

Attachments



100023768

Attachment 1

Health and Safety Plan



Attachment 1 - Health and Safety Plan - Southern Impoundment

*Provided with Final 100% Remedial Design - Southern
Impoundment (Amended April 2021)*

San Jacinto River Waste Pits Site
Harris County, Texas

International Paper Company

GHD | 5551 Corporate Boulevard Suite 200 Baton Rouge Louisiana 70808 USA
11215131 | Report No 3



Emergency Contact List

EMERGENCY INFORMATION		
Contact	Phone Number	Site Location, Hospital & Clinic Directions
Local Police:	911	18003 Market St. Channelview, Texas 77530 (29.791692, -95.066069)
Harris County Constable	(713) 637-0014	
Baytown Police Department	(281) 422-8371	
Local Fire Department:	911	
Channelview Fire Department	(281) 452-5782	
Ambulance	911	
Local Hospital: Houston Methodist Baytown Hospital	(281) 420-8600	Hospital Directions:
Address: 4401 Garth Rd. Baytown, Texas 77521		<ul style="list-style-type: none"> • Get on I-10 East (1.4 mi) • Keep right at fork to continue on TX-330 Spur South following signs for Baytown (1.6 mi) • Take the Wade Rd/Baker Rd exit (0.2 mi) • Merge onto Decker Dr. (1.1 mi) • Turn left onto W Baker Rd (2.1 mi) • Turn right (400 ft.) • Turn right (351 ft.) • Turn right at the 1st cross street (128 ft.) • Destination will be on the right Driving Time: 14 minutes Driving Distance: 7.9 miles
Work Care Clinic: Occupational Healthcare	(281) 843-2441	Occupational Healthcare Directions:
Address: 610 S. Main St. Highlands, Texas 77562		<ul style="list-style-type: none"> • Merge onto I-10 East (1.3 mi) • Take exit 787 for Crosby - Lynchburg Rd (0.1 mi) • Use any lane to turn left onto Crosby - Lynchburg Rd/S Main St • Continue to follow S Main St and destination will be on the left Driving Time: 7 min Driving Distance: 3.9 miles
National Poison Center	800-222-1222	
National Response Center	800-424-8802	
State Emergency Response System	(512) 424-2138	
EPA Environmental Response Team	(201) 321-6600	
United State Coast Guard	713-578-3000	
Implementing Party Project Manager	Work: Cell:	
Project Coordinator	Work: Cell:	



EMERGENCY INFORMATION		
Contact	Phone Number	Site Location, Hospital & Clinic Directions
Site Supervisor Work: Cell:		
On-site Health and Safety Officer Work: Cell:		
Other Contacts Work: Cell:		
Person to verify hospital route	Signature	



Table of Contents

1.	Introduction.....	1
1.1	Background.....	1
1.2	Purpose.....	1
1.3	Stop Work Authority.....	1
1.4	Personnel Requirements.....	2
1.5	Project Management and Safety Responsibilities.....	2
1.6	Site HASP Amendments.....	4
1.7	Training Requirements.....	4
1.7.1	Site-Specific Training.....	4
1.7.2	Safety Meeting/HASP Review.....	5
1.7.3	Medical Surveillance Program.....	5
2.	Site Operations.....	6
2.1	Scope of Work.....	6
3.	Hazard Evaluation.....	6
3.1	Chemical Hazards.....	6
3.1.1	Chemical Hazard Controls.....	7
3.1.2	Skin Contact and Absorption Contaminants.....	7
3.1.3	Hazard Communication/WHMIS.....	7
3.1.4	Flammable and Combustible Liquids.....	7
3.2	Physical Hazards.....	8
3.2.1	Heavy Equipment Safety.....	8
3.2.2	Noise.....	9
3.2.3	Utility Clearances.....	9
3.2.4	Vehicle Traffic and Control.....	9
3.2.5	Material Handling and Storage.....	10
3.2.6	Manual Lifting.....	10
3.2.7	Working Near Water.....	11
3.2.8	Hoisting and Rigging.....	11
3.2.9	Cranes and Hoists.....	11
3.2.10	Hand and Power Tools.....	12
3.2.11	Electrical Hazards.....	12
3.2.12	Control of Hazardous Energy.....	13
3.2.13	Excavations.....	13
3.2.14	Slip/Trip/Hit/Fall.....	14
3.2.15	Heat Stress.....	14
3.2.16	Sun Exposure.....	15
3.2.17	Cold Stress.....	16
3.2.18	Adverse Weather Conditions.....	16
3.3	Biological Hazards.....	16
3.3.1	Vegetation Overgrowth.....	17
3.3.2	Poisonous Plants.....	17
3.3.3	Insects.....	17
3.3.4	Poisonous Spiders.....	19



Table of Contents

3.3.5	Threatening Dogs	19
3.3.6	Rodents	20
3.3.7	Snakes	20
3.3.8	Scorpions	20
3.3.9	Alligators	21
3.3.10	Bloodborne Pathogens	21
4.	Personal Protective Equipment (PPE)	21
4.1	General	21
4.2	Levels of Protection	21
4.2.1	Reassessment of Protection Levels	22
5.	Air Monitoring Program	22
6.	Site Control.....	22
6.1	Communication	22
6.2	Site Security	22
6.2.1	Aggressive or Menacing Behavior	23
6.3	Decontamination	23
6.3.1	Personnel and Equipment Decontamination Procedures	23
7.	Emergency Procedures.....	23
7.1	On-Site Emergencies.....	23
7.2	Incident, Injury, and Illness Reporting and Investigation	23
7.3	Emergency Equipment/First Aid	24
7.4	Site Evacuation	24
7.5	Spill and Release Contingencies	24
8.	Recordkeeping	24
9.	References	24

Table Index

Table 1	Properties of Potential Site Contaminants
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1. Introduction

This Health and Safety Plan (HASP) was prepared by GHD Services Inc. (GHD), on behalf of International Paper Company for the Southern Impoundment of the San Jacinto River Waste Pits Superfund Site in Harris County, Texas (Site). This HASP was prepared pursuant to the requirements of the Administrative Settlement Agreement and Order on Consent for Remedial Design (AOC), Docket No. 06 02 18, with an effective date of April 11, 2018 (United States Environmental Protection Agency [EPA], 2018). The AOC includes a Statement of Work (SOW) which requires supporting deliverables to accompany the Final 100% Remedial Design for the Southern Impoundment (Southern Impoundment 100% RD) submittal to the EPA.

This HASP was developed to outline potential activities to be performed to protect site personnel from physical, chemical, and all other hazards that may be encountered during implementation of the remedial action (RA), as described in the Southern Impoundment 100% RD. Prior to initiation of RA activities, each selected remedial contractor (RC) will either update this HASP or develop its own HASP to address the components outlined in this document. This HASP was prepared in accordance with the EPA Emergency Responder Health and Safety and Occupational Safety and Health Administration (OSHA) requirements under 29 Code of Federal Regulations (CFR) 1910 and 1926, as specified in the SOW. References in this HASP to the “work site” are to the Southern Impoundment and references to “Implementing Party” are to the entity(ies) implementing the RA for the Southern Impoundment.

1.1 Background

The Site is located in Harris County, Texas, east of the City of Houston, between two unincorporated areas known as Channelview and Highlands. The Southern Impoundment is approximately 20 acres in size and is located on a small peninsula that extends south of Interstate Highway 10.

The primary hazardous substances identified in the subsurface within the Southern Impoundment are polychlorinated dibenzodioxins and polychlorinated dibenzofurans.

1.2 Purpose

The purpose of this site-specific HASP is to provide specific guidelines and establish procedures for the protection of personnel performing the activities described in Section 2. The HASP is a living document, in that it must continually evolve as work site conditions and knowledge of work activities develop. As previously stated, prior to initiation of Southern Impoundment RA activities, each RC will update this HASP or develop its own HASP to address the components outlined in this document.

1.3 Stop Work Authority

All employees will be empowered and expected to stop the work of co-workers, subcontractors, Implementing Party employees, or other contractors if any person’s safety or the environment are at risk. No repercussions will result from such an action.



During the Southern Impoundment RA, the discovery of any condition that would suggest the existence of a situation more hazardous than anticipated shall result in the removal of work site personnel from that area and re-evaluation of the hazard and the levels of protection.

1.4 Personnel Requirements

All personnel conducting activities at the work site must conduct their activities in compliance with all applicable HSE legislation at both state and federal levels to include, but not limited to, the Texas Administrative Code (TAC), 29 CFR 1910, 29 CFR 1926, and associated policies and procedures. OSHA's Hazardous Waste Operations and Emergency Response (HAZWOPER) standards (in general industry, 29 CFR 1910.120; and construction 29 CFR 1926.65) establish health and safety requirements for employers and require that employers follow specific work policies, practices, and procedures to protect their workers potential exposure to hazardous substances. The policies and practices, and procedures are incorporated into this document.

Project personnel must also be familiar with the procedures and requirements of the site-specific HASP. In the event of conflicting safety procedures/requirements, personnel must implement those safety practices affording the highest level of safety and protection.

1.5 Project Management and Safety Responsibilities

The organizational structure of this HASP is consistent with OSHA requirements in 29 CFR 1910.120(b)(2) and, for purposes of the Southern Impoundment RA, outlines project management and safety responsibilities, as described below.

Project Coordinator

The Project Coordinator (PC) or the equivalent will be responsible for the overall implementation of the HASP, and for ensuring that all HSE responsibilities are carried out in conjunction with this project. These responsibilities may include, but will not be limited to, review and approval of the HASP, qualifying and directing subcontractors relative to health, safety, and environment (HSE) performance, coordinating all HSE submittals, and consultation with the Site Supervisor (SS) regarding appropriate changes to the HASP.

Site Supervisor

The SS or the equivalent is the person who, under the supervision of the PC, will be responsible for the communication of work site requirements to work site project personnel and subcontractors. These responsibilities may include, but will not be limited to, the following:

1. Conducting a daily safety meeting that communicates the work site-specific hazards for the operations that day and identifies proactive measure will minimize the hazards.
2. Implementing procedures to confirm that all necessary clean-up and maintenance of safety equipment is conducted by project personnel.
3. Verifying that emergency phone numbers and information about emergency services, including hospital and clinic locations, is current.



4. Developing Job Safety Analysis (JSA) forms for all work tasks and revising them as appropriate.
5. Implementing procedures so that required forms are completed, filed, and submitted correctly, including those related daily safety meetings and completion of daily inspection checklists.
6. Requiring that a pre-entry briefing is conducted and documented, and serves to familiarize on-site personnel with the procedures, requirements, and provisions of the HASP.

Other duties may include responsibility for overall implementation of the HASP and for ensuring that all HSE responsibilities are carried out. These additional responsibilities may include, but will not be limited to, review and approval of the HASP, communication of work site requirements to subcontractor personnel, and consultation with the Implementing Party/work site representative regarding appropriate changes to the HASP.

The SS may also be assigned responsibility for enforcing safe work practices for project employees. In that role, the SS may watch for ill effects on personnel, especially those symptoms caused by cold/heat stress or chemical exposure and oversee the safety of visitors who enter the work site. The SS may also be assigned responsibility for communications with the Implementing Party/work site representative(s).

Other specific duties of the SS may include:

- Ordering the immediate shutdown and/or stop work of activities in the case of a medical emergency, unsafe condition, or unsafe practice.
- Providing the safety equipment, personal protective equipment (PPE), and other items necessary for employees.
- Enforcing the use of required safety equipment, PPE, and other items necessary for employee or community safety.
- Conducting work site inspections as a part of quality assurance for HSE.
- Reporting HSE concerns to work site and/or project management, as necessary.

Employee Safety Responsibility

Employees will be responsible for their own safety as well as the safety of those around them. Employees and subcontractors will be required to use any equipment that is provided in a safe and responsible manner, as directed by their supervisor.

Employees will be directed to take the following actions when appropriate:

- Suspend any operations that may cause an imminent health hazard to employees, subcontractors, or others.
- Assist in the development and revision of JSA forms that are appropriate to their current scope of work.
- Inspect tools and other equipment before each use or as manufacturer and/or OSHA dictates.
- Correct work site hazards when possible without endangering life or health.



- Report HSE concerns to the SS or PC.

Subcontractors

Subcontractors will each be responsible for the implementation of its own HASP and will be required to agree to comply with its contents. In the event of conflicting safety procedures or requirements, the subcontractor's personnel are to be required to implement those safety practices that afford the highest level of safety and protection. Subcontractors will be required to attend an initial work site orientation and subsequent safety meetings.

Equipment Operators

All equipment operators will be responsible for the safe operation of heavy equipment. This may include assigning operators will be assigned responsibility for inspecting equipment on a daily basis to ensure safe performance. Brakes, hydraulic lines, backup alarms, and fire extinguishers must be inspected routinely throughout the project. Equipment will be taken out of service if an unsafe condition occurs.

Authorized Visitors

Authorized visitors will be provided with all known information with respect to Southern Impoundment RA operations and hazards as applicable to the purpose of their visit and should be accompanied with personnel familiar with the work site's layout and procedures.

1.6 Site HASP Amendments

During the Southern Impoundment RA, any change to the scope of work must be evaluated for its impact on the overall health and safety of the project and associated personnel and to determine if modifications to the then-applicable HASP are required. A minor change would be one that adjusts already documented hazards within the HASP and does not expose work site personnel to chemicals above exposure limits, such as the introduction of a new JSA or PPE that does not involve a change in respiratory protection. Amendments to the HASP are to be documented, in addition to notifying key personnel.

Significant changes to the scope of work may require a rewrite and review/approval of the HASP.

1.7 Training Requirements

All personnel conducting work at the work site are to be required to have completed the appropriate HSE training as applicable to their job tasks/duties. Training requirements are consistent with the requirements of 29 CFR 1910.120(e) and (q)(11) and are referenced throughout this HASP.

1.7.1 Site-Specific Training

It is recommended that an initial work site-specific training session or briefing be conducted by the PC or SS prior to commencement of Southern Impoundment RA work activities. During this initial training session, employees may be instructed on the following topics:

- Personnel roles and responsibilities in regards to HSE



- Content and implementation of the HASP
- Work site hazards and controls
- Site-specific hazardous procedures
- PPE requirements
- Emergency information, including local emergency response team phone numbers, route to nearest hospital, incident reporting procedures, and emergency response procedures
- Instruction in the completion of required inspections and forms
- Location of safety equipment, such as portable eyewash, first aid kit, fire extinguishers, etc.

The meeting may include presentation of various components of this e the HASP, followed by an opportunity for attendees to ask. Personnel should not be permitted to enter or work at the Southern Impoundment work site until they have completed the site-specific training session.

It is recommended that visitors be given a site-specific briefing to provide information about site hazards, the site lay-out including work zones, emergency evacuation procedures, and other pertinent safety and health requirements, as appropriate.

1.7.2 Safety Meeting/HASP Review

It is recommended that safety meetings take place each day prior to beginning the day's work and that all site personnel should be required to attend these safety meetings, to be conducted by the SS or a designee. The safety meetings should cover specific HSE issues, including the appropriate JSAs, work site activities, changes in work site conditions, and a review of topics covered in the site-specific pre-entry briefing. The safety meetings should be documented each day with written sign-in sheets containing a list of topics discussed.

1.7.3 Medical Surveillance Program

Medical surveillance requirements should be based on a worker's potential for exposure as determined by the site characterization and job hazard analysis and as required by 29 CFR 1910.120(f)(2).

A work site medical surveillance program should be developed that provides that if a worker is injured, becomes ill, or develops signs or symptoms of possible over-exposure to hazardous substances or health hazards, medical examinations are provided to that worker as soon as possible after the occurrence and as required by the attending physician.

Medical examinations and procedures are performed by or under the supervision of a licensed physician and are provided to employees free of cost, without loss of pay, and at a reasonable time and place. The need to implement a more comprehensive medical surveillance program will be re-evaluated in the event of an over-exposure incident.



2. Site Operations

2.1 Scope of Work

The scope of work for the Southern Impoundment RA will be defined in the Southern Impoundment RD, as approved by the EPA pursuant to the AOC.

This HASP will cover the specific work site activities that will be conducted by personnel and their subcontractors during the Southern Impoundment RA. These activities are expected at a minimum to include:

- Mobilization/demobilization of personnel, materials, and equipment to and from the work site
- Southern Impoundment remediation activities
- Near water activities
- Heavy equipment spotting
- Surveying activities
- Equipment fueling
- Soil sampling using Direct Push Technology and/or rotosonic drilling
- Decontamination of personnel and equipment
- Driving

Upon selection of the RC, this HASP will be updated or one will be developed to address the scope of work in the approved Southern Impoundment RA and the specific hazards associated with that scope of work. The RC will also be expected to develop task specific JSAs for tasks involved in Southern Impoundment RA activities, which may include the activities listed above, in accordance with the job hazard analysis requirements of 29 CFR 1910.120(b)(4)(ii)(A) and the workplace hazard assessment requirements of 29 CFR 1910.132(d).

3. Hazard Evaluation

This section identifies and evaluates potential chemical, physical, and biological hazards that may be encountered during implementation of the Southern Impoundment RA, in compliance with 29 CFR 1910.120(b)(4)(ii)(A), 1910.120(c) and 1910.120(i). These hazards and any discussion regarding anticipated initial exposure levels are based on information developed in connection with the Southern Impoundment RD,

3.1 Chemical Hazards

The chemical hazards associated with conducting work site operations are expected to include the potential exposure to on-site contaminants encountered during field activities such as soil sampling, water sampling, products used in decontamination of equipment, and support products such as fuel.



The potential routes of exposure from these products during normal use may occur through inhalation of vapors and dusts, or direct contact or absorption with the materials.

The chemical hazards of concern that may be encountered during the tasks identified in the project's scope of work are listed in Table 1, and include: dioxins, furans, and PCBs. Information about those chemical hazards is included in Table 1, which includes exposure limits, signs and symptoms of exposure, chemical properties, and physical characteristics.

3.1.1 Chemical Hazard Controls

It is recommended that exposure to potential on-site contaminants/chemicals during implementation of the Southern Impoundment RA be controlled by:

- Monitoring air concentrations with appropriate equipment in the breathing zone
- Revising JSAs to list chemical hazards and associated hazard controls on a task-specific basis
- Employing dust control measures such as wetting the immediate area
- Using PPE, as appropriate, in areas known to have concentrations above the specified action level for each contaminant

3.1.2 Skin Contact and Absorption Contaminants

Skin contact with chemicals may be controlled by use of the proper PPE and good housekeeping procedures. PPE (e.g., Tyvek®, gloves) as described in Section 4 may be required for all activities where contact with potentially harmful media or materials is anticipated. Any such requirements should utilize manufacturer data on permeation and degradation to minimize skin contact potential.

3.1.3 Hazard Communication/WHMIS

It is recommended that personnel required to handle or use hazardous materials as part of their job duties be trained and educated in accordance with the Workplace Hazardous Materials Information System (WHMIS) standard as applicable. Such training may include instruction on the safe use and handling procedures of hazardous materials, how to read and access safety data sheets (SDSs), and the proper labeling requirements.

3.1.4 Flammable and Combustible Liquids

The storage, dispensing, and handling of flammable and combustible liquids should be handled in accordance with industry standards such as National Fire Protection Agency (NFPA) guidelines. The specific flammable or combustible liquids to be used at the work site may include gasoline, diesel, kerosene, oils, and solvents. The following are requirements to be applied to the handling of such liquids.

Flammable and combustible liquids are classified according to flash point. This is the temperature at which the liquid gives off sufficient vapors to readily ignite. Flammable liquids have flash points below 100°F (37.8°C). Combustible liquids have flash points above 100°F (37.8°C) and below 200°F (93.3°C).



Storage

Flammable and combustible liquids should be stored in designated areas. Such areas should be isolated from equipment and work activity that may produce flames, sparks, heat, or any form of ignition, including smoking. The most practical method is the use of one or more approved (commercially available) flammable/combustible liquid storage cabinets.

Cabinets must be labeled "Flammable - Keep Fire Away." Doors should be kept closed and labeled accordingly. Containers should be kept in the cabinet when not in use.

General Requirements

- Keep containers of flammable/combustible liquids closed when not in use.
- Keep flammable/combustible liquids in designated areas and approved cabinets.
- Do not allow use of unapproved containers for transfer or storage. Use only approved safety cans (5-gallon maximum) with a spring closing lid and spout cover, designated to safely relieve internal pressure when exposed to heat or fire.
- Use only approved self-closing spigots, faucets, and manual pumps when drawing flammable/combustible liquids from larger containers/barrels.
- Use only approved metal waste cans with lids for disposal of shop towels/oily rags.
- Designate "Smoking" and "No Smoking" areas.
- Designate fueling areas.
- Observe all signs indicating "No Smoking," "No Flames," and "No Ignition."

Transferring Flammable/Combustible Liquids

This seemingly routine task can be hazardous if certain precautions are not followed. Grounding and bonding should be observed at all times to prevent the accumulation of static electricity when transferring containers/barrels one to another. Bonding is necessary between conductive containers (e.g., a barrel and a 5-gallon container).

3.2 Physical Hazards

Physical hazards that may be present during implementation of the Southern Impoundment RA are detailed below. In addition, personnel should be made aware that the protective equipment wear may limit dexterity and visibility and may increase the difficulty of performing some tasks.

3.2.1 Heavy Equipment Safety

Heavy Equipment

It is recommended that the following practices shall be adhered to by personnel operating heavy equipment and personnel working in the vicinity of heavy equipment:



- Heavy equipment is to be inspected when equipment is initially mobilized, delivered to the work site, or after it is repaired and returned to service, to ensure that it meets all manufacturer and OSHA specifications (e.g., fire extinguishers, backup alarms, etc.).
- Heavy equipment is to be inspected on a daily basis.
- Heavy equipment is only to be operated by authorized, competent operators.
- Seat belts are to be provided on heavy equipment that is not designed for stand-up operation.
- Personnel will not be raised/lowered in buckets.
- Personnel will not ride on fender steps or any place outside the cab.
- Before leaving the equipment controls, operators are to ensure that the equipment is in its safe resting position.
- Before raising any booms, buckets, etc., personnel are to check for overhead obstructions.
- Personnel are to wear high visibility safety vests, steel-toed shoes, safety glasses, hearing protection, and hard hats during heavy equipment operations.

3.2.2 Noise

Project activities that include working in close proximity to heavy equipment and/or drilling operations, or using power tools that generate noise levels exceeding the decibel range of 85 dBA, should require the use of hearing protection with a Noise Reduction Rating (NRR) of at least 20. Hearing protection (earplugs/muffs) should be available to personnel and visitors requiring entry into these areas.

Noise monitoring should be conducted in accordance with the Hearing Conservation Program. The hearing conservation program requires monitoring of noise exposure levels in a way that identifies employees exposed to noise at or above 85 decibels (dB) averaged over 8 working hours, or an 8-hour time-weighted average (TWA).

3.2.3 Utility Clearances

It is recommended that elevated superstructures (e.g., drill rigs, backhoes, scaffolding, ladders, cranes) be required to remain a distance of 10 feet away from utility lines (<50 kV) and 20 feet away from power lines (>50 kV). Underground utilities, if present, should be clearly marked and identified prior to commencement of work. Local/state/provincial regulations and Implementing Party requirements with regards to utility locating requirements (e.g., One-Call) should be followed.

If personnel must expose a line, state law requires contractors to protect and support the underground facility line while working at the work site. Refer to the *Texas Utilities Code, Title 5, Chapter 251, and TAC Title 16, Chapter 18* for additional guidance.

3.2.4 Vehicle Traffic and Control

It is recommended that the following safety measures be taken by personnel that have the potential to be exposed to vehicle traffic:



- A high visibility safety vest meeting American National Standards Institute (ANSI) Class II garment requirements is to be worn at all times.
- Cones and other visible markers will be used to demarcate a safe work zone around the active work zone(s).
- Appropriate signage will be posted as necessary, to inform roadway/parking lot users of any additional control measures necessary.
- A flagger may be required to alert roadway users of trucks entering or the roadway.

The journey planning process is a simple risk assessment to ensure that all identified hazards are understood and managed and that unnecessary trips or those presenting an unreasonable or uncertain risk are not taken. Journey Management Plans (JMPs) should be developed for routine travel and work site access.

Additionally, **when working on an active roadway or along the shoulder or side of the road is necessary**, project personnel should follow the requirements presented in the Manual on Uniform Traffic Control Devices (MUTCD), which is found at:

http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/pdf_index.htm.

A Temporary Traffic Control Plan (TTCP) may need to be developed. The RC will work with the Implementing Party, along with the local municipality, to determine if a TTCP is required.

3.2.5 Material Handling and Storage

Material handling and storage practices to be conducted at the work site may include manual lifting of materials. Mechanical means for lifting heavy loads should be used whenever possible.

Special Precautions for Hazardous or Incompatible Materials Storage

Generally, materials are considered hazardous if they are ignitable, corrosive, reactive, or toxic. Manufacturers and suppliers of these materials should provide the recipient with SDSs, which describe their hazardous characteristics and give instructions for their safe handling and storage.

It is recommended that the following special precautions be followed regarding the storage of hazardous materials:

- Based on the information available on the SDSs, incompatible materials shall be kept in separate storage areas
- Warning signs shall be conspicuously posted, as needed, in areas where hazardous materials are stored

3.2.6 Manual Lifting

Proper lifting reduces the risk associated with moving heavy objects. It is recommended that the following be considered prior to a lift.

- Establish that you can lift the load safely
- Use a mechanical lifting device, if available



- Look for any obstructions or spills along route
- Look for any sharp edges, slivers, or other things that may cause personal injury
- Do not move any object that will obstruct your field of vision when transporting the load

In addition, it is recommended that in any lift, the body should be positioned so that the weight of the body is centered over the feet (to provide a more powerful line of thrust and also ensures better balance) and that the lift be started with a thrust of the rear foot and to not twist.

3.2.7 Working Near Water

The Southern Impoundment RA may involve working in areas where there is the potential for slipping or falling into water that is greater than 3 feet in depth. In that instance, a “no entry zone” will be established between the work area and the water hazard. The no entry zone will be clearly defined and/or demarcated by the RC.

Additional precautions may be necessary if work over water is required.

3.2.8 Hoisting and Rigging

It is recommended that wire ropes, chains, ropes, and other rigging equipment be inspected prior to each use and as necessary during use to assure their safety. Defective rigging equipment should be immediately removed from service.

Rigging should not be used unless the weight of the load falls within the rigging’s safe work operating range. This should be verified by the authorized rigger prior to any “pick” or lifting operation.

Only personnel trained in safe rigging procedures should be authorized to engage in rigging procedures. Additionally, the rigger should understand and use recognized crane signals.

3.2.9 Cranes and Hoists

The use of cranes may take place during project activities. If cranes are required during the Southern Impoundment RA, it is recommended that personnel ensure that the following safety practices are enforced:

- Each crane operator will provide a copy of the crane’s annual inspection report to the SS prior to initiating operations.
- Operators of cranes and hoists will make visual and operational inspections of the equipment prior to use. Any discrepancies that would jeopardize the safe operation of the equipment will be corrected prior to use. These inspections are to be documented via a daily inspection checklist or equivalent.
- The posted capacity of the crane will be adhered to and overloading of the equipment will not be allowed.
- The accessible swing radius of the crane will be demarcated and/or barricaded to prevent employees from entering the area.



- A competent person will investigate the soil for stability and determine the necessary amount of “cribbing” to be placed under the outrigger pads or if crane mats are necessary.
- No personnel will be permitted to work under a suspended load.
- Except for emergency communications, the operator will only recognize signs and signals from one designated signal person. This signal person will serve as the crane operator’s eyes in areas that the crane operator cannot see. This person will be familiar with crane signals, operation of the crane, and safe methods of securing and handling a load.

3.2.10 Hand and Power Tools

The following precautions are recommended when using hand and power tools.

Hand Tools

- Hand tools should meet the manufacturer’s safety standards
- Hand tools should not be altered in any way
- At a minimum, eye protection should be used when working with hand tools
- Wrenches (including adjustable, pipe, end, and socket wrenches) should not be used when jaws are sprung to the point that slippage occurs
- Impact tools (such as drift pins, wedges, and chisels) should be kept free of mushroom heads
- Wooden handles should be free of splinters or cracks and secured tightly to the tool
- Any damaged or defective tools should be immediately removed from service and tagged for destruction

Power Tools

- All power tools should be inspected regularly and used in accordance with the manufacturer’s instructions and the tool’s capabilities
- Electric tools should not be used in areas subject to fire or explosion hazards, unless they are approved for that purpose
- Portable electric tools should be connected to a Ground Fault Circuit Interrupter (GFCI) when working in wet areas
- Proper eye protection should be used when working with power tools
- Personnel should be trained in the proper use of each specific tool
- Any damaged or defective power tools should be immediately tagged and removed from service

3.2.11 Electrical Hazards

Only qualified individuals should be allowed to perform work on electrical circuits or perform electrical work on equipment. It is recommended that no employee be permitted to work on any part of an electrical power circuit unless the person is protected against electric shock by de-energizing



the circuit and grounding it, or ensuring that it has been locked and tagged out. It is recommended that any necessary electrical work adhere to the following precautions:

- All electrical wiring and equipment shall be a type listed by Underwriters Laboratories (UL) or Factory Mutual (FM) for the specific application.
- All installations shall comply with the National Electric Code (NEC) and the National Electric Safety Code (NESC).
- All electrical circuits shall be grounded according to NEC and NESC Code. GFCIs shall be used in the absence of properly grounded circuitry or when portable tools must be used around wet areas.
- Generators and like equipment should be grounded in accordance with NEC, unless exempted by NEC 250-6.
- All live wiring or equipment shall be guarded to protect all persons or objects from harm.

3.2.12 Control of Hazardous Energy

Hazardous energy sources may be encountered during the servicing and maintenance of machines and equipment, in which the unexpected energization or startup of the machines or equipment could cause injury to employees.

The minimum performance requirements to control hazardous energy require that employers develop and implement an energy control program.

It is recommended that project personnel who are required to conduct operations and maintenance activities that will require the isolation of an energy hazard using a lockout/tagout device follow a RC developed program and written procedures.

3.2.13 Excavations

All excavation and trenching operations shall be conducted in accordance and in compliance with OSHA's Standards for the Construction Industry. At a minimum, it is recommended that the following safety guidelines be adhered to while conducting excavation and trenching activities:

- Excavation and trenching operations require pre-planning to determine whether sloping or shoring systems are required, and to develop appropriate designs for such systems. In addition, the estimated location of all underground installations should be determined before digging/drilling begins. Necessary clearances should be observed.
- If there are any nearby buildings, walls, sidewalks, trees, or roads that may be threatened or undermined by the excavation, or where the stability of any of these items may be endangered by the excavation, they should be removed or supported by adequate shoring, bracing, or underpinning.
- Excavations may **not** go below the base of footings, foundations, or retaining walls unless they are adequately supported or a person who is registered as a Professional Engineer (PE) has determined that they will not be affected by the soil removal. Civil engineers or those with



licenses in a related discipline and experience should be consulted in the design and use of sloping and shoring systems. PE qualifications should be documented in writing.

Daily Inspections

It is recommended that a designated competent person perform daily inspections of excavations, the adjacent areas, and all protective systems for situations that could potentially result in slope failure.

Additionally, the competent person should be aware of the potential for confined space situations and other hazardous work conditions.

The competent person will be required to inspect, evaluate, and complete the excavation checklist at the following intervals:

- Prior to the start of work, after each extended halt in work, and as needed throughout the shift, as new sections of the excavation or trench are opened
- After every rainstorm and other natural or manmade event that may increase the load on the walls of the excavation, or otherwise affect their stability

The competent person will be given the authority to immediately suspend work if any unsafe condition is detected.

3.2.14 Slip/Trip/Hit/Fall

Slip/trip/hit/fall injuries are the most frequent of all injuries to workers. It is recommended that the following practices be implemented by work site personnel to minimize injuries:

- Spot check work areas to identify hazards
- Establish and utilize a pathway free of slip and trip hazards
- Beware of trip hazards such as wet floors, slippery floors, and uneven surfaces or terrain
- Carry only loads that you can see over
- Keep work areas clean and free of clutter, especially in storage rooms and walkways
- Communicate hazards to on-site personnel

3.2.15 Heat Stress

Recognition and Symptoms

Temperature stress is one of the most common illnesses faced by project personnel when working in elevated temperatures and/or humidity. Acclimatization and frequent rest periods must be established for conducting activities where temperature stress may occur. Below are listed signs and symptoms of heat stress along with recommended mitigation actions.

- ***Heat Rash:*** Redness of skin. Frequent rest and change of clothing are recommended.
- ***Heat Cramps:*** Painful muscle spasms in hands, feet, and/or abdomen. It is recommended to administer lightly salted water by mouth, unless there are medical restrictions.



- **Heat Exhaustion:** Clammy, moist, pale skin, along with dizziness, nausea, rapid pulse, fainting. It is recommended to Move the affected personnel to a cooler area, administer fluids, and monitor.
- **Heat Stroke:** Hot dry skin; red, spotted, or bluish; high body temperature of 104°F; mental confusion; loss of consciousness; convulsions or coma. It is recommended to immediately cool the victim by immersion in cool water. Wrap with wet sheet and sponge with cool liquid while fanning; treat for shock. **Do not delay treatment. Cool body while awaiting ambulance.**

Work Practices

The RC will be asked to implement procedures, which may include the following, to reduce heat stress:

- Heat stress monitoring
- Acclimatization
- Work/rest regimes (schedule of breaks) - mandatory breaks scheduled in summer months or during high risk activities for heat stress
- Heat stress safety PPE (cool-vests, bandanas, etc.)
- Liquids that replace electrolytes, water, and salty foods available during rest
- Use of buddy system

3.2.16 Sun Exposure

Overexposure to sunlight is a common concern when conducting fieldwork. Overexposure can occur on clear, sunny days as well as on overcast and cloudy days. Ultraviolet (UV) rays from the sun can cause skin damage or sunburn, but can also result in vision problems, allergic reactions, and other skin concerns. The RC will be asked to implement procedures, which may include the following steps, to protect against overexposure to sunlight:

- **Always Use Sunscreen:** Apply a broad spectrum sunscreen with Sun Protection Factor (SPF) of at least 15 or higher liberally on exposed skin. Reapply every 2 hours or more. Even waterproof sunscreen can come off when you towel off or sweat.
- **Cover Up:** Wearing tightly woven, loose-fitting, and full-length clothing is a good way to protect your skin from UV rays.
- **Wear a Hat:** A hat with a wide brim offers good sun protection to your eyes, ears, face, and the back of your neck - areas particularly prone to overexposure to the sun.
- **Wear Sunglasses That Block 99 to 100 Percent of UV Radiation:** Sunglasses or tinted safety glasses that provide 99 to 100 percent UVA and UVB protection will greatly reduce sun exposure that can lead to cataracts and other eye damage. Check the label when buying sunglasses.
- **Seek Shade:** Shade is a good source of protection, but keep in mind that shade structures (e.g., trees, umbrellas, canopies) do not offer complete sun protection.



- **Limit Time in the Midday Sun:** The sun's rays are strongest between 10 a.m. and 4 p.m. Whenever possible, limit exposure to the sun during these hours.

3.2.17 Cold Stress

Cold stress is similar to heat stress, in that it is caused by a number of interacting factors including environmental conditions, clothing, and workload, as well as the physical and conditioning characteristics of the individual. Hypothermia, a condition in which the body's deep core temperature falls significantly below 98.6°F (37°C), can be life threatening. A drop in core temperature to 95°F (35°C) or lower must be prevented.

Air temperature is not sufficient to determine the cold hazard of the work environment. The wind chill must be considered as it contributes to the effective temperature and insulating capabilities of clothing. The equivalent wind chill temperature should be used when estimating the combined cooling effect of wind and low air temperatures on exposed skin or when determining clothing insulation requirements to maintain the body's core temperature.

Pain in the extremities may be the first early warning of danger to cold stress. During exposure to cold, maximum severe shivering develops when the body temperature has fallen to 95°F (35°C). This should be taken as a sign of danger to the employees on-site, and cold exposures should be immediately terminated for any employee when severe shivering becomes evident. Useful physical or mental work is limited when severe shivering occurs.

Prevention of Cold Stress

A variety of measures can be implemented by the RC to prevent or reduce the likelihood of employees developing cold related ailments and disorders. These include acclimatization, fluid and electrolyte replenishment, eating a well-balanced diet, wearing warm clothing, the provision of shelter from the cold, thermal insulation of metal surfaces, adjusting work schedules, and employee education.

3.2.18 Adverse Weather Conditions

The SS will be assigned responsibility to decide whether or not to continue work based on current and pending weather conditions, and taking into account the provisions of the Emergency Response Plan for the Southern Impoundment RA (ERP). Electrical storms, heavy rains, hurricanes, tornado warnings, and sustained strong winds (approximately 40 mph) are examples of conditions that would call for the discontinuation of work and evacuation of the work site.

In addition, no work with elevated super structures (e.g., drilling, crane operations) will be permitted during any type of electrical storm, or during wind events that have wind speeds exceeding 40 mph, consistent with requirements of the ERP.

3.3 Biological Hazards

During the Southern Impoundment RA, on-site personnel may encounter biological hazards, including bloodborne pathogens, insects, spiders, scorpions, rodents, snakes, and large predators.



This section identifies precautions that is it recommended be taken if these hazards are encountered.

3.3.1 Vegetation Overgrowth

Overgrown weeds, bushes, trees, grass, and other vegetation are fire and safety hazards. A number of hidden hazards may not be immediately recognized due to the overgrowth of vegetation in areas where field activities may occur, including discarded junk, litter, and debris. Construction materials such as boards, nails, concrete, and other debris may be hidden beneath tall grass, weeds, and bushes. Other hazards may include steep slopes, potholes, trenches, soft spots, dips, etc., all dangerously concealed from the view of individuals walking or operating motorized equipment in the area. Additionally, biological hazards such as snakes, ticks, chiggers, and mosquitoes may be present, as they breed in overgrowth conditions.

3.3.2 Poisonous Plants

Common poison ivy grows as a small plant, a vine, and a shrub. Poison ivy occurs in every state. The leaves always consist of three glossy leaflets.

Poison sumac grows as a woody shrub or small tree 5 to 25 feet tall. It usually contains nine leaves, with eight paired leaves and one on top, and is common in swampy areas. The plants are potent sensitizers and can cause a mild to severe allergic reaction, referred to as “contact dermatitis.”

The best form of prevention is to avoid contact. Wearing long sleeves and use of gloves and disposable clothing, such as Tyvek, are recommended in high-risk areas to avoid exposure from contaminated apparel. Barrier creams and cleaners are also recommended.

3.3.3 Insects

Ticks

Ticks are blood feeding external parasites of mammals, birds, and reptiles throughout the world. Some human diseases of current interest in the United States caused by tick-borne pathogens include Lyme disease, ehrlichiosis, babesiosis, Rocky Mountain spotted fever, tularemia, and tick-borne relapsing fever.

Prevention

Preventative measures include wearing light-colored clothing, keeping clothing buttoned, tucking pant legs in socks, and keeping shirttails tucked in. Periodic checks for ticks should be made during the day, and especially at night. Hair should also be checked by parting it and combing through it to make sure that no ticks have attached to the scalp. Also, check clothing when it is first removed, before ticks have a chance to crawl off. A shower or bath should be taken as soon as possible after leaving the work site for the day.

Bees, Wasps, and Yellow Jackets

Stinging insects are members of the order Hymenoptera of the class Insecta. There are two major subgroups: Apidae (honeybees and bumblebees) and vespids (wasps, yellow jackets, and hornets).



Apidae are docile and usually do not sting unless provoked. The stinger of the honeybee has multiple barbs, which usually detach after a sting. Vespids have few barbs and can inflict multiple stings.

Types of stinging insects that might be encountered at this work site may include:

- Carpenter bees
- Bumblebees
- Mud dauber wasps
- Africanized killer bees
- Cicada killer wasps
- Giant hornets
- Honeybees
- Paper wasps
- Yellow jackets

Symptoms

If a person is stung, three types of reactions are possible: a normal, a toxic, or an allergic reaction.

- **Normal Reaction:** Only lasts a few hours and consists of pain, redness, swelling, itching, and warmth near the sting area
- **Toxic Reaction:** Will last for several days, results from multiple stings, and may cause cramps, headaches, fever, and drowsiness
- **Allergic Reaction:** Can cause hives, itching, swelling, tightness in the chest area, and a possibility of breathing difficulties, dizziness, unconsciousness, and cardiac arrest.

The stingers of many Hymenoptera may remain in the skin and should be removed as quickly as possible without concern for the method of removal. An ice cube placed over the sting will reduce pain; aspirin may also be useful. Persons with known hypersensitivity to such stings should carry a kit containing epinephrine in a prefilled syringe. Antihistamines may help decrease hives and angioedema. Persons who have severe symptoms of anaphylaxis, have positive venom skin test results, and are at risk for subsequent stings should receive immunotherapy regardless of age or time since anaphylaxis.

Fire Ants

Fire ants are reddish-brown in color and range from 1/8 inch to 3/8 inch in length. When a fire ant stings an individual, the individual is rarely only stung once. Most fire ant stings result in a raised welt with a white pustule. If stung by a fire ant, continue to observe the welt and try to prevent secondary infection by keeping the welt intact. However, some individuals may have an allergic reaction to a fire ant sting and require immediate medical attention. Pesticides and even hot water can be used to kill fire ant colonies. Fire ants are normally seen in the southern states.

Mosquitoes

Mosquitoes are common pests that can be found in any state and any work environment where warm, humid conditions exist. Mosquitoes can pass along diseases such as West Nile virus and malaria. Several different methods can be used to control adult mosquito populations: repellants such as DEET, mosquito traps, foggers, and vegetation and water management.



3.3.4 Poisonous Spiders

Black Widow

Black Widow spiders are not usually deadly (especially to adults) and only the female is venomous. The female spider is shiny black, usually with a reddish hourglass shape on the underside of her spherical abdomen. Her body is about 1.5 inches long, while the adult male's is approximately half that. The spider's span ranges from 1 to 3 inches. The adult males are harmless, have longer legs, and usually have yellow and red bands and spots over their back, while the young black widows are colored orange and white. The bite of a black widow is often not painful and may go unnoticed. However, the poison injected by the spider's bite can cause severe reactions in certain individuals.

Symptoms

Symptoms include abdominal pain, profuse sweating, swelling of the eyelids, pains to muscles or the soles of the feet, salivation and dry-mouth (alternating), and paralysis of the diaphragm. If a person is bitten, they should seek immediate medical attention. Clean the area of the bite with soap and water. Apply a cool compress to the bite location. Keep affected limb elevated to about heart level. Ask a doctor if acetaminophen or aspirin can be taken to relieve minor symptoms. Additional information can be obtained from the Poison Center (1 (800) 222-1222). Black widows are found throughout the tropics, U.S., and Canada.

Brown Recluse

Brown recluse spiders are usually light brown in color, but in some instances they may be darker. Brown recluse spiders are highly venomous spiders, native to the United States, and found coast to coast. The brown recluse can vary in size, but some can obtain bodies of 5/8 inches in length with a leg span of 1 1/2 inches in diameter. They can be identified by their three pairs of eyes along the head area and their fiddle shaped markings on the back. Most brown recluse bites are defensive rather than offensive. They generally only bite when they feel threatened.

Symptoms

If bitten by a brown recluse, an individual may experience open, ulcerated sores, which when left untreated may become infected and cause tissue necrosis. If an individual believes a spider has bitten them, they need to seek medical attention as soon as possible. In order to minimize the occurrence of brown recluse bites, individuals should shake their clothing and shoes thoroughly, eliminate the presence of cluttered areas, and spray the building perimeters with pesticides. Brown recluse are found throughout the U.S., Mexico, and Canada.

3.3.5 Threatening Dogs

It is recommended that the following instructions be provided to work site personnel to address situations in which they are approached by a frightened or menacing dog:

- Do not attempt to run and do not turn your back.
- Stay quiet and remember to breathe.
- Be still, with arms at sides or folded over chest with hands in fists.



- Slowly walk away sideways.
- Do not stare a dog in the eyes, as this will be interpreted as a threat.
- Avoid eye contact.

3.3.6 Rodents

Rodentia: (rats, mice, beavers, squirrels, guinea pigs, capybaras, coypu)

Rodents, or Rodentia, are the most abundant order of mammals. There are hundreds of species of rats; the most common are the black and brown rat.

The **Brown Rat** has small ears, blunt nose, and short hair. It is approximately 14 to 18 inches long (with tail). They frequently infest garbage/rubbish, slaughterhouses, domestic dwellings, warehouses, shops, and supermarkets; they also frequent any space with an easy meal and potential nesting sites.

