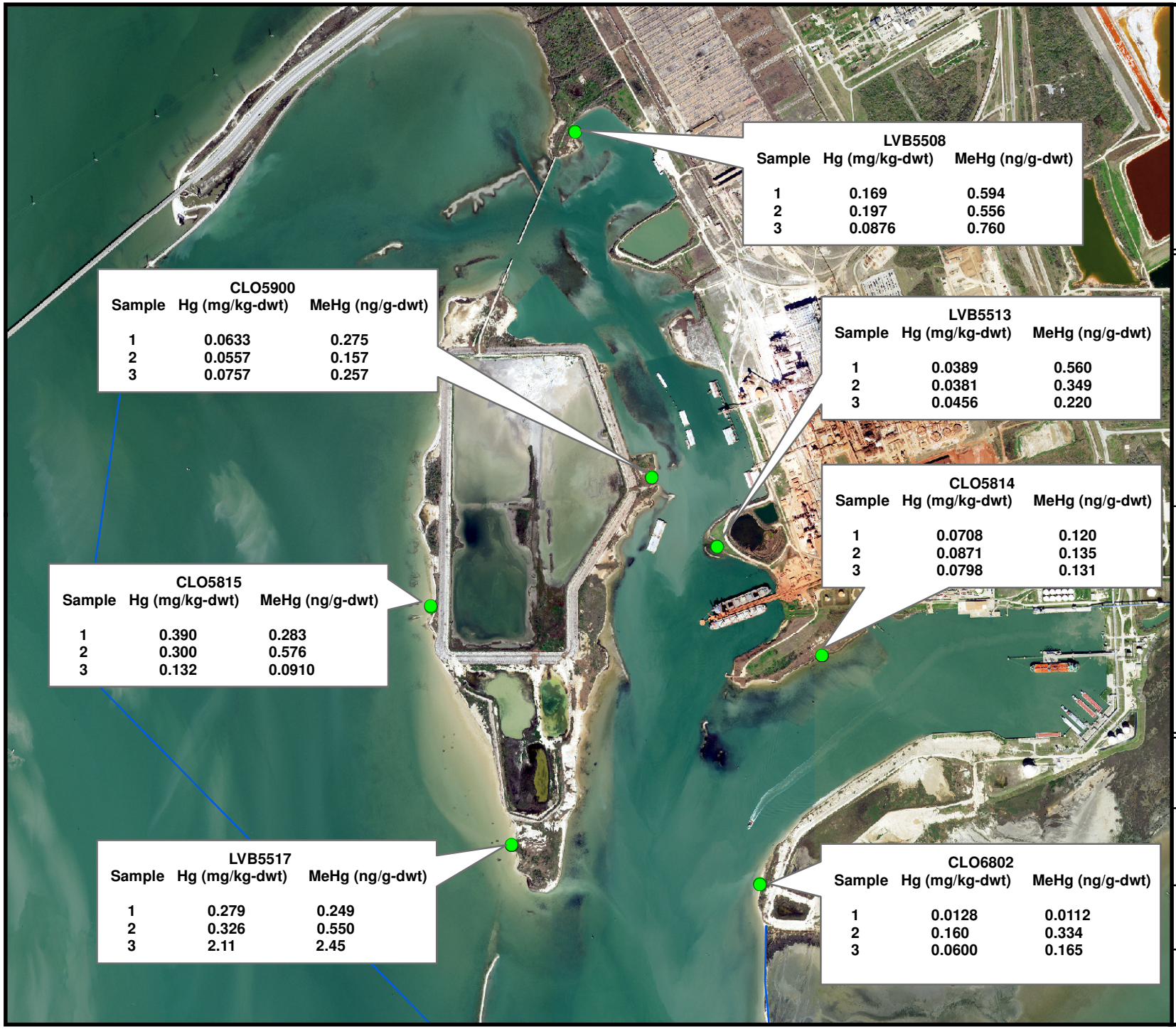
The USEPA-selected remedy for the Alcoa/Lavaca Bay Superfund Site focuses on eliminating ongoing sources of mercury to the bay, reducing surface sediment concentrations of mercury and polyaromatic hydrocarbons, and ultimately reducing mercury concentrations in fish tissue. A key factor in the Lavaca Bay remedy is the reduction in sediment mercury concentrations through targeted sediment removal efforts, capping, enhanced natural recovery, and/or natural recovery. In accordance with the provisions of the *Lavaca Bay Sediment Remediation and Long-Term Monitoring Plan Operations, Maintenance, and Monitoring Plan (OMMP, Appendix H – to the Consent Decree/Statement of Work*, March 2005), surface sediment within open water and marshes of the Closed Area adjacent to the Point Comfort Facility is monitored to document the effectiveness of the remedy.

Conclusions from the 2016 methylmercury and 1996 Mercury Reconnaissance projects (Alcoa, September 2016; Alcoa, November 1996) suggest that a relationship exists between methylmercury (meHg) in surface sediments and the mercury concentrations of prey items which live in and near those sediments. Analyzing surficial sediments from annual juvenile blue crab sampling locations was proposed to help quantify the relationship between sediment meHg and prey item total Hg concentrations, and ultimately assist in identifying locations within the Closed Area which are likely contributors of mercury into the food chain.

1.1 PURPOSE AND SCOPE

The Mercury and Methylmercury Analysis of Sediments at Closed Area Shellfish sampling locations in 2016 consisted of three surface sediment samples collected from each of the Closed Area annual shellfish monitoring locations that are not already sampled as part of the routine monitoring program for marshes (Figure 1).

This document presents a summary of sampling and laboratory procedures and analytical results for the sediment sampled from these locations. Methods and procedures for this project are the same as those used for the 2016 annual sediment monitoring project. A detailed description of the methods and procedures are presented in the OMMP.



LVB5508

Sample	Hg (mg/kg-dwt)	MeHg (ng/g-dwt)
1	0.169	0.594
2	0.197	0.556
3	0.0876	0.760

CLO5900

Sample	Hg (mg/kg-dwt)	MeHg (ng/g-dwt)
1	0.0633	0.275
2	0.0557	0.157
3	0.0757	0.257

LVB5513

Sample	Hg (mg/kg-dwt)	MeHg (ng/g-dwt)
1	0.0389	0.560
2	0.0381	0.349
3	0.0456	0.220

CLO5814

Sample	Hg (mg/kg-dwt)	MeHg (ng/g-dwt)
1	0.0708	0.120
2	0.0871	0.135
3	0.0798	0.131

CLO5815

Sample	Hg (mg/kg-dwt)	MeHg (ng/g-dwt)
1	0.390	0.283
2	0.300	0.576
3	0.132	0.0910

LVB5517

Sample	Hg (mg/kg-dwt)	MeHg (ng/g-dwt)
1	0.279	0.249
2	0.326	0.550
3	2.11	2.45

CLO6802

Sample	Hg (mg/kg-dwt)	MeHg (ng/g-dwt)
1	0.0128	0.0112
2	0.160	0.334
3	0.0600	0.165

N

0 0.25 0.5

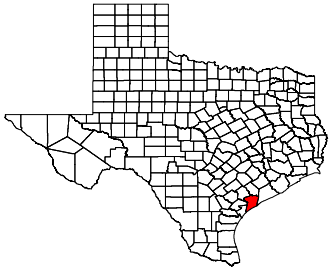
Miles

Legend

2016
Total Hg Results (mg/kg-dwt)
Methyl Hg Results (ng/g-dwt)

● Juvenile Blue Crab Sample Stations

2009 DOQQ
Calhoun County, Texas



Sediment Sample Stations, Total Hg and MeHgResults

Lavaca Bay Supplemental Studies Fall 2016

Prepared for Alcoa Corporation

BESI Benchmark Ecological Services, Inc.

Project: 98003-086-003

Date: 2/10/2017

Figure 1

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1.2 SITE DESCRIPTION

Alcoa Point Comfort Operations is located in Calhoun County, Texas, adjacent to Lavaca Bay. The area in the bay adjacent to the Alcoa Plant is associated with elevated mercury concentrations in fish tissue and is closed to the taking of finfish and shellfish for consumption by order of the Texas Department of State Health Services. This region is referred to as the Closed Area. The project area and sampling strategy for open water and marsh sediment samples within the Closed Area are documented in the OMMP.

2.0 METHODS

Sediment samples from the Closed Area shellfish monitoring stations were collected and processed by Benchmark Ecological Services, Inc. (Benchmark) on October 4, 2016 and November 1, 2016. The top 2 cm of sediment collected to determine total Hg and TOC concentrations were analyzed by ALS Laboratory Group (ALS) in Houston, Texas, and samples collected to determine meHg concentrations were analyzed by Pacific Northwest National Laboratory, Marine Sciences Laboratory, operated by Battelle (Battelle) in Sequim, Washington. Validation and evaluation of the analytical results was conducted by Environmental Chemistry Services, Inc., in Houston, Texas.

2.1 SAMPLE STATIONS

Sample stations were located using coordinates provided by Alcoa and are shown on Figure 1. The coordinates were entered into a sub-meter Global Positioning System (GPS), and the GPS was used to position personnel over each station. Final coordinates for each location were recorded using the sub-meter differential GPS.

2.2 SAMPLE COLLECTION

Sediment samples were collected from Closed Area shellfish monitoring stations using pre-cleaned 4-in long polycarbonate core tubes. Core tubes were inserted into the sediment approximately 5 to 10 cm, the bottom of each core was capped by digging around the outside of the core tube and placing the cap over the bottom, and the core was removed from the sediment. Each core was processed in the field by extruding the top 2 cm of sediment and placing the

sediment immediately into pre-cleaned, labeled 4-oz sample jars using a new (clean) disposable plastic spoon for each sample. All samples were analyzed for total Hg and TOC by ALS in and meHg by Battelle.

Sample containers were labeled with the sample ID, collection date, time, and intended analysis and were placed in re-sealable plastic bags, bubble wrapped, and immediately placed in an insulated chest for storage and transport. Total Hg and TOC samples were stored with ice and meHg samples were placed on dry ice.

Sediment station coordinates, sample IDs, field data, and results are listed in Table 1. Sampling locations and results are shown on Figure 1. Chain of Custody forms were completed for all samples collected and are maintained in the project files.

Table 1 - Sediment Stations, Sample IDs, Field Data, and Results

Station ID	Easting[1]	Northing[1]	Sample ID	Date	Time	Water Depth[2] (ft)	Total Hg			MeHg			% M		TOC		
							(mg/kg) dry wt	SQL[3] (mg/kg)	Flag	% M	(ng/g) dry wt	Flag	wt%	SQL[3] (wt%)	wt%-dry	SQL[3] (wt%-dry)	Flag
LVB5508	2748018.045	13432707.21	SMP-SE-17560	10/4/2016	10:05	1.3	0.169	0.000772		29.4	0.594		35.4	0.0100	0.886	0.0600	J+
LVB5508	2748021.905	13432701.88	SMP-SE-17561	10/4/2016	10:10	1.3	0.197	0.000713		31.1	0.556		28.8	0.0100	1.14	0.0600	
LVB5508	2748016.265	13432713.51	SMP-SE-17562	10/4/2016	10:20	1.3	0.0876	0.000702		33	0.760		30.6	0.0100	0.699	0.0600	
LVB5513	2749752.433	13427640.66	SMP-SE-17567	10/4/2016	11:10	1.5	0.0389	0.000697		33.7	0.560		26.8	0.0100	0.581	0.0600	
LVB5513	2749747.232	13427646.1	SMP-SE-17568	10/4/2016	11:15	1.5	0.0381	0.000669		29.7	0.349		24.3	0.0100	0.362	0.0600	
LVB5513	2749754.841	13427638.31	SMP-SE-17569	10/4/2016	11:20	1.5	0.0456	0.000669		28.3	0.220		25.7	0.0100	0.570	0.0600	
CLO5814	2751035.236	13426317.35	SMP-SE-17571	10/4/2016	11:35	1.5	0.0708	0.000661		22.5	0.120		23.2	0.0100	0.245	0.0600	
CLO5814	2751028.437	13426316.24	SMP-SE-17572	10/4/2016	11:40	1.5	0.0871	0.000648		26.7	0.135		22.5	0.0100	0.293	0.0600	
CLO5814	2751041.526	13426318.43	SMP-SE-17573	10/4/2016	11:45	1.5	0.0798	0.000637		24.1	0.131		23.0	0.0100	0.381	0.0600	
CLO6802	2750278.44	13423522.55	SMP-SE-17574	10/4/2016	11:55	1.0	0.0128	0.000537		14.1	0.0112	J	9.99	0.0100	0.289	0.0600	
CLO6802	2750276.148	13423529.2	SMP-SE-17575	10/4/2016	12:00	1.0	0.160	0.000751		38.6	0.334		36.6	0.0100	0.437	0.0600	
CLO6802	2750276.181	13423516.28	SMP-SE-17576	10/4/2016	12:05	1.0	0.0600	0.000658		21.6	0.165		25.4	0.0100	0.406	0.0600	
LVB5517	2747252.583	13423998.54	SMP-SE-17577	10/4/2016	12:20	1.0	0.279	0.000607		22.9	0.249		20.5	0.0100	0.388	0.0600	
LVB5517	2747252.664	13424006.65	SMP-SE-17578	10/4/2016	12:25	1.0	0.326	0.000611		25.6	0.550		21.7	0.0100	0.115	0.0600	
LVB5517	2747255.107	13423990.99	SMP-SE-17579	10/4/2016	12:30	1.0	2.11	0.00377		39.7	2.45		36.6	0.0100	0.447	0.0600	
CLO5815	2746266.991	13426910.77	SMP-SE-17580	10/4/2016	12:40	1.5	0.390	0.000731		32.8	0.283		35.7	0.0100	0.730	0.0600	
CLO5815	2746264.946	13426917.22	SMP-SE-17581	10/4/2016	12:45	1.5	0.300	0.000706		35.8	0.576		31.6	0.0100	0.150	0.0600	
CLO5815	2746269.977	13426904.85	SMP-SE-17582	10/4/2016	12:50	1.5	0.132	0.000771		40	0.0910	U	37.2	0.0100	0.468	0.0600	U
CLO5900	2748958.531	13428491.16	SMP-SE-17662	11/1/2016	12:25	1.0	0.0633	0.000648		22.6	0.275		23.3	0.0100	0.649	0.0600	
CLO5900	2748959.268	13428484.92	SMP-SE-17663	11/1/2016	12:30	1.0	0.0557	0.000631		23.1	0.157		21.5	0.0100	0.466	0.0600	
CLO5900	2748961.008	13428497.09	SMP-SE-17664	11/1/2016	12:35	1.0	0.0757	0.000650		21.5	0.257		23.4	0.0100	0.553	0.0600	

[1]Coordinates reported in NAD 1983 State Plane Texas South Central, Feet

[2] Water Depths are not calibrated to tidal level

[3]SQL - Sample Quantitation Limit

J - Analyte detected below quantitation limits.

J+ - Matrix Spike percent recovery did not meet 80-120% criteria.

U - Sample concentration was less than 5 times the mean blank concentration.

3.0 ANALYTICAL RESULTS

Sediment sample total Hg (Method 7471A) results were reported in mg/kg as dry weight, meHg results were reported as ng/g as dry weight, and TOC results were reported in percent dry weight. Benchmark received all final data packages on December 7, 2016 and data validation and evaluation was completed by Environmental Chemistry Services on December 22, 2016.

Station IDs, sample IDs, analytical results, and percent moisture are listed for each sample in Table 1. Sampling stations and analytical results are shown on Figure 1.

Analytical results for sediment samples were validated according to the Standard Operating Procedure Data Validation (Appendix E) in the *Quality Assurance Project Plan Alcoa (Point Comfort)/Lavaca Bay Superfund Site* (August 22, 2005). All analytical results were validated and may be included in the data used to evaluate the effectiveness of the approved remedy and to meet monitoring requirements specified in the Consent Decree.

4.0 REFERENCES

Alcoa, 1996. *Remedial Investigation Work Plan Volume B2C: Data Report, Mercury Reconnaissance Study*. November 1996.

Alcoa, 2005. Appendix B. *Statement of Work for Remedial Action. Alcoa (Point Comfort) / Lavaca Bay Superfund Site. Lavaca Bay Sediment Remediation and Long-Term Monitoring Plan, Operations, Maintenance, and Monitoring Plan. Alcoa (Point Comfort) / Lavaca Bay Superfund Site*. September 2003. Appendix H.

Alcoa, 2016. *Draft Lavaca Bay Methylation Special Study – Phase 2. Study 4 – Update the Understanding of Methylation Processes and Uptake in the Closed Area – Spring 2016*. Alcoa (Point Comfort)/Lavaca Bay Superfund Site. September 2016.

APPENDIX C3
LAVACA BAY SUPPLEMENTAL SEDIMENT MONITORING REPORT; INCREASED SEDIMENT SAMPLING DENSITY FOR EASTERN CAUSEWAY COVE SEDIMENTS AND GEOTECHNICAL PROPERTIES

LAVACA BAY SUPPLEMENTAL SEDIMENT MONITORING REPORT INCREASED SEDIMENT SAMPLING DENSITY FOR EASTERN CAUSEWAY COVE SEDIMENTS AND GEOTECHNICAL PROPERTIES

2016

Alcoa Point Comfort Operations
Lavaca Bay Superfund Site

March 2017

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LIST OF ACRONYMS AND ABBREVIATIONS

ALS	ALS Laboratory Group/Laboratory
cm	centimeter(s)
ECC	Eastern Causeway Cove
ft	foot / feet
GPS	Global Positioning System
Hg	Mercury
ID	Identification
Kg	kilograms
MS3	Mainland Shoreline #3
mm	millimeter
mg	milligrams
OMMP	Operation Maintenance and Monitoring Plan
oz	ounce
TOC	Total Organic Carbon
TWE	Tolunay-Wong Engineers, Inc.
USEPA	United States Environmental Protection Agency

1.0 INTRODUCTION

The USEPA-selected remedy for the Alcoa/Lavaca Bay Superfund Site focuses on eliminating ongoing sources of mercury to the bay, reducing surface sediment concentrations of mercury and polyaromatic hydrocarbons, and ultimately reducing mercury concentrations in fish tissue. A key factor in the Lavaca Bay remedy is the reduction in sediment mercury concentrations through targeted sediment removal efforts, capping, enhanced natural recovery, and/or natural recovery. In accordance with the provisions of the *Lavaca Bay Sediment Remediation and Long-Term Monitoring Plan Operations, Maintenance, and Monitoring Plan (OMMP, Appendix H – to the Consent Decree/Statement of Work*, Alcoa 2005), surface sediment within open water and marshes of the Closed Area adjacent to the Point Comfort Facility are monitored to document the effectiveness of USEPA's selected remedy.

Fall 2015 and Spring 2016 studies indicated that erosion at Mainland Shoreline #3 (MS3) and re-suspension of sediments in the Witco Channel and Causeway Cove are sources of mercury that could be transported into the Causeway Cove marshes (Alcoa, 2016a; Alcoa, 2016b). Dredging and soil removal that is scheduled for 2017 at MS3 and in the Witco Channel and Harbor is consistent with response actions historically conducted in the Closed Area.

Fall 2016 supplemental studies were designed to examine the natural processes that may be responsible for transporting mercury into Causeway Cove and the Causeway Cove marshes. Biennial open water sediment results for the region indicate that mercury concentrations in surface sediments in a portion of the eastern half of the cove are higher than the overall surface sediment average. However, the area only includes five sediment sampling stations and data derived from these stations is not sufficient to clearly define the mercury profile in the eastern part of the Causeway Cove. This supplemental project was designed to delineate the region where elevated mercury concentrations have been found in the past.

In addition to chemical analysis, the fall 2016 project plan included grain size, Atterberg Limits analysis, and Vane Shear testing at select eastern causeway cove (ECC) sediment sampling

stations. These data will be helpful in the evaluation of possible capping options for the Causeway Cove area.

1.1 PURPOSE AND SCOPE

Increased sampling density for ECC sediments in 2016 consisted of one surface sediment sample collected from each of the 59 stations shown on Figure 1. Samples were collected using an Ekman sampling device and analyzed for total Hg and total organic carbon (TOC). Sample locations and results for total Hg are shown on Figure 1.

Sampling for grain size and Atterberg Limits analysis consisted of one surface sediment sample collected from each of a subset of 30 ECC locations. The top 10 cm of sediment were subsampled from an Ekman sampling device and analyzed for grain size and Atterberg Limits. Sample locations are shown on Figure 2.

Vane shear testing was conducted at the 30 ECC locations where grain size was determined. Tests were performed at the mudline, 1 ft below the mudline, and 2 ft below the mudline at each location. Sample results are shown on Figures 3a to 3c.



Sediment Sample Stations and Total Hg Results

Lavaca Bay Supplemental Sediment Report Fall 2016

Prepared for Alcoa Corporation

BESI Benchmark Ecological Services, Inc.

Project: 98003-086-003

Date: 2/7/2017

Figure 1

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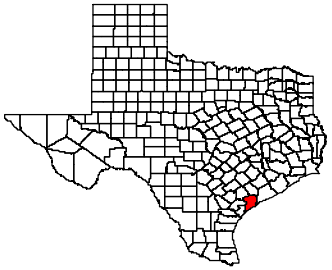
Feet

Legend

Surface Sediment Classification (USCS)

- Fat Clay
- Lean Clay
- Clayey Sand
- Clayey and Silty Sand
- Silty Sand
- Silty Gravel

2015 DOQQ
Calhoun County, Texas



Geotechnical Sample Stations and Surface Sediment Classifications

Lavaca Bay Supplemental Sediment Studies Fall 2016

Prepared for Alcoa Corporation

BESI Benchmark Ecological Services, Inc.

Project: 98003-086-003

Date: 2/21/2017

Figure 2

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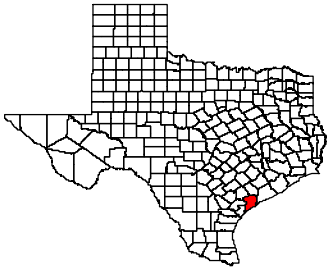
Feet

Legend

Peak Shear Strength

- < 5 pounds per square foot
- 5 - 10 pounds per square foot
- 10 - 20 pounds per square foot
- 20 - 50 pounds per square foot
- > 50 pounds per square foot

2015 DOQQ
Calhoun County, Texas



Geotechnical Sample Station Peak Shear Stresses - Mudline

Lavaca Bay Supplemental Sediment Studies Fall 2016

Prepared for Alcoa Corporation

BESI Benchmark Ecological Services, Inc.

Project: 98003-086-003

Date: 2/21/2017

Figure 3a

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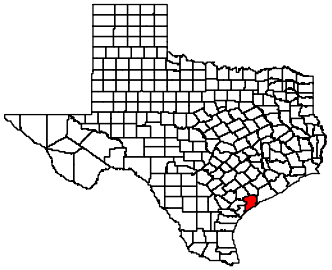
Feet

Legend

Peak Shear Strength

- < 5 pounds per square foot
- 5 - 10 pounds per square foot
- 10 - 20 pounds per square foot
- 20 - 50 pounds per square foot
- > 50 pounds per square foot
- No data collected

2015 DOQQ
Calhoun County, Texas



Geotechnical Sample Station Peak Shear Stresses - 1Ft Below Mudline

Lavaca Bay Supplemental Sediment Studies Fall 2016

Prepared for Alcoa Corporation

BESI Benchmark Ecological Services, Inc.

Project: 98003-086-003

Date: 2/21/2017

Figure 3b

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N

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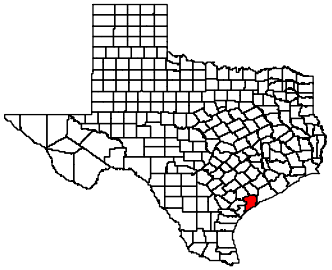
Feet

Legend

Peak Shear Strength

- < 5 pounds per square foot
- 5 - 10 pounds per square foot
- 10 - 20 pounds per square foot
- 20 - 50 pounds per square foot
- > 50 pounds per square foot
- No data collected

2015 DOQQ
Calhoun County, Texas



Geotechnical Sample Station Peak Shear Stresses - 2Ft Below Mudline

Lavaca Bay Supplemental Sediment Studies Fall 2016

Prepared for Alcoa Corporation

BESI Benchmark Ecological Services, Inc.

Project: 98003-086-003

Date: 2/21/2017

Figure 3c

M:\98003\086\003 - Supplemental\3.1 ECC Sediment\Arc\Figure3c.mxd

1.2 SITE DESCRIPTION

Alcoa Point Comfort Operations is located in Calhoun County, Texas, adjacent to Lavaca Bay. The portion of Lavaca Bay adjacent to the Alcoa Plant is associated with elevated mercury concentrations in fish tissue and is closed to the taking of finfish and shellfish for consumption by order of the Texas Department of State Health Services. This region is referred to as the Closed Area. The area and sampling strategy for routine monitoring of open water and marsh sediment within the Closed Area are documented in the OMMP.

2.0 METHODS

ECC sediment samples for total Hg and TOC analyses were collected and processed by Benchmark Ecological Services, Inc. (Benchmark) on November 2, 2016 and November 3, 2016 and analyzed by ALS Laboratory Group (ALS) in Houston, Texas. Validation and evaluation of the analytical results was conducted by Environmental Chemistry Services, Inc., in Houston, Texas.

ECC sediment samples for grain size and Atterberg limits analysis were collected and processed by Benchmark on November 29, 2016 and November 30, 2016. Grain size and Atterberg limits analyses were performed by Tolunay-Wong Engineers, Inc. (TWE) in Houston, Texas.

Vane shear testing was performed by Benchmark and Anchor QEA at locations sampled for grain size analysis. Benchmark's vessel was spudded at each test location to prevent lateral drift from wave action. The vane shear rod was inserted into the sediment at the mudline. The scale-ring on the rod was set to zero and the vane handle was turned slowly in a clockwise direction until sediment failure occurred and the maximum shear strength was measured. The test was repeated at 1 and 2 ft below the mudline to collect 3 shear strength measurements at each sampling location.

2.1 SAMPLE STATIONS

Sample stations were located using coordinates provided by Alcoa. The coordinates were entered into a sub-meter Global Positioning System (GPS), and the GPS was used to position personnel over each sample station. Final coordinates for each location were recorded using the sub-meter differential GPS. Sediment sample locations for total Hg and TOC analysis are shown on Figure 1 and locations for grain size and Atterberg limits are shown on Figure 2.

2.2 SAMPLE COLLECTION

2.2.1 TOTAL Hg AND TOC SAMPLES

ECC sediment samples for total Hg and TOC analysis were collected using an Ekman sampling device. Onboard Benchmark's vessel, the top 2 cm of sediment were removed from the Ekman device using a clean, disposable 60 mL syringe. The lower end of the syringe barrel (needle lock) was cut off to transform the syringe barrel into an open cylinder. The open end of the syringe barrel was placed on the surface of the sediment, and while holding the syringe piston stationary, the barrel was pushed 2 cm into the sample and a 0-2 cm depth sub-sample was collected. The syringe was marked at 2 cm to ensure proper depth was sampled. Samples were placed in a pre-cleaned, labeled, 4-oz sample jar. Three sub-samples were removed from each Ekman sample to provide the volume of sediment required for analysis. New (clean) syringes were used to collect and process each sample and the sub-samples were thoroughly homogenized by shaking.

Sample containers were labeled with the sample ID, collection date, time, and intended analysis and were placed in re-sealable plastic bags, bubble wrapped, and immediately placed in an insulated chest with ice for storage and transport.

Sample station coordinates, sample IDs, and sample collection dates are listed in Table 1. Chain of Custody forms were completed for all samples collected and are maintained in project files.

2.2.2 GEOTECHNICAL SAMPLES

ECC samples for grain size and Atterberg limits analysis were collected using an Ekman sampling device. Onboard the sample vessel, the top 10 cm of sediment were removed from the Ekman device using a clean, disposable spoon and placed in a pre-cleaned, labeled, 16-oz sample jar. New (clean) spoons were used to collect and process each sample and the sub-samples were thoroughly homogenized by shaking. Sample station coordinates, sample IDs, and sample collection dates are listed in Table 2.

Table 1 - Sediment Stations, Sample IDs, Field Data, and Total Hg Results

Station ID	Easting[1]	Northing[1]	Sample ID	Date	Time	Water Depth[2] (ft)	Total Hg			% M		TOC		
							(mg/kg) dry wt	SQL[3] (mg/kg)	Flag	wt%	SQL[3] (wt%)	wt%-dry	SQL[3] (wt%-dry)	Flag
ECC-001	2745765.17	13433955.14	SMP-SE-17720	11/2/2016	15:00	5.5	0.174	0.000614		21.4	0.0100	0.144	0.0600	
ECC-002	2746559.74	13434137.51	SMP-SE-17721	11/2/2016	15:15	5.0	0.147	0.000659		25.8	0.0100	0.171	0.0600	
ECC-003	2745708.86	13433303.54	SMP-SE-17741	11/3/2016	8:40	6.0	0.266	0.000667		26.1	0.0100	0.215	0.0600	
ECC-004	2746869.54	13433549.22	SMP-SE-17722	11/2/2016	15:20	5.0	0.472	0.000878		44.4	0.0100	0.480	0.0600	
ECC-005	2747067.92	13433658.51	SMP-SE-17723	11/2/2016	15:25	6.0	0.377	0.000745		31.9	0.0100	0.469	0.0600	
ECC-006	2747238.17	13433766.66	SMP-SE-17724	11/2/2016	15:30	5.5	0.200	0.000624		24.0	0.0100	0.194	0.0600	
ECC-007	2747356.44	13433734.15	SMP-SE-17725	11/2/2016	15:35	4.0	0.251	0.000740		34.6	0.0100	0.365	0.0600	
ECC-008	2745512.72	13432760.18	SMP-SE-17743	11/3/2016	8:55	6.5	0.295	0.000886		42.9	0.0100	0.621	0.0600	J+
ECC-009	2745872.34	13432953.64	SMP-SE-17742	11/3/2016	8:50	6.0	0.295	0.000708		30.6	0.0100	0.320	0.0600	
ECC-010	2746382.77	13433159.59	SMP-SE-17740	11/2/2016	16:50	5.0	0.749	0.000854		44.1	0.0100	0.602	0.0600	
ECC-011	2746624.73	13433290.01	SMP-SE-17730	11/2/2016	16:00	5.0	0.440	0.000792		40.5	0.0100	0.617	0.0600	
ECC-012	2746816.44	13433332.95	SMP-SE-17731	11/2/2016	16:05	5.0	0.701	0.000929		48.8	0.0100	0.700	0.0600	
ECC-013	2747015.55	13433511.81	SMP-SE-17728	11/2/2016	15:50	6.0	0.465	0.000882		45.7	0.0100	0.692	0.0600	
ECC-014	2747222.29	13433535.67	SMP-SE-17727	11/2/2016	15:45	5.0	0.351	0.000675		26.0	0.0100	0.343	0.0600	
ECC-015	2747434.53	13433470.64	SMP-SE-17726	11/2/2016	15:40	5.0	0.252	0.000691		28.1	0.0100	0.298	0.0600	
ECC-016	2745701.89	13432723.93	SMP-SE-17744	11/3/2016	9:00	7.0	0.376	0.000855		40.6	0.0100	0.446	0.0600	
ECC-017	2745954.24	13432761.44	SMP-SE-17745	11/3/2016	9:10	7.0	0.756	0.00107		52.9	0.0100	0.720	0.0600	
ECC-018	2746155.56	13432804.33	SMP-SE-17751	11/3/2016	9:40	6.5	0.612	0.00100		51.6	0.0100	0.665	0.0600	
ECC-019	2746405.97	13433001.80	SMP-SE-17752	11/3/2016	9:45	6.0	0.784	0.00102		52.2	0.0100	0.751	0.0600	
ECC-020	2746583.44	13433102.88	SMP-SE-17739	11/2/2016	16:45	5.5	0.888	0.000979		50.1	0.0100	0.691	0.0600	
ECC-021	2746785.72	13433126.77	SMP-SE-17738	11/2/2016	16:40	6.0	0.633	0.000964		49.6	0.0100	0.818	0.0600	
ECC-022	2747003.55	13433350.55	SMP-SE-17732	11/2/2016	16:07	6.0	0.683	0.000935		48.2	0.0100	0.833	0.0600	
ECC-023	2747154.05	13433327.58	SMP-SE-17733	11/2/2016	16:10	5.5	0.637	0.00105		52.3	0.0100	0.827	0.0600	
ECC-024	2747307.50	13433313.85	SMP-SE-17734	11/2/2016	16:15	5.0	0.289	0.000689		31.8	0.0100	0.403	0.0600	
ECC-025	2746969.64	13433134.43	SMP-SE-17737	11/2/2016	16:35	5.0	0.773	0.00117		57.1	0.0100	0.960	0.0600	
ECC-026	2747146.55	13433088.14	SMP-SE-17736	11/2/2016	16:30	5.0	0.663	0.00102		52.9	0.0100	0.851	0.0600	
ECC-027	2747354.66	13433080.60	SMP-SE-17735	11/2/2016	16:20	5.0	0.571	0.000921		47.3	0.0100	0.712	0.0600	
ECC-028	2745936.03	13432563.75	SMP-SE-17746	11/3/2016	9:12	6.5	0.522	0.000997		51.4	0.0100	0.870	0.0600	
ECC-029	2746159.25	13432591.76	SMP-SE-17749	11/3/2016	9:30	6.0	0.792	0.00118	J	58.5	0.0100	0.877	0.0600	
ECC-030	2746319.52	13432811.57	SMP-SE-17757	11/3/2016	10:10	6.0	0.645	0.00103		51.2	0.0100	0.714	0.0600	
ECC-031	2746565.90	13432926.14	SMP-SE-17753	11/3/2016	9:50	6.5	0.837	0.00115		56.9	0.0100	0.947	0.0600	
ECC-032	2746772.34	13432916.59	SMP-SE-17754	11/3/2016	9:55	6.0	0.735	0.00119		58.2	0.0100	1.01	0.0600	
ECC-033	2745838.19	13432379.59	SMP-SE-17747	11/3/2016	9:20	6.0	0.539	0.00108		55.4	0.0100	0.893	0.0600	
ECC-034	2746085.27	13432357.68	SMP-SE-17748	11/3/2016	9:25	6.0	0.757	0.00128		62.2	0.0100	0.871	0.0600	

Table 1 - Sediment Stations, Sample IDs, Field Data, and Total Hg Results

Station ID	Easting[1]	Northing[1]	Sample ID	Date	Time	Water Depth[2] (ft)	Total Hg			% M		TOC		
							(mg/kg) dry wt	SQL[3] (mg/kg)	Flag	wt%	SQL[3] (wt%)	wt%-dry	SQL[3] (wt%-dry)	Flag
ECC-035	2746292.22	13432474.08	SMP-SE-17759	11/3/2016	10:20	5.5	0.557	0.00116		58.9	0.0100	0.890	0.0600	
ECC-036	2746429.89	13432638.19	SMP-SE-17758	11/3/2016	10:15	6.0	0.660	0.00129		61.4	0.0100	0.931	0.0600	
ECC-037	2746576.00	13432738.37	SMP-SE-17756	11/3/2016	10:05	6.5	0.757	0.00113		57.7	0.0100	0.891	0.0600	
ECC-038	2746781.20	13432704.55	SMP-SE-17755	11/3/2016	10:00	5.5	0.713	0.00123		60.3	0.0100	1.20	0.0600	
ECC-039	2746974.09	13432702.92	SMP-SE-17774	11/3/2016	11:35	6.5	0.519	0.00132		62.2	0.0100	1.20	0.0600	
ECC-040	2747146.52	13432774.66	SMP-SE-17775	11/3/2016	11:40	5.5	0.446	0.00108		56.1	0.0100	0.930	0.0600	
ECC-041	2747282.22	13432852.07	SMP-SE-17777	11/3/2016	11:50	6.0	0.379	0.00106		53.6	0.0100	0.933	0.0600	
ECC-042	2747500.12	13432962.55	SMP-SE-17778	11/3/2016	11:55	4.5	0.257	0.000903		43.8	0.0100	0.970	0.0600	
ECC-043	2746331.67	13432355.44	SMP-SE-17760	11/3/2016	10:25	6.5	0.402	0.00107		52.5	0.0100	0.900	0.0600	
ECC-044	2746561.80	13432528.63	SMP-SE-17768	11/3/2016	11:05	6.0	0.559	0.00129		62.4	0.0100	0.922	0.0600	
ECC-045	2746764.97	13432530.38	SMP-SE-17769	11/3/2016	11:10	6.0	0.500	0.00137		64.2	0.0100	0.947	0.0600	
ECC-046	2746985.37	13432554.43	SMP-SE-17773	11/3/2016	11:30	6.0	0.496	0.00136		62.8	0.0100	1.07	0.0600	
ECC-047	2747207.82	13432592.27	SMP-SE-17776	11/3/2016	11:45	6.0	0.192	0.000768		35.9	0.0100	2.96	0.0600	
ECC-048	2747455.22	13432786.65	SMP-SE-17779	11/3/2016	12:00	4.5	0.230	0.000833		39.0	0.0100	0.851	0.0600	
ECC-049	2746366.14	13432146.74	SMP-SE-17762	11/3/2016	10:35	7.0	0.455	0.00123		59.8	0.0100	0.909	0.0600	
ECC-050	2746522.87	13432163.16	SMP-SE-17766	11/3/2016	10:55	6.0	0.420	0.00126		60.3	0.0100	0.901	0.0600	
ECC-051	2746555.41	13432339.38	SMP-SE-17767	11/3/2016	11:00	6.0	0.446	0.00135		64.3	0.0100	0.949	0.0600	
ECC-052	2746772.60	13432340.26	SMP-SE-17770	11/3/2016	11:15	5.5	0.427	0.00129		60.5	0.0100	0.844	0.0600	
ECC-053	2746992.91	13432375.2	SMP-SE-17771	11/3/2016	11:20	5.5	0.493	0.00142		64.6	0.0100	1.08	0.0600	
ECC-054	2747143.77	13432395.77	SMP-SE-17772	11/3/2016	11:25	5.5	0.409	0.00134		62.3	0.0100	1.13	0.0600	
ECC-055	2747374.59	13432389.16	SMP-SE-17781	11/3/2016	12:10	9.5	0.475	0.00172		72.2	0.0100	1.13	0.0600	
ECC-056	2747498.95	13432504.01	SMP-SE-17780	11/3/2016	12:05	4.5	0.239	0.000724		33.4	0.0100	0.623	0.0600	
ECC-057	2746382.39	13431979.12	SMP-SE-17763	11/3/2016	10:40	6.5	0.415	0.00116		56.8	0.0100	0.895	0.0600	
ECC-058	2746541.22	13431992.93	SMP-SE-17764	11/3/2016	10:45	6.5	0.384	0.00112		57.0	0.0100	0.839	0.0600	
ECC-059	2746714.68	13432111.48	SMP-SE-17765	11/3/2016	10:50	6.0	0.387	0.00127		60.3	0.0100	0.938	0.0600	

[1]Coordinates reported in NAD 1983 State Plane Texas South Central, Feet

[2] Water Depths are not calibrated to tidal level

[3]SQL - Sample Quantitation Limit

J - Field duplicate relative percent difference exceeded criteria of 20%

J+ - Matrix Spike percent recovery greater than criteria of 80-120%.

Table 2 - Geotechnical Sample Stations, Sample IDs, and Field Data

Station ID	Easting[1]	Northing[1]	Sample ID	Date	Time
ECC-008	2745516.88	13432753.811	SMP-SE-17900	11/29/2016	8:40
ECC-033	2745838.40	13432380.234	SMP-SE-17901	11/29/2016	9:20
SMP0014	2746170.58	13432095.100	SMP-SE-17902	11/29/2016	9:50
ECC-057	2746378.50	13431983.766	SMP-SE-17903	11/29/2016	10:15
ECC-009	2745877.93	13432949.274	SMP-SE-17094	11/29/2016	10:40
ECC-017	2745957.55	13432755.132	SMP-SE-17095	11/29/2016	11:05
ECC-029	2746157.93	13432592.997	SMP-SE-17096	11/29/2016	11:25
ECC-043	2746333.60	13432354.763	SMP-SE-17097	11/29/2016	11:50
ECC-050	2746523.79	13432166.590	SMP-SE-17098	11/29/2016	12:20
ST00203	2746946.43	13432177.139	SMP-SE-17099	11/29/2016	12:40
ECC-052	2746771.37	13432340.626	SMP-SE-17100	11/29/2016	13:40
ECC-044	2746560.90	13432526.966	SMP-SE-17101	11/29/2016	14:05
ECC-037	2746571.43	13432743.148	SMP-SE-17102	11/29/2016	14:25
ECC-030	2746316.23	13432810.512	SMP-SE-17103	11/29/2016	14:45
ST00193	2746129.00	13433004.174	SMP-SE-17104	11/29/2016	15:00
ECC-044[a]	2746560.90	13432526.966	SMP-SE-17105[a]	11/29/2016	14:15
ECC-007	2747351.73	13433735.814	SMP-SE-17106	11/29/2016	15:25
ECC-056	2747502.16	13432502.905	SMP-SE-17107	11/29/2016	15:50
ECC-047	2747209.95	13432590.733	SMP-SE-17108	11/29/2016	16:10
ECC-054	2747146.28	13432393.388	SMP-SE-17109	11/29/2016	16:30
ECC-005	2747062.87	13433661.026	SMP-SE-17110	11/30/2016	8:20
ECC-014	2747215.70	13433536.484	SMP-SE-17111	11/30/2016	8:40
ECC-024	2747303.53	13433310.644	SMP-SE-17112	11/30/2016	9:00
ECC-027	2747348.81	13433078.963	SMP-SE-17113	11/30/2016	9:25
ECC-027[b]	2747348.81	13433078.963	SMP-SE-17114[b]	11/30/2016	9:35
ECC-041	2747275.72	13432845.225	SMP-SE-17115	11/30/2016	9:45
ECC-039	2746976.24	13432696.693	SMP-SE-17116	11/30/2016	10:10
ECC-025	2746971.12	13433133.781	SMP-SE-17117	11/30/2016	10:30
ECC-022	2747000.05	13433350.903	SMP-SE-17118	11/30/2016	10:50
ECC-012	2746816.89	13433333.516	SMP-SE-17119	11/30/2016	11:15
ECC-032	2746774.69	13432915.196	SMP-SE-17120	11/30/2016	11:35
ECC-020	2746585.19	13433102.134	SMP-SE-17121	11/30/2016	11:55

[1]Coordinates reported in NAD 1983 State Plane Texas South Central, Feet

[a] Field duplicate of sample SMP-SE-17101

[b] Field duplicate of sample SMP-SE-17113

3.0 ANALYTICAL RESULTS

3.1 TOTAL Hg AND TOC RESULTS

Sediment sample total Hg (Method 7471A) results were reported in mg/kg as dry weight and TOC results were reported in percent dry weight. Benchmark received all final data packages on December 5, 2016 and data validation and evaluation was completed by Environmental Chemistry Services on December 14, 2016.

ECC sediment station numbers, sample IDs, analytical results, and percent moisture are listed for each sample in Table 1. ECC sediment analytical results are shown on Figure 1.

Analytical results for sediment samples were validated according to the *Standard Operating Procedure for Data Validation (Appendix E) in the Quality Assurance Project Plan Alcoa (Point Comfort)/Lavaca Bay Superfund Site* (Alcoa 2005b). All analytical results were validated and may be included in the data used to evaluate the effectiveness of the approved remedy and to meet monitoring requirements specified in the Consent Decree.

3.2 GEOTECHNICAL RESULTS

Sediment samples from a subset of 30 ECC sediment sampling locations were analyzed for grain size and Atterberg limits by TWE. Results for these analyses are included in the data transmission to the USEPA.

Vane shear strength results measured in situ were converted to un-corrected maximum sediment shear strengths by multiplying the reading of the scale-ring by the appropriate vane size correction factor. This value was then corrected using a correlation factor based on laboratory measured plasticity limits (Atterberg limits measured by TWE) to determine the in situ peak shear strength at each sediment sampling location and depth (Sabatini, 2002). Sediment shear strengths are shown on Figures 3a to 3c.

4.0 REFERENCES

Alcoa, 2005a. Appendix B. *Statement of Work for Remedial Action. Alcoa (Point Comfort) / Lavaca Bay Superfund Site. Lavaca Bay Sediment Remediation and Long-Term Monitoring Plan, Operations, Maintenance, and Monitoring Plan*. Alcoa (Point Comfort) / Lavaca Bay Superfund Site. September 2003. Appendix H.

Alcoa, 2005b. Appendix E. *Standard Operating Procedure for Data Validation. Quality Assurance Project Plan*. Alcoa (Point Comfort) / Lavaca Bay Superfund Site. August 22, 2005.

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Sabatini, P.J., P.W. Mayne, and R.C. Bachus, 2002. *Geotechnical Engineering Circular, No. 5, Evaluation of Soil and Rock Properties for Geotechnical Design and Construction.* Prepared for U.S. Department of Transportation, Office of Bridge Technology. Publication FHWA-IF-02-034. April 2002.

APPENDIX C4
LAVACA BAY SUPPLEMENTAL SEDIMENT MONITORING REPORT; WITCO CHANNEL WESTERN SLOPE SEDIMENT SAMPLING

LAVACA BAY SUPPLEMENTAL SEDIMENT MONITORING REPORT
WITCO CHANNEL WESTERN SLOPE SEDIMENT SAMPLING
2016

Alcoa Point Comfort Operations
Lavaca Bay Superfund Site

March 2017

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LIST OF ACRONYMS AND ABBREVIATIONS

ALS	ALS Laboratory Group/Laboratory
cm	centimeters
ECC	Eastern Causeway Cove
GPS	Global Positioning System
Hg	Mercury
ID	Identification
in	inch(es)
kg	kilogram
mg	milligram
MS3	Mainland Shoreline #3
OMMP	Operation Maintenance and Monitoring Plan
TOC	Total Organic Carbon
USEPA	United States Environmental Protection Agency

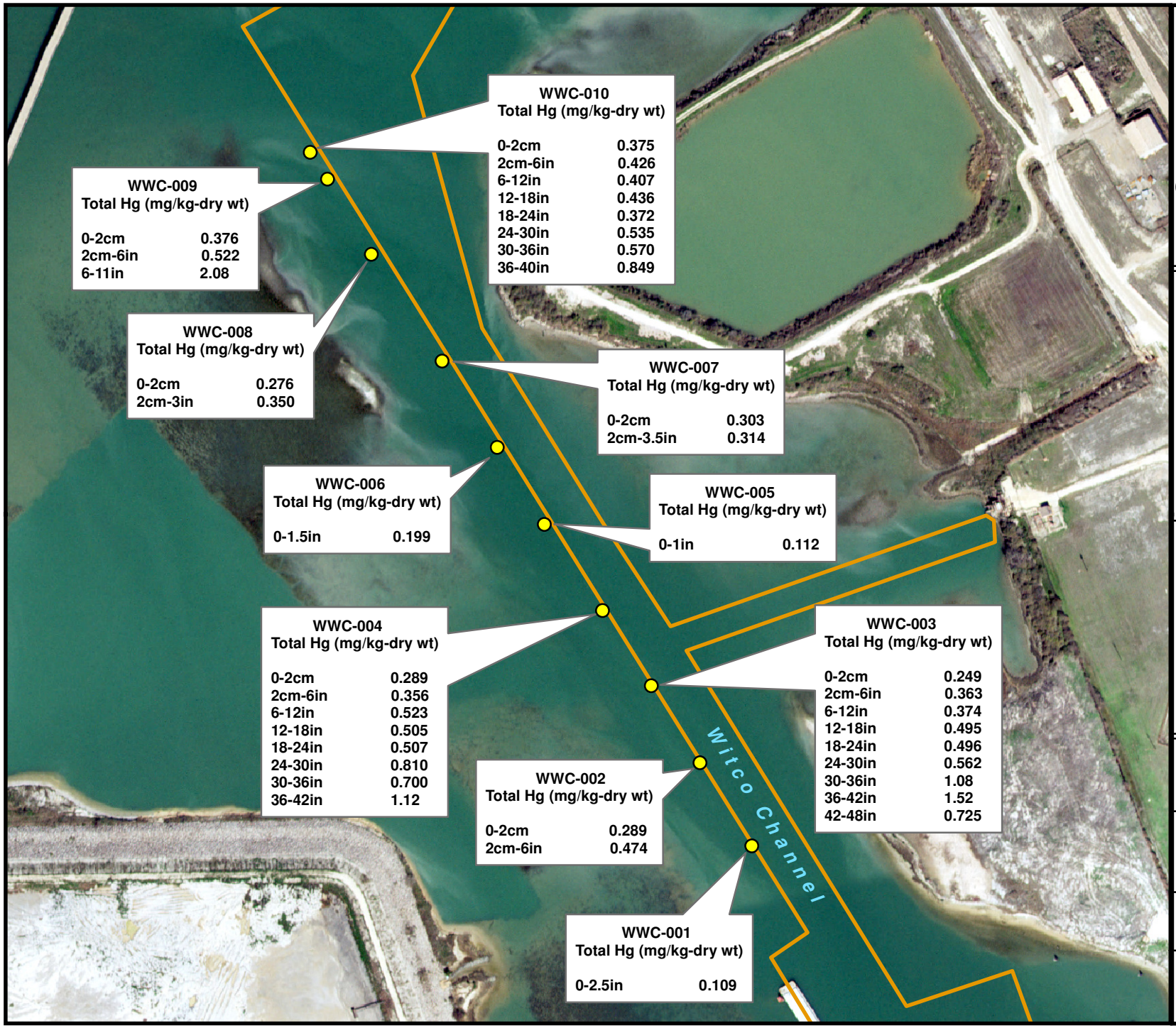
1.0 INTRODUCTION

The USEPA-approved remedial action plan for the Alcoa/Lavaca Bay Superfund Site focuses on eliminating ongoing sources of mercury to the bay, reducing surface sediment concentrations of mercury and polyaromatic hydrocarbons, and ultimately reducing mercury concentrations in fish tissue. A key factor in the Lavaca Bay remedy is the reduction in sediment mercury concentrations through targeted sediment removal efforts, capping, enhanced natural recovery, and/or natural recovery. In accordance with the provisions of the *Lavaca Bay Sediment Remediation and Long-Term Monitoring Plan Operations, Maintenance, and Monitoring Plan (OMMP, Appendix H – to the Consent Decree/Statement of Work,* Alcoa 2005a), surface sediment within open water and marshes of the Closed Area adjacent to the Point Comfort Facility will be sampled and analyzed annually for total mercury to document the effectiveness of USEPA's selected remedy.

Alcoa intends to dredge Mainland Shoreline #3 (MS3) and Witco Channel/Witco Harbor areas in 2017. Sediment on the western slope of the Witco Channel has not been evaluated and there is concern that sloughing of sediment from this slope into the channel after dredging could cause re-contamination. Information about sediment in this area will help determine whether dredging should be expanded to include the western slope of the Witco Channel.

1.1 PURPOSE AND SCOPE

Sediment core samples were collected from the western slope of the Witco Channel where post-dredge sloughing could be a potential source of re-contamination for the channel. Samples were collected from sites where unconsolidated sediment had been located during a previous survey and were analyzed for total mercury (Hg), total organic carbon (TOC), and percent moisture. Sample locations and results for total Hg are shown on Figure 1.



Sediment Sample Stations and Total Hg Results

Lavaca Bay Supplemental Sediment Studies Fall 2016

Prepared for Alcoa Corporation

BESI Benchmark Ecological Services, Inc.

Project: 98003-086-003

Date: 2/7/2017

Figure 1

M:\98003\086\003 - Supplemental\3.3 Witco Channel Sediment\Arc\Figure 1_Witco_Channel_Hg_Results.mxd

1.2 SITE DESCRIPTION

Alcoa Point Comfort Operations is located in Calhoun County, Texas, adjacent to Lavaca Bay. The portion of the bay adjacent to the Alcoa Plant is associated with elevated mercury concentrations in fish tissue and is closed to the taking of finfish and shellfish for consumption by order of the Texas Department of State Health Services. This region is referred to as the Closed Area. The project area and sampling strategy for routine monitoring of open water and marsh sediment samples within the Closed Area are documented in the OMMP.

2.0 METHODS

Sediment cores were collected and processed on November 17, 2016 by Benchmark Ecological Services, Inc. (Benchmark). After collection, sediment cores were processed on the Benchmark boat for chemical analysis. Each core sample was cut into segments representing depth strata and each segment was analyzed for total Hg and TOC by ALS Laboratory Group (ALS) in Houston, Texas. Validation and evaluation of the analytical results was conducted by Environmental Chemistry Services, Inc., in Houston, Texas.

2.1 SAMPLE STATIONS

Sample stations on the western slope of the Witco Channel were located using coordinates provided by Alcoa and are shown on Figure 1. The coordinates were entered into a sub-meter Global Positioning System (GPS) and the GPS was used to position personnel over each sample station. Final coordinates for each location were recorded using the sub-meter differential GPS.

2.2 SAMPLE COLLECTION

Sediment cores were collected using a piston core sampler. Onboard the sample vessel the core tubes were split in two using electric shears and a measuring tape was used to partition each core into the desired sampling strata. Cores were cut into segments from depths of 0 to 2 cm, 2 cm to 6 in, and 6 in sections thereafter until refusal or 6 ft sample depth was reached. A pre-cleaned stainless steel spoon was used to collect sediment from each segment. Sediment in contact with the core tube wall was not retained due to the possibility of contamination from overlying strata.

Sample containers were labeled with the sample ID, collection date, time, and intended analysis and were placed in re-sealable plastic bags, bubble wrapped, and immediately placed in an insulated chest with ice for storage and transport.

Sample station coordinates, sample IDs, and sample collection dates for the open water stations are listed in Table 1. Chain of Custody forms were completed for all samples collected and are maintained in the project files.

Table 1 - Sediment Stations, Sample IDs, Field Data, and Total Hg Results

Station ID	Easting[1]	Northing[1]	Sample Interval	Sample ID	Date	Time	Water Depth[2] (ft)	Total Hg			% M		TOC		
								(mg/kg) dry wt	SQL[3] (mg/kg)	Flag	wt%	SQL[3] (wt%)	wt%-dry	SQL[3] (wt%-dry)	Flag
WWC-001	2748945	13430055	0-2.5in	SMP-SE-17830	11/17/2016	9:35	13.5	0.109	0.000916		46.2	0.0100	0.273	0.0600	
WWC-002	2748837	13430228	0-2cm	SMP-SE-17827	11/17/2016	9:20	11.7	0.289	0.000969		48.5	0.0100	0.498	0.0600	
			2cm-6in	SMP-SE-17828	11/17/2016	9:20	11.7	0.474	0.000810		40.2	0.0100	0.362	0.0600	
WWC-003	2748735	13430389	0-2cm	SMP-SE-17818	11/17/2016	9:55	11.8	0.249	0.00110		53.8	0.0100	0.516	0.0600	
			2cm-6in	SMP-SE-17819	11/17/2016	9:55	11.8	0.363	0.000970		49.4	0.0100	0.448	0.0600	
			6-12in	SMP-SE-17820	11/17/2016	9:55	11.8	0.374	0.00107		53.6	0.0100	0.730	0.0600	
			12-18in	SMP-SE-17821	11/17/2016	9:55	11.8	0.495	0.00106		52.9	0.0100	0.705	0.0600	
			18-24in	SMP-SE-17822	11/17/2016	9:55	11.8	0.496	0.000969		50.9	0.0100	0.758	0.0600	
			24-30in	SMP-SE-17823	11/17/2016	9:55	11.8	0.562	0.00104		52.7	0.0100	0.758	0.0600	
			30-36in	SMP-SE-17824	11/17/2016	9:55	11.8	1.08	0.000946		47.1	0.0100	0.784	0.0600	
			36-42in	SMP-SE-17825	11/17/2016	9:55	11.8	1.52	0.00181		44.9	0.0100	0.655	0.0600	
			42-48in	SMP-SE-17826	11/17/2016	9:55	11.8	0.725	0.000845		41.8	0.0100	0.393	0.0600	
WWC-004	2748634	13430547	0-2cm	SMP-SE-17809	11/17/2016	10:10	12.6	0.289	0.00176		71.4	0.0100	1.00	0.0600	
			2cm-6in	SMP-SE-17810	11/17/2016	10:10	12.6	0.356	0.00134		62.4	0.0100	0.826	0.0600	
			6-12in	SMP-SE-17811	11/17/2016	10:10	12.6	0.523	0.00107		55.9	0.0100	0.792	0.0600	
			12-18in	SMP-SE-17812	11/17/2016	10:10	12.6	0.505	0.000945		46.9	0.0100	0.548	0.0600	
			18-24in	SMP-SE-17813	11/17/2016	10:10	12.6	0.507	0.00100		53.0	0.0100	0.746	0.0600	
			24-30in	SMP-SE-17814	11/17/2016	10:10	12.6	0.810	0.00101		50.5	0.0100	0.684	0.0600	
			30-36in	SMP-SE-17815	11/17/2016	10:10	12.6	0.700	0.00104		51.5	0.0100	0.718	0.0600	
			36-42in	SMP-SE-17816	11/17/2016	10:10	12.6	1.12	0.000868		45.4	0.0100	0.606	0.0600	
WWC-005	2748512	13430727	0-1in	SMP-SE-17808	11/17/2016	10:30	11.1	0.112	0.000742		34.9	0.0100	0.287	0.0600	
WWC-006	2748414	13430887	0-1.5in	SMP-SE-17807	11/17/2016	10:50	10.9	0.199	0.000830		38.6	0.0100	0.525	0.0600	
WWC-007	2748299	13431068	0-2cm	SMP-SE-17805	11/17/2016	11:10	11.7	0.303	0.00184		73.1	0.0100	1.10	0.0600	
			2cm-3.5in	SMP-SE-17806	11/17/2016	11:10	11.7	0.314	0.00176		73.2	0.0100	1.16	0.0600	
WWC-008	2748151	13431291	0-2cm	SMP-SE-17803	11/17/2016	11:30	11.9	0.276	0.00195		74.1	0.0100	1.08	0.0600	
			2cm-3in	SMP-SE-17804	11/17/2016	11:30	11.9	0.350	0.00141		65.0	0.0100	0.914	0.0600	
WWC-009	2748059	13431448	0-2cm	SMP-SE-17800	11/17/2016	12:00	9.3	0.376	0.00122		59.8	0.0100	0.837	0.0600	
			2cm-6in	SMP-SE-17801	11/17/2016	12:00	9.3	0.522	0.00112		54.9	0.0100	0.802	0.0600	
			6-11in	SMP-SE-17802	11/17/2016	12:00	9.3	2.08	0.00481		47.5	0.0100	0.667	0.0600	
WWC-010	2748023	13431504	0-2cm	SMP-SE-17831	11/17/2016	15:35	10.5	0.375	0.00141		63.9	0.0100	0.936	0.0600	
			2cm-6in	SMP-SE-17832	11/17/2016	15:35	10.5	0.426	0.00132		63.4	0.0100	0.967	0.0600	
			6-12in	SMP-SE-17833	11/17/2016	15:35	10.5	0.407	0.00130		61.0	0.0100	0.807	0.0600	
			12-18in	SMP-SE-17834	11/17/2016	15:35	10.5	0.436	0.00130		62.6	0.0100	0.856	0.0600	
			18-24in	SMP-SE-17835	11/17/2016	15:35	10.5	0.372	0.00116		56.5	0.0100	0.807	0.0600	
			24-30in	SMP-SE-17836	11/17/2016	15:35	10.5	0.535	0.00120		57.6	0.0100	0.767	0.0600	
			30-36in	SMP-SE-17837	11/17/2016	15:35	10.5	0.570	0.00107		54.0	0.0100	0.784	0.0600	
			36-40in	SMP-SE-17838	11/17/2016	15:35	10.5	0.849	0.00112		55.1	0.0100	0.741	0.0600	

[1]Coordinates reported in NAD 1983 State Plane Texas South Central, Feet

[2] Water Depths are not calibrated to tidal level

[3]SQL - Sample Quantitation Limit

3.0 ANALYTICAL RESULTS

Sediment sample total Hg (Method 7471A) results were reported in mg/kg as dry weight and TOC results were reported in percent weight as dry weight. Benchmark received all final data packages on December 15, 2016 and data validation and evaluation was completed by Environmental Chemistry Services on December 17, 2016.

Sediment station numbers, sample IDs, analytical results, and percent moisture are listed for each sample in Table 1. Sediment analytical results are shown on Figure 1.

Analytical results for sediment samples were validated according to the *Standard Operating Procedure Data Validation (Appendix E) in the Quality Assurance Project Plan Alcoa (Point Comfort)/Lavaca Bay Superfund Site* (Alcoa 2005b). All analytical results were validated and may be included in the data used to evaluate the effectiveness of the approved remedy and to meet monitoring requirements specified in the Consent Decree.

4.0 REFERENCES

Alcoa, 2005a. Appendix B. *Statement of Work for Remedial Action. Alcoa (Point Comfort) / Lavaca Bay Superfund Site. Lavaca Bay Sediment Remediation and Long-Term Monitoring Plan, Operations, Maintenance, and Monitoring Plan*. Alcoa (Point Comfort) / Lavaca Bay Superfund Site. September 2003. Appendix H.

Alcoa, 2005b. Appendix E. *Standard Operating Procedure for Data Validation. Quality Assurance Project Plan*. Alcoa (Point Comfort) / Lavaca Bay Superfund Site. August 22, 2005.

APPENDIX C5
LAVACA BAY SUPPLEMENTAL SEDIMENT MONITORING RPOERT; WITCO CHANNEL WESTERN SLOPE PROBING REPORT

LAVACA BAY SUPPLEMENTAL SEDIMENT MONITORING
WITCO CHANNEL WESTERN SLOPE PROBING REPORT

Alcoa Point Comfort Operations
Lavaca Bay Superfund Site

March 2017

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LIST OF ACRONYMS AND ABBREVIATIONS

ft	foot/feet
GPS	Global Positioning System
Hg	Mercury
ID	Identification
in	inch(es)
MS3	Mainland Shoreline #3
OMMP	Operation Maintenance and Monitoring Plan
USEPA	United States Environmental Protection Agency

1.0 INTRODUCTION

The USEPA-selected remedy for the Alcoa/Lavaca Bay Superfund Site focuses on eliminating ongoing sources of mercury to the bay, reducing surface sediment concentrations of mercury and polyaromatic hydrocarbons, and ultimately reducing mercury concentrations in fish tissue. A key factor in the Lavaca Bay remedy is the reduction in sediment mercury concentrations through targeted sediment removal efforts, capping, enhanced natural recovery, and/or natural recovery. In accordance with the provisions of the *Lavaca Bay Sediment Remediation and Long-Term Monitoring Plan Operations, Maintenance, and Monitoring Plan* (OMMP, Appendix H – to the *Consent Decree/Statement of Work*, Alcoa 2005), surface sediment within open water and marshes of the Closed Area adjacent to the Point Comfort Facility will be sampled and analyzed annually for total mercury to document the effectiveness of USEPA's selected remedy.

Fall 2015 and Spring 2016 studies indicated that erosion at Mainland Shoreline #3 (MS3) and re-suspension of sediments in the Witco Channel and Causeway Cove are potential sources of mercury that could be transported into the Causeway Cove marshes (Alcoa, 2016a; Alcoa, 2016b). Dredging and excavation scheduled for 2017 at MS3 and the Witco Channel and Harbor is consistent with response actions historically conducted in the Closed Area.

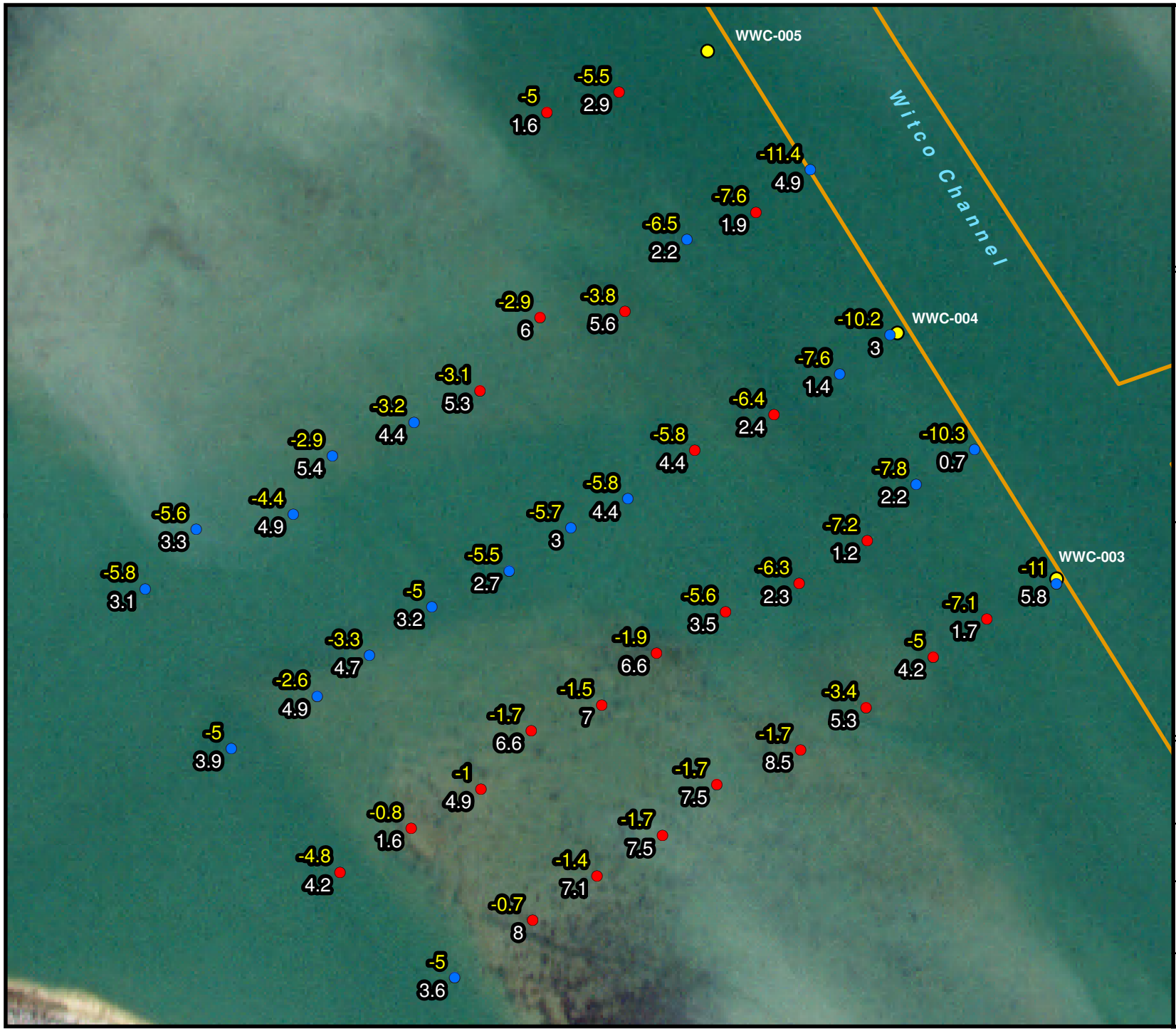
1.1 OBJECTIVE

A survey of the western slope of the Witco Channel was conducted to evaluate and delineate the unconsolidated material accumulated at its base, where plans for additional dredging are pending. The results of this project will inform evaluations of options for dredging of the Witco Channel.

1.2 SCOPE OF WORK

Benchmark Ecological Services, Inc. (Benchmark) used four sampling transects that were established on the western slope of the Witco Channel, perpendicular to its centerline. Water depth and depth of unconsolidated sediment were measured at 50 ft intervals along each of the four transects. Water depth was measured using a weighted disc and measuring tape.

Unconsolidated sediment was measured using a metal probe pushed into the sediment down to stiff resistance. Unconsolidated sediment depth was determined by subtracting water depth from probe depth (depth to resistance) at each site. Probing survey locations and results are shown on Figure 1. Water depths collected for each probing location and the depth of unconsolidated sediment are shown in Table 1.



Witco Channel Western Slope
Probing Locations and Results

Lavaca Bay Supplemental
Sediment Report Fall 2016

Prepared for
Alcoa Corporation

BESI Benchmark Ecological Services, Inc.

Project: 98003-086-003
Date: 2/8/2017

Figure 1

M:\98003\086\003 - Supplemental\3.3 Witco Channel Sediment\Witco Unconsolidated Sediment\arc\Witco_Western_Slope_Probing_Results

Table 1 - Witco Channel Western Slope Probing Data

Station	Coordinates (NAD 83, State Plane ft, FIPS 4204)		Water Depth (NGVD29 ft)	Sediment Surface Elevation (NGVD29 ft)	Depth of Unconsolidated Sediment (ft)
	Easting	Northing			
1	2748577.775	13430650.94	12.6	-11.4	4.9
2	2748543.061	13430623.91	8.8	-7.6	1.9
3	2748498.955	13430606.32	7.7	-6.5	2.2
4	2748459.5	13430560.29	5.0	-3.8	5.6
5	2748405.163	13430556.29	4.1	-2.9	6.0
6	2748366.72	13430509.44	4.3	-3.1	5.3
7	2748324.63	13430489.3	4.4	-3.2	4.4
8	2748272.432	13430467.73	4.1	-2.9	5.4
9	2748247.453	13430430.26	5.6	-4.4	4.9
10	2748185.458	13430420.8	6.8	-5.6	3.3
11	2748152.778	13430382.6	7.0	-5.8	3.1
12	2748628.667	13430545.25	11.4	-10.2	3.0
13	2748596.598	13430520.31	8.8	-7.6	1.4
14	2748554.712	13430494.23	7.6	-6.4	2.4
15	2748504.02	13430471.42	7.0	-5.8	4.4
16	2748461.217	13430440.26	7.0	-5.8	4.4
17	2748424.767	13430421.73	6.9	-5.7	3.0
18	2748385.49	13430394.27	6.7	-5.5	2.7
19	2748336.069	13430371.08	6.2	-5.0	3.2
20	2748296.328	13430340.08	4.5	-3.3	4.7
21	2748262.912	13430313.96	3.8	-2.6	4.9
22	2748207.737	13430280.38	6.2	-5.0	3.9
23	2748682.756	13430472.02	11.5	-10.3	0.7
24	2748645.473	13430449.54	9.0	-7.8	2.2
25	2748614.277	13430413.66	8.4	-7.2	1.2
26	2748570.674	13430386.11	7.5	-6.3	2.3
27	2748523.696	13430368.25	6.8	-5.6	3.5
28	2748479.671	13430341.57	3.1	-1.9	6.6
29	2748444.468	13430308.31	2.7	-1.5	7.0
30	2748399.637	13430291.96	2.9	-1.7	6.6
31	2748367.504	13430254.56	2.2	-1.0	4.9
32	2748322.801	13430229.43	2.0	-0.8	1.6
33	2748277.464	13430201.17	6.0	-4.8	4.2
34	2748735.014	13430385.99	12.2	-11.0	5.8
35	2748690.66	13430363.52	8.3	-7.1	1.7
36	2748656.425	13430339.27	6.2	-5.0	4.2
37	2748613.568	13430306.86	4.6	-3.4	5.3
38	2748571.677	13430279.72	2.9	-1.7	8.5
39	2748518.095	13430257.48	2.9	-1.7	7.5
40	2748483.472	13430224.78	2.9	-1.7	7.5
41	2748441.636	13430198.85	2.6	-1.4	7.1
42	2748400.602	13430170.54	1.9	-0.7	8.0
43	2748350.763	13430133.84	6.2	-5.0	3.6
45	2748455.477	13430700.73	6.7	-5.5	2.9
46	2748409.394	13430687.7	6.2	-5.0	1.6

2.0 METHODS

Benchmark conducted field work on December 27, 2016 from a 24-ft aluminum workboat equipped with a Global Positioning System (GPS). Metal probing rods were used to penetrate the unconsolidated surface material to measure sediment depth and map sediment distribution. Probing location coordinates were entered into a sub-meter GPS, and the GPS was used to position personnel over each location. Probing data was then layered over aerial imagery to develop a map of soft unconsolidated sediment.

3.0 RESULTS

Benchmark collected data from 46 locations on the western slope of the Witco Channel. A layer of oyster shell was encountered at the majority of the probe locations. At all locations the layer of shell was less than 12 in thick and depths of unconsolidated sediment ranged from 0.7 ft to 8.5 ft. Sediment elevation and depth of unconsolidated sediment are shown on Figure 1. Station number, coordinates, water depth, and depth of unconsolidated sediment are shown in Table 1.

4.0 REFERENCES

Alcoa, 2005. Appendix B. *Statement of Work for Remedial Action. Alcoa (Point Comfort) / Lavaca Bay Superfund Site. Lavaca Bay Sediment Remediation and Long-Term Monitoring Plan, Operations, Maintenance, and Monitoring Plan.* Alcoa (Point Comfort) / Lavaca Bay Superfund Site. September 2003. Appendix H.

Alcoa, 2016a. *Draft Lavaca Bay Methylation Special Study – Phase 2. Study 4 – Update the Understanding of Methylation Processes and Uptake in the Closed Area – Spring 2016.* Alcoa (Point Comfort)/Lavaca Bay Superfund Site. September 2016.

Alcoa, 2016b. *Draft Report on Lavaca Bay High Resolution Water Column Monitoring Program*. Alcoa (Point Comfort)/Lavaca Bay Superfund Site. September 2016.

APPENDIX C6
LAVACA BAY SUPPLEMENTAL REPORT; SMP0048 SEDIMENT DELINEATION REPORT

LAVACA BAY SUPPLEMENTAL REPORT
SMP0048 SEDIMENT DELINEATION REPORT

Alcoa Point Comfort Operations
Lavaca Bay Superfund Site

March 2017

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LIST OF ACRONYMS AND ABBREVIATIONS

ALS	ALS Laboratory Group/Laboratory
cm	centimeter(s)
ft	foot / feet
GPS	Global Positioning System
Hg	Mercury
ID	Identification
ml	milliliters
OMMP	Operation Maintenance and Monitoring Plan
oz	ounce

1.0 Introduction

The USEPA-selected remedy for the Alcoa/Lavaca Bay Superfund Site focuses on eliminating ongoing sources of mercury to the bay, reducing surface sediment concentrations of mercury and polyaromatic hydrocarbons, and ultimately reducing mercury concentrations in fish tissue. A key factor in the Lavaca Bay remedy is the reduction in sediment mercury concentrations through targeted sediment removal efforts, capping, enhanced natural recovery, and/or natural recovery. In accordance with the provisions of *the Lavaca Bay Sediment Remediation and Long-Term Monitoring Plan Operations, Maintenance, and Monitoring Plan (OMMP, Appendix H – to the Consent Decree/Statement of Work,* Alcoa 2005a), surface sediment within open water and marshes of the Closed Area adjacent to the Point Comfort Facility will be sampled and analyzed annually for total mercury to document the effectiveness of the remedy.

The Lavaca Bay Annual Sediment Monitoring Report Fall 2016 (Appendix C1) indicated the mercury concentration in sediment at the Open Water station SMP0048 was significantly higher than the historic mean for the station, and the 2016 mean for open water sediment. The average total mercury (Hg) concentration in samples collected from the location between 2011 and 2015 was 0.965 mg/kg (dry weight). The total Hg concentration in the 2016 sample was 17.3 mg/kg (dry weight) which is approximately 18 times greater than the historic average. This supplemental sediment sampling project was conducted to determine if the unusually high mercury concentration measured at SMP0048 during the Fall 2016 monitoring event is representative of the current mercury level around the station, or an isolated hot spot, or a sampling artifact.

1.1 PURPOSE AND SCOPE

Samples were collected from the original sampling station (SMP0048) and 11 supplemental locations which were established within a 50 ft radius of the original station. All samples were collected using the same methods used for open water sediment samples during the annual monitoring event. The goal of the supplemental sampling event was to determine if the result for

the 2016 annual monitoring event from SMP0048 accurately represented the current mercury level for the site. Sample locations and results for total Hg are shown in Figure 1.

This document presents a summary of sampling and analytical methods and the results of the SMP0048 Sediment Delineation Project. Methods and procedures for this project are the same as those used during the Lavaca Bay Annual Sediment Monitoring Project Fall 2016. A detailed description of the methods and procedures are presented in the OMMP.



N

0 10 20

Feet

Sediment Sample Stations and Total Hg Results

- SMP0048 Sample Location (11/01/16)
- Supplemental Sediment Sample Stations (01/26/17)

- Total Hg Result (mg/kg dry weight)

- Sample Station ID

Notes

2015 DOQQ (Point Comfort Quad)



Calhoun County, TX

Prepared for Alcoa Corporation

BESI Benchmark Ecological Services, Inc.

Project: 98003-086-003

Date: 2/14/2017

Figure 1

M:\98003\086\003 - Supplemental\DolphinDelineation\ana results.mxd

1.2 SITE DESCRIPTION

Alcoa Point Comfort Operations is located in Calhoun County, Texas, adjacent to Lavaca Bay. The portion of the bay adjacent to the Alcoa Facility is associated with elevated mercury concentrations in fish tissue and is closed to the taking of finfish and shellfish for consumption by order of the Texas Department of State Health Services. This region is referred to as the Closed Area. The project area and sampling strategy for routine monitoring of open water and marsh sediment samples within the Closed Area are documented in the OMMP. The specific location of this project is the Annual Open Water Sediment Monitoring sample location SMP0048, which is located on the western side of the Alcoa Channel across from the alumina loading docks and directly behind the barge mooring dolphins.

2.0 METHODS

Sediment samples were collected and processed by Benchmark Ecological Services, Inc. (Benchmark). Sediment samples were collected on January 26, 2017, and were analyzed for total Hg and percent moisture by ALS Laboratory Group (ALS) in Houston, Texas.

2.1 SAMPLE STATIONS

Sample stations were located using coordinates provided by Alcoa and are shown on Figure 1. The coordinates were entered into a sub-meter Global Positioning System (GPS), and the GPS was used to position personnel over each sample station. Final coordinates for each location were recorded using the sub-meter differential GPS.

2.2 SAMPLE COLLECTION

Sediment samples were collected using an Ekman sampling device. Onboard Benchmark's vessel the top 2 cm of sediment were removed from the Ekman sample using a clean, disposable 60 mL syringe. The lower end of the syringe barrel (needle lock) was cut off to transform the syringe barrel into an open cylinder. The open end of the syringe barrel was placed on the surface of the sediment, and while holding the syringe piston stationary, the barrel was pushed 2 cm into the sampler and a 0-2 cm depth sub-sample was collected. The syringe was marked at 2 cm to ensure the proper depth was sampled. Samples were placed in a pre-cleaned, labeled, 4 oz

sample jar. Three sub-samples were removed with the syringe from each Ekman sample to provide the volume of sediment required for analysis. New (clean) syringes were used to collect and process each sample, which then was thoroughly homogenized by shaking.

Sample containers were labeled with the sample ID, collection date, time, and intended analysis and were placed in re-sealable plastic bags, bubble wrapped, and immediately placed in an insulated chest with ice for storage and transport. Samples were delivered to the lab immediately after sampling on January 26, 2017.

Sample station coordinates, sample IDs, and sample collection dates for the twelve additional open water samples are listed in Table 1. Chain of Custody forms were completed for all samples collected and are maintained in the project files.

Table 1 - Sediment Stations, Sample IDs, Field Data, and Results

Station ID	Coordinates		Sample ID	Date	Time	Total Hg			% M	
	Easting[1]	Northing[1]				(mg/kg) dry wt	SQL[2] (mg/kg)	Flag	wt%	SQL[3] (wt%)
SUP-0503	2749343.01	13429050.62	SMP-SE-17900	1/26/2017	8:30	1.00	0.00279		63.4	0.0100
SUP-0507	2749330.05	13429056.72	SMP-SE-17901	1/26/2017	8:45	1.11	0.00155		67.6	0.0100
SUP-0502	2749327.52	13429042.45	SMP-SE-17902	1/26/2017	8:50	0.274	0.00171		70.7	0.0100
SUP-0508	2749340.26	13429039.86	SMP-SE-17903	1/26/2017	9:00	0.833	0.000896		46.5	0.0100
SUP-0509	2749352.55	13429023.04	SMP-SE-17904	1/26/2017	9:05	0.264	0.00123		60.8	0.0100
SUP-0510	2749362.34	13429006.99	SMP-SE-17905	1/26/2017	9:15	0.281	0.00125		61.3	0.0100
SUP-0501	2749306.90	13429033.27	SMP-SE-17906	1/26/2017	9:20	0.283	0.00174		71.2	0.0100
SUP-0500	2749290.60	13429025.04	SMP-SE-17907	1/26/2017	9:30	0.279	0.00144		65.8	0.0100
SUP-0512	2749290.60	13429025.04	SMP-SE-17908*	1/26/2017	9:30	0.271	0.00149		66.6	0.0100
SUP-0505	2749307.45	13429092.46	SMP-SE-17909	1/26/2017	9:40	0.392	0.00137		63.9	0.0100
SUP-0506	2749320.12	13429071.66	SMP-SE-17910	1/26/2017	9:50	0.381	0.00159		68.6	0.0100
SUP-0504	2749363.84	13429058.56	SMP-SE-17911	1/26/2017	10:00	0.317	0.00180		73.2	0.0100
SUP-0048	2749335.65	13429045.39	SMP-SE-17912	1/26/2017	10:20	0.286	0.00127		60.6	0.0100

[1]Coordinates reported in NAD 1983, State Plane - Texas South Central, Feet

[2]SQL - Sample Quantitation Limit

* - Field Duplicate of SMP-SE-17907

3.0 ANALYTICAL RESULTS

Sediment sample total Hg (Method 7471A) results were reported in mg/kg as dry weight. Benchmark received all final data packages on February 8, 2016. Data validation and evaluation was completed by Environmental Chemistry Services on February 13, 2017.

Sediment station numbers, sample IDs, analytical results, and percent moisture are listed for each sample in Table 1, and analytical results are shown on Figure 1.

Analytical results for sediment samples were validated according to the *Standard Operating Procedure Data Validation* (*Appendix E) in the Quality Assurance Project Plan Alcoa (Point Comfort)/Lavaca Bay Superfund Site* (Alcoa 2005b). All analytical results were validated and may be included in the data used to evaluate the effectiveness of the approved remedy and to meet monitoring requirements specified in the Consent Decree.

4.0 REFERENCES

Alcoa, 2005a. Appendix B. *Statement of Work for Remedial Action. Alcoa (Point Comfort) / Lavaca Bay Superfund Site. Lavaca Bay Sediment Remediation and Long-Term Monitoring Plan, Operations, Maintenance, and Monitoring Plan*. Alcoa (Point Comfort) / Lavaca Bay Superfund Site. September 2003. Appendix H.

Alcoa, 2005b. Appendix E. *Standard Operating Procedure for Data Validation. Quality Assurance Project Plan*. Alcoa (Point Comfort) / Lavaca Bay Superfund Site. August 22, 2005.

Alcoa, 2016. *Lavaca Bay Annual Sediment Monitoring Report Fall 2016*. Alcoa (Point Comfort)/Lavaca Bay Superfund Site. January 2017.

APPENDIX D1
LAVACA BAY FINFISH AND SHELLFISH MONITORING REPORT

LAVACA BAY FINFISH AND SHELLFISH MONITORING REPORT 2016

Alcoa Point Comfort Operations
Lavaca Bay Superfund Site

March 2017

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LIST OF ACRONYMS AND ABBREVIATIONS

DI	Deionized
ft	foot / feet
g	gram(s)
in	inch(es)
mm	millimeter(s)
OMMP	Operations, Maintenance, and Monitoring Plan
µg	microgram

1.0 INTRODUCTION

A key factor in the success of the Lavaca Bay Remedy is the reduction in tissue mercury concentrations through targeted source control efforts, sediment removal efforts, capping, enhanced natural recovery, and/or natural recovery. The Consent Decree (March 2005) for the Lavaca Bay Superfund Site requires annual monitoring of finfish and shellfish for total mercury until the Remedial Action Objective (RAO) is met. The performance standard is based on a statistical comparison of Closed Area and Adjacent Open Area red drum mercury concentrations. The remedy will be complete when the mean mercury concentrations for the two areas are not statistically different from each other for two consecutive years based on the results of statistical test methods described in the *Lavaca Bay Finfish and Shellfish Operations, Maintenance, and Monitoring Plan (OMMP, Appendix I – to the Consent Decree/ Statement of Work*, Alcoa, 2005a)

1.1 PURPOSE AND SCOPE

The objective of the program is to monitor the recovery of mercury levels in finfish and shellfish. The monitoring data collected under this program are used to assess the effectiveness of remedial actions implemented at the site and to determine when the remedy is complete. This document presents a summary of sampling and analytical methods and the results of the 2016 monitoring project. A detailed description of the methods and procedures for this project are presented in the OMMP.

1.2 SITE DESCRIPTION

The Alcoa Point Comfort Operations Plant is located in Calhoun County, Texas, adjacent to Lavaca Bay. The portion of the bay adjacent to the Alcoa Plant is associated with elevated mercury concentrations in fish tissue and is closed to the taking of finfish and blue crabs for consumption by order of the Texas Department of State Health Services. This area is referred to as the Closed Area and is delineated on the figures contained in this report. The monitoring areas

specified in the OMMP include both the Closed Area and designated areas outside the Closed Area (referred to as Adjacent Open Area).

2.0 METHODS

Red drum and juvenile blue crab tissue samples for the 2016 Finfish and Blue Crab Monitoring Project were collected and processed by Benchmark Ecological Services, Inc., and analyzed by Pacific Northwest National Laboratory, Marine Sciences Laboratory, operated by Battelle in Sequim, Washington. Samples were collected between September 22, 2016 and December 6, 2016. Validation and evaluation of the analytical results were conducted by Environmental Chemistry Services, Inc., in Houston, Texas.

2.1 SAMPLE STATIONS

A total of 30 red drum samples were collected from 10 stations inside the Closed Area (Figure 1), and 31 samples were collected from 10 stations in the Adjacent Open Areas (Figure 2). A total of 30 juvenile blue crab composite samples were collected from 10 stations inside the Closed Area (Figure 3). Thirty composite crab samples were also collected from 10 stations in Adjacent Open Areas (Figure 4).

As described in the OMMP (p. 3-3), the objectives for selecting sample stations are to achieve equal geographic representation of the four quadrants (or zones) within the Closed Area. As also stated in the OMMP (p. 3-3), netting success will be variable and stations from which samples are collected and the number of samples per station will vary. The actual numbers of stations sampled for red drum and juvenile blue crab during the 2016 monitoring event are shown for each of the four Closed Area zones on Figures 1 and 3, respectively. Table 1 shows the number of red drum and juvenile blue crab samples collected per zone.

Table 1 – Tissue Samples Analyzed per Zone

Zone	Red Drum Samples	Juvenile Blue Crab Samples
Zone 1	3	3
Zone 2	15	15
Zone 3	6	3
Zone 4	6	9

The primary objective for the placement of monitoring stations in both Areas was to achieve a geographically uniform distribution of stations within each one (OMMP). The general goal for both sampling areas was to collect approximately the same number of samples from 10 to 12 stations, distributed evenly over the sampling area. Whenever possible, from one year to the next, red drum and juvenile blue crab samples are collected from the same stations.

The distribution of red drum samples ranged from 3 samples in Zone 1 to 15 samples in Zone 2. The number of juvenile blue crab samples ranged from 3 samples in Zones 1 and 3 (3 samples per zone), to 15 samples in Zone 2. The uneven distribution of samples is due to the irregular distribution of suitable habitat within the zones.



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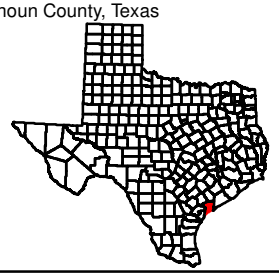
0 1,500 3,000 Feet

Legend

- Red Drum Stations
- #.## Total Hg (ug/g wet weight)
- Zone Boundaries
- Closed Area Boundary

Notes

2015 0.5m DOQQ (Point Comfort) Quad
Calhoun County, Texas



Lavaca Bay Finfish and Shellfish Monitoring Report 2016

Closed Area Red Drum Sample Stations and Analytical Results

Prepared for Alcoa Corporation

BESI Benchmark Ecological Services, Inc

Project: 98003-086-001
Date: 01/04/2017

Figure 1

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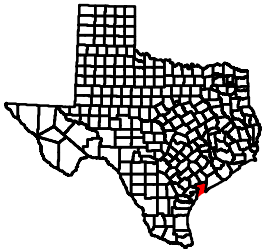
0 0.5 1 Miles

Legend

- Red Drum Stations
- #.## Total Hg (ug/g wet weight)

Notes

2009 0.5m DOQQ (Point Comfort) Quad
Calhoun County, Texas



Lavaca Bay Finfish and Shellfish Monitoring Report 2016

Adjacent Area Red Drum Sample Stations and Analytical Results

Prepared for
Alcoa Corporation

BESI Benchmark Ecological Services, Inc.

Project: 98003-086-001
Date: 01/04/2017

Figure 2

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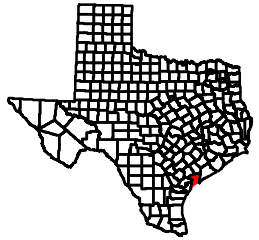
0 1,500 3,000 Feet

Legend

- Juvenile Blue Crab Stations
- #.## Total Hg (ug/g wet weight)
- Zone Boundaries
- Closed Area

Notes

2015 0.5m DOQQ (Point Comfort) Quad
Calhoun County, Texas



Lavaca Bay Finfish and Shellfish Monitoring Report 2016

Closed Area Juvenile Blue Crab Sample Stations and Analytical Results

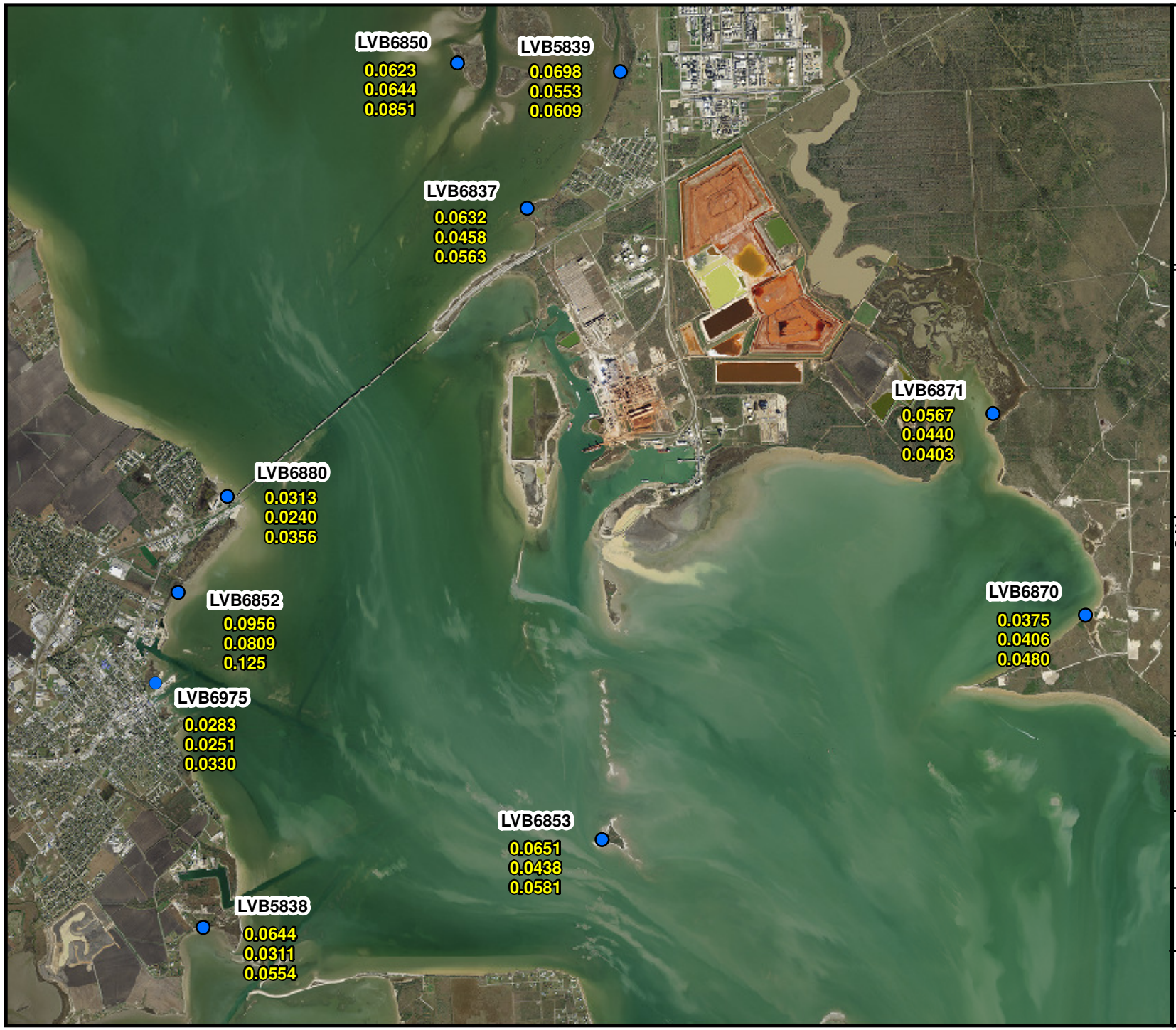
Prepared for Alcoa Corporation

BESI Benchmark Ecological Services, Inc.

Project: 98003-086-001
Date: 01/04/2017

Figure 3

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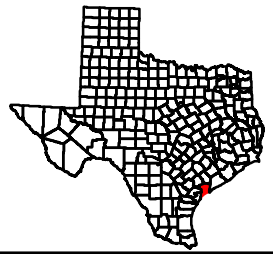
0 0.5 1 Miles

Legend

- Juvenile Blue Crab Stations
- #.## Total Hg (ug/g wet weight)

Notes

2009 0.5m DOQQ (Point Comfort) Quad
Calhoun County, Texas



Lavaca Bay Finfish and Shellfish Monitoring Report 2016

Adjacent Area Juvenile Blue Crab Sample Stations and Analytical Results

Prepared for
Alcoa Corporation

BESI Benchmark Ecological Services, Inc.

Project: 98003-086-001
Date: 01/05/2017

Figure 4

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2.2 SAMPLE COLLECTION

2.2.1 Red Drum

Red drum were collected from the Closed and Adjacent Open Areas between September 27, 2016 and December 6, 2016. In the Closed Area, 30 red drum tissue samples were collected from the 10 sample stations shown on Figure 1. In the Adjacent Open Area, 31 red drum tissue samples were collected from the 10 sample stations shown on Figure 2. Sampling was conducted from a 20-ft aluminum boat and a Global Positioning System (GPS) was used to determine the coordinates of all sample stations.

Red drum specimens were collected using gill nets (6 ft. x 150 ft.) with 6-in stretch mesh. Multiple nets (1-5) were set at each sample station in the evening, and the nets were allowed to fish over night. The nets were retrieved the following morning, and the fish were removed. Gill nets were set at stations shown on Figures 1 and 2. Red drum with total lengths between 508 and 711 mm (20 to 28 in) were removed from the gill nets, placed in plastic bags, and labeled with station identification (ID), date, and time. According to Texas Parks and Wildlife regulations, only red drum measuring between 20 and 28 in (total length) may be legally harvested by recreational fishermen. Labeled bags were immediately placed in an insulated box with ice for storage. Undersized and oversized red drum and specimens of other species were returned to the water.

The following information (at a minimum) was recorded on data sheets:

Station ID	Initials of field personnel	End date
Gear type	Set date	End time
Water depth	Set time	List of photo log entries

2.2.2 Juvenile Blue Crab

Juvenile blue crabs were collected from the Closed and Adjacent Open Areas between September 22, 2016 and October 12, 2016. In the Closed Area, 30 juvenile blue crab tissue samples were collected from 10 historical monitoring stations (Figure 3). In the Adjacent Open Area, 30 juvenile blue crab tissue samples were collected from 10 sample stations (Figure 4). Sampling was conducted from a 20-ft aluminum boat. A Global Positioning System was used to determine the coordinates of all sample stations.

Juvenile blue crabs were collected using barrel-type minnow traps baited with commercial crab bait (gulf menhaden). Traps were checked every 2 to 72 hours. Crabs were removed from the traps, inspected, and sorted by size in a clean sorting tray. Injured, dead, undersized, and oversized blue crabs, as well as by-catch, were returned to the water. Crabs that were between 25-75 mm in width were retained. Width is the distance between the tips of the primary lateral spines of the carapace. Crabs collected in the field were placed in resealable bags labeled with station ID, date, and collection time. Labeled bags were immediately placed in an insulated chest with ice. Data sheets were used to record the same sample site information listed above for finfish samples.

2.3 SAMPLE PROCESSING

2.3.1 Red Drum

Red drum samples were processed on the date of collection in the Alcoa Clean Lab (located at the Alcoa Point Comfort Facility) and remained on ice until processing was complete. Fish were weighed, measured, scaled, and rinsed with deionized (DI) water. Data were recorded on tissue processing data sheets and are listed in Table 2 (Closed Area specimens) and Table 3 (Adjacent Open Area specimens). After scale removal, individual fish were placed in clean plastic bags and returned to cold storage until all fish were scaled.

In the clean lab, the fish were again rinsed with DI water and placed on pre-cleaned Teflon cutting boards. The right fillet (with skin) was removed with pre-cleaned, hexane-rinsed

stainless steel fillet knives. The fillets were cut into small cubes, mixed, and weighed (g). The fillet samples generally weigh 300-400 g which is more tissue than the lab requires. A random 50-100g sub-sample was removed, weighed, and placed in a pre-cleaned sample container supplied by the analytical laboratory. Fillet weights and sample weights were recorded on sample processing data sheets and are listed in Tables 2 and 3 for Closed Area and Adjacent Open Area specimens, respectively. Sample jars were labeled with sample number, species, collection date, time, and initials of processing personnel.

The containers with samples were placed into resealable plastic bags and stored at 4 ±2 degrees Celsius. Chain of Custody forms were completed for all samples collected and are maintained in the project files. Sample containers were shipped to Battelle overnight on the date of processing.

2.3.2 Juvenile Blue Crab

Blue crabs were processed within 24 hours of collection in the Alcoa Clean Lab and remained on ice or in a refrigerator until processing was complete. In the laboratory, crabs were rinsed with DI water and sorted by size on pre-cleaned Teflon cutting boards. Individual blue crabs were measured, weighed, and placed into sample containers. Each sample was a composite of 5 crabs measuring 25-75 mm in width. Individual crab weights and total sample weights were recorded on sample processing data sheets. Data associated with Closed Area and Adjacent Open Area juvenile blue crab monitoring are listed in Tables 4 and 5, respectively. Sample containers were labeled with the sample ID, collection date, time, and initials of processing personnel and were placed into resealable plastic bags in a secure refrigerator in the Clean Lab. Samples were shipped overnight to Battelle for analysis.

3.0 ANALYTICAL RESULTS

Red drum and juvenile blue crab samples were analyzed for total mercury and percent moisture by Battelle. Total mercury results were reported in µg/g as wet weight. Benchmark received the final data package from the analytical laboratory on December 29, 2016, and Analytical QA/QC was completed by Environmental Chemistry Services on January 9, 2017. Analytical results for red drum collected from the Closed Area are presented in Table 2, and the results for red drum

collected from the Adjacent Open Area are presented in Table 3. Analytical results for juvenile blue crabs collected from the Closed Area are presented in Table 4, and results for juvenile blue crabs collected from the Adjacent Open Area are presented in Table 5.

Analytical results for both red drum and juvenile blue crab samples were validated according to the *Standard Operating Procedure Data Validation (Appendix E) in the Quality Assurance Project Plan Alcoa (Point Comfort)/Lavaca Bay Superfund Site* (Alcoa 2005b). All analytical results were validated and may be included in the data used to evaluate the effectiveness of the approved remedy and to meet monitoring requirements specified in the Consent Decree.

Table 2 - Closed Area Red Drum Sample Stations, Sample IDs, Processing Data, and Analytical Results

Station ID	Sample ID	Date	Time	Total Length (mm)	Standard Length (mm)	Total Weight (g)	Tissue Weight (g)	Sample Weight (g)	Percent Moisture	Total Hg wet weight (µg/g)	Flag
LVB5508	B12b-TF-18560	9/27/2016	11:55	664	530	2920	308.7	59.7	80.0	1.19	
LVB5504	B12b-TF-18561	9/27/2016	12:05	681	550	2900	361.4	61.3	78.4	1.07	
CLO5818	B12b-TF-18562	9/28/2016	8:20	627	522	2420	126.4	41.6	78.4	1.10	
LVB5518	B12b-TF-18564	9/28/2016	7:50	510	404	1200	153.2	44.3	78.6	0.323	
CLO5900	B12b-TF-18565	9/28/2016	9:15	693	586	3200	339.1	56.1	78.8	0.866	
CLO5802	B12b-TF-18568	10/4/2016	10:39	620	510	2580	406.3	61.3	70.0	1.77	
CLO5814	B12b-TF-18573	10/6/2016	8:59	609	500	2510	399.6	59.9	76.3	0.377	
LVB5513	B12b-TF-18574	10/6/2016	8:46	686	570	3310	538.7	64.9	79.2	0.368	
CLO5803	B12b-TF-18576	10/10/2016	9:45	523	415	1410	179.9	42.8	77.8	0.936	
CLO5802	B12b-TF-18577	10/11/2016	8:00	515	400	1350	216.0	59.5	77.9	1.05	
CLO5814	B12b-TF-18578	10/11/2016	9:50	550	430	1580	214.5	49.2	80.2	1.21	
CLO5814	B12b-TF-18582	10/12/2016	9:30	538	425	1520	223.6	59.5	80.2	0.574	
LVB5518	B12b-TF-18584	10/17/2016	10:02	515	405	1320	184.5	49.6	79.3	0.304	
LVB5518	B12b-TF-18585	10/17/2016	10:02	562	450	1750	259.6	53.7	78.5	0.368	
CLO5900	B12b-TF-18590	10/21/2016	9:00	672	545	2920	352.6	55.2	78.9	1.67	
LVB5513	B12b-TF-18592	10/25/2016	9:40	710	580	3400	362.0	58.1	79.6	0.422	
CLO5802	B12b-TF-18593	10/26/2016	8:31	682	565	3180	401.2	63.0	79.1	0.840	
CLO5818	B12b-TF-18594	10/26/2016	9:11	542	435	1450	160.6	43.2	80.1	0.868	
CLO5803	B12b-TF-18607	11/9/2016	6:45	649	530	2750	396.6	58.6	80.0	1.17	
CLO5815	B12b-TF-18608	11/9/2016	7:15	566	450	1870	278.9	58.0	78.6	0.284	
CLO5815	B12b-TF-18609	11/10/2016	6:40	521	415	1490	252.5	62.1	79.6	0.330	
CLO5815	B12b-TF-18610	11/14/2016	6:45	597	470	2180	322.7	56.2	79.6	0.448	
CLO5803	B12b-TF-18614	11/16/2016	7:36	668	540	2950	463.8	58.9	77.8	0.321	
LVB5508	B12b-TF-18619	11/29/2016	7:00	677	555	3180	455.7	62.7	81.0	1.50	
CLO5818	B12b-TF-18620	11/29/2016	9:22	512	400	1350	192.9	55.3	78.1	0.488	
CLO5900	B12b-TF-18621	12/1/2016	8:50	509	410	1100	173.0	48.3	79.1	0.318	
LVB5513	B12b-TF-18622	12/5/2016	9:35	711	575	4180	608.4	60.1	77.2	0.605	
LVB5504	B12b-TF-18623	12/5/2016	8:20	709	585	4040	530.8	60.1	78.5	0.347	
LVB5508	B12b-TF-18624	12/6/2016	7:45	673	540	3160	440.1	62.3	77.8	0.375	
LVB5504	B12b-TF-18625	12/6/2016	8:35	691	570	2870	368.2	50.9	79.7	0.973	
Average Values				**613**	**495**	**2401**	**322.4**	**55.9**	**78.6**	**0.749**	

Table 3 - Adjacent Area Red Drum Sample Stations, Sample IDs, Processing Data, and Analytical Results

Station ID	Sample ID	Date	Time	Total Length (mm)	Standard Length (mm)	Total Weight (g)	Tissue Weight (g)	Sample Weight (g)	Percent Moisture	Total Hg wet weight (µg/g)	Flag
LVB5839	B12b-TF-18566	9/29/2016	7:23	697	580	3750	510.9	60.8	80.9	0.368	
LVB5838	B12b-TF-18567	10/3/2016	8:25	592	480	2280	316.5	61.7	80.0	0.239	
LVB6880	B12b-TF-18569	10/5/2016	8:31	659	545	3180	459.6	62.6	80.9	0.484	
LVB6870	B12b-TF-18570	10/5/2016	9:21	531	425	1450	187.6	44.5	78.9	0.440	
LVB6870	B12b-TF-18571	10/6/2016	7:52	687	560	3290	448.8	62.3	78.5	0.417	
LVB6871	B12b-TF-18572	10/6/2016	8:12	702	580	3700	502.3	58.7	78.0	0.320	
LVB5841	B12b-TF-18575	10/10/2016	8:00	669	545	3150	510.1	61.9	78.6	0.360	
LVB6870	B12b-TF-18579	10/12/2016	8:16	624	490	2380	369.2	59.9	80.1	0.378	
LVB6950	B12b-TF-18580	10/12/2016	7:45	706	575	3750	552.2	67.4	78.2	0.324	
CLO5830	B12b-TF-18581	10/12/2016	8:53	710	580	3650	510.7	62.2	79.4	0.594	
LVB5839	B12b-TF-18583	10/13/2016	7:42	688	560	3420	532.6	53.0	80.2	0.264	
LVB6837	B12b-TF-18586	10/17/2016	8:13	691	560	3270	392.1	58.3	80.5	0.511	
LVB6950	B12b-TF-18587	10/18/2016	9:15	701	560	3700	451.2	55.8	78.7	0.296	
LVB6871	B12b-TF-18588	10/20/2016	9:24	677	545	3200	428.8	58.9	79.9	0.381	
LVB6950	B12b-TF-18589	10/20/2016	9:48	659	525	3120	445.2	62.8	77.0	0.314	
LVB6871	B12b-TF-18591	10/25/2016	9:05	665	550	2920	376.0	59.6	79.2	0.354	
LVB5839	B12b-TF-18595	10/27/2016	7:21	641	520	2650	398.5	58.7	79.6	0.406	
LVB5839	B12b-TF-18596	10/27/2016	7:21	660	525	2910	381.9	57.4	80.4	0.419	
CLO5830	B12b-TF-18597	11/1/2016	7:00	661	540	2830	354.9	55.9	79.7	0.466	
LVB5841	B12b-TF-18598	11/2/2016	8:23	628	510	2660	348.7	58.0	79.9	0.342	
LVB5838	B12b-TF-18599	11/2/2016	8:45	542	435	1450	191.9	43.0	81.8	0.293	
LVB5841	B12b-TF-18604	11/7/2016	7:15	676	550	3380	485.3	65.4	78.9	0.266	
LVB5838	B12b-TF-18605	11/7/2016	7:45	670	545	2920	395.1	63.7	79.5	0.381	
CLO5830	B12b-TF-18606	11/7/2016	8:40	652	530	2670	376.1	61.2	79.6	0.267	
LVB6880	B12b-TF-18611	11/14/2016	8:00	700	570	3560	524.0	60.0	78.9	0.326	
LVB6850	B12b-TF-18612	11/15/2016	7:15	520	415	1490	271.3	53.8	79.6	0.219	
LVB6850	B12b-TF-18613	11/16/2016	6:53	525	420	1400	213.7	55.0	79.2	0.319	
LVB6850	B12b-TF-18615	11/17/2016	6:40	559	450	1900	282.5	54.4	79.7	0.357	
LVB6880	B12b-TF-18616	11/21/2016	7:00	679	555	2930	379.7	59.6	80.7	0.541	
LVB6837	B12b-TF-18617	11/21/2016	9:00	710	580	3480	483.9	58.1	79.4	0.544	
LVB6837	B12b-TF-18618	11/21/2016	9:00	661	535	2960	410.5	56.9	80.2	0.416	
Average Values				**650**	**527**	**2884**	**403.0**	**58.4**	**79.6**	**0.374**	

Table 4 - Closed Area Juvenile Blue Crab Sample Stations, Sample IDs, Processing Data, and Analytical Results

Station ID	Sample ID	Date	Time	Width (mm)	Crab Weight (g)	Sample Weight (g)	Percent Moisture	Total Hg wet weight (µg/g)	Flag
CLO5802	B12b-TS-19069	9/22/16	17:11	37.0	5.3	42.6	70.8	0.212	
				37.5	4.0				
				30.0	2.9				
				50.0	7.8				
				74.0	22.6				
CLO5802	B12b-TS-19070	9/22/16	17:11	27.0	1.9	10.3	65.3	0.128	
				28.5	1.8				
				32.5	2.7				
				26.5	1.7				
				30.0	2.2				
CLO5815	B12b-TS-19072	9/22/16	17:30	42.0	4.0	51.8	72.9	0.0905	
				74.0	19.3				
				28.5	1.4				
				53.0	9.4				
				66.0	17.7				
CLO5802	B12b-TS-19073	9/23/16	11:10	28.0	2.1	16.3	66.4	0.170	
				29.0	2.0				
				20.0	1.6				
				41.5	4.2				
				41.0	6.4				
LVB5513	B12b-TS-19074	9/26/16	12:55	71.5	27.2	53.5	65.8	0.102	
				58.5	12.5				
				33.0	2.8				
				43.0	7.9				
				37.0	3.1				
CLO6802	B12b-TS-19075	9/22/16	16:24	40.0	3.6	29.4	71.3	0.0562	
				40.0	4.4				
				42.0	7.3				
				44.0	6.7				
				49.0	7.4				
CLO6802	B12b-TS-19076	9/26/16	12:31	36.5	3.8	26.6	68.5	0.0600	
				28.5	1.9				
				29.0	1.7				
				35.0	2.9				
				54.0	16.3				
CLO6802	B12b-TS-19081	9/26/16	12:31	31.1	2.0	61.6	66.3	0.0875	
				72.8	30.8				
				45.3	7.1				
				55.9	9.6				
				51.2	12.1				

Table 4 - Closed Area Juvenile Blue Crab Sample Stations, Sample IDs, Processing Data, and Analytical Results

Station ID	Sample ID	Date	Time	Width (mm)	Crab Weight (g)	Sample Weight (g)	Percent Moisture	Total Hg wet weight (µg/g)	Flag
LVB5504	B12b-TS-19083	9/22/16	16:54	66.0	15.2	39.5	70.1	0.109	
				55.8	10.2				
				41.1	6.3				
				30.7	2.3				
				42.4	5.5				
CLO5814	B12B-TS-19085	9/22/16	16:13	71.9	19.5	87.9	72.5	0.0775	
				58.9	14.2				
				73.1	21.4				
				68.1	19.7				
				54.4	13.1				
CLO5900	B12B-TS-19086	9/22/16	16:44	45.2	5.9	34.0	70.5	0.0817	
				51.9	8.2				
				65.8	11.0				
				42.9	4.2				
				42.7	4.7				
LVB5508	B12b-TS-19089	9/26/16	13:32	36.7	4.3	37.9	66.9	0.269	
				35.6	4.0				
				30.5	2.9				
				28.6	2.0				
				64.1	24.7				
LVB5508	B12b-TS-19090	9/28/17	10:30	70.8	30.9	84.6	72.1	0.197	
				69.0	26.9				
				37.8	5.2				
				61.2	18.8				
				31.4	2.8				
LVB5508	B12b-TS-19091	9/28/16	10:30	68.9	32.9	72.4	68.7	0.283	
				69.4	31.0				
				33.3	3.1				
				33.3	2.9				
				32.2	2.5				
CLO5814	B12b-TS-19095	10/2/16	15:05	44.7	6.7	45.3	74.2	0.0484	
				67.9	20.2				
				50.2	7.7				
				33.3	2.3				
				50.4	8.4				
LVB5504	B12b-TS-19097	9/27/16	18:00	26.4	1.7	53.7	72.8	0.104	
				33.7	2.4				
				73.3	23.1				
				66.3	20.9				
				40.0	5.6				

Table 4 - Closed Area Juvenile Blue Crab Sample Stations, Sample IDs, Processing Data, and Analytical Results

Station ID	Sample ID	Date	Time	Width (mm)	Crab Weight (g)	Sample Weight (g)	Percent Moisture	Total Hg wet weight (µg/g)	Flag
CLO5900	B12b-TS-19099	9/27/16	17:30	35.5	2.5	24.1	75.1	0.0810	
				31.4	2.1				
				58.2	14.6				
				35.3	2.6				
				32.0	2.3				
CLO5900	B12b-TS-19100	10/2/16	14:43	33.0	2.6	31.4	68.0	0.0893	
				42.9	5.0				
				47.5	7.6				
				27.8	1.8				
				60.8	14.4				
LVB5513	B12b-TS-19102	9/28/16	11:00	33.0	3.1	50.2	69.1	0.0964	
				70.1	24.3				
				26.7	1.5				
				36.7	4.7				
				62.5	16.6				
CLO5803	B12b-TS-19103	9/28/16	12:00	58.6	11.4	48.7	71.9	0.148	
				61.8	13.7				
				65.0	16.7				
				27.0	1.7				
				41.6	5.2				
CLO5815	B12b-TS-19104	9/29/16	13:05	37.6	3.2	29.4	67.1	0.0570	
				34.0	2.3				
				49.4	6.1				
				64.6	16.1				
				32.4	1.7				
LVB5517	B12b-TS-19105	10/2/16	15:20	29.1	2.4	19.2	65.7	0.0985	
				27.5	1.5				
				32.0	1.8				
				28.4	1.5				
				56.9	12.0				
LVB5517	B12b-TS-19106	10/4/16	11:18	26.8	1.0	25.4	71.1	0.104	
				42.0	4.8				
				35.2	3.3				
				42.5	5.7				
				52.5	10.6				
CLO5814	B12b-TS-19108	10/2/16	15:05	49.4	8.5	49.1	68.7	0.0610	
				65.7	16.9				
				57.1	14.2				
				35.6	3.5				
				46.4	6.0				

Table 4 - Closed Area Juvenile Blue Crab Sample Stations, Sample IDs, Processing Data, and Analytical Results

Station ID	Sample ID	Date	Time	Width (mm)	Crab Weight (g)	Sample Weight (g)	Percent Moisture	Total Hg wet weight (µg/g)	Flag
LVB5504	B12b-TS-19109	10/3/16	10:40	33.2	2.2	56.4	66.5	0.116	
				51.7	14.8				
				56.5	14.0				
				33.3	2.8				
				68.6	22.6				
LVB5517	B12b-TS-19111	10/4/16	11:18	26.6	1.2	11.9	65.6	0.0742	
				37.3	3.4				
				29.1	1.7				
				37.2	4.2				
				26.7	1.4				
LVB5513	B12b-TS-19112	10/4/16	10:11	69.1	25.8	54.8	69.3	0.0668	
				55.0	10.0				
				48.1	8.3				
				37.7	3.5				
				51.2	7.2				
CLO5803	B12b-TS-19116	10/4/16	10:51	51.3	13.6	76.3	68.9	0.230	
				70.8	34.2				
				47.4	6.5				
				74.0	18.5				
				31.7	3.5				
CLO5803	B12b-TS-19118	10/9/16	19:00	25.8	1.4	19.0	66.6	0.263	
				27.4	1.3				
				29.0	2.0				
				26.4	1.5				
				51.4	12.8				
CLO5815	B12b-TS-19121	10/6/16	11:55	48.4	14.8	38.1	66.6	0.0561	
				50.4	12.0				
				32.5	2.3				
				43.1	4.7				
				36.7	4.3				
Average Values				**44.9**	**8.5**	**43.9**	**69.2**	**0.1206**	

Table 5 - Adjacent Area Juvenile Blue Crab Sample Stations, Sample IDs, Processing Data, and Analytical Results

Station ID	Sample ID	Date	Time	Width (mm)	Crab Weight (g)	Sample Weight (g)	Percent Moisture	Total Hg wet weight (µg/g)	Flag
LVB6870	B12b-TS-19060	9/22/16	15:30	46.0	9.0	35.5	70.5	0.0375	
				38.0	5.9				
				45.0	10.7				
				38.0	5.8				
				33.0	4.1				
LVB6837	B12b-TS-19061	9/22/16	18:00	43.0	7.2	53.0	66.2	0.0632	
				41.0	4.7				
				70.0	27.6				
				46.0	7.0				
				48.0	6.5				
LVB6837	B12b-TS-19062	9/22/16	18:00	68.0	21.2	45.3	71.4	0.0458	
				48.0	6.2				
				28.5	2.0				
				56.0	12.3				
				38.0	3.6				
LVB6850	B12b-TS-19063	9/22/16	13:36	45.0	6.4	20.3	69.7	0.0623	
				39.0	3.8				
				34.0	3.1				
				35.0	3.9				
				32.5	3.1				
LVB6850	B12b-TS-19064	9/22/16	13:36	26.0	1.7	25.5	68.5	0.0644	
				38.0	4.6				
				35.0	3.2				
				42.5	5.8				
				54.0	10.2				
LVB6871	B12b-TS-19065	9/22/16	15:42	28.0	2.3	31.8	67.2	0.0567	
				30.0	3.1				
				30.5	2.0				
				57.0	12.8				
				52.5	11.6				
LVB6871	B12b-TS-19066	9/22/16	15:42	26.0	1.6	34.2	68.7	0.0440	
				35.0	3.4				
				60.5	15.6				
				38.0	3.7				
				55.5	9.9				
LVB5839	B12b-TS-19067	9/22/16	13:15	71.0	35.1	55.9	66.1	0.0698	
				35.5	4.8				
				35.0	4.3				
				41.0	5.4				
				44.0	6.3				

Table 5 - Adjacent Area Juvenile Blue Crab Sample Stations, Sample IDs, Processing Data, and Analytical Results

Station ID	Sample ID	Date	Time	Width (mm)	Crab Weight (g)	Sample Weight (g)	Percent Moisture	Total Hg wet weight (µg/g)	Flag
LVB5839	B12b-TS-19068	9/22/16	13:15	29.5	2.2	47.3	69.3	0.0553	
				39.0	5.5				
				44.0	6.6				
				57.0	14.9				
				67.0	18.1				
LVB5839	B12b-TS-19071	9/22/16	13:15	66.5	22.6	43.6	68.9	0.0609	
				39.5	6.1				
				34.0	3.7				
				39.0	6.4				
				35.5	4.8				
LVB6871	B12b-TS-19077	9/23/16	9:50	57.0	12.1	35.8	67.4	0.0403	
				36.5	4.1				
				49.0	8.6				
				45.0	7.8				
				33.0	3.2				
LVB6870	B12b-TS-19078	9/22/16	15:30	31.0	3.2	24.5	69.3	0.0406	
				35.0	3.5				
				33.0	2.9				
				38.0	4.4				
				49.5	10.5				
LVB6837	B12b-TS-19082	9/23/16	11:50	74.1	22.9	52.1	69.4	0.0563	
				38.5	4.3				
				34.9	2.9				
				29.8	2.5				
				67.3	19.5				
LVB6850	B12b-TS-19084	9/23/16	8:00	26.4	1.6	32.8	66.0	0.0851	
				28.3	2.5				
				32.9	2.7				
				29.8	2.1				
				70.5	23.9				
LVB6880	B12b-TS-19087	9/22/16	13:57	44.3	5.7	32.4	68.0	0.0313	
				63.9	20.4				
				36.7	3.2				
				28.9	1.8				
				28.8	1.3				
LVB6870	B12b-TS-19088	9/26/16	11:55	36.0	4.8	40.6	70.0	0.0480	
				56.4	17.2				
				44.1	8.5				
				35.7	4.0				
				38.8	6.1				

Table 5 - Adjacent Area Juvenile Blue Crab Sample Stations, Sample IDs, Processing Data, and Analytical Results

Station ID	Sample ID	Date	Time	Width (mm)	Crab Weight (g)	Sample Weight (g)	Percent Moisture	Total Hg wet weight (µg/g)	Flag
LVB6880	B12b-TS-19092	9/27/16	16:55	35.1	2.8	20.3	67.6	0.0240	
				48.2	7.2				
				49.0	7.5				
				26.0	1.3				
				27.8	1.5				
LVB5838	B12b-TS-19093	9/26/16	11:05	65.1	27.4	49.5	66.6	0.0644	
				44.3	7.6				
				28.6	2.1				
				36.8	3.9				
				44.4	8.5				
LVB6853	B12b-TS-19096	9/29/16	12:15	41.0	4.8	47.8	67.0	0.0651	
				56.3	17.2				
				47.6	8.3				
				50.8	11.5				
				44.4	6.0				
LVB6852	B12b-TS-19098	9/27/16	16:46	60.1	20.3	124.5	70.0	0.0956	
				65.5	25.3				
				71.9	33.3				
				60.7	23.1				
				61.2	22.5				
LVB6880	B12b-TS-19101	9/29/16	10:18	37.0	3.0	17.0	69.7	0.0356	
				45.8	8.1				
				29.0	1.8				
				26.9	2.0				
				27.4	2.1				
LVB6853	B12b-TS-19107	10/2/16	18:10	44.5	7.3	53.4	69.0	0.0438	
				61.2	19.4				
				40.6	5.5				
				46.9	7.5				
				56.8	13.7				
LVB5838	B12b-TS-19110	10/4/16	12:00	47.1	8.0	42.5	72.0	0.0311	
				41.1	6.9				
				47.7	8.3				
				36.4	4.0				
				52.5	15.3				
LVB5838	B12b-TS-19113	10/6/16	11:20	37.2	4.9	78.6	69.5	0.0554	
				61.1	15.3				
				70.3	35.1				
				37.8	5.1				
				59.2	18.2				

Table 5 - Adjacent Area Juvenile Blue Crab Sample Stations, Sample IDs, Processing Data, and Analytical Results

Station ID	Sample ID	Date	Time	Width (mm)	Crab Weight (g)	Sample Weight (g)	Percent Moisture	Total Hg wet weight (µg/g)	Flag
LVB6852	B12b-TS-19114	10/4/16	12:34	65.5	28.4	84.8	67.1	0.0809	
				28.7	2.5				
				44.1	8.3				
				73.4	35.7				
				48.2	9.9				
LVB6853	B12b-TS-19115	10/6/16	11:10	25.8	1.4	22.7	66.6	0.0581	
				30.2	2.4				
				41.9	5.1				
				47.8	9.2				
				38.7	4.6				
LVB6852	B12b-TS-19117	10/9/16	17:05	71.2	34.9	151.6	68.1	0.125	
				68.3	30.2				
				61.1	23.4				
				69.1	30.6				
				74.9	32.5				
LVB6975	B12b-TS-19119	10/6/16	11:36	26.1	1.6	40.1	72.9	0.0283	
				31.3	3.1				
				53.8	10.0				
				52.0	13.4				
				56.8	12.0				
LVB6975	B12b-TS-19120	10/11/16	10:30	54.1	11.3	31.5	72.9	0.0251	
				42.2	5.9				
				46.2	6.6				
				42.0	6.5				
				25.2	1.2				
LVB6975	B12b-TS-19122	10/12/16	9:52	45.7	6.4	42.8	67.0	0.0330	
				44.0	6.9				
				43.8	5.8				
				35.3	3.7				
				60.5	20.0				
Average Values				**44.9**	**9.5**	**50.9**	**68.8**	**0.0542**	

4.0 REFERENCES

Alcoa, 2005a. Appendix B. *Statement of Work for Remedial Action. Alcoa (Point Comfort) / Lavaca Bay Superfund Site. Lavaca Bay Finfish and Shellfish Operations, Maintenance, and Monitoring Plan. Alcoa (Point Comfort) / Lavaca Bay Superfund Site.* October 2003. Appendix I.

Alcoa, 2005b. Appendix E. *Standard Operating Procedure for Data Validation. Quality Assurance Project Plan.* Alcoa (Point Comfort) / Lavaca Bay Superfund Site. August 22, 2005.

APPENDIX D2
LAVACA BAY RED DRUM GUT CONTENT SURVEY REPORT

LAVACA BAY RED DRUM GUT CONTENT SURVEY REPORT
2016

Alcoa Point Comfort Operations
Lavaca Bay Superfund Site

March 2017

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LIST OF ACRONYMS AND ABBREVIATIONS

ft	foot / feet
in	inch(es)
mm	millimeter(s)
RAAER	Remedial Action Annual Effectiveness Report

1.0 INTRODUCTION

A key factor in the success of the Lavaca Bay Remedy is the reduction in tissue mercury concentrations through targeted source control efforts, sediment removal efforts, capping, enhanced natural recovery, and/or natural recovery. In accordance with Section 4.4 (Recommendations) of the *2014 Remedial Action Annual Effectiveness Report* (RAAER) (Alcoa, 2015), gut content surveys have been conducted to improve our understanding of food web pathways by which methylmercury bioaccumulates in red drum.

1.1 PURPOSE AND SCOPE

The objective of the Gut Content Survey was to evaluate the stomach contents of red drum collected for the 2016 monitoring event and to determine if prey items with elevated levels of mercury, other than the species routinely monitored, are being consumed by red drum (*Sciaenops ocellatus*).

The stomach contents of each red drum collected and processed for the 2016 Annual Monitoring Study were removed, sorted, and identified for this survey. Thirty fish were collected from the Closed Area stations and thirty-one fish were collected from Adjacent Open Area stations.

1.2 SITE DESCRIPTION

An area in Lavaca Bay adjacent to the Alcoa Plant is associated with elevated mercury concentrations in fish tissue and is closed to the taking of finfish and blue crabs for consumption by order of the Texas Department of State Health Services. This region is referred to as the Closed Area. Sampling locations outside of the Closed Area were designated the Adjacent Open Area. Monitoring strategies and requirements are specified in the *Lavaca Bay Finfish and Shellfish Operations, Maintenance, and Monitoring Plan (OMMP, Appendix I – to the Consent Decree/ Statement of Work*, Alcoa, 2005).

2.0 METHODS

As described in the Lavaca Bay Finfish and Shellfish Monitoring Report 2016 (Appendix D1) legal-sized red drum were collected and processed by Benchmark Ecological Services, Inc. (Benchmark) between September 27, 2016 and December 6, 2016. Processing was conducted at the Alcoa Clean Lab on the Alcoa Facility, in Point Comfort, Texas (Point Comfort Operations). None of the stomach contents collected for this survey were chemically analyzed.

2.1 SAMPLE STATIONS

Sample station locations are shown on Figures 1 and 2 in the Lavaca Bay Finfish and Shellfish Monitoring Report 2016 (Appendix D1).

Table 1 shows the number of red drum collected by zone. The distribution of red drum ranged from 3 fish in Zone 1 to 15 fish in Zone 2. The uneven distribution of samples is due to the irregular distribution of suitable habitat within the zones.

Table 1 – Red Drum Collected by Zone

Zone	Red Drum
Zone 1	3
Zone 2	15
Zone 3	6
Zone 4	6

2.2 SAMPLE COLLECTION

A detailed description of the methods for collecting red drum for this survey is provided in the Lavaca Bay Finfish and Shellfish Monitoring Report 2016 (Appendix D1). This effort was conducted according to procedures developed by Alcoa for gut content surveys performed in 2011 and 2012 which are described in Benchmark Standard Operating Procedure SOP-BESI-515. Only legal-sized red drum (508-711 mm; 20-28 in total length) were retained for this survey. Undersized and oversized red drum and specimens of other species were returned to the water.

2.3 SAMPLE PROCESSING

Red drum samples were processed on the date of collection in the Alcoa Clean Lab and remained on ice until processing was complete. After the right fillet (with skin) was removed from each fish and placed in a sample container, the abdominal cavity was opened and the stomach removed. Removal involved cutting the esophagus just above and the intestine and just below the stomach. The stomach was then cut open, and its contents were removed and placed on a cutting board.

Identifiable contents were separated by species and counted. Gut contents were photographed and the associated red drum sample IDs were recorded on the gut content data sheet along with species counts (Tables 2 and 3). Representative photos are included in the data transmission to the USEPA.

3.0 OBSERVATIONS

Observations and figures are based on prey species occurrence per red drum, rather than total count (Figures 1 through 4) to reflect general feeding trends without weighing the dataset if one fish gut exhibits an abundance of a single prey item. The following was observed:

- Juvenile blue crabs were not the most abundant species in the gut, but are consistently found in red drum, especially in fish collected near marshes.
- The most common prey items from Closed Area reefs were worm eels (*Myrophis punctatus*) and hardhead catfish (A*riopsis felis*), whereas the most common prey items from Adjacent Open Area reefs were hardhead catfish and juvenile blue crab (*Callinectes sapidus*).
- The most common prey items from Closed Area marshes were hardhead catfish and juvenile blue crabs, whereas the most common prey items from Adjacent Open Area marshes were juvenile blue crabs, hardhead catfish, and penaeid shrimp (*Litopenaeus setiferus*, *Farfantepenaeus aztecus*, and *Farfantepenaeus duorarum*).
- A significant number of red drum collected in both reef and marsh habitats in the Closed and Adjacent Open areas had empty guts.
- This is the first Lavaca Bay Gut Content Survey to find hardhead catfish as a major component of the red drum diet.

