EPA R6 and ERT Dive Team Operations
SUMMARY REPORT
Cap Assessment and Sampling Activities
San Jacinto Waste Pits
Channelview, TX
September 6 to 15, 2017

BACKGROUND

The San Jacinto River Waste Pit Superfund Site history has been presented in several documents approved by EPA. In brief, paper mill wastes were disposed in impoundments about 14 acres in size at the site in the 1960's, resulting in dioxin and furan contamination in the adjacent waterbody of the San Jacinto River. The impoundments/waste pits are situated on a 20-acre parcel immediately north of Interstate Highway 10 on the west bank of the San Jacinto River.

Pursuant to an EPA-issued Order on Consent (AOC), International Paper Company (IPC) and McGinnes Industrial Maintenance Corporation (MIMC) undertook a Time Critical Removal Action (TCRA). As a central component of that action, IPC and MIMC implemented action to stabilize the waste pits and to install the TCRA Cap. The original 1966 boundaries of the northern impoundments/waste pits and impacted area extend into the current basin of the San Jacinto River, with a portion of the cap underwater in depths extending to a maximum of approximately16 feet. The TCRA Cap is designed to prevent the migration of dioxins and furans from the historic boundaries of the northern impoundment into the San Jacinto River and its sediments. TCRA Cap installation was completed in July 2011.

INTRODUCTION

In December 2015 and April 2016, the EPA Region 6 Dive Team, assisted by the Environmental Response Team (ERT), conducted Scientific diving operations to assess the condition of the underwater cap in detail and determine whether there exist cap deficient areas which may require repair. Prior to diving events, PRP probing methods from a boat were conducted every 30 feet to assess cap integrity. The cap deficient areas, or 'Areas of Interest' (AOIs), were identified by PRP probing and/or EPA divers, most of which were located in the Northwest area of the underwater cap. The cap deficient areas, which may expose waste pit materials to the river environment, were identified and documented in EPA Dive Team reports. Subsequently the PRP conducted further confirmatory probing and made repairs to the cap, as needed.

PURPOSE

Recently, Hurricane Harvey dumped 20-50 inches of rain in the Houston area, causing widespread flooding and destruction. During the week of September 4 and 11, 2017, PRP contractors probed the cap area to help determine if cap damage had occurred. To further investigate cap condition in more detail, Region 6 EPA requested that EPA certified scientific divers conduct an underwater investigation to determine if high currents and flooding had damaged the integrity of the armored cap.

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The current investigation, conducted by U.S. EPA Region 6 and ERT dive teams during September 11 to 15, 2017, was designed to safely conduct diver assessment of TCRA Cap integrity. The diver survey focused on the northwest area of the armored cap and the cap slope area, where the underwater cap slopes at about a 1.5:1 ratio down toward the outer boundary of the cap. During the diver assessment, discussions with the RPM led to implementation of a joint EPA-PRP diver surficial sediment sampling event. The purpose of the sampling was to determine if any areas identified as AOIs, or exposed soft sediment with no rock/cap material present underneath, may contain dioxins or furans from waste material, which could migrate off-site and into the environment.

ACTIVITIES

EPA Scientific divers visually and tactilely inspected areas of the TCRA Cap in order to determine if the armor stone was intact in the Northwest area of the cap. The EPA Assessment Area was selected based upon six probing based Probing Areas of Interest (Probing AOIs) provided by the PRP (Table 1) and was focused specifically on the northwest portion of the cap. Time did not allow all six of the Probing AOIs to be assessed by EPA divers. If additional Probing AOIs were located by the PRP the data was not provided to EPA while onsite. Table 2 compares EPA Diver Areas of Interest (Diver AOIs) observations with Probing AOI observations. Diver AOIs focused specifically on locations where armor stone was not present or only intermittently present with potential landfill material exposed to the surface water of the San Jacinto River. During dive operations, the diver observed numerous areas where the armor stone was significantly less than 1-foot, but these areas were not considered Diver AOIs since the objective of the dive was to assess areas where sediments or potential landfill waste material were exposed to the surface water. Most of the area on from the base of the slope outward contained what is assumed to be depositional river sediments with thicknesses up to at least 4 feet covering the armor stone. These depositional sediments were also sampled to assess if landfill material that may have been released during the storm was redeposited in these areas. Diver observations and field notes taken focused on this objective.

Diving operations consisted of a single line tended SCUBA diver, using communications (comm) rope attached to the diver harness. During the diver cap survey there was direct communication between the diver and communication box operator. Although the diver survey was in near zero visibility conditions, every few feet the diver, by using tactile sensation with hands and feeling any resistance to rod penetration, was able to determine whether any armor cap materials were present on the surface or at depth.