The **Black Rat** can be identified by its tail, which is always longer than the combined length of the head and body. It is also slimmer and more agile than the Norwegian or Brown rat. Its size varies according to its environment and food supply.

The **House Mouse** has the amazing ability to adapt and now can frequently be found in human dwellings. In buildings, mice will live anywhere and they are very difficult to keep out. Mice are also omnivorous and will eat anything.

Rats and mice often become a serious problem in cold winter months when they seek food and warmth inside buildings. They may suddenly appear in large numbers when excavation work disturbs their in-ground nesting locations or their food source is changed.

3.3.7 Snakes

Snakes may be found in any region of the country. While many snakes encountered are not venomous, a few are, so all snakes should be given a wide berth. If you see a snake, back away from it slowly and do not touch it. If you or someone you know are bitten, try to see and remember the color and shape of the snake, which can help with treatment of the snakebite.

Venomous snakes include the coral snake and pit vipers, such as the cottonmouth (water moccasin), copperhead, and rattlesnake. The venom of pit vipers is primarily *hematoxic* because it acts upon the victim's blood system. This venom breaks down blood cells and blood vessels and affects heart action. Bite victims experience severe burning pain, localized swelling and discoloration for the first 3 to 30 minutes, followed by nausea, vomiting, occasional diarrhea, and usually shock.

3.3.8 Scorpions

Forty different types of scorpions are found in the U.S. ***All the different types are located in the southern states.***



Wind scorpions, including sun scorpions, are easily recognized by the pair of large, pincer-like chelicerae on the head in front of the mouth and by the slight, waist-like constriction near the middle of the body. Unlike the broadly joined cephalothorax and abdomen of scorpions, wind scorpions have three distinct body regions - a segmented cephalothoracic area with two eyes at the front margin, a three-segmented thorax, and a ten-segmented abdomen.

Death by a scorpion sting, if it occurs, is the result of heart or respiratory failure some hours after the incident.

3.3.9 Alligators

Similar to snakes, lizards, and other reptiles, alligators are cold-blooded (or ectothermic), meaning the air or water temperature around them determines their body temperature. The **American alligator** primarily *inhabits the southeastern U.S.: Alabama, Arkansas, North and South Carolina, Florida, Georgia, Louisiana, Mississippi, Oklahoma, and Texas*. They primarily live in freshwater swamps and marshes, but also in rivers, lakes, and smaller bodies of water. Alligators are classified as a threatened species and thus enjoy the protection of state and federal law. State and federal law prohibits people from killing, harassing, molesting, or attempting to move alligators. The potential for being bitten or injured by a provoked alligator is high. Maintain a distance of at least 15 feet from any alligator.

Seek immediate medical attention if bitten by an alligator. Alligators harbor very infectious bacteria, and even minor bites may require special treatment.

3.3.10 Bloodborne Pathogens

Hepatitis and other communicable diseases are largely transmitted through exposure to bodily fluids containing the hepatitis virus, which could be found on refuse encountered in subsurface investigations.

Preventative measures include wearing appropriate PPE: work gloves, a long sleeved shirt, and safety footwear.

4. Personal Protective Equipment (PPE)

4.1 General

The purpose of PPE is to shield or isolate individuals from the chemical and physical hazards that may be encountered during work activities.

The type of PPE required for a project will vary based on the level of protection required to protect the employee from physical, chemical, biological, and thermal hazards.

4.2 Levels of Protection

The level of protection should correspond to the level of hazard known or suspected in the specific work area. Prior to commencement of Southern Impoundment RA work, PPE will be selected by the RC with specific considerations to the hazards associated with work site activities.



- All PPE should be disposed of and/or decontaminated at the conclusion of each workday. Decontamination procedures should follow the concept of decontaminating the most contaminated PPE first.
- All disposable equipment should be removed before meal breaks and at the conclusion of the workday, and replaced with new equipment prior to commencing work.

4.2.1 Reassessment of Protection Levels

It is recommended that protection levels provided by PPE selection be upgraded or downgraded by the RC, based upon a change in work site conditions or the review of the results of air monitoring.

5. Air Monitoring Program

Air monitoring should be performed while intrusive activities are taking place to detect the presence and relative level of any air contaminants that may be an inhalation hazard. The purpose of air monitoring is to identify and quantify airborne contaminants in order to determine the level of worker protection needed. Air monitoring requirements are outlined in the Site-Wide Monitoring Plan (SWMP).

6. Site Control

It is recommended that the RC adopt requirements governing site control and work area demarcation, in compliance with 29 CFR 1910.120(b)(4)(ii)(F) and 29 CFR 1910.120(d), that include posting signage and placing barricades. All construction areas should have the appropriate signage posted. Barricades and warning signs should be placed to warn personnel of potential hazards. The RC may elect to utilize a standby person (spotter) may be utilized in place of barricades, where appropriate.

6.1 Communication

All work site personnel should be capable of communicating with other personnel at all times. It is recommended that different means of communications be utilized, including as appropriate using an air horn, walkie-talkie, cell phone, or hand signals.

6.2 Site Security

Site security is necessary to prevent the exposure of unauthorized, unprotected people to work site hazards and to avoid interference with safe working procedures. Security should be maintained outside of the actual work area(s) as to prevent unauthorized entry into the work area(s).

It is recommended that a "No Trespassing Violators Will Be Prosecuted" sign should be maintained at the entrance to the work site, with only authorized personnel allowed in this area.



6.2.1 Aggressive or Menacing Behavior

The RC should adopt procedures for situations in which personnel are confronted by an individual whose behavior becomes aggressive or menacing. Those procedures may include instructing personnel to remain as calm as possible and to avoid arguing with or physically confronting the individual, to attempt to distance yourself from the individual, and advising others in the area to leave the scene and request police assistance by having someone call 911.

6.3 Decontamination

It is recommended that the SS be responsible for ensuring that all personnel and pieces of equipment leaving the work site are properly decontaminated according to the procedures outlined below.

6.3.1 Personnel and Equipment Decontamination Procedures

All PPE should be disposed of and/or decontaminated at the conclusion of each workday. Decontamination procedures should follow the concept of decontaminating the most contaminated PPE first, along with other requirements of 29 CFR 1910.120(k).

All disposable equipment should be removed before meal breaks and at the conclusion of the workday, and should be replaced with new equipment prior to commencing work.

- All equipment and vehicles should be decontaminated or discarded upon exit. A temporary decontamination pad will be set up on-site during project operations, as needed. All decontamination materials should be drummed for subsequent disposal. Decontamination wash water will be treated through the on-site wastewater treatment system, as that system is described in the Southern Impoundment 100% RD.

7. Emergency Procedures

7.1 On-Site Emergencies

The PC or SS will likely be responsible for contacting local emergency services, if necessary, for specific emergency situations.

An Emergency Information Sheet containing the hospital location, directions, government agency phone numbers, and emergency phone numbers are located in at the front of this HASP. The contact information will need to be updated prior to commencement of Southern Impoundment RA activities.

7.2 Incident, Injury, and Illness Reporting and Investigation

Any work-related incident, injury, illness, exposure, or property loss will be required to be reported the SS, and then to the PC and the Implementing Party. Motor vehicle accidents should also be reported through this system.



Occupational incidents resulting in employee injury or illness should be investigated by the SS. This investigation may be required to include determining the cause of the incident and modifying future work activities to eliminate the hazard.

7.3 Emergency Equipment/First Aid

It is recommended that safety equipment be made available for use by site personnel, and be located within 30 feet of the work area(s), and maintained at the work site. The safety equipment may include, but is not limited to, the following:

- First Aid kit (size dependent upon the number of personnel on-site)
- Emergency eyewash bottles and/or an eyewash station
- Emergency alarms as a means to alert all personnel instantaneously for an emergency
- Fire extinguisher (at a minimum, a 2A/10BC should be on-site)

7.4 Site Evacuation

In the event of an emergency situation such as fire, explosion, or significant release of toxic gases, personnel should follow the procedures outlined in the ERP. Prior to commencement of Southern Impoundment RA activities, the RC should develop and post relevant JMPs showing the routes to the nearest hospital, urgent care facility, and storm shelter.

7.5 Spill and Release Contingencies

If a spill has occurred, the first step is personal safety, then controlling the spread of contamination, if possible. Personnel should follow the procedures outlined in the ERP.

8. Recordkeeping

The SS may be assigned responsibility for establishing and maintaining records of all necessary monitoring activities. These records may include the items listed below:

- Name and job classification of the employees involved on specific tasks
- Air monitoring/sampling results and instrument calibration logs
- Records of training acknowledgment forms (work site-specific training, safety meetings, etc.)
- Documentation of work site inspections, results of inspections, and corrective actions implemented
- Emergency reports describing any incidents or accidents

9. References

EPA, 2018. Administrative Settlement Agreement and Order on Consent for Remedial Design. U.S. EPA Region 6, CERCLA Docket. No. 06-02-18. In the matter of: San Jacinto Waste Pits Superfund



Site, Harris County, Texas. International Paper Company and McGinnes Industrial Maintenance Corporation, Respondents. April 2018.

Table 1

**Properties of Potential Site Contaminants
Health and Safety Plan
San Jacinto River Waste Pits Site
Harris County, Texas**

Chemical Name (Synonyms)	Concentration at Site	Exposure Limits	Routes Of Entry	Symptoms/Health Effects	Chemical Properties	Physical Characteristics
2, 3, 7, 8-tetrachloro-dibenzo-p-dioxin Dioxine TCDBD TCDD 2, 3, 7, 8-TCDD CAS-1746-01-6		TLV: NE PEL: NE STEL: NE IDLH: NE	Inhalation Absorption Ingestion Eye/skin contact	ACUTE: Irritation to the eyes; allergic dermatitis; gastrointestinal disturbance; CHRONIC: Chloracne; Porphyria; possible reproductive and teratogenic effects; liver and kidney damage; hemorrhage. Potential occupational carcinogen.	(FP) NE (VP) 0.000002 mm (IP) NE (UEL) NE (LEL) NE	Colorless to white, crystalline solid. (Exposure may occur through contact at previously contaminated worksites
Furfuran Divinylene oxide CAS-110-00-9		TLV: NE PEL: NE STEL: NE IDLH: NE	Inhalation Absorption	ACUTE: Irritation of the respiratory tract. May cause lung oedema. CHRONIC: May be fatal if swallowed	(FP) -35 C (VP) NE (IP) NE (UEL) 14.3% (LEL) 2.3%	Clear, colorless liquid that turns brown upon standing with a characteristic odor.
Polychlorinated Biphenyls PCB (42%) Chlorodiphenyl (42% chlorine) Aroclor 1242 CAS-53469-21-9		TLV: 1 mg/m3 [skin] PEL: 1 mg/m3 [skin] STEL: NE IDLH: 5 mg/m3	Inhalation Absorption (skin) Ingestion	ACUTE: Eye irritation. CHRONIC: Dermatitis, chloracne, liver damage.	(FP) NA (VP) 0.001 mm (IP) NE (UEL) NA (LEL) NA	Colorless to light colored viscous liquid with a mild hydrocarbon odor.
Polychlorinated Biphenyls PCB (54%) Chlorodiphenyl (54% chlorine) Aroclor 1254 CAS-11097-69-1		TLV: 0.5 mg/m3 [skin] PEL: 0.5 mg/m3 [skin] STEL: NE IDLH: 5 mg/m3	Inhalation Absorption (skin) Ingestion	ACUTE: Eye irritation. CHRONIC: Dermatitis, chloracne, liver damage.	(FP) NA (VP) 0.00006 mm (IP) NA (UEL) NA (LEL) NA	Colorless to pale yellow viscous liquid or solid (<50°F) with a mild hydrocarbon odor.

Notes:

FP	FP - Flash Point	PEL	PEL - OSHA Permissible Exposure Limit
IDLH	IDLH - Immediately Dangerous to Life and Health	STEL	STEL - Short Term Exposure Limit
IP	IP - Ionization Potential	TLV	TLV - ACGIH Threshold Limit Value
NE	NE - Not Established (Information Not Available)	VP	VP - Vapor Pressure
NA	NA - Not Applicable	C	C - Ceiling Exposure Limit
CNS	CNS - Central Nervous System	[skin]	[skin] - potential for dermal absorption
PNS	PNS - Peripheral Nervous System	mm	mm - millimeters Hg (mercury)
ppm	ppm - parts per million	eV	eV - electrovolts
mg/m3	mg/m3 - milligrams per cubic meter		

Attachment 2

Emergency Response Plan



Attachment 2 - Emergency Response Plan - Southern Impoundment

*Provided with Final 100% Remedial Design - Southern
Impoundment (Amended April 2021)*

San Jacinto River Waste Pits Site
Harris County, Texas

International Paper Company

GHD | 5551 Corporate Boulevard Suite 200 Baton Rouge Louisiana 70808 USA
11215131 | Report No 3



Table of Contents

1.	Introduction.....	1
2.	Pre-Emergency Planning	1
2.1	Coordination with Outside Parties	1
2.2	Initial Notification Procedures	2
2.3	Emergency Contacts.....	2
3.	Emergency Recognition and Prevention.....	1
3.1	Emergency Recognition.....	2
3.2	Release Prevention Measures.....	2
4.	Personnel Roles	3
4.1	Site Supervisor.....	3
4.2	Health and Safety Officer	4
4.3	On-Site Personnel.....	4
5.	Severe Weather Preparation.....	5
5.1	Re-Entry Procedure	7
5.2	Site Inspection	7
6.	Evacuation Route and Procedures	7
6.1	Minor Releases Requiring Limited Evacuation	8
6.2	Major Release Requiring Evacuation of the Work Site.....	8
6.3	Site Evacuation Route	9
6.4	Evacuation Procedures.....	9
7.	Emergency Site Security and Control	9
7.1	Delineation of Work Zones.....	10
7.2	Communication Systems	10
8.	Emergency First Aid and Medical Treatment.....	10
8.1	Emergency Medical Actions	10
8.2	First Aid	11
8.3	Emergency Numbers	11
9.	Emergency Alerting and Response Procedures for On-Site Incidents.....	11
9.1	Emergency Alerting Procedures	11
9.2	Emergency Response Procedures	12
10.	Personal Protection and Emergency Equipment	13
10.1	Personal Protective Equipment	13



Table of Contents

- 10.2 Emergency Equipment..... 13
 - 10.2.1 Air Monitoring Equipment 13
 - 10.2.2 Emergency Response Clean-Up Equipment..... 13
 - 10.2.3 Emergency Safety Equipment 13
- 11. Response Follow-Up 13
- 12. References 14



1. Introduction

This Emergency Response Plan (ERP) was prepared by GHD Services Inc. (GHD), on behalf of International Paper Company for the Southern Impoundment of the San Jacinto River Waste Pits Superfund Site in Harris County, Texas (Site). This ERP was prepared pursuant to the requirements of the Administrative Settlement Agreement and Order on Consent for Remedial Design (AOC), Docket No. 06 02 18, with an effective date of April 11, 2018 (United States Environmental Protection Agency [EPA], 2018), and in accordance with the EPA Emergency Responder Health and Safety and Occupational Safety and Health Administration (OSHA) requirements under 29 Code of Federal Regulations (CFR) 1910 and 1926. The AOC includes a Statement of Work (SOW) which requires supporting deliverables to accompany the Final 100% Remedial Design for the Southern Impoundment (Southern Impoundment 100% RD) submittal to the EPA.

Major incidents that may require emergency response could include severe weather, fire, explosion, chemical reaction, truck rollovers, off-site accidents involving transport vehicles, spills or other incidents that may pose a hazard to on-site personnel and nearby residents and/or the environment. References in this ERP to the “work site” are to the Southern Impoundment and references to “Implementing Party” are to the entity(ies) implementing the remedial action (RA) for the Southern Impoundment. Prior to initiation of Southern Impoundment RA activities, this ERP should be updated by the selected Remedial Contractor (RC).

The Site is located in Harris County, Texas, east of the City of Houston, between two unincorporated areas known as Channelview and Highlands. The Southern Impoundment is approximately 20 acres in size and is located on a small peninsula that extends south of Interstate Highway 10.

2. Pre-Emergency Planning

2.1 Coordination with Outside Parties

During any emergency events on-site, personnel may coordinate and communicate with the following authorities (as necessary):

- EPA Region 6
- Harris County Sheriff
- Channelview Fire Department
- National Response Center
- Harris County Hazardous Materials Response Team (HCHMRT)
- Texas Commission on Environmental Quality (TCEQ)
- Texas Railroad Commission (TRRC)
- Texas Department of Transportation (TxDOT)



- United States Coast Guard (USCG)
- Port of Houston Authority (POHA)

A meeting with these authorities may be requested and conducted by the Implementing Party prior to the commencement of each phase of Southern Impoundment RA activities at the work site, in order to facilitate a coordinated, integrated, and timely response for any emergencies that may occur during intrusive field activities which represent a potential for release of hazardous substances. Topics that may be discussed/reviewed at the meeting may include the following:

- Site history/historical response actions
- Nature and extent of contamination
- Nature and duration of anticipated RA field activities
- Contents of the Southern Impoundment Health and Safety Plan (HASP)
- ERP contents
- Transportation routes
- Emergency response support that can be provided by local emergency response authorities

2.2 Initial Notification Procedures

To minimize hazards to human health and safety and/or the environment, in the event of a fire, explosion, spill, or release involving a hazardous substance including oil, raw materials and by-products, or hazardous waste, it will be the responsibility of on-site personnel to immediately report any such releases to the Site Supervisor (whose role is defined in Section 4). The Site Supervisor will be responsible for implementing emergency procedures, if necessary, and for notification of appropriate project specific contacts and local emergency response authorities listed in Table 1.

2.3 Emergency Contacts

The emergency telephone numbers for the local emergency response authorities and other local, state, and federal authorities are presented in Table 1. The closest hospital to the work site is located approximately 9 miles east of the work site, in Baytown, Texas. The emergency telephone numbers and the emergency route to the hospital will be posted at the work site prior to commencement of Southern Impoundment RA activities at the work site and will be included in the Southern Impoundment HASP.



Table 1 Emergency Information

EMERGENCY INFORMATION		
Contact	Phone Number	Site Location
Local Police:	911	Southern Impoundment: 18003 Market St. Channelview, Texas 77530 (29.791692, -95.066069)
Harris County Constable	713-637-0014	
Baytown Police Department	281-422-8371	
Local Fire Department:	911	
Channelview Fire Department	281-452-5782	
Ambulance	911	
Stakeholders		
EPA Region 6	(800) 887-6063 or (214) 665-2760	
National Response Center	800-424-8802	
Harris County Hazardous Materials Response Team 24 Hour Emergency Line	800-590-0005	
Texas Commission on Environmental Quality (TCEQ)	713-767-3500	
Texas State Emergency Response Commission	800-832-8224	
Texas Railroad Commission (TRRC)	844-773-0305 or 512-463-6788	
Texas Department of Transportation (TxDOT)	800-558-9368	
United States Coast Guard (USCG)	504-589-6225	
Port of Houston Emergency Dispatch	713-670-3611	
Non-Emergency Dispatch	713-670-3620	

3. Emergency Recognition and Prevention

This section describes the methods and procedures that may be used to recognize and prevent or minimize the adverse effects of any releases of hazardous substances that may occur at the work site during implementation of the Southern Impoundment RD.



3.1 Emergency Recognition

Procedures will be put in place so that on-site personnel will be prepared to recognize and report to the Site Supervisor any incident (e.g., fire, explosion) or releases of hazardous substances which may endanger human health and safety or the environment. Specifically, when personnel discover such an incident or release of a hazardous substance, the procedures that on-site personnel would be instructed to follow would include the following:

- Report the incident/release to the Site Supervisor.
- The Site Supervisor will determine if the incident/release represents an emergency and, if so, will immediately notify a person to be designed by the Implementing Party or the RC and designated as the project coordinator (or equivalent) for the Southern Impoundment RA (Project Coordinator) and local emergency response authorities, if necessary.

The procedures would also address plans so that personnel in the affected area(s) will immediately evacuate the area of release or the work site in accordance with the "Evacuation Procedures," presented in Section 6.

3.2 Release Prevention Measures

The following procedures/measures may be implemented at the work site to prevent potential releases of or minimize the impact of releases of hazardous substances during the Southern Impoundment RA:

- All potential hazardous substances (i.e., diesel fuel, etc.) will be stored in vessels with adequate secondary containment should a spill occur.
- All potential contaminated substances generated during activities (i.e., impacted soils, dewatering fluids, decontamination fluid, used PPE, etc.) will be placed onto the appropriate staging pads or placed in compatible containers.
- The Site Supervisor will be accountable for hazardous substances spill/release prevention, and is responsible for properly instructing on-site personnel in the operation and maintenance of equipment to prevent the discharges of hazardous substances.
- A supply of spill/release response materials and emergency safety equipment should be stored at the work site during activities to immediately respond to releases/emergencies.
- On-site personnel will be trained, consistent with the level of their responsibilities and in accordance with 29 CFR 1910.120(q)(6), so that they are capable of providing immediate response in order to contain and/or mitigate spills and releases.
- If necessary, a meeting is to be conducted with local emergency response authorities in order to facilitate a coordinated, integrated, and timely response for any emergencies that on-site personnel are unable to contain and/or control.



4. Personnel Roles

This section of the ERP describes, for purposes of the Southern Impoundment RA, the various personnel roles, responsibilities, and the lines of authority that individuals may be assigned and communication procedures that may be followed by on-site personnel involved in responses to incidents or emergencies.

4.1 Site Supervisor

The Site Supervisor (or equivalent) will be assigned responsibility for implementing on-site emergency response procedures and directing the on-site and emergency personnel. All on-site personnel and their communications would be coordinated through the Site Supervisor. Specific duties of the Site Supervisor in the case of an incident may include the following:

- Initially identify the source and character of the incident and the type and quantity of any release (if applicable). Assess possible hazards to human health or the environment in consultation with the Health and Safety Officer (as defined in Section 4.2) that may result directly from the incident.
- If the incident may threaten human health or safety of on-site personnel, immediately determine whether evacuation of the work site is necessary in consultation with the Project Coordinator and EPA Remedial Project Manager (RPM).
- If the incident does not threaten human health or safety of on-site personnel or nearby residents or the environment, determine if on-site personnel can contain or control the incident or release. If not, notify local emergency response authorities identified above in Table 1.
- Direct on-site personnel to control the incident or release until, if necessary, outside emergency response help arrives. Specifically ensure that the location where the incident/release occurred and the surrounding area are evacuated and all operations in the vicinity of the incident are discontinued to ensure that fire, explosions, or spills do not spread. Direct work site personnel not involved in emergency response actions to avoid the area of the incident and leave emergency control procedures unobstructed and ensure protected personnel are on standby for emergency rescue, if necessary.
- Determine, in consultation with the Health and Safety Officer, when the emergency has passed and initiate an "all clear" signal to notify on-site personnel of such.
- Ensure that all emergency equipment used is decontaminated, recharged, and/or fit for its intended use before work site operations are resumed.
- Record time, date, and details of the incident, and submit a written incident report to the EPA within 20 days of the release, if the release is at or above reportable quantities.
 - Per regulations developed under the CERCLA of 1980 (Superfund), a spill/release of one pound or more of any hazardous substance for which a reportable quantity has not been established and which is listed under the Solid Waste Disposal Act, Clean Air Act, Clean Water Act, or Toxic Substances Control Act (TSCA), may require reporting.



4.2 Health and Safety Officer

This individual will be responsible for identifying and evaluating actual and potential hazards and provide oversight of emergency response actions with respect to the safety of operations being conducted. The Health and Safety Officer will likely report directly to the Site Supervisor. Specific duties of the Health and Safety Officer may include:

- Conduct an initial assessment of the emergency situation to identify chemical(s) and potential physical hazard(s) of the emergency response actions.
- Perform necessary air monitoring to determine levels of exposure and necessary protective equipment for emergency personnel and evaluate the potential for off-site migration of airborne contaminants.
- Present a safety briefing to on-site personnel to inform them of the actual and potential hazards of the emergency response and required levels of personnel protective equipment.
- Identify use of any engineering controls, (e.g., ventilation, remote handling devices, etc.), to control overexposure of personnel to hazardous substances.
- Identify work zones to be established by on-site personnel.
- Investigate any injuries or illnesses as a result of accidents occurring during the emergency response.
- Observe the safety of clean-up activities and ensure appropriate PPE requirements are being adhered to.
- Determine when it is safe for personnel to return to the affected area after emergency response action are completed.
- Maintain a log of safety briefings, air monitoring, safety observations, and other important issues relevant to safety.

4.3 On-Site Personnel

The Site Supervisor will be responsible for directing the on-site personnel in emergency response operations. Specific steps that the Site Supervisor may take in directing on-site personnel are described below.

The on-site personnel will be instructed to respond initially to all emergency incidents. Priorities of on-site personnel will be to protect human health and safety of on-site personnel and nearby residents, and then the environment. Concentration will be placed on preventing the spill/release from spreading to nearby areas. Specific duties of the on-site personnel may be as follows:

- Clear the area of all personnel not actually involved in responding to the emergency, and remove any injured persons from the area such that medical treatment can be administered by qualified first-aid trained personnel.
 - Prior to allowing treatment of injured persons by first-aid trained personnel, decontamination of the injured persons will be performed. On-site personnel will be



responsible for ensuring that the level of decontamination reflects the extent of injury and level of contamination.

- Establish appropriate work zones for emergency response as directed by the Health and Safety Officer.
- Control the incident or release at the direction of the Site Supervisor, until, if necessary, outside emergency response help arrives.

The Site Supervisor may appoint or designate, as necessary, on-site personnel to assist in the following efforts:

- Notification of local emergency response authorities.
- Site evacuation and accounting of personnel and visitors.
- Assuring that personnel not involved in the emergency response and/or clean-up activities are kept a safe distance from the area and do not interfere with operations.
- Maintaining on-site traffic lanes for emergency response vehicles.
- Sampling efforts to determine the extent of contamination and clean-up efforts, if appropriate.
- Proper containerization, labeling and staging of any recovered hazardous substances, if appropriate.
- Assisting in decontaminating, recharging, or replacing all emergency equipment used during the emergency response.
- Assisting in returning personnel to their work areas after the "all clear" signal is given.

5. Severe Weather Preparation

The Site Supervisor will adopt procedures to monitor weather and river levels, along with any Hazardous Weather Outlooks for the surrounding areas. The Site Supervisor will also adopt procedures to be followed in the event that a severe weather or tornado watch or warning is issued by the National Weather Service, which may include directing on-site personnel to shelter areas, which will be determined prior to the Southern Impoundment RA. Routes to shelters will be included in the Southern Impoundment HASP.

As detailed in the Southern Impoundment 100% RD, it is anticipated that Southern Impoundment RA activities will be conducted in the months of the year with a lower likelihood for hurricanes and tropical storms, but there could be exceptions in which activities take place during the remaining months of the year. There would be defined preparation phases to address situations involving severe weather, a tropical depression, tropical storm, or a hurricane that is anticipated to make landfall in the general vicinity of the work site based on the National Hurricane Center advisories. Four phases and associated procedures that may be adopted to protect the work site and personnel in the event of severe weather are described below.



Phase I Preparation

Phase I preparations would be for expected severe weather events, including heavy rains with potential localized flooding, in the southeast Texas vicinity and will affect the Channelview Area within 96 hours. In the event of a Phase I scenario, the Site Supervisor would execute the following steps:

- Monitor the weather forecast for updated predictions
- Consider suspending all non-essential work site activities and deliveries and covering any open excavations
- List all work necessary to control loose materials/equipment from potential damage (water or wind)
- Verify that all supplies needed to secure the work site are available

Phase II Preparation

Phase II preparations would be for an expected tropical depression, tropical storm, or hurricane landfall in the southeast Texas vicinity which is predicted to have up to 50 miles per hour (mph) winds and will affect the Channelview Area within 96 hours. In the event of a Phase II scenario, the Site Supervisor would execute the procedures outlined in Phase I and, in addition, execute the following:

- Suspend all non-essential work
- Consider timing of a complete suspension of work and for covering of any open excavations
- Secure or remove equipment that could be damaged by the storm (i.e., small totes, drums, vehicles, monitoring instruments, etc.)

Phase III Preparation

Phase III preparations would be for an expected tropical depression, tropical storm, or hurricane landfall in the southeast Texas vicinity which is predicted to have up to 50 mph winds and will affect the Channelview Area within 84 hours. In the event of a Phase III scenario, the Site Supervisor would follow the procedures outlined in Phases I and II and, in addition, execute the following:

- Cancel all deliveries
- Suspend all work and shutdown and move equipment off-site, as necessary
- Take all records off-site
- Backfill any open excavations using available on-site material or clean backfill

Phase IV Preparation

Phase IV preparations would be for an expected tropical depression, tropical storm, or hurricane landfall in the vicinity of southeast Texas which is predicted to affect the Channelview Area within 72 hours. In the event of a Phase IV scenario, the Site Supervisor would follow the procedures outlined in Phases I, II, and III and, in addition, execute the following:



- Evacuate all personnel from the work site
- Suspend all work activities and move equipment off-site, to the extent that has not already been done under Phase III, until the Site Supervisor, in coordination with the Project Coordinator and EPA RPM, determines the work site is safe for re-entry

5.1 Re-Entry Procedure

The Health and Safety Officer, in coordination with the Project Coordinator and Implementing Party, will be responsible for determining the appropriate time for personnel to return to the work site. Site personnel will not be permitted to access the work site until the Site Supervisor approves entry.

Federal, state, and local government agencies and law enforcement officials have agreed to recognize specific identification from critical infrastructure owners and operators, and their contractors, subcontractors, and assignees that seek access into a closed emergency area. Once identity has been verified, access is granted at the discretion of agency or official representatives (e.g., law enforcement, National Guard). A valid State Driver's License and/or employer-issued photo ID and/or Transportation Worker Identification Credential (TWIC) Card may be required to gain access at checkpoints.

Once the local authorities have granted access, the Site Supervisor, in coordination with the Implementing Party, can then determine the appropriate time for personnel to return to the work Site.

5.2 Site Inspection

Once it is determined that the work site is safe to access, it is anticipated that specific personnel selected by the Site Supervisor will mobilize to the work site to complete a post-severe weather site inspection. The Site Supervisor will be responsible for determining how such personnel should document work site conditions, including with photographs and field notes. In addition, the Site Supervisor may have such personnel note any damage or impact to materials or equipment, determine approximate high water levels, and/or obtain relevant information from any local residents that may have stayed in the area during the storm. The Site Supervisor will also be responsible to, if necessary, direct personnel to prepare a site inspection report for submittal to the EPA.

6. Evacuation Route and Procedures

Emergencies require prompt and deliberate action. In the event of a hazardous substance spill/release, it will be necessary for the RC's personnel and other persons present at the work site to follow an established set of procedures consistent with OSHA requirements in 29 CFR 1910.120(b)(4)(ii)(J) and (j)(1)(viii). The procedures that are established should be followed as closely as possible, with the understanding that, in specific emergency situations, the Site Supervisor may deviate from the procedures to provide a more effective plan for bringing the situation under control. The Site Supervisor will be responsible for determining which situations require evacuation of the work site.



This section describes procedures which may be employed to address potential exposures of on-site personnel and persons in the vicinity of the work site to hazardous conditions arising out of spills/releases of hazardous substances at the work site. It is anticipated that no single defined route can be identified for evacuation or safe distances due to the nature of the work, and that safe distances will only be determined at the time of an emergency, based on a combination of work site and incident conditions. However, the following measures are provided to serve as general guidelines. Table 2 below addresses the criteria for releases.

Table 2 Criteria for Hazardous Substances Spill/Release Incidents

Release Classification	Criteria
Minor Release	<ul style="list-style-type: none">• Low toxicity compound spill > 1 barrel (bbl) outside secondary containment, or ≥ 5 bbl inside secondary containment, unless it impacts or potentially impacts state or marine waters• Single handheld detector with a lower explosive limit (LEL) reading ≥ 50 percent• Smoke Investigation
Major Release	<ul style="list-style-type: none">• High toxicity compound spill impacting or potentially impacting state or marine waters• Fire or Explosion• Hazardous substances release with off-site potential

6.1 Minor Releases Requiring Limited Evacuation

As part of the procedures applicable in the event of minor releases (small spills of low toxicity) of hazardous substances, personnel may be directed to evacuate the immediate area and report to the Contaminant Reduction Zone (CRZ). The CRZ will be determined by the RC and Implementing Party prior to the Southern Impoundment RA. Low toxicity may be defined for this purpose as a compound having an Animal LD₅₀ greater than 50 milligrams/ kilograms (mg/kg). A signal to evacuate a limited area in the case of a minor release will be established, such as one short blast using an air horn or verbal communication. Small spills or leaks from a container will require initial evacuation of an area, potentially at least 35 feet in all directions, to allow for clean-up and to prevent exposure.

After initial assessment of the extent of the release and potential hazards, the Site Supervisor, in consultation with the Health and Safety Officer, will determine the specific boundaries for evacuation. Appropriate steps such as caution tape, rope, traffic cones, or barricades would be used to secure the boundaries.

6.2 Major Release Requiring Evacuation of the Work Site

As part of the procedures applicable in the event of a major hazardous substance release (large spills of high toxicity), personnel may be directed to evacuate the work site. High toxicity may be defined for this purpose as a compound having an Animal LD₅₀ less than 50 mg/kg. A signal to notify on-site personnel to evacuate the work site in case of major releases requiring evacuation of the work site will be established prior to the Southern Impoundment RA. Site evacuation would be initiated by the Site Supervisor, in consultation to the extent practical, with the Project Coordinator,



the Implementing Party, and the EPA RPM. However, if necessary, the Site Supervisor would initiate work site evacuation, as necessary, to protect the health and safety of on-site personnel.

6.3 Site Evacuation Route

As part of the procedures governing evacuation of the work site, muster points and evacuation routes for the work site will be identified. The routes should be addressed during safety meetings, including any changes to such routes due to changing work site conditions, work activities, and weather factors. A secondary evacuation route would also be identified during the safety meeting.

6.4 Evacuation Procedures

As part of the procedures to be followed in the event work site evacuation is necessary, it is recommended that the following actions (or similar) be undertaken:

- The signal for work site evacuation should be activated.
- No further entry of visitors, contractors, or trucks will be permitted. Vehicle traffic within the work site should cease to allow safe exit of personnel and movement of emergency equipment.
- **ALL** personnel, visitors, and contractors should immediately leave through the identified primary or secondary evacuation route.
- No persons will remain or re-enter the work site unless to carry out their emergency duty procedures. Those within the work site area will normally only include emergency response personnel or other emergency teams (e.g., fire department).
- Immediately upon exit, **ALL** personnel, visitors, and contractors should be accounted for by the Site Supervisor or designee.
- The names of emergency response team members and/or other emergency team members involved in emergency response should be reported to the Site Supervisor.
- Re-entry into emergency areas, to find persons not accounted for should not be attempted.
- Re-entry into the work site will be made only after an "all clear" signal is given by the Site Supervisor. At his/her direction, a signal or other notification will be given for re-entry into the work site.

7. Emergency Site Security and Control

The Site Supervisor will put in place security measures to be followed in the event of an emergency. Implementation of security procedures should begin with the notification that an emergency has occurred. If it is necessary to evacuate personnel from the work site or an area within the work site, security measures would be implemented to safely remove personnel and to secure the area from re-entry, to prevent or minimize the exposure of unprotected personnel to work site hazards and avoiding interference with emergency response actions. As part of those measures, on-site personnel should be instructed to immediately take steps to secure the spill/release area and



establish safe boundaries (i.e., work zones). This may include, if necessary, establishing the following three work zones at the direction of the Health and Safety Officer:

- Support Zone (SZ) - The uncontaminated area where emergency response personnel should not be exposed to hazardous conditions
- Contaminant-Reduction Zone (CRZ) - The area where decontamination takes place
- Exclusion Zone (EZ) - The contaminated area/emergency response area

7.1 Delineation of Work Zones

The location of these three zones would be pre-determined, based on, to the extent applicable, sampling and monitoring results, expected work activities, and potential routes and extent of contamination dispersion in the event of a release. Procedures should be adopted to minimize movement of personnel and equipment among these zones, to restrict to access control points to prevent cross contamination from contaminated areas to clean areas, and to clearly mark work zones, including by lines, placards, hazard tape, construction cones and/or signs, or enclosed by physical barriers such as fences or ropes.

7.2 Communication Systems

A system of communication should be established at the hazardous substance spill/release scene. The communication system would address both internal communication among on-site personnel and external communication between on-site and off-site personnel.

The Site Supervisor will be responsible for determining the proper methods of communication at the work site. The Site Supervisor will also be responsible for instructing all on-site personnel on the use of the selected communication methods.

8. Emergency First Aid and Medical Treatment

During the Southern Impoundment RA, it is anticipated that any personnel requiring emergency medical attention would be evacuated immediately from EZs and CRZs and that personnel will be instructed not enter such area to attempt a rescue if their own lives would be threatened. The decision whether or not to decontaminate a victim prior to evacuation in such a situation will be based on the type and severity of the illness or injury and the nature of the contaminant. Personnel would be instructed that if decontamination does not interfere with essential treatment, it should be performed.

8.1 Emergency Medical Actions

If actual or suspected serious injury occurs, it is recommended that these steps be followed:

- Remove the exposed or injured person(s) from immediate danger
- First aid to be rendered at on-site personnel discretion. Decontaminate affected personnel after critical first aid is given



- Notify Site Supervisor and Health and Safety Officer of the incident.
- Obtain emergency medical services or ambulance transport to the hospital. Routes to the nearest hospital and urgent care facility will be included in the HASP and posted on the work Site.
- Other personnel in the work area will be evacuated to a safe distance until the Health and Safety Officer determines that it is safe for work to resume. If there is any doubt regarding the condition of the area, work shall not commence until all hazard-control issues are resolved.

8.2 First Aid

Qualified personnel may give first aid at their discretion and stabilize an individual needing assistance. Professional medical assistance should be obtained at the earliest possible opportunity.

8.3 Emergency Numbers

In the event of an emergency medical incident the telephone numbers provided in Table 1 should be available to be used to summon assistance.

9. Emergency Alerting and Response Procedures for On-Site Incidents

In the event of an emergency involving an on-site hazardous substance spill or release, the general procedures that be may be used for rapid and safe response and control of the situation may include those identified below.

9.1 Emergency Alerting Procedures

If on-site personnel discover a chemical spill or a vapor or substance release, they should immediately notify the Site Supervisor. When contacted, the Site Supervisor should obtain information pertaining to the following, to the extent applicable:

- The substance spilled or released.
- Location of the release or spillage of hazardous substance.
- An estimate of quantity released and the rate at which it is being released.
- The direction in which the spill/release or vapor or smoke release is heading.
- Any injuries involved.
- Fire explosion or chemical reaction or possibility of these events.
- The area and substances involved and the intensity of the fire or explosion.

This information will then be used by the Site Supervisor to assess the magnitude and potential severity of the spill or release.



9.2 Emergency Response Procedures

The initial response to any emergency should be to protect human health and safety, and then the environment. Other steps, such as identification, containment, treatment, and disposal assessment, should be considered as part of the secondary response.

Emergency response procedures may include the measures described below:

If a spill/release occurred that was not contained within a dike or sump area (e.g., drum staging area or decontamination pad), an area of isolation should be established around the spill/release. The size of the area should be established depending on the size of the spill/release and the substances involved.

If the spill/release results in the formation of a toxic vapor cloud (by outbreak of fire or other), further evacuation may be required, based on isolation directions that have been established prior to the initiation of work activities for Southern Impoundment RA. A decision may be made to modify the scope of the evacuation based on air monitoring performed by the Health and Safety Officer.

If the control and clean-up of a spill or release is determined to be within the capabilities of the on-site personnel and to not threaten human health or safety of on-site personnel or nearby residents, local emergency response authorities may not be notified. A decision on notifications to local emergency authorities would be made by the Site Supervisor, and in consultation with the Implementing Party and EPA RPM, if practicable.

Any release occurring from drums or other containers containing solid wastes should be placed into approved containers and should be labeled as to its contents and transferred to the on-site staging area pending treatment and/or off-site disposal.

In the event of spilled liquid, the spilled liquids should be confined to the immediate area of the spill and the liquids may be pumped, with the use of a portable hand pump, into an overpack drum or tank (or similar container) or absorbed with an inert absorbent. The spilled liquids should be confined by implementing steps such as diking around the spill with native material or with an inert absorbent. Containers containing such materials should be appropriately labeled as to contents and transferred to an on-site drum staging area pending treatment and/or off-site disposal. In some situations, such as if the spilled liquid consisted of non-aqueous phase liquids (NAPL) or decontamination water, additional steps may be required to address the spilled substance and visibly affected soils.

The Site Supervisor is designated responsibility for determining whether spill or release is not within the capabilities of the on-site personnel or for other reasons should be immediately reported to the 911 dispatcher. In that situation, the Site Supervisor will have responsibility for initiating evacuation of potentially affected work site areas.



10. Personal Protection and Emergency Equipment

10.1 Personal Protective Equipment

Emergency response personnel entering an EZ for emergency spill/release response should, depending on the task and exposure potential, be required to wear an appropriate protection level as determined by the RC and Implementing Party and as directed by the Health and Safety Officer.

10.2 Emergency Equipment

Emergency equipment will need to be available for deployment during emergencies/releases of hazardous substances if needed. That emergency equipment may include the equipment discussed below.

10.2.1 Air Monitoring Equipment

The RC will determine which direct reading instrumentation will be used in emergency situations to assess the degree of environmental hazard prior to the Southern Impoundment RA. The equipment to be used for air monitoring is further discussed in the Southern Impoundment RD Site-Wide Monitoring Plan.

10.2.2 Emergency Response Clean-Up Equipment

A sufficient supply of emergency response clean-up equipment should be maintained at the work site to be used for spill/release control. The RC will determine which emergency response clean-up equipment should be used in for spill/release control prior to the commencement of activities at the work site as part of the Southern Impoundment RA.

10.2.3 Emergency Safety Equipment

It is recommended that the following equipment, at a minimum, be staged at the work site, during active Southern Impoundment RA activities, to provide for safety and first aid:

- Air horn
- Additional PPE equipment
- Potable water
- OSHA approved first aid kit sized for a minimum of ten people
- Portable emergency eyewash
- 20-pound ABC type dry chemical fire extinguishers (one per each piece of heavy equipment)

11. Response Follow-Up

Following all emergency response actions and activation of this ERP, it is recommended that the Site Supervisor adopt response follow-up procedures that include conducting a debriefing session



for all key individuals involved to evaluate the response and revisions to ERP, if necessary. The follow-up procedures may address the need for and responsibility for preparation of an incident report.

12. References

EPA, 2018. Administrative Settlement Agreement and Order on Consent for Remedial Design. U.S. EPA Region 6, CERCLA Docket. No. 06-02-18. In the matter of: San Jacinto Waste Pits Superfund Site, Harris County, Texas. International Paper Company and McGinnes Industrial Maintenance Corporation, Respondents. April 2018.

Attachment 3

Pre-Construction Field Sampling Plan

Attachment 3 - Pre-Construction Field Sampling Plan - Southern Impoundment

*Provided with Final 100% Remedial Design - Southern
Impoundment (Amended April 2021)*

San Jacinto River Waste Pits Site
Harris County, Texas

International Paper Company

GHD | 5551 Corporate Boulevard Suite 200 Baton Rouge Louisiana 70808 USA
11215131 | Report No 3



Table of Contents

1.	Introduction.....	1
1.1	Overview of Pre-Construction Sampling.....	1
2.	Pre-Mobilization Activities	2
3.	Pre-Construction Confirmation Sampling Plan	3
3.1	Overburden Confirmation Sampling	3
3.2	Sidewall Confirmation Sampling	4
3.3	Bottom of Excavation Confirmation Sampling	4
3.4	Confirmation Sampling Summary	5
4.	Composite Sample Preparation	5
4.1	Quality Assurance/Quality Control (QA/QC).....	6
5.	Waste Characterization Sampling	6
6.	Pre-Construction Assessment of Water Volumes to Be Managed During Excavation	7
6.1	Pre-Construction Field Program	7
6.2	Pre-Construction Water Sampling	7
6.3	Piezometers and Monitoring Well Plug and Abandonment	8
7.	Data Validation, Quality Control, and Reporting	8
8.	Health and Safety.....	8
9.	Investigation Derived Wastes.....	9
10.	References	9

Figure Index

Figure 1	Overall Site Plan
Figure 2	Northeast Excavation Area Overburden Sampling Plan And Section
Figure 3	Confirmation Sampling Example Cross-Sections

Table Index

Table 1	Northeast Excavation Area Confirmation Composite Samples
Table 2	North Central Excavation Area Confirmation Composite Samples
Table 3	South Central Excavation Area Confirmation Composite Samples
Table 4	Southwest Excavation Area Confirmation Composite Samples



Attachment Index

Attachment 1 Pre-Construction Confirmation Borings Drawings



1. Introduction

This Pre-Construction Field Sampling Plan (PC FSP) was prepared by GHD Services Inc. (GHD), on behalf of International Paper Company, for the Southern Impoundment of the San Jacinto River Waste Pits Site in Harris County, Texas (Site). This PC FSP was prepared in conjunction with the Final 100% Remedial Design for the Southern Impoundment (Southern Impoundment 100% RD) to describe planned pre-construction sampling activities at the Southern Impoundment as part of the Southern Impoundment remedial action (RA).