Table 2 - 2016 Closed Area Red Drum Gut Contents

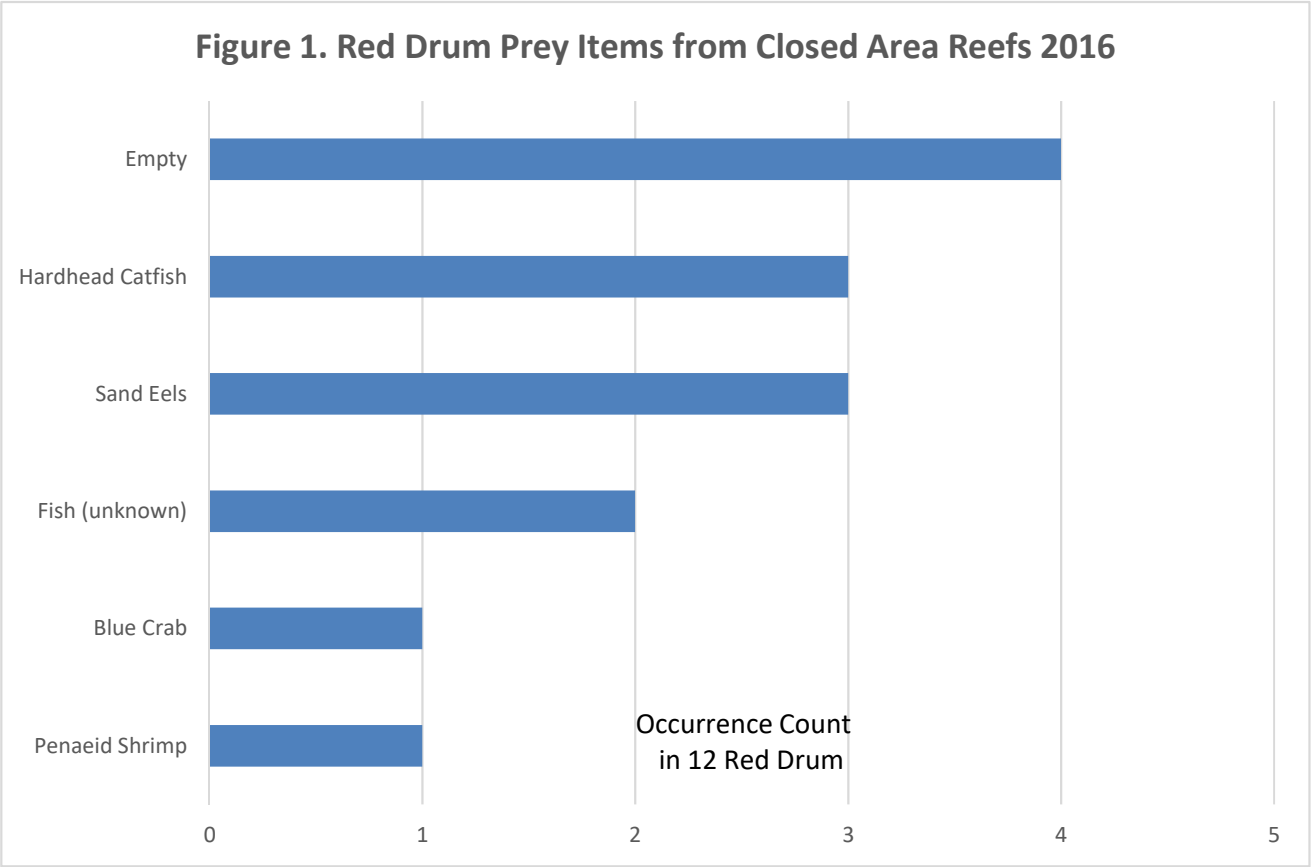
Habitat	Station ID	Sample ID	Gut Content			
			Content	Number	Internal Parasites Present	Gut Content Weight (g)
Reef	CLO5815	B12b-TF-18608	Sand Eel	1	y	1.5
	CLO5815	B12b-TF-18609	Single Hardhead Catfish Bone	1		NR
	CLO5815	B12b-TF-18610	Hardhead Catfish	1		6.0
	LVB5508	B12b-TF-18560	Unidentified Tissue	1		1.1
	LVB5508	B12b-TF-18619	Sand Eel	4		17.1
			Unidentified Fish	2		
			Juvenile Blue Crab	1		
	LVB5508	B12b-TF-18624	Sand Eel	1		0.8
	LVB5513	B12b-TF-18592	Empty Gut	[1]NA	y	NA
	LVB5513	B12b-TF-18574	Empty Gut	[1]NA		NA
	LVB5513	B12b-TF-18622	Empty Gut	[1]NA	y	NA
	LVB5518	B12b-TF-18584	Penaeid Shrimp	4		3.2
	LVB5518	B12b-TF-18585	Hardhead Catfish	3	y	12.4
	LVB5518	B12b-TF-18564	Empty Gut	[1]NA		NA
Marsh	CLO5802	B12b-TF-18568	Penaeid Shrimp	2		4.2
	CLO5802	B12b-TF-18577	Penaeid Shrimp	8		13.3
	CLO5802	B12b-TF-18593	Hardhead Catfish	3		13.5
			Sand Eel	1		
	CLO5803	B12b-TF-18576	Empty Gut	[1]NA		NA
	CLO5803	B12b-TF-18607	Grass Shrimp	3		1.9
			Juvenile Blue Crab	1		
			Hardhead Catfish	1		
	CLO5803	B12b-TF-18614	Empty Gut	[1]NA		NA
	CLO5814	B12b-TF-18573	Empty Gut	[1]NA		NA
	CLO5814	B12b-TF-18578	Sand Eel	1		6.5
			Unidentified Fish	1		
	CLO5814	B12b-TF-18582	Hardhead Catfish Spine	1		0.1
	CLO5818	B12b-TF-18562	Juvenile Blue Crab	1		3.3
	CLO5818	B12b-TF-18594	Empty Gut	[1]NA		NA
	CLO5818	B12b-TF-18620	Pinfish	1	y	21.2
	CLO5900	B12b-TF-18565	Empty Gut	[1]NA		NA
	CLO5900	B12b-TF-18590	Hardhead Catfish	2		58.1
	CLO5900	B12b-TF-18621	Sand Eel	1	y	3.0
			Mud Crab	1		
	LVB5504	B12b-TF-18561	Juvenile Blue Crab	1		9.3
			Stone Crab	1		
	LVB5504	B12b-TF-18623	Empty Gut	[1]NA		NA
	LVB5504	B12b-TF-18625	Unidentified Fish	1		1.1

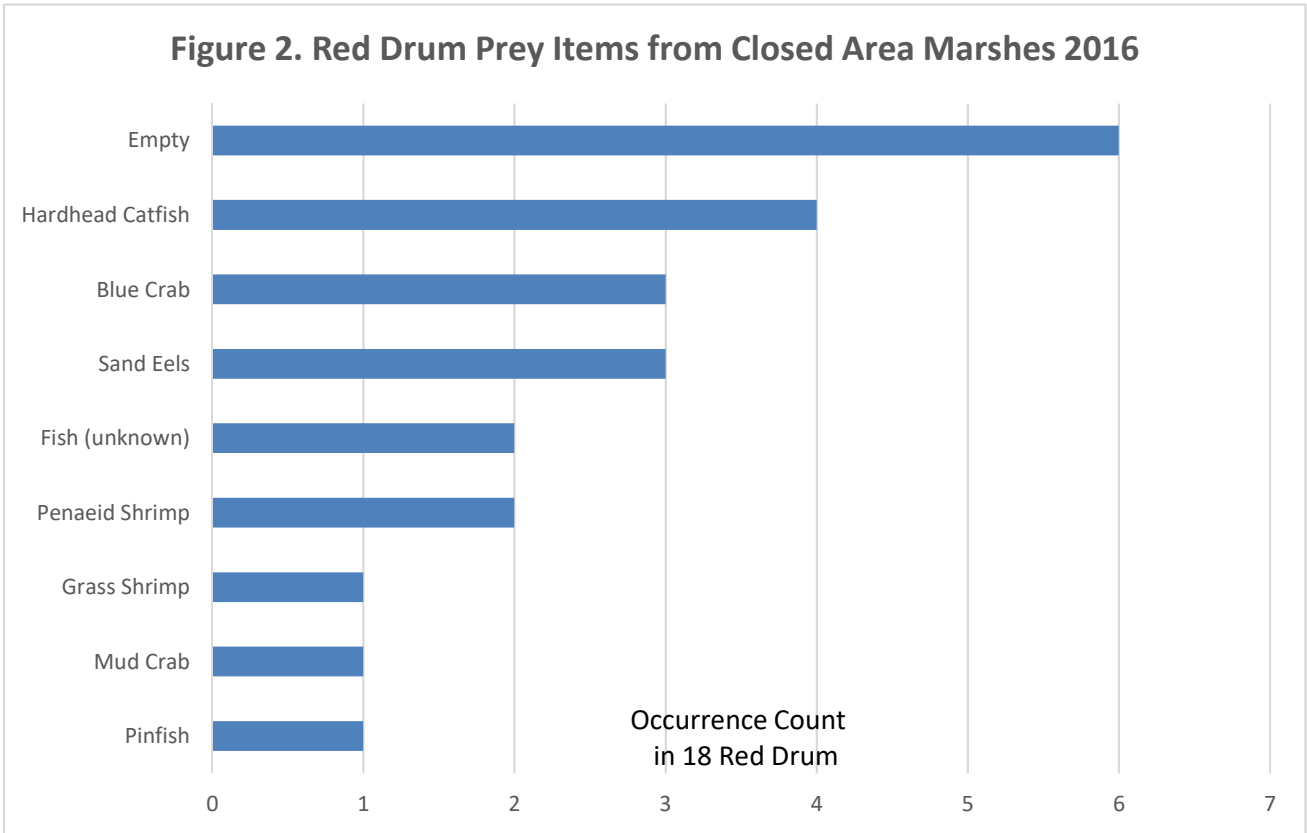
[1]NA - Gut cavity was empty

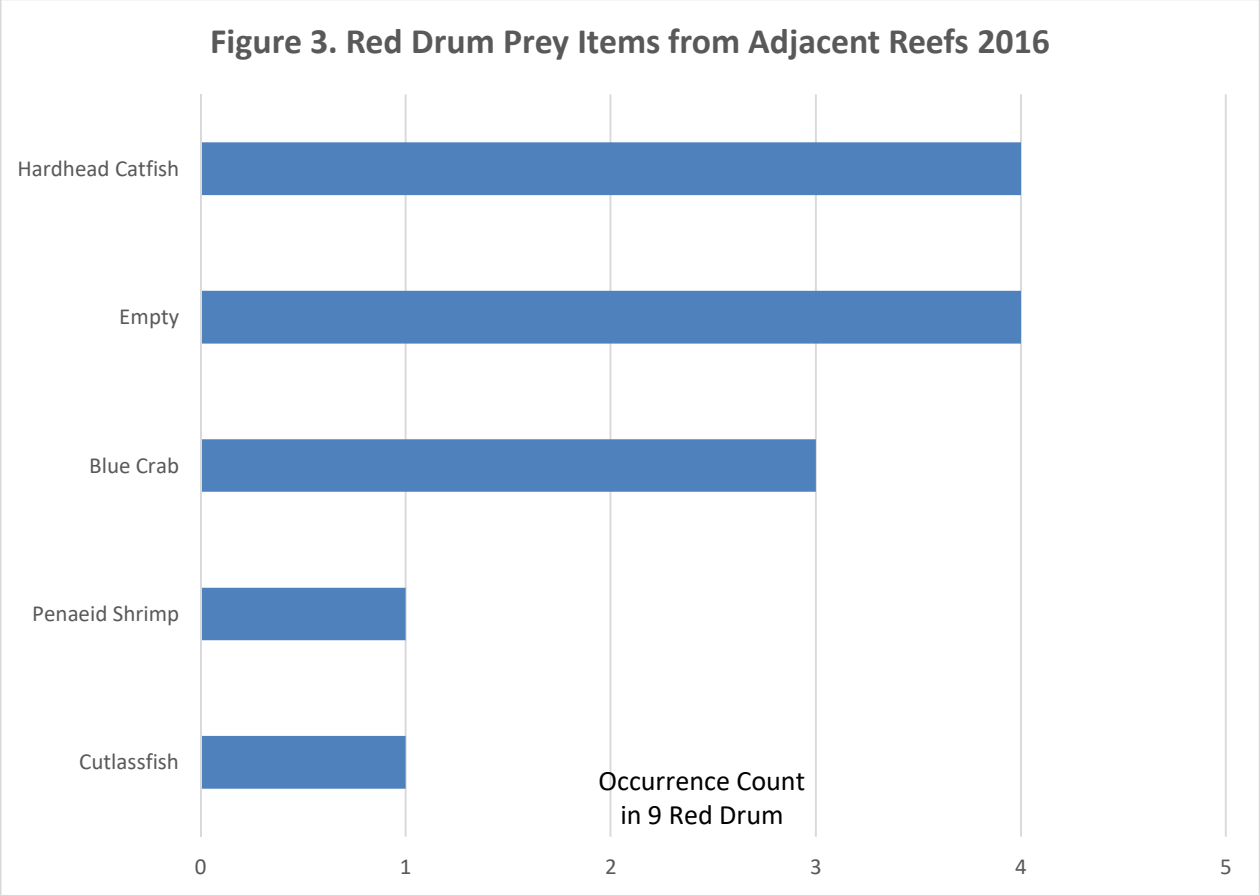
Table 3 - 2016 Adjacent Area Red Drum Gut Contents

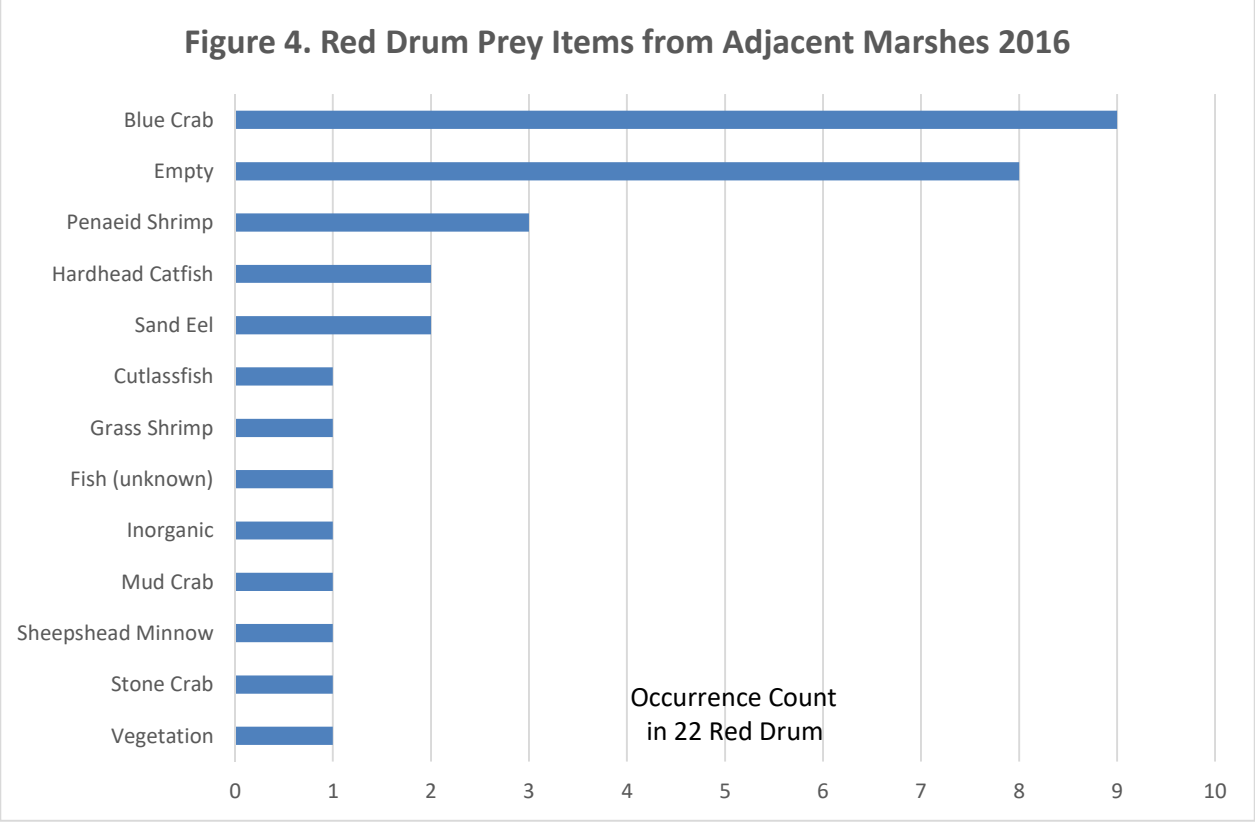
Habitat	Station ID	Sample ID	Gut Content			
			Content	Number	Internal Parasites Present	Gut Content Weight (g)
Reef	LVB6880	B12B-TF-18616	Hardhead Catfish	1	y	5.2
	LVB6837	B12B-TF-18617	Penaeid Shrimp	3		9.6
	LVB6837	B12B-TF-18618	Empty Gut	[1]NA		NA
	LVB6880	B12B-TF-18611	Empty Gut	[1]NA	y	NA
	LVB6950	B12B-TF-18589	Juvenile Blue Crab	1		142.2
			Hardhead Catfish	1		
			Cutlassfish	12		
	LVB6837	B12B-TF-18586	Empty Gut	[1]NA		NA
	LVB6950	B12B-TF-18587	Juvenile Blue Crab	1		14.9
			Hardhead Catfish	1		
	LVB6950	B12B-TF-18580	Juvenile Blue Crab	1		26.6
			Hardhead Catfish	1		
	LVB6880	B12B-TF-18569	Empty Gut	[1]NA		NA
Marsh	LVB5841	B12B-TF-18575	Juvenile Blue Crab	1		14.9
			Sand Eel	1		
	LVB5841	B12B-TF-18598	Juvenile Blue Crab	1		50.1
			Unidentified Fish	1		
	LVB5841	B12B-TF-18604	Empty Gut	[1]NA		NA
	LVB5839	B12B-TF-18566	Juvenile Blue Crab	1		10.3
	LVB5838	B12B-TF-18567	Empty Gut	[1]NA		NA
	LVB6870	B12B-TF-18570	Sheepshead Minnow	1		4.0
			Penaeid Shrimp	2		
			Grass Shrimp	2		
	LVB6870	B12B-TF-18571	Juvenile Blue Crab	1		5.3
	LVB6871	B12B-TF-18572	Empty Gut	[1]NA		NA
	LVB6870	B12B-TF-18579	Hardhead Catfish	1		3.8
	CLO5830	B12B-TF-18581	Empty Gut	[1]NA		NA
	LVB5839	B12B-TF-18583	Empty Gut	[1]NA	y	NA
	LVB6871	B12B-TF-18588	Juvenile Blue Crab	3	y	91.3
			Stone Crab	1		
	LVB6871	B12B-TF-18591	Hardhead Catfish	8		52.9
			Spartina spp. Vegetation	1		
			Juvenile Blue Crab	1		
	LVB5839	B12B-TF-18595	Softshell Blue Crab	1		40.7
	LVB5839	B12B-TF-18596	Empty Gut	[1]NA	y	NA
	CLO5830	B12B-TF-18597	Mud Crab	1		1.6
	LVB5838	B12B-TF-18599	Fishing Jig with Head	1		14.1
	LVB5838	B12B-TF-18605	Penaeid Shrimp	1	y	2.9
	CLO5830	B12B-TF-18606	Blue Crab Claw	1		20.7
			Cutlassfish	2		
	LVB6850	B12B-TF-18613	Empty Gut	[1]NA		NA
	LVB6850	B12B-TF-18612	Empty Gut	[1]NA		NA
	LVB6850	B12B-TF-18615	Penaeid Shrimp	3		9.7
			Sand Eel	1	y	
			Mud Crab	1		
			Juvenile Blue Crab	3		

[1]NA - Gut cavity was empty


Figure 1. Red Drum Prey Items from Closed Area Reefs 2016
Empty
Hardhead Catfish
Sand Eels
Fish (unknown)
Blue Crab
Penaeid Shrimp
Occurrence Count in 12 Red Drum
0
1
2
3
4
5


Figure 2. Red Drum Prey Items from Closed Area Marshes 2016
Empty
Hardhead Catfish
Blue Crab
Sand Eels
Fish (unknown)
Penaeid Shrimp
Grass Shrimp
Mud Crab
Pinfish
Occurrence Count in 18 Red Drum
0
1
2
3
4
5
6
7


Figure 3. Red Drum Prey Items from Adjacent Reefs 2016
Hardhead Catfish
Empty
Blue Crab
Penaeid Shrimp
Cutlassfish
Occurrence Count
in 9 Red Drum
0
1
2
3
4
5


Figure 4. Red Drum Prey Items from Adjacent Marshes 2016
Blue Crab
Empty
Penaeid Shrimp
Hardhead Catfish
Sand Eel
Cutlassfish
Grass Shrimp
Fish (unknown)
Inorganic
Mud Crab
Sheepshead Minnow
Stone Crab
Vegetation
Occurrence Count
in 22 Red Drum
0
1
2
3
4
5
6
7
8
9
10

4.0 REFERENCES

Alcoa, 2005. Appendix B. *Statement of Work for Remedial Action. Alcoa (Point Comfort) / Lavaca Bay Superfund Site. Lavaca Bay Finfish and Shellfish Operations, Maintenance, and Monitoring Plan.* Alcoa (Point Comfort) / Lavaca Bay Superfund Site. October 2003. Appendix I.

Alcoa, 2015. *2014 Remedial Action Annual Effectiveness Report.* Alcoa (Point Comfort) / Lavaca Bay Superfund Site. March 31, 2015.

APPENDIX E
SHORT-TERM WATER COLUMN SAMPLING IN EAST CAUSEWAY COVE

SHORT-TERM WATER COLUMN SAMPLING IN EAST CAUSEWAY COVE 2016

Alcoa Point Comfort Operations
Lavaca Bay Superfund Site

March 2017

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LIST OF ACRONYMS AND ABBREVIATIONS

ALS	ALS Laboratory Group/Laboratory
DHg	Dissolved Mercury
ECC	Eastern Causeway Cove
ft	foot / feet
GPS	Global Positioning System
ID	Identification
OMMP	Operation Maintenance and Monitoring Plan
PHg	Particulate Mercury
RAAER	Remedial Action Annual Effectiveness Report
THg	Total Mercury
TSS	Total Suspended Solids

1.0 INTRODUCTION

Routine and supplemental studies conducted in the Closed Area during the fall of 2015 indicate that recovery of mercury levels in surface sediments and prey items in the majority of the Closed Area is continuing, but recovery in the eastern portion of the Closed Area from Mainland Shoreline No. 3 (MS3) to Causeway Cove has been less effective (Alcoa, March 2016a). This area may serve as a significant source of mercury for the red drum food chain. The results of studies conducted in the fall of 2015 and spring of 2016 indicate that erosion at MS3 and resuspension of sediments in the Witco Channel and Causeway Cove are sources of mercury that could be transported into red drum habitat areas (Alcoa, September 2016b; Alcoa, September 2016c).

This project was conducted to provide additional information about movement of suspended mercury in the Causeway Cove Area, and to determine if this source of mercury might account for the reduced level of recovery in the region. This project may also provide information about where sediment mercury sources still exist and support the development of focused remedial alternatives.

1.1 PURPOSE AND SCOPE

Short-term water column sampling in Eastern Causeway Cove (ECC) consisted of the collection of surface water grab samples at eleven locations within the Witco Cut and ECC during a flood tide. Four events were targeted; sampling locations and results are shown on Figures 1 through 4. Samples were analyzed for total mercury (THg), dissolved mercury (DHg), particulate mercury (PHg), and total suspended solids (TSS).

This document presents a summary of sampling and analytical methods and the results of the short-term water column monitoring.

1.2 SITE DESCRIPTION

Alcoa Point Comfort Operations is located in Calhoun County, Texas, adjacent to Lavaca Bay. The area in the bay adjacent to the Alcoa Plant is associated with elevated mercury concentrations in fish tissue and is closed to the taking of finfish and shellfish for consumption by order of the Texas Department of State Health Services. This location is referred to as the Closed Area. The project area and sampling strategy for the short-term water column sampling in ECC are documented in the 2016 Fall Work Plan (Alcoa, 2016d).

2.0 METHODS

Water samples were collected and processed by Benchmark Ecological Services, Inc. (Benchmark). Samples collected for TSS, THg, DHg, and PHg were analyzed by Battelle Marine Laboratory in Sequim, Washington. Water samples were collected and processed on October 27, 2016, November 10, 2016, December 13, 2016, and December 21, 2016. Validation and evaluation of the analytical results were conducted by Environmental Chemistry Services, Inc., in Houston, Texas.

2.1 SAMPLE STATIONS

Sample stations were located using maps provided by Anchor QEA. The coordinates were entered into a sub-meter Global Positioning System (GPS), and the GPS was used to position personnel over each sample station. Final coordinates for each station location were recorded using the sub-meter differential GPS. Water sample locations are shown on Figures 1 through 4.

2.2 SAMPLE COLLECTION

Water samples at sample station HRW-016, near Witco Harbor, were collected directly into sample jars provided by the analytical laboratory, using a peristaltic pump and clean tubing. The

water depth at sample station HRW-016 was approximately 10 ft. and the sample was collected at mid-depth.

Water depth for the samples from the 10 sample stations north of the Dredge Island bridge was 1.5 feet below the surface of the water directly into clean 2.5 gallon cubitainers. The water samples were collected directly into cubitainers to reduce the overall time for the sampling event. The average water depth for these sample stations was approximately 4 ft. Cubitainers were labeled with station ID and stored on ice until all water samples were collected. After 10 samples were collected, the cubitainers were shaken up and water for total Hg (THg) and TSS analysis were immediately poured from the cubitainers into clean sample jars provided by the analytical laboratory. A peristaltic pump with clean tubing and 0.45 micron filter was used at each sample station to collect and filter water for dissolved Hg analysis.

Sample containers were labeled with the sample ID, collection date, time, and intended analysis and were placed in re-sealable plastic bags, bubble wrapped, and immediately placed in an insulated chest with ice for storage and transport. Sample station coordinates, sample IDs, and sample collection dates for the open water stations are listed in Table 1. Chain of Custody forms were completed for all samples collected and are maintained in the project files.

Table 1 - 2016 Causeway Water Stations, Sample IDs, Field Data, and Results

Sample Station	Sample ID	Filtered[a]/ Unfiltered[b]	Sample Date	Event	Time	Lab Sample ID	Total Hg (ng/L)	TSS (mg/L)
HRW-008	HRW-008-102716F	Filtered	10/27/2016	1	14:15	3551-242	1.44	
HRW-008	HRW-008-102716U	Unfiltered	10/27/2016	1	14:15	3551-241 r1	12.2	26.1
HRW-009	HRW-009-102716F	Filtered	10/27/2016	1	14:05	3551-240	1.48	
HRW-009	HRW-009-102716U	Unfiltered	10/27/2016	1	14:05	3551-239	10.00	16.6
HRW-010	HRW-010-102716F	Filtered	10/27/2016	1	13:55	3551-238	2.57	
HRW-010	HRW-010-102716U	Unfiltered	10/27/2016	1	13:55	3551-237	11.3	17.3
HRW-011	HRW-011-102716F	Filtered	10/27/2016	1	14:25	3551-244	1.74	
HRW-011	HRW-011-102716U	Unfiltered	10/27/2016	1	14:25	3551-243	20.1	28.7
HRW-012	HRW-012-102716F	Filtered	10/27/2016	1	14:35	3551-246	1.78	
HRW-012	HRW-012-102716U	Unfiltered	10/27/2016	1	14:35	3551-245	14.9	24.4
HRW-013	HRW-013-102716F	Filtered	10/27/2016	1	13:45	3551-248	3.95	
HRW-013	HRW-013-102716U	Unfiltered	10/27/2016	1	13:45	3551-247	12.1	24.0
HRW-014	HRW-014-102716F	Filtered	10/27/2016	1	14:05	3551-252	2.01	
HRW-014	HRW-014-102716U	Unfiltered	10/27/2016	1	14:05	3551-251 r1	13.0	31.2
HRW-015	HRW-015-102716F	Filtered	10/27/2016	1	13:55	3551-250	4.04	
HRW-015	HRW-015-102716U	Unfiltered	10/27/2016	1	13:55	3551-249	13.6	28.6
HRW-016	HRW-016-102716F	Filtered	10/27/2016	1	14:25	3551-256	0.870	
HRW-016	HRW-016-102716U	Unfiltered	10/27/2016	1	14:25	3551-255	5.03	14.1
HRW-ISCOA	HRW-ISCOA-102716F	Filtered	10/27/2016	1	13:45	3551-236	1.97	
HRW-ISCOA	HRW-ISCOA-102716U	Unfiltered	10/27/2016	1	13:45	3551-235 r1	12.7	18.9
HRW-ISCOB	HRW-ISCOB-102716F	Filtered	10/27/2016	1	14:15	3551-254	1.64	
HRW-ISCOB	HRW-ISCOB-102716U	Unfiltered	10/27/2016	1	14:15	3551-253 r1	9.47	19.2
HRW-100	HRW-100-102716F[c]	Filtered	10/27/2016	1	14:30	3551-258	4.07	
HRW-100	HRW-100-102716U[c]	Unfiltered	10/27/2016	1	14:30	3551-257	14.5	31.9
HRW-008	HRW-008-111016F	Filtered	11/10/2016	2	12:25	3551-269	0.762	
HRW-008	HRW-008-111016U	Unfiltered	11/10/2016	2	12:25	3551-270 r1	15.5	34.0
HRW-009	HRW-009-111016F	Filtered	11/10/2016	2	12:25	3551-277	2.50	
HRW-009	HRW-009-111016U	Unfiltered	11/10/2016	2	12:25	3551-278 r1	13.3	26.1
HRW-010	HRW-010-111016F	Filtered	11/10/2016	2	12:20	3551-275	0.763	
HRW-010	HRW-010-111016U	Unfiltered	11/10/2016	2	12:20	3551-276	7.99	15.5
HRW-011	HRW-011-111016F	Filtered	11/10/2016	3	12:30	3551-279	0.962	
HRW-011	HRW-011-111016U	Unfiltered	11/10/2016	2	12:30	3551-280	7.79	16.0
HRW-012	HRW-012-111016F	Filtered	11/10/2016	2	12:35	3551-281	0.439	
HRW-012	HRW-012-111016U	Unfiltered	11/10/2016	2	12:35	3551-282	6.08	16.6
HRW-013	HRW-013-111016F	Filtered	11/10/2016	2	12:40	3551-263	1.43	

Table 1 - 2016 Causeway Water Stations, Sample IDs, Field Data, and Results

Sample Station	Sample ID	Filtered[a]/ Unfiltered[b]	Sample Date	Event	Time	Lab Sample ID	Total Hg (ng/L)	TSS (mg/L)
HRW-013	HRW-013-111016U	Unfiltered	11/10/2016	2	12:40	3551-264	7.82	17.2
HRW-014	HRW-014-111016F	Filtered	11/10/2016	2	12:20	3551-267	0.985	
HRW-014	HRW-014-111016U	Unfiltered	11/10/2016	2	12:20	3551-268	9.72	22.2
HRW-015	HRW-015-111016F	Filtered	11/10/2016	2	12:15	3551-265	0.536	
HRW-015	HRW-015-111016U	Unfiltered	11/10/2016	2	12:15	3551-266	5.87	15.7
HRW-016	HRW-016-111016F	Filtered	11/10/2016	2	12:35	3551-259	0.619	
HRW-016	HRW-016-111016U	Unfiltered	11/10/2016	2	12:35	3551-260 r1	3.59	14.6
HRW-ISCOA	HRW-ISCOA-111016F	Filtered	11/10/2016	2	12:15	3551-273	0.926	
HRW-ISCOA	HRW-ISCOA-111016U	Unfiltered	11/10/2016	2	12:15	3551-274 r1	7.42	15.3
HRW-ISCOB	HRW-ISCOB-111016F	Filtered	11/10/2016	2	12:30	3551-271	0.435	
HRW-ISCOB	HRW-ISCOB-111016U	Unfiltered	11/10/2016	2	12:30	3551-272	2.97	13.1
HRW-100	HRW-100-111016F[d]	Filtered	11/10/2016	2	12:40	3551-261	0.564	
HRW-100	HRW-100-111016U[d]	Unfiltered	11/10/2016	2	12:40	3551-262	6.06	16.0
HRW-008	HRW-008-121316F	Filtered	12/13/2016	3	14:10	3551-284	0.693	
HRW-008	HRW-008-121316U	Unfiltered	12/13/2016	3	14:10	3551-283	2.70	7.98
HRW-009	HRW-009-121316F	Filtered	12/13/2016	3	14:10	3551-286	0.718	
HRW-009	HRW-009-121316U	Unfiltered	12/13/2016	3	14:10	3551-285	2.37	6.67
HRW-010	HRW-010-121316F	Filtered	12/13/2016	3	14:05	3551-288	1.34	
HRW-010	HRW-010-121316U	Unfiltered	12/13/2016	3	14:05	3551-287 r1	2.45	6.36
HRW-011	HRW-011-121316F	Filtered	12/13/2016	3	14:15	3551-290	1.21	
HRW-011	HRW-011-121316U	Unfiltered	12/13/2016	3	14:15	3551-289	2.33	6.75
HRW-012	HRW-012-121316F	Filtered	12/13/2016	3	14;20	3551-292	0.930	
HRW-012	HRW-012-121316U	Unfiltered	12/13/2016	3	14:20	3551-291	4.35	8.99
HRW-013	HRW-013-121316F	Filtered	12/13/2016	3	14:25	3551-294	1.47	
HRW-013	HRW-013-121316U	Unfiltered	12/13/2016	3	14:25	3551-293 r1	3.39	6.79
HRW-014	HRW-014-121316F	Filtered	12/13/2016	3	14:05	3551-296	1.07	
HRW-014	HRW-014-121316U	Unfiltered	12/13/2016	3	14:05	3551-295	1.58	4.25
HRW-015	HRW-015-121316F	Filtered	12/13/2016	3	14:00	3551-298	0.751	
HRW-015	HRW-015-121316U	Unfiltered	12/13/2016	3	14:00	3551-297 r1	3.20	8.17
HRW-016	HRW-016-121316F	Filtered	12/13/2016	3	14:20	3551-300	0.780	
HRW-016	HRW-016-121316U	Unfiltered	12/13/2016	3	14:20	3551-299	2.75	7.16
HRW-ISCOA	HRW-ISCOA-121316F	Filtered	12/13/2016	3	14:00	3551-302	1.60	
HRW-ISCOA	HRW-ISCOA-121316U	Unfiltered	12/13/2016	3	14:00	3551-301 r1	3.23	5.95
HRW-ISCOB	HRW-ISCOB-121316F	Filtered	12/13/2016	3	14:15	3551-304	0.616	
HRW-ISCOB	HRW-ISCOB-121316U	Unfiltered	12/13/2016	3	14:15	3551-303	2.16	5.84

Table 1 - 2016 Causeway Water Stations, Sample IDs, Field Data, and Results

Sample Station	Sample ID	Filtered[a]/ Unfiltered[b]	Sample Date	Event	Time	Lab Sample ID	Total Hg (ng/L)	TSS (mg/L)
HRW-100	HRW-100-121316F[e]	Filtered	12/13/2016	3	14:25	3551-306	0.772	
HRW-100	HRW-100-121316U[e]	Unfiltered	12/13/2016	3	14:25	3551-305	2.77	6.72
HRW-008	HRW-008-122116F	Filtered	12/21/2016	4	11:10	3551-308	0.607	
HRW-008	HRW-008-122116U	Unfiltered	12/21/2016	4	11:10	3551-307	1.43	5.62
HRW-009	HRW-009-122116F	Filtered	12/21/2016	4	10:40	3551-310	0.649	
HRW-009	HRW-009-122116U	Unfiltered	12/21/2016	4	10:40	3551-309 r1	1.35	4.93
HRW-010	HRW-010-122116F	Filtered	12/21/2016	4	10:35	3551-312	0.644	
HRW-010	HRW-010-122116U	Unfiltered	12/21/2016	4	10:35	3551-311	1.49	4.62
HRW-011	HRW-011-122116F	Filtered	12/21/2016	4	10:45	3551-314	0.741	
HRW-011	HRW-011-122116U	Unfiltered	12/21/2016	4	10:45	3551-313	1.35	4.88
HRW-012	HRW-012-122116F	Filtered	12/21/2016	4	10:50	3551-316	1.11	
HRW-012	HRW-012-122116U	Unfiltered	12/21/2016	4	10:50	3551-315	1.42	4.08
HRW-013	HRW-013-122116F	Filtered	12/21/2016	4	10:55	3551-318	0.631	
HRW-013	HRW-013-122116U	Unfiltered	12/21/2016	4	10:55	3551-317	1.88	3.85
HRW-014	HRW-014-122116F	Filtered	12/21/2016	4	11:05	3551-320	0.624	
HRW-014	HRW-014-122116U	Unfiltered	12/21/2016	4	11:05	3551-319	1.35	4.37
HRW-015	HRW-015-122116F	Filtered	12/21/2016	4	11:00	3551-322	0.585	
HRW-015	HRW-015-122116U	Unfiltered	12/21/2016	4	11:00	3551-321	1.30	4.23
HRW-016	HRW-016-122116F	Filtered	12/21/2016	4	11:20	3551-324	0.493	
HRW-016	HRW-016-122116U	Unfiltered	12/21/2016	4	11:20	3551-323 r1	1.34	9.53
HRW-ISCOA	HRW-ISCOA-122116F	Filtered	12/21/2016	4	10:30	3551-326	0.628	
HRW-ISCOA	HRW-ISCOA-122116U	Unfiltered	12/21/2016	4	10:30	3551-325	1.91	5.81
HRW-ISCOB	HRW-ISCOB-122116F	Filtered	12/21/2016	4	11:15	3551-328	0.595	
HRW-ISCOB	HRW-ISCOB-122116U	Unfiltered	12/21/2016	4	11:15	3551-327	1.20	3.29
HRW-100	HRW-100-122116F[f]	Filtered	12/21/2016	4	11:10	3551-330	0.604	
HRW-100	HRW-100-122116U[f]	Unfiltered	12/21/2016	4	11:10	3551-329	1.54	8.22

[a] Filtered-Dissolved Hg Samples

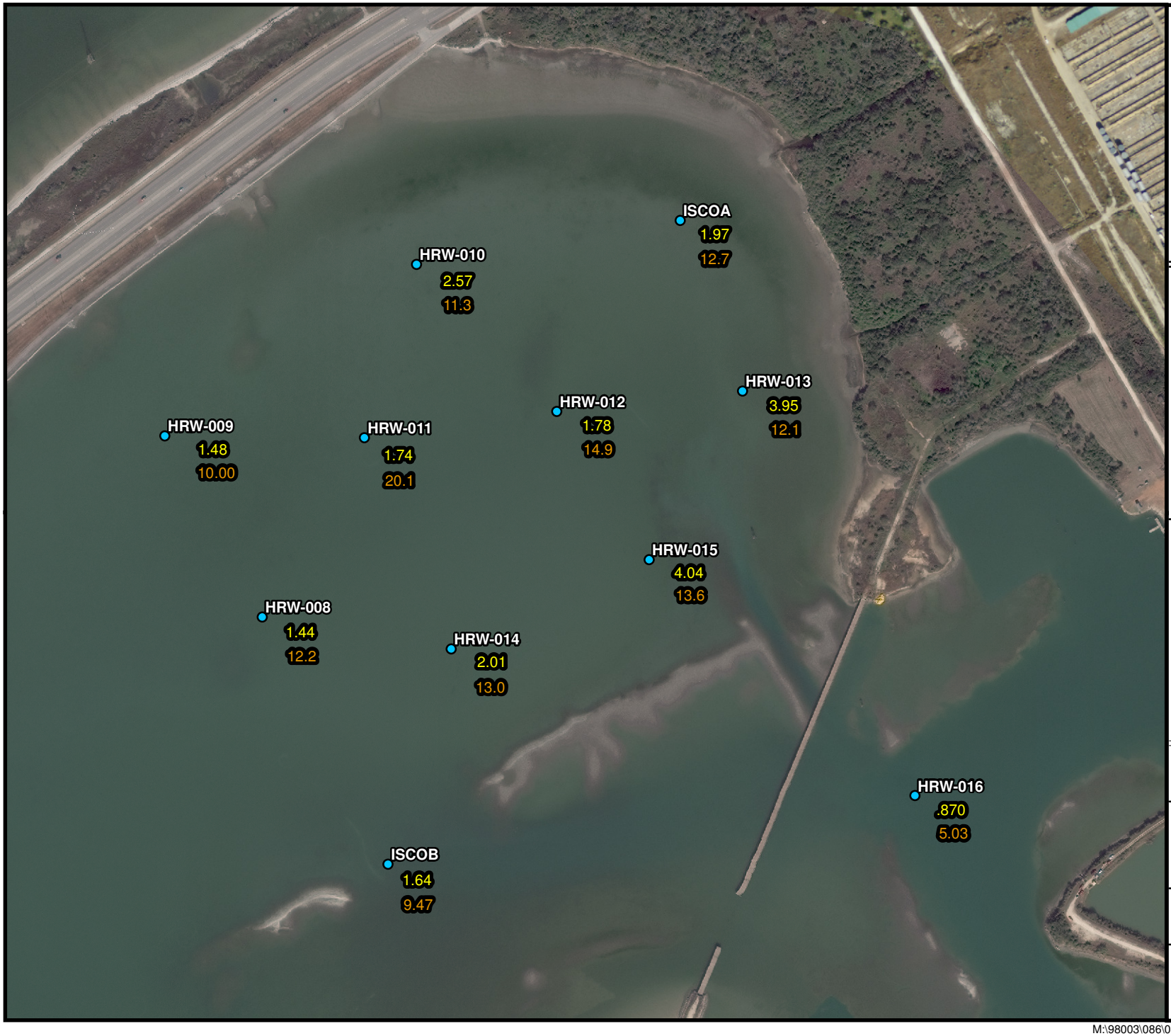
[b] Unfiltered-Total Hg Samples

[c] HRW-100-102716U-F Duplicate of HRW-015-102716U-F

[d] HRW-100-111016U-F Duplicate of HRW-013-111016U-F

[e] HRW-100-121316U-F Duplicate of HRW-013-121316U-F

[f] HRW-100-122116U-F Duplicate of HRW-008-122116U-F



N

0 200 400 800

Feet

Legend

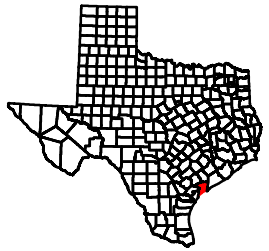
Water Sample Stations

Filtered Total Hg Results (ng/L)

Unfiltered Total Hg Results (ng/L)

Notes

2015 WV2 Aerial (Point Comfort Quad)
Calhoun County, Texas



Lavaca Bay Supplemental Report Fall 2016

East Causeway Cove Water Column Sampling Event 1

Prepared for
Alcoa Corporation

BESI Benchmark Ecological Services, Inc.

Project: 98003-086-003
Date: 01/13/2017

Figure 1

M:\98003\086\003 - Supplemental\3.4 Causeway Water\Figure1.mxd



N

0 200 400 800

Feet

Legend

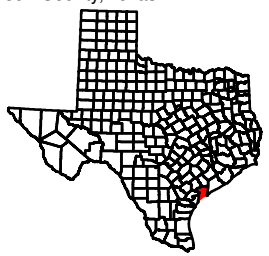
Water Sample Stations

Filtered Total Hg Results (ng/L)

Unfiltered Total Hg Results (ng/L)

Notes

2015 WV2 Aerial (Point Comfort Quad)
Calhoun County, Texas



Lavaca Bay Supplemental Report Fall 2016

East Causeway Cove Water Column Sampling Event 2

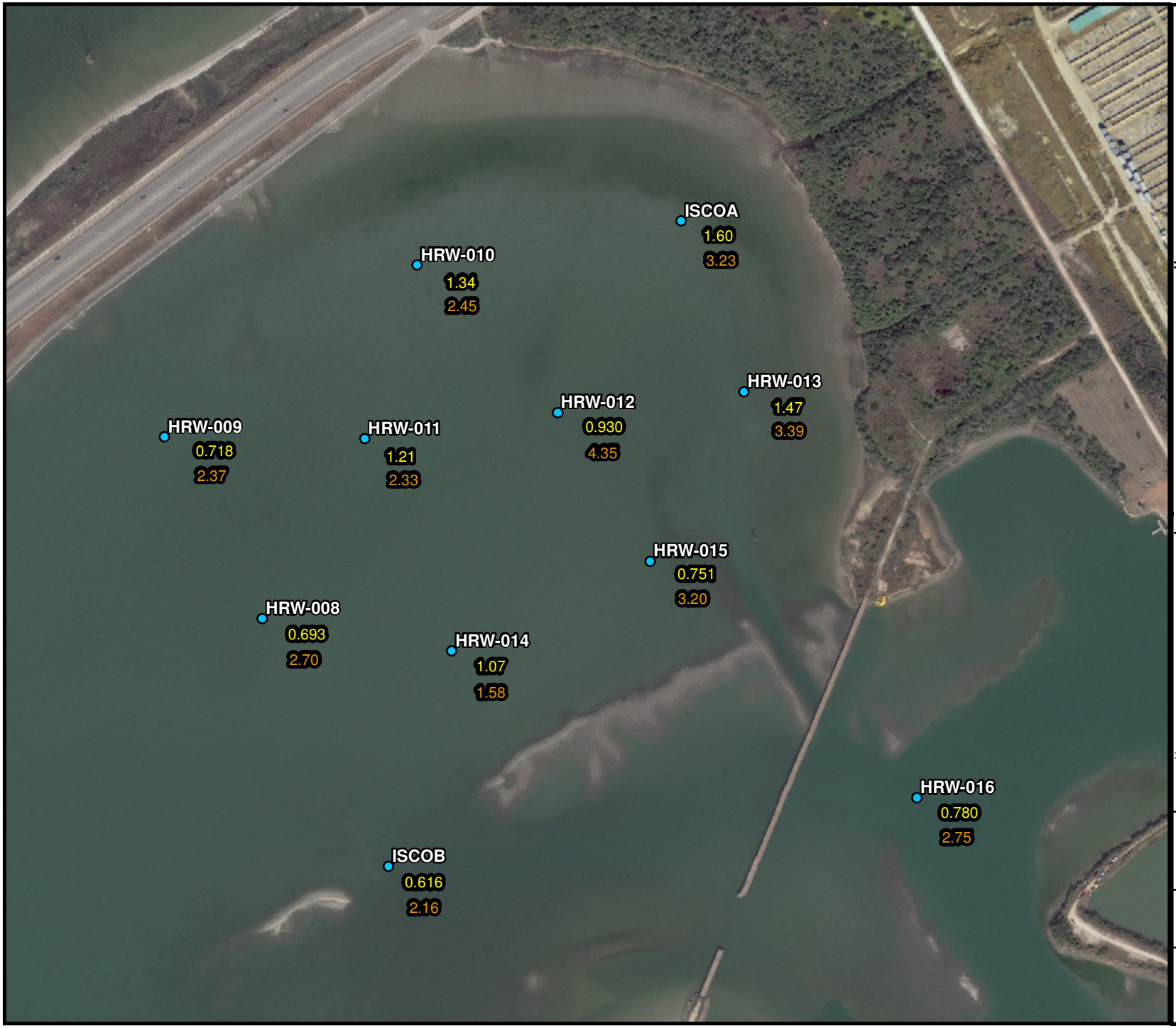
Prepared for
Alcoa Corporation

BESI Benchmark Ecological Services, Inc.

Project: 98003-086-003
Date: 01/13/2017

Figure 2

M:\98003\086\003 - Supplemental\3.4 Causeway Water\Figure2.mxd



N

0 200 400 800

Feet

Legend

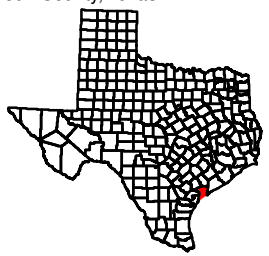
Water Sample Stations

Filtered Total Hg Results (ng/L)

Unfiltered Total Hg Results (ng/L)

Notes

2015 WV2 Aerial (Point Comfort Quad)
Calhoun County, Texas



Fall 2016 High Resolution Water Study

East Causeway Cove Water Column Sampling Event 3

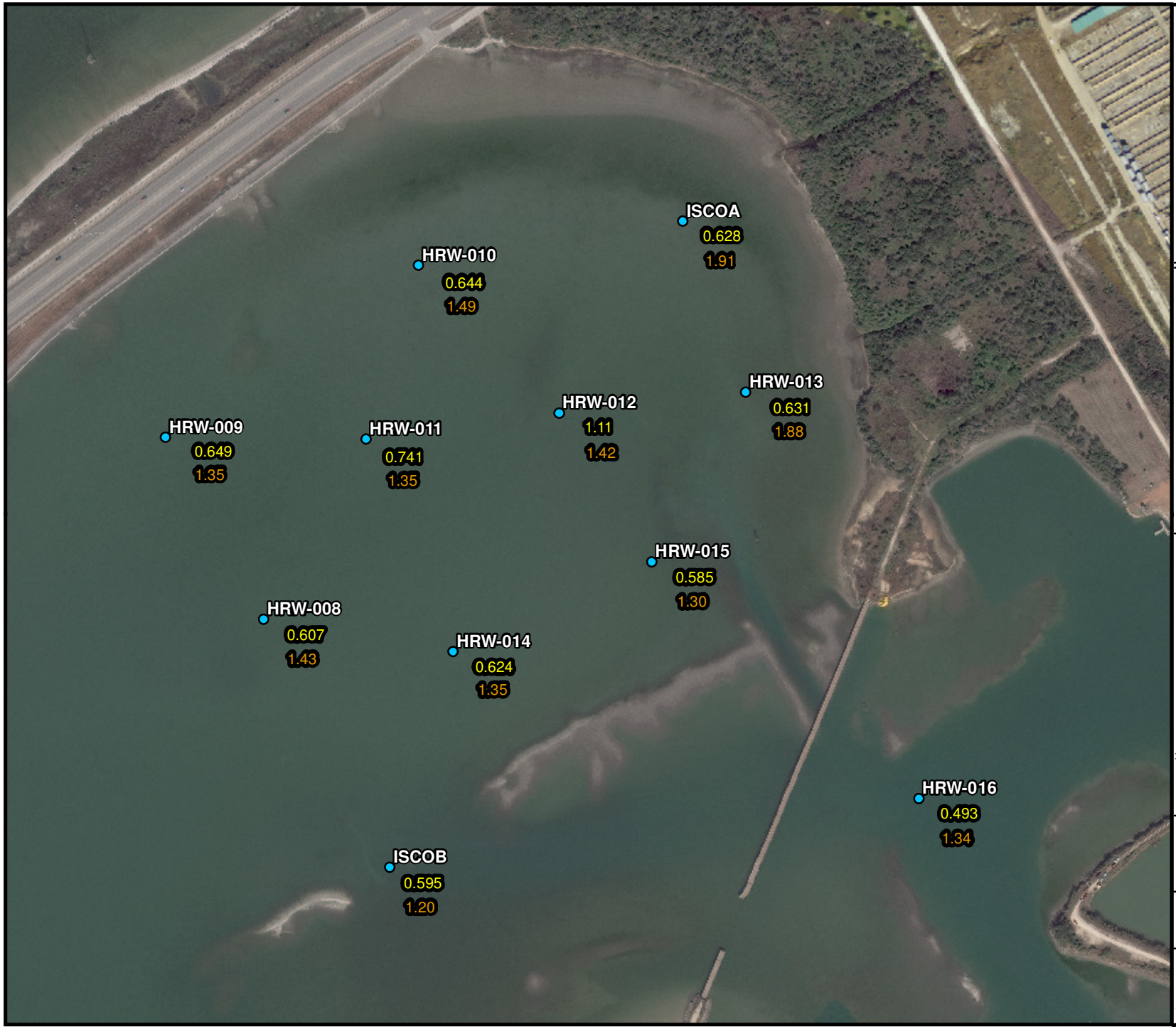
Prepared for
Alcoa Corporation

BESI Benchmark Ecological Services, Inc.

Project: 98003-086-003
Date: 01/13/2017

Figure 3

M:\98003\086\003 - Supplemental\3.4 Causeway Water\Figure3.mxd



N

0 200 400 800

Feet

Legend

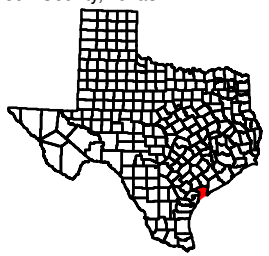
Water Sample Stations

Filtered Total Hg Results (ng/L)

Unfiltered Total Hg Results (ng/L)

Notes

2015 WV2 Aerial (Point Comfort Quad)
Calhoun County, Texas



Fall 2016 High Resolution Water Study

East Causeway Cove Water Column Sampling Event 4

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Alcoa Corporation

BESI Benchmark Ecological Services, Inc.

Project: 98003-086-003
Date: 01/13/2017

Figure 4

M:\98003\086\003 - Supplemental\3.4 Causeway Water\Figure4.mxd

3.0 ANALYTICAL RESULTS

Water sample DHg results were reported in nanogram per liter, PHg results were reported as microgram per gram as dry weight, and TSS results were reported as milligram per liter. Benchmark received all final data packages on January 10, 2017 and data validation and evaluation was completed by Environmental Chemistry Services on December 16, 2016.

Water station numbers, sample IDs, and analytical results are listed for each sample in Table 1. Water filtered and unfiltered THg analytical results are shown on Figures 1, 2, 3, and 4 for sampling events 1, 2, 3, and 4 respectively.

Analytical results for water samples were validated according to the Standard Operating Procedure Data Validation (Appendix E) in the Quality Assurance Project Plan Alcoa (Point Comfort)/Lavaca Bay Superfund Site (Alcoa, 2005).

4.0 REFERENCES

Alcoa, 2005. Appendix E. *Standard Operating Procedure for Data Validation. Quality Assurance Project Plan.* Alcoa (Point Comfort) / Lavaca Bay Superfund Site. August 22, 2005.

Alcoa, 2016a. *Draft Lavaca Bay Methylation Special Study – Phase 2. Study 4 – Update the Understanding of Methylation Processes and Uptake in the Closed Area – Spring 2016.* Alcoa (Point Comfort)/Lavaca Bay Superfund Site. September 2016.

Alcoa, 2016b. *Draft Report on Lavaca Bay High Resolution Water Column Monitoring Program.* Alcoa (Point Comfort)/Lavaca Bay Superfund Site. September 2016.

Alcoa, 2016c. *Response Action Plan Witco Channel and Harbor Dredging and MS3 Excavation*. Alcoa (Point Comfort)/Lavaca Bay Superfund Site. October 2016.

Alcoa, 2016e. *Fall 2016 Study Plan*. Alcoa (Point Comfort)/Lavaca Bay Superfund Site. September 2016.

APPENDIX F
LAVACA BAY SUPPLEMENTAL REPORT; CAUSEWAY COVE BATHYMETRY

LAVACA BAY SUPPLEMENTAL REPORT
CAUSEWAY COVE BATHYMETRY
2016

Alcoa Point Comfort Operations

Lavaca Bay Superfund Site

March 2017

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LIST OF ACRONYMS AND ABBREVIATIONS

Benchmark	Benchmark Ecological Services, Inc.
GPS	Global Positioning System
ID	Identification
NAVD29	North American Vertical Datum 1929
QA/QC	Quality Assurance/Quality Control

1.0 INTRODUCTION

A key factor in the Lavaca Bay remedy is the reduction in sediment mercury concentrations through targeted sediment removal efforts, capping, enhanced natural recovery, and/or natural recovery.

The *Witco Channel and Harbor Dredging, MS3 Excavation and Causeway Cove Response Action Plan – Response Action Plan Addendum* (Alcoa 2016) indicates that select marshes and marsh sediment will be removed to an elevation that is not conducive to marsh grass growth. This survey was conducted to document the elevation range of Causeway Cove marshes. Open water bathymetry data were also collected to assess additional potential remedial efforts.

1.1 PURPOSE AND SCOPE

The shallow water emergent marshes along the eastern shoreline of Causeway Cove were surveyed by hand with depth rod and handheld Global Positioning System (GPS) receiver. The goal of this portion of the survey was to establish a baseline elevation range within which emergent grass was growing. These elevations were used to establish the boundaries for potential marsh removal. The open water areas of the cove were surveyed with GPS and sonar at a density sufficient to develop qualitative elevation contours. Open water sediment surface elevations were less accurate than marsh sediment elevations due to poor weather conditions and wave action.

1.2 SITE DESCRIPTION

The portion of Lavaca Bay adjacent to the Alcoa Plant is associated with elevated mercury concentrations in fish tissue and is closed to the taking of finfish and shellfish for consumption by order of the Texas Department of State Health Services. The area included in this survey is in Causeway Cove and Marshes 1, 2, and 3 which are located south of Highway 35 and north of Dredge Island in the Closed Area.

2.0 METHOD

2.1 MARSH SURVEY

Bathymetric data were collected on the eastern Causeway Cove shoreline on October 11, 2016. Transects are shown on Figure 1. Tide elevation data were collected at the tide gauge located on the Dredge Island Bridge in approximately one-hour intervals and used to adjust depth to sediment surface measurements for changes in water surface elevation. Along each transect a depth rod was lowered onto the sediment surface and water depth was recorded in inches. Depths were recorded along each transect at approximately 20 foot intervals; times and GPS coordinates were recorded for each measurement. Information collected from the tide gauge over time and water depth measurements collected in the marshes were used to determine sediment surface elevation. Sediment elevations are relative to North American Vertical Datum 1929 (NAVD29).



N

0 125 250 500

Feet

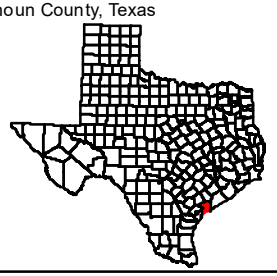
Legend

Causeway Marsh Bathymetry Study Area

Bathymetry Transects

Notes

2015 0.5m DOQQ (Point Comfort)
Calhoun County, Texas



Marsh Bathymetry Transects

Causeway Cove Bathymetry Report Fall 2016

Prepared for
Alcoa Corporation

BESI Benchmark Ecological Services, Inc.

Project: 98003-086-003

Date: 03/09/2017

Figure 1

M:\98003\086\003 - Supplemental\Causeway Marsh Bathymetry\Figure 1_030917.mxd



N

0 25 50 100 150

Feet

Legend

Area A - The elevation at the outer edge is -3 inches NGVD 29

Area B - The elevation at the outer edge is -9 inches NGVD 29

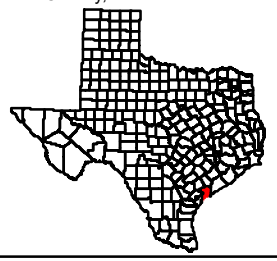
Bathymetry Transects

Bathymetry Survey Points

Sediment Elevation related to NGVD 29 (inches)

Notes

2015 0.5m DOQQ (Point Comfort)
Calhoun County, Texas



Bathymetry Survey Points

Causeway Cove Bathymetry Report Fall 2016

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Project: 98003-086-003

Date: 03/09/17

Figure 2a

M:\98003\086\003 - Supplemental\Causeway Marsh Bathymetry\Arc\Figure 2 A Bathymetry Survey Points



N

0 37.5 75 150

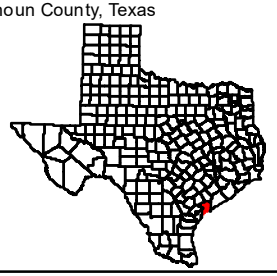
Feet

Legend

- Area A - The elevation at the outer edge is -3 inches NGVD 29
- Area B - The elevation at the outer edge is -9 inches NGVD 29
- Bathymetry Transects
- Bathymetry Survey Points
- # Sediment Elevation related to NGVD 29 (inches)
- Clay Layer Survey Points
- # Clay Elevation related to NGVD 29 (inches)

Notes

2015 0.5m DOQQ (Point Comfort)
Calhoun County, Texas



Bathymetry Survey Points

Causeway Cove Bathymetry Report Fall 2016

Prepared for
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Project: 98003-086-003
Date: 03/09/17

Figure 2b

M:\98003\086\003 - Supplemental\Causeway Marsh Bathymetry\Arc\Figure 2B Bathymetry Survey Points



N

0 25 50 100

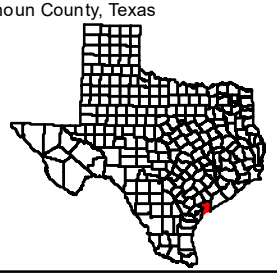
Feet

Legend

- Area A - The elevation at the outer edge is -3 inches NGVD 29
- Area B - The elevation at the outer edge is -9 inches NGVD 29
- Bathymetry Transects
- Bathymetry Survey Points
- # Sediment Elevation related to NGVD 29 (inches)
- Clay Layer Survey Points
- # Clay Elevation related to NGVD 29 (inches)

Notes

2015 0.5m DOQQ (Point Comfort)
Calhoun County, Texas



Bathymetry Survey Points

Causeway Cove Bathymetry Report Fall 2016

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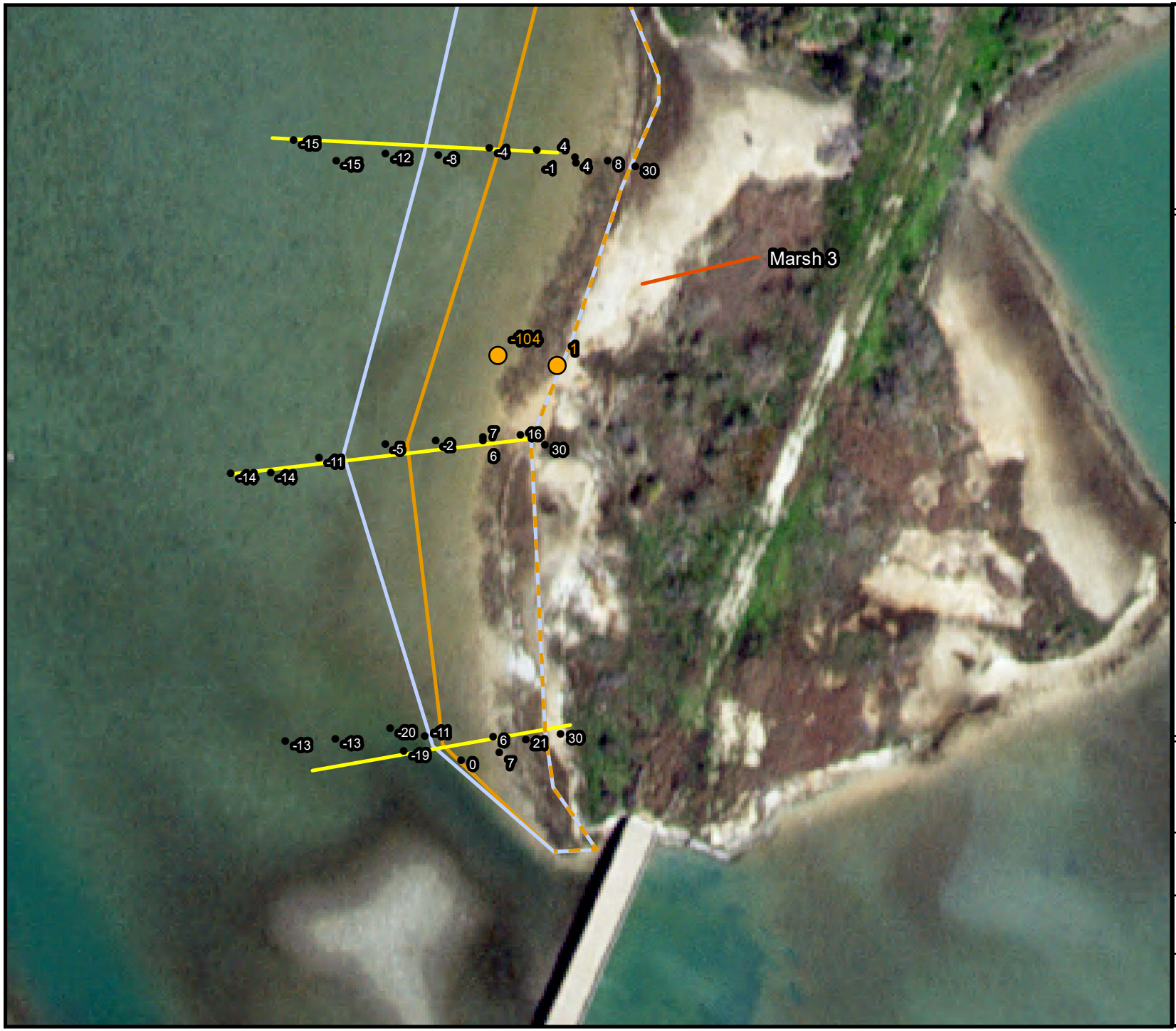
BESI Benchmark Ecological Services, Inc.

Project: 98003-086-003

Date: 03/09/2017

Figure 2c

M:\98003\086\003 - Supplemental\Causeway Marsh Bathymetry\Arc\Figure 2 C Bathymetry Survey Points



N

0 25 50 100

Feet

Legend

Area A - The elevation at the outer edge is -3 inches NGVD 29

Area B - The elevation at the outer edge is -9 inches NGVD 29

Bathymetry Transects

Bathymetry Survey Points

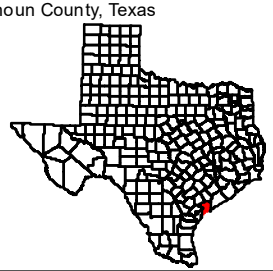
Sediment Elevation related to NGVD 29 (inches)

Clay Layer Survey Points

Clay Elevation related to NGVD 29 (inches)

Notes

2015 0.5m DOQQ (Point Comfort)
Calhoun County, Texas



Bathymetry Survey Points

Causeway Cove Bathymetry Report Fall 2016

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Project: 98003-086-003

Date: 03/09/2017

Figure 2d

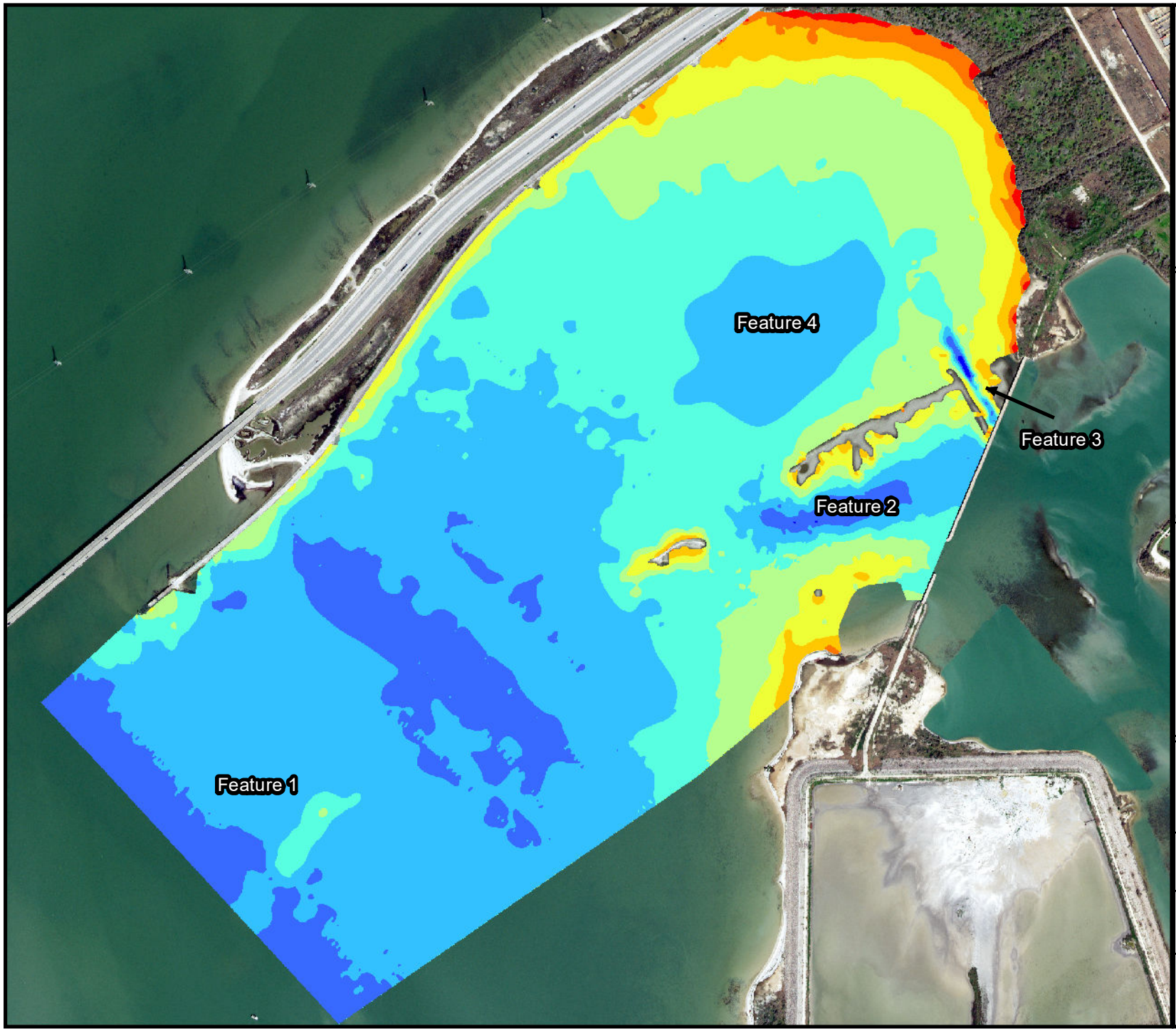
M:\98003\086\003 - Supplemental\Causeway Marsh Bathymetry\Arc\Figure 2 D Bathymetry Survey Points

2.2 OPEN WATER SURVEY

Open water survey data were collected in three phases. The initial survey was conducted on October 31, 2016 and covered the portion of Causeway Cove north of the major oyster reefs and east of the western extent of Dredge Island. The survey was extended west of the western shore of Dredge Island and between the major reefs and Dredge Island Bridge on November 4, 2016. Four quality assurance (QA) verification transects were surveyed on December 9, 2016 (Figure 4).

Bathymetric data was collected in Causeway Cove from Benchmark Ecological Services, Inc.'s (Benchmark) custom 24 foot sampling boat. Tide levels were recorded from the tide gauge on the Dredge Island Bridge before surveying was initiated and after the survey was complete. The boat was outfitted with a single beam sonar fathometer and GPS receiver which were used to survey parallel transects where no obstructions prevented navigation. A point survey density sufficient to accurately represent the bathymetry was collected around reefs and other shallow water areas. Benchmark used a lead line to confirm sonar readings, before, during, and after surveying activities. These measurements were collected to ensure the sonar equipment was functioning properly and recording depths which agreed with manual measurements. No discrepancies were noted during the survey except where zero return was obtained in Feature 4 – discussed in Section 3.2 (Figure 3).

Upon completion of field activities the combined GPS and sonar file was uploaded for post-processing which corrected for transducer draft and tide elevation. The results are shown in Table 2.



N

0 300 600 1,200

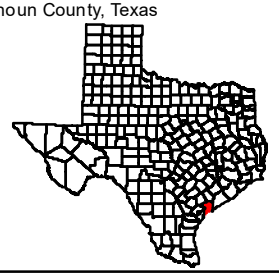
Feet

Legend

Causeway Cove Bathymetry (NAVD29 Feet)

- < -5.5
- -5.5 - -4.5
- -4.5 - -3.5
- -3.5 - -2.5
- -2.5 - -1.5
- -1.5 - -0.5
- -0.5 - 0.5
- 0.5 - 1.5
- 1.5 - 2.5

2015 0.5m DOQQ (Point Comfort)
Calhoun County, Texas



Causeway Cove Bathymetry

Causeway Cove Bathymetry Report Fall 2016

Prepared for Alcoa Corporation

BESI Benchmark Ecological Services, Inc.

Project: 98003-086-003-3.6

Date: 03/09/2017

Figure 3

M:\98003\086\003 - Supplemental\3.6 Causeway Marsh Bathymetry\Arc\Figure 3 OW Bathymetry fig.mxd



N

0 300 600 1,200

Feet

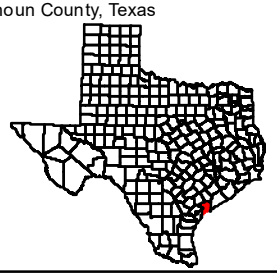
Legend

QA Transect Points

Survey Points

Notes

2015 0.5m DOQQ (Point Comfort)
Calhoun County, Texas



Open Water Survey Points

Causeway Cove Bathymetry Report Fall 2016

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Alcoa Corporation

BESI Benchmark Ecological Services, Inc.

Project: 98003-086-003-3.6

Date: 03/09/2017

Figure 4

M:\98003\086\003 - Supplemental\3.6 Causeway Marsh Bathymetry\Arc\Figure 4 OWSurvey Points.mxd

3.0 DISCUSSION

3.1 MARSH SURVEY

The results of this survey are presented on Figures 2a-2d. The marsh survey indicates that emergent marsh (*Spartina alterniflora*) flourishes between approximately +9 and +30 inches NAVD29 on the surveyed portion of the Causeway Cove shoreline. Sediment elevation data obtained from this portion of the survey was also tied to the open water data sets to produce a complete surface elevation map for the entirety of Causeway Cove including the shoreline marshes.

3.2 OPEN WATER SURVEY

The results of this survey indicate a few bathymetric features dispersed over a gently sloping and generally flat bay bottom (Figure 3). The area northwest of Dredge Island has an average elevation range between -3.5 and -4.5 feet NAVD29 and exhibits a small distinctive ridge on the central western extent of the survey area where sediment elevation rises to -2.4 feet NAVD29 (Feature 1). There are two distinct open water oyster reefs north of the Dredge Island Bridge. These areas were physically exposed during field activities and therefore excluded from the sonar sounding survey. The area south of these reefs includes a channel running between the reef and Dredge Island which was probably part of the old Alcoa Smelter Channel (Feature 2). The deepest part of the channel had a sediment elevation of -5.2 feet NAVD29. A branch of the Smelter Channel runs north under the Dredge Island Bridge and along the shore of Marsh 3 (Feature 3). The deepest part of this channel had a sediment elevation of -6.4 feet NAVD29. The depression located in Causeway Cove north of the oyster reefs described above (Feature 4) was not surveyed with sonar because the sediment in this region was too soft to produce a distinct return with the transducer frequency employed. Depths to sediment were measured manually at thirteen locations in this area (Figure 4).

The four QA transects indicate an average absolute deviation of 0.24 feet where they crossed original survey sample locations.

Table 1 - Marsh Bathymetry Station Coordinates, Times, Elevations, and Locations

Waypoint	Coordinates (NAD83 State Plane - ft)		Field Sample Time	Water Depth Recorded in Field (in)	Water Elevation Corrected to NGVD 29 (in)	Sediment Elevation NGVD 29 (in)	Edge Marsh (Y/N)
	Easting	Northing					
1	2746014.49	13434207.06	09:30:44am	26.5	32.2	5.7	N
2	2746021.46	13434185.39	09:33:14am	27.0	32.2	5.2	N
3	2746031.96	13434165.49	09:34:50am	32.3	32.2	-0.1	N
4	2746041.36	13434136.65	09:36:59am	35.0	32.2	-2.8	N
5	2746054.82	13434115.09	09:38:19am	37.0	32.2	-4.8	N
6	2746066.16	13434089.22	09:39:53am	39.0	32.2	-6.8	N
7	2746072.40	13434070.39	09:41:26am	40.5	32.2	-8.3	N
8	2746077.27	13434057.66	09:42:56am	41.0	32.2	-8.8	N
9	2746159.04	13434332.60	09:47:29am	25.3	32.0	6.7	N
10	2746158.96	13434301.21	09:48:52am	26.8	32.0	5.2	N
11	2746165.85	13434278.58	09:50:09am	27.0	32.0	5.0	N
12	2746180.71	13434253.67	09:51:24am	27.0	32.0	5.0	N
13	2746179.53	13434227.16	09:52:47am	27.5	32.0	4.5	N
14	2746186.93	13434197.70	09:53:53am	28.3	32.0	3.7	N
15	2746191.08	13434174.40	09:55:40am	30.5	32.0	1.5	N
16	2746202.63	13434150.80	09:56:38am	32.5	32.0	-0.5	N
17	2746208.33	13434127.19	09:58:01am	36.0	32.0	-4.0	N
18	2746211.40	13434103.75	09:59:30am	39.8	32.0	-7.8	N
19	2746215.08	13434083.34	10:00:38am	41.5	32.0	-9.5	N
20	2746357.11	13434382.23	10:07:15am	15.0	32.0	17.0	N
21	2746347.41	13434357.50	10:08:18am	22.0	32.0	10.0	N
22	2746361.43	13434328.97	10:09:27am	22.5	32.0	9.5	N
23	2746358.85	13434303.85	10:10:13am	24.0	32.0	8.0	N
24	2746357.37	13434276.75	10:11:27am	25.8	32.0	6.2	N
25	2746364.40	13434243.21	10:13:22am	27.0	32.0	5.0	N
26	2746366.80	13434207.25	10:15:12am	28.0	32.0	4.0	N
27	2746367.73	13434169.54	10:16:34am	30.0	32.0	2.0	N
28	2746368.15	13434126.74	10:18:18am	38.5	32.0	-6.5	N
29	2746372.16	13434096.52	10:20:01am	43.5	32.0	-11.5	N
30	2746372.20	13434076.71	10:21:00am	44.5	32.0	-12.5	N
31	2746363.61	13434393.25	10:35:42am	0.0	32.0	32.0	N
32	2746155.18	13434354.13	10:38:00am	0.0	32.0	32.0	N
33	2746005.26	13434240.43	10:39:54am	0.0	32.0	32.0	N
34	2746567.36	13434389.71	10:46:06am	0.0	32.0	32.0	N
35	2746564.44	13434372.32	10:47:41am	9.0	32.0	23.0	N
36	2746562.57	13434348.03	10:48:42am	16.0	32.0	16.0	N
37	2746558.56	13434322.87	10:49:29am	24.0	32.0	8.0	N
38	2746550.79	13434296.36	10:51:59am	23.0	32.0	9.0	N
39	2746550.42	13434273.22	10:52:43am	24.5	32.0	7.5	N
40	2746554.35	13434250.18	10:53:24am	25.0	32.0	7.0	N
41	2746570.28	13434223.36	10:54:52am	27.0	32.0	5.0	N
42	2746563.44	13434195.72	10:56:01am	27.5	32.0	4.5	N
43	2746564.54	13434169.44	10:56:58am	30.0	32.0	2.0	N
44	2746561.99	13434143.74	10:57:40am	35.0	32.0	-3.0	N
45	2746562.25	13434120.20	10:58:28am	41.0	32.0	-9.0	N
46	2746566.45	13434095.86	10:59:16am	43.5	32.0	-11.5	N
47	2746774.69	13434387.49	11:06:03am	0.0	32.0	32.0	N
48	2746773.73	13434363.17	11:07:01am	10.0	32.0	22.0	N
49	2746772.59	13434338.16	11:07:42am	13.0	32.0	19.0	N
50	2746769.87	13434312.79	11:08:42am	19.0	32.0	13.0	N
51	2746759.89	13434288.32	11:09:32am	25.0	32.0	7.0	N
52	2746756.47	13434263.20	11:10:30am	25.0	32.0	7.0	N
53	2746753.92	13434237.70	11:11:13am	27.0	32.0	5.0	N
54	2746752.49	13434211.36	11:12:03am	27.5	32.0	4.5	N
55	2746754.95	13434183.10	11:12:48am	29.0	32.0	3.0	N

Table 1 - Marsh Bathymetry Station Coordinates, Times, Elevations, and Locations

Waypoint	Coordinates (NAD83 State Plane - ft)		Field Sample Time	Water Depth Recorded in Field (in)	Water Elevation Corrected to NGVD 29 (in)	Sediment Elevation NGVD 29 (in)	Edge Marsh (Y/N)
	Easting	Northing					
56	2746753.66	13434163.14	11:14:06am	32.0	32.0	0.0	N
57	2746753.40	13434134.61	11:15:00am	38.5	32.0	-6.5	N
58	2746751.47	13434112.15	11:15:45am	42.0	30.6	-11.4	N
59	2746745.90	13434094.10	11:16:41am	44.0	30.6	-13.4	N
60	2746970.98	13434336.28	11:21:18am	0.0	30.6	30.6	N
61	2746967.11	13434313.57	11:22:17am	12.5	30.6	18.1	N
62	2746961.09	13434286.33	11:23:01am	21.0	30.6	9.6	N
63	2746953.94	13434259.89	11:23:51am	22.5	30.6	8.1	N
64	2746948.45	13434232.86	11:24:49am	24.0	30.6	6.6	N
65	2746943.95	13434204.22	11:25:40am	26.8	30.6	3.8	N
66	2746932.58	13434181.07	11:26:27am	28.5	30.6	2.1	N
67	2746939.46	13434150.74	11:27:13am	33.5	30.6	-2.9	N
68	2746935.31	13434125.75	11:28:04am	39.0	30.6	-8.4	N
69	2746929.64	13434100.67	11:28:53am	41.0	30.6	-10.4	N
70	2746920.49	13434082.76	11:29:38am	42.0	30.6	-11.4	N
71	2747168.41	13434290.42	11:35:44am	0.0	30.6	30.6	N
72	2747161.02	13434269.56	11:36:24am	13.0	30.6	17.6	N
73	2747155.67	13434244.03	11:37:24am	16.8	30.6	13.8	N
74	2747129.21	13434233.08	11:38:35am	19.5	30.6	11.1	N
75	2747117.75	13434212.60	11:39:30am	23.0	30.6	7.6	N
76	2747108.60	13434190.22	11:40:27am	24.5	30.6	6.1	N
77	2747095.62	13434165.43	11:41:53am	27.0	30.6	3.6	N
78	2747083.87	13434140.07	11:42:39am	32.5	30.6	-1.9	N
79	2747074.06	13434113.48	11:43:27am	37.0	30.6	-6.4	N
80	2747061.94	13434089.58	11:44:17am	39.5	30.6	-8.9	N
81	2747046.87	13434067.90	11:45:10am	41.0	30.6	-10.4	N
82	2747334.40	13434210.48	11:52:35am	0.0	30.6	30.6	N
83	2747321.17	13434191.45	11:53:27am	13.0	30.6	17.6	N
84	2747311.50	13434171.98	11:54:17am	19.0	30.6	11.6	N
85	2747300.34	13434151.92	11:56:18am	21.5	30.6	9.1	N
86	2747289.75	13434134.14	11:57:16am	23.0	30.6	7.6	N
87	2747279.23	13434110.30	11:58:01am	27.0	30.6	3.6	N
88	2747267.85	13434086.12	11:58:48am	29.0	30.6	1.6	N
89	2747255.12	13434063.41	11:59:31am	31.5	30.6	-0.9	N
90	2747235.11	13434047.21	12:00:51pm	35.0	30.6	-4.4	N
91	2747218.14	13434027.83	12:01:37pm	37.0	30.6	-6.4	N
92	2747193.31	13434007.04	12:02:24pm	39.0	30.6	-8.4	N
93	2747172.96	13433989.12	12:03:55pm	40.0	30.6	-9.4	N
94	2747276.18	13433932.43	12:07:48pm	40.5	30.6	-9.9	N
95	2747296.22	13433948.42	12:08:47pm	38.0	30.6	-7.4	N
96	2747320.02	13433961.71	12:09:46pm	36.0	30.6	-5.4	N
97	2747343.49	13433976.24	12:10:42pm	33.0	30.6	-2.4	N
98	2747366.35	13433992.81	12:11:27pm	30.0	30.6	0.6	N
99	2747391.14	13434004.38	12:12:07pm	26.0	30.6	4.6	N
100	2747409.83	13434017.33	12:12:50pm	22.0	30.6	8.6	N
101	2747427.08	13434024.67	12:13:38pm	20.0	30.6	10.6	N
102	2747448.28	13434035.74	12:14:19pm	9.0	30.6	21.6	N
103	2747459.95	13434039.42	12:14:53pm	0.0	30.6	30.6	N
104	2747541.11	13433881.19	12:16:44pm	0.0	30.6	30.6	N
105	2747524.43	13433868.44	12:18:02pm	24.0	30.6	6.6	N
106	2747490.94	13433856.24	12:22:14pm	28.5	30.6	2.1	N
107	2747459.92	13433844.95	12:23:20pm	34.0	30.6	-3.4	N
108	2747435.40	13433836.16	12:24:20pm	37.0	30.6	-6.4	N
109	2747411.75	13433822.43	12:25:18pm	39.8	30.6	-9.2	N
110	2747390.20	13433808.77	12:26:14pm	41.0	30.6	-10.4	N

Table 1 - Marsh Bathymetry Station Coordinates, Times, Elevations, and Locations

Waypoint	Coordinates (NAD83 State Plane - ft)		Field Sample Time	Water Depth Recorded in Field (in)	Water Elevation Corrected to NGVD 29 (in)	Sediment Elevation NGVD 29 (in)	Edge Marsh (Y/N)
	Easting	Northing					
111	2747373.51	13433800.36	12:26:59pm	42.0	30.6	-11.4	N
112	2747463.46	13433628.53	12:30:27pm	42.0	30.6	-11.4	N
113	2747485.73	13433634.81	12:32:43pm	40.0	30.6	-9.4	N
114	2747510.08	13433650.88	12:33:35pm	38.5	30.6	-7.9	N
115	2747529.68	13433659.43	12:34:22pm	36.5	30.6	-5.9	N
116	2747551.26	13433666.64	12:35:15pm	34.0	30.6	-3.4	N
117	2747572.41	13433674.46	12:36:00pm	29.5	30.6	1.1	N
118	2747590.14	13433683.50	12:36:52pm	24.0	30.6	6.6	N
119	2747619.88	13433696.28	12:37:56pm	0.0	30.6	30.6	N
120	2747702.18	13433511.43	12:57:14pm	0.0	29.9	29.9	N
121	2747666.25	13433514.38	12:58:37pm	22.5	29.9	7.4	N
122	2747644.11	13433508.86	12:59:38pm	26.3	29.9	3.6	N
123	2747620.19	13433500.35	01:00:30pm	31.0	29.9	-1.1	N
124	2747601.04	13433489.37	01:01:23pm	31.5	29.9	-1.6	N
125	2747574.66	13433486.14	01:02:10pm	34.0	29.9	-4.1	N
126	2747547.33	13433484.66	01:03:18pm	36.0	29.9	-6.1	N
127	2747522.75	13433481.75	01:04:31pm	39.0	29.9	-9.1	N
128	2747498.02	13433474.65	01:05:20pm	41.5	29.9	-11.6	N
129	2747485.11	13433472.45	01:06:07pm	42.0	29.9	-12.1	N
130	2747473.34	13433302.03	01:09:42pm	45.0	29.9	-15.1	N
131	2747498.00	13433304.11	01:10:52pm	42.0	29.9	-12.1	N
132	2747522.17	13433305.68	01:11:54pm	40.0	29.9	-10.1	N
133	2747550.08	13433310.81	01:12:41pm	38.0	29.9	-8.1	N
134	2747573.73	13433315.77	01:13:25pm	34.0	29.9	-4.1	N
135	2747598.34	13433320.04	01:14:26pm	31.0	29.9	-1.1	N
136	2747619.44	13433323.84	01:15:15pm	24.0	29.9	5.9	N
137	2747646.01	13433330.52	01:16:21pm	25.0	29.9	4.9	N
138	2747667.71	13433333.63	01:17:17pm	26.0	29.9	3.9	N
139	2747687.41	13433339.27	01:18:04pm	13.5	29.9	16.4	N
140	2747711.64	13433343.75	01:18:59pm	5.0	29.9	24.9	N
141	2747735.89	13433345.29	01:19:37pm	0.0	29.9	29.9	N
142	2747762.23	13433186.87	01:21:28pm	0.0	29.9	29.9	N
143	2747739.46	13433186.78	01:22:22pm	12.5	29.9	17.4	N
144	2747715.22	13433184.37	01:23:32pm	19.0	29.9	10.9	N
145	2747689.01	13433174.33	01:24:32pm	26.5	29.9	3.4	N
146	2747656.92	13433170.51	01:25:40pm	32.0	29.9	-2.1	N
147	2747630.41	13433158.58	01:26:42pm	37.0	29.9	-7.1	N
148	2747600.42	13433164.13	01:30:07pm	40.0	29.9	-10.1	N
149	2747569.15	13433161.68	01:31:13pm	44.0	29.9	-14.1	N
150	2747574.11	13432971.56	01:35:48pm	44.5	29.9	-14.6	N
151	2747603.61	13432970.73	01:36:56pm	44.5	29.9	-14.6	N
152	2747634.14	13432975.45	01:37:58pm	41.5	29.9	-11.6	N
153	2747655.99	13432980.31	01:38:50pm	40.0	29.9	-10.1	N
154	2747691.70	13432977.36	01:39:53pm	37.0	29.9	-7.1	N
155	2747715.62	13432978.29	01:40:54pm	34.0	29.9	-4.1	N
156	2747742.84	13432981.06	01:41:50pm	21.0	29.9	8.9	N
157	2747763.14	13432805.66	01:47:46pm	0.0	29.9	29.9	N
158	2747746.29	13432809.10	01:49:31pm	22.0	29.9	7.9	N
159	2747726.41	13432811.55	01:50:58pm	26.0	29.9	3.9	N
160	2747703.29	13432815.83	01:52:13pm	30.5	29.9	-0.6	N
161	2747674.34	13432817.05	01:53:46pm	33.8	29.9	-3.9	N
162	2747643.20	13432812.66	01:54:43pm	38.0	29.9	-8.1	N
163	2747610.82	13432813.36	01:55:44pm	41.5	29.9	-11.6	N
164	2747580.72	13432809.06	01:56:54pm	44.5	29.9	-14.6	N
165	2747554.69	13432821.83	01:57:55pm	45.0	29.9	-15.1	N

Table 1 - Marsh Bathymetry Station Coordinates, Times, Elevations, and Locations

Waypoint	Coordinates (NAD83 State Plane - ft)		Field Sample Time	Water Depth Recorded in Field (in)	Water Elevation Corrected to NGVD 29 (in)	Sediment Elevation NGVD 29 (in)	Edge Marsh (Y/N)
	Easting	Northing					
166	2747516.60	13432618.71	02:02:07pm	44.0	29.9	-14.1	N
167	2747540.85	13432618.96	02:03:13pm	43.5	29.9	-13.6	N
168	2747570.40	13432628.15	02:04:26pm	40.8	29.9	-10.9	N
169	2747610.73	13432636.23	02:05:23pm	35.0	29.9	-5.1	N
170	2747641.35	13432638.36	02:06:51pm	31.5	29.9	-1.6	N
171	2747670.47	13432640.69	02:08:02pm	23.0	29.9	6.9	N
172	2747692.90	13432642.01	02:08:50pm	14.0	29.9	15.9	N
173	2747707.94	13432635.60	02:09:28pm	0.0	29.9	29.9	N
174	2747717.87	13432459.92	02:11:10pm	0.0	29.9	29.9	N
175	2747696.58	13432456.41	02:11:58pm	8.5	29.9	21.4	N
176	2747680.62	13432448.54	02:12:38pm	23.0	29.9	6.9	N
177	2747657.31	13432443.68	02:13:40pm	30.0	29.9	-0.1	N
178	2747635.16	13432458.76	02:14:48pm	41.0	29.9	-11.1	N
179	2747613.71	13432463.08	02:15:53pm	49.0	29.5	-19.5	N
180	2747622.25	13432449.50	02:18:21pm	48.5	29.5	-19.0	N
181	2747580.67	13432456.86	02:20:12pm	42.0	29.5	-12.5	N
182	2747549.85	13432455.52	02:21:05pm	42.0	29.5	-12.5	N
183	2747676.59	13432458.21	02:24:32pm	23.3	29.5	6.2	Y
184	2747670.35	13432638.67	02:27:09pm	24.0	29.5	5.5	Y
185	2747726.82	13432808.16	02:29:52pm	25.5	29.5	4.0	Y
186	2747746.28	13432980.63	02:32:06pm	19.5	29.5	10.0	Y
187	2747726.74	13433171.80	02:34:54pm	18.5	29.5	11.0	Y
188	2747681.65	13433342.87	02:37:05pm	17.0	29.5	12.5	Y
189	2747682.12	13433522.21	02:39:37pm	19.0	29.5	10.5	Y
190	2747517.57	13433891.42	02:43:43pm	18.0	29.5	11.5	Y
191	2747431.30	13434038.03	02:46:18pm	18.5	29.5	11.0	Y
192	2747286.57	13434161.82	02:48:46pm	18.5	29.5	11.0	Y
193	2747132.52	13434224.39	02:51:27pm	19.0	29.5	10.5	Y
194	2746970.92	13434275.34	02:53:47pm	20.0	29.5	9.5	Y
195	2746762.88	13434287.25	02:56:37pm	23.3	29.5	6.2	Y
196	2746573.32	13434324.55	03:02:06pm	21.0	29.5	8.5	Y
197	2746372.24	13434345.12	03:04:33pm	20.5	29.5	9.0	Y

4.0 REFERENCES

Alcoa, 2016. *Witco Channel and Harbor Dredging, MS3 Excavation and Causeway Cove Response Action Plan - Response Action Plan* Addendum (Appendix C). Alcoa (Point Comfort)/Lavaca Bay Superfund Site. December 2016.

APPENDIX G
MARSH REMOVAL SEDIMENT PORE WATER REPORT

MARSH REMOVAL SEDIMENT PORE WATER REPORT
2016

Alcoa Point Comfort Operations
Lavaca Bay Superfund Site

March 2017

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LIST OF ACRONYMS AND ABBREVIATIONS

ALS	ALS Laboratory Group/Laboratory
cm	centimeter(s)
ft	foot / feet
GPS	Global Positioning System
ID	Identification
in	inch(es)
L	Liter
mg	milligram
NAVD29	North American Vertical Datum 1929
rpm	revolutions per minute
umhos/cm	micromhos/cm
USEPA	United States Environmental Protection Agency

1.0 INTRODUCTION

The USEPA-selected remedy for the Alcoa/Lavaca Bay Superfund Site focuses on eliminating ongoing sources of mercury to the bay, reducing surface sediment concentrations of mercury and polyaromatic hydrocarbons, and ultimately reducing mercury concentrations in fish tissue. As described in the *Response Action Plan Addendum to the Witco Channel and Harbor Dredging and MS3 Excavation, Causeway Cove Response Action Plan* (Alcoa 2016), Alcoa proposes to remove the emergent grasses and surface sediment associated with Marshes 1, 2, 3, and the fringe marsh area around the former Witco Marsh (Figure 1). The emergent vegetation and sediment will be mechanically removed from the upland edge of the emergent grasses to the outer edge of the emergent marshes in the bay. Sediment will be removed to a proposed final sediment elevation of -3 in North American Vertical Datum 1929 (NGVD29) (-0.25 ft NGVD29) which is 12 in below where the emergent grasses are currently growing.

On November 18, 2016 Alcoa submitted to USEPA a Marsh Removal Sediment Sampling Plan that was designed to measure and document the total mercury (Hg) concentrations in the sediment layer that will be exposed after the Causeway Cove and Witco marshes are removed. This project serves as an addendum to the *Marsh Removal Sediment Sampling Report* (Alcoa 2017), providing analytic and geophysical information on chloride and sulfate concentrations which would likely be present in de-water effluent (sediment pore water) from excavated materials. The pore water chemistry data will be maintained in the project files to document disposal of the sediment and vegetation removed from the marshes. This document presents a summary of sampling and analytical methods and the results of the pore water sampling conducted in the Causeway Cove marshes.

1.1 PURPOSE AND SCOPE

This marsh sediment pore water project was primarily designed to determine the volume of water contained in excavated sediment associated with removal of Causeway Cove and Witco marshes. It also serves to document concentrations of chloride and sulfate, and to determine salinity of the pore water contained in the sediment which will be removed.



N

0 125 250 500

Feet

Legend

Pore Water Sample Station

Causeway Cove and Witco Marshes

Notes

2015 DOQQ Aerials

Pore Water Sample Station

Marsh Removal Pore Water Sampling Report

Prepared For Alcoa Corporation

BESI Benchmark Ecological Services, Inc.

Project: 98003-086-003

Date: 3/10/2016

Figure 1

M:\98003\086\003 - Supplemental\water sampling\arc\Figure 1_Pore_Water.mxd

1.2 SITE DESCRIPTION

Alcoa Point Comfort Operations is located in Calhoun County, Texas, adjacent to Lavaca Bay. The portion of Lavaca Bay adjacent to the Alcoa Plant is associated with elevated mercury concentrations in fish tissue and is closed to the taking of finfish and shellfish for consumption by order of the Texas Department of State Health Services. This region is referred to as the Closed Area. The Causeway Cove and Witco marshes are located in the Closed Area as shown on Figure 1.

2.0 METHODS

A single, representative pore water sample from the Marsh Removal Sediment Sampling project area was collected and processed by Benchmark Ecological Services, Inc. (Benchmark). The sample was analyzed for specific conductance/salinity, chloride, and sulfate by ALS Laboratory Group (ALS) in Houston, Texas. Marsh sediment samples were collected on December 13, 2016 and post-processed on December 14, 2016. Samples were delivered to the lab immediately following processing on December 14, 2016.

The sediment was thoroughly homogenized on the morning of December 14, 2016 and eight aliquots (600 ml) were removed from the original sediment sample and placed in a centrifuge. The eight aliquots were centrifuged for approximately 15 minutes at 1000 rotations per minute (rpm). The porewater produced by this process was decanted into a volumetric cylinder for volume measurement. Decant water samples were combined and centrifuged again to remove suspended solids introduced during decanting. This final separation was conducted at 2610 rpm for 30 minutes. Processing dates, times, speeds, and volumetric yields are listed in Table 1.

2.1 SAMPLE STATIONS

The sample station was located above the water line in the approximate center of the emergent segment of Marsh 1. Actual coordinates for the sample location were recorded using a sub-meter differential Global Positioning System [GPS (Figure 1)].

2.2 SAMPLE COLLECTION

Benchmark collected sediment from a single location in Marsh 1 to represent the sediment scheduled for removal. The sample location was located above the water line to ensure that bay-water inflow would not affect the final result. Sediment above 0.25 ft NAVD29 was collected with a decontaminated stainless steel shovel and placed in a new, food-grade plastic container. This sample measured approximately 4.5 gallons and was immediately placed on ice for transport to Benchmark for further processing.

Sediment descriptions were recorded on field data sheets. Sample station coordinates and sample IDs are listed in Table 2. A Chain of Custody form was completed for the sample and is maintained in the project files.

Table 1 - Sediment Centrifuge Decant Results

Sample Aliquot	Sample Weight (g)	Sample Volume (mL)	Decanted Water Volume (mL)
Aliquot 1	1130.5	600	63.0
Aliquot 2	1123.4	600	63.0
Aliquot 3	1117.4	600	93.0
Aliquot 4	1116.0	600	93.5
Aliquot 5	1116.0	600	85.0
Aliquot 6	1113.9	600	83.0
Aliquot 7	1115.0	600	84.0
Aliquot 8	1112.7	600	83.0
TOTAL	**8944.9**	**4800**	**647.5**
		Average	**0.1349 mL water/ mL sediment**
			27.25 gallons/cubic yard

Table 2 - Pore Water Analytical Results and Coordinates

Sample ID	Easting[1]	Northing[1]	Specific Conductance (umhos/cm)	SQL[2]	Flag	Salinity (Parts per Thousand)	SQL[2]	Flag	Chloride (mg/L)	SQL	Flag	Sulfate (mg/L)	SQL[2]	Flag
CM1-PW-121316C	2747216.08	13434258.58	29,400	25.0		20.2	2.00		7,970	20.0		647	20.0	

[1] Coordinates Reported in NAD 83 State Plane Texas South Central, Feet

[2] SQL-Sample Quantitation Limit

3.0 ANALYTICAL RESULTS

Sediment samples were analyzed for chloride and sulfate anions (Method SW9056), specific conductance (Method E120.1), and salinity (Method SM2520) by ALS in Houston, Texas. Results for anion analyses are reported as milligrams per liter (mg/L) concentration. Salinity is reported as parts per thousand and specific conductance as micromhos per cm. Benchmark received all final data packages on December 19, 2016. The liquid component of the marsh sediment was found to be 13.5% by volume (27.25 gallons per cubic yard).

4.0 REFERENCES

Alcoa, 2016. *Witco Channel and Harbor Dredging, MS3 Excavation and Causeway Cove Response Action Plan - Response Action Plan Addendum* (Appendix C). Alcoa (Point Comfort)/Lavaca Bay Superfund Site. December 2016.

Alcoa, 2017. *Marsh Removal Sediment Sampling Report.* Alcoa (Point Comfort)/Lavaca Bay Superfund Site. January 2017.

APPENDIX H
LAVACA BAY SUPPLEMENTAL SEDIMENT MONITORING; ASSESS POTENTIAL AREAS OF INCREASED RESUSPENSION USING LANDSAT IMAGES

LAVACA BAY SUPPLEMENTAL SEDIMENT MONITORING

ASSESS POTENTIAL AREAS OF INCREASED RESUSPENSION USING LANDSAT IMAGES

Alcoa Point Comfort Operations
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March 2017

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Figure 21. Map of Turbidity Information near Lavaca Bay on 12/04/2015 at 17:00 UTC
Figure 22. Map of Turbidity Information near Lavaca Bay on 01/05/2016 at 17:00 UTC
Figure 23. Map of Turbidity Information near Lavaca Bay on 02/06/2016 at 17:00 UTC
Figure 24. Map of Turbidity Information near Lavaca Bay on 03/25/2016 at 17:00 UTC
Figure 25. Map of Turbidity Information near Lavaca Bay on 06/29/2016 at 17:00 UTC
Figure 26. Map of Turbidity Information near Lavaca Bay on 07/15/2016 at 17:00 UTC

LIST OF ACRONYMS AND ABBREVIATIONS

ETM+	Enhanced Thematic Mapper Plus
m/s	meters per second
NOAA	National Oceanic and Atmospheric Administration
PKV	Port Lavaca, Calhoun County, Texas, weather station
SVM	Support Vector Machine
TOA	Top of Atmosphere
USGS	U.S. Geological Survey

1.0 INTRODUCTION

Monitoring in 2015 and 2016 indicated that resuspension of sediments in the Witco Channel and Causeway Cove introduces mercury to the water column that could be transported into the Causeway Cove marshes (Alcoa 2016a; Alcoa 2016b). Follow-up work was conducted in fall 2016 to further understand the resuspension issue. Included in this work is the LANDSAT study discussed here. It was designed to provide information to help delineate areas within Causeway Cove that are susceptible to wind-driven resuspension.

1.1 PURPOSE AND SCOPE

To investigate the turbidity patterns in the Lavaca Bay area under various wind conditions, LANDSAT images of the Texas coast collected in 2011 or later were downloaded and analyzed. Because cloud cover can interfere with interpretation, images with greater than 20% cloud cover over the Closed Area were removed from the analysis.

Sixty-nine LANDSAT imageries (both Enhanced Thematic Mapper Plus [ETM+] and LANDSAT 8) collected from April 2011 to August 2016 were downloaded from the U.S. Geological Survey (USGS) website. The imageries were preprocessed (i.e., unzipped and composited) and clipped to the study area boundary. After an initial review of the imageries, a decision was made to focus only on the LANDSAT 8 imageries as: 1) the ETM+ images contain wide stripes of missing data; and 2) LANDSAT 8 data have adequate temporal coverage of the study area from 2013 to 2016. This resulted in 26 images available for interpretation.

Wind direction and speed information collected concurrent to remote imaging was downloaded from the National Oceanic and Atmospheric Administration (NOAA) VCAT2 weather station. Wind data for days without available NOAA data were collected from the Port Lavaca, Calhoun County, Texas (PKV) weather station.

2.0 METHODS

Turbidity was interpreted from each of the preprocessed LANDSAT 8 imageries using a support vector machine (SVM) supervised classification approach (Mountrakis et al. 2011). Due to lack of ground-truthing turbidity data, turbidity was qualitatively identified as low, medium, or high.

Before the turbidity classification, the Top of Atmosphere (TOA) reflectance were calculated for each LANDSAT 8 image to make the pixel value of all surfaces consistent (USGS 2016a; USGS 2016b). The calculated TOA reflectance surfaces were used in lieu of the original digital numbered surfaces for the classification. In each image, hundreds of reference points were randomly distributed and manually interpreted from five TOA reflectance surfaces with representative characteristics and little distraction (i.e., little cloud cover). These interpreted reference points were used to calibrate the SVM classification models.

A series of well-adopted SVM models were cross-validated using the reference points and the model. The SVM model with the highest cross-validation accuracy was selected for the turbidity classification. Each of the 26 TOA imageries was classified using the selected SVM model one after another. The 26 classified imageries were then post-processed by 1) labeling areas with cloud/cirrus cover using the LANDSAT 8 quality control surface (USGS 2016c); and 2) excluding terrain areas from the classification surface.

Local wind conditions for the 8- and 4-hour period prior to LANDSAT image collection, based on the metadata describing the collection time, were retrieved from the NOAA and PKV weather stations. Wind data were processed to develop windrose plots depicting wind intensity and direction patterns for the hours preceding each image.

3.0 RESULTS

Turbidity conditions for each of the 26 LANDSAT images were mapped and assessed in conjunction with wind conditions to determine spatial patterns of wind-driven resuspension within the Causeway Cove (Figures 1 through 26).

Several images were collected during or in the days following significant storm events in central and south Texas. The storm events led to increased runoff into the rivers feeding Lavaca Bay and discharge of high volumes of highly turbid fresh water into the Bay. During the days and sometimes weeks following these events, turbidity levels throughout Lavaca Bay, including within Causeway Cove, remained elevated regardless of wind and tidal conditions. Due to this, satellite images collected subsequent to high stream flow measurements at USGS gauges 08164000 (Lavaca River near Edna, Texas) and 08164390 (Navidad River at Strane Park near Edna, Texas) on May 4, 2013; June 5, 2013; March 20, 2014; March 23, 2015; June 11, 2015; July 13, 2015; July 29, 2015; and June 29, 2016, were excluded from the wind-turbidity analysis. It is possible that lingering turbidity from storm events impacted other imagery days; however, all remaining available imagery (18 images) was used in this analysis.

Wind speeds and directions ranged widely across the times imagery was collected: 12 images occurred during winds from the north, northeast, or northwest; 10 images occurred during predominantly southern or southeastern winds; and the remaining occurred during easterly or variable wind conditions.

Days with strong southerly winds are as follows:

- July 15, 2016
- July 26, 2014
- August 8, 2013
- July 23, 2013
- June 21, 2013

Days with moderate to strong northerly to easterly winds are as follows:

- Marsh 25, 2016
- January 5, 2016
- December 4, 2015
- October 17, 2015
- February 19, 2015
- January 15, 2014

Days with moderate to strong north-westerly to westerly winds are as follows:

- February 6, 2016
- October 14, 2014

Low wind days are as follows:

- November 18, 2015
- October 1, 2015
- August 14, 2015
- August 11, 2014
- September 25, 2013

Most days with strong southerly winds (predominantly greater than 5 meters per second [m/s], often greater than 7 m/s) produced significant turbidity in Causeway Cove. Very little variation in turbidity can be determined from the resolution of the LANDSAT imagery, indicating that these wind conditions generate sufficient wave energy to resuspend sediments throughout the cove. On July 23, 2013, a small area of low and medium turbidity is seen in the north and west Causeway Cove despite sustained winds over 7 m/s. The cause of the lack of resuspension in this region is unknown, and significant cloud cover prevents comparison to turbidity patterns in the remainder of the cove.

Days with moderate to strong north, northwest, northeast, and easterly winds generate less wave action, and the cove experienced only moderate to low (unperturbed) turbidity. Turbidity

patterns suggest that the initial impact of the wind and wave action during these conditions occurs along the shoreline and at the oyster reefs. The area of moderate turbidity gradually increases, moving westward, with potential areas of high turbidity developing along the Dredge Island Bridge. Unique turbidity patterns are present on January 15, 2014. On this day, strong winds prevailed 8 hours prior to the LANDSAT image collection but had diminished by 4 hours prior. The turbidity patterns suggest that the 4-hour window of calmer wind conditions may be of adequate duration to allow for the settling out of suspended solids along the northeast shoreline and western open water areas of the cove.

Most days with low winds (less than 4 m/s) experience little resuspension regardless of wind direction. Low turbidity conditions predominate within Causeway Cove, with small regions of moderate resuspension at or extending from the shoreline. The exceptions to this pattern are August 11, 2014, and August 14, 2015, which experienced light and variable winds for the 8 hours prior to the imagery but had moderate turbidity throughout the region. The source of turbidity in the bay on these days is unknown; the preceding days experienced similar winds and no large flow events occurred in the weeks prior to the images.

4.0 CONCLUSIONS

The examined wind data indicate that winds in Lavaca Bay predominantly blow from the north or the south, with easterly or variable winds occurring less frequently. Turbidity patterns in Causeway Cove indicate that winds below 4 m/s, regardless of direction, generate little resuspension. Above 4 m/s, wind-generated wave action begins to resuspend surface sediments, initially along the shorelines and the oyster reefs and then spreading westward into the deeper, open-water area.

In general, northern and eastern winds generate less resuspension than southerly winds. This indicates that the cove shoreline and causeway peninsula likely provide a sheltering effect to the cove waters from winds traveling from these directions. Southern winds appear to have the strongest resuspension potential, generating widespread turbidity throughout the cove and possibly Witco Channel above 5 m/s.

5.0 REFERENCES

Alcoa, 2016a. *Draft Lavaca Bay Methylation Special Study – Phase 2, Study 4 – Update the Understanding of Methylation Processes and Uptake in the Closed Area – Spring 2016*. Alcoa (Point Comfort)/Lavaca Bay Superfund Site. September 2016.

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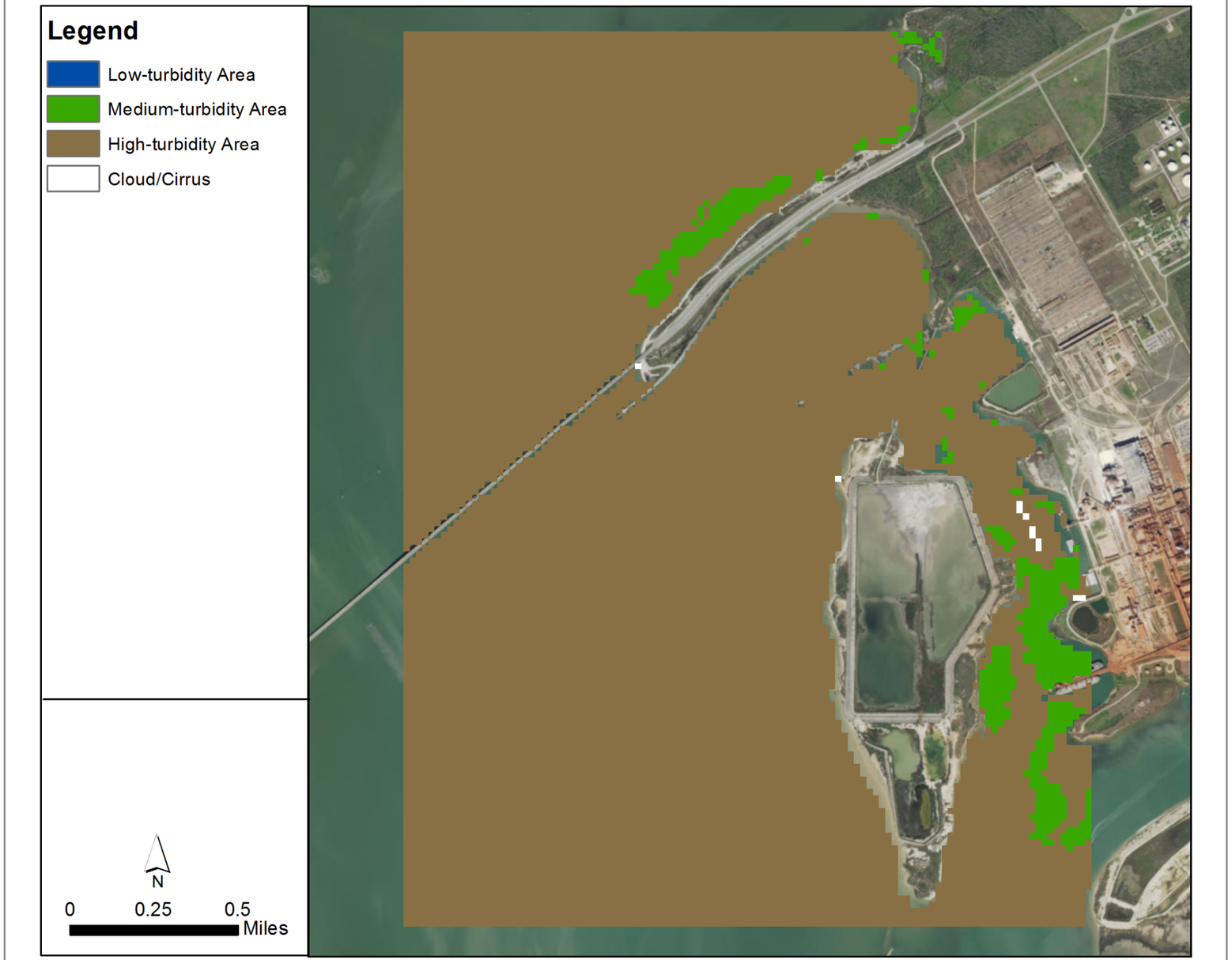
Mountrakis G., J. IM, and C. Ogole, 2011. Support Vector Machines in Remote Sensing. *ISPRS Journal of Photogrammetry and Remote Sensing* 66(3):2011.

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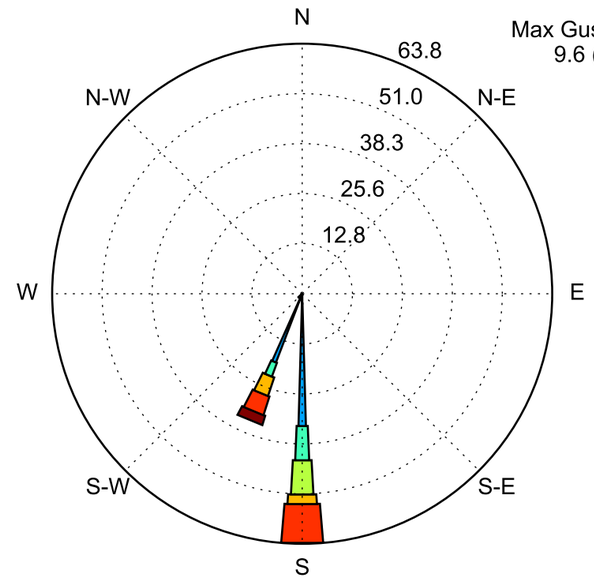
USGS, 2016b. Using the USGS Landsat 8 Product. Available from: https://landsat.usgs.gov/using-usgs-landsat-8-product. Last modified on 11/29/2016.

USGS, 2016c. Landsat 8 Pre-Collection Quality Assessment Band. Available from: https://landsat.usgs.gov/qualityband. Last modified on 11/29/2016.

FIGURES



Day impacted by high flow event



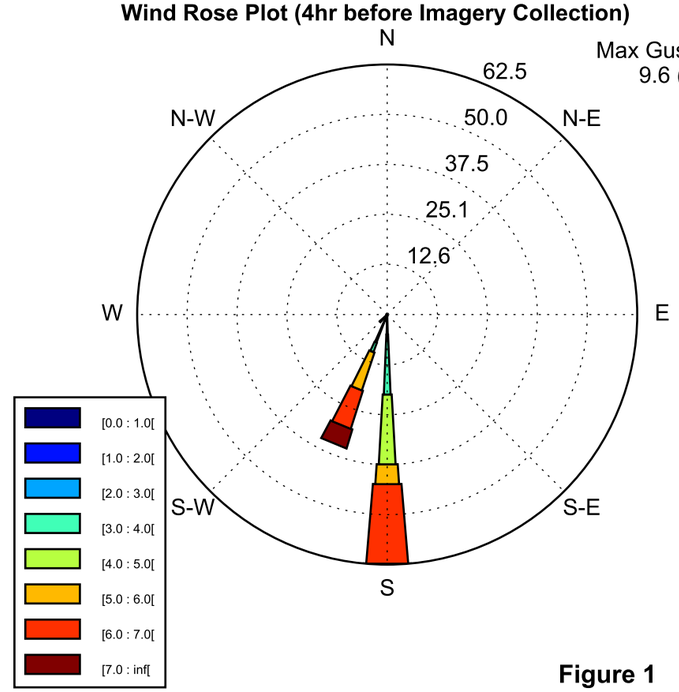


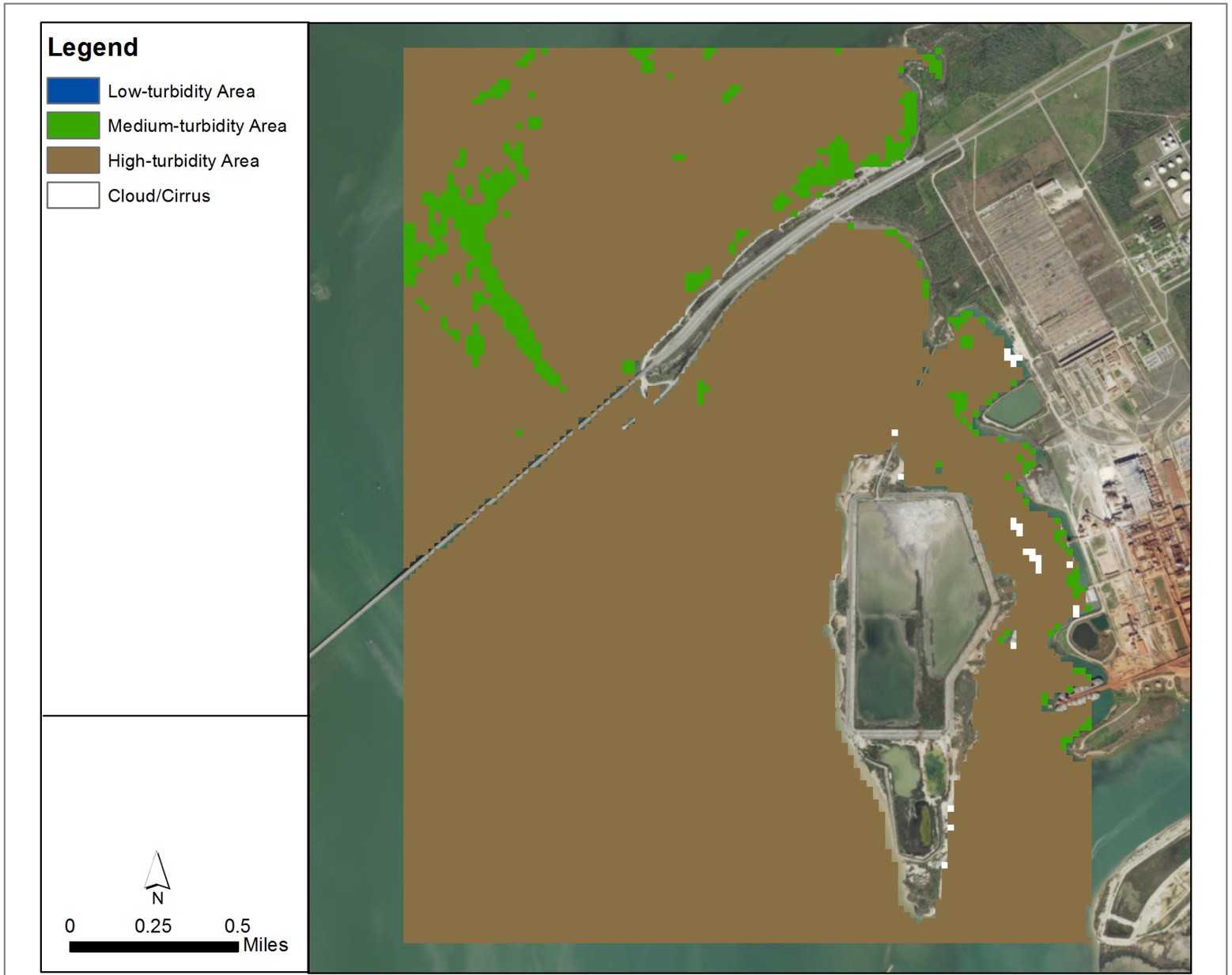
Figure 1

Map of Turbidity Information near Lavaca Bay on 05/04/2013 at 17:00 UTC

Note: Turbidity information was obtained from Landsat 8 imagery (LC80260402013124LGN01).
Wind data from NOAA VAT2 weather station when available. Wind data from PKV weather station for days without NOAA data.

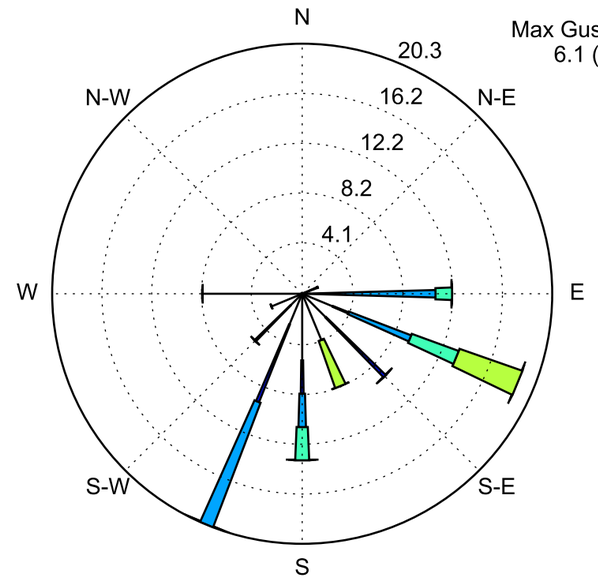
Prepared for Alcoa Corporation

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Day impacted by high flow event

Wind Rose Plot (8hr before Imagery Collection)



Wind Rose Plot (4hr before Imagery Collection)

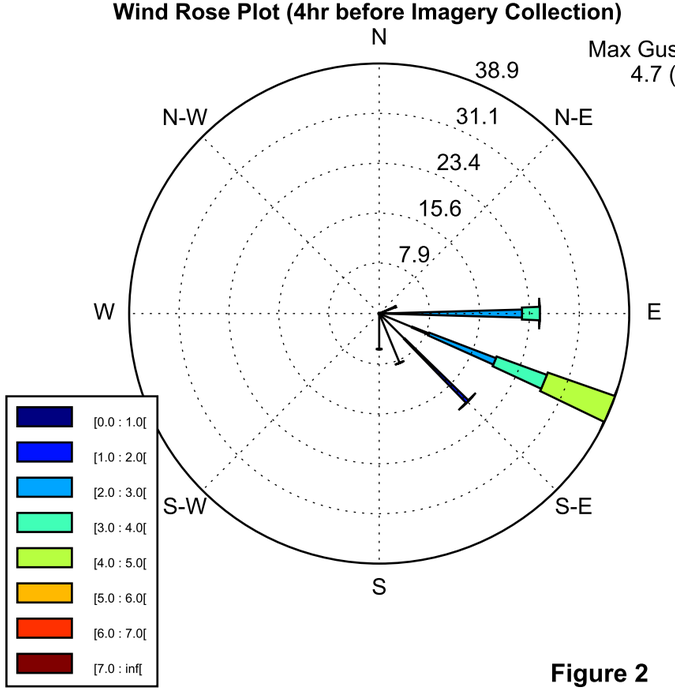


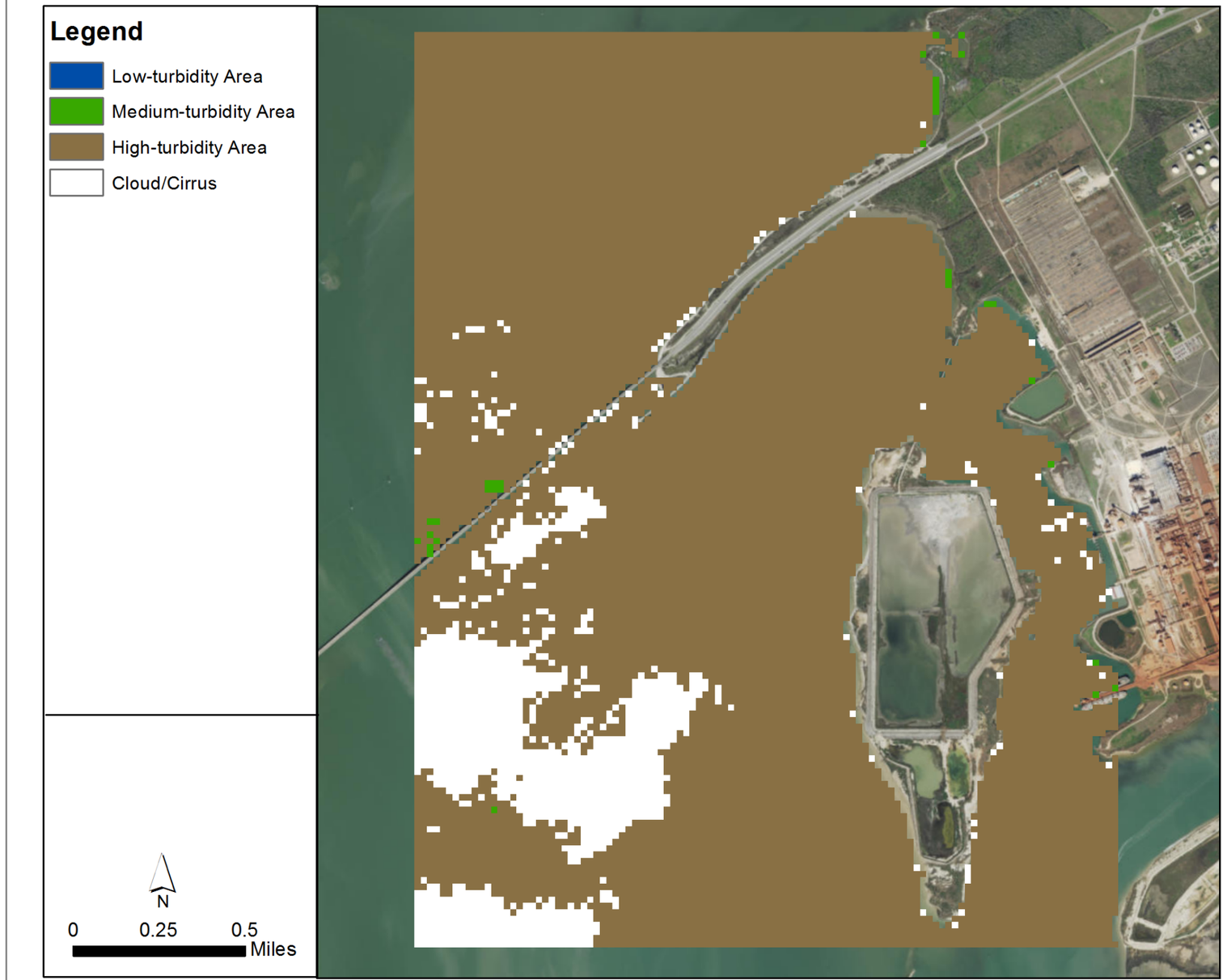
Figure 2

Map of Turbidity Information near Lavaca Bay on 06/05/2013 at 17:00 UTC

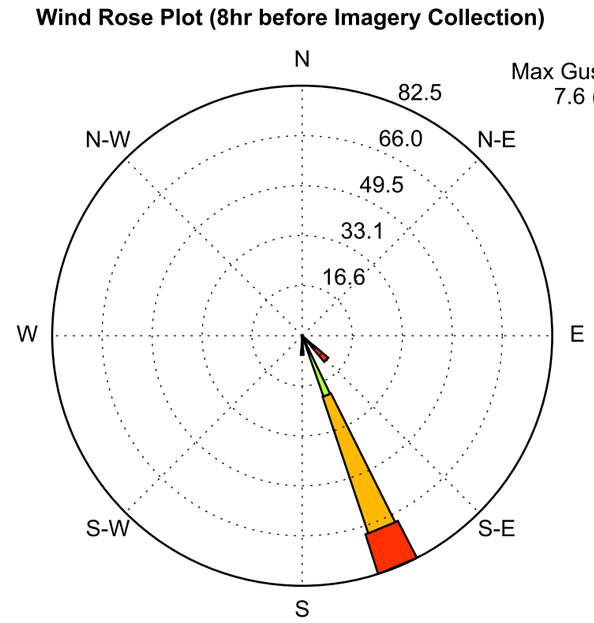
Note: Turbidity information was obtained from Landsat 8 imagery (LC80260402013156LGN00).
Wind data from NOAA VAT2 weather station when available. Wind data from PKV weather station for days without NOAA data.