During the diver's inspection, observations were communicated from the diver to the surface via hardline communications and recorded in a field notebook. Divers also used a 4-foot section of rebar to estimate the thickness of the armor stone layer and to verify if armor stone was present under overlying sediments. If rebar was inserted its full length into the substrate (about 4 feet) without contacting a hard surface, the area was identified as not having rock present and was recorded as a Diver AOI. The Diver AOIs were not always single point features, but in some cases marked points within larger areas, which are referred to as EPA Sample Search Areas (Figure 1). Some of the Diver AOIs were located by collecting GPS positions over the diver's

bubbles on the surface. If there were multiple smaller gaps in cap material in the same area, the diver chose one deficient area to be GPS captured, which served as a representation of that area.

For example, Sample #30 was taken from a larger area that had been identified several times throughout this project period. The PRP provided two Probing AOI points in this area, 146c and 146b, which were approximately 7 feet apart. On September 11th, a diver conducted a 10-foot circle search based on these Probing AOI and identified an area approximately 8 x 8 foot, which had intermittent areas of exposed sediment with no cap material underneath. Another diver, conducting a radial search through the same area on September 13th, also observed several gaps in the armor stone over a larger area. One of these gaps, a 2 x 2 foot area, was identified as an AOI for potential sampling as NE01. Based on the surface probing and diver observations made on September 11th and September 13th, the general area, as identified on Figure 2, became an EPA Sample Search Area. Areas, such as the one described above, with exposed or intermittently rock-covered sediments were targeted for sampling. EPA Diver AOIs and EPA Sample Search areas on summarized on Figure 2 and Table 3.

Week of September 6 to 9, 2017

The PRP began conducting probing operations on September 6, 2017. An EPA Dive Team member was requested by the EPA Region 6 Remedial Project Manager (RPM) to be onsite to participate in the probing activities. This allowed the EPA to confirm when gaps in cap were identified and begin to plan for diving activities which were scheduled during the week of September 11th.

On September 6th, the Dive Team member was onshore, as the contractors were not prepared for additional personnel on the boat. On September 7th through 9th, an EPA Dive Team member was on the boat for the majority of the probing activities. The PRP's contractor collected probing data on 30-foot nodes throughout the entire cap area. The intent of the probing was to assess areas of the cap that did not have the required minimum 12 to 24 inches of armor stone.

At each probing location, the PRP recorded their observations on a "Post Harvey Probing Data" log sheet. An EPA Dive Team member conducted independent probing on the other side of the vessel at some of the locations. EPA's probing was not done at every location, but was focused on areas that seemed to have exposed soft sediment, with no overlying or underlying armor stone, or areas that had previously had AOIs from other dive cap surveys. The data obtained by the EPA Dive Team member and the PRP's contractor was not always consistent, although no effort was made to compare the data every location that was assessed by both parties.

A list of these six Probing AOIs were provided to EPA prior to the initiation of dive activities on September 11th (Table 1). The list provided by the PRP did not include all of the AOIs identified, but was focused on the AOIs that had no refusal when probing, indicating that there may be a gap in the armor stone.

Monday, September 11, 2017

The R6/ERT dive team mobilized to the site and discussed the operation with the PRP contractor inside the main gate to the site. As before, the PRP contractor provided the boat and operator for the diving operations. A second contractor was present on the dive boat to observe the dive activities and their observations were recorded in a field log book.

After reviewing the Health and Safety Plan, Dive Safety Plan, and general rules for safe boating operations, the diving operations were initiated after noon. GPS coordinates from the Probing AOIs were used to drop a weighted buoy. The diver descended the buoy line and assessed an approximately 10-foot radial circle around the weight. The Probing AOIs surveyed included 141b, 118, 146a, and 146b. Table 2 contains a summary of the diver's observations made within these search areas.

Tuesday, *September 12, 2017*

No diving operations were conducted. The dive team spent the day off-site filling SCUBA tanks, getting supplies, and drafting an EPA Diver Sediment Sampling Procedure.

Data from that day's dive, along with the PRP Probing AOIs, was used to define a focused EPA Assessment Area. The area was based on observations made during the dives and set in size so it could be surveyed in a single day. Probing AOIs outside this area were not able to be assessed during this site mobilization.

Wednesday, September 13, 2017

On September 13th a diver cap survey was conducted over a broader area (EPA Assessment Area) which encompassed some of the AOIs investigated on September 11th and included some of the underwater cap slope sections in the Northwest area of the cap. This area was chosen because it encompassed the most significant areas that seemed to have thin, intermittent, or no cap material (armor stone) present. The EPA Assessment Area was approximately 100 by 100 feet. EPA provided GPS coordinates for the corners of this area and buoys were deployed to mark the EPA Assessment Area boundary.