The Southern Impoundment RA involves excavation and removal of approximately 24,600 cubic yards (cy) of 2,3,7,8-tetrachlorinated dibenzo-p-dioxin (dioxin) Toxicity Equivalent for Mammals (TEQ_{DFM}) impacted material to a maximum depth of 10 feet below ground surface (ft bgs). As part of excavation activities, approximately 22,900 cy of overburden located above the delineated zone of impact within each excavation area will be removed and stockpiled for re-use as backfill after impacted soils beneath the overburden has been excavated. The delineated zone of impact for each polygon or other excavation area consists of one or more 2-ft vertical intervals to be removed during excavation.

Figure 1 depicts the four excavation areas that will be part of the Southern Impoundment RA activities. These four areas have been delineated based upon data from the Remedial Investigation (RI), conducted in 2011 and 2012, and the Pre-Design Investigation (PDI), conducted in 2018 and 2019. Each excavation areas has been divided into polygons of a half an acre or less which correspond to the results of a boring from the PDI or RI which exceeded the 240 ng/kg TEQ_{DF,M} clean-up level on a depth-weighted average (DWA).

References in this PC FSP to the "work site" are to the Southern Impoundment and references to "Implementing Party" are to the entity(ies) implementing the RA for the Southern Impoundment.

1.1 Overview of Pre-Construction Sampling

To fully determine the vertical extent of overburden above the delineated zone of impact and the horizontal and vertical extent of impacted soils, a pre-construction confirmation sampling event will be conducted by a RC selected by the Implementing Party. The sampling event will take place in advance of excavation and removal activities.

This PC FSP identifies sample collection procedures, analytical techniques, and handling methods associated with the pre-construction confirmation sampling. A cross-section illustrating the locations of the overburden and sidewall samples relative to each other and to the side slopes is shown on Figure 2. A cross-section illustrating the different types of samples to be collected is shown on Figure 3.

The sample locations for the four excavation areas (Northeast [NE], North Central [NC], South Central [SC], and Southwest [SW]) are presented on the following drawings in Appendix D to the



Southern Impoundment 100% RD, copies of which are included as part of this PC FSP as the Pre-Construction Confirmation Borings Drawings (Attachment 1):

- Drawing C-07 - NE Excavation Area Overburden Sampling Plan
- Drawing C-08 - NE Excavation Area Sidewall Sampling Plan
- Drawing C-09 - NE Excavation Bottom of Excavation Sampling Plan
- Drawing C-15 - NC Excavation Area Overburden Sampling Plan
- Drawing C-16 - NC Excavation Area Sidewall Sampling Plan
- Drawing C-17 - NC Excavation Bottom of Excavation Sampling Plan
- Drawing C-23 - SC Excavation Area Overburden Sampling Plan
- Drawing C-24 - SC Excavation Area Sidewall Sampling Plan
- Drawing C-25 - SC Excavation Bottom of Excavation Sampling Plan
- Drawing C-31 - SW Excavation Area Overburden Sampling Plan
- Drawing C-32 - SW Excavation Area Sidewall Sampling Plan
- Drawing C-33 - SW Excavation Bottom of Excavation Sampling Plan

In addition to the pre-construction confirmation sampling, samples of the waste material will also be collected and analyzed for off-site disposal waste characterization. These samples will be collected at a frequency (per volume of waste material) specified by the selected off-site disposal facility. In addition, data will be also collected to be used in refining the volume of wastewater to be treated by the waste water treatment system for the Southern Impoundment RA. Four temporary piezometers will be installed to assess the hydraulic conductivity of the materials within the Southern Impoundment to better understand the expected infiltration rates of both perched water and groundwater that could be encountered during excavation activities. Data obtained will be used to refine the water volume estimates used for both temporary storage and treatment rates in the Southern Impoundment RA.

2. Pre-Mobilization Activities

Prior to the commencement of sampling activities, any notifications required under access agreements required in order perform the Southern Impoundment RA will be given. Any required notifications would also be provided to the United States Environmental Protection Agency (EPA) prior to the planned field event.

The Texas 811 call before you dig system will be initiated three days prior to drilling activities and a thorough work site reconnaissance will be completed prior to commencing field activities. The drilling locations will be evaluated for underground and overhead utilities, as well as any other obstructions, in accordance with standards established by the Implementing Party.



3. Pre-Construction Confirmation Sampling Plan

Three different types of confirmation samples will be collected pursuant to this PC FSP:

- Overburden soils that are to be placed back in the excavations will be sampled to ensure that dioxin concentrations after replacement of the overburden meet the established 240 ng/kg TEQ_{DF,M} clean-up level on a DWA.
- Sidewall samples will be collected to confirm that the lateral extent of impacted soils have been defined for purposes of removal.
- Bottom of excavation samples will be collected to confirm the vertical extent of impact has been defined (down to the maximum 10-foot depth bgs).

The Pre-Construction Confirmation Borings Drawings included in Attachment 1 focus on each of the four excavation areas. The area shaded in green is where excavation is required, based upon PDI and RI data. The bold lines outline the excavation polygons defined by the associated PDI or RI soil boring. The hashed lines indicate the overlain sampling grids of approximately 500 cy of volume to be used for overburden sampling.

3.1 Overburden Confirmation Sampling

Overburden samples will be collected during the pre-construction confirmation sampling event based upon the expected extent of overburden, as defined by RI and PDI data. Each polygon that is defined by a PDI or RI sample boring has been divided into approximately 500 cy confirmation sampling grids. The intent is to collect a 5-point (or more) composite sample from each grid for analysis, with individual samples to be collected over the vertical and horizontal extent of the 500 cy volume. This approach will allow for full delineation of the location and the volume of reusable overburden prior to construction, so that the designated overburden can be immediately replaced in an excavation after the material from the delineated zone of impact has been removed.

The depth/thickness of the overburden in each sampling grid will determine how many borings are installed in that grid to provide a representative sample. As the overburden thickness can range from 0 to 8 feet above the zone of impact, the following bullets describe how each of these 2-ft depth intervals will be sampled and composited:

- In sampling grids where the depth of overburden is 2 feet, five individual borings would be installed, with the composite sample consisting of soils collected from 0 to 2 ft bgs at each boring resulting in a 5-point composite.
- In sampling grids where the depth of overburden is 4 feet deep, three borings would be installed, with the composite sample consisting of both 0 to 2 ft bgs and 2 to 4 ft bgs at each boring resulting in a 6-point composite.
- In sampling grids where the depth of overburden is 6 feet deep, two borings would be installed, with the composite sample consisting of 0 to 2 ft bgs, 2 to 4 ft bgs, and 4 to 6 ft bgs at each boring resulting in a 6-point composite.



- In sampling grids where the depth of overburden is 8 feet deep, two borings would be installed, with the composite sample consisting of 0 to 2 ft bgs, 2 to 4 ft bgs, 4 to 6 ft bgs, and 6 to 8 ft bgs at each boring resulting in an 8-point composite.

The samples required to create the overburden confirmation composite samples for each of the four excavation areas are detailed in Tables 1 through 4, respectively. The overburden pre-construction confirmation sample locations are shown in the design drawings (C-07, C-15, C-23, and C-31), included in Attachment 1. The depth intervals in the tables are denoted as 'a' for 0 to 2 ft bgs, 'b' for 2 to 4 ft bgs, 'c' for 4 to 6 ft bgs, 'd' for 6 to 8 ft bgs, and 'e' for 8 to 10 ft bgs.

3.2 Sidewall Confirmation Sampling

Sidewall samples will also be collected during the pre-construction sampling event. All planned borings around the perimeter of the excavation area will be sampled for sidewall confirmation in the same locations at which overburden confirmation samples will be collected (as discussed in the previous section). Each sidewall composite sample will be sampled at 2-ft depth intervals and composited into one vertical composite sample. It is anticipated that sidewall borings around the perimeter of the four excavation areas will be installed first and the samples will be put on a rush turnaround time with the Approved Laboratory. Results from these samples will determine if step-out locations need to be added to fully delineate the horizontal extent of material for excavation.

For sidewall composite sampling, each of the borings located at the outer edges of the excavated polygons within the various sampling grids will be sampled at 2-ft bgs intervals to a total depth of 10 ft bgs, with the five 2-ft samples composited into one sample for each boring. Using the same sample nomenclature as previously described for overburden sampling, a composite sidewall sample would consist of individual soil samples labeled as A1a, A1b, A1c, A1d, and A1e (for a 5-point composite that would be collected over the entire 10-ft depth of the boring). Where the individual 2-ft sample intervals for sidewall sampling are the same as those identified for overburden sampling, the 2-ft sample core would be split in advance of compositing in accordance with the procedure for doing so in Section 4.

The samples required to create the sidewall confirmation composite samples for each of the four excavation areas (NE, NC, SC, and SW) are detailed in Tables 1 through 4, respectively. The locations of the samples are shown in the design drawings (C-08, C-16, C-24, and C-32), included in Attachment 1.

3.3 Bottom of Excavation Confirmation Sampling

For bottom of excavation pre-construction confirmation sampling, many of the same borings as used for overburden confirmation would be extended to collect samples at depths below the impacted zone. Where the bottom of excavation is less than 10 feet, samples would be collected from the 2-ft depth interval directly below the bottom depth of the zone of impact to verify that the soils below the bottom depth of the excavation have dioxin concentrations below 240 ng/kg TEQ_{DF,M} DWA. At least one 5-point composite sample will be taken from every polygon.

The samples required to create the bottom of excavation confirmation composite samples for each of the four excavation areas (NE, NC, SC, and SW) are detailed in Tables 1 through 4, respectively.



The locations of the samples are shown in the design drawings (C-09, C-17, C-25, and C-33), included in Attachment 1.

3.4 Confirmation Sampling Summary

Pre-construction confirmation sampling is required as part of the Southern Impoundment RA and prior to the commencement of excavation activities at the Southern Impoundment to better understand the following:

- The volume and extent of overburden available for reuse
- The horizontal extent of the impacted material
- The vertical extent of the impacted material (to a maximum depth of 10 ft bgs)

The pre-construction confirmation sampling plan includes a total of 202 confirmation boring locations, 26 borings in the NE excavation area, 62 borings in the NC excavation area, 51 borings in the SC excavation area, and 63 borings in the SW excavation area.

Tables 1 through 4 detail the pre-construction confirmation composite samples (overburden, sidewall, and bottom of excavation) for each of the four excavation areas. These tables identify a total of 160 composite samples to be analyzed, 25 samples in the NE excavation area, 49 samples in the NC excavation area, 37 samples in the SC excavation area, and 49 samples in the SW excavation area.

The majority of the submitted composite samples will be 5-point composites, but there are circumstances where the composites may be 4-point, or as many as 9-point composites.

4. Composite Sample Preparation

The pre-construction confirmation soil borings will be installed using direct-push drilling methodology. The collection of composite samples from the various installed borings within each polygon/sampling grid could potentially use the same 2-ft bgs depth interval for both horizontal compositing (overburden or bottom of excavation) and vertical compositing (sidewall sampling). In order to ensure that the sample collected from a specific depth interval is properly divided for both horizontal and vertical compositing, the following procedure will be followed:

- Place each 2-foot soil sample in separate stainless steel bowl
- Break up the 2-foot long soil core and create a homogenous mix
- Separate the homogenous soil mixture into two distinct halves
- Half of each bowl will be designated for the horizontal (overburden or bottom) composite
- The other half will be designated for the vertical (sidewall) composite
- Five (or more) half mixtures will be combined for a horizontal composite
- Five (or more) half mixtures will be combined for a vertical composite



Where there is no need to split a sample, the remainder of the collected material would be containerized and properly disposed of.

All samples will be placed into laboratory-supplied containers on ice and sealed and labeled under chain-of-custody (COC) documentation for subsequent delivery to a EPA-accredited laboratory (Approved Laboratory) for analysis using EPA approved methods. The sampling and analytical testing program is detailed in the Quality Assurance Project Plan (QAPP). Pre-construction confirmation composite samples will be analyzed for dioxins and furans utilizing EPA Method 1613B.

4.1 Quality Assurance/Quality Control (QA/QC)

Quality control samples will be collected in accordance with the QAPP. One field duplicate (FD) and one matrix spike/matrix spike duplicate (MS/MSD) sample will be collected at a frequency of one for each set of 20 samples.

Trip blanks will be prepared by the Approved Laboratory under the QAPP and will accompany sampling containers containing volatile constituents throughout the sample collection and transport operations. All trip blanks will also be labeled and dated with the same date as the collected samples for the corresponding cooler.

Field blanks will be collected during sampling at a frequency of one for each set of 20 composite samples. Field blanks will be prepared by pouring laboratory purified water into appropriate sample containers. Laboratory supplied temperature blanks will accompany sample coolers, per the QAPP.

Container labels will show a unique sample location and sample date/time to facilitate the COC cross-referencing. Field and laboratory duplicate containers will be numbered in the same manner, with the field duplicate receiving the "FD" designation and the laboratory duplicate the "MS/MSD" designation.

Any samples with suspected high levels of constituents (based on visual or field screening observations) will be annotated on the COC so that the Approved Laboratory can take necessary measures to implement appropriate dilution procedures to ensure acceptable results. Any conditions that may have negative effects on the quality of results, including inclement weather, will be reported to the Approved Laboratory.

Once shipped, the Approved Laboratory will be alerted of the shipment and the number of coolers. Label tracking information will be used to ensure that all coolers were received by the Approved Laboratory in a timely manner.

5. Waste Characterization Sampling

As part of the implementation of the Southern Impoundment RA, an off-site disposal facility will be selected to receive the approximately 24,600 cy of excavated impacted material from the Southern Impoundment. This disposal facility will require some volume-based frequency of waste characterization sampling to establish profiles for the waste being transported to the disposal facility and verify that different truckloads of waste will be consistent with those profiles. Depending upon



the required sampling frequency, this PC FSP will be updated to indicate boring locations in which the zone of impact will be sampled (along with the overburden and/or bottom and/or sidewalls) to analyze for waste characterization.

6. Pre-Construction Assessment of Water Volumes to Be Managed During Excavation

Data from boring logs and a transducer installed in a monitoring well in the Southern Impoundment indicate that perched water will likely be encountered during excavation activities at depths ranging from two to six ft bgs. Limited hydrogeological information is available to predict the rate of infiltration of encountered water into an excavation. Highly conservative estimates for infiltration rates were used as the basis of design for water storage and treatment for the RD, as described in the Southern Impoundment 100% RD.

6.1 Pre-Construction Field Program

To obtain a more accurate assessment of the expected water volumes to be managed during the Southern Impoundment RA, four temporary piezometers will be installed, one within each proposed excavation area at the planned deepest point of excavation. Each piezometer will be constructed of PVC well screen and casing over the 10-ft depth using the same drilling equipment that will be utilized for the pre-construction sampling event.

Upon completion of the four temporary piezometers, field tests will be conducted, including slug (rising or falling head) testing, specific capacity testing, etc. to provide more specific numbers for hydraulic conductivity, transmissivity, and sustainable pumping rates within each excavation area. The information provided by this pre-construction sampling will refine the assumptions in the Southern Impoundment RD for water storage and treatment prior to the start of construction activities.

6.2 Pre-Construction Water Sampling

One water sample will be collected from each of the four temporary piezometers and submitted for analyses of the parameters identified below that were detected in water samples from the Southern Impoundment and/or Northern Impoundment during the 2019 Treatability Study. The analytical results will be reviewed to confirm the parameters requiring treatment. Sampling will include the following parameters:

- Total and Dissolved Dioxins and Furans - EPA 1613B
- Total and Dissolved Metals - EPA 6010C
- Total and Dissolved Mercury - EPA 7470A
- Alkalinity - SM 2320B
- Ammonia Nitrogen - EPA 350.1
- Anions (bromide, chloride, fluoride, nitrate, nitrite, sulfate) - EPA 300.0



- Biochemical Oxygen Demand (BOD) - SM 5210B
- Chemical Oxygen Demand (COD) - EPA 410.4
- pH - EPA 9040C
- Phosphorus - EPA-SW846-6010D/3050B/7471B
- Sulfide - EPA-SW846-9034
- Total Dissolved Solids (TDS) - Standard Methods SM2540C
- Total Organic Carbon (TOC) - Standard Methods SM5310C
- Total Suspended Solids (TSS) - SM 2540D

Dissolved metals and dioxins will be filtered using an 0.45 micron filter. If sufficient volume is not available for all analyses listed above, the parameter list will be revised.

6.3 Piezometers and Monitoring Well Plug and Abandonment

Upon completion of all aquifer and analytical testing and prior to Southern Impoundment RA excavation activities, the temporary piezometers, as well as the three existing monitoring wells on the Southern Impoundment, will be plugged and abandoned by a licensed Texas driller in accordance with regulatory guidelines (Texas Administrative Code, Title 16, Section 76.104a).

7. Data Validation, Quality Control, and Reporting

All laboratory analytical data will be reviewed and validated. The validation of laboratory data will follow the guidance presented in the QAPP and will result in a completed data validation report that will be submitted to the EPA.

At the completion of data validation activities, all validated data will be provided to the EPA.

8. Health and Safety

Consistent with the requirements outlined in the Southern Impoundment RA Health and Safety Plan (HASP), the RC conducting the pre-construction event will be required to conduct safety meetings at least once per day. During these meetings, the field team will describe the activities to be completed that day, identify safety hazards, review lessons learned, and remind employees of important safety procedures.

Ambient air will be monitored during sampling using a hand-held photoionization detector (PID) to detect the potential presence of gases in the breathing zone. If a measurement exceeds any of the air quality criteria established in the HASP, the field team will stop work and evaluate the path forward.



9. Investigation Derived Wastes

Consistent with the Southern Impoundment RD Transportation and Off-Site Disposal Plan (TODP), investigation-derived waste (IDW) from sampling and decontamination activities will be containerized and temporarily stored on the Southern Impoundment. Liquid waste (e.g., decontamination water) and dry waste (e.g., soil) will be segregated and transferred into United States Department of Transportation- approved 55-gallon drums, or other approved containers, and temporarily stored at the Southern Impoundment pending analytical results.

All disposable materials used for sample collection and processing, such as paper towels and gloves, will be placed in heavyweight garbage bags or other appropriate containers. Disposable supplies that do not contain impacted material will be removed from the Southern Impoundment by sampling personnel and placed in a normal refuse container for disposal at a solid waste landfill.

All IDW will be disposed of in accordance with all applicable regulations and guidelines, as further specified in the TODP.

10. References

EPA, 2018. Administrative Settlement Agreement and Order on Consent for Remedial Design. U.S. EPA Region 6, CERCLA Docket. No. 06-02-18. In the matter of: San Jacinto Waste Pits Superfund Site, Harris County, Texas. International Paper Company and McGinnes Industrial Maintenance Corporation, Respondents. April 2018.



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Legend

---	PROPERTY BOUNDARY
---	PROPERTY EXHAUSTION
---	EXISTING CONTOUR INTERVAL
---	FENCELINE
---	BOUNDARY
---	TOP OF BANK
---	TOP OF SLOPE
---	OVERHEAD ELECTRICAL
---	GUARDRAIL
---	UNDERGROUND CULV LINE
---	POWER BORING LOCATION
---	MONITORING WELL
---	POWER POLE
---	LIGHT POLE
---	WELL
---	AREA OF ABSTRACT
---	AREA OF INTEREST (QUIP-FIT EXCAVATION)
---	ASPHALT
---	CONCRETE
---	GRAVEL

Client
 SAN JACINTO RIVER WASTE PITS

Project
 SOUTHERN IMPOUNDMENT PRE-CONSTRUCTION FIELD SAMPLING PLAN HARRIS COUNTY, TEXAS

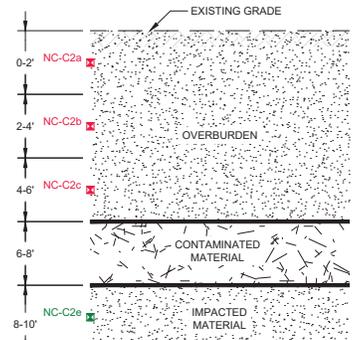
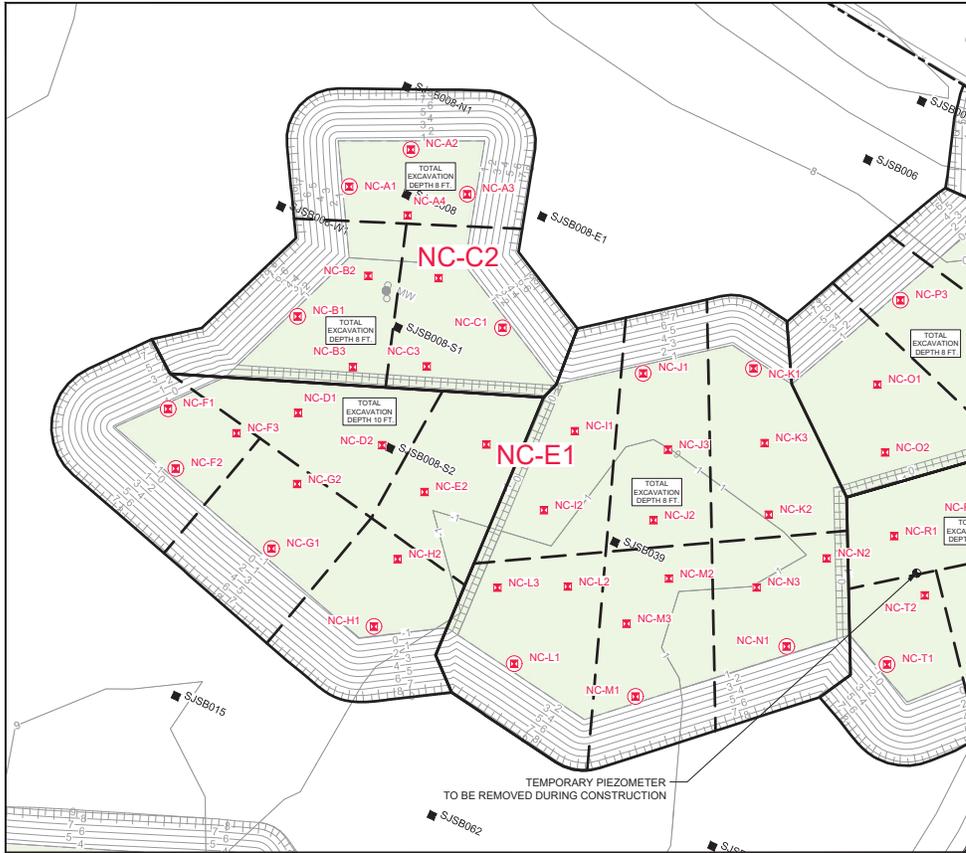
No.	Issue	Drawn	Appr'd	Date

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 Checked: gp, Design Check: LL
 Project: SW, Date: Dec 18, 2020
 The documents shall not be used for construction unless signed and sealed by a professional engineer.
 Original Size: Arch D, Bar is one inch on original size drawing.
 Project No: 11215131

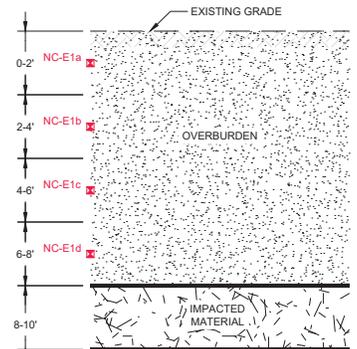
OVERALL SITE PLAN

FIGURE 1

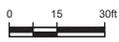
Sheet 1 of 17



SAMPLE POINT NC-C2



SAMPLE POINT NC-E1



- LEGEND**
- POLYGON LIMITS (WITH ADDITIONAL SIDE SLOPE AREAS)
 - - - SAMPLING GRIDS (500 CY) WITHIN POLYGONS
 - SJSB002 PD/RRI BORING LOCATION
 - POLYGONS WITH IMPACTED SOILS AT DEPTH

- PRE-CONSTRUCTION SIDEWALL BORING LOCATIONS (SAMPLES COLLECTED EVERY 2 FEET, COMPOSITE TO BOTTOM OF EXCAVATION)
- ⊠ PRE-CONSTRUCTION OVERBURDEN CONFIRMATION BORING LOCATIONS (COMPOSITE SAMPLES COLLECTED OVER SAMPLING GRID)
- ⊞ BOTTOM OF EXCAVATION CONFIRMATION SAMPLE
- EXC. EXCAVATION
- POI PRE-DESIGN INVESTIGATION
- RI REMEDIAL INVESTIGATION



SAN JACINTO RIVER WASTE PITS
 SOUTHERN IMPOUNDMENT
 HARRIS COUNTY, TEXAS
PRE-CONSTRUCTION FIELD SAMPLING PLAN
 CONFIRMATION SAMPLING EXAMPLE CROSS-SECTIONS

11215131
 Dec 16, 2020

FIGURE 3

CAD File: N:\US\Baton Rouge\Project\02\11215131\Digital_Design\ACAD 2019\Figures\11215131-02-DWG-0-204.dwg

Table 1
Northeast Excavation Area Confirmation Composite Samples
Southern Impoundment - San Jacinto River Waste Pits Site
Harris County, Texas

NE Overburden Confirmation Samples														
Polygon	Impacted Zone	Composite Sample ID	Discrete Samples											
SJSB012-N2	6 to 10 ft bgs	NE-O-1	NE-A1a	NE-A1b	NE-A1c	NE-A2a	NE-A2b	NE-A2c						
		NE-O-2	NE-B1a	NE-B1b	NE-B1c	NE-B2a	NE-B2b	NE-B2c	NE-B3a	NE-B3b	NE-B3c			
		NE-O-3	NE-C1a	NE-C1b	NE-C1c	NE-C2a	NE-C2b	NE-C2c	NE-C3a	NE-C3b	NE-C3c	NE-C4a	NE-C4b	NE-C4c
		NE-O-4	NE-D1a	NE-D1b	NE-D1c	NE-D2a	NE-D2b	NE-D2c						
		NE-O-5	NE-E1a	NE-E1b	NE-E1c	NE-E2a	NE-E2b	NE-E2c	NE-E3a	NE-E3b	NE-E3c			
SJSB012-W2	4 to 6 ft bgs	NE-O-6	NE-F1a	NE-F1b	NE-F2a	NE-F2b	NE-F3a	NE-F3b						
		NE-O-7	NE-G1a	NE-G1b	NE-G2a	NE-G2b	NE-G3a	NE-G3b	NE-G4a	NE-G4b				
SJSB012/SJSB012-W1	4 to 8 ft bgs	NE-O-8	NE-H1a	NE-H1b	NE-H2a	NE-H2b	NE-H3a	NE-H3b	NE-H4a	NE-H4b				
		NE-O-9	NE-I1a	NE-I1b	NE-I2a	NE-I2b	NE-I3a	NE-I3b	NE-H2a	NE-H2b				

NE Sidewall Confirmation Samples													
Polygon	Impacted Zone	Composite Sample ID	Discrete Samples										
SJSB012-N2	6 to 10 ft bgs	NE-S-1	NE-A1a	NE-A1b	NE-A1c	NE-A1d	NE-A1e						
		NE-S-2	NE-A2a	NE-A2b	NE-A2c	NE-A2d	NE-A2e						
		NE-S-3	NE-B1a	NE-B1b	NE-B1c	NE-B1d	NE-B1e						
		NE-S-4	NE-C1a	NE-C1b	NE-C1c	NE-C1d	NE-C1e						
		NE-S-5	NE-C3a	NE-C3b	NE-C3c	NE-C3d	NE-C3e						
		NE-S-6	NE-E1a	NE-E1b	NE-E1c	NE-E1d	NE-E1e						
		NE-S-7	NE-E2a	NE-E2b	NE-E2c	NE-E2d	NE-E2e						
SJSB012-W2	4 to 6 ft bgs	NE-S-8	NE-F1a	NE-F1b	NE-F1c	NE-F1d	NE-F1e						
		NE-S-9	NE-G1a	NE-G1b	NE-G1c	NE-G1d	NE-G1e						
		NE-S-10	NE-G2a	NE-G2b	NE-G2c	NE-G2d	NE-G2e						
SJSB012/SJSB012-W1	4 to 8 ft bgs	NE-S-11	NE-H1a	NE-H1b	NE-H1c	NE-H1d	NE-H1e						
		NE-S-12	NE-H3a	NE-H3b	NE-H3c	NE-H3d	NE-H3e						
		NE-S-13	NE-I1a	NE-I1b	NE-I1c	NE-I1d	NE-I1e						
		NE-S-14	NE-I2a	NE-I2b	NE-I2c	NE-I2d	NE-I2e						

NE Bottom of Excavation Confirmation Samples													
Polygon	Impacted Zone	Composite Sample ID	Discrete Samples										
SJSB012-W2	4 to 6 ft bgs	NE-B-1	NE-F1d	NE-F2d	NE-F3d	NE-G1d	NE-G2d	NE-G3d	NE-G4d				
SJSB012/SJSB012-W1	4 to 8 ft bgs	NE-B-2	NE-H1e	NE-H2e	NE-H3e	NE-H4e	NE-I1e	NE-I2e	NE-I3e				

Notes:
 The depth intervals are denoted as 'a' for 0 to 2 ft bgs, 'b' for 2 to 4 ft bgs, 'c' for 4 to 6 ft bgs, 'd' for 6 to 8 ft bgs, and 'e' for 8 to 10 ft bgs
 ft bgs = feet below ground surface

Table 2
North Central Excavation Area Confirmation Composite Samples
Southern Impoundment - San Jacinto River Waste Pits Site
Harris County, Texas

NC Overburden Confirmation Samples														
Polygon	Impacted Zone	Composite Sample ID	Discrete Samples											
SJSB008/SJSB008-S1	6 to 8 ft bgs	NC-O-1	NC-A1a	NC-A1b	NC-A1c	NC-A2b	NC-A2b	NC-A2c	NC-A3a	NC-A3b	NC-A3c	NC-A4a	NC-A4b	NC-A4c
		NC-O-2	NC-B1a	NC-B1b	NC-B1c	NC-B2a	NC-B2b	NC-B2c	NC-B3a	NC-B3b	NC-B3c			
		NC-O-3	NC-C1a	NC-C1b	NC-C1c	NC-C2a	NC-C2b	NC-C2c	NC-C3a	NC-C3b	NC-C3c			
SJSB008-S2	8 to 10 ft bgs	NC-O-4	NC-D1a	NC-D1b	NC-D1c	NC-D1d	NC-D2a	NC-D2b	NC-D2c	NC-D2d				
		NC-O-5	NC-E1a	NC-E1b	NC-E1c	NC-E1d	NC-E2a	NC-E2b	NC-E2c	NC-E2d				
		NC-O-6	NC-F1a	NC-F1b	NC-F1c	NC-F1d	NC-F2a	NC-F2b	NC-F2c	NC-F2d	NC-F3a	NC-F3b	NC-F3c	NC-F3d
		NC-O-7	NC-G1a	NC-G1b	NC-G1c	NC-G1d	NC-G2a	NC-G2b	NC-G2c	NC-G2d				
		NC-O-8	NC-H1a	NC-H1b	NC-H1c	NC-H1d	NC-H2a	NC-H2b	NC-H2c	NC-H2d				
SJSB039	6 to 8 ft bgs	NC-O-9	NC-I1a	NC-I1b	NC-I1c	NC-I2a	NC-I2b	NC-I2c						
		NC-O-10	NC-J1a	NC-J1b	NC-J1c	NC-J2a	NC-J2b	NC-J2c	NC-J3a	NC-J3b	NC-J3c			
		NC-O-11	NC-K1a	NC-K1b	NC-K1c	NC-K2a	NC-K2b	NC-K2c	NC-K3a	NC-K3b	NC-K3c			
		NC-O-12	NC-L1a	NC-L1b	NC-L1c	NC-L2a	NC-L2b	NC-L2c	NC-L3a	NC-L3b	NC-L3c			
		NC-O-13	NC-M1a	NC-M1b	NC-M1c	NC-M2a	NC-M2b	NC-M2c	NC-M3a	NC-M3b	NC-M3c			
SJSB061	6 to 8 ft bgs	NC-O-14	NC-N1a	NC-N1b	NC-N1c	NC-N2a	NC-N2b	NC-N2c	NC-N3a	NC-N3b	NC-N3c			
		NC-O-15	NC-O1a	NC-O1b	NC-O1c	NC-O2a	NC-O2b	NC-O2c						
		NC-O-16	NC-P1a	NC-P1b	NC-P1c	NC-P2a	NC-P2b	NC-P2c	NC-P3a	NC-P3b	NC-P3c			
SJSB040	8 to 10 ft bgs	NC-O-17	NC-Q1a	NC-Q1b	NC-Q1c	NC-Q2a	NC-Q2b	NC-Q2c						
		NC-O-18	NC-R1a	NC-R1b	NC-R1c	NC-R1d	NC-R2a	NC-R2b	NC-R2c	NC-R2d				
		NC-O-19	NC-S1a	NC-S1b	NC-S1c	NC-S1d	NC-S2a	NC-S2b	NC-S2c	NC-S2d				
		NC-O-20	NC-T1a	NC-T1b	NC-T1c	NC-T1d	NC-T2a	NC-T2b	NC-T2c	NC-T2d				
		NC-O-21	NC-U1a	NC-U1b	NC-U1c	NC-U1d	NC-U2a	NC-U2b	NC-U2c	NC-U2d				
SJSB061-C1	6 to 8 ft bgs	NC-O-22	NC-V1a	NC-V1b	NC-V1c	NC-V1d	NC-V2a	NC-V2b	NC-V2c	NC-V2d				
SJSB060/SJSB060-C1	6 to 8 ft bgs	NC-O-23	NC-W1a	NC-W1b	NC-W1c	NC-W2a	NC-W2b	NC-W2c	NC-W3a	NC-W3b	NC-W3c			
		NC-O-24	NC-X1a	NC-X1b	NC-X1c	NC-X2a	NC-X2b	NC-X2c						
		NC-O-25	NC-Y1a	NC-Y1b	NC-Y1c	NC-Y2a	NC-Y2b	NC-Y2c						

NC Sidewall Confirmation Samples														
Polygon	Impacted Zone	Composite Sample ID	Discrete Samples											
SJSB008/SJSB008-S1	6 to 8 ft bgs	NC-S-1	NC-A1a	NC-A1b	NC-A1c	NC-A1d	NC-A1e							
		NC-S-2	NC-A2a	NC-A2b	NC-A2c	NC-A2d	NC-A2e							
		NC-S-3	NC-A3a	NC-A3b	NC-A3c	NC-A3d	NC-A3e							
		NC-S-4	NC-B1a	NC-B1b	NC-B1c	NC-B1d	NC-B1e							
		NC-S-5	NC-C1a	NC-C1b	NC-C1c	NC-C1d	NC-C1e							
SJSB008-S2	8 to 10 ft bgs	NC-S-6	NC-F1a	NC-F1b	NC-F1c	NC-F1d	NC-F1e							
		NC-S-7	NC-F2a	NC-F2b	NC-F2c	NC-F2d	NC-F2e							
		NC-S-8	NC-G1a	NC-G1b	NC-G1c	NC-G1d	NC-G1e							
		NC-S-9	NC-H1a	NC-H1b	NC-H1c	NC-H1d	NC-H1e							
SJSB039	6 to 8 ft bgs	NC-S-10	NC-J1a	NC-J1b	NC-J1c	NC-J1d	NC-J1e							
		NC-S-11	NC-K1a	NC-K1b	NC-K1c	NC-K1d	NC-K1e							
		NC-S-12	NC-L1a	NC-L1b	NC-L1c	NC-L1d	NC-L1e							
		NC-S-13	NC-M1a	NC-M1b	NC-M1c	NC-M1d	NC-M1e							
SJSB061	6 to 8 ft bgs	NC-S-14	NC-N1a	NC-N1b	NC-N1c	NC-N1d	NC-N1e							
		NC-S-15	NC-P1a	NC-P1b	NC-P1c	NC-P1d	NC-P1e							
SJSB040	8 to 10 ft bgs	NC-S-16	NC-T1a	NC-T1b	NC-T1c	NC-T1d	NC-T1e							
		NC-S-17	NC-U1a	NC-U1b	NC-U1c	NC-U1d	NC-U1e							
SJSB061-C1	6 to 8 ft bgs	NC-S-18	NC-V1a	NC-V1b	NC-V1c	NC-V1d	NC-V1e							
		NC-S-19	NC-W1a	NC-W1b	NC-W1c	NC-W1d	NC-W1e							

NC Bottom of Excavation Confirmation Samples														
Polygon	Impacted Zone	Composite Sample ID	Discrete Samples											
SJSB008/SJSB008-S1	6 to 8 ft bgs	NC-B-1	NC-A1e	NC-A2e	NC-A3e	NC-A4e	NC-B1e	NC-B2e	NC-B3e	NC-C1e	NC-C2e	NC-C3e		
SJSB039	6 to 8 ft bgs	NC-B-2	NC-I1e	NC-I2e	NC-J1e	NC-J2e	NC-J3e	NC-K1e	NC-K2e	NC-K3e				
		NC-B-3	NC-L1e	NC-L2e	NC-L3e	NC-M1e	NC-M2e	NC-M3e	NC-N1e	NC-N2e	NC-N3e			
SJSB061	6 to 8 ft bgs	NC-B-4	NC-O1e	NC-O2e	NC-P1e	NC-P2e	NC-P3e	NC-Q1e	NC-Q2e					
SJSB061-C1/SJSB060/SJSB060-C1	6 to 8 ft bgs	NC-B-5	NC-W1e	NC-W2e	NC-W3e	NC-X1e	NC-X2e	NC-Y1e	NC-Y2e					

Notes:
 The depth intervals are denoted as 'a' for 0 to 2 ft bgs, 'b' for 2 to 4 ft bgs, 'c' for 4 to 6 ft bgs, 'd' for 6 to 8 ft bgs, and 'e' for 8 to 10 ft bgs
 ft bgs = feet below ground surface

Table 3
South Central Excavation Area Confirmation Composite Samples
Southern Impoundment - San Jacinto River Waste Pits Site
Harris County, Texas

SC Overburden Confirmation Samples										
Polygon	Impacted Zone	Composite Sample ID	Discrete Samples							
SJSB041	2 to 6 ft bgs	SC-O-1	SC-A1a	SC-A2a	SC-A3a	SC-A4a	SC-A5a			
		SC-O-2	SC-B1a	SC-B2a	SC-B3a	SC-B4a	SC-B5a			
SJSB019-N1/SJSB019-N2	4 to 8 ft bgs	SC-O-3	SC-C1a	SC-C1b	SC-C2a	SC-C2b	SC-C3a	SC-C3b		
		SC-O-4	SC-D1a	SC-D1b	SC-D2a	SC-D2b	SC-D3a	SC-D3b	SC-D4a	SC-D4b
		SC-O-5	SC-E1a	SC-E1b	SC-E2a	SC-E2b	SC-E3a	SC-E3b		
SJSB019-W1	2 to 8 ft bgs	SC-O-6	SC-F1a	SC-F2a	SC-F3a	SC-F4a	SC-F5a			
SJSB019	8 to 10 ft bgs	SC-O-7	SC-G1a	SC-G1b	SC-G1c	SC-G1d	SC-G2a	SC-G2b	SC-G2c	SC-G2d
SJSB019-E1	4 to 10 ft bgs	SC-O-8	SC-H1a	SC-H1b	SC-H2a	SC-H2b	SC-H3a	SC-H3b		
SJSB019-E2	4 to 6 ft bgs	SC-O-9	SC-I1a	SC-I1b	SC-I2a	SC-I2b	SC-I3a	SC-I3b		
		SC-O-10	SC-J1a	SC-J1b	SC-J2a	SC-J2b	SC-J3a	SC-J3b	SC-J4a	SC-J4b
SJSB019-S1	4 to 6 ft bgs	SC-O-11	SC-K1a	SC-K1b	SC-K2a	SC-K2b	SC-K3a	SC-K3b	SC-K4a	SC-K4b
SJSB019-S2	0 to 2 ft bgs	SC-O-12	SC-L1a	SC-L2b	SC-L3a	SC-L4b	SC-L5a			
		SC-O-13	SC-M1a	SC-M2b	SC-M3a	SC-M4b	SC-M5a			

SC Sidewall Confirmation Samples										
Polygon	Impacted Zone	Composite Sample ID	Discrete Samples							
SJSB041	2 to 6 ft bgs	SC-S-1	SC-A1a	SC-A1b	SC-A1c	SC-A1d	SC-A1e			
		SC-S-2	SC-A2a	SC-A2b	SC-A2c	SC-A2d	SC-A2e			
		SC-S-3	SC-A3a	SC-A3b	SC-A3c	SC-A3d	SC-A3e			
		SC-S-4	SC-B1a	SC-B1b	SC-B1c	SC-B1d	SC-B1e			
		SC-S-5	SC-B2a	SC-B2b	SC-B2c	SC-B2d	SC-B2e			
		SC-S-6	SC-B3a	SC-B3b	SC-B3c	SC-B3d	SC-B3e			
SJSB019-N1/SJSB019-N2	4 to 8 ft bgs	SC-S-7	SC-C1a	SC-C1b	SC-C1c	SC-C1d	SC-C1e			
		SC-S-8	SC-D1a	SC-D1b	SC-D1c	SC-D1d	SC-D1e			
		SC-S-9	SC-D2a	SC-D2b	SC-D2c	SC-D2d	SC-D2e			
SJSB019-W1	2 to 8 ft bgs	SC-S-10	SC-F1a	SC-F1b	SC-F1c	SC-F1d	SC-F1e			
		SC-S-11	SC-F2a	SC-F2b	SC-F2c	SC-F2d	SC-F2e			
		SC-S-12	SC-F3a	SC-F3b	SC-F3c	SC-F3d	SC-F3e			
SJSB019-E2	4 to 6 ft bgs	SC-S-13	SC-I1a	SC-I1b	SC-I1c	SC-I1d	SC-I1e			
		SC-S-14	SC-J1a	SC-J1b	SC-J1c	SC-J1d	SC-J1e			
SJSB019-S1	4 to 6 ft bgs	SC-S-15	SC-J2a	SC-J2b	SC-J2c	SC-J2d	SC-J2e			
		SC-S-16	SC-K2a	SC-K2b	SC-K2c	SC-K2d	SC-K2e			
		SC-S-17	SC-K3a	SC-K3b	SC-K3c	SC-K3d	SC-K3e			

SC Bottom of Excavation Confirmation Samples										
Polygon	Impacted Zone	Composite Sample ID	Discrete Samples							
SJSB041	2 to 6 ft bgs	SC-B-1	SC-A1d	SC-A2d	SC-A3d	SC-A4d	SC-A5d			
		SC-B-2	SC-B1d	SC-B2d	SC-B3d	SC-B4d	SC-B5d			
SJSB019-N1/SJSB019-N2	4 to 8 ft bgs	SC-B-3	SC-C1e	SC-C2e	SC-C3e	SC-E1e	SC-E2e			
		SC-B-4	SC-D1e	SC-D2e	SC-D3e	SC-D4e	SC-E3e			
SJSB019-W1	2 to 8 ft bgs	SC-B-5	SC-F1e	SC-F2e	SC-F3e	SC-F4e	SC-F5e			
SJSB019-E2	4 to 6 ft bgs	SC-B-6	SC-I1d	SC-I2d	SC-I3d	SC-J1d	SC-J2d	SC-J3d	SC-J4d	
SJSB019-S1	4 to 6 ft bgs	SC-B-7	SC-K1d	SC-K2d	SC-K3d	SC-K4d				

Notes:
 The depth intervals are denoted as 'a' for 0 to 2 ft bgs, 'b' for 2 to 4 ft bgs, 'c' for 4 to 6 ft bgs, 'd' for 6 to 8 ft bgs, and 'e' for 8 to 10 ft bgs
 ft bgs = feet below ground surface