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Strong southerly wind day



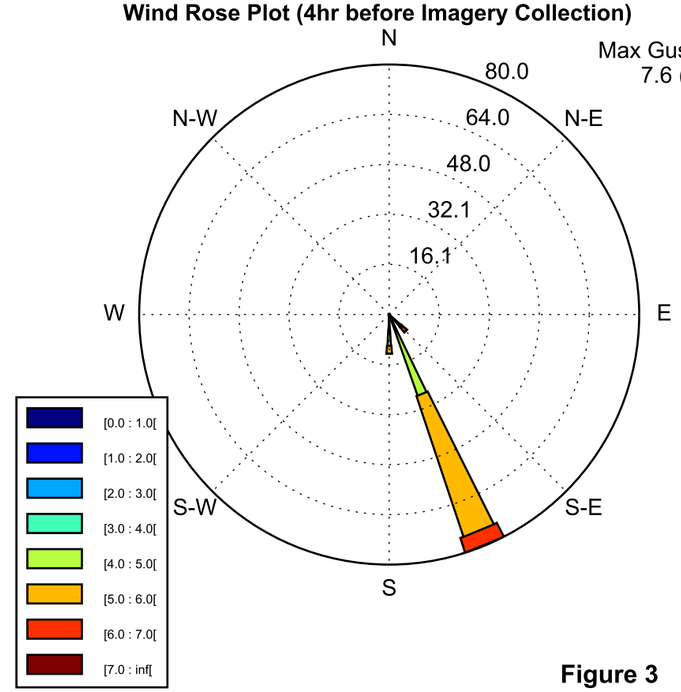


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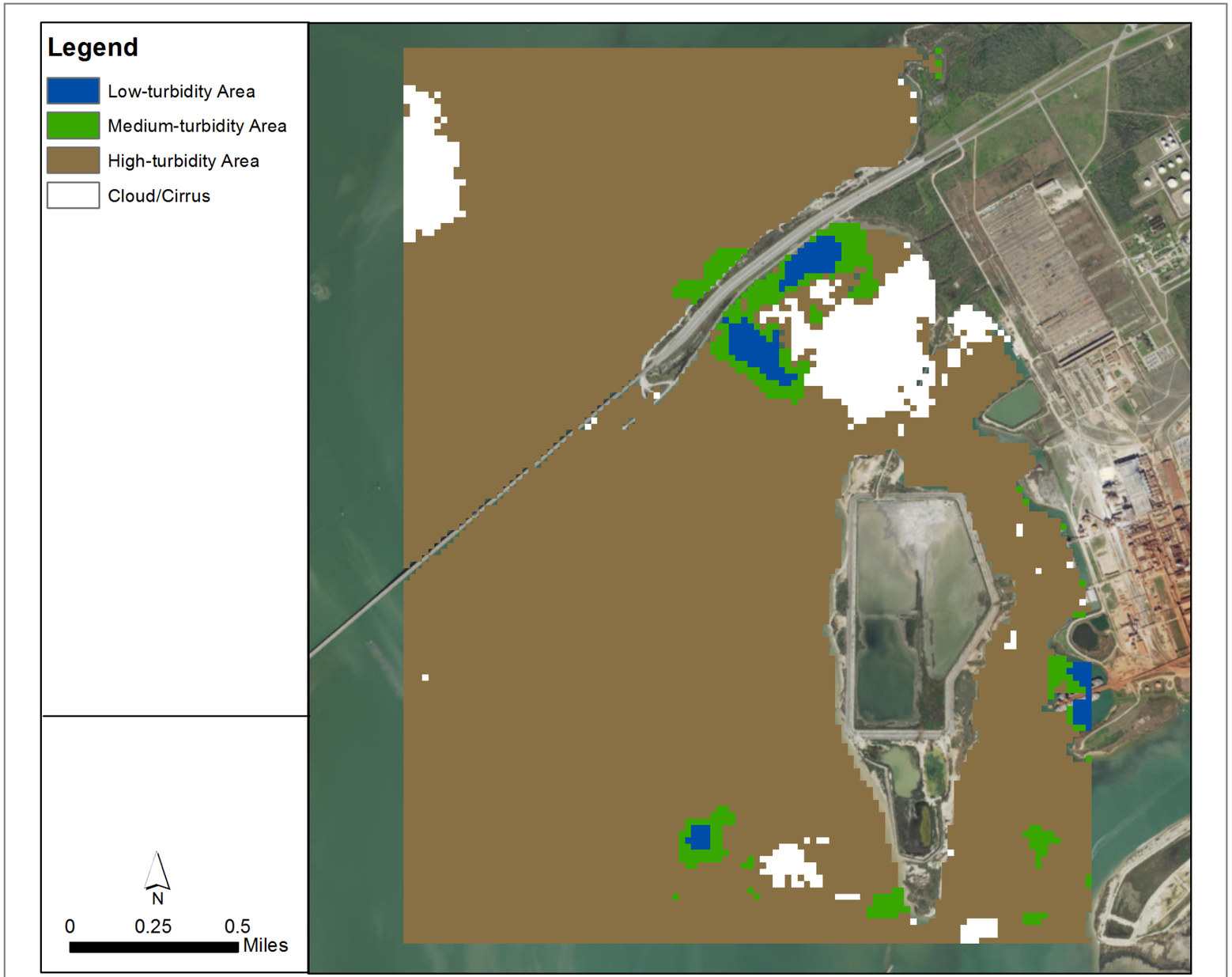
Map of Turbidity Information near Lavaca Bay on 06/21/2013 at 17:00 UTC

Note: Turbidity information was obtained from Landsat 8 imagery (LC80260402013172LGN00).
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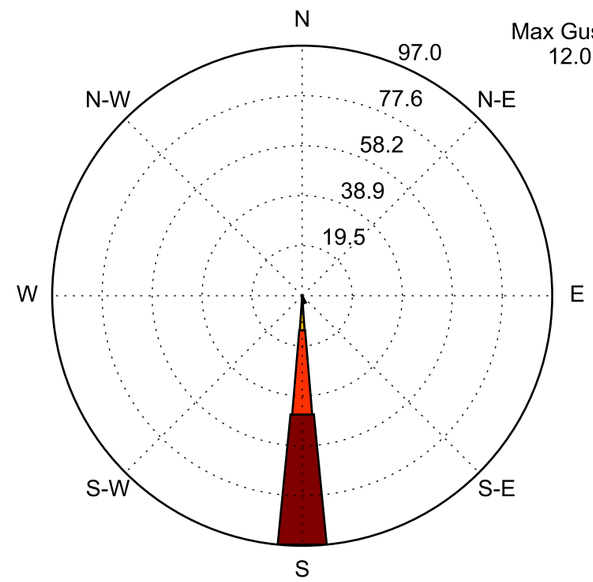
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Strong southerly wind day



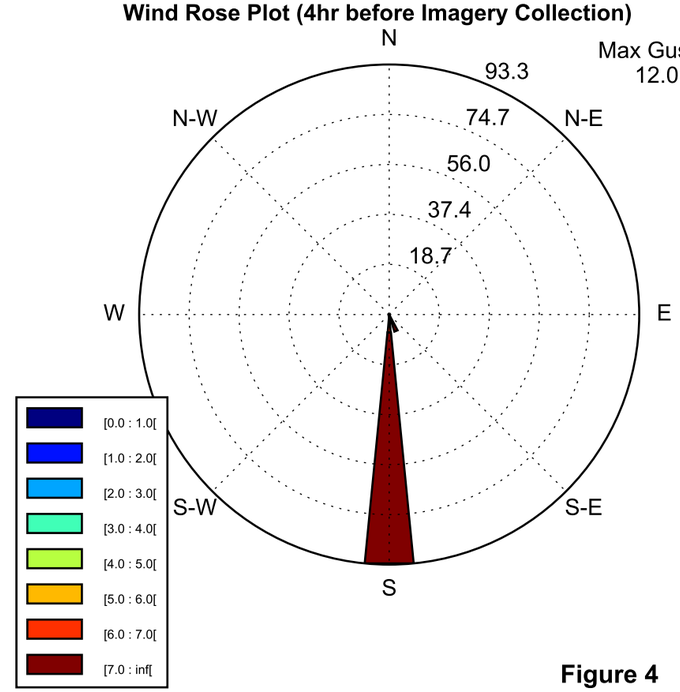


Figure 4

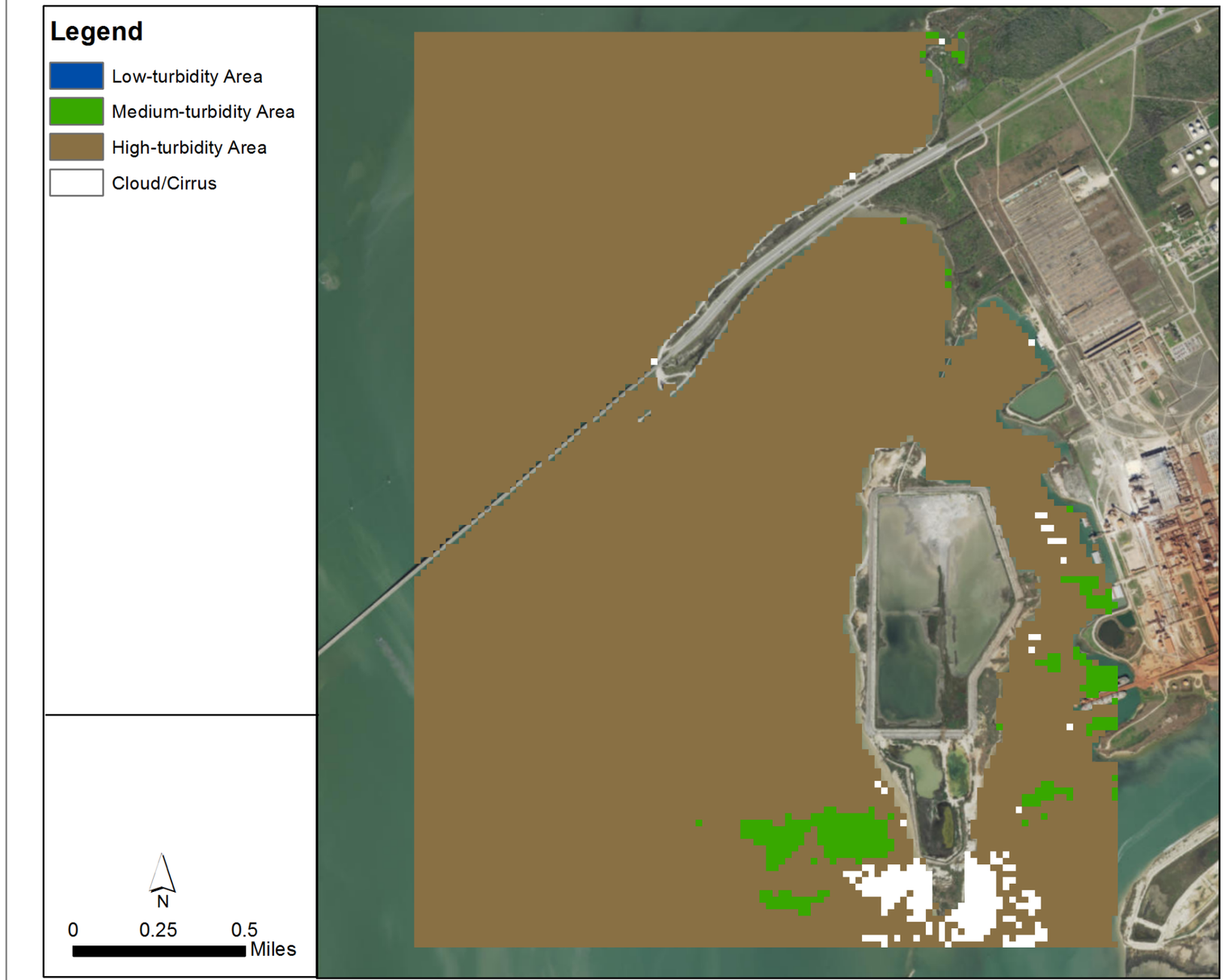
Map of Turbidity Information near Lavaca Bay on 07/23/2013 at 17:00 UTC

Note: Turbidity information was obtained from Landsat 8 imagery (LC80260402013204LGN00).
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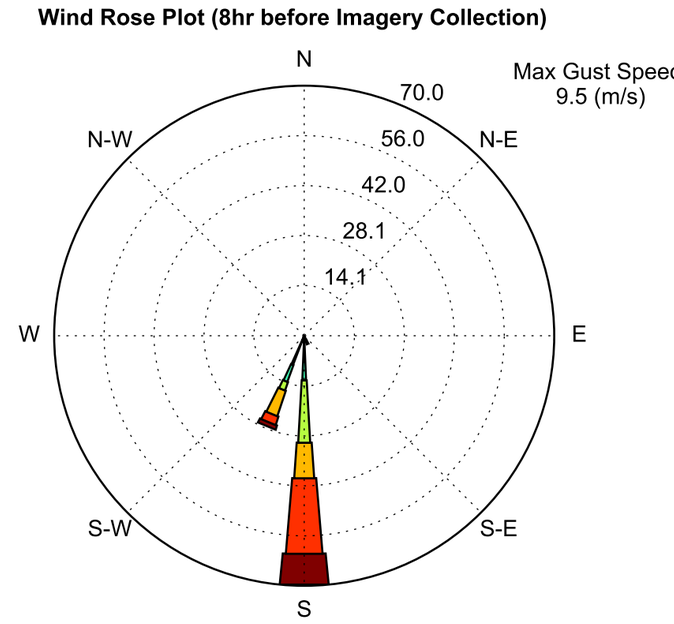
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Strong southerly wind day



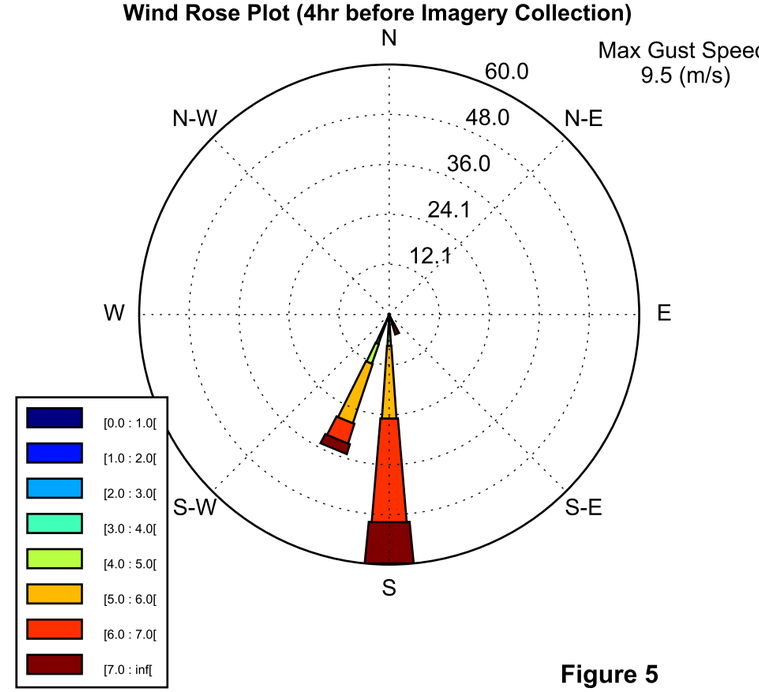


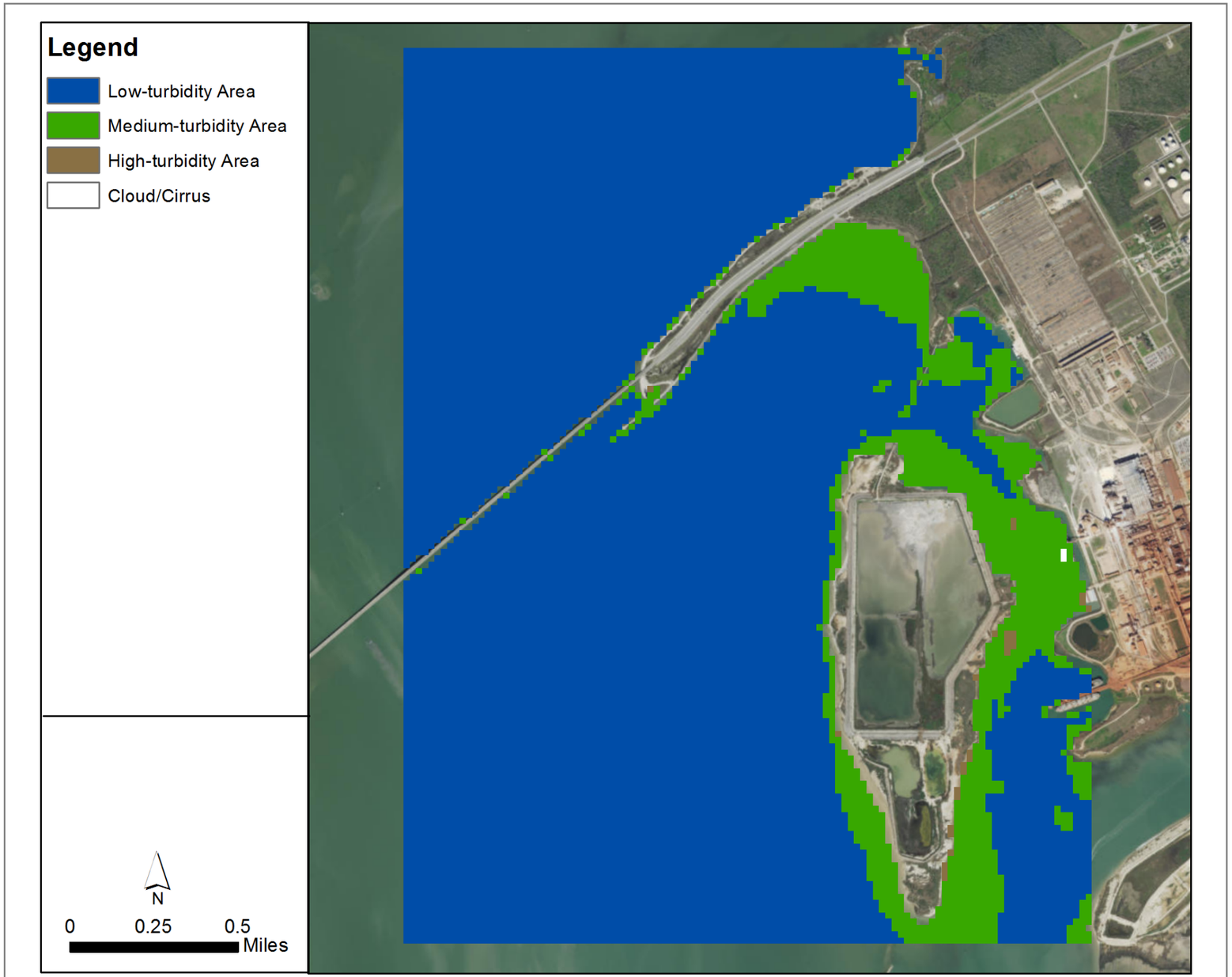
Figure 5

Map of Turbidity Information near Lavaca Bay on 08/08/2013 at 17:00 UTC

Note: Turbidity information was obtained from Landsat 8 imagery (LC80260402013220LGN00).
Wind data from NOAA VAT2 weather station when available. Wind data from PKV weather station for days without NOAA data.

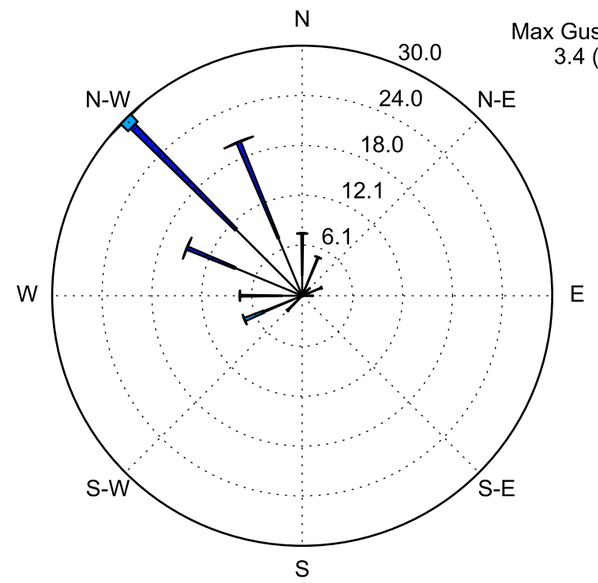
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Low wind day

Wind Rose Plot (8hr before Imagery Collection)



Wind Rose Plot (4hr before Imagery Collection)

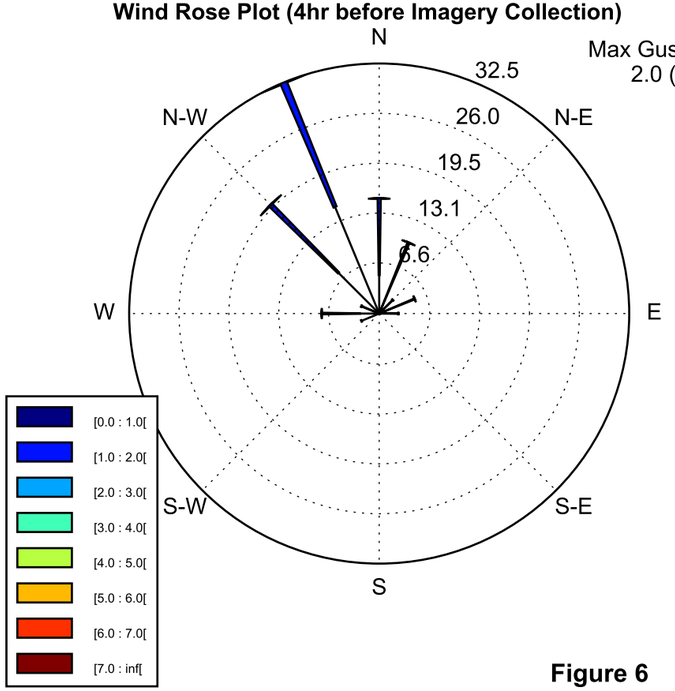


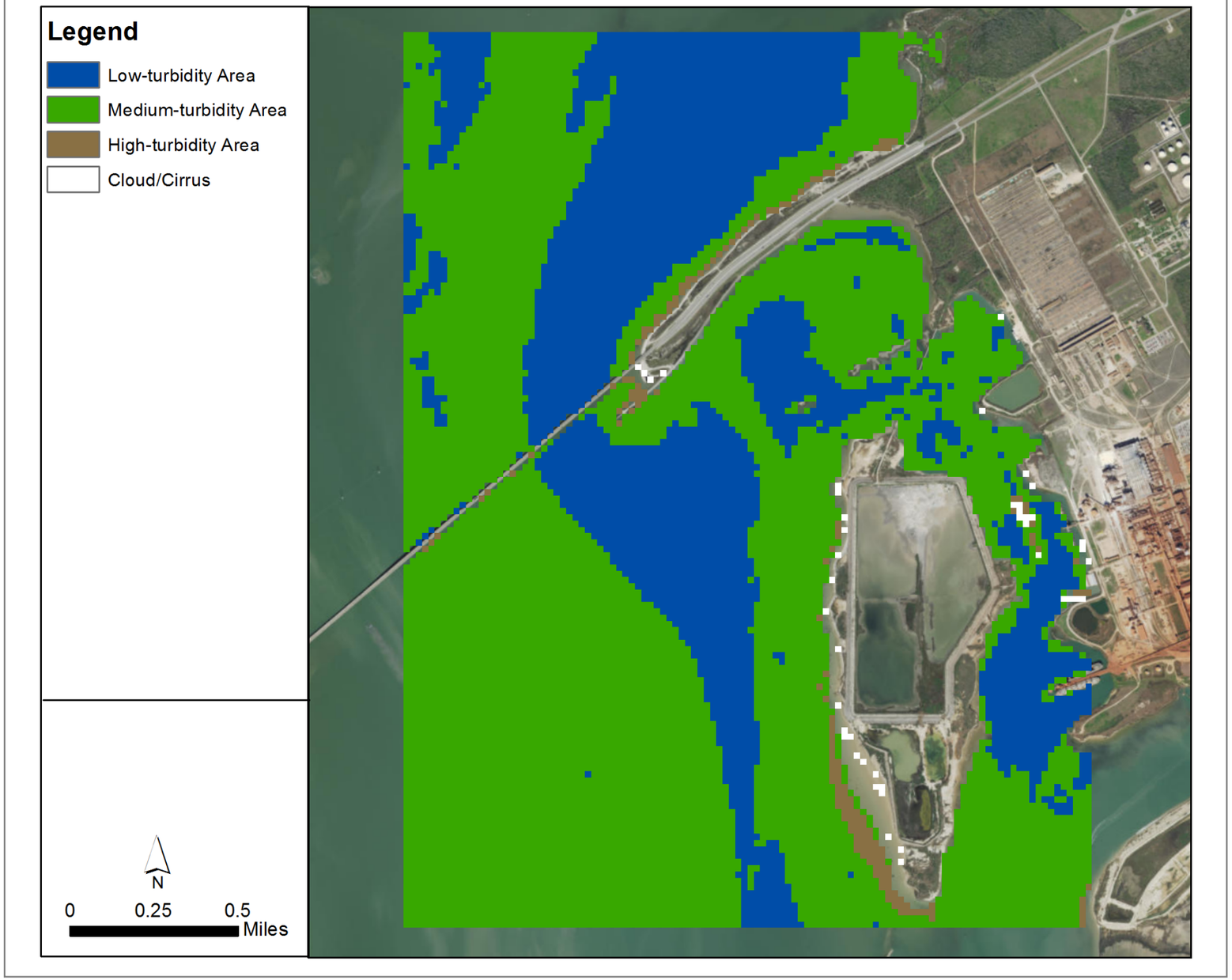
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Map of Turbidity Information near Lavaca Bay on 09/25/2013 at 17:00 UTC

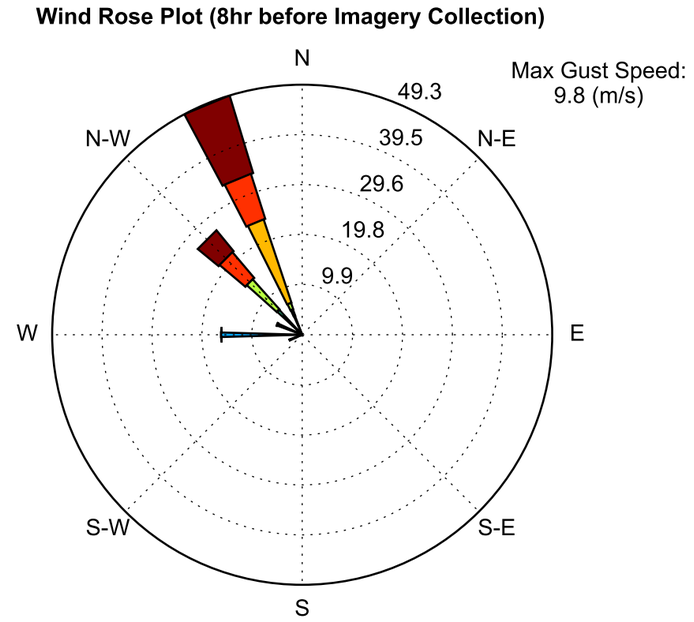
Note: Turbidity information was obtained from Landsat 8 imagery (LC80260402013268LGN00).
Wind data from NOAA VAT2 weather station when available. Wind data from PKV weather station for days without NOAA data.

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Moderate to strong northerly to easterly wind day



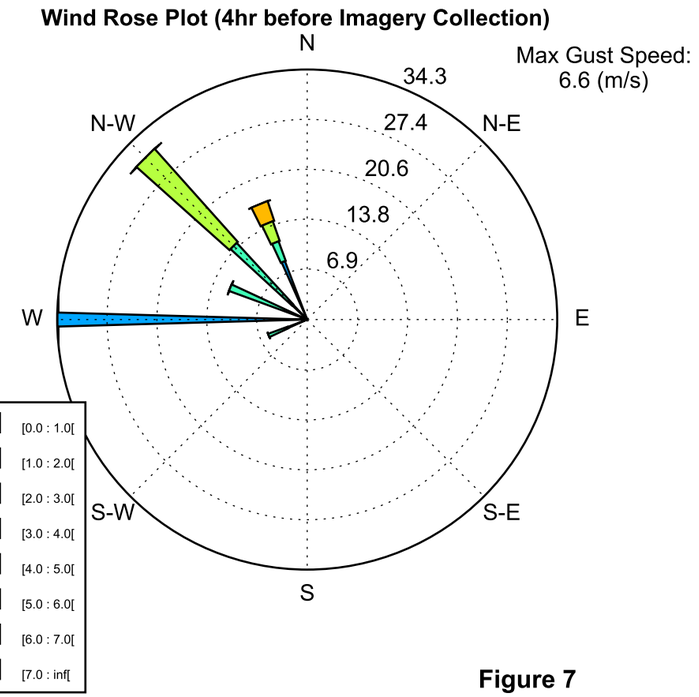


Figure 7

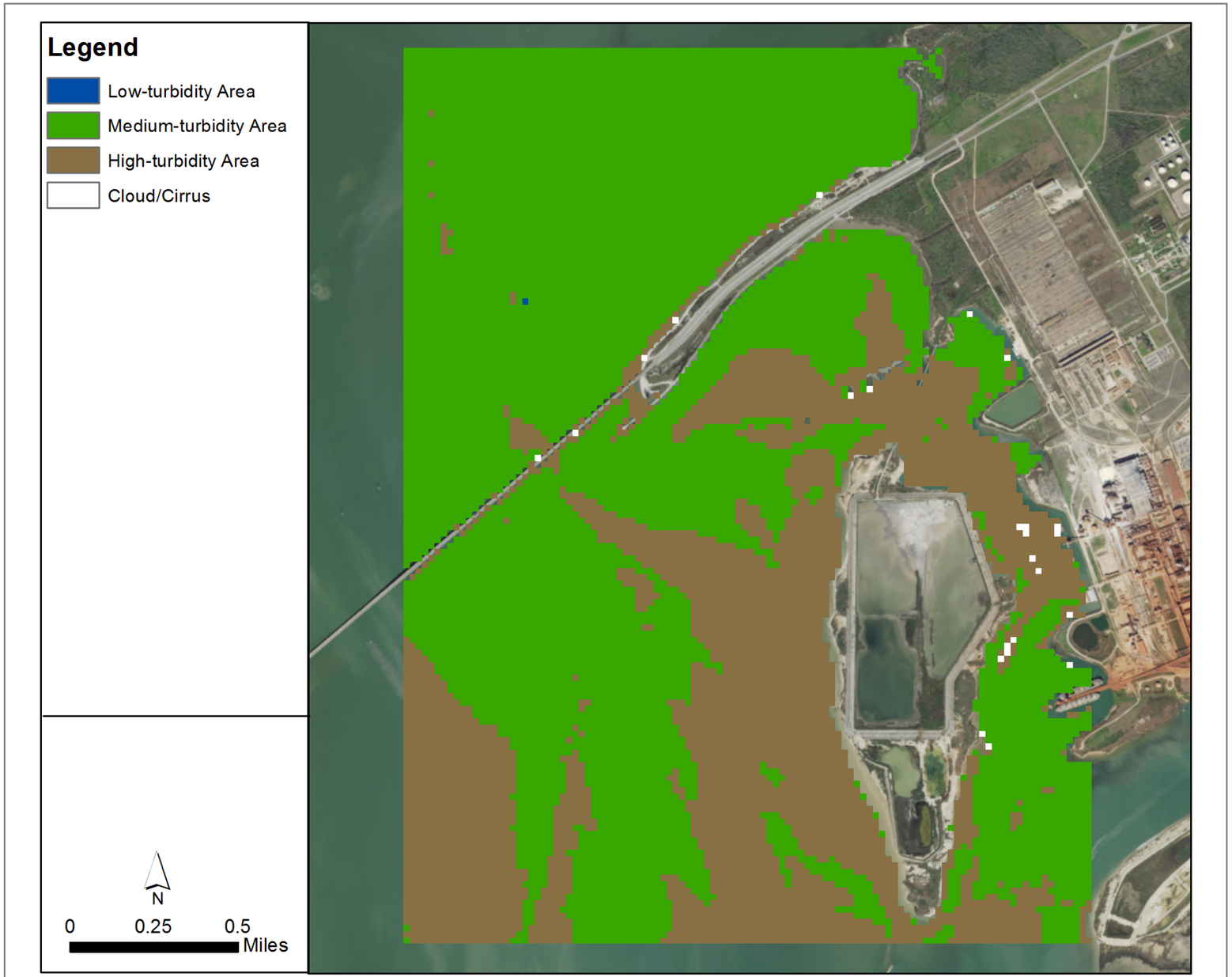
Map of Turbidity Information near Lavaca Bay on 01/15/2014 at 17:00 UTC

Note: Turbidity information was obtained from Landsat 8 imagery (LC80260402014015LGN00).
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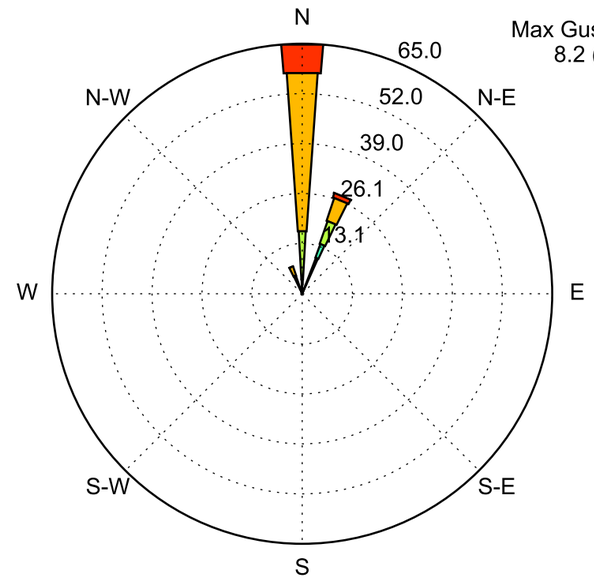
ANCHOR QEA

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Day impacted by high flow event

Wind Rose Plot (8hr before Imagery Collection)



Wind Rose Plot (4hr before Imagery Collection)

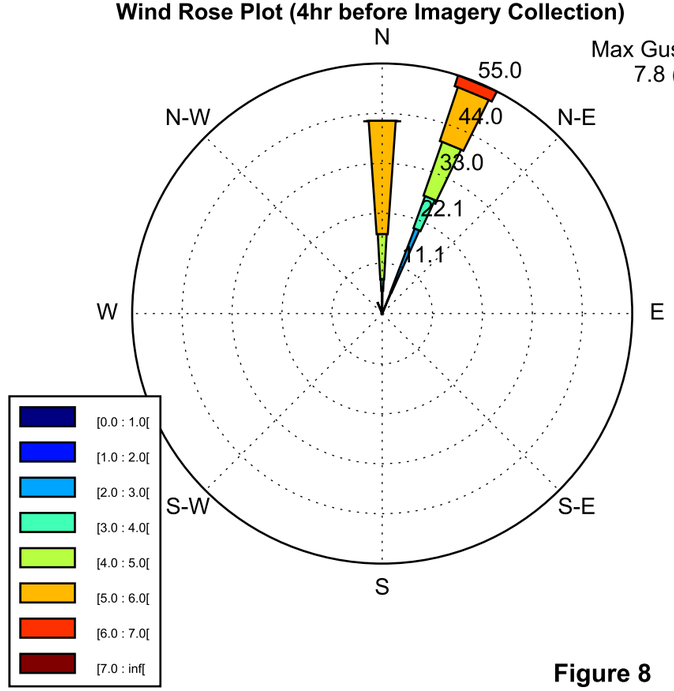


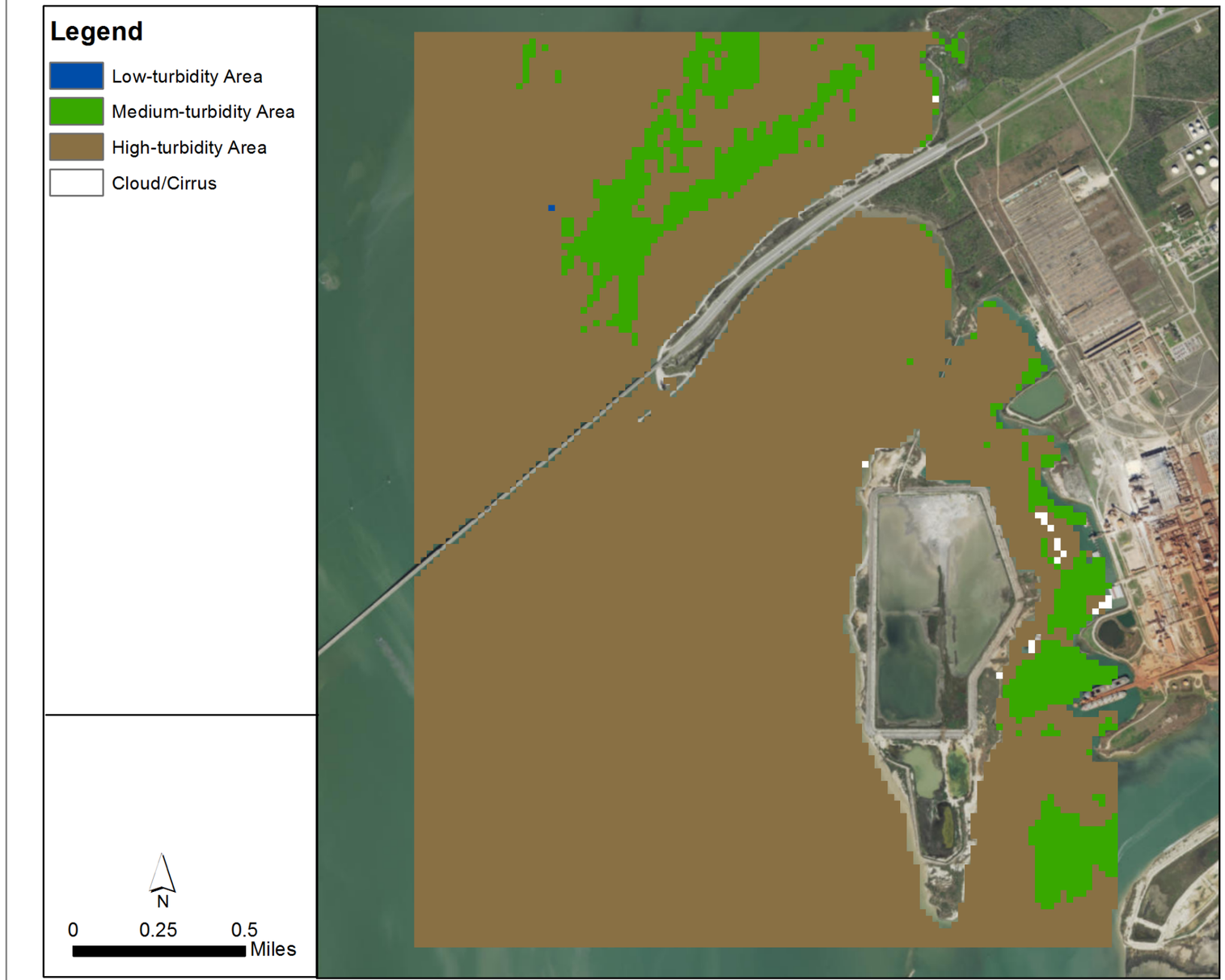
Figure 8

Map of Turbidity Information near Lavaca Bay on 03/20/2014 at 17:00 UTC

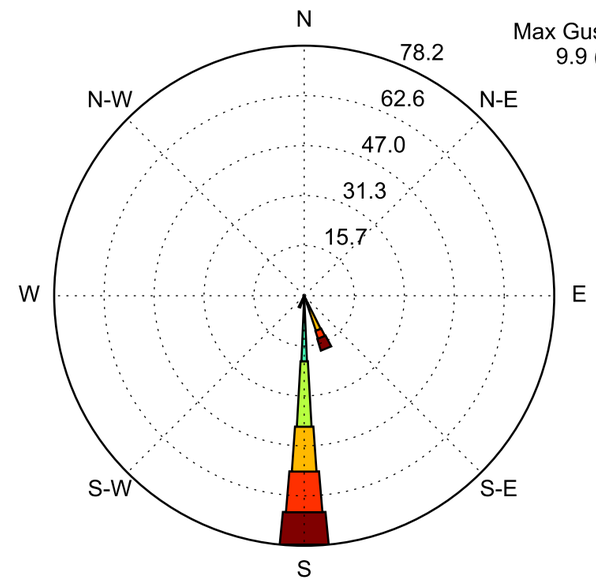
Note: Turbidity information was obtained from Landsat 8 imagery (LC80260402014079LGN00).
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Strong southerly wind day



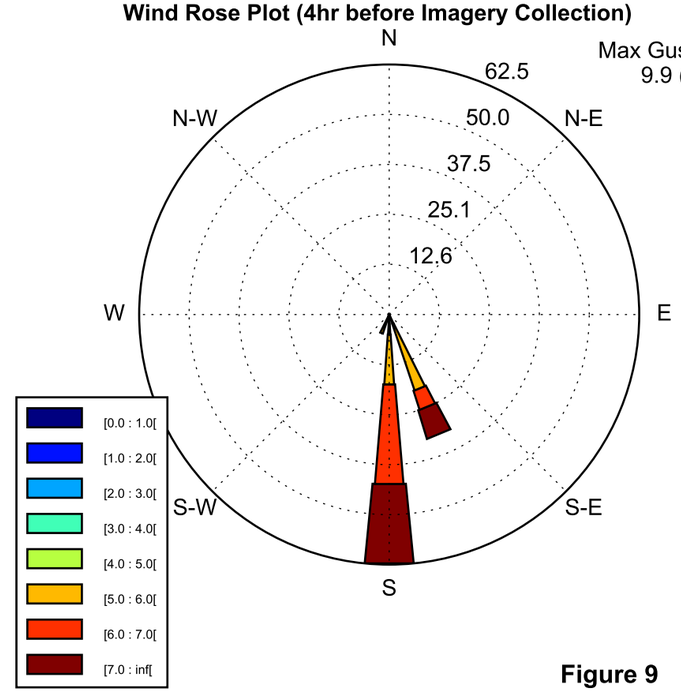


Figure 9

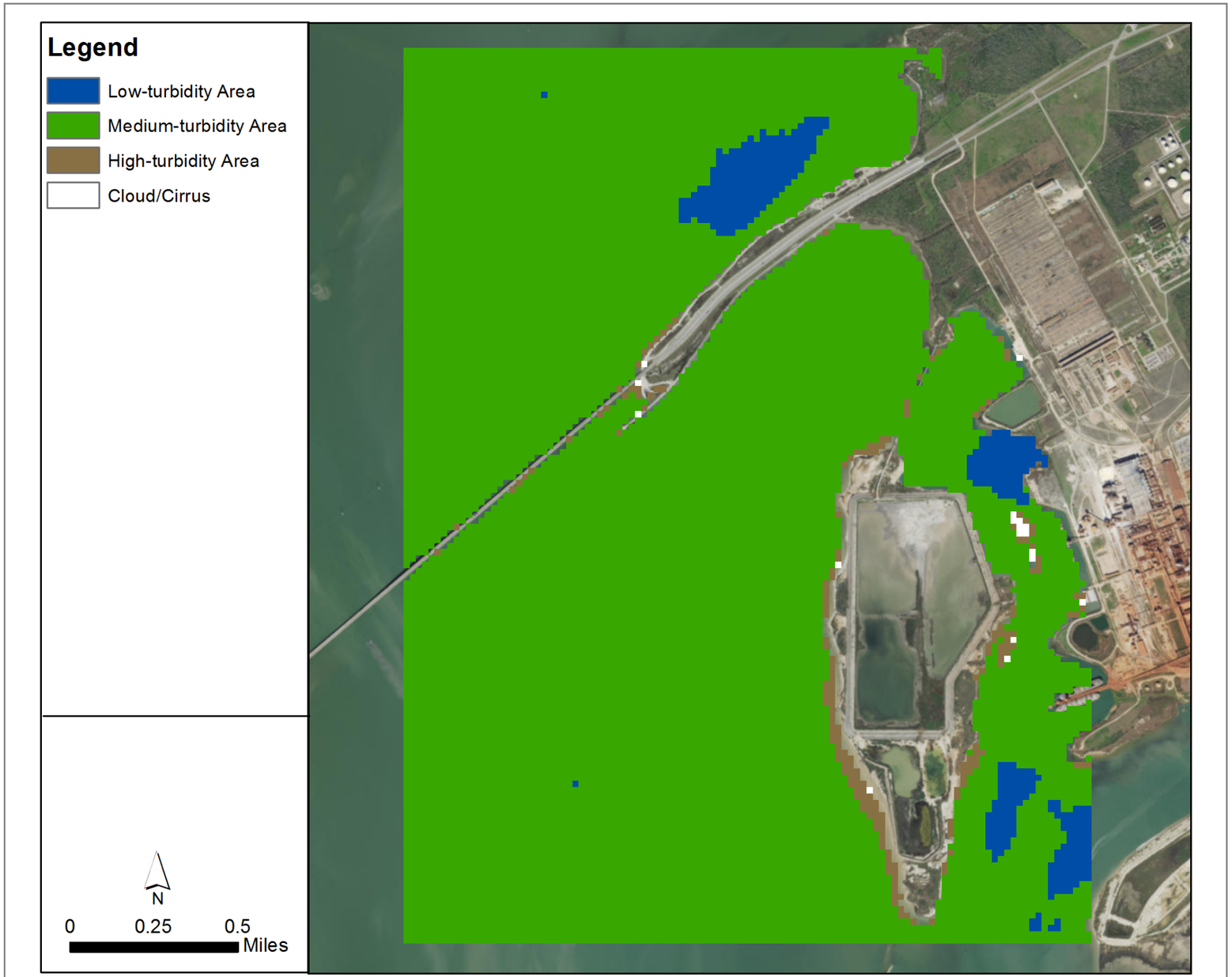
Map of Turbidity Information near Lavaca Bay on 07/26/2014 at 17:00 UTC

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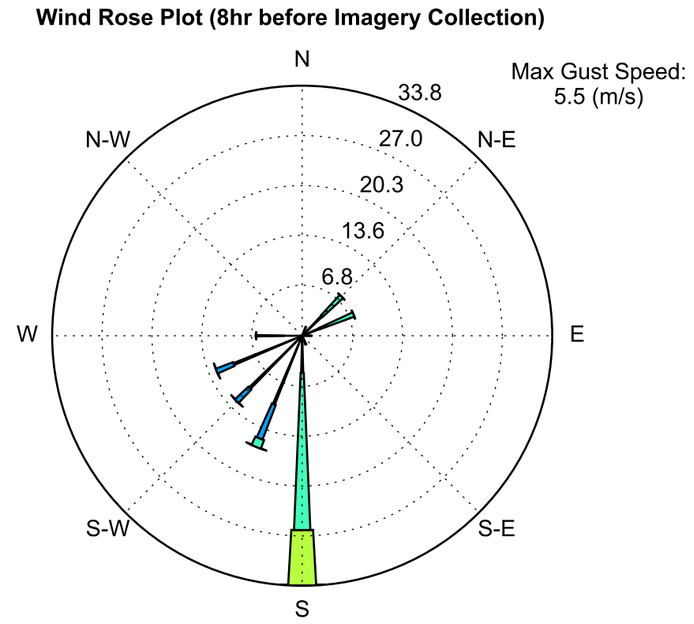
Prepared for Alcoa Corporation

ANCHOR QEA

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Low wind day



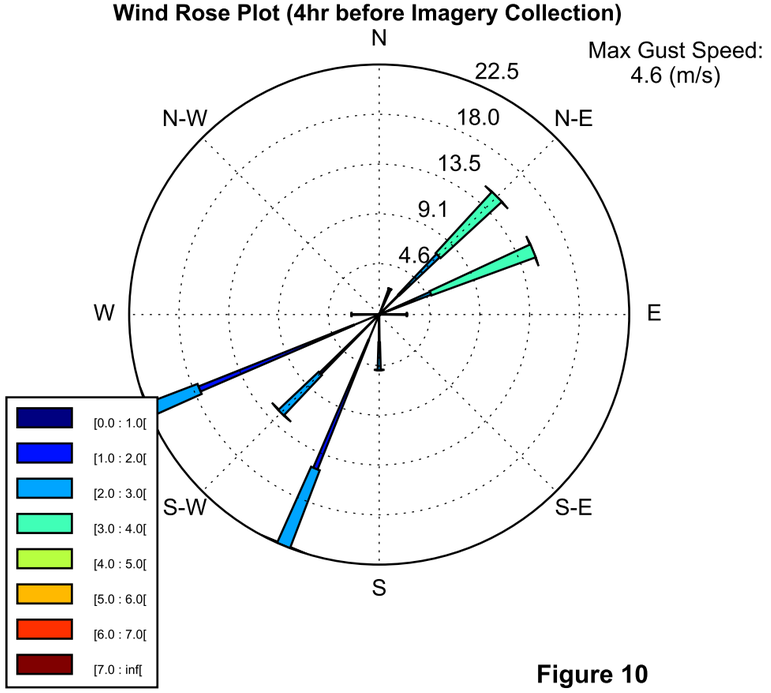


Figure 10

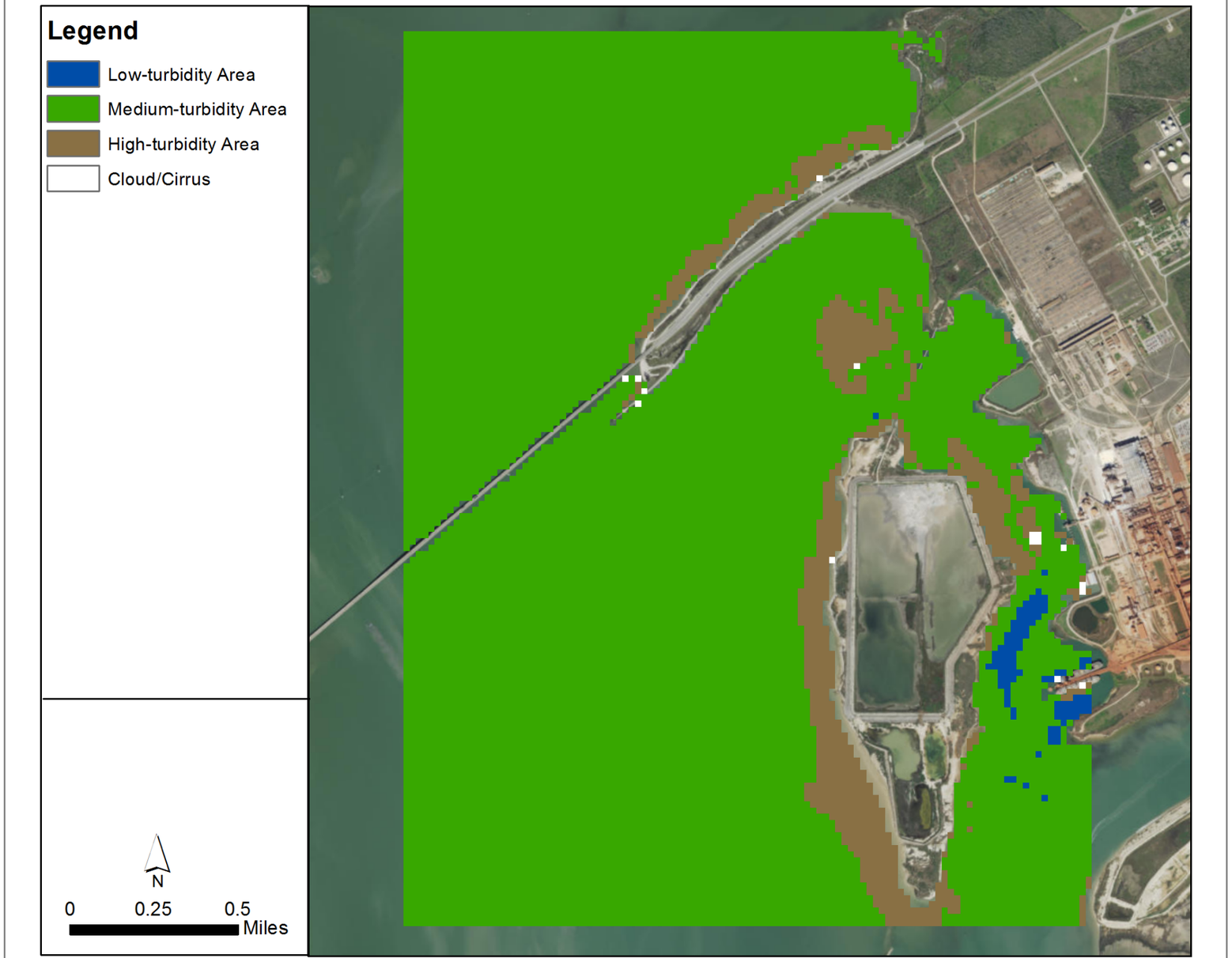
Map of Turbidity Information near Lavaca Bay on 08/11/2014 at 17:00 UTC

Note: Turbidity information was obtained from Landsat 8 imagery (LC80260402014223LGN00).
Wind data from NOAA VAT2 weather station when available. Wind data from PKV weather station for days without NOAA data.

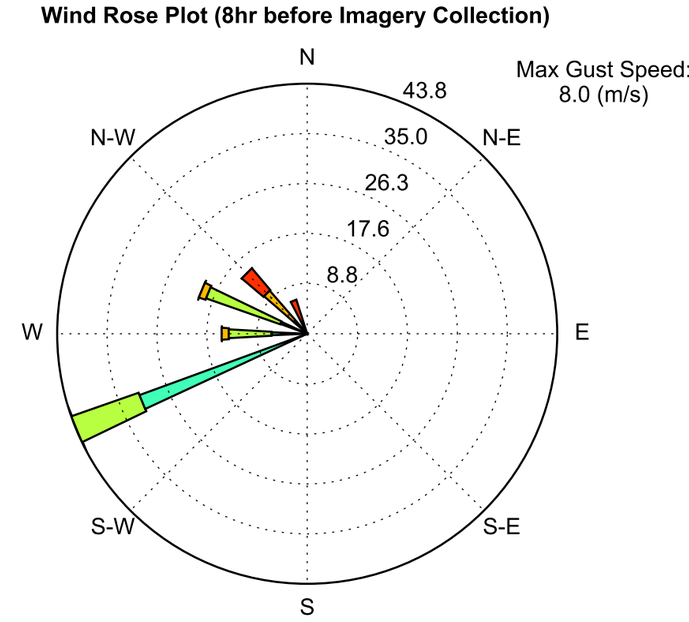
Prepared for Alcoa Corporation

ANCHOR QEA

zl - C:\Users\zlu\workspace\LandsatProcessor\mapping\turbidity_classification_visualization.py 2/20/2017 16:52:56



Moderate to strong north-westerly to westerly wind day



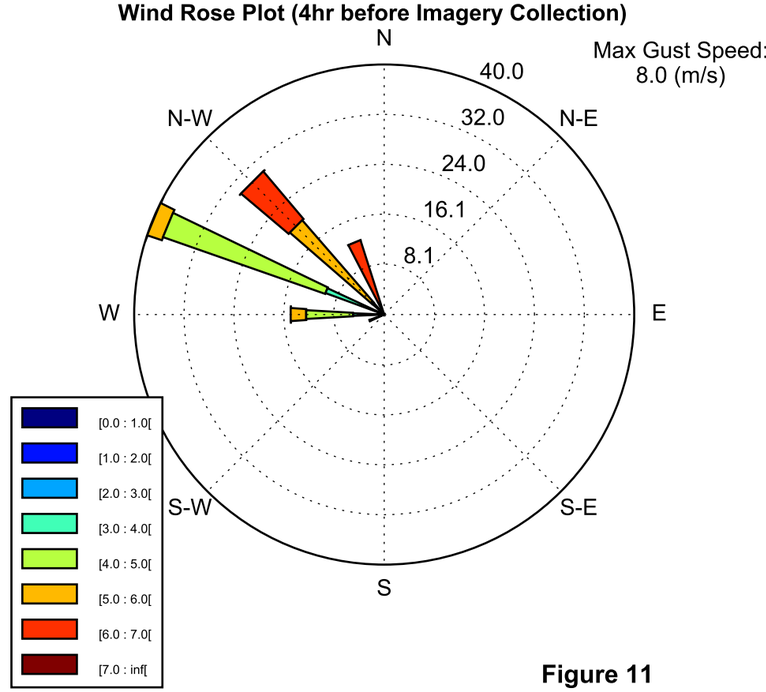


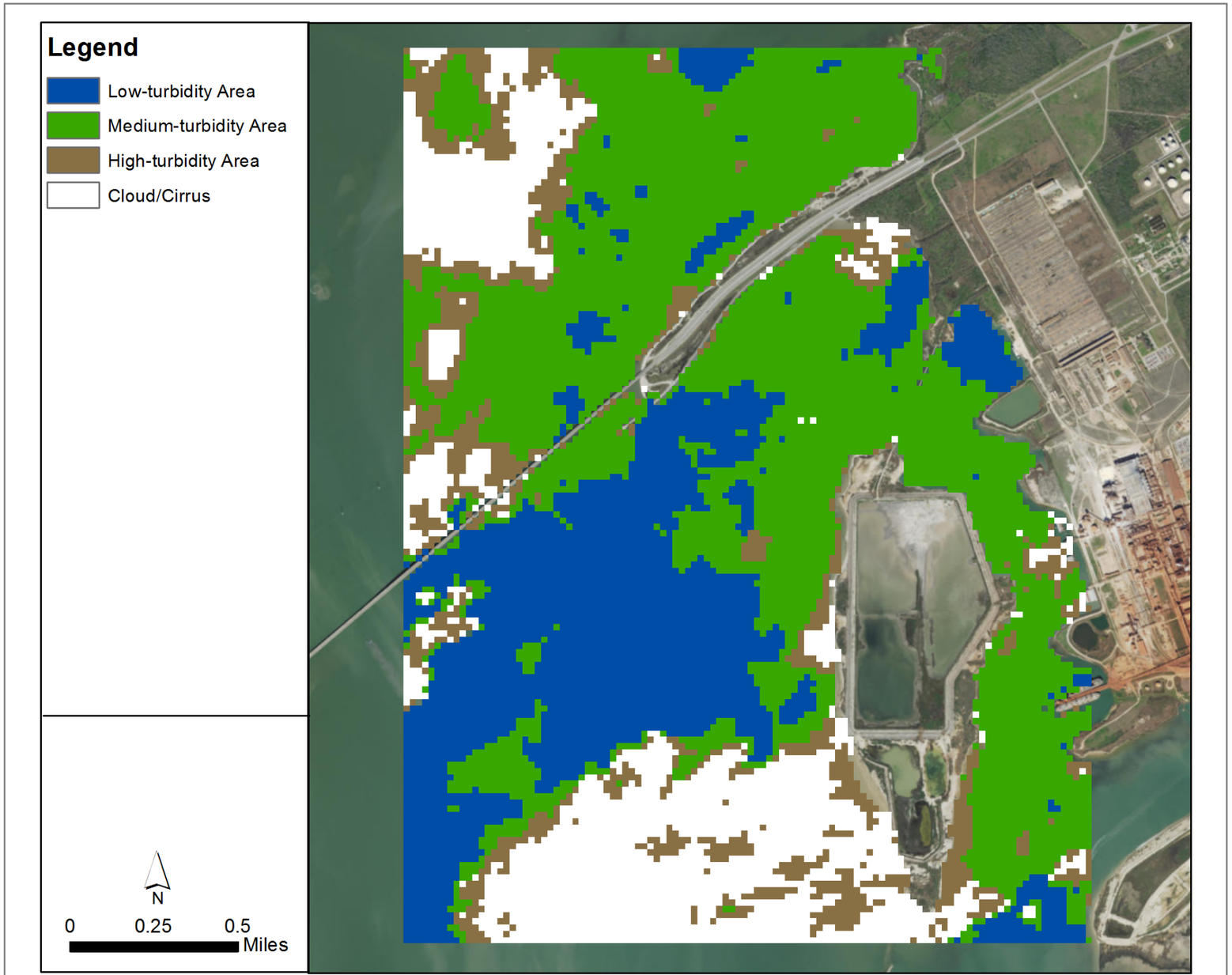
Figure 11

Map of Turbidity Information near Lavaca Bay on 10/14/2014 at 17:00 UTC

Note: Turbidity information was obtained from Landsat 8 imagery (LC80260402014287LGN00).
Wind data from NOAA VAT2 weather station when available. Wind data from PKV weather station for days without NOAA data.

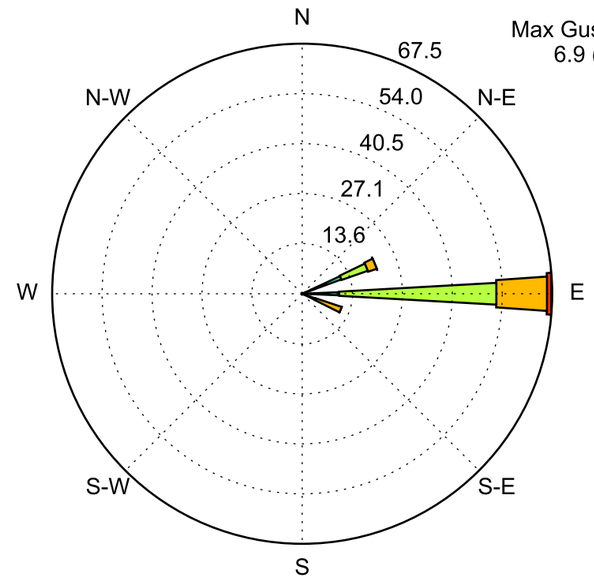
Prepared for Alcoa Corporation

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Moderate to strong northerly to easterly wind day

Wind Rose Plot (8hr before Imagery Collection)



Wind Rose Plot (4hr before Imagery Collection)

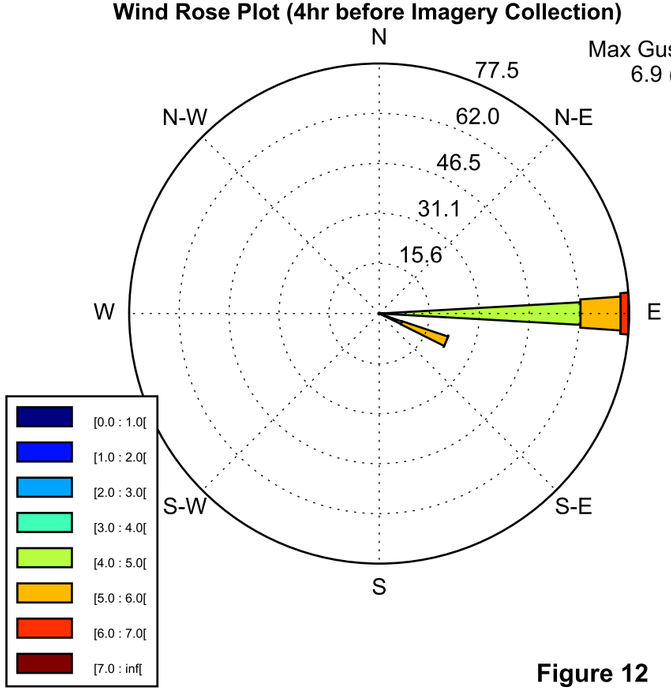


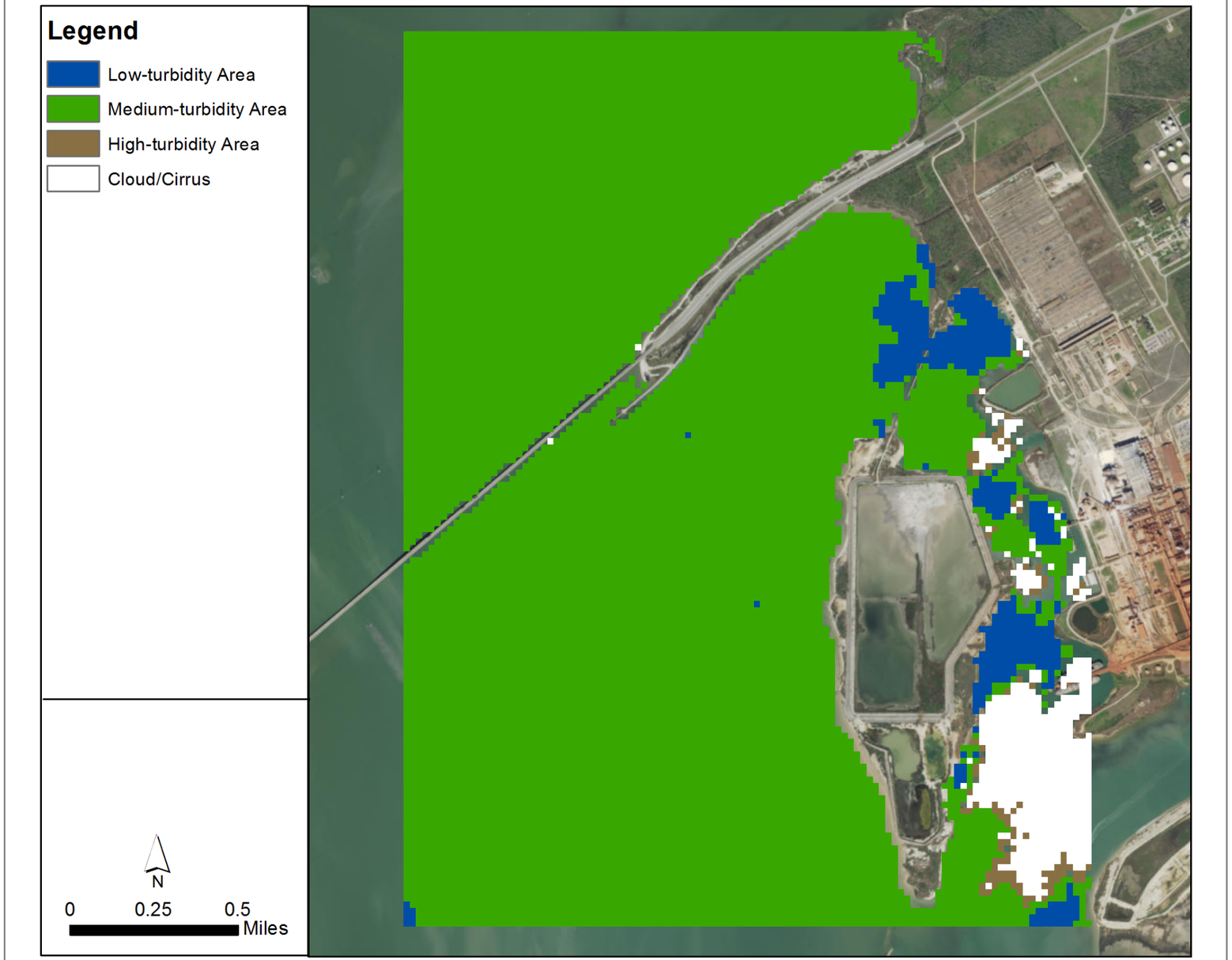
Figure 12

Map of Turbidity Information near Lavaca Bay on 02/19/2015 at 17:00 UTC

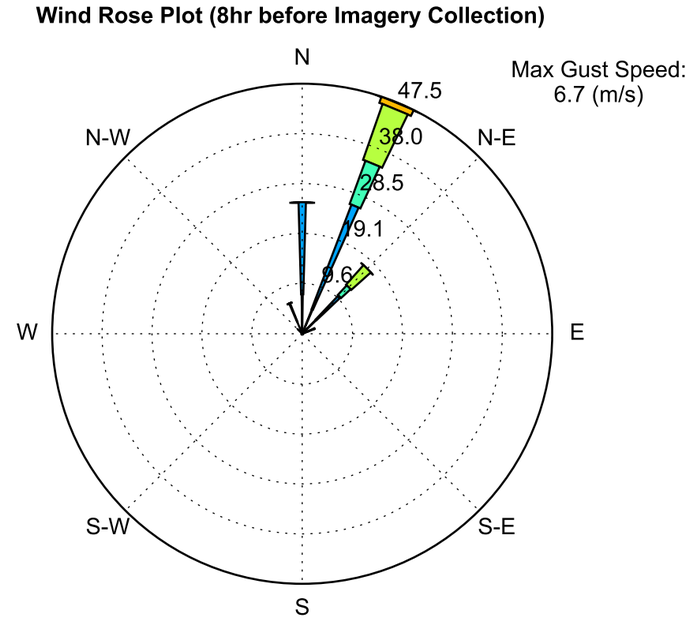
Note: Turbidity information was obtained from Landsat 8 imagery (LC80260402015050LGN00).
Wind data from NOAA VAT2 weather station when available. Wind data from PKV weather station for days without NOAA data.

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Day impacted by high flow event



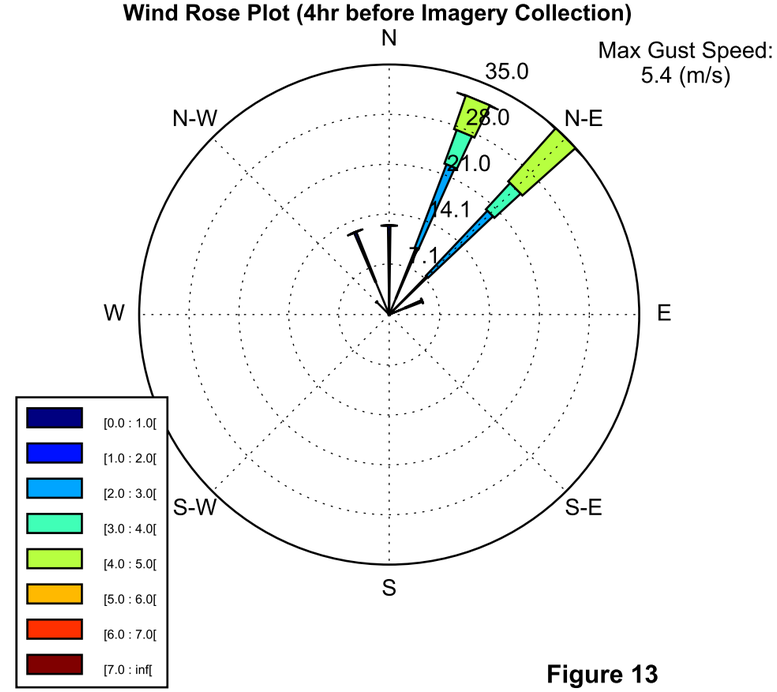


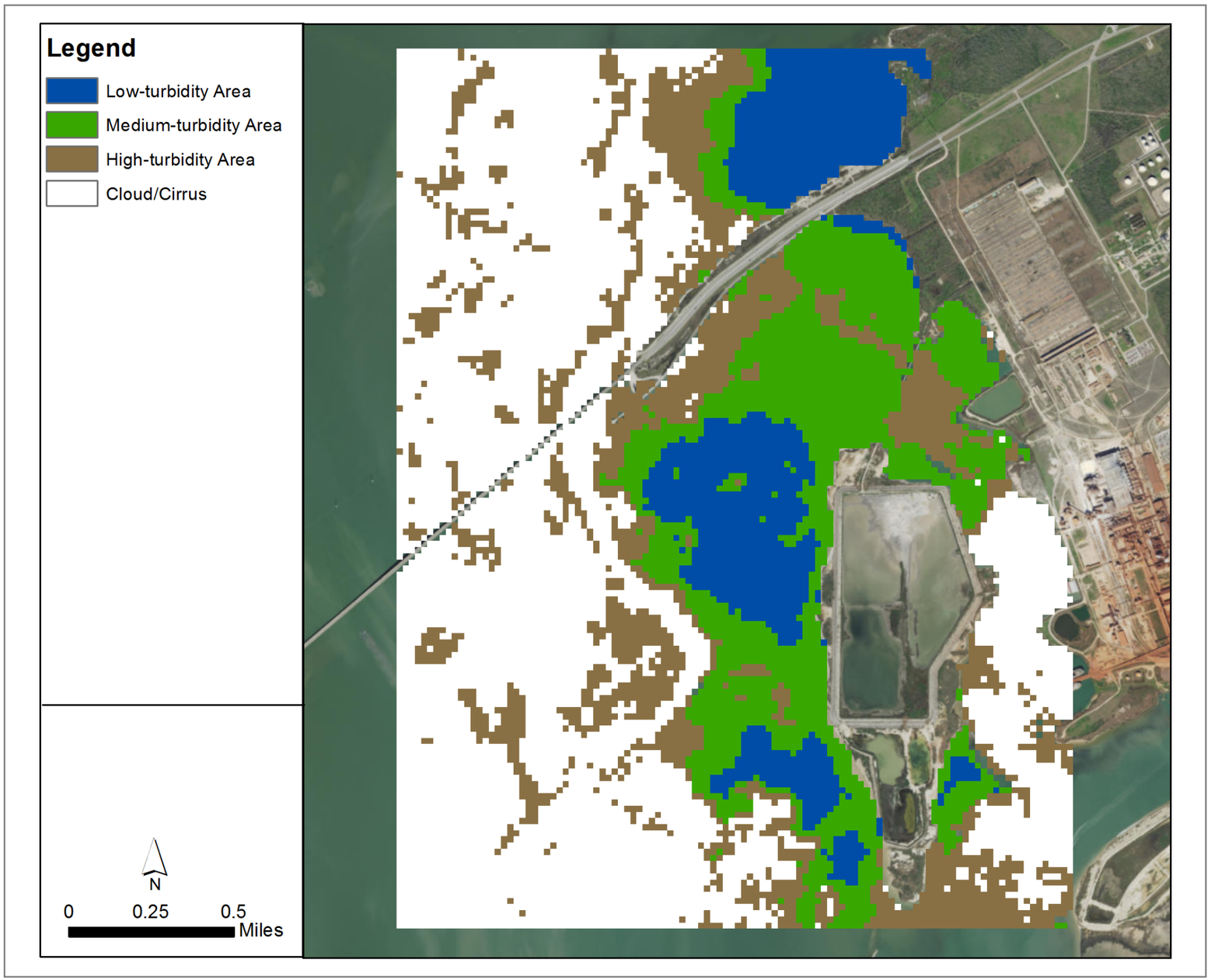
Figure 13

Map of Turbidity Information near Lavaca Bay on 03/23/2015 at 17:00 UTC

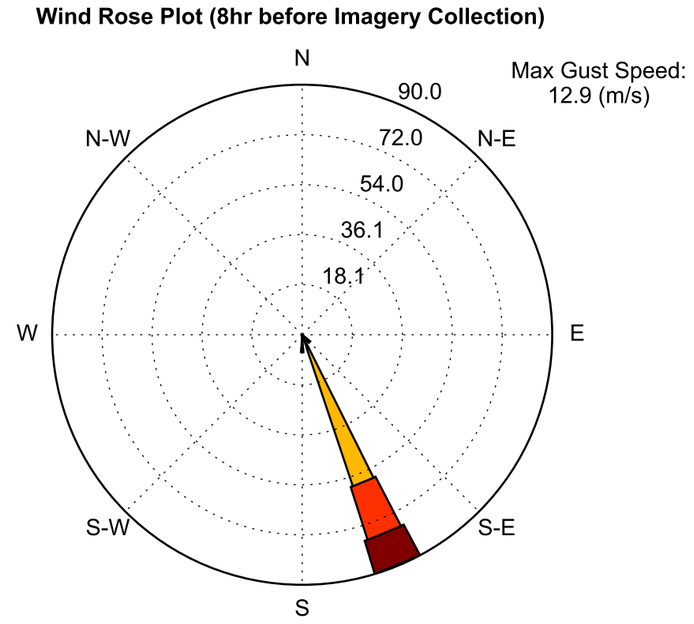
Note: Turbidity information was obtained from Landsat 8 imagery (LC80260402015082LGN00).
Wind data from NOAA VAT2 weather station when available. Wind data from PKV weather station for days without NOAA data.

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Day impacted by high flow event



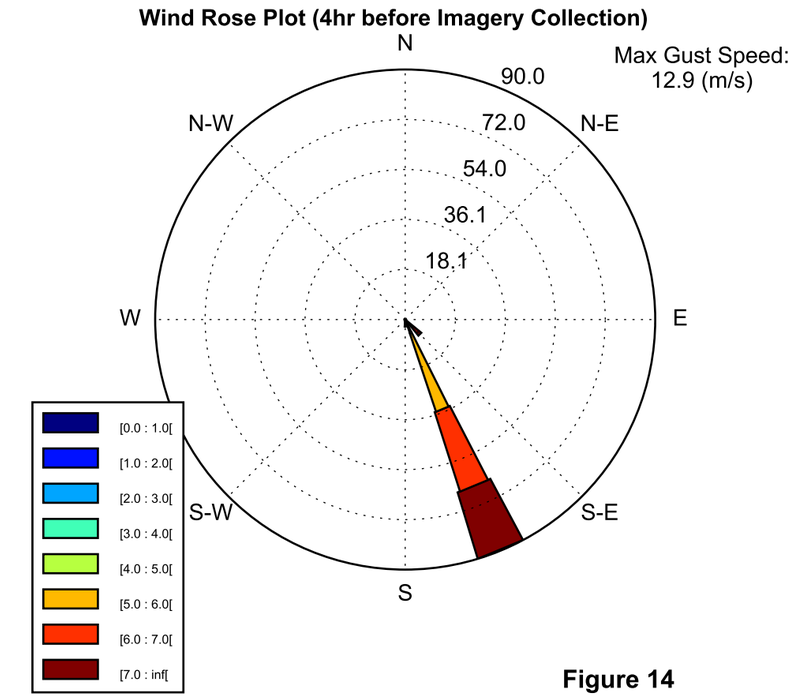


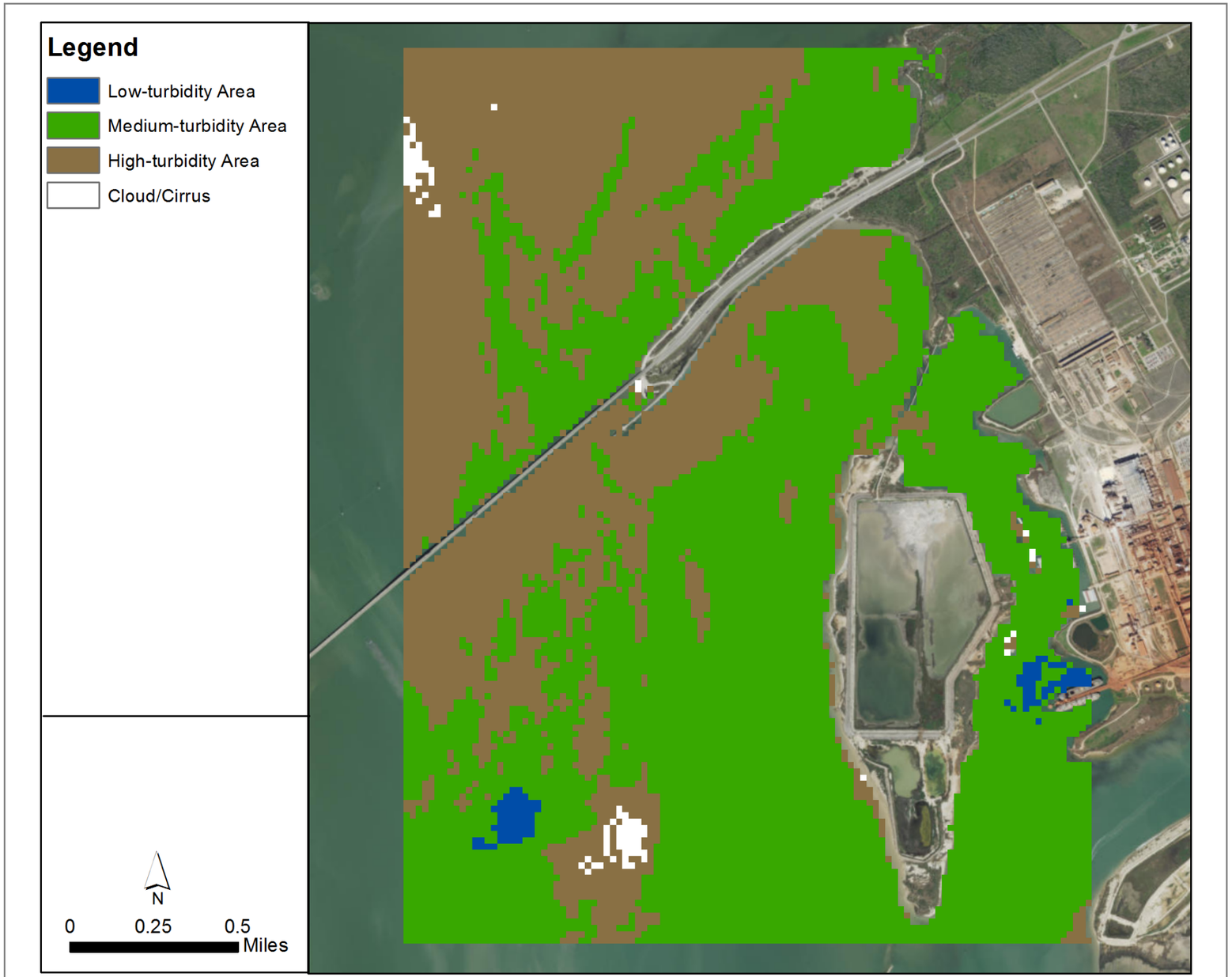
Figure 14

Map of Turbidity Information near Lavaca Bay on 06/11/2015 at 17:00 UTC

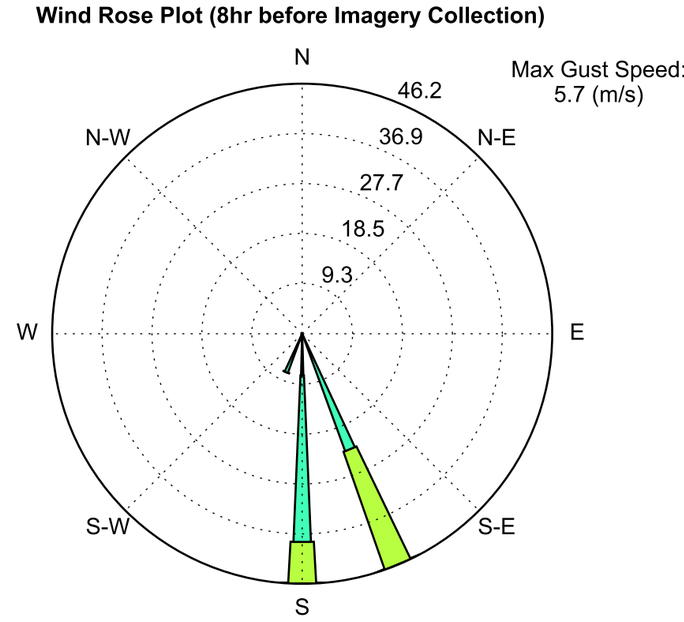
Note: Turbidity information was obtained from Landsat 8 imagery (LC80260402015162LGN00).
Wind data from NOAA VAT2 weather station when available. Wind data from PKV weather station for days without NOAA data.

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Day impacted by high flow event



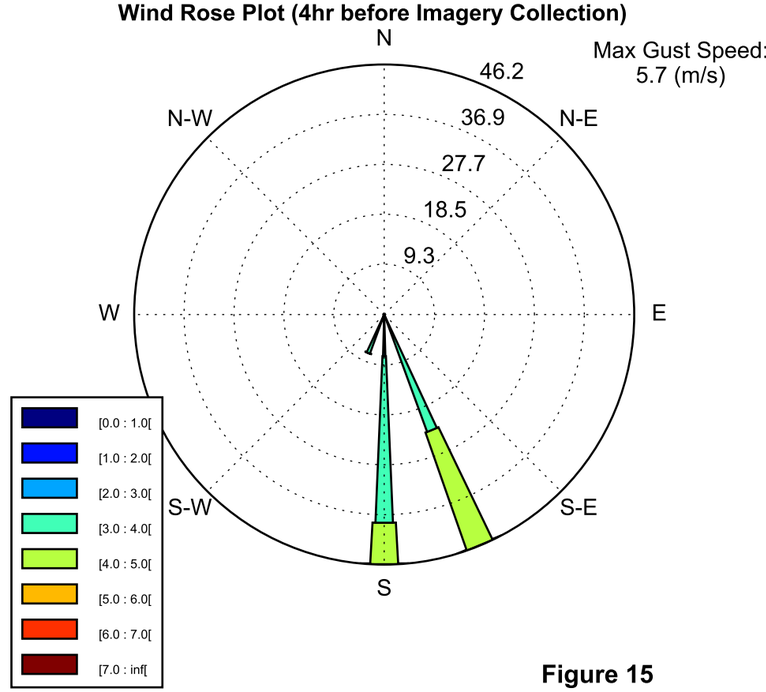


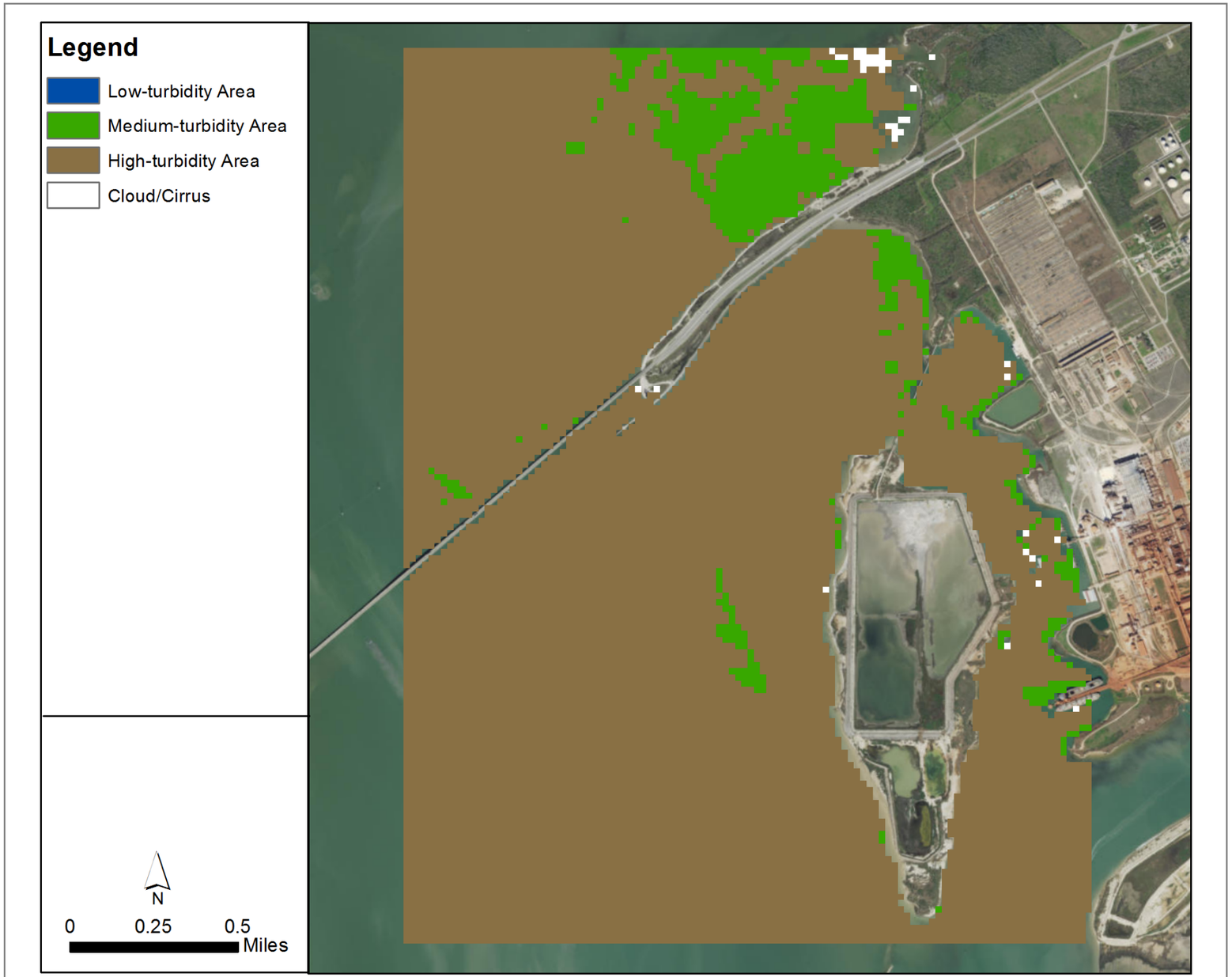
Figure 15

Map of Turbidity Information near Lavaca Bay on 07/13/2015 at 17:00 UTC

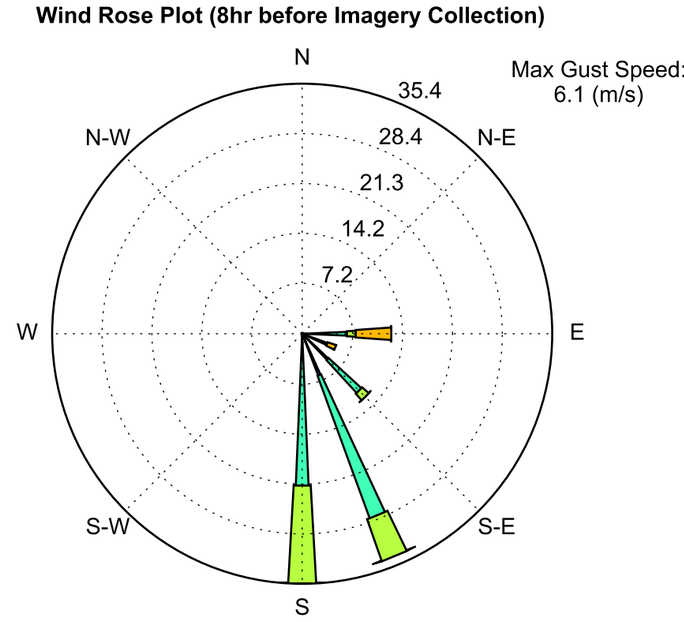
Note: Turbidity information was obtained from Landsat 8 imagery (LC80260402015194LGN00).
Wind data from NOAA VAT2 weather station when available. Wind data from PKV weather station for days without NOAA data.

Prepared for Alcoa Corporation

ANCHOR QEA



Day impacted by high flow event



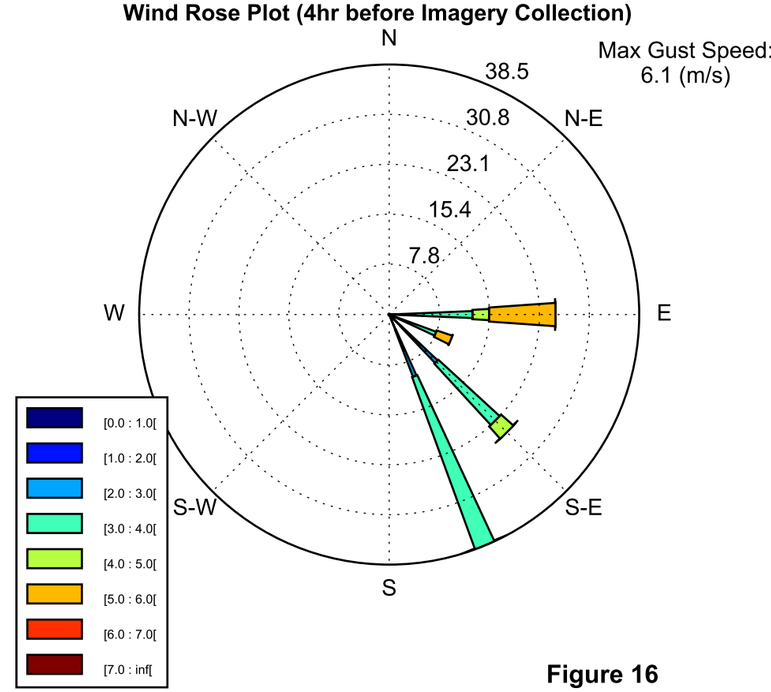


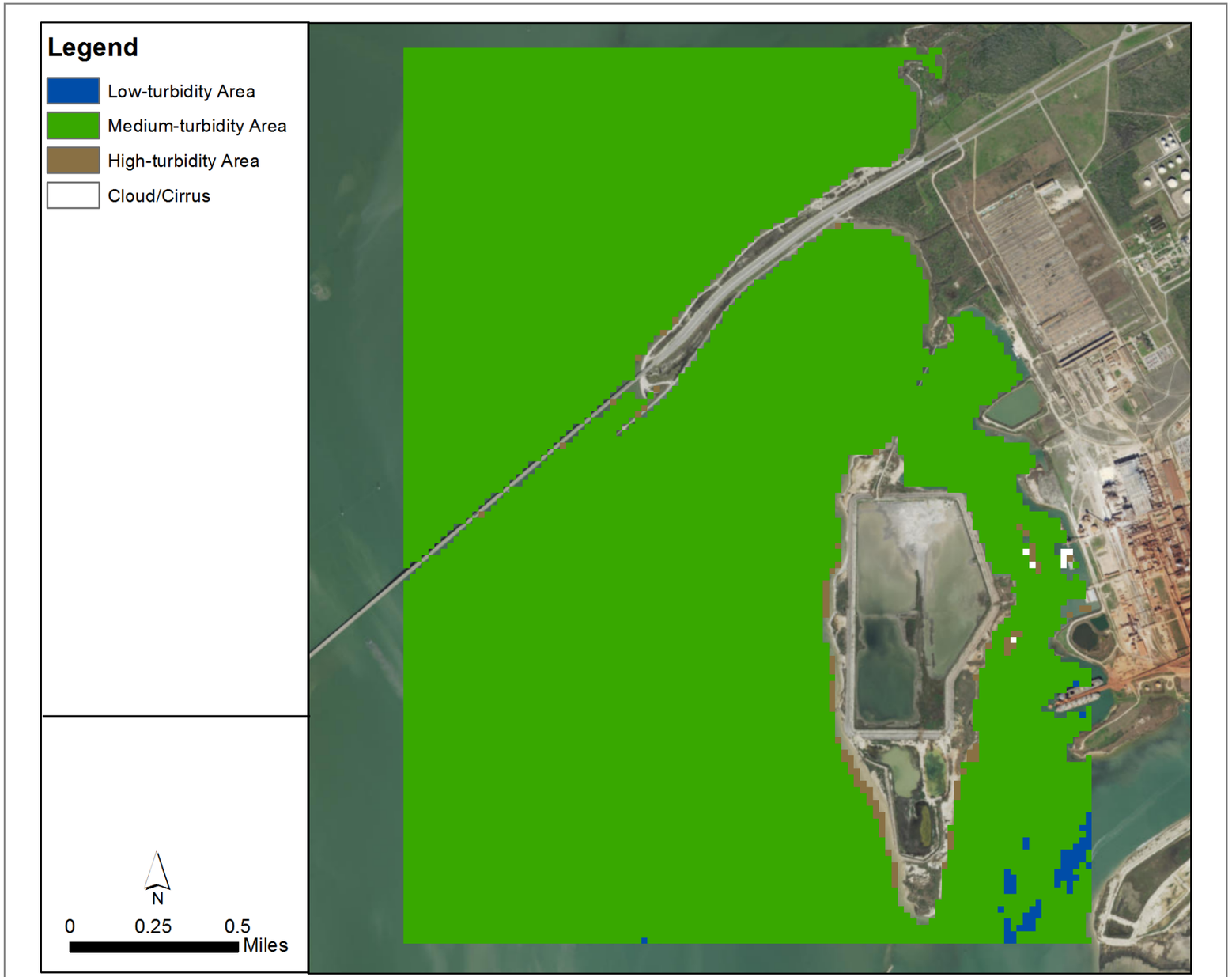
Figure 16

Map of Turbidity Information near Lavaca Bay on 07/29/2015 at 17:00 UTC

Note: Turbidity information was obtained from Landsat 8 imagery (LC80260402015210LGN00).
Wind data from NOAA VAT2 weather station when available. Wind data from PKV weather station for days without NOAA data.

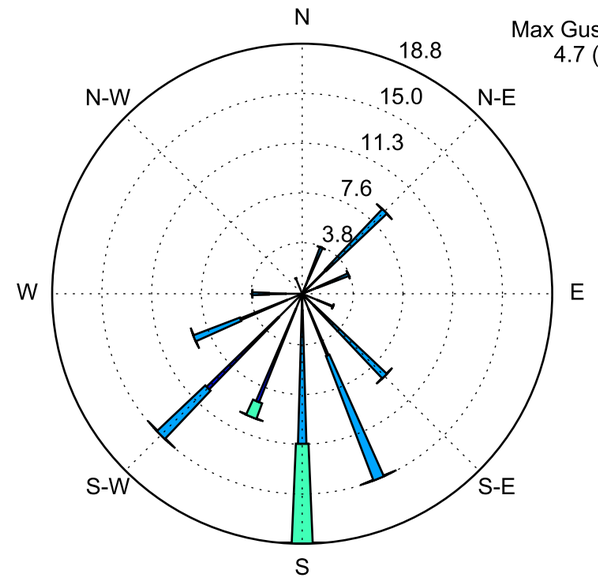
Prepared for Alcoa Corporation

ANCHOR QEA



Low wind day

Wind Rose Plot (8hr before Imagery Collection)



Wind Rose Plot (4hr before Imagery Collection)

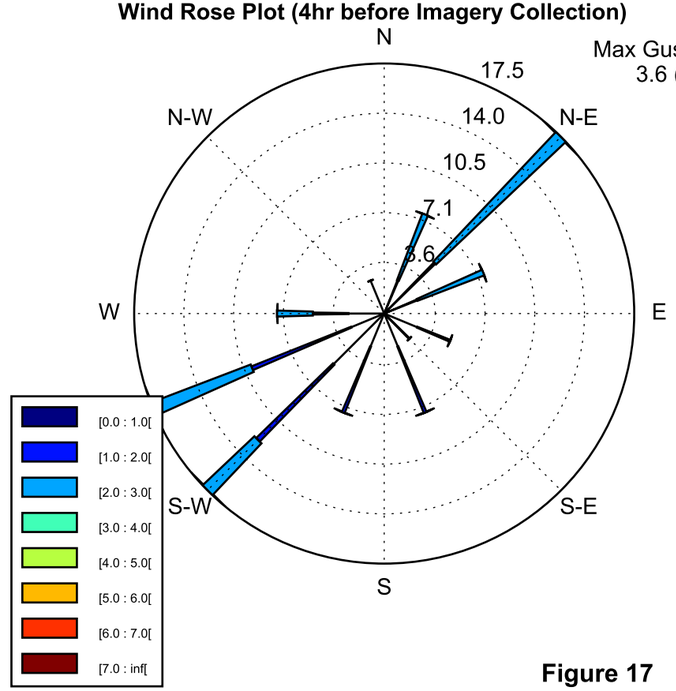


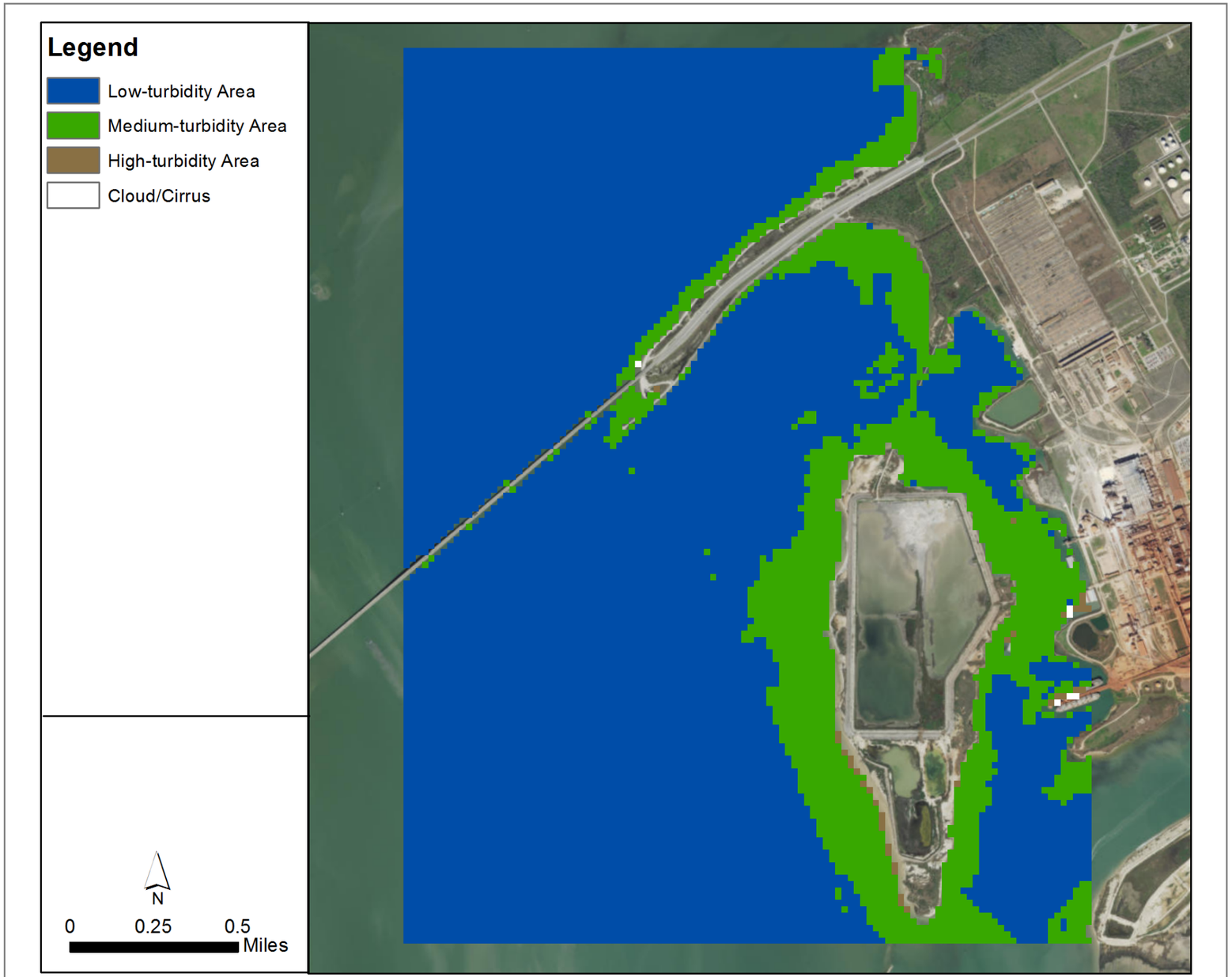
Figure 17

Map of Turbidity Information near Lavaca Bay on 08/14/2015 at 17:00 UTC

Note: Turbidity information was obtained from Landsat 8 imagery (LC80260402015226LGN00).
Wind data from NOAA VAT2 weather station when available. Wind data from PKV weather station for days without NOAA data.

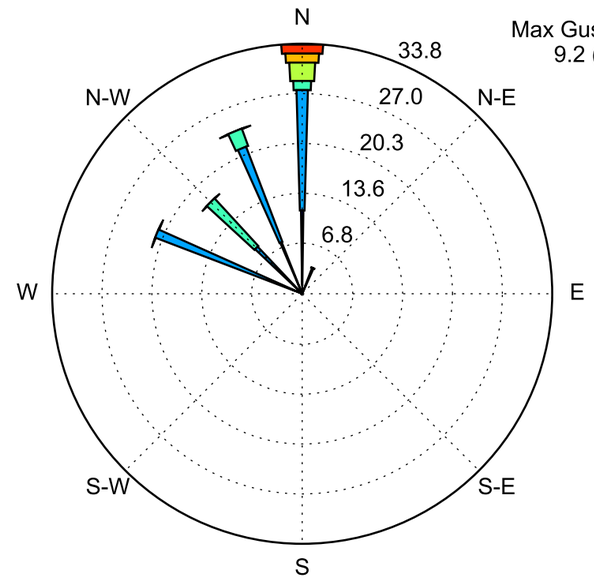
Prepared for Alcoa Corporation

ANCHOR QEA



Low wind day

Wind Rose Plot (8hr before Imagery Collection)



Wind Rose Plot (4hr before Imagery Collection)

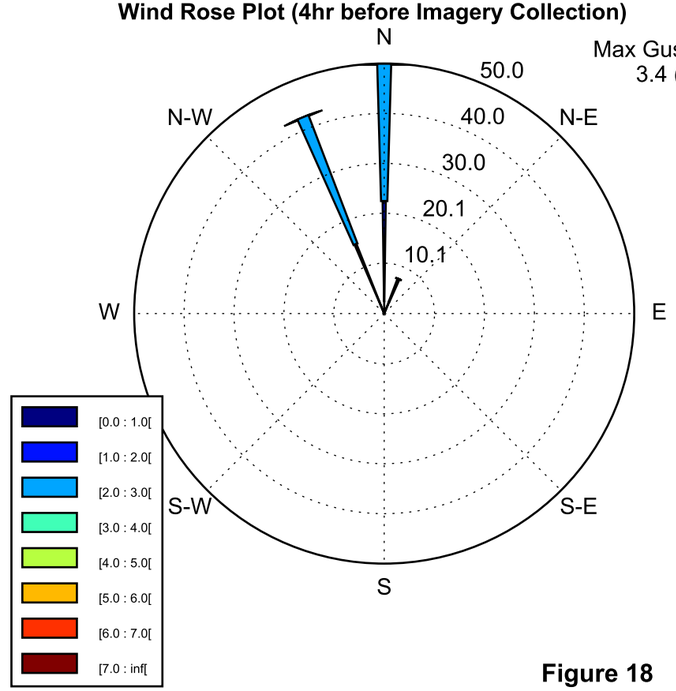


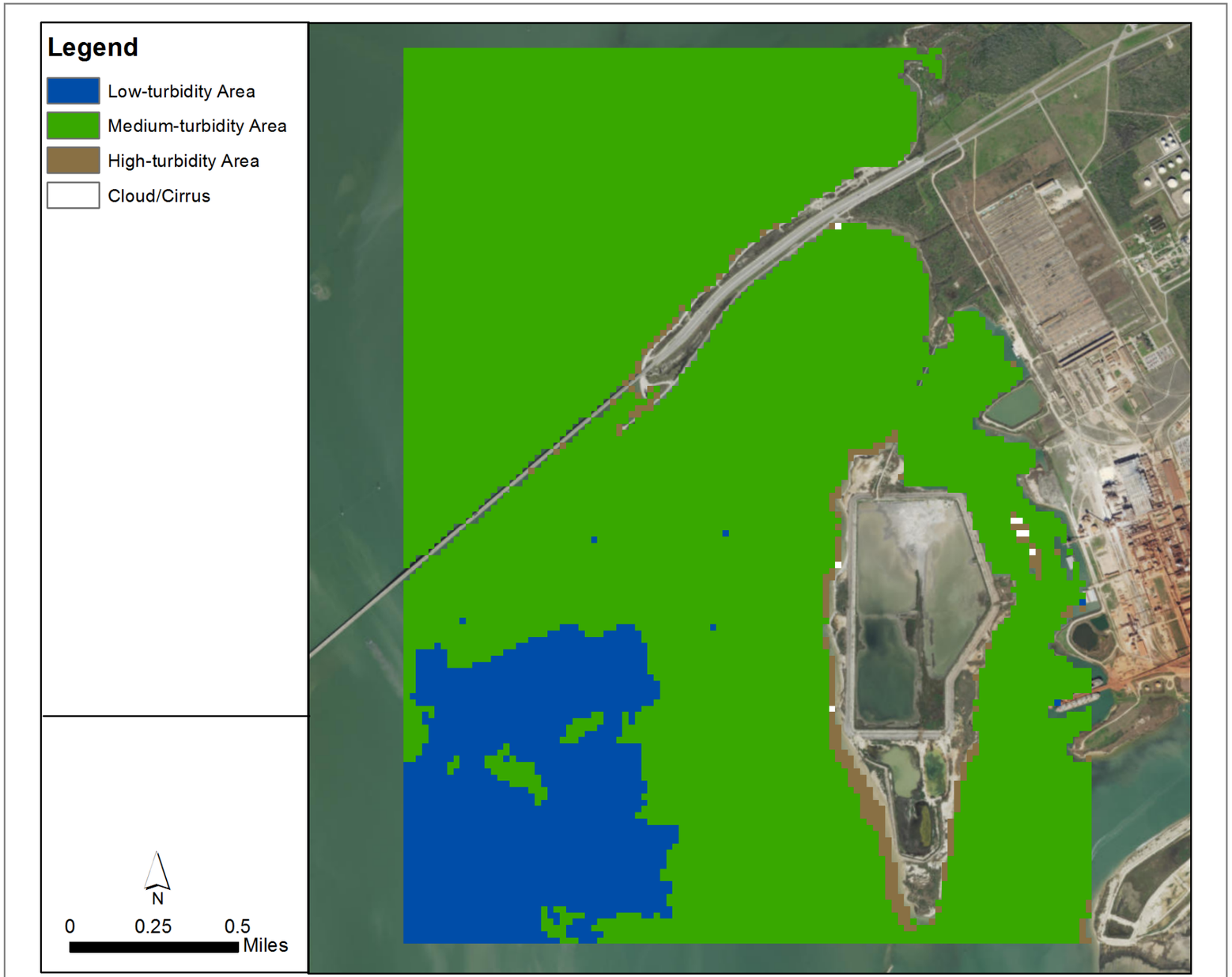
Figure 18

Map of Turbidity Information near Lavaca Bay on 10/01/2015 at 17:00 UTC

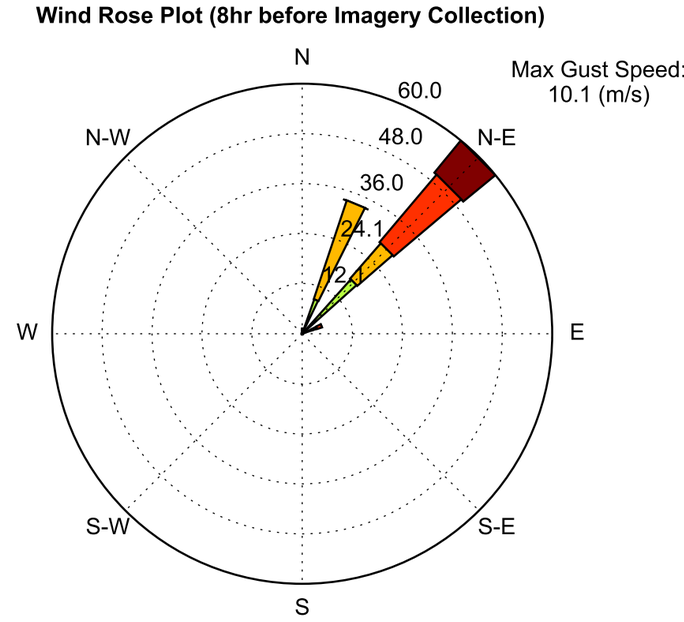
Note: Turbidity information was obtained from Landsat 8 imagery (LC80260402015274LGN00).
Wind data from NOAA VAT2 weather station when available. Wind data from PKV weather station for days without NOAA data.

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ANCHOR QEA



Moderate to strong northerly to easterly wind day



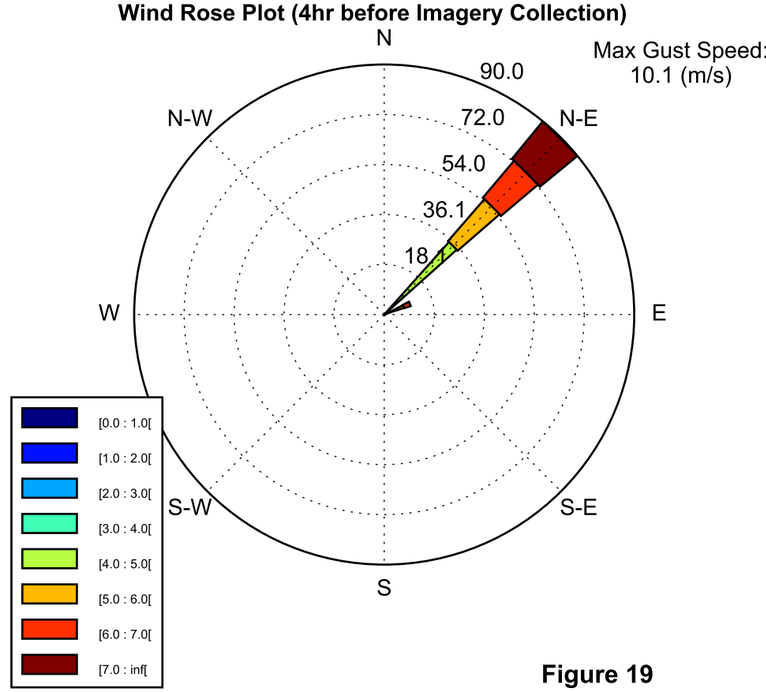


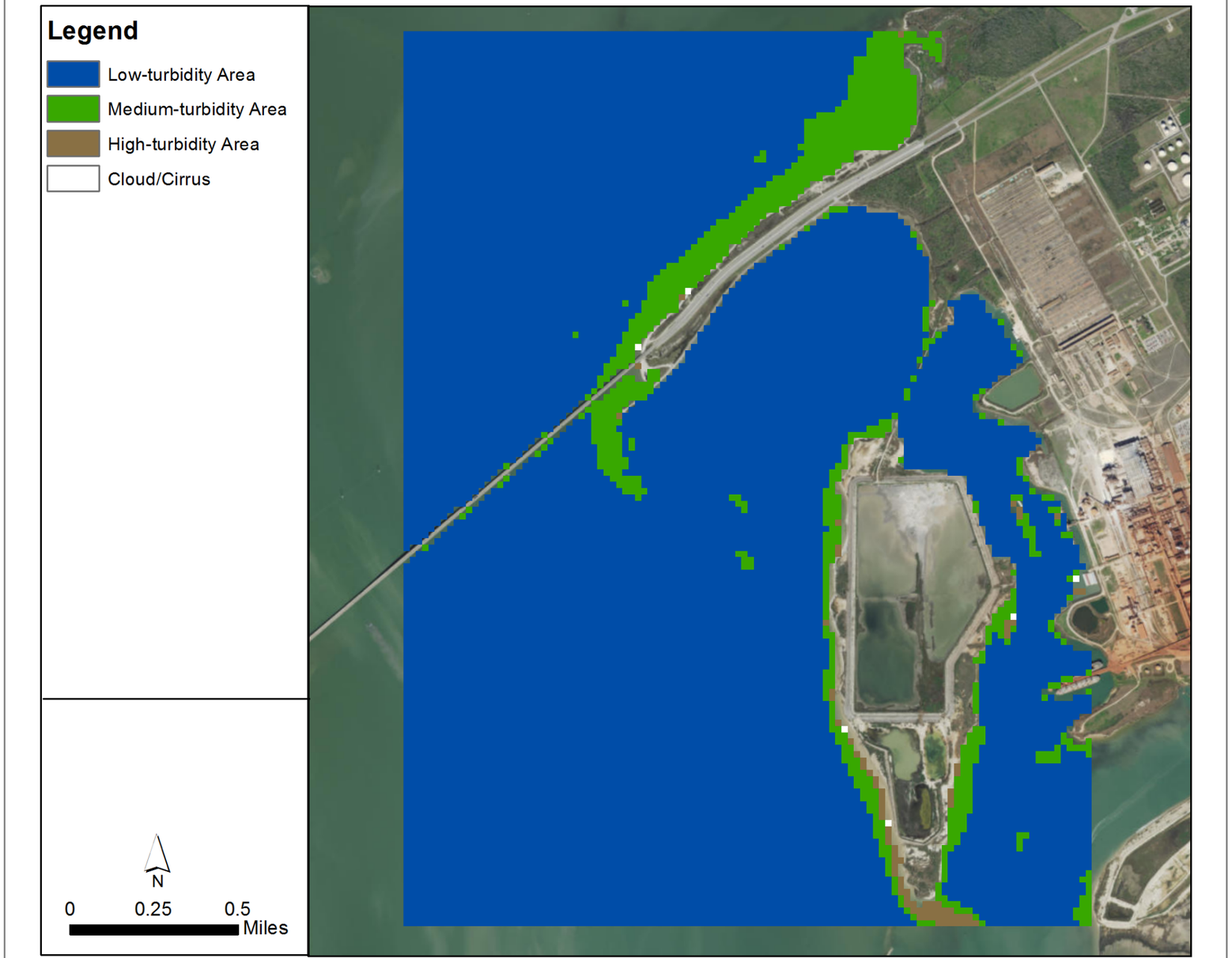
Figure 19

Map of Turbidity Information near Lavaca Bay on 10/17/2015 at 17:00 UTC

Note: Turbidity information was obtained from Landsat 8 imagery (LC80260402015290LGN00).
Wind data from NOAA VAT2 weather station when available. Wind data from PKV weather station for days without NOAA data.

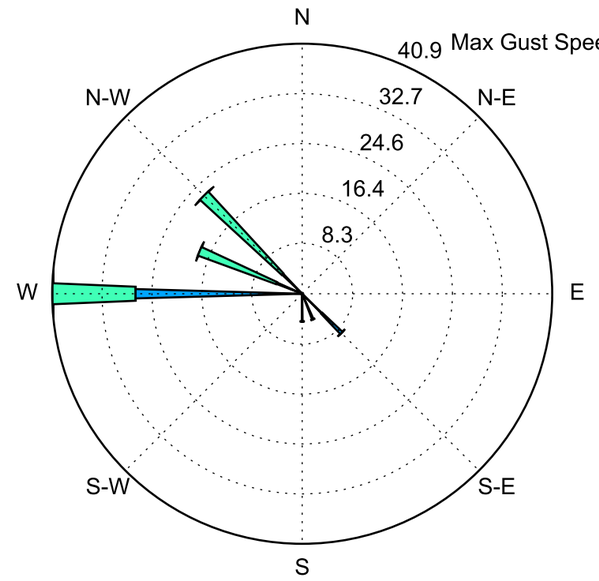
Prepared for Alcoa Corporation

ANCHOR QEA



Low wind day

Wind Rose Plot (8hr before Imagery Collection)



Wind Rose Plot (4hr before Imagery Collection)

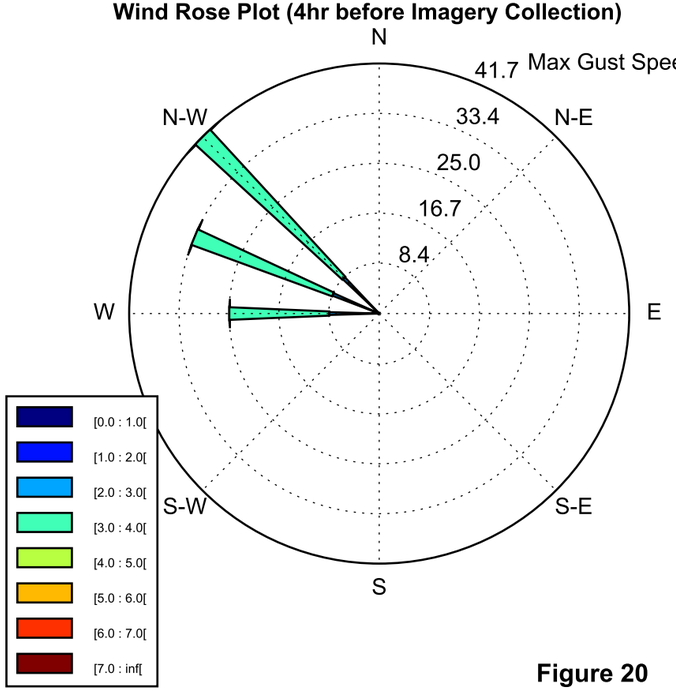


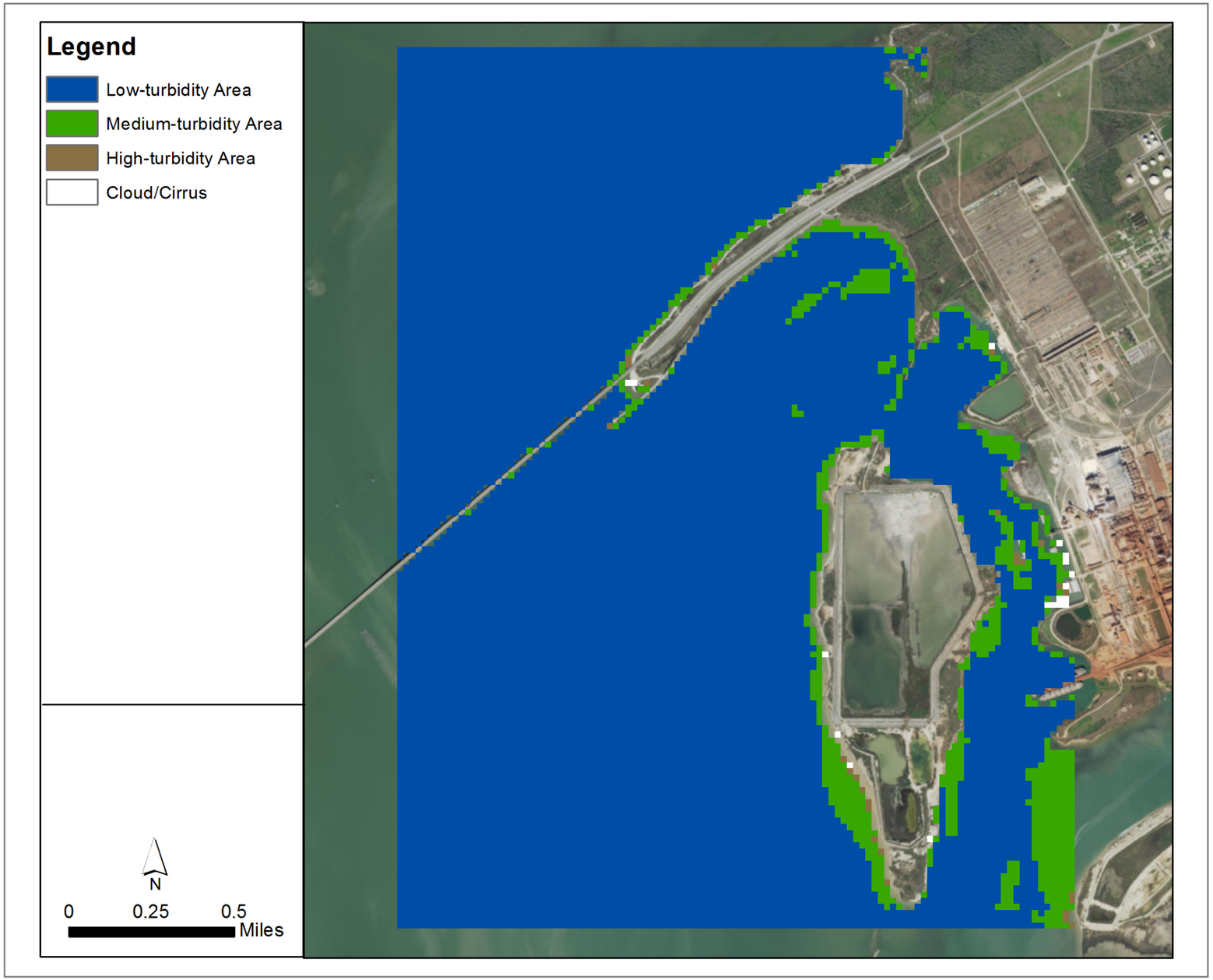
Figure 20

Map of Turbidity Information near Lavaca Bay on 11/18/2015 at 17:00 UTC

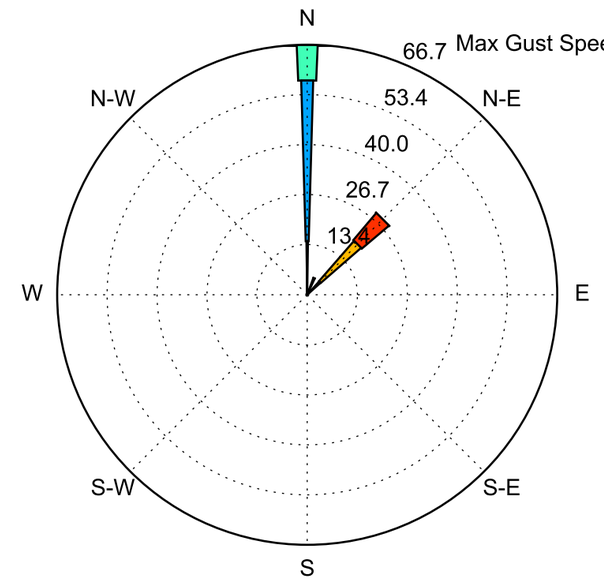
Note: Turbidity information was obtained from Landsat 8 imagery (LC80260402015322LGN00).
Wind data from NOAA VAT2 weather station when available. Wind data from PKV weather station for days without NOAA data.

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Moderate to strong northerly to easterly wind day



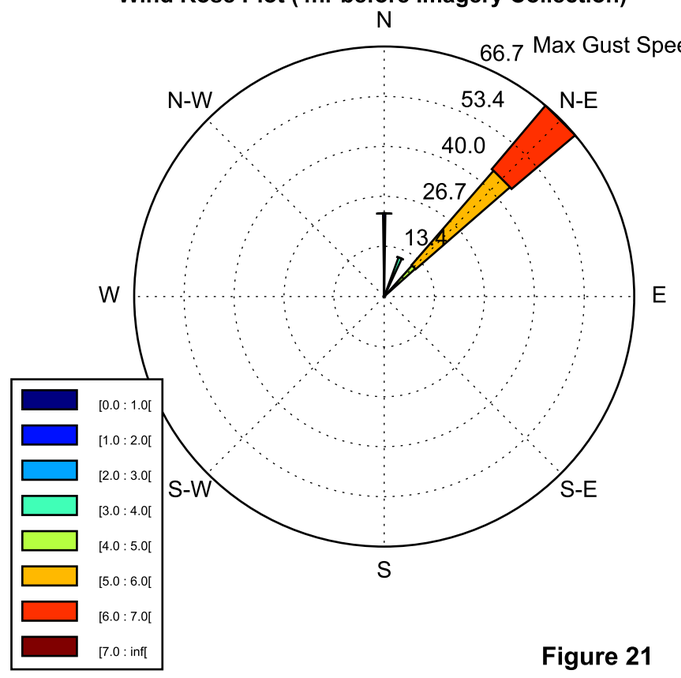


Figure 21

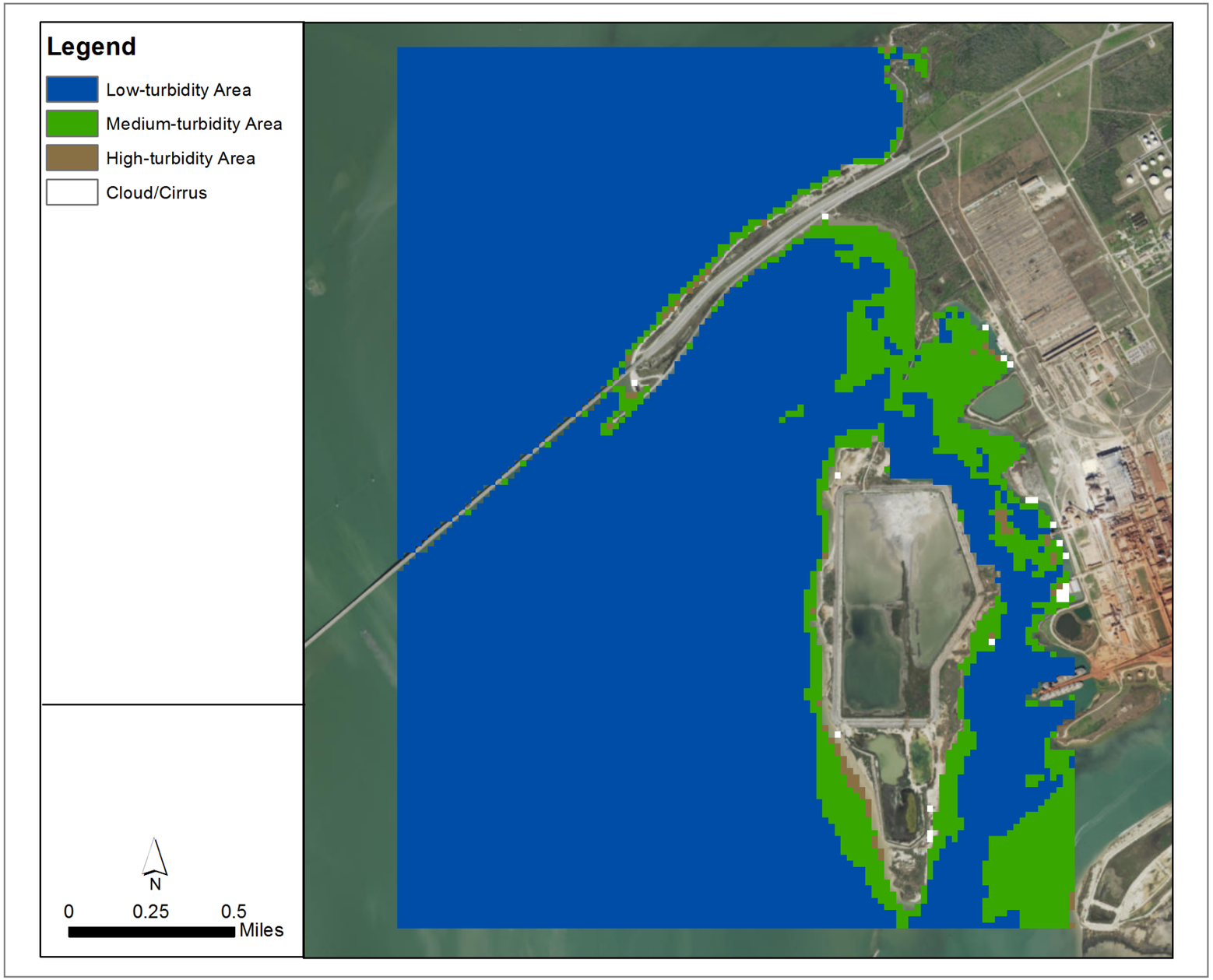
Map of Turbidity Information near Lavaca Bay on 12/04/2015 at 17:00 UTC

Note: Turbidity information was obtained from Landsat 8 imagery (LC80260402015338LGN00).
Wind data from NOAA VAT2 weather station when available. Wind data from PKV weather station for days without NOAA data.