The EPA Assessment Area was divided into three quadrants which were assessed by positioning the dive vessel on a corner of the Assessment Area and conducting radial inward searches at 5-foot increments. The vessel was positioned in the southwest corner, followed by the northwest corner and finally the northeast corner. There was some overlap in the Assessment Area when it was searched from adjacent corners.

The diver was deployed into the water and surveyed the area close to the vessel, then the dive tender released 5 feet of comm rope and the diver conducted a radial survey from edge to edge with a tight comm rope. After reaching the edge of the Assessment Area, or ascending into water less than about 3-feet in depth, the tender would release an additional 5 feet of comm rope. The diver would then tighten the comm rope and head on a radial transect to the opposite edge of the Assessment Area. This process was repeated until the entire quadrant was surveyed. The

southeastern corner was on the shoreline and most of the water in that quadrant was very shallow, but the deeper sections of that quadrant were assessed during the dives made on the west and east corners. Figure 2 shows the EPA Assessment Areas along with the EPA Diver AOIs. Diver descriptions for these AOIs are summarized in Table 3. During this survey, the divers observed that both the top and slopes of the cap contained varying thicknesses and coverages (complete/intact, intermittent, none) of armor stone. If there were significant gaps in the cap, the diver chose a possible area for sampling and a GPS point was taken. If there were multiple gaps in a larger area, one GPS coordinate was taken to be a representative sample of that area. At the base of the slope and extending into the river, the armor stone was found to be intact with up to 4 feet of what assumed to be depositional material on top of it. The thickness of the overlying sediments tended to be the thinnest near the base of the slope and generally got thicker heading away from the slope.

Thursday, September 14, 2017

No diver surveys were conducted. Divers went through dive logs and reviewed other documentation to plan the next day's diving operations. Other activities were communications with EPA Region 6 and the PRP regarding the proposed Diver Sediment Sampling Procedures.

Diver observations made during dives on September 11th and 13th was reviewed by the EPA. Based on the review of this data, four EPA Sample Search Areas were identified (Figure 3). These areas contained multiple Diver and/or Probing AOIs. Due limited visibility and limitations GPS accuracy and precision it was important to initially target areas that contained exposed sediments rather than just try and go to specific points to collect samples.

Friday, September 15, 2017

Upon arriving on site the sampling location coordinates were provided to the boat captain and dive gear was loaded on the dive vessel. Sampling was performed as per San Jacinto River Waste Pits Post-Harvey Diver Sampling Procedures which were provided to U.S. EPA by Anchor QEA (PRP Contractor) on September 14th (See Appendix B.). This procedure was in response to the Diver Sediment Sampling Procedure submitted September 13, 2017 (See Appendix C).

The procedure was implemented by dropping a weighted buoy at a point within an EPA Sample Search Area. An EPA diver descended from the surface buoy and searched the nearby area for exposed soft material with no or only intermittent rock to collect the sediment sample. Once the diver chose the sample location, the buoy weight was moved to this point. Any area with intact rock cover, even if less than the 12 inches specified was left undisturbed and not sampled. No probing was done when identifying sampling locations.

After the buoy was repositioned to a specific sample point within the EPA Sample Search Area, an Anchor QEA subcontract Orion diver would walk to the buoy and collect a sediment sample. After the Orion diver returned to their vessel, an EPA diver would swim to the point and collect a collocated sample. The first samples in the sample search area were taken from locations described as on-the-cap and represented areas where the cap did not appear to be intact and soft sediments

were exposed to the surface water. GPS coordinates were also collected at all buoys after sample collection was completed to ensure that the buoy had not moved from original placement.

In addition to the targeted sediment sample collected (as described above) a second sediment sample was collected from a nearby location that was from the base of the slope outward. These samples were collected in assumed depositional areas that were below the base of the slope. These locations were typically characterized by a few inches to greater than a 4-foot layer of soft depositional sediments that were overlying a harder material that was interpreted to be the armor cap. These samples were collected to assess whether waste materials from the site may have been mobilized during the storm and redeposited in these depositional areas. Sample locations and descriptions of these locations are summarized in Table 4. A total of 7 on-the-cap locations and 7 below base of slope sample locations were collected, for a total of 14 field sample locations. Figure 3 contains the sediment sample locations.

As per the sampling procedure provided by Anchor QEA, all sediment samples were collected directly into an 8-ounce jar by scoping the jar into the upper 3-inches of the sediments, using the spoon if needed. The jars were capped on the bottom of the river immediately after collection and brought to the surface for processing. All samples collected by Anchor QEA (Orion) and EPA divers were immediately handed to Anchor QEA on the Orion dive boat for sample processing and analysis. Divers gloves were decontaminated with water between each sample location.