Table 4
Southwest Excavation Area Confirmation Composite Samples
Southern Impoundment - San Jacinto River Waste Pits Site
Harris County, Texas

SW Overburden Confirmation Samples										
Polygon	Impacted Zone	Composite Sample ID	Discrete Samples							
SJSB065-C1	2 to 8 ft bgs	SW-O-1	SW-A1a	SW-A2a	SW-A3a	SW-A4a	SW-A5a			
SJSB065	2 to 6 ft bgs	SW-O-2	SW-B1a	SW-B2a	SW-B3a	SW-B4a	SW-B5a			
SJSB066	2 to 4 ft bgs	SW-O-3	SW-D1a	SW-D2a	SW-D3a	SW-D4a	SW-D5a			
SJSB023-N1/SJSB023	2 to 6 ft bgs	SW-O-4	SW-E1a	SW-E2a	SW-E3a	SW-E4a	SW-G1a			
SJSB023-E1	4 to 6 ft bgs	SW-O-5	SW-H1a	SW-H1b	SW-H2a	SW-H2b	SW-H3a	SW-H3b	SW-H4b	
SJSB067	2 to 4 ft bgs	SW-O-6	SW-K1a	SW-K2a	SW-K3a	SW-K4a	SW-K5a			
		SW-O-7	SW-L1a	SW-L2a	SW-L3a	SW-L4a	SW-L5a			
SJSB025-N1/SJSB025-N2	2 to 8 ft bgs	SW-O-8	SW-M1a	SW-M2a	SW-M3a	SW-M4a	SW-M5a			
		SW-O-9	SW-N1a	SW-N2a	SW-N3a	SW-N4a	SW-N5a			
SJSB025/SJSB025-S1	2 to 6 ft bgs	SW-O-10	SW-O1a	SW-O2a	SW-O3a	SW-O4a	SW-O5a			

SW Sidewall Confirmation Samples										
Polygon	Impacted Zone	Composite Sample ID	Discrete Samples							
SJSB065-C1	2 to 8 ft bgs	SW-S-1	SW-A1a	SW-A1b	SW-A1c	SW-A1d	SW-A1e			
SJSB065	2 to 6 ft bgs	SW-S-2	SW-A2a	SW-A2b	SW-A2c	SW-A2d	SW-A2e			
		SW-S-3	SW-B1a	SW-B1b	SW-B1c	SW-B1d	SW-B1e			
		SW-S-4	SW-B2a	SW-B2b	SW-B2c	SW-B2d	SW-B2e			
SJSB023-W2	0 to 6 ft bgs	SW-S-5	SW-C1a	SW-C1b	SW-C1c	SW-C1d	SW-C1e			
SJSB066	2 to 4 ft bgs	SW-S-6	SW-D1a	SW-D1b	SW-D1c	SW-D1d				
		SW-S-7	SW-D2a	SW-D2b	SW-D2c	SW-D2d				
SJSB023-N1	2 to 6 ft bgs	SW-S-8	SW-E1a	SW-E1b	SW-E1c	SW-E1d	SW-E1e			
		SW-S-9	SW-E2a	SW-E2b	SW-E2c	SW-E2d	SW-E2e			
		SW-S-10	SW-E3a	SW-E3b	SW-E3c	SW-E3d	SW-E3e			
SJSB023-E1	4 to 6 ft bgs	SW-S-11	SW-H1a	SW-H1b	SW-H1c	SW-H1d	SW-H1e			
		SW-S-12	SW-H2a	SW-H2b	SW-H2c	SW-H2d	SW-H2e			
SJSB023-S1	0 to 6 ft bgs	SW-S-13	SW-I1a	SW-I1b	SW-I1c	SW-I1d	SW-I1e			
SJSB023-S2	0 to 4 ft bgs	SW-S-14	SW-J1a	SW-J1b	SW-J1c	SW-J1d				
SJSB067	2 to 4 ft bgs	SW-S-15	SW-K1a	SW-K1b	SW-K1c	SW-K1d				
		SW-S-16	SW-K2a	SW-K2b	SW-K2c	SW-K2d				
		SW-S-17	SW-L1a	SW-L1b	SW-L1c	SW-L1d				
		SW-S-18	SW-L2a	SW-L2b	SW-L2c	SW-L2d				
		SW-S-19	SW-L3a	SW-L3b	SW-L3c	SW-L3d				
SJSB025-N1/SJSB025-N2	2 to 8 ft bgs	SW-S-20	SW-M1a	SW-M1b	SW-M1c	SW-M1d	SW-M1e			
		SW-S-21	SW-M2a	SW-M2b	SW-M2c	SW-M2d	SW-M2e			
		SW-S-22	SW-M3a	SW-M3b	SW-M3c	SW-M3d	SW-M3e			
		SW-S-23	SW-N1a	SW-N1b	SW-N1c	SW-N1d	SW-N1e			
SJSB025/SJSB025-S1	2 to 6 ft bgs	SW-S-24	SW-N2a	SW-N2b	SW-N2c	SW-N2d	SW-N2e			
		SW-S-25	SW-O1a	SW-O1b	SW-O1c	SW-O1d	SW-O1e			
		SW-S-26	SW-O3a	SW-O3b	SW-O3c	SW-O3d	SW-O3e			
		SW-S-27	SW-O4a	SW-O4b	SW-O4c	SW-O4d	SW-O4e			

Table 4
Southwest Excavation Area Confirmation Composite Samples
Southern Impoundment - San Jacinto River Waste Pits Site
Harris County, Texas

SW Bottom of Excavation Confirmation Samples											
Polygon	Impacted Zone	Composite Sample ID	Discrete Samples								
SJSB065-C1	2 to 8 ft bgs	SW-B-1	SW-A1e	SW-A2e	SW-A3e	SW-A4e	SW-A5e				
SJSB065	2 to 6 ft bgs	SW-B-2	SW-B1d	SW-B2d	SW-B3d	SW-B4d	SW-B5d				
SJSB023-W2	0 to 6 ft bgs	SW-B-3	SW-C1d	SW-C2d	SW-C3d	SW-C4d	SW-C5d				
SJSB066	2 to 4 ft bgs	SW-B-4	SW-D1c	SW-D2c	SW-D3c	SW-D4c	SW-D5c				
SJSB023-N1/SJSB023-E1	2/4 to 6 ft bgs	SW-B-5	SW-E1d	SW-E2d	SW-E3d	SW-E4d	SW-H1d	SW-H2d	SW-H3d	SW-H4b	
SJSB023-W1/SJSB023/ SJSB023-S1	0/2 to 6 ft bgs	SW-B-6	SW-F1d	SW-F2d	SW-G1d	SW-I1d	SW-I2d				
SJSB023-S2	0 to 4 ft bgs	SW-B-7	SW-J1c	SW-J2c	SW-J3c	SW-J4c	SW-J5c				
SJSB067	2 to 4 ft bgs	SW-B-8	SW-K1c	SW-K2c	SW-K3c	SW-K4c	SW-K5c				
		SW-B-9	SW-L1c	SW-L2c	SW-L3c	SW-L4c	SW-L5c				
SJSB025-N1/SJSB025-N2	2 to 8 ft bgs	SW-B-10	SW-M1e	SW-M2e	SW-M3e	SW-M4e	SW-M5e				
		SW-B-11	SW-N1e	SW-N2e	SW-N3e	SW-N4e	SW-N5e				
SJSB025/SJSB025-S1	2 to 6 ft bgs	SW-B-12	SW-O1d	SW-O2d	SW-O3d	SW-O4d	SW-O5d				

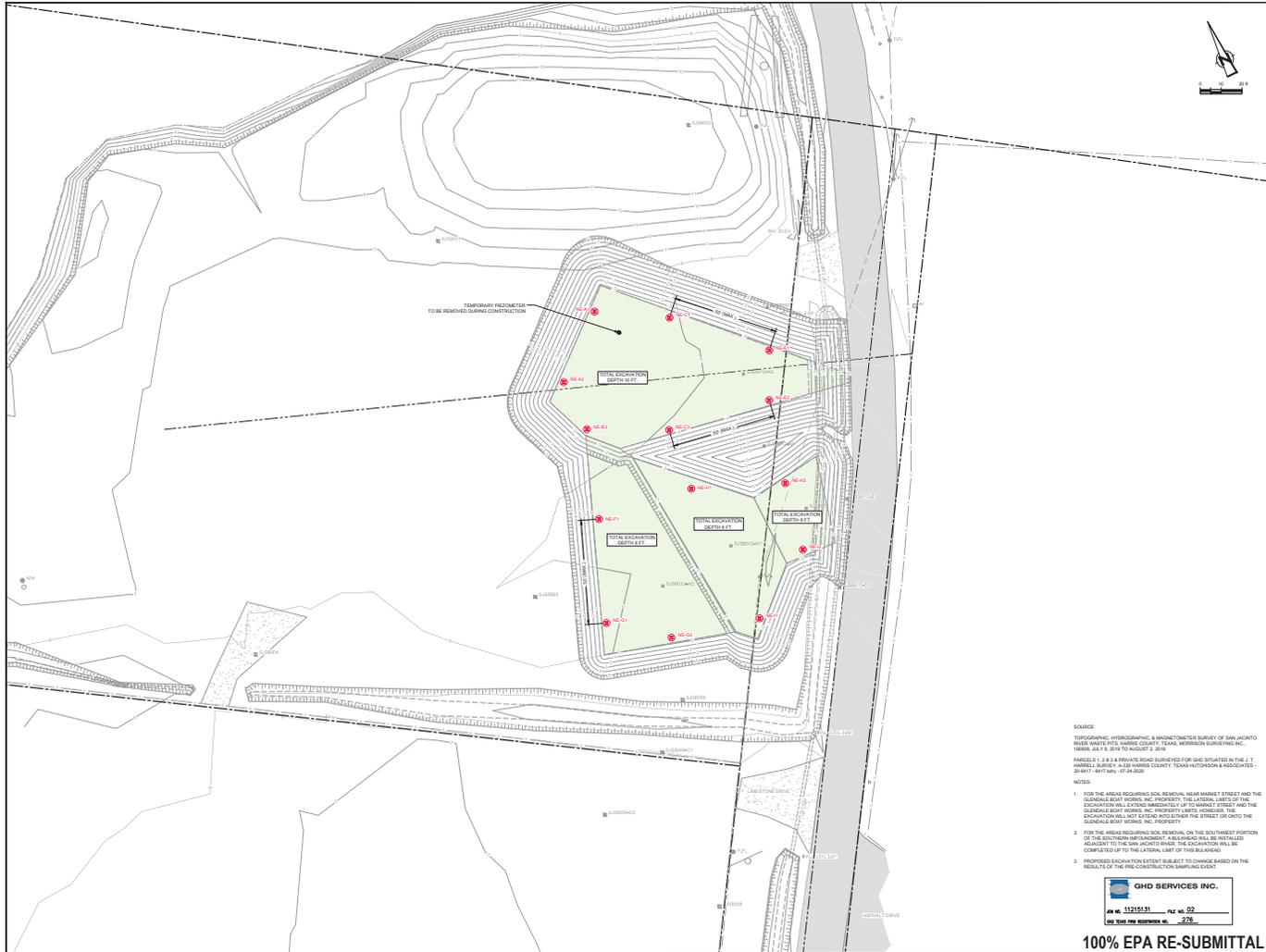
Notes:

The depth intervals are denoted as 'a' for 0 to 2 ft bgs, 'b' for 2 to 4 ft bgs, 'c' for 4 to 6 ft bgs, 'd' for 6 to 8 ft bgs, and 'e' for 8 to 10 ft bgs
ft bgs = feet below ground surface

Attachments

Attachment A

Pre-Construction Confirmation Borings Drawings



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Review of Documents
 This document will be used and design construction shall be an extension of the original design. The original design and shall be held in the original office of the author.

LEGEND

---	PROPERTY BOUNDARY
---	PROPERTY EASEMENT
---	EXISTING CONTOUR INTERVAL
---	FENCELINE
---	BOUNDARY OF BANK
---	TOP OF BANK
---	TOE OF SLOPE
---	UNDERGROUND UTILITY
---	GUARDRAIL
---	UNDERGROUND UTILITY LINE
---	POWER BONDING LOCATION
---	MONITORING WELL
---	POWER POLE
---	LIGHT POLE
---	WELL
---	AREA OF ABSTRACT
---	ASPHALT
---	CONCRETE
---	GRAVEL
---	EXCAVATION CONTOUR INTERVAL
---	EXCAVATION TOP OF BANK
---	EXCAVATION TOE OF SLOPE
---	PROPOSED EXISTING BENCH
---	CONSTRUCTION BONDING LOCATION

Client: **SAN JACINTO RIVER WASTE PITS**
 Project: **FINAL (100%) REMEDIAL DESIGN SOUTHERN IMPOUNDMENT (AMENDED APRIL 2021) HARRIS COUNTY, TEXAS**

No.	Issue	Drawn	Checked	Approved	Date
3	100% EPA RE-SUBMITTAL	MW	RM	RM	04/19/2021
4	100% EPA SUBMITTAL	MW	RM	RM	12/18/2020

Drawn	MW	Designer	RM
Checked	gp	Design	LL
Project	DR	Date	Apr 19, 2021
Scale	1" = 20'	Scale	1" = 20'
Original Size	11x17	Original Size	11x17

Project No: **11215131**

Title: **NORtheast Excavation Area Sidewall Sampling Plan**

Sheet No: **C-08**
 Sheet 9 of 49

SOURCE:
 TOPOGRAPHIC, HYDROGRAPHIC & MONOMETER SURVEY OF SAN JACINTO RIVER WASTE PITS, HARRIS COUNTY, TEXAS, NORWSON SURVEYING INC., TAMPA, FLA. 8. 2015 TO AUGUST 2, 2015
 PARCELS 1, 2 & 3 PRIVATE BONDING SUBMITTED FOR GHD SITUATED IN THE J. T. SMITH SURVEY, 4-20 HARRIS COUNTY, TEXAS AUTODSON & ASSOCIATES, DARTMOUTH, MASS. 01928-0008

NOTES:

- FOR THE AREAS REQUIRING SOIL REMOVAL, NEAR MARKET STREET AND THE SOUTHWEST PORTION OF THE SOUTHWEST BRANCHMENT, THE LATERAL LIMITS OF THE EXCAVATION WILL EXTEND PROXIMATELY TO EXHIBIT STREET AND THE SOUTHWEST PORTION OF THE SOUTHWEST BRANCHMENT. THE EXCAVATION WILL AFFECT EXISTING EXHIBIT STREET AND THE SOUTHWEST PORTION OF THE SOUTHWEST BRANCHMENT.
- FOR THE AREAS REQUIRING SOIL REMOVAL, ON THE SOUTHWEST PORTION OF THE SOUTHWEST BRANCHMENT, A BENCH WILL BE INSTALLED ADJACENT TO THE SAN JACINTO RIVER. THE EXCAVATION WILL BE COMPLETED TO THE LATERAL LIMIT OF THE BENCH.
- PROPOSED EXCAVATION EXTENT SUBJECT TO CHANGE BASED ON THE RESULTS OF THE PRE-CONSTRUCTION SAMPLING EVENT.

GHD SERVICES INC.
 11215131 FILE NO. 02
 SHEET NO. C-08 OF 49

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LEGEND

- PROPERTY BOUNDARY
- PROPERTY EDGE/BOUNDARY
- EXISTING CONTOUR INTERVAL
- FENCE LINE
- SLOPE LINE
- TOP OF BANK
- TOE OF SLOPE
- UNDERGROUND ELECTRICAL GUARDRAIL
- UNDERGROUND CCTV LINE
- UNDERGROUND LOCATION
- UNDERGROUND WELL
- POWER POLE
- LIGHT POLE
- WELL

AREA OF IMPACT

- ASPHALT
- CONCRETE
- GRASS
- EXCAVATION CONTROL INTERVAL
- EXCAVATION TOP OF BANK
- EXCAVATION TOE OF SLOPE
- SAMPLING GRID (SEE SHEET C-11)
- PROPOSED TO BE EXCAVATED
- CONSTRUCTION BUREAU (CONTRACTOR)
- PROPOSED TO BE EXCAVATED
- EXISTING TO BE EXCAVATED
- CONSTRUCTION BUREAU (CONTRACTOR)

Client: **SAN JACINTO RIVER WASTE PITS**

Project: **FINAL (100%) REMEDIAL DESIGN SOUTHERN IMPOUNDMENT (AMENDED APRIL 2021) HARRIS COUNTY, TEXAS**

No.	Issue	Drawn	Approved	Date
5	100% EPA RE-SUBMITTAL	MM	RM	04/19/2021
4	100% EPA SUBMITTAL	MM	RM	12/16/2020

Drawn: MM Designer: RM
 Check: MM Check: LL
 Project: **CW** Date: **Apr 15, 2021**
 Consultant: E-mail: **ll@ghd.com**
 Original Size: Plot to scale on original size drawing
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Sheet No. **11215131**

NORTHEAST EXCAVATION AREA BOTTOM OF EXCAVATION SAMPLING PLAN

Sheet No. **C-09**

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JOB NO. 11215131 FILE NO. 02

DATE THIS DRAWING WAS PLOTTED: 2/18/21

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Revised Documents

The document will be issue and design documents shall be an indication of engineering review. The approval of GHD and shall be for the use of the client. No other party shall be responsible for the design of the work.

Legend

- PROPERTY BOUNDARY
- EXISTING CONTOUR INTERVAL
- FENCE LINE
- SIDEWALK
- TOP OF BANK
- TOP OF SLOPE
- UNDERGROUND UTILITY
- GUARDRAIL
- INTERSECTION CITY LINE
- POWER BORING LOCATION
- MONITORING WELL
- POWER POLE
- LIGHT POLE
- WELL

AREA OF ABSTRACT

- ASPHALT
- CONCRETE
- GRAVEL
- EXCAVATION CONTOUR INTERVAL
- EXCAVATION TOP OF BANK
- EXCAVATION TOP OF SLOPE
- PROCAUTION SIGN BENCH LOCATION

Client

SAN JACINTO RIVER WASTE PITS

Project

FINAL (100%) REMEDIAL DESIGN SOUTHERN IMPOUNDMENT (AMENDED APRIL 2021) HARRIS COUNTY, TEXAS

No.	Issue	Drawn	Appr'd	Date
5	100% EPA RE-SUBMITTAL	MM	RM	04/19/2021
4	100% EPA SUBMITTAL	MM	RM	12/18/2020

Drawn: MM, Designer: RM, Design Check: RM

Project: 12182929, Date: Apr 19, 2021

Original Size: 11x17 inch on original size drawing

Arch D

Project No: 12182929

Notes

- FOR THE AREAS REQUIRING SOIL REMOVAL, NEAR MARKET STREET AND THE GENERALIZED BOAT WORMS, INC. PROPERTY, THE LATERAL LIMITS OF THE EXCAVATION WILL EXTEND PROXIMATELY TO EXHIBIT STREET AND THE GENERALIZED BOAT WORMS, INC. PROPERTY LIMITS. HOWEVER, THE EXCAVATION WILL NOT EXTEND BEYONDER THE STREET OR INTO THE GENERALIZED BOAT WORMS, INC. PROPERTY.
- FOR THE AREAS REQUIRING SOIL REMOVAL ON THE SOUTHWEST PORTION OF THE SOUTHERN IMPOUNDMENT, A SIGNAGE WILL BE INSTALLED ADJACENT TO THE SAN JACINTO RIVER. THE EXCAVATION WILL BE COMPLETED TO THE LATERAL LIMIT OF THE SIGNAGE.
- PROPOSED EXCAVATION EXTENT SUBJECT TO CHANGE BASED ON THE RESULTS OF THE PRE-CONSTRUCTION SAMPLING EVENT.

SOURCE

TOPOGRAPHIC, HYDROGRAPHIC & MONITORING SURVEY OF SAN JACINTO RIVER WASTE PITS, HARRIS COUNTY, TEXAS, NORWORTH SURVEYING INC., 08/14/2019 TO AUGUST 2, 2019

PARCELS 2, 3 & 4 PRIVATE SONS SUBDIVISION FOR GHD SITUATED IN THE J. T. SMITH 1ST EASY, 07-04-0008

GHD SERVICES INC.

NO. 12182929, FILE NO. 02

NO. 001 ONE SURVEYOR NO. 278

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STATE OF TEXAS
 DEPARTMENT OF AGRICULTURE
 SOIL CONSERVATION SERVICE
 HARRIS COUNTY

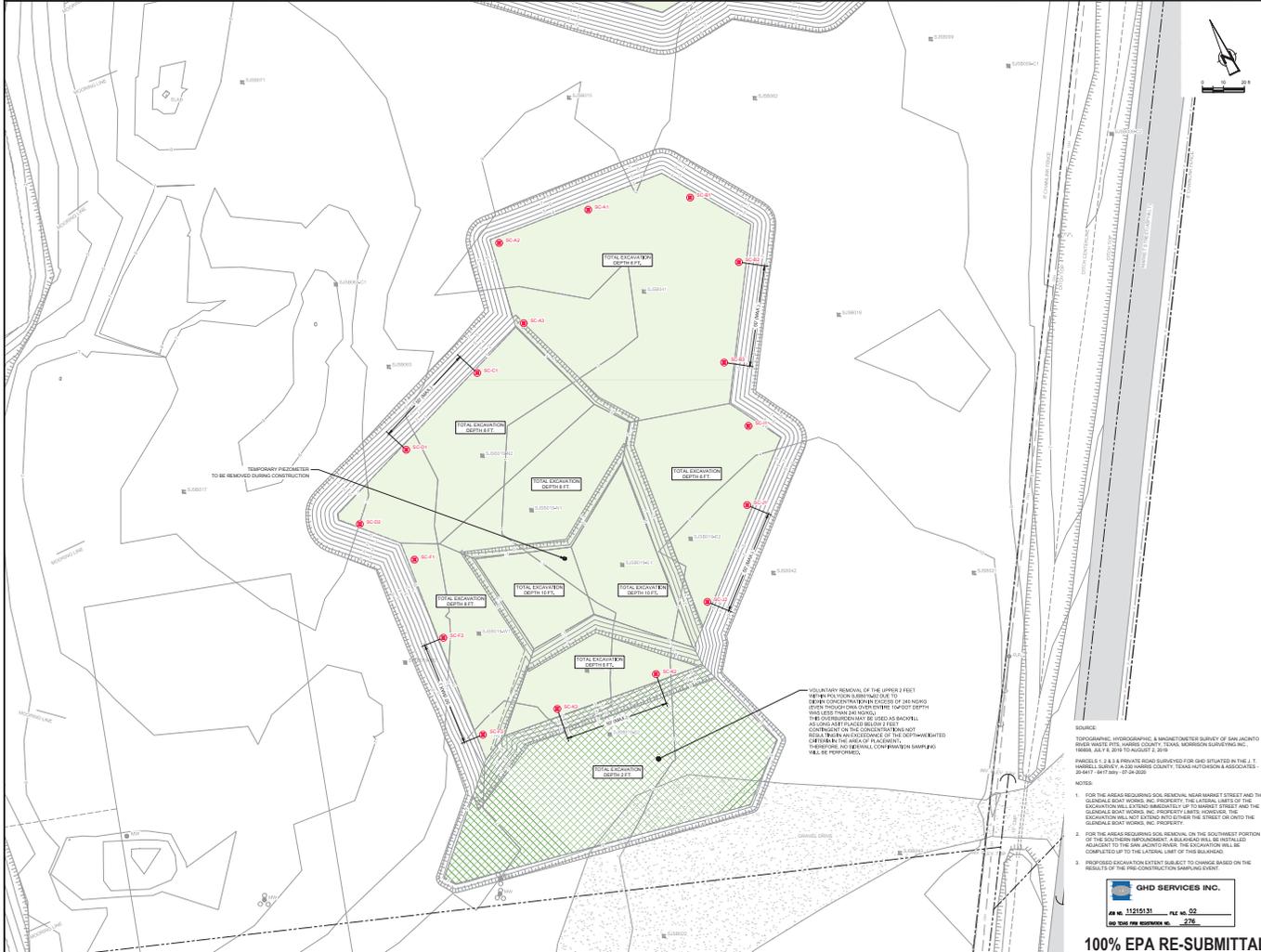
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 This document and the data and design information herein, are an instrument of professional service, the preparation of which and the use thereof are subject to the terms and conditions of the contract for professional services between the client and GHD.

Client
SAN JACINTO RIVER WASTE PITS
FINAL (100%) REMEDIAL DESIGN SOUTHERN IMPOUNDMENT (AMENDED APRIL 2021) HARRIS COUNTY, TEXAS

No.	Issue	Drawn	Checked	Approved	Date
5	100% EPA RE-SUBMITTAL	MM	RM	RM	04/19/2021
4	100% EPA SUBMITTAL	MM	RM	RM	12/18/2020

Drawn: MM, Designer: RM
 Checked: GP, Design Check: LL
 Project: 11215131, Date: Apr 19, 2021
 Original Size: 11" x 17", Scale: 1" = 20'
 Title: **Arch D**, North Central Excavation Area Bottom of Excavation Sampling Plan
 Project No: 11215131
 Sheet No: **C-17**

GHD SERVICES INC.
 11215131, FILE NO. 02
 278





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 OCEAN M. LOCKERTS
 Mayor
 #192021

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LEGEND

- PROPERTY BOUNDARY
- EXISTING CONTOUR INTERVAL
- FENCE LINE
- SCHEDULE
- TOP OF BANK
- TOP OF SLOPE
- UNDERGROUND UTILITY
- GUARDRAIL
- INTERSECTION OF UTILITY LINE
- POWER BOWLING LOCATION
- MONITORING WELL
- POWER POLE
- LIGHT POLE
- WELL

AREA OF AFFECT

- AREA OF INTEREST (PROPERTY EXEMPT)
- ASPHALT
- CONCRETE
- GRAVEL
- EXCAVATION CONTOUR INTERVAL
- EXCAVATION TOP OF BANK
- EXCAVATION TOP OF SLOPE
- PROPOSED CONTOUR INTERVAL
- CONSTRUCTION ROW (CONTRACT)

Arch D

Scale: 1" = 20'

Original Size: 36" x 48" (on original size drawing)

Scale: 1" = 20'

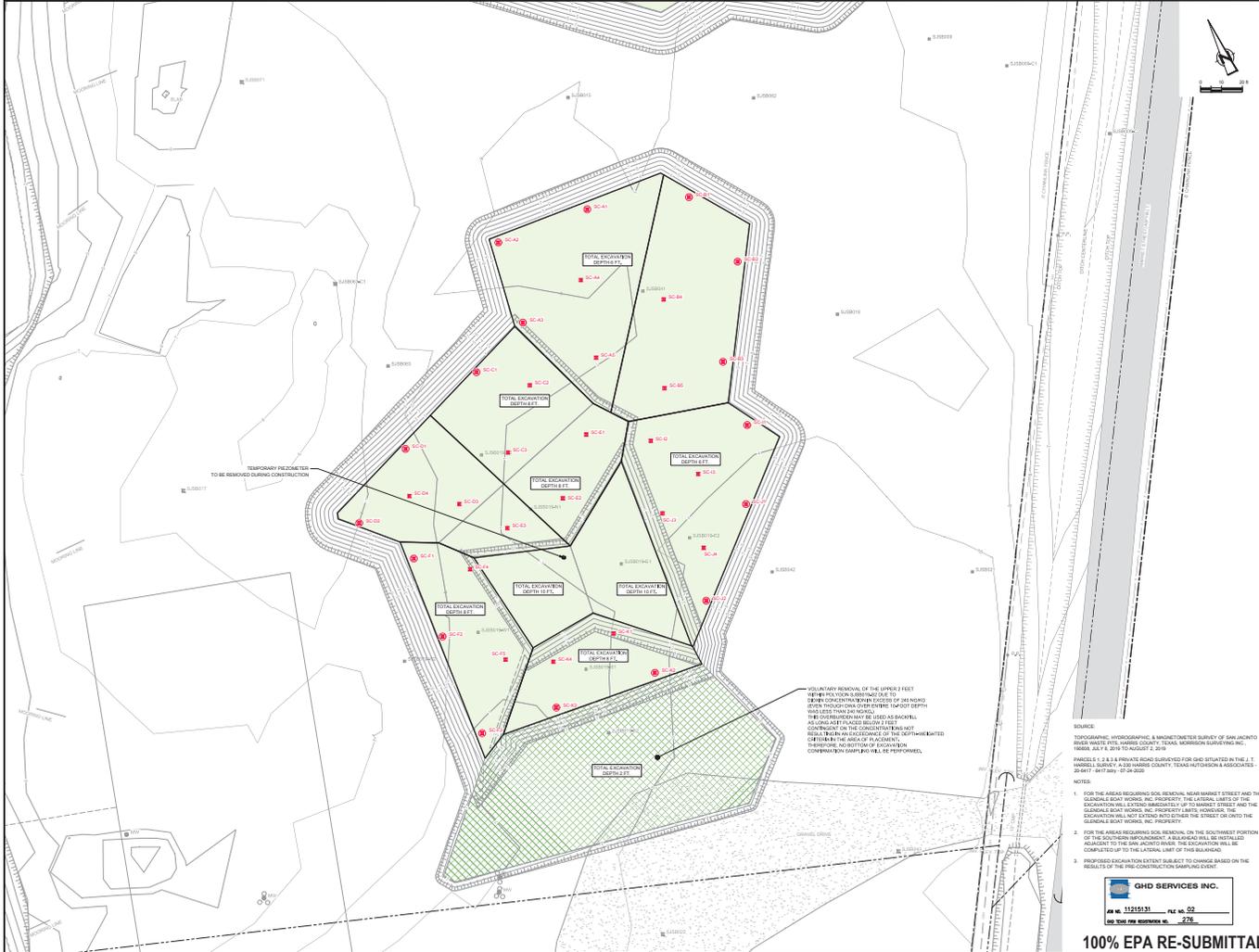
Original Size: 36" x 48" (on original size drawing)

Project: 11215131

File: SOUTH CENTRAL EXCAVATION AREA SIDEWALL SAMPLING PLAN

Sheet No.: C-24

Sheet 25 of 49





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LEGEND

- PROPERTY BOUNDARY
- PROPERTY EXEMPTION
- EXISTING CONTOUR INTERVAL
- FENCE LINE
- BOUNDARY
- TOP OF BANK
- TOP OF SLOPE
- UNDERGROUND UTILITY
- GUARDRAIL
- UNDERGROUND UTILITY LINE
- POWER SERVICE LOCATION
- MONITORING WELL
- POWER POLE
- LIGHT POLE
- WELL
- AREA OF SUBJECT
- AREA OF INTEREST (QUALIFY EXAMINE)
- ASPHALT
- CONCRETE
- GRAVEL
- EXCAVATION CONTOUR INTERVAL
- EXCAVATION TOP OF BANK
- EXCAVATION TOP OF SLOPE
- PROPOSED EXCAVATION (SEE CIVIL)
- AREA OF EXCAVATION (SEE CIVIL)
- PROPOSED EXCAVATION
- PROPOSED EXCAVATION
- CONSTRUCTION (SEE CIVIL)

Client
SAN JACINTO RIVER WASTE PITS

Project
FINAL (100%) REMEDIAL DESIGN SOUTHERN IMPOUNDMENT (AMENDED APRIL 2021) HARRIS COUNTY, TEXAS

No.	Issue	Class	Appr.	Date
1	100% EPA RE-SUBMITTAL	REV	RM	04/19/2021
2	100% EPA SUBMITTAL	REV	RM	12/18/2020

Drawn	Issue	Checked	Appr.	Date
gsp				

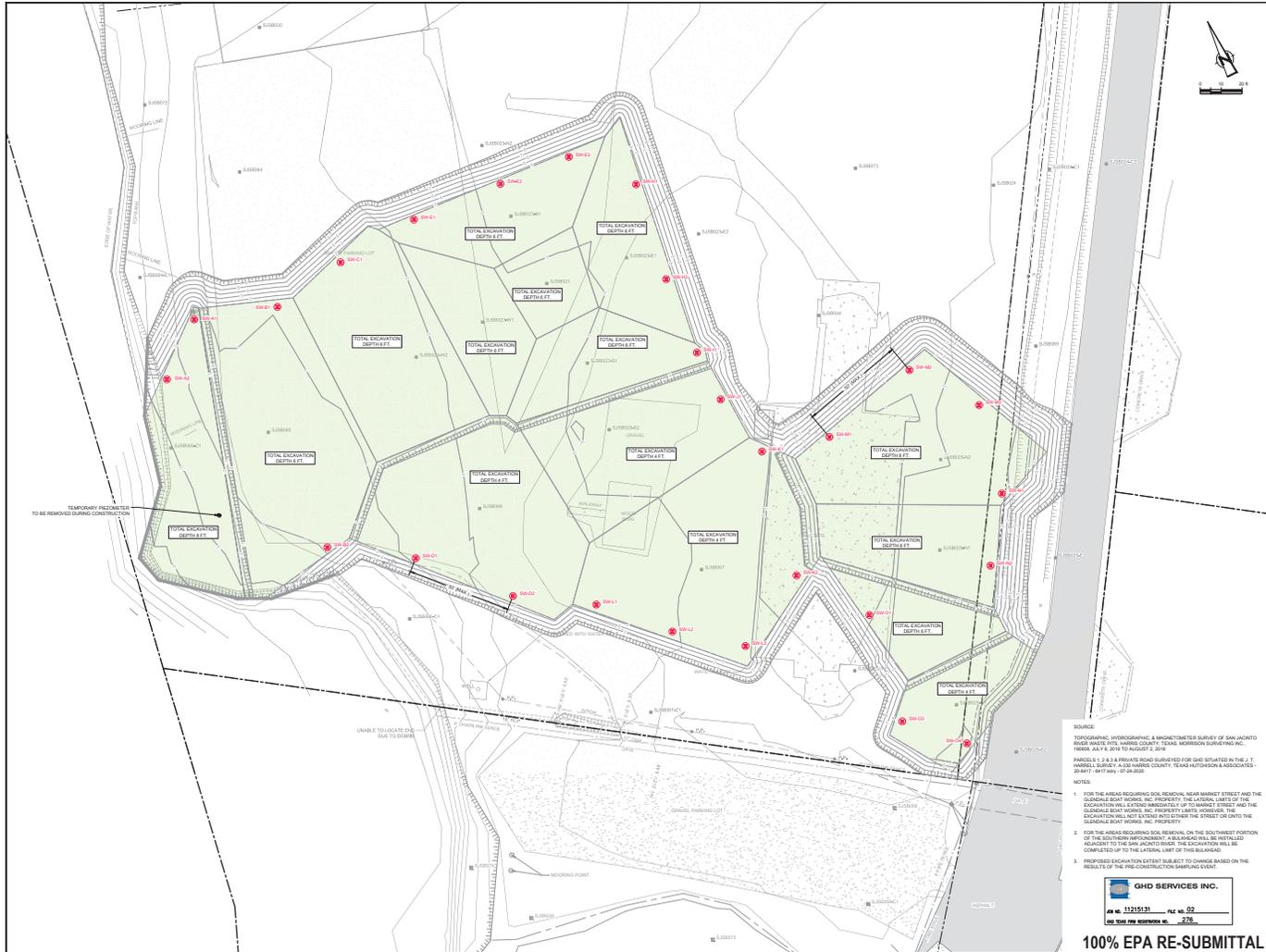
Project 04/19/2021
Design 04/19/2021
Scale 1" = 20'
Original Size See scale drawing
Arch D See scale drawing
Project No. 11215131

South Central Excavation Area Bottom of Excavation Sampling Plan

Sheet No. C-25

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Legend

- PROPERTY BOUNDARY
- EXCAVATION CONTOUR INTERVAL
- FENCE LINE
- BOUNDARY
- TOP OF BANK
- TOP OF SLOPE
- UNDERGROUND UTILITY
- GUARDRAIL
- POWER BOWLING LOCATION
- MONITORING WELL
- POWER POLE
- LIGHT POLE
- WELL

--- AREA OF ABSTRACT

--- ASPHALT

--- CONCRETE

--- GRAVEL

--- EXCAVATION CONTOUR INTERVAL

--- EXCAVATION TOP OF BANK

--- EXCAVATION TOP OF SLOPE

--- PROPOSED EXCAVATION LOCATION

SAN JACINTO RIVER WASTE PITS

Project: **FINAL (100%) REMEDIAL DESIGN SOUTHERN IMPOUNDMENT (AMENDED APRIL 2021) HARRIS COUNTY, TEXAS**

No.	Issue	Drawn	Checked	Approved	Date
1	100% EPA RE-SUBMITTAL	MW	RH		04/19/2021
2	100% EPA SUBMITTAL	MW	RH		12/18/2020

Drawn: MW Designer: RH
 Checked: GH Design Check: LL
 Project: SW Date: Apr 19, 2021
 Scale: 1" = 20'
 Original Size: 8 1/2" x 11" (not on original size drawing)

Arch D Project No: 11215131

SOUTHWEST EXCAVATION AREA SIDEWALL SAMPLING PLAN

Sheet No: **C-32**

Sheet 33 of 49

Attachment 4 Field Sampling Plan



Attachment 4 - Field Sampling Plan - Southern Impoundment

*Provided with Final 100% Remedial Design - Southern
Impoundment (Amended April 2021)*

San Jacinto River Waste Pits Site
Harris County, Texas

International Paper Company

GHD | 5551 Corporate Boulevard Suite 200 Baton Rouge Louisiana 70808 USA
11215131 | Report No 3



Table of Contents

- 1. Introduction..... 2
 - 1.1 Relationship to Supporting Plans..... 2
- 2. Off-Site Backfill Characterization Sampling 2
 - 2.1 Sampling Rationale..... 3
 - 2.2 Sample Collection Objective..... 3
 - 2.3 Sample Type, Location, and Frequency 3
 - 2.4 Sample Equipment and Procedures 4
 - 2.4.1 List of Equipment Needed 4
 - 2.4.2 Decontamination of Sampling Equipment 4
 - 2.4.3 Sample Labeling 4
 - 2.4.4 Sample Packing and Shipping..... 5
- 3. Water Sampling..... 5
 - 3.1 Sample Collection Objective..... 5
 - 3.2 Sample Type, Location, and Frequency of Compliance Sampling..... 5
 - 3.3 Sample Equipment and Procedures 6
 - 3.3.1 List of Equipment Needed 6
 - 3.3.2 Equipment Calibration 6
 - 3.3.3 Sampling Procedure 6
- 4. Investigation Derived Wastes..... 8
- 5. References 8

Attachment Index

Attachment A Water Treatment System P&ID



1. Introduction

This Field Sampling Plan (FSP) was prepared by GHD Services Inc. (GHD), on behalf of International Paper Company for the Southern Impoundment of the San Jacinto River Waste Pits Superfund Site in Harris County, Texas (Site). This FSP was prepared pursuant to the requirements of the Administrative Settlement Agreement and Order on Consent for Remedial Design (AOC), Docket No. 06 02 18, with an effective date of April 11, 2018 (United States Environmental Protection Agency [EPA], 2018). The AOC includes a Statement of Work (SOW) which requires supporting deliverables to accompany the Final 100% Remedial Design for the Southern Impoundment (Southern Impoundment 100% RD) submittal to the EPA.

This FSP describes procedures for sampling of treated water from the wastewater treatment system and the imported backfill that will be used to fill excavations during implementation of the Southern Impoundment remedial action (RA). It outlines the procedures for collection of samples consistent with the sample design. This FSP was prepared in accordance with *Sampling and Analysis Plan Guidance and Template, Version 4*, General Projects R9QA/009.1 May 2014 EPA. References in this FSP to the “work site” are to the Southern Impoundment. Prior to initiation of Southern Impoundment RA activities, each selected remedial contractor (RC) will, as applicable, either update this FSP or develop its own FSP to address the components outlined in this document.

1.1 Relationship to Supporting Plans

The FSP should be considered in combination with the other supporting plans. The Pre-Construction Field Sampling Plan (PC FSP) defines the procedures for sampling that will be completed during the Southern Impoundment RA prior to excavation activities to further delineate excavation limits, characterize excavated material for off-site disposal, and collect other data to support the Southern Impoundment RA. The Construction Quality Assurance/Quality Control Plan (CQA/QCP) describes the procedures to verify that the excavation objectives are achieved during implementation. The Site-Wide Monitoring Plan (SWMP) describes the procedures for monitoring to prevent the potential spread of dust generated during construction and monitoring of the best management practices (BMPs) with respect to stormwater. Field and analytical quality procedures are described in the Quality Assurance Project Plan (QAPP). The Transportation and Off-Site Disposal Plan (TODP) describes the procedures for on-site management and loading of excavated material to be disposed of off-site during the Southern Impoundment RA, the transportation routes for off-site shipments from the Southern Impoundment, and measures to be implemented if needed to protect communities that may be affected by the shipments.

2. Off-Site Backfill Characterization Sampling

It is anticipated that during the Southern Impoundment RA approximately 25,000 cubic yards of imported fill from an off-site source will be used in backfilling excavations. As described in the Southern Impoundment 100% RD, imported fill will be combined with excavated overburden soils to backfill excavations. Prior to importing backfill to the Southern Impoundment, the material to be used as imported fill will be sampled to confirm that it does not contain constituents of potential concern (COPCs) above the EPA Regional Screening Levels (RSL) for resident soil (EPA RSL Table, May 2020) or the Texas Commission on Environmental Quality (TCEQ) Texas Risk



Reduction Program (TRRP) Tier 1 Residential Soil protective concentration levels (PCLs; for total petroleum hydrocarbons [TPH]).

2.1 Sampling Rationale

A soil sample from each imported fill source will be collected and analyzed to confirm that the imported fill does not contain COPCs above the specified levels. Only one sample per imported fill source is required as long as the general location of the source of material does not change or there has not been any identified change in the composition of the imported fill. Imported fill will be periodically monitored by the RC through visual inspections to confirm that no changes in composition have occurred. If the material appears to have altered or changed in physical composition via visual inspection, additional characterization samples may be required.

2.2 Sample Collection Objective

The objective of collecting source imported fill soil samples will be to ensure that the sample is representative of the material from that source as a whole. Soil samples should be composited from different locations and elevations of imported fill material from the source. Soil samples should be collected directly from the source and analyzed at the approved analytical laboratory (Approved Laboratory) prior to delivery to the Southern Impoundment.

2.3 Sample Type, Location, and Frequency

Each off-site imported fill soil sample is to be tested for the analytical parameters listed in Table 2.3, pursuant to EPA Test Methods for Evaluating Solid Waste: Physical/Chemical Methods (SW 846) and Target Compound List (TCL)/Target Analyte List (TAL) and the other analytical methods listed in Table 2.3. Analytical test methods and quality assurance/quality control procedures (QA/QC) are outlined in the QAPP.

Table 2.3 Analytical Testing Procedures for Source Sampling

Analytical Parameters	Analytical Methods ⁽¹⁾
TAL ⁽³⁾ Metals	SW-846 6020A/7471A
Hexavalent Chromium	SW-846 7196A
Cyanide	SW-846 9010/9012
TCL ⁽²⁾ Volatiles	SW-846 8260B
TCL Semi-Volatiles	SW-846 8270D
TCL Pesticides	SW-846 8081B
Polychlorinated Biphenyls	SW-846 8082A
Herbicides	SW-846 8151A
Dioxins and Furans	SW-846 1613B
Total Petroleum Hydrocarbons	TX 1005/1006 ⁽⁴⁾

Notes:

(1) EPA SW 846.

(2) TCL: Target Compound List.

(3) TAL: Target Analyte List.

(4) TCEQ Methods 1005 and 1006



2.4 Sample Equipment and Procedures

All source sample collection activities will be done using clean hand tools such as a trowel or sharp shooter shovel, as access allows. It is intended that the samples would be collected in accordance with the procedures set forth below and those governing the collection and shipment of samples contained in the QAPP.

2.4.1 List of Equipment Needed

Source sampling equipment may include:

- Shovel
- Trowel
- Nitrile Gloves
- Buckets
- Mixing Bowl

2.4.2 Decontamination of Sampling Equipment

Source sample collection equipment that is not disposable should be decontaminated before and after sample collection at each sample location. Equipment cleaning procedures may include the following:

- Initial rinse with laboratory-grade deionized water to remove soil adhered to the equipment
- Apply a non-phosphate laboratory-grade detergent to the equipment and scrub using an abrasion brush to thoroughly clean the sampling equipment
- Triple rinse the equipment with laboratory-grade deionized water
- Air-dry the rinsed equipment and wrap in clean, protective plastic, until used

2.4.3 Sample Labeling

Labels should be secured to the sample containers and be written in indelible inks. Sample containers should be packaged and shipped on ice within an insulated ice chest to the Approved Laboratory for analysis following proper chain-of-custody protocol.