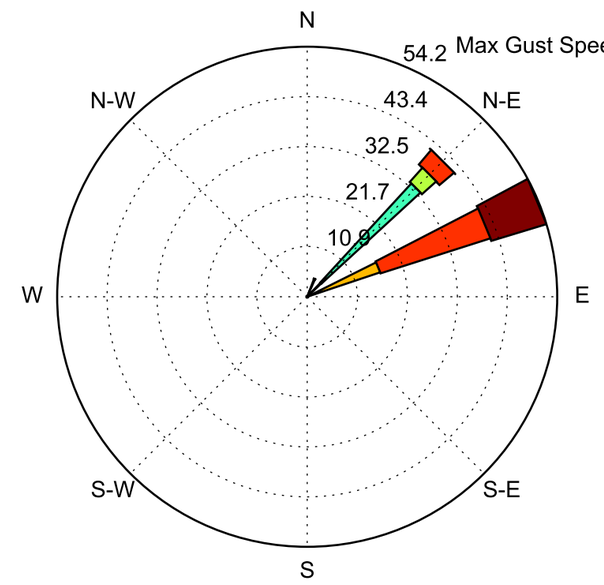
Prepared for Alcoa Corporation

ANCHOR QEA

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Moderate to strong northerly to easterly wind day



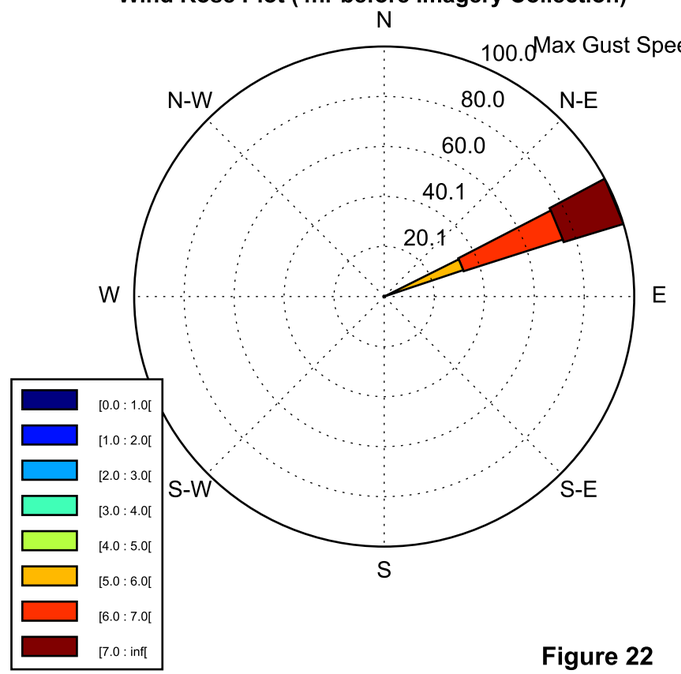


Figure 22

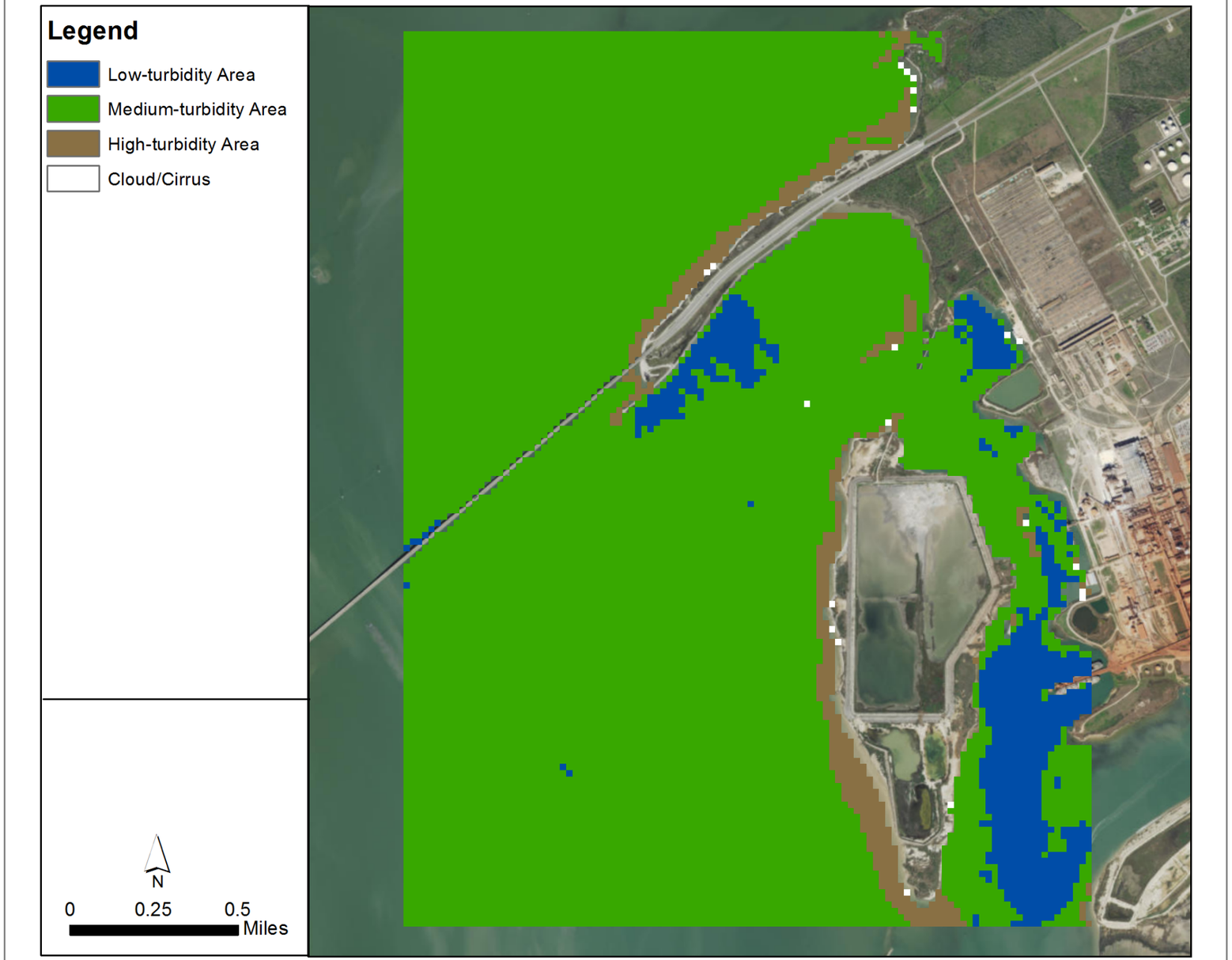
Map of Turbidity Information near Lavaca Bay on 01/05/2016 at 17:00 UTC

Note: Turbidity information was obtained from Landsat 8 imagery (LC80260402016005LGN00).
Wind data from NOAA VAT2 weather station when available. Wind data from PKV weather station for days without NOAA data.

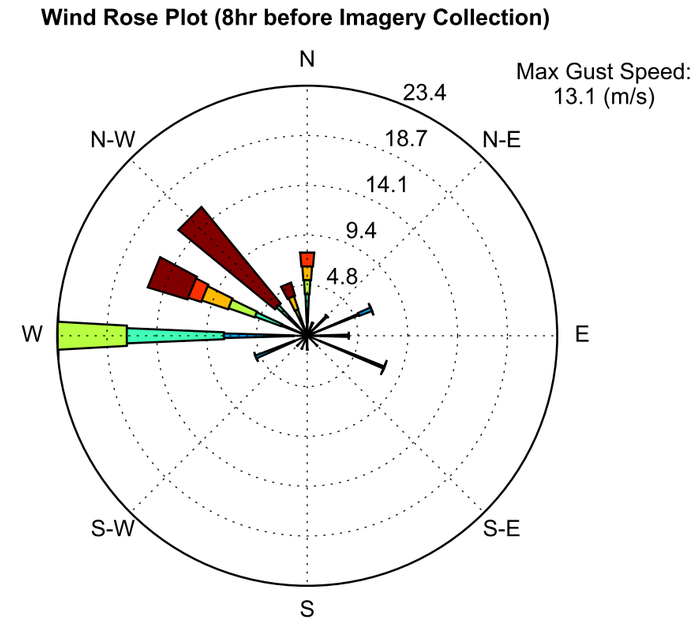
Prepared for Alcoa Corporation

ANCHOR QEA

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Moderate to strong north-westerly to westerly wind day



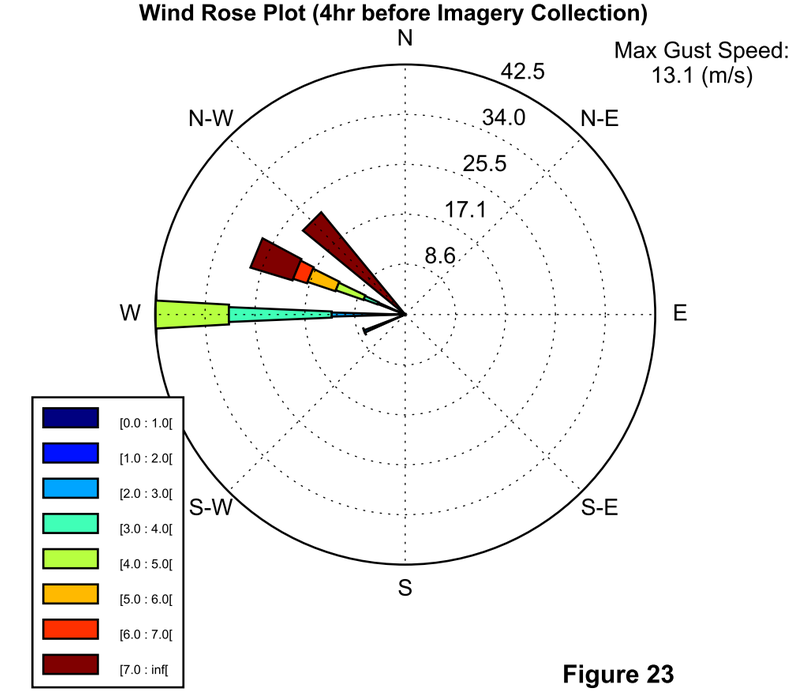


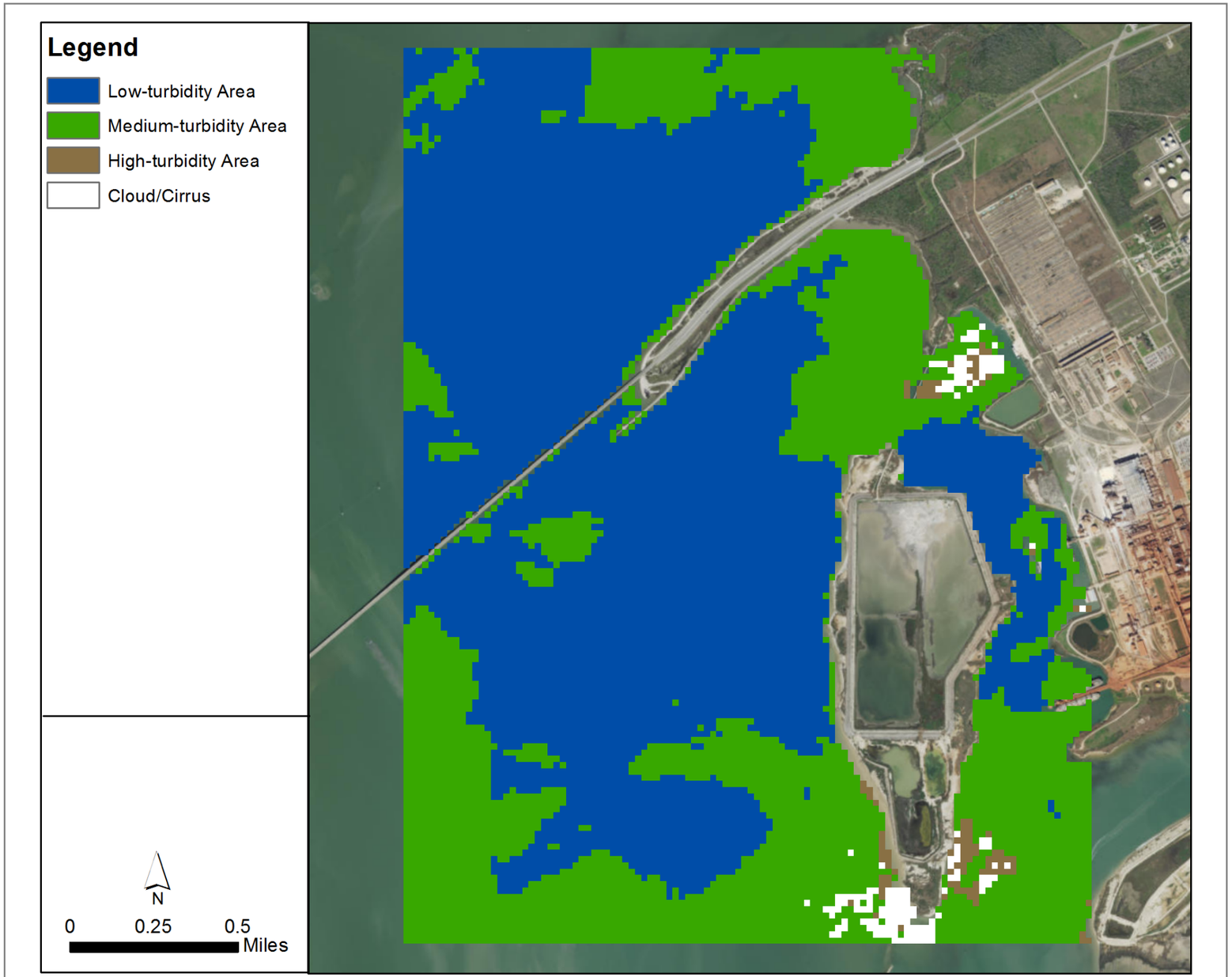
Figure 23

Map of Turbidity Information near Lavaca Bay on 02/06/2016 at 17:00 UTC

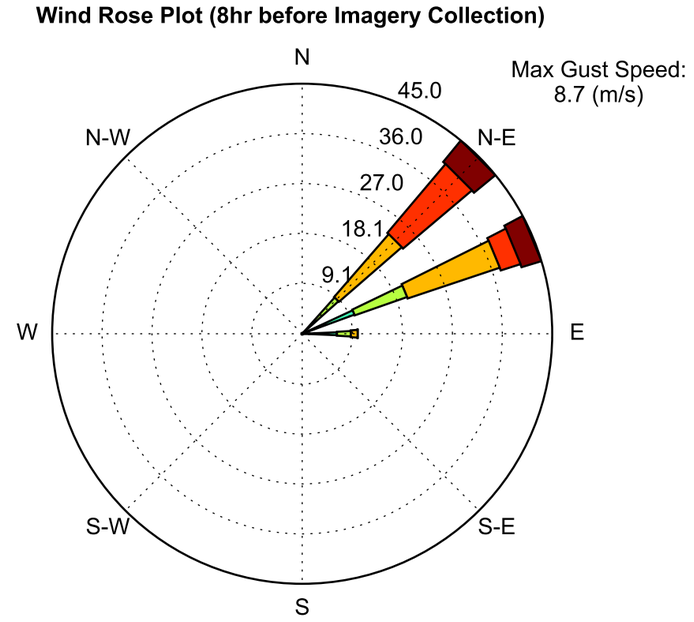
Note: Turbidity information was obtained from Landsat 8 imagery (LC80260402016037LGN00).
Wind data from NOAA VAT2 weather station when available. Wind data from PKV weather station for days without NOAA data.

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Moderate to strong northerly to easterly wind day



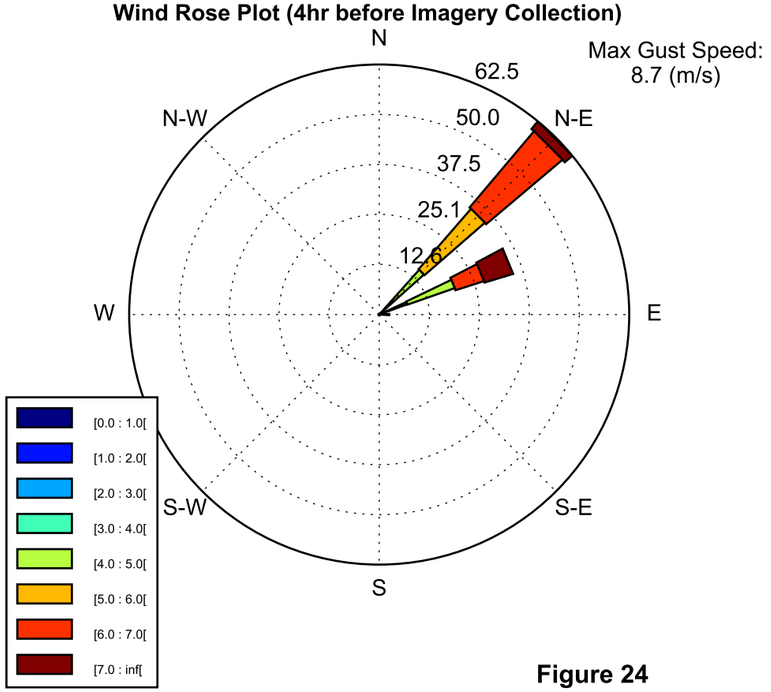


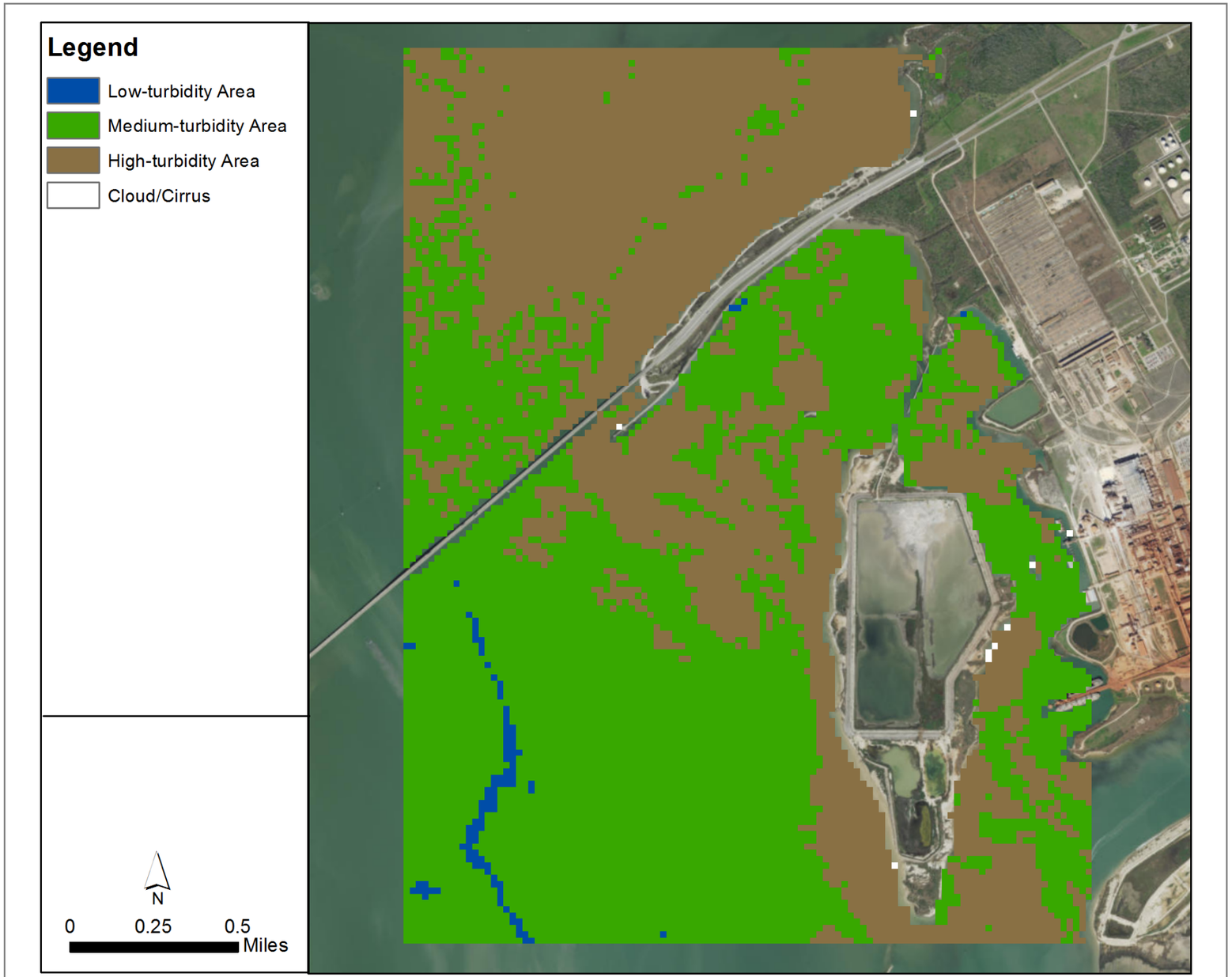
Figure 24

Map of Turbidity Information near Lavaca Bay on 03/25/2016 at 17:00 UTC

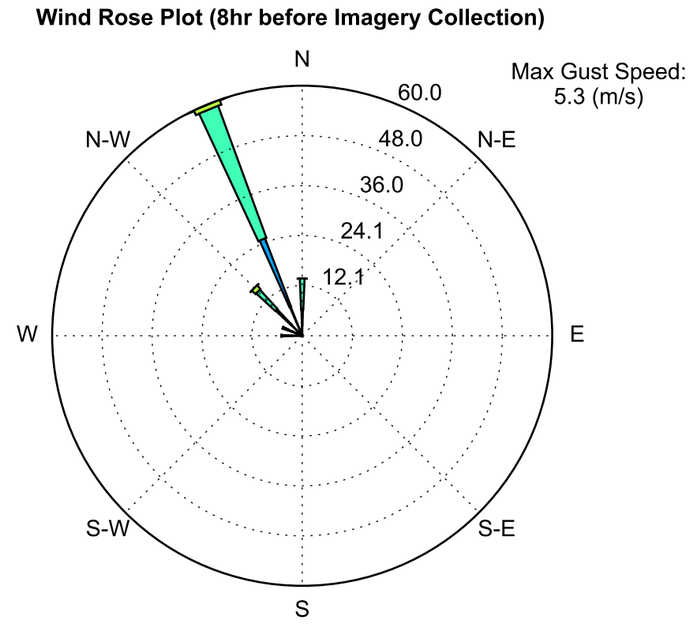
Note: Turbidity information was obtained from Landsat 8 imagery (LC80260402016085LGN00).
Wind data from NOAA VAT2 weather station when available. Wind data from PKV weather station for days without NOAA data.

Prepared for Alcoa Corporation

ANCHOR QEA



Day impacted by high flow event



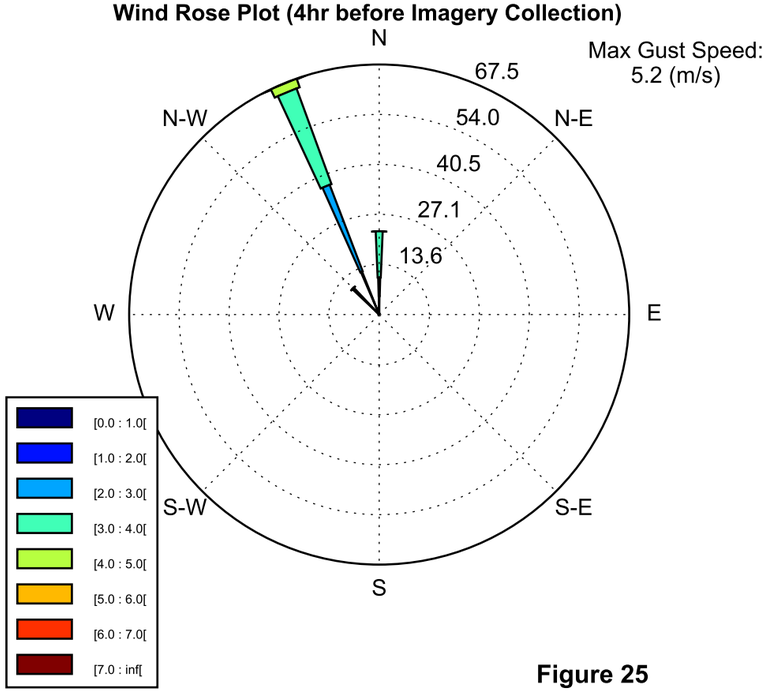


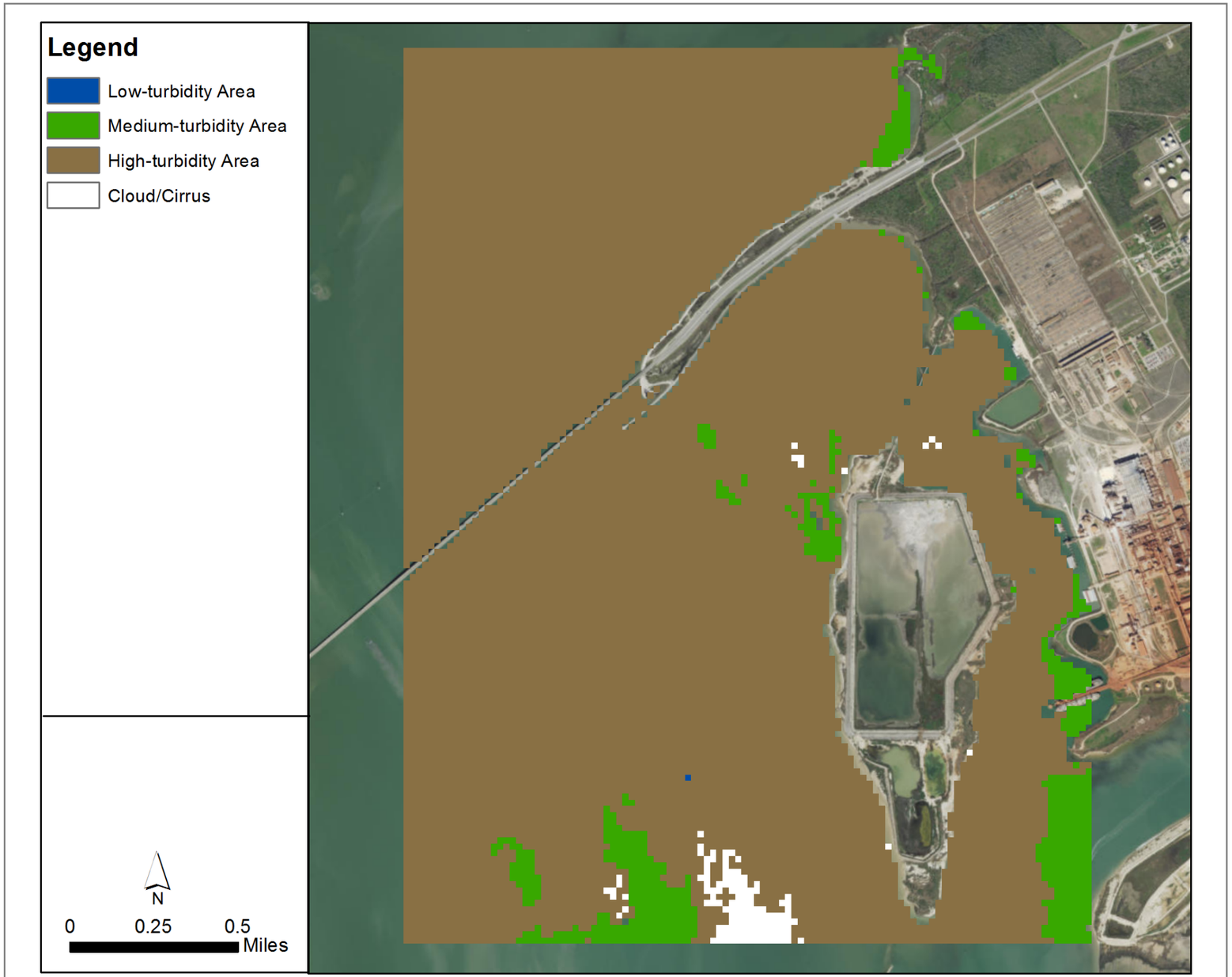
Figure 25

Map of Turbidity Information near Lavaca Bay on 06/29/2016 at 17:00 UTC

Note: Turbidity information was obtained from Landsat 8 imagery (LC80260402016181LGN00).
Wind data from NOAA VAT2 weather station when available. Wind data from PKV weather station for days without NOAA data.

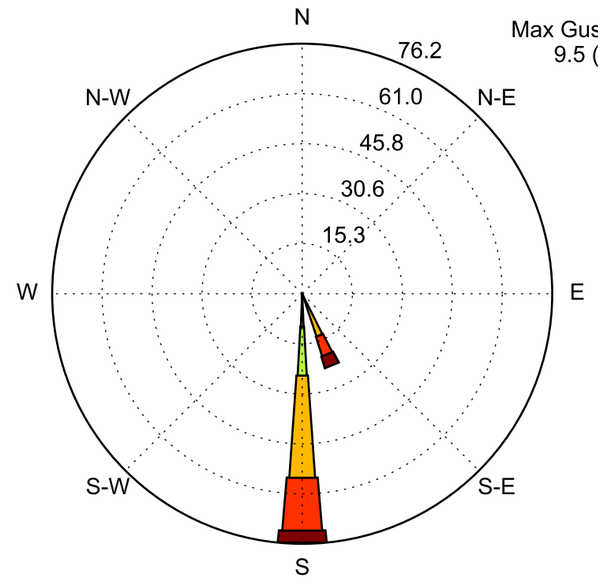
Prepared for Alcoa Corporation

ANCHOR QEA



Strong southerly wind day

Wind Rose Plot (8hr before Imagery Collection)



Wind Rose Plot (4hr before Imagery Collection)

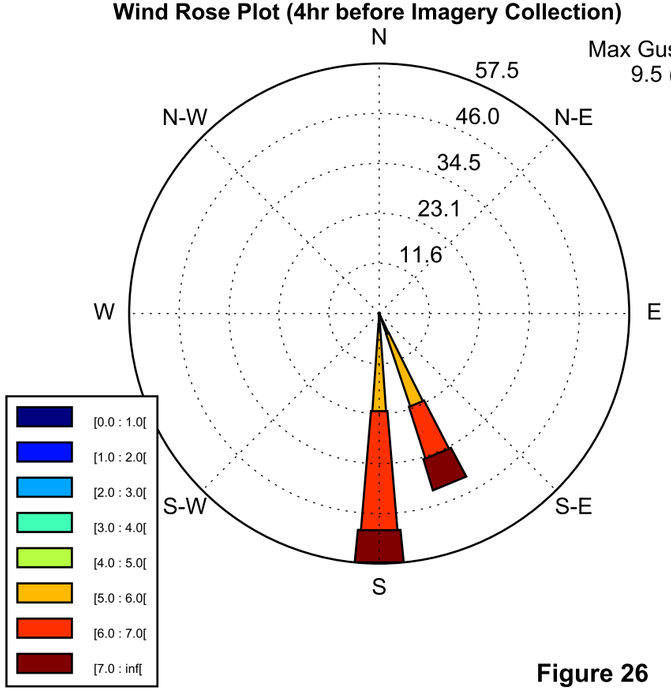


Figure 26

Map of Turbidity Information near Lavaca Bay on 07/15/2016 at 17:00 UTC

Note: Turbidity information was obtained from Landsat 8 imagery (LC80260402016197LGN00).
Wind data from NOAA VAT2 weather station when available. Wind data from PKV weather station for days without NOAA data.

Prepared for Alcoa Corporation

ANCHOR QEA

ANNUAL SAMPLING AND SUPPLEMENTAL DATA

2016 Marsh Sediment Stations, Sample IDs, and Results

Habitat	Station ID	Sample ID	Date	Total Hg				Methyl Hg			TOC	
				% M	(mg/kg) dry wt	SQL[1] (mg/kg)	Flag	% M	(ng/g) dry wt	Flag	% M	(wt%) dry wt
Marsh 1	Marsh-1-1R	SMP-SE-17600	10/17/2016	27.8	0.0970	0.000707		25.0	0.154		27.8	0.144
	Marsh-1-2R	SMP-SE-17601	10/17/2016	23.6	0.0964	0.000660		22.7	0.308		23.6	0.182
	Marsh-1-3R	SMP-SE-17602	10/17/2016	23.0	0.105	0.000659		27.0	0.407		23.0	0.202
	Marsh-1-4R	SMP-SE-17603	10/17/2016	23.1	0.0946	0.000654		22.6	0.122		23.1	0.129
	Marsh-1-5R	SMP-SE-17604	10/17/2016	27.3	0.102	0.000677		23.9	0.172		27.3	0.187
	Marsh-1-6R	SMP-SE-17605	10/17/2016	26.5	0.0816	0.000682		24.8	0.188		26.5	0.234
	Marsh-1-7R	SMP-SE-17606	10/18/2016	24.3	0.0803	0.000674		25.8	0.110		24.3	0.181
	Marsh-1-8R	SMP-SE-17607	10/18/2016	27.7	0.0812	0.000674		25.2	0.292		27.7	0.281
	Marsh-1-9R	SMP-SE-17608	10/18/2016	24.2	0.0874	0.000665		27.9	0.301		24.2	0.392
	Marsh-1-10R	SMP-SE-17609	10/18/2016	29.8	0.913	0.000708		31.2	0.820		29.8	0.727
	Marsh-1-11R	SMP-SE-17610	10/18/2016	18.6	0.110	0.000614		24.7	0.190		18.6	0.314
	Marsh-1-12R	SMP-SE-17611	10/18/2016	19.9	0.125	0.000633		22.5	0.500		19.9	0.299
					0.1645							
Marsh 2	Marsh-2-1R	SMP-SE-17612	10/18/2016	20.3	0.0203	0.000591		22.7	0.0317	J,U	20.3	0.370
	Marsh-2-2R	SMP-SE-17613	10/18/2016	23.5	0.0354	0.000642		27.6	0.227		23.5	0.602
	Marsh-2-3R	SMP-SE-17614	10/18/2016	41.2	0.143	0.000814		34.8	0.885		41.2	1.28
	Marsh-2-4R	SMP-SE-17615	10/18/2016	28.7	0.0865	0.000683		27.9	0.437		28.7	0.886
	Marsh-2-5R	SMP-SE-17616	10/18/2016	22.3	0.0545	0.000623		27.0	0.285		22.3	0.529
	Marsh-2-6R	SMP-SE-17617	10/18/2016	23.0	0.0282	0.000661		23.7	0.144		23.0	0.462
					0.0613							
Marsh 3	Marsh-3-1R	SMP-SE-17618	10/18/2016	21.6	0.0489	0.000613		21.3	0.774		21.6	0.720
	Marsh-3-2R	SMP-SE-17619	10/18/2016	34.9	0.0803	0.000734		36.9	0.655		34.9	0.499
	Marsh-3-3R	SMP-SE-17620	10/18/2016	28.8	0.0586	0.000671		30.1	0.238		28.8	0.240
	Marsh-3-4R	SMP-SE-17621	10/18/2016	28.0	0.0571	0.000676	J+	31.2	0.254	J++	28.0	0.256
	Marsh-3-5R	SMP-SE-17623	10/18/2016	33.3	0.0452	0.000730		32.1	0.186		33.3	0.464
	Marsh-3-6R	SMP-SE-17624	10/18/2016	20.0	0.0468	0.000633		18.4	0.268		20.0	1.11
					0.0562							
Marsh 5	Marsh-5-1R	SMP-SE-17625	10/18/2016	27.3	0.294	0.000702		30.8	0.409		27.3	2.46
	Marsh-5-2R	SMP-SE-17626	10/18/2016	30.4	0.347	0.000720		33.1	0.600		30.4	1.71
	Marsh-5-3R	SMP-SE-17627	10/18/2016	36.1	0.407	0.000775		33.1	0.369		36.1	1.13
	Marsh-5-4R	SMP-SE-17628	10/18/2016	35.3	0.272	0.000787		40.8	0.120		35.3	1.40
	Marsh-5-5R	SMP-SE-17661	11/01/2016	39.1	0.202	0.000806		45.7	1.38		39.1	1.26
	Marsh-5-6R	SMP-SE-17629	10/18/2016	26.4	0.0800	0.000646		24.7	0.0124	J	26.4	0.569
					0.2670							
Marsh 6	Marsh-6-1R	SMP-SE-17630	10/18/2016	37.2	0.177	0.000780		38.4	0.0240	J	37.2	1.08
	Marsh-6-2R	SMP-SE-17631	10/18/2016	60.7	0.389	0.00123		58.1	1.46		60.7	2.13
	Marsh-6-3R	SMP-SE-17632	10/18/2016	50.1	0.489	0.00101		49.6	0.0621		50.1	1.57
	Marsh-6-4R	SMP-SE-17633	10/18/2016	48.9	0.285	0.000951		50.4	0.344	J++	48.9	1.40
	Marsh-6-5R	SMP-SE-17635	10/18/2016	42.2	1.05	0.000856		45.1	1.26		42.2	1.64
	Marsh-6-6R	SMP-SE-17636	10/18/2016	30.3	0.131	0.000722		49.4	0.654		30.3	0.770
	Marsh-6-7R	SMP-SE-17637	10/18/2016	29.5	0.233	0.000686		30.4	0.237		29.5	0.593
	Marsh-6-8R	SMP-SE-17638	10/18/2016	25.7	0.210	0.000659		30.9	0.578		25.7	0.584
	Marsh-6-9R	SMP-SE-17639	10/19/2016	27.7	0.576	0.000684		32.0	0.372		27.7	0.327
	Marsh-6-10R	SMP-SE-17640	10/19/2016	31.6	0.0432	0.000741		32.6	0.0133	J	31.6	0.0904
					0.3583							

2016 Marsh Sediment Stations, Sample IDs, and Results

Habitat	Station ID	Sample ID	Date	Total Hg				Methyl Hg			TOC	
				% M	(mg/kg) dry wt	SQL [1] (mg/kg)	Flag	% M	(ng/g) dry wt	Flag	% M	(wt%) dry wt
Marsh 7	Marsh-7-1R	SMP-SE-17641	10/19/2016	33.2	0.214	0.000764		33.2	0.312		33.2	0.138
	Marsh-7-2R	SMP-SE-17642	10/19/2016	31.7	1.10	0.00147		38.2	0.732		31.7	0.524
	Marsh-7-3R	SMP-SE-17643	10/19/2016	18.9	0.151	0.000590		20.9	0.308		18.9	0.886
	Marsh-7-4R	SMP-SE-17644	10/19/2016	35.7	0.449	0.000778		36.7	0.682		35.7	1.28
	Marsh-7-5R	SMP-SE-17645	10/19/2016	31.5	0.501	0.000737	J+	31.8	0.542		31.5	1.13
	Marsh-7-6R	SMP-SE-17647	10/19/2016	28.3	0.880	0.000709		27.9	0.478		28.3	0.781
					0.5492							
Marsh 15	Marsh-15-1R	NA	NA	NA	NA	NA		NA	NA		NA	NA
	Marsh-15-2R	NA	NA	NA	NA	NA		NA	NA		NA	NA
	Marsh-15-3R	NA	NA	NA	NA	NA		NA	NA		NA	NA
	Marsh-15-4R	NA	NA	NA	NA	NA		NA	NA		NA	NA
	Marsh-15-5R	SMP-SE-17656	10/19/2016	28.7	0.0362	0.000706		27.0	0.127		28.7	0.0907
	Marsh-15-6R	NA	NA	NA	NA	NA		NA	NA		NA	NA
	Marsh-15-7R	NA	NA	NA	NA	NA		NA	NA		NA	NA
	Marsh-15-8R	NA	NA	NA	NA	NA		NA	NA		NA	NA
	Marsh-15-9R	SMP-SE-17657	10/19/2016	21.6	0.0267	0.000611		23.9	0.187		21.6	0.133
	Marsh-15-10R	SMP-SE-17658	10/19/2016	25.6	0.0747	0.000685		26.6	0.198		25.6	0.677
					0.0459							
Marsh 19	Marsh-19-1R	SMP-SE-17648	10/19/2016	20.7	0.0849	0.000621		21.0	0.118		20.7	0.133
	Marsh-19-2R	SMP-SE-17649	10/19/2016	27.3	0.0327	0.000690		27.1	0.150		27.3	0.0845
	Marsh-19-3R	SMP-SE-17650	10/19/2016	32.5	1.05	0.00148		32.0	0.389		32.5	0.0722
	Marsh-19-4R	SMP-SE-17651	10/19/2016	23.8	0.0779	0.000657		23.4	0.0994		23.8	0.284
	Marsh-19-5R	SMP-SE-17652	10/19/2016	23.3	0.105	0.000664		22.9	0.139		23.3	0.120
	Marsh-19-6R	SMP-SE-17653	10/19/2016	23.9	0.272	0.000648		22.7	0.197		23.9	0.229
	Marsh-19-7R	SMP-SE-17654	10/19/2016	31.3	1.62	0.00146		33.7	1.33		31.3	0.182
	Marsh-19-8R	SMP-SE-17660	11/01/2016	15.6	0.124	0.000602		14.4	0.0928		15.6	0.182
					0.4208							

[1] SQL - Sample Quantitation Limit

J - Analyte detected below quantitation limits.

J+ - Field duplicate pair did not meet criteria of <20% Total Hg relative percent difference.

J++ - Field duplicate pair did not meet criteria of <35% MeHg relative percent difference.

U - Result less than 5 times the method blank average.

2016 Annual Open Water Sediment Stations, Sample IDs, Field Data, and Results

Station ID	Easting[1]	Northing[1]	Sample ID	Date	Time	Water Depth[2] (ft)	Total Hg			% M		TOC		
							(mg/kg) dry wt	SQL[3] (mg/kg)	Flag	wt%	SQL[3] (wt%)	wt%-dry	SQL[3] (wt%-dry)	Flag
LVB0904	2748607.84	13432756.43	SMP-SE-17670	11/1/2016	13:05	7.6	0.388	0.00158		67.8	0.0100	1.24	0.0600	
SMP0017	2748602.91	13431868.98	SMP-SE-17671	11/1/2016	13:30	10.0	0.368	0.00174		71.4	0.0100	1.37	0.0600	
SMP0016	2747731.01	13432103.13	SMP-SE-17672	11/1/2016	13:40	6.5	0.450	0.00142		64.5	0.0100	1.08	0.0600	
STO0218	2747783.63	13431346.15	SMP-SE-17673	11/1/2016	14:00	5.0	0.384	0.000917		44.8	0.0100	0.694	0.0600	
SUP0119	2748164.39	13431094.78	SMP-SE-17674	11/1/2016	14:20	8.0	0.263	0.000972		47.9	0.0100	0.633	0.0600	
LVB0907	2747361.87	13430972.27	SMP-SE-17675	11/1/2016	14:30	5.5	0.386	0.00111		55.1	0.0100	0.554	0.0600	
LVB0908	2747545.77	13430781.40	SMP-SE-17676	11/1/2016	14:40	9.5	0.386	0.00148		67.7	0.0100	0.999	0.0600	
SUP0053	2747598.59	13430453.47	SMP-SE-17677	11/1/2016	14:50	9.0	0.398	0.00192		73.5	0.0100	1.10	0.0600	
SUP0122	2748135.89	13430573.43	SMP-SE-17678	11/1/2016	16:25	3.3	0.421	0.000782		35.3	0.0100	0.508	0.0600	
SUP0043	2748397.24	13430138.70	SMP-SE-17679	11/1/2016	16:35	3.0	0.534	0.000649		22.2	0.0100	0.279	0.0600	
SUP0129	2748632.06	13430042.69	SMP-SE-17680	11/1/2016	16:40	5.0	0.434	0.000889	J+	46.0	0.0100	0.653	0.0600	
SMP0040	2748586.42	13429641.29	SMP-SE-17682	11/1/2016	16:50	2.9	0.327	0.000651		25.5	0.0100	0.363	0.0600	
SMP0047	2748794.75	13428999.24	SMP-SE-17683	11/1/2016	16:55	5.5	0.223	0.000949		47.5	0.0100	0.611	0.0600	
SMP0048	2749331.96	13429051.00	SMP-SE-17684	11/1/2016	17:00	7.2	17.3	0.0176		43.9	0.0100	0.891	0.0600	
SUP0132	2748919.44	13429526.14	SMP-SE-17685	11/1/2016	17:15	5.1	0.271	0.00116		56.8	0.0100	1.19	0.0600	
LVB0911	2746232.35	13429025.10	SMP-SE-17686	11/2/2016	9:10	4.0	0.194	0.000807		36.9	0.0100	0.267	0.0600	
SUP0073	2746102.52	13429151.78	SMP-SE-17687	11/2/2016	9:15	5.0	0.373	0.000818		37.9	0.0100	0.268	0.0600	
STO0189	2746100.70	13429690.76	SMP-SE-17688	11/2/2016	9:20	5.0	0.240	0.000627		22.3	0.0100	0.117	0.0600	
SMP0038	2745296.15	13429634.85	SMP-SE-17689	11/2/2016	9:25	7.5	0.202	0.00109		55.1	0.0100	0.730	0.0600	
SMP0028	2744476.44	13430488.40	SMP-SE-17690	11/2/2016	9:30	6.5	0.230	0.00133		61.6	0.0100	0.892	0.0600	
STO0162	2745327.15	13430558.04	SMP-SE-17691	11/2/2016	9:40	6.5	0.407	0.00107		52.3	0.0100	0.647	0.0600	
LVB0909	2746297.74	13430382.74	SMP-SE-17692	11/2/2016	9:45	4.5	0.168	0.000658		26.2	0.0100	0.205	0.0600	
SUP0107	2746530.03	13430934.47	SMP-SE-17693	11/2/2016	9:50	4.0	0.212	0.000641		24.5	0.0100	0.769	0.0600	
SMP0031	2746776.77	13430794.71	SMP-SE-17694	11/2/2016	10:00	4.5	0.356	0.00106		54.2	0.0100	0.625	0.0600	
SUP0106	2746521.88	13431157.50	SMP-SE-17695	11/2/2016	10:05	5.0	0.200	0.000796		32.8	0.0100	0.443	0.0600	
SUP0110	2747165.03	13431365.66	SMP-SE-17696	11/2/2016	10:10	5.5	0.281	0.000856		42.2	0.0100	0.583	0.0600	
STO0191	2746128.48	13431348.78	SMP-SE-17698	11/2/2016	10:20	7.0	0.178	0.000782		36.3	0.0100	0.571	0.0600	
SMP0020	2745306.77	13431286.12	SMP-SE-17699	11/2/2016	10:25	6.5	0.319	0.000842		41.7	0.0100	0.443	0.0600	
STO0153	2744503.89	13431363.14	SMP-SE-17700	11/2/2016	10:30	8.5	0.316	0.000905		45.0	0.0100	0.515	0.0600	
STO0160	2745328.16	13432231.30	SMP-SE-17701	11/2/2016	10:40	7.0	0.351	0.00136		64.2	0.0100	1.06	0.0600	
SMP0014	2746163.08	13432113.75	SMP-SE-17702	11/2/2016	10:45	6.0	0.535	0.00125		59.6	0.0100	0.805	0.0600	
STO0203	2746952.02	13432200.17	SMP-SE-17703	11/2/2016	10:55	5.5	0.432	0.00135		62.3	0.0100	0.812	0.0600	
SUP0016	2747340.57	13432643.47	SMP-SE-17704	11/2/2016	11:00	4.5	0.401	0.000794		38.6	0.0100	0.885	0.0600	
SMP0009	2746973.23	13432894.30	SMP-SE-17705	11/2/2016	11:05	6.0	0.599	0.00105		51.8	0.0100	0.864	0.0600	

2016 Annual Open Water Sediment Stations, Sample IDs, Field Data, and Results

Station ID	Easting[1]	Northing[1]	Sample ID	Date	Time	Water Depth[2] (ft)	Total Hg			% M		TOC		
							(mg/kg) dry wt	SQL[3] (mg/kg)	Flag	wt%	SQL[3] (wt%)	wt%-dry	SQL[3] (wt%-dry)	Flag
STO0193	2746119.11	13433001.40	SMP-SE-17706	11/2/2016	11:15	7.0	0.531	0.000896		44.6	0.0100	0.598	0.0600	
SMP0007	2745296.13	13432885.79	SMP-SE-17707	11/2/2016	11:20	7.5	0.212	0.000646		26.7	0.0100	0.251	0.0600	
SMP0004	2746188.74	13433687.08	SMP-SE-17708	11/2/2016	11:30	6.5	0.215	0.000731		30.9	0.0100	0.284	0.0600	
STO0201	2746953.83	13433773.37	SMP-SE-17710	11/2/2016	11:38	5.5	0.253	0.000730		31.5	0.0100	0.388	0.0600	
SUP0020	2748986.63	13430786.63	SMP-SE-17711	11/2/2016	11:50	5.0	0.421	0.000841		44.0	0.0100	0.641	0.0600	
SUP0021	2749441.13	13430583.99	SMP-SE-17712	11/2/2016	11:55	7.0	0.429	0.000955		48.4	0.0100	0.807	0.0600	
LVB0917	2749204.67	13430034.16	SMP-SE-17713	11/2/2016	12:00	4.5	0.545	0.000639		25.9	0.0100	0.572	0.0600	
SMP0041	2749500.19	13429826.60	SMP-SE-17714	11/2/2016	12:10	3.0	0.176	0.000693		28.3	0.0100	0.393	0.0600	
SMP0049	2750150.62	13428607.17	SMP-SE-17715	11/2/2016	12:20	15.0	0.371	0.00138		63.4	0.0100	1.09	0.0600	
STO0223	2748581.17	13430553.78	SMP-SE-17716	11/2/2016	12:30	10.0	0.288	0.000948		47.7	0.0100	0.570	0.0600	

[1]Coordinates reported in NAD 1983 State Plane Texas South Central, Feet

[2] Water Depths are not calibrated to tidal level

[3]SQL - Sample Quantitation Limit

J+ - Matrix Spike Percent Recovery exceeded criteria of 85-115%

Closed Area Juvenile Blue Crab Sample Stations, Sample IDs, Processing Data, and Analytical Results

Station ID	Sample ID	Date	Time	Width (mm)	Crab Weight (g)	Sample Weight (g)	Percent Moisture	Total Hg wet weight (µg/g)	Flag
CLO5802	B12b-TS-19069	9/22/16	17:11	37.0	5.3	42.6	70.8	0.212	
				37.5	4.0				
				30.0	2.9				
				50.0	7.8				
				74.0	22.6				
CLO5802	B12b-TS-19070	9/22/16	17:11	27.0	1.9	10.3	65.3	0.128	
				28.5	1.8				
				32.5	2.7				
				26.5	1.7				
				30.0	2.2				
CLO5815	B12b-TS-19072	9/22/16	17:30	42.0	4.0	51.8	72.9	0.0905	
				74.0	19.3				
				28.5	1.4				
				53.0	9.4				
				66.0	17.7				
CLO5802	B12b-TS-19073	9/23/16	11:10	28.0	2.1	16.3	66.4	0.170	
				29.0	2.0				
				20.0	1.6				
				41.5	4.2				
				41.0	6.4				
LVB5513	B12b-TS-19074	9/26/16	12:55	71.5	27.2	53.5	65.8	0.102	
				58.5	12.5				
				33.0	2.8				
				43.0	7.9				
				37.0	3.1				
CLO6802	B12b-TS-19075	9/22/16	16:24	40.0	3.6	29.4	71.3	0.0562	
				40.0	4.4				
				42.0	7.3				
				44.0	6.7				
				49.0	7.4				
CLO6802	B12b-TS-19076	9/26/16	12:31	36.5	3.8	26.6	68.5	0.0600	
				28.5	1.9				
				29.0	1.7				
				35.0	2.9				
				54.0	16.3				
CLO6802	B12b-TS-19081	9/26/16	12:31	31.1	2.0	61.6	66.3	0.0875	
				72.8	30.8				
				45.3	7.1				
				55.9	9.6				
				51.2	12.1				

Closed Area Juvenile Blue Crab Sample Stations, Sample IDs, Processing Data, and Analytical Results

Station ID	Sample ID	Date	Time	Width (mm)	Crab Weight (g)	Sample Weight (g)	Percent Moisture	Total Hg wet weight (µg/g)	Flag
LVB5504	B12b-TS-19083	9/22/16	16:54	66.0	15.2	39.5	70.1	0.109	
				55.8	10.2				
				41.1	6.3				
				30.7	2.3				
				42.4	5.5				
CLO5814	B12B-TS-19085	9/22/16	16:13	71.9	19.5	87.9	72.5	0.0775	
				58.9	14.2				
				73.1	21.4				
				68.1	19.7				
				54.4	13.1				
CLO5900	B12B-TS-19086	9/22/16	16:44	45.2	5.9	34.0	70.5	0.0817	
				51.9	8.2				
				65.8	11.0				
				42.9	4.2				
				42.7	4.7				
LVB5508	B12b-TS-19089	9/26/16	13:32	36.7	4.3	37.9	66.9	0.269	
				35.6	4.0				
				30.5	2.9				
				28.6	2.0				
				64.1	24.7				
LVB5508	B12b-TS-19090	9/28/17	10:30	70.8	30.9	84.6	72.1	0.197	
				69.0	26.9				
				37.8	5.2				
				61.2	18.8				
				31.4	2.8				
LVB5508	B12b-TS-19091	9/28/16	10:30	68.9	32.9	72.4	68.7	0.283	
				69.4	31.0				
				33.3	3.1				
				33.3	2.9				
				32.2	2.5				
CLO5814	B12b-TS-19095	10/2/16	15:05	44.7	6.7	45.3	74.2	0.0484	
				67.9	20.2				
				50.2	7.7				
				33.3	2.3				
				50.4	8.4				
LVB5504	B12b-TS-19097	9/27/16	18:00	26.4	1.7	53.7	72.8	0.104	
				33.7	2.4				
				73.3	23.1				
				66.3	20.9				
				40.0	5.6				

Closed Area Juvenile Blue Crab Sample Stations, Sample IDs, Processing Data, and Analytical Results

Station ID	Sample ID	Date	Time	Width (mm)	Crab Weight (g)	Sample Weight (g)	Percent Moisture	Total Hg wet weight (µg/g)	Flag
CLO5900	B12b-TS-19099	9/27/16	17:30	35.5	2.5	24.1	75.1	0.0810	
				31.4	2.1				
				58.2	14.6				
				35.3	2.6				
				32.0	2.3				
CLO5900	B12b-TS-19100	10/2/16	14:43	33.0	2.6	31.4	68.0	0.0893	
				42.9	5.0				
				47.5	7.6				
				27.8	1.8				
				60.8	14.4				
LVB5513	B12b-TS-19102	9/28/16	11:00	33.0	3.1	50.2	69.1	0.0964	
				70.1	24.3				
				26.7	1.5				
				36.7	4.7				
				62.5	16.6				
CLO5803	B12b-TS-19103	9/28/16	12:00	58.6	11.4	48.7	71.9	0.148	
				61.8	13.7				
				65.0	16.7				
				27.0	1.7				
				41.6	5.2				
CLO5815	B12b-TS-19104	9/29/16	13:05	37.6	3.2	29.4	67.1	0.0570	
				34.0	2.3				
				49.4	6.1				
				64.6	16.1				
				32.4	1.7				
LVB5517	B12b-TS-19105	10/2/16	15:20	29.1	2.4	19.2	65.7	0.0985	
				27.5	1.5				
				32.0	1.8				
				28.4	1.5				
				56.9	12.0				
LVB5517	B12b-TS-19106	10/4/16	11:18	26.8	1.0	25.4	71.1	0.104	
				42.0	4.8				
				35.2	3.3				
				42.5	5.7				
				52.5	10.6				
CLO5814	B12b-TS-19108	10/2/16	15:05	49.4	8.5	49.1	68.7	0.0610	
				65.7	16.9				
				57.1	14.2				
				35.6	3.5				
				46.4	6.0				

Closed Area Juvenile Blue Crab Sample Stations, Sample IDs, Processing Data, and Analytical Results

Station ID	Sample ID	Date	Time	Width (mm)	Crab Weight (g)	Sample Weight (g)	Percent Moisture	Total Hg wet weight (µg/g)	Flag
LVB5504	B12b-TS-19109	10/3/16	10:40	33.2	2.2	56.4	66.5	0.116	
				51.7	14.8				
				56.5	14.0				
				33.3	2.8				
				68.6	22.6				
LVB5517	B12b-TS-19111	10/4/16	11:18	26.6	1.2	11.9	65.6	0.0742	
				37.3	3.4				
				29.1	1.7				
				37.2	4.2				
				26.7	1.4				
LVB5513	B12b-TS-19112	10/4/16	10:11	69.1	25.8	54.8	69.3	0.0668	
				55.0	10.0				
				48.1	8.3				
				37.7	3.5				
				51.2	7.2				
CLO5803	B12b-TS-19116	10/4/16	10:51	51.3	13.6	76.3	68.9	0.230	
				70.8	34.2				
				47.4	6.5				
				74.0	18.5				
				31.7	3.5				
CLO5803	B12b-TS-19118	10/9/16	19:00	25.8	1.4	19.0	66.6	0.263	
				27.4	1.3				
				29.0	2.0				
				26.4	1.5				
				51.4	12.8				
CLO5815	B12b-TS-19121	10/6/16	11:55	48.4	14.8	38.1	66.6	0.0561	
				50.4	12.0				
				32.5	2.3				
				43.1	4.7				
				36.7	4.3				
Average Values				**44.9**	**8.5**	**43.9**	**69.2**	**0.1206**	

Adjacent Area Juvenile Blue Crab Sample Stations, Sample IDs, Processing Data, and Analytical Results

Station ID	Sample ID	Date	Time	Width (mm)	Crab Weight (g)	Sample Weight (g)	Percent Moisture	Total Hg wet weight (µg/g)	Flag
LVB6870	B12b-TS-19060	9/22/16	15:30	46.0	9.0	35.5	70.5	0.0375	
				38.0	5.9				
				45.0	10.7				
				38.0	5.8				
				33.0	4.1				
LVB6837	B12b-TS-19061	9/22/16	18:00	43.0	7.2	53.0	66.2	0.0632	
				41.0	4.7				
				70.0	27.6				
				46.0	7.0				
				48.0	6.5				
LVB6837	B12b-TS-19062	9/22/16	18:00	68.0	21.2	45.3	71.4	0.0458	
				48.0	6.2				
				28.5	2.0				
				56.0	12.3				
				38.0	3.6				
LVB6850	B12b-TS-19063	9/22/16	13:36	45.0	6.4	20.3	69.7	0.0623	
				39.0	3.8				
				34.0	3.1				
				35.0	3.9				
				32.5	3.1				
LVB6850	B12b-TS-19064	9/22/16	13:36	26.0	1.7	25.5	68.5	0.0644	
				38.0	4.6				
				35.0	3.2				
				42.5	5.8				
				54.0	10.2				
LVB6871	B12b-TS-19065	9/22/16	15:42	28.0	2.3	31.8	67.2	0.0567	
				30.0	3.1				
				30.5	2.0				
				57.0	12.8				
				52.5	11.6				
LVB6871	B12b-TS-19066	9/22/16	15:42	26.0	1.6	34.2	68.7	0.0440	
				35.0	3.4				
				60.5	15.6				
				38.0	3.7				
				55.5	9.9				
LVB5839	B12b-TS-19067	9/22/16	13:15	71.0	35.1	55.9	66.1	0.0698	
				35.5	4.8				
				35.0	4.3				
				41.0	5.4				
				44.0	6.3				

Adjacent Area Juvenile Blue Crab Sample Stations, Sample IDs, Processing Data, and Analytical Results

Station ID	Sample ID	Date	Time	Width (mm)	Crab Weight (g)	Sample Weight (g)	Percent Moisture	Total Hg wet weight (µg/g)	Flag
LVB5839	B12b-TS-19068	9/22/16	13:15	29.5	2.2	47.3	69.3	0.0553	
				39.0	5.5				
				44.0	6.6				
				57.0	14.9				
				67.0	18.1				
LVB5839	B12b-TS-19071	9/22/16	13:15	66.5	22.6	43.6	68.9	0.0609	
				39.5	6.1				
				34.0	3.7				
				39.0	6.4				
				35.5	4.8				
LVB6871	B12b-TS-19077	9/23/16	9:50	57.0	12.1	35.8	67.4	0.0403	
				36.5	4.1				
				49.0	8.6				
				45.0	7.8				
				33.0	3.2				
LVB6870	B12b-TS-19078	9/22/16	15:30	31.0	3.2	24.5	69.3	0.0406	
				35.0	3.5				
				33.0	2.9				
				38.0	4.4				
				49.5	10.5				
LVB6837	B12b-TS-19082	9/23/16	11:50	74.1	22.9	52.1	69.4	0.0563	
				38.5	4.3				
				34.9	2.9				
				29.8	2.5				
				67.3	19.5				
LVB6850	B12b-TS-19084	9/23/16	8:00	26.4	1.6	32.8	66.0	0.0851	
				28.3	2.5				
				32.9	2.7				
				29.8	2.1				
				70.5	23.9				
LVB6880	B12b-TS-19087	9/22/16	13:57	44.3	5.7	32.4	68.0	0.0313	
				63.9	20.4				
				36.7	3.2				
				28.9	1.8				
				28.8	1.3				
LVB6870	B12b-TS-19088	9/26/16	11:55	36.0	4.8	40.6	70.0	0.0480	
				56.4	17.2				
				44.1	8.5				
				35.7	4.0				
				38.8	6.1				

Adjacent Area Juvenile Blue Crab Sample Stations, Sample IDs, Processing Data, and Analytical Results

Station ID	Sample ID	Date	Time	Width (mm)	Crab Weight (g)	Sample Weight (g)	Percent Moisture	Total Hg wet weight (µg/g)	Flag
LVB6880	B12b-TS-19092	9/27/16	16:55	35.1	2.8	20.3	67.6	0.0240	
				48.2	7.2				
				49.0	7.5				
				26.0	1.3				
				27.8	1.5				
LVB5838	B12b-TS-19093	9/26/16	11:05	65.1	27.4	49.5	66.6	0.0644	
				44.3	7.6				
				28.6	2.1				
				36.8	3.9				
				44.4	8.5				
LVB6853	B12b-TS-19096	9/29/16	12:15	41.0	4.8	47.8	67.0	0.0651	
				56.3	17.2				
				47.6	8.3				
				50.8	11.5				
				44.4	6.0				
LVB6852	B12b-TS-19098	9/27/16	16:46	60.1	20.3	124.5	70.0	0.0956	
				65.5	25.3				
				71.9	33.3				
				60.7	23.1				
				61.2	22.5				
LVB6880	B12b-TS-19101	9/29/16	10:18	37.0	3.0	17.0	69.7	0.0356	
				45.8	8.1				
				29.0	1.8				
				26.9	2.0				
				27.4	2.1				
LVB6853	B12b-TS-19107	10/2/16	18:10	44.5	7.3	53.4	69.0	0.0438	
				61.2	19.4				
				40.6	5.5				
				46.9	7.5				
				56.8	13.7				
LVB5838	B12b-TS-19110	10/4/16	12:00	47.1	8.0	42.5	72.0	0.0311	
				41.1	6.9				
				47.7	8.3				
				36.4	4.0				
				52.5	15.3				
LVB5838	B12b-TS-19113	10/6/16	11:20	37.2	4.9	78.6	69.5	0.0554	
				61.1	15.3				
				70.3	35.1				
				37.8	5.1				
				59.2	18.2				

Adjacent Area Juvenile Blue Crab Sample Stations, Sample IDs, Processing Data, and Analytical Results

Station ID	Sample ID	Date	Time	Width (mm)	Crab Weight (g)	Sample Weight (g)	Percent Moisture	Total Hg wet weight (µg/g)	Flag
LVB6852	B12b-TS-19114	10/4/16	12:34	65.5	28.4	84.8	67.1	0.0809	
				28.7	2.5				
				44.1	8.3				
				73.4	35.7				
				48.2	9.9				
LVB6853	B12b-TS-19115	10/6/16	11:10	25.8	1.4	22.7	66.6	0.0581	
				30.2	2.4				
				41.9	5.1				
				47.8	9.2				
				38.7	4.6				
LVB6852	B12b-TS-19117	10/9/16	17:05	71.2	34.9	151.6	68.1	0.125	
				68.3	30.2				
				61.1	23.4				
				69.1	30.6				
				74.9	32.5				
LVB6975	B12b-TS-19119	10/6/16	11:36	26.1	1.6	40.1	72.9	0.0283	
				31.3	3.1				
				53.8	10.0				
				52.0	13.4				
				56.8	12.0				
LVB6975	B12b-TS-19120	10/11/16	10:30	54.1	11.3	31.5	72.9	0.0251	
				42.2	5.9				
				46.2	6.6				
				42.0	6.5				
				25.2	1.2				
LVB6975	B12b-TS-19122	10/12/16	9:52	45.7	6.4	42.8	67.0	0.0330	
				44.0	6.9				
				43.8	5.8				
				35.3	3.7				
				60.5	20.0				
Average Values				**44.9**	**9.5**	**50.9**	**68.8**	**0.0542**	

Closed Area Red Drum Sample Stations, Sample IDs, Processing Data, and Analytical Results

Station ID	Sample ID	Date	Time	Total Length (mm)	Standard Length (mm)	Total Weight (g)	Tissue Weight (g)	Sample Weight (g)	Percent Moisture	Total Hg wet weight (µg/g)	Flag
LVB5508	B12b-TF-18560	9/27/2016	11:55	664	530	2920	308.7	59.7	80.0	1.19	
LVB5504	B12b-TF-18561	9/27/2016	12:05	681	550	2900	361.4	61.3	78.4	1.07	
CLO5818	B12b-TF-18562	9/28/2016	8:20	627	522	2420	126.4	41.6	78.4	1.10	
LVB5518	B12b-TF-18564	9/28/2016	7:50	510	404	1200	153.2	44.3	78.6	0.323	
CLO5900	B12b-TF-18565	9/28/2016	9:15	693	586	3200	339.1	56.1	78.8	0.866	
CLO5802	B12b-TF-18568	10/4/2016	10:39	620	510	2580	406.3	61.3	70.0	1.77	
CLO5814	B12b-TF-18573	10/6/2016	8:59	609	500	2510	399.6	59.9	76.3	0.377	
LVB5513	B12b-TF-18574	10/6/2016	8:46	686	570	3310	538.7	64.9	79.2	0.368	
CLO5803	B12b-TF-18576	10/10/2016	9:45	523	415	1410	179.9	42.8	77.8	0.936	
CLO5802	B12b-TF-18577	10/11/2016	8:00	515	400	1350	216.0	59.5	77.9	1.05	
CLO5814	B12b-TF-18578	10/11/2016	9:50	550	430	1580	214.5	49.2	80.2	1.21	
CLO5814	B12b-TF-18582	10/12/2016	9:30	538	425	1520	223.6	59.5	80.2	0.574	
LVB5518	B12b-TF-18584	10/17/2016	10:02	515	405	1320	184.5	49.6	79.3	0.304	
LVB5518	B12b-TF-18585	10/17/2016	10:02	562	450	1750	259.6	53.7	78.5	0.368	
CLO5900	B12b-TF-18590	10/21/2016	9:00	672	545	2920	352.6	55.2	78.9	1.67	
LVB5513	B12b-TF-18592	10/25/2016	9:40	710	580	3400	362.0	58.1	79.6	0.422	
CLO5802	B12b-TF-18593	10/26/2016	8:31	682	565	3180	401.2	63.0	79.1	0.840	
CLO5818	B12b-TF-18594	10/26/2016	9:11	542	435	1450	160.6	43.2	80.1	0.868	
CLO5803	B12b-TF-18607	11/9/2016	6:45	649	530	2750	396.6	58.6	80.0	1.17	
CLO5815	B12b-TF-18608	11/9/2016	7:15	566	450	1870	278.9	58.0	78.6	0.284	
CLO5815	B12b-TF-18609	11/10/2016	6:40	521	415	1490	252.5	62.1	79.6	0.330	
CLO5815	B12b-TF-18610	11/14/2016	6:45	597	470	2180	322.7	56.2	79.6	0.448	
CLO5803	B12b-TF-18614	11/16/2016	7:36	668	540	2950	463.8	58.9	77.8	0.321	
LVB5508	B12b-TF-18619	11/29/2016	7:00	677	555	3180	455.7	62.7	81.0	1.50	
CLO5818	B12b-TF-18620	11/29/2016	9:22	512	400	1350	192.9	55.3	78.1	0.488	
CLO5900	B12b-TF-18621	12/1/2016	8:50	509	410	1100	173.0	48.3	79.1	0.318	
LVB5513	B12b-TF-18622	12/5/2016	9:35	711	575	4180	608.4	60.1	77.2	0.605	
LVB5504	B12b-TF-18623	12/5/2016	8:20	709	585	4040	530.8	60.1	78.5	0.347	
LVB5508	B12b-TF-18624	12/6/2016	7:45	673	540	3160	440.1	62.3	77.8	0.375	
LVB5504	B12b-TF-18625	12/6/2016	8:35	691	570	2870	368.2	50.9	79.7	0.973	
Average Values				**613**	**495**	**2401**	**322.4**	**55.9**	**78.6**	**0.749**	

Adjacent Area Red Drum Sample Stations, Sample IDs, Processing Data, and Analytical Results

Station ID	Sample ID	Date	Time	Total Length (mm)	Standard Length (mm)	Total Weight (g)	Tissue Weight (g)	Sample Weight (g)	Percent Moisture	Total Hg wet weight (µg/g)	Flag
LVB5839	B12b-TF-18566	9/29/2016	7:23	697	580	3750	510.9	60.8	80.9	0.368	
LVB5838	B12b-TF-18567	10/3/2016	8:25	592	480	2280	316.5	61.7	80.0	0.239	
LVB6880	B12b-TF-18569	10/5/2016	8:31	659	545	3180	459.6	62.6	80.9	0.484	
LVB6870	B12b-TF-18570	10/5/2016	9:21	531	425	1450	187.6	44.5	78.9	0.440	
LVB6870	B12b-TF-18571	10/6/2016	7:52	687	560	3290	448.8	62.3	78.5	0.417	
LVB6871	B12b-TF-18572	10/6/2016	8:12	702	580	3700	502.3	58.7	78.0	0.320	
LVB5841	B12b-TF-18575	10/10/2016	8:00	669	545	3150	510.1	61.9	78.6	0.360	
LVB6870	B12b-TF-18579	10/12/2016	8:16	624	490	2380	369.2	59.9	80.1	0.378	
LVB6950	B12b-TF-18580	10/12/2016	7:45	706	575	3750	552.2	67.4	78.2	0.324	
CLO5830	B12b-TF-18581	10/12/2016	8:53	710	580	3650	510.7	62.2	79.4	0.594	
LVB5839	B12b-TF-18583	10/13/2016	7:42	688	560	3420	532.6	53.0	80.2	0.264	
LVB6837	B12b-TF-18586	10/17/2016	8:13	691	560	3270	392.1	58.3	80.5	0.511	
LVB6950	B12b-TF-18587	10/18/2016	9:15	701	560	3700	451.2	55.8	78.7	0.296	
LVB6871	B12b-TF-18588	10/20/2016	9:24	677	545	3200	428.8	58.9	79.9	0.381	
LVB6950	B12b-TF-18589	10/20/2016	9:48	659	525	3120	445.2	62.8	77.0	0.314	
LVB6871	B12b-TF-18591	10/25/2016	9:05	665	550	2920	376.0	59.6	79.2	0.354	
LVB5839	B12b-TF-18595	10/27/2016	7:21	641	520	2650	398.5	58.7	79.6	0.406	
LVB5839	B12b-TF-18596	10/27/2016	7:21	660	525	2910	381.9	57.4	80.4	0.419	
CLO5830	B12b-TF-18597	11/1/2016	7:00	661	540	2830	354.9	55.9	79.7	0.466	
LVB5841	B12b-TF-18598	11/2/2016	8:23	628	510	2660	348.7	58.0	79.9	0.342	
LVB5838	B12b-TF-18599	11/2/2016	8:45	542	435	1450	191.9	43.0	81.8	0.293	
LVB5841	B12b-TF-18604	11/7/2016	7:15	676	550	3380	485.3	65.4	78.9	0.266	
LVB5838	B12b-TF-18605	11/7/2016	7:45	670	545	2920	395.1	63.7	79.5	0.381	
CLO5830	B12b-TF-18606	11/7/2016	8:40	652	530	2670	376.1	61.2	79.6	0.267	
LVB6880	B12b-TF-18611	11/14/2016	8:00	700	570	3560	524.0	60.0	78.9	0.326	
LVB6850	B12b-TF-18612	11/15/2016	7:15	520	415	1490	271.3	53.8	79.6	0.219	
LVB6850	B12b-TF-18613	11/16/2016	6:53	525	420	1400	213.7	55.0	79.2	0.319	
LVB6850	B12b-TF-18615	11/17/2016	6:40	559	450	1900	282.5	54.4	79.7	0.357	
LVB6880	B12b-TF-18616	11/21/2016	7:00	679	555	2930	379.7	59.6	80.7	0.541	
LVB6837	B12b-TF-18617	11/21/2016	9:00	710	580	3480	483.9	58.1	79.4	0.544	
LVB6837	B12b-TF-18618	11/21/2016	9:00	661	535	2960	410.5	56.9	80.2	0.416	
Average Values				**650**	**527**	**2884**	**403.0**	**58.4**	**79.6**	**0.374**	

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
1	2746014.49	13434207.06	0.5
2	2746021.46	13434185.39	0.4
3	2746031.96	13434165.49	0.0
4	2746041.36	13434136.65	-0.2
5	2746054.82	13434115.09	-0.4
6	2746066.16	13434089.22	-0.6
7	2746072.40	13434070.39	-0.7
8	2746077.27	13434057.66	-0.7
9	2746159.04	13434332.60	0.6
10	2746158.96	13434301.21	0.4
11	2746165.85	13434278.58	0.4
12	2746180.71	13434253.67	0.4
13	2746179.53	13434227.16	0.4
14	2746186.93	13434197.70	0.3
15	2746191.08	13434174.40	0.1
16	2746202.63	13434150.80	0.0
17	2746208.33	13434127.19	-0.3
18	2746211.40	13434103.75	-0.6
19	2746215.08	13434083.34	-0.8
20	2746357.11	13434382.23	1.4
21	2746347.41	13434357.50	0.8
22	2746361.43	13434328.97	0.8
23	2746358.85	13434303.85	0.7
24	2746357.37	13434276.75	0.5
25	2746364.40	13434243.21	0.4
26	2746366.80	13434207.25	0.3
27	2746367.73	13434169.54	0.2
28	2746368.15	13434126.74	-0.5
29	2746372.16	13434096.52	-1.0
30	2746372.20	13434076.71	-1.0
31	2746363.61	13434393.25	2.7
32	2746155.18	13434354.13	2.7
33	2746005.26	13434240.43	2.7
34	2746567.36	13434389.71	2.7
35	2746564.44	13434372.32	1.9
36	2746562.57	13434348.03	1.3
37	2746558.56	13434322.87	0.7
38	2746550.79	13434296.36	0.8
39	2746550.42	13434273.22	0.6
40	2746554.35	13434250.18	0.6
41	2746570.28	13434223.36	0.4
42	2746563.44	13434195.72	0.4
43	2746564.54	13434169.44	0.2
44	2746561.99	13434143.74	-0.3
45	2746562.25	13434120.20	-0.8
46	2746566.45	13434095.86	-1.0
47	2746774.69	13434387.49	2.7
48	2746773.73	13434363.17	1.8

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
49	2746772.59	13434338.16	1.6
50	2746769.87	13434312.79	1.1
51	2746759.89	13434288.32	0.6
52	2746756.47	13434263.20	0.6
53	2746753.92	13434237.70	0.4
54	2746752.49	13434211.36	0.4
55	2746754.95	13434183.10	0.3
56	2746753.66	13434163.14	0.0
57	2746753.40	13434134.61	-0.5
58	2746751.47	13434112.15	-1.0
59	2746745.90	13434094.10	-1.1
60	2746970.98	13434336.28	2.6
61	2746967.11	13434313.57	1.5
62	2746961.09	13434286.33	0.8
63	2746953.94	13434259.89	0.7
64	2746948.45	13434232.86	0.6
65	2746943.95	13434204.22	0.3
66	2746932.58	13434181.07	0.2
67	2746939.46	13434150.74	-0.2
68	2746935.31	13434125.75	-0.7
69	2746929.64	13434100.67	-0.9
70	2746920.49	13434082.76	-1.0
71	2747168.41	13434290.42	2.6
72	2747161.02	13434269.56	1.5
73	2747155.67	13434244.03	1.2
74	2747129.21	13434233.08	0.9
75	2747117.75	13434212.60	0.6
76	2747108.60	13434190.22	0.5
77	2747095.62	13434165.43	0.3
78	2747083.87	13434140.07	-0.2
79	2747074.06	13434113.48	-0.5
80	2747061.94	13434089.58	-0.7
81	2747046.87	13434067.90	-0.9
82	2747334.40	13434210.48	2.6
83	2747321.17	13434191.45	1.5
84	2747311.50	13434171.98	1.0
85	2747300.34	13434151.92	0.8
86	2747289.75	13434134.14	0.6
87	2747279.23	13434110.30	0.3
88	2747267.85	13434086.12	0.1
89	2747255.12	13434063.41	-0.1
90	2747235.11	13434047.21	-0.4
91	2747218.14	13434027.83	-0.5
92	2747193.31	13434007.04	-0.7
93	2747172.96	13433989.12	-0.8
94	2747276.18	13433932.43	-0.8
95	2747296.22	13433948.42	-0.6
96	2747320.02	13433961.71	-0.5

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
97	2747343.49	13433976.24	-0.2
98	2747366.35	13433992.81	0.1
99	2747391.14	13434004.38	0.4
100	2747409.83	13434017.33	0.7
101	2747427.08	13434024.67	0.9
102	2747448.28	13434035.74	1.8
103	2747459.95	13434039.42	2.6
104	2747541.11	13433881.19	2.6
105	2747524.43	13433868.44	0.6
106	2747490.94	13433856.24	0.2
107	2747459.92	13433844.95	-0.3
108	2747435.40	13433836.16	-0.5
109	2747411.75	13433822.43	-0.8
110	2747390.20	13433808.77	-0.9
111	2747373.51	13433800.36	-1.0
112	2747463.46	13433628.53	-1.0
113	2747485.73	13433634.81	-0.8
114	2747510.08	13433650.88	-0.7
115	2747529.68	13433659.43	-0.5
116	2747551.26	13433666.64	-0.3
117	2747572.41	13433674.46	0.1
118	2747590.14	13433683.50	0.6
119	2747619.88	13433696.28	2.6
120	2747702.18	13433511.43	2.5
121	2747666.25	13433514.38	0.6
122	2747644.11	13433508.86	0.3
123	2747620.19	13433500.35	-0.1
124	2747601.04	13433489.37	-0.1
125	2747574.66	13433486.14	-0.3
126	2747547.33	13433484.66	-0.5
127	2747522.75	13433481.75	-0.8
128	2747498.02	13433474.65	-1.0
129	2747485.11	13433472.45	-1.0
130	2747473.34	13433302.03	-1.3
131	2747498.00	13433304.11	-1.0
132	2747522.17	13433305.68	-0.8
133	2747550.08	13433310.81	-0.7
134	2747573.73	13433315.77	-0.3
135	2747598.34	13433320.04	-0.1
136	2747619.44	13433323.84	0.5
137	2747646.01	13433330.52	0.4
138	2747667.71	13433333.63	0.3
139	2747687.41	13433339.27	1.4
140	2747711.64	13433343.75	2.1
141	2747735.89	13433345.29	2.5
142	2747762.23	13433186.87	2.5
143	2747739.46	13433186.78	1.5
144	2747715.22	13433184.37	0.9

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
145	2747689.01	13433174.33	0.3
146	2747656.92	13433170.51	-0.2
147	2747630.41	13433158.58	-0.6
148	2747600.42	13433164.13	-0.8
149	2747569.15	13433161.68	-1.2
150	2747574.11	13432971.56	-1.2
151	2747603.61	13432970.73	-1.2
152	2747634.14	13432975.45	-1.0
153	2747655.99	13432980.31	-0.8
154	2747691.70	13432977.36	-0.6
155	2747715.62	13432978.29	-0.3
156	2747742.84	13432981.06	0.7
157	2747763.14	13432805.66	2.5
158	2747746.29	13432809.10	0.7
159	2747726.41	13432811.55	0.3
160	2747703.29	13432815.83	-0.1
161	2747674.34	13432817.05	-0.3
162	2747643.20	13432812.66	-0.7
163	2747610.82	13432813.36	-1.0
164	2747580.72	13432809.06	-1.2
165	2747554.69	13432821.83	-1.3
166	2747516.60	13432618.71	-1.2
167	2747540.85	13432618.96	-1.1
168	2747570.40	13432628.15	-0.9
169	2747610.73	13432636.23	-0.4
170	2747641.35	13432638.36	-0.1
171	2747670.47	13432640.69	0.6
172	2747692.90	13432642.01	1.3
173	2747707.94	13432635.60	2.5
174	2747717.87	13432459.92	2.5
175	2747696.58	13432456.41	1.8
176	2747680.62	13432448.54	0.6
177	2747657.31	13432443.68	0.0
178	2747635.16	13432458.76	-0.9
179	2747613.71	13432463.08	-1.6
180	2747622.25	13432449.50	-1.6
181	2747580.67	13432456.86	-1.0
182	2747549.85	13432455.52	-1.0
183	2747676.59	13432458.21	0.5
184	2747670.35	13432638.67	0.5
185	2747726.82	13432808.16	0.3
186	2747746.28	13432980.63	0.8
187	2747726.74	13433171.80	0.9
188	2747681.65	13433342.87	1.0
189	2747682.12	13433522.21	0.9
190	2747517.57	13433891.42	1.0
191	2747431.30	13434038.03	0.9
192	2747286.57	13434161.82	0.9

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
193	2747132.52	13434224.39	0.9
194	2746970.92	13434275.34	0.8
195	2746762.88	13434287.25	0.5
196	2746573.32	13434324.55	0.7
197	2746372.24	13434345.12	0.8
198	2746014.49	13434207.06	0.5
199	2746021.46	13434185.39	0.4
200	2746031.96	13434165.49	0.0
201	2746041.36	13434136.65	-0.2
202	2746054.82	13434115.09	-0.4
203	2746066.16	13434089.22	-0.6
204	2746072.40	13434070.39	-0.7
205	2746077.27	13434057.66	-0.7
206	2746159.04	13434332.60	0.6
207	2746158.96	13434301.21	0.4
208	2746165.85	13434278.58	0.4
209	2746180.71	13434253.67	0.4
210	2746179.53	13434227.16	0.4
211	2746186.93	13434197.70	0.3
212	2746191.08	13434174.40	0.1
213	2746202.63	13434150.80	0.0
214	2746208.33	13434127.19	-0.3
215	2746211.40	13434103.75	-0.6
216	2746215.08	13434083.34	-0.8
217	2746357.11	13434382.23	1.4
218	2746347.41	13434357.50	0.8
219	2746361.43	13434328.97	0.8
220	2746358.85	13434303.85	0.7
221	2746357.37	13434276.75	0.5
222	2746364.40	13434243.21	0.4
223	2746366.80	13434207.25	0.3
224	2746367.73	13434169.54	0.2
225	2746368.15	13434126.74	-0.5
226	2746372.16	13434096.52	-1.0
227	2746372.20	13434076.71	-1.0
228	2746363.61	13434393.25	2.7
229	2746155.18	13434354.13	2.7
230	2746005.26	13434240.43	2.7
231	2746567.36	13434389.71	2.7
232	2746564.44	13434372.32	1.9
233	2746562.57	13434348.03	1.3
234	2746558.56	13434322.87	0.7
235	2746550.79	13434296.36	0.8
236	2746550.42	13434273.22	0.6
237	2746554.35	13434250.18	0.6
238	2746570.28	13434223.36	0.4
239	2746563.44	13434195.72	0.4
240	2746564.54	13434169.44	0.2

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
241	2746561.99	13434143.74	-0.3
242	2746562.25	13434120.20	-0.8
243	2746566.45	13434095.86	-1.0
244	2746774.69	13434387.49	2.7
245	2746773.73	13434363.17	1.8
246	2746772.59	13434338.16	1.6
247	2746769.87	13434312.79	1.1
248	2746759.89	13434288.32	0.6
249	2746756.47	13434263.20	0.6
250	2746753.92	13434237.70	0.4
251	2746752.49	13434211.36	0.4
252	2746754.95	13434183.10	0.3
253	2746753.66	13434163.14	0.0
254	2746753.40	13434134.61	-0.5
255	2746751.47	13434112.15	-1.0
256	2746745.90	13434094.10	-1.1
257	2746970.98	13434336.28	2.6
258	2746967.11	13434313.57	1.5
259	2746961.09	13434286.33	0.8
260	2746953.94	13434259.89	0.7
261	2746948.45	13434232.86	0.6
262	2746943.95	13434204.22	0.3
263	2746932.58	13434181.07	0.2
264	2746939.46	13434150.74	-0.2
265	2746935.31	13434125.75	-0.7
266	2746929.64	13434100.67	-0.9
267	2746920.49	13434082.76	-1.0
268	2747168.41	13434290.42	2.6
269	2747161.02	13434269.56	1.5
270	2747155.67	13434244.03	1.2
271	2747129.21	13434233.08	0.9
272	2747117.75	13434212.60	0.6
273	2747108.60	13434190.22	0.5
274	2747095.62	13434165.43	0.3
275	2747083.87	13434140.07	-0.2
276	2747074.06	13434113.48	-0.5
277	2747061.94	13434089.58	-0.7
278	2747046.87	13434067.90	-0.9
279	2747334.40	13434210.48	2.6
280	2747321.17	13434191.45	1.5
281	2747311.50	13434171.98	1.0
282	2747300.34	13434151.92	0.8
283	2747289.75	13434134.14	0.6
284	2747279.23	13434110.30	0.3
285	2747267.85	13434086.12	0.1
286	2747255.12	13434063.41	-0.1
287	2747235.11	13434047.21	-0.4
288	2747218.14	13434027.83	-0.5

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
289	2747193.31	13434007.04	-0.7
290	2747172.96	13433989.12	-0.8
291	2747276.18	13433932.43	-0.8
292	2747296.22	13433948.42	-0.6
293	2747320.02	13433961.71	-0.5
294	2747343.49	13433976.24	-0.2
295	2747366.35	13433992.81	0.1
296	2747391.14	13434004.38	0.4
297	2747409.83	13434017.33	0.7
298	2747427.08	13434024.67	0.9
299	2747448.28	13434035.74	1.8
300	2747459.95	13434039.42	2.6
301	2747541.11	13433881.19	2.6
302	2747524.43	13433868.44	0.6
303	2747490.94	13433856.24	0.2
304	2747459.92	13433844.95	-0.3
305	2747435.40	13433836.16	-0.5
306	2747411.75	13433822.43	-0.8
307	2747390.20	13433808.77	-0.9
308	2747373.51	13433800.36	-1.0
309	2747463.46	13433628.53	-1.0
310	2747485.73	13433634.81	-0.8
311	2747510.08	13433650.88	-0.7
312	2747529.68	13433659.43	-0.5
313	2747551.26	13433666.64	-0.3
314	2747572.41	13433674.46	0.1
315	2747590.14	13433683.50	0.6
316	2747619.88	13433696.28	2.6
317	2747702.18	13433511.43	2.5
318	2747666.25	13433514.38	0.6
319	2747644.11	13433508.86	0.3
320	2747620.19	13433500.35	-0.1
321	2747601.04	13433489.37	-0.1
322	2747574.66	13433486.14	-0.3
323	2747547.33	13433484.66	-0.5
324	2747522.75	13433481.75	-0.8
325	2747498.02	13433474.65	-1.0
326	2747485.11	13433472.45	-1.0
327	2747473.34	13433302.03	-1.3
328	2747498.00	13433304.11	-1.0
329	2747522.17	13433305.68	-0.8
330	2747550.08	13433310.81	-0.7
331	2747573.73	13433315.77	-0.3
332	2747598.34	13433320.04	-0.1
333	2747619.44	13433323.84	0.5
334	2747646.01	13433330.52	0.4
335	2747667.71	13433333.63	0.3
336	2747687.41	13433339.27	1.4

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
337	2747711.64	13433343.75	2.1
338	2747735.89	13433345.29	2.5
339	2747762.23	13433186.87	2.5
340	2747739.46	13433186.78	1.5
341	2747715.22	13433184.37	0.9
342	2747689.01	13433174.33	0.3
343	2747656.92	13433170.51	-0.2
344	2747630.41	13433158.58	-0.6
345	2747600.42	13433164.13	-0.8
346	2747569.15	13433161.68	-1.2
347	2747574.11	13432971.56	-1.2
348	2747603.61	13432970.73	-1.2
349	2747634.14	13432975.45	-1.0
350	2747655.99	13432980.31	-0.8
351	2747691.70	13432977.36	-0.6
352	2747715.62	13432978.29	-0.3
353	2747742.84	13432981.06	0.7
354	2747763.14	13432805.66	2.5
355	2747746.29	13432809.10	0.7
356	2747726.41	13432811.55	0.3
357	2747703.29	13432815.83	-0.1
358	2747674.34	13432817.05	-0.3
359	2747643.20	13432812.66	-0.7
360	2747610.82	13432813.36	-1.0
361	2747580.72	13432809.06	-1.2
362	2747554.69	13432821.83	-1.3
363	2747516.60	13432618.71	-1.2
364	2747540.85	13432618.96	-1.1
365	2747570.40	13432628.15	-0.9
366	2747610.73	13432636.23	-0.4
367	2747641.35	13432638.36	-0.1
368	2747670.47	13432640.69	0.6
369	2747692.90	13432642.01	1.3
370	2747707.94	13432635.60	2.5
371	2747717.87	13432459.92	2.5
372	2747696.58	13432456.41	1.8
373	2747680.62	13432448.54	0.6
374	2747657.31	13432443.68	0.0
375	2747635.16	13432458.76	-0.9
376	2747613.71	13432463.08	-1.6
377	2747622.25	13432449.50	-1.6
378	2747580.67	13432456.86	-1.0
379	2747549.85	13432455.52	-1.0
380	2747676.59	13432458.21	0.5
381	2747670.35	13432638.67	0.5
382	2747726.82	13432808.16	0.3
383	2747746.28	13432980.63	0.8
384	2747726.74	13433171.80	0.9

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
385	2747681.65	13433342.87	1.0
386	2747682.12	13433522.21	0.9
387	2747517.57	13433891.42	1.0
388	2747431.30	13434038.03	0.9
389	2747286.57	13434161.82	0.9
390	2747132.52	13434224.39	0.9
391	2746970.92	13434275.34	0.8
392	2746762.88	13434287.25	0.5
393	2746573.32	13434324.55	0.7
394	2746372.24	13434345.12	0.8
395	2746245.96	13434091.57	-0.9
396	2746248.13	13434088.35	-0.9
397	2746261.40	13434076.89	-1.0
398	2746265.83	13434074.52	-1.0
399	2746275.20	13434070.05	-1.0
400	2746281.15	13434067.33	-1.1
401	2746291.00	13434062.57	-1.1
402	2746298.66	13434059.13	-1.1
403	2746308.19	13434054.39	-1.1
404	2746315.10	13434051.88	-1.1
405	2746321.73	13434049.89	-1.1
406	2746329.34	13434047.30	-1.1
407	2746342.97	13434043.56	-1.1
408	2746348.70	13434041.97	-1.1
409	2746357.10	13434038.58	-1.2
410	2746364.41	13434035.99	-1.2
411	2746370.89	13434033.41	-1.2
412	2746379.82	13434029.51	-1.3
413	2746386.41	13434026.78	-1.3
414	2746403.91	13434021.87	-1.3
415	2746413.00	13434019.01	-1.3
416	2746428.35	13434014.03	-1.4
417	2746434.26	13434011.50	-1.4
418	2746441.10	13434009.53	-1.4
419	2746450.11	13434007.92	-1.5
420	2746457.84	13434006.10	-1.4
421	2746469.04	13434004.11	-1.5
422	2746479.17	13434003.22	-1.4
423	2746487.15	13434002.32	-1.4
424	2746494.84	13434001.90	-1.4
425	2746501.99	13434000.62	-1.5
426	2746509.25	13433999.27	-1.5
427	2746516.04	13433997.28	-1.5
428	2746521.75	13433994.32	-1.5
429	2746527.11	13433992.27	-1.5
430	2746535.71	13433990.19	-1.5
431	2746543.39	13433987.85	-1.5
432	2746551.18	13433985.51	-1.5

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
433	2746559.12	13433982.72	-1.5
434	2746566.57	13433977.42	-1.5
435	2746573.61	13433971.23	-1.5
436	2746581.69	13433965.05	-1.6
437	2746588.70	13433959.07	-1.5
438	2746595.45	13433953.79	-1.6
439	2746602.23	13433948.07	-1.6
440	2746609.65	13433942.92	-1.6
441	2746619.59	13433937.09	-1.6
442	2746628.66	13433932.53	-1.6
443	2746640.34	13433928.20	-1.6
444	2746648.71	13433925.08	-1.6
445	2746658.72	13433922.33	-1.7
446	2746669.06	13433920.26	-1.6
447	2746677.91	13433918.55	-1.6
448	2746686.44	13433916.72	-1.6
449	2746692.66	13433915.35	-1.6
450	2746700.57	13433912.44	-1.7
451	2746707.91	13433908.32	-1.7
452	2746714.07	13433903.12	-1.7
453	2746719.26	13433896.67	-1.7
454	2746724.88	13433888.52	-1.7
455	2746729.04	13433882.64	-1.7
456	2746734.13	13433875.67	-1.8
457	2746739.65	13433867.65	-1.8
458	2746745.25	13433860.78	-1.8
459	2746753.22	13433853.36	-1.8
460	2746760.23	13433846.01	-1.9
461	2746766.55	13433839.73	-1.8
462	2746773.46	13433833.39	-1.8
463	2746780.75	13433827.78	-1.8
464	2746787.72	13433822.10	-1.8
465	2746795.41	13433815.46	-1.8
466	2746802.47	13433808.66	-1.8
467	2746808.22	13433801.95	-1.8
468	2746813.17	13433795.74	-1.8
469	2746818.76	13433788.91	-1.8
470	2746825.28	13433782.21	-1.9
471	2746830.97	13433775.81	-1.8
472	2746837.45	13433768.45	-1.8
473	2746845.99	13433759.75	-1.8
474	2746852.94	13433753.46	-1.8
475	2746861.26	13433746.96	-1.9
476	2746868.62	13433741.72	-1.8
477	2746875.97	13433736.20	-1.8
478	2746883.30	13433730.10	-1.8
479	2746890.41	13433724.49	-1.8
480	2746898.76	13433716.83	-1.9

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
481	2746905.66	13433709.93	-1.8
482	2746913.34	13433703.63	-1.8
483	2746920.55	13433698.17	-1.8
484	2746926.49	13433693.23	-1.9
485	2746933.66	13433687.29	-1.8
486	2746940.83	13433680.88	-1.8
487	2746948.07	13433673.23	-1.9
488	2746954.23	13433667.47	-1.9
489	2746961.15	13433662.04	-1.9
490	2746967.68	13433656.81	-1.8
491	2746974.25	13433651.40	-1.9
492	2746981.43	13433645.82	-1.8
493	2746988.49	13433640.23	-1.9
494	2746996.13	13433633.38	-1.9
495	2747004.56	13433626.18	-1.9
496	2747010.01	13433621.35	-1.9
497	2747018.77	13433613.79	-1.9
498	2747026.05	13433606.42	-1.9
499	2747032.32	13433600.66	-1.9
500	2747040.79	13433592.88	-1.9
501	2747047.53	13433587.11	-1.8
502	2747054.86	13433580.95	-1.8
503	2747061.78	13433574.23	-1.8
504	2747068.41	13433568.22	-1.8
505	2747076.86	13433560.10	-1.8
506	2747083.22	13433555.05	-1.8
507	2747089.83	13433549.18	-1.8
508	2747096.69	13433543.47	-1.8
509	2747103.52	13433538.16	-1.8
510	2747110.50	13433532.57	-1.8
511	2747118.36	13433526.73	-1.8
512	2747126.50	13433520.77	-1.8
513	2747135.10	13433514.21	-1.8
514	2747144.17	13433505.78	-1.8
515	2747152.60	13433497.87	-1.8
516	2747159.53	13433491.28	-1.9
517	2747165.93	13433484.71	-1.8
518	2747173.81	13433477.25	-1.8
519	2747179.80	13433470.76	-1.8
520	2747185.41	13433464.63	-1.9
521	2747192.94	13433457.13	-1.9
522	2747201.73	13433450.52	-1.8
523	2747209.59	13433444.65	-1.8
524	2747217.44	13433438.23	-1.8
525	2747225.22	13433432.62	-1.8
526	2747234.42	13433427.24	-1.8
527	2747241.53	13433421.72	-1.8
528	2747250.52	13433415.81	-1.8

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
529	2747259.45	13433409.19	-1.8
530	2747266.88	13433403.53	-1.8
531	2747275.42	13433397.36	-1.8
532	2747282.51	13433390.29	-1.8
533	2747289.75	13433383.18	-1.8
534	2747296.28	13433376.82	-1.8
535	2747302.36	13433370.37	-1.8
536	2747307.90	13433363.90	-1.8
537	2747314.77	13433356.72	-1.8
538	2747322.26	13433349.47	-1.8
539	2747328.79	13433341.72	-1.8
540	2747335.75	13433333.96	-1.8
541	2747343.05	13433326.86	-1.8
542	2747349.36	13433321.05	-1.8
543	2747357.10	13433314.41	-1.8
544	2747365.52	13433306.54	-1.8
545	2747376.12	13433297.28	-1.8
546	2747384.27	13433290.44	-1.7
547	2747392.75	13433284.76	-1.8
548	2747401.42	13433278.75	-1.6
549	2747410.01	13433271.77	-1.6
550	2747417.90	13433265.01	-1.5
551	2747426.08	13433258.17	-1.5
552	2747432.76	13433252.15	-1.5
553	2747439.50	13433246.32	-1.6
554	2747446.68	13433239.55	-1.5
555	2747454.13	13433231.96	-1.5
556	2747461.90	13433224.16	-1.5
557	2747470.09	13433217.02	-1.5
558	2747477.35	13433210.49	-1.5
559	2747484.03	13433204.26	-1.5
560	2747491.16	13433197.89	-1.5
561	2747497.30	13433192.25	-1.5
562	2747506.39	13433184.21	-1.4
563	2747514.76	13433177.04	-1.5
564	2747522.19	13433170.34	-1.5
565	2747531.58	13433162.09	-1.4
566	2747539.93	13433153.88	-1.3
567	2747548.70	13433145.56	-1.3
568	2747557.25	13433137.84	-1.3
569	2747565.23	13433131.54	-1.3
570	2747573.78	13433124.16	-1.3
571	2747581.27	13433117.85	-1.3
572	2747589.66	13433110.35	-1.2
573	2747597.82	13433102.80	-1.2
574	2747605.08	13433095.18	-1.1
575	2747611.76	13433087.97	-1.1
576	2747619.75	13433081.64	-1.1

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
577	2747627.09	13433074.94	-1.1
578	2747632.98	13433067.29	-1.0
579	2747640.48	13433061.78	-1.0
580	2747647.27	13433058.78	-0.8
581	2747654.90	13433054.91	-0.9
582	2747662.67	13433050.04	-0.8
583	2747670.72	13433044.33	-0.8
584	2747080.81	13432210.97	-1.8
585	2747087.25	13432211.32	-1.8
586	2747093.79	13432212.52	-1.8
587	2747117.43	13432236.63	-1.8
588	2747104.62	13432270.69	-2.0
589	2747094.63	13432286.09	-2.1
590	2747081.82	13432300.64	-2.1
591	2747071.23	13432305.63	-2.1
592	2747056.39	13432310.87	-2.0
593	2747038.25	13432319.76	-2.0
594	2747021.79	13432330.00	-2.1
595	2747008.49	13432343.77	-2.2
596	2746996.80	13432356.64	-2.1
597	2746988.05	13432367.71	-2.2
598	2746977.67	13432379.13	-2.2
599	2746966.91	13432390.10	-2.2
600	2745973.77	13433241.41	-2.6
601	2745962.90	13433248.13	-2.6
602	2745951.49	13433255.28	-2.5
603	2745943.42	13433260.56	-2.5
604	2745928.91	13433273.43	-2.5
605	2745914.17	13433287.85	-2.6
606	2745902.10	13433298.09	-2.5
607	2745888.35	13433310.33	-2.5
608	2745879.54	13433318.74	-2.5
609	2745870.45	13433327.06	-2.5
610	2745862.77	13433334.37	-2.5
611	2745851.93	13433342.31	-2.5
612	2745842.25	13433350.22	-2.5
613	2745831.05	13433358.37	-2.5
614	2745821.49	13433366.16	-2.4
615	2745810.04	13433376.04	-2.5
616	2745797.68	13433387.25	-2.5
617	2745785.38	13433398.54	-2.4
618	2745773.73	13433410.40	-2.4
619	2745760.07	13433422.31	-2.3
620	2745749.74	13433430.24	-2.5
621	2745738.98	13433439.92	-2.3
622	2745727.36	13433450.38	-2.3
623	2745716.89	13433458.76	-2.3
624	2745704.80	13433467.41	-2.2

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
625	2745693.13	13433476.62	-2.2
626	2745681.29	13433485.85	-2.2
627	2745669.60	13433493.84	-2.1
628	2745658.95	13433501.88	-2.0
629	2745649.36	13433510.25	-2.0
630	2745640.79	13433517.75	-2.0
631	2745632.28	13433526.05	-2.0
632	2745623.93	13433536.24	-2.0
633	2745615.50	13433547.28	-2.0
634	2745608.31	13433558.26	-1.9
635	2745601.62	13433567.08	-2.0
636	2745591.34	13433576.26	-2.0
637	2745582.20	13433584.21	-1.9
638	2745568.98	13433594.18	-1.9
639	2745559.67	13433602.30	-1.9
640	2745548.47	13433612.13	-1.9
641	2745538.05	13433622.28	-1.8
642	2745528.51	13433630.95	-1.8
643	2745515.90	13433642.52	-1.8
644	2745506.02	13433651.00	-1.8
645	2745498.35	13433657.98	-1.8
646	2745491.11	13433663.50	-1.8
647	2745480.76	13433671.02	-1.8
648	2745473.59	13433676.02	-1.8
649	2745465.21	13433682.01	-1.8
650	2745459.14	13433687.10	-1.8
651	2745445.88	13433697.86	-1.8
652	2745441.63	13433700.45	-1.8
653	2745435.88	13433704.23	-1.8
654	2745428.46	13433709.56	-1.8
655	2745423.27	13433713.30	-1.7
656	2745415.91	13433718.30	-1.7
657	2745406.74	13433724.63	-1.6
658	2745400.85	13433728.69	-1.5
659	2745394.51	13433732.51	-1.5
660	2744724.96	13433180.48	-1.8
661	2744726.85	13433161.69	-2.0
662	2744730.81	13433155.00	-2.2
663	2744737.86	13433148.01	-2.4
664	2744752.46	13433133.99	-2.5
665	2744762.14	13433127.36	-2.6
666	2744782.04	13433110.18	-2.8
667	2744789.67	13433097.54	-2.9
668	2744796.61	13433085.58	-2.9
669	2744807.83	13433069.84	-2.9
670	2744818.41	13433059.73	-2.9
671	2744838.27	13433038.31	-3.0
672	2744848.54	13433027.71	-2.9

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
673	2744856.31	13433020.12	-2.9
674	2744867.60	13433008.29	-2.9
675	2744879.46	13432995.48	-2.9
676	2744885.37	13432987.99	-2.9
677	2744893.96	13432978.23	-2.9
678	2744901.90	13432968.46	-2.9
679	2744911.63	13432957.01	-3.0
680	2744918.88	13432947.10	-3.0
681	2744927.53	13432935.64	-2.9
682	2744935.63	13432923.74	-3.0
683	2744942.59	13432914.70	-3.0
684	2744949.27	13432906.40	-3.0
685	2744959.70	13432893.51	-2.9
686	2744969.43	13432881.64	-3.0
687	2744978.48	13432869.29	-2.9
688	2744986.81	13432857.85	-3.0
689	2744993.48	13432848.64	-3.0
690	2745003.00	13432836.79	-3.0
691	2745011.67	13432827.06	-3.1
692	2745019.43	13432817.04	-3.1
693	2745027.43	13432807.36	-3.1
694	2745035.34	13432797.83	-3.1
695	2745042.91	13432789.45	-3.1
696	2745052.17	13432778.67	-3.1
697	2745059.64	13432769.78	-3.1
698	2745069.28	13432757.51	-3.0
699	2745077.99	13432747.23	-3.1
700	2745086.50	13432738.42	-3.1
701	2745094.98	13432729.14	-3.2
702	2745105.39	13432718.50	-3.1
703	2745114.60	13432710.01	-3.1
704	2745125.86	13432699.67	-3.1
705	2745136.06	13432690.30	-3.1
706	2745144.78	13432682.01	-3.1
707	2745153.36	13432673.75	-3.1
708	2745164.78	13432663.92	-3.1
709	2745173.17	13432654.59	-3.2
710	2745182.10	13432642.61	-3.2
711	2745192.03	13432632.11	-3.2
712	2745200.28	13432623.26	-3.2
713	2745210.74	13432612.72	-3.1
714	2745220.22	13432602.86	-3.1
715	2745228.60	13432594.19	-3.1
716	2745236.73	13432585.94	-3.2
717	2745246.74	13432576.25	-3.1
718	2745255.13	13432568.37	-3.2
719	2745262.27	13432560.20	-3.1
720	2745270.37	13432551.62	-3.2

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
721	2745278.02	13432543.61	-3.1
722	2745286.50	13432535.31	-3.1
723	2745297.45	13432524.47	-3.2
724	2745307.71	13432514.59	-3.2
725	2745317.75	13432504.80	-3.1
726	2745328.00	13432495.20	-3.1
727	2745339.28	13432485.53	-3.1
728	2745349.56	13432476.05	-3.1
729	2745359.56	13432466.87	-3.1
730	2745369.59	13432456.50	-3.0
731	2745377.90	13432447.53	-3.1
732	2745386.63	13432437.59	-3.1
733	2745397.33	13432424.61	-3.1
734	2745404.91	13432415.53	-3.0
735	2745412.65	13432406.67	-3.0
736	2745419.55	13432399.37	-2.9
737	2745428.44	13432390.72	-2.9
738	2745436.63	13432383.05	-3.0
739	2745445.80	13432375.47	-3.0
740	2745462.91	13432361.95	-3.1
741	2745474.22	13432354.75	-3.1
742	2745486.45	13432345.49	-3.0
743	2745496.84	13432336.23	-3.0
744	2745505.34	13432326.93	-3.1
745	2745513.21	13432318.28	-3.1
746	2745521.96	13432308.46	-3.2
747	2745532.38	13432298.80	-3.1
748	2745546.70	13432287.58	-3.1
749	2745557.17	13432279.01	-3.1
750	2745568.34	13432269.49	-3.0
751	2745575.41	13432261.71	-3.1
752	2745584.55	13432252.76	-3.0
753	2745594.71	13432244.89	-3.1
754	2745604.70	13432236.56	-3.1
755	2745616.64	13432226.23	-3.0
756	2745626.20	13432217.62	-3.1
757	2745634.66	13432209.93	-3.0
758	2745645.38	13432200.22	-3.0
759	2745654.47	13432192.45	-2.9
760	2745663.30	13432183.88	-2.9
761	2745673.56	13432173.82	-2.9
762	2745683.05	13432163.90	-2.9
763	2745692.28	13432155.65	-2.9
764	2745701.20	13432146.90	-3.0
765	2745710.63	13432138.10	-2.9
766	2745722.46	13432127.44	-3.0
767	2745731.63	13432119.58	-3.0
768	2745743.09	13432109.09	-3.0

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
769	2745752.50	13432101.45	-3.0
770	2745760.85	13432094.03	-2.9
771	2745771.65	13432084.07	-3.0
772	2745782.55	13432074.55	-2.9
773	2745792.30	13432066.94	-2.9
774	2745803.10	13432058.42	-2.9
775	2745815.47	13432047.82	-3.0
776	2745825.54	13432039.65	-2.9
777	2745836.70	13432030.46	-2.9
778	2745846.73	13432021.28	-2.9
779	2745855.09	13432012.34	-2.9
780	2745862.66	13432003.78	-2.9
781	2745873.24	13431995.22	-2.9
782	2745884.40	13431986.18	-2.9
783	2745893.47	13431978.05	-2.7
784	2745901.69	13431970.54	-2.9
785	2745911.26	13431962.81	-2.9
786	2745923.04	13431954.92	-2.8
787	2745934.37	13431946.68	-2.8
788	2745943.88	13431939.19	-2.9
789	2745953.33	13431930.98	-2.9
790	2745962.20	13431922.99	-2.9
791	2745972.75	13431914.67	-2.9
792	2745981.85	13431907.82	-2.9
793	2745990.58	13431900.50	-2.9
794	2745998.72	13431893.02	-2.9
795	2746005.60	13431884.08	-2.9
796	2746013.71	13431875.47	-2.9
797	2746023.28	13431866.04	-2.9
798	2746034.20	13431856.85	-2.8
799	2746041.92	13431848.04	-2.8
800	2746049.56	13431841.01	-2.9
801	2746058.60	13431832.84	-2.9
802	2746071.89	13431822.36	-2.8
803	2746080.15	13431815.49	-2.8
804	2746090.06	13431807.10	-2.9
805	2746099.62	13431798.58	-2.9
806	2746109.05	13431790.82	-2.9
807	2746119.32	13431783.04	-2.9
808	2746131.45	13431774.27	-2.9
809	2746140.78	13431766.42	-2.9
810	2746151.95	13431756.83	-2.9
811	2746163.05	13431747.86	-3.0
812	2746176.21	13431738.14	-3.1
813	2746186.55	13431729.36	-3.1
814	2746195.23	13431722.07	-3.2
815	2746206.63	13431712.64	-3.2
816	2746218.77	13431704.30	-3.3

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
817	2746228.32	13431694.86	-3.4
818	2746238.93	13431686.24	-3.4
819	2746246.88	13431681.53	-3.2
820	2746251.20	13431676.93	-3.0
821	2746257.30	13431667.85	-3.2
822	2746263.10	13431660.41	-2.9
823	2746270.45	13431653.67	-3.1
824	2746277.46	13431647.26	-3.1
825	2746283.48	13431641.11	-2.9
826	2746290.32	13431634.36	-3.1
827	2746296.17	13431628.36	-3.0
828	2746302.67	13431621.90	-3.2
829	2746310.27	13431615.97	-3.2
830	2746317.60	13431611.27	-3.2
831	2746324.03	13431605.77	-3.2
832	2746330.25	13431600.26	-3.4
833	2746337.86	13431593.53	-3.5
834	2746347.42	13431586.56	-3.5
835	2746353.37	13431581.23	-3.5
836	2746359.27	13431575.47	-3.4
837	2746365.79	13431570.63	-3.5
838	2746373.27	13431565.15	-3.5
839	2746379.18	13431560.27	-3.7
840	2746385.69	13431556.32	-3.6
841	2746392.85	13431553.09	-3.6
842	2746406.14	13431546.17	-3.5
843	2746414.29	13431538.29	-3.6
844	2746420.63	13431529.55	-3.6
845	2746426.78	13431522.12	-3.7
846	2746433.75	13431513.97	-3.9
847	2746439.10	13431506.49	-3.9
848	2746444.29	13431499.68	-4.2
849	2746451.19	13431492.76	-4.3
850	2746456.55	13431486.74	-4.6
851	2746464.90	13431479.47	-4.8
852	2746470.56	13431473.89	-5.0
853	2746476.24	13431468.28	-5.0
854	2746484.97	13431459.77	-4.9
855	2746491.50	13431453.38	-5.0
856	2746498.37	13431446.21	-5.1
857	2746509.60	13431436.02	-5.1
858	2746517.87	13431430.28	-4.3
859	2746529.74	13431423.51	-4.4
860	2746547.68	13431416.30	-3.7
861	2746559.63	13431411.85	-3.7
862	2745638.81	13430108.17	-3.3
863	2745631.61	13430107.80	-3.2
864	2745622.41	13430110.39	-3.3

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
865	2745604.27	13430117.97	-3.3
866	2745592.01	13430128.41	-3.3
867	2745578.40	13430144.10	-3.3
868	2745564.96	13430159.43	-3.3
869	2745542.03	13430175.87	-3.4
870	2745522.60	13430184.43	-3.4
871	2745500.15	13430190.95	-3.5
872	2745478.49	13430198.21	-3.6
873	2745457.33	13430207.07	-3.6
874	2745440.49	13430214.25	-3.6
875	2745422.03	13430224.17	-3.6
876	2745408.95	13430232.28	-3.7
877	2745393.12	13430240.88	-3.7
878	2745378.34	13430249.63	-3.7
879	2745259.62	13430328.17	-3.9
880	2745251.60	13430328.64	-3.8
881	2745234.04	13430336.38	-3.8
882	2745223.88	13430345.59	-3.9
883	2745212.32	13430356.78	-3.8
884	2745202.19	13430368.31	-3.9
885	2745191.77	13430383.09	-3.8
886	2745180.75	13430394.81	-3.9
887	2745166.59	13430404.97	-3.9
888	2745147.80	13430414.92	-3.9
889	2745129.21	13430425.72	-3.8
890	2745117.49	13430434.93	-3.9
891	2745104.50	13430445.11	-3.9
892	2745087.46	13430458.08	-3.9
893	2745074.26	13430469.42	-3.8
894	2745062.57	13430480.86	-3.9
895	2745046.66	13430498.94	-3.9
896	2745037.13	13430512.15	-3.8
897	2745024.33	13430526.46	-3.8
898	2745013.81	13430538.77	-3.7
899	2745001.36	13430554.18	-3.9
900	2744988.75	13430570.04	-3.9
901	2744977.96	13430581.95	-3.9
902	2744965.06	13430596.01	-4.1
903	2744955.15	13430607.26	-4.1
904	2744945.43	13430617.06	-4.0
905	2744932.54	13430630.45	-4.1
906	2744919.21	13430644.44	-4.3
907	2744904.86	13430658.32	-4.3
908	2744892.37	13430668.15	-4.2
909	2744881.39	13430676.15	-4.0
910	2744869.40	13430685.45	-4.0
911	2744859.38	13430693.77	-4.0
912	2744699.36	13430838.76	-3.9

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
913	2743658.90	13431702.54	-3.1
914	2743690.19	13431731.68	-2.9
915	2743714.16	13431707.33	-3.6
916	2743732.98	13431682.73	-3.7
917	2743749.47	13431669.20	-3.8
918	2743765.76	13431661.79	-3.8
919	2743784.94	13431649.39	-3.7
920	2743799.26	13431632.95	-3.6
921	2743809.53	13431618.83	-3.6
922	2743820.10	13431602.87	-3.7
923	2743840.24	13431578.01	-3.7
924	2743857.05	13431559.64	-3.9
925	2743867.91	13431550.97	-3.7
926	2743881.29	13431541.98	-3.7
927	2743893.50	13431531.74	-3.8
928	2743907.06	13431519.37	-3.7
929	2743917.91	13431508.20	-3.6
930	2743929.48	13431496.40	-3.7
931	2743944.19	13431484.11	-3.7
932	2743962.22	13431474.31	-3.9
933	2743978.66	13431464.68	-3.9
934	2743992.16	13431456.73	-3.9
935	2744006.20	13431447.32	-3.8
936	2744020.73	13431436.44	-3.8
937	2744035.35	13431422.38	-3.8
938	2744046.68	13431413.01	-3.9
939	2744058.55	13431401.92	-3.9
940	2744067.47	13431392.01	-3.9
941	2744079.60	13431384.07	-3.9
942	2744092.23	13431375.36	-3.9
943	2744103.74	13431366.18	-3.9
944	2744116.06	13431354.92	-3.9
945	2744127.42	13431342.71	-3.9
946	2744142.41	13431326.53	-3.9
947	2744155.32	13431314.79	-3.9
948	2744167.75	13431303.95	-3.9
949	2744182.37	13431292.64	-3.9
950	2744198.45	13431282.00	-3.9
951	2744213.79	13431270.85	-4.1
952	2744229.09	13431259.22	-4.2
953	2744242.38	13431248.22	-4.1
954	2744256.80	13431235.10	-3.9
955	2744269.98	13431224.13	-4.0
956	2744283.35	13431214.62	-4.0
957	2744298.95	13431202.90	-4.1
958	2744313.82	13431191.02	-4.1
959	2744428.71	13431054.70	-4.0
960	2744434.41	13431040.31	-4.1

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
961	2744440.39	13431033.30	-4.0
962	2744450.86	13431022.33	-4.0
963	2744463.71	13431014.37	-4.1
964	2744478.95	13431009.53	-4.1
965	2744491.62	13431006.93	-4.2
966	2744507.55	13431003.42	-4.1
967	2744529.02	13430990.17	-4.1
968	2744548.81	13430976.68	-4.2
969	2744560.50	13430969.55	-4.3
970	2744570.62	13430962.47	-4.2
971	2744580.52	13430955.55	-4.2
972	2744591.73	13430946.78	-4.0
973	2744603.04	13430939.09	-4.2
974	2744615.21	13430930.66	-4.0
975	2744623.32	13430924.54	-4.1
976	2744633.97	13430916.96	-4.1
977	2744644.16	13430910.16	-4.2
978	2744658.10	13430900.39	-4.2
979	2744667.14	13430891.10	-4.2
980	2744675.51	13430880.24	-4.2
981	2744687.49	13430869.39	-4.2
982	2744699.96	13430857.73	-4.1
983	2744714.14	13430845.65	-4.1
984	2744729.27	13430835.75	-4.1
985	2744894.26	13430676.85	-4.2
986	2744904.96	13430667.68	-4.3
987	2744914.67	13430660.87	-4.3
988	2744923.82	13430655.18	-4.3
989	2744935.18	13430649.53	-4.2
990	2744955.35	13430634.86	-4.0
991	2744975.35	13430619.63	-4.1
992	2744987.60	13430608.27	-4.1
993	2744998.85	13430593.96	-4.1
994	2745008.34	13430583.43	-4.1
995	2745020.65	13430570.64	-4.0
996	2745033.40	13430558.65	-4.0
997	2745047.81	13430546.00	-3.9
998	2745063.47	13430533.40	-3.8
999	2745075.05	13430523.73	-4.0
1000	2745087.42	13430513.04	-3.9
1001	2745103.72	13430502.31	-4.0
1002	2745118.20	13430492.46	-3.9
1003	2745132.14	13430480.34	-4.0
1004	2745145.64	13430468.62	-3.9
1005	2745155.68	13430460.01	-3.9
1006	2745165.71	13430450.95	-3.9
1007	2745177.06	13430439.36	-3.8
1008	2745187.70	13430425.38	-3.8

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
1009	2745198.04	13430411.69	-3.9
1010	2745211.29	13430400.11	-3.8
1011	2745222.28	13430389.94	-3.9
1012	2745235.57	13430379.30	-3.9
1013	2745247.88	13430367.92	-3.9
1014	2745262.23	13430354.13	-3.9
1015	2745276.00	13430341.00	-3.9
1016	2745290.24	13430328.34	-3.7
1017	2745301.33	13430318.63	-3.8
1018	2745311.91	13430310.20	-3.9
1019	2745329.62	13430296.45	-3.8
1020	2745344.14	13430284.65	-3.9
1021	2745358.46	13430268.70	-3.8
1022	2745371.48	13430257.63	-3.9
1023	2745385.09	13430244.71	-3.8
1024	2745398.95	13430231.16	-3.7
1025	2745409.51	13430219.61	-3.7
1026	2745425.09	13430208.57	-3.9
1027	2745435.87	13430195.93	-3.8
1028	2745448.05	13430183.80	-3.7
1029	2745461.93	13430173.42	-3.7
1030	2745473.92	13430163.27	-3.6
1031	2745487.09	13430153.06	-3.5
1032	2745499.90	13430143.36	-3.6
1033	2745512.15	13430132.37	-3.5
1034	2745524.01	13430120.51	-3.5
1035	2745534.95	13430110.16	-3.4
1036	2745547.06	13430100.50	-3.4
1037	2745559.74	13430090.71	-3.6
1038	2745570.34	13430080.17	-3.5
1039	2745581.19	13430069.02	-3.5
1040	2745592.69	13430058.93	-3.3
1041	2745602.38	13430048.28	-3.5
1042	2745612.53	13430035.87	-3.5
1043	2747421.56	13432326.35	-6.6
1044	2747425.30	13432315.79	-6.5
1045	2747416.39	13432343.41	-6.4
1046	2747428.26	13432308.14	-6.3
1047	2747419.04	13432333.80	-6.3
1048	2747404.71	13432373.80	-6.2
1049	2747401.16	13432381.77	-6.2
1050	2747397.70	13432390.33	-6.2
1051	2747394.47	13432398.15	-6.2
1052	2747413.19	13432352.48	-6.1
1053	2747410.12	13432360.44	-6.1
1054	2747432.13	13432300.30	-6.0
1055	2747407.82	13432366.67	-6.0
1056	2747390.95	13432407.32	-5.9

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
1057	2747436.42	13432293.04	-5.6
1058	2747388.87	13432412.79	-5.6
1059	2746430.30	13431448.37	-5.6
1060	2746562.82	13431456.33	-5.6
1061	2746611.80	13431525.44	-5.5
1062	2746556.54	13431445.41	-5.5
1063	2746438.95	13431458.12	-5.4
1064	2746645.26	13431558.84	-5.4
1065	2746588.29	13431498.74	-5.4
1066	2747440.01	13432284.85	-5.4
1067	2746545.13	13431426.58	-5.3
1068	2747385.38	13432420.46	-5.3
1069	2747336.79	13432489.17	-5.3
1070	2746454.65	13431477.59	-5.2
1071	2746461.37	13431486.69	-5.2
1072	2746469.38	13431497.09	-5.2
1073	2746652.97	13431566.81	-5.2
1074	2746574.99	13431476.52	-5.2
1075	2746550.79	13431436.26	-5.2
1076	2747636.43	13431872.39	-5.2
1077	2747630.53	13431848.40	-5.2
1078	2747623.51	13431833.17	-5.2
1079	2747338.36	13432500.32	-5.2
1080	2746412.78	13431429.74	-5.2
1081	2746628.38	13431542.92	-5.2
1082	2747615.64	13431898.72	-5.2
1083	2747632.26	13431884.16	-5.2
1084	2746766.78	13431496.99	-5.2
1085	2746772.93	13431507.66	-5.2
1086	2746787.83	13431531.72	-5.2
1087	2746798.65	13431548.37	-5.2
1088	2742266.06	13430453.10	-5.1
1089	2742279.19	13430480.26	-5.1
1090	2742247.96	13430445.60	-5.1
1091	2747443.34	13432275.81	-5.1
1092	2742197.88	13430481.63	-5.1
1093	2747335.52	13432480.60	-5.1
1094	2746636.93	13431550.81	-5.1
1095	2746603.59	13431516.95	-5.1
1096	2746595.30	13431508.21	-5.1
1097	2747635.45	13431862.46	-5.1
1098	2746747.83	13431464.25	-5.1
1099	2746792.92	13431539.20	-5.1
1100	2746805.13	13431559.91	-5.1
1101	2746986.23	13431558.97	-5.1
1102	2742278.50	13430457.51	-5.1
1103	2743170.60	13429317.23	-5.0
1104	2742290.64	13430492.17	-5.0

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
1105	2742267.96	13430468.26	-5.0
1106	2742238.08	13430434.78	-5.0
1107	2747383.45	13432426.73	-5.0
1108	2747378.43	13432442.97	-5.0
1109	2742240.63	13430518.15	-5.0
1110	2742210.77	13430495.43	-5.0
1111	2742181.57	13430405.33	-5.0
1112	2743877.61	13431023.00	-5.0
1113	2743849.76	13431050.13	-5.0
1114	2743813.87	13431087.71	-5.0
1115	2746659.72	13431575.88	-5.0
1116	2746619.65	13431533.38	-5.0
1117	2746582.08	13431487.39	-5.0
1118	2746568.88	13431466.39	-5.0
1119	2747614.01	13431820.32	-5.0
1120	2747500.24	13431685.11	-5.0
1121	2747605.67	13431902.30	-5.0
1122	2747623.29	13431894.00	-5.0
1123	2746760.16	13431485.63	-5.0
1124	2746811.13	13431572.74	-5.0
1125	2743404.93	13429050.66	-5.0
1126	2742238.65	13430322.41	-5.0
1127	2742252.82	13430436.83	-5.0
1128	2742258.96	13430445.46	-5.0
1129	2742288.76	13430456.92	-5.0
1130	2742300.52	13430451.25	-5.0
1131	2742312.51	13430443.36	-5.0
1132	2743086.51	13429407.98	-5.0
1133	2743158.80	13429330.12	-5.0
1134	2742314.26	13430513.81	-5.0
1135	2742304.14	13430505.04	-5.0
1136	2742218.18	13430415.26	-5.0
1137	2742208.12	13430406.15	-5.0
1138	2742196.36	13430396.43	-5.0
1139	2742186.13	13430389.24	-5.0
1140	2742175.92	13430375.71	-5.0
1141	2742174.55	13430360.23	-5.0
1142	2742179.03	13430331.97	-5.0
1143	2742222.87	13430509.91	-5.0
1144	2742187.17	13430471.47	-5.0
1145	2742173.62	13430441.41	-5.0
1146	2747334.60	13432471.84	-5.0
1147	2743919.98	13430978.00	-4.9
1148	2743894.87	13431005.25	-4.9
1149	2743887.34	13431014.03	-4.9
1150	2743830.47	13431069.18	-4.9
1151	2743805.18	13431095.64	-4.9
1152	2743795.48	13431104.52	-4.9

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
1153	2746405.54	13431421.03	-4.9
1154	2747506.78	13431699.18	-4.9
1155	2746754.29	13431475.57	-4.9
1156	2746779.49	13431519.17	-4.9
1157	2747046.27	13431656.30	-4.9
1158	2743258.16	13429441.64	-4.9
1159	2743416.52	13429036.33	-4.9
1160	2742185.63	13430323.42	-4.9
1161	2742195.08	13430316.39	-4.9
1162	2742207.04	13430312.55	-4.9
1163	2742218.43	13430310.74	-4.9
1164	2742245.64	13430332.92	-4.9
1165	2742248.48	13430352.82	-4.9
1166	2742245.28	13430365.80	-4.9
1167	2742242.14	13430378.51	-4.9
1168	2742249.04	13430427.15	-4.9
1169	2743060.80	13429437.74	-4.9
1170	2743098.23	13429394.84	-4.9
1171	2743110.61	13429380.25	-4.9
1172	2743120.90	13429368.63	-4.9
1173	2743133.66	13429356.18	-4.9
1174	2743146.51	13429343.31	-4.9
1175	2743182.64	13429303.43	-4.9
1176	2742616.73	13429936.04	-4.9
1177	2742780.97	13429755.99	-4.9
1178	2747381.48	13432433.64	-4.9
1179	2742360.90	13430215.62	-4.9
1180	2742176.72	13430457.97	-4.9
1181	2742175.51	13430420.17	-4.9
1182	2742190.66	13430387.11	-4.9
1183	2742198.07	13430373.45	-4.9
1184	2742209.36	13430355.37	-4.9
1185	2742232.20	13430329.93	-4.9
1186	2745002.51	13430265.17	-4.9
1187	2747573.41	13432072.84	-4.9
1188	2744389.19	13430894.46	-4.9
1189	2744493.11	13430802.18	-4.9
1190	2743957.84	13430941.20	-4.9
1191	2743948.51	13430950.21	-4.9
1192	2743911.63	13430987.55	-4.9
1193	2743904.09	13430995.93	-4.9
1194	2743867.89	13431032.86	-4.9
1195	2743858.86	13431041.60	-4.9
1196	2743840.02	13431059.63	-4.9
1197	2743820.99	13431080.23	-4.9
1198	2743738.21	13431156.86	-4.9
1199	2744151.22	13430747.13	-4.9
1200	2744371.31	13430518.88	-4.9