At approximately 1800 the EPA diver cap survey and sampling activities were completed. All EPA dives were logged and a summary of the dives is contained in Table 5. The EPA divers conducted a total of 18 dives at depths up to 16 feet. No injuries occurred to divers or topside support personnel.

SUMMARY OF ACTIVITIES

The EPA Dive Team, using Probing AOIs provided by the PRP's subcontractor, assessed a 100 x 100 foot portion of the northwestern portion of the cap as defined as the EPA Assessment Area (Figure 3). Multiple Diver AOIs were identified within EPA Assessment Area, which contained areas of exposed sediments (potentially landfill waste material) with no or intermittent armor stone coverage. The Diver AOIs did not appear to be depositional areas since no armor stone could be felt at depths up to 4 feet below the sediment surface and they were typically near areas containing surficial armor stone of varying thicknesses.

Based on the Probing AOIs and Diver AOIs, four EPA Sample Search Areas were identified. EPA divers returned to these areas on September 15th and selected 7 sample locations which contained soft sediments with intermittent or no armor stone present. In addition to these 7 sediment samples, 7 additional locations were selected in area that contained depositional sediments off the base of the slope. Orion divers, followed by EPA divers, collected a sediment sample at each of these locations and these samples were submitted for analysis.

PHOTOGRAPHS

September 7, 2017

Anchor contactor with 18ft probe that was used for initial probing operations. Sediments on probe are thick and grey in color.

September 11, 2017

EPA Diver doing initial inspection of Probing AOI locations 146a and 146b.

September 15, 2017

Orion diver headed to first sampling location. The three locations closest to diver are sample locations 20, 21, and 22, and are considered to be on-the-cap. The buoy furthest out is location 23, and is the corresponding off cap river sediment sample location for sample 20.

September 15, 2017

EPA diver is delivering sample to contractor's boat. Additional contractor on john boat is confirming buoy location after sampling, to ensure samples were taken in original location.

September 15, 2017

EPA diver with empty sampling container and spoon used to collect sample.

LIST OF APPENDICES

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- Table 3 – EPA Diver AOI Descriptions from 9/13/17 Radial Search Dives
- Table 4 –EPA Diver Sample Location Descriptions from 9/15/17 Dive Operations
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- Figure 2 – Probing and Diver Areas of Interest (AOI)
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Appendix A

Table 1. PRP Probing AOIs Identified through 09/10/17 for EPA Dive Investigation (DRAFT DATA)
San Jacinto Waste Pits Superfund Site
Channelview, Texas
September 2017

Original ID	Comment	X	Y	Status (091217)
141b	2x2' area covered by 4" gravel	3216893.38	13857816.87	Dive-Inspected
146b	1' sediment, some gravel, large rocks present, possible geotextile @1' - possible overlay material	3216927.32	13857826.81	Dive-Inspected
146c		3216921.19	13857829.55	Dive-Inspected
281	2x2' area	3217530.31	13857551.41	
305	2x2' area	3217401.89	13857613.50	
510	0.4' sediment over geotextile	3216986.96	13857738.13	Covered
118	4-5" gravel mix over over 3-4' of sediment.	3216858.53	13857836.42	Dive-Inspected

Coordinates Reported as NAD83, State Plane FIPS:4204 (US Survey Feet)

Table 2 . EPA Diver AOI Descriptions from 9/11/17 Dive Investigation
San Jacinto Waste Pits Superfund Site
Channelview, Texas
September 2017

Original ID	Contractor Description from Probing	Dive Duration	Brief EPA Diver Description
141b	2x2' area covered by 4" gravel	19 min	Covered in A Rock 6x6' dip Sediment with rock about 4' sediment on top
146b	1' sediment, some gravel, large rocks present, possible geotextile @1' - possible overlay material	26 min	Near buoy 4' sediment with rock underneath 5' circle - harder material (sand?) with 2' sediment over rock 2x2 section of geotextile material
146c			Type C rock on top of repair area
281	2x2' area	No Dive	N/A
305	2x2' area	No Dive	N/A
510	0.4' sediment over geotextile	No Dive	N/A
118a	4-5" gravel mix over over 3-4' of sediment.	36 min	Large rock - Edge of Slope A rock - with possible oyster growth 2x2 area > 4' no rock although consistency change
118b		29 min	At depth 7' NW of buoy 2.5' sediment on top of rock at base of slope 10 W of buoy - area about 6x6 with sediment with no rock underneath it Overall in area 70% hit rock 30% no rock. Area extends about 10' from buoy
118b		25 min	Dive along slope. Most areas of interest were near buoy as traveling north Lots of areas with sediment with no rock detected underneath