Labels may contain the following information:

- Sample identification (this includes a sample number and may include a sample container number)
- Initials of sample collector(s)
- Date and time of sample collection
- Location or source of sample collection
- Analysis to be performed
- Preservative utilized



2.4.4 Sample Packing and Shipping

When possible, sample container preparation and packing for shipment should be completed in a well-organized and clean area, free of any potential for cross-contamination of the samples. Sample containers may be prepared for shipment as follows:

1. Containers will be wiped clean of all debris/water using paper towels (paper towels must be disposed of with other potentially impacted materials).
2. Ensure that the sample labelling protocol outlined above has been completed.

The following standard guidelines may be followed when packing samples for shipment:

1. The entire contents of the cooler will be sealed in a large plastic bag.
2. The trip blank and the temperature blank will be included with shipments of samples for volatiles analysis.
3. If the cooler is being shipped by a common carrier, such as Federal Express, the chain-of custody will be placed in a sealed plastic bag inside the cooler.
4. Custody seals (two, minimum) are to be placed on each cooler and covered with clear tape.
5. Cooler lids and drain holes are to be sealed with packaging tape.
6. All prior stickers/markings or any prior shipping labels are to be removed from coolers prior to shipment or sample custody release.

3. Water Sampling

During the Southern Impoundment RA, water that accumulates in an open excavation (through seepage or precipitation) will be treated through an on-site water treatment system prior to discharge to the San Jacinto River. The water treatment process, the results of treatability testing, and the calculated discharge criteria are detailed in the Southern Impoundment 100% RD.

3.1 Sample Collection Objective

The water treatment system has been designed to remove suspended solids and COPCs associated with those solids, including dioxins/furans and metals. Sampling is required for purposes of compliance with discharge criteria for total suspended solids (TSS), pH, dioxins/furans, and metals.

3.2 Sample Type, Location, and Frequency of Compliance Sampling

The compliance sampling location with respect to the water treatment system is identified on Drawing P-03 (included as Attachment A). The location is downstream of the Service Water Storage tank, as identified on Drawing P-03, and prior to the point of discharge to the San Jacinto River. Table 3.2 below presents a summary of the analysis type and minimum frequency of sampling. The discharge of treated water is expected to be sporadic. Therefore, the sampling frequency applies to time periods when a discharge is occurring.



Table 3.2 – Sample Analysis and Frequency

Parameter ⁽¹⁾	Sample Type	Minimum Frequency ⁽²⁾
pH ⁽³⁾	Grab	Once per week
Total Suspended Solids	Composite	Twice per week
Dioxins/furans	Composite	Once per week
Metals	Composite	Once per week

Notes:

⁽¹⁾ Test procedures used must be specified in 30 TAC 319.11-319.12. Laboratory tests must meet requirements of 30 TAC, chapter 25, Environmental Testing Laboratory Accreditation and Certification.

⁽²⁾ When discharging

⁽³⁾ Inline monitoring of effluent pH will also be conducted and is covered in the design specification.

If analyses at the discharge indicate that effluent has not met treatment criteria for a certain parameter, a second sample of treated water is to be collected and analyzed for that parameter as soon as practical.

3.3 Sample Equipment and Procedures

3.3.1 List of Equipment Needed

Water sampling equipment may include:

- Sample containers
- Bucket and stirrer (if collecting multiple samples at same location)
- Gloves
- Waterproof ink pen
- Notebook
- pH meter and calibration standards

3.3.2 Equipment Calibration

The pH meter should be calibrated using a portable meter following instrument manufacturer instructions. A two-point calibration should be conducted at a minimum. Records of pH meter calibration should be maintained at the work site during the Southern Impoundment RA, as specified in the QAPP.

3.3.3 Sampling Procedure

It is recommended that the following procedure be followed when collecting water samples:

- Obtain sample cooler, bottles and container from the Approved Laboratory.



- Inspect sample containers for cleanliness, integrity, and the presence and suitability of any required preservatives.
- Flush line at sample port to clear water standing in line in order to obtain a representative sample. Containerize the flush water and return to treatment system.
- Collect fresh grab samples in a clean bucket. If possible, samples will be collected directly into sample containers. Volume should be sufficient to fill all bottles. Stir bucket, if used, to suspend solids. Divide each sample between containers such that essentially identical samples are collected and submitted to the Approved Laboratory for each sample location during each sampling event.
- Collect composite samples for a 24-hour period or over the length of the discharge period (if the discharge occurs for less than 24 hours). A composite sampler may be used to collect flow-weighted composite sample. Alternatively, a series of grab samples may be composited in volumes proportional to flow, and collected at the intervals required by 30 TAC 319.9.
- If possible, sufficient equipment will be sent to the field so that all sampling can be conducted without the need for field decontamination. Decontamination of field equipment should be conducted as specified in the QAPP. Sample collectors should change gloves after each sampling event.
- Label sample bottles clearly, using a thin tip permanent marker pen. The label should include:
 - Sampling date
 - Sampling time
 - Sample identification number
 - Job number
- Cross-check labels to ensure that labels and field sheet IDs match.
- Place samples on ice immediately.
- Seal samples in separate bubble wrap and plastic bags with proper labeling on each sample.
- Cover samples with ice to keep cool during shipping.
- Place all sealed bags containing the samples inside a large contractor bag inside the cooler.
- Complete chain of custody documentation. Place a chain of custody form in a separate plastic bag placed on top of the samples for shipment. Keep a copy for reference. If a copy is not available, take photograph of the form as a record.
- Samples should be shipped on the same day as sampling. If samples cannot be shipped on the same day, cooler must be drained periodically, and ice replaced. Samples must arrive at the Approved Laboratory within the hold times provided by the Approved Laboratory.
- Notify the Approved Laboratory when the samples should arrive.



4. Investigation Derived Wastes

Investigation derived waste (IDW) from sampling and decontamination activities will be containerized and temporarily stored on the Southern Impoundment. Liquid waste (e.g., decontamination water) and dry waste (e.g., excavated material and/or soiled personal protective equipment) should be segregated and transferred into United States Department of Transportation approved 55-gallon drums, or other approved containers, and temporarily stored at the Southern Impoundment pending analytical results.

All disposable materials used for sample collection and processing, such as paper towels and gloves, should be placed in heavyweight garbage bags or other appropriate containers. Disposable supplies that do not contain IDW should be removed from the Southern Impoundment by sampling personnel and placed in a normal refuse container for disposal at a solid waste landfill.

All IDW will be disposed of in accordance with all applicable regulations and guidelines as specified in the TODP.

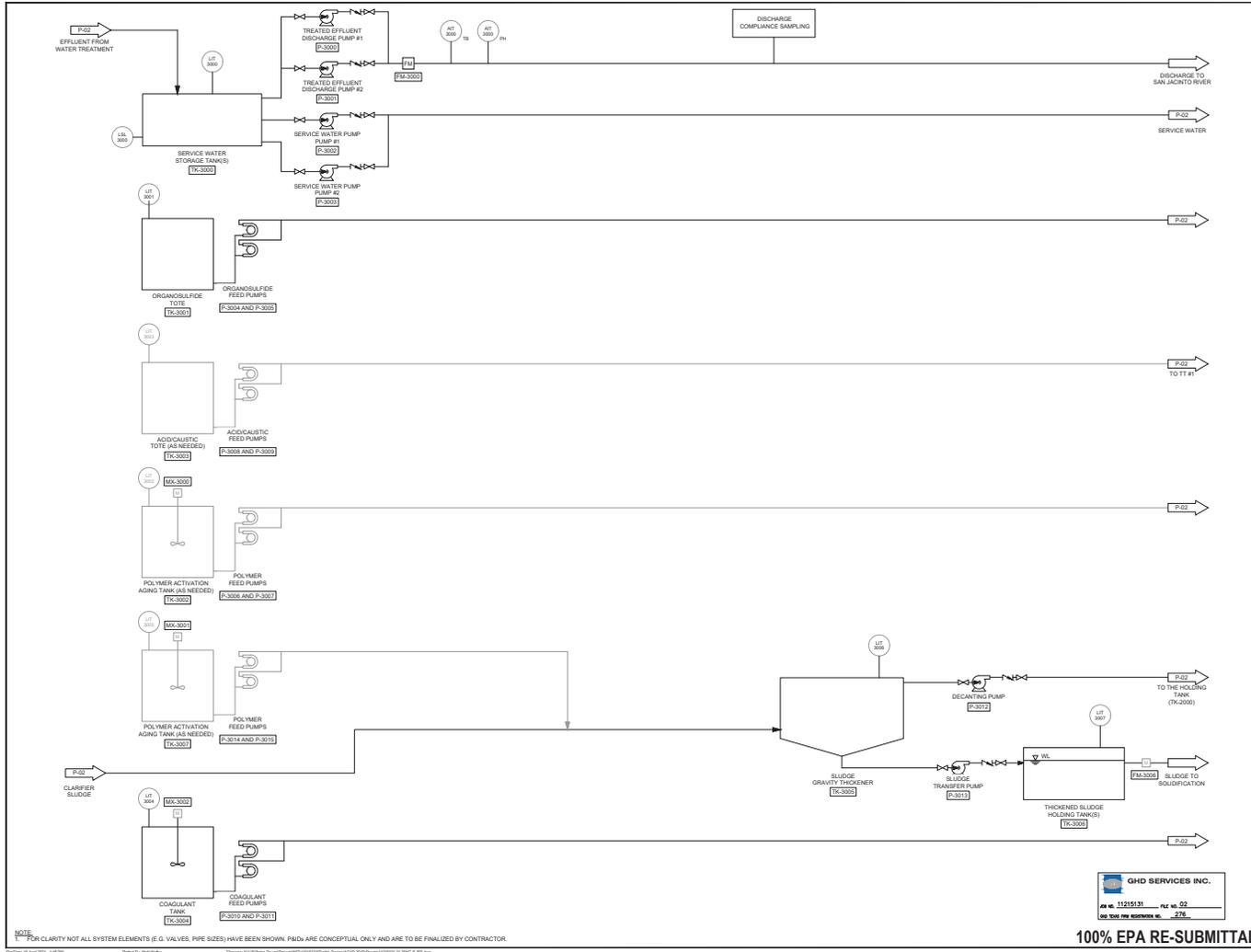
5. References

EPA, 2018. Administrative Settlement Agreement and Order on Consent for Remedial Design. U.S. EPA Region 6, CERCLA Docket. No. 06-02-18. In the matter of: San Jacinto Waste Pits Superfund Site, Harris County, Texas. International Paper Company and McGinnes Industrial Maintenance Corporation, Respondents. April 2018.

Attachments

Attachment A

Water Treatment System P&ID



NOTE: FOR CLARITY NOT ALL SYSTEM ELEMENTS (E.G. VALVES, PIPE SIZES) HAVE BEEN SHOWN. P&IDs ARE CONCEPTUAL ONLY AND ARE TO BE FINALIZED BY CONTRACTOR.

GHD SERVICES INC.
 11215131 FILE NO. 02
 SAN JACINTO RIVER IMPROVEMENT # 278



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Client: **SAN JACINTO RIVER WASTE PITS**

Project: **FINAL (100%) REMEDIAL DESIGN SOUTHERN IMPOUNDMENT (AMENDED APRIL 2021) HARRIS COUNTY, TEXAS**

No.	Issue	Drawn	Appr'd	Date
1	100% EPA RE-SUBMITTAL	MM	MF	04/19/2021
2	100% EPA SUBMITTAL	MM	MF	12/18/2020

Drawn: **BP** Designer: **KJ**
 Checked: **MM** Design Check: **MM**
 Project Coordinator: **DM** Date: **Apr 19, 2021**
 Scale: **N.T.S.**
 Original Size: **Arch D** Bar is same inch on original size drawing. @ 80mm maximum TT

Project No: **11215131**

Title: **WATER TREATMENT SYSTEM P&ID (2 OF 2)**

Sheet No: **P-03**

Sheet 48 of 49

Attachment 5

Quality Assurance Project Plan



Attachment 5 - Quality Assurance Project Plan - Southern Impoundment

Provided with Final 100% Remedial Design - Southern Impoundment (Amended April 2021)

San Jacinto River Waste Pits Site
Harris County, Texas

International Paper Company

GHD | 5551 Corporate Boulevard Suite 200 Baton Rouge Louisiana 70808 USA
11215131 | Report No 3



Table of Contents

1.	Introduction.....	1
2.	Project Management	2
2.1	Project Organization	2
2.1.1	Roles and Responsibilities	2
2.1.2	Quality Assurance Roles and/or Responsibilities	3
2.1.3	Field Responsibilities	3
2.1.4	Laboratory Responsibilities	4
2.2	Quality Objectives and Criteria	4
2.2.1	Measurement Performance Criteria	5
2.3	Special Training Requirements/Certifications	6
2.4	Documentation and Records	6
2.4.1	Field and Laboratory Records	6
2.4.2	Data Reporting Format	7
2.4.3	Data Archiving and Retrieval	8
3.	Data Generation and Acquisition	8
3.1	Sampling Program	8
3.2	Sampling Methods	8
3.3	Sample Handling and Custody Requirements	8
3.3.1	Sample Handling and Packaging	8
3.3.2	Chain of Custody	8
3.4	Analytical Method Requirements	10
3.5	Quality Control Requirements	10
3.5.1	Field Sampling Quality Control	10
3.5.2	Analytical Quality Control	10
3.6	Instrument/Equipment Testing, Inspection, and Maintenance Requirements	10
3.6.1	Field Equipment Maintenance	10
3.6.2	Field Equipment and Sampling Container Cleaning/Decontamination Procedures	11
3.6.3	Laboratory Instrument Maintenance	11
3.7	Calibration Procedures and Frequency	11
3.7.1	Field Instruments/Equipment	11
3.7.2	Laboratory Instruments	11
3.8	Inspection/Acceptance Criteria for Supplies and Consumables	11
3.8.1	Field Supplies and Consumables	12
3.8.2	Laboratory Supplies and Consumables	12
3.9	Data Management	12
3.9.1	Data Recording	12



Table of Contents

3.9.2	Data Validation	12
3.9.3	Data Transformation/ Calculations	13
3.9.4	Data Transmittal/Transfer	13
3.9.5	Data Assessment.....	13
3.9.6	Data Tracking	14
3.9.7	Data Storage and Retrieval	14
3.9.8	Data Security	14
4.	Assessment and Oversight	14
4.1	Assessments and Response Actions	14
4.2	Reports to Management	15
5.	Data Validation and Usability	15
5.1	Data Review, Verification, and Validation.....	15
5.2	Validation and Verification Methods	16
5.3	Usability/Reconciliation with Data Quality Objectives.....	16
6.	References	17

Table Index

Table 1	Analyte List, Analytical Methods, and Quantitation Limits
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Quality Assurance Project Plan Signature Page

Site Name: San Jacinto River Waste Pits Superfund Site

Location Address: 18003 Market St., Channelview, Texas 77530 (29.791692, -95.066069)

Anticipated Start Date: TBD _____ Anticipated Project Duration: TBD _____

Prepared By: _____ Date: _____

Project Manager: _____ Date: _____

Quality Assurance Officer: _____ Date: _____

This signature page must be completed prior to Southern Impoundment RA activities and be available on site for review.



Acronyms and Abbreviations

ANSI/ASQC	American National Standards Institute/American Society for Quality Control
AOC	Administrative Settlement Agreement and Order of Consent
CFR	Code of Federal Regulations
CLP	Contract Laboratory Program
DQOs	Data Quality Objectives
EDDs	Electronic Data Deliverables
EPA	United States Environmental Protection Agency
FSP	Field Sampling Plans
GC/MS	Gas Chromatography/Mass Spectrometry
GHD	GHD Services Inc.
HAZWOPER	Hazardous Waste Operations and Emergency Response
IPC	International Paper Company
LCS	Laboratory Control Sample
LIMS	Laboratory Information Management System
MDL	Method Detection Limit
MS/MSD	Matrix Spike/Matrix Spike Duplicate
NELAP	National Environmental Laboratory Accreditation Program
PARCCS	Precision, Accuracy, Representativeness, Comparability, Completeness, Sensitivity
PE	Performance Evaluation
QA	Quality Assurance
QA/QC	Quality Assurance/Quality Control
QAPP	Quality Assurance Project Plan
QC	Quality Control
RA	Remedial Action
RPD	Relative Percent Difference
SOP	Standard Operating Procedure
SOW	Statement of Work
SWMP	Site-Wide Monitoring Plan
TCEQ	Texas Commission on Environmental Quality



1. Introduction

This Quality Assurance Project Plan (QAPP) was prepared by GHD Services Inc. (GHD), on behalf of International Paper Company for the Southern Impoundment of the San Jacinto River Waste Pits Superfund Site in Harris County, Texas (Site). This QAPP was prepared pursuant to the requirements of the Administrative Settlement Agreement and Order on Consent for Remedial Design (AOC), Docket No. 06 02 18, with an effective date of April 11, 2018 (United States Environmental Protection Agency [EPA], 2018). The AOC includes a Statement of Work (SOW) which requires supporting deliverables to accompany the Final 100% Remedial Design for the Southern Impoundment (Southern Impoundment 100% RD) submittal to the EPA.

This QAPP was developed to augment the Pre-Construction Field Sampling Plan and the Field Sampling Plan (collectively, FSPs) and the Site-Wide Monitoring Plan (SWMP) and to address sample analysis and data handling during implementation of the remedial action (RA) for the Southern Impoundment. This QAPP was prepared in accordance with the EPA Requirements for Quality Assurance Project Plans, QA/R 5, EPA/240/B 01003 (March 2001, reissued May 2006); Guidance for Quality Assurance Project Plans, QA/G 5, EPA/240/R 02/009 (December 2002); and Uniform Federal Policy for Quality Assurance Project Plans, Parts 1 3, EPA/505/B 04/900A through 900C (March 2005). References in this QAPP to the “work site” are to the Southern Impoundment and references to “Implementing Party” are to the entity(ies) implementing the RA for the Southern Impoundment.

Prior to initiation of Southern Impoundment RA activities, the selected remedial contractor(s) (RC) will update this QAPP or develop a separate QAPP that addresses the components outlined in this document.

In accordance with the EPA guidance listed above, there are four main topics that must be included in a QAPP.

Those four topics are:

- Project Management - project management, project objectives, and project history
- Data Generation and Acquisition - descriptions of the design and implementation of all measurement systems that will be used during the project
- Assessment/Oversight - the procedures used to ensure proper implementation of the QAPP
- Data Validation and Usability - the quality assurance (QA) activities that occur after the data collection phase of the project is completed

Components of tasks associated with these four topics and suggested responsibilities for project management, data generation and acquisition, assessment/oversight, and data validation and usability are outlined in this QAPP.

This QAPP is a dynamic document, and it will be updated with specific addenda, if necessary, to reflect new scopes of work or changes in the current scope of required sampling. Any necessary modifications will be made by the Quality Assurance Officer (QA Officer) to be designated by the



Implementing Party and will be reviewed by the Project Coordinator. This QAPP may be, depending on the length of the Southern Impoundment RA, reviewed on an annual basis by the QA Officer to determine if it should be modified to reflect any work being conducted at the work site.

2. Project Management

2.1 Project Organization

It is anticipated that, for purposes of the Southern Impoundment RA, project management and safety responsibilities may be assigned as described below. The role and if applicable, proposed responsibilities of the EPA, the Implementing Party, QA personnel, field personnel, and laboratory personnel are described in the following subsections. Additionally, any recommended training/certification requirements related to implementation of the Southern Impoundment RA are identified.

2.1.1 Roles and Responsibilities

United States Environmental Protection Agency

The EPA is the lead agency with respect to the Southern Impoundment RA. It is assumed that the EPA will designate a Remedial Project Manager (RPM) to oversee the Southern Impoundment RA.

Project Coordinator

The Project Coordinator will be designated by the Implementing Party or the RC to ensure that the Southern Impoundment RA is implemented in accordance with the approved Southern Impoundment 100% RD. It is anticipated that the Project Coordinator would have technical responsibility for data collection activities. The Project Coordinator's responsibilities may include reviewing QA reports, approving and authorizing actions necessary to accomplish QA objectives, and acting as liaison between agencies and field staff.

Laboratory Project Manager

Analytical laboratory options for the Southern Impoundment RA are still under consideration. The analytical laboratory selected to perform environmental analyses for the Southern Impoundment RA will hereafter in this document be identified as the "Approved Laboratory". The Approved Laboratory is expected to be a full-service chemical analytical laboratory accredited under National Environmental Laboratory Accreditation Program (NELAP) and certified in Texas. More than one Approved Laboratory may be selected.

The Laboratory Project Manager will be a person designated by an Approved Laboratory and approved by the RC. The Laboratory Project Manager is anticipated to act as the primary point of contact between the Approved Laboratory and the Project Coordinator and will have responsibility to address technical issues relating to generated analytical data.

The responsibilities of the Laboratory Project Manager may include the following:

- Ensure that resources of the Approved Laboratory are available on an as-required basis



- Review of scope of work and planned analyses and methods
- Review of final analytical reports
- Approval of final reports prior to submission

2.1.2 Quality Assurance Roles and/or Responsibilities

Project team members with QA responsibilities may include the Implementing Party QA Officer and the person designated by each Approved Laboratory as its Quality Assurance Officer (Laboratory QA Officer). Responsibilities of these individuals may include the following:

Implementing Party QA Officer

- Manage field activities and field quality assurance/quality control (QA/QC)
- Conduct oversight and review of field QA/QC
- Prepare Standard Operating Procedures (SOPs) for field activities
- Advise on appropriate sampling procedures and methods for field activities
- Review of laboratory QA/QC
- Coordination and review of data validation and assessment
- Advise on laboratory corrective action procedures
- Prepare and review QA reports
- Implement and document field corrective actions, if required

Laboratory QA Officer

- Coordinate and perform overview of laboratory systems audits
- Perform overview of QA/QC documentation
- Conduct detailed data review
- Implement and document Approved Laboratory's corrective actions, if required
- Oversee compliance with Approved Laboratory's quality assurance plans.
- Oversee preparation of Approved Laboratory's SOPs

2.1.3 Field Responsibilities

A selected RC will conduct all field sampling and obtain field measurements related to sampling during the RA, as described in the FSPs and the SWMP. The specific procedures for field sample collection and field measurements will be developed in compliance with applicable SOPs for fieldwork, as determined by the selected RC. These procedures may include requiring the RC's field team leader to document any field-related non-conformances that are identified or reported by the leader or field team members and to implement and document any corrective actions.



2.1.4 Laboratory Responsibilities

Analyses for the RA will be performed by an Approved Laboratory. The shipping address and contact information for Approved Laboratory will be provided prior to samples being collected. The roles and specific responsibilities of the Approved Laboratory's personnel involved in the project may include the following:

Laboratory Contact

- Coordinate laboratory analyses
- Supervise in-house chain-of-custody
- Subcontract sample analyses, as needed
- Schedule sample analyses
- Oversee data review
- Oversee preparation of analytical reports

Sample Custodian

- Receive and inspect incoming sample containers
- Record the condition of incoming sample containers
- Sign appropriate documents
- Verify correctness of chain-of-custody documentation
- Notify Laboratory Contact of any non-conformances identified during sample receipt and inspection
- Assign a unique identification number to each sample, and enter the client identification number and sample identification numbers into the sample receiving log
- Initiate transfer of the samples to appropriate laboratory sections
- Control and monitor access/storage of samples and extracts

2.2 Quality Objectives and Criteria

Data quality objectives (DQOs) are qualitative and quantitative statements derived from the outputs of each step of the DQOs process. The DQOs process is a series of planning steps based on the scientific method that is designed to ensure that the type, quantity, and quality of environmental data used in decision making are appropriate for the intended application. A systematic planning process will be used to develop DQOs for purposes of this QAPP. That process, as described in *EPA's Guidance on Systematic Planning Using the DQOs Process* (EPA, 2006), is designed to ensure that environmental data are of the appropriate type and quality for the intended use, and lead to logical conclusions and defensible decisions or estimates. DQOs are developed through a seven step process that is both sequential and iterative, depending upon the complexity of the problem. The steps involve both qualitative and quantitative criteria. The overarching outcomes of the DQO process are described below.



There are seven steps in the DQO process that include:

1. Stating the problem
2. Identifying the goal of the study
3. Identifying information inputs
4. Defining the boundaries of the study
5. Developing the analytical approach
6. Specifying performance or acceptance criteria
7. Developing the plan for obtaining data

The resulting statements and DQOs are summarized as follows:

1	Problem	The Southern Impoundment 100% RD calls for a RA that involves removal of waste material and off-site disposal.
2	Goal	The goal is to collect the data necessary to ensure the excavation boundaries satisfy the requirements contained in the approved Southern Impoundment RD, to characterize excavated materials and wastes, and to ensure that the discharges from the wastewater treatment system meet applicable regulatory standards.
3	Inputs	Analytical chemistry data will be collected to ensure that excavation has been conducted as provided for in the approved Southern Impoundment RD and that applicable regulatory standards for air and water discharges are met.
4	Boundaries	Impacted material, air, and water samples from the Southern Impoundment will be collected.
5	Analytical Approach	The analytical approach is to generate usable data in accordance with this QAPP.
6	Acceptance Criteria	Laboratory acceptance criteria are presented in this QAPP for the RA activities to generate validated data to address data needs and identified data gaps.
7	Plan	The plan for sample collection activities is presented in the FSPs, presented as part of the Southern Impoundment 100% RD.

2.2.1 Measurement Performance Criteria

The measurement performance criteria for precision, accuracy, representativeness, completeness, comparability, and sensitivity (PARCCS) will be determined by the Implementing Party, the RC, and the Approved Laboratory prior to the RA. All required guidelines and recommendations will be used to determine these criteria.



2.3 Special Training Requirements/Certifications

Field sampling team members will be required to have successfully completed relevant field training protocols and to follow the Health and Safety Plan for the Southern Impoundment RD. They will also, if appropriate, be required to have received the 40-hour Hazardous Waste Operations and Emergency Response (HAZWOPER) safety training and annual 8-hour refresher courses required by 29 Code of Federal Regulations (CFR) Parts 1910 and 1926. The RC will be required to maintain employee training documentation.

Laboratory personnel training records will be maintained by the Approved Laboratory. The Approved Laboratory must be accredited through the NELAP and the Texas Commission on Environmental Quality (TCEQ) for the methods that that it will perform, as applicable to demonstrate compliance with EPA's requirement that the Approved Laboratory have a documented quality system that complies with American National Standards Institute/American Society for Quality Control (ANSI/ASQC) E4-94 ("Specifications and Guidelines for Quality System for Environmental Data Collection and Environmental Technology Programs", January 1995), and EPA QA/R-2 ("EPA Requirements for Quality Management Plans", March 2001). Prior to laboratory selection, these requirements will be verified.

2.4 Documentation and Records

The documents, records, and reports that are expected to be generated during Southern Impoundment RA activities are identified in the following subsections. The Project Coordinator will ensure the most current version of the QAPP is available prior to each sampling event.

2.4.1 Field and Laboratory Records

Documents and records generated are expected to include sample collection records, Quality Control (QC) sample records, laboratory records, and data handling records. A brief description of these documents and records are provided below.

Sample collection records to be used during RA sampling activities may include field logbooks and/or project standard field forms, stratigraphic logs, chain-of-custody records, field narratives, and shipping papers.

QC sample records to be used to document the generation of QC samples may include field logbooks and/or project standard field forms recording field blank samples, and field duplicate samples. The Approved Laboratory will maintain quality records for all analytical blank samples (i.e.: trip blank, equipment blank, and/or field blank samples).

Calibration data, where applicable, should be recorded in these logbooks and/or on project standard field forms.

Laboratory records to be maintained for the project may include sample receipt documentation, laboratory narratives, field and laboratory chain-of-custody documentation, sample container cleanliness certifications, reagent and standard reference material certifications, sample preparation records, sample analysis records (i.e., run logs), instrument/raw data, QC data, calibration data, corrective action reports, and final reports.



Data handling records to be maintained may include records verifying the accuracy of computer programs used to process or reduce raw data into final results and data validation reports. The Approved Laboratory will be expected maintain documentation of data verification and reduction procedures as necessary for the analyses used during the Southern Impoundment RA.

The RC may also maintain checklists, notes, and reports generated during the external data validation process.

2.4.2 Data Reporting Format

Field data is expected to be recorded in field logbooks and/or on project standard field forms. Field data will likely be generated primarily from observations. This information will be included in project reports or submittals.

Laboratory reports for sampling and monitoring activities will include data deliverables, which may include some or all of the following:

1. Case narrative for each analyzed batch of samples
2. Cross referencing of laboratory sample to project sample identification numbers
3. Description of data qualifiers to be used
4. Methods of sample preparation and analyses for samples
5. Sample results
6. Raw data for sample results and laboratory QC samples
7. Results of (dated) initial and continuing calibration checks and Gas Chromatography/Mass Spectrometry (GC/MS) tuning results
8. Matrix Spike/Matrix Spike Duplicate (MS/MSD) recoveries, Laboratory Control Sample (LCS), method blank results, surrogate recoveries, calibration check compounds and system performance check compound results (organics)
9. MS recoveries and matrix duplicate Relative Percent Difference (RPDs), LCS, serial dilutions, method blank results, and reagent blank results (inorganics)
10. Labeled and dated chromatograms/spectra of sample results and laboratory QC checks

Any data package prepared in connection with the Southern Impoundment RA should be an EPA "Contract Laboratory Program-like (CLP-like)" data package consisting of all the information presented in a CLP data package but not necessarily on CLP forms.

The Approved Laboratory will maintain validation and calibration data, which may include raw instrument data (including calibration data and instrument performance checks), method detection limit (MDL) studies, and method performance and validation studies. Summaries of the results of these studies should be included in the data packages.



2.4.3 Data Archiving and Retrieval

Procedures will be put in place regarding retention of records. It is anticipated that records would be maintained, taking into account, the Approved Laboratory's and the RC's record retention policies and applicable EPA or other agency requirements.

3. Data Generation and Acquisition

The RC will define requirements for design and implementation of the measurement systems to be used during the RA activities. These may include sampling procedures, analytical procedures, and data handling and documentation requirements that are detailed in the following subsections.

3.1 Sampling Program

The rationale for the sampling activities to be conducted during the RA is described in the Southern Impoundment 100% RD, the FSPs, and the SWMP.

3.2 Sampling Methods

SOPs for sample collection will be provided by the RC prior to the start of RA activities.

3.3 Sample Handling and Custody Requirements

The procedures for sample handling, labeling, shipping, and chain-of-custody documentation that may be adopted in connection with RA activities are provided in the subsections that follow.

3.3.1 Sample Handling and Packaging

The procedures used to collect and handle the samples will be provided in the RC's SOPs. The sample identification procedure will be determined prior to the start of RA activities by the RC. Unique sample numbers will be assigned to samples. Procedures will be put in place to record information such as sample identifications, sample locations, and sample depths in field logbooks or field forms.

Samples will be required to be placed in shipping coolers containing ice following collection, and then shipped or delivered to an Approved Laboratory.

3.3.2 Chain of Custody

Chain-of-custody is the sequence of possession of an item. Field, laboratory, and final evidence files custody procedures that may be used during RA activities are described in the subsections that follow.

3.3.2.1 Field Custody Procedures

Log books and/or project standard field forms may be used to record field data collection activities. Field log books are bound field survey books or notebooks with consecutively numbered pages. Each log book should be identified by a project-specific document number.



The RC should develop a standard format for the logbooks prior to the RA to ensure that the date, start time, weather, names of all sampling team members present, and the signature of the person making the entry are recorded. The names of individuals visiting the Southern Impoundment and the purpose of their visit should also be recorded in the field logbook.

All field measurements and sample collection information should be recorded in a logbook and/or on a project standard field form. Project standard field forms should be specifically prepared for each project sampling location. These forms should be used to record all field measurements/information and samples collected for each location. All entries in such forms should be completed in ink, without any erasures. If an incorrect entry is made, the incorrect information should be crossed out with a single strike mark. The correct information should then be entered adjacent to the original entry. The forms are to be signed and dated.

Whenever a sample is collected, an identification and a detailed description (if necessary) of the location should be recorded in the logbook and/or on a project standard field form. Photographs taken at a location, if any, should be noted in the logbook. All equipment used to obtain field measurements should be recorded in the field logbook and/or on a project standard field form. In addition, the calibration data for all field measurement equipment should be recorded in the field logbook or on standard field forms.

Samples should be collected according to the applicable sampling procedures documented in the FSPs or other project-appropriate planning document. The equipment used to collect samples, time of sample collection, sample description, volume and number of containers, and preservatives added (if applicable) should be recorded in the field logbook and/or on a project standard field form. A deviation from sampling procedures in the FSPs, QAPP, or other project-appropriate planning document should be documented in the field logbook and/or on a project standard field form. Each sample should be uniquely identified by the procedure determined by the RC.

3.3.2.2 Laboratory Custody Procedures

The Approved Laboratory's sample custody begins when the samples are received at the laboratory. The Approved Laboratory's sample custodian should assign a unique laboratory sample identification number to each incoming sample. The field sample identification numbers, laboratory sample identification numbers, date and time of sample collection, date and time of sample receipt, and requested analyses will be entered into the sample receiving log. The Approved Laboratory's sample log-in, custody, and document control procedures should be consistent with its standard operating procedure for handling samples.

Following log-in, all samples should be stored within an access-controlled location and should be maintained properly preserved until completion of all laboratory analyses. Unused sample aliquots and sample extracts should be maintained properly preserved for a minimum of 30 days following receipt of the final report by the RC, or as agreed upon by the RC and the Approved Laboratory. The Approved Laboratory will be responsible for the disposal of unused sample aliquots, sample containers, and sample extracts in accordance with all applicable local, state, and federal regulations.



3.3.2.3 Final Evidence Files Custody Procedures

All records will be maintained consistent with the Approved Laboratory's and the RC's record retention policies and applicable EPA or other agency requirements.

3.4 Analytical Method Requirements

The laboratory analytical methods that are anticipated to be used are included in Table 1.

The turnaround time required for the analyses required for each batch of samples is to be noted on the chain-of-custody documents submitted with the samples and will be communicated to the Approved Laboratory prior to the sampling event, as necessary.

3.5 Quality Control Requirements

The field and laboratory QC requirements that may be adopted for the Southern Impoundment RA are discussed in the following subsections. Specific QC checks and acceptance criteria are identified in the discussion of the referenced analytical methods.

3.5.1 Field Sampling Quality Control

Field QC requirements include analyzing reference standards for instrument calibration and for routine calibration checks. Field QC samples for this project include use of equipment blank samples to determine the existence and magnitude of sample contamination resulting from sample containers or sampling procedures and field duplicate samples to assess the overall precision of the sampling and analysis event.

3.5.2 Analytical Quality Control

The laboratory QC requirements for the analyses include analyzing method blanks, instrument performance checks, initial calibration standards, calibration verification standards, internal standards, surrogate compound spikes, and LCS. The acceptance criteria for LCS and surrogate compounds should be generated by the Approved Laboratory and included in the Approved Laboratory's reports.

3.6 Instrument/Equipment Testing, Inspection, and Maintenance Requirements

Procedures to verify that instruments and equipment are functional and properly maintained will be established by the RC, and may include those described in the following subsections.

3.6.1 Field Equipment Maintenance

Field equipment should be inspected and tested prior to use in the field and maintenance logs maintained. Prior to use in the field, the equipment should be checked again, and the performance information recorded. All equipment returned from the field should be inspected and tested. Any required maintenance should be performed and documented prior to the equipment being returned to service.



3.6.2 Field Equipment and Sampling Container Cleaning/Decontamination Procedures

Equipment cleaning/decontamination procedures will be addressed in SOPs developed by the RC. Sample containers are expected to be provided by the Approved Laboratory. All containers will be required to be pre-cleaned in accordance with the EPA guidance document entitled "Specifications and Guidance for Contaminant-Free Sample Containers", EPA 540/R-93/051. Certificates of analysis for each lot of containers will be maintained by the Approved Laboratory or be available from the vendor upon request.

3.6.3 Laboratory Instrument Maintenance

As part of its QA/QC program, the Approved Laboratory will be expected to conduct routine preventive maintenance (including maintaining instruments based on the manufacturer's specifications) to minimize the occurrence of instrument failure and other system malfunctions and to document all maintenance that is performed should be documented in the Approved Laboratory's maintenance logbooks or other records.

3.7 Calibration Procedures and Frequency

Procedures for calibrating and maintaining the accuracy of all the instruments and measuring equipment that will be used for conducting field sampling and laboratory analyses will be established by the RC, and may include those described in the following subsections.

3.7.1 Field Instruments/Equipment

Instruments and equipment used to gather, generate, or measure environmental data are to be calibrated with sufficient frequency and in such a manner that accuracy and reproducibility of results are consistent with the manufacturer's specifications.

Equipment to be used during field sampling should be examined to confirm that it is in operating condition.

3.7.2 Laboratory Instruments

There should be approved written procedures for calibration of laboratory equipment. Records of calibration, repairs, or replacement should be filed and maintained by the designated laboratory personnel performing QC activities and be available for a QA audit. The Approved Laboratory should have trained staff and in-house spare parts available for instrument repair or should maintain service contracts with vendors. Specific calibration procedures and frequencies are to be detailed in the referenced methods.

3.8 Inspection/Acceptance Criteria for Supplies and Consumables

Procedures will be established by the RC to ensure that supplies and consumables used in the field and laboratory will be available as needed and free of contaminants, and may include the procedures detailed in the following subsections.



3.8.1 Field Supplies and Consumables

Supplies and consumables for field sampling will be obtained from various vendors and should include sample containers, detergent and water for equipment decontamination, and field blank water. Additional field supplies and consumables may include pump tubing and personal protective equipment. These materials should not introduce contaminants into the samples or interfere with the analyses. All field supplies should be consumed or replaced with sufficient frequency to prevent deterioration or degradation that may interfere with the analyses.

3.8.2 Laboratory Supplies and Consumables

The Approved Laboratory's vendors for general labware, reagents, chromatography supplies, and organic standards should be certified and meet the requirements of the analytical method or the Approved Laboratory QAPP. The lot numbers of reagents and standards should be recorded and dates of receipt, first use, and expiration will be documented by the Approved Laboratory. Certificates of analysis should be maintained on file to document reagent/standard purity.

3.9 Data Management

Procedures for managing data from generation to final use and storage will be established by the RC, and may include the procedures detailed in the subsections that follow.

3.9.1 Data Recording

Field information should be recorded in field logbooks, on project standard field forms or by other means, and should include measurements from direct reading instruments or direct measurements. Field staff will be responsible for recording field data and identifying and correcting recording errors.

Laboratory data should be recorded in a variety of formats. Data from instruments is to be recorded on magnetic media, strip charts, or bench sheets or by other means. Data recording requirements should be identified for each preparation and analysis method.

3.9.2 Data Validation

3.9.2.1 Field Data

Procedures for validation of field data will be established by the RC, and may consist of checking for transcription errors and reviewing information recorded in field logbooks. Data transcribed from the field logbook into summary tables for reporting purposes will need to be verified for correctness by the Field QA Officer or designee, with any limitations on the use of field data should be identified.

3.9.2.2 Environmental Laboratory Generated Data

A full validation (or Stage 4 validation equivalent) may be performed on data collected during the RA. The full validation process would include a review of all technical holding times, instrument performance check sample results, initial and continuing calibration results, and all batch and matrix QC (including equipment blanks, field duplicates, MS/MSD, laboratory duplicates, surrogate recoveries, method blanks, LCS results, continuing and initial calibration checks, and the



identification and quantitation of specific analytes of interest), and review of raw and supporting documentation. Assessment of analytical data would include checks on data consistency by looking for comparability of duplicate analyses, adherence to accuracy and precision control criteria detailed in this QAPP and anomalously high or low parameter values. The results of these data validations would be reported to the Laboratory Project Manager, with notations as to any discrepancies and their effect upon acceptability of the data. The procedure should include data validation reports that summarize the samples reviewed, parameters reviewed, any nonconformance with the established criteria, and validation actions (including data qualifiers).

3.9.3 Data Transformation/ Calculations

Field data calculation procedures may be different in scope compared to those implemented for laboratory data. Direct reading instrumentation may be employed in the field, if needed. The use of field instruments would generate data read directly from the meters following calibration, which would then be recorded into field logbooks, project standard field forms or other records immediately after the measurements are obtained. Laboratory data calculations would be made to produce final results from raw data.

3.9.4 Data Transmittal/Transfer

Field data should be entered into a standard spreadsheet format or documented by some other means. It is expected to be the QA Officer's responsibility to verify the correctness of the field data after the data are transferred.

The Approved Laboratory is expected to provide data in electronic format as electronic data deliverables (EDDs), which are generated directly from the laboratory information management system (LIMS). Laboratory EDDs can be imported into the database, and the data can be maintained in the database for manipulation and presentation.

It is expected to be the QA Officer's responsibility to verify the correctness of the analytical database after the laboratory data for each event have been imported, such as by comparing the data from the database to the hard copy analytical reports for a specified percentage (such as 10 percent) of the sample results and addressing any discrepancies between the database and analytical reports.

3.9.5 Data Assessment

Assessment of laboratory data is expected to be performed using the procedures established for different analytical methods. These assessments performed may include determining the mean, standard deviation, relative standard deviation, percent difference, RPD, and percent recovery for certain QC elements.

Assessment of QC data for data validation purposes should also include determining the percent recovery, RPD, and percent completeness.



3.9.6 Data Tracking

Data generated in the field, such as water level measurements, is to be recorded in field logbooks, on project standard field forms or by other means, as there are no unique or special tracking requirements for these data. The data should be transcribed for analysis and reporting, and included as part of a final evidence file.

Tracking of analytical data in a database should include recording the Approved Laboratory generating the data, the date when the EDD was received and imported, the date when qualifiers were applied to the results, the level of data review performed, and the data review guidance used to evaluate the data.

3.9.7 Data Storage and Retrieval

Laboratory data and electronic instrument data should be stored in hard copy and/or electronic format in accordance with applicable data retention requirements established by the Implementing Party and/or the RC.

3.9.8 Data Security

The laboratory data security is expected to be the responsibility of the Laboratory Project Manager. Data security measures to be implemented may include prohibitions on access to archived data without authorization.

4. Assessment and Oversight

Procedures for assessment and oversight to ensure implementation of this QAPP and of QA/QC activities will be established by the RC, and may include the procedures detailed in the following subsections.

4.1 Assessments and Response Actions

Assessments consisting of internal and external audits may be performed during the project. Internal technical system audits of both field and laboratory procedures may be conducted to verify that sampling and analysis are being performed in accordance with the procedures established in the FSPs, SWMP, and this QAPP.

An internal field technical system audit of field activities may be conducted by the QA Officer or designee at the beginning of the field sampling activities to identify deficiencies in the field sampling and documentation procedures. The field technical system audit may include examining field sampling records and chain-of-custody documentation. In addition, sample collection, handling, and packaging in compliance with the established procedures may be reviewed during the field audit. Any deficiencies identified should be documented and corrective actions should then be taken and documented.



Follow-up audits may be performed as necessary to verify that deficiencies have been corrected and that the QA/QC procedures described in this QAPP and the approved Southern Impoundment RD have been followed.

An internal laboratory technical system audit may be conducted by the Laboratory's QA Officer or designee. The laboratory technical system audit may include examining laboratory documentation regarding sample receiving, sample log-in, storage and tracking, chain-of-custody procedures, sample preparation and analysis, instrument operating records, data handling and management, data tracking and control, and data reduction and verification.

Corrective action resulting from deficiencies identified during the internal laboratory technical system audit should be implemented immediately. The Laboratory will ensure implementation and documentation of the corrective action. All problems requiring corrective action and the corrective action taken will be reported to the Laboratory Project Manager. Follow-up audits will be performed as necessary to verify that deficiencies have been corrected.

External laboratory audits, if conducted, may include, but not be limited to, reviewing laboratory analytical procedures, laboratory on-site audits, and/or submitting performance evaluation samples to the laboratory for analysis.

4.2 Reports to Management

Quality assurance information should be summarized following completion of RA activities. This information should consist of the results of external performance evaluations, results of periodic data quality validation and assessment, data use limitations, and any significant QA problems identified, and corrective actions taken.

5. Data Validation and Usability

Procedures for QA activities to be performed to ensure that the data are scientifically defensible, properly documented, of known quality, and meet the project objectives will be established by the RC, and may include those procedures described in the following sections.