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
1201	2746262.10	13431497.40	-4.9
1202	2746282.46	13431507.64	-4.9
1203	2746421.55	13431438.55	-4.9
1204	2746447.02	13431468.16	-4.9
1205	2747032.46	13431634.80	-4.8
1206	2746973.35	13431537.18	-4.8
1207	2742358.86	13430504.89	-4.8
1208	2742355.04	13430528.61	-4.8
1209	2743344.68	13429456.26	-4.8
1210	2743334.96	13429467.37	-4.8
1211	2743310.06	13429497.46	-4.8
1212	2743299.75	13429508.71	-4.8
1213	2743288.88	13429520.34	-4.8
1214	2743279.75	13429531.67	-4.8
1215	2743270.92	13429541.12	-4.8
1216	2743509.15	13429167.64	-4.8
1217	2743150.51	13429558.66	-4.8
1218	2743215.80	13429489.44	-4.8
1219	2743237.49	13429463.43	-4.8
1220	2743246.25	13429453.25	-4.8
1221	2743546.32	13428898.00	-4.8
1222	2743559.14	13428882.56	-4.8
1223	2743570.86	13428868.78	-4.8
1224	2743584.34	13428855.07	-4.8
1225	2743660.71	13428773.98	-4.8
1226	2743378.04	13429082.23	-4.8
1227	2743391.35	13429066.53	-4.8
1228	2743431.54	13429018.53	-4.8
1229	2742229.07	13430313.68	-4.8
1230	2742249.29	13430343.36	-4.8
1231	2742239.46	13430391.01	-4.8
1232	2742241.18	13430402.81	-4.8
1233	2742244.61	13430413.73	-4.8
1234	2742325.85	13430432.72	-4.8
1235	2742337.05	13430421.49	-4.8
1236	2742362.73	13430378.56	-4.8
1237	2742366.92	13430362.03	-4.8
1238	2743017.36	13429488.18	-4.8
1239	2743031.69	13429472.59	-4.8
1240	2743074.46	13429422.24	-4.8
1241	2742257.66	13430456.50	-4.8
1242	2742227.75	13430424.30	-4.8
1243	2742174.90	13430345.60	-4.8
1244	2742586.64	13429963.28	-4.8
1245	2742601.72	13429950.67	-4.8
1246	2742628.78	13429922.88	-4.8
1247	2742642.22	13429911.36	-4.8
1248	2742654.12	13429900.24	-4.8

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
1249	2742272.61	13430291.10	-4.8
1250	2742285.20	13430280.36	-4.8
1251	2742412.99	13430152.74	-4.8
1252	2742436.86	13430129.80	-4.8
1253	2742501.97	13430062.74	-4.8
1254	2742513.33	13430048.83	-4.8
1255	2742529.07	13430026.05	-4.8
1256	2742542.22	13430010.47	-4.8
1257	2742556.13	13429995.51	-4.8
1258	2742573.02	13429977.36	-4.8
1259	2742255.37	13430526.83	-4.8
1260	2742220.30	13430342.42	-4.8
1261	2742243.49	13430318.42	-4.8
1262	2747340.58	13432508.75	-4.8
1263	2747577.36	13432077.01	-4.8
1264	2744625.70	13430675.86	-4.8
1265	2744378.61	13430902.99	-4.8
1266	2744418.70	13430869.25	-4.8
1267	2744017.60	13430880.74	-4.8
1268	2744006.67	13430890.33	-4.8
1269	2743988.15	13430909.91	-4.8
1270	2743975.76	13430922.24	-4.8
1271	2743966.79	13430932.27	-4.8
1272	2743938.73	13430959.22	-4.8
1273	2743928.62	13430969.46	-4.8
1274	2743786.62	13431113.18	-4.8
1275	2743777.28	13431122.77	-4.8
1276	2743768.04	13431131.30	-4.8
1277	2743758.44	13431139.33	-4.8
1278	2743748.54	13431147.44	-4.8
1279	2744143.56	13430755.01	-4.8
1280	2746252.27	13431493.23	-4.8
1281	2746476.21	13431507.45	-4.8
1282	2747522.02	13431721.41	-4.8
1283	2747487.18	13431658.87	-4.8
1284	2746729.35	13431432.23	-4.8
1285	2746816.52	13431583.83	-4.8
1286	2747018.15	13431613.31	-4.8
1287	2747010.57	13431602.73	-4.8
1288	2742398.55	13430451.26	-4.8
1289	2743364.87	13429434.36	-4.8
1290	2743326.44	13429478.93	-4.8
1291	2743318.01	13429487.71	-4.8
1292	2743250.94	13429560.89	-4.8
1293	2743445.15	13429236.97	-4.7
1294	2743530.45	13429145.73	-4.7
1295	2743543.54	13429132.65	-4.7
1296	2743555.72	13429119.83	-4.7

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
1297	2743572.20	13429102.79	-4.7
1298	2743604.80	13429069.97	-4.7
1299	2743636.84	13429034.23	-4.7
1300	2743192.70	13429515.36	-4.7
1301	2743204.15	13429502.43	-4.7
1302	2743227.70	13429475.45	-4.7
1303	2743856.01	13428629.57	-4.7
1304	2743533.39	13428911.99	-4.7
1305	2743736.84	13428691.67	-4.7
1306	2742370.94	13430348.24	-4.7
1307	2742374.91	13430338.36	-4.7
1308	2742383.75	13430324.18	-4.7
1309	2742405.80	13430304.58	-4.7
1310	2743196.99	13429286.87	-4.7
1311	2743447.51	13429000.75	-4.7
1312	2743462.51	13428986.43	-4.7
1313	2742355.20	13430393.00	-4.7
1314	2742892.42	13429633.32	-4.7
1315	2742904.85	13429618.82	-4.7
1316	2742918.45	13429603.62	-4.7
1317	2742932.78	13429586.78	-4.7
1318	2742943.93	13429573.96	-4.7
1319	2742965.09	13429548.06	-4.7
1320	2742978.10	13429532.39	-4.7
1321	2743001.17	13429505.46	-4.7
1322	2743044.46	13429457.07	-4.7
1323	2742326.03	13430523.05	-4.7
1324	2742667.67	13429886.07	-4.7
1325	2742681.17	13429871.53	-4.7
1326	2742691.91	13429859.32	-4.7
1327	2742705.77	13429841.71	-4.7
1328	2742732.91	13429811.09	-4.7
1329	2742745.51	13429797.23	-4.7
1330	2742758.04	13429784.17	-4.7
1331	2742769.59	13429769.29	-4.7
1332	2742816.25	13429716.48	-4.7
1333	2742828.79	13429701.96	-4.7
1334	2742841.95	13429686.75	-4.7
1335	2742854.22	13429673.53	-4.7
1336	2742866.34	13429660.76	-4.7
1337	2742346.00	13430231.41	-4.7
1338	2742374.67	13430199.81	-4.7
1339	2742388.42	13430182.75	-4.7
1340	2742400.90	13430166.73	-4.7
1341	2742449.53	13430117.47	-4.7
1342	2742459.93	13430108.69	-4.7
1343	2742473.12	13430094.88	-4.7
1344	2742489.55	13430076.84	-4.7

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
1345	2747538.75	13432139.22	-4.7
1346	2747447.20	13432267.38	-4.7
1347	2742257.08	13430304.68	-4.7
1348	2744991.19	13430276.76	-4.7
1349	2745022.44	13430243.85	-4.7
1350	2744615.51	13430685.16	-4.7
1351	2744653.53	13430644.43	-4.7
1352	2744670.96	13430623.42	-4.7
1353	2744689.90	13430602.05	-4.7
1354	2744707.30	13430583.85	-4.7
1355	2744750.09	13430531.11	-4.7
1356	2744766.03	13430513.46	-4.7
1357	2744368.11	13430912.74	-4.7
1358	2744400.12	13430886.12	-4.7
1359	2744410.31	13430876.85	-4.7
1360	2744435.95	13430854.03	-4.7
1361	2744453.41	13430838.15	-4.7
1362	2744463.29	13430828.38	-4.7
1363	2744482.64	13430811.93	-4.7
1364	2744526.36	13430771.53	-4.7
1365	2744546.29	13430752.83	-4.7
1366	2744564.67	13430735.16	-4.7
1367	2744576.90	13430725.05	-4.7
1368	2744198.78	13431085.18	-4.7
1369	2744220.72	13431065.76	-4.7
1370	2743677.05	13431213.58	-4.7
1371	2743639.64	13431246.67	-4.7
1372	2743997.19	13430900.31	-4.7
1373	2743728.59	13431165.47	-4.7
1374	2743717.19	13431174.81	-4.7
1375	2743707.67	13431183.79	-4.7
1376	2744331.28	13430560.27	-4.7
1377	2744323.39	13430568.83	-4.7
1378	2744281.56	13430615.09	-4.7
1379	2744169.67	13430729.98	-4.7
1380	2744094.64	13430803.38	-4.7
1381	2744088.38	13430810.02	-4.7
1382	2744076.31	13430822.54	-4.7
1383	2744065.07	13430834.38	-4.7
1384	2744054.15	13430846.32	-4.7
1385	2744044.79	13430855.51	-4.7
1386	2744035.71	13430864.38	-4.7
1387	2744026.56	13430872.63	-4.7
1388	2744557.44	13430323.63	-4.7
1389	2744506.86	13430378.06	-4.7
1390	2744490.02	13430393.96	-4.7
1391	2744466.19	13430419.37	-4.7
1392	2744455.23	13430431.95	-4.7

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
1393	2744360.32	13430530.15	-4.7
1394	2744340.73	13430550.56	-4.7
1395	2744876.92	13429952.07	-4.7
1396	2744748.19	13430124.20	-4.7
1397	2746272.61	13431502.71	-4.7
1398	2746292.39	13431512.50	-4.7
1399	2746350.24	13431545.38	-4.7
1400	2744821.29	13429651.71	-4.7
1401	2746397.29	13431410.68	-4.7
1402	2744044.91	13430426.11	-4.7
1403	2744226.92	13430239.73	-4.7
1404	2746665.69	13431587.19	-4.7
1405	2746529.78	13431394.10	-4.7
1406	2746524.63	13431383.35	-4.7
1407	2747494.88	13431672.47	-4.7
1408	2747570.07	13431890.92	-4.7
1409	2743712.79	13429199.49	-4.7
1410	2747052.00	13431666.41	-4.7
1411	2747004.71	13431592.52	-4.7
1412	2746992.39	13431572.02	-4.7
1413	2746979.29	13431547.64	-4.7
1414	2746958.56	13431514.04	-4.7
1415	2742455.16	13430518.37	-4.7
1416	2742387.08	13430462.22	-4.7
1417	2742375.69	13430476.49	-4.7
1418	2742365.47	13430490.64	-4.7
1419	2743196.56	13429617.35	-4.7
1420	2743175.15	13429638.70	-4.7
1421	2743468.17	13429324.08	-4.7
1422	2743456.64	13429335.73	-4.7
1423	2743355.31	13429444.26	-4.7
1424	2743261.45	13429550.50	-4.7
1425	2743240.78	13429571.19	-4.7
1426	2743230.17	13429581.00	-4.7
1427	2743220.34	13429591.13	-4.7
1428	2743208.01	13429606.06	-4.7
1429	2743548.45	13429241.09	-4.7
1430	2743538.56	13429252.50	-4.7
1431	2743076.70	13430984.17	-4.7
1432	2743952.85	13428722.26	-4.7
1433	2743466.44	13429213.91	-4.7
1434	2743476.84	13429202.33	-4.7
1435	2743488.51	13429189.37	-4.7
1436	2743498.59	13429179.34	-4.7
1437	2743585.07	13429090.20	-4.7
1438	2743596.03	13429079.02	-4.7
1439	2743616.56	13429057.50	-4.7
1440	2743628.04	13429044.66	-4.7

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
1441	2743650.73	13429018.85	-4.7
1442	2743660.45	13429008.02	-4.7
1443	2743671.11	13428998.03	-4.7
1444	2743681.05	13428988.17	-4.7
1445	2743045.40	13429661.41	-4.7
1446	2743069.84	13429638.14	-4.7
1447	2743098.49	13429611.48	-4.7
1448	2743127.19	13429580.98	-4.7
1449	2743139.88	13429568.23	-4.7
1450	2743165.52	13429543.85	-4.7
1451	2743180.28	13429528.18	-4.7
1452	2743817.12	13428616.88	-4.7
1453	2743845.53	13428621.49	-4.7
1454	2743869.20	13428642.89	-4.7
1455	2743960.10	13428711.19	-4.7
1456	2742865.60	13429850.22	-4.7
1457	2742962.68	13429745.51	-4.7
1458	2743520.93	13428924.63	-4.7
1459	2743598.00	13428841.94	-4.7
1460	2743609.71	13428829.93	-4.7
1461	2743621.15	13428817.33	-4.7
1462	2743633.86	13428803.57	-4.7
1463	2743645.30	13428791.37	-4.7
1464	2743672.77	13428760.70	-4.7
1465	2743721.14	13428708.69	-4.7
1466	2743760.82	13428663.30	-4.7
1467	2743774.42	13428642.88	-4.7
1468	2743787.03	13428628.54	-4.7
1469	2742392.90	13430314.77	-4.7
1470	2742418.93	13430296.44	-4.7
1471	2742452.05	13430280.91	-4.7
1472	2742481.58	13430259.54	-4.7
1473	2742557.17	13430188.98	-4.7
1474	2742576.32	13430160.11	-4.7
1475	2742595.50	13430134.69	-4.7
1476	2742608.27	13430120.38	-4.7
1477	2742620.21	13430105.87	-4.7
1478	2742644.15	13430082.19	-4.7
1479	2742677.35	13430048.43	-4.7
1480	2743484.79	13428963.36	-4.7
1481	2742348.30	13430405.36	-4.7
1482	2742953.44	13429561.60	-4.7
1483	2742988.86	13429519.54	-4.7
1484	2742717.55	13429827.05	-4.7
1485	2742792.53	13429742.88	-4.7
1486	2742803.51	13429730.58	-4.7
1487	2742882.10	13429643.83	-4.7
1488	2744706.47	13431113.79	-4.7

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
1489	2744608.58	13431201.75	-4.7
1490	2744597.19	13431213.04	-4.7
1491	2744587.25	13431221.76	-4.7
1492	2744564.05	13431242.13	-4.7
1493	2742306.76	13430262.12	-4.7
1494	2742328.97	13430245.14	-4.7
1495	2742424.81	13430141.50	-4.7
1496	2745040.74	13430785.99	-4.7
1497	2744928.19	13430907.90	-4.7
1498	2744862.44	13430969.49	-4.7
1499	2744818.15	13431007.74	-4.7
1500	2744806.70	13431017.90	-4.7
1501	2747544.14	13432133.05	-4.7
1502	2745183.37	13430600.74	-4.7
1503	2744901.35	13430375.95	-4.6
1504	2744918.81	13430354.36	-4.6
1505	2744932.62	13430338.04	-4.6
1506	2744958.97	13430308.56	-4.6
1507	2745047.64	13430213.73	-4.6
1508	2745057.05	13430203.56	-4.6
1509	2745075.27	13430184.46	-4.6
1510	2745094.24	13430165.50	-4.6
1511	2745158.07	13430098.11	-4.6
1512	2747569.19	13432070.14	-4.6
1513	2744605.81	13430694.83	-4.6
1514	2744680.37	13430612.92	-4.6
1515	2744698.40	13430592.96	-4.6
1516	2744717.69	13430572.60	-4.6
1517	2744726.51	13430562.20	-4.6
1518	2744735.22	13430550.74	-4.6
1519	2744742.38	13430539.95	-4.6
1520	2744758.19	13430521.68	-4.6
1521	2744774.32	13430505.16	-4.6
1522	2744782.92	13430496.34	-4.6
1523	2744836.00	13430444.25	-4.6
1524	2744845.03	13430436.48	-4.6
1525	2744874.58	13430405.15	-4.6
1526	2744891.16	13430386.44	-4.6
1527	2744427.35	13430861.87	-4.6
1528	2744443.93	13430846.46	-4.6
1529	2744504.08	13430791.86	-4.6
1530	2744514.97	13430782.57	-4.6
1531	2744535.54	13430763.15	-4.6
1532	2744555.95	13430743.40	-4.6
1533	2744586.96	13430716.06	-4.6
1534	2744595.68	13430706.36	-4.6
1535	2744030.20	13431227.04	-4.6
1536	2744166.85	13431109.43	-4.6

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
1537	2744208.60	13431077.06	-4.6
1538	2743657.51	13431231.25	-4.6
1539	2743648.81	13431238.78	-4.6
1540	2743631.57	13431254.55	-4.6
1541	2743601.49	13431283.95	-4.6
1542	2743585.31	13431300.72	-4.6
1543	2743576.88	13431309.38	-4.6
1544	2744305.79	13430588.89	-4.6
1545	2744299.04	13430596.83	-4.6
1546	2744291.21	13430604.99	-4.6
1547	2744274.47	13430622.53	-4.6
1548	2744225.43	13430675.93	-4.6
1549	2744215.97	13430684.66	-4.6
1550	2744176.19	13430722.89	-4.6
1551	2744160.10	13430738.90	-4.6
1552	2744134.74	13430763.88	-4.6
1553	2744117.68	13430780.54	-4.6
1554	2744100.88	13430796.93	-4.6
1555	2744587.93	13430289.84	-4.6
1556	2744566.78	13430313.64	-4.6
1557	2744521.67	13430361.60	-4.6
1558	2744474.78	13430409.43	-4.6
1559	2744398.49	13430487.99	-4.6
1560	2744382.38	13430506.40	-4.6
1561	2744900.74	13429924.58	-4.6
1562	2744882.78	13429942.78	-4.6
1563	2744813.28	13430047.69	-4.6
1564	2744959.68	13429802.69	-4.6
1565	2746311.26	13431523.11	-4.6
1566	2744668.18	13429799.09	-4.6
1567	2744685.02	13429780.39	-4.6
1568	2744705.64	13429762.71	-4.6
1569	2744831.75	13429642.84	-4.6
1570	2744842.76	13429634.11	-4.6
1571	2744852.94	13429627.00	-4.6
1572	2744875.67	13429612.08	-4.6
1573	2744902.75	13429605.54	-4.6
1574	2746377.50	13431384.81	-4.6
1575	2746483.53	13431517.45	-4.6
1576	2743682.47	13429391.85	-4.6
1577	2744307.52	13430155.80	-4.6
1578	2744324.14	13430137.37	-4.6
1579	2744355.41	13430110.06	-4.6
1580	2744365.85	13430100.58	-4.6
1581	2744558.77	13429904.37	-4.6
1582	2744057.21	13430404.57	-4.6
1583	2744096.30	13430356.79	-4.6
1584	2744148.32	13430307.66	-4.6

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
1585	2746669.97	13431598.56	-4.6
1586	2747600.94	13431807.46	-4.6
1587	2747590.84	13431904.43	-4.6
1588	2746735.50	13431442.84	-4.6
1589	2746741.74	13431453.15	-4.6
1590	2746822.02	13431593.15	-4.6
1591	2746826.77	13431600.07	-4.6
1592	2747041.34	13431647.45	-4.6
1593	2747025.55	13431624.68	-4.6
1594	2746998.18	13431581.87	-4.6
1595	2746963.98	13431523.24	-4.6
1596	2747057.29	13431674.51	-4.6
1597	2742435.97	13430538.67	-4.6
1598	2742479.47	13430493.54	-4.6
1599	2742520.81	13430322.07	-4.6
1600	2742458.79	13430386.82	-4.6
1601	2742421.82	13430427.18	-4.6
1602	2742409.36	13430440.88	-4.6
1603	2742717.83	13430114.44	-4.6
1604	2743185.01	13429628.69	-4.6
1605	2743150.53	13429665.47	-4.6
1606	2743688.18	13429095.83	-4.6
1607	2743679.26	13429103.66	-4.6
1608	2743670.16	13429112.93	-4.6
1609	2743662.27	13429121.57	-4.6
1610	2743652.47	13429132.62	-4.6
1611	2743528.04	13429264.90	-4.6
1612	2743517.43	13429275.78	-4.6
1613	2743504.58	13429287.61	-4.6
1614	2743491.59	13429300.73	-4.6
1615	2743479.69	13429312.92	-4.6
1616	2743096.24	13430966.13	-4.6
1617	2743089.58	13430972.36	-4.6
1618	2743082.64	13430978.89	-4.6
1619	2743963.17	13428804.53	-4.6
1620	2743954.00	13428817.69	-4.6
1621	2743800.22	13428982.86	-4.6
1622	2743780.81	13429001.15	-4.6
1623	2743752.33	13429031.01	-4.6
1624	2743700.67	13428966.54	-4.6
1625	2743721.12	13428945.26	-4.6
1626	2743775.07	13428889.68	-4.6
1627	2743810.09	13428850.53	-4.6
1628	2743889.70	13428761.00	-4.6
1629	2743435.78	13429246.99	-4.6
1630	2743455.81	13429224.57	-4.6
1631	2743519.74	13429156.21	-4.6
1632	2743690.48	13428978.22	-4.6

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
1633	2744141.92	13428826.88	-4.6
1634	2743058.42	13429649.43	-4.6
1635	2743084.80	13429624.43	-4.6
1636	2743112.45	13429597.04	-4.6
1637	2744511.49	13431492.62	-4.6
1638	2744524.51	13431484.63	-4.6
1639	2743800.73	13428620.38	-4.6
1640	2743832.29	13428618.11	-4.6
1641	2743881.43	13428653.93	-4.6
1642	2743896.15	13428667.44	-4.6
1643	2743911.22	13428679.91	-4.6
1644	2743944.80	13428701.03	-4.6
1645	2743973.08	13428720.78	-4.6
1646	2743985.61	13428729.61	-4.6
1647	2744029.35	13428755.02	-4.6
1648	2744071.87	13428783.30	-4.6
1649	2742708.93	13430015.34	-4.6
1650	2742719.53	13430003.43	-4.6
1651	2742730.05	13429992.40	-4.6
1652	2742740.58	13429980.27	-4.6
1653	2742752.21	13429967.68	-4.6
1654	2742762.88	13429957.66	-4.6
1655	2742774.92	13429946.20	-4.6
1656	2742786.35	13429933.08	-4.6
1657	2742797.02	13429920.04	-4.6
1658	2742807.78	13429908.17	-4.6
1659	2742819.88	13429896.37	-4.6
1660	2742831.37	13429884.36	-4.6
1661	2742890.46	13429823.58	-4.6
1662	2742905.64	13429808.25	-4.6
1663	2742922.80	13429791.11	-4.6
1664	2742990.55	13429718.86	-4.6
1665	2743004.01	13429705.15	-4.6
1666	2743033.99	13429672.42	-4.6
1667	2743507.64	13428939.11	-4.6
1668	2743683.44	13428749.27	-4.6
1669	2743695.30	13428735.89	-4.6
1670	2743706.68	13428722.81	-4.6
1671	2743748.57	13428678.56	-4.6
1672	2742435.38	13430288.46	-4.6
1673	2742467.05	13430273.32	-4.6
1674	2742493.23	13430248.68	-4.6
1675	2742506.29	13430237.52	-4.6
1676	2742518.96	13430226.87	-4.6
1677	2742534.48	13430212.31	-4.6
1678	2742545.70	13430201.36	-4.6
1679	2742566.78	13430175.15	-4.6
1680	2742632.82	13430092.96	-4.6

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
1681	2742655.20	13430071.78	-4.6
1682	2742667.13	13430059.26	-4.6
1683	2742688.93	13430036.24	-4.6
1684	2742698.97	13430026.20	-4.6
1685	2743209.51	13429271.61	-4.6
1686	2743366.69	13429096.41	-4.6
1687	2743474.91	13428973.40	-4.6
1688	2742351.64	13430543.36	-4.6
1689	2744414.20	13431394.52	-4.6
1690	2744695.48	13431123.41	-4.6
1691	2744683.22	13431134.04	-4.6
1692	2744670.97	13431145.37	-4.6
1693	2744659.04	13431156.59	-4.6
1694	2744634.43	13431180.19	-4.6
1695	2744620.89	13431191.25	-4.6
1696	2744552.77	13431251.84	-4.6
1697	2744532.12	13431270.40	-4.6
1698	2744510.73	13431293.06	-4.6
1699	2744478.19	13431328.54	-4.6
1700	2747375.76	13432451.08	-4.6
1701	2745058.31	13430762.18	-4.6
1702	2745030.66	13430797.39	-4.6
1703	2744938.66	13430897.27	-4.6
1704	2744918.88	13430917.34	-4.6
1705	2744907.31	13430929.39	-4.6
1706	2744885.09	13430950.63	-4.6
1707	2744850.68	13430979.21	-4.6
1708	2744830.13	13430997.90	-4.6
1709	2744796.54	13431028.05	-4.6
1710	2747533.52	13432144.84	-4.6
1711	2742311.19	13430566.00	-4.6
1712	2742298.37	13430554.15	-4.6
1713	2745148.66	13430644.59	-4.6
1714	2745414.50	13430224.11	-4.6
1715	2747342.98	13432516.27	-4.6
1716	2745211.77	13430042.32	-4.6
1717	2744970.00	13430297.45	-4.6
1718	2744981.05	13430285.94	-4.6
1719	2745014.58	13430253.41	-4.6
1720	2745030.45	13430233.71	-4.6
1721	2745039.40	13430223.56	-4.6
1722	2745065.99	13430193.75	-4.6
1723	2745084.94	13430174.45	-4.6
1724	2745103.70	13430155.55	-4.6
1725	2745121.24	13430136.74	-4.6
1726	2745131.15	13430126.85	-4.6
1727	2747579.64	13432082.30	-4.6
1728	2744634.71	13430666.75	-4.6

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
1729	2744800.44	13430478.60	-4.6
1730	2744817.54	13430461.52	-4.6
1731	2744826.35	13430452.83	-4.6
1732	2744855.91	13430425.21	-4.6
1733	2744865.79	13430414.23	-4.6
1734	2744882.48	13430396.38	-4.6
1735	2744348.90	13430932.77	-4.6
1736	2744359.41	13430922.41	-4.6
1737	2743949.65	13431301.03	-4.6
1738	2744003.89	13431251.33	-4.6
1739	2744023.52	13431232.60	-4.6
1740	2744177.53	13431101.23	-4.6
1741	2744187.29	13431093.66	-4.6
1742	2744233.86	13431050.82	-4.6
1743	2744242.13	13431040.97	-4.6
1744	2743697.94	13431192.52	-4.6
1745	2743667.13	13431222.73	-4.6
1746	2743624.04	13431262.35	-4.6
1747	2743615.42	13431270.95	-4.6
1748	2743593.53	13431292.17	-4.6
1749	2743568.73	13431318.45	-4.6
1750	2743558.76	13431328.79	-4.6
1751	2743542.42	13431346.47	-4.6
1752	2743530.35	13431435.96	-4.6
1753	2743535.05	13431471.63	-4.6
1754	2744252.64	13430645.89	-4.6
1755	2744242.67	13430657.33	-4.6
1756	2744234.68	13430666.58	-4.6
1757	2744205.41	13430694.51	-4.6
1758	2744195.82	13430703.57	-4.6
1759	2744185.81	13430713.06	-4.6
1760	2744126.47	13430772.40	-4.6
1761	2744109.79	13430788.49	-4.6
1762	2744611.54	13430267.62	-4.6
1763	2744599.62	13430279.78	-4.6
1764	2744575.98	13430303.25	-4.6
1765	2744548.18	13430332.79	-4.6
1766	2744540.09	13430341.89	-4.6
1767	2744531.68	13430350.59	-4.6
1768	2744513.88	13430370.25	-4.6
1769	2744499.51	13430385.37	-4.6
1770	2744434.51	13430450.63	-4.6
1771	2744423.87	13430459.53	-4.6
1772	2744414.91	13430468.67	-4.6
1773	2744406.63	13430477.88	-4.6
1774	2744390.88	13430497.07	-4.6
1775	2744917.29	13429905.75	-4.6
1776	2744910.24	13429915.30	-4.6

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
1777	2744891.53	13429933.45	-4.6
1778	2744847.66	13430007.01	-4.6
1779	2744820.16	13430038.96	-4.6
1780	2744787.93	13430077.43	-4.6
1781	2744726.49	13430149.05	-4.6
1782	2744710.53	13430168.16	-4.6
1783	2744702.43	13430176.04	-4.6
1784	2744693.20	13430185.48	-4.6
1785	2744684.90	13430193.97	-4.6
1786	2744666.86	13430211.06	-4.6
1787	2744965.25	13429606.50	-4.5
1788	2745015.84	13429617.42	-4.5
1789	2744949.79	13429838.91	-4.5
1790	2744935.74	13429871.81	-4.5
1791	2744929.87	13429883.94	-4.5
1792	2746301.56	13431517.57	-4.5
1793	2746341.76	13431540.38	-4.5
1794	2744675.83	13429789.10	-4.5
1795	2744695.04	13429771.76	-4.5
1796	2744716.34	13429752.11	-4.5
1797	2744736.21	13429732.80	-4.5
1798	2744754.75	13429713.92	-4.5
1799	2744764.08	13429703.20	-4.5
1800	2744791.95	13429674.39	-4.5
1801	2744801.28	13429667.63	-4.5
1802	2744864.20	13429619.40	-4.5
1803	2744926.14	13429601.91	-4.5
1804	2744938.18	13429603.28	-4.5
1805	2744951.81	13429604.94	-4.5
1806	2746229.64	13431483.65	-4.5
1807	2743690.89	13429382.27	-4.5
1808	2743674.64	13429401.14	-4.5
1809	2743665.08	13429412.19	-4.5
1810	2743657.34	13429421.20	-4.5
1811	2744315.33	13430146.05	-4.5
1812	2744333.08	13430128.80	-4.5
1813	2744343.58	13430120.70	-4.5
1814	2744375.96	13430091.59	-4.5
1815	2744399.65	13430070.80	-4.5
1816	2744409.85	13430061.14	-4.5
1817	2744421.30	13430049.76	-4.5
1818	2744449.59	13430016.91	-4.5
1819	2744469.35	13429996.10	-4.5
1820	2744489.03	13429975.75	-4.5
1821	2744500.16	13429965.46	-4.5
1822	2744047.48	13430418.85	-4.5
1823	2744061.94	13430398.18	-4.5
1824	2744157.46	13430300.17	-4.5

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
1825	2744175.93	13430283.12	-4.5
1826	2744197.02	13430267.21	-4.5
1827	2744206.71	13430258.97	-4.5
1828	2744217.87	13430248.53	-4.5
1829	2744251.43	13430213.20	-4.5
1830	2744271.04	13430195.56	-4.5
1831	2744297.63	13430167.24	-4.5
1832	2747560.71	13431770.50	-4.5
1833	2747549.72	13431757.26	-4.5
1834	2747514.04	13431712.22	-4.5
1835	2744115.35	13428837.58	-4.5
1836	2744145.18	13428885.47	-4.5
1837	2744074.11	13428976.30	-4.5
1838	2744043.69	13430438.07	-4.5
1839	2743746.62	13429167.12	-4.5
1840	2743767.88	13429145.49	-4.5
1841	2743794.03	13429118.50	-4.5
1842	2746839.25	13431619.20	-4.5
1843	2743628.56	13429284.84	-4.5
1844	2743639.33	13429273.78	-4.5
1845	2743683.02	13429230.98	-4.5
1846	2743692.20	13429220.44	-4.5
1847	2743703.33	13429208.59	-4.5
1848	2743723.79	13429189.14	-4.5
1849	2743735.99	13429177.87	-4.5
1850	2743291.82	13429631.96	-4.5
1851	2743302.25	13429620.29	-4.5
1852	2743314.28	13429606.85	-4.5
1853	2743324.72	13429593.75	-4.5
1854	2743333.40	13429583.23	-4.5
1855	2743341.01	13429574.30	-4.5
1856	2743357.18	13429556.93	-4.5
1857	2743369.05	13429544.52	-4.5
1858	2746951.41	13431502.25	-4.5
1859	2747063.49	13431685.03	-4.5
1860	2742532.29	13430308.99	-4.5
1861	2742509.68	13430333.82	-4.5
1862	2742496.44	13430348.46	-4.5
1863	2742445.95	13430401.86	-4.5
1864	2742435.90	13430413.51	-4.5
1865	2742848.61	13429977.84	-4.5
1866	2742817.46	13430011.06	-4.5
1867	2742780.25	13430048.58	-4.5
1868	2742755.12	13430071.47	-4.5
1869	2742738.17	13430091.45	-4.5
1870	2742697.59	13430136.21	-4.5
1871	2742679.23	13430158.15	-4.5
1872	2742632.37	13430203.36	-4.5

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
1873	2742603.59	13430231.42	-4.5
1874	2743162.45	13429652.00	-4.5
1875	2743110.87	13429704.43	-4.5
1876	2743053.81	13429762.05	-4.5
1877	2742924.98	13429898.12	-4.5
1878	2742911.89	13429910.83	-4.5
1879	2743406.07	13429392.60	-4.5
1880	2743730.26	13429053.17	-4.5
1881	2743698.61	13429085.71	-4.5
1882	2743642.90	13429144.31	-4.5
1883	2743634.32	13429153.28	-4.5
1884	2743556.84	13429232.30	-4.5
1885	2743126.55	13430933.13	-4.5
1886	2743118.43	13430942.20	-4.5
1887	2743108.99	13430952.55	-4.5
1888	2743102.07	13430959.94	-4.5
1889	2743997.71	13428766.35	-4.5
1890	2743993.11	13428776.59	-4.5
1891	2743983.76	13428785.35	-4.5
1892	2743971.81	13428793.73	-4.5
1893	2743946.83	13428830.16	-4.5
1894	2743938.98	13428840.39	-4.5
1895	2743920.29	13428860.19	-4.5
1896	2743875.49	13428904.68	-4.5
1897	2743863.84	13428916.45	-4.5
1898	2743837.57	13428942.46	-4.5
1899	2743762.26	13429020.40	-4.5
1900	2747434.21	13431814.24	-4.5
1901	2747437.80	13431822.60	-4.5
1902	2743711.57	13428955.55	-4.5
1903	2743730.68	13428935.46	-4.5
1904	2743742.02	13428923.96	-4.5
1905	2743754.74	13428911.97	-4.5
1906	2743765.24	13428901.03	-4.5
1907	2743786.42	13428876.68	-4.5
1908	2743797.75	13428864.39	-4.5
1909	2743833.77	13428824.56	-4.5
1910	2743845.83	13428809.57	-4.5
1911	2743857.39	13428797.07	-4.5
1912	2743868.82	13428783.92	-4.5
1913	2743879.96	13428771.44	-4.5
1914	2743921.22	13428729.56	-4.5
1915	2743935.06	13428723.47	-4.5
1916	2743970.81	13428725.13	-4.5
1917	2743986.22	13428731.57	-4.5
1918	2743994.45	13428741.92	-4.5
1919	2743998.57	13428753.11	-4.5
1920	2743393.87	13429293.22	-4.5

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
1921	2743426.01	13429257.82	-4.5
1922	2744172.71	13428845.14	-4.5
1923	2743269.64	13429430.17	-4.5
1924	2744486.40	13431507.10	-4.5
1925	2744537.49	13431475.81	-4.5
1926	2744560.42	13431458.97	-4.5
1927	2744571.69	13431452.22	-4.5
1928	2744605.76	13431429.95	-4.5
1929	2743927.47	13428689.91	-4.5
1930	2744000.53	13428739.00	-4.5
1931	2744016.13	13428746.76	-4.5
1932	2744044.76	13428765.19	-4.5
1933	2744058.00	13428773.72	-4.5
1934	2744082.53	13428790.51	-4.5
1935	2742844.33	13429872.55	-4.5
1936	2742856.01	13429861.36	-4.5
1937	2742876.00	13429839.07	-4.5
1938	2742950.04	13429758.69	-4.5
1939	2742978.04	13429730.83	-4.5
1940	2743013.42	13429694.31	-4.5
1941	2743022.28	13429684.62	-4.5
1942	2743494.72	13428952.93	-4.5
1943	2742585.34	13430147.49	-4.5
1944	2742338.89	13430533.22	-4.5
1945	2744738.02	13431082.93	-4.5
1946	2744717.36	13431104.27	-4.5
1947	2744646.40	13431169.43	-4.5
1948	2744575.44	13431232.46	-4.5
1949	2744542.79	13431260.17	-4.5
1950	2744497.37	13431306.90	-4.5
1951	2744487.68	13431317.95	-4.5
1952	2747373.52	13432459.32	-4.5
1953	2747371.56	13432467.09	-4.5
1954	2745049.69	13430774.50	-4.5
1955	2745013.69	13430818.23	-4.5
1956	2744895.77	13430940.31	-4.5
1957	2744760.78	13431063.07	-4.5
1958	2747550.46	13432126.84	-4.5
1959	2747450.83	13432260.87	-4.5
1960	2742282.87	13430542.85	-4.5
1961	2742268.49	13430533.69	-4.5
1962	2745218.81	13430557.89	-4.5
1963	2745192.27	13430591.39	-4.5
1964	2745131.99	13430666.56	-4.5
1965	2745124.50	13430676.49	-4.5
1966	2745193.02	13430060.86	-4.5
1967	2744909.82	13430365.61	-4.5
1968	2744945.67	13430322.12	-4.5

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
1969	2745140.55	13430116.96	-4.5
1970	2745150.21	13430106.37	-4.5
1971	2745174.61	13430081.08	-4.5
1972	2745183.96	13430070.97	-4.5
1973	2744644.18	13430656.12	-4.5
1974	2744662.05	13430633.17	-4.5
1975	2744808.82	13430469.72	-4.5
1976	2744301.19	13430975.25	-4.5
1977	2744472.05	13430821.01	-4.5
1978	2743970.85	13431282.02	-4.5
1979	2743980.64	13431272.92	-4.5
1980	2743994.45	13431260.13	-4.5
1981	2744042.34	13431217.11	-4.5
1982	2744058.15	13431204.42	-4.5
1983	2744067.47	13431196.65	-4.5
1984	2744076.91	13431187.52	-4.5
1985	2744155.61	13431118.52	-4.5
1986	2744271.26	13431005.14	-4.5
1987	2744280.35	13430994.48	-4.5
1988	2743924.73	13431321.45	-4.5
1989	2743687.30	13431202.88	-4.5
1990	2743551.54	13431336.02	-4.5
1991	2743535.68	13431356.69	-4.5
1992	2743529.90	13431368.34	-4.5
1993	2743526.03	13431382.50	-4.5
1994	2743525.99	13431410.33	-4.5
1995	2743539.34	13431508.36	-4.5
1996	2744313.70	13430579.57	-4.5
1997	2744264.06	13430633.41	-4.5
1998	2742569.00	13430571.65	-4.5
1999	2742561.04	13430579.54	-4.5
2000	2744634.75	13430242.40	-4.5
2001	2744445.49	13430441.35	-4.5
2002	2744348.71	13430541.67	-4.5
2003	2744863.61	13429975.36	-4.5
2004	2744860.22	13429987.15	-4.5
2005	2744839.14	13430017.16	-4.5
2006	2744829.42	13430027.97	-4.5
2007	2744806.06	13430057.60	-4.5
2008	2744779.56	13430087.20	-4.5
2009	2744771.08	13430097.78	-4.5
2010	2744756.07	13430115.00	-4.5
2011	2744719.50	13430157.86	-4.5
2012	2744657.45	13430220.07	-4.5
2013	2745035.10	13429693.60	-4.5
2014	2744977.25	13429766.90	-4.5
2015	2744923.78	13429895.07	-4.5
2016	2746332.10	13431534.45	-4.5

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
2017	2743418.41	13429667.01	-4.5
2018	2743410.18	13429675.23	-4.5
2019	2744641.31	13429827.86	-4.5
2020	2744725.66	13429742.39	-4.5
2021	2744745.51	13429723.75	-4.5
2022	2744772.35	13429693.61	-4.5
2023	2744811.81	13429658.89	-4.5
2024	2744890.30	13429608.42	-4.5
2025	2744913.00	13429601.63	-4.5
2026	2746173.44	13431459.16	-4.5
2027	2746238.87	13431487.31	-4.5
2028	2746384.92	13431393.87	-4.5
2029	2743648.40	13429430.83	-4.5
2030	2743639.18	13429440.09	-4.5
2031	2743443.15	13429641.10	-4.5
2032	2744388.55	13430080.78	-4.5
2033	2744431.34	13430038.87	-4.5
2034	2744441.09	13430027.37	-4.5
2035	2744459.62	13430006.29	-4.5
2036	2744480.07	13429984.74	-4.5
2037	2744518.78	13429946.31	-4.5
2038	2744528.60	13429935.93	-4.5
2039	2744580.44	13429885.12	-4.5
2040	2744590.24	13429875.36	-4.5
2041	2744598.91	13429866.73	-4.5
2042	2744620.49	13429848.00	-4.5
2043	2743956.12	13429104.15	-4.5
2044	2743837.98	13429225.95	-4.5
2045	2743813.41	13429252.88	-4.5
2046	2743769.77	13429300.96	-4.5
2047	2744052.20	13430411.72	-4.5
2048	2744068.43	13430388.59	-4.5
2049	2744114.62	13430339.31	-4.5
2050	2744128.58	13430327.40	-4.5
2051	2744167.36	13430290.53	-4.5
2052	2744185.81	13430276.28	-4.5
2053	2744235.07	13430231.60	-4.5
2054	2744243.95	13430222.25	-4.5
2055	2744260.99	13430204.46	-4.5
2056	2744289.27	13430176.15	-4.5
2057	2746540.39	13431416.69	-4.5
2058	2747573.35	13431784.39	-4.5
2059	2747541.35	13431745.83	-4.5
2060	2747531.36	13431732.70	-4.5
2061	2744101.92	13428837.15	-4.5
2062	2744128.01	13428841.96	-4.5
2063	2744145.49	13428857.22	-4.5
2064	2744148.82	13428877.14	-4.5

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
2065	2744139.47	13428893.52	-4.5
2066	2744132.88	13428900.28	-4.5
2067	2744124.82	13428910.41	-4.5
2068	2744107.92	13428933.05	-4.5
2069	2744100.86	13428942.99	-4.5
2070	2744086.20	13428963.84	-4.5
2071	2744051.87	13428995.96	-4.5
2072	2744031.55	13429016.33	-4.5
2073	2743756.78	13429156.75	-4.5
2074	2743776.10	13429136.55	-4.5
2075	2743958.86	13428958.62	-4.5
2076	2743969.98	13428947.45	-4.5
2077	2743980.08	13428936.38	-4.5
2078	2744013.22	13428903.17	-4.5
2079	2744049.65	13428866.67	-4.5
2080	2744060.04	13428856.92	-4.5
2081	2744072.23	13428846.26	-4.5
2082	2746833.75	13431609.67	-4.5
2083	2746844.93	13431628.10	-4.5
2084	2743548.97	13429369.73	-4.5
2085	2743562.35	13429357.18	-4.5
2086	2743574.69	13429344.14	-4.5
2087	2743585.73	13429331.81	-4.5
2088	2743595.76	13429320.10	-4.5
2089	2743607.27	13429306.80	-4.5
2090	2743617.63	13429295.95	-4.5
2091	2743651.42	13429261.17	-4.5
2092	2743672.66	13429240.73	-4.5
2093	2743077.67	13429852.68	-4.5
2094	2743112.20	13429818.46	-4.5
2095	2743133.47	13429795.13	-4.5
2096	2743163.52	13429764.08	-4.5
2097	2743183.10	13429746.01	-4.5
2098	2743221.39	13429706.53	-4.5
2099	2743244.62	13429683.14	-4.5
2100	2743255.57	13429671.27	-4.5
2101	2743380.63	13429531.90	-4.5
2102	2742943.49	13429993.61	-4.5
2103	2742964.99	13429967.99	-4.5
2104	2743031.88	13429896.67	-4.5
2105	2742421.36	13430552.63	-4.5
2106	2742502.17	13430468.19	-4.5
2107	2742516.56	13430451.11	-4.5
2108	2742540.12	13430419.62	-4.5
2109	2742563.28	13430395.50	-4.5
2110	2742565.26	13430275.23	-4.5
2111	2742554.32	13430286.70	-4.5
2112	2742544.29	13430297.20	-4.5

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
2113	2742485.42	13430360.09	-4.5
2114	2747111.85	13431543.26	-4.4
2115	2747120.98	13431560.88	-4.4
2116	2747126.96	13431571.68	-4.4
2117	2747138.42	13431590.84	-4.4
2118	2747161.32	13431633.81	-4.4
2119	2747182.25	13431686.56	-4.4
2120	2742889.10	13429933.44	-4.4
2121	2742881.30	13429943.95	-4.4
2122	2742858.75	13429966.98	-4.4
2123	2742839.26	13429989.29	-4.4
2124	2742804.95	13430023.15	-4.4
2125	2742768.31	13430059.24	-4.4
2126	2742746.51	13430082.05	-4.4
2127	2742728.85	13430101.38	-4.4
2128	2742707.75	13430125.85	-4.4
2129	2742688.65	13430147.49	-4.4
2130	2742668.71	13430168.97	-4.4
2131	2742655.96	13430180.93	-4.4
2132	2742644.68	13430191.82	-4.4
2133	2742621.52	13430213.32	-4.4
2134	2742612.25	13430222.24	-4.4
2135	2742593.58	13430242.31	-4.4
2136	2742575.32	13430264.25	-4.4
2137	2743136.70	13429681.37	-4.4
2138	2743124.16	13429692.39	-4.4
2139	2743088.53	13429726.74	-4.4
2140	2743078.61	13429736.75	-4.4
2141	2743042.93	13429775.85	-4.4
2142	2743031.09	13429788.29	-4.4
2143	2743009.75	13429808.54	-4.4
2144	2742999.67	13429819.95	-4.4
2145	2742975.68	13429842.53	-4.4
2146	2742964.68	13429853.12	-4.4
2147	2742956.25	13429862.67	-4.4
2148	2742947.25	13429874.13	-4.4
2149	2742935.96	13429886.82	-4.4
2150	2742899.28	13429922.61	-4.4
2151	2743315.77	13431080.80	-4.4
2152	2743324.06	13431073.71	-4.4
2153	2743347.47	13431052.10	-4.4
2154	2743417.49	13429380.06	-4.4
2155	2743396.39	13429403.07	-4.4
2156	2743385.06	13429415.00	-4.4
2157	2743374.06	13429425.44	-4.4
2158	2743720.34	13429063.52	-4.4
2159	2743709.81	13429074.70	-4.4
2160	2743624.49	13429161.97	-4.4

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
2161	2743143.19	13430914.82	-4.4
2162	2743930.56	13428849.85	-4.4
2163	2743908.37	13428872.53	-4.4
2164	2743896.12	13428884.93	-4.4
2165	2743886.18	13428893.68	-4.4
2166	2743851.82	13428928.58	-4.4
2167	2743820.07	13428963.25	-4.4
2168	2743809.56	13428973.67	-4.4
2169	2743790.55	13428991.90	-4.4
2170	2743770.72	13429010.69	-4.4
2171	2743742.11	13429041.84	-4.4
2172	2747420.18	13431785.84	-4.4
2173	2747445.59	13431837.33	-4.4
2174	2743823.20	13428836.75	-4.4
2175	2743900.10	13428748.33	-4.4
2176	2743909.46	13428737.64	-4.4
2177	2745348.55	13430815.35	-4.4
2178	2744519.23	13429082.75	-4.4
2179	2744985.35	13431170.44	-4.4
2180	2745010.39	13431153.25	-4.4
2181	2745132.04	13431030.52	-4.4
2182	2745151.96	13431016.30	-4.4
2183	2745168.20	13431000.54	-4.4
2184	2744126.98	13428817.40	-4.4
2185	2744156.84	13428836.12	-4.4
2186	2744212.63	13428875.59	-4.4
2187	2744242.95	13428896.98	-4.4
2188	2743365.53	13429322.05	-4.4
2189	2744455.85	13431519.20	-4.4
2190	2744468.32	13431514.19	-4.4
2191	2744548.86	13431466.87	-4.4
2192	2744582.62	13431445.20	-4.4
2193	2744595.04	13431437.37	-4.4
2194	2744620.63	13431419.80	-4.4
2195	2744096.36	13428799.05	-4.4
2196	2744114.21	13428809.72	-4.4
2197	2742939.26	13429771.30	-4.4
2198	2744403.12	13431405.09	-4.4
2199	2744371.46	13431435.74	-4.4
2200	2744748.59	13431073.73	-4.4
2201	2744727.59	13431093.23	-4.4
2202	2744521.18	13431281.48	-4.4
2203	2744455.07	13431352.97	-4.4
2204	2744442.24	13431365.11	-4.4
2205	2744433.01	13431374.34	-4.4
2206	2745022.23	13430807.16	-4.4
2207	2745003.37	13430829.78	-4.4
2208	2744993.63	13430839.18	-4.4

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
2209	2744959.43	13430875.63	-4.4
2210	2744948.43	13430887.59	-4.4
2211	2744874.30	13430960.44	-4.4
2212	2744840.51	13430988.36	-4.4
2213	2744784.81	13431040.19	-4.4
2214	2744775.20	13431049.83	-4.4
2215	2747555.33	13432121.55	-4.4
2216	2745314.53	13430433.16	-4.4
2217	2745277.33	13430480.67	-4.4
2218	2745252.15	13430513.56	-4.4
2219	2745231.76	13430540.08	-4.4
2220	2745209.30	13430570.19	-4.4
2221	2745200.88	13430581.05	-4.4
2222	2745174.23	13430612.08	-4.4
2223	2745164.68	13430624.38	-4.4
2224	2745140.58	13430654.60	-4.4
2225	2745114.97	13430688.92	-4.4
2226	2745418.48	13430212.09	-4.4
2227	2745406.39	13430254.79	-4.4
2228	2745402.36	13430268.82	-4.4
2229	2745387.56	13430307.22	-4.4
2230	2745375.49	13430333.95	-4.4
2231	2745369.82	13430347.15	-4.4
2232	2745229.15	13430022.01	-4.4
2233	2745239.48	13430007.81	-4.4
2234	2745113.11	13430146.20	-4.4
2235	2744791.17	13430487.46	-4.4
2236	2744319.09	13429010.51	-4.4
2237	2744290.74	13429013.58	-4.4
2238	2744268.94	13429044.23	-4.4
2239	2744259.40	13429077.62	-4.4
2240	2744292.22	13430982.47	-4.4
2241	2744309.95	13430966.41	-4.4
2242	2744338.43	13430942.43	-4.4
2243	2743960.88	13431292.14	-4.4
2244	2744263.36	13431016.53	-4.4
2245	2743627.53	13431542.40	-4.4
2246	2743637.70	13431531.49	-4.4
2247	2743694.87	13431467.34	-4.4
2248	2743841.05	13431378.04	-4.4
2249	2743852.58	13431370.04	-4.4
2250	2743885.44	13431350.67	-4.4
2251	2743894.55	13431344.33	-4.4
2252	2743906.53	13431335.62	-4.4
2253	2743937.86	13431310.93	-4.4
2254	2743507.76	13429726.81	-4.4
2255	2743690.13	13429543.96	-4.4
2256	2743710.20	13429520.11	-4.4

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
2257	2743777.03	13429450.53	-4.4
2258	2743524.87	13431395.64	-4.4
2259	2743532.28	13431449.44	-4.4
2260	2743533.59	13431460.23	-4.4
2261	2743538.39	13431497.43	-4.4
2262	2742618.33	13430521.70	-4.4
2263	2742584.88	13430555.31	-4.4
2264	2742576.99	13430563.86	-4.4
2265	2744868.88	13429965.17	-4.4
2266	2744855.60	13429995.92	-4.4
2267	2744797.04	13430067.47	-4.4
2268	2744763.97	13430106.38	-4.4
2269	2744741.00	13430132.58	-4.4
2270	2744733.72	13430141.27	-4.4
2271	2744677.25	13430201.43	-4.4
2272	2744646.87	13430229.76	-4.4
2273	2744978.88	13429607.69	-4.4
2274	2744992.30	13429610.07	-4.4
2275	2745006.20	13429614.38	-4.4
2276	2745024.69	13429621.26	-4.4
2277	2745032.23	13429624.43	-4.4
2278	2745040.08	13429631.03	-4.4
2279	2745050.05	13429654.52	-4.4
2280	2745049.77	13429664.30	-4.4
2281	2745044.49	13429679.07	-4.4
2282	2745027.22	13429702.73	-4.4
2283	2745018.97	13429713.05	-4.4
2284	2745003.57	13429733.33	-4.4
2285	2744995.99	13429740.95	-4.4
2286	2744989.13	13429749.10	-4.4
2287	2744983.10	13429757.39	-4.4
2288	2744970.90	13429778.75	-4.4
2289	2744964.97	13429790.08	-4.4
2290	2744956.41	13429812.53	-4.4
2291	2744953.75	13429825.58	-4.4
2292	2744945.22	13429850.49	-4.4
2293	2744940.64	13429861.21	-4.4
2294	2743435.05	13429650.59	-4.4
2295	2743426.37	13429659.28	-4.4
2296	2743402.03	13429684.08	-4.4
2297	2743395.00	13429691.56	-4.4
2298	2743370.32	13429718.45	-4.4
2299	2744630.43	13429838.15	-4.4
2300	2744650.24	13429818.81	-4.4
2301	2744659.96	13429807.76	-4.4
2302	2744781.38	13429684.50	-4.4
2303	2746164.31	13431454.83	-4.4
2304	2746370.59	13431375.62	-4.4

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
2305	2746391.06	13431402.19	-4.4
2306	2743699.69	13429373.06	-4.4
2307	2743628.73	13429450.94	-4.4
2308	2743620.37	13429458.97	-4.4
2309	2743450.69	13429632.44	-4.4
2310	2744510.10	13429955.21	-4.4
2311	2744537.63	13429925.39	-4.4
2312	2744547.80	13429913.65	-4.4
2313	2744569.44	13429895.78	-4.4
2314	2744607.81	13429858.93	-4.4
2315	2743946.35	13429114.95	-4.4
2316	2743936.94	13429125.33	-4.4
2317	2743867.16	13429194.18	-4.4
2318	2743857.24	13429204.49	-4.4
2319	2743820.74	13429244.40	-4.4
2320	2743804.47	13429262.66	-4.4
2321	2743796.28	13429271.33	-4.4
2322	2743788.57	13429280.01	-4.4
2323	2743779.23	13429290.67	-4.4
2324	2743751.37	13429319.72	-4.4
2325	2744074.39	13430380.14	-4.4
2326	2744080.44	13430372.31	-4.4
2327	2744105.66	13430347.29	-4.4
2328	2744139.19	13430316.47	-4.4
2329	2747479.05	13431645.32	-4.4
2330	2744085.79	13428839.28	-4.4
2331	2744138.88	13428849.47	-4.4
2332	2744149.03	13428865.62	-4.4
2333	2744116.76	13428921.43	-4.4
2334	2744093.87	13428953.00	-4.4
2335	2744062.83	13428986.07	-4.4
2336	2743997.25	13429055.16	-4.4
2337	2743985.57	13429068.60	-4.4
2338	2743975.53	13429080.68	-4.4
2339	2747581.34	13431900.75	-4.4
2340	2743784.78	13429127.79	-4.4
2341	2743816.09	13429096.07	-4.4
2342	2743827.59	13429084.78	-4.4
2343	2743838.68	13429074.71	-4.4
2344	2743875.63	13429040.69	-4.4
2345	2743885.77	13429031.73	-4.4
2346	2743907.46	13429011.42	-4.4
2347	2743928.43	13428991.98	-4.4
2348	2743938.25	13428981.42	-4.4
2349	2743948.98	13428969.42	-4.4
2350	2743990.99	13428924.96	-4.4
2351	2744024.88	13428891.73	-4.4
2352	2744037.33	13428878.85	-4.4

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
2353	2746850.61	13431636.99	-4.4
2354	2743661.39	13429251.44	-4.4
2355	2743089.50	13429841.16	-4.4
2356	2743100.25	13429830.87	-4.4
2357	2743122.84	13429807.31	-4.4
2358	2743153.15	13429774.10	-4.4
2359	2743193.17	13429736.22	-4.4
2360	2743202.80	13429726.66	-4.4
2361	2743212.51	13429716.01	-4.4
2362	2746921.69	13431453.23	-4.4
2363	2742814.22	13430139.17	-4.4
2364	2742824.70	13430126.37	-4.4
2365	2742834.48	13430115.36	-4.4
2366	2742854.77	13430093.49	-4.4
2367	2742866.83	13430079.60	-4.4
2368	2742879.05	13430068.54	-4.4
2369	2742933.35	13430005.74	-4.4
2370	2742954.59	13429979.72	-4.4
2371	2742988.20	13429944.48	-4.4
2372	2742999.64	13429931.91	-4.4
2373	2743009.77	13429920.78	-4.4
2374	2743020.44	13429908.08	-4.4
2375	2743043.56	13429885.75	-4.4
2376	2743055.02	13429875.50	-4.4
2377	2743066.22	13429864.00	-4.4
2378	2747095.16	13431746.23	-4.4
2379	2742530.29	13430433.41	-4.4
2380	2742552.47	13430406.01	-4.4
2381	2742577.88	13430384.13	-4.4
2382	2742622.34	13430345.26	-4.4
2383	2742688.73	13430276.34	-4.4
2384	2742711.19	13430252.27	-4.4
2385	2742472.04	13430372.98	-4.4
2386	2747149.65	13431611.84	-4.4
2387	2747155.98	13431623.09	-4.4
2388	2747187.05	13431697.60	-4.4
2389	2747202.55	13431726.79	-4.4
2390	2742829.98	13429999.67	-4.4
2391	2742791.72	13430037.23	-4.4
2392	2742584.70	13430254.11	-4.4
2393	2743434.31	13430982.01	-4.4
2394	2743475.76	13430950.16	-4.4
2395	2743495.87	13430932.11	-4.4
2396	2743539.06	13430891.24	-4.4
2397	2743591.65	13430841.85	-4.4
2398	2743098.28	13429716.43	-4.4
2399	2743064.05	13429750.62	-4.4
2400	2743019.97	13429799.09	-4.4

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
2401	2742987.47	13429832.47	-4.4
2402	2743263.65	13431143.64	-4.4
2403	2743271.01	13431132.58	-4.4
2404	2743277.47	13431124.51	-4.4
2405	2743296.50	13431103.69	-4.4
2406	2743306.63	13431091.18	-4.4
2407	2743335.64	13431063.71	-4.4
2408	2743358.84	13431041.97	-4.4
2409	2743369.42	13431032.01	-4.4
2410	2743382.14	13431021.39	-4.4
2411	2743390.33	13431014.48	-4.4
2412	2743399.50	13431007.84	-4.4
2413	2743408.54	13431001.08	-4.4
2414	2743447.23	13429348.49	-4.4
2415	2747281.75	13431698.53	-4.4
2416	2743190.88	13430866.15	-4.4
2417	2743828.59	13428952.85	-4.4
2418	2747411.12	13431759.99	-4.4
2419	2747427.72	13431800.54	-4.4
2420	2747455.18	13431861.28	-4.4
2421	2745204.44	13430959.62	-4.4
2422	2745317.57	13430849.70	-4.4
2423	2745356.13	13430807.91	-4.4
2424	2744492.25	13429063.54	-4.4
2425	2743375.65	13429311.07	-4.4
2426	2743384.83	13429302.45	-4.4
2427	2743404.29	13429282.31	-4.4
2428	2743414.27	13429271.42	-4.4
2429	2744869.48	13431274.95	-4.4
2430	2744929.89	13431223.31	-4.4
2431	2744973.01	13431180.55	-4.4
2432	2745025.57	13431141.77	-4.4
2433	2745037.16	13431133.90	-4.4
2434	2745068.84	13431101.12	-4.4
2435	2745086.70	13431082.59	-4.4
2436	2745111.24	13431058.28	-4.4
2437	2745119.36	13431048.12	-4.4
2438	2745141.54	13431022.24	-4.4
2439	2744188.74	13428855.34	-4.4
2440	2744201.84	13428865.43	-4.4
2441	2744221.86	13428882.94	-4.4
2442	2744233.93	13428891.09	-4.4
2443	2744255.78	13428905.53	-4.4
2444	2744268.56	13428914.61	-4.4
2445	2744307.79	13428940.63	-4.4
2446	2744322.33	13428950.04	-4.4
2447	2744337.21	13428961.17	-4.4
2448	2744352.38	13428973.68	-4.4

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
2449	2744364.35	13428982.73	-4.4
2450	2744400.78	13429006.44	-4.4
2451	2744413.59	13429014.85	-4.4
2452	2744450.03	13429036.82	-4.4
2453	2743283.76	13429414.34	-4.4
2454	2744424.82	13431533.86	-4.4
2455	2744497.66	13431501.08	-4.4
2456	2744633.58	13431411.26	-4.4
2457	2744648.92	13431401.45	-4.4
2458	2744665.10	13431392.58	-4.4
2459	2744803.85	13431326.75	-4.4
2460	2744591.98	13429270.44	-4.4
2461	2746191.00	13431570.45	-4.4
2462	2746149.48	13431462.23	-4.4
2463	2744423.89	13431383.93	-4.3
2464	2744393.40	13431414.67	-4.3
2465	2744381.48	13431425.94	-4.3
2466	2744314.35	13431487.59	-4.3
2467	2744304.29	13431496.90	-4.3
2468	2744293.06	13431505.56	-4.3
2469	2744469.30	13431338.20	-4.3
2470	2744984.03	13430848.70	-4.3
2471	2744972.51	13430860.63	-4.3
2472	2747565.68	13432110.97	-4.3
2473	2742322.19	13430580.12	-4.3
2474	2745295.93	13430457.34	-4.3
2475	2745285.37	13430469.89	-4.3
2476	2745269.42	13430492.49	-4.3
2477	2745260.45	13430503.52	-4.3
2478	2745240.95	13430527.38	-4.3
2479	2745156.89	13430634.18	-4.3
2480	2745393.48	13430293.90	-4.3
2481	2745381.73	13430321.00	-4.3
2482	2745358.46	13430371.03	-4.3
2483	2745349.55	13430383.37	-4.3
2484	2745202.75	13430051.64	-4.3
2485	2745220.59	13430032.87	-4.3
2486	2745252.20	13429996.03	-4.3
2487	2745314.12	13429959.76	-4.3
2488	2743604.17	13429888.59	-4.3
2489	2745166.02	13430089.68	-4.3
2490	2747583.38	13432089.91	-4.3
2491	2744327.54	13429012.79	-4.3
2492	2744284.53	13429018.64	-4.3
2493	2744278.75	13429025.10	-4.3
2494	2744273.23	13429033.31	-4.3
2495	2744266.01	13429055.99	-4.3
2496	2744262.70	13429066.50	-4.3

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
2497	2744256.45	13429090.30	-4.3
2498	2744254.65	13429102.24	-4.3
2499	2744258.10	13429181.99	-4.3
2500	2744216.89	13429256.98	-4.3
2501	2744328.51	13430950.21	-4.3
2502	2744165.13	13429048.94	-4.3
2503	2744207.39	13429010.40	-4.3
2504	2744218.14	13428997.94	-4.3
2505	2744229.43	13428983.51	-4.3
2506	2744253.31	13428956.20	-4.3
2507	2744369.15	13428991.28	-4.3
2508	2744366.60	13429005.28	-4.3
2509	2744360.65	13429012.26	-4.3
2510	2744352.40	13429015.84	-4.3
2511	2744256.32	13431024.37	-4.3
2512	2743799.41	13429428.13	-4.3
2513	2743811.67	13429415.07	-4.3
2514	2743832.44	13429391.17	-4.3
2515	2743843.60	13429379.36	-4.3
2516	2743854.55	13429368.52	-4.3
2517	2743865.12	13429356.73	-4.3
2518	2743884.68	13429336.62	-4.3
2519	2743895.79	13429324.72	-4.3
2520	2743927.68	13429294.62	-4.3
2521	2744000.99	13429221.30	-4.3
2522	2744051.56	13429171.11	-4.3
2523	2744153.99	13429061.36	-4.3
2524	2743617.48	13431548.72	-4.3
2525	2743654.03	13431508.90	-4.3
2526	2743664.38	13431497.14	-4.3
2527	2743684.60	13431476.49	-4.3
2528	2743705.74	13431459.37	-4.3
2529	2743716.56	13431453.34	-4.3
2530	2743728.68	13431446.13	-4.3
2531	2743740.34	13431439.81	-4.3
2532	2743755.12	13431432.41	-4.3
2533	2743767.48	13431425.10	-4.3
2534	2743779.42	13431418.28	-4.3
2535	2743791.37	13431411.33	-4.3
2536	2743803.71	13431403.69	-4.3
2537	2743816.60	13431395.45	-4.3
2538	2743828.73	13431387.38	-4.3
2539	2743866.56	13431360.97	-4.3
2540	2743464.27	13429766.48	-4.3
2541	2743485.20	13429746.55	-4.3
2542	2743496.79	13429737.19	-4.3
2543	2743518.15	13429717.08	-4.3
2544	2743699.89	13429532.19	-4.3

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
2545	2743528.56	13431423.76	-4.3
2546	2743536.69	13431484.59	-4.3
2547	2742601.80	13430538.10	-4.3
2548	2742592.95	13430547.64	-4.3
2549	2743123.76	13429989.22	-4.3
2550	2745046.87	13429641.99	-4.3
2551	2746321.79	13431528.33	-4.3
2552	2743378.91	13429708.69	-4.3
2553	2743274.32	13429828.43	-4.3
2554	2743187.40	13429921.61	-4.3
2555	2746356.20	13431356.42	-4.3
2556	2746363.40	13431365.93	-4.3
2557	2743966.07	13429092.13	-4.3
2558	2743923.63	13429138.16	-4.3
2559	2743913.44	13429148.35	-4.3
2560	2743902.39	13429159.12	-4.3
2561	2743893.45	13429167.56	-4.3
2562	2743884.60	13429176.56	-4.3
2563	2743876.22	13429185.19	-4.3
2564	2743847.74	13429215.70	-4.3
2565	2743828.08	13429236.35	-4.3
2566	2743760.68	13429310.13	-4.3
2567	2743744.61	13429326.50	-4.3
2568	2746673.86	13431608.33	-4.3
2569	2746535.43	13431405.49	-4.3
2570	2744042.11	13429005.30	-4.3
2571	2744019.58	13429029.71	-4.3
2572	2744006.78	13429043.99	-4.3
2573	2743803.90	13429108.04	-4.3
2574	2743860.77	13429054.59	-4.3
2575	2743896.57	13429021.56	-4.3
2576	2743918.09	13429003.07	-4.3
2577	2744001.44	13428914.60	-4.3
2578	2746723.12	13431421.40	-4.3
2579	2746857.18	13431646.70	-4.3
2580	2746863.61	13431655.55	-4.3
2581	2743536.77	13429380.82	-4.3
2582	2743143.32	13429784.36	-4.3
2583	2743173.15	13429754.98	-4.3
2584	2743395.49	13429516.54	-4.3
2585	2742761.63	13430199.17	-4.3
2586	2742774.58	13430183.95	-4.3
2587	2742793.51	13430163.07	-4.3
2588	2742803.59	13430152.49	-4.3
2589	2742844.93	13430104.08	-4.3
2590	2742890.02	13430057.12	-4.3
2591	2742899.32	13430046.71	-4.3
2592	2742912.32	13430031.89	-4.3

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
2593	2742923.14	13430018.36	-4.3
2594	2742975.63	13429956.75	-4.3
2595	2747073.88	13431705.55	-4.3
2596	2747068.63	13431695.26	-4.3
2597	2742592.69	13430372.42	-4.3
2598	2742612.17	13430356.15	-4.3
2599	2742632.19	13430334.40	-4.3
2600	2742644.46	13430322.22	-4.3
2601	2742655.51	13430310.95	-4.3
2602	2742679.56	13430285.21	-4.3
2603	2742701.06	13430263.76	-4.3
2604	2742722.66	13430239.70	-4.3
2605	2744325.37	13430144.16	-4.3
2606	2744340.96	13430128.81	-4.3
2607	2744352.69	13430118.08	-4.3
2608	2742359.09	13430551.04	-4.3
2609	2742367.58	13430563.23	-4.3
2610	2743810.23	13430625.43	-4.3
2611	2747105.55	13431533.43	-4.3
2612	2747169.31	13431655.80	-4.3
2613	2747177.51	13431676.43	-4.3
2614	2747215.24	13431747.53	-4.3
2615	2742870.61	13429955.16	-4.3
2616	2743445.17	13430974.37	-4.3
2617	2743455.66	13430966.42	-4.3
2618	2743465.47	13430958.91	-4.3
2619	2743519.14	13430909.39	-4.3
2620	2743548.31	13430883.47	-4.3
2621	2743581.87	13430852.04	-4.3
2622	2743601.99	13430831.88	-4.3
2623	2743612.18	13430822.76	-4.3
2624	2743630.31	13430802.84	-4.3
2625	2743651.23	13430782.02	-4.3
2626	2743662.67	13430770.92	-4.3
2627	2743697.39	13430737.89	-4.3
2628	2743710.12	13430727.30	-4.3
2629	2743724.47	13430714.49	-4.3
2630	2743735.72	13430704.61	-4.3
2631	2743771.39	13430668.95	-4.3
2632	2743248.09	13431168.35	-4.3
2633	2743256.16	13431156.32	-4.3
2634	2743286.08	13431114.87	-4.3
2635	2743418.86	13430993.49	-4.3
2636	2743437.75	13429359.79	-4.3
2637	2747300.38	13431732.48	-4.3
2638	2743567.81	13429221.77	-4.3
2639	2743254.11	13430809.11	-4.3
2640	2743224.82	13430834.42	-4.3

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
2641	2743216.67	13430842.36	-4.3
2642	2743182.79	13430873.39	-4.3
2643	2743174.00	13430881.10	-4.3
2644	2743165.44	13430889.74	-4.3
2645	2743150.43	13430907.01	-4.3
2646	2743135.65	13430923.23	-4.3
2647	2743062.11	13430994.99	-4.3
2648	2743493.76	13430589.26	-4.3
2649	2743476.55	13430606.28	-4.3
2650	2743467.53	13430614.54	-4.3
2651	2743449.81	13430631.51	-4.3
2652	2747364.58	13431617.37	-4.3
2653	2747414.07	13431769.01	-4.3
2654	2747441.47	13431829.72	-4.3
2655	2747457.69	13431868.43	-4.3
2656	2745186.33	13430979.64	-4.3
2657	2745194.86	13430970.37	-4.3
2658	2745216.52	13430947.44	-4.3
2659	2745226.48	13430937.77	-4.3
2660	2745236.13	13430928.88	-4.3
2661	2745246.45	13430918.55	-4.3
2662	2745265.52	13430900.20	-4.3
2663	2745291.04	13430876.64	-4.3
2664	2745326.26	13430841.62	-4.3
2665	2745363.62	13430800.75	-4.3
2666	2745383.71	13430779.80	-4.3
2667	2745391.32	13430770.42	-4.3
2668	2745398.19	13430762.03	-4.3
2669	2745406.19	13430752.38	-4.3
2670	2744480.75	13429056.62	-4.3
2671	2744670.03	13429193.75	-4.3
2672	2744769.23	13429258.54	-4.3
2673	2744241.39	13429863.87	-4.3
2674	2744214.79	13429891.79	-4.3
2675	2744206.93	13429900.87	-4.3
2676	2744198.15	13429910.75	-4.3
2677	2744181.21	13429927.98	-4.3
2678	2744172.87	13429935.80	-4.3
2679	2744154.17	13429952.08	-4.3
2680	2744094.06	13430006.08	-4.3
2681	2744890.21	13431255.38	-4.3
2682	2744898.88	13431249.77	-4.3
2683	2744952.60	13431201.38	-4.3
2684	2744961.35	13431193.02	-4.3
2685	2744998.68	13431161.67	-4.3
2686	2745056.16	13431115.27	-4.3
2687	2745095.85	13431074.64	-4.3
2688	2745124.57	13431039.48	-4.3

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
2689	2745160.65	13431008.10	-4.3
2690	2744279.88	13428923.41	-4.3
2691	2744292.84	13428931.26	-4.3
2692	2744376.88	13428990.31	-4.3
2693	2744438.33	13429029.14	-4.3
2694	2744461.42	13429043.76	-4.3
2695	2743353.58	13429335.31	-4.3
2696	2744324.47	13429779.60	-4.3
2697	2744441.46	13431525.86	-4.3
2698	2744679.69	13431384.96	-4.3
2699	2744695.12	13431376.16	-4.3
2700	2744708.47	13431370.07	-4.3
2701	2744724.12	13431363.75	-4.3
2702	2744753.32	13431354.45	-4.3
2703	2744790.31	13431337.81	-4.3
2704	2744566.32	13429250.98	-4.3
2705	2744577.74	13429260.46	-4.3
2706	2744660.80	13429310.09	-4.3
2707	2744690.33	13429447.14	-4.3
2708	2744591.37	13429528.19	-4.3
2709	2744275.54	13431618.57	-4.3
2710	2744260.39	13429475.80	-4.3
2711	2744369.61	13429371.68	-4.3
2712	2744414.23	13429332.00	-4.3
2713	2746199.51	13431594.41	-4.3
2714	2746139.39	13431437.85	-4.3
2715	2743222.71	13429255.06	-4.3
2716	2743967.38	13429780.57	-4.3
2717	2743993.64	13429753.59	-4.3
2718	2743734.28	13430009.76	-4.3
2719	2743743.57	13429998.83	-4.3
2720	2744357.34	13431449.13	-4.3
2721	2744344.21	13431460.96	-4.3
2722	2744333.01	13431469.60	-4.3
2723	2744323.80	13431478.13	-4.3
2724	2744266.82	13431526.69	-4.3
2725	2744228.99	13431560.51	-4.3
2726	2744206.66	13431580.65	-4.3
2727	2747560.87	13432115.99	-4.3
2728	2747527.64	13432151.21	-4.3
2729	2745323.01	13430420.77	-4.3
2730	2745305.13	13430446.92	-4.3
2731	2745106.27	13430701.48	-4.3
2732	2745481.78	13430110.58	-4.3
2733	2745438.06	13430173.29	-4.3
2734	2745410.71	13430238.14	-4.3
2735	2745340.71	13430395.75	-4.3
2736	2745331.19	13430408.96	-4.3

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
2737	2745264.00	13429986.76	-4.3
2738	2745276.81	13429978.77	-4.3
2739	2745302.63	13429965.07	-4.3
2740	2745339.30	13429951.19	-4.3
2741	2743862.43	13429620.90	-4.3
2742	2743595.50	13429895.72	-4.3
2743	2744167.99	13429303.40	-4.3
2744	2744127.96	13429343.24	-4.3
2745	2744091.81	13429382.94	-4.3
2746	2744067.77	13429409.02	-4.3
2747	2744059.05	13429417.16	-4.3
2748	2744032.15	13429442.79	-4.3
2749	2744015.49	13429461.77	-4.3
2750	2744007.52	13429471.12	-4.3
2751	2743999.65	13429479.83	-4.3
2752	2743984.13	13429495.78	-4.3
2753	2743976.56	13429503.06	-4.3
2754	2743907.18	13429576.37	-4.3
2755	2743899.92	13429584.00	-4.3
2756	2743884.99	13429598.59	-4.3
2757	2743876.91	13429605.59	-4.3
2758	2744310.31	13429009.90	-4.3
2759	2744299.40	13429010.78	-4.3
2760	2744253.49	13429126.94	-4.3
2761	2744253.01	13429140.92	-4.3
2762	2744254.70	13429151.56	-4.3
2763	2744256.85	13429163.56	-4.3
2764	2744256.89	13429192.82	-4.3
2765	2744204.21	13429269.34	-4.3
2766	2744175.85	13429037.82	-4.3
2767	2744238.99	13428969.84	-4.3
2768	2744265.28	13428949.44	-4.3
2769	2744368.15	13428997.99	-4.3
2770	2744086.87	13431178.16	-4.3
2771	2743822.09	13429402.84	-4.2
2772	2743875.81	13429345.52	-4.2
2773	2743905.37	13429315.31	-4.2
2774	2743916.67	13429304.70	-4.2
2775	2743938.44	13429284.08	-4.2
2776	2743948.18	13429274.53	-4.2
2777	2743959.31	13429264.37	-4.2
2778	2743980.36	13429245.11	-4.2
2779	2743990.37	13429234.16	-4.2
2780	2744010.51	13429210.68	-4.2
2781	2744020.34	13429200.91	-4.2
2782	2744062.88	13429160.67	-4.2
2783	2744074.42	13429150.12	-4.2
2784	2744085.88	13429138.13	-4.2

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
2785	2744095.68	13429127.15	-4.2
2786	2744106.11	13429115.36	-4.2
2787	2744119.82	13429099.85	-4.2
2788	2744130.77	13429088.04	-4.2
2789	2743607.17	13431552.77	-4.2
2790	2743645.18	13431520.70	-4.2
2791	2743675.04	13431486.53	-4.2
2792	2743474.02	13429756.80	-4.2
2793	2743679.88	13429554.60	-4.2
2794	2743720.35	13429509.14	-4.2
2795	2743730.97	13429498.84	-4.2
2796	2743748.16	13429479.96	-4.2
2797	2743768.03	13429459.49	-4.2
2798	2743787.83	13429440.45	-4.2
2799	2742609.16	13430530.54	-4.2
2800	2743179.61	13429931.51	-4.2
2801	2743140.11	13429970.78	-4.2
2802	2743113.15	13429999.06	-4.2
2803	2743078.92	13430033.13	-4.2
2804	2743055.82	13430057.80	-4.2
2805	2742934.04	13430189.47	-4.2
2806	2746359.09	13431550.38	-4.2
2807	2743386.28	13429700.76	-4.2
2808	2743361.88	13429728.73	-4.2
2809	2743352.66	13429739.24	-4.2
2810	2743327.70	13429767.04	-4.2
2811	2743310.40	13429786.86	-4.2
2812	2743297.23	13429802.23	-4.2
2813	2743249.79	13429855.99	-4.2
2814	2743230.26	13429871.96	-4.2
2815	2743203.71	13429902.69	-4.2
2816	2746220.64	13431479.25	-4.2
2817	2743709.91	13429362.51	-4.2
2818	2743734.86	13429335.14	-4.2
2819	2747471.48	13431631.81	-4.2
2820	2743849.79	13429064.18	-4.2
2821	2746870.02	13431664.28	-4.2
2822	2746933.91	13431472.17	-4.2
2823	2742747.37	13430213.91	-4.2
2824	2742784.72	13430171.91	-4.2
2825	2742667.71	13430298.25	-4.2
2826	2742734.66	13430227.57	-4.2
2827	2744318.33	13430150.26	-4.2
2828	2744363.85	13430107.40	-4.2
2829	2743791.35	13430647.60	-4.2
2830	2743799.70	13430637.68	-4.2
2831	2743820.81	13430615.31	-4.2
2832	2743861.82	13430574.98	-4.2

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
2833	2747099.80	13431524.20	-4.2
2834	2747132.43	13431580.11	-4.2
2835	2747143.87	13431601.54	-4.2
2836	2747165.43	13431644.57	-4.2
2837	2747172.97	13431667.40	-4.2
2838	2747192.00	13431707.61	-4.2
2839	2743485.64	13430941.68	-4.2
2840	2743507.89	13430920.01	-4.2
2841	2743528.49	13430900.29	-4.2
2842	2743559.92	13430873.20	-4.2
2843	2743571.74	13430862.13	-4.2
2844	2743620.47	13430813.36	-4.2
2845	2743639.71	13430793.09	-4.2
2846	2743672.80	13430761.13	-4.2
2847	2743748.09	13430693.28	-4.2
2848	2743427.48	13429370.03	-4.2
2849	2747362.25	13431860.48	-4.2
2850	2747352.43	13431841.22	-4.2
2851	2747291.38	13431716.59	-4.2
2852	2747268.04	13431672.36	-4.2
2853	2747253.19	13431644.47	-4.2
2854	2747199.78	13431538.99	-4.2
2855	2743315.71	13430754.42	-4.2
2856	2743307.11	13430762.05	-4.2
2857	2743288.03	13430779.82	-4.2
2858	2743280.06	13430786.67	-4.2
2859	2743272.35	13430793.21	-4.2
2860	2743262.82	13430801.49	-4.2
2861	2743243.85	13430817.89	-4.2
2862	2743234.78	13430825.85	-4.2
2863	2743208.55	13430849.93	-4.2
2864	2743199.97	13430858.23	-4.2
2865	2743156.91	13430899.13	-4.2
2866	2747460.91	13431877.74	-4.2
2867	2743634.43	13430454.23	-4.2
2868	2743538.96	13430546.08	-4.2
2869	2743512.16	13430570.34	-4.2
2870	2743503.25	13430578.94	-4.2
2871	2743485.73	13430597.57	-4.2
2872	2743458.20	13430623.40	-4.2
2873	2743359.99	13430714.00	-4.2
2874	2743325.20	13430745.20	-4.2
2875	2745488.96	13430649.05	-4.2
2876	2745517.22	13430614.27	-4.2
2877	2747416.93	13431777.57	-4.2
2878	2747423.81	13431793.63	-4.2
2879	2747431.01	13431806.52	-4.2
2880	2747452.14	13431853.23	-4.2

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
2881	2743665.91	13430421.69	-4.2
2882	2745308.37	13430858.93	-4.2
2883	2745333.77	13430833.30	-4.2
2884	2745341.65	13430823.98	-4.2
2885	2745371.46	13430791.95	-4.2
2886	2745415.51	13430742.24	-4.2
2887	2745472.37	13430670.23	-4.2
2888	2744506.02	13429073.94	-4.2
2889	2744563.77	13429114.70	-4.2
2890	2744717.18	13429222.95	-4.2
2891	2744278.06	13429825.10	-4.2
2892	2744266.75	13429836.63	-4.2
2893	2744233.09	13429872.51	-4.2
2894	2744223.72	13429882.26	-4.2
2895	2744189.64	13429919.20	-4.2
2896	2744163.24	13429944.04	-4.2
2897	2744134.88	13429968.33	-4.2
2898	2744124.14	13429977.92	-4.2
2899	2744114.47	13429986.44	-4.2
2900	2744084.29	13430015.87	-4.2
2901	2744049.18	13430051.85	-4.2
2902	2744021.55	13430078.86	-4.2
2903	2744845.34	13431294.26	-4.2
2904	2744857.29	13431285.79	-4.2
2905	2744879.17	13431265.09	-4.2
2906	2744909.45	13431241.69	-4.2
2907	2744919.36	13431232.94	-4.2
2908	2744940.97	13431212.47	-4.2
2909	2745104.39	13431065.95	-4.2
2910	2744389.38	13428998.65	-4.2
2911	2744425.08	13429020.81	-4.2
2912	2744564.93	13429554.77	-4.2
2913	2744485.25	13429620.46	-4.2
2914	2744441.14	13429663.78	-4.2
2915	2744382.47	13429719.75	-4.2
2916	2744765.47	13431350.61	-4.2
2917	2744776.78	13431346.00	-4.2
2918	2744814.21	13431317.51	-4.2
2919	2744826.80	13431307.87	-4.2
2920	2744601.98	13429276.90	-4.2
2921	2744639.80	13429295.54	-4.2
2922	2744679.25	13429320.11	-4.2
2923	2744721.14	13429408.34	-4.2
2924	2744716.68	13429418.85	-4.2
2925	2744659.41	13429469.46	-4.2
2926	2744618.85	13429490.78	-4.2
2927	2744611.92	13429499.47	-4.2
2928	2744604.78	13429509.05	-4.2

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
2929	2744174.39	13431676.95	-4.2
2930	2744226.17	13431647.23	-4.2
2931	2744263.58	13431625.73	-4.2
2932	2744312.59	13431596.47	-4.2
2933	2744365.92	13431565.90	-4.2
2934	2744378.30	13431558.66	-4.2
2935	2744394.46	13431549.42	-4.2
2936	2744413.33	13431539.39	-4.2
2937	2746130.21	13431412.33	-4.2
2938	2744337.71	13429400.71	-4.2
2939	2744381.50	13429360.06	-4.2
2940	2744391.73	13429351.50	-4.2
2941	2744436.00	13429311.69	-4.2
2942	2744446.28	13429302.24	-4.2
2943	2744455.56	13429294.35	-4.2
2944	2744466.36	13429284.46	-4.2
2945	2744474.64	13429274.20	-4.2
2946	2744482.97	13429265.14	-4.2
2947	2744504.82	13429244.86	-4.2
2948	2744531.68	13429235.79	-4.2
2949	2744543.78	13429238.32	-4.2
2950	2744554.65	13429243.24	-4.2
2951	2746207.20	13431620.57	-4.2
2952	2746205.07	13431611.90	-4.2
2953	2746194.05	13431578.04	-4.2
2954	2746146.16	13431453.78	-4.2
2955	2743955.15	13429793.48	-4.2
2956	2743979.78	13429768.51	-4.2
2957	2744059.08	13429679.98	-4.2
2958	2744067.87	13429670.56	-4.2
2959	2744078.01	13429660.07	-4.2
2960	2744098.11	13429638.48	-4.2
2961	2744110.24	13429625.50	-4.2
2962	2744159.13	13429578.32	-4.2
2963	2744094.52	13431687.00	-4.2
2964	2744080.70	13431698.76	-4.2
2965	2742365.10	13430554.15	-4.2
2966	2743714.58	13430031.52	-4.2
2967	2743752.76	13429990.03	-4.2
2968	2743761.70	13429981.16	-4.2
2969	2743770.51	13429972.96	-4.2
2970	2744279.66	13431516.69	-4.2
2971	2744252.83	13431538.54	-4.2
2972	2744241.61	13431548.27	-4.2
2973	2744217.65	13431570.58	-4.2
2974	2744196.38	13431591.23	-4.2
2975	2744185.28	13431601.46	-4.2
2976	2744173.34	13431612.18	-4.2

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
2977	2744162.90	13431621.69	-4.2
2978	2744120.49	13431660.96	-4.2
2979	2744113.13	13431668.58	-4.2
2980	2747368.55	13432476.02	-4.2
2981	2747571.06	13432105.66	-4.2
2982	2747454.86	13432254.37	-4.2
2983	2745494.36	13430088.89	-4.2
2984	2745474.29	13430120.76	-4.2
2985	2745455.28	13430146.52	-4.2
2986	2745446.89	13430158.11	-4.2
2987	2745430.17	13430186.54	-4.2
2988	2745423.47	13430199.88	-4.2
2989	2745397.44	13430283.01	-4.2
2990	2745365.16	13430359.25	-4.2
2991	2747347.20	13432521.27	-4.2
2992	2747333.46	13432461.84	-4.2
2993	2743545.37	13429941.75	-4.2
2994	2745290.88	13429970.46	-4.2
2995	2745325.85	13429955.15	-4.2
2996	2745351.69	13429948.98	-4.2
2997	2745388.58	13429949.11	-4.2
2998	2745401.51	13429952.97	-4.2
2999	2745426.31	13429963.97	-4.2
3000	2745448.04	13429976.95	-4.2
3001	2745481.94	13430007.10	-4.2
3002	2747579.58	13432100.71	-4.2
3003	2747557.89	13432130.13	-4.2
3004	2747551.46	13432138.05	-4.2
3005	2747469.50	13432295.28	-4.2
3006	2743869.90	13429613.03	-4.2
3007	2743854.49	13429628.90	-4.2
3008	2743838.13	13429645.21	-4.2
3009	2743824.03	13429660.00	-4.2
3010	2743809.21	13429674.42	-4.2
3011	2743613.25	13429880.24	-4.2
3012	2743586.18	13429903.12	-4.2
3013	2743576.34	13429912.22	-4.2
3014	2743567.53	13429920.72	-4.2
3015	2743560.87	13429927.11	-4.2
3016	2747583.24	13432094.29	-4.2
3017	2744150.96	13429319.69	-4.2
3018	2744119.00	13429352.62	-4.2
3019	2744110.20	13429361.10	-4.2
3020	2744100.77	13429372.27	-4.2
3021	2744048.53	13429426.70	-4.2
3022	2744040.27	13429434.67	-4.2
3023	2744022.87	13429453.09	-4.2
3024	2743991.98	13429487.93	-4.2

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
3025	2743968.92	13429510.89	-4.2
3026	2743960.91	13429519.84	-4.2
3027	2743953.45	13429528.13	-4.2
3028	2743892.29	13429591.46	-4.2
3029	2744254.05	13429114.03	-4.2
3030	2744255.05	13429204.92	-4.2
3031	2744252.68	13429216.69	-4.2
3032	2744248.10	13429227.45	-4.2
3033	2744236.58	13429243.73	-4.2
3034	2744225.71	13429251.71	-4.2
3035	2744210.70	13429262.40	-4.2
3036	2744194.14	13429279.34	-4.2
3037	2744176.82	13429294.93	-4.2
3038	2744319.02	13430957.94	-4.2
3039	2744096.43	13431168.35	-4.2
3040	2743970.98	13429254.12	-4.2
3041	2744031.03	13429190.98	-4.2
3042	2744040.76	13429182.07	-4.2
3043	2744143.11	13429073.54	-4.2
3044	2743594.49	13431554.00	-4.2
3045	2744644.41	13431514.11	-4.2
3046	2744618.80	13431526.39	-4.2
3047	2744591.34	13431538.32	-4.2
3048	2743445.48	13429788.40	-4.2
3049	2743454.68	13429777.71	-4.2
3050	2743541.93	13431519.60	-4.2
3051	2743352.83	13429882.94	-4.2
3052	2743372.40	13429862.43	-4.2
3053	2743424.30	13429810.25	-4.2
3054	2742644.87	13430496.74	-4.2
3055	2742636.56	13430504.46	-4.2
3056	2742626.62	13430513.19	-4.2
3057	2742641.13	13430594.27	-4.2
3058	2742651.70	13430583.69	-4.2
3059	2742675.05	13430467.58	-4.2
3060	2742655.22	13430487.38	-4.2
3061	2743169.65	13429941.55	-4.2
3062	2743159.39	13429951.09	-4.2
3063	2743132.01	13429980.22	-4.2
3064	2743102.78	13430008.87	-4.2
3065	2743093.78	13430017.71	-4.2
3066	2743086.73	13430024.52	-4.2
3067	2743071.98	13430040.85	-4.2
3068	2743063.46	13430049.98	-4.2
3069	2743040.64	13430074.10	-4.2
3070	2743033.03	13430081.93	-4.2
3071	2743018.70	13430097.67	-4.2
3072	2743010.93	13430105.53	-4.2

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
3073	2743004.96	13430112.20	-4.2
3074	2742998.48	13430119.57	-4.2
3075	2742984.33	13430134.33	-4.2
3076	2742977.19	13430141.47	-4.2
3077	2742970.23	13430148.22	-4.2
3078	2742949.72	13430172.36	-4.2
3079	2742918.57	13430205.80	-4.2
3080	2746369.16	13431555.86	-4.2
3081	2743343.60	13429749.29	-4.2
3082	2743336.47	13429757.56	-4.2
3083	2743319.38	13429776.56	-4.2
3084	2743303.32	13429795.25	-4.2
3085	2743289.94	13429810.37	-4.2
3086	2743281.51	13429819.95	-4.2
3087	2743266.60	13429837.63	-4.2
3088	2743257.84	13429847.63	-4.2
3089	2743240.76	13429863.82	-4.2
3090	2743222.08	13429880.08	-4.2
3091	2743211.92	13429891.79	-4.2
3092	2743195.49	13429912.55	-4.2
3093	2746182.55	13431463.25	-4.2
3094	2746211.00	13431475.06	-4.2
3095	2743458.15	13429624.09	-4.2
3096	2743725.79	13429344.83	-4.2
3097	2743719.29	13429352.28	-4.2
3098	2746679.72	13431623.85	-4.2
3099	2743967.74	13430431.28	-4.1
3100	2743981.23	13430436.77	-4.1
3101	2743999.78	13430435.69	-4.1
3102	2744016.03	13430422.34	-4.1
3103	2744023.76	13430403.39	-4.1
3104	2746927.60	13431462.59	-4.1
3105	2747079.20	13431714.84	-4.1
3106	2744309.81	13430155.66	-4.1
3107	2743831.86	13430605.36	-4.1
3108	2743841.37	13430596.35	-4.1
3109	2743851.54	13430585.89	-4.1
3110	2743897.61	13430540.88	-4.1
3111	2743910.56	13430529.90	-4.1
3112	2743920.68	13430521.21	-4.1
3113	2743931.92	13430512.20	-4.1
3114	2743962.12	13430484.85	-4.1
3115	2743982.26	13430463.80	-4.1
3116	2747196.59	13431715.90	-4.1
3117	2743757.95	13430683.12	-4.1
3118	2743782.25	13430657.34	-4.1
3119	2747078.96	13431487.89	-4.1
3120	2747367.40	13431871.25	-4.1

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
3121	2747357.00	13431850.03	-4.1
3122	2747340.60	13431819.39	-4.1
3123	2747322.69	13431783.05	-4.1
3124	2747314.00	13431765.31	-4.1
3125	2747307.79	13431751.07	-4.1
3126	2747275.81	13431686.76	-4.1
3127	2747230.25	13431591.81	-4.1
3128	2743614.83	13429171.16	-4.1
3129	2743297.00	13430771.23	-4.1
3130	2747464.06	13431885.36	-4.1
3131	2743626.22	13430462.26	-4.1
3132	2743588.70	13430499.29	-4.1
3133	2743555.71	13430529.24	-4.1
3134	2743547.42	13430537.60	-4.1
3135	2743529.84	13430553.91	-4.1
3136	2743520.59	13430562.04	-4.1
3137	2743440.61	13430639.74	-4.1
3138	2743428.22	13430649.91	-4.1
3139	2743401.52	13430674.38	-4.1
3140	2743392.18	13430683.82	-4.1
3141	2743382.24	13430692.67	-4.1
3142	2743375.06	13430699.44	-4.1
3143	2743367.38	13430706.47	-4.1
3144	2743351.95	13430720.97	-4.1
3145	2743343.54	13430728.29	-4.1
3146	2743334.74	13430736.59	-4.1
3147	2745479.53	13430660.56	-4.1
3148	2745626.92	13430489.83	-4.1
3149	2747377.46	13431642.08	-4.1
3150	2747405.53	13431740.06	-4.1
3151	2747408.48	13431751.21	-4.1
3152	2744840.42	13429308.54	-4.1
3153	2744864.23	13429325.98	-4.1
3154	2744925.46	13429365.87	-4.1
3155	2744954.55	13429380.22	-4.1
3156	2744969.33	13429391.19	-4.1
3157	2744983.08	13429400.90	-4.1
3158	2743807.21	13430282.11	-4.1
3159	2743710.75	13430376.50	-4.1
3160	2743682.60	13430405.42	-4.1
3161	2743658.53	13430429.10	-4.1
3162	2743650.56	13430437.25	-4.1
3163	2743642.78	13430445.57	-4.1
3164	2745255.15	13430909.83	-4.1
3165	2745273.97	13430892.14	-4.1
3166	2745282.87	13430883.91	-4.1
3167	2745300.64	13430867.46	-4.1
3168	2745424.38	13430733.34	-4.1

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
3169	2745433.13	13430723.79	-4.1
3170	2745454.43	13430696.22	-4.1
3171	2745462.71	13430684.75	-4.1
3172	2744538.28	13429096.22	-4.1
3173	2744550.04	13429103.48	-4.1
3174	2744576.19	13429123.83	-4.1
3175	2744588.77	13429134.27	-4.1
3176	2744601.66	13429144.11	-4.1
3177	2744615.28	13429153.93	-4.1
3178	2744627.85	13429162.58	-4.1
3179	2744640.78	13429171.75	-4.1
3180	2744654.70	13429182.67	-4.1
3181	2744750.33	13429245.16	-4.1
3182	2744259.70	13429844.38	-4.1
3183	2744251.01	13429853.71	-4.1
3184	2744144.58	13429960.70	-4.1
3185	2744103.83	13429996.61	-4.1
3186	2744074.65	13430025.40	-4.1
3187	2744065.76	13430034.20	-4.1
3188	2744005.66	13430094.41	-4.1
3189	2745177.58	13430990.65	-4.1
3190	2744582.50	13429538.67	-4.1
3191	2744573.33	13429546.62	-4.1
3192	2744539.89	13429575.90	-4.1
3193	2744528.91	13429584.08	-4.1
3194	2744519.27	13429591.41	-4.1
3195	2744501.84	13429604.55	-4.1
3196	2744493.68	13429611.98	-4.1
3197	2744473.79	13429630.89	-4.1
3198	2744453.18	13429651.13	-4.1
3199	2744421.72	13429682.21	-4.1
3200	2744401.95	13429701.07	-4.1
3201	2744391.85	13429710.73	-4.1
3202	2744372.82	13429730.09	-4.1
3203	2744353.62	13429750.73	-4.1
3204	2744343.67	13429761.28	-4.1
3205	2744334.54	13429769.69	-4.1
3206	2744315.82	13429788.17	-4.1
3207	2744306.96	13429796.83	-4.1
3208	2744287.56	13429816.94	-4.1
3209	2744736.88	13431359.23	-4.1
3210	2744614.48	13429282.03	-4.1
3211	2744650.59	13429303.21	-4.1
3212	2744692.76	13429327.09	-4.1
3213	2744727.50	13429372.86	-4.1
3214	2744728.15	13429384.19	-4.1
3215	2744710.39	13429427.74	-4.1
3216	2744681.94	13429453.92	-4.1

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
3217	2744646.41	13429474.09	-4.1
3218	2744631.68	13429479.92	-4.1
3219	2744598.53	13429518.86	-4.1
3220	2744215.36	13431654.02	-4.1
3221	2744239.44	13431639.80	-4.1
3222	2744251.68	13431633.07	-4.1
3223	2744288.08	13431611.42	-4.1
3224	2744300.76	13431603.85	-4.1
3225	2744323.57	13431589.35	-4.1
3226	2744335.73	13431582.65	-4.1
3227	2746113.13	13431376.59	-4.1
3228	2744198.42	13429537.95	-4.1
3229	2744228.45	13429507.02	-4.1
3230	2744238.39	13429496.96	-4.1
3231	2744249.20	13429486.27	-4.1
3232	2744271.83	13429464.91	-4.1
3233	2744282.85	13429454.50	-4.1
3234	2744294.35	13429443.03	-4.1
3235	2744304.73	13429432.73	-4.1
3236	2744315.27	13429422.56	-4.1
3237	2744327.58	13429410.89	-4.1
3238	2744347.08	13429392.37	-4.1
3239	2744358.53	13429382.06	-4.1
3240	2744401.70	13429342.80	-4.1
3241	2744425.66	13429321.56	-4.1
3242	2744492.74	13429254.25	-4.1
3243	2744518.53	13429237.59	-4.1
3244	2746202.73	13431603.98	-4.1
3245	2746196.80	13431585.45	-4.1
3246	2746177.12	13431538.77	-4.1
3247	2746155.70	13431478.70	-4.1
3248	2746152.58	13431470.65	-4.1
3249	2746136.36	13431429.50	-4.1
3250	2743231.86	13429244.00	-4.1
3251	2743356.02	13429110.64	-4.1
3252	2743935.97	13429813.08	-4.1
3253	2743948.32	13429800.96	-4.1
3254	2744001.95	13429744.58	-4.1
3255	2744010.63	13429735.47	-4.1
3256	2744019.69	13429725.44	-4.1
3257	2744029.25	13429714.06	-4.1
3258	2744040.39	13429700.63	-4.1
3259	2744049.17	13429691.00	-4.1
3260	2744086.22	13429650.46	-4.1
3261	2744121.75	13429615.22	-4.1
3262	2744131.79	13429605.65	-4.1
3263	2744140.71	13429596.60	-4.1
3264	2744167.13	13429570.10	-4.1

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
3265	2744179.71	13429557.23	-4.1
3266	2744069.73	13431707.83	-4.1
3267	2744043.47	13431729.32	-4.1
3268	2744034.68	13431735.82	-4.1
3269	2743685.32	13430061.64	-4.1
3270	2743695.04	13430051.69	-4.1
3271	2743705.19	13430041.04	-4.1
3272	2743722.99	13430022.39	-4.1
3273	2744151.82	13431631.86	-4.1
3274	2744140.34	13431642.29	-4.1
3275	2744130.12	13431651.80	-4.1
3276	2744105.38	13431676.44	-4.1
3277	2747365.45	13432486.68	-4.1
3278	2747459.74	13432247.31	-4.1
3279	2742334.72	13430593.34	-4.1
3280	2745098.34	13430711.65	-4.1
3281	2745065.61	13430752.36	-4.1
3282	2745500.93	13430065.01	-4.1
3283	2745462.73	13430137.26	-4.1
3284	2743553.02	13429934.50	-4.1
3285	2743530.81	13429957.09	-4.1
3286	2743523.49	13429965.17	-4.1
3287	2745364.80	13429946.78	-4.1
3288	2745377.24	13429947.16	-4.1
3289	2745489.12	13430018.56	-4.1
3290	2745494.30	13430029.45	-4.1
3291	2747582.24	13432096.80	-4.1
3292	2743845.82	13429637.41	-4.1
3293	2743831.81	13429651.78	-4.1
3294	2743816.83	13429667.35	-4.1
3295	2743801.23	13429682.03	-4.1
3296	2743793.43	13429690.04	-4.1
3297	2744159.33	13429311.48	-4.1
3298	2744143.51	13429327.46	-4.1
3299	2744135.91	13429334.90	-4.1
3300	2744083.18	13429392.15	-4.1
3301	2744075.68	13429399.95	-4.1
3302	2744185.35	13429287.21	-4.1
3303	2744144.79	13431127.11	-4.1
3304	2743582.41	13431552.66	-4.1
3305	2744711.08	13431486.93	-4.1
3306	2744669.85	13431503.21	-4.1
3307	2744656.10	13431508.90	-4.1
3308	2744632.86	13431519.70	-4.1
3309	2744606.67	13431531.74	-4.1
3310	2744559.75	13431551.04	-4.1
3311	2744528.77	13431563.36	-4.1
3312	2743528.96	13429706.73	-4.1

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
3313	2743670.55	13429564.93	-4.1
3314	2743149.73	13430088.06	-4.1
3315	2743237.69	13429999.26	-4.1
3316	2743315.62	13429919.33	-4.1
3317	2743327.52	13429907.01	-4.1
3318	2743411.07	13429822.05	-4.1
3319	2743434.16	13429800.03	-4.1
3320	2742553.81	13430587.65	-4.1
3321	2742629.24	13430606.49	-4.1
3322	2742661.44	13430573.10	-4.1
3323	2742910.86	13430214.45	-4.1
3324	2742902.49	13430224.03	-4.1
3325	2742895.36	13430232.14	-4.1
3326	2742888.56	13430239.74	-4.1
3327	2742870.76	13430258.12	-4.1
3328	2742852.63	13430275.34	-4.1
3329	2742801.21	13430330.70	-4.1
3330	2742718.91	13430421.66	-4.1
3331	2742693.55	13430447.84	-4.1
3332	2742665.08	13430477.34	-4.1
3333	2743148.21	13429961.53	-4.1
3334	2743047.82	13430066.42	-4.1
3335	2743025.40	13430089.73	-4.1
3336	2742991.49	13430127.44	-4.1
3337	2742963.27	13430156.73	-4.1
3338	2742956.91	13430164.31	-4.1
3339	2742941.52	13430181.64	-4.1
3340	2746377.59	13431560.48	-4.1
3341	2746545.52	13431582.81	-4.1
3342	2746123.55	13431438.13	-4.1
3343	2746518.81	13431372.14	-4.1
3344	2743973.11	13430434.26	-4.1
3345	2744007.56	13430432.69	-4.1
3346	2744020.96	13430414.19	-4.1
3347	2744024.87	13430392.84	-4.1
3348	2746709.14	13431399.19	-4.1
3349	2746716.16	13431409.46	-4.1
3350	2746916.33	13431444.73	-4.1
3351	2746910.87	13431434.41	-4.1
3352	2747099.95	13431755.32	-4.1
3353	2747085.34	13431726.91	-4.1
3354	2742402.07	13430567.23	-4.1
3355	2742379.81	13430569.70	-4.1
3356	2743869.22	13430566.78	-4.1
3357	2743877.46	13430558.42	-4.1
3358	2743886.73	13430549.80	-4.1
3359	2743942.21	13430503.33	-4.1
3360	2743951.82	13430495.12	-4.1

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
3361	2743972.36	13430474.33	-4.1
3362	2744001.84	13430443.91	-4.1
3363	2747094.70	13431515.74	-4.1
3364	2747209.40	13431738.76	-4.1
3365	2747226.78	13431769.29	-4.1
3366	2747089.57	13431506.64	-4.1
3367	2743239.82	13431179.51	-4.1
3368	2747347.09	13431830.14	-4.1
3369	2747330.86	13431800.20	-4.1
3370	2747328.08	13431794.14	-4.1
3371	2747259.67	13431658.66	-4.1
3372	2747248.32	13431633.21	-4.1
3373	2747243.42	13431620.40	-4.1
3374	2747206.19	13431548.57	-4.1
3375	2747187.09	13431520.68	-4.1
3376	2743578.90	13429210.78	-4.1
3377	2743618.37	13430470.00	-4.1
3378	2743609.20	13430479.04	-4.1
3379	2743598.71	13430489.71	-4.1
3380	2743580.59	13430506.40	-4.1
3381	2743571.23	13430514.53	-4.1
3382	2743563.14	13430522.32	-4.1
3383	2743417.93	13430658.41	-4.1
3384	2743409.59	13430666.68	-4.1
3385	2745508.03	13430626.77	-4.1
3386	2745525.23	13430602.52	-4.1
3387	2745533.23	13430594.21	-4.1
3388	2745561.22	13430561.60	-4.1
3389	2745591.50	13430530.34	-4.1
3390	2745637.72	13430477.01	-4.1
3391	2745652.27	13430458.81	-4.1
3392	2747359.23	13431613.60	-4.1
3393	2747449.08	13431845.30	-4.1
3394	2744899.79	13429348.81	-4.0
3395	2744911.45	13429358.38	-4.0
3396	2745056.02	13429449.32	-4.0
3397	2743965.25	13430136.99	-4.0
3398	2743865.98	13430229.12	-4.0
3399	2743815.57	13430274.47	-4.0
3400	2743798.63	13430290.46	-4.0
3401	2743788.43	13430299.91	-4.0
3402	2743778.73	13430308.46	-4.0
3403	2743769.88	13430316.81	-4.0
3404	2743754.53	13430330.85	-4.0
3405	2743744.71	13430340.16	-4.0
3406	2743737.76	13430347.30	-4.0
3407	2743719.66	13430366.90	-4.0
3408	2743701.57	13430386.34	-4.0

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
3409	2743692.84	13430394.90	-4.0
3410	2743674.66	13430413.30	-4.0
3411	2745443.47	13430710.20	-4.0
3412	2747335.35	13431596.85	-4.0
3413	2744684.65	13429203.35	-4.0
3414	2744702.72	13429213.90	-4.0
3415	2744736.01	13429235.69	-4.0
3416	2744785.90	13429270.40	-4.0
3417	2744800.45	13429280.28	-4.0
3418	2744814.16	13429289.92	-4.0
3419	2744825.62	13429298.75	-4.0
3420	2744058.27	13430042.49	-4.0
3421	2744040.02	13430060.41	-4.0
3422	2744030.59	13430069.42	-4.0
3423	2744013.92	13430086.29	-4.0
3424	2743296.01	13429400.75	-4.0
3425	2743340.63	13429349.15	-4.0
3426	2744552.55	13429565.70	-4.0
3427	2744510.63	13429598.15	-4.0
3428	2744463.41	13429640.12	-4.0
3429	2744432.91	13429671.80	-4.0
3430	2744412.52	13429690.56	-4.0
3431	2744364.20	13429739.64	-4.0
3432	2744296.57	13429807.89	-4.0
3433	2744706.91	13429336.16	-4.0
3434	2744717.19	13429348.75	-4.0
3435	2744722.55	13429358.71	-4.0
3436	2744725.08	13429396.19	-4.0
3437	2744699.19	13429439.07	-4.0
3438	2744672.03	13429462.25	-4.0
3439	2744188.98	13431669.51	-4.0
3440	2744201.51	13431662.88	-4.0
3441	2744350.38	13431574.63	-4.0
3442	2744190.12	13429546.29	-4.0
3443	2744213.75	13429522.17	-4.0
3444	2746212.07	13431638.26	-4.0
3445	2746173.36	13431530.43	-4.0
3446	2746170.14	13431522.41	-4.0
3447	2746164.41	13431504.52	-4.0
3448	2746161.70	13431495.25	-4.0
3449	2746142.84	13431446.21	-4.0
3450	2746133.60	13431419.99	-4.0
3451	2743839.21	13429907.77	-4.0
3452	2744150.44	13429587.90	-4.0
3453	2743655.70	13430093.76	-4.0
3454	2743779.54	13429965.19	-4.0
3455	2743788.48	13429956.59	-4.0
3456	2743830.18	13429916.76	-4.0

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
3457	2747364.11	13432491.65	-4.0
3458	2743083.11	13431130.40	-4.0
3459	2742955.65	13430754.79	-4.0
3460	2742604.10	13430868.24	-4.0
3461	2745500.54	13430052.84	-4.0
3462	2745497.90	13430076.29	-4.0
3463	2745488.69	13430101.64	-4.0
3464	2743537.96	13429949.19	-4.0
3465	2743486.84	13430005.38	-4.0
3466	2743479.91	13430012.64	-4.0
3467	2743472.23	13430020.29	-4.0
3468	2745413.70	13429957.46	-4.0
3469	2745437.65	13429970.76	-4.0
3470	2745458.94	13429982.91	-4.0
3471	2745467.28	13429989.05	-4.0
3472	2745475.31	13429997.48	-4.0
3473	2747545.32	13432146.58	-4.0
3474	2743783.31	13429699.31	-4.0
3475	2743620.96	13429872.63	-4.0
3476	2744404.64	13431625.14	-4.0
3477	2744106.03	13431158.92	-4.0
3478	2744697.03	13431493.20	-4.0
3479	2744681.80	13431498.79	-4.0
3480	2744574.67	13431544.92	-4.0
3481	2744545.04	13431556.84	-4.0
3482	2744512.99	13431569.46	-4.0
3483	2744496.56	13431576.35	-4.0
3484	2743078.53	13430160.08	-4.0
3485	2743090.58	13430147.96	-4.0
3486	2743161.02	13430076.89	-4.0
3487	2743171.02	13430066.31	-4.0
3488	2743190.28	13430046.32	-4.0
3489	2743201.50	13430034.54	-4.0
3490	2743213.31	13430022.53	-4.0
3491	2743224.58	13430011.60	-4.0
3492	2743248.10	13429988.44	-4.0
3493	2743268.36	13429965.66	-4.0
3494	2743280.43	13429954.05	-4.0
3495	2743291.00	13429943.78	-4.0
3496	2743302.40	13429931.79	-4.0
3497	2743341.09	13429894.43	-4.0
3498	2743363.77	13429871.40	-4.0
3499	2743381.82	13429852.90	-4.0
3500	2743390.92	13429843.18	-4.0
3501	2743401.01	13429832.33	-4.0
3502	2742947.62	13430300.37	-4.0
3503	2742970.40	13430275.27	-4.0
3504	2743032.37	13430207.90	-4.0

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
3505	2743043.97	13430195.52	-4.0
3506	2743056.66	13430184.02	-4.0
3507	2743067.40	13430172.60	-4.0
3508	2742881.91	13430246.71	-4.0
3509	2742844.43	13430284.25	-4.0
3510	2742835.27	13430294.52	-4.0
3511	2742826.38	13430303.02	-4.0
3512	2742817.06	13430312.86	-4.0
3513	2742807.66	13430322.97	-4.0
3514	2742786.48	13430348.68	-4.0
3515	2742779.91	13430356.84	-4.0
3516	2742772.87	13430365.87	-4.0
3517	2742745.06	13430396.02	-4.0
3518	2742735.96	13430405.50	-4.0
3519	2742727.70	13430413.68	-4.0
3520	2742710.43	13430430.02	-4.0
3521	2742702.27	13430438.12	-4.0
3522	2742684.63	13430457.84	-4.0
3523	2742926.13	13430197.51	-4.0
3524	2746112.77	13431432.60	-4.0
3525	2746191.41	13431466.46	-4.0
3526	2743612.17	13429466.69	-4.0
3527	2743466.47	13429614.57	-4.0
3528	2746503.16	13431342.52	-4.0
3529	2746684.15	13431633.02	-4.0
3530	2743991.01	13430437.04	-4.0
3531	2746876.22	13431674.90	-4.0
3532	2746905.67	13431424.76	-4.0
3533	2747106.14	13431765.11	-4.0
3534	2747089.88	13431736.55	-4.0
3535	2743989.95	13430454.76	-4.0
3536	2744017.89	13430429.79	-4.0
3537	2744032.91	13430416.08	-4.0
3538	2744047.44	13430404.00	-4.0
3539	2747221.19	13431758.57	-4.0
3540	2747072.82	13431478.04	-4.0
3541	2747084.38	13431497.42	-4.0
3542	2747336.02	13431810.34	-4.0
3543	2747235.87	13431603.29	-4.0
3544	2747193.46	13431530.02	-4.0
3545	2743056.33	13431000.48	-4.0
3546	2747466.68	13431892.76	-4.0
3547	2747469.07	13431900.55	-4.0
3548	2747384.02	13431902.23	-4.0
3549	2745499.27	13430636.89	-4.0
3550	2745609.80	13430509.90	-4.0
3551	2745663.70	13430444.57	-4.0
3552	2747346.38	13431606.90	-4.0

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
3553	2747382.10	13431659.10	-4.0
3554	2747400.26	13431714.62	-4.0
3555	2747402.14	13431722.34	-4.0
3556	2747403.77	13431731.79	-4.0
3557	2744876.89	13429334.04	-4.0
3558	2744889.02	13429341.58	-4.0
3559	2744999.31	13429411.90	-4.0
3560	2745013.04	13429420.38	-4.0
3561	2745040.92	13429438.61	-4.0
3562	2745105.26	13429479.05	-4.0
3563	2745151.95	13429508.37	-4.0
3564	2743957.38	13430145.78	-4.0
3565	2743930.56	13430171.17	-4.0
3566	2743893.11	13430204.57	-4.0
3567	2743839.19	13430253.26	-4.0
3568	2743831.44	13430260.17	-4.0
3569	2743823.30	13430267.38	-4.0
3570	2743729.22	13430356.12	-4.0
3571	2743998.40	13430101.95	-4.0
3572	2743990.26	13430110.74	-4.0
3573	2743982.18	13430119.38	-4.0
3574	2743974.12	13430127.87	-4.0
3575	2743307.86	13429388.04	-4.0
3576	2746228.37	13431692.61	-4.0
3577	2746209.21	13431629.66	-4.0
3578	2746158.73	13431486.75	-4.0
3579	2743850.06	13429897.66	-4.0
3580	2742377.67	13430563.95	-4.0
3581	2743577.21	13430162.83	-4.0
3582	2743588.83	13430153.71	-4.0
3583	2743617.53	13430128.03	-4.0
3584	2743629.34	13430117.45	-4.0
3585	2743637.93	13430110.34	-4.0
3586	2743646.46	13430102.35	-4.0
3587	2743799.76	13429946.68	-4.0
3588	2743810.42	13429935.77	-4.0
3589	2743818.66	13429927.56	-4.0
3590	2743288.71	13430444.99	-4.0
3591	2743296.62	13430436.83	-4.0
3592	2743353.93	13430380.10	-4.0
3593	2743086.85	13431148.58	-4.0
3594	2742988.68	13430725.81	-4.0
3595	2743010.63	13430708.19	-4.0
3596	2747581.16	13432097.33	-4.0
3597	2747576.37	13432101.04	-4.0
3598	2747522.76	13432156.84	-4.0
3599	2745090.26	13430721.17	-4.0
3600	2745082.71	13430730.25	-4.0

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
3601	2743239.40	13430250.74	-4.0
3602	2743516.69	13429972.50	-3.9
3603	2743509.65	13429980.28	-3.9
3604	2743502.71	13429988.24	-3.9
3605	2743495.28	13429996.32	-3.9
3606	2743465.65	13430026.31	-3.9
3607	2743457.47	13430033.03	-3.9
3608	2743448.90	13430040.66	-3.9
3609	2743440.63	13430048.04	-3.9
3610	2743433.36	13430054.63	-3.9
3611	2743420.18	13430069.20	-3.9
3612	2743384.97	13430108.90	-3.9
3613	2743361.82	13430130.09	-3.9
3614	2743334.14	13430159.12	-3.9
3615	2743289.92	13430202.74	-3.9
3616	2743263.39	13430226.09	-3.9
3617	2745498.73	13430041.34	-3.9
3618	2747563.03	13432123.23	-3.9
3619	2744390.92	13431632.05	-3.9
3620	2744346.32	13431651.70	-3.9
3621	2743775.30	13429707.40	-3.9
3622	2744457.32	13431589.95	-3.9
3623	2744447.67	13431597.53	-3.9
3624	2744439.29	13431603.54	-3.9
3625	2744414.79	13431619.31	-3.9
3626	2743946.43	13429536.06	-3.9
3627	2743924.34	13429560.51	-3.9
3628	2743916.17	13429568.14	-3.9
3629	2744117.48	13431148.67	-3.9
3630	2744130.37	13431138.97	-3.9
3631	2744725.59	13431480.83	-3.9
3632	2744480.53	13431583.06	-3.9
3633	2743546.62	13431529.51	-3.9
3634	2743570.79	13431549.22	-3.9
3635	2745080.59	13431340.16	-3.9
3636	2744948.85	13431390.65	-3.9
3637	2743101.92	13430136.64	-3.9
3638	2743116.60	13430122.07	-3.9
3639	2743127.90	13430111.36	-3.9
3640	2743137.98	13430101.32	-3.9
3641	2743180.67	13430056.12	-3.9
3642	2743258.61	13429976.98	-3.9
3643	2742844.28	13430395.97	-3.9
3644	2742902.70	13430342.94	-3.9
3645	2742915.02	13430332.16	-3.9
3646	2742959.38	13430287.84	-3.9
3647	2742993.36	13430252.88	-3.9
3648	2743011.16	13430232.28	-3.9

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
3649	2743021.85	13430220.00	-3.9
3650	2742683.70	13430552.38	-3.9
3651	2742862.15	13430266.24	-3.9
3652	2742793.60	13430339.72	-3.9
3653	2742763.15	13430376.58	-3.9
3654	2742754.76	13430386.07	-3.9
3655	2746553.00	13431590.28	-3.9
3656	2746567.58	13431607.86	-3.9
3657	2746101.69	13431427.68	-3.9
3658	2746134.05	13431442.40	-3.9
3659	2746492.79	13431527.09	-3.9
3660	2747408.46	13431490.44	-3.9
3661	2747402.61	13431476.84	-3.9
3662	2747396.68	13431460.99	-3.9
3663	2747454.31	13431592.53	-3.9
3664	2743526.87	13429390.34	-3.9
3665	2743409.54	13429504.42	-3.9
3666	2746939.94	13431482.05	-3.9
3667	2747235.25	13431788.55	-3.9
3668	2747244.08	13431807.36	-3.9
3669	2743232.26	13431188.59	-3.9
3670	2743077.69	13431184.58	-3.9
3671	2747373.09	13431882.04	-3.9
3672	2747218.15	13431569.76	-3.9
3673	2747212.09	13431558.66	-3.9
3674	2743604.76	13429181.20	-3.9
3675	2743586.23	13429202.33	-3.9
3676	2747378.09	13431891.35	-3.9
3677	2745543.23	13430584.00	-3.9
3678	2745552.32	13430573.33	-3.9
3679	2745574.04	13430546.53	-3.9
3680	2745676.64	13430427.03	-3.9
3681	2747372.12	13431625.66	-3.9
3682	2747379.30	13431651.90	-3.9
3683	2744941.10	13429372.59	-3.9
3684	2745028.27	13429431.34	-3.9
3685	2745071.08	13429457.28	-3.9
3686	2745088.82	13429469.29	-3.9
3687	2745120.21	13429489.27	-3.9
3688	2745166.74	13429518.34	-3.9
3689	2743947.87	13430154.52	-3.9
3690	2743939.50	13430162.61	-3.9
3691	2743921.65	13430179.19	-3.9
3692	2743912.92	13430186.84	-3.9
3693	2743903.47	13430195.00	-3.9
3694	2743883.58	13430213.12	-3.9
3695	2743874.51	13430221.13	-3.9
3696	2743856.79	13430238.02	-3.9

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
3697	2743848.08	13430245.76	-3.9
3698	2743761.74	13430324.27	-3.9
3699	2743329.09	13429362.57	-3.9
3700	2746230.15	13431699.93	-3.9
3701	2746224.51	13431677.77	-3.9
3702	2746220.63	13431662.61	-3.9
3703	2746215.96	13431646.87	-3.9
3704	2743313.20	13429155.60	-3.9
3705	2743327.18	13429141.41	-3.9
3706	2743342.36	13429126.45	-3.9
3707	2743927.14	13429821.31	-3.9
3708	2743481.24	13430247.57	-3.9
3709	2743513.14	13430219.76	-3.9
3710	2743545.58	13430189.27	-3.9
3711	2743556.18	13430179.95	-3.9
3712	2743566.90	13430171.12	-3.9
3713	2743607.50	13430137.18	-3.9
3714	2743666.97	13430081.53	-3.9
3715	2743676.32	13430071.48	-3.9
3716	2743116.59	13430605.64	-3.9
3717	2743125.62	13430597.84	-3.9
3718	2743158.48	13430567.79	-3.9
3719	2743177.12	13430549.25	-3.9
3720	2743197.20	13430530.30	-3.9
3721	2743250.01	13430481.89	-3.9
3722	2743269.74	13430462.61	-3.9
3723	2743437.88	13430288.68	-3.9
3724	2743447.32	13430279.88	-3.9
3725	2747362.16	13432498.84	-3.9
3726	2747330.79	13432560.80	-3.9
3727	2747317.77	13432571.26	-3.9
3728	2742901.87	13430791.50	-3.9
3729	2742911.36	13430783.99	-3.9
3730	2742921.03	13430778.03	-3.9
3731	2742931.78	13430771.64	-3.9
3732	2742944.59	13430763.09	-3.9
3733	2742966.97	13430744.78	-3.9
3734	2742999.86	13430716.77	-3.9
3735	2743019.98	13430698.17	-3.9
3736	2743030.99	13430685.84	-3.9
3737	2743042.61	13430674.22	-3.9
3738	2743054.36	13430663.58	-3.9
3739	2743066.16	13430653.28	-3.9
3740	2743076.31	13430643.34	-3.9
3741	2743086.40	13430634.03	-3.9
3742	2743096.65	13430624.52	-3.9
3743	2747463.46	13432241.57	-3.9
3744	2742348.21	13430605.35	-3.9

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
3745	2743089.08	13431165.79	-3.9
3746	2745073.18	13430742.19	-3.9
3747	2743249.09	13430241.25	-3.9
3748	2743231.31	13430258.80	-3.9
3749	2743223.57	13430266.48	-3.9
3750	2743214.25	13430275.95	-3.9
3751	2743197.84	13430292.37	-3.9
3752	2743188.58	13430303.06	-3.9
3753	2743173.38	13430322.96	-3.9
3754	2743158.42	13430339.29	-3.9
3755	2743149.83	13430346.52	-3.9
3756	2743133.05	13430361.97	-3.9
3757	2743125.84	13430370.14	-3.9
3758	2743113.34	13430386.86	-3.9
3759	2743426.49	13430061.93	-3.9
3760	2743412.74	13430078.26	-3.9
3761	2743406.98	13430086.03	-3.9
3762	2743399.23	13430094.28	-3.9
3763	2743392.49	13430101.49	-3.9
3764	2743369.41	13430123.02	-3.9
3765	2743354.19	13430137.31	-3.9
3766	2743346.64	13430144.74	-3.9
3767	2743340.56	13430151.81	-3.9
3768	2743327.38	13430166.41	-3.9
3769	2743321.19	13430172.90	-3.9
3770	2743313.99	13430180.40	-3.9
3771	2743305.44	13430188.40	-3.9
3772	2743297.63	13430195.49	-3.9
3773	2743280.66	13430211.08	-3.9
3774	2743271.72	13430218.33	-3.9
3775	2743256.08	13430233.77	-3.9
3776	2747572.94	13432109.63	-3.9
3777	2747567.81	13432117.05	-3.9
3778	2747539.82	13432156.03	-3.9
3779	2744377.78	13431638.15	-3.9
3780	2744365.49	13431643.78	-3.9
3781	2744323.52	13431660.80	-3.9
3782	2744311.00	13431666.85	-3.9
3783	2744302.64	13431670.64	-3.9
3784	2744224.20	13431704.87	-3.9
3785	2744212.75	13431711.12	-3.9
3786	2744164.37	13431739.02	-3.9
3787	2747561.03	13432067.19	-3.9
3788	2744429.66	13431610.41	-3.9
3789	2744753.74	13431469.16	-3.9
3790	2744467.18	13431588.85	-3.9
3791	2744453.11	13431594.68	-3.9
3792	2744439.01	13431600.00	-3.9

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
3793	2743542.63	13429694.48	-3.9
3794	2743660.75	13429575.94	-3.9
3795	2743553.59	13431538.25	-3.9
3796	2743562.01	13431544.80	-3.9
3797	2745050.78	13431351.67	-3.9
3798	2745018.51	13431363.38	-3.9
3799	2745002.23	13431369.26	-3.9
3800	2744977.81	13431378.69	-3.9
3801	2744886.90	13431412.81	-3.9
3802	2744872.46	13431419.13	-3.9
3803	2744857.88	13431426.14	-3.9
3804	2744801.50	13431450.95	-3.9
3805	2742703.13	13430530.74	-3.9
3806	2742715.70	13430518.50	-3.9
3807	2742749.53	13430484.24	-3.9
3808	2742772.66	13430459.02	-3.9
3809	2742822.66	13430415.64	-3.9
3810	2742833.06	13430406.43	-3.9
3811	2742855.26	13430386.29	-3.9
3812	2742867.35	13430374.86	-3.9
3813	2742926.48	13430321.37	-3.9
3814	2742981.95	13430264.14	-3.9
3815	2743002.23	13430242.82	-3.9
3816	2742618.96	13430617.40	-3.9
3817	2742672.45	13430562.11	-3.9
3818	2746401.29	13431572.77	-3.8
3819	2746527.41	13431562.62	-3.8
3820	2746533.19	13431569.08	-3.8
3821	2746539.79	13431576.32	-3.8
3822	2746560.68	13431598.67	-3.8
3823	2746155.01	13431450.73	-3.8
3824	2746348.76	13431345.90	-3.8
3825	2746507.44	13431351.17	-3.8
3826	2747460.50	13431606.13	-3.8
3827	2747435.68	13431548.31	-3.8
3828	2747111.50	13431775.22	-3.8
3829	2747250.49	13431816.97	-3.8
3830	2747256.58	13431826.95	-3.8
3831	2745572.65	13430968.87	-3.8
3832	2743068.74	13431178.02	-3.8
3833	2743086.09	13431190.73	-3.8
3834	2743095.09	13431197.22	-3.8
3835	2743050.61	13431006.31	-3.8
3836	2745470.11	13429734.61	-3.8
3837	2745689.80	13430411.03	-3.8
3838	2747375.09	13431632.92	-3.8
3839	2747385.45	13431666.12	-3.8
3840	2747388.71	13431672.40	-3.8

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
3841	2747393.59	13431687.44	-3.8
3842	2745139.18	13429500.39	-3.8
3843	2745184.00	13429530.25	-3.8
3844	2745196.50	13429539.74	-3.8
3845	2743318.16	13429376.21	-3.8
3846	2746120.85	13431393.24	-3.8
3847	2746116.91	13431384.56	-3.8
3848	2746226.49	13431686.23	-3.8
3849	2746166.96	13431513.77	-3.8
3850	2743860.13	13429888.27	-3.8
3851	2742393.13	13430577.26	-3.8
3852	2743492.23	13430237.86	-3.8
3853	2743502.66	13430228.84	-3.8
3854	2743523.87	13430209.31	-3.8
3855	2743534.92	13430198.81	-3.8
3856	2743597.38	13430145.78	-3.8
3857	2743106.75	13430614.85	-3.8
3858	2743135.96	13430588.36	-3.8
3859	2743168.72	13430557.73	-3.8
3860	2743186.81	13430539.54	-3.8
3861	2743208.18	13430520.72	-3.8
3862	2743219.27	13430510.70	-3.8
3863	2743229.91	13430500.99	-3.8
3864	2743240.20	13430491.84	-3.8
3865	2743260.77	13430471.29	-3.8
3866	2743279.33	13430454.09	-3.8
3867	2743306.03	13430427.63	-3.8
3868	2743315.36	13430417.49	-3.8
3869	2743324.74	13430408.63	-3.8
3870	2743334.02	13430399.34	-3.8
3871	2743344.68	13430389.41	-3.8
3872	2743362.76	13430370.89	-3.8
3873	2743372.09	13430360.29	-3.8
3874	2743381.08	13430350.87	-3.8
3875	2743391.20	13430341.24	-3.8
3876	2743400.46	13430331.31	-3.8
3877	2743410.39	13430320.45	-3.8
3878	2743419.84	13430309.73	-3.8
3879	2743428.98	13430298.09	-3.8
3880	2743459.71	13430268.12	-3.8
3881	2743470.49	13430257.68	-3.8
3882	2747360.95	13432505.52	-3.8
3883	2747358.40	13432515.55	-3.8
3884	2747312.38	13432576.02	-3.8
3885	2743076.11	13431112.52	-3.8
3886	2742977.51	13430735.46	-3.8
3887	2742592.86	13430851.33	-3.8
3888	2742585.06	13430834.65	-3.8