Table 3. EPA Diver AOI Descriptions from 9/13/17 Radial Search Dives
San Jacinto Waste Pits Superfund Site
Channelview, Texas
September 2017

AOI	EPA Diver Description
SW01	1 inch of gravel, and then 4 feet soft material with no refusal. Other areas around this point have 2 ft. of soft material with refusal on hard rock. Next to oyster slant.
SW02	4 feet of exposed soft material with intermittent oyster growth on top of soft material. Variable area. 2x2.
SW03	Base of slope.
SW04	Base of Slope. No refusal.
SW05	Base of slope.
SW06	Couple of feet from base of slope on incline. 2 areas of exposed soft material with no refusal.
NW01	Hole with exposed soft material with solid rock around, no refusal. This is a large area. Other areas near this point with superficial layer of intermittent oyster rock. Exposed soft material with no refusal throughout this area.
NW02	8-10 inches of rock over soft material.
NW03	Large rock scattered on top of 1-2 inches of type A rock. Below is soft material, no refusal.
NW04	Top of slope. 4-6 inches of type A and then soft material. Large rock intermittent.
NW05	1 inch type A rock over soft material, no refusal. Rock is intermittent.
NW06	Gap in large rock. Some type A rock intermittent over exposed soft material. Other areas around have 4-6 inches of type A rock and then soft material. Going down slope.
NW07	Intermittent big rock over exposed soft material, no refusal. Other areas near this point have refusal at 1ft under soft material.
NW08	1 ft. soft material on hard rock at base of slope.
NW09	Base of Slope
NE 01	2x2 area of exposed soft material. Could be larger area, could not reach. Solid oyster reef on either side of this area.

*Soft material - This material could be waste material or sediment.

Table 4. EPA Diver Sample Location Descriptions from 9/15/17 Dive Operations
San Jacinto Waste Pits Superfund Site
Channelview, Texas
September 2017

Sample #	Description of Area
20	2x2 soft area surrounded by type A rock with intermittent larger rock. Buoy placed by the soft material to sample. Sand in some areas further away.
21	2x2 intermittent type A rock. Area sampled is soft material exposed to water.
22	1x1 foot opening. Intermittent gravel on top of exposed sediment. Surrounding area has type A rock and intermittent large rock.
23	Possible disposition down slope from sample 20.
24	Possible disposition down slope from sample 21.
25	Possible disposition down slope from sample 22.
26	2x2 section. Some intermittent type A and oyster shells but mostly baron at surface.
27	Muddy texture with intermittent small rock. 2x2 area. Sediment exposed to surface.
28	Possible deposition down slope from sample 26.
29	Possible deposition down slope from sample 27.
30	1.5x 1.5 clay area next to 1.5x1.5 sand area surrounded by areas with type A rock.
31	Intermittent area of soft sediment exposed with some type A rock. On slope.
32	Possible deposition down slope.
33	Possible deposition down slope.

Table 5. EPA Diver Logs
San Jacinto Waste Pits Superfund Site
Channelview, Texas
September 2017

Date	Diver	Standby	Tender	Divemaster	Time (Start)	Time (End	Bottom Time	Location/Activity
9/11/2017	A. Howard	A. Humphrey	D. Adams	S. Grossman	12:14	13:11	0:57	Location 141 and 118a Survey from Probing
9/11/2017	A. Howard	A. Humphrey	D. Adams	S. Grossman	13:40	14:09	0:29	Location 118b Survey from Probing
9/11/2017	A. Howard	A. Humphrey	D. Adams	S. Grossman	15:34	16:00	0:26	Location 146 Survey from Probing
9/11/2017	A. Howard	A. Humphrey	D. Adams	S. Grossman	16:30	16:55	0:25	Location 118b Survey from Probing
9/13/2017	S. Grossman	J. Penland	D. Adams	A. Humphrey	11:45	12:58	1:13	Half Circle Search SW01-SW06
9/13/2017	S. Grossman	J. Penland	D. Adams	A. Humphrey	13:36	14:50	1:14	Half Circle Search NW01-NW09
9/13/2017	J. Penland	S. Grossman	D. Adams	A. Humphrey	16:22	17:20	0:58	Half Circle Search NE01
9/15/2017	S. Grossman	A. Humphrey	D. Adams	A. Humphrey	9:00	10:00	1:00	Evaluate Sample Locations 20-25 and place buoys
9/15/2017	S. Grossman	A. Humphrey	D. Adams	A. Humphrey	10:41	11:20	0:39	Sample #20, 21, 22 and 23
9/15/2017	S. Grossman	A. Humphrey	D. Adams	A. Humphrey	11:34	11:36	0:02	Sample #24
9/15/2017	S. Grossman	A. Humphrey	D. Adams	A. Humphrey	11:55	11:59	0:04	Sample #25
9/15/2017	A. Humphrey	S. Grossman	D. Adams	S. Grossman	13:17	14:05	0:48	Evaluate Sample Locations 26-29 and place buoys.
9/15/2017	A. Humphrey	S. Grossman	D. Adams	S. Grossman	14:22	14:35	0:13	Sample #26 and 27
9/15/2017	A. Humphrey	S. Grossman	D. Adams	S. Grossman	14:50	15:02	0:12	Sample #28 and 29
9/15/2017	A. Howard	S. Grossman	D. Adams	A. Humphrey	15:35	16:00	0:25	Place Buoy and Sample #30
9/15/2017	A. Howard	S. Grossman	D. Adams	A. Humphrey	16:12	16:17	0:05	Sample #31
9/15/2017	A. Howard	S. Grossman	D. Adams	A. Humphrey	16:40	16:57	0:17	Place Buoy and Sample #32
9/15/2017	A. Howard	S. Grossman	D. Adams	A. Humphrey	17:10	17:30	0:20	Sample #33