5.1 Data Review, Verification, and Validation

All field and laboratory data is to be reviewed, verified, and validated. These terms are defined as follows:

- Data review is the in-house examination to ensure that the data have been recorded, transmitted, and processed correctly.
- Data verification is the process for evaluating the completeness, correctness, and conformance/compliance of a specific data set against the method, procedural, or contractual specifications.
- Data validation is an analyte and sample-specific process that extends the evaluation of data beyond method, procedure, or contractual compliance (i.e., data verification) to determine the quality of a specific data set relative to the end use.



The procedures and criteria that may be used to verify and validate field and laboratory data are presented in Section 5.2.

Laboratory data review should consist of raw data being reduced to results and checked by the responsible analyst. A second review of the data reduction procedure may be conducted by another analyst or senior chemist. After the data are verified, a draft report may be reviewed by the Laboratory Project Manager. Final reports are generated, signed, and transmitted after approval of the draft by the Laboratory Project Manager.

5.2 Validation and Verification Methods

Field data should be verified by reviewing field documentation and chain of custody records. Data from direct reading field instruments should be verified by reviewing calibration and operating records and QC data.

Verification of sample collection procedures should consist of reviewing sample collection documentation for compliance with the requirements of the work plan and QAPP. If alternate sampling procedures were used, the acceptability of the procedure would need to be evaluated to determine the effect on the usability of the data. Data usability should not be affected if the procedure that was used is determined to be an acceptable alternative that fulfills the measurement performance criteria.

The Approved Laboratory should internally verify its data by reviewing and documenting sample receipt, sample preparation, sample analysis (including internal QC checks), and data reduction and reporting. Any deviations from the acceptance criteria, corrective actions taken, and data determined to be of limited usability (i.e., laboratory-qualified data) should be noted in the laboratory reports.

Data validation should be conducted by the RC. The results of the data validation procedure should identify data that do not meet the measurement performance criteria. Data validation should determine whether the data are acceptable, of limited usability (qualified as estimated), or rejected. Data qualified as estimated should be reviewed and a discussion of the usability of estimated data should be included in the data validation report. The results of data verification/validation should be summarized in data validation report provided to the Project Coordinator for use in interpreting the results and for use in project reports.

Data determined to be unusable may require corrective action, such as resampling by the field team or reanalysis of samples by the laboratory.

5.3 Usability/Reconciliation with Data Quality Objectives

The overall usability of the data from the RA should be assessed by evaluating the PARCCS of the data set to the measurement performance criteria using basic statistical quantities, as applicable. The procedures and statistical formulas to be used for these evaluations will be determined by the RC prior to the RA.



6. References

EPA, 2006. EPA's Guidance on Systematic Planning Using the DQOs Process. United States Environmental Protection Agency. February 2006.

EPA, 2018. Administrative Settlement Agreement and Order on Consent for Remedial Design. U.S. EPA Region 6, CERCLA Docket. No. 06-02-18. In the matter of: San Jacinto Waste Pits Superfund Site, Harris County, Texas. International Paper Company and McGinnes Industrial Maintenance Corporation, Respondents. April 2018.

Analyte List and Quantitation Limits

Analyte List	Analytical Methods	Targeted Quantitation Limits
Soil and Sediment		
Dioxins and Furans		
2,3,7,8-TCDD	SW-846 1613B	Laboratory MDL
1,2,3,7,8-PeCDD	SW-846 1613B	Laboratory MDL
1,2,3,4,7,8-HxCDD	SW-846 1613B	Laboratory MDL
1,2,3,6,7,8-HxCDD	SW-846 1613B	Laboratory MDL
1,2,3,7,8,9-HxCDD	SW-846 1613B	Laboratory MDL
2,3,7,8-TCDF	SW-846 1613B	Laboratory MDL
1,2,3,7,8-PeCDF	SW-846 1613B	Laboratory MDL
2,3,4,7,8-PeCDF	SW-846 1613B	Laboratory MDL
1,2,3,4,7,8-HxCDF	SW-846 1613B	Laboratory MDL
1,2,3,6,7,8-HxCDF	SW-846 1613B	Laboratory MDL
1,2,3,7,8,9-HxCDF	SW-846 1613B	Laboratory MDL
Waste Characterization		
Total cyanide, reactive	SW846 9012B	Laboratory MDL
Total sulfide, reactive	SW846 9034	Laboratory MDL
TCLP VOC	SW846 1311/8260D/5030B	Laboratory MDL
TCLP SVOC	SW846 1311/8270D	Laboratory MDL
TCLP RCRA 8 Metals	SW846 1311/6010/7471	Laboratory MDL
TPH 1005/1006	TX-1005 / TX-1006 ²	Laboratory MDL
PCB	SW846 8082A/3510C	Laboratory MDL
Water and Contact Water		
Dioxins/Furans		
2,3,7,8-TCDD	SW-846 1613B	Laboratory MDL
1,2,3,7,8-PeCDD	SW-846 1613B	Laboratory MDL
1,2,3,4,7,8-HxCDD	SW-846 1613B	Laboratory MDL
1,2,3,6,7,8-HxCDD	SW-846 1613B	Laboratory MDL
1,2,3,7,8,9-HxCDD	SW-846 1613B	Laboratory MDL
2,3,7,8-TCDF	SW-846 1613B	Laboratory MDL
1,2,3,7,8-PeCDF	SW-846 1613B	Laboratory MDL
2,3,4,7,8-PeCDF	SW-846 1613B	Laboratory MDL
1,2,3,4,7,8-HxCDF	SW-846 1613B	Laboratory MDL
1,2,3,6,7,8-HxCDF	SW-846 1613B	Laboratory MDL
1,2,3,7,8,9-HxCDF	SW-846 1613B	Laboratory MDL
TSS	SM 2540D	Laboratory MDL

Analyte List and Quantitation Limits

Analyte List	Analytical Methods	Targeted Quantitation Limits
Soil and Sediment		
Metals		
Antimony	SW-846 6020A	Laboratory MDL
Arsenic	SW-846 6020A	Laboratory MDL
Barium	SW-846 6020A	Laboratory MDL
Beryllium	SW-846 6020A	Laboratory MDL
Boron	SW-846 6020A	Laboratory MDL
Cadmium	SW-846 6020A	Laboratory MDL
Calcium	SW-846 6020A	Laboratory MDL
Chromium	SW-846 6020A	Laboratory MDL
Cobalt	SW-846 6020A	Laboratory MDL
Copper	SW-846 6020A	Laboratory MDL
Iron	SW-846 6020A	Laboratory MDL
Lead	SW-846 6020A	Laboratory MDL
Magnesium	SW-846 6020A	Laboratory MDL
Manganese	SW-846 6020A	Laboratory MDL
Molybdenum	SW-846 6020A	Laboratory MDL
Nickel	SW-846 6020A	Laboratory MDL
Phosphorus	SW-846 6020A	Laboratory MDL
Potassium	SW-846 6020A	Laboratory MDL
Selenium	SW-846 6020A	Laboratory MDL
Silver	SW-846 6020A	Laboratory MDL
Sodium	SW-846 6020A	Laboratory MDL
Strontium	SW-846 6020A	Laboratory MDL
Thallium	SW-846 6020A	Laboratory MDL
Tin	SW-846 6020A	Laboratory MDL
Titanium	SW-846 6020A	Laboratory MDL
Vanadium	SW-846 6020A	Laboratory MDL
Zinc	SW-846 6020A	Laboratory MDL
Off-Site Backfill Sampling		
Hexavalent Chromium	SW-846 7196A	Laboratory MDL
TPH	TX-1005 / TX-1006 ²	Laboratory MDL

Analyte List and Quantitation Limits

Analyte List	Analytical Methods	Targeted Quantitation Limits
Soil and Sediment		
Dioxins and Furans		
2,3,7,8-TCDD	SW-846 1613B	Laboratory MDL
1,2,3,7,8-PeCDD	SW-846 1613B	Laboratory MDL
1,2,3,4,7,8-HxCDD	SW-846 1613B	Laboratory MDL
1,2,3,6,7,8-HxCDD	SW-846 1613B	Laboratory MDL
1,2,3,7,8,9-HxCDD	SW-846 1613B	Laboratory MDL
2,3,7,8-TCDF	SW-846 1613B	Laboratory MDL
1,2,3,7,8-PeCDF	SW-846 1613B	Laboratory MDL
2,3,4,7,8-PeCDF	SW-846 1613B	Laboratory MDL
1,2,3,4,7,8-HxCDF	SW-846 1613B	Laboratory MDL
1,2,3,6,7,8-HxCDF	SW-846 1613B	Laboratory MDL
1,2,3,7,8,9-HxCDF	SW-846 1613B	Laboratory MDL
Target Analyte List Volatiles		
1,1,1-Trichloroethane	SW-846 8260B	Laboratory MDL
1,1,2,2-Tetrachloroethane	SW-846 8260B	Laboratory MDL
1,1,2-Trichloro-1,2,2-trifluoroethane	SW-846 8260B	Laboratory MDL
1,1,2-Trichloroethane	SW-846 8260B	Laboratory MDL
1,1-Dichloroethane	SW-846 8260B	Laboratory MDL
1,1-Dichloroethylene	SW-846 8260B	Laboratory MDL
1,2,4-Trichlorobenzene	SW-846 8260B	Laboratory MDL
1,2-Dibromo-3-chloropropane	SW-846 8260B	Laboratory MDL
1,2-Dibromoethane	SW-846 8260B	Laboratory MDL
1,2-Dichloroethane	SW-846 8260B	Laboratory MDL
1,2-Dichloropropane	SW-846 8260B	Laboratory MDL
2-Butanone	SW-846 8260B	Laboratory MDL
2-Hexanone	SW-846 8260B	Laboratory MDL
4-Methyl-2-pentanone	SW-846 8260B	Laboratory MDL
Acetone	SW-846 8260B	Laboratory MDL
Benzene	SW-846 8260B	Laboratory MDL
Bromodichloromethane	SW-846 8260B	Laboratory MDL
Bromoform	SW-846 8260B	Laboratory MDL
Bromomethane	SW-846 8260B	Laboratory MDL
Carbon disulfide	SW-846 8260B	Laboratory MDL
Carbon tetrachloride	SW-846 8260B	Laboratory MDL
Chlorobenzene	SW-846 8260B	Laboratory MDL
Chloroethane	SW-846 8260B	Laboratory MDL
Chloroform	SW-846 8260B	Laboratory MDL
Chloromethane	SW-846 8260B	Laboratory MDL

Analyte List and Quantitation Limits

Analyte List	Analytical Methods	Targeted Quantitation Limits
Soil and Sediment		
cis-1,2-Dichloroethylene	SW-846 8260B	Laboratory MDL
cis-1,3-Dichloropropene	SW-846 8260B	Laboratory MDL
Cyclohexane	SW-846 8260B	Laboratory MDL
Dibromochloromethane	SW-846 8260B	Laboratory MDL
Dichlorodifluoromethane	SW-846 8260B	Laboratory MDL
Ethylbenzene	SW-846 8260B	Laboratory MDL
Isopropylbenzene	SW-846 8260B	Laboratory MDL
m-Dichlorobenzene	SW-846 8260B	Laboratory MDL
Methyl Acetate	SW-846 8260B	Laboratory MDL
Methyl tert-Butyl Ether	SW-846 8260B	Laboratory MDL
Methylcyclohexane	SW-846 8260B	Laboratory MDL
Methylene chloride	SW-846 8260B	Laboratory MDL
o-Dichlorobenzene	SW-846 8260B	Laboratory MDL
p-Dichlorobenzene	SW-846 8260B	Laboratory MDL
Styrene	SW-846 8260B	Laboratory MDL
Tetrachloroethylene	SW-846 8260B	Laboratory MDL
Toluene	SW-846 8260B	Laboratory MDL
trans-1,2-Dichloroethylene	SW-846 8260B	Laboratory MDL
trans-1,3-Dichloropropene	SW-846 8260B	Laboratory MDL
Trichloroethylene	SW-846 8260B	Laboratory MDL
Trichlorofluoromethane	SW-846 8260B	Laboratory MDL
Vinyl chloride	SW-846 8260B	Laboratory MDL
Xylene(total)	SW-846 8260B	Laboratory MDL
Target Compound List Semi-Volatiles		
1,1'-Biphenyl	SW-846 8270D	Laboratory MDL
2,2'-oxybis(1-Chloropropane)	SW-846 8270D	Laboratory MDL
2,4,5-Trichlorophenol	SW-846 8270D	Laboratory MDL
2,4,6-Trichlorophenol	SW-846 8270D	Laboratory MDL
2,4-Dichlorophenol	SW-846 8270D	Laboratory MDL
2,4-Dimethylphenol	SW-846 8270D	Laboratory MDL
2,4-Dinitrophenol	SW-846 8270D	Laboratory MDL
2,4-Dinitrotoluene	SW-846 8270D	Laboratory MDL
2,6-Dinitrotoluene	SW-846 8270D	Laboratory MDL
2-Chloronaphthalene	SW-846 8270D	Laboratory MDL
2-Chlorophenol	SW-846 8270D	Laboratory MDL
2-Methylnaphthalene	SW-846 8270D	Laboratory MDL
3,3'-Dichlorobenzidine	SW-846 8270D	Laboratory MDL
4,6-Dinitro-o-cresol	SW-846 8270D	Laboratory MDL
4-Bromophenyl-phenylether	SW-846 8270D	Laboratory MDL
4-Chlorophenyl phenyl ether	SW-846 8270D	Laboratory MDL

Analyte List and Quantitation Limits

Analyte List	Analytical Methods	Targeted Quantitation Limits
Soil and Sediment		
Acenaphthene	SW-846 8270D	Laboratory MDL
Acenaphthylene	SW-846 8270D	Laboratory MDL
Acetophenone	SW-846 8270D	Laboratory MDL
Anthracene	SW-846 8270D	Laboratory MDL
Atrazine	SW-846 8270D	Laboratory MDL
Benzaldehyde	SW-846 8270D	Laboratory MDL
Benzo[a]anthracene	SW-846 8270D	Laboratory MDL
Benzo[a]pyrene	SW-846 8270D	Laboratory MDL
Benzo[b]fluoranthene	SW-846 8270D	Laboratory MDL
Benzo[ghi]perylene	SW-846 8270D	Laboratory MDL
Benzo[k]fluoranthene	SW-846 8270D	Laboratory MDL
Bis(2-chloroethoxy)methane	SW-846 8270D	Laboratory MDL
Bis(2-chloroethyl)ether	SW-846 8270D	Laboratory MDL
Bis(2-ethylhexyl) phthalate	SW-846 8270D	Laboratory MDL
Butyl benzyl phthalate	SW-846 8270D	Laboratory MDL
Caprolactam	SW-846 8270D	Laboratory MDL
Carbazole	SW-846 8270D	Laboratory MDL
Chrysene	SW-846 8270D	Laboratory MDL
Dibenz[a,h]anthracene	SW-846 8270D	Laboratory MDL
Dibenzofuran	SW-846 8270D	Laboratory MDL
Diethyl phthalate	SW-846 8270D	Laboratory MDL
Dimethyl phthalate	SW-846 8270D	Laboratory MDL
Di-n-butyl phthalate	SW-846 8270D	Laboratory MDL
Di-n-octyl phthalate	SW-846 8270D	Laboratory MDL
Fluoranthene	SW-846 8270D	Laboratory MDL
Fluorene	SW-846 8270D	Laboratory MDL
Hexachlorobenzene	SW-846 8270D	Laboratory MDL
Hexachlorobutadiene	SW-846 8270D	Laboratory MDL
Hexachlorocyclopentadiene	SW-846 8270D	Laboratory MDL
Hexachloroethane	SW-846 8270D	Laboratory MDL
Indeno(1,2,3 cd)pyrene	SW-846 8270D	Laboratory MDL
Isophorone	SW-846 8270D	Laboratory MDL
m-Nitroaniline	SW-846 8270D	Laboratory MDL
Naphthalene	SW-846 8270D	Laboratory MDL
Nitrobenzene	SW-846 8270D	Laboratory MDL
N-Nitrosodiphenylamine	SW-846 8270D	Laboratory MDL
N-Nitrosodipropylamine	SW-846 8270D	Laboratory MDL
o-Cresol	SW-846 8270D	Laboratory MDL
o-Nitroaniline	SW-846 8270D	Laboratory MDL
o-Nitrophenol	SW-846 8270D	Laboratory MDL
p-Chloroaniline	SW-846 8270D	Laboratory MDL
p-Chloro-m-cresol	SW-846 8270D	Laboratory MDL

Analyte List and Quantitation Limits

Analyte List	Analytical Methods	Targeted Quantitation Limits
Soil and Sediment		
p-Cresol	SW-846 8270D	Laboratory MDL
Pentachlorophenol	SW-846 8270D	Laboratory MDL
Phenanthrene	SW-846 8270D	Laboratory MDL
Phenol	SW-846 8270D	Laboratory MDL
p-Nitroaniline	SW-846 8270D	Laboratory MDL
p-Nitrophenol	SW-846 8270D	Laboratory MDL
Pyrene	SW-846 8270D	Laboratory MDL
Target Compound List Pesticides		
alpha-BHC	SW-846 8081B	Laboratory MDL
beta-BHC	SW-846 8081B	Laboratory MDL
delta-BHC	SW-846 8081B	Laboratory MDL
gamma-BHC (Lindane)	SW-846 8081B	Laboratory MDL
Heptachlor	SW-846 8081B	Laboratory MDL
Aldrin	SW-846 8081B	Laboratory MDL
Heptachlor epoxide	SW-846 8081B	Laboratory MDL
Endosulfan I	SW-846 8081B	Laboratory MDL
Dieldrin	SW-846 8081B	Laboratory MDL
4,4'-DDE	SW-846 8081B	Laboratory MDL
Endrin	SW-846 8081B	Laboratory MDL
Endosulfan II	SW-846 8081B	Laboratory MDL
4,4'-DDD	SW-846 8081B	Laboratory MDL
Endosulfan sulfate	SW-846 8081B	Laboratory MDL
4,4'-DDT	SW-846 8081B	Laboratory MDL
Methoxychlor	SW-846 8081B	Laboratory MDL
Endrin ketone	SW-846 8081B	Laboratory MDL
Endrin aldehyde	SW-846 8081B	Laboratory MDL
alpha-Chlordane	SW-846 8081B	Laboratory MDL
gamma-Chlordane	SW-846 8081B	Laboratory MDL
Toxaphene	SW-846 8081B	Laboratory MDL
Polychlorinated Biphenyls		
Aroclor-1016	SW-846 8082A	Laboratory MDL
Aroclor-1221	SW-846 8082A	Laboratory MDL
Aroclor-1232	SW-846 8082A	Laboratory MDL
Aroclor-1242	SW-846 8082A	Laboratory MDL
Aroclor-1248	SW-846 8082A	Laboratory MDL
Aroclor-1254	SW-846 8082A	Laboratory MDL
Aroclor-1260	SW-846 8082A	Laboratory MDL

Analyte List and Quantitation Limits

Analyte List	Analytical Methods	Targeted Quantitation Limits
Soil and Sediment		
Target Compound List Metals		
Aluminum	SW-846 6020A	Laboratory MDL
Antimony	SW-846 6020A	Laboratory MDL
Arsenic	SW-846 6020A	Laboratory MDL
Barium	SW-846 6020A	Laboratory MDL
Beryllium	SW-846 6020A	Laboratory MDL
Cadmium	SW-846 6020A	Laboratory MDL
Calcium	SW-846 6020A	Laboratory MDL
Chromium	SW-846 6020A	Laboratory MDL
Cobalt	SW-846 6020A	Laboratory MDL
Copper	SW-846 6020A	Laboratory MDL
Iron	SW-846 6020A	Laboratory MDL
Lead	SW-846 6020A	Laboratory MDL
Magnesium	SW-846 6020A	Laboratory MDL
Manganese	SW-846 6020A	Laboratory MDL
Mercury	SW-846 7470	Laboratory MDL
Nickel	SW-846 6020A	Laboratory MDL
Potassium	SW-846 6020A	Laboratory MDL
Selenium	SW-846 6020A	Laboratory MDL
Silver	SW-846 6020A	Laboratory MDL
Sodium	SW-846 6020A	Laboratory MDL
Thallium	SW-846 6020A	Laboratory MDL
Vanadium	SW-846 6020A	Laboratory MDL
Zinc	SW-846 6020A	Laboratory MDL
Cyanide	SW-846 9010/9012	Laboratory MDL

Notes:

- 1 - SW-846 - "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", EPA SW-846, 3rd Edition with Updates I through IVB.
- 2 - Texas Natural Resource Conservation Commission, "Total Petroleum Hydrocarbons" (TNRCC Method 1005) and "Characterization of Nc₆ to Nc₃₅ Petroleum Hydrocarbons in Environmental Samples" (TNRCC Method 1006), Revision 03, 06/01/2001

Attachment 6

Site Wide Monitoring Plan



Attachment 6 - Site Wide Monitoring Plan - Southern Impoundment

*Provided with Final 100% Remedial Design - Southern
Impoundment (Amended April 2021)*

San Jacinto River Waste Pits Site
Harris County, Texas

International Paper Company

GHD | 5551 Corporate Boulevard Suite 200 Baton Rouge Louisiana 70808 USA
11215131 | Report No 3



Table of Contents

1.	Introduction.....	1
1.1	Background.....	1
1.2	Relationship to Supporting Plans.....	1
2.	Site-Wide Monitoring Approach	2
2.1	Monitoring During Construction	2
2.2	Post-Construction Surveying	2
3.	Environmental Media.....	2
3.1	Soils	2
3.2	Dust and Particulates.....	3
3.3	Stormwater.....	3
4.	Data Collection and Monitoring Procedures	3
4.1	Excavation Performance Verification	3
4.2	Dust and Particulate Monitoring.....	3
4.2.1	Monitoring Instruments and Procedures	3
4.2.2	Monitor Design and Frequency	4
4.2.3	Suppression and Mitigation Measures	4
4.3	Stormwater.....	4
4.3.1	Stormwater Construction Components.....	5
4.3.2	Stormwater Monitoring and Maintenance Procedures	5
4.3.3	Stormwater Inspection Procedures	5
4.3.4	Responses to Changed Conditions	6
4.4	Odors	6
5.	Documentation	7
6.	References	7

Attachment Index

Attachment A Soil Erosion and Sediment Control Drawings



1. Introduction

1.1 Background

This Site-Wide Monitoring Plan (SWMP) was prepared by GHD Services Inc. (GHD), on behalf of International Paper Company, for the Southern Impoundment of the San Jacinto River Waste Pits Superfund Site in Harris County, Texas (Site). This SWMP was prepared pursuant to the requirements of the Administrative Settlement Agreement and Order on Consent for Remedial Design (AOC), Docket No. 06 02 18, with an effective date of April 11, 2018 (United States Environmental Protection Agency [EPA], 2018). The AOC includes a Statement of Work (SOW) which requires supporting deliverables to accompany the Final 100% Remedial Design for the Southern Impoundment (Southern Impoundment 100% RD) submittal to the EPA.

This SWMP describes the framework for monitoring to be performed by a remedial contractor (RC) to prevent the potential spread of dust generated during construction and the monitoring of the best management practices (BMPs) in a construction Stormwater Pollution Prevention Plan (SWPPP) that the RC will prepare to manage stormwater runoff. This SWMP also lists options for the RC to control odors if they occur during construction as part of the Southern Impoundment RA.

References in this FSP to the “work site” are to the Southern Impoundment. Prior to initiation of Southern Impoundment RA activities, each selected RC will either update this SWMP or develop its own SWMP to address the components outlined in this document.

1.2 Relationship to Supporting Plans

The SWMP should be considered in combination with the other supporting plans. The Pre-Construction Field Sampling Plan (PC FSP) defines the procedures for sampling that will be completed during the Southern Impoundment RA prior to excavation activities to further delineate excavation limits, characterize excavated material for off-site disposal, and collect other data to support the Southern Impoundment RA. The Construction Quality Assurance/Quality Control Plan (CQA/QCP) describes the procedures to verify that the excavation objectives are achieved during implementation. The Field Sampling Plan (FSP) describes the procedures for sampling the treated contact water and the imported backfill that will be used to fill excavations during implementation of the Southern Impoundment RA. Field and analytical quality procedures are described in the Quality Assurance Project Plan (QAPP). The Transportation and Off-Site Disposal Plan (TODP) describes the procedures for on-site management and loading of excavated material to be disposed of off-site during the Southern Impoundment RA, the transportation routes for off-site shipments from the Southern Impoundment, and measures to be implemented if needed to protect communities that may be affected by the shipments.

In addition, this SWMP will be supported by a site-wide Air Monitoring Plan which will detail how dust will be monitored and, as needed, suppressed. The Air Monitoring Plan will be developed by the RC. A SWPPP will also be developed by the RC that details the measures to be taken to control stormwater run-on and run-off at the Southern Impoundment during the RA.



2. Site-Wide Monitoring Approach

2.1 Monitoring During Construction

Excavation limits will be defined prior to excavation activities by the sampling described in the PC FSP. During construction, monitoring of excavation activities will include delineation of excavation boundaries. As each excavation is completed, surveying will be performed to verify the extent of excavation (both vertical and horizontal) and to clearly mark the boundaries of the excavation for the subsequent area. These associated monitoring activities to be performed in relation to the excavation work are addressed in the CQA/QCP.

Excavation and loading activities must be performed in a controlled manner to prevent or significantly reduce the generation of dust. During the Southern Impoundment RA, the RC will prepare and implement an Air Monitoring Plan, or equivalent, which will provide air monitoring procedures for particulate matter and action levels when air quality data approaches or exceeds the criteria established by that plan. If criteria levels are exceeded, work would then only continue after steps required by the Air Monitoring Plan have been implemented.

Stormwater control will be an essential part of the excavation program, both with regards to run-on and runoff during rain events. The RC will be required to manage stormwater run-on so it is to the extent possible diverted from open excavations in order to reduce the volume of water requiring treatment and to prevent sloughing of the excavation faces. Also, during large rain events that might overwhelm open excavations, the RC will be take steps (which may include pumping, as necessary) to ensure that accumulated stormwater does not overflow from the excavation. Detailed plans for soil erosion and sediment controls can be found on design drawings C-04 and C-05 in Attachment A. The plan for implementation of stormwater BMPs will be detailed in the RC-developed SWPPP.

2.2 Post-Construction Surveying

Upon completion of backfilling, surveying will be performed by the RC to confirm that fill placement was completed to the pre-construction elevations. Grading of the final surface should be performed to ensure that surface water drains away from the backfilled areas (i.e., no ponding).

3. Environmental Media

This section describes the regulatory framework methods for monitoring of environmental media present on-site to prevent spread of impacted material beyond the limits of the excavation areas.

3.1 Soils

The PC FSP details the procedures that will be used to further refine and delineate the materials which exceed the 240 nanograms per kilograms (ng/kg) TEQ_{DF,M} clean-up level on a depth-weighted average (DWA) in the Southern Impoundment. The PC FSP also describes the sampling that will be done to evaluate the suitability of excavated overburden for reuse as backfill.



3.2 Dust and Particulates

Dust and particulates could result from construction or other on-site activities. The RC will develop an Air Monitoring Plan prior to the Southern Impoundment RA to establish action levels and monitoring procedures for dust and particulates during construction activities. The RC-developed Air Monitoring Plan will include procedures for dust and particulate mitigation and control.

3.3 Stormwater

For the Southern Impoundment RA, the RC will be required to develop and implement a SWPPP to manage stormwater and address run-on and run-off from the excavation areas that meets the substantive requirements of the applicable or relevant and appropriate requirements for stormwater management. Preventative measures included in the SWPPP may include grading the area surrounding the excavation to drain surface water away from an open excavation, and/or constructing berms to prevent water from entering an excavation. Additional measures may include diverting surface water in areas adjacent to an excavation to existing surface drainage systems, and requiring that these surface drainage systems be kept open and operational.

Even with surface water run-on controls, water from precipitation and perched water infiltration will accumulate within the excavation area. The RC will develop procedures to manage this contact water and may do so by operating and maintaining necessary dewatering equipment to remove the water from the excavations and convey it to on-site contact water storage tanks.

4. Data Collection and Monitoring Procedures

The RC will adopt procedures for collecting data during construction. Some data will be collected during the PC FSP and other data will be collected in connection with air monitoring for dust and particulate control and stormwater controls.

4.1 Excavation Performance Verification

The procedures for collecting data during construction to achieve the 240 ng/kg TEQ_{DF,M} clean-up level on a DWA for soil and to define the overburden that is suitable for reuse are described in the PC FSP. The CQA/QCP describes the procedures to verify that the excavation limits have been achieved as defined by the PC FSP.

4.2 Dust and Particulate Monitoring

Dust and particulate monitoring will be performed as specified in the Air Monitoring Plan to be developed by the RC. Due to the nature of known Constituents of Potential Concern (COPCs) on-site, the RC may include particulate matter (PM₁₀) monitoring in the dust and particulate monitoring program. Suggested monitoring and mitigation activities are summarized below.

4.2.1 Monitoring Instruments and Procedures

Real-time air monitoring for dust and particulates may be performed using dust monitors placed at the perimeter of the work site, typically upwind and downwind of Southern Impoundment RA



activities, and programmed to monitor particulate concentrations. All instruments would be calibrated and operated in accordance with the manufacturer's specifications or applicable test/method specifications.

4.2.2 Monitor Design and Frequency

Data from the dust monitors may be collected throughout Southern Impoundment RA ground disturbance activities. If concentrations of dust and PM₁₀ exceed the standards included in the Air Monitoring Plan (suggested to be a 24-hour time averaged standard of 0.15 milligram/cubic meter [mg/m³] standard set forth by the National Ambient Air Quality Standards (NAAQS) for PM₁₀), RC personnel will be required to implement dust suppression measures. The RC should establish action levels based on real-time monitoring to prevent the exceedance of the 24-hour standard.

4.2.3 Suppression and Mitigation Measures

The RC will be required to implement dust and particulate suppression and mitigation measures on-site to minimize airborne dust produced from construction activities. Dust suppression measures may include, but would not be limited to:

- Reduction of on-Site traffic
- Reduction in speed of on-Site traffic
- Watering or misting on-Site roads
- Use of appropriate truck covers
- Applying or maintaining aggregate, or similar, for on-site roads

4.3 Stormwater

Stormwater monitoring will be performed in accordance with the SWPPP which will be developed by the RC. The intent of the SWPPP will be to identify BMPs that will be implemented to prevent stormwater impacts. These BMPs may include, but would not be limited to, the following:

- Minimize the disturbed area and protect natural features and soil:
 - Limit access to the impacted area
 - Use only approved access roads
- Control stormwater flowing onto and through the Southern Impoundment
- Stabilize disturbed soils promptly
- Establish perimeter controls
- Retain any potential pollutants on-site
- Inspect and maintain all controls
- Immediately repair or remove any leaking equipment
- Inspect equipment prior to entering or leaving the jobsite to ensure that it is clean and free of soils, vegetation, and trapped debris



4.3.1 Stormwater Construction Components

The anticipated sequences of construction activities that may be adopted and BMPs that may be installed for the Southern Impoundment to address stormwater are briefly described below.

- Silt fencing, straw wattles or similar devices may be installed around the perimeter of the Southern Impoundment work areas before any stripping of the topsoil or disturbance of the ground
- Under-grate, over-grate, and/or curb inlet filters may be placed at storm drain grates before construction occurs, if necessary
- Straw bales or wattles may be installed in drainage ways present throughout the Southern Impoundment
- Construction entrance(s) may be constructed to minimize the tracking of sediment off-site and onto adjacent roadways
- Straw/hay bales and filter fabric or filter bags may be used for filtration
- Secondary containment should be utilized around the wastewater treatment system
- Secondary containment and/or berms and silt fencing may be utilized around the staging and/or dewatering areas for excavated and stockpiled material

4.3.2 Stormwater Monitoring and Maintenance Procedures

Stormwater monitoring and maintenance procedures will be outlined in the SWPPP. The following procedures may be identified in the SWPPP and used to monitor stormwater erosion and sediments control to ensure compliance with the construction SWPPP for project and post-project activities, as applicable:

- Identify areas where maintenance of erosion and sediment controls are inadequate
- Remove sediment from any installed commercial grade silt fences when sediment buildup reaches one-third the height of the fence
- Re-anchor and/or repair commercial grade silt fences, hay/straw bales, and other BMPs as necessary
- Conduct follow-up inspections of disturbed areas to determine the success of stabilization measures
- Remove sediment from construction entrances when rock is clogged. Re-grade and add additional rock as necessary to retain efficiency

4.3.3 Stormwater Inspection Procedures

Under the SWPPP, a qualified person who is knowledgeable of the conditions at the Southern Impoundment will be designated to conduct inspections during Southern Impoundment RA activities. This inspector, subject to the provisions of the SWPPP, would be given authority to stop activities that may result in a violation or deviation of the SWPPP.



The responsibilities of the inspector may include:

- Ensuring compliance with the requirements of the SWPPP and other environmental permits and approvals
- Verifying that the limits of authorized project work areas and locations of access roads are properly marked before clearing
- Verifying the location of drainage and irrigation systems
- Identifying stabilization needs in all areas
- Ensuring that temporary erosion controls are properly installed and maintained daily, as necessary
- Inspecting areas of disturbed or bare soil
- Inspecting areas used for storage of materials that are exposed to stormwater
- Inspecting temporary structural erosion and sediment control devices/measures
- Inspecting areas where vehicles enter or exit the work site
- Inspecting locations where stormwater naturally discharges from the Southern Impoundment
- Ensuring the repair of all ineffective, temporary, erosion control measures within 24 hours of identification
- Ensuring restoration of contours and topsoil
- Establishing a program to monitor the success of restoration

4.3.4 Responses to Changed Conditions

The RC will be required to amend the SWPPP as needed during the Southern Impoundment RA.

4.4 Odors

There is the potential that Southern Impoundment RA excavation activities may cause odors. Odors are most likely to occur during excavation activities when previously buried material and soils are unearthed and exposed to air. The main concern with respect to odors is the potential impact on adjacent businesses, the neighboring community, and Southern Impoundment RA workers.

If odors are present, the RC may implement on-site measures to counter, suppress, or mask the associated nuisance, as outlined in the RC's Air Monitoring Plan. These measures may include, but are not limited to the following:

- Deployment of odor suppressing foams
- Perimeter misting systems
- Perimeter masking desiccants
- Minimization of the number and/or size of stockpiles
- Minimization of the size and time excavations remain open



5. Documentation

This section addresses the monitoring documentation requirements for the environmental media of concern. The RC will be required to maintain necessary documentation, including survey records related to the excavation areas. Dust and particulate monitoring records and all notes regarding the maintenance of stormwater controls should also be maintained on-site. The frequency and types of documentation required for dust and stormwater monitoring should be outlined by the RC in the Air Monitoring Plan and the SWPPP, respectively.

6. References

EPA, 2018. Administrative Settlement Agreement and Order on Consent for Remedial Design. U.S. EPA Region 6, CERCLA Docket. No. 06-02-18. In the matter of: San Jacinto Waste Pits Superfund Site, Harris County, Texas. International Paper Company and McGinnes Industrial Maintenance Corporation, Respondents. April 2018.

Attachments

Attachment A

Soil Erosion and Sediment Control Drawings





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LEGEND	
	PROPERTY EASEMENT
	EXISTING CONTOUR INTERVAL
	FENCING LINE
	TOP OF BANK
	SIDE OF SLOPE
	OVERHEAD ELECTRICAL
	UNDERGROUND UTILITY LINE
	FOUR BORING LOCATION
	METEOROLOGICAL WELL
	POWER POLE
	LIGHT POLE
	WELL
	AREA OF IMPACT
	ASPHALT
	CONCRETE
	GRAVEL
	SILT FENCE
	TURBIDITY CURTAIN

Client
SAN JACINTO RIVER WASTE PITS

Project
FINAL (100%) REMEDIAL DESIGN SOUTHERN IMPOUNDMENT (AMENDED APRIL 2021) HARRIS COUNTY, TEXAS

No.	Issue	Drawn	Appr'd	Date
7	100% EPA RE-SUBMITTAL	MW	RH	04/19/2021
8	100% EPA SUBMITTAL	MW	RH	12/18/2020

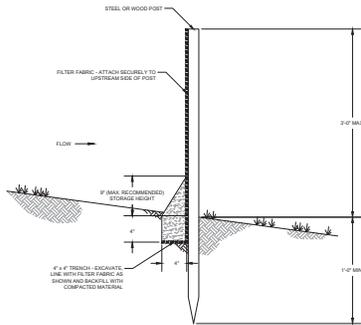
Drawn	MW	Designer	RH
Checked	gsp	Checked	ll
Project	Construction	Date	Apr 19, 2021
The document shall not be used for any other project without GHD's written authorization.		Scale	1" = 100'
Original Size	Arch D	Not to scale on original size drawing	8 1/2" x 11" (ANSI)

Project No: 11215131

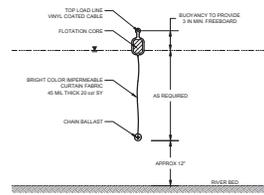
SOIL EROSION AND SEDIMENT CONTROL PLAN

Sheet No: **C-04**

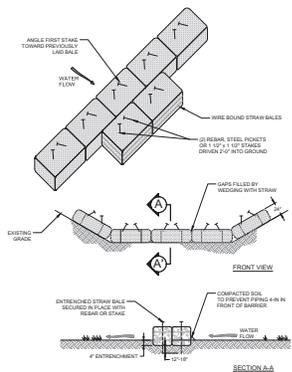
100% EPA RE-SUBMITTAL



DETAIL 1 TEMPORARY SILT FENCE
N.T.S. C-04



DETAIL 2 TURBIDITY CURTAIN
N.T.S. C-04



DETAIL 3 STRAW BALE BARRIER
N.T.S. C-04

- NOTES
1. TURBIDITY CURTAIN SHALL BE TYPE 4 ACCORDING TO DEPARTMENT OF THE ARMY US ARMY CORPS OF ENGINEERS WASHINGTON, DC, ENGINEERING AND DESIGN HANDBOOK FOR THE PREVENTION OF STREAM WATER POLLUTION PREVENTION PLAN FOR CONSTRUCTION ACTIVITIES, APPENDIX C, PART II TURBIDITY CURTAIN, COLUMN 28 (FIGURE 10-108). CURTAIN 4-VISIBAL, 45 MIL THICK, 24 IN. WIDE, EQUIPPED WITH LEAD TRANSVERSE TYPE PANEL CONNECTORS, HEAT SEALED FABRIC SEAMS AND TIGHT SEAM JOINTS.
 2. INCLUDE MOORING SYSTEM IF REQUIRED.



Review of Documents
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Client: **SAN JACINTO RIVER WASTE PITS**
Project: **FINAL (100%) REMEDIATION DESIGN SOUTHERN IMPOUNDMENT (AMENDED APRIL 2021) HARRIS COUNTY, TEXAS**

No.	Issue	Drawn	Appr'd	Date
7	100% EPA RE-SUBMITTAL	MW	RH	04/19/2021
6	100% EPA SUBMITTAL	MW	RH	12/18/2020

Drawn: MW Designer: RH
Checked: GP Design Check: LL
Project: SW Date: Apr 19, 2021
Coordinate: SW
The documents shall not be used for construction unless signed and sealed by a professional engineer.
Original Size: Arch D Seal is void with an original size drawing.
Project No: 11215131
Title: **SOIL EROSION AND SEDIMENT CONTROL DETAILS**
Sheet No: **C-05**

GHD SERVICES INC.
11215131 FILE NO. 02
100 ONE ONE SUITE 200
275

100% EPA RE-SUBMITTAL

Attachment 7 Construction Quality Assurance/Quality Control Plan



Attachment 7 - Construction Quality Assurance/Quality Control Plan (CQA/QCP) - Southern Impoundment

Provided with Final 100% Remedial Design - Southern Impoundment (Amended April 2021)

San Jacinto River Waste Pits Site
Harris County, Texas

International Paper Company

GHD | 5551 Corporate Boulevard Suite 200 Baton Rouge Louisiana 70808 USA
11215131 | Report No 3



Table of Contents

1.	Introduction.....	1
1.1	Relationship to Supporting Plans.....	1
2.	Project Organization.....	2
3.	Inspection and Testing Activities.....	2
3.1	Inspections.....	2
3.2	Testing.....	3
4.	Inspection Documentation.....	4
	This section details the recommended documentation requirements for the CQA/QCP.	4
4.1	Work Site Log Book.....	4
4.2	Photo Documentation.....	4
4.3	CQA Instrument Calibration.....	4
4.4	Inspection and Test Log Book.....	4
5.	Problem/Corrective Action Reports.....	4
6.	Project Meetings.....	5
7.	QA/QC Documentation and Storage of Records.....	5
8.	References.....	6

Tables

Table 1	Summary of Construction Quality Assurance and Quality Control Inspections
Table 2	Summary of Construction Quality Assurance and Quality Control Tests



1. Introduction

The Construction Quality Assurance/Quality Control Plan (CQA/QCP) was prepared by GHD Services Inc. (GHD), on behalf of International Paper Company, for the Southern Impoundment of the San Jacinto River Waste Pits Superfund Site in Harris County, Texas (Site). This CQA/QCP was prepared pursuant to the requirements of the Administrative Settlement Agreement and Order on Consent for Remedial Design (AOC), Docket No. 06 02 18, with an effective date of April 11, 2018 (United States Environmental Protection Agency [EPA], 2018). The AOC includes a Statement of Work (SOW) which requires supporting deliverables to accompany the Final 100% Remedial Design for the Southern Impoundment (Southern Impoundment 100% RD) submittal to the EPA.

The CQA/QCP describes activities to be used to verify that the construction of the Southern Impoundment remedial action (RA) will satisfy applicable plans, specifications, and related requirements, including quality objectives. This CQA/QCP identifies construction quality control (CQC) activities that will take place during the Southern Impoundment RA. The RC will implement such CQC activities to measure and control the characteristics of the materials and the construction methods during the Southern Impoundment RA to demonstrate that the materials and construction meet the requirements of the RD specifications and drawings, as specified in a plan prepared by the RC. CQC activities to be implemented by the RC during the Southern Impoundment RA are identified in the individual specification sections provided in the technical specifications, included as Appendix E to the Southern Impoundment 100% RD.

References in this CQA/QCP to the "work site" are to the Southern Impoundment and references to "Implementing Party" are to the entity(ies) implementing the RA for the Southern Impoundment. Prior to initiation of Southern Impoundment RA activities, each selected remedial contractor (RC) will either update this CQA/QCP or develop its own CQA/QCP to address the components outlined in this document.

1.1 Relationship to Supporting Plans

The CQA/QCP should be considered in combination with the other supporting plans. The Pre-Construction Field Sampling Plan (PC FSP) defines the procedures for sampling that will be completed during the Southern Impoundment RA prior to excavation activities to further delineate excavation limits, characterize excavated material for off-site disposal, and collect other data to support the Southern Impoundment RA. The Site-Wide Monitoring Plan (SWMP) describes the procedures for monitoring to prevent the potential spread of dust generated during construction and monitoring of the best management practices (BMPs) with respect to stormwater. Field and analytical quality procedures are described in the Quality Assurance Project Plan (QAPP). The Field Sampling Plan (FSP) provides the procedures for sampling the treated contact water and the imported backfill that will be used to fill excavations during implementation of the Southern Impoundment RA. The Transportation and Off-Site Disposal Plan (TODP) describes the procedures for on-site management and loading of excavated material to be disposed of off-site during the Southern Impoundment RA, the transportation routes for off-site shipments from the Southern



Impoundment, and measures to be implemented if needed to protect communities that may be affected by the shipments.

2. Project Organization

The CQA team will implement the QA functions independently of the other aspects of the construction effort. The team members collectively should possess all required credentials, capabilities, and experience required to provide QA for Southern Impoundment construction activities. The project organization will be identified after the procurement process and therefore the roles and responsibilities have not been completely defined. However, the CQA team will likely be comprised of personnel with the following roles and general responsibilities:

- **CQA Engineering Project Manager** - Provide overall construction QA project oversight
- **Engineer** - Provide field management of CQA/CQC activities
- **Quality Assurance Official (QA Official)** - Perform CQA audits
- **CQA/CQC Support Personnel** - Conduct CQA tests and inspections as directed by the Engineer
- **QA/QC Laboratories** – These will each be an Approved Laboratory (as described in the QAPP) that will provide QA/QC testing of materials used in the construction activities, as requested by the Engineer
- **Remedial Contractor** - Carry out construction activities according to project specifications and design drawings and implement the CQC requirements specified in the project specifications

3. Inspection and Testing Activities

3.1 Inspections

Throughout the period of construction, the quality of work completed and material used for each of the work tasks is to be confirmed through regular inspections of the work, conducted by the RC and verified by the Engineer and CQA support personnel, on a periodic basis.