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
3889	2742359.91	13430618.24	-3.8
3890	2743205.36	13430284.69	-3.8
3891	2743180.94	13430313.85	-3.8
3892	2743165.48	13430331.85	-3.8
3893	2743106.31	13430393.73	-3.8
3894	2743100.17	13430399.48	-3.8
3895	2743093.13	13430406.01	-3.8
3896	2743084.93	13430412.37	-3.8
3897	2743077.65	13430418.74	-3.8
3898	2743070.70	13430425.85	-3.8
3899	2743063.57	13430433.63	-3.8
3900	2743056.31	13430441.65	-3.8
3901	2743049.12	13430449.79	-3.8
3902	2743041.45	13430457.01	-3.8
3903	2743033.25	13430464.67	-3.8
3904	2743016.54	13430479.69	-3.8
3905	2743002.44	13430495.43	-3.8
3906	2747355.96	13432388.45	-3.8
3907	2747359.93	13432381.07	-3.8
3908	2743924.28	13431871.41	-3.8
3909	2743898.08	13431883.54	-3.8
3910	2743378.09	13430115.34	-3.8
3911	2747465.94	13432307.34	-3.8
3912	2744334.15	13431656.11	-3.8
3913	2744261.37	13431688.38	-3.8
3914	2744250.18	13431694.03	-3.8
3915	2744237.98	13431698.81	-3.8
3916	2744200.53	13431718.46	-3.8
3917	2744188.98	13431725.35	-3.8
3918	2744175.90	13431732.40	-3.8
3919	2743767.50	13429715.35	-3.8
3920	2743627.95	13429865.85	-3.8
3921	2743939.03	13429545.33	-3.8
3922	2743932.02	13429552.77	-3.8
3923	2744769.52	13431462.87	-3.8
3924	2744741.51	13431474.36	-3.8
3925	2745112.16	13431328.25	-3.8
3926	2745066.49	13431345.66	-3.8
3927	2745032.44	13431357.97	-3.8
3928	2744989.73	13431374.31	-3.8
3929	2744962.98	13431384.76	-3.8
3930	2744932.95	13431396.12	-3.8
3931	2744916.23	13431402.29	-3.8
3932	2744902.09	13431407.46	-3.8
3933	2744844.80	13431432.03	-3.8
3934	2744829.56	13431438.02	-3.8
3935	2744813.80	13431445.01	-3.8
3936	2744785.04	13431457.46	-3.8

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
3937	2742728.29	13430506.51	-3.8
3938	2742760.44	13430471.54	-3.8
3939	2742784.32	13430447.80	-3.8
3940	2742797.04	13430435.99	-3.8
3941	2742808.31	13430427.87	-3.8
3942	2742878.15	13430364.90	-3.8
3943	2742889.45	13430355.35	-3.8
3944	2742936.54	13430312.25	-3.8
3945	2742544.93	13430596.70	-3.8
3946	2742693.38	13430540.87	-3.8
3947	2746392.48	13431568.35	-3.8
3948	2746410.39	13431577.26	-3.8
3949	2746145.84	13431446.79	-3.8
3950	2746201.83	13431470.97	-3.8
3951	2743604.89	13429474.10	-3.8
3952	2747415.46	13431504.33	-3.8
3953	2747466.22	13431619.51	-3.8
3954	2747448.27	13431577.56	-3.8
3955	2747429.50	13431533.94	-3.8
3956	2746693.90	13431380.95	-3.8
3957	2746945.57	13431491.86	-3.8
3958	2747262.18	13431837.03	-3.7
3959	2747266.87	13431848.13	-3.7
3960	2747067.06	13431467.89	-3.7
3961	2743223.51	13431197.01	-3.7
3962	2745611.30	13430922.88	-3.7
3963	2745564.34	13430979.42	-3.7
3964	2747471.29	13431907.43	-3.7
3965	2747474.73	13431916.37	-3.7
3966	2747477.20	13431923.13	-3.7
3967	2745215.75	13429550.08	-3.7
3968	2745230.88	13429562.04	-3.7
3969	2745287.83	13429606.44	-3.7
3970	2745300.09	13429615.50	-3.7
3971	2745359.50	13429654.90	-3.7
3972	2745418.25	13429696.47	-3.7
3973	2745491.81	13429751.34	-3.7
3974	2745703.29	13430397.01	-3.7
3975	2747391.28	13431679.53	-3.7
3976	2747395.63	13431695.19	-3.7
3977	2746221.76	13431289.16	-3.7
3978	2746234.68	13431715.20	-3.7
3979	2746232.15	13431707.20	-3.7
3980	2746180.80	13431546.56	-3.7
3981	2743242.75	13429232.30	-3.7
3982	2742406.94	13430587.91	-3.7
3983	2743147.30	13430577.95	-3.7
3984	2747324.58	13432565.88	-3.7

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
3985	2747470.01	13432231.64	-3.7
3986	2743089.64	13431181.47	-3.7
3987	2742953.68	13430548.20	-3.7
3988	2742946.00	13430557.00	-3.7
3989	2742909.31	13430595.63	-3.7
3990	2742879.32	13430624.67	-3.7
3991	2742576.90	13430822.07	-3.7
3992	2743141.28	13430354.18	-3.7
3993	2743119.96	13430378.89	-3.7
3994	2743025.09	13430471.64	-3.7
3995	2743009.30	13430487.74	-3.7
3996	2742980.72	13430517.66	-3.7
3997	2742960.01	13430539.95	-3.7
3998	2747333.44	13432451.08	-3.7
3999	2743910.25	13431877.49	-3.7
4000	2743876.19	13431896.63	-3.7
4001	2744152.63	13431746.40	-3.7
4002	2744140.43	13431753.61	-3.7
4003	2744128.68	13431760.44	-3.7
4004	2744115.78	13431767.67	-3.7
4005	2744088.63	13431782.90	-3.7
4006	2744075.50	13431791.32	-3.7
4007	2744063.05	13431799.23	-3.7
4008	2744027.95	13431818.19	-3.7
4009	2745190.27	13431299.30	-3.7
4010	2745175.69	13431303.81	-3.7
4011	2745159.32	13431309.94	-3.7
4012	2745144.03	13431316.08	-3.7
4013	2745127.39	13431322.50	-3.7
4014	2745096.10	13431333.87	-3.7
4015	2745325.06	13431255.00	-3.7
4016	2745236.96	13431283.44	-3.7
4017	2745222.36	13431288.26	-3.7
4018	2745204.99	13431294.79	-3.7
4019	2742738.60	13430496.39	-3.7
4020	2742534.95	13430606.34	-3.7
4021	2746502.06	13431536.42	-3.7
4022	2746305.89	13431290.51	-3.7
4023	2746341.81	13431335.94	-3.7
4024	2747422.46	13431518.01	-3.7
4025	2746689.33	13431644.10	-3.7
4026	2747442.54	13431563.51	-3.7
4027	2746702.20	13431390.36	-3.7
4028	2746881.66	13431686.47	-3.7
4029	2743423.39	13429491.32	-3.7
4030	2747122.49	13431794.99	-3.7
4031	2747286.68	13431892.16	-3.7
4032	2747292.38	13431901.30	-3.7

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
4033	2747271.36	13431858.16	-3.7
4034	2747276.01	13431868.93	-3.7
4035	2745591.02	13430945.20	-3.7
4036	2745582.51	13430956.21	-3.7
4037	2745556.79	13430989.63	-3.7
4038	2743058.93	13431171.27	-3.7
4039	2743102.56	13431205.24	-3.7
4040	2747224.55	13431580.07	-3.7
4041	2747180.99	13431510.40	-3.7
4042	2745574.69	13429810.40	-3.7
4043	2743594.59	13429191.96	-3.7
4044	2747399.02	13431935.65	-3.7
4045	2745247.05	13429574.87	-3.7
4046	2745272.45	13429594.60	-3.7
4047	2745329.42	13429636.23	-3.7
4048	2745345.69	13429645.31	-3.7
4049	2745444.73	13429717.63	-3.7
4050	2745716.90	13430385.19	-3.7
4051	2746125.24	13431401.95	-3.7
4052	2746230.15	13431286.50	-3.7
4053	2746273.73	13431271.34	-3.7
4054	2746241.17	13431736.83	-3.7
4055	2746218.52	13431655.49	-3.7
4056	2746187.53	13431561.88	-3.7
4057	2743253.45	13429220.73	-3.7
4058	2743302.69	13429167.03	-3.7
4059	2743869.83	13429877.92	-3.6
4060	2742420.92	13430598.53	-3.6
4061	2742939.81	13430563.70	-3.6
4062	2742931.16	13430572.39	-3.6
4063	2742923.73	13430579.65	-3.6
4064	2742915.89	13430588.05	-3.6
4065	2742902.36	13430602.59	-3.6
4066	2742894.04	13430610.95	-3.6
4067	2742888.03	13430616.74	-3.6
4068	2742872.03	13430631.31	-3.6
4069	2742864.14	13430639.81	-3.6
4070	2742856.97	13430647.31	-3.6
4071	2742832.50	13430668.02	-3.6
4072	2742769.07	13430734.44	-3.6
4073	2742760.73	13430742.56	-3.6
4074	2742752.73	13430749.90	-3.6
4075	2742745.40	13430757.36	-3.6
4076	2742996.31	13430501.92	-3.6
4077	2742988.04	13430510.71	-3.6
4078	2742972.68	13430525.48	-3.6
4079	2742965.30	13430532.74	-3.6
4080	2747349.29	13432405.11	-3.6

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
4081	2747352.87	13432395.92	-3.6
4082	2747363.88	13432374.47	-3.6
4083	2744003.85	13431831.69	-3.6
4084	2743994.14	13431836.76	-3.6
4085	2743982.59	13431843.04	-3.6
4086	2743967.16	13431850.53	-3.6
4087	2743954.01	13431857.42	-3.6
4088	2743940.37	13431864.06	-3.6
4089	2743886.14	13431889.88	-3.6
4090	2744101.29	13431775.45	-3.6
4091	2744052.65	13431804.23	-3.6
4092	2744039.25	13431811.36	-3.6
4093	2744014.92	13431825.45	-3.6
4094	2743635.90	13429857.24	-3.6
4095	2745378.57	13431239.13	-3.6
4096	2745337.79	13431251.75	-3.6
4097	2745306.37	13431260.67	-3.6
4098	2745293.47	13431265.59	-3.6
4099	2745250.36	13431278.96	-3.6
4100	2742524.80	13430618.87	-3.6
4101	2746519.76	13431554.23	-3.6
4102	2746321.82	13431308.27	-3.6
4103	2743473.72	13429606.12	-3.6
4104	2746498.10	13431332.17	-3.6
4105	2747390.71	13431446.87	-3.6
4106	2747385.45	13431432.22	-3.6
4107	2746887.21	13431697.47	-3.6
4108	2746893.49	13431709.43	-3.6
4109	2746900.16	13431414.40	-3.6
4110	2747128.74	13431808.29	-3.6
4111	2747303.64	13431918.18	-3.6
4112	2747230.64	13431778.55	-3.6
4113	2743183.21	13431226.99	-3.6
4114	2745659.72	13430866.18	-3.6
4115	2742994.83	13431099.71	-3.6
4116	2743108.74	13431212.07	-3.6
4117	2745586.46	13429822.65	-3.6
4118	2745611.51	13429843.53	-3.6
4119	2743046.91	13431011.05	-3.6
4120	2747479.16	13431930.00	-3.6
4121	2747394.01	13431923.47	-3.6
4122	2747389.09	13431912.98	-3.6
4123	2745259.49	13429584.18	-3.6
4124	2745312.57	13429625.52	-3.6
4125	2745372.14	13429665.31	-3.6
4126	2745401.11	13429684.23	-3.6
4127	2745430.66	13429707.40	-3.6
4128	2745483.01	13429743.78	-3.6

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
4129	2745506.92	13429764.55	-3.6
4130	2745549.33	13429792.34	-3.6
4131	2747397.12	13431702.33	-3.6
4132	2746109.97	13431367.92	-3.6
4133	2746248.78	13431767.71	-3.6
4134	2746244.37	13431750.61	-3.6
4135	2746242.57	13431742.86	-3.6
4136	2746238.96	13431729.19	-3.6
4137	2746236.66	13431721.86	-3.6
4138	2746184.16	13431554.43	-3.6
4139	2743278.29	13429193.56	-3.6
4140	2742435.31	13430605.96	-3.6
4141	2742613.96	13430805.04	-3.6
4142	2747357.16	13432520.92	-3.6
4143	2747342.11	13432549.08	-3.6
4144	2747337.32	13432554.41	-3.6
4145	2747306.63	13432579.53	-3.6
4146	2747517.52	13432163.22	-3.6
4147	2747479.25	13432220.50	-3.6
4148	2747475.41	13432225.51	-3.6
4149	2742849.07	13430654.83	-3.6
4150	2742842.20	13430660.75	-3.6
4151	2742824.72	13430676.18	-3.6
4152	2742816.69	13430685.22	-3.6
4153	2742808.11	13430694.07	-3.6
4154	2742800.14	13430702.74	-3.6
4155	2742792.09	13430710.93	-3.6
4156	2742784.32	13430718.94	-3.6
4157	2742776.81	13430726.77	-3.6
4158	2742614.63	13430881.65	-3.6
4159	2742373.44	13430633.49	-3.6
4160	2747353.93	13432526.25	-3.6
4161	2747343.40	13432423.55	-3.6
4162	2743860.59	13431902.10	-3.6
4163	2743760.51	13429722.73	-3.6
4164	2743552.79	13429684.51	-3.5
4165	2745397.79	13431230.41	-3.5
4166	2745351.55	13431248.17	-3.5
4167	2745277.42	13431270.71	-3.5
4168	2745263.21	13431275.11	-3.5
4169	2742519.88	13430632.91	-3.5
4170	2742597.95	13430639.89	-3.5
4171	2746511.53	13431545.46	-3.5
4172	2746573.65	13431617.62	-3.5
4173	2746297.77	13431280.04	-3.5
4174	2746313.94	13431300.19	-3.5
4175	2746328.78	13431316.22	-3.5
4176	2747372.58	13431400.62	-3.5

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
4177	2747169.32	13431875.37	-3.5
4178	2747116.40	13431783.92	-3.5
4179	2747281.22	13431880.83	-3.5
4180	2747239.27	13431798.09	-3.5
4181	2747050.99	13431436.31	-3.5
4182	2743160.36	13431235.64	-3.5
4183	2743165.10	13431235.46	-3.5
4184	2743199.56	13431217.36	-3.5
4185	2743208.70	13431209.93	-3.5
4186	2745668.06	13430854.31	-3.5
4187	2745600.64	13430934.09	-3.5
4188	2747175.19	13431499.40	-3.5
4189	2742997.33	13431088.06	-3.5
4190	2742992.71	13431108.72	-3.5
4191	2747404.69	13431946.59	-3.5
4192	2745384.86	13429674.32	-3.5
4193	2745520.62	13429775.20	-3.5
4194	2745537.35	13429785.27	-3.5
4195	2745731.61	13430374.58	-3.5
4196	2745749.79	13430361.31	-3.5
4197	2746107.52	13431358.06	-3.5
4198	2746194.22	13431292.22	-3.5
4199	2746213.26	13431290.66	-3.5
4200	2746281.36	13431268.97	-3.5
4201	2743265.45	13429208.54	-3.5
4202	2743291.06	13429179.56	-3.5
4203	2743915.78	13429831.26	-3.5
4204	2747350.13	13432537.15	-3.5
4205	2747346.13	13432543.13	-3.5
4206	2743067.60	13431096.40	-3.5
4207	2747586.03	13432094.57	-3.5
4208	2747512.04	13432170.67	-3.5
4209	2747485.30	13432211.72	-3.5
4210	2742738.42	13430767.10	-3.5
4211	2742730.15	13430788.78	-3.5
4212	2742567.07	13430808.76	-3.5
4213	2742556.60	13430797.57	-3.5
4214	2742387.07	13430646.42	-3.5
4215	2747336.44	13432441.33	-3.5
4216	2747346.29	13432415.05	-3.5
4217	2743848.46	13431902.36	-3.5
4218	2743652.14	13429585.46	-3.5
4219	2745420.85	13431220.37	-3.5
4220	2742608.10	13430628.91	-3.5
4221	2746419.00	13431582.35	-3.5
4222	2746056.92	13431405.84	-3.5
4223	2746090.93	13431422.79	-3.5
4224	2746513.35	13431361.90	-3.5

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
4225	2747379.42	13431416.95	-3.5
4226	2746899.18	13431720.31	-3.4
4227	2746905.19	13431729.09	-3.4
4228	2743516.77	13429400.37	-3.4
4229	2747056.22	13431446.30	-3.4
4230	2747061.62	13431456.74	-3.4
4231	2743177.23	13431230.19	-3.4
4232	2743191.54	13431222.05	-3.4
4233	2745630.88	13430901.91	-3.4
4234	2745621.24	13430911.71	-3.4
4235	2745550.72	13430999.69	-3.4
4236	2747169.86	13431489.63	-3.4
4237	2747146.03	13431448.22	-3.4
4238	2742999.29	13431079.11	-3.4
4239	2745598.88	13429833.12	-3.4
4240	2745629.89	13429853.18	-3.4
4241	2745646.13	13429863.70	-3.4
4242	2745664.04	13429872.45	-3.4
4243	2745677.71	13429881.39	-3.4
4244	2745715.82	13429910.80	-3.4
4245	2745562.73	13429800.97	-3.4
4246	2746184.89	13431292.36	-3.4
4247	2746205.04	13431291.71	-3.4
4248	2743878.88	13429868.14	-3.4
4249	2742448.28	13430613.42	-3.4
4250	2742650.56	13430848.96	-3.4
4251	2742586.93	13430781.92	-3.4
4252	2742892.30	13430799.57	-3.4
4253	2742732.88	13430777.35	-3.4
4254	2742729.39	13430800.93	-3.4
4255	2742400.23	13430657.66	-3.4
4256	2747339.75	13432432.41	-3.4
4257	2747390.82	13432335.99	-3.4
4258	2747490.68	13432226.89	-3.4
4259	2747486.06	13432236.91	-3.4
4260	2743643.53	13429848.49	-3.4
4261	2745448.61	13431210.83	-3.4
4262	2745432.83	13431215.86	-3.4
4263	2746580.38	13431627.36	-3.4
4264	2746068.10	13431411.38	-3.4
4265	2743597.19	13429482.36	-3.4
4266	2747351.17	13431359.42	-3.4
4267	2746915.24	13431750.97	-3.4
4268	2743434.77	13429480.56	-3.4
4269	2743504.79	13429413.72	-3.4
4270	2746893.44	13431403.99	-3.4
4271	2747135.28	13431820.92	-3.4
4272	2747298.78	13431910.55	-3.4

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
4273	2747309.70	13431928.06	-3.4
4274	2747314.75	13431937.68	-3.4
4275	2747320.44	13431949.84	-3.4
4276	2745678.13	13430840.34	-3.4
4277	2745650.49	13430877.87	-3.4
4278	2745641.38	13430889.60	-3.4
4279	2747164.34	13431479.51	-3.4
4280	2743027.42	13431034.30	-3.4
4281	2745689.31	13429889.80	-3.4
4282	2743042.44	13431016.84	-3.4
4283	2747413.71	13431971.83	-3.4
4284	2746167.41	13431293.79	-3.3
4285	2746176.41	13431292.73	-3.3
4286	2746265.39	13431274.06	-3.3
4287	2746299.79	13431263.07	-3.3
4288	2746309.27	13431259.55	-3.3
4289	2743906.05	13429840.14	-3.3
4290	2742633.08	13430820.49	-3.3
4291	2742599.88	13430792.43	-3.3
4292	2742562.52	13430764.81	-3.3
4293	2743056.42	13431079.46	-3.3
4294	2743038.90	13431057.95	-3.3
4295	2747506.40	13432178.20	-3.3
4296	2747502.27	13432184.09	-3.3
4297	2747380.42	13432350.92	-3.3
4298	2747386.35	13432342.54	-3.3
4299	2746079.74	13431417.75	-3.3
4300	2746334.60	13431324.57	-3.3
4301	2747357.35	13431371.41	-3.3
4302	2746694.13	13431653.50	-3.3
4303	2746761.56	13431675.90	-3.3
4304	2746746.86	13431683.25	-3.3
4305	2743460.31	13429455.94	-3.3
4306	2743493.54	13429424.74	-3.3
4307	2746685.83	13431372.13	-3.3
4308	2747155.72	13431854.48	-3.3
4309	2747148.63	13431842.54	-3.3
4310	2745629.94	13431069.43	-3.3
4311	2745646.01	13431064.18	-3.3
4312	2745708.35	13431030.14	-3.3
4313	2747045.45	13431426.35	-3.3
4314	2745716.16	13430789.37	-3.3
4315	2747158.45	13431469.30	-3.3
4316	2747151.02	13431456.89	-3.3
4317	2747140.33	13431438.14	-3.3
4318	2743032.98	13431028.04	-3.3
4319	2743005.11	13431062.67	-3.3
4320	2743049.68	13431166.32	-3.3

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
4321	2745704.20	13429901.51	-3.3
4322	2745729.48	13429920.99	-3.3
4323	2745762.27	13430353.46	-3.3
4324	2746106.29	13431349.65	-3.3
4325	2746106.67	13431340.48	-3.3
4326	2746108.32	13431332.13	-3.3
4327	2746238.46	13431283.81	-3.3
4328	2746256.60	13431277.75	-3.3
4329	2746317.37	13431256.82	-3.3
4330	2742658.71	13430866.93	-3.3
4331	2742574.81	13430773.60	-3.3
4332	2747354.55	13432528.52	-3.3
4333	2747299.48	13432583.28	-3.3
4334	2743049.08	13431068.79	-3.3
4335	2747497.08	13432192.09	-3.3
4336	2747493.17	13432198.81	-3.3
4337	2747489.86	13432204.41	-3.3
4338	2742416.71	13430670.81	-3.3
4339	2747369.38	13432365.99	-3.2
4340	2743834.32	13431894.69	-3.2
4341	2742519.39	13430642.35	-3.2
4342	2742564.96	13430662.22	-3.2
4343	2742586.96	13430651.31	-3.2
4344	2746019.05	13431389.54	-3.2
4345	2746045.36	13431400.57	-3.2
4346	2746278.10	13431252.19	-3.2
4347	2746284.67	13431262.15	-3.2
4348	2743481.98	13429596.51	-3.2
4349	2746480.41	13431295.93	-3.2
4350	2747329.68	13431323.40	-3.2
4351	2746732.83	13431685.70	-3.2
4352	2746912.11	13431742.43	-3.2
4353	2746916.92	13431759.42	-3.2
4354	2746753.32	13431680.52	-3.2
4355	2746739.16	13431685.25	-3.2
4356	2743447.54	13429468.84	-3.2
4357	2743472.72	13429443.72	-3.2
4358	2743483.08	13429434.15	-3.2
4359	2747175.98	13431884.93	-3.2
4360	2747162.06	13431864.92	-3.2
4361	2747141.40	13431832.08	-3.2
4362	2745601.08	13431084.19	-3.2
4363	2745660.54	13431059.91	-3.2
4364	2745675.64	13431052.75	-3.2
4365	2745685.58	13431046.71	-3.2
4366	2745698.03	13431037.67	-3.2
4367	2747034.57	13431406.46	-3.2
4368	2747040.18	13431417.13	-3.2

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
4369	2745754.97	13430740.64	-3.2
4370	2745707.11	13430801.87	-3.2
4371	2745687.99	13430827.87	-3.2
4372	2743015.71	13431046.71	-3.2
4373	2743001.68	13431070.31	-3.2
4374	2742991.50	13431117.57	-3.2
4375	2745754.23	13429940.83	-3.2
4376	2746111.05	13431325.24	-3.2
4377	2746127.97	13431306.42	-3.2
4378	2746143.83	13431298.82	-3.2
4379	2746151.15	13431296.11	-3.2
4380	2746290.67	13431266.05	-3.2
4381	2743887.12	13429859.72	-3.2
4382	2743896.45	13429849.52	-3.2
4383	2742462.88	13430623.66	-3.2
4384	2742642.07	13430831.47	-3.2
4385	2742472.88	13430633.04	-3.2
4386	2743025.15	13431050.92	-3.2
4387	2742731.04	13430815.75	-3.2
4388	2742545.37	13430785.33	-3.2
4389	2742533.84	13430773.30	-3.2
4390	2742524.00	13430761.66	-3.2
4391	2742430.10	13430682.76	-3.2
4392	2747375.16	13432358.49	-3.2
4393	2743750.74	13429732.32	-3.2
4394	2743657.76	13429831.57	-3.2
4395	2743650.83	13429840.14	-3.2
4396	2742574.75	13430659.16	-3.2
4397	2746428.41	13431587.39	-3.1
4398	2745999.15	13431377.94	-3.1
4399	2746268.66	13431235.51	-3.1
4400	2746291.13	13431271.09	-3.1
4401	2746492.82	13431320.97	-3.1
4402	2746486.14	13431308.57	-3.1
4403	2747365.03	13431386.08	-3.1
4404	2746769.20	13431672.92	-3.1
4405	2746887.48	13431395.52	-3.1
4406	2747325.94	13431961.99	-3.1
4407	2747331.38	13431971.89	-3.1
4408	2745745.77	13430997.60	-3.1
4409	2745583.71	13431095.81	-3.1
4410	2745618.37	13431073.39	-3.1
4411	2745720.06	13431020.27	-3.1
4412	2745733.77	13431008.54	-3.1
4413	2745696.51	13430816.25	-3.1
4414	2747134.44	13431428.02	-3.1
4415	2745740.89	13429930.77	-3.1
4416	2745789.29	13430337.86	-3.1

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
4417	2745804.51	13430328.73	-3.1
4418	2745848.86	13430320.53	-3.1
4419	2747481.39	13431937.88	-3.1
4420	2745774.67	13430346.76	-3.1
4421	2746113.60	13431321.48	-3.1
4422	2746117.64	13431315.62	-3.1
4423	2746135.72	13431302.37	-3.1
4424	2746158.86	13431294.80	-3.1
4425	2742552.41	13430755.58	-3.1
4426	2742542.12	13430743.50	-3.1
4427	2743010.50	13431043.89	-3.1
4428	2742953.63	13431032.68	-3.1
4429	2742935.79	13431033.32	-3.1
4430	2742735.90	13430838.31	-3.1
4431	2742481.94	13430725.65	-3.1
4432	2742454.80	13430703.81	-3.1
4433	2742442.96	13430693.75	-3.1
4434	2747395.30	13432327.48	-3.1
4435	2747400.34	13432317.83	-3.1
4436	2747532.31	13432167.03	-3.1
4437	2743563.19	13429674.00	-3.1
4438	2743641.47	13429595.75	-3.1
4439	2742523.97	13430652.38	-3.1
4440	2742532.75	13430660.89	-3.1
4441	2742541.94	13430662.54	-3.1
4442	2742553.29	13430663.26	-3.1
4443	2746586.75	13431636.61	-3.1
4444	2746033.71	13431395.51	-3.1
4445	2743588.38	13429490.92	-3.1
4446	2743491.87	13429586.23	-3.1
4447	2746132.42	13431116.57	-3.1
4448	2746020.69	13431179.31	-3.1
4449	2747345.01	13431345.58	-3.1
4450	2746717.78	13431682.49	-3.1
4451	2746043.49	13431095.07	-3.1
4452	2747208.78	13431937.95	-3.1
4453	2747195.90	13431915.88	-3.1
4454	2745793.30	13430959.42	-3.0
4455	2745571.06	13431104.21	-3.0
4456	2745735.20	13430764.38	-3.0
4457	2745726.63	13430775.78	-3.0
4458	2745542.72	13431010.62	-3.0
4459	2745791.30	13430700.46	-3.0
4460	2745779.28	13430714.66	-3.0
4461	2745807.76	13429982.91	-3.0
4462	2747247.00	13431419.53	-3.0
4463	2747250.90	13431428.51	-3.0
4464	2747254.31	13431436.30	-3.0

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
4465	2747258.41	13431447.39	-3.0
4466	2747262.54	13431457.20	-3.0
4467	2746122.40	13431310.60	-3.0
4468	2746247.72	13431280.89	-3.0
4469	2742533.86	13430729.25	-3.0
4470	2742524.54	13430713.24	-3.0
4471	2742490.13	13430656.99	-3.0
4472	2742482.43	13430644.30	-3.0
4473	2742996.38	13431037.68	-3.0
4474	2743090.01	13431198.73	-3.0
4475	2742733.50	13430828.33	-3.0
4476	2742739.00	13430849.50	-3.0
4477	2742511.75	13430749.55	-3.0
4478	2742498.65	13430739.44	-3.0
4479	2742468.15	13430713.48	-3.0
4480	2743822.56	13431887.17	-3.0
4481	2743573.14	13429663.84	-3.0
4482	2746009.27	13431383.91	-3.0
4483	2746266.68	13431227.45	-3.0
4484	2746272.40	13431243.08	-3.0
4485	2747102.53	13431109.15	-3.0
4486	2747098.47	13431095.90	-3.0
4487	2747094.55	13431081.40	-3.0
4488	2746125.33	13431121.15	-3.0
4489	2746118.36	13431124.39	-3.0
4490	2746109.08	13431128.13	-3.0
4491	2746047.01	13431162.54	-3.0
4492	2746037.54	13431168.23	-3.0
4493	2746029.30	13431173.79	-3.0
4494	2746011.85	13431185.77	-3.0
4495	2746706.86	13431675.22	-3.0
4496	2746702.34	13431668.70	-3.0
4497	2746917.11	13431767.13	-3.0
4498	2746777.21	13431671.87	-3.0
4499	2747573.88	13431903.80	-3.0
4500	2746677.55	13431362.87	-3.0
4501	2746055.24	13431093.91	-3.0
4502	2747337.18	13431981.18	-3.0
4503	2745757.86	13430985.54	-3.0
4504	2745769.80	13430976.21	-3.0
4505	2745780.28	13430968.78	-3.0
4506	2745805.67	13430949.89	-3.0
4507	2745476.50	13431084.72	-3.0
4508	2747028.74	13431395.86	-3.0
4509	2745764.50	13430731.30	-3.0
4510	2745744.59	13430752.50	-3.0
4511	2747120.54	13431405.81	-3.0
4512	2745828.24	13430655.01	-3.0

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
4513	2745801.67	13430687.60	-3.0
4514	2745768.63	13429950.88	-3.0
4515	2745783.58	13429959.55	-3.0
4516	2745797.08	13429971.35	-3.0
4517	2745817.86	13430324.25	-3.0
4518	2745833.73	13430322.75	-3.0
4519	2745876.44	13430319.43	-3.0
4520	2747484.08	13431949.33	-3.0
4521	2747207.97	13431343.98	-3.0
4522	2747217.65	13431362.01	-3.0
4523	2747220.61	13431368.23	-3.0
4524	2747224.79	13431377.04	-3.0
4525	2747229.18	13431385.30	-3.0
4526	2747233.73	13431394.32	-3.0
4527	2742505.53	13430680.63	-2.9
4528	2742918.65	13431033.85	-2.9
4529	2742903.69	13431034.30	-2.9
4530	2742883.38	13430806.82	-2.9
4531	2742743.13	13430860.77	-2.9
4532	2747359.36	13432528.96	-2.9
4533	2747405.12	13432308.88	-2.9
4534	2747481.84	13432248.59	-2.9
4535	2747462.40	13432319.73	-2.9
4536	2747062.40	13431894.64	-2.9
4537	2745956.08	13431113.53	-2.9
4538	2746437.26	13431592.60	-2.9
4539	2745954.17	13431265.08	-2.9
4540	2745991.44	13431371.23	-2.9
4541	2743569.27	13429508.91	-2.9
4542	2746138.78	13431110.46	-2.9
4543	2746075.11	13431147.21	-2.9
4544	2746067.43	13431151.81	-2.9
4545	2746056.20	13431157.82	-2.9
4546	2746002.73	13431192.62	-2.9
4547	2745994.17	13431199.52	-2.9
4548	2745987.26	13431205.80	-2.9
4549	2745980.52	13431214.38	-2.9
4550	2745960.74	13431245.03	-2.9
4551	2747339.47	13431333.54	-2.9
4552	2747286.22	13431302.26	-2.9
4553	2746712.38	13431679.67	-2.9
4554	2746017.36	13431075.69	-2.9
4555	2746024.19	13431084.46	-2.9
4556	2746032.56	13431090.76	-2.9
4557	2746066.72	13431091.44	-2.9
4558	2746077.03	13431088.02	-2.9
4559	2746086.07	13431082.84	-2.9
4560	2747202.15	13431927.11	-2.9

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
4561	2747189.18	13431905.81	-2.9
4562	2747183.11	13431896.29	-2.9
4563	2747127.48	13431417.02	-2.9
4564	2742992.21	13431124.99	-2.9
4565	2743039.71	13431161.91	-2.9
4566	2745819.59	13430666.14	-2.9
4567	2745811.17	13430677.16	-2.9
4568	2745823.45	13429996.40	-2.9
4569	2745862.91	13430317.13	-2.9
4570	2745890.37	13430323.59	-2.9
4571	2747212.74	13431352.61	-2.9
4572	2746327.25	13431253.76	-2.9
4573	2746335.75	13431250.95	-2.9
4574	2746344.86	13431247.39	-2.9
4575	2742513.16	13430694.04	-2.9
4576	2742497.54	13430668.18	-2.9
4577	2742968.18	13431033.78	-2.9
4578	2742872.63	13430815.99	-2.9
4579	2742747.26	13430870.31	-2.9
4580	2747409.03	13432300.46	-2.9
4581	2743809.49	13431879.76	-2.9
4582	2743664.39	13429822.98	-2.9
4583	2747044.07	13431891.67	-2.9
4584	2743583.02	13429653.99	-2.8
4585	2743633.52	13429604.31	-2.8
4586	2745463.76	13431206.17	-2.8
4587	2745970.48	13431111.14	-2.8
4588	2745659.20	13431144.20	-2.8
4589	2746591.80	13431644.58	-2.8
4590	2745952.17	13431275.77	-2.8
4591	2743578.56	13429500.44	-2.8
4592	2743500.14	13429577.96	-2.8
4593	2746099.88	13431132.42	-2.8
4594	2746091.19	13431137.76	-2.8
4595	2745966.18	13431233.26	-2.8
4596	2746474.42	13431283.82	-2.8
4597	2747317.99	13431315.39	-2.8
4598	2746663.82	13431348.26	-2.8
4599	2746011.80	13431065.12	-2.8
4600	2747222.22	13431960.39	-2.8
4601	2745817.06	13430941.68	-2.8
4602	2745467.15	13431097.36	-2.8
4603	2747024.26	13431384.82	-2.8
4604	2745887.81	13430583.00	-2.8
4605	2745853.69	13430623.11	-2.8
4606	2745845.47	13430634.49	-2.8
4607	2745836.79	13430644.74	-2.8
4608	2745838.93	13430008.25	-2.8

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
4609	2745906.64	13430328.65	-2.8
4610	2747416.97	13431981.53	-2.8
4611	2747203.47	13431336.39	-2.8
4612	2747292.72	13432585.52	-2.8
4613	2742886.38	13431033.95	-2.8
4614	2743771.27	13431852.94	-2.8
4615	2747472.59	13432284.86	-2.8
4616	2743741.87	13429741.43	-2.8
4617	2747057.53	13431892.25	-2.8
4618	2747067.40	13431898.28	-2.8
4619	2746932.41	13431811.13	-2.8
4620	2745819.87	13431141.67	-2.8
4621	2745808.39	13431145.83	-2.8
4622	2745644.73	13431143.07	-2.8
4623	2746049.68	13431092.51	-2.8
4624	2746033.38	13431095.38	-2.8
4625	2746017.16	13431099.40	-2.8
4626	2746000.25	13431103.20	-2.8
4627	2745985.25	13431107.18	-2.8
4628	2746599.22	13431656.38	-2.8
4629	2746612.75	13431675.59	-2.8
4630	2745957.05	13431255.84	-2.8
4631	2745951.82	13431285.12	-2.8
4632	2745969.59	13431343.64	-2.8
4633	2745976.15	13431353.90	-2.8
4634	2745983.27	13431363.10	-2.8
4635	2745973.73	13431223.17	-2.8
4636	2746464.12	13431260.93	-2.8
4637	2747302.88	13431309.16	-2.8
4638	2747230.49	13431270.56	-2.8
4639	2746724.16	13431684.88	-2.8
4640	2746913.33	13431775.68	-2.7
4641	2746844.61	13431734.08	-2.7
4642	2746790.83	13431673.67	-2.7
4643	2746784.46	13431672.35	-2.7
4644	2746670.41	13431354.89	-2.7
4645	2746097.69	13431076.01	-2.7
4646	2746028.22	13431022.36	-2.7
4647	2747233.53	13431983.79	-2.7
4648	2747215.14	13431948.78	-2.7
4649	2745827.25	13430934.91	-2.7
4650	2745839.83	13430924.81	-2.7
4651	2745851.29	13430916.57	-2.7
4652	2745873.79	13430900.18	-2.7
4653	2745885.46	13430890.73	-2.7
4654	2745895.89	13430880.58	-2.7
4655	2745908.07	13430868.86	-2.7
4656	2745918.14	13430859.04	-2.7

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
4657	2745937.71	13430834.66	-2.7
4658	2745486.59	13431073.92	-2.7
4659	2743027.31	13431157.02	-2.7
4660	2745917.86	13430545.89	-2.7
4661	2745910.88	13430554.55	-2.7
4662	2745904.01	13430564.13	-2.7
4663	2745896.64	13430573.28	-2.7
4664	2745877.82	13430592.91	-2.7
4665	2745869.01	13430602.61	-2.7
4666	2745862.76	13430611.19	-2.7
4667	2745853.74	13430017.70	-2.7
4668	2747430.16	13432003.02	-2.7
4669	2747424.66	13431994.46	-2.7
4670	2747179.13	13431295.68	-2.7
4671	2747064.15	13431138.13	-2.7
4672	2747073.43	13431141.65	-2.7
4673	2747081.10	13431146.59	-2.7
4674	2747087.49	13431153.34	-2.7
4675	2746399.01	13431234.37	-2.7
4676	2746353.84	13431244.53	-2.7
4677	2746362.17	13431242.51	-2.7
4678	2746381.15	13431238.63	-2.7
4679	2742982.57	13431035.75	-2.7
4680	2742872.11	13431034.90	-2.7
4681	2742753.34	13430881.90	-2.7
4682	2743150.73	13431265.95	-2.7
4683	2743137.59	13431251.17	-2.7
4684	2743121.67	13431235.63	-2.7
4685	2743794.97	13431872.02	-2.7
4686	2743782.74	13431862.44	-2.7
4687	2747552.00	13432066.58	-2.7
4688	2747053.76	13431891.05	-2.7
4689	2747071.58	13431902.88	-2.7
4690	2747076.26	13431908.00	-2.7
4691	2743592.40	13429645.00	-2.7
4692	2743602.89	13429634.73	-2.7
4693	2746921.69	13431808.07	-2.7
4694	2746927.29	13431809.07	-2.7
4695	2746955.10	13431836.02	-2.7
4696	2745941.04	13431115.14	-2.7
4697	2745926.30	13431117.88	-2.7
4698	2745896.01	13431122.62	-2.7
4699	2745881.96	13431125.74	-2.7
4700	2745776.02	13431154.63	-2.7
4701	2745761.18	13431158.69	-2.7
4702	2745675.82	13431146.64	-2.7
4703	2746841.68	13431739.47	-2.7
4704	2746606.54	13431667.81	-2.7

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
4705	2746625.21	13431690.32	-2.7
4706	2745958.60	13431316.01	-2.7
4707	2746270.12	13431213.47	-2.7
4708	2746267.72	13431219.97	-2.7
4709	2747119.93	13431150.39	-2.7
4710	2747112.62	13431137.28	-2.7
4711	2747106.49	13431123.01	-2.7
4712	2743560.23	13429517.08	-2.7
4713	2743524.13	13429552.85	-2.7
4714	2743515.44	13429561.93	-2.7
4715	2746159.28	13431063.33	-2.7
4716	2746148.16	13431095.50	-2.7
4717	2746143.96	13431103.40	-2.7
4718	2747273.95	13431296.15	-2.7
4719	2747259.55	13431288.81	-2.7
4720	2747245.25	13431281.08	-2.7
4721	2747218.59	13431262.23	-2.7
4722	2746908.13	13431784.14	-2.7
4723	2746840.84	13431727.90	-2.7
4724	2746638.83	13431315.22	-2.7
4725	2746109.69	13431067.61	-2.7
4726	2746119.55	13431056.41	-2.7
4727	2746130.42	13431045.57	-2.7
4728	2746881.55	13431385.91	-2.7
4729	2746073.61	13430967.82	-2.7
4730	2746040.91	13431004.36	-2.7
4731	2746034.48	13431013.74	-2.7
4732	2747238.21	13431994.22	-2.7
4733	2747228.36	13431972.52	-2.7
4734	2745863.42	13430907.65	-2.7
4735	2745968.32	13430803.17	-2.7
4736	2747019.21	13431373.19	-2.7
4737	2747107.73	13431384.42	-2.7
4738	2747101.74	13431375.00	-2.7
4739	2747089.15	13431353.34	-2.7
4740	2742994.64	13431132.26	-2.7
4741	2743016.04	13431151.88	-2.7
4742	2745926.29	13430536.31	-2.7
4743	2745868.17	13430028.42	-2.7
4744	2745882.99	13430040.04	-2.7
4745	2745925.82	13430333.28	-2.7
4746	2745943.04	13430340.35	-2.7
4747	2745956.36	13430343.85	-2.7
4748	2747484.77	13431954.71	-2.7
4749	2747198.34	13431327.47	-2.6
4750	2746438.54	13431226.14	-2.6
4751	2746389.42	13431236.58	-2.6
4752	2742759.83	13430894.16	-2.6

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
4753	2742807.35	13430905.66	-2.6
4754	2747589.17	13432093.35	-2.6
4755	2743756.17	13431840.92	-2.6
4756	2747498.05	13432215.16	-2.6
4757	2743734.43	13429748.84	-2.6
4758	2743672.34	13429814.28	-2.6
4759	2743612.77	13429625.06	-2.6
4760	2743622.96	13429614.73	-2.6
4761	2746940.66	13431816.42	-2.6
4762	2746953.50	13431832.88	-2.6
4763	2746955.15	13431840.01	-2.6
4764	2746954.64	13431843.66	-2.6
4765	2745909.50	13431121.46	-2.6
4766	2745866.21	13431129.31	-2.6
4767	2745850.08	13431134.47	-2.6
4768	2745834.45	13431137.86	-2.6
4769	2745791.67	13431150.84	-2.6
4770	2745745.06	13431161.92	-2.6
4771	2746838.53	13431735.54	-2.6
4772	2746843.81	13431745.43	-2.6
4773	2746077.31	13431088.97	-2.6
4774	2746063.05	13431090.78	-2.6
4775	2746444.52	13431596.41	-2.6
4776	2746620.01	13431683.30	-2.6
4777	2745953.22	13431295.23	-2.6
4778	2745961.53	13431324.88	-2.6
4779	2745965.13	13431334.29	-2.6
4780	2743542.80	13429534.18	-2.6
4781	2743532.13	13429544.36	-2.6
4782	2743508.06	13429569.52	-2.6
4783	2746201.36	13431038.51	-2.6
4784	2746193.16	13431041.26	-2.6
4785	2746167.02	13431055.99	-2.6
4786	2746155.19	13431070.13	-2.6
4787	2746152.88	13431077.58	-2.6
4788	2746151.11	13431086.75	-2.6
4789	2746469.20	13431272.41	-2.6
4790	2746327.11	13431194.53	-2.6
4791	2747204.86	13431251.58	-2.6
4792	2746856.82	13431753.60	-2.6
4793	2746643.09	13431323.90	-2.6
4794	2746657.08	13431341.26	-2.6
4795	2746140.08	13431034.98	-2.6
4796	2746163.35	13431012.54	-2.6
4797	2746173.67	13431002.27	-2.6
4798	2746201.99	13430973.16	-2.6
4799	2746082.14	13430958.64	-2.6
4800	2746065.68	13430975.58	-2.6

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
4801	2746047.61	13430993.77	-2.6
4802	2747241.27	13432006.29	-2.6
4803	2745929.54	13430846.23	-2.6
4804	2745958.30	13430813.17	-2.6
4805	2745979.56	13430792.73	-2.6
4806	2745990.10	13430783.65	-2.6
4807	2747114.36	13431395.08	-2.6
4808	2747095.35	13431364.08	-2.6
4809	2743002.13	13431143.30	-2.6
4810	2745976.72	13430482.12	-2.6
4811	2745964.11	13430494.99	-2.6
4812	2745954.38	13430505.25	-2.6
4813	2745935.45	13430526.16	-2.6
4814	2745896.17	13430050.01	-2.6
4815	2745911.18	13430060.28	-2.6
4816	2745970.62	13430345.70	-2.6
4817	2745983.00	13430346.84	-2.6
4818	2747438.82	13432011.77	-2.6
4819	2746962.22	13431118.82	-2.6
4820	2747054.22	13431134.82	-2.6
4821	2746418.67	13431230.11	-2.6
4822	2746457.49	13431222.45	-2.6
4823	2747286.25	13432586.27	-2.6
4824	2742856.79	13431033.58	-2.6
4825	2742797.35	13430906.64	-2.6
4826	2742817.63	13430899.90	-2.6
4827	2742825.43	13430889.21	-2.6
4828	2742829.85	13430881.19	-2.6
4829	2742834.81	13430869.92	-2.6
4830	2742862.19	13430826.56	-2.6
4831	2743159.11	13431277.86	-2.6
4832	2743109.42	13431226.29	-2.6
4833	2743094.91	13431212.82	-2.6
4834	2742643.94	13430906.16	-2.6
4835	2747365.24	13432531.79	-2.5
4836	2743694.02	13429790.13	-2.5
4837	2743688.68	13429797.39	-2.5
4838	2743680.20	13429806.09	-2.5
4839	2746916.91	13431807.97	-2.5
4840	2746936.96	13431813.45	-2.5
4841	2746945.75	13431821.38	-2.5
4842	2746950.96	13431828.16	-2.5
4843	2746952.77	13431847.13	-2.5
4844	2746949.58	13431850.44	-2.5
4845	2746946.68	13431853.10	-2.5
4846	2745729.10	13431161.10	-2.5
4847	2746108.86	13431083.13	-2.5
4848	2746091.30	13431087.10	-2.5

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
4849	2746630.46	13431697.78	-2.5
4850	2746637.32	13431709.23	-2.5
4851	2745955.75	13431305.41	-2.5
4852	2743551.39	13429525.82	-2.5
4853	2746184.33	13431045.53	-2.5
4854	2746175.56	13431049.98	-2.5
4855	2746452.82	13431237.53	-2.5
4856	2746356.41	13431176.48	-2.5
4857	2746344.41	13431187.30	-2.5
4858	2746316.66	13431195.23	-2.5
4859	2746295.94	13431195.93	-2.5
4860	2746281.03	13431201.87	-2.5
4861	2746274.41	13431207.10	-2.5
4862	2746220.80	13431032.14	-2.5
4863	2746798.51	13431676.73	-2.5
4864	2746649.50	13431332.51	-2.5
4865	2746152.40	13431022.95	-2.5
4866	2746870.14	13431366.90	-2.5
4867	2746164.11	13430871.88	-2.5
4868	2746136.20	13430904.43	-2.5
4869	2746090.86	13430949.07	-2.5
4870	2745949.01	13430822.88	-2.5
4871	2746003.11	13430774.81	-2.5
4872	2746014.61	13430763.46	-2.5
4873	2746047.37	13430735.70	-2.5
4874	2745555.54	13431116.17	-2.5
4875	2745533.09	13431021.36	-2.5
4876	2745494.28	13431064.66	-2.5
4877	2745940.91	13430081.14	-2.5
4878	2742997.21	13431137.95	-2.5
4879	2743007.70	13431147.07	-2.5
4880	2746021.64	13430433.45	-2.5
4881	2745945.17	13430516.30	-2.5
4882	2745925.72	13430070.61	-2.5
4883	2745997.40	13430347.20	-2.5
4884	2747444.90	13432015.55	-2.5
4885	2747434.35	13432008.14	-2.5
4886	2747023.24	13431125.79	-2.5
4887	2747034.58	13431128.59	-2.5
4888	2746409.05	13431232.32	-2.5
4889	2746429.20	13431228.05	-2.5
4890	2747231.10	13432320.84	-2.5
4891	2742767.48	13430901.33	-2.5
4892	2742848.37	13430846.00	-2.5
4893	2742854.96	13430835.38	-2.5
4894	2747550.79	13432070.48	-2.5
4895	2742625.15	13430893.24	-2.5
4896	2743743.24	13431831.72	-2.5

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
4897	2743726.74	13429756.45	-2.5
4898	2747036.93	13431892.37	-2.5
4899	2746948.83	13431824.52	-2.5
4900	2746942.35	13431857.15	-2.5
4901	2746910.66	13431808.52	-2.5
4902	2745709.47	13431156.00	-2.5
4903	2745629.09	13431146.68	-2.5
4904	2746844.74	13431752.74	-2.5
4905	2746305.43	13431052.06	-2.5
4906	2746182.04	13431070.48	-2.5
4907	2746162.54	13431073.24	-2.5
4908	2746644.00	13431719.18	-2.4
4909	2746652.78	13431727.48	-2.4
4910	2746458.45	13431248.99	-2.4
4911	2746372.44	13431165.87	-2.4
4912	2746337.80	13431190.91	-2.4
4913	2746284.76	13431199.54	-2.4
4914	2746260.06	13431015.25	-2.4
4915	2746240.04	13431024.92	-2.4
4916	2746210.95	13431035.11	-2.4
4917	2746900.96	13431790.30	-2.4
4918	2746635.63	13431306.28	-2.4
4919	2746216.17	13430954.71	-2.4
4920	2746232.64	13430943.56	-2.4
4921	2746876.06	13431376.93	-2.4
4922	2746126.27	13430913.83	-2.4
4923	2746117.65	13430922.43	-2.4
4924	2746109.11	13430931.09	-2.4
4925	2746100.06	13430939.81	-2.4
4926	2747251.95	13432029.07	-2.4
4927	2746025.23	13430754.26	-2.4
4928	2746056.74	13430725.75	-2.4
4929	2746066.48	13430715.00	-2.4
4930	2747013.12	13431361.94	-2.4
4931	2745952.09	13430090.43	-2.4
4932	2745961.15	13430101.28	-2.4
4933	2746008.94	13430443.01	-2.4
4934	2745997.87	13430455.55	-2.4
4935	2745987.30	13430470.14	-2.4
4936	2746012.18	13430346.23	-2.4
4937	2747485.75	13431961.90	-2.4
4938	2747044.79	13431131.70	-2.4
4939	2747093.67	13431160.39	-2.4
4940	2746447.85	13431224.50	-2.4
4941	2742670.53	13430892.35	-2.4
4942	2742776.94	13430905.46	-2.4
4943	2742786.29	13430907.08	-2.4
4944	2742840.22	13430859.52	-2.4

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
4945	2747412.64	13432289.98	-2.4
4946	2742657.27	13430907.96	-2.4
4947	2742633.30	13430900.73	-2.4
4948	2747372.76	13432533.44	-2.4
4949	2743731.80	13431821.98	-2.4
4950	2747478.15	13432261.78	-2.4
4951	2743717.90	13429765.47	-2.4
4952	2743709.09	13429774.31	-2.4
4953	2743701.42	13429782.05	-2.4
4954	2747080.04	13431912.47	-2.4
4955	2746938.23	13431861.33	-2.4
4956	2745691.61	13431150.26	-2.4
4957	2746833.98	13431731.94	-2.4
4958	2746451.83	13431600.28	-2.4
4959	2747129.95	13431163.64	-2.4
4960	2746448.13	13431226.70	-2.4
4961	2746419.22	13431171.39	-2.4
4962	2746410.86	13431167.13	-2.4
4963	2746401.20	13431164.82	-2.4
4964	2746307.50	13431194.77	-2.4
4965	2747191.74	13431238.54	-2.4
4966	2746271.26	13431009.20	-2.4
4967	2746250.17	13431020.19	-2.4
4968	2746230.92	13431028.91	-2.4
4969	2746836.64	13431720.74	-2.4
4970	2746833.51	13431714.83	-2.4
4971	2746812.17	13431688.23	-2.4
4972	2746184.81	13430992.71	-2.4
4973	2746195.40	13430982.63	-2.4
4974	2746209.07	13430962.58	-2.4
4975	2746242.07	13430937.63	-2.4
4976	2746863.87	13431358.20	-2.4
4977	2746196.94	13430822.87	-2.4
4978	2746175.21	13430855.37	-2.4
4979	2746153.74	13430885.72	-2.4
4980	2746055.65	13430984.58	-2.4
4981	2747258.41	13432041.70	-2.4
4982	2747246.77	13432018.23	-2.4
4983	2746075.82	13430705.44	-2.4
4984	2746085.39	13430695.55	-2.4
4985	2746105.27	13430680.45	-2.4
4986	2746037.49	13430745.19	-2.3
4987	2745974.45	13430111.83	-2.3
4988	2746024.90	13430351.40	-2.3
4989	2746043.24	13430360.10	-2.3
4990	2746046.05	13430417.86	-2.3
4991	2747486.05	13431969.61	-2.3
4992	2747450.85	13432017.66	-2.3

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
4993	2746476.29	13431218.32	-2.3
4994	2747208.30	13432318.60	-2.3
4995	2747238.40	13432321.82	-2.3
4996	2743169.72	13431292.95	-2.3
4997	2743721.91	13431810.98	-2.3
4998	2747524.57	13432177.06	-2.3
4999	2746246.24	13431059.13	-2.3
5000	2746233.48	13431059.90	-2.3
5001	2746215.68	13431062.40	-2.3
5002	2746123.81	13431079.45	-2.3
5003	2746662.06	13431731.02	-2.3
5004	2746686.41	13431731.74	-2.3
5005	2747141.09	13431177.68	-2.3
5006	2746443.31	13431214.20	-2.3
5007	2746432.70	13431187.43	-2.3
5008	2746426.17	13431178.48	-2.3
5009	2746391.61	13431163.35	-2.3
5010	2746381.75	13431164.06	-2.3
5011	2746364.37	13431169.91	-2.3
5012	2746284.00	13431001.72	-2.3
5013	2746862.27	13431763.07	-2.3
5014	2746818.39	13431692.96	-2.3
5015	2746804.96	13431681.86	-2.3
5016	2746223.84	13430949.08	-2.3
5017	2746252.98	13430930.11	-2.3
5018	2746269.62	13430915.83	-2.3
5019	2746276.31	13430908.19	-2.3
5020	2746281.82	13430899.29	-2.3
5021	2746215.12	13430805.48	-2.3
5022	2746204.97	13430813.83	-2.3
5023	2746189.33	13430832.99	-2.3
5024	2746181.02	13430846.14	-2.3
5025	2746095.12	13430687.71	-2.3
5026	2746115.03	13430671.54	-2.3
5027	2746126.29	13430661.50	-2.3
5028	2747342.73	13431992.55	-2.3
5029	2747347.56	13432003.10	-2.3
5030	2747268.86	13432060.24	-2.3
5031	2747083.46	13431342.31	-2.3
5032	2747077.59	13431332.40	-2.3
5033	2745987.31	13430120.57	-2.3
5034	2746002.80	13430129.58	-2.3
5035	2746051.36	13430369.42	-2.3
5036	2746056.24	13430381.62	-2.3
5037	2746057.65	13430391.34	-2.3
5038	2746057.84	13430400.61	-2.3
5039	2746053.46	13430409.33	-2.3
5040	2746032.28	13430427.21	-2.3

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
5041	2747486.20	13431976.84	-2.3
5042	2747457.46	13432018.01	-2.3
5043	2746982.40	13431119.06	-2.3
5044	2747001.47	13431121.56	-2.3
5045	2747012.37	13431123.55	-2.3
5046	2747099.80	13431167.92	-2.3
5047	2746466.92	13431220.45	-2.3
5048	2746485.56	13431216.17	-2.3
5049	2747213.62	13432318.68	-2.2
5050	2747254.44	13432328.82	-2.2
5051	2747278.92	13432585.75	-2.2
5052	2742840.00	13431030.09	-2.2
5053	2742668.66	13430907.03	-2.2
5054	2743710.85	13431800.05	-2.2
5055	2747475.08	13432273.69	-2.2
5056	2747460.76	13432333.02	-2.2
5057	2747083.55	13431919.31	-2.2
5058	2746932.65	13431868.14	-2.2
5059	2746845.34	13431758.48	-2.2
5060	2746291.47	13431053.82	-2.2
5061	2746202.01	13431065.62	-2.2
5062	2746143.19	13431075.46	-2.2
5063	2746672.87	13431732.53	-2.2
5064	2747170.67	13431216.28	-2.2
5065	2747150.35	13431191.32	-2.2
5066	2746439.74	13431203.60	-2.2
5067	2747180.40	13431226.78	-2.2
5068	2746317.16	13430981.77	-2.2
5069	2746301.69	13430989.96	-2.2
5070	2746292.76	13430996.48	-2.2
5071	2746829.48	13431705.54	-2.2
5072	2746825.03	13431699.53	-2.2
5073	2746638.92	13431282.57	-2.2
5074	2746635.85	13431291.87	-2.2
5075	2746634.54	13431300.53	-2.2
5076	2746261.84	13430922.92	-2.2
5077	2746288.76	13430890.04	-2.2
5078	2746296.35	13430880.54	-2.2
5079	2746304.84	13430870.68	-2.2
5080	2746312.33	13430863.58	-2.2
5081	2746137.60	13430652.80	-2.2
5082	2746147.39	13430644.87	-2.2
5083	2746155.63	13430637.93	-2.2
5084	2745544.03	13431125.23	-2.2
5085	2746982.24	13431310.76	-2.2
5086	2746988.03	13431322.01	-2.2
5087	2747007.00	13431352.43	-2.2
5088	2745514.92	13431040.68	-2.2

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
5089	2745504.12	13431053.22	-2.2
5090	2746015.80	13430138.02	-2.2
5091	2746047.54	13430155.53	-2.2
5092	2746035.30	13430355.46	-2.2
5093	2747467.94	13432014.41	-2.2
5094	2747462.68	13432016.29	-2.2
5095	2747175.26	13431288.92	-2.2
5096	2747193.43	13431320.54	-2.2
5097	2747152.08	13431256.55	-2.2
5098	2746493.46	13431213.83	-2.2
5099	2746514.57	13431208.51	-2.2
5100	2747222.60	13432319.96	-2.2
5101	2747265.29	13432584.49	-2.2
5102	2747245.77	13432324.04	-2.2
5103	2742827.16	13431024.43	-2.2
5104	2742753.71	13430969.21	-2.2
5105	2747594.93	13432091.89	-2.2
5106	2743193.58	13431314.27	-2.2
5107	2743182.48	13431305.35	-2.2
5108	2747381.21	13432532.00	-2.2
5109	2743663.32	13431751.27	-2.2
5110	2747504.44	13432206.72	-2.2
5111	2747030.82	13431892.73	-2.1
5112	2747085.04	13431922.73	-2.1
5113	2747086.33	13431926.81	-2.1
5114	2746930.66	13431870.99	-2.1
5115	2746926.61	13431874.38	-2.1
5116	2745617.58	13431151.81	-2.1
5117	2746273.23	13431055.76	-2.1
5118	2746259.72	13431057.64	-2.1
5119	2747160.35	13431204.17	-2.1
5120	2746348.23	13430972.20	-2.1
5121	2746308.88	13430985.41	-2.1
5122	2746644.77	13431274.04	-2.1
5123	2746858.15	13431350.10	-2.1
5124	2746251.13	13430767.70	-2.1
5125	2746241.34	13430779.38	-2.1
5126	2746231.03	13430790.35	-2.1
5127	2746163.76	13430630.91	-2.1
5128	2747276.37	13432070.21	-2.1
5129	2747263.84	13432051.02	-2.1
5130	2747002.14	13431344.28	-2.1
5131	2745523.31	13431031.37	-2.1
5132	2747072.24	13431323.30	-2.1
5133	2747065.85	13431312.53	-2.1
5134	2747060.82	13431302.49	-2.1
5135	2747485.71	13431987.07	-2.1
5136	2747483.73	13431993.19	-2.1

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
5137	2747480.31	13432000.01	-2.1
5138	2747476.94	13432005.61	-2.1
5139	2747473.77	13432010.75	-2.1
5140	2746951.18	13431119.66	-2.1
5141	2747157.02	13431262.27	-2.1
5142	2746505.05	13431211.18	-2.1
5143	2746525.33	13431205.69	-2.1
5144	2746533.87	13431203.42	-2.1
5145	2746543.61	13431200.33	-2.1
5146	2747271.74	13432585.63	-2.1
5147	2743207.98	13431326.51	-2.1
5148	2747416.56	13432281.16	-2.1
5149	2742685.03	13430903.23	-2.1
5150	2742676.80	13430906.10	-2.1
5151	2743651.38	13431739.72	-2.1
5152	2743699.72	13431789.25	-2.1
5153	2743689.60	13431779.65	-2.1
5154	2743675.56	13431765.58	-2.1
5155	2745476.79	13431201.78	-2.1
5156	2745605.16	13431158.32	-2.1
5157	2746846.71	13431765.27	-2.1
5158	2746374.09	13431046.30	-2.1
5159	2746361.39	13431047.74	-2.1
5160	2746335.91	13431050.11	-2.1
5161	2746463.82	13431608.27	-2.1
5162	2746358.88	13430969.47	-2.1
5163	2746325.07	13430978.86	-2.1
5164	2746676.15	13431245.30	-2.0
5165	2746667.19	13431251.82	-2.0
5166	2746658.79	13431259.24	-2.0
5167	2746852.15	13431341.19	-2.0
5168	2746846.15	13431332.11	-2.0
5169	2746176.33	13430621.08	-2.0
5170	2745459.72	13431119.58	-2.0
5171	2746994.05	13431332.40	-2.0
5172	2746033.20	13430146.82	-2.0
5173	2746056.30	13430163.58	-2.0
5174	2747183.77	13431303.97	-2.0
5175	2747188.20	13431311.71	-2.0
5176	2746942.30	13431120.91	-2.0
5177	2746992.36	13431120.24	-2.0
5178	2747105.77	13431175.51	-2.0
5179	2747163.16	13431269.56	-2.0
5180	2747260.59	13432332.95	-2.0
5181	2742815.36	13431016.20	-2.0
5182	2742764.67	13430978.91	-2.0
5183	2743220.68	13431339.43	-2.0
5184	2743363.46	13431462.26	-2.0

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
5185	2747419.06	13432477.74	-2.0
5186	2747412.44	13432496.07	-2.0
5187	2747518.17	13432186.43	-2.0
5188	2747077.42	13431973.90	-2.0
5189	2746921.95	13431877.40	-2.0
5190	2746847.71	13431771.57	-2.0
5191	2746349.66	13431048.47	-2.0
5192	2746322.24	13431050.49	-2.0
5193	2746470.24	13431612.55	-2.0
5194	2746391.55	13430958.99	-2.0
5195	2746335.34	13430975.23	-2.0
5196	2746319.31	13430857.42	-2.0
5197	2746329.43	13430848.06	-2.0
5198	2746350.67	13430833.80	-2.0
5199	2746684.44	13431239.38	-2.0
5200	2746650.07	13431267.38	-2.0
5201	2746839.90	13431323.66	-2.0
5202	2746264.70	13430743.20	-2.0
5203	2746258.90	13430753.56	-2.0
5204	2746190.05	13430611.82	-2.0
5205	2746202.44	13430606.93	-2.0
5206	2746216.07	13430605.66	-2.0
5207	2746230.79	13430606.02	-2.0
5208	2746243.02	13430606.40	-2.0
5209	2746271.98	13430732.07	-2.0
5210	2747352.30	13432014.39	-2.0
5211	2747284.39	13432080.10	-2.0
5212	2746069.07	13430179.03	-2.0
5213	2747126.92	13431206.10	-1.9
5214	2746552.16	13431197.95	-1.9
5215	2747258.46	13432581.97	-1.9
5216	2747212.23	13432486.67	-1.9
5217	2742675.52	13430905.65	-1.9
5218	2743640.86	13431729.63	-1.9
5219	2743374.01	13431473.55	-1.9
5220	2743354.08	13431452.86	-1.9
5221	2747426.36	13432453.75	-1.9
5222	2747423.30	13432465.24	-1.9
5223	2747415.60	13432487.94	-1.9
5224	2747408.80	13432504.38	-1.9
5225	2747388.41	13432529.35	-1.9
5226	2747512.43	13432196.07	-1.9
5227	2747458.30	13432078.32	-1.9
5228	2747346.83	13432139.34	-1.9
5229	2747325.87	13432112.88	-1.9
5230	2747086.03	13431930.92	-1.9
5231	2747077.24	13431964.39	-1.9
5232	2747077.42	13431968.90	-1.9

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
5233	2747077.58	13431979.15	-1.9
5234	2746906.99	13431809.14	-1.9
5235	2745590.74	13431164.05	-1.9
5236	2746828.57	13431727.47	-1.9
5237	2746400.05	13431045.71	-1.9
5238	2746379.50	13430962.82	-1.9
5239	2746368.87	13430966.08	-1.9
5240	2746893.77	13431791.89	-1.9
5241	2746252.84	13430607.67	-1.9
5242	2746089.67	13430199.60	-1.9
5243	2747168.83	13431277.48	-1.9
5244	2746973.00	13431118.71	-1.9
5245	2746561.34	13431195.86	-1.9
5246	2746569.73	13431193.62	-1.9
5247	2746624.22	13431174.69	-1.9
5248	2747251.38	13432578.11	-1.9
5249	2747239.97	13432571.19	-1.9
5250	2747210.12	13432503.94	-1.9
5251	2747213.44	13432479.01	-1.9
5252	2747215.66	13432472.66	-1.9
5253	2742805.14	13431010.20	-1.9
5254	2743232.50	13431350.34	-1.9
5255	2743628.25	13431720.86	-1.8
5256	2743504.26	13431595.21	-1.8
5257	2743494.75	13431585.84	-1.8
5258	2743421.20	13431515.00	-1.8
5259	2743409.27	13431504.45	-1.8
5260	2747404.51	13432512.82	-1.8
5261	2747459.43	13432344.91	-1.8
5262	2747449.23	13432081.70	-1.8
5263	2747347.25	13432133.10	-1.8
5264	2747348.84	13432127.77	-1.8
5265	2747262.50	13432106.35	-1.8
5266	2747270.66	13432108.04	-1.8
5267	2747021.05	13431894.24	-1.8
5268	2747085.18	13431935.44	-1.8
5269	2747083.96	13431939.93	-1.8
5270	2747082.64	13431946.51	-1.8
5271	2747077.85	13431959.58	-1.8
5272	2747078.36	13431984.41	-1.8
5273	2747080.98	13431990.28	-1.8
5274	2746916.38	13431880.09	-1.8
5275	2746849.22	13431778.89	-1.8
5276	2746387.02	13431045.19	-1.8
5277	2746476.12	13431617.85	-1.8
5278	2746426.09	13430950.14	-1.8
5279	2746413.25	13430953.37	-1.8
5280	2746401.33	13430956.60	-1.8

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
5281	2746358.06	13430829.90	-1.8
5282	2746754.90	13431225.78	-1.8
5283	2746722.14	13431225.38	-1.8
5284	2746701.30	13431229.24	-1.8
5285	2746692.26	13431233.17	-1.8
5286	2746833.96	13431314.57	-1.8
5287	2746264.31	13430611.63	-1.8
5288	2746283.68	13430720.27	-1.8
5289	2747356.89	13432025.12	-1.8
5290	2747294.44	13432089.73	-1.8
5291	2747055.52	13431292.38	-1.8
5292	2746112.22	13430215.77	-1.8
5293	2746127.93	13430233.65	-1.8
5294	2747130.37	13431214.77	-1.8
5295	2747134.46	13431223.48	-1.8
5296	2747139.21	13431233.03	-1.8
5297	2746593.64	13431184.21	-1.8
5298	2746603.38	13431181.21	-1.8
5299	2747245.00	13432574.77	-1.8
5300	2747211.45	13432513.66	-1.8
5301	2747211.07	13432495.58	-1.8
5302	2747219.88	13432466.65	-1.8
5303	2747266.22	13432337.39	-1.8
5304	2742681.31	13430914.40	-1.8
5305	2742778.83	13430991.15	-1.8
5306	2743343.38	13431445.02	-1.8
5307	2743330.75	13431433.12	-1.8
5308	2743320.74	13431421.84	-1.8
5309	2743268.16	13431375.80	-1.8
5310	2743617.08	13431710.75	-1.8
5311	2743605.48	13431698.50	-1.8
5312	2743552.79	13431643.67	-1.8
5313	2743542.12	13431633.09	-1.8
5314	2743531.93	13431622.64	-1.8
5315	2743524.35	13431614.58	-1.8
5316	2743513.95	13431605.10	-1.8
5317	2743485.71	13431576.81	-1.8
5318	2743475.32	13431567.18	-1.8
5319	2743464.61	13431555.98	-1.8
5320	2743453.03	13431544.92	-1.8
5321	2743444.43	13431537.31	-1.8
5322	2743433.17	13431526.59	-1.8
5323	2743385.77	13431483.63	-1.8
5324	2747398.89	13432522.16	-1.8
5325	2747457.60	13432358.04	-1.8
5326	2747433.77	13432433.45	-1.8
5327	2747429.52	13432443.97	-1.8
5328	2747344.59	13432152.41	-1.8

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
5329	2747345.86	13432146.00	-1.8
5330	2747352.38	13432121.75	-1.8
5331	2747253.92	13432105.13	-1.8
5332	2747279.81	13432108.96	-1.8
5333	2747307.60	13432110.97	-1.8
5334	2747317.69	13432111.76	-1.8
5335	2747334.48	13432112.72	-1.8
5336	2747079.98	13431953.13	-1.8
5337	2746910.79	13431884.05	-1.8
5338	2746413.28	13431045.19	-1.7
5339	2746827.81	13431305.12	-1.7
5340	2746821.20	13431294.89	-1.7
5341	2746815.99	13431286.43	-1.7
5342	2746810.53	13431278.76	-1.7
5343	2746731.38	13431224.14	-1.7
5344	2746709.27	13431227.55	-1.7
5345	2746277.96	13430618.92	-1.7
5346	2746291.90	13430712.70	-1.7
5347	2747321.21	13432100.50	-1.7
5348	2747313.03	13432099.38	-1.7
5349	2747304.21	13432096.64	-1.7
5350	2745463.70	13431136.61	-1.7
5351	2745531.41	13431134.99	-1.7
5352	2746961.85	13431281.65	-1.7
5353	2746968.77	13431290.30	-1.7
5354	2746975.71	13431300.26	-1.7
5355	2747043.50	13431271.74	-1.7
5356	2746139.85	13430244.87	-1.7
5357	2746932.22	13431122.38	-1.7
5358	2747123.15	13431197.40	-1.7
5359	2747143.30	13431241.80	-1.7
5360	2747146.86	13431249.22	-1.7
5361	2746578.47	13431190.54	-1.7
5362	2746645.99	13431168.32	-1.7
5363	2747235.74	13432566.23	-1.7
5364	2747231.26	13432559.28	-1.7
5365	2747213.22	13432523.21	-1.7
5366	2747224.99	13432462.40	-1.7
5367	2743255.18	13431366.47	-1.7
5368	2743241.93	13431358.09	-1.7
5369	2747543.42	13432076.09	-1.7
5370	2743573.04	13431666.53	-1.7
5371	2743562.06	13431654.23	-1.7
5372	2743397.39	13431493.57	-1.7
5373	2747455.97	13432369.22	-1.7
5374	2747449.65	13432397.87	-1.7
5375	2747445.82	13432406.17	-1.7
5376	2747442.39	13432414.51	-1.7

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
5377	2747437.97	13432424.27	-1.7
5378	2747389.77	13432163.74	-1.7
5379	2747387.50	13432167.99	-1.7
5380	2747384.87	13432170.56	-1.7
5381	2747288.27	13432109.41	-1.7
5382	2747297.75	13432109.89	-1.7
5383	2747013.11	13431896.12	-1.7
5384	2747084.46	13431994.99	-1.7
5385	2746872.36	13431945.10	-1.7
5386	2746426.39	13431043.11	-1.7
5387	2746486.69	13431633.50	-1.7
5388	2746439.08	13430946.20	-1.7
5389	2746366.01	13430826.38	-1.7
5390	2746763.83	13431228.28	-1.7
5391	2746744.39	13431224.47	-1.7
5392	2747049.20	13431281.82	-1.6
5393	2747036.78	13431262.45	-1.6
5394	2746155.77	13430256.51	-1.6
5395	2747112.89	13431183.56	-1.6
5396	2747117.85	13431189.51	-1.6
5397	2746614.07	13431177.93	-1.6
5398	2746635.31	13431171.39	-1.6
5399	2747226.77	13432552.97	-1.6
5400	2747216.42	13432532.27	-1.6
5401	2742741.42	13430954.11	-1.6
5402	2743309.19	13431410.72	-1.6
5403	2743280.29	13431385.92	-1.6
5404	2743594.94	13431687.92	-1.6
5405	2743583.14	13431676.31	-1.6
5406	2747452.86	13432389.40	-1.6
5407	2747441.37	13432084.43	-1.6
5408	2747381.73	13432172.99	-1.6
5409	2747343.77	13432157.27	-1.6
5410	2747356.20	13432117.87	-1.6
5411	2747002.95	13431898.68	-1.6
5412	2746869.93	13431936.55	-1.6
5413	2746904.90	13431889.17	-1.6
5414	2746870.72	13431932.30	-1.6
5415	2745574.27	13431169.81	-1.6
5416	2746850.13	13431785.83	-1.6
5417	2746440.52	13431040.24	-1.6
5418	2746482.72	13431627.90	-1.6
5419	2746459.19	13430941.01	-1.6
5420	2746804.83	13431269.80	-1.6
5421	2746799.99	13431260.92	-1.6
5422	2746794.32	13431252.72	-1.6
5423	2746288.46	13430624.78	-1.6
5424	2747361.08	13432035.88	-1.6

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
5425	2747329.89	13432101.80	-1.6
5426	2746943.13	13431243.13	-1.6
5427	2746947.57	13431251.97	-1.6
5428	2746951.55	13431261.20	-1.6
5429	2746956.42	13431272.31	-1.6
5430	2747029.57	13431250.69	-1.6
5431	2747022.38	13431238.65	-1.6
5432	2747016.87	13431227.87	-1.6
5433	2746654.50	13431166.39	-1.6
5434	2747223.10	13432545.85	-1.5
5435	2747219.72	13432538.74	-1.5
5436	2742697.61	13430925.71	-1.5
5437	2743293.54	13431399.43	-1.5
5438	2747455.00	13432378.32	-1.5
5439	2747465.93	13432075.06	-1.5
5440	2747393.05	13432153.59	-1.5
5441	2747391.78	13432158.87	-1.5
5442	2747243.44	13432103.45	-1.5
5443	2747343.03	13432112.53	-1.5
5444	2746988.78	13431904.82	-1.5
5445	2746995.32	13431900.96	-1.5
5446	2747090.04	13432003.18	-1.5
5447	2746869.74	13431939.38	-1.5
5448	2746870.75	13431942.57	-1.5
5449	2746532.00	13431696.74	-1.5
5450	2746453.23	13431038.00	-1.5
5451	2746479.67	13430935.18	-1.5
5452	2746449.22	13430943.57	-1.5
5453	2746596.37	13430929.40	-1.5
5454	2746779.54	13431238.33	-1.5
5455	2746299.31	13430704.04	-1.5
5456	2745518.52	13431144.42	-1.5
5457	2746172.00	13430269.65	-1.5
5458	2746185.64	13430279.93	-1.5
5459	2746923.02	13431123.83	-1.5
5460	2747231.77	13432458.57	-1.5
5461	2742726.12	13430943.46	-1.5
5462	2742709.97	13430932.67	-1.5
5463	2747480.27	13432162.20	-1.5
5464	2747486.63	13432154.17	-1.5
5465	2747493.18	13432145.49	-1.5
5466	2747432.66	13432085.92	-1.5
5467	2747391.12	13432142.86	-1.5
5468	2747346.33	13432164.85	-1.5
5469	2746823.31	13431724.31	-1.4
5470	2746526.63	13431689.83	-1.4
5471	2746521.10	13431682.95	-1.4
5472	2746562.13	13430923.30	-1.4

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
5473	2746478.88	13430804.55	-1.4
5474	2746786.71	13431245.13	-1.4
5475	2746771.20	13431231.97	-1.4
5476	2746296.36	13430631.43	-1.4
5477	2747364.41	13432044.91	-1.4
5478	2745467.54	13431145.71	-1.4
5479	2746940.10	13431233.44	-1.4
5480	2746201.21	13430290.31	-1.4
5481	2746665.24	13431164.63	-1.4
5482	2746676.55	13431162.52	-1.4
5483	2747270.98	13432342.46	-1.4
5484	2747474.86	13432169.16	-1.4
5485	2747543.60	13432067.13	-1.4
5486	2747384.21	13432129.60	-1.4
5487	2747388.43	13432136.25	-1.4
5488	2747392.81	13432148.22	-1.4
5489	2747376.75	13432175.54	-1.4
5490	2746982.18	13431908.34	-1.4
5491	2746879.16	13431950.46	-1.4
5492	2746900.29	13431892.34	-1.4
5493	2745492.79	13431196.23	-1.4
5494	2746763.74	13431767.82	-1.4
5495	2746765.98	13431759.27	-1.4
5496	2746483.20	13431034.54	-1.4
5497	2746468.06	13431035.78	-1.4
5498	2746493.62	13431642.57	-1.4
5499	2746496.54	13431650.83	-1.4
5500	2746511.68	13430930.60	-1.4
5501	2746504.77	13430930.28	-1.4
5502	2746470.87	13430938.02	-1.4
5503	2746675.61	13430930.71	-1.3
5504	2746665.05	13430932.96	-1.3
5505	2746589.34	13430927.19	-1.3
5506	2746569.26	13430923.20	-1.3
5507	2746497.14	13430814.90	-1.3
5508	2746504.56	13430817.18	-1.3
5509	2746522.83	13430817.99	-1.3
5510	2746938.03	13431223.36	-1.3
5511	2747011.64	13431215.78	-1.3
5512	2747006.38	13431202.20	-1.3
5513	2746913.55	13431125.16	-1.3
5514	2746687.66	13431160.74	-1.3
5515	2747420.25	13432272.89	-1.3
5516	2747499.61	13432136.21	-1.3
5517	2747416.50	13432087.20	-1.3
5518	2747425.40	13432085.93	-1.3
5519	2747371.23	13432177.41	-1.3
5520	2747349.20	13432168.96	-1.3

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
5521	2747235.27	13432102.22	-1.3
5522	2746871.28	13431929.75	-1.3
5523	2745560.73	13431174.59	-1.3
5524	2746755.95	13431812.77	-1.3
5525	2746817.26	13431721.62	-1.3
5526	2746850.00	13431793.08	-1.3
5527	2746537.86	13431704.52	-1.3
5528	2746711.28	13430984.10	-1.3
5529	2746495.47	13431032.41	-1.3
5530	2746500.85	13431659.52	-1.3
5531	2746684.88	13430928.13	-1.3
5532	2746614.63	13430935.57	-1.3
5533	2746605.32	13430931.97	-1.3
5534	2746578.85	13430923.89	-1.3
5535	2746469.46	13430800.97	-1.3
5536	2746487.61	13430808.91	-1.3
5537	2746514.10	13430817.81	-1.3
5538	2746530.08	13430817.32	-1.3
5539	2746552.08	13430815.49	-1.3
5540	2746304.41	13430641.05	-1.3
5541	2746305.98	13430696.26	-1.3
5542	2747339.23	13432100.17	-1.3
5543	2745493.54	13431153.72	-1.3
5544	2745506.95	13431151.10	-1.3
5545	2746937.14	13431214.08	-1.3
5546	2746215.15	13430300.02	-1.3
5547	2747241.49	13432454.91	-1.2
5548	2747275.79	13432349.45	-1.2
5549	2747603.05	13432086.54	-1.2
5550	2747407.91	13432088.95	-1.2
5551	2747379.21	13432124.38	-1.2
5552	2747361.63	13432113.01	-1.2
5553	2746977.08	13431911.55	-1.2
5554	2747093.73	13432009.57	-1.2
5555	2746699.58	13430986.93	-1.2
5556	2746510.89	13431029.56	-1.2
5557	2746506.55	13431666.37	-1.2
5558	2746513.37	13431674.50	-1.2
5559	2746736.65	13430977.95	-1.2
5560	2746692.32	13430926.09	-1.2
5561	2746655.36	13430935.75	-1.2
5562	2746647.04	13430937.65	-1.2
5563	2746637.09	13430939.06	-1.2
5564	2746555.11	13430923.67	-1.2
5565	2746886.43	13431790.91	-1.2
5566	2746455.90	13430801.36	-1.2
5567	2746462.42	13430800.98	-1.2
5568	2746538.00	13430816.60	-1.2

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
5569	2746544.99	13430816.35	-1.2
5570	2746565.91	13430813.82	-1.2
5571	2745477.92	13431152.24	-1.2
5572	2746903.26	13431126.29	-1.2
5573	2747278.27	13432355.66	-1.2
5574	2747423.92	13432264.52	-1.2
5575	2747442.75	13432226.69	-1.2
5576	2747451.08	13432212.53	-1.2
5577	2747455.02	13432205.27	-1.2
5578	2747463.49	13432187.06	-1.2
5579	2747468.75	13432177.51	-1.2
5580	2747504.15	13432128.56	-1.2
5581	2747353.48	13432172.25	-1.1
5582	2747099.10	13432015.99	-1.1
5583	2747104.58	13432021.80	-1.1
5584	2747162.91	13432072.88	-1.1
5585	2747169.51	13432077.20	-1.1
5586	2747176.11	13432080.38	-1.1
5587	2747227.46	13432100.16	-1.1
5588	2747351.88	13432112.44	-1.1
5589	2746972.60	13431915.24	-1.1
5590	2746895.44	13431895.44	-1.1
5591	2745548.16	13431179.18	-1.1
5592	2746850.63	13431801.69	-1.1
5593	2746757.90	13431804.34	-1.1
5594	2746759.89	13431787.22	-1.1
5595	2746761.03	13431778.86	-1.1
5596	2746768.42	13431750.82	-1.1
5597	2746520.09	13430929.47	-1.1
5598	2746709.01	13430920.98	-1.1
5599	2746701.99	13430923.76	-1.1
5600	2746624.90	13430938.50	-1.1
5601	2746532.80	13430926.93	-1.1
5602	2746871.77	13431782.07	-1.1
5603	2746582.54	13430809.11	-1.1
5604	2746594.86	13430806.59	-1.1
5605	2746449.54	13430802.26	-1.1
5606	2747367.64	13432056.35	-1.1
5607	2746997.71	13431191.23	-1.1
5608	2746228.69	13430310.94	-1.1
5609	2746238.85	13430322.40	-1.1
5610	2746893.75	13431127.25	-1.1
5611	2746702.25	13431157.32	-1.1
5612	2746716.18	13431154.78	-1.1
5613	2747248.85	13432451.55	-1.1
5614	2747279.72	13432362.24	-1.1
5615	2747438.92	13432233.56	-1.1
5616	2747446.38	13432220.00	-1.1

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
5617	2747459.00	13432196.36	-1.1
5618	2747510.20	13432118.32	-1.1
5619	2747366.13	13432178.12	-1.1
5620	2747357.14	13432174.95	-1.1
5621	2747109.90	13432027.00	-1.1
5622	2747114.47	13432032.04	-1.1
5623	2747157.59	13432068.63	-1.1
5624	2746883.54	13431953.41	-1.1
5625	2746755.04	13431821.65	-1.1
5626	2746759.11	13431796.23	-1.1
5627	2746724.80	13430980.44	-1.0
5628	2746657.46	13430996.64	-1.0
5629	2746525.51	13431025.72	-1.0
5630	2746877.87	13431787.11	-1.0
5631	2746434.87	13430801.75	-1.0
5632	2746442.47	13430802.42	-1.0
5633	2746309.29	13430650.81	-1.0
5634	2746312.60	13430685.88	-1.0
5635	2746724.84	13431153.16	-1.0
5636	2747280.73	13432369.15	-1.0
5637	2747427.57	13432256.95	-1.0
5638	2747430.82	13432249.27	-1.0
5639	2747532.78	13432085.90	-1.0
5640	2747473.36	13432071.95	-1.0
5641	2747373.23	13432119.81	-1.0
5642	2747361.61	13432177.27	-1.0
5643	2747366.86	13432109.31	-1.0
5644	2747119.05	13432037.01	-1.0
5645	2747219.57	13432096.65	-1.0
5646	2747360.45	13432113.90	-1.0
5647	2746968.62	13431918.97	-1.0
5648	2746890.02	13431898.96	-1.0
5649	2745531.44	13431184.07	-1.0
5650	2745519.55	13431188.34	-1.0
5651	2745505.09	13431192.94	-1.0
5652	2746770.95	13431742.91	-1.0
5653	2746811.45	13431719.22	-1.0
5654	2746543.48	13431712.28	-1.0
5655	2746689.15	13430989.49	-1.0
5656	2746678.12	13430992.22	-1.0
5657	2746667.53	13430994.68	-1.0
5658	2746646.26	13430998.57	-1.0
5659	2746541.56	13430924.76	-1.0
5660	2746313.89	13430664.87	-0.9
5661	2746314.70	13430676.29	-0.9
5662	2747369.93	13432065.33	-0.9
5663	2746938.16	13431202.52	-0.9
5664	2746989.56	13431183.89	-0.9

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
5665	2746254.46	13430334.67	-0.9
5666	2746736.29	13431151.17	-0.9
5667	2746747.49	13431148.87	-0.9
5668	2747255.77	13432445.78	-0.9
5669	2747281.15	13432377.27	-0.9
5670	2747434.82	13432240.91	-0.9
5671	2747521.78	13432101.89	-0.9
5672	2747526.86	13432094.25	-0.9
5673	2747400.88	13432092.12	-0.9
5674	2747539.48	13432067.72	-0.9
5675	2747200.00	13432088.80	-0.9
5676	2747209.56	13432091.93	-0.9
5677	2746964.91	13431921.66	-0.9
5678	2746635.23	13431000.32	-0.9
5679	2746619.49	13431004.54	-0.9
5680	2746603.65	13430803.91	-0.9
5681	2747346.47	13432097.21	-0.9
5682	2746940.89	13431194.07	-0.9
5683	2746980.32	13431179.46	-0.9
5684	2746268.33	13430345.29	-0.9
5685	2746884.11	13431128.02	-0.9
5686	2746758.06	13431146.29	-0.9
5687	2747263.79	13432437.54	-0.8
5688	2747517.05	13432107.95	-0.8
5689	2747394.68	13432096.81	-0.8
5690	2747124.02	13432042.05	-0.8
5691	2747128.75	13432047.48	-0.8
5692	2747183.70	13432083.89	-0.8
5693	2747192.01	13432086.38	-0.8
5694	2747367.34	13432116.39	-0.8
5695	2746962.42	13431923.50	-0.8
5696	2746876.14	13431918.45	-0.8
5697	2746896.36	13431810.84	-0.8
5698	2746851.81	13431808.36	-0.8
5699	2746612.18	13430802.32	-0.8
5700	2746624.13	13430800.31	-0.8
5701	2746630.19	13430800.19	-0.8
5702	2747370.80	13432073.76	-0.8
5703	2746956.78	13431176.29	-0.8
5704	2746945.34	13431187.24	-0.8
5705	2747281.49	13432386.82	-0.8
5706	2747373.53	13432105.67	-0.8
5707	2747380.60	13432103.04	-0.8
5708	2747387.61	13432100.81	-0.8
5709	2747150.89	13432063.67	-0.8
5710	2746955.22	13431928.54	-0.7
5711	2746884.86	13431902.41	-0.7
5712	2746549.59	13431719.70	-0.7

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
5713	2746426.13	13430803.24	-0.7
5714	2746279.25	13430354.15	-0.7
5715	2746971.02	13431175.28	-0.7
5716	2746964.02	13431174.46	-0.7
5717	2746873.30	13431129.32	-0.7
5718	2747266.77	13432433.91	-0.7
5719	2747282.15	13432396.67	-0.7
5720	2746946.96	13431934.25	-0.7
5721	2746879.77	13431908.22	-0.7
5722	2746856.89	13431821.39	-0.7
5723	2746751.78	13431847.62	-0.7
5724	2746755.03	13431830.04	-0.7
5725	2746609.32	13431809.67	-0.7
5726	2746616.75	13431814.30	-0.7
5727	2746624.85	13431819.14	-0.7
5728	2746631.03	13431824.54	-0.7
5729	2746682.31	13431858.13	-0.7
5730	2746292.58	13430364.82	-0.6
5731	2746306.53	13430374.31	-0.6
5732	2746768.32	13431145.22	-0.6
5733	2747134.05	13432052.53	-0.6
5734	2746879.55	13431912.45	-0.6
5735	2746855.00	13431825.59	-0.6
5736	2746857.87	13431818.42	-0.6
5737	2746851.97	13431816.35	-0.6
5738	2746746.99	13431854.32	-0.6
5739	2746754.23	13431839.65	-0.6
5740	2746776.08	13431735.22	-0.6
5741	2746806.30	13431718.71	-0.6
5742	2746581.58	13431776.84	-0.6
5743	2746637.26	13431829.97	-0.6
5744	2746663.97	13431848.81	-0.6
5745	2746673.92	13431853.01	-0.6
5746	2747368.99	13432080.64	-0.6
5747	2747354.35	13432093.05	-0.6
5748	2746950.20	13431180.97	-0.6
5749	2747271.83	13432427.52	-0.5
5750	2747282.21	13432402.56	-0.5
5751	2747139.70	13432056.43	-0.5
5752	2747144.95	13432059.77	-0.5
5753	2746942.15	13431937.77	-0.5
5754	2746854.27	13431829.66	-0.5
5755	2746855.52	13431824.11	-0.5
5756	2746856.11	13431822.87	-0.5
5757	2746554.81	13431727.09	-0.5
5758	2746603.13	13431804.75	-0.5
5759	2746642.69	13431835.39	-0.5
5760	2746656.24	13431845.82	-0.5

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
5761	2746691.24	13431862.79	-0.5
5762	2746740.37	13431859.76	-0.5
5763	2746606.85	13431007.47	-0.5
5764	2747365.80	13432083.07	-0.5
5765	2747358.47	13432090.36	-0.5
5766	2746319.05	13430385.36	-0.5
5767	2746854.57	13431132.56	-0.5
5768	2746864.53	13431130.85	-0.5
5769	2747276.55	13432420.09	-0.5
5770	2746862.14	13431817.29	-0.4
5771	2746865.11	13431817.69	-0.4
5772	2746867.28	13431818.07	-0.4
5773	2746852.62	13431820.97	-0.4
5774	2746852.03	13431826.05	-0.4
5775	2746797.49	13431720.72	-0.4
5776	2746573.28	13431763.50	-0.4
5777	2746577.59	13431769.87	-0.4
5778	2746648.96	13431841.61	-0.4
5779	2746734.91	13431862.51	-0.4
5780	2746417.33	13430806.17	-0.4
5781	2746779.53	13431142.83	-0.4
5782	2747280.34	13432411.21	-0.4
5783	2747532.56	13432068.40	-0.4
5784	2746895.28	13431957.68	-0.4
5785	2746937.81	13431940.85	-0.4
5786	2746850.48	13431831.01	-0.4
5787	2746846.81	13431840.87	-0.4
5788	2746782.14	13431728.48	-0.3
5789	2746789.76	13431723.89	-0.3
5790	2746568.84	13431757.28	-0.3
5791	2746585.63	13431782.75	-0.3
5792	2746597.11	13431797.98	-0.3
5793	2746700.86	13431866.83	-0.3
5794	2746538.06	13431022.35	-0.3
5795	2746504.36	13430720.92	-0.3
5796	2746513.62	13430730.59	-0.3
5797	2746538.69	13430748.45	-0.3
5798	2746331.99	13430393.77	-0.3
5799	2746345.50	13430403.62	-0.3
5800	2746826.60	13431135.76	-0.3
5801	2746845.21	13431134.05	-0.3
5802	2746788.90	13431140.86	-0.3
5803	2746934.75	13431943.14	-0.3
5804	2746852.64	13431838.28	-0.3
5805	2746875.85	13431817.24	-0.3
5806	2746848.80	13431835.52	-0.3
5807	2746558.87	13431734.85	-0.3
5808	2746590.49	13431789.28	-0.3

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
5809	2746713.10	13431868.12	-0.3
5810	2746729.00	13431864.92	-0.3
5811	2746378.44	13430819.81	-0.3
5812	2746487.09	13430699.10	-0.2
5813	2746495.59	13430710.80	-0.2
5814	2746526.09	13430740.05	-0.2
5815	2746566.65	13430760.25	-0.2
5816	2746835.84	13431134.80	-0.2
5817	2746798.40	13431139.41	-0.2
5818	2746807.51	13431138.14	-0.2
5819	2746817.38	13431136.64	-0.2
5820	2747490.81	13432068.11	-0.2
5821	2746902.49	13431957.47	-0.2
5822	2746924.54	13431948.23	-0.2
5823	2746930.78	13431945.28	-0.2
5824	2746877.66	13431816.88	-0.2
5825	2746881.26	13431815.92	-0.2
5826	2746885.04	13431814.72	-0.2
5827	2746843.37	13431848.27	-0.2
5828	2746562.52	13431743.16	-0.2
5829	2746565.31	13431750.93	-0.2
5830	2746721.89	13431866.81	-0.2
5831	2746385.39	13430815.23	-0.2
5832	2746407.60	13430807.40	-0.2
5833	2746479.92	13430688.46	-0.2
5834	2746553.46	13430756.78	-0.2
5835	2746580.46	13430761.94	-0.2
5836	2746358.10	13430413.12	-0.2
5837	2746369.24	13430424.32	-0.2
5838	2746908.47	13431955.61	-0.1
5839	2746911.72	13431954.40	-0.1
5840	2746915.63	13431952.47	-0.1
5841	2746921.64	13431949.42	-0.1
5842	2746928.34	13431946.60	-0.1
5843	2746591.23	13431011.23	-0.1
5844	2746399.80	13430808.46	-0.1
5845	2746473.56	13430678.46	-0.1
5846	2746918.65	13431950.79	0.0
5847	2746593.76	13430762.49	0.0
5848	2746389.62	13430451.72	0.0
5849	2746397.73	13430467.83	0.0
5850	2746404.38	13430483.03	0.0
5851	2746425.94	13430578.83	0.0
5852	2746433.17	13430602.69	0.0
5853	2746437.16	13430616.19	0.0
5854	2746461.48	13430660.71	0.0
5855	2746467.05	13430670.97	0.0
5856	2747502.33	13432067.50	0.0

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
5857	2746408.84	13430498.76	0.1
5858	2746414.55	13430515.19	0.1
5859	2746418.35	13430530.23	0.1
5860	2746422.16	13430546.16	0.1
5861	2746423.06	13430563.71	0.1
5862	2746429.55	13430590.15	0.1
5863	2746450.19	13430641.39	0.1
5864	2746455.24	13430650.55	0.1
5865	2746579.43	13431013.79	0.1
5866	2746564.06	13431017.25	0.1
5867	2746548.95	13431019.78	0.1
5868	2746796.40	13430734.14	0.1
5869	2746804.13	13430736.22	0.1
5870	2746817.55	13430741.25	0.1
5871	2746830.46	13430744.94	0.1
5872	2746858.93	13430755.37	0.1
5873	2746891.44	13430771.99	0.1
5874	2746903.09	13430779.70	0.1
5875	2746912.61	13430784.81	0.1
5876	2746924.00	13430789.10	0.1
5877	2746443.56	13430629.18	0.1
5878	2746839.15	13430747.10	0.2
5879	2746847.32	13430750.16	0.2
5880	2746867.94	13430759.19	0.2
5881	2746880.45	13430765.51	0.2
5882	2746606.51	13430762.02	0.2
5883	2746618.72	13430760.63	0.2
5884	2746630.96	13430757.80	0.4
5885	2746642.71	13430751.07	0.5
5886	2746653.47	13430744.68	0.5
5887	2746663.89	13430738.74	0.5
5888	2746676.24	13430734.18	0.5
5889	2746687.85	13430731.83	0.5
5890	2745554.62	13433862.82	0.7
5891	2746194.85	13434350.89	0.6
5892	2746207.42	13434369.68	0.6
5893	2746223.48	13434376.81	0.6
5894	2746286.35	13434355.87	0.6
5895	2746304.02	13434339.56	0.6
5896	2746336.06	13434324.62	0.6
5897	2746491.24	13434316.77	0.6
5898	2746538.49	13434303.03	0.6
5899	2747576.67	13432180.00	0.6
5900	2747059.18	13432088.53	0.7
5901	2745541.08	13433850.87	0.5
5902	2745996.32	13434210.46	0.5
5903	2746034.28	13434242.70	0.5
5904	2746180.04	13434340.58	0.5

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
5905	2746273.09	13434363.85	0.5
5906	2746320.48	13434329.32	0.5
5907	2746352.42	13434315.99	0.5
5908	2746382.99	13434308.28	0.5
5909	2746402.24	13434308.04	0.5
5910	2746418.31	13434312.27	0.5
5911	2746434.23	13434319.83	0.5
5912	2746451.50	13434318.29	0.5
5913	2746471.83	13434317.98	0.5
5914	2746514.31	13434311.55	0.5
5915	2747632.67	13432243.56	0.5
5916	2747554.74	13431976.28	0.5
5917	2746450.15	13431751.44	0.7
5918	2746490.38	13431809.40	0.6
5919	2745968.69	13434193.00	0.4
5920	2745982.67	13434203.28	0.4
5921	2746008.98	13434219.59	0.4
5922	2746021.39	13434228.99	0.4
5923	2746047.44	13434253.67	0.4
5924	2746165.67	13434330.87	0.4
5925	2746368.82	13434310.82	0.4
5926	2746558.10	13434290.97	0.4
5927	2747618.26	13432194.27	0.6
5928	2745508.15	13433829.67	0.4
5929	2745526.69	13433840.60	0.4
5930	2745588.84	13433899.41	0.4
5931	2745940.69	13434163.64	0.4
5932	2746134.56	13434316.44	0.4
5933	2746150.22	13434324.02	0.4
5934	2746573.32	13434276.59	0.4
5935	2747549.48	13431955.11	0.4
5936	2745725.18	13431290.84	0.6
5937	2746924.08	13432049.48	0.5
5938	2745601.70	13433910.62	0.3
5939	2745956.58	13434178.23	0.3
5940	2746120.34	13434306.24	0.3
5941	2746585.59	13434264.26	0.3
5942	2746598.56	13434248.04	0.3
5943	2747615.51	13432189.52	0.5
5944	2745693.74	13431291.41	0.5
5945	2747055.80	13432098.28	0.4
5946	2746920.17	13432051.02	0.4
5947	2746063.07	13434266.40	0.2
5948	2746106.31	13434298.36	0.2
5949	2746614.56	13434226.11	0.2
5950	2746629.04	13434207.00	0.2
5951	2745702.99	13431299.98	0.4
5952	2746461.08	13431792.27	0.4

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
5953	2745499.40	13433819.89	0.1
5954	2746078.17	13434278.54	0.1
5955	2746091.61	13434287.66	0.1
5956	2747573.44	13432171.12	0.1
5957	2747572.35	13432163.93	0.1
5958	2747598.61	13432247.15	0.3
5959	2745602.43	13433827.78	0.3
5960	2745845.51	13431360.06	0.4
5961	2745681.86	13431284.67	0.4
5962	2745672.60	13431281.37	0.4
5963	2746446.06	13431735.78	0.4
5964	2745575.24	13433887.61	0.0
5965	2745618.86	13433923.32	0.0
5966	2746640.11	13434184.12	0.0
5967	2746915.83	13432052.85	0.2
5968	2745563.94	13433876.52	0.0
5969	2745652.22	13433952.27	0.0
5970	2747546.54	13431943.74	0.0
5971	2745858.32	13431361.00	0.2
5972	2745664.50	13431277.42	0.2
5973	2746465.13	13431805.82	0.2
5974	2746234.95	13434207.63	0.2
5975	2746217.83	13434216.51	0.2
5976	2746172.33	13434214.47	0.2
5977	2747537.07	13432348.23	-0.1
5978	2747559.46	13431987.14	-0.1
5979	2745567.87	13433800.85	0.1
5980	2745554.23	13433783.16	0.1
5981	2745864.08	13431285.64	0.2
5982	2745754.12	13431289.03	0.2
5983	2745831.14	13431363.27	0.1
5984	2745804.62	13431361.41	0.1
5985	2745654.98	13431272.47	0.1
5986	2746248.15	13434196.08	0.1
5987	2746201.94	13434221.67	0.1
5988	2746186.53	13434220.62	0.1
5989	2746155.71	13434205.44	0.1
5990	2745635.54	13433934.73	-0.2
5991	2745664.02	13433962.63	-0.2
5992	2745927.75	13434148.47	-0.2
5993	2746647.24	13434165.92	-0.2
5994	2747615.57	13432264.20	-0.2
5995	2747591.47	13432251.66	0.0
5996	2745586.64	13433816.45	0.0
5997	2745837.04	13431290.39	0.1
5998	2745820.96	13431363.00	0.1
5999	2745792.45	13431361.95	0.1
6000	2745710.65	13431311.82	0.1

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
6001	2745645.09	13431264.64	0.1
6002	2746442.63	13431718.63	0.0
6003	2746142.12	13434190.43	0.0
6004	2746491.76	13431817.75	-0.1
6005	2746482.22	13431816.63	-0.1
6006	2745916.57	13434131.59	-0.3
6007	2747539.25	13432360.74	-0.3
6008	2747549.22	13432311.93	-0.3
6009	2747572.73	13432154.61	-0.3
6010	2746015.52	13434143.88	-0.1
6011	2745995.64	13434123.72	-0.1
6012	2745884.40	13431283.17	0.0
6013	2746260.33	13434181.91	-0.1
6014	2746133.52	13434177.76	-0.1
6015	2745492.85	13433801.34	-0.3
6016	2745713.59	13434008.17	-0.3
6017	2745909.46	13434111.60	-0.3
6018	2747538.08	13432334.26	-0.3
6019	2747543.58	13432322.12	-0.3
6020	2747556.73	13432303.89	-0.3
6021	2747563.35	13432298.33	-0.3
6022	2747532.48	13432301.16	-0.1
6023	2745811.90	13431291.39	-0.1
6024	2745781.25	13431290.30	-0.1
6025	2745776.54	13431359.30	-0.1
6026	2745635.54	13431256.98	-0.1
6027	2746270.66	13434167.28	-0.1
6028	2745681.35	13433975.92	-0.4
6029	2745699.35	13433992.26	-0.4
6030	2745732.71	13434022.19	-0.4
6031	2745752.32	13434032.01	-0.4
6032	2745904.68	13434091.90	-0.4
6033	2747572.07	13432292.69	-0.4
6034	2747578.78	13432263.68	-0.2
6035	2746075.67	13434164.06	-0.2
6036	2746047.92	13434167.05	-0.2
6037	2746032.46	13434158.32	-0.2
6038	2745717.29	13431318.57	-0.2
6039	2746439.57	13431703.88	-0.2
6040	2746123.88	13434162.93	-0.2
6041	2747052.20	13432108.44	-0.3
6042	2746702.43	13431099.53	-0.5
6043	2745096.97	13433527.33	-0.5
6044	2745897.01	13434078.94	-0.5
6045	2746655.35	13434146.70	-0.5
6046	2747542.51	13432372.21	-0.5
6047	2747593.74	13432278.41	-0.5
6048	2747603.08	13432271.38	-0.5

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
6049	2747542.36	13431934.21	-0.5
6050	2747547.33	13432295.68	-0.3
6051	2746090.32	13434150.10	-0.3
6052	2745766.34	13431353.30	-0.3
6053	2745724.67	13431325.95	-0.3
6054	2744544.73	13433017.57	-0.6
6055	2745882.33	13434071.44	-0.6
6056	2747555.19	13432288.68	-0.4
6057	2747517.48	13432310.21	-0.4
6058	2745868.23	13431364.10	-0.3
6059	2745755.35	13431348.87	-0.3
6060	2745749.06	13431346.39	-0.3
6061	2745740.02	13431342.51	-0.3
6062	2746683.38	13431959.35	-0.5
6063	2746729.90	13431097.36	-0.7
6064	2744089.16	13432367.20	-0.7
6065	2744557.90	13433033.27	-0.7
6066	2745115.14	13433543.04	-0.7
6067	2745405.63	13433766.80	-0.7
6068	2747561.36	13432382.51	-0.7
6069	2747581.96	13432286.46	-0.7
6070	2747569.91	13432273.53	-0.5
6071	2747496.97	13432325.45	-0.5
6072	2745979.12	13434102.56	-0.5
6073	2745961.99	13434084.43	-0.5
6074	2745531.84	13433762.25	-0.5
6075	2745731.50	13431332.28	-0.4
6076	2746434.16	13431689.93	-0.4
6077	2746697.70	13431980.59	-0.5
6078	2746689.32	13431963.16	-0.5
6079	2746667.54	13431097.92	-0.7
6080	2745578.36	13431199.25	-0.7
6081	2745555.98	13431203.60	-0.7
6082	2745521.62	13431207.58	-0.7
6083	2744974.63	13433422.53	-0.7
6084	2745306.49	13433694.45	-0.7
6085	2745385.21	13433754.54	-0.7
6086	2745425.41	13433777.39	-0.7
6087	2745807.88	13434070.63	-0.7
6088	2745863.02	13434070.61	-0.7
6089	2747553.13	13432381.15	-0.7
6090	2747563.40	13432280.56	-0.5
6091	2745673.32	13431298.42	-0.4
6092	2746466.65	13431825.55	-0.5
6093	2746283.47	13434148.59	-0.5
6094	2746115.34	13434145.41	-0.5
6095	2746897.98	13432065.89	-0.6
6096	2746695.88	13431973.36	-0.6

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
6097	2746670.55	13431954.27	-0.6
6098	2746638.24	13431098.99	-0.8
6099	2745631.00	13431189.34	-0.8
6100	2745607.95	13431193.73	-0.8
6101	2743869.07	13432050.14	-0.8
6102	2744534.36	13432998.83	-0.8
6103	2745326.66	13433707.30	-0.8
6104	2745444.12	13433778.96	-0.8
6105	2745768.06	13434040.72	-0.8
6106	2745794.95	13434061.00	-0.8
6107	2745825.02	13434076.20	-0.8
6108	2745844.68	13434070.81	-0.8
6109	2746104.82	13434130.46	-0.6
6110	2745944.65	13434066.15	-0.6
6111	2745925.00	13434046.81	-0.6
6112	2747310.34	13432407.47	-0.6
6113	2747046.57	13432116.71	-0.7
6114	2743921.64	13432122.59	-0.9
6115	2743973.31	13432200.78	-0.9
6116	2744187.45	13432503.72	-0.9
6117	2744220.33	13432553.63	-0.9
6118	2744372.75	13432780.55	-0.9
6119	2744487.16	13432941.40	-0.9
6120	2744519.69	13432984.10	-0.9
6121	2744649.47	13433134.72	-0.9
6122	2745075.21	13433512.10	-0.9
6123	2745782.33	13434050.10	-0.9
6124	2746119.53	13434111.69	-0.7
6125	2745900.85	13434030.31	-0.7
6126	2745875.34	13434020.85	-0.7
6127	2745851.49	13434004.23	-0.7
6128	2745789.68	13433954.94	-0.7
6129	2746933.73	13431171.39	-0.6
6130	2746905.29	13431178.85	-0.6
6131	2746711.08	13432004.15	-0.7
6132	2747292.95	13432395.77	-0.7
6133	2746699.41	13431988.61	-0.8
6134	2746473.25	13431818.61	-0.8
6135	2746754.88	13431094.83	-1.0
6136	2746615.45	13431102.18	-1.0
6137	2743731.51	13431856.57	-1.0
6138	2743886.72	13432067.27	-1.0
6139	2744021.84	13432272.07	-1.0
6140	2744040.06	13432294.82	-1.0
6141	2744203.96	13432528.48	-1.0
6142	2744283.67	13432653.58	-1.0
6143	2744501.10	13432962.44	-1.0
6144	2744576.47	13433054.32	-1.0

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
6145	2744597.72	13433078.51	-1.0
6146	2744615.29	13433095.94	-1.0
6147	2744631.54	13433119.08	-1.0
6148	2744703.00	13433186.74	-1.0
6149	2744769.40	13433256.94	-1.0
6150	2744878.00	13433360.66	-1.0
6151	2744895.29	13433373.31	-1.0
6152	2744984.55	13433438.56	-1.0
6153	2744999.01	13433450.44	-1.0
6154	2745133.96	13433558.76	-1.0
6155	2745367.91	13433739.13	-1.0
6156	2745492.26	13433783.07	-1.0
6157	2746664.83	13434123.98	-1.0
6158	2745833.24	13433988.21	-0.8
6159	2745813.28	13433971.98	-0.8
6160	2745622.24	13433842.25	-0.8
6161	2747320.26	13432419.38	-0.8
6162	2746106.26	13434122.87	-0.8
6163	2747260.27	13432405.24	-0.8
6164	2747272.95	13432389.05	-0.8
6165	2746892.83	13432070.66	-0.8
6166	2743522.97	13431634.40	-1.0
6167	2743743.56	13431874.34	-1.0
6168	2744057.34	13432315.72	-1.0
6169	2744237.31	13432579.83	-1.0
6170	2744718.04	13433205.64	-1.0
6171	2744802.67	13433294.08	-1.0
6172	2745348.32	13433721.80	-1.0
6173	2747564.92	13432000.09	-1.0
6174	2747470.57	13432347.21	-0.8
6175	2746134.35	13434093.40	-0.8
6176	2745768.67	13433941.45	-0.8
6177	2745745.17	13433924.45	-0.8
6178	2746955.73	13431167.19	-0.8
6179	2746878.22	13431183.68	-0.8
6180	2745910.07	13431279.53	-0.8
6181	2746299.63	13434128.96	-0.8
6182	2746096.85	13434093.11	-0.9
6183	2747250.66	13432417.42	-0.9
6184	2747281.66	13432372.07	-0.9
6185	2747040.92	13432124.61	-0.9
6186	2746700.22	13431993.60	-0.9
6187	2746580.39	13431106.24	-1.1
6188	2743990.59	13432223.17	-1.1
6189	2744071.23	13432338.45	-1.1
6190	2744110.91	13432390.69	-1.1
6191	2744171.41	13432481.26	-1.1
6192	2744304.44	13432680.04	-1.1

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
6193	2744356.38	13432754.49	-1.1
6194	2744471.61	13432918.27	-1.1
6195	2744666.84	13433149.99	-1.1
6196	2744683.53	13433167.52	-1.1
6197	2744784.67	13433275.48	-1.1
6198	2744843.44	13433324.83	-1.1
6199	2745015.44	13433466.94	-1.1
6200	2745035.29	13433481.03	-1.1
6201	2745055.97	13433495.97	-1.1
6202	2745282.79	13433674.30	-1.1
6203	2745482.18	13433772.62	-1.1
6204	2745721.20	13433907.09	-0.9
6205	2745699.81	13433892.47	-0.9
6206	2745016.06	13433363.13	-0.9
6207	2745885.51	13431368.42	-0.9
6208	2747284.68	13432353.38	-0.9
6209	2747282.88	13432336.82	-0.9
6210	2743537.02	13431646.70	-1.2
6211	2743658.26	13431770.04	-1.2
6212	2743960.17	13432175.69	-1.2
6213	2744003.81	13432241.58	-1.2
6214	2744156.86	13432460.59	-1.2
6215	2744389.83	13432801.08	-1.2
6216	2744455.19	13432894.49	-1.2
6217	2744738.98	13433222.87	-1.2
6218	2744757.06	13433240.10	-1.2
6219	2744860.61	13433343.42	-1.2
6220	2744967.99	13433403.07	-1.2
6221	2745155.67	13433576.01	-1.2
6222	2745462.68	13433772.95	-1.2
6223	2746674.57	13434100.46	-1.2
6224	2746147.65	13434073.28	-1.0
6225	2745645.87	13433858.92	-1.0
6226	2746979.94	13431157.39	-0.9
6227	2746423.29	13431676.20	-1.0
6228	2746470.56	13431840.78	-1.0
6229	2746093.13	13434066.60	-1.0
6230	2746092.12	13434046.65	-1.0
6231	2745356.07	13433732.09	-1.1
6232	2746658.83	13431954.05	-1.1
6233	2745662.64	13431183.16	-1.3
6234	2743612.32	13431718.73	-1.3
6235	2744256.90	13432605.35	-1.3
6236	2744270.10	13432627.08	-1.3
6237	2744441.45	13432870.07	-1.3
6238	2744823.88	13433309.83	-1.3
6239	2745176.38	13433591.34	-1.3
6240	2745215.10	13433623.42	-1.3

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
6241	2746681.29	13434080.91	-1.3
6242	2747574.13	13432144.40	-1.3
6243	2746155.79	13434060.68	-1.1
6244	2745674.46	13433876.40	-1.1
6245	2745045.08	13433383.42	-1.1
6246	2745853.61	13431384.77	-1.0
6247	2746697.68	13431995.46	-1.1
6248	2747275.96	13432386.24	-1.1
6249	2746316.41	13434109.19	-1.1
6250	2746088.36	13434021.82	-1.1
6251	2747240.59	13432429.80	-1.1
6252	2746886.45	13432075.83	-1.1
6253	2745358.60	13433733.39	-1.2
6254	2746702.39	13432003.36	-1.2
6255	2746543.28	13431108.88	-1.4
6256	2743703.56	13431820.75	-1.4
6257	2743717.97	13431840.47	-1.4
6258	2743859.46	13432031.16	-1.4
6259	2743900.73	13432079.17	-1.4
6260	2743935.54	13432139.49	-1.4
6261	2744130.89	13432414.00	-1.4
6262	2744144.26	13432436.68	-1.4
6263	2744323.31	13432702.68	-1.4
6264	2744339.43	13432725.33	-1.4
6265	2744408.58	13432825.16	-1.4
6266	2744425.49	13432845.96	-1.4
6267	2745195.75	13433606.41	-1.4
6268	2745237.59	13433640.96	-1.4
6269	2745259.07	13433656.77	-1.4
6270	2747536.10	13431925.11	-1.4
6271	2744999.14	13433345.34	-1.2
6272	2746838.16	13431191.24	-1.1
6273	2745791.32	13433866.91	-1.2
6274	2745800.00	13433901.99	-1.2
6275	2745822.16	13433913.45	-1.2
6276	2745840.73	13433913.62	-1.2
6277	2747009.69	13433925.65	-1.4
6278	2743597.85	13431702.13	-1.4
6279	2743756.45	13431880.43	-1.4
6280	2743828.76	13431970.94	-1.4
6281	2744915.87	13433371.60	-1.4
6282	2744969.39	13433386.00	-1.4
6283	2746689.77	13434060.91	-1.4
6284	2746702.41	13434042.42	-1.4
6285	2746183.91	13434024.01	-1.2
6286	2746166.12	13434045.90	-1.2
6287	2745513.52	13433746.93	-1.2
6288	2745866.64	13431385.28	-1.2

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
6289	2746330.02	13434089.35	-1.2
6290	2746088.13	13434004.10	-1.2
6291	2746092.65	13433979.42	-1.2
6292	2745790.60	13433885.91	-1.3
6293	2745858.89	13433911.93	-1.3
6294	2745877.31	13433910.48	-1.3
6295	2745364.90	13433709.25	-1.3
6296	2746974.13	13433935.40	-1.4
6297	2746986.74	13433935.39	-1.4
6298	2746997.40	13433933.57	-1.4
6299	2747019.81	13433916.02	-1.4
6300	2747058.73	13433869.67	-1.4
6301	2747069.33	13433857.63	-1.4
6302	2747112.91	13431014.50	-1.5
6303	2747095.83	13431018.45	-1.5
6304	2746507.15	13431113.95	-1.5
6305	2743463.71	13431568.28	-1.5
6306	2743516.28	13431621.46	-1.5
6307	2743553.92	13431656.59	-1.5
6308	2743676.43	13431785.81	-1.5
6309	2743691.49	13431802.43	-1.5
6310	2743948.86	13432155.64	-1.5
6311	2746712.50	13434024.13	-1.5
6312	2747002.03	13431146.35	-1.2
6313	2746808.88	13431196.76	-1.2
6314	2747035.67	13431223.72	-1.3
6315	2747106.60	13431205.77	-1.3
6316	2746476.08	13431853.33	-1.3
6317	2746340.90	13434073.24	-1.3
6318	2747229.14	13432445.05	-1.3
6319	2745800.50	13433849.05	-1.4
6320	2745897.87	13433908.22	-1.4
6321	2745920.25	13433905.00	-1.4
6322	2745938.66	13433901.39	-1.4
6323	2745957.47	13433895.13	-1.4
6324	2747036.51	13432132.60	-1.4
6325	2746456.35	13431812.71	-1.4
6326	2746447.02	13431804.81	-1.4
6327	2747494.28	13432680.06	-1.5
6328	2747502.17	13432689.94	-1.5
6329	2747511.60	13432704.13	-1.5
6330	2746946.54	13433922.73	-1.5
6331	2746963.01	13433932.61	-1.5
6332	2747029.39	13433905.30	-1.5
6333	2747039.34	13433890.94	-1.5
6334	2747048.76	13433879.80	-1.5
6335	2747077.70	13433847.11	-1.5
6336	2747086.87	13433833.73	-1.5

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
6337	2747097.90	13433819.45	-1.5
6338	2747118.71	13433792.36	-1.5
6339	2747500.02	13433168.62	-1.5
6340	2747513.57	13433070.27	-1.5
6341	2747511.10	13432983.46	-1.5
6342	2747493.22	13432911.15	-1.5
6343	2745701.06	13431179.45	-1.6
6344	2743476.39	13431580.25	-1.6
6345	2743642.47	13431749.32	-1.6
6346	2743911.25	13432098.47	-1.6
6347	2746716.68	13434011.60	-1.6
6348	2746731.15	13433980.65	-1.6
6349	2747126.38	13431010.76	-1.6
6350	2747457.90	13432364.30	-1.4
6351	2746199.74	13434003.89	-1.4
6352	2746859.81	13431264.84	-1.3
6353	2746895.40	13431257.38	-1.3
6354	2746962.12	13431244.14	-1.3
6355	2746997.87	13431235.52	-1.3
6356	2747074.49	13431212.45	-1.3
6357	2745841.75	13431387.36	-1.4
6358	2746412.91	13431666.11	-1.4
6359	2746726.95	13432019.60	-1.4
6360	2747276.17	13432319.37	-1.4
6361	2745815.00	13433830.60	-1.4
6362	2747451.98	13432659.52	-1.6
6363	2747457.65	13432658.75	-1.6
6364	2747462.20	13432659.76	-1.6
6365	2747467.37	13432661.54	-1.6
6366	2747471.96	13432663.25	-1.6
6367	2747477.91	13432668.07	-1.6
6368	2747486.71	13432674.05	-1.6
6369	2747508.96	13432698.28	-1.6
6370	2747498.41	13432747.84	-1.6
6371	2747492.76	13432759.67	-1.6
6372	2747488.48	13432766.29	-1.6
6373	2747474.23	13432781.88	-1.6
6374	2747460.45	13432794.42	-1.6
6375	2746936.61	13433911.39	-1.6
6376	2747107.44	13433806.64	-1.6
6377	2747128.18	13433778.87	-1.6
6378	2747136.79	13433765.64	-1.6
6379	2747146.49	13433749.26	-1.6
6380	2747155.50	13433731.86	-1.6
6381	2747465.26	13433235.94	-1.6
6382	2747503.29	13433154.79	-1.6
6383	2747505.04	13433135.26	-1.6
6384	2747508.37	13433103.17	-1.6

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
6385	2747511.59	13433083.85	-1.6
6386	2747516.63	13433034.39	-1.6
6387	2747516.12	13433018.53	-1.6
6388	2747514.03	13433001.48	-1.6
6389	2747507.99	13432968.86	-1.6
6390	2747503.53	13432951.69	-1.6
6391	2747498.18	13432929.64	-1.6
6392	2746776.26	13431090.64	-1.7
6393	2743584.59	13431684.26	-1.7
6394	2746723.93	13433995.23	-1.7
6395	2747107.08	13431011.76	-1.7
6396	2746212.24	13433984.24	-1.5
6397	2745901.30	13431373.26	-1.4
6398	2746683.07	13431986.93	-1.4
6399	2747453.59	13432555.15	-1.5
6400	2746369.06	13434041.57	-1.5
6401	2746353.84	13434057.20	-1.5
6402	2746095.98	13433957.35	-1.5
6403	2746105.43	13433941.24	-1.5
6404	2746114.87	13433928.03	-1.5
6405	2747217.69	13432257.07	-1.5
6406	2745841.64	13433793.18	-1.5
6407	2745828.60	13433811.20	-1.5
6408	2745975.10	13433878.86	-1.5
6409	2745982.01	13433861.87	-1.5
6410	2745743.92	13433778.74	-1.5
6411	2747513.21	13432712.42	-1.7
6412	2747479.99	13432775.32	-1.7
6413	2747467.41	13432788.11	-1.7
6414	2747451.40	13432802.68	-1.7
6415	2747429.96	13432822.57	-1.7
6416	2746946.16	13433859.38	-1.7
6417	2746938.07	13433872.25	-1.7
6418	2746933.05	13433886.08	-1.7
6419	2746932.63	13433897.62	-1.7
6420	2747162.40	13433718.46	-1.7
6421	2747182.16	13433688.70	-1.7
6422	2747192.97	13433674.44	-1.7
6423	2747337.08	13433456.35	-1.7
6424	2747445.16	13433270.03	-1.7
6425	2747457.23	13433250.68	-1.7
6426	2747473.50	13433221.05	-1.7
6427	2747482.82	13433205.91	-1.7
6428	2747492.88	13433188.47	-1.7
6429	2747506.00	13433120.34	-1.7
6430	2747516.69	13433054.84	-1.7
6431	2747128.11	13431015.12	-1.8
6432	2746475.46	13431116.98	-1.8

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
6433	2746439.37	13431121.63	-1.8
6434	2743570.62	13431667.91	-1.8
6435	2743630.67	13431732.25	-1.8
6436	2743842.76	13431989.55	-1.8
6437	2744969.88	13433367.53	-1.8
6438	2746740.44	13433965.39	-1.8
6439	2746750.65	13433946.34	-1.8
6440	2746769.24	13433914.63	-1.8
6441	2747576.14	13432135.36	-1.8
6442	2747443.77	13432389.70	-1.6
6443	2746230.44	13433958.56	-1.6
6444	2746753.19	13431203.59	-1.5
6445	2746823.31	13431272.22	-1.5
6446	2746930.80	13431251.65	-1.5
6447	2747445.22	13432578.84	-1.5
6448	2747426.92	13432606.66	-1.5
6449	2746383.16	13434025.34	-1.5
6450	2746128.00	13433908.21	-1.6
6451	2747219.35	13432456.91	-1.6
6452	2745860.45	13433770.43	-1.6
6453	2745985.23	13433846.81	-1.6
6454	2745819.39	13433766.93	-1.6
6455	2745785.24	13433772.22	-1.6
6456	2745764.88	13433774.12	-1.6
6457	2745721.54	13433781.54	-1.6
6458	2745703.26	13433776.35	-1.6
6459	2745691.35	13433765.86	-1.6
6460	2745359.54	13433699.60	-1.6
6461	2746704.08	13432009.92	-1.6
6462	2746647.30	13431956.32	-1.6
6463	2747445.65	13432661.55	-1.7
6464	2747445.76	13432807.62	-1.7
6465	2747437.59	13432816.38	-1.7
6466	2747419.73	13432830.03	-1.7
6467	2746962.10	13433824.50	-1.8
6468	2746955.98	13433842.30	-1.8
6469	2747173.01	13433702.07	-1.8
6470	2747202.16	13433660.34	-1.8
6471	2747210.55	13433647.37	-1.8
6472	2747220.12	13433634.13	-1.8
6473	2747291.80	13433526.80	-1.8
6474	2747300.54	13433513.81	-1.8
6475	2747328.22	13433471.31	-1.8
6476	2747389.95	13433353.50	-1.8
6477	2747416.06	13433312.13	-1.8
6478	2747425.49	13433299.40	-1.8
6479	2747434.60	13433286.54	-1.8
6480	2744957.46	13433356.18	-1.8

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
6481	2746759.08	13433932.73	-1.8
6482	2747144.44	13431016.19	-1.8
6483	2747437.77	13432405.18	-1.6
6484	2747429.61	13432429.18	-1.6
6485	2747390.16	13432530.88	-1.6
6486	2746249.62	13433933.26	-1.6
6487	2745492.68	13433728.94	-1.6
6488	2745067.29	13433401.56	-1.6
6489	2744982.49	13433327.59	-1.6
6490	2746708.04	13431211.40	-1.5
6491	2745878.30	13431389.34	-1.6
6492	2747451.02	13432546.77	-1.6
6493	2747451.96	13432567.58	-1.6
6494	2747436.63	13432593.51	-1.6
6495	2746395.32	13434009.26	-1.6
6496	2746137.54	13433892.98	-1.6
6497	2747190.77	13432252.61	-1.7
6498	2745889.28	13433733.63	-1.7
6499	2745873.81	13433754.98	-1.7
6500	2745986.11	13433828.88	-1.7
6501	2745984.75	13433811.48	-1.7
6502	2745981.10	13433792.71	-1.7
6503	2745864.32	13433756.18	-1.7
6504	2745839.31	13433763.01	-1.7
6505	2745685.76	13433750.62	-1.7
6506	2746877.08	13432084.63	-1.7
6507	2745355.05	13433685.49	-1.7
6508	2746706.66	13432016.56	-1.7
6509	2746472.67	13431832.19	-1.7
6510	2746434.51	13431799.12	-1.7
6511	2747437.15	13432661.68	-1.8
6512	2747406.31	13432839.39	-1.8
6513	2747397.52	13432845.55	-1.8
6514	2747230.03	13433621.84	-1.8
6515	2747240.14	13433609.06	-1.8
6516	2747251.04	13433593.89	-1.8
6517	2747262.43	13433576.36	-1.8
6518	2747273.83	13433557.09	-1.8
6519	2747281.55	13433542.34	-1.8
6520	2747309.74	13433498.91	-1.8
6521	2747319.31	13433483.87	-1.8
6522	2747344.70	13433442.85	-1.8
6523	2747353.13	13433426.90	-1.8
6524	2747361.40	13433410.31	-1.8
6525	2747368.25	13433396.49	-1.8
6526	2747382.01	13433369.73	-1.8
6527	2747397.76	13433340.10	-1.8
6528	2747406.48	13433325.59	-1.8