Document Name: Figure 1_Area Mapv03
Map Creation Date: 10/3/2017
Coordinate System: NAD 1983 2011 StatePlane Texas South Central FIPS 4204 FtUS
Projection: Lambert Conformal Conic
Datum: NAD 1983 2011
Units: Foot US

N

0 50 100 200 300 400 Feet

U.S. Environmental Protection Agency
Environmental Response Team
Edison, New Jersey

Figure 1
Map of Probing AOIs and EPA Assessment Areas
San Jacinto Waste Pits
Channelview, TX

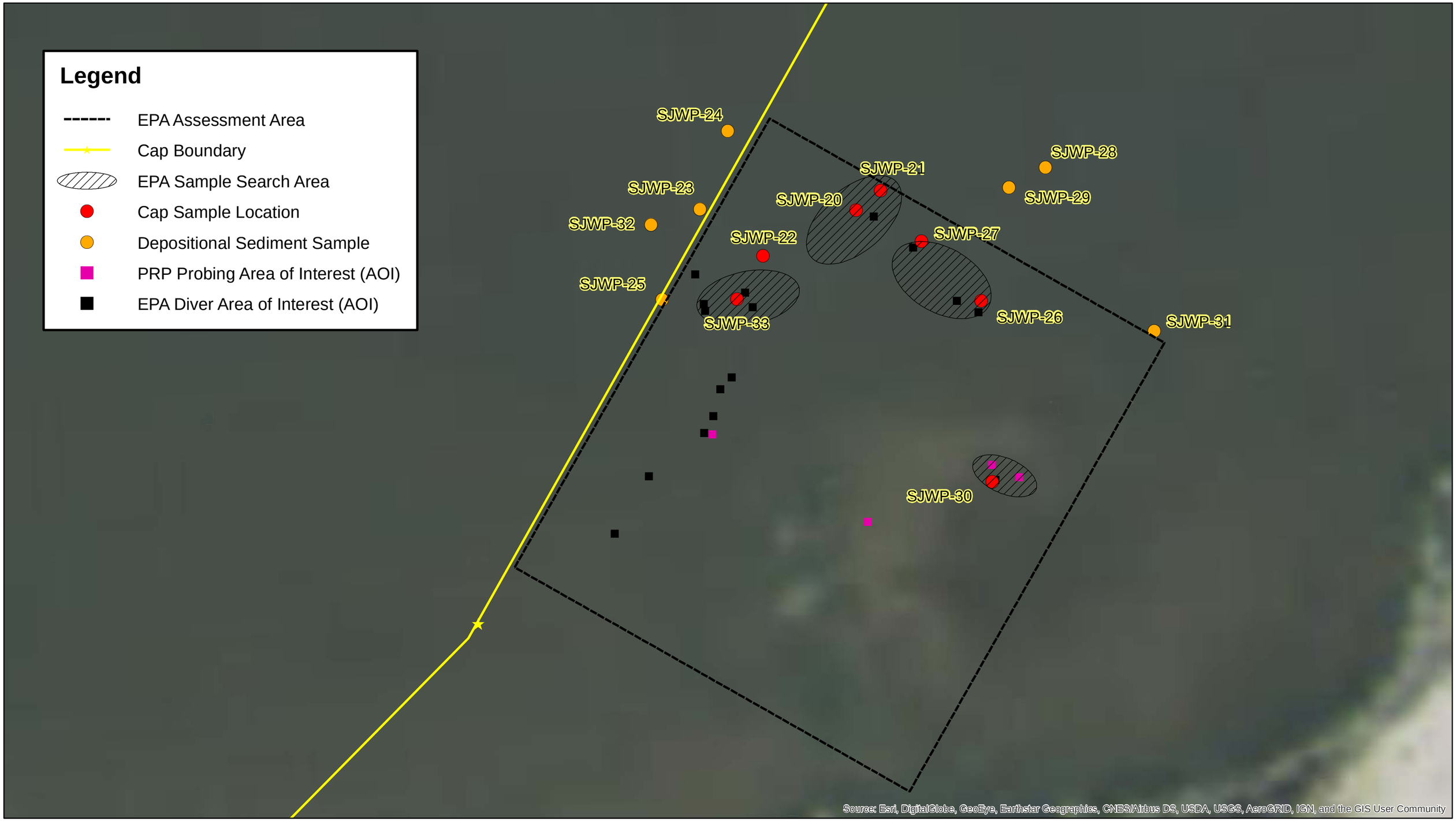
Document Name: Figure 2_Area Mapv05
Map Creation Date: 10/3/2017
Coordinate System: NAD 1983 2011 StatePlane Texas South Central FIPS 4204 FtUS
Projection: Lambert Conformal Conic
Datum: NAD 1983 2011
Units: Foot US