The exact inspections to be conducted will be determined by the RC and Engineer and incorporated into the updated CQA/QCP, but suggested inspections are included in Table 1 and outlined below.

- i) Daily inspections of the work in progress.
- ii) Inspection of material as it is delivered to the Southern Impoundment to check for damage during delivery.
- iii) Comparison of the material delivered to the Southern Impoundment to the design specifications to ensure that the proper material has been delivered to the Southern Impoundment.



- iv) Inspections of materials after they have been installed to ensure that there has not been damage during installation and that the materials have been installed in accordance with the construction specifications.
- v) Inspections of backfill placement and compaction in accordance with the appropriate specifications.
- vi) Inspections of post-construction survey data to ensure the excavation extents are meeting the site clean-up standards, as will be defined by the work described in the PC FSP.
- vii) A pre-construction inspection should be performed prior to beginning work on any major work task. A pre-construction inspection may include the following:
 - A review of contract and specification requirements to ensure that all materials and/or equipment have been tested according to applicable standards and specifications.
 - Steps to ensure that provisions have been made to provide required quality control testing.
 - An examination of the work area to ascertain that all applicable/necessary preliminary work tasks have been completed/performed.
- viii) General inspections should be performed by the Engineer periodically as the amount of work completed warrants an inspection. A general inspection may include the following:
 - Examination of the quality of workmanship.
 - Testing of materials for compliance with the project specifications/requirements.
 - Identification of any omissions.
 - Assessment of general progress of work performed.

The inspections performed by the Engineer should be recorded in the work site log book as described in Sections 4.1 and 7.0 and copies of inspection reports should be maintained on-site.

The components of each work task to be inspected, the types of inspections required, and the frequency of the inspections are summarized in Table 1.

3.2 Testing

In addition to the daily inspections of the construction progress, material testing is to be carried out, as required. Material testing should be performed to ensure compliance with manufacturer specifications and design criteria as presented in the project specifications. The exact testing to be conducted will be determined by the RC and Engineer and incorporated into the updated CQA/QCP, but suggested inspections are included in Table 2.

Table 2 includes suggested testing requirements, methods of testing, testing frequency, key acceptance criteria, test sample sizes and locations, and potential corrective measures for each of these work task components and submittals (i.e., test reports, certificates verifying material quality/workmanship, etc.). For convenience, the Southern Impoundment RA QC requirements specified in the project specifications and the CQA requirements are also included in Table 2. It is suggested that CQA testing be conducted at a frequency of testing of ten percent of the Southern



Impoundment RA QC testing requirements. If a particular test for a material or work activity frequently fails, the Engineer should increase the rate of QA testing as deemed appropriate for the material/activity.

Southern Impoundment RA QC testing should be performed by the RC to measure and control the characteristics of the materials and installation procedures used in the Southern Impoundment RA activities in order to demonstrate that the materials and installations meet the requirements of the project specifications. Details of the Southern Impoundment RA QC requirements are specified in the project technical specifications.

4. Inspection Documentation

This section details the recommended documentation requirements for the CQA/QCP.

4.1 Work Site Log Book

The Engineer should record construction quality control activities in a work site log book to be kept on-site.

4.2 Photo Documentation

As part of the log, photographs should be taken and date-stamped showing significant construction activities. Suggested significant activities requiring photo documentation are included in Table 1. The photo log should be maintained by the Engineer.

4.3 CQA Instrument Calibration

The CQA support personnel should record calibrations of testing equipment in an instrument calibration/t inspection log book, maintained on-site by the Engineer. Actions taken as a result of recalibration should be recorded in the inspection log book, as described in the next section.

4.4 Inspection and Test Log Book

It is recommended that all observations and CQA quality control field tests should be recorded by the CQA support personnel into an inspection and test log book and that such log books be numbered sequentially. Separate log books may be kept for various work task components (i.e., soil, liners). These books should be kept on-site and maintained by the Engineer. For efficiency, the RC may formulate necessary inspection items into checklist forms for completion in the field.

5. Problem/Corrective Action Reports

A problem is defined as material or workmanship that does not meet the project specifications or drawings. Any problem/corrective action reports prepared with respect to such a problem should be cross-referenced to specific inspection entries in the inspection and test log book where the



problem was identified. The RC should devise a process for identifying and addressing any problems to the satisfaction of the Engineer and the Implementing Party.

6. Project Meetings

Project meetings should be held during the construction period to ensure that all tasks are accomplished according to schedule and that they are completed in accordance with the technical specifications and drawings. As discussed below, these progress meetings may be attended by the QA Engineering Project Manager, Engineer, CQA support personnel, RC, the Implementing Party, EPA, and/or TCEQ, subject to availability, and other agencies, subcontractors or project support personnel, as appropriate. The exact meetings to be conducted will be determined by the RC and Engineer and incorporated into the updated CQA/QCP, but suggested project meetings and their purpose are included below.

- **Pre-Construction Meeting** - To review the general project scope, resolve any uncertainties in the project specifications and construction drawings, and to review levels of responsibility, reporting requirements, and health and safety requirements.
- **Daily Progress Meetings** - To review daily work schedule progress. This meeting is intended to be an informal meeting held at the start and/or at the end of each work day.
- **Weekly Progress Meetings** - To provide an update of work schedule progress on a weekly basis, and identify schedule slippages and efforts required to get back onto schedule, if required.
- **Monthly Progress Meetings** - To provide a construction progress update to EPA and/or TCEQ. May be conducted informally by conference call and may be combined with weekly meeting, if appropriate.
- **Problem or Work Deficiency Meetings (As Needed)** - To address any problems or deficiencies which have occurred or are likely to occur.

The detailed topics to be discussed and the attendees for these meetings will be determined based on the activities that are occurring and the overall project structure and organization. The EPA and TCEQ representatives may opt to attend some of the meetings. For all meetings held during the Southern Impoundment RA, with the exception of the daily progress meetings, minutes may be prepared and distributed to all attendees.

7. QA/QC Documentation and Storage of Records

Prior to initiation of Southern Impoundment RA activities, the RC will be required to establish a process for creation and retention of QA/QC documentation. Documentation that may need to be retained on-site includes the following:

- RD and design drawings
- Project Specifications



- CQA and Southern Impoundment RA QC inspection and test results
- RC submittals
- RC's work site log book including photo documentation
- CQA inspection log book
- Problem/corrective action reports

Once the construction is complete, all CQA documents (originals) will be maintained following the records retention requirements to be defined for the Southern Impoundment RA.

8. References

EPA, 2018. Administrative Settlement Agreement and Order on Consent for Remedial Design. U.S. EPA Region 6, CERCLA Docket. No. 06-02-18. In the matter of: San Jacinto Waste Pits Superfund Site, Harris County, Texas. International Paper Company and McGinnes Industrial Maintenance Corporation, Respondents. April 2018.

Table 1

**Summary of Construction Quality Assurance and Quality Control Inspections
Southern Impoundment Remediation
San Jacinto River Waste Pits Site
Harris County, Texas**

Key Work Task Component to be Inspected	Key Items to be Checked During Inspection	Type of Inspection	Frequency of Inspection	Contractor Submittals to Resident Engineer
A. Temporary Traffic Control				
<ul style="list-style-type: none"> Vehicle Screening Traffic Control Inspection Truck and Traffic Control Inspection Traffic Control Devices 	<ul style="list-style-type: none"> Is a vehicle screening and inspection program included in the Temporary Traffic Control Plan? Is a traffic controls inspection program included in the Temporary Traffic Control Plan? Are daily tracking logs recorded? Are existing conditions photo documentation logs recorded? Have signs been inspected for legibility, damage, suitability, and location? Are signs clean/repared/replaced to maintain clarity and reflectiveness? 	<ul style="list-style-type: none"> Check Section 01 35 00 	<ul style="list-style-type: none"> continuous continuous continuous continuous 	<ul style="list-style-type: none"> Temporary Traffic Control Plan Temporary Traffic Control Plan Temporary Traffic Control Plan Truck and Traffic Control Inspection Forms None
B. Health and Safety				
<ul style="list-style-type: none"> Health and Safety Planning 	<ul style="list-style-type: none"> Are health and safety procedures in place? 	<ul style="list-style-type: none"> Check Section 1 35 29 	<ul style="list-style-type: none"> continuous 	<ul style="list-style-type: none"> Health and Safety Plan
C. Temporary Facilities and Controls				
<ul style="list-style-type: none"> Utilities Construction Facilities Vehicular Access and Parking Barriers and Enclosures Temporary Controls 	<ul style="list-style-type: none"> Have utilities been coordinated with local electrical utility? Have construction facilities been provided as specified? Has vehicular access and parking been provided as specified? Have barriers and enclosures been provided as specified? Have temporary controls been provided as specified? 	<ul style="list-style-type: none"> Check Section 01 00 00 Visual 	<ul style="list-style-type: none"> Periodic during installation 	<ul style="list-style-type: none"> None None None None None
D. Temporary Soil Erosion and Sediment Control				
<ul style="list-style-type: none"> Erosion Control Items 	<ul style="list-style-type: none"> Is depth of embankment in accordance with drawings? Are tears or holes present in silt fence fabric? Is erosion around and under silt fence present? Is sagging or collapse evident? Has a Storm Water Pollution Prevention Plan (SWPPP) maintained consistently with the SESC Plan and NJDES 5G3 permit conditions and include routine logged inspections of project stormwater control Best Management Practices. 	<ul style="list-style-type: none"> Visual & check drawings Visual Visual Visual Check permit 	<ul style="list-style-type: none"> continuous continuous continuous continuous continuous 	<ul style="list-style-type: none"> Soil Erosion & Sediment Control Plan Product Data none none Storm Water Pollution Prevention Plan

Table 1
Summary of Construction Quality Assurance and Quality Control Inspections
Southern Impoundment Remediation
San Jacinto River Waste Pits Site
Harris County, Texas

Key Work Task Component to be Inspected	Key Items to be Checked During Inspection	Type of Inspection	Frequency of Inspection	Contractor Submittals to Resident Engineer
G. Dewatering				
<ul style="list-style-type: none"> • Dewatering Equipment • Sediment/Soil Dewatering 	<ul style="list-style-type: none"> • Does equipment meet specifications? • Has system been installed as specified? • Has equipment and surplus raw materials been removed? • Is dewatering procedure adequate to contain impacted groundwater? • Is material being dewatered as specified? • Is settlement being detected where critical structures or facilities existing immediately adjacent to areas of proposed dewatering. • Is discharge within limits set by permits? 	<ul style="list-style-type: none"> • Check Section 31 23 19 • Visual • Check Section 31 23 19 and Drawings • Visual • Check Section 31 23 19 • Visual • Check Section 31 23 19 • Visual • Check Section 31 23 19 • Visual • Check permit 	<ul style="list-style-type: none"> • Upon delivery • Periodic during installation • Daily as required • Periodic during operation • During staging • Periodic during operation • As required 	<ul style="list-style-type: none"> • Dewatering Plan • Dewatering Plan • Dewatering Plan • Discharge data • Testing results • None • Testing results; solids/sediment waste data;
H. Fill				
<ul style="list-style-type: none"> • Common Fill • Common Fill (cont'd) • Topsoil • Coarse Aggregate • Backfilling Excavations 	<ul style="list-style-type: none"> • Does fill meet specifications? • Has fill been placed as specified? • Does topsoil meet specifications? • Does aggregate meet specifications? • Are excavations being backfilled as specified? • Has horizontal and vertical control been maintained? 	<ul style="list-style-type: none"> • Check Section 31 23 23 and Drawings • Visual • Survey • Check Section 31 23 23 • Visual • Check Section 21 23 23 • Check Section 31 23 23 and Drawings • Check Section 31 23 23 • Visual 	<ul style="list-style-type: none"> • Each source of fill • Periodic during installation • Each source of topsoil • Each source of aggregate • During backfilling • After placement 	<ul style="list-style-type: none"> • Geotechnical testing results • Analytical data • Product data • Limits of excavation and thickness measurements • Geotechnical testing results • Analytical data • Product data • Source of aggregate • Geotechnical data • Samples • Suppliers' Certificates • Geotechnical data • Survey • Analytical results • Test reports

Table 1
Summary of Construction Quality Assurance and Quality Control Inspections
Southern Impoundment Remediation
San Jacinto River Waste Pits Site
Harris County, Texas

Key Work Task Component to be Inspected	Key Items to be Checked During Inspection	Type of Inspection	Frequency of Inspection	Contractor Submittals to Resident Engineer
I. Sheet Piles				
<ul style="list-style-type: none"> Materials 	<ul style="list-style-type: none"> Do materials provided meet specifications? 	<ul style="list-style-type: none"> Check Section 31 41 16 	<ul style="list-style-type: none"> Upon delivery 	<ul style="list-style-type: none"> Product data Mix Design Test samples in accordance with AI MS-2 Records
<ul style="list-style-type: none"> Installation 	<ul style="list-style-type: none"> Have sheet piles been inspected prior to and after installation? Have sheet piles been installed as specified? 	<ul style="list-style-type: none"> Check Section 31 41 16 and Drawings Check Section 31 41 16 and Drawings 	<ul style="list-style-type: none"> After installation After installation 	<ul style="list-style-type: none"> Records Certifications
J. Chain Link Fences and Gates				
<ul style="list-style-type: none"> Materials 	<ul style="list-style-type: none"> Do materials provided meet specifications? 	<ul style="list-style-type: none"> Check Section 32 31 13 	<ul style="list-style-type: none"> Upon delivery 	<ul style="list-style-type: none"> Product data Manufacturer's instructions
<ul style="list-style-type: none"> Installation 	<ul style="list-style-type: none"> Have chain link fences and gates been installed as specified? Has a final inspection taken place? 	<ul style="list-style-type: none"> Check Section 32 31 13 and Drawings Check Section 32 31 13 and Drawings 	<ul style="list-style-type: none"> After installation upon Substantial Performance 	<ul style="list-style-type: none"> Certifications Records
K. Seeding				
<ul style="list-style-type: none"> Topsoil Placement 	<ul style="list-style-type: none"> Has topsoil been placed as specified? Has topsoil been lightly surface compacted following seeding? Horizontal and vertical control 	<ul style="list-style-type: none"> Check Section 31 23 23 Visual Visual Visual Survey 	<ul style="list-style-type: none"> Periodic during placement Periodic following seeding Following placement 	<ul style="list-style-type: none"> None None Survey
<ul style="list-style-type: none"> Seeding 	<ul style="list-style-type: none"> Are materials stored properly? Does seed, lime, fertilizer, and mulch meet specifications? Has hydroseed, fertilizer, and mulch been applied as specified? Have correct quantities of hydroseed, fertilizer, and mulch been placed? Have bare spots been rehydroseeded? Is height of grass as specified? 	<ul style="list-style-type: none"> Visual Check Section 32 92 19 Check Section 32 93 00 Visual Check Section 32 93 00 Visual Visual Check Section 32 93 00 	<ul style="list-style-type: none"> Periodic during storage Prior to application Periodic during application Periodic during placement Periodic during installation Periodically during maintenance 	<ul style="list-style-type: none"> Manufacturer's instructions Source of materials Product data Seeding and Erosion Control Plan Seed certificates Fertilizer certificates None None

Table 2
Summary of Construction Quality Assurance and Quality Control Tests
 Southern Impoundment Remediation
 San Jacinto River Waste Pile Site
 Harris County, Texas

Work Task Component to be Tested	Type of Test	Standard	Frequency of Tests per Construction Specifications	Key Acceptance Criteria	Sample Size/Location	Potential Corrective Measures	Test Location	Percentage of Test Frequency by Contractor	Percentage of Test Frequency by Engineer
A. Health and Safety (Section 01 80 00)									
• Reportable Quantities	• Identification of hazardous chemicals	• State accredited method	• Throughout the Works	• In accordance with State accredited criteria	• As determined by Engineer	• See Section 01 35 29	• On Site	• 50	• 50
B. Fill (Section 31 23 23)									
• Imported Common Fill Material	• Particle Size	• ASTM D6913/D6913M and D7928	• Minimum 1 test per 2,500 cu yd (clay)	• Per ASTM standard	• Sample size per ASTM collected at source	• Locate suitable material and re-test	• Analytical Laboratory	• 100	• 0
	• Soil Classification	• ASTM D2487	• Minimum 1 test per 2,500 cu yd (clay)	• Any except poorly graded and except CH, MH, OL and OH	• As above	• As above	• Analytical Laboratory	• 100	• 0
• Imported Topsoil Material	• Particle Size	• ASTM D422	• Minimum 1 test per 2,500 cu yd	• Per ASTM standard	• Sample size per ASTM collected at source	• Locate suitable material and re-test	• Analytical Laboratory	• 100	• 0
	• pH	• ASTM D4972	• Minimum 1 test per 2,500 cu yd	• Per ASTM standard	• Sample size per ASTM	• Locate suitable material and re-test	• Analytical Laboratory	• 100	• 0
	• Organic Content	• ASTM D2974	• Minimum 1 test per 2,500 cu yd	• Per ASTM standard					
• Aggregate Material	• Phosphorus, potassium, calcium, and magnesium	• In accordance with State accredited criteria	• Minimum 1 test per 2,500 cu yd						
	• Grain Size	• ASTM C117, C136, and D6913/D6913M	• Minimum 1 test per 1,000 cu yd	• Per ASTM standard	• Sample size per ASTM collected at source	• Locate suitable material and re-test	• Analytical Laboratory	• 100	• 0
• Imported Common Fill, Topsoil and Aggregate Material	• Chemical Analysis	• (1) EPA SW 846, TCL: Target Compound List, (2) TAL: Target Analyte List, Methods Parameter TAL ¹ Metals Hexavalent Chromium Cyanide TCL ¹ Volatiles TCL Semi-Volatiles TCL Pesticides SW-846 8081B SW-846 8082A SW-846 8151A	• Minimum 1 test per source	• In accordance with State accredited criteria	• Sample collected from stockpile at source	• As above	• Analytical Laboratory	• 100	• 0
• Imported Common Fill, Topsoil and Aggregate Placement	• Particle Size Analysis	• ASTM D6913/D6913M and ASTM D7928 or ASTM C117 and ASTM C136	• Minimum 1 test per source	• Per ASTM standard	• Sample size per ASTM	• Locate suitable material and re-test	• Analytical Laboratory	• 100	• 0
C. Sheet Piles (Section 31 41 16)									
• Sheet Piles Material	• Material Testing	• ASTM A616M	• See standard	• Per ASTM standard	• Sample size per ASTM	• Per ASTM standard	• Per ASTM standard	• 100	• 0
D. Seeding (Section 32 92 18)									
• Seed Material	-	-	-	-	-	-	-	-	-
E. Turbidity Curtain (Section 35 49 20)									
• Geotextiles Material	• Tensile Strength	• ASTM D4632/D4632M	• See standard	• (Wrap) 350, (Fib) 250	• As above	• As above	• As above	• 100	• 0
	• Elongation at Break	• ASTM D4632/D4632M	• See standard	• 34	• As above	• As above	• As above	• 100	• 0
	• Mullen Burst Strength	• ASTM D2786/D3786M	• See standard	• 510	• As above	• As above	• As above	• 100	• 0
	• Trapezoid Tear Strength	• ASTM D4633	• See standard	• 65	• As above	• As above	• As above	• 100	• 0
	• Puncture Strength	• ASTM D4833/D4833M	• See standard	• 140	• As above	• As above	• As above	• 100	• 0
	• Permeability	• ASTM D4491	• See standard	• 0.04	• As above	• As above	• As above	• 100	• 0
	• Permeability	• ASTM D4491	• See standard	• 0.01	• As above	• As above	• As above	• 100	• 0
	• Water Flow Rate	• ASTM D4491	• See standard	• 5	• As above	• As above	• As above	• 100	• 0
	• Apparent Opening Size (AOS)	• ASTM D4751	• Once per month minimum	• 70	• As above	• As above	• As above	• 100	• 0
	• Ultra Violet Resistance	• ASTM D4355	• Once per month minimum	• 80/500	• As above	• As above	• As above	• 100	• 0
Installation	• Conformance Testing	• ASTM D4354	• See standard	• In accordance with State accredited criteria	• As above	• As above	• As above	• 50	• 50
	• Acceptance Testing	• ASTM D4750	• See standard	• In accordance with State accredited criteria	• As above	• As above	• As above	• 50	• 50

Notes:
 * Minimum criteria, unless identified otherwise.
 1. The quality assurance/quality control tests included herein are suggested in accordance with the technical specifications.
 MARV Minimum Average Roll Value
 AI Asphalt Institute
 ASTM ASTM International

Attachment 8

Transportation and Off-Site Disposal Plan



Attachment 8 - Transportation and Off-Site Disposal Plan - Southern Impoundment

Provided with Final 100% Remedial Design - Southern Impoundment (Amended April 2021)

San Jacinto River Waste Pits Site
Harris County, Texas

International Paper Company

GHD | 5551 Corporate Boulevard Suite 200 Baton Rouge Louisiana 70808 USA
11215131 | Report No 3



Table of Contents

- 1. Introduction..... 1
 - 1.1 Relationship to Supporting Plans..... 1
- 2. Roles and Responsibilities 1
- 3. Compliance with Off-Site Disposal Rule 2
- 4. Waste Classification Procedures 3
 - 4.1 Waste Stream Categories and Disposal Options 3
 - 4.2 Waste Sampling and Classification 4
- 5. On-Site Management and Loading 4
 - 5.1 Transportation Truck/Container Requirements..... 4
 - 5.2 Truck Staging and Loading Requirements 4
 - 5.2.1 Lining Trucks and Securing Loads 4
 - 5.2.2 Control and Mitigation of Tracking Waste Beyond Work Areas 4
- 6. Transportation 4
- 7. Document and Reporting 5
 - 7.1 Waste Profiles 5
 - 7.2 Manifests..... 5
 - 7.3 Waste Reporting 5
- 8. References 6

Figure Index

Figure 1 Transportation Routes



1. Introduction

This Transportation and Off-Site Disposal Plan (TODP) was prepared by GHD Services Inc. (GHD), on behalf of International Paper Company for the Southern Impoundment of the San Jacinto River Waste Pits Superfund Site in Harris County, Texas (Site). This TODP was prepared pursuant to the requirements of the Administrative Settlement Agreement and Order on Consent for Remedial Design (AOC), Docket No. 06 02 18, with an effective date of April 11, 2018 (United States Environmental Protection Agency [EPA], 2018). The AOC includes a Statement of Work (SOW) which requires supporting deliverables to accompany the Final 100% Remedial Design for the Southern Impoundment (Southern Impoundment 100% RD) submittal to the Environmental Protection Agency (EPA).

This TODP provides the procedures for on-site management and loading of excavated material to be disposed of off-site during the Southern Impoundment RA, the transportation routes for off-site shipments from the Southern Impoundment, and measures to be implemented if needed to protect communities that may be affected by the shipments. It also addresses the management of other wastes generated during implementation of the Southern Impoundment RA (collectively, Wastes). References in this TODP to the "work site" are to the Southern Impoundment and references to "Implementing Party" are to the entity(ies) implementing the RA for the Southern Impoundment. Prior to initiation of Southern Impoundment RA activities, each selected remedial contractor (RC) will either update this TODP or develop its own TODP to address the components outlined in this document.

1.1 Relationship to Supporting Plans

The TODP should be considered in combination with the other supporting plans. The Pre-Construction Field Sampling Plan (PC FSP) defines the procedures for sampling that will be completed during the Southern Impoundment RA prior to excavation activities to further delineate excavation limits, characterize excavated material for off-site disposal, and collect other data to support the Southern Impoundment RA. The Construction Quality Assurance/Quality Control Plan (CQA/QCP) describes the procedures to verify that the excavation objectives are achieved during implementation. The Site-Wide Monitoring Plan (SWMP) describes the procedures for monitoring to prevent the potential spread of dust generated during construction and monitoring of the best management practices (BMPs) with respect to stormwater. The field and analytical quality procedures are described in the Quality Assurance Project Plan (QAPP). The FSP provides the procedures for sampling the treated contact water and the imported backfill that will be used to fill excavations during implementation of the Southern Impoundment RA.

2. Roles and Responsibilities

Roles and responsibilities of those involved in activities addressed by this TODP should be defined in the plan to be developed by the RC, but are expected to include the following:



- Generator - The Implementing Party or some other party involved in the Southern Impoundment RD will be the generator of the Wastes. The Generator will be responsible for signing the waste profiles and the manifests. The Generator's signatory authority may be delegated to another representative on-site.
- Engineer or Implementing Party's Representative - The Engineer or Implementing Party's Representative will be responsible for inspecting and documenting the work for conformance with the specifications and other contract documents, including the loading and transportation of excavated materials for disposal off-site. This role may include a waste coordinator to track Waste-related activities and prepare the documentation of the kind described in Section 7.0.
- Remedial Contractor (RC) - The RC will be responsible for managing and loading the excavated materials for transportation to the disposal facility and management and disposal of other Wastes generated during the Southern Impoundment RA.
- Transporter - A Transporter will have responsibility for transporting Waste to the selected Disposal Facility(ies). The Transporter will sign the waste manifests as the Transporter.
- Disposal Facility - A Disposal Facility will be responsible for approving waste profiles, receiving the waste shipments, documenting the weight/volume, and disposing of the Waste properly according to its permits. A Disposal Facility will sign the waste manifests as the Disposal Facility and return the completed manifest to the Generator.

3. Compliance with Off-Site Disposal Rule

Section 121(d)(3) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) applies to any CERCLA response action involving the off-site transfer of any hazardous substance, pollutant, or contaminant (CERCLA wastes). That section requires that CERCLA wastes may only be placed in a facility operating in compliance with RCRA or other applicable Federal or State requirements. It further prohibits the transfer of CERCLA wastes to a land disposal facility that is releasing contaminants into the environment, and requires that any releases from other waste management units must be controlled. These principles are interpreted in the Off-Site Rule (OSR), set forth in the National Contingency Plan (NCP), at 40 CFR 300.440.

The OSR establishes the criteria and procedures for determining whether facilities are acceptable for the receipt of CERCLA wastes from response actions authorized or funded under CERCLA. The OSR establishes compliance criteria and release criteria, and establishes a process for determining whether facilities are acceptable based on those criteria. The OSR also establishes procedures for notification of unacceptability, reconsideration of unacceptability determinations, and re-evaluation of unacceptability determinations.

As required by the SOW, the Implementing Party must obtain the EPA's certification that a proposed Disposal Facility is operating in compliance with CERCLA OSR requirements before shipping any hazardous substances, pollutants, or contaminants to it. The Implementing Party will contact the EPA Region VI regional off-site contact (ROC) to inquire about the status of each selected Disposal Facility. Confirmation that a Disposal Facility is able to receive CERCLA waste



will be documented in a correspondence sent to the EPA Remedial Project Manager (RPM) prior to shipping material to the Disposal Facility.

4. Waste Classification Procedures

The Southern Impoundment 100% RD describes the waste determination process for Impacted Material (as defined below). Further sampling may be required to confirm the characterization of the Impacted Material. Prior to off-site disposal, the plan to be developed by the RC will identify in more detail waste classification procedures and the disposal options with respect to the different waste streams to be managed during the Southern Impoundment RA. The different waste categories and procedures that may be included are described below.

4.1 Waste Stream Categories and Disposal Options

It is anticipated that the following waste categories may be generated during the Southern Impoundment RA:

- Impacted Material - Impacted material that is excavated (other than Potentially-Impacted Remediation Debris, described below) and determined to not be suitable for reuse will be solidified, as necessary, and transported to an off-site Disposal Facility. The excavated materials will be characterized as described in the Southern Impoundment 100% RD.
- Potentially Impacted Remediation Debris - Excavated Materials could include debris, including miscellaneous wood, concrete, metal and trash that, because of their contact with other materials, may have to be characterized for disposal. This also may include tarps, plastic, wood, discarded treatment filters, discarded personal protective equipment (PPE), and other spent construction materials that may have come into contact with excavated materials.
- Non-Impacted Remediation Debris - Non-impacted remediation debris could include any cleared vegetation, demolition debris, and/or other debris encountered at the surface. These materials may be managed as Class 3 non-hazardous waste under the regulations governing classification of non-hazardous industrial solid waste in Texas (30 Texas Administrative Code [TAC] §335.505, 335.506, and 335.508), or can be managed with the excavated materials as Class 2 non-hazardous waste.
- Spent Media from Water Treatment System - The spent carbon and other spent media from the wastewater treatment system may be transferred to a vendor for recycling or regeneration. If the spent carbon or other spent media cannot be recycled/regenerated for other uses, the material would be characterized and transported off-site for disposal. The media will need to be characterized at the time it is generated, but is expected to be a Class 2 non-hazardous waste.
- General Trash and Sanitary Sewage - General trash and sanitary sewage will need to be handled through service companies that specialize and are licensed for these activities or through some other means adopted by the RC.

The applicable waste classifications will be updated during the Southern Impoundment RA.



4.2 Waste Sampling and Classification

The plan developed by the RC will define characterization procedures to be used to profile Waste. Excavated materials (other than those classified as Potentially Impacted Remediation Debris) will be further characterized utilizing the guidance provided in Chapter Nine "Sampling Plan" of the *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods* (EPA, 1986) and in *RCRA Waste Sampling Draft Technical Guidance* (EPA, 2002) and classified during the pre-construction sampling event, as detailed in the PC FSP. The applicable sampling and analytical methods are addressed in the PC FSP and in the QAPP.

5. On-Site Management and Loading

The plan to be developed by the RC will identify procedures for on-site management of the Impacted Material and other Wastes and their transportation off-site for disposal. The RC's plan is expected to address the elements below.

5.1 Transportation Truck/Container Requirements

Trucks, such as 20-ton end-dump trucks or roll-off containers that will be loaded onto trucks are expected to be used to transport materials off-site for disposal. The RC's plan will include requirements for inspection of trucks and containers used for this purpose.

5.2 Truck Staging and Loading Requirements

5.2.1 Lining Trucks and Securing Loads

The trucks beds and containers will be required to have a liner. Procedures will be required to address any free liquids observed after loading, such as the addition of solidification agents. Tarps or other coverings will be required to be placed over the loads and secured prior to trucks leaving the Southern Impoundment.

5.2.2 Control and Mitigation of Tracking Waste Beyond Work Areas

Procedures will be established to prevent any tracking of waste or mud beyond the limits of the Southern Impoundment. This may include an inspection/cleaning station at a location where all trucks are required to pass before leaving the loading area, at which trucks will be inspected and if necessary, cleaned. Cleaning techniques may include dry or wet decontamination methods.

6. Transportation

The plan to be developed by the RC will be required to address safety procedures to be followed to control access and egress to the work site by vehicles, including signage and the use of flaggers, if appropriate. A preliminary map showing the route from the Southern Impoundment to I-10 is also provided as Figure 1. It is anticipated that the RC will put in place a transportation plan with each Transporter that will confirm the truck routes to the selected Disposal Facility, and describe the



safety procedures that will be employed to protect the public. The plan developed by the RC would include measures for communicating with neighboring businesses regarding the timing and volume of track traffic leaving the work site, and all required coordination with the Texas Department of Transportation (TxDOT) and if applicable, Harris County regarding permitting, signage, and the timing and volume of truck traffic.

7. Document and Reporting

The plan to be developed by the RC will address documentation requirements related to the management of the Wastes, and may include the elements identified below.

7.1 Waste Profiles

Waste profiles will be developed and maintained on-site by the RC for the different waste types listed in Section 4.0 and for the different Disposal Facilities designated to receive the waste. Profiles will also be developed for any additional waste streams that are identified during the Southern Impoundment RA. The waste profiles will describe the waste and provide the Disposal Facility with the information it needs to ensure the waste can be managed at its facility under that profile. Waste profiles should also include waste codes and other information consistent with RCRA (40 CFR Part 261 and 268) and TAC Chapter 335, Subchapter R. Copies of the profiles will be maintained on-site and any changes to a profile will require the approval by both the Generator and the Disposal Facility, after which the profile will be updated to reflect the approved changes.

7.2 Manifests

Hazardous waste is not expected to be generated during the Southern Impoundment RA. However, if hazardous waste, as defined in 40 CFR part 261, is identified, it will be managed and disposed of in accordance with RCRA regulations. Most Disposal Facilities have a non-hazardous waste manifest or shipping document to track waste custody, quantities (wet tons), and to document that the waste was received and disposed of at the facility. The quantity and type of waste will be logged and tracked during the Southern Impoundment RA utilizing whatever mechanism is required by the Disposal Facility.

7.3 Waste Reporting

The plan developed by the RC will be required to track information about Impacted Material and Wastes generated and shipped off-site as part of the Southern Impoundment RA. In addition, the plan developed by the RC will address any required regulatory filings, including those under 30 TAC §335.9(a)(2). The waste tracking for each load transported off-site may include:

- Transporter Name
- Date of Shipment
- Load No. - Internal Sequential Load number
- Truck No. - Number that uniquely identifies the truck (such as the license number)



- Manifest Tracking Number - preprinted number on waste manifest
- Waste Type - Either Waste Profile Number or other unique waste identifier
- Disposal Facility
- Quantity - Typically weight, but some waste may be tracked as volume
- Date Received at Disposal Facility

8. References

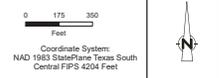
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EPA, 2002. RCRA Waste Sampling Draft Technical Guidance - Planning, Implementation, and Assessment. EPA530-D-02-002. Office of Solid Waste. August 2002.

EPA, 2018. Administrative Settlement Agreement and Order on Consent for Remedial Design. U.S. EPA Region 6, CERCLA Docket. No. 06 02 18. In the matter of: San Jacinto Waste Pits Superfund Site, Harris County, Texas. International Paper Company and McGinnes Industrial Maintenance Corporation, Respondents. April 2018.



Source: Google Earth Imagery 12/1/2019



Coordinate System:
 NAD 1983 StatePlane Texas South
 Central FIPS 4204 Feet



SAN JACINTO RIVER WASTE PITS SITE
 HARRIS COUNTY, TEXAS
 FINAL 100% REMEDIAL DESIGN – SOUTHERN IMPOUNDMENT (AMENDED APRIL 2021)
 TRANSPORTATION AND OFFSITE DISPOSAL PLAN
 TRANSPORTATION ROUTES

11215131
 Apr 13, 2021

FIGURE 1

GIS File: I:\gish\right\GIS\Baton Rouge\Project\652\11215131\GIS\Map\Deliverables\MISC\00\11215131_202007_MISC001_08003.mxd

Attachment 9

Institutional Controls Implementation and Assurance Plan



Attachment 9 - Institutional Controls Implementation and Assurance Plan - Southern Impoundment

*Provided with Final 100% Remedial Design - Southern
Impoundment (Amended April 2021)*

San Jacinto River Waste Pits Site
Harris County, Texas

International Paper Company

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11215131 | Report No 3



Table of Contents

1.	Introduction.....	1
1.1	Plan Objectives	1
2.	Site Details	1
2.1	Site Description	1
2.2	Property Information	2
2.2.1	Musgrove Property	2
2.2.2	Market Street Property	3
3.	Planned Institutional Controls	3
4.	References	4

Figures

Figure 1 Southern Peninsula Property Locations

Appendix Index

Appendix A	2020 Property Survey
Appendix B	Musgrove Property Title Documents
Appendix C	Market Street Property Title Documents
Appendix D	San Jacinto River Landowners Association Articles of Association and Declaration of Covenants Conditions and Restrictions



1. Introduction

This Institutional Control Implementation and Assurance Plan (ICIAP) was prepared by GHD Services Inc. (GHD), on behalf of International Paper Company, for the Southern Impoundment of the San Jacinto River Waste Pits Superfund Site in Harris County, Texas (Site). This ICIAP was prepared pursuant to the requirements of the Administrative Settlement Agreement and Order on Consent for Remedial Design (AOC), Docket No. 06 02 18, with an effective date of April 11, 2018 (United States Environmental Protection Agency [EPA], 2018). The AOC includes a Statement of Work (SOW) which requires supporting deliverables to accompany the Final 100% Remedial Design for the Southern Impoundment (Southern Impoundment 100% RD) submittal to the EPA.

This ICIAP describes a plan to implement, maintain and monitor institutional controls (ICs) at the Southern Impoundment. *Institutional Controls: A Guide to Planning, Implementing, Maintaining, and Enforcing Institutional Controls at Contaminated Sites*, OSWER 9355.0- 89, EPA/540/R- 09/001 (EPA, 2012a), *Institutional Controls: A Guide to Preparing Institutional Controls Implementation and Assurance Plans at Contaminated Sites*, OSWER 9200.0-77, EPA/540/R-09/02 (EPA 2012b), and as applicable, Texas Commission on Environmental Quality (TCEQ) guidance, were considered in developing this ICIAP.

The ICIAP is a dynamic document that is expected to require updating at or before the conclusion of the Southern Impoundment remedial action (RA).

1.1 Plan Objectives

The overall objectives of the ICIAP are to:

- Identify ICs to meet requirements applicable to the Southern Impoundment as referenced in the 2017 ROD (EPA, 2017) and in the SOW that is part of the AOC (EPA, 2018).
- Establish and document the activities and responsible entities to implement, maintain, enforce, terminate, and/or modify the ICs, as appropriate.

The SOW states that the ICIAP is to include:

- Locations of recorded real property interests and resource interests in real property that may affect ICs, including accurate mapping and geographic information system coordinates of such interests.
- Legal descriptions and survey maps that are prepared according to current Texas American Land Title Association (TLTA) Survey guidelines and certified by a licensed surveyor.

2. Site Details

2.1 Site Description

The Site is located in Harris County, Texas, east of the City of Houston, between two unincorporated areas known as Channelview and Highlands.



The Southern Impoundment is approximately 20 acres in size and is located on a small peninsula in the San Jacinto River that extends south of Interstate Highway 10. There are several active businesses operating on the peninsula, including Kirby Inland Marine (Kirby), Glendale Boat Works, and Southwest Shipyards.

2.2 Property Information

The location of properties at and adjoining the Southern Impoundment are shown on Figure 1. To prepare this IACIP, a certified property survey with respect to the boundaries of certain of those properties was conducted by Hutchison & Associates and is included as Appendix A.

The survey included an 18.7 acre property owned by Musgrove Towing Service, Inc. (Musgrove) and identified in Harris County records as Assessor Parcel Number (APN) 94 (Musgrove Property) and currently leased by Musgrove to Kirby Inland Marine, LLP (Kirby Inland Marine), an approximately 7.3 acre property that is owned by Kirby Inland Marine and identified as APN 107 (Kirby Property), and a private road that provides access to the properties on the peninsula (Market Street Property). Title records reflect that the Market Street Property is owned by Kirby, subject to rights of adjoining property owners under a recorded covenant. During the Southern Impoundment RA, excavation activities are anticipated to take place on a portion of the Musgrove Property (approximately 4.9 acres of the 18.7 acres). Excavation activities would also take place on a portion of the Market Street Property, up to the boundary of the access road itself. A final survey would then be conducted following completion of Southern Impoundment RA construction to confirm the boundaries and to define the specific portions of the Musgrove Property and/or Market Street Property at which the remediation activities took place. Subject to the results of pre-construction sampling to be conducted as part of the Southern Impoundment RA, no excavation activities are anticipated to take place on any properties identified on Figure 1 other than the Musgrove Property and a portion of the Market Street Property.

Additional information is provided below regarding the Musgrove Property and the Market Street Property.

2.2.1 Musgrove Property

The property address is 18003 Market Street, Channelview, Texas 77530. The property is zoned for commercial/industrial use. It encompasses 18.708 acres of land on the west side of the peninsula located between the San Jacinto River and the Old River Lake in the J.T. Harrell Survey, Abstract No. 330, Harris County, Texas. The property is shown in Appendix A as Parcel 1 and Parcel 2, located to the north and south, respectively, of property owned by New Lost River, LLC and occupied by Glendale Boat Works. The acreage on the survey indicates the portion of the property that is upland (approximately 13.46 acres [delineated by a solid line] of the total property [delineated by a dashed line]).

A preliminary title report for the Musgrove Property prepared by Title Houston Holdings (included as Appendix B) did not identify any current property or involuntary liens against the property.

The preliminary title report did identify the following easements, restrictions, and other encumbrances:



- A 10-ft wide right of way easement that is granted to Houston Lighting and Power Company recorded under County Clerk's File No. E481553
- Memorandum of Lease in favor of Dalar Outdoor recorded under County Clerk's File No. G727444
- A restrictive covenant in a deed recorded in Volume 3253, Page 106 of the Deed Records of Harris County, Texas and under County Clerk's File No. G978048, granting perpetual right-of-way and easement for the purpose of using and maintaining a road (Market Street)

2.2.2 Market Street Property

The Market Street Property is a parcel, approximately 60 feet in width, that runs from the northeast to the southwest along the southern peninsula and provides access to the other properties shown on Figure 1. Title documents for the Market Street Property, attached as Appendix C indicate that the Market Street Property is owned by Kirby Inland Marine, pursuant to a Special Warranty Deed recorded January 27, 2004, included in Appendix C. The Market Street Property is zoned for commercial/industrial use and encompasses 2.2911 acres of land. Title records also contain an agreement, recorded in 1981, that appears to be between five owners of property on the southern peninsula, related to the maintenance and repair of the roadway on the Market Street Property. The document, titled Articles of Association of San Jacinto River Landowners Association and Declaration of Covenants, Conditions and Restrictions, is attached as Appendix D. The signatories on this document are the following:

- Musgrove Towing Service, Inc.
- Southwestern Barge & Fleet Service, Inc.
- Marine Engine Service, Inc.
- Glendale Boat Works, Inc.
- Kirby Inland Marine (previously Dixie Carriers, Inc.)

The current status of the San Jacinto River Landowners Association is unknown.

3. Planned Institutional Controls

Institutional controls are non-engineered instruments, such as administrative and/or legal controls, that help to minimize the potential for human exposure to contamination and/or protect the integrity of a remedy. Generally speaking, there are four types of institutional controls: (1) proprietary controls, such as easements or covenants; (2) governmental controls, such as building codes or groundwater use regulations; (3) enforcement and permit tools, such as orders, permits, or consent decrees; and (4) informational devices, such as deed notices and advisories.

The ROD contains the following statement regarding ICs for the Southern Impoundment:

- *Deed restrictions are to be applied to parcels where dioxin concentration does not allow for unrestricted use and unlimited access*



- *Notices would be attached to deeds of affected properties to alert potential future purchasers of the presence of waste and soils with dioxin concentrations exceeding EPA's protective level of 51 nanograms per kilogram (ng/kg) for residential exposures (unlimited use and unrestricted [sic] access)*
- *As a result of the long-term persistence of dioxin, it is anticipated that the institutional controls will be essentially permanent measures*

A proprietary control in the form of an environmental restrictive covenant (ERC) is proposed with respect to the Musgrove Property and the Market Street Property and will be proposed for any additional properties at which they are required. The ERC would prohibit land uses other than for commercial/industries activities. It may also contain provisions governing access to the property and future activities, including prohibitions or limitations on specific activities related to construction of structures, installation of wells, and disturbance of subsurface soils below a specified depth.

Restrictions on such future activities will be addressed as part of the ERC, although specific requirements may instead or in addition be addressed as part of a soil management plan (SMP). The ERC would provide record notice of any rights of access and of restrictions associated with the use of and activities on affected properties.

The terms of a proposed ERC and, if applicable, a SMP would be discussed in connection with negotiations regarding access to the affected properties for purposes of implementing the Southern Impoundment RA. Any changes in the scope of any proprietary controls that may be proposed would be evaluated following the completion of the pre-construction sampling event and the final delineation of the excavation boundaries. Placement of the controls would not occur until after the completion of construction activities and post-construction surveying has been completed.

The proposed form of the ERC and, if applicable, a SMP for each property would be provided to EPA for approval, together with current title reports for each property. As approved, the recording of any such document would be subject to obtaining the consent and approval of the property owners and also to obtaining any subordination agreements, release or other consents that may be required by the EPA with respect to record matters that affect title, including any liens, claims, easements, mortgages or other encumbrances. In the case of the Market Street Property, additional investigation will be required with respect to the status of the San Jacinto River Landowners Association and the identity of those parties with an interest in the Market Street Property and whose consent may be required with respect to any ERC and, if applicable, the SMP with respect to that property.

4. References

EPA, 2012a. Institutional Controls. A Guide to Planning, Implementing, Maintaining, and Enforcing Institutional Controls at Contaminated Sites, OSWER 9355.0-89, EPA/540/R-09/001.

EPA, 2012b. Institutional Controls. A Guide to Preparing Institutional Controls Implementation and Assurance Plans at Contaminated Sites, OSWER 9200.0-77, EPA/540/R-09/02.