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
6529	2747138.61	13431014.61	-1.9
6530	2743853.74	13432009.77	-1.9
6531	2744938.83	13433359.61	-1.9
6532	2746780.43	13433892.48	-1.9
6533	2746789.61	13433873.56	-1.9
6534	2746821.38	13433811.76	-1.9
6535	2747426.47	13432443.26	-1.7
6536	2747425.05	13432462.71	-1.7
6537	2747422.91	13432479.92	-1.7
6538	2747420.75	13432489.57	-1.7
6539	2747377.65	13432542.75	-1.7
6540	2745475.68	13433710.09	-1.7
6541	2746662.36	13431216.42	-1.6
6542	2746785.68	13431280.74	-1.7
6543	2747140.00	13431197.81	-1.7
6544	2745893.51	13431392.36	-1.7
6545	2746481.46	13431865.91	-1.7
6546	2747433.92	13432517.09	-1.7
6547	2747441.63	13432527.43	-1.7
6548	2747414.59	13432624.54	-1.7
6549	2746149.67	13433875.83	-1.7
6550	2747208.42	13432469.25	-1.7
6551	2747269.25	13432304.11	-1.7
6552	2747259.79	13432287.51	-1.7
6553	2747248.53	13432276.70	-1.7
6554	2747233.46	13432266.97	-1.7
6555	2745942.92	13433759.31	-1.7
6556	2745927.31	13433753.89	-1.7
6557	2745904.95	13433748.22	-1.7
6558	2745686.63	13433737.08	-1.7
6559	2745695.32	13433723.78	-1.8
6560	2745711.55	13433704.61	-1.8
6561	2745728.13	13433681.54	-1.8
6562	2747388.79	13432851.80	-1.9
6563	2747380.86	13432859.22	-1.9
6564	2747372.02	13432874.77	-1.9
6565	2747368.51	13432883.26	-1.9
6566	2747375.20	13433382.94	-1.9
6567	2746395.70	13431123.13	-2.0
6568	2743507.70	13431603.24	-2.0
6569	2743824.64	13431954.54	-2.0
6570	2746796.83	13433858.47	-2.0
6571	2746809.04	13433836.59	-2.0
6572	2746846.80	13433776.23	-2.0
6573	2747578.06	13432128.82	-2.0
6574	2747582.34	13432112.75	-2.0
6575	2747404.28	13432514.83	-1.8
6576	2746284.56	13433884.72	-1.8

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
6577	2746267.23	13433907.56	-1.8
6578	2746738.17	13432031.82	-1.8
6579	2747260.11	13432376.95	-1.8
6580	2746424.01	13433964.98	-1.8
6581	2746417.26	13433977.95	-1.8
6582	2746406.78	13433994.62	-1.8
6583	2746157.52	13433858.92	-1.8
6584	2747204.81	13432252.05	-1.8
6585	2747179.12	13432257.79	-1.8
6586	2745913.22	13433704.34	-1.8
6587	2745902.10	13433717.10	-1.8
6588	2745972.65	13433776.63	-1.8
6589	2745958.13	13433767.27	-1.8
6590	2745886.30	13433748.77	-1.8
6591	2745742.71	13433664.59	-1.8
6592	2745352.53	13433672.14	-1.9
6593	2745349.70	13433658.03	-1.9
6594	2745557.19	13433330.08	-1.9
6595	2746638.51	13431957.69	-1.9
6596	2746628.92	13431958.71	-1.9
6597	2746406.36	13431788.33	-1.9
6598	2747377.14	13432866.52	-2.0
6599	2747365.56	13432890.30	-2.0
6600	2746356.28	13431125.79	-2.1
6601	2743456.88	13431554.12	-2.1
6602	2746835.10	13433793.51	-2.1
6603	2746858.38	13433757.33	-2.1
6604	2746891.39	13433696.50	-2.1
6605	2746904.27	13433675.76	-2.1
6606	2746916.22	13433655.77	-2.1
6607	2746966.95	13433575.56	-2.1
6608	2745434.30	13433676.70	-1.9
6609	2746701.85	13431298.66	-1.8
6610	2746740.10	13431291.35	-1.8
6611	2746641.87	13431970.83	-1.8
6612	2746748.99	13432044.39	-1.8
6613	2746761.15	13432058.26	-1.8
6614	2746794.23	13432086.38	-1.8
6615	2747412.84	13432497.85	-1.8
6616	2747422.36	13432506.37	-1.8
6617	2746435.97	13433940.87	-1.9
6618	2746166.70	13433840.43	-1.9
6619	2747195.68	13432483.46	-1.9
6620	2745753.49	13433651.65	-1.9
6621	2747029.10	13432142.62	-1.9
6622	2745353.38	13433625.71	-1.9
6623	2746391.75	13431782.63	-2.0
6624	2747364.98	13432897.76	-2.1

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
6625	2747364.21	13432904.78	-2.1
6626	2745727.90	13431177.87	-2.1
6627	2743494.00	13431587.19	-2.1
6628	2746870.92	13433737.01	-2.1
6629	2746880.67	13433715.69	-2.1
6630	2746931.95	13433636.32	-2.1
6631	2746944.35	13433617.92	-2.1
6632	2746954.35	13433598.62	-2.1
6633	2746978.11	13433554.79	-2.1
6634	2746994.42	13433531.62	-2.1
6635	2747020.31	13433489.27	-2.1
6636	2747032.47	13433469.16	-2.1
6637	2747580.22	13432121.48	-2.1
6638	2747366.26	13432551.41	-1.9
6639	2745460.10	13433690.22	-1.9
6640	2745403.33	13433669.97	-1.9
6641	2745382.05	13433659.16	-1.9
6642	2746613.43	13431220.01	-1.8
6643	2746555.04	13431230.26	-1.8
6644	2745650.52	13431303.35	-1.9
6645	2743632.72	13431725.68	-1.9
6646	2745827.70	13431393.32	-1.9
6647	2746664.35	13431979.56	-1.9
6648	2747404.95	13432637.93	-1.9
6649	2747393.39	13432651.14	-1.9
6650	2746455.67	13433916.35	-1.9
6651	2746178.02	13433822.28	-1.9
6652	2746193.11	13433786.87	-1.9
6653	2747161.93	13432526.53	-2.0
6654	2745939.16	13433672.05	-2.0
6655	2745923.82	13433690.94	-2.0
6656	2747017.85	13432152.20	-2.0
6657	2746862.65	13432103.44	-2.0
6658	2745475.40	13433613.39	-2.0
6659	2745465.43	13433622.36	-2.0
6660	2745350.47	13433640.10	-2.0
6661	2745529.51	13433366.02	-2.0
6662	2746714.82	13432034.14	-2.0
6663	2747362.64	13432914.66	-2.1
6664	2747359.98	13432923.44	-2.1
6665	2746330.22	13431128.48	-2.2
6666	2747007.34	13433511.68	-2.2
6667	2747101.40	13433289.74	-2.2
6668	2747356.34	13432562.73	-2.0
6669	2746300.91	13433861.10	-2.0
6670	2745358.57	13433646.60	-2.0
6671	2745338.42	13433630.27	-2.0
6672	2746596.18	13431953.21	-2.0

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
6673	2746617.37	13431963.07	-2.0
6674	2746776.09	13432075.46	-2.0
6675	2746810.36	13432094.34	-2.0
6676	2746823.65	13432104.07	-2.0
6677	2746858.04	13432124.87	-2.0
6678	2747236.60	13432366.77	-2.0
6679	2747381.00	13432667.46	-2.0
6680	2747341.54	13432709.90	-2.0
6681	2746187.31	13433804.34	-2.0
6682	2747152.10	13432539.16	-2.0
6683	2747172.01	13432513.79	-2.0
6684	2747136.76	13432309.13	-2.0
6685	2745966.52	13433637.50	-2.1
6686	2745952.55	13433656.66	-2.1
6687	2745778.07	13433618.63	-2.1
6688	2747002.84	13432166.80	-2.1
6689	2747009.52	13432159.80	-2.1
6690	2745513.16	13433571.41	-2.1
6691	2745488.14	13433599.11	-2.1
6692	2745453.12	13433632.53	-2.1
6693	2745442.56	13433642.43	-2.1
6694	2745431.81	13433654.19	-2.1
6695	2745357.21	13433607.16	-2.1
6696	2745539.09	13433353.72	-2.1
6697	2745547.61	13433342.16	-2.1
6698	2745588.12	13433292.06	-2.1
6699	2746710.56	13432022.98	-2.1
6700	2746618.41	13431961.23	-2.1
6701	2746420.34	13431793.95	-2.1
6702	2747359.78	13432935.69	-2.2
6703	2747359.72	13432946.24	-2.2
6704	2747361.78	13432967.65	-2.2
6705	2747341.25	13433043.70	-2.2
6706	2747332.48	13433052.79	-2.2
6707	2747324.43	13433061.09	-2.2
6708	2747311.24	13433073.50	-2.2
6709	2746219.63	13431142.98	-2.3
6710	2745481.96	13431214.20	-2.3
6711	2743778.57	13431883.45	-2.3
6712	2747074.38	13433338.62	-2.3
6713	2747118.30	13433270.65	-2.3
6714	2747316.81	13433021.49	-2.3
6715	2746341.74	13433810.95	-2.1
6716	2746326.69	13433832.68	-2.1
6717	2745319.52	13433613.48	-2.1
6718	2745301.36	13433598.51	-2.1
6719	2744962.63	13433307.67	-2.1
6720	2746519.84	13431236.66	-2.0

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
6721	2746675.69	13431304.89	-2.0
6722	2745913.95	13431379.25	-2.0
6723	2746407.23	13431654.77	-2.1
6724	2746488.95	13431879.41	-2.1
6725	2746499.12	13431893.31	-2.1
6726	2746511.27	13431904.05	-2.1
6727	2746568.25	13431938.64	-2.1
6728	2746837.40	13432112.64	-2.1
6729	2746873.77	13432132.51	-2.1
6730	2746883.85	13432144.30	-2.1
6731	2746883.29	13432185.62	-2.1
6732	2747397.38	13432480.97	-2.1
6733	2747405.98	13432488.96	-2.1
6734	2746486.65	13433875.60	-2.1
6735	2746475.14	13433892.67	-2.1
6736	2746197.28	13433768.54	-2.1
6737	2747111.65	13432603.16	-2.1
6738	2747184.32	13432499.50	-2.1
6739	2747166.51	13432269.66	-2.1
6740	2747146.11	13432297.62	-2.1
6741	2745979.15	13433619.99	-2.1
6742	2745764.92	13433635.76	-2.1
6743	2745804.66	13433588.94	-2.1
6744	2746975.23	13432193.57	-2.1
6745	2746981.39	13432187.39	-2.1
6746	2746989.03	13432180.63	-2.1
6747	2746995.90	13432173.48	-2.1
6748	2746846.06	13432129.43	-2.2
6749	2745502.11	13433584.04	-2.2
6750	2745362.63	13433590.63	-2.2
6751	2745372.22	13433574.31	-2.2
6752	2745517.23	13433382.41	-2.2
6753	2746709.71	13432049.30	-2.2
6754	2746712.63	13432043.54	-2.2
6755	2746713.80	13432028.78	-2.2
6756	2746606.83	13431967.36	-2.2
6757	2746595.38	13431974.65	-2.2
6758	2746577.67	13431987.27	-2.2
6759	2746465.59	13431836.71	-2.2
6760	2746381.44	13431776.68	-2.2
6761	2747361.71	13432958.11	-2.3
6762	2747361.39	13432977.12	-2.3
6763	2747360.76	13432986.77	-2.3
6764	2747359.62	13432995.43	-2.3
6765	2747357.23	13433007.88	-2.3
6766	2747356.06	13433017.95	-2.3
6767	2747352.65	13433027.75	-2.3
6768	2747317.86	13433066.69	-2.3

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
6769	2747305.16	13433078.86	-2.3
6770	2747296.03	13433083.40	-2.3
6771	2747287.82	13433086.76	-2.3
6772	2747278.75	13433091.11	-2.3
6773	2747268.99	13433094.69	-2.3
6774	2746248.86	13431140.08	-2.4
6775	2746187.34	13431145.33	-2.4
6776	2747073.54	13433330.22	-2.4
6777	2747083.79	13433307.73	-2.4
6778	2747264.49	13433081.13	-2.4
6779	2747283.50	13433058.87	-2.4
6780	2746366.38	13433777.72	-2.2
6781	2745276.24	13433581.80	-2.2
6782	2745251.65	13433560.53	-2.2
6783	2745176.12	13433498.98	-2.2
6784	2747028.53	13431135.38	-2.1
6785	2746646.98	13431309.81	-2.1
6786	2746528.88	13431915.85	-2.1
6787	2746551.47	13431926.98	-2.1
6788	2746583.49	13431947.64	-2.1
6789	2747119.43	13432299.62	-2.2
6790	2747176.89	13432334.32	-2.2
6791	2747217.44	13432356.13	-2.2
6792	2747369.13	13432682.39	-2.2
6793	2747356.98	13432695.13	-2.2
6794	2747325.27	13432724.37	-2.2
6795	2746498.07	13433854.01	-2.2
6796	2746202.10	13433747.22	-2.2
6797	2746206.36	13433727.19	-2.2
6798	2746210.88	13433710.51	-2.2
6799	2747135.26	13432566.70	-2.2
6800	2747143.44	13432551.85	-2.2
6801	2747156.03	13432284.96	-2.2
6802	2747084.77	13432367.18	-2.2
6803	2746855.25	13432115.63	-2.2
6804	2746838.11	13432138.14	-2.2
6805	2746822.32	13432153.75	-2.2
6806	2745627.21	13433445.23	-2.2
6807	2745611.56	13433460.97	-2.2
6808	2745535.56	13433546.57	-2.2
6809	2745524.54	13433557.83	-2.2
6810	2745388.88	13433551.15	-2.2
6811	2745502.32	13433401.36	-2.2
6812	2746704.49	13432056.14	-2.3
6813	2746557.01	13432004.52	-2.3
6814	2747347.77	13433036.22	-2.4
6815	2745954.84	13431161.45	-2.5
6816	2747248.28	13433105.60	-2.5

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
6817	2747301.03	13433041.04	-2.5
6818	2747527.23	13431909.23	-2.5
6819	2747155.64	13431033.34	-2.5
6820	2746404.46	13433725.44	-2.3
6821	2746382.48	13433756.29	-2.3
6822	2745224.21	13433536.77	-2.3
6823	2745198.38	13433517.06	-2.3
6824	2744939.16	13433285.24	-2.3
6825	2744663.89	13433022.69	-2.3
6826	2744118.79	13432262.89	-2.3
6827	2743659.73	13431741.78	-2.2
6828	2746883.04	13432201.56	-2.2
6829	2747019.93	13432261.92	-2.2
6830	2747080.49	13432282.05	-2.2
6831	2747135.18	13432310.22	-2.2
6832	2747311.32	13432739.60	-2.2
6833	2746546.83	13433781.83	-2.2
6834	2746509.50	13433830.50	-2.2
6835	2747074.94	13432654.03	-2.3
6836	2747086.25	13432638.78	-2.3
6837	2747123.20	13432585.47	-2.3
6838	2746032.02	13433559.48	-2.3
6839	2746018.88	13433573.32	-2.3
6840	2746006.21	13433588.03	-2.3
6841	2745993.69	13433602.13	-2.3
6842	2745792.57	13433602.56	-2.3
6843	2745816.14	13433576.07	-2.3
6844	2746831.43	13432145.26	-2.3
6845	2745590.34	13433485.98	-2.3
6846	2745576.77	13433502.43	-2.3
6847	2745400.78	13433537.47	-2.3
6848	2745411.03	13433524.33	-2.3
6849	2745430.40	13433494.83	-2.3
6850	2745470.78	13433439.48	-2.3
6851	2746587.48	13431979.61	-2.3
6852	2746567.51	13431996.05	-2.3
6853	2746370.02	13431768.80	-2.4
6854	2746088.63	13431152.18	-2.5
6855	2745965.97	13431161.38	-2.5
6856	2745871.19	13431163.19	-2.5
6857	2745831.64	13431169.32	-2.5
6858	2745796.71	13431172.10	-2.5
6859	2745751.54	13431176.10	-2.5
6860	2747243.71	13433117.27	-2.5
6861	2747254.55	13433092.17	-2.5
6862	2747238.70	13431284.23	-2.5
6863	2747223.29	13431187.74	-2.5
6864	2747164.30	13431047.67	-2.5

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
6865	2746540.68	13433558.91	-2.3
6866	2746488.52	13433621.14	-2.3
6867	2746465.79	13433650.11	-2.3
6868	2746443.01	13433676.68	-2.3
6869	2746425.26	13433697.65	-2.3
6870	2745111.15	13433439.72	-2.3
6871	2744133.93	13432286.37	-2.3
6872	2745931.55	13431274.67	-2.2
6873	2745911.19	13431399.62	-2.3
6874	2746890.03	13432165.01	-2.3
6875	2747041.77	13432264.97	-2.3
6876	2747154.80	13432322.21	-2.3
6877	2746653.95	13433622.16	-2.3
6878	2746628.36	13433654.16	-2.3
6879	2746562.20	13433764.47	-2.3
6880	2746526.64	13433803.85	-2.3
6881	2746219.11	13433695.96	-2.3
6882	2746227.34	13433681.56	-2.3
6883	2746249.80	13433647.19	-2.3
6884	2746259.59	13433635.68	-2.3
6885	2746270.17	13433621.85	-2.3
6886	2746290.65	13433593.84	-2.3
6887	2747054.03	13432681.00	-2.3
6888	2747064.99	13432666.99	-2.3
6889	2747096.41	13432624.64	-2.3
6890	2747102.96	13432615.05	-2.3
6891	2746101.84	13433470.03	-2.4
6892	2746075.10	13433502.15	-2.4
6893	2746061.26	13433518.66	-2.4
6894	2745831.15	13433558.85	-2.4
6895	2745849.59	13433539.45	-2.4
6896	2745863.89	13433523.84	-2.4
6897	2745636.60	13433433.04	-2.4
6898	2745602.47	13433471.35	-2.4
6899	2745562.80	13433517.35	-2.4
6900	2745550.92	13433530.31	-2.4
6901	2745420.67	13433510.23	-2.4
6902	2745442.75	13433477.56	-2.4
6903	2745457.87	13433456.20	-2.4
6904	2745485.65	13433422.11	-2.4
6905	2746545.97	13432013.47	-2.4
6906	2746122.81	13431149.30	-2.6
6907	2746049.15	13431152.71	-2.6
6908	2745928.08	13431160.71	-2.6
6909	2745900.75	13431161.09	-2.6
6910	2745775.57	13431173.77	-2.6
6911	2743799.71	13431889.56	-2.6
6912	2747298.44	13431371.28	-2.6

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
6913	2747228.12	13431266.73	-2.6
6914	2747223.96	13431252.50	-2.6
6915	2747145.42	13432855.43	-2.4
6916	2747116.98	13432890.17	-2.4
6917	2746622.53	13433462.39	-2.4
6918	2746607.97	13433476.26	-2.4
6919	2746517.17	13433590.70	-2.4
6920	2745157.98	13433481.53	-2.4
6921	2745092.29	13433420.76	-2.4
6922	2744644.50	13432999.28	-2.4
6923	2744150.12	13432308.41	-2.4
6924	2746472.09	13431248.60	-2.3
6925	2743624.99	13431708.26	-2.3
6926	2746612.84	13431317.54	-2.4
6927	2746899.99	13432229.19	-2.4
6928	2746910.48	13432238.01	-2.4
6929	2747199.64	13432346.86	-2.4
6930	2746703.32	13433535.00	-2.4
6931	2746694.64	13433551.86	-2.4
6932	2746686.79	13433576.30	-2.4
6933	2746673.11	13433599.33	-2.4
6934	2746237.13	13433664.27	-2.4
6935	2746281.91	13433606.61	-2.4
6936	2746299.47	13433581.80	-2.4
6937	2746326.18	13433549.98	-2.4
6938	2747112.08	13432336.32	-2.4
6939	2746130.40	13433433.28	-2.4
6940	2746116.13	13433451.37	-2.4
6941	2746089.64	13433485.60	-2.4
6942	2745878.49	13433504.54	-2.5
6943	2745890.85	13433487.91	-2.5
6944	2745646.06	13433419.16	-2.5
6945	2746158.23	13431147.56	-2.7
6946	2747285.32	13431343.03	-2.7
6947	2747263.18	13431311.11	-2.7
6948	2747213.45	13431164.19	-2.7
6949	2747347.87	13432577.18	-2.5
6950	2747104.15	13432907.19	-2.5
6951	2746998.36	13433043.14	-2.5
6952	2746989.28	13433056.91	-2.5
6953	2746635.69	13433446.11	-2.5
6954	2746593.10	13433494.34	-2.5
6955	2746557.01	13433537.79	-2.5
6956	2745132.42	13433457.71	-2.5
6957	2744626.74	13432976.96	-2.5
6958	2744609.89	13432959.60	-2.5
6959	2746438.67	13431252.57	-2.4
6960	2746405.78	13431252.62	-2.4

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
6961	2746375.44	13431250.59	-2.4
6962	2746349.26	13431247.73	-2.4
6963	2746007.79	13431259.54	-2.4
6964	2745630.51	13431308.76	-2.4
6965	2743926.37	13431709.04	-2.4
6966	2747169.10	13431190.58	-2.4
6967	2747188.75	13431188.30	-2.4
6968	2747205.10	13431187.00	-2.4
6969	2745811.38	13431402.09	-2.4
6970	2747100.48	13432290.05	-2.5
6971	2747175.89	13432899.07	-2.5
6972	2747158.01	13432917.05	-2.5
6973	2747125.88	13432951.07	-2.5
6974	2746311.64	13433565.62	-2.5
6975	2746339.29	13433533.73	-2.5
6976	2746348.58	13433520.02	-2.5
6977	2746361.97	13433503.08	-2.5
6978	2746377.05	13433485.16	-2.5
6979	2746434.25	13433409.13	-2.5
6980	2746441.92	13433396.06	-2.5
6981	2746456.37	13433368.32	-2.5
6982	2746574.84	13433223.94	-2.5
6983	2747035.01	13432703.44	-2.5
6984	2747043.86	13432692.95	-2.5
6985	2747123.49	13432324.06	-2.5
6986	2747100.18	13432350.10	-2.5
6987	2747074.04	13432379.95	-2.5
6988	2747062.57	13432392.60	-2.5
6989	2746257.74	13433290.62	-2.5
6990	2746217.31	13433335.65	-2.5
6991	2746169.65	13433388.34	-2.5
6992	2746157.36	13433399.00	-2.5
6993	2746141.47	13433416.75	-2.5
6994	2746046.13	13433537.95	-2.5
6995	2745899.36	13433475.59	-2.5
6996	2745912.36	13433459.55	-2.5
6997	2745658.32	13433404.69	-2.5
6998	2745598.34	13433278.89	-2.6
6999	2746533.43	13432021.50	-2.6
7000	2746520.11	13432028.60	-2.6
7001	2747320.60	13431416.15	-2.8
7002	2747310.19	13431394.84	-2.8
7003	2747273.34	13431321.32	-2.8
7004	2747225.86	13431211.33	-2.8
7005	2747132.23	13432871.59	-2.6
7006	2747094.30	13432920.70	-2.6
7007	2747084.60	13432933.33	-2.6
7008	2746574.89	13433516.70	-2.6

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
7009	2744908.46	13433268.29	-2.6
7010	2744681.49	13433040.07	-2.6
7011	2746889.04	13432217.96	-2.5
7012	2747334.32	13432434.61	-2.5
7013	2747296.62	13432757.46	-2.5
7014	2747276.63	13432785.33	-2.5
7015	2747214.33	13432859.18	-2.5
7016	2747142.93	13432933.75	-2.6
7017	2747104.09	13432973.42	-2.6
7018	2746466.78	13433356.40	-2.6
7019	2746483.90	13433338.29	-2.6
7020	2746498.30	13433320.91	-2.6
7021	2746510.86	13433304.83	-2.6
7022	2746563.22	13433238.15	-2.6
7023	2746654.01	13433125.64	-2.6
7024	2746668.38	13433111.00	-2.6
7025	2746245.59	13433303.32	-2.6
7026	2746201.07	13433353.79	-2.6
7027	2745924.20	13433447.08	-2.6
7028	2745937.30	13433432.39	-2.6
7029	2745947.96	13433419.08	-2.6
7030	2745959.93	13433403.29	-2.6
7031	2745974.11	13433384.35	-2.6
7032	2746811.19	13432164.13	-2.6
7033	2746801.83	13432176.16	-2.6
7034	2745677.43	13433382.95	-2.6
7035	2746356.19	13431763.91	-2.7
7036	2743826.35	13431935.41	-2.8
7037	2747342.45	13431459.50	-2.8
7038	2747331.55	13431436.59	-2.8
7039	2747204.87	13431143.40	-2.8
7040	2747173.25	13431062.30	-2.8
7041	2747167.18	13432827.69	-2.6
7042	2747157.41	13432841.32	-2.6
7043	2747070.78	13432949.08	-2.6
7044	2747052.42	13432973.26	-2.6
7045	2747030.56	13432999.51	-2.6
7046	2747018.13	13433015.11	-2.6
7047	2747009.93	13433026.98	-2.6
7048	2744885.56	13433254.99	-2.6
7049	2744866.38	13433242.85	-2.6
7050	2744825.72	13433208.24	-2.6
7051	2744595.81	13432939.56	-2.6
7052	2744169.74	13432337.34	-2.6
7053	2746326.46	13431247.77	-2.5
7054	2747261.82	13432807.19	-2.6
7055	2747243.49	13432827.32	-2.6
7056	2747200.94	13432873.41	-2.6

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
7057	2747063.81	13433023.25	-2.6
7058	2747048.89	13433046.17	-2.6
7059	2746450.22	13433380.81	-2.6
7060	2746523.83	13433286.47	-2.7
7061	2746549.89	13433254.76	-2.7
7062	2746587.99	13433207.03	-2.7
7063	2746615.01	13433173.20	-2.7
7064	2746626.58	13433159.51	-2.7
7065	2746640.36	13433140.81	-2.7
7066	2747026.13	13432715.63	-2.7
7067	2746314.01	13433225.67	-2.7
7068	2746302.17	13433241.79	-2.7
7069	2746283.70	13433259.88	-2.7
7070	2746271.27	13433275.90	-2.7
7071	2746231.13	13433319.88	-2.7
7072	2746188.68	13433367.77	-2.7
7073	2745987.53	13433367.25	-2.7
7074	2745998.01	13433352.26	-2.7
7075	2746022.12	13433322.67	-2.7
7076	2746034.02	13433306.16	-2.7
7077	2746093.40	13433231.73	-2.7
7078	2745722.97	13433320.89	-2.7
7079	2745698.65	13433355.75	-2.7
7080	2745667.44	13433394.33	-2.7
7081	2743455.67	13431535.83	-2.9
7082	2747586.11	13432098.23	-2.9
7083	2747570.69	13432015.05	-2.9
7084	2747329.78	13432606.74	-2.7
7085	2747042.25	13432986.89	-2.7
7086	2744841.57	13433226.58	-2.7
7087	2744811.01	13433187.29	-2.7
7088	2744790.07	13433164.06	-2.7
7089	2744772.22	13433144.09	-2.7
7090	2744753.54	13433123.25	-2.7
7091	2744579.64	13432919.41	-2.7
7092	2746146.87	13431240.57	-2.6
7093	2746094.79	13431242.97	-2.6
7094	2746042.15	13431253.15	-2.6
7095	2745978.43	13431267.23	-2.6
7096	2745955.61	13431270.99	-2.6
7097	2743955.01	13431707.62	-2.6
7098	2746579.69	13431322.34	-2.7
7099	2747228.37	13432842.06	-2.7
7100	2747092.85	13432985.20	-2.7
7101	2746538.51	13433268.24	-2.7
7102	2746601.65	13433189.96	-2.7
7103	2747004.45	13432735.45	-2.7
7104	2747016.58	13432728.75	-2.7

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
7105	2746445.89	13433077.85	-2.7
7106	2746011.36	13433335.98	-2.8
7107	2746056.58	13433277.42	-2.8
7108	2746071.68	13433258.59	-2.8
7109	2746083.73	13433244.21	-2.8
7110	2746116.42	13433202.67	-2.8
7111	2746130.25	13433187.96	-2.8
7112	2746145.89	13433171.37	-2.8
7113	2746159.71	13433154.43	-2.8
7114	2745787.73	13433239.84	-2.8
7115	2745772.21	13433255.34	-2.8
7116	2745762.11	13433269.36	-2.8
7117	2745754.57	13433281.89	-2.8
7118	2745741.72	13433297.08	-2.8
7119	2745732.16	13433306.97	-2.8
7120	2745712.97	13433335.41	-2.8
7121	2745689.35	13433368.14	-2.8
7122	2745612.69	13433259.71	-2.8
7123	2745623.29	13433243.93	-2.8
7124	2744161.85	13432214.12	-3.0
7125	2743817.16	13431898.82	-3.0
7126	2743826.83	13431914.75	-3.0
7127	2747197.76	13431122.37	-3.0
7128	2747340.41	13432588.40	-2.8
7129	2747320.76	13432630.94	-2.8
7130	2747188.69	13432799.45	-2.8
7131	2747178.34	13432811.94	-2.8
7132	2747060.13	13432961.81	-2.8
7133	2746650.22	13433432.73	-2.8
7134	2744734.73	13433103.17	-2.8
7135	2747066.08	13431118.79	-2.7
7136	2746068.93	13431248.19	-2.7
7137	2745803.39	13431477.71	-2.7
7138	2746395.39	13431644.59	-2.8
7139	2746429.68	13433098.09	-2.8
7140	2746312.05	13433228.22	-2.8
7141	2746044.69	13433292.17	-2.8
7142	2746103.00	13433219.61	-2.8
7143	2745911.87	13433121.00	-2.9
7144	2745888.05	13433143.34	-2.9
7145	2745875.71	13433155.95	-2.9
7146	2745852.70	13433175.59	-2.9
7147	2745825.46	13433204.04	-2.9
7148	2745804.14	13433226.22	-2.9
7149	2745633.35	13433229.20	-2.9
7150	2745655.91	13433199.37	-2.9
7151	2745668.43	13433181.80	-2.9
7152	2745690.49	13433151.25	-2.9

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
7153	2745712.95	13433118.46	-2.9
7154	2745724.94	13433104.20	-2.9
7155	2745794.27	13433026.69	-2.9
7156	2745832.83	13432984.88	-2.9
7157	2745884.43	13432919.68	-2.9
7158	2745896.66	13432904.54	-2.9
7159	2745276.64	13433157.74	-2.9
7160	2745247.73	13433185.24	-2.9
7161	2745150.80	13433274.04	-2.9
7162	2745124.47	13433283.43	-2.9
7163	2746340.59	13431760.20	-2.9
7164	2746326.59	13431757.07	-2.9
7165	2744149.56	13432206.65	-3.0
7166	2746105.10	13432389.87	-3.7
7167	2747350.86	13431478.05	-3.1
7168	2747190.34	13431100.24	-3.1
7169	2747182.68	13431080.51	-3.1
7170	2744714.23	13433079.40	-2.9
7171	2746120.97	13431241.95	-2.8
7172	2745748.17	13431435.96	-2.8
7173	2745779.87	13431424.36	-2.8
7174	2747079.34	13433001.29	-2.9
7175	2746459.77	13433063.29	-2.9
7176	2745838.50	13433191.24	-2.9
7177	2745815.12	13433215.41	-2.9
7178	2745643.21	13433215.45	-2.9
7179	2745678.63	13433168.02	-3.0
7180	2745746.53	13433080.60	-3.0
7181	2745770.86	13433054.80	-3.0
7182	2745804.98	13433014.75	-3.0
7183	2745848.38	13432966.21	-3.0
7184	2745863.14	13432947.00	-3.0
7185	2745874.26	13432932.85	-3.0
7186	2745909.01	13432889.67	-3.0
7187	2745920.34	13432875.89	-3.0
7188	2745346.96	13433075.12	-3.0
7189	2745331.30	13433093.94	-3.0
7190	2745317.33	13433110.48	-3.0
7191	2745290.56	13433142.57	-3.0
7192	2745264.45	13433168.70	-3.0
7193	2745233.41	13433200.22	-3.0
7194	2745203.12	13433227.36	-3.0
7195	2745191.96	13433237.46	-3.0
7196	2745171.48	13433256.91	-3.0
7197	2745097.16	13433282.96	-3.0
7198	2745069.75	13433269.62	-3.0
7199	2745056.18	13433254.80	-3.0
7200	2745074.34	13433111.51	-3.0

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
7201	2745087.09	13433094.19	-3.0
7202	2746312.37	13431753.24	-3.0
7203	2746188.48	13431797.25	-3.0
7204	2746142.31	13431834.82	-3.0
7205	2747368.96	13431523.24	-3.2
7206	2744697.59	13433059.66	-3.0
7207	2744564.11	13432899.61	-3.0
7208	2744546.19	13432875.31	-3.0
7209	2746304.36	13431245.09	-2.9
7210	2746277.07	13431241.35	-2.9
7211	2745585.43	13431325.29	-2.9
7212	2745758.75	13431432.55	-2.9
7213	2745795.58	13431414.84	-2.9
7214	2747390.51	13432474.98	-2.9
7215	2746993.16	13432741.71	-3.0
7216	2746470.18	13433047.48	-3.0
7217	2745700.77	13433134.12	-3.0
7218	2745735.79	13433091.59	-3.0
7219	2745759.40	13433067.97	-3.0
7220	2745819.37	13433000.08	-3.0
7221	2745428.10	13432994.99	-3.0
7222	2745303.44	13433125.40	-3.0
7223	2745047.32	13433236.05	-3.0
7224	2745042.06	13433217.65	-3.0
7225	2745041.07	13433196.51	-3.1
7226	2745045.06	13433168.67	-3.1
7227	2745098.73	13433077.48	-3.1
7228	2745110.11	13433057.96	-3.1
7229	2745567.52	13432569.94	-3.1
7230	2745610.23	13432531.47	-3.1
7231	2746296.53	13431749.44	-3.1
7232	2746222.53	13431756.41	-3.1
7233	2746171.83	13431810.41	-3.1
7234	2746151.58	13431826.05	-3.1
7235	2746127.17	13431849.44	-3.1
7236	2746114.18	13431859.81	-3.1
7237	2745696.73	13432208.23	-3.1
7238	2745664.46	13432231.64	-3.1
7239	2745650.28	13432242.72	-3.1
7240	2745634.56	13432252.79	-3.1
7241	2745572.42	13432299.72	-3.1
7242	2745553.93	13432313.51	-3.1
7243	2746034.88	13431673.63	-3.1
7244	2745873.91	13431551.90	-3.1
7245	2747359.80	13431500.46	-3.2
7246	2747324.97	13432619.78	-3.0
7247	2747313.30	13432645.69	-3.0
7248	2744525.59	13432849.86	-3.0

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
7249	2744507.18	13432827.35	-3.0
7250	2744453.29	13432755.12	-3.0
7251	2744403.24	13432684.49	-3.0
7252	2744385.38	13432663.94	-3.0
7253	2744352.73	13432625.53	-3.0
7254	2744337.80	13432603.98	-3.0
7255	2746180.94	13431235.09	-2.9
7256	2743630.04	13431685.05	-3.0
7257	2745683.84	13431496.47	-3.0
7258	2746542.83	13431327.64	-3.0
7259	2745954.33	13431424.84	-3.0
7260	2746012.03	13431458.53	-3.0
7261	2746380.11	13431635.98	-3.0
7262	2746494.26	13433017.95	-3.1
7263	2746486.19	13433029.82	-3.1
7264	2745781.80	13433041.73	-3.1
7265	2745653.18	13432794.05	-3.1
7266	2745612.15	13432832.10	-3.1
7267	2745513.72	13432919.92	-3.1
7268	2745445.89	13432979.66	-3.1
7269	2745377.15	13433041.85	-3.1
7270	2745364.40	13433053.63	-3.1
7271	2745218.99	13433213.73	-3.1
7272	2745043.05	13433182.68	-3.1
7273	2745051.23	13433149.96	-3.1
7274	2745061.89	13433130.00	-3.1
7275	2745120.16	13433039.70	-3.1
7276	2745128.96	13433021.35	-3.1
7277	2745135.20	13433005.47	-3.1
7278	2745148.82	13432968.23	-3.1
7279	2745159.71	13432946.42	-3.1
7280	2745213.15	13432879.22	-3.1
7281	2745526.56	13432602.77	-3.1
7282	2745636.16	13432508.84	-3.1
7283	2745656.58	13432490.00	-3.1
7284	2745679.95	13432468.90	-3.1
7285	2745702.23	13432449.92	-3.1
7286	2745724.75	13432431.09	-3.1
7287	2745745.02	13432415.38	-3.1
7288	2746280.04	13431746.23	-3.1
7289	2746251.32	13431744.97	-3.1
7290	2746205.64	13431777.58	-3.1
7291	2745704.38	13432203.30	-3.1
7292	2745680.30	13432219.93	-3.1
7293	2745622.75	13432261.84	-3.1
7294	2745491.84	13432355.30	-3.1
7295	2745421.65	13432405.51	-3.2
7296	2745380.29	13432440.84	-3.2

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
7297	2745044.74	13432729.99	-3.2
7298	2744974.94	13432797.56	-3.2
7299	2744911.13	13432855.25	-3.2
7300	2744883.90	13432882.27	-3.2
7301	2744838.37	13432924.37	-3.2
7302	2744781.90	13432942.74	-3.2
7303	2744759.27	13432935.96	-3.2
7304	2744742.27	13432924.94	-3.2
7305	2744679.79	13432818.21	-3.2
7306	2744714.09	13432738.05	-3.2
7307	2745775.96	13431858.17	-3.2
7308	2745838.29	13431819.04	-3.2
7309	2745855.95	13431804.62	-3.2
7310	2745951.91	13431739.70	-3.2
7311	2745982.92	13431715.84	-3.2
7312	2745930.06	13431551.57	-3.2
7313	2745846.66	13431556.64	-3.2
7314	2745704.95	13431603.81	-3.2
7315	2745690.32	13431629.82	-3.2
7316	2745716.94	13431623.36	-3.2
7317	2745763.06	13431612.76	-3.2
7318	2745783.68	13431607.33	-3.2
7319	2745804.71	13431601.92	-3.2
7320	2744181.97	13432221.70	-3.3
7321	2744141.40	13432193.19	-3.3
7322	2745451.07	13431218.16	-3.3
7323	2743463.18	13431517.18	-3.3
7324	2744466.54	13432776.21	-3.1
7325	2744420.01	13432706.60	-3.1
7326	2744366.74	13432643.50	-3.1
7327	2744321.77	13432580.84	-3.1
7328	2744291.05	13432533.36	-3.1
7329	2744222.62	13432425.68	-3.1
7330	2746232.93	13431234.40	-3.0
7331	2745745.80	13431488.25	-3.0
7332	2745768.84	13431485.62	-3.0
7333	2745842.25	13431469.58	-3.0
7334	2745914.34	13431454.92	-3.0
7335	2745936.57	13431385.30	-3.1
7336	2745941.55	13431417.50	-3.1
7337	2746360.75	13431627.23	-3.1
7338	2745688.52	13432764.97	-3.2
7339	2745682.67	13432771.01	-3.2
7340	2745668.08	13432783.45	-3.2
7341	2745640.67	13432806.14	-3.2
7342	2745627.44	13432819.12	-3.2
7343	2745583.29	13432854.57	-3.2
7344	2745556.96	13432881.92	-3.2

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
7345	2745542.48	13432895.88	-3.2
7346	2745525.77	13432909.44	-3.2
7347	2745497.19	13432934.21	-3.2
7348	2745410.90	13433010.24	-3.2
7349	2745394.79	13433023.53	-3.2
7350	2745182.51	13432911.26	-3.2
7351	2745227.04	13432864.05	-3.2
7352	2745243.96	13432849.68	-3.2
7353	2745290.66	13432813.33	-3.2
7354	2745330.36	13432777.42	-3.2
7355	2745491.65	13432630.61	-3.2
7356	2745507.46	13432617.56	-3.2
7357	2745547.13	13432587.13	-3.2
7358	2745587.87	13432551.83	-3.2
7359	2745770.19	13432395.85	-3.2
7360	2746263.32	13431744.57	-3.2
7361	2746213.48	13431767.59	-3.2
7362	2745609.68	13432272.42	-3.2
7363	2745539.13	13432324.70	-3.2
7364	2745523.41	13432334.31	-3.2
7365	2745510.26	13432343.55	-3.2
7366	2745477.14	13432364.44	-3.2
7367	2745459.80	13432373.20	-3.2
7368	2745447.24	13432381.17	-3.2
7369	2745435.20	13432392.47	-3.2
7370	2745411.27	13432414.68	-3.2
7371	2745343.89	13432468.22	-3.2
7372	2745327.85	13432481.88	-3.2
7373	2745314.60	13432493.43	-3.2
7374	2745106.60	13432676.83	-3.2
7375	2745077.39	13432701.92	-3.2
7376	2745061.37	13432715.92	-3.2
7377	2745029.95	13432743.13	-3.2
7378	2745000.24	13432768.97	-3.2
7379	2744987.14	13432784.73	-3.2
7380	2744958.62	13432811.67	-3.2
7381	2744896.46	13432870.01	-3.2
7382	2744871.69	13432895.28	-3.2
7383	2744810.88	13432939.10	-3.2
7384	2744708.76	13432895.32	-3.2
7385	2744682.73	13432783.86	-3.2
7386	2744688.67	13432768.53	-3.2
7387	2744758.25	13432702.36	-3.2
7388	2744772.43	13432695.36	-3.2
7389	2744790.97	13432685.48	-3.2
7390	2744915.01	13432581.84	-3.2
7391	2745351.09	13432191.98	-3.2
7392	2745599.86	13431994.00	-3.3

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
7393	2745684.52	13431927.81	-3.3
7394	2745798.66	13431844.61	-3.3
7395	2745817.33	13431833.60	-3.3
7396	2745878.74	13431785.68	-3.3
7397	2746001.24	13431701.49	-3.3
7398	2745827.19	13431557.82	-3.3
7399	2745692.54	13431618.98	-3.3
7400	2744777.51	13432347.39	-3.3
7401	2744535.75	13432551.28	-3.3
7402	2745602.72	13431648.39	-3.3
7403	2745826.42	13431596.21	-3.3
7404	2745851.30	13431590.54	-3.3
7405	2745424.15	13431220.90	-3.4
7406	2743486.06	13431501.56	-3.4
7407	2747518.73	13431887.38	-3.4
7408	2747296.75	13432665.83	-3.2
7409	2747281.28	13432679.20	-3.2
7410	2744484.73	13432798.99	-3.2
7411	2744437.42	13432733.30	-3.2
7412	2744276.12	13432510.40	-3.2
7413	2744265.20	13432489.93	-3.2
7414	2744237.36	13432446.10	-3.2
7415	2744208.50	13432403.74	-3.2
7416	2744182.66	13432362.64	-3.2
7417	2747112.96	13431088.18	-3.1
7418	2746256.04	13431238.90	-3.1
7419	2745714.39	13431492.05	-3.1
7420	2745985.10	13431444.80	-3.1
7421	2746021.69	13431435.96	-3.1
7422	2746065.09	13431424.27	-3.1
7423	2745928.33	13431410.43	-3.1
7424	2745976.99	13431438.99	-3.1
7425	2745992.21	13431447.02	-3.1
7426	2746302.72	13431605.57	-3.1
7427	2745596.74	13432842.54	-3.3
7428	2745570.18	13432868.29	-3.3
7429	2745480.57	13432948.74	-3.3
7430	2745464.21	13432966.23	-3.3
7431	2745171.70	13432925.73	-3.3
7432	2745197.09	13432895.10	-3.3
7433	2745271.03	13432828.99	-3.3
7434	2745312.74	13432793.55	-3.3
7435	2745344.40	13432764.15	-3.3
7436	2745362.97	13432747.74	-3.3
7437	2745379.81	13432731.54	-3.3
7438	2745397.30	13432715.19	-3.3
7439	2745412.81	13432699.88	-3.3
7440	2745456.57	13432662.87	-3.3

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
7441	2745475.32	13432645.45	-3.3
7442	2746239.75	13431746.80	-3.3
7443	2745595.51	13432283.13	-3.3
7444	2745398.12	13432426.60	-3.3
7445	2745364.87	13432452.01	-3.3
7446	2745299.57	13432507.57	-3.3
7447	2745285.28	13432519.80	-3.3
7448	2745271.52	13432532.65	-3.3
7449	2745254.23	13432544.64	-3.3
7450	2745238.22	13432556.81	-3.3
7451	2745221.19	13432571.60	-3.3
7452	2745207.36	13432585.00	-3.3
7453	2745191.98	13432599.62	-3.3
7454	2745152.85	13432634.99	-3.3
7455	2745137.56	13432649.00	-3.3
7456	2745121.12	13432663.57	-3.3
7457	2745015.78	13432755.73	-3.3
7458	2744942.07	13432825.56	-3.3
7459	2744927.00	13432840.61	-3.3
7460	2744724.85	13432911.78	-3.3
7461	2744696.04	13432878.54	-3.3
7462	2744686.27	13432856.84	-3.3
7463	2744682.72	13432837.78	-3.3
7464	2744679.84	13432800.26	-3.3
7465	2744698.66	13432753.16	-3.3
7466	2744729.28	13432722.42	-3.3
7467	2744743.70	13432711.44	-3.3
7468	2744823.25	13432665.11	-3.3
7469	2744850.60	13432640.22	-3.3
7470	2744870.42	13432622.99	-3.3
7471	2744904.50	13432593.67	-3.3
7472	2744936.44	13432556.07	-3.3
7473	2744949.10	13432540.76	-3.3
7474	2744960.71	13432526.34	-3.3
7475	2745005.92	13432470.12	-3.3
7476	2745143.94	13432361.81	-3.3
7477	2745216.53	13432299.48	-3.3
7478	2745248.53	13432274.45	-3.3
7479	2745480.76	13432088.35	-3.3
7480	2745563.18	13432019.98	-3.3
7481	2745582.59	13432005.84	-3.3
7482	2745669.67	13431941.19	-3.3
7483	2745701.31	13431913.19	-3.3
7484	2745738.08	13431883.93	-3.3
7485	2745756.77	13431870.85	-3.3
7486	2746052.99	13431659.89	-3.3
7487	2745976.56	13431571.49	-3.3
7488	2745955.87	13431561.71	-3.3

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
7489	2745801.42	13431557.04	-3.3
7490	2745780.76	13431556.34	-3.3
7491	2745755.93	13431559.85	-3.3
7492	2745737.66	13431570.78	-3.3
7493	2745721.34	13431586.05	-3.3
7494	2745673.14	13431644.12	-3.3
7495	2745656.82	13431659.91	-3.3
7496	2745640.21	13431677.67	-3.3
7497	2745616.74	13431698.31	-3.3
7498	2745542.18	13431756.75	-3.3
7499	2744564.74	13432526.31	-3.4
7500	2744506.13	13432574.29	-3.4
7501	2744468.84	13432581.81	-3.4
7502	2744449.10	13432579.61	-3.4
7503	2744392.59	13432555.97	-3.4
7504	2744379.02	13432539.81	-3.4
7505	2745472.76	13431657.01	-3.4
7506	2745550.34	13431651.06	-3.4
7507	2745572.07	13431649.62	-3.4
7508	2745663.48	13431635.57	-3.4
7509	2745741.33	13431618.28	-3.4
7510	2744400.87	13432098.39	-3.4
7511	2744370.87	13432125.72	-3.4
7512	2744351.99	13432137.77	-3.4
7513	2744334.60	13432145.36	-3.4
7514	2744280.67	13432172.38	-3.4
7515	2744258.66	13432186.28	-3.4
7516	2744062.53	13432016.77	-3.4
7517	2744113.74	13431980.64	-3.4
7518	2744537.80	13431827.28	-3.4
7519	2747266.24	13432695.35	-3.3
7520	2747253.38	13432713.67	-3.3
7521	2744307.76	13432557.42	-3.3
7522	2744253.01	13432466.85	-3.3
7523	2744195.27	13432381.80	-3.3
7524	2745557.14	13431334.58	-3.2
7525	2745433.44	13431365.73	-3.2
7526	2745401.96	13431374.40	-3.2
7527	2743651.14	13431665.92	-3.2
7528	2743692.55	13431737.06	-3.2
7529	2743895.14	13431711.20	-3.2
7530	2745877.45	13431461.59	-3.2
7531	2745951.99	13431450.52	-3.2
7532	2746027.77	13431468.27	-3.2
7533	2746197.76	13431559.62	-3.2
7534	2746250.11	13431584.05	-3.2
7535	2746319.29	13431612.77	-3.2
7536	2746339.75	13431620.48	-3.2

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
7537	2745141.97	13432984.95	-3.4
7538	2745435.13	13432681.32	-3.4
7539	2745095.77	13432685.60	-3.4
7540	2744807.57	13432675.55	-3.4
7541	2744838.59	13432652.63	-3.4
7542	2744887.13	13432610.38	-3.4
7543	2744925.75	13432568.38	-3.4
7544	2744970.84	13432511.43	-3.4
7545	2744980.48	13432497.39	-3.4
7546	2745059.40	13432427.03	-3.4
7547	2745075.54	13432414.80	-3.4
7548	2745111.10	13432390.60	-3.4
7549	2745158.19	13432348.66	-3.4
7550	2745172.15	13432333.86	-3.4
7551	2745200.12	13432311.46	-3.4
7552	2745232.48	13432286.00	-3.4
7553	2745278.40	13432252.48	-3.4
7554	2745293.35	13432240.60	-3.4
7555	2745370.56	13432174.86	-3.4
7556	2745443.97	13432119.74	-3.4
7557	2745464.33	13432102.52	-3.4
7558	2745546.32	13432033.28	-3.4
7559	2745633.18	13431967.50	-3.4
7560	2745651.06	13431954.61	-3.4
7561	2745719.80	13431897.73	-3.4
7562	2746018.61	13431688.26	-3.4
7563	2746071.39	13431631.13	-3.4
7564	2746029.29	13431592.19	-3.4
7565	2745997.47	13431582.05	-3.4
7566	2745899.46	13431550.05	-3.4
7567	2745563.59	13431742.20	-3.4
7568	2745525.03	13431768.22	-3.4
7569	2745503.59	13431780.83	-3.4
7570	2745478.12	13431802.00	-3.4
7571	2745456.66	13431817.59	-3.4
7572	2745420.31	13431842.14	-3.4
7573	2745314.22	13431916.18	-3.4
7574	2745293.04	13431932.38	-3.4
7575	2745197.49	13432006.30	-3.4
7576	2745039.64	13432133.59	-3.4
7577	2745025.86	13432144.61	-3.4
7578	2744861.20	13432278.89	-3.4
7579	2744824.94	13432305.58	-3.4
7580	2744792.01	13432335.04	-3.4
7581	2744755.85	13432367.40	-3.4
7582	2744719.80	13432397.01	-3.4
7583	2744681.18	13432426.33	-3.4
7584	2744645.28	13432456.52	-3.4

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
7585	2744627.13	13432470.99	-3.4
7586	2744594.28	13432500.49	-3.4
7587	2744580.30	13432513.31	-3.4
7588	2744548.62	13432541.12	-3.4
7589	2744523.33	13432561.57	-3.4
7590	2744486.80	13432580.75	-3.4
7591	2744425.80	13432575.19	-3.4
7592	2744410.83	13432568.57	-3.4
7593	2744369.63	13432523.34	-3.4
7594	2744376.09	13432442.39	-3.4
7595	2744385.91	13432425.49	-3.4
7596	2744400.34	13432402.41	-3.4
7597	2744567.79	13432209.87	-3.4
7598	2745451.86	13431660.05	-3.4
7599	2745526.78	13431652.73	-3.4
7600	2745631.14	13431641.76	-3.5
7601	2744617.29	13431925.49	-3.5
7602	2744555.73	13431961.28	-3.5
7603	2744533.96	13431972.66	-3.5
7604	2744521.13	13431979.35	-3.5
7605	2744507.31	13431988.27	-3.5
7606	2744486.37	13432003.53	-3.5
7607	2744472.59	13432013.67	-3.5
7608	2744440.90	13432038.95	-3.5
7609	2744430.32	13432051.32	-3.5
7610	2744412.08	13432083.29	-3.5
7611	2744386.88	13432112.09	-3.5
7612	2744314.93	13432154.86	-3.5
7613	2744298.91	13432162.73	-3.5
7614	2744269.40	13432179.13	-3.5
7615	2744244.76	13432194.99	-3.5
7616	2744199.68	13432220.64	-3.5
7617	2744112.34	13432125.13	-3.5
7618	2744104.10	13432110.33	-3.5
7619	2744093.64	13432093.25	-3.5
7620	2744087.05	13432082.91	-3.5
7621	2744078.86	13432069.51	-3.5
7622	2744069.33	13432050.93	-3.5
7623	2744136.14	13431975.50	-3.5
7624	2744154.80	13431970.09	-3.5
7625	2744271.47	13431904.95	-3.5
7626	2744364.26	13431890.17	-3.5
7627	2744383.42	13431893.22	-3.5
7628	2744418.14	13431887.47	-3.5
7629	2744450.24	13431869.61	-3.5
7630	2744485.20	13431849.97	-3.5
7631	2744514.78	13431838.02	-3.5
7632	2745385.73	13431224.64	-3.5

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
7633	2745351.72	13431228.27	-3.5
7634	2745319.27	13431231.01	-3.5
7635	2745265.08	13431235.56	-3.5
7636	2747422.00	13431648.71	-3.5
7637	2747378.20	13431542.63	-3.5
7638	2747092.64	13431098.24	-3.2
7639	2746207.45	13431233.75	-3.2
7640	2745523.36	13431341.68	-3.3
7641	2745459.61	13431357.43	-3.3
7642	2745373.53	13431382.65	-3.3
7643	2743926.32	13431646.64	-3.3
7644	2745461.29	13431533.10	-3.3
7645	2745489.13	13431528.62	-3.3
7646	2745557.76	13431516.20	-3.3
7647	2745593.33	13431509.78	-3.3
7648	2745640.06	13431503.19	-3.3
7649	2746117.79	13431530.19	-3.3
7650	2746176.70	13431552.26	-3.3
7651	2746235.31	13431576.04	-3.3
7652	2746266.09	13431592.71	-3.3
7653	2745167.67	13432621.67	-3.5
7654	2744991.76	13432483.63	-3.5
7655	2745024.63	13432454.38	-3.5
7656	2745040.10	13432443.51	-3.5
7657	2745093.57	13432402.46	-3.5
7658	2745126.94	13432377.37	-3.5
7659	2745263.44	13432263.45	-3.5
7660	2745312.15	13432223.67	-3.5
7661	2745333.70	13432206.13	-3.5
7662	2745497.23	13432074.73	-3.5
7663	2745531.91	13432044.84	-3.5
7664	2746069.84	13431609.79	-3.5
7665	2746058.99	13431599.08	-3.5
7666	2745596.71	13431714.99	-3.5
7667	2745582.54	13431726.95	-3.5
7668	2745399.62	13431857.01	-3.5
7669	2745384.35	13431867.33	-3.5
7670	2745360.75	13431884.07	-3.5
7671	2745339.55	13431898.93	-3.5
7672	2745256.30	13431960.43	-3.5
7673	2745241.77	13431971.47	-3.5
7674	2745227.00	13431982.22	-3.5
7675	2745212.25	13431994.69	-3.5
7676	2745180.58	13432019.37	-3.5
7677	2745161.81	13432033.49	-3.5
7678	2745114.62	13432072.72	-3.5
7679	2745081.91	13432100.60	-3.5
7680	2745052.54	13432123.55	-3.5

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
7681	2744996.78	13432169.95	-3.5
7682	2744971.25	13432190.43	-3.5
7683	2744955.37	13432202.69	-3.5
7684	2744889.68	13432255.16	-3.5
7685	2744877.27	13432266.09	-3.5
7686	2744842.44	13432292.47	-3.5
7687	2744738.29	13432383.34	-3.5
7688	2744700.92	13432410.58	-3.5
7689	2744663.52	13432441.51	-3.5
7690	2744609.83	13432487.19	-3.5
7691	2744361.24	13432480.40	-3.5
7692	2744367.03	13432462.04	-3.5
7693	2744411.39	13432384.29	-3.5
7694	2744443.00	13432330.10	-3.5
7695	2744455.16	13432304.81	-3.5
7696	2744482.96	13432270.03	-3.5
7697	2744508.77	13432247.97	-3.5
7698	2744528.46	13432235.70	-3.5
7699	2744545.18	13432225.53	-3.5
7700	2744600.36	13432170.49	-3.5
7701	2744616.67	13432151.26	-3.5
7702	2744635.82	13432132.85	-3.5
7703	2744727.74	13432053.91	-3.5
7704	2745325.71	13431677.92	-3.5
7705	2745348.84	13431676.48	-3.5
7706	2745395.76	13431669.89	-3.5
7707	2745427.46	13431663.26	-3.5
7708	2745500.34	13431654.38	-3.5
7709	2744956.00	13431838.37	-3.6
7710	2744644.57	13431904.87	-3.6
7711	2744607.31	13431932.02	-3.6
7712	2744596.49	13431938.93	-3.6
7713	2744583.36	13431946.04	-3.6
7714	2744451.66	13432029.85	-3.6
7715	2744420.90	13432068.81	-3.6
7716	2744214.75	13432215.04	-3.6
7717	2744132.85	13432172.43	-3.6
7718	2744120.45	13432138.89	-3.6
7719	2744064.49	13432036.35	-3.6
7720	2744064.30	13431997.48	-3.6
7721	2744068.72	13431989.28	-3.6
7722	2744079.46	13431981.97	-3.6
7723	2744101.36	13431982.52	-3.6
7724	2744179.47	13431956.36	-3.6
7725	2744191.34	13431947.98	-3.6
7726	2744207.59	13431935.82	-3.6
7727	2744223.69	13431924.39	-3.6
7728	2744257.77	13431909.21	-3.6

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
7729	2744288.48	13431901.47	-3.6
7730	2744304.12	13431897.83	-3.6
7731	2744345.51	13431890.82	-3.6
7732	2744400.95	13431894.71	-3.6
7733	2744430.62	13431879.44	-3.6
7734	2744472.41	13431855.83	-3.6
7735	2744505.24	13431842.67	-3.6
7736	2745196.22	13431244.37	-3.6
7737	2747142.71	13431092.82	-3.3
7738	2745485.98	13431351.18	-3.3
7739	2745341.64	13431393.33	-3.3
7740	2745434.05	13431539.64	-3.4
7741	2745521.94	13431522.87	-3.4
7742	2746499.06	13431338.96	-3.4
7743	2746158.81	13431546.31	-3.4
7744	2745185.27	13432322.30	-3.6
7745	2745391.85	13432159.36	-3.6
7746	2745412.45	13432143.57	-3.6
7747	2745619.16	13431978.52	-3.6
7748	2745438.03	13431829.22	-3.6
7749	2745145.06	13432046.70	-3.6
7750	2745129.08	13432059.88	-3.6
7751	2745066.68	13432113.21	-3.6
7752	2745011.60	13432156.91	-3.6
7753	2744986.76	13432178.74	-3.6
7754	2744924.85	13432227.45	-3.6
7755	2744905.15	13432242.74	-3.6
7756	2744808.22	13432320.93	-3.6
7757	2744361.26	13432500.24	-3.6
7758	2744422.60	13432366.05	-3.6
7759	2744430.85	13432350.40	-3.6
7760	2744465.78	13432286.65	-3.6
7761	2744692.26	13432083.02	-3.6
7762	2744711.51	13432067.48	-3.6
7763	2744784.01	13432008.68	-3.6
7764	2744802.61	13431993.25	-3.6
7765	2744822.87	13431978.00	-3.6
7766	2744845.01	13431960.93	-3.6
7767	2744884.01	13431928.67	-3.6
7768	2744907.61	13431908.52	-3.6
7769	2745012.83	13431831.20	-3.6
7770	2745110.44	13431759.39	-3.6
7771	2745124.23	13431745.11	-3.6
7772	2745157.23	13431717.23	-3.6
7773	2745370.71	13431674.53	-3.6
7774	2744914.50	13431845.90	-3.6
7775	2744804.61	13431853.59	-3.6
7776	2744719.36	13431868.90	-3.6

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
7777	2744704.73	13431871.88	-3.6
7778	2744682.18	13431878.06	-3.6
7779	2744568.66	13431954.72	-3.6
7780	2744544.72	13431967.18	-3.6
7781	2744226.09	13432207.22	-3.7
7782	2744125.62	13432155.28	-3.7
7783	2744325.17	13431894.18	-3.7
7784	2744552.50	13431820.91	-3.7
7785	2744785.05	13431755.64	-3.7
7786	2746886.73	13432588.37	-3.7
7787	2745225.78	13431240.20	-3.7
7788	2745165.98	13431246.73	-3.7
7789	2745128.17	13431249.76	-3.7
7790	2745021.81	13431258.41	-3.7
7791	2744763.28	13431300.73	-3.7
7792	2747387.48	13431563.46	-3.7
7793	2743984.03	13431705.87	-3.4
7794	2745402.26	13431543.98	-3.4
7795	2746187.37	13431406.20	-3.4
7796	2746048.07	13431483.84	-3.5
7797	2746095.78	13431512.91	-3.5
7798	2746282.76	13431599.30	-3.5
7799	2745426.57	13432134.20	-3.6
7800	2745514.83	13432059.73	-3.6
7801	2745098.22	13432087.19	-3.7
7802	2744940.20	13432215.75	-3.7
7803	2744582.91	13432192.29	-3.7
7804	2744655.79	13432116.53	-3.7
7805	2744672.17	13432100.41	-3.7
7806	2744745.19	13432039.43	-3.7
7807	2744765.44	13432023.72	-3.7
7808	2744865.62	13431944.35	-3.7
7809	2744951.22	13431878.42	-3.7
7810	2744970.47	13431864.10	-3.7
7811	2744991.69	13431848.41	-3.7
7812	2745034.40	13431815.03	-3.7
7813	2745055.79	13431801.61	-3.7
7814	2745073.36	13431788.04	-3.7
7815	2745138.96	13431732.21	-3.7
7816	2745217.50	13431673.64	-3.7
7817	2745238.13	13431668.12	-3.7
7818	2745255.08	13431672.53	-3.7
7819	2745277.52	13431677.11	-3.7
7820	2744945.68	13431839.56	-3.7
7821	2744897.56	13431847.22	-3.7
7822	2744886.06	13431846.71	-3.7
7823	2744874.50	13431845.37	-3.7
7824	2744843.29	13431847.93	-3.7

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
7825	2744831.55	13431849.79	-3.7
7826	2744816.82	13431852.11	-3.7
7827	2744785.95	13431857.84	-3.7
7828	2744771.93	13431859.50	-3.7
7829	2744693.02	13431873.72	-3.7
7830	2744669.52	13431885.42	-3.7
7831	2744632.22	13431914.58	-3.7
7832	2744237.08	13431916.53	-3.7
7833	2744578.41	13431809.62	-3.7
7834	2744607.83	13431800.32	-3.7
7835	2744801.93	13431750.66	-3.7
7836	2746622.17	13432354.99	-3.8
7837	2744923.57	13431270.03	-3.8
7838	2744894.13	13431273.84	-3.8
7839	2744784.87	13431296.60	-3.8
7840	2743898.34	13431428.72	-3.8
7841	2743511.41	13431496.53	-3.8
7842	2747588.70	13432079.81	-3.8
7843	2747451.90	13431734.19	-3.8
7844	2745270.38	13431407.80	-3.5
7845	2745332.43	13431556.13	-3.5
7846	2745366.02	13431551.95	-3.5
7847	2746141.26	13431542.20	-3.5
7848	2745093.13	13431774.43	-3.8
7849	2745177.79	13431700.68	-3.8
7850	2745195.37	13431686.84	-3.8
7851	2745300.67	13431679.48	-3.8
7852	2744932.76	13431843.01	-3.8
7853	2744862.86	13431845.29	-3.8
7854	2744656.80	13431894.76	-3.8
7855	2744620.35	13431795.82	-3.8
7856	2744684.01	13431782.90	-3.8
7857	2746073.63	13432140.32	-3.7
7858	2746364.21	13432144.68	-3.9
7859	2746403.63	13432600.66	-3.9
7860	2745091.74	13431252.27	-3.9
7861	2745058.18	13431254.04	-3.9
7862	2744959.29	13431264.34	-3.9
7863	2744835.11	13431284.60	-3.9
7864	2744736.23	13431307.15	-3.9
7865	2744653.34	13431324.21	-3.9
7866	2744624.25	13431330.68	-3.9
7867	2744600.85	13431336.26	-3.9
7868	2744481.01	13431353.23	-3.9
7869	2744374.87	13431363.17	-3.9
7870	2744050.89	13431413.44	-3.9
7871	2744019.59	13431418.92	-3.9
7872	2743986.65	13431423.02	-3.9

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
7873	2743956.44	13431422.55	-3.9
7874	2743926.79	13431424.68	-3.9
7875	2743868.53	13431433.75	-3.9
7876	2743718.88	13431459.37	-3.9
7877	2743658.23	13431471.13	-3.9
7878	2747507.15	13431857.36	-3.9
7879	2747457.54	13431752.87	-3.9
7880	2747438.91	13431687.89	-3.9
7881	2747429.61	13431670.93	-3.9
7882	2745307.61	13431401.62	-3.6
7883	2743891.41	13431644.15	-3.6
7884	2745118.68	13431585.87	-3.6
7885	2745211.18	13431573.62	-3.6
7886	2745294.32	13431561.96	-3.6
7887	2746107.46	13431415.36	-3.6
7888	2744752.22	13431862.17	-3.9
7889	2744734.64	13431866.10	-3.9
7890	2744634.82	13431791.31	-3.9
7891	2744665.56	13431787.10	-3.9
7892	2744735.26	13431769.79	-3.9
7893	2744769.87	13431760.39	-3.9
7894	2746745.47	13433036.57	-3.9
7895	2746149.96	13432401.07	-3.9
7896	2744992.08	13431259.71	-3.9
7897	2744866.17	13431279.14	-3.9
7898	2744805.24	13431291.91	-3.9
7899	2744710.86	13431313.48	-3.9
7900	2744683.11	13431318.67	-3.9
7901	2744577.70	13431339.93	-3.9
7902	2744556.49	13431343.70	-3.9
7903	2744531.07	13431347.07	-3.9
7904	2744505.74	13431350.94	-3.9
7905	2744455.35	13431356.17	-3.9
7906	2744427.15	13431360.04	-3.9
7907	2744399.62	13431361.06	-3.9
7908	2744344.79	13431368.27	-3.9
7909	2744315.29	13431372.42	-3.9
7910	2744256.66	13431379.62	-3.9
7911	2744221.88	13431386.61	-3.9
7912	2744189.19	13431392.83	-3.9
7913	2744128.73	13431404.47	-3.9
7914	2744103.46	13431407.79	-3.9
7915	2744079.83	13431410.68	-3.9
7916	2743835.96	13431438.25	-3.9
7917	2743807.46	13431441.81	-3.9
7918	2743778.61	13431447.22	-3.9
7919	2743751.20	13431451.77	-3.9
7920	2743685.47	13431467.00	-3.9

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
7921	2743628.16	13431478.04	-3.9
7922	2743605.23	13431481.89	-3.9
7923	2743571.90	13431486.60	-3.9
7924	2743536.40	13431492.20	-3.9
7925	2747512.06	13431872.09	-3.9
7926	2745233.00	13431409.74	-3.6
7927	2745205.13	13431409.10	-3.6
7928	2745179.60	13431409.45	-3.6
7929	2745043.16	13431420.89	-3.6
7930	2745014.64	13431425.67	-3.6
7931	2743858.19	13431644.93	-3.7
7932	2743677.88	13431659.92	-3.7
7933	2743720.86	13431728.14	-3.7
7934	2743864.14	13431712.42	-3.7
7935	2744260.63	13431705.99	-3.7
7936	2745008.71	13431604.51	-3.7
7937	2745148.14	13431582.58	-3.7
7938	2745249.49	13431568.80	-3.7
7939	2746149.64	13431410.48	-3.7
7940	2746453.25	13431349.19	-3.7
7941	2746067.02	13431495.76	-3.7
7942	2747383.86	13432469.08	-3.7
7943	2744930.75	13431892.20	-3.9
7944	2744707.31	13431775.80	-4.0
7945	2744752.72	13431766.53	-4.0
7946	2746210.17	13432890.10	-4.0
7947	2744286.79	13431376.07	-4.0
7948	2744159.12	13431399.82	-4.0
7949	2747586.68	13432064.31	-4.0
7950	2747499.59	13431840.92	-4.0
7951	2747463.34	13431772.32	-4.0
7952	2747445.75	13431708.15	-4.0
7953	2747414.11	13431628.73	-4.0
7954	2745141.63	13431409.77	-3.7
7955	2745114.03	13431410.81	-3.7
7956	2745073.98	13431416.50	-3.7
7957	2744978.18	13431430.95	-3.7
7958	2744919.56	13431438.91	-3.7
7959	2744303.25	13431556.65	-3.7
7960	2743784.44	13431718.08	-3.7
7961	2744016.37	13431710.87	-3.7
7962	2744081.59	13431720.33	-3.7
7963	2744136.66	13431719.09	-3.7
7964	2744165.27	13431717.46	-3.7
7965	2744420.31	13431689.20	-3.7
7966	2744457.39	13431685.37	-3.7
7967	2744493.18	13431682.57	-3.7
7968	2744880.89	13431621.40	-3.7

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
7969	2744908.88	13431615.73	-3.7
7970	2744937.83	13431612.15	-3.7
7971	2745180.62	13431579.93	-3.7
7972	2745759.94	13432152.26	-4.0
7973	2746895.40	13432850.60	-4.1
7974	2746541.35	13432843.47	-4.1
7975	2745931.15	13432661.91	-4.1
7976	2747405.17	13431607.51	-4.1
7977	2747395.71	13431585.34	-4.1
7978	2744950.88	13431435.41	-3.8
7979	2744886.31	13431443.62	-3.8
7980	2744852.84	13431446.34	-3.8
7981	2744822.25	13431451.16	-3.8
7982	2744791.45	13431456.89	-3.8
7983	2744758.92	13431462.10	-3.8
7984	2744729.51	13431465.85	-3.8
7985	2744399.71	13431545.02	-3.8
7986	2744333.96	13431550.88	-3.8
7987	2744263.41	13431562.78	-3.8
7988	2743987.25	13431635.56	-3.8
7989	2743957.11	13431643.47	-3.8
7990	2743824.75	13431650.06	-3.8
7991	2743796.97	13431652.96	-3.8
7992	2743768.56	13431653.50	-3.8
7993	2743739.23	13431656.00	-3.8
7994	2743749.80	13431719.68	-3.8
7995	2743831.42	13431713.72	-3.8
7996	2744195.73	13431716.13	-3.8
7997	2744228.57	13431712.03	-3.8
7998	2744289.98	13431704.12	-3.8
7999	2744319.23	13431701.65	-3.8
8000	2744342.90	13431697.02	-3.8
8001	2744373.58	13431691.89	-3.8
8002	2744528.82	13431680.59	-3.8
8003	2744559.96	13431673.50	-3.8
8004	2744828.53	13431630.74	-3.8
8005	2744852.82	13431626.31	-3.8
8006	2744974.58	13431608.68	-3.8
8007	2745045.99	13431598.36	-3.8
8008	2746412.69	13431357.68	-3.8
8009	2747491.01	13431822.76	-4.2
8010	2744429.87	13431541.53	-3.9
8011	2744366.71	13431548.39	-3.9
8012	2744228.63	13431570.13	-3.9
8013	2744200.04	13431576.89	-3.9
8014	2744171.74	13431582.77	-3.9
8015	2744109.28	13431607.66	-3.9
8016	2744078.35	13431618.51	-3.9

Marsh and Open Water Bathymetry Coordinates and Elevations

Sequential ID	Coordinates (NAD83 State Plane- Feet)		Sediment Elevation (NAVD29 Feet)
	Easting	Northing	
8017	2744047.64	13431625.07	-3.9
8018	2744013.16	13431631.24	-3.9
8019	2744049.41	13431717.86	-3.9
8020	2744596.54	13431666.54	-3.9
8021	2744674.33	13431655.93	-3.9
8022	2744774.38	13431639.92	-3.9
8023	2744802.00	13431635.44	-3.9
8024	2745075.41	13431593.97	-3.9
8025	2746385.11	13431362.66	-3.9
8026	2746214.78	13431567.53	-3.9
8027	2747481.03	13431805.12	-4.2
8028	2744695.15	13431471.03	-4.0
8029	2744560.16	13431503.01	-4.0
8030	2744135.55	13431598.20	-4.0
8031	2743711.74	13431659.30	-4.0
8032	2744110.02	13431722.84	-4.0
8033	2744634.97	13431661.88	-4.0
8034	2744703.11	13431649.97	-4.0
8035	2746338.37	13431371.93	-4.0
8036	2747470.44	13431787.68	-4.3
8037	2744646.26	13431481.57	-4.0
8038	2744618.65	13431487.82	-4.0
8039	2744589.93	13431494.55	-4.0
8040	2744459.71	13431535.29	-4.0
8041	2744734.74	13431644.47	-4.1
8042	2746224.40	13431397.91	-4.1
8043	2746266.74	13431386.45	-4.1
8044	2747583.03	13432047.41	-4.4
8045	2747577.10	13432029.97	-4.4
8046	2744526.98	13431513.57	-4.1
8047	2744496.52	13431524.68	-4.1
8048	2746305.89	13431377.35	-4.1
8049	2747344.81	13432442.42	-4.2
8050	2747375.59	13432464.55	-4.6
8051	2747354.36	13432449.75	-4.9
8052	2747364.44	13432457.55	-5.0

SampID	SampDate	AnalDate	Matrix	Method	Analyte	CAS	Result	Qual	Units	MDL	DF	SQL	MQL	LabID
CM1-PW-121316C	12/13/2016	12/18/2016	Water	SW9056	Chloride	16887-00-6	7970		mg/L	0.2	100	20	50	HS16120736-01
CM1-PW-121316C	12/13/2016	12/18/2016	Water	SW9056	Sulfate	14808-79-8	647		mg/L	0.2	100	20	50	HS16120736-01
CM1-PW-121316C	12/13/2016	12/19/2016	Water	E120.1	Specific Conductance	COND	29400		umhos/cm	5	5	25	25	HS16120736-01
CM1-PW-121316C	12/13/2016	12/19/2016	Water	SM2520	Salinity	salinity	20.2		ppt	2	1	2	2	HS16120736-01

SampID	SampDate	Matrix	Method	Analyte	CAS	Result	Qual
SMP-SE-17200	12/07/2016	Sediment	SW7471A	Mercury	7439-97-6	0.00789	
SMP-SE-17200	12/07/2016	Sediment	SW3550	Percent Moisture	MOIST	24.4	
SMP-SE-17200	12/07/2016	Sediment	SW9060	Total Organic Carbon	7440-44-0	0.166	
SMP-SE-17201	12/07/2016	Sediment	SW7471A	Mercury	7439-97-6	0.00609	
SMP-SE-17201	12/07/2016	Sediment	SW3550	Percent Moisture	MOIST	26.2	
SMP-SE-17201	12/07/2016	Sediment	SW9060	Total Organic Carbon	7440-44-0	0.255	
SMP-SE-17202	12/07/2016	Sediment	SW7471A	Mercury	7439-97-6	0.0147	
SMP-SE-17202	12/07/2016	Sediment	SW3550	Percent Moisture	MOIST	43.5	
SMP-SE-17202	12/07/2016	Sediment	SW9060	Total Organic Carbon	7440-44-0	0.377	
SMP-SE-17203	12/07/2016	Sediment	SW7471A	Mercury	7439-97-6	0.00598	
SMP-SE-17203	12/07/2016	Sediment	SW3550	Percent Moisture	MOIST	26.3	
SMP-SE-17203	12/07/2016	Sediment	SW9060	Total Organic Carbon	7440-44-0	0.134	
SMP-SE-17204	12/07/2016	Sediment	SW7471A	Mercury	7439-97-6	0.0135	
SMP-SE-17204	12/07/2016	Sediment	SW3550	Percent Moisture	MOIST	25.2	
SMP-SE-17204	12/07/2016	Sediment	SW9060	Total Organic Carbon	7440-44-0	0.276	
SMP-SE-17205	12/07/2016	Sediment	SW7471A	Mercury	7439-97-6	0.00731	
SMP-SE-17205	12/07/2016	Sediment	SW3550	Percent Moisture	MOIST	28.3	
SMP-SE-17205	12/07/2016	Sediment	SW9060	Total Organic Carbon	7440-44-0	0.283	
SMP-SE-17206	12/07/2016	Sediment	SW7471A	Mercury	7439-97-6	0.0126	
SMP-SE-17206	12/07/2016	Sediment	SW3550	Percent Moisture	MOIST	24.6	
SMP-SE-17206	12/07/2016	Sediment	SW9060	Total Organic Carbon	7440-44-0	0.333	
SMP-SE-17207	12/07/2016	Sediment	SW7471A	Mercury	7439-97-6	0.145	
SMP-SE-17207	12/07/2016	Sediment	SW3550	Percent Moisture	MOIST	20.7	
SMP-SE-17207	12/07/2016	Sediment	SW9060	Total Organic Carbon	7440-44-0	0.126	
SMP-SE-17208	12/09/2016	Soil	SW7471A	Mercury	7439-97-6	0.00414	J
SMP-SE-17208	12/09/2016	Soil	SW3550	Percent Moisture	MOIST	22.9	
SMP-SE-17208	12/09/2016	Soil	SW9060	Total Organic Carbon	7440-44-0	0.475	
SMP-SE-17209	12/09/2016	Soil	SW7471A	Mercury	7439-97-6	0.00655	
SMP-SE-17209	12/09/2016	Soil	SW3550	Percent Moisture	MOIST	26.1	
SMP-SE-17209	12/09/2016	Soil	SW9060	Total Organic Carbon	7440-44-0	0.236	
SMP-SE-17210	12/09/2016	Soil	SW7471A	Mercury	7439-97-6	0.0157	
SMP-SE-17210	12/09/2016	Soil	SW3550	Percent Moisture	MOIST	24.6	
SMP-SE-17210	12/09/2016	Soil	SW9060	Total Organic Carbon	7440-44-0	0.179	

Units	MDL	DF	SQL	MQL
mg/Kg-dry	0.00047	1	0.000647	0.00458
wt%	0.01	1	0.01	0.01
wt%-dry	0.06	1	0.06	0.06
mg/Kg-dry	0.00047	1	0.000692	0.0049
wt%	0.01	1	0.01	0.01
wt%-dry	0.06	1	0.06	0.06
mg/Kg-dry	0.00047	1	0.000852	0.00603
wt%	0.01	1	0.01	0.01
wt%-dry	0.06	1	0.06	0.06
mg/Kg-dry	0.00047	1	0.000691	0.00489
wt%	0.01	1	0.01	0.01
wt%-dry	0.06	1	0.06	0.06
mg/Kg-dry	0.00047	1	0.000644	0.00456
wt%	0.01	1	0.01	0.01
wt%-dry	0.06	1	0.06	0.06
mg/Kg-dry	0.00047	1	0.000678	0.00479
wt%	0.01	1	0.01	0.01
wt%-dry	0.06	1	0.06	0.06
mg/Kg-dry	0.00047	1	0.00065	0.0046
wt%	0.01	1	0.01	0.01
wt%-dry	0.06	1	0.06	0.06
mg/Kg-dry	0.00047	1	0.000628	0.00445
wt%	0.01	1	0.01	0.01
wt%-dry	0.06	1	0.06	0.06
mg/Kg-dry	0.00047	1	0.000635	0.00449
wt%	0.01	1	0.01	0.01
wt%-dry	0.06	1	0.06	0.06
mg/Kg-dry	0.00047	1	0.00069	0.00488
wt%	0.01	1	0.01	0.01
wt%-dry	0.06	1	0.06	0.06
mg/Kg-dry	0.00047	1	0.000668	0.00472
wt%	0.01	1	0.01	0.01
wt%-dry	0.06	1	0.06	0.06

2016 Supplemental Eastern Causeway Cove Sediment Stations, Sample IDs, Field Data, and Results

Station ID	Easting[1]	Northing[1]	Sample ID	Date	Time	Water Depth[2] (ft)	Total Hg			% M		TOC		
							(mg/kg) dry wt	SQL[3] (mg/kg)	Flag	wt%	SQL[3] (wt%)	wt%-dry	SQL[3] (wt%-dry)	Flag
ECC-001	2745765.17	13433955.14	SMP-SE-17720	11/2/2016	15:00	5.5	0.174	0.000614		21.4	0.0100	0.144	0.0600	
ECC-002	2746559.74	13434137.51	SMP-SE-17721	11/2/2016	15:15	5.0	0.147	0.000659		25.8	0.0100	0.171	0.0600	
ECC-003	2745708.86	13433303.54	SMP-SE-17741	11/3/2016	8:40	6.0	0.266	0.000667		26.1	0.0100	0.215	0.0600	
ECC-004	2746869.54	13433549.22	SMP-SE-17722	11/2/2016	15:20	5.0	0.472	0.000878		44.4	0.0100	0.480	0.0600	
ECC-005	2747067.92	13433658.51	SMP-SE-17723	11/2/2016	15:25	6.0	0.377	0.000745		31.9	0.0100	0.469	0.0600	
ECC-006	2747238.17	13433766.66	SMP-SE-17724	11/2/2016	15:30	5.5	0.200	0.000624		24.0	0.0100	0.194	0.0600	
ECC-007	2747356.44	13433734.15	SMP-SE-17725	11/2/2016	15:35	4.0	0.251	0.000740		34.6	0.0100	0.365	0.0600	
ECC-008	2745512.72	13432760.18	SMP-SE-17743	11/3/2016	8:55	6.5	0.295	0.000886		42.9	0.0100	0.621	0.0600	J+
ECC-009	2745872.34	13432953.64	SMP-SE-17742	11/3/2016	8:50	6.0	0.295	0.000708		30.6	0.0100	0.320	0.0600	
ECC-010	2746382.77	13433159.59	SMP-SE-17740	11/2/2016	16:50	5.0	0.749	0.000854		44.1	0.0100	0.602	0.0600	
ECC-011	2746624.73	13433290.01	SMP-SE-17730	11/2/2016	16:00	5.0	0.440	0.000792		40.5	0.0100	0.617	0.0600	
ECC-012	2746816.44	13433332.95	SMP-SE-17731	11/2/2016	16:05	5.0	0.701	0.000929		48.8	0.0100	0.700	0.0600	
ECC-013	2747015.55	13433511.81	SMP-SE-17728	11/2/2016	15:50	6.0	0.465	0.000882		45.7	0.0100	0.692	0.0600	
ECC-014	2747222.29	13433535.67	SMP-SE-17727	11/2/2016	15:45	5.0	0.351	0.000675		26.0	0.0100	0.343	0.0600	
ECC-015	2747434.53	13433470.64	SMP-SE-17726	11/2/2016	15:40	5.0	0.252	0.000691		28.1	0.0100	0.298	0.0600	
ECC-016	2745701.89	13432723.93	SMP-SE-17744	11/3/2016	9:00	7.0	0.376	0.000855		40.6	0.0100	0.446	0.0600	
ECC-017	2745954.24	13432761.44	SMP-SE-17745	11/3/2016	9:10	7.0	0.756	0.00107		52.9	0.0100	0.720	0.0600	
ECC-018	2746155.56	13432804.33	SMP-SE-17751	11/3/2016	9:40	6.5	0.612	0.00100		51.6	0.0100	0.665	0.0600	
ECC-019	2746405.97	13433001.80	SMP-SE-17752	11/3/2016	9:45	6.0	0.784	0.00102		52.2	0.0100	0.751	0.0600	
ECC-020	2746583.44	13433102.88	SMP-SE-17739	11/2/2016	16:45	5.5	0.888	0.000979		50.1	0.0100	0.691	0.0600	
ECC-021	2746785.72	13433126.77	SMP-SE-17738	11/2/2016	16:40	6.0	0.633	0.000964		49.6	0.0100	0.818	0.0600	
ECC-022	2747003.55	13433350.55	SMP-SE-17732	11/2/2016	16:07	6.0	0.683	0.000935		48.2	0.0100	0.833	0.0600	
ECC-023	2747154.05	13433327.58	SMP-SE-17733	11/2/2016	16:10	5.5	0.637	0.00105		52.3	0.0100	0.827	0.0600	
ECC-024	2747307.50	13433313.85	SMP-SE-17734	11/2/2016	16:15	5.0	0.289	0.000689		31.8	0.0100	0.403	0.0600	
ECC-025	2746969.64	13433134.43	SMP-SE-17737	11/2/2016	16:35	5.0	0.773	0.00117		57.1	0.0100	0.960	0.0600	
ECC-026	2747146.55	13433088.14	SMP-SE-17736	11/2/2016	16:30	5.0	0.663	0.00102		52.9	0.0100	0.851	0.0600	
ECC-027	2747354.66	13433080.60	SMP-SE-17735	11/2/2016	16:20	5.0	0.571	0.000921		47.3	0.0100	0.712	0.0600	
ECC-028	2745936.03	13432563.75	SMP-SE-17746	11/3/2016	9:12	6.5	0.522	0.000997		51.4	0.0100	0.870	0.0600	
ECC-029	2746159.25	13432591.76	SMP-SE-17749	11/3/2016	9:30	6.0	0.792	0.00118	J	58.5	0.0100	0.877	0.0600	
ECC-030	2746319.52	13432811.57	SMP-SE-17757	11/3/2016	10:10	6.0	0.645	0.00103		51.2	0.0100	0.714	0.0600	
ECC-031	2746565.90	13432926.14	SMP-SE-17753	11/3/2016	9:50	6.5	0.837	0.00115		56.9	0.0100	0.947	0.0600	
ECC-032	2746772.34	13432916.59	SMP-SE-17754	11/3/2016	9:55	6.0	0.735	0.00119		58.2	0.0100	1.01	0.0600	
ECC-033	2745838.19	13432379.59	SMP-SE-17747	11/3/2016	9:20	6.0	0.539	0.00108		55.4	0.0100	0.893	0.0600	
ECC-034	2746085.27	13432357.68	SMP-SE-17748	11/3/2016	9:25	6.0	0.757	0.00128		62.2	0.0100	0.871	0.0600	

2016 Supplemental Eastern Causeway Cove Sediment Stations, Sample IDs, Field Data, and Results

Station ID	Easting[1]	Northing[1]	Sample ID	Date	Time	Water Depth[2] (ft)	Total Hg			% M		TOC		
							(mg/kg) dry wt	SQL[3] (mg/kg)	Flag	wt%	SQL[3] (wt%)	wt%-dry	SQL[3] (wt%-dry)	Flag
ECC-035	2746292.22	13432474.08	SMP-SE-17759	11/3/2016	10:20	5.5	0.557	0.00116		58.9	0.0100	0.890	0.0600	
ECC-036	2746429.89	13432638.19	SMP-SE-17758	11/3/2016	10:15	6.0	0.660	0.00129		61.4	0.0100	0.931	0.0600	
ECC-037	2746576.00	13432738.37	SMP-SE-17756	11/3/2016	10:05	6.5	0.757	0.00113		57.7	0.0100	0.891	0.0600	
ECC-038	2746781.20	13432704.55	SMP-SE-17755	11/3/2016	10:00	5.5	0.713	0.00123		60.3	0.0100	1.20	0.0600	
ECC-039	2746974.09	13432702.92	SMP-SE-17774	11/3/2016	11:35	6.5	0.519	0.00132		62.2	0.0100	1.20	0.0600	
ECC-040	2747146.52	13432774.66	SMP-SE-17775	11/3/2016	11:40	5.5	0.446	0.00108		56.1	0.0100	0.930	0.0600	
ECC-041	2747282.22	13432852.07	SMP-SE-17777	11/3/2016	11:50	6.0	0.379	0.00106		53.6	0.0100	0.933	0.0600	
ECC-042	2747500.12	13432962.55	SMP-SE-17778	11/3/2016	11:55	4.5	0.257	0.000903		43.8	0.0100	0.970	0.0600	
ECC-043	2746331.67	13432355.44	SMP-SE-17760	11/3/2016	10:25	6.5	0.402	0.00107		52.5	0.0100	0.900	0.0600	
ECC-044	2746561.80	13432528.63	SMP-SE-17768	11/3/2016	11:05	6.0	0.559	0.00129		62.4	0.0100	0.922	0.0600	
ECC-045	2746764.97	13432530.38	SMP-SE-17769	11/3/2016	11:10	6.0	0.500	0.00137		64.2	0.0100	0.947	0.0600	
ECC-046	2746985.37	13432554.43	SMP-SE-17773	11/3/2016	11:30	6.0	0.496	0.00136		62.8	0.0100	1.07	0.0600	
ECC-047	2747207.82	13432592.27	SMP-SE-17776	11/3/2016	11:45	6.0	0.192	0.000768		35.9	0.0100	2.96	0.0600	
ECC-048	2747455.22	13432786.65	SMP-SE-17779	11/3/2016	12:00	4.5	0.230	0.000833		39.0	0.0100	0.851	0.0600	
ECC-049	2746366.14	13432146.74	SMP-SE-17762	11/3/2016	10:35	7.0	0.455	0.00123		59.8	0.0100	0.909	0.0600	
ECC-050	2746522.87	13432163.16	SMP-SE-17766	11/3/2016	10:55	6.0	0.420	0.00126		60.3	0.0100	0.901	0.0600	
ECC-051	2746555.41	13432339.38	SMP-SE-17767	11/3/2016	11:00	6.0	0.446	0.00135		64.3	0.0100	0.949	0.0600	
ECC-052	2746772.60	13432340.26	SMP-SE-17770	11/3/2016	11:15	5.5	0.427	0.00129		60.5	0.0100	0.844	0.0600	
ECC-053	2746992.91	13432375.2	SMP-SE-17771	11/3/2016	11:20	5.5	0.493	0.00142		64.6	0.0100	1.08	0.0600	
ECC-054	2747143.77	13432395.77	SMP-SE-17772	11/3/2016	11:25	5.5	0.409	0.00134		62.3	0.0100	1.13	0.0600	
ECC-055	2747374.59	13432389.16	SMP-SE-17781	11/3/2016	12:10	9.5	0.475	0.00172		72.2	0.0100	1.13	0.0600	
ECC-056	2747498.95	13432504.01	SMP-SE-17780	11/3/2016	12:05	4.5	0.239	0.000724		33.4	0.0100	0.623	0.0600	
ECC-057	2746382.39	13431979.12	SMP-SE-17763	11/3/2016	10:40	6.5	0.415	0.00116		56.8	0.0100	0.895	0.0600	
ECC-058	2746541.22	13431992.93	SMP-SE-17764	11/3/2016	10:45	6.5	0.384	0.00112		57.0	0.0100	0.839	0.0600	
ECC-059	2746714.68	13432111.48	SMP-SE-17765	11/3/2016	10:50	6.0	0.387	0.00127		60.3	0.0100	0.938	0.0600	

[1]Coordinates reported in NAD 1983 State Plane Texas South Central, Feet

[2] Water Depths are not calibrated to tidal level

[3]SQL - Sample Quantitation Limit

J - Field duplicate relative percent difference exceeded criteria of 20%

J+ - Matrix Spike percent recovery greater than criteria of 80-120%.

Location ID	Northing	Easting	Water Depth (ft)	Depth Below Mudling (ft)	Uncorrected Peak Shear Strength (pounds per square foot)	65 mm Vane Correction Factor (kPa)	32 mm Vane Correction Factor (kPa)	25.4 mm Vane Correction Factor (kPa)	Notes
ECC-008	13432753.81	2745516.87	4.5	0	41.20	68			
ECC-008	13432753.81	2745516.87	4.5	-1	41.20	68			
ECC-008	13432753.81	2745516.87	4.5	-2	54.52	90			
ECC-033	13432380.23	2745838.40	4.0	0	2.42	4			
ECC-033	13432380.23	2745838.40	4.0	-1	9.69	16			
ECC-033	13432380.23	2745838.40	4.0	-2	52.10	86			
SMP0014	13432095.10	2746170.58	4.0	0	0.00	0			
SMP0014	13432095.10	2746170.58	4.0	-1	18.17	30			
SMP0014	13432095.10	2746170.58	4.0	-2	47.25	78			
ECC-057	13431983.77	2746378.50	3.9	0	4.85	8			
ECC-057	13431983.77	2746378.50	3.9	-1	50.89	84			
ECC-057	13431983.77	2746378.50	3.9	-2	48.46	80			
ECC-009	13432949.27	2745877.93	4.1	0	32.71	54			
ECC-009	13432949.27	2745877.93	4.1	-1	47.25	78			
ECC-009	13432949.27	2745877.93	4.1	-2	52.10	86			
ECC-017	13432755.13	2745957.55	4.1	0	7.27	12			
ECC-017	13432755.13	2745957.55	4.1	-1	38.77	64			
ECC-017	13432755.13	2745957.55	4.1	-2	47.25	78			
ECC-029	13432593.00	2746157.93	4.1	0	4.85	8			
ECC-029	13432593.00	2746157.93	4.1	-1	32.71	54			
ECC-029	13432593.00	2746157.93	4.1	-2	47.25	78			
ECC-043	13432354.76	2746333.60	3.9	0	6.06	10			
ECC-043	13432354.76	2746333.60	3.9	-1	29.08	48			
ECC-043	13432354.76	2746333.60	3.9	-2	50.89	84			
ECC-50	13432166.59	2746523.79	3.8	0	3.63	6			
ECC-50	13432166.59	2746523.79	3.8	-1	24.23	40			
ECC-50	13432166.59	2746523.79	3.8	-2	48.46	80			
STO-0203	13432177.14	2746946.43	3.0	0	21.81	36			Osyter bed at surface.
STO-0203	13432177.14	2746946.43	3.0	-1	32.71	54			
STO-0203	13432177.14	2746946.43	3.0	-2	47.25	78			
ECC-052	13432340.63	2746771.37	3.5	0	2.42	4			
ECC-052	13432340.63	2746771.37	3.5	-1	26.66	44			
ECC-052	13432340.63	2746771.37	3.5	-2	46.04	76			
ECC-044	13432526.97	2746560.90	3.9	0	2.42	4			
ECC-044	13432526.97	2746560.90	3.9	-1	15.75	26			
ECC-044	13432526.97	2746560.90	3.9	-2	26.66	44			
ECC-037	13432743.15	2746571.43	3.9	0	2.42	4			
ECC-037	13432743.15	2746571.43	3.9	-1	16.96	28			
ECC-037	13432743.15	2746571.43	3.9	-2	24.23	40			
ECC-030	13432810.51	2746316.23	4.0	0	3.63	6			
ECC-030	13432810.51	2746316.23	4.0	-1	21.81	36			
ECC-030	13432810.51	2746316.23	4.0	-2	50.89	84			
STO-0193	13433004.17	2746129.00	3.9	0	6.06	10			
STO-0193	13433004.17	2746129.00	3.9	-1	47.25	78			
STO-0193	13433004.17	2746129.00	3.9	-2	49.68	82			
ECC-007	13433735.81	2747351.72	2.6	0	20.39		4		Thicker oyster reef layer. Smaller vane used to penetrate.
ECC-007	13433735.81	2747351.72	2.6	-1	112.14		22		Thicker oyster reef layer. Smaller vane used to penetrate.
ECC-007	13433735.81	2747351.72	2.6	-2	152.91		30		Thicker oyster reef layer. Smaller vane used to penetrate.
ECC-056	13432502.90	2747502.16	2.7	0	112.14		22		Thicker oyster reef layer. Smaller vane used to penetrate.
ECC-056	13432502.90	2747502.16	2.7	-1	122.33		24		Thicker oyster reef layer. Smaller vane used to penetrate.
ECC-056	13432502.90	2747502.16	2.7	-2	50.97		10		Thicker oyster reef layer. Smaller vane used to penetrate.
ECC-047	13432590.73	2747209.95	2.8	0	122.33			12	Thicker oyster reef layer. Smaller vane used to penetrate.
ECC-047	13432590.73	2747209.95	2.8	-1					Could not penetrate with vane.
ECC-047	13432590.73	2747209.95	2.8	-2					Could not penetrate with vane.
ECC-054	13432393.39	2747146.28	4.7	0	52.10	86			
ECC-054	13432393.39	2747146.28	4.7	-1	39.98	66			
ECC-054	13432393.39	2747146.28	4.7	-2	53.31	88			
ECC-005	13433661.03	2747062.87	2.9	0	7.27	12			
ECC-005	13433661.03	2747062.87	2.9	-1	52.10	86			
ECC-005	13433661.03	2747062.87	2.9	-2	52.10	86			
ECC-014	13433536.48	2747215.70	2.9	0	9.69	16			
ECC-014	13433536.48	2747215.70	2.9	-1	53.31	88			
ECC-014	13433536.48	2747215.70	2.9	-2	53.31	88			
ECC-024	13433310.64	2747303.53	2.9	0	6.06	10			
ECC-024	13433310.64	2747303.53	2.9	-1	42.41	70			
ECC-024	13433310.64	2747303.53	2.9	-2	36.35	60			
ECC-027	13433078.96	2747348.81	2.9	0	3.63	6			
ECC-027	13433078.96	2747348.81	2.9	-1	19.39	32			
ECC-027	13433078.96	2747348.81	2.9	-2	47.25	78			
ECC-041	13432845.23	2747275.72	3.0	0	16.96	28			
ECC-041	13432845.23	2747275.72	3.0	-1	23.02	38			
ECC-041	13432845.23	2747275.72	3.0	-2	48.46	80			
ECC-039	13432696.69	2746976.24	3.4	0	1.21	2			
ECC-039	13432696.69	2746976.24	3.4	-1	13.33	22			
ECC-039	13432696.69	2746976.24	3.4	-2	48.46	80			
ECC-025	13433133.78	2746971.12	3.2	0	3.63	6			
ECC-025	13433133.78	2746971.12	3.2	-1	26.66	44			
ECC-025	13433133.78	2746971.12	3.2	-2	49.68	82			
ECC-022	13433350.90	2747000.05	3.0	0	3.63	6			
ECC-022	13433350.90	2747000.05	3.0	-1	24.23	40			
ECC-022	13433350.90	2747000.05	3.0	-2	49.68	82			
ECC-012	13433333.52	2746816.89	3.0	0	7.27	12			
ECC-012	13433333.52	2746816.89	3.0	-1	35.14	58			
ECC-012	13433333.52	2746816.89	3.0	-2	47.25	78			
ECC-032	13432915.20	2746774.69	3.4	0	2.42	4			
ECC-032	13432915.20	2746774.69	3.4	-1	14.54	24			
ECC-032	13432915.20	2746774.69	3.4	-2	50.89	84			
ECC-020	13433102.13	2746585.19	3.2	0	12.12	20			
ECC-020	13433102.13	2746585.19	3.2	-1	25.44	42			
ECC-020	13433102.13	2746585.19	3.2	-2	48.46	80			

Tolunay-Wong Engineers, Inc.

10710 S. Sam Houston Parkway W., Suite 100 * Houston, TX 77031 * Phone (713) 722-7064 * Fax (713) 722-0319

TWE Project No. 16.13.195 **Project Name**: Study 3.1 Eastern Causeway Sediment

Client Name: Benchmark Ecological Services, Inc.

SUMMARY OF LABORATORY TESTING

SAMPLE I.D	GRAIN SIZE DISTRIBUTION % FINER			ATTERBERG LIMITS		
	No. 10	No. 60	No. 200	LL	PL	PI
17094	100.0%	99.1%	68.7%	33	17	16
17095	100.0%	99.8%	79.0%	57	21	36
17096	100.0%	99.8%	86.0%	65	23	42
17097	100.0%	99.9%	91.1%	79	25	54
17098	100.0%	99.9%	92.0%	77	26	51
17099	100.0%	96.0%	74.4%	60	23	37
17100	100.0%	99.9%	91.5%	76	23	53
17101	100.0%	99.9%	91.5%	81	24	57
17102	100.0%	99.9%	85.1%	67	24	43
17103	100.0%	99.5%	81.2%	62	22	40
17104	100.0%	99.7%	78.0%	43	18	25
17105	100.0%	99.8%	87.7%	69	24	45
17106	100.0%	99.2%	29.0%	25	20	5
17107	100.0%	93.7%	43.1%	Too	Much	Shells
17108-Sieve Done	33.2%	25.0%	17.7%	Too	Much	Shell
17109	100.0%	96.2%	78.8%	78	26	52
17110	100.0%	99.3%	55.6%	30	17	13
17111	100.0%	98.6%	44.0%	30	16	14
17112	100.0%	97.4%	39.9%	27	17	10
17113	100.0%	99.2%	79.6%	52	18	34
17114	100.0%	99.3%	79.4%	50	20	30
17115	100.0%	98.4%	78.4%	58	21	37
17116	100.0%	99.6%	84.3%	68	22	46
17117	100.0%	99.9%	87.3%	62	23	39
17118	100.0%	99.3%	75.9%	43	16	27
17119	100.0%	99.7%	83.7%	45	17	28
17120	100.0%	99.9%	86.5%	61	20	41
17121	100.0%	98.8%	84.4%	51	20	31
17900	100.0%	98.9%	59.4%	33	17	16
17901	100.0%	99.9%	78.6%	61	22	39
17902	100.0%	99.6%	87.9%	69	25	44
17903	100.0%	99.5%	84.4%	67	22	45

Particle Size Analysis ASTM D 422



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	0.2	31.1	53.6	15.1

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	SMP-SE	17094		Gray SANDY LEAN CLAY	CL

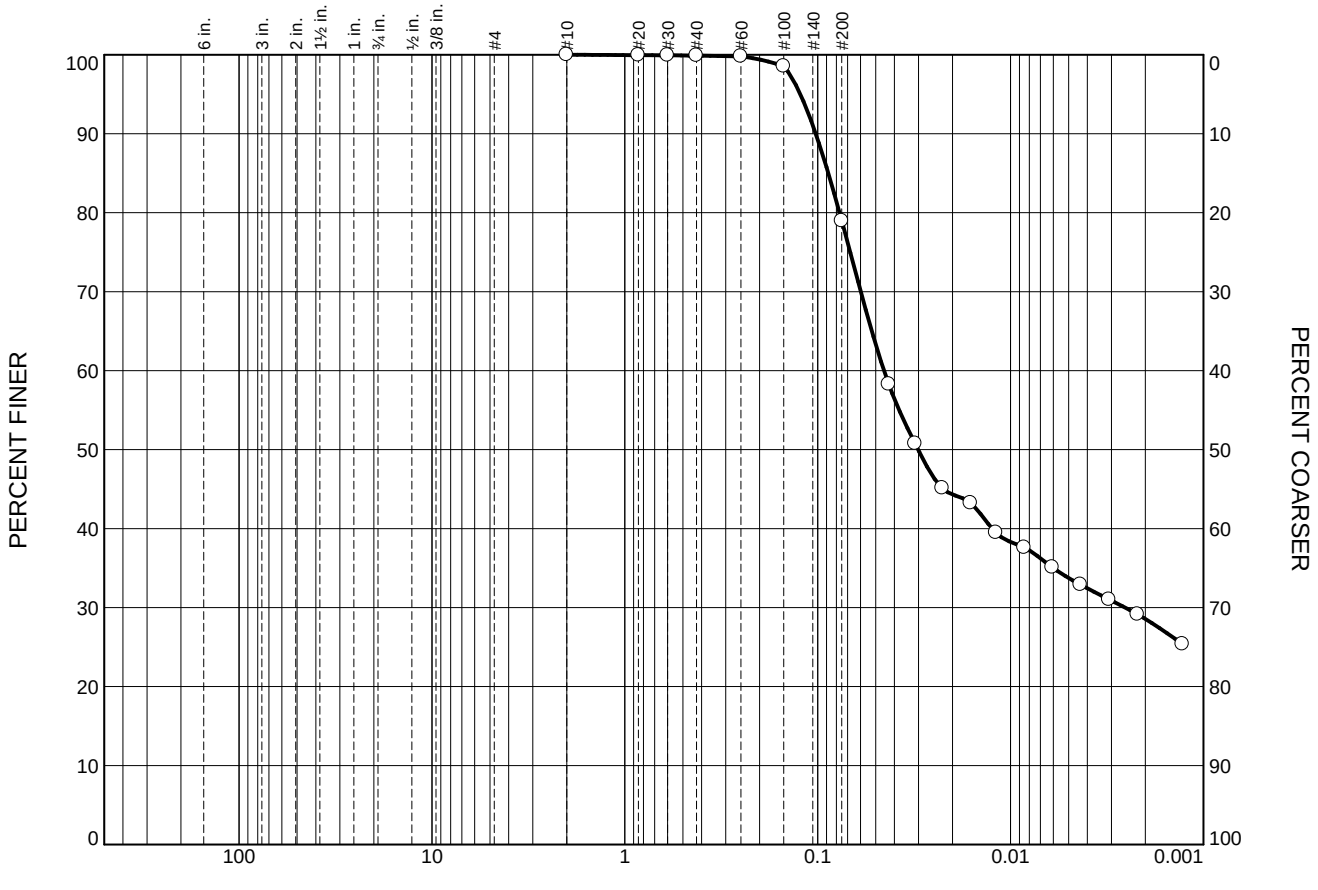
Tolunay-Wong Engineers, Inc.
Houston, Texas

Client: Benchmark Ecological Services, Inc.

Project: Geotechnical Lab Testing Study 3.1 Eastern Causeway Sediment

Project No.: 16.13.195 **Figure**

Particle Size Analysis ASTM D 422



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	0.1	20.9	50.4	28.6

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	SMP-SE	17095		Gray FAT CLAY with SAND	CH

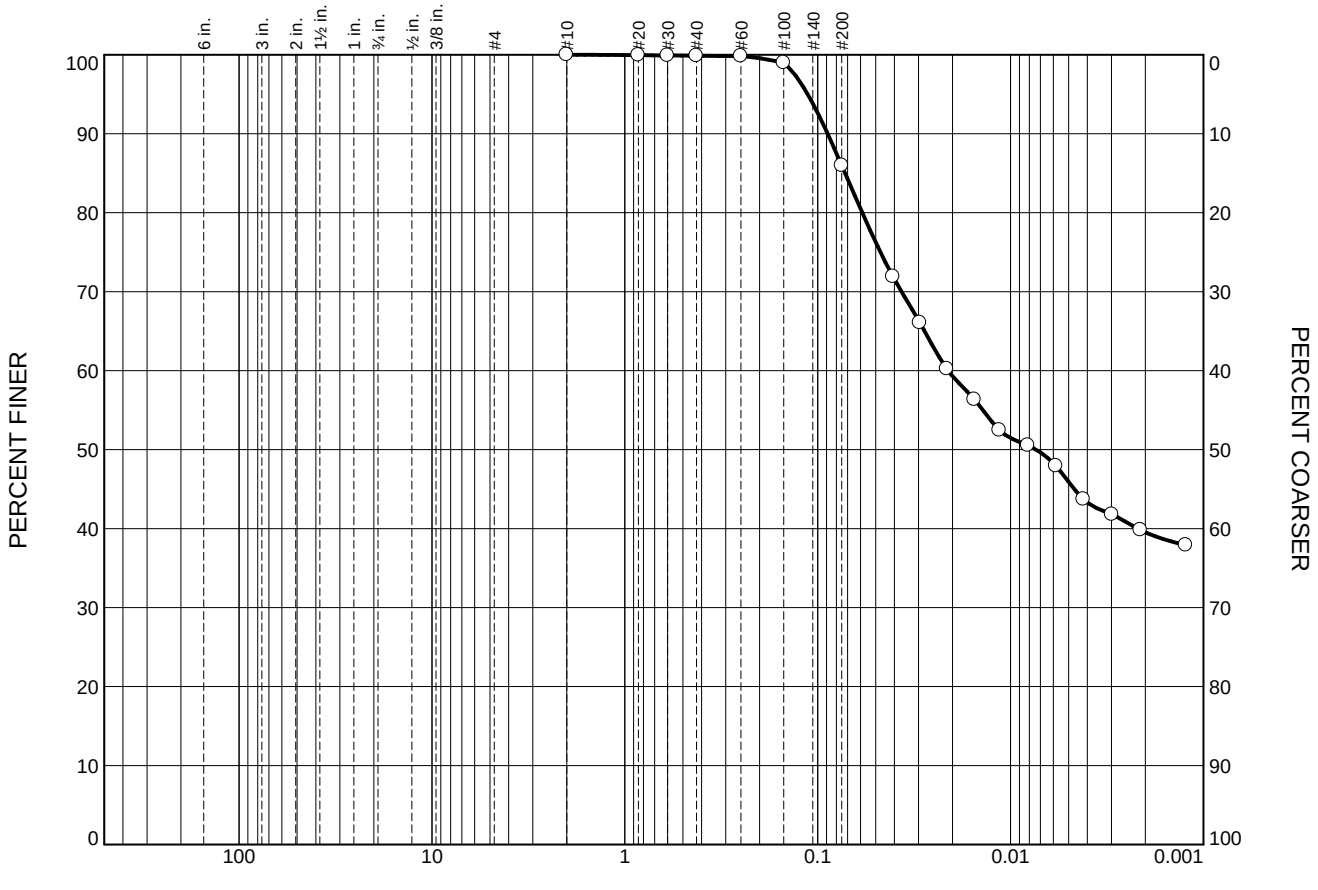
Tolunay-Wong Engineers, Inc.
Houston, Texas

Client: Benchmark Ecological Services, Inc.

Project: Geotechnical Lab Testing Study 3.1 Eastern Causeway Sediment

Project No.: 16.13.195 **Figure**

Particle Size Analysis ASTM D 422



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	0.1	13.9	46.5	39.5

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	SMP-SE	17096		Gray FAT CLAY	CH

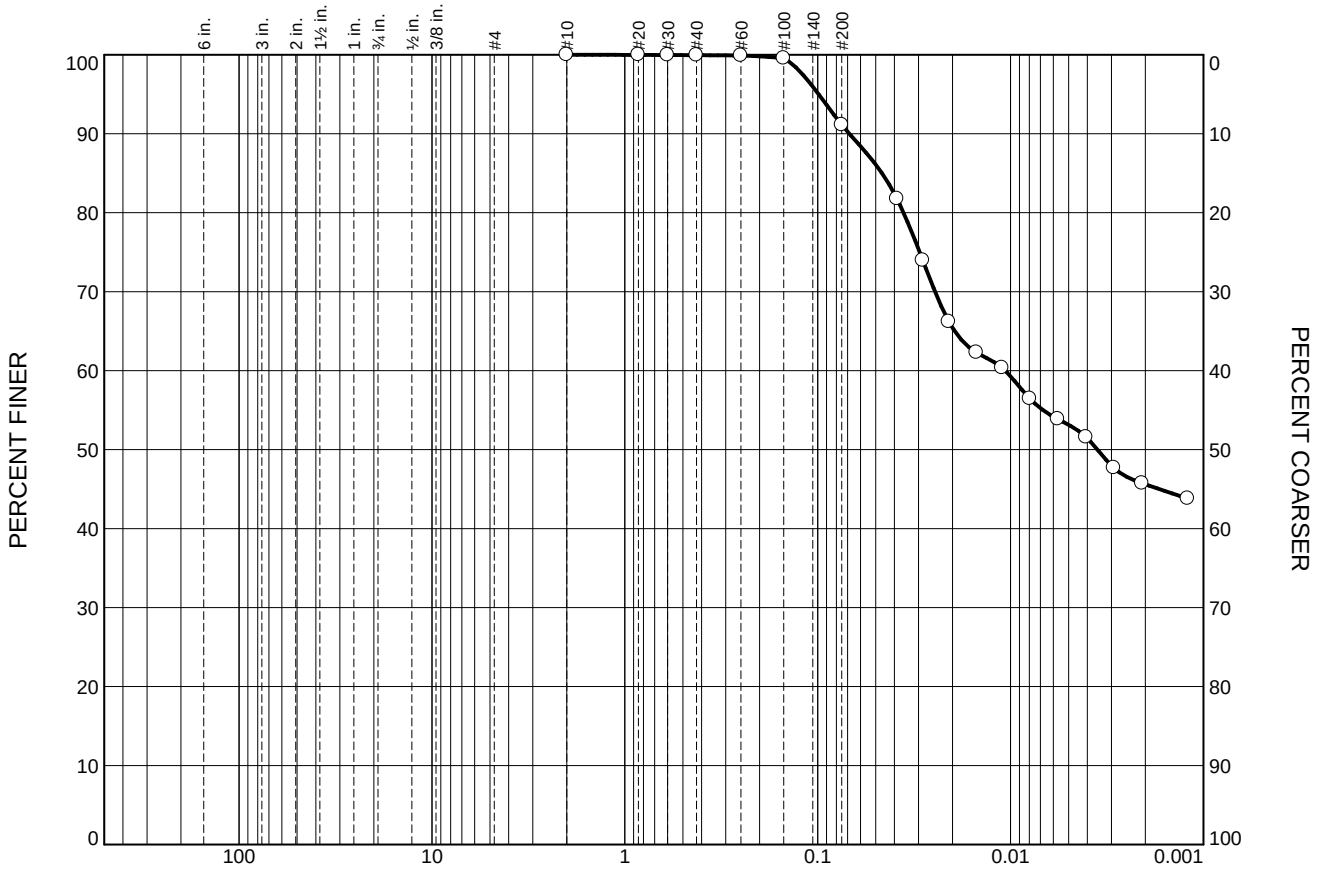
Tolunay-Wong Engineers, Inc.
Houston, Texas

Client: Benchmark Ecological Services, Inc.

Project: Geotechnical Lab Testing Study 3.1 Eastern Causeway Sediment

Project No.: 16.13.195 **Figure**

Particle Size Analysis ASTM D 422



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	0.1	8.8	45.5	45.6

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	SMP-SE	17097		Gray FAT CLAY	CH

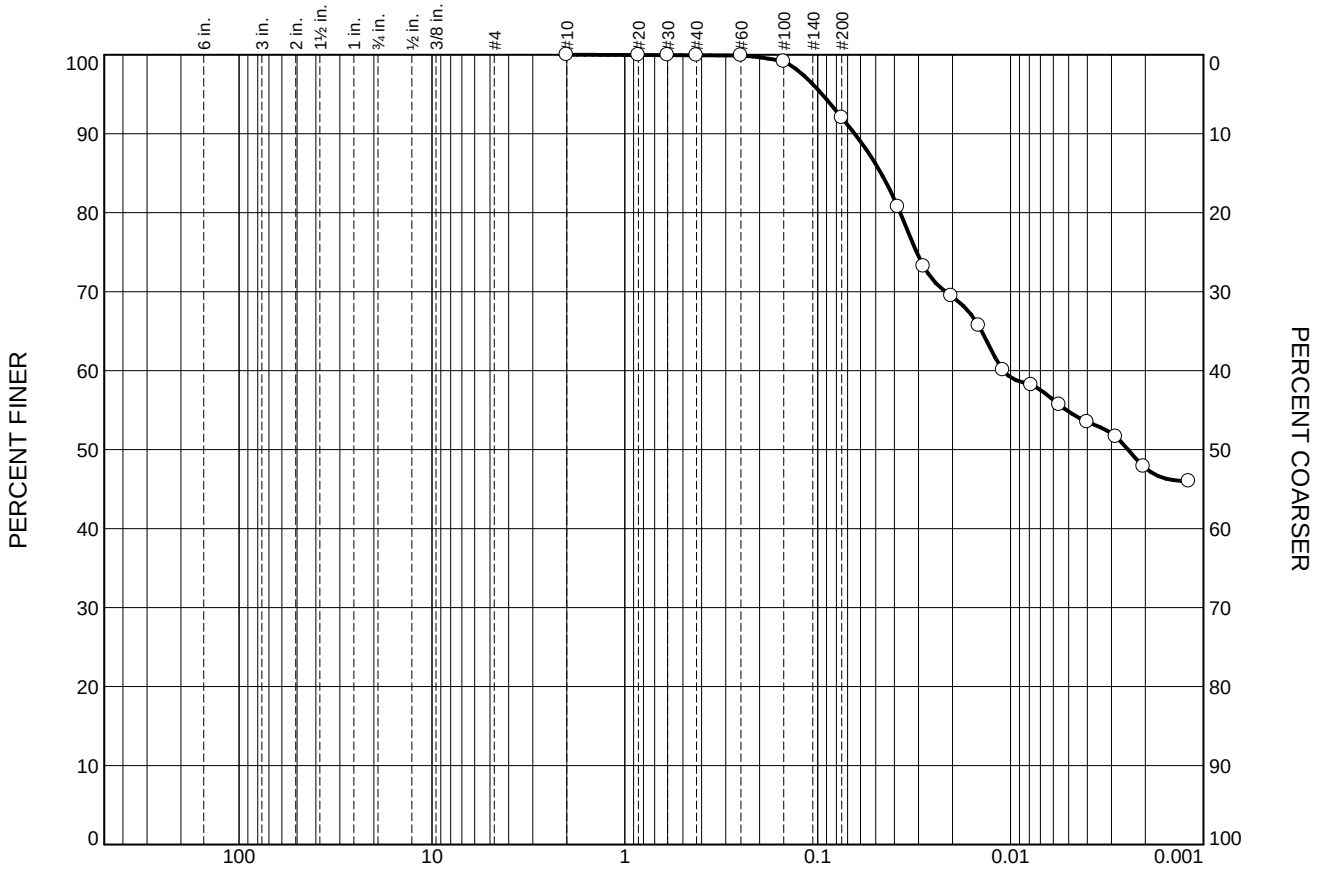
Tolunay-Wong Engineers, Inc.
Houston, Texas

Client: Benchmark Ecological Services, Inc.

Project: Geotechnical Lab Testing Study 3.1 Eastern Causeway Sediment

Project No.: 16.13.195 **Figure**

Particle Size Analysis ASTM D 422



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	0.1	7.9	44.3	47.7

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	SMP-SE	17098		Gray FAT CLAY	CH

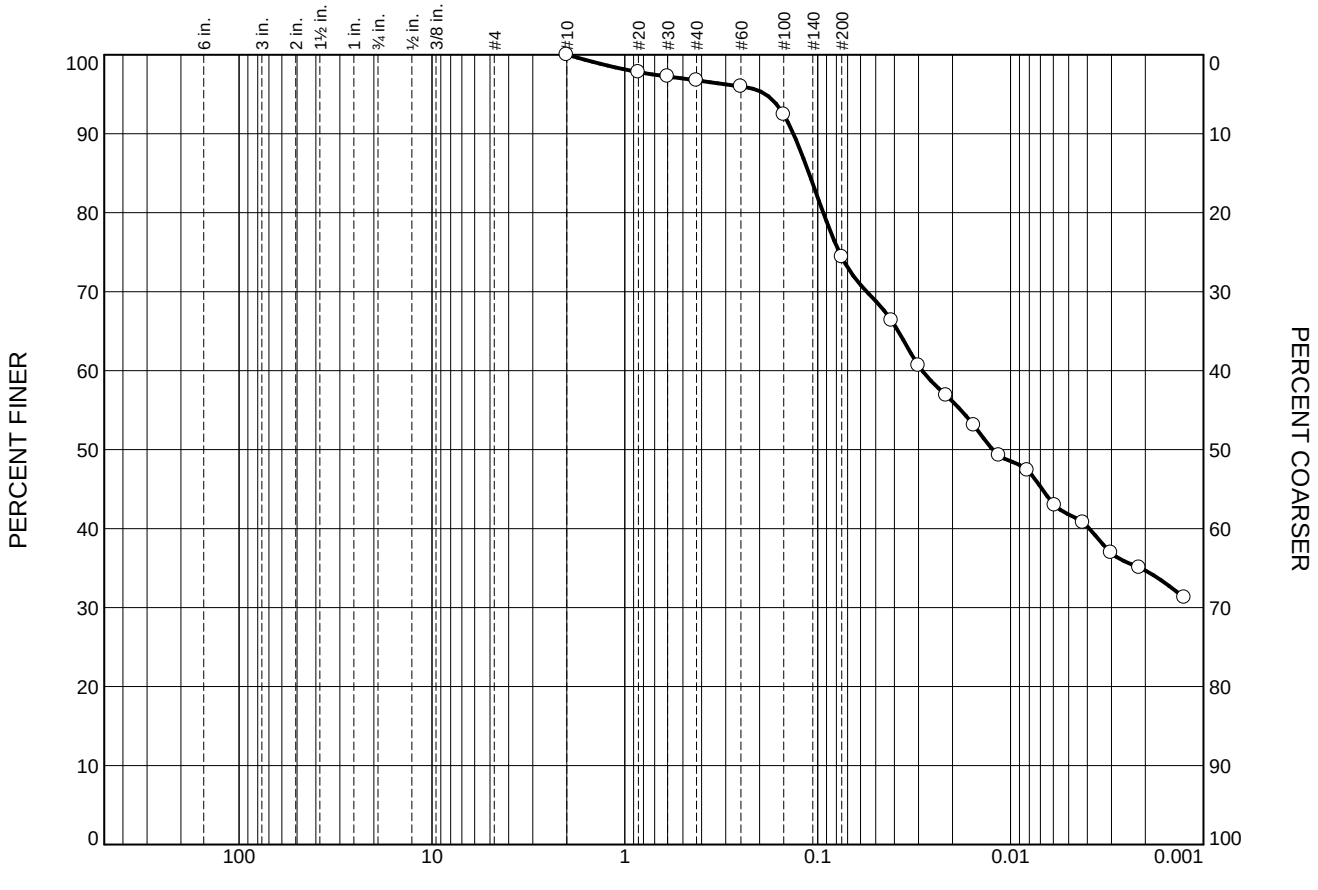
Tolunay-Wong Engineers, Inc.
Houston, Texas

Client: Benchmark Ecological Services, Inc.

Project: Geotechnical Lab Testing Study 3.1 Eastern Causeway Sediment

Project No.: 16.13.195 **Figure**

Particle Size Analysis ASTM D 422



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	3.2	22.4	39.7	34.7

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	SMP-SE	17099		Gray FAT CLAY with SAND	CH

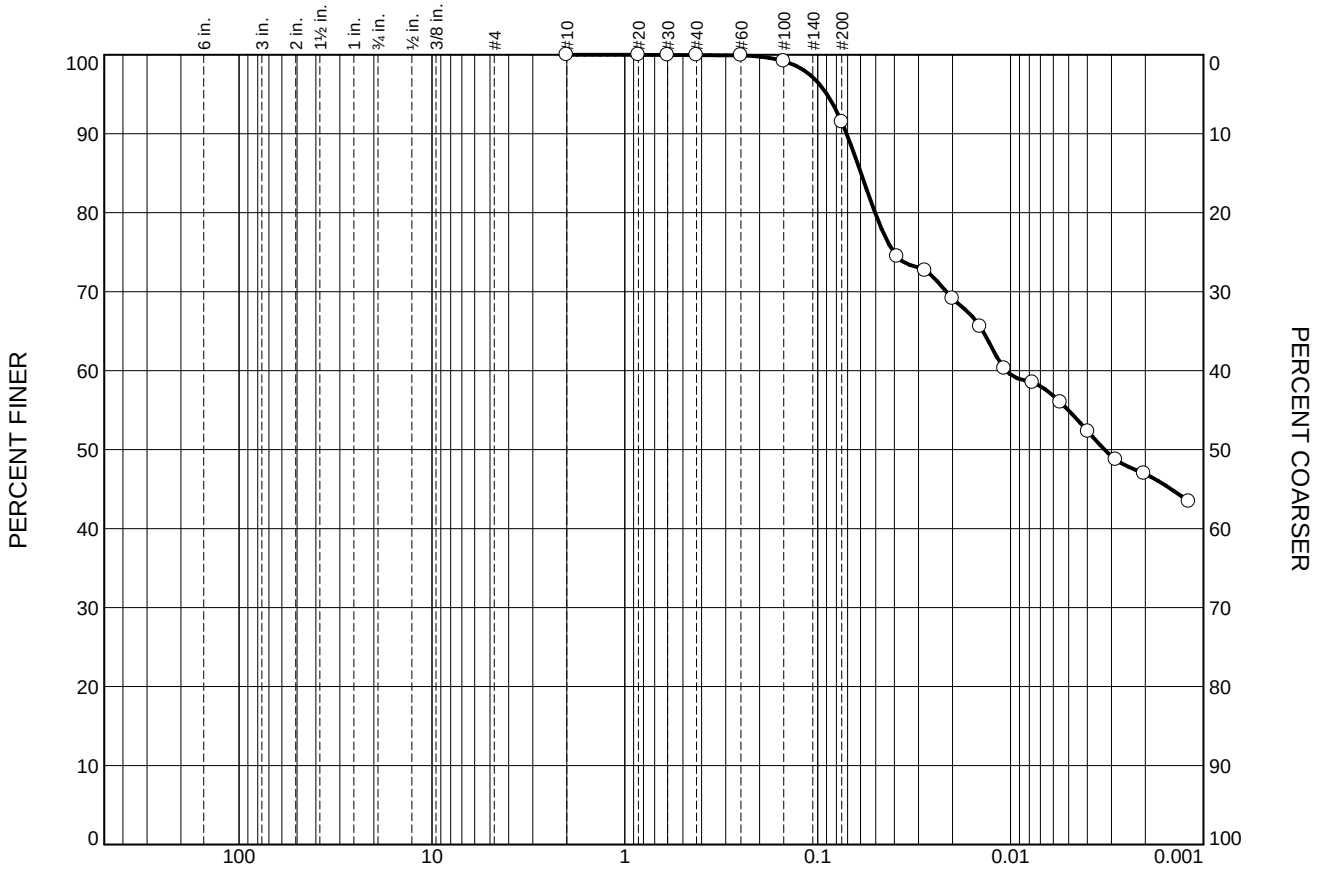
Tolunay-Wong Engineers, Inc.
Houston, Texas

Client: Benchmark Ecological Services, Inc.

Project: Geotechnical Lab Testing Study 3.1 Eastern Causeway Sediment

Project No.: 16.13.195 **Figure**

Particle Size Analysis ASTM D 422



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	0.1	8.4	44.6	46.9

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	SMP-SE	17100		Gray FAT CLAY	CH

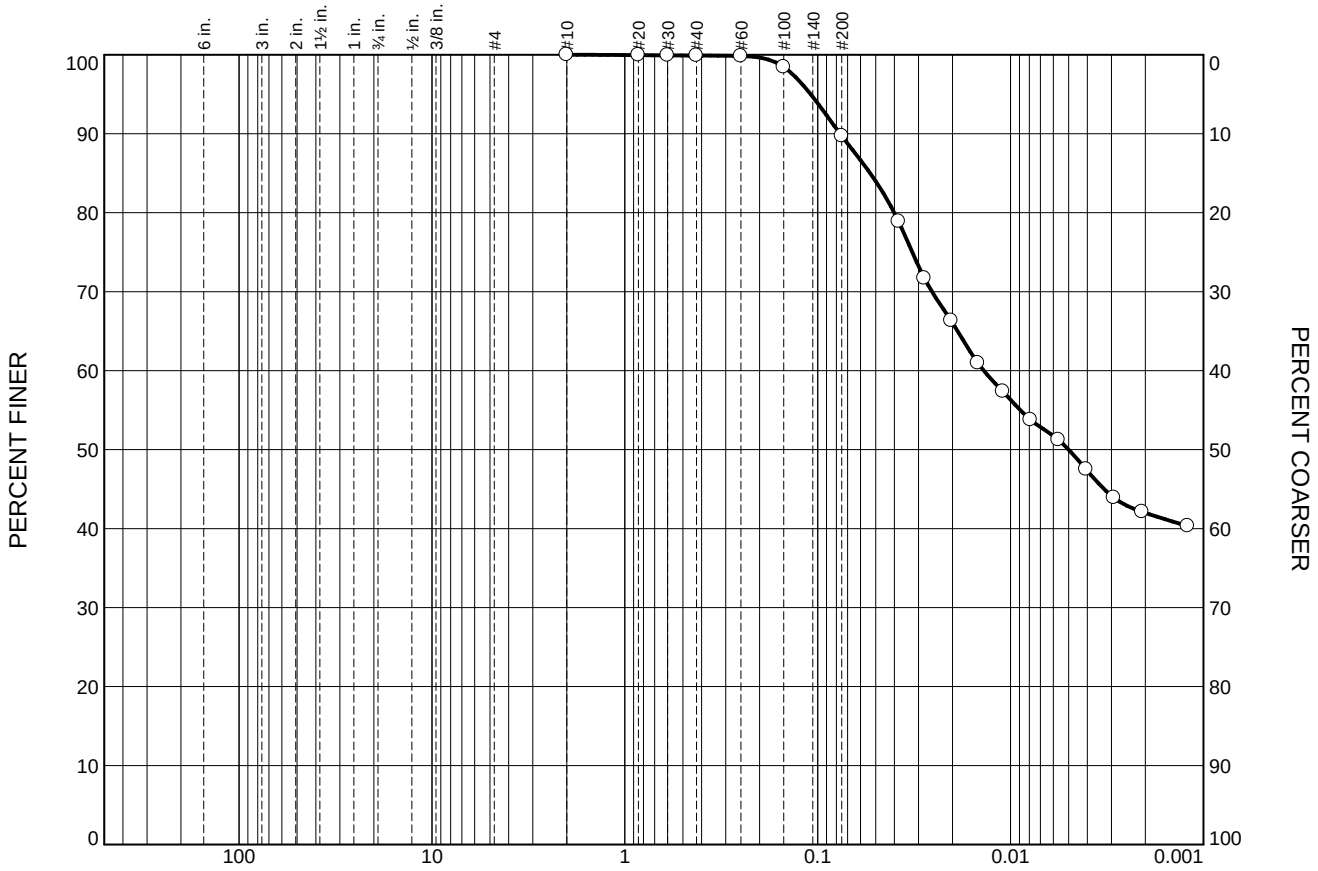
Tolunay-Wong Engineers, Inc.
Houston, Texas

Client: Benchmark Ecological Services, Inc.