0 5 10 20 30 40 Feet

N

U.S. Environmental Protection Agency
Environmental Response Team
Edison, New Jersey

Figure 2
Probing and Diver Areas of Interest (AOI)
San Jacinto Waste Pits
Channelview, TX



Document Name: Figure 3_Area Mapv03
Map Creation Date: 10/3/2017
Coordinate System: NAD 1983 2011 StatePlane Texas South Central FIPS 4204 FtUS
Projection: Lambert Conformal Conic
Datum: NAD 1983 2011
Units: Foot US

0 10 20 40 60 80 Feet

N

U.S. Environmental Protection Agency
Environmental Response Team
Edison, New Jersey

Figure 3
Sample Location Map
San Jacinto Waste Pits
Channelview, TX

Appendix B

614 Magnolia Avenue
Ocean Springs, Mississippi 39564
228.818.9626

Memorandum

September 14, 2017

To: Gary Miller, Carlos Sanchez, USEPA Region 6

From: David Keith, Anchor QEA, LLC

cc: Phil Slowiak, International Paper Company (IP)

Dave Moreira, McGinnes Industrial Maintenance Corporation (MIMC)

Re: San Jacinto River Waste Pits Post-Harvey Diver Sampling Procedures

This memorandum was prepared in response to the U.S. Environmental Protection Agency (USEPA) – Environmental Response Team (ERT) Diver Sediment Sampling Procedures work plan provided to IP and MIMC (Respondents) for review on September 13, 2017. IP and MIMC provided their preliminary comments to that work plan to USEPA in a letter to Anne Foster from Al Axe on September 13, 2017. The Respondents discussed refinements to the work plan and sampling approach with USEPA the morning of September 14, 2017. USEPA believes there are areas of potential rock displacement, and areas of undisturbed rock with accumulations of sediment. The sampling is to be conducted in each of these areas as USEPA directs. The approach involves having a certified dive team provided by the Respondents work with the USEPA dive team to perform sampling at the same locations using equivalent sampling methodology as described below.

The procedures for the sampling shall include the following:

1. USEPA dive team members identify sampling locations at potential rock displacement areas and nearby areas of undisturbed rock with accumulations of sediment, and shall mark these locations with a buoy, or other marker that does not penetrate the underlying substrate.
    a. The support team on the dive boat shall record the GPS coordinates of the sample location as accurately as possible.
    b. Samples shall be taken at each designated location
2. After a location is identified, the Respondents' diver shall go to that location and collect a surface sample of sediment using the following procedures:
    a. Each sample shall be collected using a pre-cleaned and laboratory certified 8-ounce sample jar by sliding the jar along the surface, and using a pre-cleaned spoon or spatula to push the surface material into the jar. The jar, or utensil shall not penetrate more than 3 inches into the sediment, and in no instance, shall the jar or utensils disturb any competent cap materials. After the diver collects adequate material in the jar, it will be immediately capped and taken to the boat for labeling,

logging, and placed in an ice chest. Post sample observations and logging shall include:

i. Decanting water off of the top of the sample
ii. Photographing the sediment in the jar with the cap removed
iii. Providing a written description of each samples' color, texture, grain size, odor, or any other distinguishing feature
iv. Removing any size fractions greater than gravel – defined as greater than 64 mm.

3. After the Respondents' diver has collected a sample, USEPA shall go to the same location and collect a sample using the same procedures.
4. Equipment decontamination, chain of custody, and data validation and usability assessments will be conducted according the Sampling and Analysis Plan: Sediment Study, San Jacinto River Waste Pits Superfund Site (Integral Consulting Inc & Anchor QEA, LLC, 2010).
5. Samples will be analyzed by ALS Laboratories for dioxins and furans using USEPA method 1613B/8290A. Craig Hutchings from Integral Consulting will serve as the Laboratory Quality Assurance Coordinator.

The Respondents' dive team may collect additional samples beyond those directed by USEPA using the procedures described above.

Please provide your concurrence of these procedures through the signature line below:

_____

Gary Miller, Remedial Project Manager, USEPA Region 6

Appendix C

U.S. Environmental Protection Agency - Environmental Response Team (ERT)

Diver Sediment Sampling Procedures

BACKGROUND

The San Jacinto River Waste Pit Site history has been documented in several documents prepared for, submitted to, and approved by the EPA. In brief, paper mill wastes were disposed in impoundments about 14 acres in size at the site in the 1960's resulting dioxin and furan contamination in the adjacent waterbody of the San Jacinto River. The impoundments/waste pits are situated on a 20-acre parcel immediately north of Interstate Highway 10 on the west bank of the river.

Pursuant to an EPA-issued Order on Consent (AOC), International Paper Company (IPC) and McGinnes Industrial Maintenance Corporation (MIMC) undertook a Time Critical Removal Action (TCRA). As a central component of that action, IPC and MIMC implemented action to stabilize the waste pits and to install the TCRA Cap. The original 1966 boundaries of the northern impoundments/waste pits and impacted area extend into the current basin of the San Jacinto River, and thus a portion of the cap is underwater in depths extending to a maximum of approximately16 feet. The TCTA Cap is designed to prevent the migration of dioxins and furans from the historic boundaries of the northern impoundment into the San Jacinto River and its sediments.

METHODOLOGY

Sediment samples will be collected by U.S. Environmental Protection Agency (EPA) certified scientific divers as specified in U.S. EPA ERT/Scientific, Engineering, Response & Analytical Services (SERAS) SOP 2016 *"Sediment Sampling"* (U.S. EPA 2001) and Sediment Field Sampling Plan April 2010, San Jacinto River Waste Pits Superfund Site (Integral Consulting Inc & Anchor QEA, LLC, 2010).

A diver will assess the sediments at the San Jacinto Waste Pits site using a 4-foot probe (e.g., rebar) looking for areas where armor stone or geotextile material is not observed in the upper 4 feet of the sediment. These locations will be designated with a surface marker buoy. Once one or more potential target areas are located the diver will return to the surface to get sediment sampling equipment. The sediment sampling equipment will consist of a polycarbonate tube (or similar material), sledge hammer (if required) and two plastic end caps.

The diver will descend back to the sample location and the 12- inch long tube will be inserted vertically into the sediment to a depth of 6-inches below the top of the sediment surface. The tube will be marked with thick tape at 6-inches so the diver can feel when the tube is inserted 6-inches into surficial sediments. Once the tube is pushed to the desired depth a plastic end cap will be tightly placed on the top of the tube, which minimizes any loss of sediment sample from the bottom of the tube. The tube will be slowly pulled vertically from the sediment, keeping the plastic end cap intact. When the bottom of the tube is just above the sediment surface it will be immediately capped. The sediment sample will be handed from the diver to surface personnel on the dive support vessel. The sediment sample will be labelled with sample location, sample date/time and a directional arrow pointing to the top of the tube. Throughout collection and transportation, the tube will be maintained in an upright vertical position to minimize disturbance of the sediments.

After being transported to the processing area, the sediments in tubes will be allowed to settle and a small (1/8”) hole will be drilled above the sediment/water interface. After the overlying water has been drained the sediment will be transferred to a dedicated aluminum pan and homogenized with a dedicated stainless-steel spoon until the sediment attains a visually uniform color and texture. The sediment will be transferred to a labeled sample container. Each sample container will be labeled with the sample location and sample time/date. Samples will be maintained and shipped to the laboratory for analysis on wet ice at 4°C.

REFERENCES

Anchor QEA and Integral Consulting. 2010. Sediment Field Sampling Plan San Jacinto River Waste Pits Superfund Site. Prepared for McGinnes Industrial Maintenance Corporation, International Paper Company, and U.S. Environmental Protection Agency, Region 6. Anchor QEA, Ocean Springs, MS.

USEPA. 2001. U.S. EPA ERT SERAS Standard Operating Procedure (SOP) 2016 ‘Sediment Sampling” Washington, DC. https://clu-in.org/download/ert/2016-R00.pdf