Project: Geotechnical Lab Testing Study 3.1 Eastern Causeway Sediment

Project No.: 16.13.195 **Figure**

Particle Size Analysis ASTM D 422



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	0.1	10.2	47.7	42.0

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	SMP-SE	17101		Gray FAT CLAY	CH

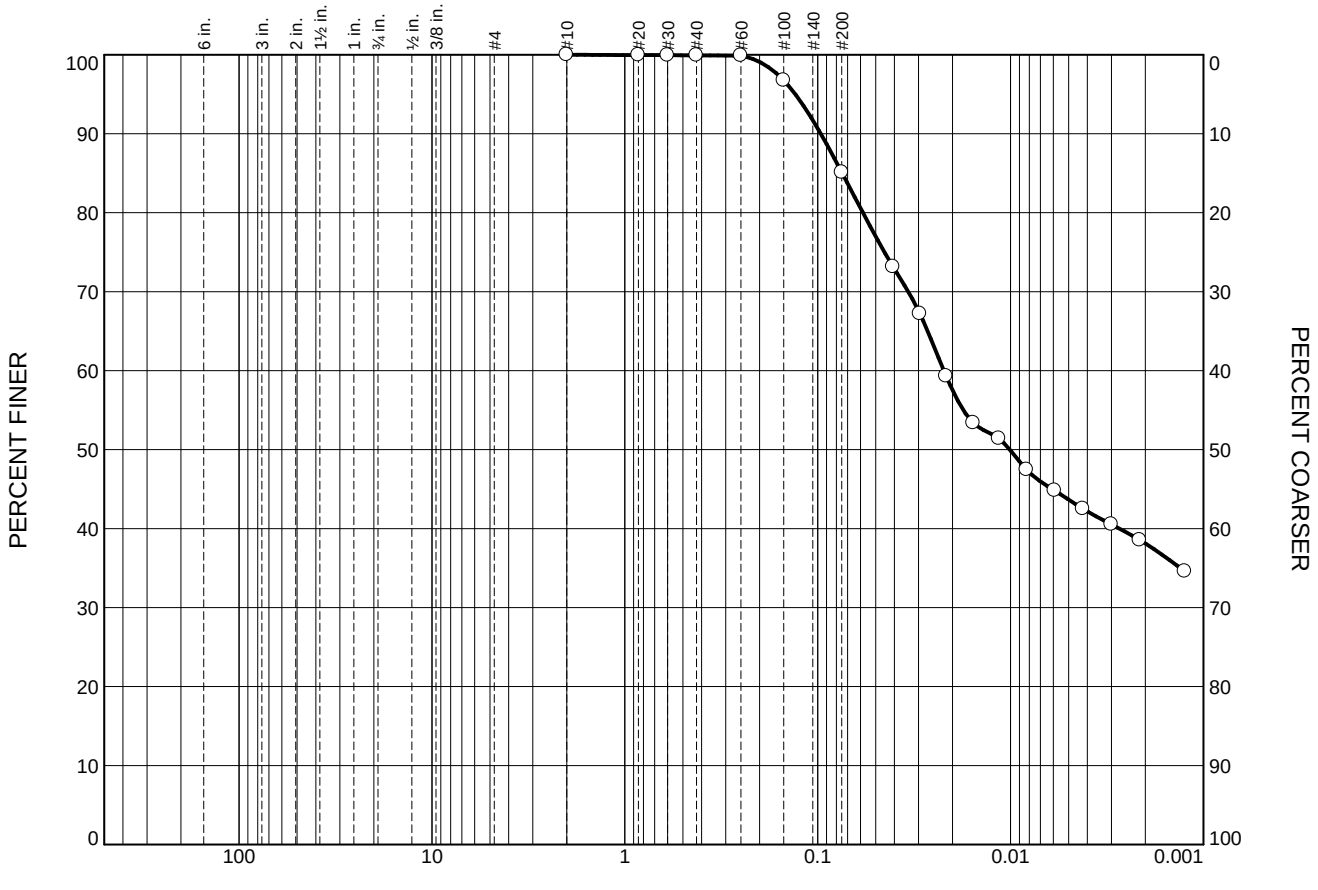
Tolunay-Wong Engineers, Inc.
Houston, Texas

Client: Benchmark Ecological Services, Inc.

Project: Geotechnical Lab Testing Study 3.1 Eastern Causeway Sediment

Project No.: 16.13.195 **Figure**

Particle Size Analysis ASTM D 422



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	0.1	14.8	47.0	38.1

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	SMP-SE	17102		Gray FAT CLAY	CH

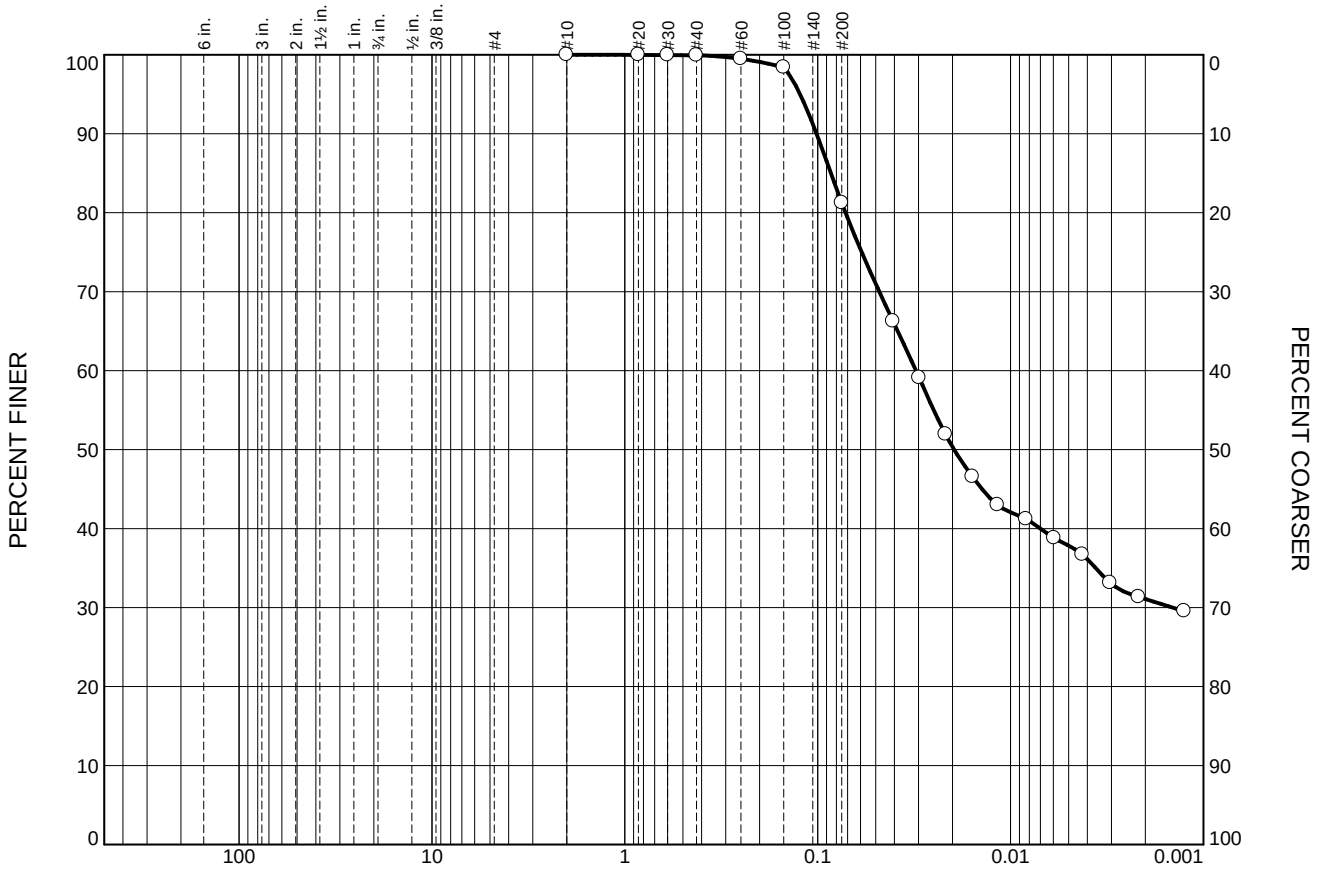
Tolunay-Wong Engineers, Inc.
Houston, Texas

Client: Benchmark Ecological Services, Inc.

Project: Geotechnical Lab Testing Study 3.1 Eastern Causeway Sediment

Project No.: 16.13.195 **Figure**

Particle Size Analysis ASTM D 422



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	0.1	18.7	50.1	31.1

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	SMP-SE	17103		Gray FAT CLAY with SAND	CH

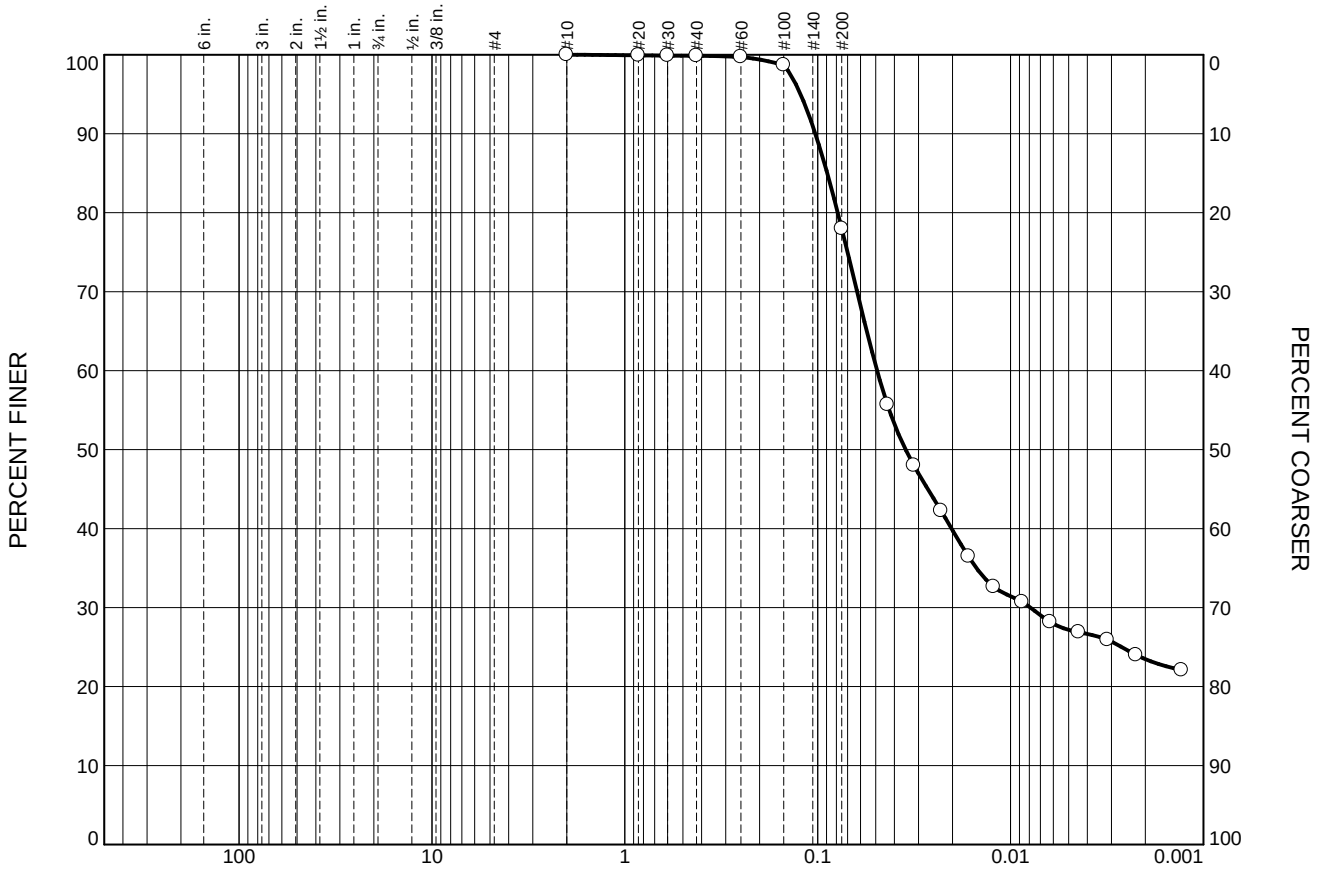
Tolunay-Wong Engineers, Inc.
Houston, Texas

Client: Benchmark Ecological Services, Inc.

Project: Geotechnical Lab Testing Study 3.1 Eastern Causeway Sediment

Project No.: 16.13.195 **Figure**

Particle Size Analysis ASTM D 422



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	0.1	21.9	54.5	23.5

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	SMP-SE	17104		Gray LEAN CLAY with SAND	CL

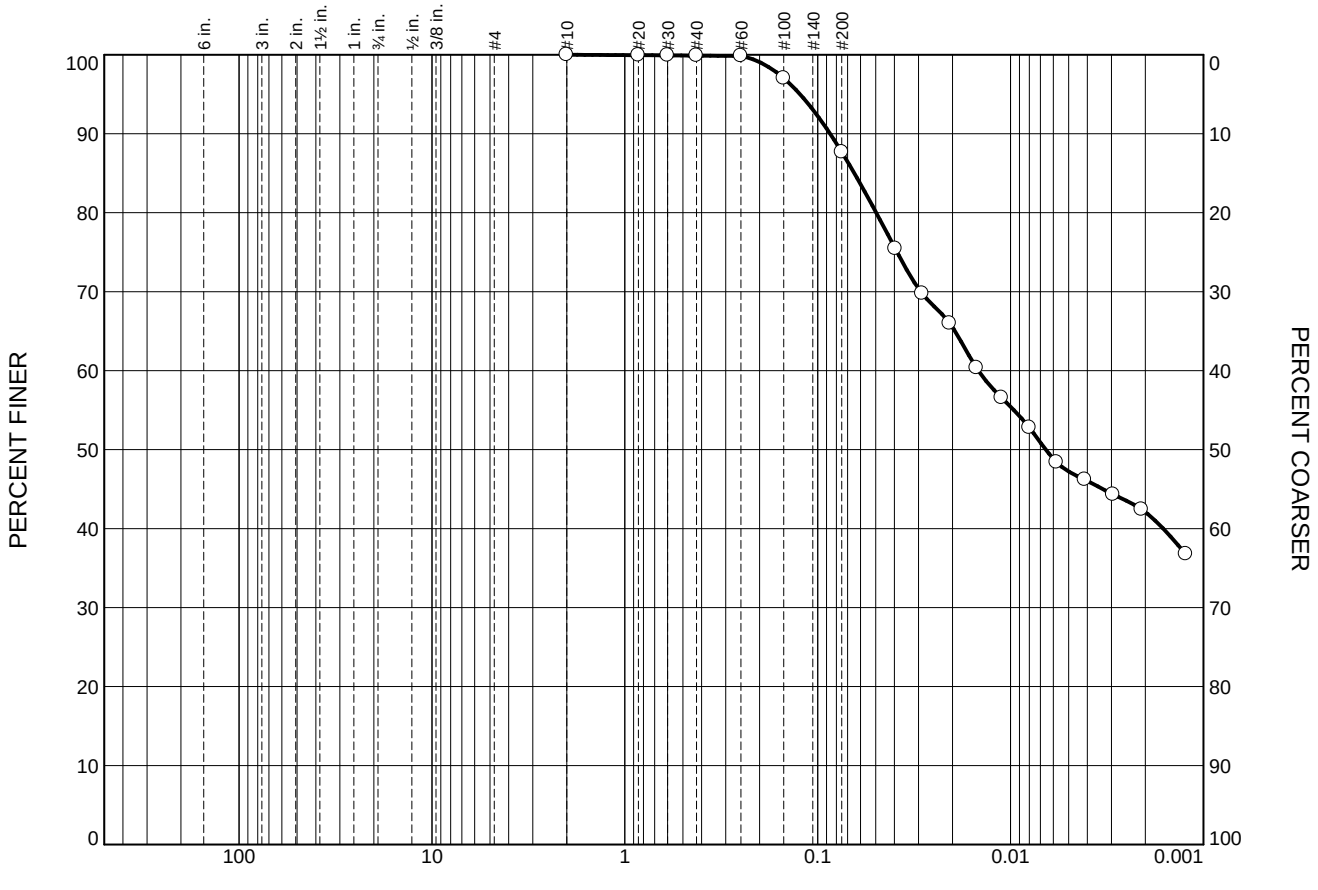
Tolunay-Wong Engineers, Inc.
Houston, Texas

Client: Benchmark Ecological Services, Inc.

Project: Geotechnical Lab Testing Study 3.1 Eastern Causeway Sediment

Project No.: 16.13.195 **Figure**

Particle Size Analysis ASTM D 422



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	0.1	12.2	45.6	42.1

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	SMP-SE	17105		Gray FAT CLAY	CH

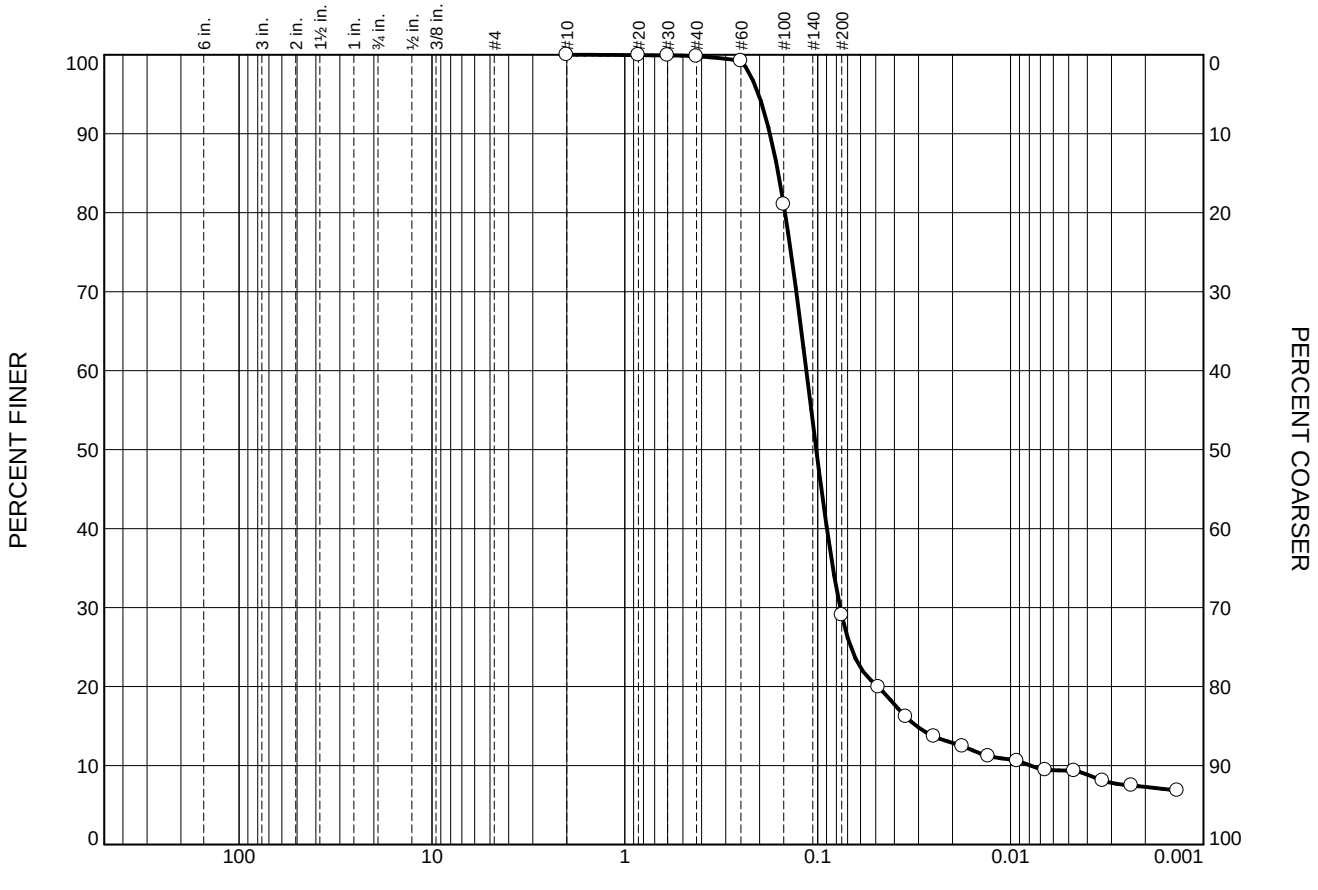
Tolunay-Wong Engineers, Inc.
Houston, Texas

Client: Benchmark Ecological Services, Inc.

Project: Geotechnical Lab Testing Study 3.1 Eastern Causeway Sediment

Project No.: 16.13.195 **Figure**

Particle Size Analysis ASTM D 422



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	0.2	70.8	21.7	7.3

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	SMP-SE	17106		Gray SILTY CLAYEY SAND	SC-SM

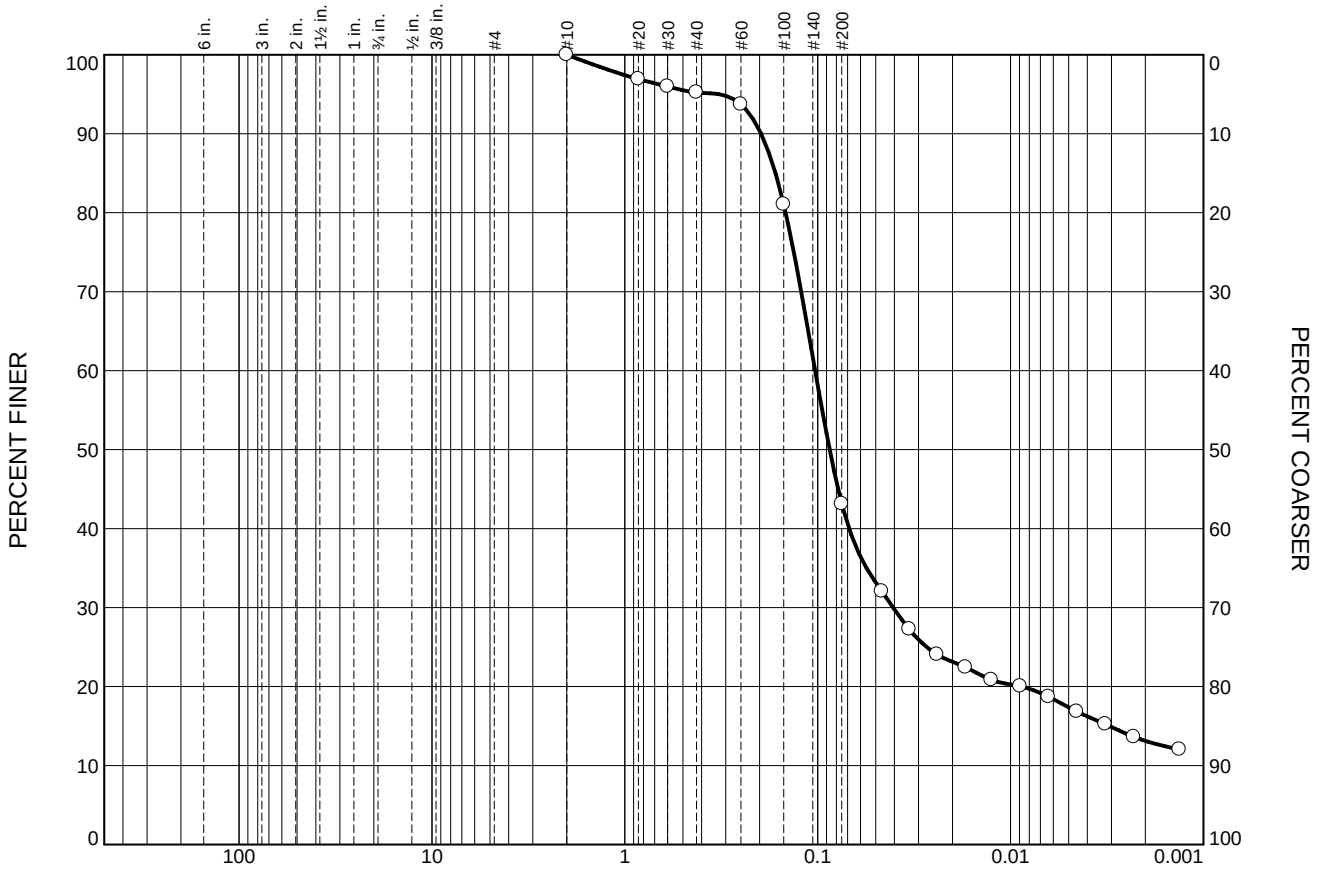
Tolunay-Wong Engineers, Inc.
Houston, Texas

Client: Benchmark Ecological Services, Inc.

Project: Geotechnical Lab Testing Study 3.1 Eastern Causeway Sediment

Project No.: 16.13.195 **Figure**

Particle Size Analysis ASTM D 422



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	4.8	52.1	30.0	13.1

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	SMP-SE	17107		Gray CLAYEY SAND	SM

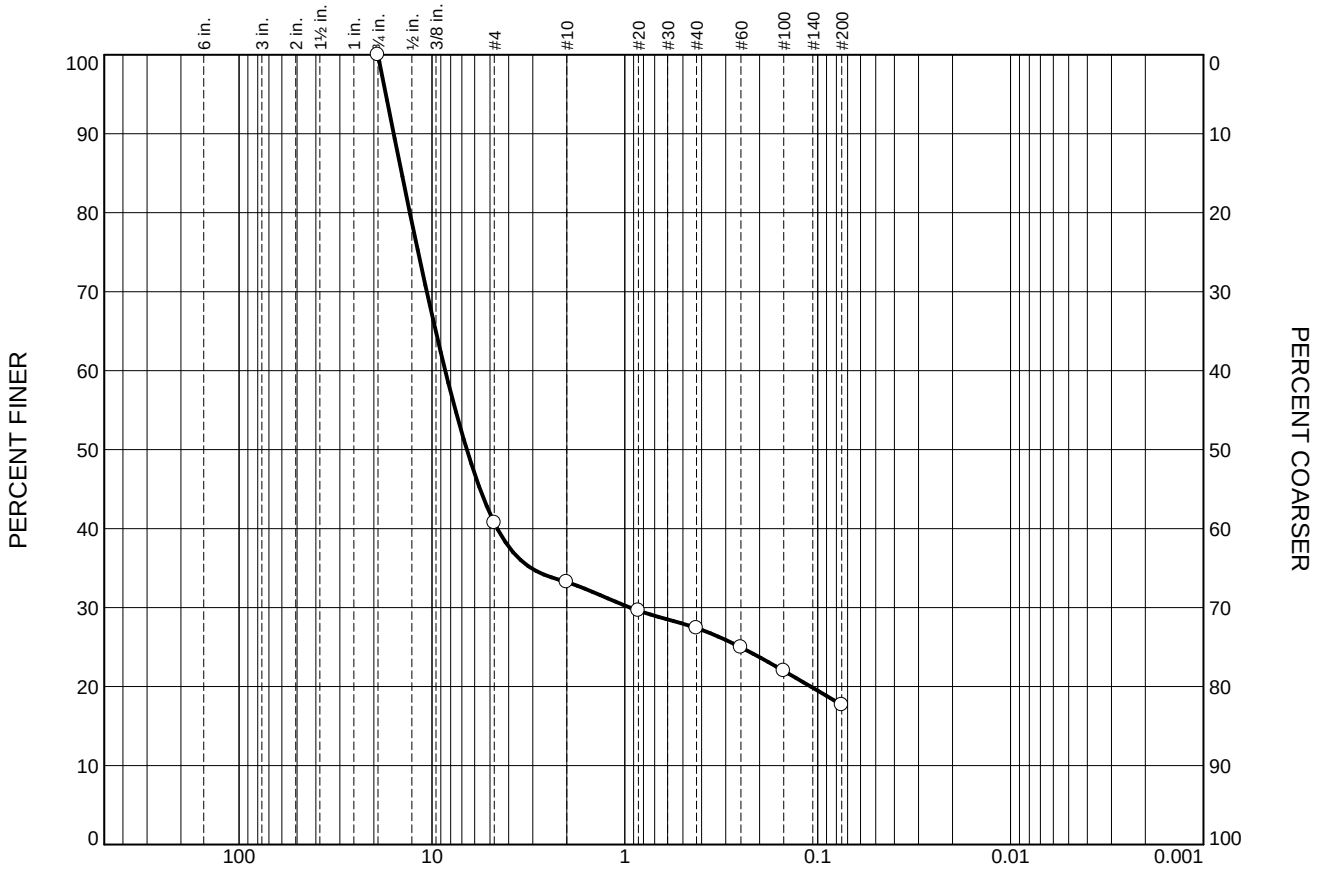
Tolunay-Wong Engineers, Inc.
Houston, Texas

Client: Benchmark Ecological Services, Inc.

Project: Geotechnical Lab Testing Study 3.1 Eastern Causeway Sediment

Project No.: 16.13.195 **Figure**

Particle Size Analysis ASTM D 422



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	59.3	7.5	5.8	9.7	17.7	

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	SMP-SE	17108		Gray poorly graded GRAVEL with CLAY and SAND	GM

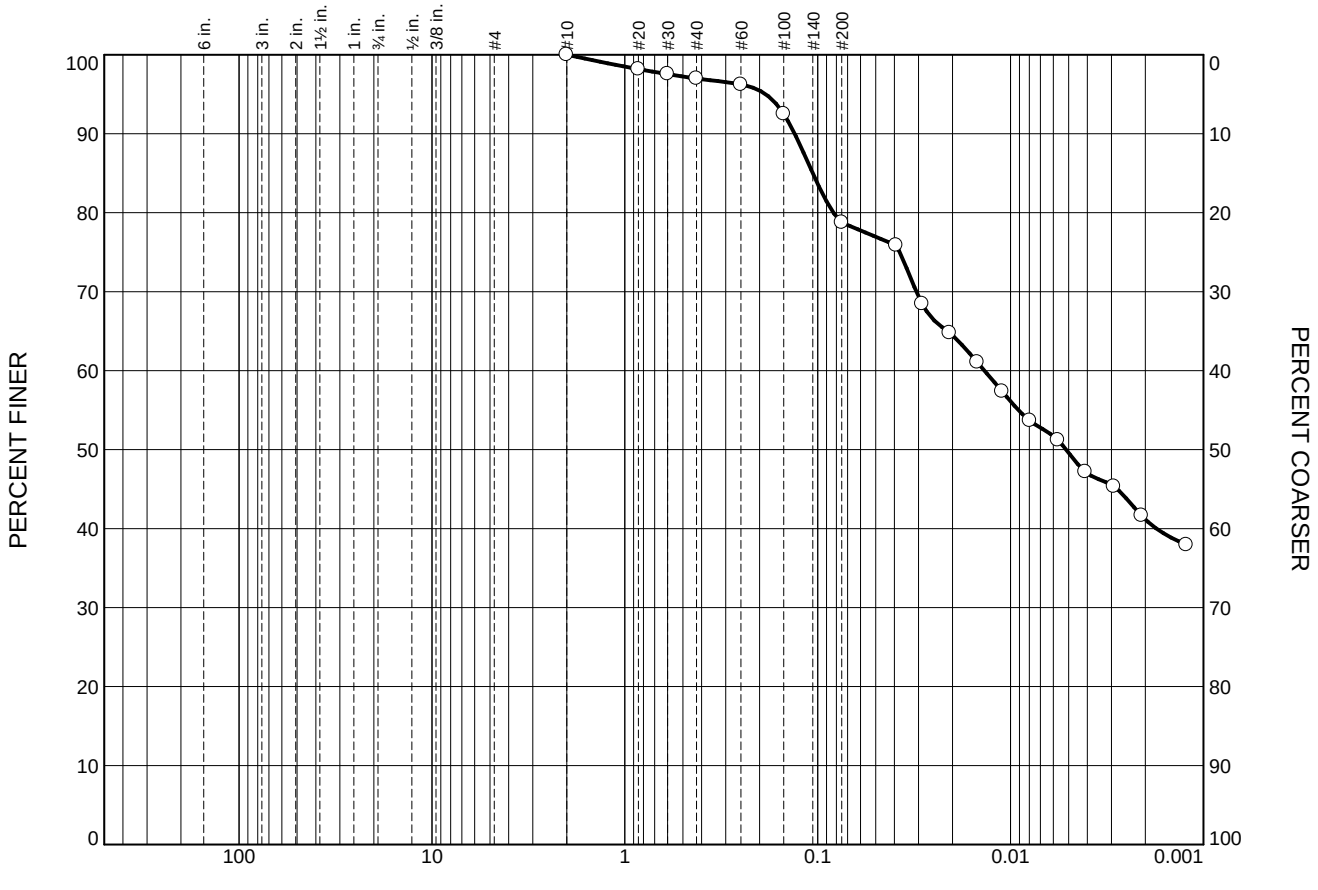
Tolunay-Wong Engineers, Inc.
Houston, Texas

Client: Benchmark Ecological Services, Inc.

Project: Geotechnical Lab Testing Study 3.1 Eastern Causeway Sediment

Project No.: 16.13.195 **Figure**

Particle Size Analysis ASTM D 422



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	3.0	18.2	37.6	41.2

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	SMP-SE	17109		Gray FAT CLAY with SAND	CH

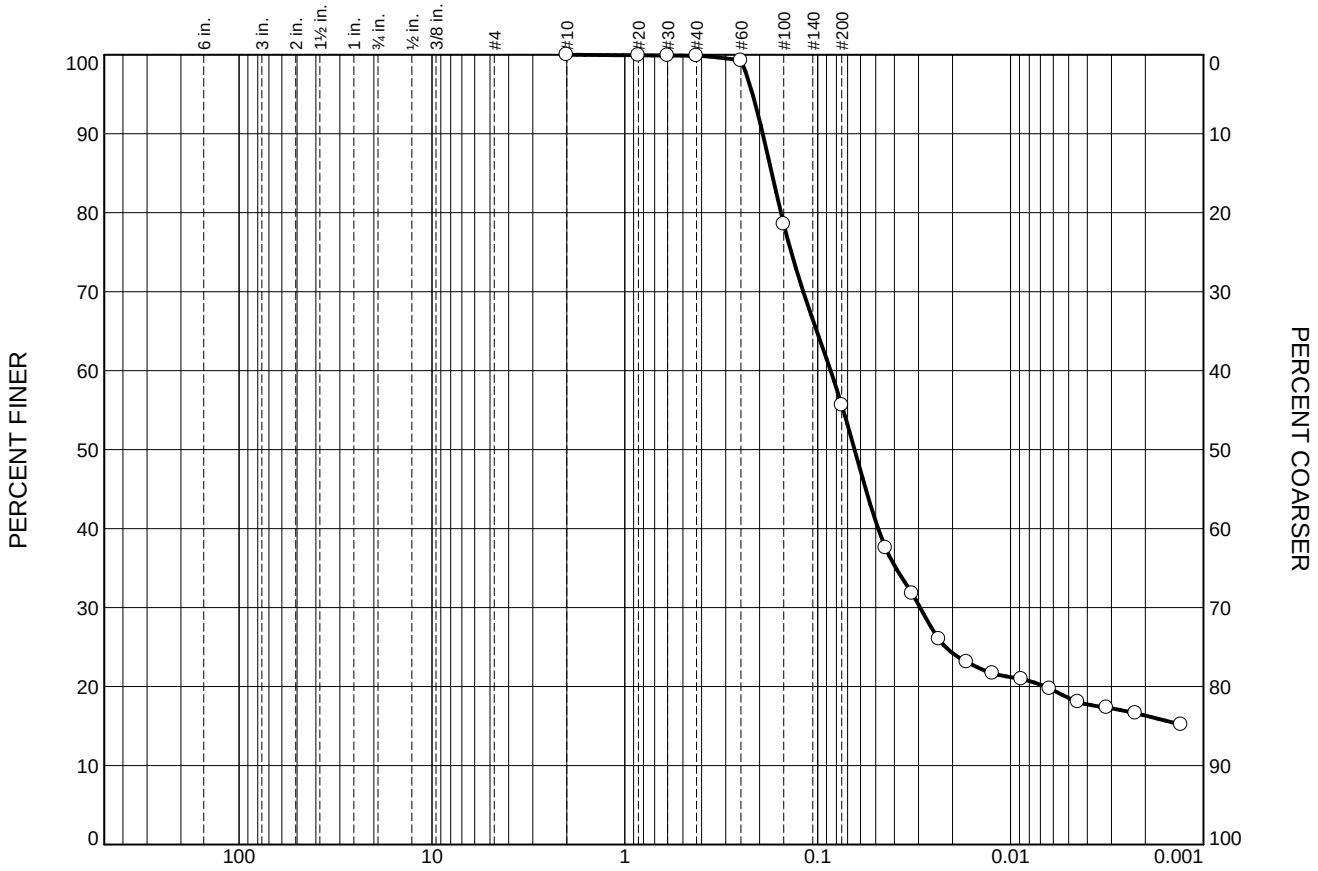
Tolunay-Wong Engineers, Inc.
Houston, Texas

Client: Benchmark Ecological Services, Inc.

Project: Geotechnical Lab Testing Study 3.1 Eastern Causeway Sediment

Project No.: 16.13.195 **Figure**

Particle Size Analysis ASTM D 422



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	0.1	44.3	39.3	16.3

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	SMP-SE	17110		Gray SANDY LEAN CLAY	CL

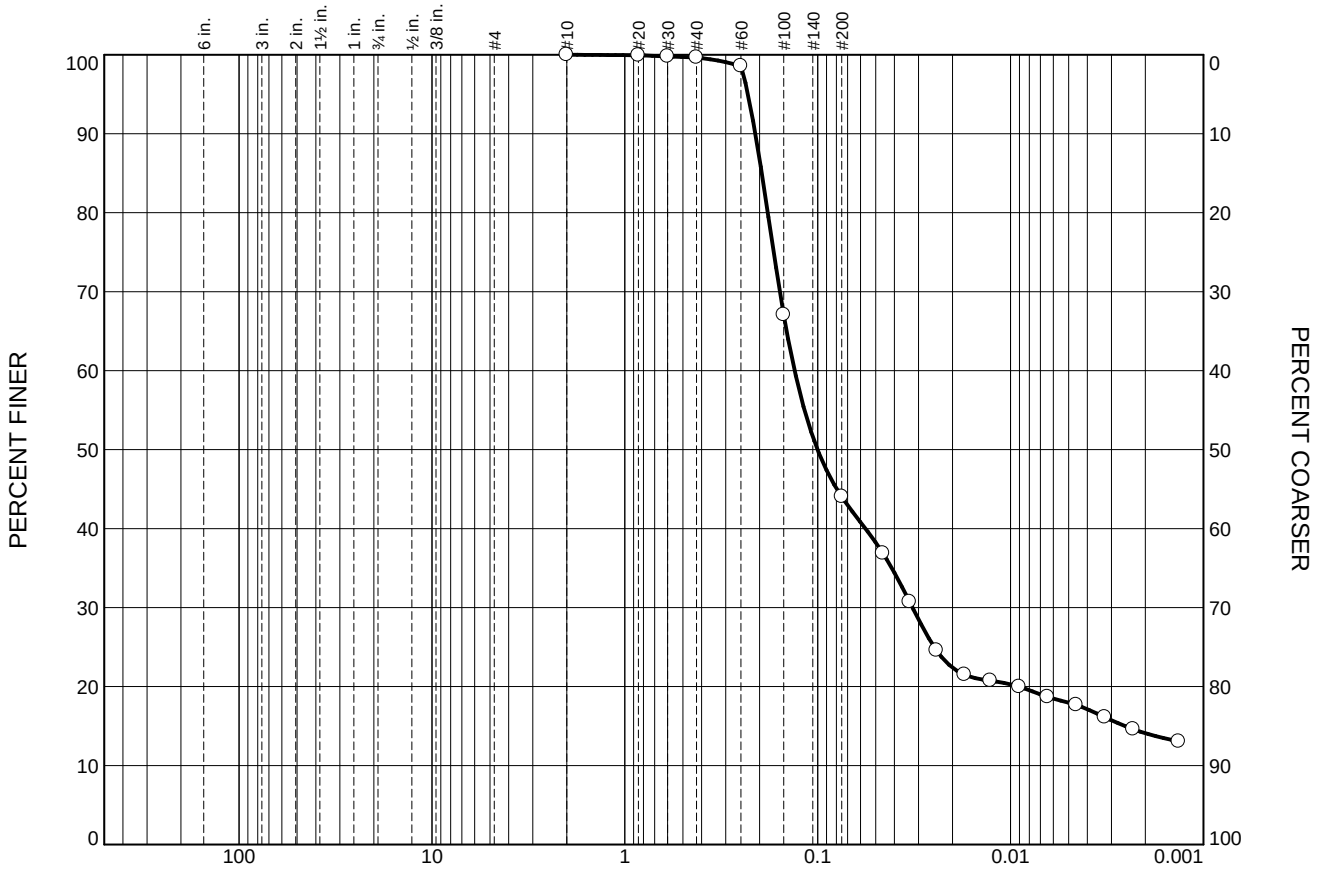
Tolunay-Wong Engineers, Inc.
Houston, Texas

Client: Benchmark Ecological Services, Inc.

Project: Geotechnical Lab Testing Study 3.1 Eastern Causeway Sediment

Project No.: 16.13.195 **Figure**

Particle Size Analysis ASTM D 422



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	0.4	55.6	29.9	14.1

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	SMP-SE	17111		Gray CLAYEY SAND	SC

Tolunay-Wong Engineers, Inc.
Houston, Texas

Client: Benchmark Ecological Services, Inc.

Project: Geotechnical Lab Testing Study 3.1 Eastern Causeway Sediment

Project No.: 16.13.195 **Figure**

Particle Size Analysis ASTM D 422



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	1.0	59.1	26.4	13.5

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	SMP-SE	17112		Gray CLAYEY SAND	SC

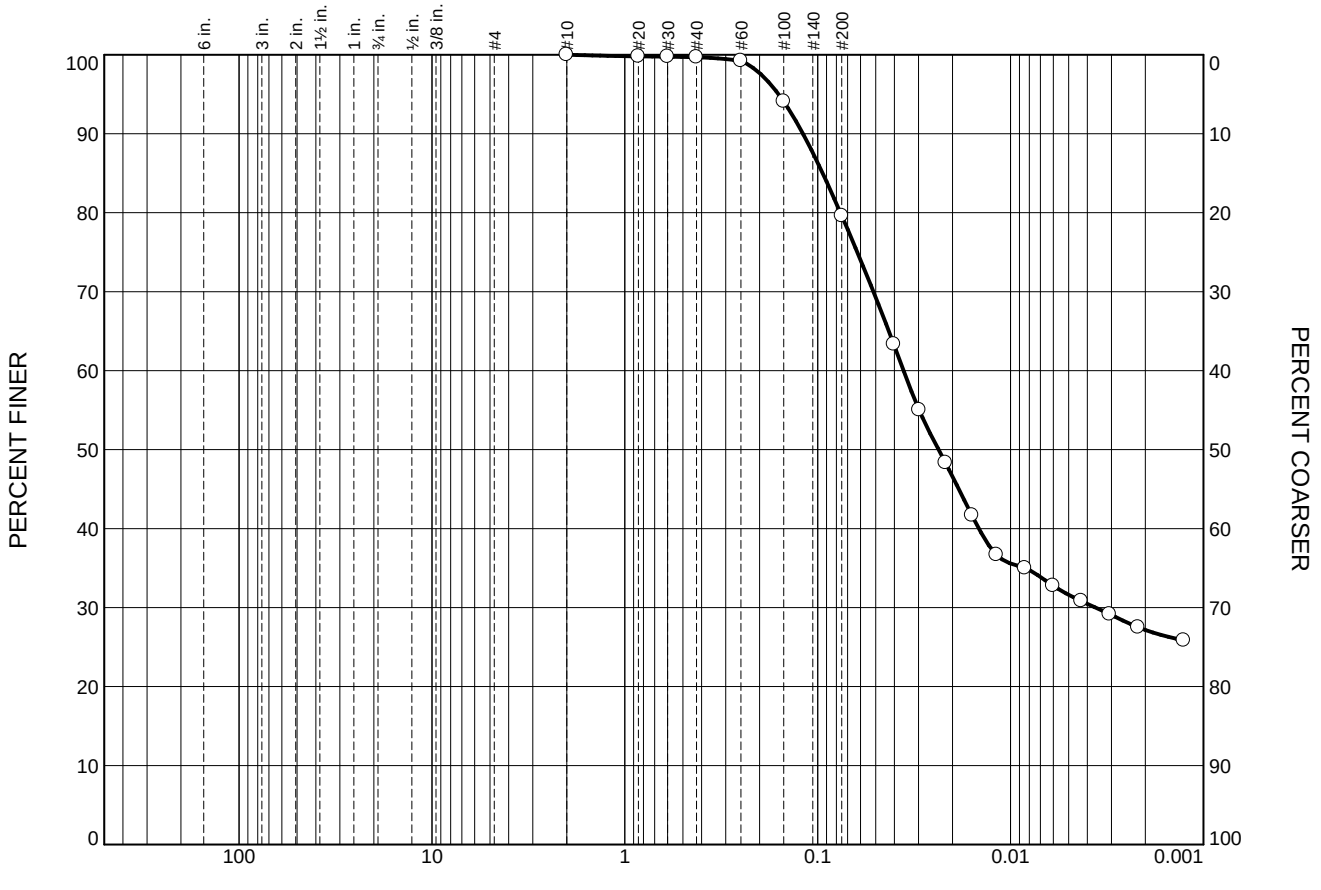
Tolunay-Wong Engineers, Inc.
Houston, Texas

Client: Benchmark Ecological Services, Inc.

Project: Geotechnical Lab Testing Study 3.1 Eastern Causeway Sediment

Project No.: 16.13.195 **Figure**

Particle Size Analysis ASTM D 422



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	0.3	20.1	52.4	27.2

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	SMP-SE	17113		Gray FAT CLAY with SAND	CH

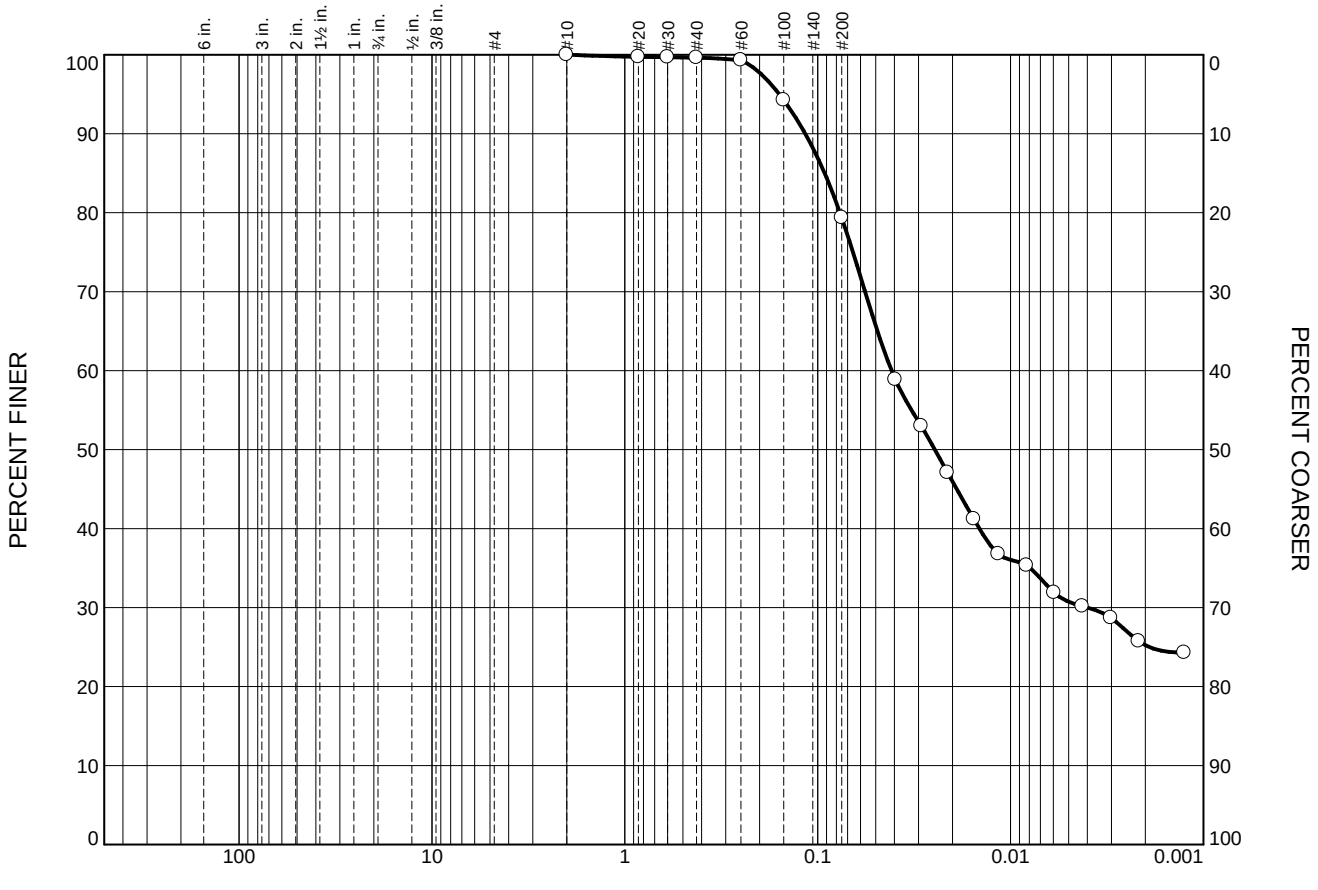
Tolunay-Wong Engineers, Inc.
Houston, Texas

Client: Benchmark Ecological Services, Inc.

Project: Geotechnical Lab Testing Study 3.1 Eastern Causeway Sediment

Project No.: 16.13.195 **Figure**

Particle Size Analysis ASTM D 422



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	0.4	20.2	54.2	25.2

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	SMP-SE	17114		Gray FAT CLAY with SAND	CH

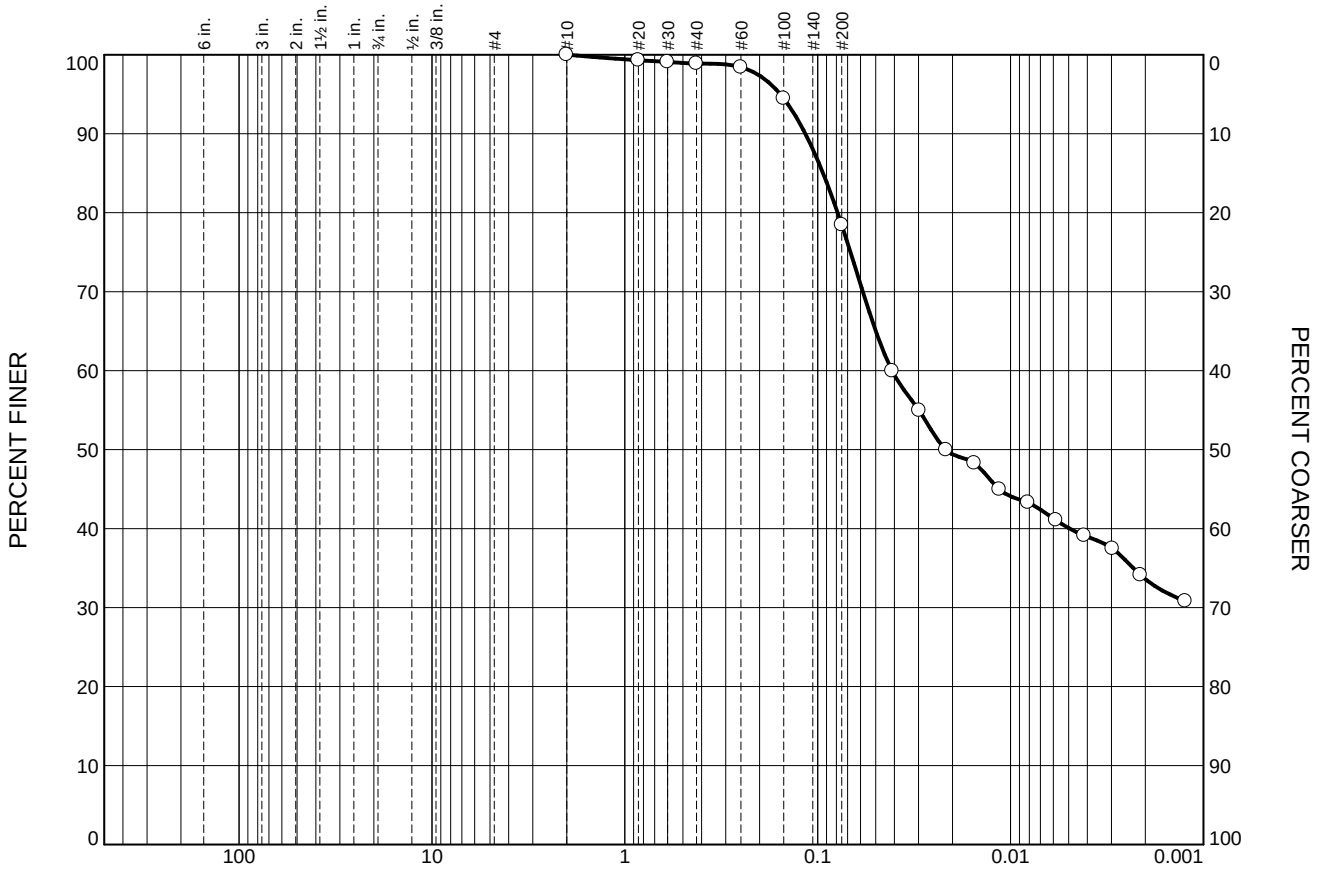
Tolunay-Wong Engineers, Inc.
Houston, Texas

Client: Benchmark Ecological Services, Inc.

Project: Geotechnical Lab Testing Study 3.1 Eastern Causeway Sediment

Project No.: 16.13.195 **Figure**

Particle Size Analysis ASTM D 422



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	1.1	20.5	44.8	33.6

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	SMP-SE	17115		Gray FAT CLAY with SAND	CH

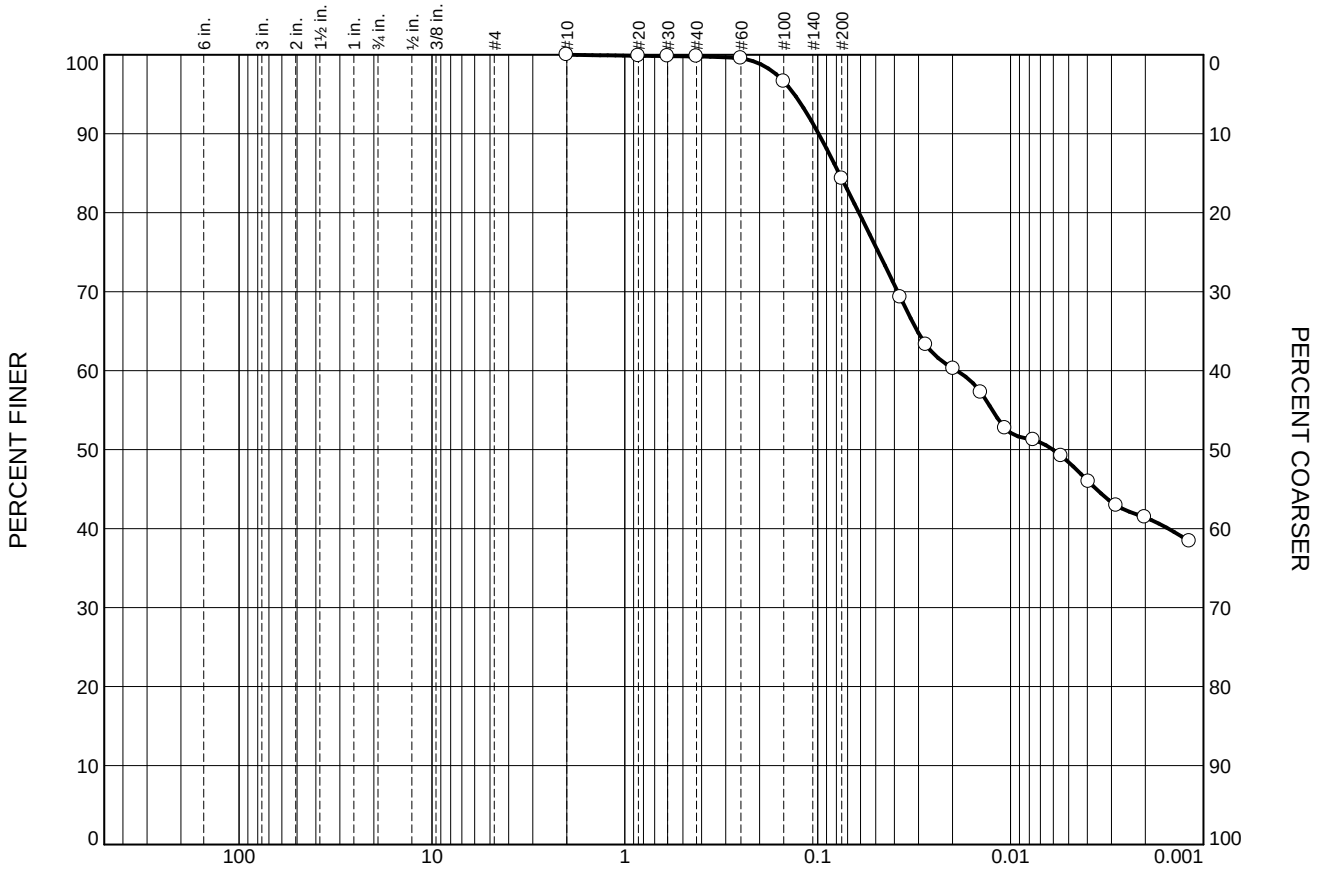
Tolunay-Wong Engineers, Inc.
Houston, Texas

Client: Benchmark Ecological Services, Inc.

Project: Geotechnical Lab Testing Study 3.1 Eastern Causeway Sediment

Project No.: 16.13.195 **Figure**

Particle Size Analysis ASTM D 422



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	0.2	15.5	42.9	41.4

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	SMP-SE	17116		Gray FAT CLAY with SAND	CH

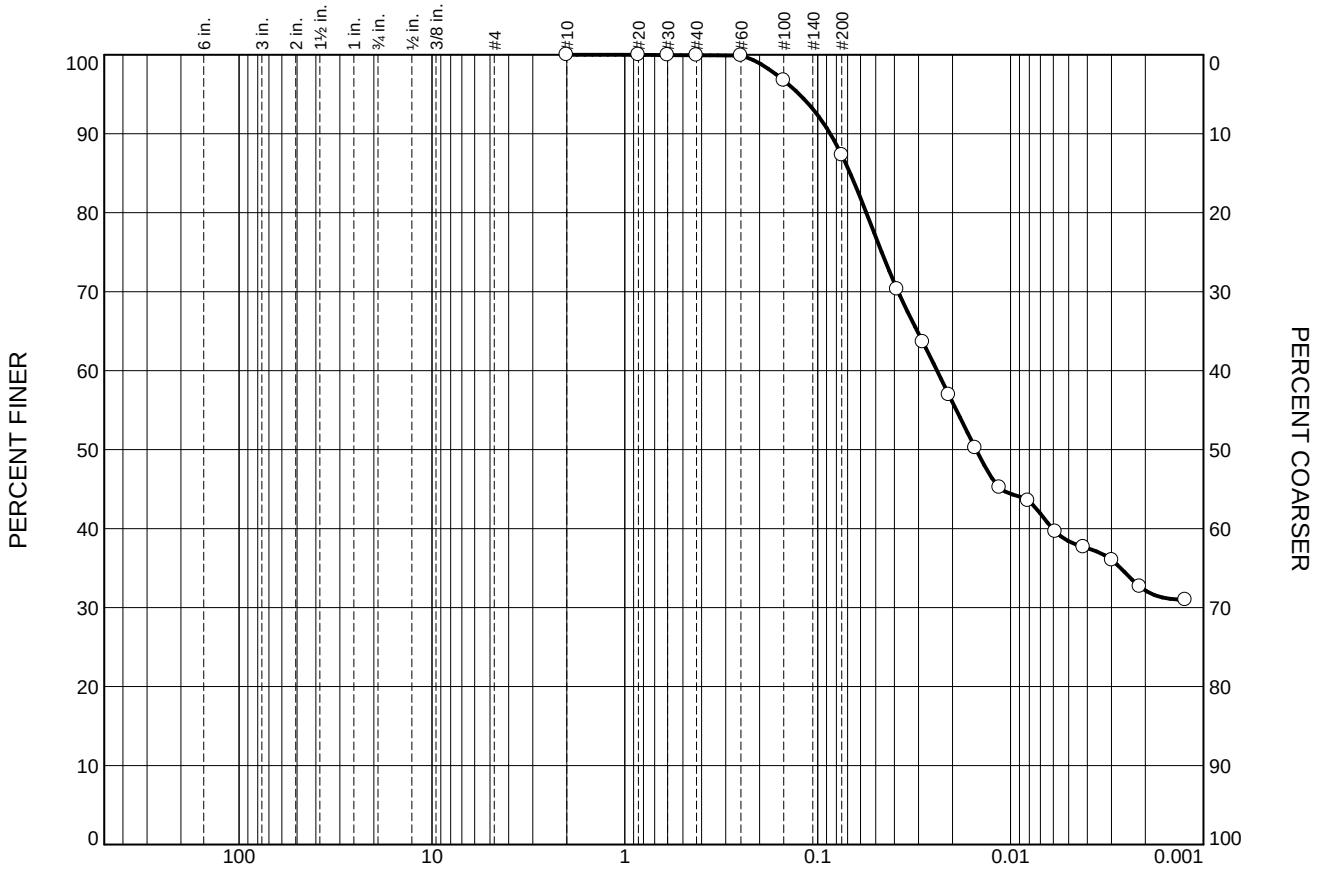
Tolunay-Wong Engineers, Inc.
Houston, Texas

Client: Benchmark Ecological Services, Inc.

Project: Geotechnical Lab Testing Study 3.1 Eastern Causeway Sediment

Project No.: 16.13.195 **Figure**

Particle Size Analysis ASTM D 422



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	0.1	12.6	55.1	32.2

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	SMP-SE	17117		Gray FAT CLAY	CH

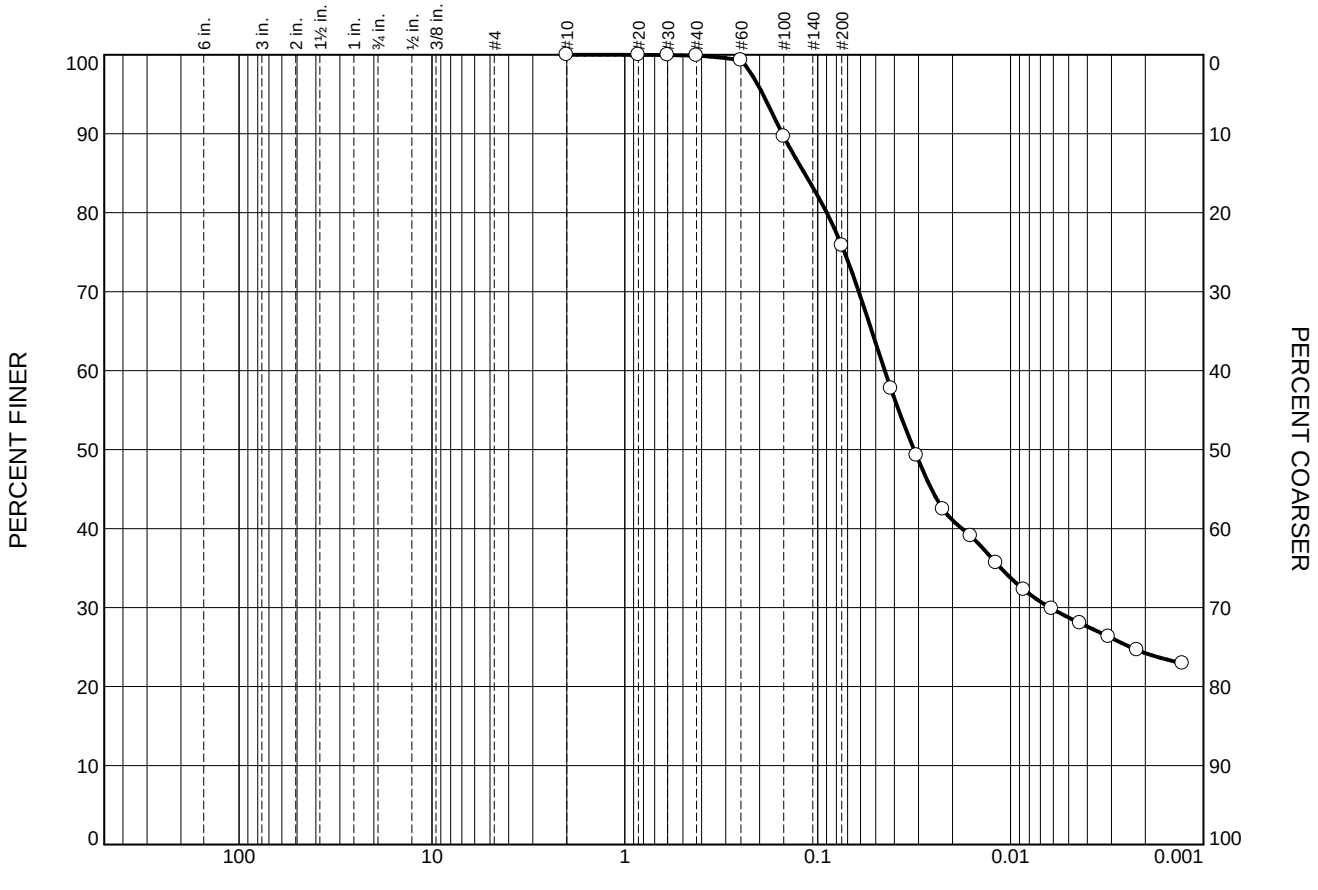
Tolunay-Wong Engineers, Inc.
Houston, Texas

Client: Benchmark Ecological Services, Inc.

Project: Geotechnical Lab Testing Study 3.1 Eastern Causeway Sediment

Project No.: 16.13.195 **Figure**

Particle Size Analysis ASTM D 422



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	0.1	24.0	51.7	24.2

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	SMP-SE	17118		Gray LEAN CLAY with SAND	CL

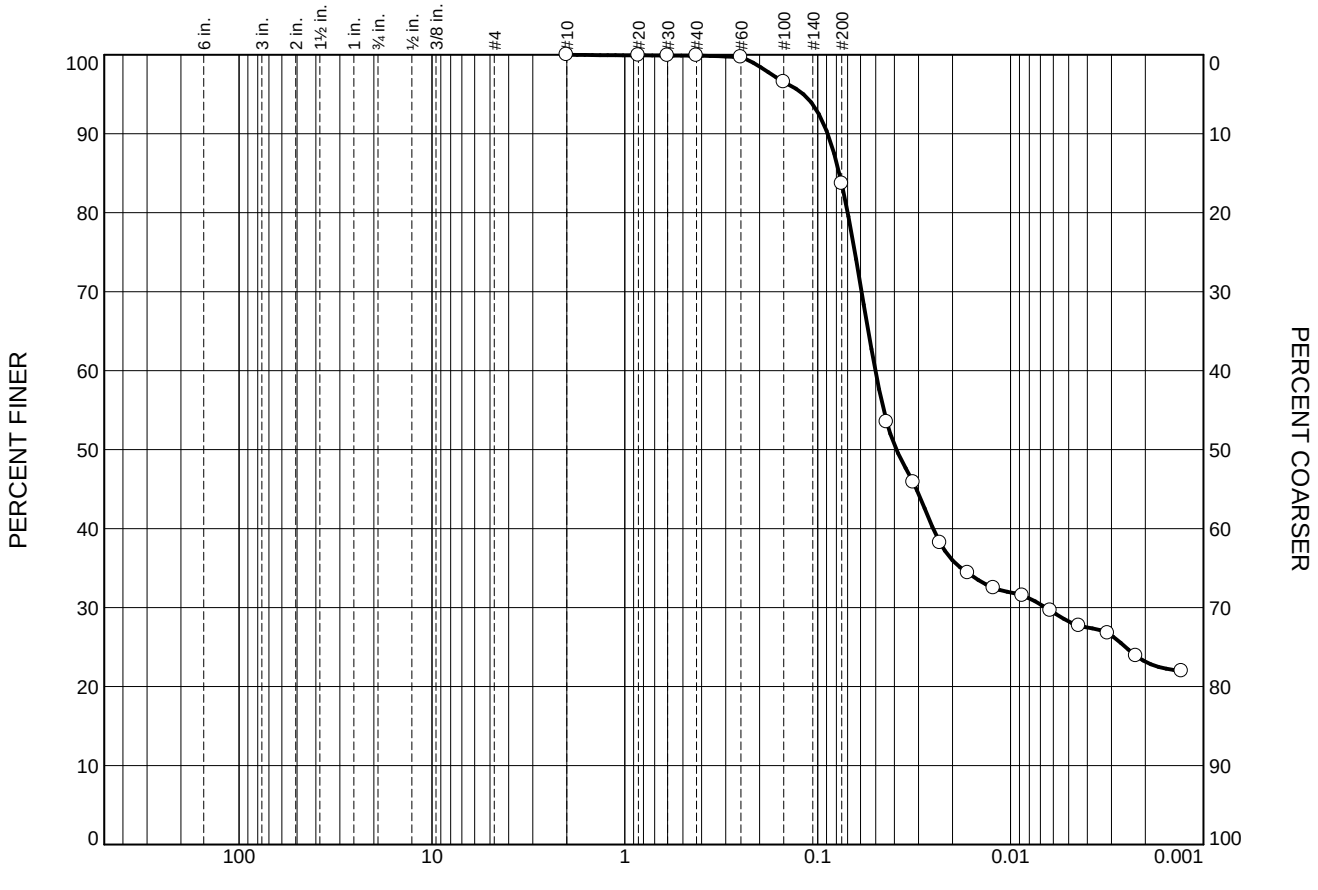
Tolunay-Wong Engineers, Inc.
Houston, Texas

Client: Benchmark Ecological Services, Inc.

Project: Geotechnical Lab Testing Study 3.1 Eastern Causeway Sediment

Project No.: 16.13.195 **Figure**

Particle Size Analysis ASTM D 422



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	0.1	16.2	60.6	23.1

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	SMP-SE	17119		Gray LEAN CLAY with SAND	CL

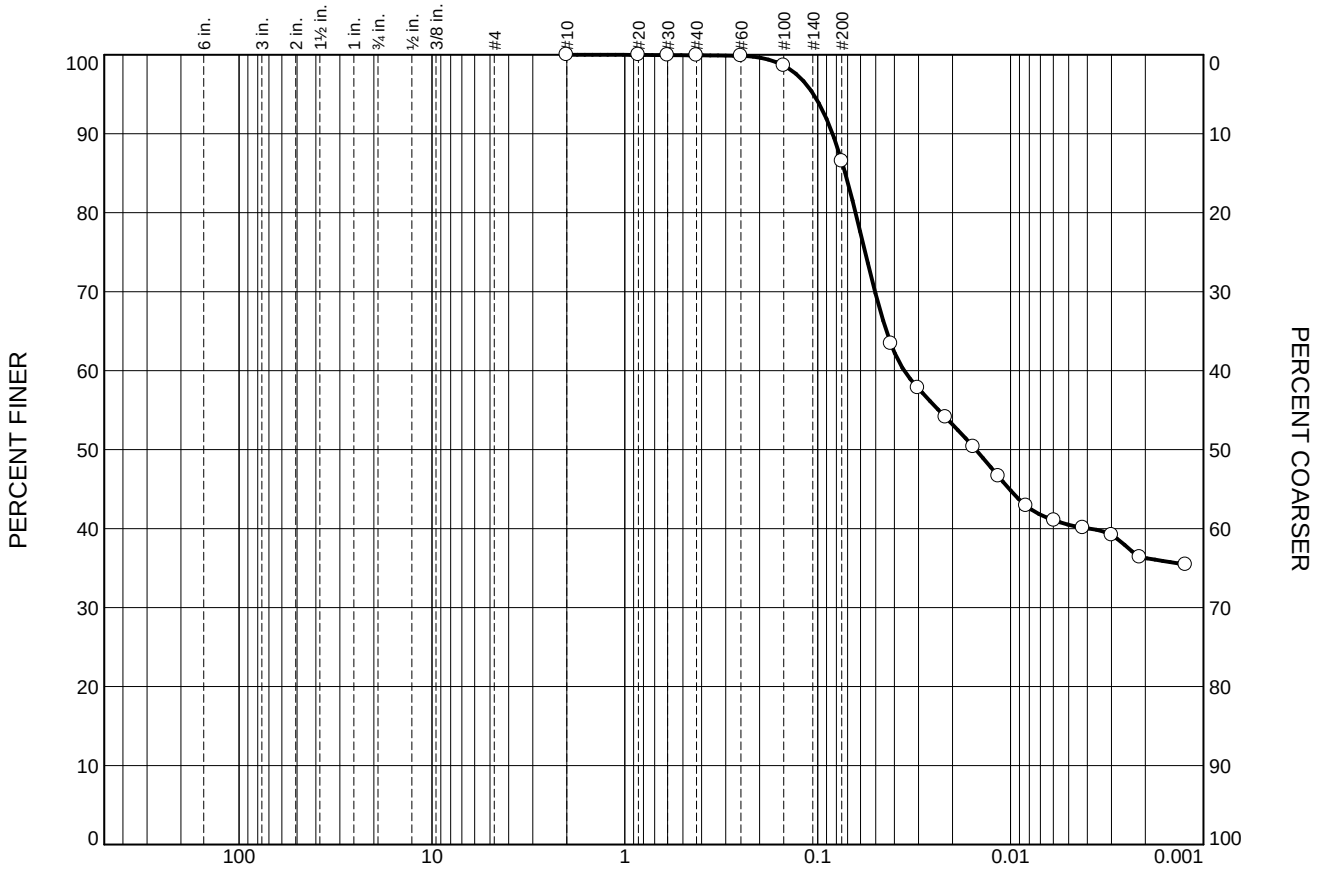
Tolunay-Wong Engineers, Inc.
Houston, Texas

Client: Benchmark Ecological Services, Inc.

Project: Geotechnical Lab Testing Study 3.1 Eastern Causeway Sediment

Project No.: 16.13.195 **Figure**

Particle Size Analysis ASTM D 422



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	0.1	13.4	50.2	36.3

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	SMP-SE	17120		Gray FAT CLAY	CH

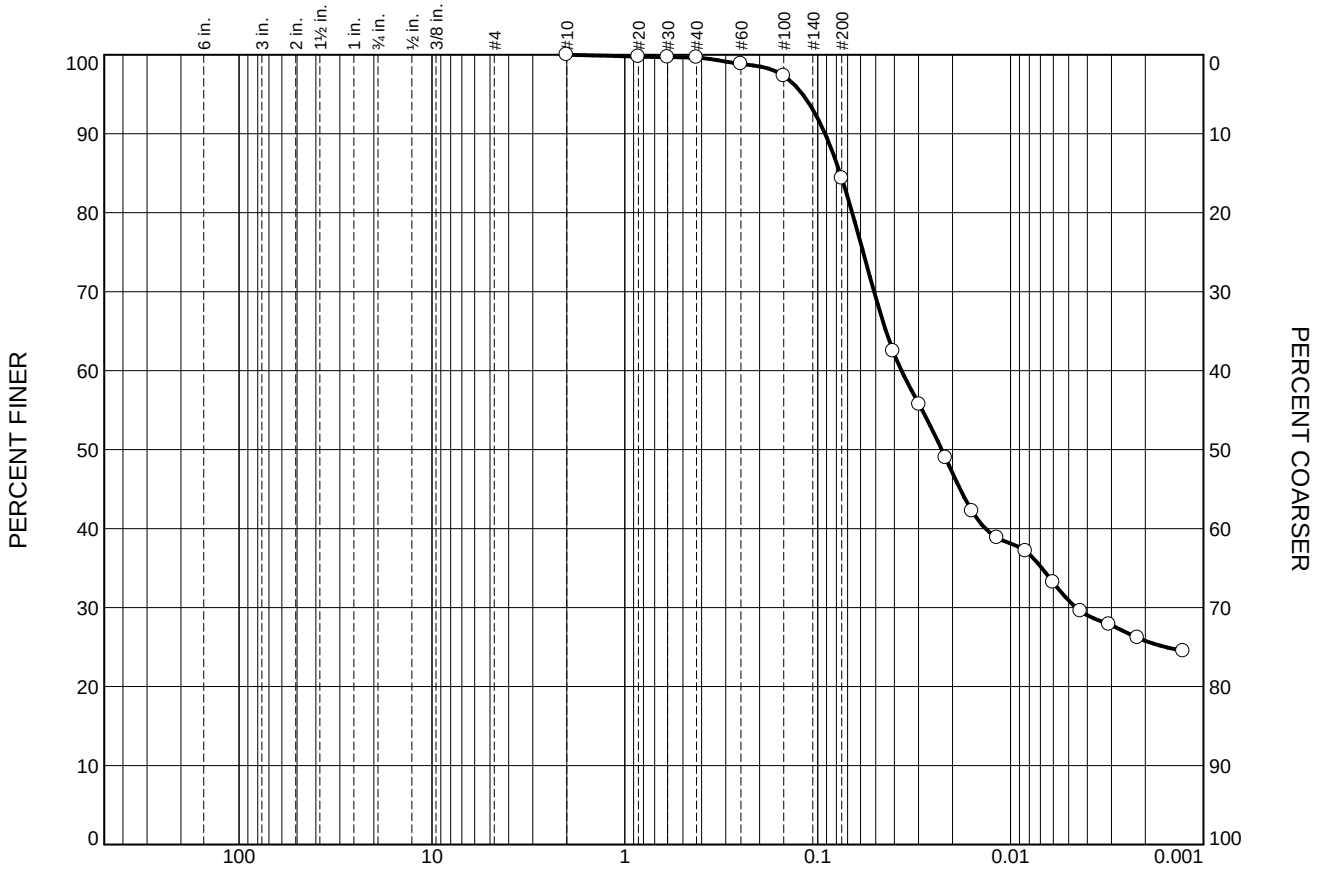
Tolunay-Wong Engineers, Inc.
Houston, Texas

Client: Benchmark Ecological Services, Inc.

Project: Geotechnical Lab Testing Study 3.1 Eastern Causeway Sediment

Project No.: 16.13.195 **Figure**

Particle Size Analysis ASTM D 422



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	0.4	15.2	58.6	25.8

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	SMP-SE	17121		Gray FAT CLAY with SAND	CH

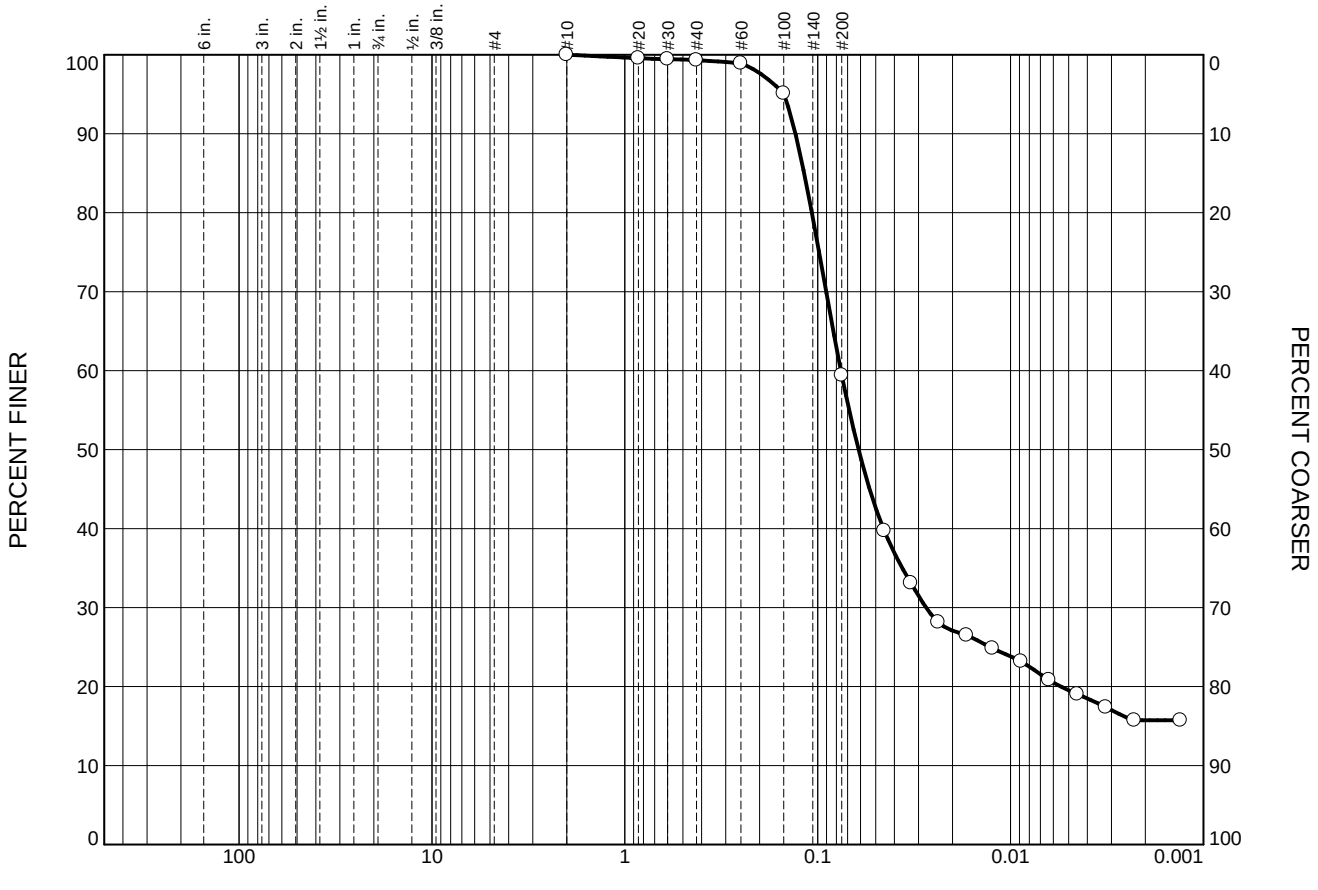
Tolunay-Wong Engineers, Inc.
Houston, Texas

Client: Benchmark Ecological Services, Inc.

Project: Geotechnical Lab Testing Study 3.1 Eastern Causeway Sediment

Project No.: 16.13.195 **Figure**

Particle Size Analysis ASTM D 422



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	0.7	39.9	43.7	15.7

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	SMP-SE	17900		Gray SANDY LEAN CLAY	CL

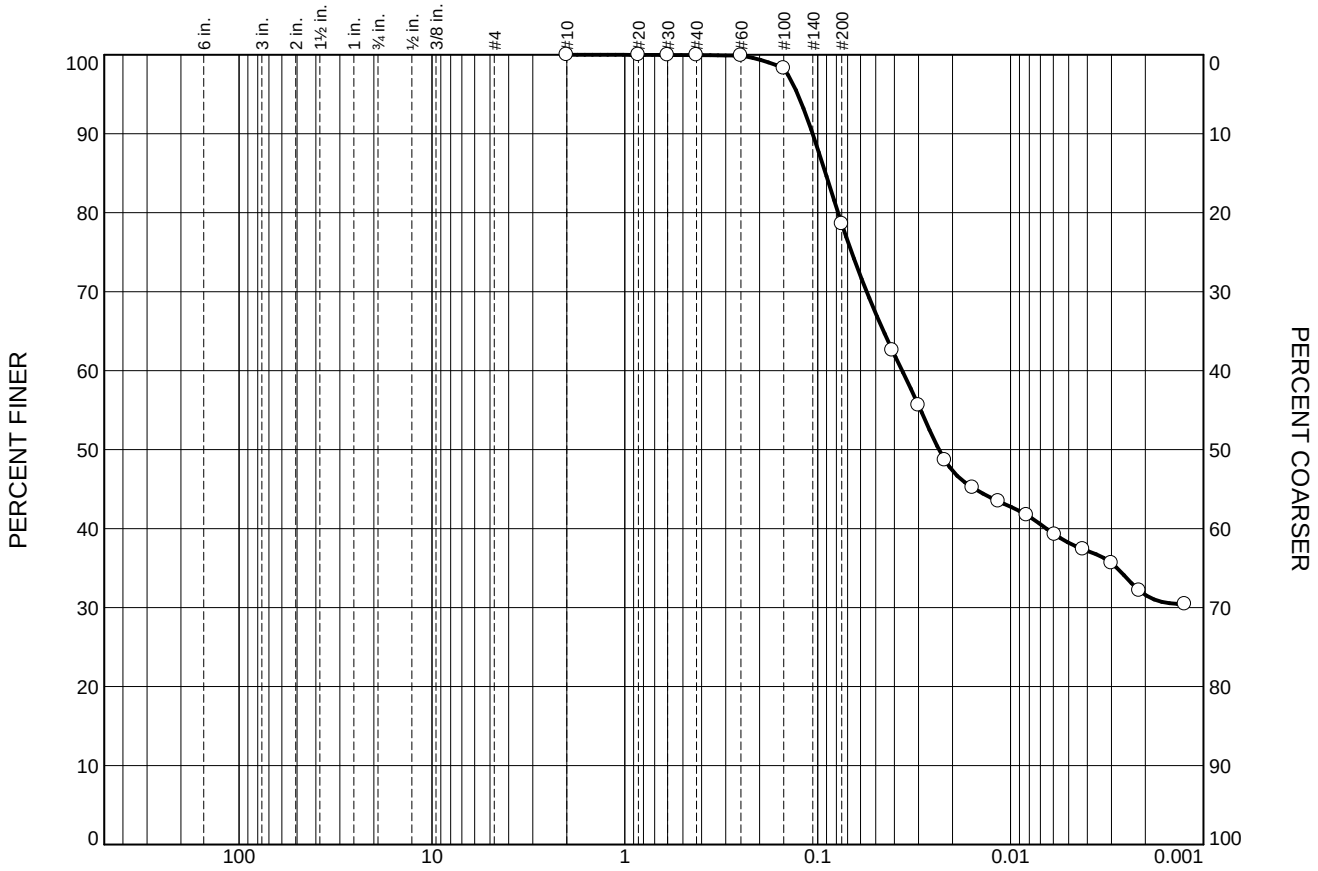
Tolunay-Wong Engineers, Inc.
Houston, Texas

Client: Benchmark Ecological Services, Inc.

Project: Geotechnical Lab Testing Study 3.1 Eastern Causeway Sediment

Project No.: 16.13.195 **Figure**

Particle Size Analysis ASTM D 422



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	0.1	21.3	47.0	31.6

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	SMP-SE	17901		Gray FAT CLAY with SAND	CH

Tolunay-Wong Engineers, Inc.
Houston, Texas

Client: Benchmark Ecological Services, Inc.

Project: Geotechnical Lab Testing Study 3.1 Eastern Causeway Sediment

Project No.: 16.13.195 **Figure**

Particle Size Analysis ASTM D 422



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	0.3	11.8	48.4	39.5

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	SMP-SE	17902		Gray FAT CLAY	CH

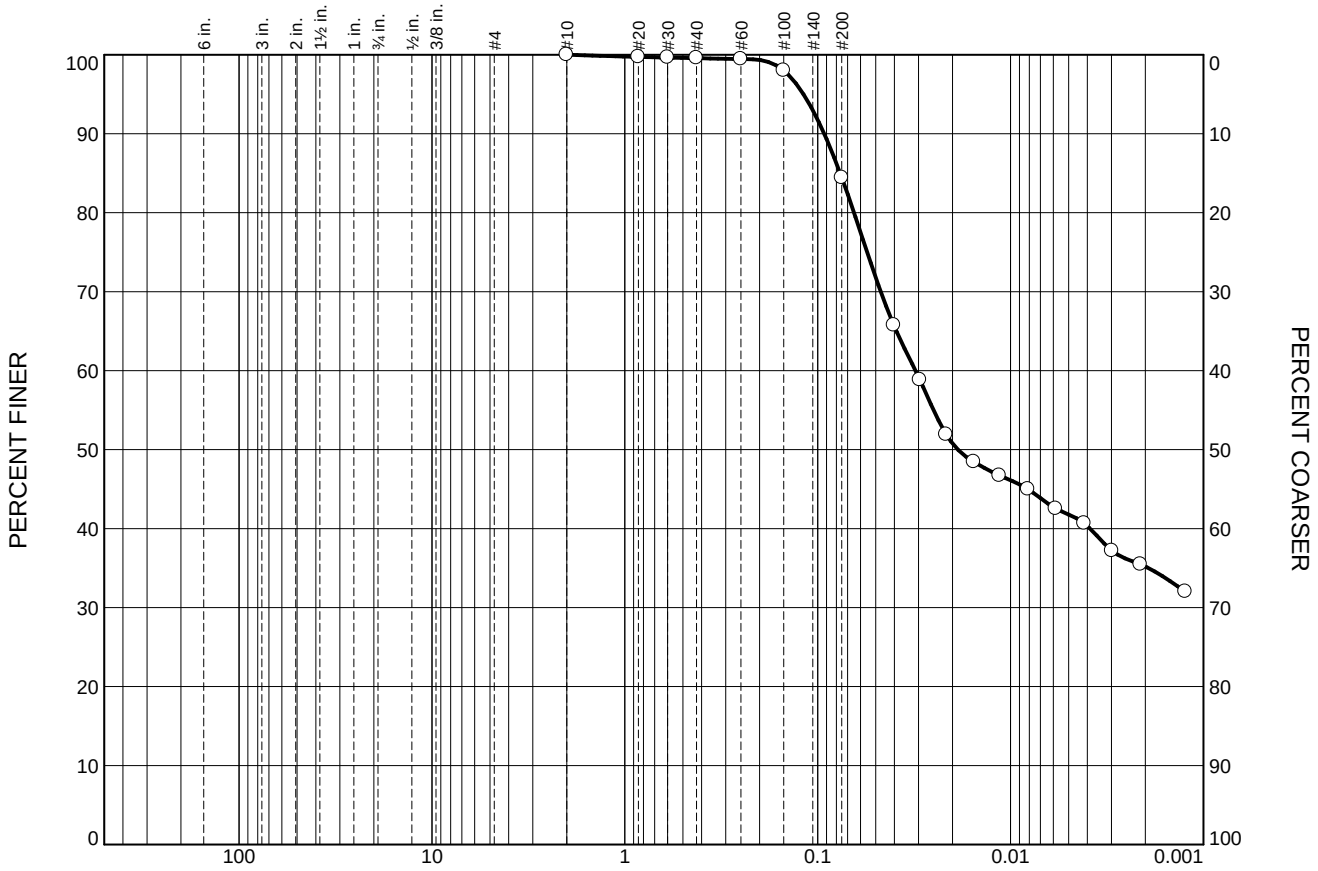
Tolunay-Wong Engineers, Inc.
Houston, Texas

Client: Benchmark Ecological Services, Inc.

Project: Geotechnical Lab Testing Study 3.1 Eastern Causeway Sediment

Project No.: 16.13.195 **Figure**

Particle Size Analysis ASTM D 422



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	0.4	15.2	49.2	35.2

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	SMP-SE	17903		Gray FAT CLAY with SAND	CH

Tolunay-Wong Engineers, Inc.
Houston, Texas

Client: Benchmark Ecological Services, Inc.

Project: Geotechnical Lab Testing Study 3.1 Eastern Causeway Sediment

Project No.: 16.13.195 **Figure**

2016 Closed Area Red Drum Gut Contents

Habitat	Station ID	Sample ID	Gut Content			
			Content	Number	Internal Parasites Present	Gut Content Weight (g)
Reef	CLO5815	B12b-TF-18608	Sand Eel	1	y	1.5
	CLO5815	B12b-TF-18609	Single Hardhead Catfish Bone	1		NR
	CLO5815	B12b-TF-18610	Hardhead Catfish	1		6.0
	LVB5508	B12b-TF-18560	Unidentified Tissue	1		1.1
	LVB5508	B12b-TF-18619	Sand Eel	4		17.1
			Unidentified Fish	2		
			Juvenile Blue Crab	1		
	LVB5508	B12b-TF-18624	Sand Eel	1		0.8
	LVB5513	B12b-TF-18592	Empty Gut	[1]NA	y	NA
	LVB5513	B12b-TF-18574	Empty Gut	[1]NA		NA
	LVB5513	B12b-TF-18622	Empty Gut	[1]NA	y	NA
	LVB5518	B12b-TF-18584	Penaeid Shrimp	4		3.2
	LVB5518	B12b-TF-18585	Hardhead Catfish	3	y	12.4
	LVB5518	B12b-TF-18564	Empty Gut	[1]NA		NA
Marsh	CLO5802	B12b-TF-18568	Penaeid Shrimp	2		4.2
	CLO5802	B12b-TF-18577	Penaeid Shrimp	8		13.3
	CLO5802	B12b-TF-18593	Hardhead Catfish	3		13.5
			Sand Eel	1		
	CLO5803	B12b-TF-18576	Empty Gut	[1]NA		NA
	CLO5803	B12b-TF-18607	Grass Shrimp	3		1.9
			Juvenile Blue Crab	1		
			Hardhead Catfish	1		
	CLO5803	B12b-TF-18614	Empty Gut	[1]NA		NA
	CLO5814	B12b-TF-18573	Empty Gut	[1]NA		NA
	CLO5814	B12b-TF-18578	Sand Eel	1		6.5
			Unidentified Fish	1		
	CLO5814	B12b-TF-18582	Hardhead Catfish Spine	1		0.1
	CLO5818	B12b-TF-18562	Juvenile Blue Crab	1		3.3
	CLO5818	B12b-TF-18594	Empty Gut	[1]NA		NA
	CLO5818	B12b-TF-18620	Pinfish	1	y	21.2
	CLO5900	B12b-TF-18565	Empty Gut	[1]NA		NA
	CLO5900	B12b-TF-18590	Hardhead Catfish	2		58.1
	CLO5900	B12b-TF-18621	Sand Eel	1	y	3.0
			Mud Crab	1		
	LVB5504	B12b-TF-18561	Juvenile Blue Crab	1		9.3
			Stone Crab	1		
	LVB5504	B12b-TF-18623	Empty Gut	[1]NA		NA
	LVB5504	B12b-TF-18625	Unidentified Fish	1		1.1

[1]NA - Gut cavity was empty

2016 Adjacent Area Red Drum Gut Contents

Habitat	Station ID	Sample ID	Gut Content			
			Content	Number	Internal Parasites Present	Gut Content Weight (g)
Reef	LVB6880	B12B-TF-18616	Hardhead Catfish	1	y	5.2
	LVB6837	B12B-TF-18617	Penaeid Shrimp	3		9.6
	LVB6837	B12B-TF-18618	Empty Gut	[1]NA		NA
	LVB6880	B12B-TF-18611	Empty Gut	[1]NA	y	NA
	LVB6950	B12B-TF-18589	Juvenile Blue Crab	1		142.2
			Hardhead Catfish	1		
			Cutlassfish	12		
	LVB6837	B12B-TF-18586	Empty Gut	[1]NA		NA
	LVB6950	B12B-TF-18587	Juvenile Blue Crab	1		14.9
			Hardhead Catfish	1		
	LVB6950	B12B-TF-18580	Juvenile Blue Crab	1		26.6
			Hardhead Catfish	1		
	LVB6880	B12B-TF-18569	Empty Gut	[1]NA		NA
Marsh	LVB5841	B12B-TF-18575	Juvenile Blue Crab	1		14.9
			Sand Eel	1		
	LVB5841	B12B-TF-18598	Juvenile Blue Crab	1		50.1
			Unidentified Fish	1		
	LVB5841	B12B-TF-18604	Empty Gut	[1]NA		NA
	LVB5839	B12B-TF-18566	Juvenile Blue Crab	1		10.3
	LVB5838	B12B-TF-18567	Empty Gut	[1]NA		NA
	LVB6870	B12B-TF-18570	Sheepshead Minnow	1		4.0
			Penaeid Shrimp	2		
			Grass Shrimp	2		
	LVB6870	B12B-TF-18571	Juvenile Blue Crab	1		5.3
	LVB6871	B12B-TF-18572	Empty Gut	[1]NA		NA
	LVB6870	B12B-TF-18579	Hardhead Catfish	1		3.8
	CLO5830	B12B-TF-18581	Empty Gut	[1]NA		NA
	LVB5839	B12B-TF-18583	Empty Gut	[1]NA	y	NA
	LVB6871	B12B-TF-18588	Juvenile Blue Crab	3	y	91.3
			Stone Crab	1		
	LVB6871	B12B-TF-18591	Hardhead Catfish	8		52.9
			Spartina spp. Vegetation	1		
			Juvenile Blue Crab	1		
	LVB5839	B12B-TF-18595	Softshell Blue Crab	1		40.7
	LVB5839	B12B-TF-18596	Empty Gut	[1]NA	y	NA
	CLO5830	B12B-TF-18597	Mud Crab	1		1.6
	LVB5838	B12B-TF-18599	Fishing Jig with Head	1		14.1
	LVB5838	B12B-TF-18605	Penaeid Shrimp	1	y	2.9
	CLO5830	B12B-TF-18606	Blue Crab Claw	1		20.7
			Cutlassfish	2		
	LVB6850	B12B-TF-18613	Empty Gut	[1]NA		NA
	LVB6850	B12B-TF-18612	Empty Gut	[1]NA		NA
	LVB6850	B12B-TF-18615	Penaeid Shrimp	3	y	9.7
			Sand Eel	1		
			Mud Crab	1		
			Juvenile Blue Crab	3		

[1]NA - Gut cavity was empty

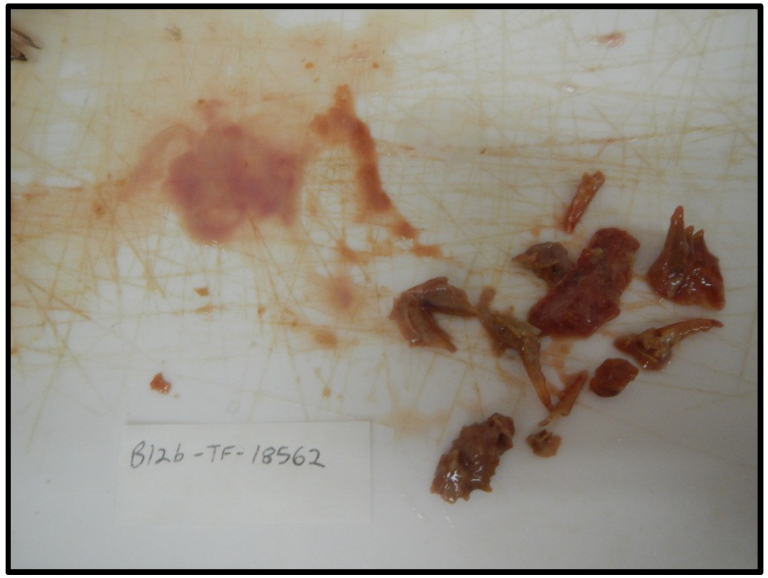
Photographs: Lavaca Bay Gut Content Survey 2016



Station ID LVB5508, Sample ID B12b-TF-18560



Station ID LVB5504, Sample ID B12b-TF-18561



Station ID CLO5818, Sample ID B12b-TF-18562



Station ID LVB5839, Sample ID B12b-TF-18566

BESI Benchmark Ecological Services, Inc.

Fall 2016

Gut Content Photos



Station ID CLO5802, Sample ID B12b-TF-18568



Station ID LVB6870, Sample ID B12b-TF-18570



Station ID LVB6870, Sample ID B12b-TF-18571



Station ID LVB5841, Sample ID B12b-TF-18575

BESI Benchmark Ecological Services, Inc.

Fall 2016

Gut Content Photos



Station ID CLO5802, Sample ID B12b-TF-18577



Station ID CLO5814, Sample ID B12b-TF-18578



Station ID LVB6870, Sample ID B12b-TF-18579



Station ID LVB6950, Sample ID B12b-TF-18580

BESI Benchmark Ecological Services, Inc.

Fall 2016

Gut Content Photos



Station ID CLO5830, Sample ID B12b-TF-18581



Station ID CLO5814, Sample ID B12b-TF-18582



Station ID LVB5518, Sample ID B12b-TF-18584



Station ID LVB5518, Sample ID B12b-TF-18585

BESI Benchmark Ecological Services, Inc.

Fall 2016

Gut Content Photos



Station ID LVB6950, Sample ID B12b-TF-18587



Station ID LVB6871, Sample ID B12b-TF-18588



Station ID LVB6950, Sample ID B12b-TF-18589



Station ID CLO5900, Sample ID B12b-TF-18590

BESI Benchmark Ecological Services, Inc.

Fall 2016

Gut Content Photos



Station ID LVB6871, Sample ID B12b-TF-18591



Station ID CLO5802, Sample ID B12b-TF-18593



Station ID LVB5839, Sample ID B12b-TF-18595



Station ID CLO5830, Sample ID B12b-TF-18597

BESI Benchmark Ecological Services, Inc.

Fall 2016

Gut Content Photos



Station ID LVB5841, Sample ID B12b-TF-18598



Station ID LVB5838, Sample ID B12b-TF-18599



Station ID LVB5838, Sample ID B12b-TF-18605



Station ID CLO5830, Sample ID B12b-TF-18606

BESI Benchmark Ecological Services, Inc.

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Gut Content Photos



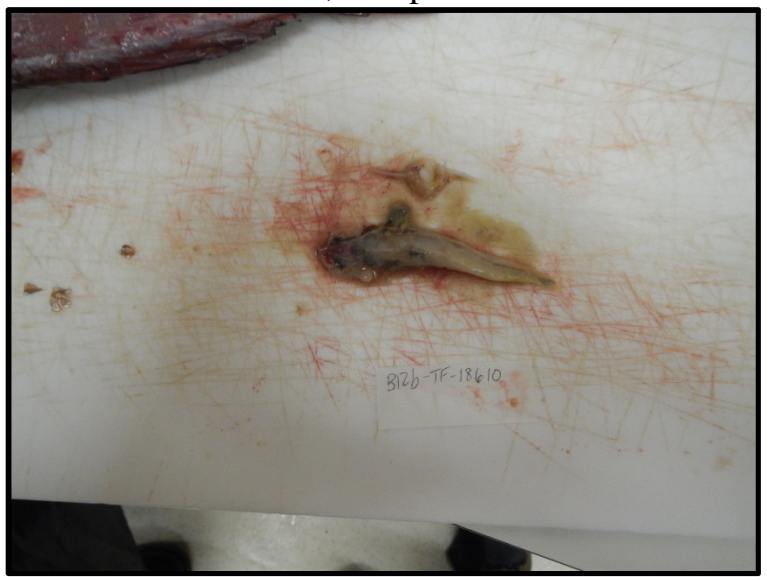
Station ID CLO5803, Sample ID B12b-TF-18607



Station ID CLO5815, Sample ID B12b-TF-18608



Station ID CLO5815, Sample ID B12b-TF-18609



Station ID CLO5815, Sample ID B12b-TF-18610

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Gut Content Photos



Station ID LVB6850, Sample ID B12b-TF-18615



Station ID LVB6880, Sample ID B12b-TF-18616



Station ID LVB6837, Sample ID B12b-TF-18617



Station ID LVB5508, Sample ID B12b-TF-18619

BESI Benchmark Ecological Services, Inc.

Fall 2016

Gut Content Photos



Station ID CLO5818, Sample ID B12b-TF-18620



Station ID CLO5900, Sample ID B12b-TF-18621



Station ID LVB5508, Sample ID B12b-TF-18624



Station ID LVB5504, Sample ID B12b-TF-18625

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Gut Content Photos

2016 Blue Crab Sediment Stations, Sample IDs, Field Data, and Results

Station ID	Easting[1]	Northing[1]	Sample ID	Date	Time	Water Depth[2] (ft)	Total Hg			MeHg			% M		TOC		
							(mg/kg) dry wt	SQL[3] (mg/kg)	Flag	% M	(ng/g) dry wt	Flag	wt%	SQL[3] (wt%)	wt%-dry	SQL[3] (wt%-dry)	Flag
LVB5508	2748018.045	13432707.21	SMP-SE-17560	10/4/2016	10:05	1.3	0.169	0.000772		29.4	0.594		35.4	0.0100	0.886	0.0600	J+
LVB5508	2748021.905	13432701.88	SMP-SE-17561	10/4/2016	10:10	1.3	0.197	0.000713		31.1	0.556		28.8	0.0100	1.14	0.0600	
LVB5508	2748016.265	13432713.51	SMP-SE-17562	10/4/2016	10:20	1.3	0.0876	0.000702		33	0.760		30.6	0.0100	0.699	0.0600	
LVB5508	2748016.265	13432713.51	SMP-SE-17563	10/4/2016	10:35	1.3	0.197	0.000729		33	.786		29.9	0.0100	0.717	0.0600	
LVB5513	2749752.433	13427640.66	SMP-SE-17567	10/4/2016	11:10	1.5	0.0389	0.000697		33.7	0.560		26.8	0.0100	0.581	0.0600	
LVB5513	2749747.232	13427646.1	SMP-SE-17568	10/4/2016	11:15	1.5	0.0381	0.000669		29.7	0.349		24.3	0.0100	0.362	0.0600	
LVB5513	2749754.841	13427638.31	SMP-SE-17569	10/4/2016	11:20	1.5	0.0456	0.000669		28.3	0.220		25.7	0.0100	0.570	0.0600	
LVB5513	2749754.841	13427638.31	SMP-SE-17570	10/4/2016	11:25	1.5	0.0486	0.000701		28	.204		27.5	0.0100	0.524	0.0600	
CLO5814	2751035.236	13426317.35	SMP-SE-17571	10/4/2016	11:35	1.5	0.0708	0.000661		22.5	0.120		23.2	0.0100	0.245	0.0600	
CLO5814	2751028.437	13426316.24	SMP-SE-17572	10/4/2016	11:40	1.5	0.0871	0.000648		26.7	0.135		22.5	0.0100	0.293	0.0600	
CLO5814	2751041.526	13426318.43	SMP-SE-17573	10/4/2016	11:45	1.5	0.0798	0.000637		24.1	0.131		23.0	0.0100	0.381	0.0600	
CLO6802	2750278.44	13423522.55	SMP-SE-17574	10/4/2016	11:55	1.0	0.0128	0.000537		14.1	0.0112	J	9.99	0.0100	0.289	0.0600	
CLO6802	2750276.148	13423529.2	SMP-SE-17575	10/4/2016	12:00	1.0	0.160	0.000751		38.6	0.334		36.6	0.0100	0.437	0.0600	
CLO6802	2750276.181	13423516.28	SMP-SE-17576	10/4/2016	12:05	1.0	0.0600	0.000658		21.6	0.165		25.4	0.0100	0.406	0.0600	
LVB5517	2747252.583	13423998.54	SMP-SE-17577	10/4/2016	12:20	1.0	0.279	0.000607		22.9	0.249		20.5	0.0100	0.388	0.0600	
LVB5517	2747252.664	13424006.65	SMP-SE-17578	10/4/2016	12:25	1.0	0.326	0.000611		25.6	0.550		21.7	0.0100	0.115	0.0600	
LVB5517	2747255.107	13423990.99	SMP-SE-17579	10/4/2016	12:30	1.0	2.11	0.00377		39.7	2.45		36.6	0.0100	0.447	0.0600	
CLO5815	2746266.991	13426910.77	SMP-SE-17580	10/4/2016	12:40	1.5	0.390	0.000731		32.8	0.283		35.7	0.0100	0.730	0.0600	
CLO5815	2746264.946	13426917.22	SMP-SE-17581	10/4/2016	12:45	1.5	0.300	0.000706		35.8	0.576		31.6	0.0100	0.150	0.0600	
CLO5815	2746269.977	13426904.85	SMP-SE-17582	10/4/2016	12:50	1.5	0.132	0.000771		40	0.0910	U	37.2	0.0100	0.468	0.0600	U
CLO5900	2748958.531	13428491.16	SMP-SE-17662	11/1/2016	12:25	1.0	0.0633	0.000648		22.6	0.275		23.3	0.0100	0.649	0.0600	
CLO5900	2748959.268	13428484.92	SMP-SE-17663	11/1/2016	12:30	1.0	0.0557	0.000631		23.1	0.157		21.5	0.0100	0.466	0.0600	
CLO5900	2748961.008	13428497.09	SMP-SE-17664	11/1/2016	12:35	1.0	0.0757	0.000650		21.5	0.257		23.4	0.0100	0.553	0.0600	

[1]Coordinates reported in NAD 1983 State Plane Texas South Central, Feet

[2]Water Depths are not calibrated to tidal level

[3]SQL - Sample Quantitation Limit

J - Analyte detected below quantitation limits.

J+ - Matrix Spike percent recovery did not meet 80-120% criteria.

U - Sample concentration was less than 5 times the mean blank concentration.

SampID	SampDate	Matrix	Total Mercury			Percent Moistu	
			Result	Units	MDL	Result	Units
SMP-SE-17900	01/26/2017	Sediment	1	mg/Kg-dry	0.00047	63.4	wt%
SMP-SE-17901	01/26/2017	Sediment	1.11	mg/Kg-dry	0.00047	67.6	wt%
SMP-SE-17902	01/26/2017	Sediment	0.274	mg/Kg-dry	0.00047	70.7	wt%
SMP-SE-17903	01/26/2017	Sediment	0.833	mg/Kg-dry	0.00047	46.5	wt%
SMP-SE-17904	01/26/2017	Sediment	0.264	mg/Kg-dry	0.00047	60.8	wt%
SMP-SE-17905	01/26/2017	Sediment	0.281	mg/Kg-dry	0.00047	61.3	wt%
SMP-SE-17906	01/26/2017	Sediment	0.283	mg/Kg-dry	0.00047	71.2	wt%
SMP-SE-17907	01/26/2017	Sediment	0.279	mg/Kg-dry	0.00047	65.8	wt%
SMP-SE-17908	01/26/2017	Sediment	0.271	mg/Kg-dry	0.00047	66.6	wt%
SMP-SE-17909	01/26/2017	Sediment	0.392	mg/Kg-dry	0.00047	63.9	wt%
SMP-SE-17910	01/26/2017	Sediment	0.381	mg/Kg-dry	0.00047	68.6	wt%
SMP-SE-17911	01/26/2017	Sediment	0.317	mg/Kg-dry	0.00047	73.2	wt%
SMP-SE-17912	01/26/2017	Sediment	0.286	mg/Kg-dry	0.00047	60.6	wt%

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2016 Causeway Water Stations, Sample IDs, Field Data, and Results

Sample Station	Sample ID	Filtered[a]/ Unfiltered[b]	Sample Date	Event	Time	Lab Sample ID	Total Hg (ng/L)	TSS (mg/L)
HRW-008	HRW-008-102716F	Filtered	10/27/2016	1	14:15	3551-242	1.44	
HRW-008	HRW-008-102716U	Unfiltered	10/27/2016	1	14:15	3551-241 r1	12.2	26.1
HRW-009	HRW-009-102716F	Filtered	10/27/2016	1	14:05	3551-240	1.48	
HRW-009	HRW-009-102716U	Unfiltered	10/27/2016	1	14:05	3551-239	10.00	16.6
HRW-010	HRW-010-102716F	Filtered	10/27/2016	1	13:55	3551-238	2.57	
HRW-010	HRW-010-102716U	Unfiltered	10/27/2016	1	13:55	3551-237	11.3	17.3
HRW-011	HRW-011-102716F	Filtered	10/27/2016	1	14:25	3551-244	1.74	
HRW-011	HRW-011-102716U	Unfiltered	10/27/2016	1	14:25	3551-243	20.1	28.7
HRW-012	HRW-012-102716F	Filtered	10/27/2016	1	14:35	3551-246	1.78	
HRW-012	HRW-012-102716U	Unfiltered	10/27/2016	1	14:35	3551-245	14.9	24.4
HRW-013	HRW-013-102716F	Filtered	10/27/2016	1	13:45	3551-248	3.95	
HRW-013	HRW-013-102716U	Unfiltered	10/27/2016	1	13:45	3551-247	12.1	24.0
HRW-014	HRW-014-102716F	Filtered	10/27/2016	1	14:05	3551-252	2.01	
HRW-014	HRW-014-102716U	Unfiltered	10/27/2016	1	14:05	3551-251 r1	13.0	31.2
HRW-015	HRW-015-102716F	Filtered	10/27/2016	1	13:55	3551-250	4.04	
HRW-015	HRW-015-102716U	Unfiltered	10/27/2016	1	13:55	3551-249	13.6	28.6
HRW-016	HRW-016-102716F	Filtered	10/27/2016	1	14:25	3551-256	0.870	
HRW-016	HRW-016-102716U	Unfiltered	10/27/2016	1	14:25	3551-255	5.03	14.1
HRW-ISCOA	HRW-ISCOA-102716F	Filtered	10/27/2016	1	13:45	3551-236	1.97	
HRW-ISCOA	HRW-ISCOA-102716U	Unfiltered	10/27/2016	1	13:45	3551-235 r1	12.7	18.9
HRW-ISCOB	HRW-ISCOB-102716F	Filtered	10/27/2016	1	14:15	3551-254	1.64	
HRW-ISCOB	HRW-ISCOB-102716U	Unfiltered	10/27/2016	1	14:15	3551-253 r1	9.47	19.2
HRW-100	HRW-100-102716F[c]	Filtered	10/27/2016	1	14:30	3551-258	4.07	
HRW-100	HRW-100-102716U[c]	Unfiltered	10/27/2016	1	14:30	3551-257	14.5	31.9
HRW-008	HRW-008-111016F	Filtered	11/10/2016	2	12:25	3551-269	0.762	
HRW-008	HRW-008-111016U	Unfiltered	11/10/2016	2	12:25	3551-270 r1	15.5	34.0
HRW-009	HRW-009-111016F	Filtered	11/10/2016	2	12:25	3551-277	2.50	
HRW-009	HRW-009-111016U	Unfiltered	11/10/2016	2	12:25	3551-278 r1	13.3	26.1
HRW-010	HRW-010-111016F	Filtered	11/10/2016	2	12:20	3551-275	0.763	
HRW-010	HRW-010-111016U	Unfiltered	11/10/2016	2	12:20	3551-276	7.99	15.5
HRW-011	HRW-011-111016F	Filtered	11/10/2016	3	12:30	3551-279	0.962	
HRW-011	HRW-011-111016U	Unfiltered	11/10/2016	2	12:30	3551-280	7.79	16.0
HRW-012	HRW-012-111016F	Filtered	11/10/2016	2	12:35	3551-281	0.439	
HRW-012	HRW-012-111016U	Unfiltered	11/10/2016	2	12:35	3551-282	6.08	16.6
HRW-013	HRW-013-111016F	Filtered	11/10/2016	2	12:40	3551-263	1.43	

Table 1 - 2016 Causeway Water Stations, Sample IDs, Field Data, and Results

Sample Station	Sample ID	Filtered[a]/ Unfiltered[b]	Sample Date	Event	Time	Lab Sample ID	Total Hg (ng/L)	TSS (mg/L)
HRW-013	HRW-013-111016U	Unfiltered	11/10/2016	2	12:40	3551-264	7.82	17.2
HRW-014	HRW-014-111016F	Filtered	11/10/2016	2	12:20	3551-267	0.985	
HRW-014	HRW-014-111016U	Unfiltered	11/10/2016	2	12:20	3551-268	9.72	22.2
HRW-015	HRW-015-111016F	Filtered	11/10/2016	2	12:15	3551-265	0.536	
HRW-015	HRW-015-111016U	Unfiltered	11/10/2016	2	12:15	3551-266	5.87	15.7
HRW-016	HRW-016-111016F	Filtered	11/10/2016	2	12:35	3551-259	0.619	
HRW-016	HRW-016-111016U	Unfiltered	11/10/2016	2	12:35	3551-260 r1	3.59	14.6
HRW-ISCOA	HRW-ISCOA-111016F	Filtered	11/10/2016	2	12:15	3551-273	0.926	
HRW-ISCOA	HRW-ISCOA-111016U	Unfiltered	11/10/2016	2	12:15	3551-274 r1	7.42	15.3
HRW-ISCOB	HRW-ISCOB-111016F	Filtered	11/10/2016	2	12:30	3551-271	0.435	
HRW-ISCOB	HRW-ISCOB-111016U	Unfiltered	11/10/2016	2	12:30	3551-272	2.97	13.1
HRW-100	HRW-100-111016F[d]	Filtered	11/10/2016	2	12:40	3551-261	0.564	
HRW-100	HRW-100-111016U[d]	Unfiltered	11/10/2016	2	12:40	3551-262	6.06	16.0
HRW-008	HRW-008-121316F	Filtered	12/13/2016	3	14:10	3551-284	0.693	
HRW-008	HRW-008-121316U	Unfiltered	12/13/2016	3	14:10	3551-283	2.70	7.98
HRW-009	HRW-009-121316F	Filtered	12/13/2016	3	14:10	3551-286	0.718	
HRW-009	HRW-009-121316U	Unfiltered	12/13/2016	3	14:10	3551-285	2.37	6.67
HRW-010	HRW-010-121316F	Filtered	12/13/2016	3	14:05	3551-288	1.34	
HRW-010	HRW-010-121316U	Unfiltered	12/13/2016	3	14:05	3551-287 r1	2.45	6.36
HRW-011	HRW-011-121316F	Filtered	12/13/2016	3	14:15	3551-290	1.21	
HRW-011	HRW-011-121316U	Unfiltered	12/13/2016	3	14:15	3551-289	2.33	6.75
HRW-012	HRW-012-121316F	Filtered	12/13/2016	3	14;20	3551-292	0.930	
HRW-012	HRW-012-121316U	Unfiltered	12/13/2016	3	14:20	3551-291	4.35	8.99
HRW-013	HRW-013-121316F	Filtered	12/13/2016	3	14:25	3551-294	1.47	
HRW-013	HRW-013-121316U	Unfiltered	12/13/2016	3	14:25	3551-293 r1	3.39	6.79
HRW-014	HRW-014-121316F	Filtered	12/13/2016	3	14:05	3551-296	1.07	
HRW-014	HRW-014-121316U	Unfiltered	12/13/2016	3	14:05	3551-295	1.58	4.25
HRW-015	HRW-015-121316F	Filtered	12/13/2016	3	14:00	3551-298	0.751	
HRW-015	HRW-015-121316U	Unfiltered	12/13/2016	3	14:00	3551-297 r1	3.20	8.17
HRW-016	HRW-016-121316F	Filtered	12/13/2016	3	14:20	3551-300	0.780	
HRW-016	HRW-016-121316U	Unfiltered	12/13/2016	3	14:20	3551-299	2.75	7.16
HRW-ISCOA	HRW-ISCOA-121316F	Filtered	12/13/2016	3	14:00	3551-302	1.60	
HRW-ISCOA	HRW-ISCOA-121316U	Unfiltered	12/13/2016	3	14:00	3551-301 r1	3.23	5.95
HRW-ISCOB	HRW-ISCOB-121316F	Filtered	12/13/2016	3	14:15	3551-304	0.616	
HRW-ISCOB	HRW-ISCOB-121316U	Unfiltered	12/13/2016	3	14:15	3551-303	2.16	5.84

Table 1 - 2016 Causeway Water Stations, Sample IDs, Field Data, and Results

Sample Station	Sample ID	Filtered[a]/ Unfiltered[b]	Sample Date	Event	Time	Lab Sample ID	Total Hg (ng/L)	TSS (mg/L)
HRW-100	HRW-100-121316F[e]	Filtered	12/13/2016	3	14:25	3551-306	0.772	
HRW-100	HRW-100-121316U[e]	Unfiltered	12/13/2016	3	14:25	3551-305	2.77	6.72
HRW-008	HRW-008-122116F	Filtered	12/21/2016	4	11:10	3551-308	0.607	
HRW-008	HRW-008-122116U	Unfiltered	12/21/2016	4	11:10	3551-307	1.43	5.62
HRW-009	HRW-009-122116F	Filtered	12/21/2016	4	10:40	3551-310	0.649	
HRW-009	HRW-009-122116U	Unfiltered	12/21/2016	4	10:40	3551-309 r1	1.35	4.93
HRW-010	HRW-010-122116F	Filtered	12/21/2016	4	10:35	3551-312	0.644	
HRW-010	HRW-010-122116U	Unfiltered	12/21/2016	4	10:35	3551-311	1.49	4.62
HRW-011	HRW-011-122116F	Filtered	12/21/2016	4	10:45	3551-314	0.741	
HRW-011	HRW-011-122116U	Unfiltered	12/21/2016	4	10:45	3551-313	1.35	4.88
HRW-012	HRW-012-122116F	Filtered	12/21/2016	4	10:50	3551-316	1.11	
HRW-012	HRW-012-122116U	Unfiltered	12/21/2016	4	10:50	3551-315	1.42	4.08
HRW-013	HRW-013-122116F	Filtered	12/21/2016	4	10:55	3551-318	0.631	
HRW-013	HRW-013-122116U	Unfiltered	12/21/2016	4	10:55	3551-317	1.88	3.85
HRW-014	HRW-014-122116F	Filtered	12/21/2016	4	11:05	3551-320	0.624	
HRW-014	HRW-014-122116U	Unfiltered	12/21/2016	4	11:05	3551-319	1.35	4.37
HRW-015	HRW-015-122116F	Filtered	12/21/2016	4	11:00	3551-322	0.585	
HRW-015	HRW-015-122116U	Unfiltered	12/21/2016	4	11:00	3551-321	1.30	4.23
HRW-016	HRW-016-122116F	Filtered	12/21/2016	4	11:20	3551-324	0.493	
HRW-016	HRW-016-122116U	Unfiltered	12/21/2016	4	11:20	3551-323 r1	1.34	9.53
HRW-ISCOA	HRW-ISCOA-122116F	Filtered	12/21/2016	4	10:30	3551-326	0.628	
HRW-ISCOA	HRW-ISCOA-122116U	Unfiltered	12/21/2016	4	10:30	3551-325	1.91	5.81
HRW-ISCOB	HRW-ISCOB-122116F	Filtered	12/21/2016	4	11:15	3551-328	0.595	
HRW-ISCOB	HRW-ISCOB-122116U	Unfiltered	12/21/2016	4	11:15	3551-327	1.20	3.29
HRW-100	HRW-100-122116F[f]	Filtered	12/21/2016	4	11:10	3551-330	0.604	
HRW-100	HRW-100-122116U[f]	Unfiltered	12/21/2016	4	11:10	3551-329	1.54	8.22

[a] Filtered-Dissolved Hg Samples

[b] Unfiltered-Total Hg Samples

[c] HRW-100-102716U-F Duplicate of HRW-015-102716U-F

[d] HRW-100-111016U-F Duplicate of HRW-013-111016U-F

[e] HRW-100-121316U-F Duplicate of HRW-013-121316U-F

[f] HRW-100-122116U-F Duplicate of HRW-008-122116U-F

Witco Channel Western Slope Sediment Sampling Results

Station ID	Easting[1]	Northing[1]	Sample Interval	Sample ID	Date	Time	Water Depth[2] (ft)	Total Hg			% M		TOC		
								(mg/kg) dry wt	SQL[3] (mg/kg)	Flag	wt%	SQL[3] (wt%)	wt%-dry	SQL[3] (wt%-dry)	Flag
WWC-001	2748945	13430055	0-2.5in	SMP-SE-17830	11/17/2016	9:35	13.5	0.109	0.000916		46.2	0.0100	0.273	0.0600	
WWC-002	2748837	13430228	0-2cm	SMP-SE-17827	11/17/2016	9:20	11.7	0.289	0.000969		48.5	0.0100	0.498	0.0600	
			2cm-6in	SMP-SE-17828	11/17/2016	9:20	11.7	0.474	0.000810		40.2	0.0100	0.362	0.0600	
WWC-003	2748735	13430389	0-2cm	SMP-SE-17818	11/17/2016	9:55	11.8	0.249	0.00110		53.8	0.0100	0.516	0.0600	
			2cm-6in	SMP-SE-17819	11/17/2016	9:55	11.8	0.363	0.000970		49.4	0.0100	0.448	0.0600	
			6-12in	SMP-SE-17820	11/17/2016	9:55	11.8	0.374	0.00107		53.6	0.0100	0.730	0.0600	
			12-18in	SMP-SE-17821	11/17/2016	9:55	11.8	0.495	0.00106		52.9	0.0100	0.705	0.0600	
			18-24in	SMP-SE-17822	11/17/2016	9:55	11.8	0.496	0.000969		50.9	0.0100	0.758	0.0600	
			24-30in	SMP-SE-17823	11/17/2016	9:55	11.8	0.562	0.00104		52.7	0.0100	0.758	0.0600	
			30-36in	SMP-SE-17824	11/17/2016	9:55	11.8	1.08	0.000946		47.1	0.0100	0.784	0.0600	
			36-42in	SMP-SE-17825	11/17/2016	9:55	11.8	1.52	0.00181		44.9	0.0100	0.655	0.0600	
			42-48in	SMP-SE-17826	11/17/2016	9:55	11.8	0.725	0.000845		41.8	0.0100	0.393	0.0600	
WWC-004	2748634	13430547	0-2cm	SMP-SE-17809	11/17/2016	10:10	12.6	0.289	0.00176		71.4	0.0100	1.00	0.0600	
			2cm-6in	SMP-SE-17810	11/17/2016	10:10	12.6	0.356	0.00134		62.4	0.0100	0.826	0.0600	
			6-12in	SMP-SE-17811	11/17/2016	10:10	12.6	0.523	0.00107		55.9	0.0100	0.792	0.0600	
			12-18in	SMP-SE-17812	11/17/2016	10:10	12.6	0.505	0.000945		46.9	0.0100	0.548	0.0600	
			18-24in	SMP-SE-17813	11/17/2016	10:10	12.6	0.507	0.00100		53.0	0.0100	0.746	0.0600	
			24-30in	SMP-SE-17814	11/17/2016	10:10	12.6	0.810	0.00101		50.5	0.0100	0.684	0.0600	
			30-36in	SMP-SE-17815	11/17/2016	10:10	12.6	0.700	0.00104		51.5	0.0100	0.718	0.0600	
			36-42in	SMP-SE-17816	11/17/2016	10:10	12.6	1.12	0.000868		45.4	0.0100	0.606	0.0600	
WWC-005	2748512	13430727	0-1in	SMP-SE-17808	11/17/2016	10:30	11.1	0.112	0.000742		34.9	0.0100	0.287	0.0600	
WWC-006	2748414	13430887	0-1.5in	SMP-SE-17807	11/17/2016	10:50	10.9	0.199	0.000830		38.6	0.0100	0.525	0.0600	
WWC-007	2748299	13431068	0-2cm	SMP-SE-17805	11/17/2016	11:10	11.7	0.303	0.00184		73.1	0.0100	1.10	0.0600	
			2cm-3.5in	SMP-SE-17806	11/17/2016	11:10	11.7	0.314	0.00176		73.2	0.0100	1.16	0.0600	
WWC-008	2748151	13431291	0-2cm	SMP-SE-17803	11/17/2016	11:30	11.9	0.276	0.00195		74.1	0.0100	1.08	0.0600	
			2cm-3in	SMP-SE-17804	11/17/2016	11:30	11.9	0.350	0.00141		65.0	0.0100	0.914	0.0600	
WWC-009	2748059	13431448	0-2cm	SMP-SE-17800	11/17/2016	12:00	9.3	0.376	0.00122		59.8	0.0100	0.837	0.0600	
			2cm-6in	SMP-SE-17801	11/17/2016	12:00	9.3	0.522	0.00112		54.9	0.0100	0.802	0.0600	
			6-11in	SMP-SE-17802	11/17/2016	12:00	9.3	2.08	0.00481		47.5	0.0100	0.667	0.0600	
WWC-010	2748023	13431504	0-2cm	SMP-SE-17831	11/17/2016	15:35	10.5	0.375	0.00141		63.9	0.0100	0.936	0.0600	
			2cm-6in	SMP-SE-17832	11/17/2016	15:35	10.5	0.426	0.00132		63.4	0.0100	0.967	0.0600	
			6-12in	SMP-SE-17833	11/17/2016	15:35	10.5	0.407	0.00130		61.0	0.0100	0.807	0.0600	
			12-18in	SMP-SE-17834	11/17/2016	15:35	10.5	0.436	0.00130		62.6	0.0100	0.856	0.0600	
			18-24in	SMP-SE-17835	11/17/2016	15:35	10.5	0.372	0.00116		56.5	0.0100	0.807	0.0600	
			24-30in	SMP-SE-17836	11/17/2016	15:35	10.5	0.535	0.00120		57.6	0.0100	0.767	0.0600	
			30-36in	SMP-SE-17837	11/17/2016	15:35	10.5	0.570	0.00107		54.0	0.0100	0.784	0.0600	
			36-40in	SMP-SE-17838	11/17/2016	15:35	10.5	0.849	0.00112		55.1	0.0100	0.741	0.0600	

[1]Coordinates reported in NAD 1983 State Plane Texas South Central, Feet

[2] Water Depths are not calibrated to tidal level

[3]SQL - Sample Quantitation Limit