EPA, 2017. Record of Decision, San Jacinto River Waste Pits. Harris County, Texas. EPA ID: TXN000606611. U.S. Environmental Protection Agency, Region 6. Dallas, Texas. October 2017.

EPA, 2018. Administrative Settlement Agreement and Order on Consent for Remedial Design. U.S. EPA Region 6, CERCLA Docket. No. 06-02-18. In the matter of: San Jacinto Waste Pits Superfund Site, Harris County, Texas. International Paper Company and McGinnes Industrial Maintenance Corporation, Respondents. April 2018.

Appendices

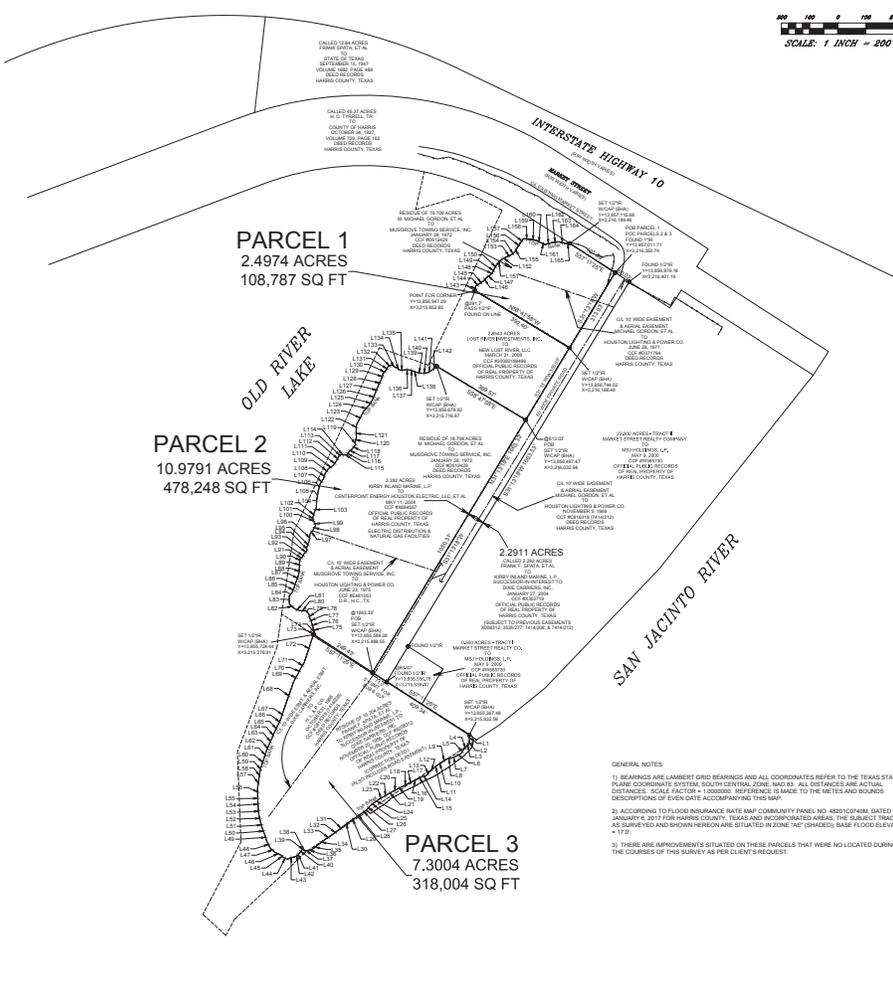
Appendix A

2020 Property Survey

Parcel Line Table			Parcel Line Table		
Line #	Length	Direction	Line #	Length	Direction
L1	19.09	S11° 44' 28"E	L73	9.43	N18° 10' 27"E
L2	11.21	S18° 43' 10"W	L74	0.48	N38° 12' 40"E
L3	12.30	S31° 53' 38"W	L75	12.99	N15° 13' 53"W
L4	15.72	S40° 06' 27"W	L76	22.95	N16° 51' 23"W
L5	17.99	S35° 16' 47"W	L77	12.79	N23° 50' 13"W
L6	18.58	S62° 58' 18"W	L78	18.38	N14° 37' 19"W
L7	17.66	S65° 37' 37"W	L79	15.66	N41° 17' 03"W
L8	19.69	S80° 04' 54"W	L80	21.88	N89° 52' 27"W
L9	18.02	S56° 29' 22"W	L81	19.02	N69° 29' 47"W
L10	18.51	S53° 13' 47"W	L82	25.67	N47° 51' 30"W
L11	18.24	S52° 38' 44"W	L83	28.48	N0° 45' 45"W
L12	18.99	S50° 05' 38"W	L84	15.21	N40° 27' 17"E
L13	18.08	S39° 08' 27"W	L85	20.42	N21° 15' 51"E
L14	17.20	S73° 16' 12"W	L86	23.20	N19° 53' 08"E
L15	16.53	S63° 41' 21"W	L87	23.88	N20° 22' 54"E
L16	18.38	S94° 23' 33"W	L88	25.36	N5° 50' 20"E
L17	17.92	S65° 11' 11"W	L89	20.70	N0° 46' 59"E
L18	25.81	S61° 03' 06"W	L90	12.27	N10° 14' 45"E
L19	19.36	S84° 09' 51"W	L91	8.24	N67° 39' 40"E
L20	18.30	S62° 35' 46"W	L92	14.40	N28° 30' 36"E
L21	19.84	S61° 04' 55"W	L93	16.84	N42° 52' 15"E
L22	18.25	S58° 58' 33"W	L94	8.38	N18° 58' 50"W
L23	19.28	S61° 01' 29"W	L95	26.30	N22° 32' 39"E
L24	17.83	S53° 44' 40"W	L96	25.72	N5° 21' 21"E
L25	18.76	S52° 29' 09"W	L97	18.06	N37° 11' 43"E
L26	19.69	S41° 48' 19"W	L98	18.65	N29° 24' 00"E
L27	22.83	S54° 48' 13"W	L99	12.42	N23° 06' 56"W
L28	23.41	S54° 22' 36"W	L100	9.75	N31° 23' 03"W
L29	27.09	S55° 42' 50"W	L101	9.58	N2° 39' 20"E
L30	28.47	S54° 09' 04"W	L102	18.91	N16° 27' 62"E
L31	20.21	S52° 28' 16"W	L103	19.01	N21° 43' 07"E
L32	31.17	S52° 12' 51"W	L104	21.82	N1° 39' 17"E
L33	30.07	S56° 35' 26"W	L105	38.90	N8° 26' 53"E
L34	28.45	S52° 56' 40"W	L106	22.48	N14° 49' 12"E
L35	28.59	S52° 05' 11"W	L107	21.39	N33° 16' 13"E
L36	15.39	S70° 37' 07"W	L108	21.70	N18° 14' 52"E
L37	10.86	N83° 48' 18"W	L109	19.81	N34° 04' 24"E
L38	6.05	N59° 44' 10"W	L110	19.65	N56° 33' 38"E
L39	3.74	N34° 07' 57"W	L111	19.44	N36° 31' 53"E
L40	21.70	S38° 28' 53"W	L112	20.31	N28° 02' 14"E
L41	7.32	S30° 22' 19"W	L113	8.54	N50° 20' 53"E
L42	8.62	S98° 24' 34"W	L114	12.22	S86° 06' 02"E
L43	33.21	S73° 10' 58"W	L115	9.61	N89° 05' 39"E
L44	13.82	N64° 40' 19"W	L116	10.61	N32° 41' 33"E
L45	10.63	N41° 50' 06"W	L117	17.33	N47° 09' 48"E
L46	24.92	N64° 46' 37"W	L118	18.43	N40° 25' 01"E
L47	22.51	N47° 17' 38"W	L119	10.34	N4° 53' 20"W
L48	27.76	N26° 37' 30"W	L120	17.65	N13° 48' 03"E
L49	28.73	N17° 25' 47"W	L121	28.08	N1° 08' 51"W
L50	21.04	N19° 59' 01"W	L122	15.84	N2° 04' 23"E
L51	24.39	N16° 01' 37"W	L123	56.95	N28° 07' 34"E
L52	23.71	N14° 10' 37"W	L124	24.26	N41° 55' 44"E
L53	28.71	N4° 11' 28"W	L125	23.74	N34° 39' 07"E
L54	22.16	N4° 00' 51"W	L126	25.84	N22° 52' 20"E
L55	18.52	N11° 21' 30"W	L127	27.52	N21° 15' 36"E
L56	27.77	N1° 00' 47"W	L128	26.50	N25° 06' 38"E
L57	34.06	N8° 37' 40"E	L129	23.97	N19° 25' 42"E
L58	21.25	N6° 34' 16"E	L130	13.44	N40° 09' 49"E
L59	25.51	N19° 42' 38"E	L131	14.65	N30° 31' 57"E
L60	25.53	N19° 42' 38"E	L132	14.65	N59° 16' 52"E
L61	27.58	N16° 09' 00"E	L133	20.26	S80° 24' 05"E
L62	24.46	N23° 19' 14"E	L134	16.42	S57° 19' 31"E
L63	26.12	N24° 23' 11"E	L135	12.24	N86° 29' 44"E
L64	24.03	N21° 32' 07"E	L136	24.54	S89° 12' 30"E
L65	28.33	N27° 57' 00"E	L137	8.33	S65° 11' 30"E
L66	24.58	N23° 58' 34"E	L138	15.41	S72° 31' 25"E
L67	31.19	N18° 10' 08"E	L139	17.69	S78° 44' 45"E
L68	109.54	N19° 06' 42"E	L140	18.35	N85° 00' 23"E
L69	30.56	N29° 28' 41"E	L141	19.11	N64° 03' 54"E
L70	20.50	N25° 51' 45"E	L142	23.77	N49° 53' 46"E
L71	25.68	N31° 39' 01"E			
L72	104.53	N18° 10' 27"E			

J. T. HARRELL SURVEY

A - 330



Parcel Line Table		
Line #	Length	Direction
L143	17.25	N9° 10' 47"E
L144	14.97	N56° 28' 51"E
L145	15.69	N56° 09' 16"E
L146	18.26	N42° 39' 29"E
L147	17.48	N54° 35' 39"E
L148	12.83	N38° 30' 53"E
L149	10.88	N23° 16' 08"E
L150	19.53	N31° 28' 39"E
L151	22.81	N41° 50' 33"E
L152	22.28	N62° 15' 01"E
L153	17.00	N66° 40' 36"E
L154	16.09	N53° 17' 15"E
L155	17.50	N29° 22' 10"E
L156	21.23	N32° 01' 08"E
L157	18.10	N36° 07' 31"E
L158	24.19	S85° 03' 12"E
L159	22.10	S80° 29' 18"E
L160	21.57	S83° 41' 17"E
L161	13.32	S67° 42' 46"E
L162	24.18	N75° 01' 45"E
L163	25.42	N82° 11' 05"E
L164	26.41	S75° 30' 12"E
L165	13.28	N86° 32' 28"E

BEING 2.4974 ACRES (PARCEL 1) AND 10.9791 ACRES (PARCEL 2) AND THAT CERTAIN 7.3004 ACRES (PARCEL 3) SITUATED IN THE J. T. HARRELL SURVEY, ABSTRACT 330, HARRIS COUNTY, TEXAS. SAID 2.4974 ACRES AND SAID 10.9791 ACRES BEING THE NON-SUBMERGED LAND RESIDUE OF THAT CERTAIN CALLED 18.708 ACRES CONVEYED BY M. MICHAEL GORDON AND FRANK F. SPATA TO MUSGROVE TOWING SERVICE, INC. BY DEED DATED JANUARY 28, 1972 AND RECORDED UNDER COUNTY CLERK'S FILE #D512429 OF THE DEED RECORDS OF HARRIS COUNTY, TEXAS. SAID 7.3004 ACRES BEING THE NON-SUBMERGED LAND RESIDUE OF THAT CERTAIN CALLED 10.204 ACRES CONVEYED BY FRANK P. SPATA, ET AL. TO KIRBY INLAND MARINE, L.P. AS SUCCESSOR-IN-INTEREST TO DIXIE CARRIERS, INC. BY CORRECTION DEED DATED EFFECTIVE NOVEMBER 20, 1956 AND RECORDED UNDER COUNTY CLERK'S FILE #X008312 OF THE OFFICIAL PUBLIC RECORDS OF REAL PROPERTY OF HARRIS COUNTY, TEXAS; TOGETHER WITH THE RESIDUE OF THAT CERTAIN CALLED 2.292 ACRES CONVEYED BY FRANK F. SPATA, ET AL. TO KIRBY INLAND MARINE, L.P. AS SUCCESSOR-IN-INTEREST TO DIXIE CARRIERS, INC. BY DEED DATED JANUARY 27, 2004 AND RECORDED UNDER COUNTY CLERK'S FILE #X353719 OF THE OFFICIAL PUBLIC RECORDS OF REAL PROPERTY OF HARRIS COUNTY, TEXAS; SUBJECT TO PREVIOUS EASEMENTS RECORDED UNDER COUNTY CLERK'S FILE #X008312; VOLUME 3535, PAGE 277; VOLUME 7414, PAGE 208 AND VOLUME 7414, PAGE 212. OFFICIAL PUBLIC RECORDS AND DEED RECORDS OF HARRIS COUNTY, TEXAS.

AS PER ABSTRACT SERVICES OF HOUSTON; SURVEY REPORT #2020-07-0019:

PARCELS 1 & 2 SHOWN HEREON: BEING THE RESIDUE OF AN 18.708 ACRE TRACT OF LAND IN THE J. T. HARRELL SURVEY, ABSTRACT 330, HARRIS COUNTY, TEXAS CONVEYED BY M. MICHAEL GORDON AND FRANK F. SPATA TO MUSGROVE TOWING SERVICE, INC. BY DEED DATED JANUARY 28, 1972 AND RECORDED UNDER COUNTY CLERK'S FILE #D512429 OF THE DEED RECORDS OF HARRIS COUNTY, TEXAS.

PARCELS 1 & 2 ARE SUBJECT TO THE FOLLOWING:
 1) 10 FOOT WIDE RIGHT OF WAY EASEMENT GRANTED TO HOUSTON LIGHTING AND POWER COMPANY BY INSTRUMENT DATED JUNE 23, 1975 AND RECORDED UNDER COUNTY CLERK'S FILE #E41993 OF THE DEED RECORDS OF HARRIS COUNTY, TEXAS; TOGETHER WITH AERIAL EASEMENT; AS SHOWN HEREON.

PARCEL 3 SHOWN HEREON: BEING THE RESIDUE OF THAT CERTAIN 10.204 ACRE TRACT OF LAND SITUATED IN THE J. T. HARRELL SURVEY, ABSTRACT 330, HARRIS COUNTY, TEXAS CONVEYED BY FRANK P. SPATA, ET AL. TO KIRBY INLAND MARINE, L.P. AS SUCCESSOR-IN-INTEREST TO DIXIE CARRIERS, INC. BY CORRECTION DEED DATED EFFECTIVE NOVEMBER 20, 1956 AND RECORDED UNDER COUNTY CLERK'S FILE #X008312 OF THE OFFICIAL PUBLIC RECORDS OF REAL PROPERTY OF HARRIS COUNTY, TEXAS; TOGETHER WITH 65 FEET WIDE ACCESS EASEMENT (CALLED 2.92 ACRES) AS SHOWN HEREON.

PARCEL 3 IS SUBJECT TO THE FOLLOWING:
 1) 10 FOOT WIDE RIGHT OF WAY EASEMENT GRANTED TO HOUSTON LIGHTING AND POWER COMPANY BY INSTRUMENT DATED OCTOBER 31, 1988 AND RECORDED UNDER COUNTY CLERK'S FILE #C316131 (VOLUME 7414, PAGE 208) OF THE DEED RECORDS OF HARRIS COUNTY, TEXAS; TOGETHER WITH AERIAL EASEMENT AND 7 WIDE EASEMENT FOR OVERHEAD WIRE; STUB POLE AND DOWNPOLE; AS SHOWN HEREON.

I, JULIENE HARROD, REGISTERED PROFESSIONAL LAND SURVEYOR NO. 4379 DO HEREBY CERTIFY THAT THIS MAP DELINEATES THE RESULTS OF A SURVEY MADE ON THE GROUND, UNDER MY SUPERVISION, IN JULY OF 2020 AND THAT ALL LINE, CORNER AND LANDMARKS ARE ACCURATELY SHOWN HEREON.

WITNESS MY HAND AND SEAL AT BAYTOWN, TEXAS, THIS 3RD DAY OF AUGUST, A.D. 2020.



HUTCHISON & ASSOCIATES
 ENGINEERS - SURVEYORS
 1209 DECKER DRIVE - BAYTOWN, TEXAS 77520 - 281-422-8113
 ENG. REG. # 17-427 - SURVEYING REG. # 000283-20

PROJECT: SURVEY
 DESIGN: PARCELS 1, 2 & 3 & PRIVATE ROAD
 DRAWN: A.H.
 CHECKED: J.R.
 DATE: 07-24-2020
 SCALE: 1"=200'
 F.B.
 SITUATED IN THE
 J. T. HARRELL SURVEY, A 330
 HARRIS COUNTY, TEXAS.

Appendix B

Musgrove Property Title Documents



7500 San Felipe, Suite 1020
Houston, TX 77063
713.589.9000 (OFFICE)
713.231.5028 (FAX)

TITLE REPORT

GF Number: 7910-20-0019

Date: July 29, 2020

Title Houston Holdings has examined the real property records, the state district court, and the county court records for the county in which the real property is located. The time period examined extended to July 23rd, 2020. If you desire different or additional examination, please contact us immediately.

Title Vested in: Musgrove Towing Service, Inc.

By virtue of a General Warranty Deed dated January 28, 1972 recorded under County Clerk's File No. D512429. SAVE and EXCEPT the tract of land described under County Clerk's File No. 20080188496.

Property Description:

Being the remaining of 18.708 acres of land in the J. T. Harrell Survey, Abstract No. 330, Harris County, Texas, more particularly described as follows:

COMMENCING at an iron pipe on the west bank of the San Jacinto River and in the south line of Market Street Road;

THENCE North 55 deg. 13 min. West 553.9 feet along the south line of said road to an offset point in the south line of said road

THENCE South 34 deg. 47 min. West 75 feet to another offset point in the South line of said road;

THENCE North 55 deg. 13 mini. West 231,.178feet along the South line. of said road to a stake at the place of beginning from which an iron pipe bears North 33 deg. 05 min. East 7 5. 03 feet;

THENCE South 33 deg. 05 min. West 1, 663.92 feet to an iron pipe;

THENCE North 55 deg. 13 min. West 384.84 feet to an iron pipe on the east bank of Old River Lake;

THENCE up the bank of Old River Lake with the following meanders: North 10 deg. 07 min. East 300. 92 feet to an iron pipe; North 26 deg. 54 min. East 718 feet to an iron pipe; South 68 deg. 27 min. East 185 feet to a stake; North 27 deg. 26 min. East 610 feet to a stake; North 60 deg. 37 min. West 127. 62 feet to an iron pipe; South 75 deg. 54 min. West 202 feet to an iron pipe at the mouth of a ditch flowing into said lake;

THENCE North 14 deg. 49 min. East 137.58 feet to a stake in the south line of Market Street Road on the east bank of said ditch from which an iron pipe bears North 14 deg. 49 min. East 62.92 feet;

THENCE along the South line of said road following a curve to the right having a radius of 1, 021 feet for a distance of 368.1 feet to a stake at the end of said curve;

THENCE South 55 deg. 13 min. East 402.22 feet to the PLACE OF BEGINNING;

Restrictions:

Subject to all restrictive Covenants as set forth in Deed recorded in Volume 3253, Page 106 of the Deed Records of Harris County, Texas and under County Clerk's File No. G978048.

Easements and other Encumbrances:

10 foot wide Right of Way Easement granted to Houston Lighting and Power Company recorded under County Clerk's File No. E481553.

Memorandum of Lease in favor of Dalar Outdoor recorded under County Clerk's File No. G727444.

Property Liens:

None of Record.

Involuntary Liens:

None of record.

NOTICE: Title Houston Holdings (the "Company") has provided this report or certificate to you under the terms set forth below. **By accepting this report or certificate, you agree to these terms and you agree that the Company has no liability to you, except as expressly limited herein.** To the maximum extent allowed by law, the Company disclaims any and all warranties, express or implied, concerning this report or certificate and the information contained therein. Your only remedy for any mistake, misstatement, inaccuracy, error or omission made or occurring in this report or certificate, or made or occurring in its delivery or non-delivery, is expressly limited to an action to recover damages, which damages you expressly agree are limited to an amount equal to the sum actually paid for this report or certificate plus the sum of \$100.00. You further agree that: the Company is not liable for consequential or special damages; the limitation of damages set forth herein is reasonable considering the amount paid, the limited services requested, and the intended use of this report or certificate; the Company would not provide the requested report or certificate without this limitation of damages; the limitation of damages applies to all claims, whether the claim arises under contract, tort or other law; and the Company has no liability to any third person arising from or related to this report or certificate. **This report or certificate is not a title insurance policy or title opinion and is not a guaranty or warranty of title.** In its role as a title insurance agent, the Company sells policies of title insurance. If you desire protection against title defects, you should purchase a title insurance policy. Liability will then exist only under the terms of the policy will be measured and limited by the policy, and the liability will be that of the title insurance company named in the policy. No representative of the Company has the authority to make any oral statements correcting, contradicting, revising, amending or supplementing this report or certificate, including the terms of this notice.

When preparing this report or certificate, the Company used only the information contained in the public records specifically identified above. (If none is identified, the Company used only the Real Property

Records of the county in which the property is located.) Documents not recorded and events and other matters not reflected in the public records may affect ownership and title but will not be reflected on this report or certificate. No inspection has been made of the property. Matters that may be shown by an inspection or on a survey may also affect ownership and title but will not be reflected on this report or certificate.

The Company may identify a document listed above by a term commonly used to describe similar documents. By way of illustration, a document titled "Restrictive Covenants" may be referred to as "Deed Restrictions" or as "Covenants, Conditions and Restrictions." The Company may also identify a document using its actual title. The Company, however, makes no warranty or representation that the term, title or other name used to describe the document accurately reflects the legal effect of the document. For example, a document titled "Restrictive Covenants" may also establish a lien, an easement, or some other interest.

In order to determine the effect of a document, the document must be carefully reviewed. The Company does not provide legal advice concerning the effect or significance of documents shown on this report or certificate. If you have a question as to the effect or significance of a document, you should obtain the assistance of a qualified professional.

Title Houston Holdings

V. ANDREEV

Vladimir Andreev
Title Examiner

THE STATE OF TEXAS
COUNTY OF HARRIS

1583225

KNOW ALL MEN BY THESE PRESENTS:

That we, M. MICHAEL GORDON, a bachelor and a resident of Harris County, Texas, and FRANK F. SPATA and wife, FLOY SPATA, residents of Harris County, Texas, hereinafter collectively termed "Grantors", for and in consideration of the sum of TEN AND NO/100 DOLLARS (\$10.00) and other good and valuable consideration in cash to us in hand paid by DIXIE CARRIERS, INC., a corporation, the receipt and sufficiency of which consideration are hereby confessed and acknowledged, have GRANTED, BARGAINED, SOLD and CONVEYED, and by these presents, do hereby GRANT, BARGAIN, SELL and CONVEY, unto the said DIXIE CARRIERS, INC., a Delaware corporation lawfully doing business in the State of Texas, hereinafter called "Grantee", all of the following described land situated in Harris County, Texas, to-wit:

All that certain 10.204 acres of land located in the southerly end of a tract described as Tract No. 2 in deed to M. Michael Gordon, et al, dated November 15, 1943, and recorded in Volume 1297, Page 16 of the deed records, said 10.204 acres being located between the San Jacinto River and Old River Lake in the J. T. Harrell Survey, Abstract No. 330, Harris County, Texas, and being more particularly described as follows:

BEGINNING at a 1/2 inch pipe on the west bank of the San Jacinto River located at the end of an old barb wire fence (approximately 25 feet from a pasture gate) from which an 8 inch Catalpa tree bears N. 2° 52' W. 34 feet, a double 6 inch Bois d' Arc tree bears N. 57° 23' W. 50 feet, and the San Jacinto Monument bears S. 14° 44' W., said 1/2 inch pipe being also located N. 42° 01' E. 309.67 feet from a 1 inch pipe located on the west bank of the San Jacinto River at the northeast corner of the Mary Niedermeyer Survey, Abstract No. 1736, and the southeast corner of the J. T. Harrell Survey;

THENCE N. 45° 23' W. a distance of 111 feet along an old down fence to a 1/2 inch pipe on the east bank of Old River Lake;

THENCE N. 29° 47' E. a distance of 61 feet to a 1/2 inch pipe on the south side of a private cut from San Jacinto River to Old River Lake where it intersects the east bank of Old River Lake;

THENCE N. 29° 46' E. a distance of 229.56 feet across said private cut to a 1/2 inch pipe where the north bank of said private cut intersects the east bank of Old River Lake;

THENCE N. 0° 18' W. a distance of 319.86 feet to a 1/2 inch pipe on the east bank of Old River Lake;

THENCE N. 22° 35' E. a distance of 398.30 feet to a 1/2 inch pipe on the east bank of Old River Lake;
THENCE N. 10° 07' E. a distance of 119.38 feet to a 3/4 inch pipe on the east bank of Old River Lake marking the northwest corner of the 10.204 acres herein described;

THENCE S. 55° 13' E., passing a 3/4 inch pipe at 384.84 feet, another 3/4 inch pipe at 444.86 feet, and continuing in all a distance of 824.85 feet to a 3/4 inch pipe on the west bank of the San Jacinto River from which a 12 inch elm bears N. 71° 16' W. 69.6 feet, a 10 inch elm bears N. 12° 08' E. 65 feet, and the San Jacinto Monument bears S. 17° 18' W.;

THENCE S. 58° 40' W. a distance of 734.43 feet to a 1/2 inch pipe on the west bank of Old River;

THENCE S. 47° 02' W. a distance of 100 feet to a 1/2 inch pipe on the north bank of a private cut from San Jacinto River to Old River Lake where it intersects the west bank of Old River;

THENCE S. 48° 51' W. a distance of 240.27 feet to a 1/2 inch pipe on the south bank of said private cut where it intersects the west bank of the San Jacinto River;

THENCE S. 30° 37' W. a distance of 65.8 feet to the PLACE OF BEGINNING, and containing 10.204 acres, consisting of 0.157 acre located south of the aforementioned private cut, 0.704 acre in the private cut, and 9.343 acres north of the private cut;

And for the same consideration hereinabove recited and receipted for, we (the said Grantors) do hereby further grant, bargain, sell and convey unto Grantee, its successors and assigns, a perpetual right-of-way and easement for the purpose of constructing, using and maintaining a road over and across the following described premises situated in Harris County, Texas, to-wit:

Being all that certain tract or parcel of land located in the J. T. Harrell Survey, Abstract No. 330, Harris County, Texas, being part of Tract No. 2 as described in deed to M. Michael Gordon, et al, by deed dated November 15, 1943, and recorded in Volume 1297, Page 16 of the deed records, more particularly described as follows:

BEGINNING at a point in the south right-of-way line of Market Street Road located N. 55° 13' W. 553.9 feet, S. 34° 47' W. 75 feet, and N. 55° 13' W. 171.76 feet from a 1/2 inch pipe on the west bank of the San Jacinto River where the south right-of-way line of Market Street Road intersects same;

THENCE S. 33° 05' W. a distance of 1663.92 feet to a 3/4 inch pipe located N. 55° 13' W. 379.99 feet from another 3/4 inch pipe on the west bank of the San Jacinto River from which a 12 inch elm bears N. 71° 16' W. 69.6 feet and a 10 inch elm bears N. 12° 08' E. 65 feet;

THENCE N. 55° 13' W. a distance of 60.02 feet to a 3/4 inch pipe;

THENCE N. 33° 05' E. a distance of 1663.92 feet to a point in the south right-of-way line of Market Street Road;

THENCE S. 55° 13' E. a distance of 60.02 feet to the PLACE OF BEGINNING, and containing 2.292 acres of land,

In connection herewith, it is distinctly ~~understood~~ that this does not constitute a conveyance of the 2.292 acre tract of land hereinabove immediately next described but covers only the right to construct, maintain, operate and use a roadway over, upon and across said land, as a covenant running with, and for the benefit of the 10.204 acre tract of land which is conveyed hereby. Said right-of-way and easement is not for the exclusive use and benefit of Grantee, its successors and assigns, as owner of said 10.204 acre tract of land, to the extent, and only to the extent that same may be used by Grantors, our heirs and assigns (only as owners of parcels of land out of the 48.2 acre tract of land described as Tract No. 2 in that certain deed dated November 15, 1943, to M. Michael Gordon and Frank Spata and of record in Volume 1297, Page 16 of the Deed Records of Harris County, Texas) providing that such use does not, or will not interfere with the use and enjoyment of such right-of-way and easement by Grantee, its successors and assigns. Grantee does not covenant or agree hereunder either to construct or to maintain a road or street, after construction, upon said right-of-way and easement - it being the intent hereof that Grantee, its successors and assigns, shall have the right to construct and the right to use and to maintain, after construction, such road or street, at its will and election.

Mention is made of the fact that the lands hereby conveyed and the lands affected by the easement hereinabove granted are subject to those certain mineral interests outstanding thereunder - being the mineral interests reserved by the heirs of J. P. Magee in those certain deeds recorded in Volume 452, Page 339, Volume 453, Page 237, Volume 441, Page 299, Volume 437, Page 591, Volume 452, Page 336, Volume 440, Page 120, Volume 443, Page 188, and Volume 793, Page 602 of the Deed Records of Harris County, Texas, to which deeds reference is here made. Grantors do hereby

grant, sell and convey unto Grantee, its successors and assigns, all interests in and to oil, gas and other minerals in, on or under the 10.204 acre tract of land hereinabove described, including any and all reversionary rights and estates in and to said oil, gas and minerals, owned, claimed or held by Grantors. Grantors warrant and represent that we hold and own in fee title not less than an undivided one/sixteenth (1/16th) interest in and to all of the oil, gas and minerals in, on or under the said 10.204 acre tract of land, which said undivided interest, without limitation, is hereby conveyed unto Grantee, its successors and assigns.

Grantors except hereunder and reserve unto ourselves, our heirs and assigns (as, but only as owners of the remaining portion of the 48.2 acre tract of land described as Tract No. 2 in deed recorded in Volume 1297, Page 16 of the Deed Records of Harris County, Texas - i.e. the portion of the 48.2 acre tract of land not conveyed hereunder) a perpetual, non-exclusive easement (as a covenant running with the land for the benefit of the remainder of the 48.2 acre tract and as a burden upon the lands included within said channel or canal) to use the channel or canal (which Grantors hereby represent to have been man-made) lying across the southerly portion of the 10.204 acre tract of land hereby conveyed - the location of which canal or channel is fixed and located in the description of the said 10.204 acre tract of land hereinabove set out - for ingress and egress through same to and from San Jacinto River to Old River Bay. It is expressly understood, however, that Grantors reserve unto ourselves, our heirs and assigns (as owners of the balance of said 48.2 acre tract) only the right to such use of said canal or channel for ingress and egress as shall not interfere unreasonably with the use of said canal or channel by Grantee, its successors and assigns, and that Grantee, its successors and assigns, shall be under no

duty whatsoever to dredge or otherwise maintain such canal or channel and shall, in no event, be liable for loss of life, injury or loss or damage to property incurred or suffered by Grantors, our heirs or assigns, in using such canal or channel. The use of the canal or channel by us or our heirs or assigns shall be at our or their sole risk and responsibility.

TO HAVE AND TO HOLD the above described premises (and easement for road purposes), together with all and singular the rights and appurtenances thereto in anywise belonging, unto Grantee, its successors and assigns, forever; and we, the said Grantors, do hereby bind ourselves, our heirs and legal representatives, to warrant and forever defend all and singular the said premises (and easement for road purposes) unto Grantee, its successors and assigns, against every person whomsoever lawfully claiming or to claim the same or any part thereof.

EXECUTED on this the 20th day of November, 1956.

M. Michael Gordon
M. Michael Gordon

Frank F. Spata
Frank F. Spata

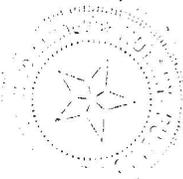
Floy Spata
Floy Spata

THE STATE OF TEXAS
COUNTY OF HARRIS

BEFORE ME, the undersigned authority, on this day personally appeared M. MICHAEL GORDON, known to me to be the person whose name is subscribed to the foregoing instrument, and acknowledged to me that he executed the same for the purposes and consideration therein expressed.

GIVEN under my hand and seal of office, this the 20 day of November, A. D. 1956.

John A. Cole
Notary Public in and for
Harris County, T e x a s



THE STATE OF TEXAS
COUNTY OF HARRIS

BEFORE ME, the undersigned authority, on this day personally appeared FRANK F. SPATA, known to me to be the person whose name is subscribed to the foregoing instrument, and acknowledged to me that he executed the same for the purposes and consideration therein expressed.



GIVEN under my hand and seal of office, this the 20th day of November, A.D. 1956.

Mina Robbins
Notary Public in and for
Harris County, T e x a s

THE STATE OF TEXAS }
COUNTY OF HARRIS }

BEFORE ME, the undersigned authority, on this day personally appeared FLOY SPATA, wife of FRANK F. SPATA, known to me to be the person whose name is subscribed to the foregoing instrument, and acknowledged to me that she executed the same for the purposes and consideration therein expressed; and that the said FLOY SPATA, having been examined by me privily and apart from her husband, and having the same fully explained to her, acknowledged such instrument to be her act and deed, and declared that she had willingly signed the same for the purposes and consideration therein expressed, and that she did not wish to retract it.



GIVEN under my hand and seal of office, this the 20th day of November, A.D. 1956.

Mina Robbins
Notary Public in and for
Harris County, T e x a s

Filed for Record November 21, 1956 at 1:15 o'clock P.M.

Recorded Dec 27 1956 at 9:56 o'clock A.M.

W. D. MILLER, Clerk County Court Harris County, Texas

By Harley C. Lebler, Deputy

THENCE North 55 deg. 13 min. West 231.78 feet along the South line of said road to a stake at the place of beginning from which an iron pipe bears North 33 deg. 05 min. East 75.03 feet;

THENCE South 33 deg. 05 min. West 1,663.92 feet to an iron pipe;

THENCE North 55 deg. 13 min. West 384.84 feet to an iron pipe on the east bank of Old River Lake;

THENCE up the bank of Old River Lake with the following meanders: North 10 deg. 07 min. East 300.92 feet to an iron pipe; North 26 deg. 54 min. East 718 feet to an iron pipe; South 68 deg. 27 min. East 185 feet to a stake; North 27 deg. 26 min. East 610 feet to a stake; North 60 deg. 37 min. West 127.62 feet to an iron pipe; South 75 deg. 54 min. West 202 feet to an iron pipe at the mouth of a ditch flowing into said lake;

THENCE North 14 deg. 49 min. East 137.58 feet to a stake in the south line of Market Street Road on the east bank of said ditch from which an iron pipe bears North 14 deg. 49 min. East 62.92 feet;

THENCE along the South line of said road following a curve to the right having a radius of 1,021 feet for a distance of 368.1 feet to a stake at the end of said curve;

THENCE South 55 deg. 13 min. East 402.22 feet to the PLACE OF BEGINNING;

together with the right of ingress and egress to and from San Jacinto River to Old River Bay through a certain channel lying South of the above tract, all as reserved and set forth in Deed from Grantors herein to DIXIE CARRIERS, INC., dated November 20, 1956, and recorded in Volume 3253, Page 106 of the Deed Records of Harris County, Texas.

TO HAVE AND TO HOLD the above described premises, together with all and singular, the rights and appurtenances thereto in anywise belonging, unto the Grantee, its successors and assigns, forever; and Grantors do hereby bind themselves, their heirs, executors and administrators, to Warrant and Forever Defend all and singular the said premises unto the said Grantee, its successors and assigns, against every person whomsoever lawfully claiming, or to claim the same or any part thereof.

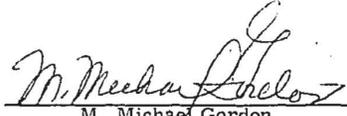
139-35-2359

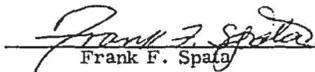
To secure the payment of the above described note, the Vendor's Lien is retained upon the real property herein conveyed, as well as Superior Title reserved, until such note is fully paid according to its face, tenor and effect, when this Deed shall become absolute, such note being further and additionally secured in its payment by a Deed of Trust, with power of sale, this day executed and delivered by the Grantee to O. F. HORN, TRUSTEE, for the use of the holders of such note.

Grantors hold and own in fee title not less than an undivided one-sixteenth (1/16) interest in and to all of the oil, gas and other minerals in, on and under the tract of land herein conveyed, which undivided interest, without limitation, is hereby conveyed unto Grantee, its successors and assigns.

This conveyance is made and accepted subject to any and all conditions, restrictions, easements and reservations, if any, relating to the hereinabove described property to the extent, and only to the extent, that the same may still be in force and effect, shown of record in the Office of the County Clerk of Harris County, Texas; and is further subject to an unrecorded easement from Grantors herein to HOUSTON LIGHTING & POWER COMPANY, such easement being granted at the specific instance and request of Grantee.

WITNESS OUR HANDS at Houston, Texas, this 28th day of January, 1972 A. D.


M. Michael Gordon


Frank F. Spatz

139-45-2360

JM/jd

6-3-75

JUL-10-75 405868 E 481553 1ST A PD

HLAP 24 (8-78)

350

E481553

EAS
D D

File No. _____
Job No. WA-17231
County Harris
Map 6159-C

RECORDER'S MEMORANDUM:
In Recording This Instrument It Was Necessary
To Place On The Recordation The Notation
or Notations As Shown.

THE STATE OF TEXAS

COUNTY OF HARRIS

123-12-0586

KNOW ALL MEN BY THESE PRESENTS:

THAT Musgrove Towing Service, Inc., a Texas corporation

(hereinafter

referred to as Grantor, whether one or more), of _____ County, Texas, for and in consideration of One Dollar (\$1.00) to grantor in hand paid by Houston Lighting & Power Company (hereinafter referred to as Grantee), and other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, has granted, and by these presents does grant unto Grantee, its successors, assigns and lessees, a right-of-way for electric distribution and communication lines, consisting of wires, poles and other necessary or desirable equipment across, over, along, upon and under the following described lands located in Harris County, Texas:

That certain tract or parcel of land consisting of 18.708 acres of land in the J. T. Harrell Survey, Abstract No. 330, and being the same property described and conveyed in a deed dated January 28, 1972, from Michael Gordon, et al, to Grantors herein, and recorded in the Official Public Records of Real Property, Harris County, Texas, bearing Film Code No. 139-35-2358.

The easement herein granted is an unobstructed easement ten (10) feet wide at, below and from the ground level upward for Grantee's overhead and underground distribution system, the location of which is shown by a dot-dash symbol on Sketch No. 75-0440, prepared by Houston Lighting & Power Company, hereto attached and made an integral part hereof, said easement being further described in the last paragraph below, together with a necessary down guy easement, the location of which is shown on said attached sketch.

RECORDER'S MEMORANDUM:
All Or Parts Of The Text On This Page
Is Carbon Copy

FILED
HARRIS COUNTY, TEXAS
JUL 10 10 21 AM 1975

The easement granted herein is an easement ten (10) feet wide at and below normal ground level and extending upward to a plane twenty (20) feet above the ground, and from said plane and upward the easement is twenty (20) feet wide with the same centerline as at ground level, together with (1) the right to use and to keep all of said easement area free and clear of any and all obstructions except property line fences, and (2) the rights of ingress and egress to and from said right-of-way for the purpose of constructing, operating, inspecting, repairing, maintaining, replacing, and removing said wires, poles and equipment; and Grantor, his successors, assigns, agents or licensees, shall not have the right to cause or permit any obstruction except property line fences to be placed or constructed or to grow within said easement area without the express written consent of Grantee.

EXECUTED this 23 day of June, 1975.

ATTEST:

MUSGROVE TOWING SERVICE, INC.

Secretary

BY: H. W. Musgrove
President

STATE OF TEXAS

Harris County

RECORDER'S MEMORANDUM:
All Or Parts Of The Text On This Page
Is Carbon Copy

123-12-0587

BEFORE ME, the undersigned authority, a Notary Public in and for Harris County, Texas, on this day personally appeared K. W. Musgrave, President of Musgrove Towing Service, Inc. known to me to be the person whose name is subscribed to the foregoing instrument, and acknowledged to me that he executed the same for the purposes and consideration therein expressed in the capacity therein stated and as the act and deed of said Corporation.

GIVEN UNDER MY HAND AND SEAL OF OFFICE this 23 day of June, A. D. 1975
Betty L. Blackburn
Notary Public, Harris County, Texas

STATE OF TEXAS

County

BEFORE ME, the undersigned authority, a Notary Public in and for County, Texas, on this day personally appeared known to me to be the person whose name is/are subscribed to the foregoing instrument, and acknowledged to me that executed the same for the purposes and consideration therein expressed.

GIVEN UNDER MY HAND AND SEAL OF OFFICE this day of A. D. 19 Notary Public, County, Texas

STATE OF TEXAS

County

BEFORE ME, the undersigned authority, a Notary Public in and for County, Texas, on this day personally appeared and wife, both known to me to be the persons whose names are subscribed to the foregoing instrument, and acknowledged to me that they each executed the same for the purposes and consideration therein expressed, and the said wife of the said having been examined by me privily and apart from her husband, and having the same fully explained to her, she, the said acknowledged such instrument to be her act and deed, and declared that she had willingly signed the same for the purposes and consideration therein expressed, and that she did not wish to retract it.

GIVEN UNDER MY HAND AND SEAL OF OFFICE this day of A. D. 19 Notary Public, County, Texas

STATE OF TEXAS

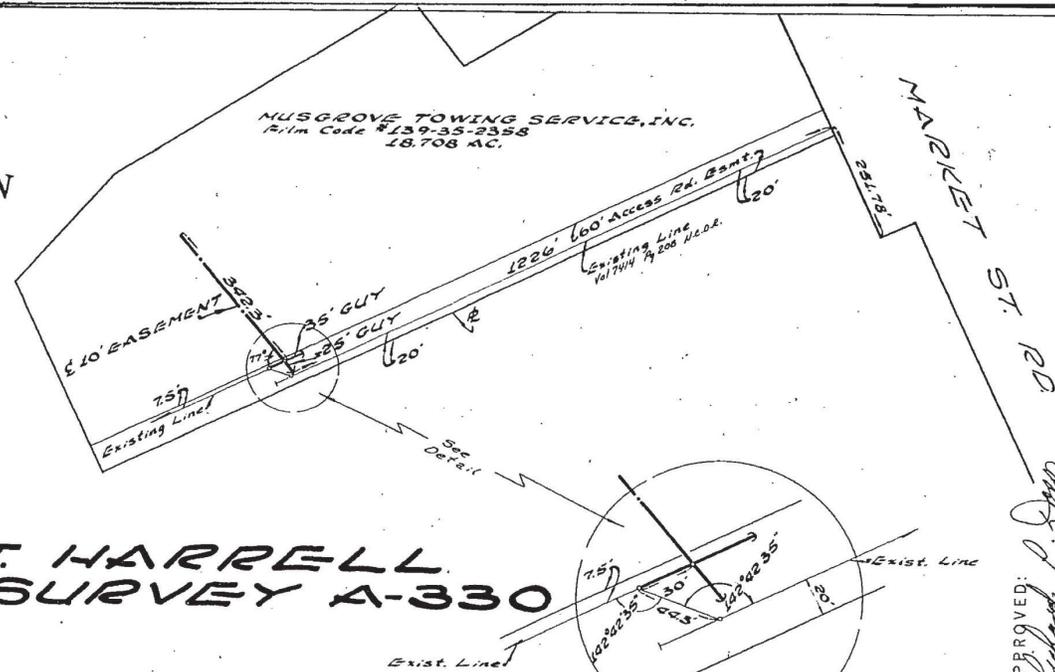
County

BEFORE ME, the undersigned authority, a Notary Public in and for County, Texas, on this day personally appeared and wife, both known to me to be the persons whose names are subscribed to the foregoing instrument, and acknowledged to me that they each executed the same for the purposes and consideration therein expressed, and the said wife of the said having been examined by me privily and apart from her husband, and having the same fully explained to her, she, the said acknowledged such instrument to be her act and deed, and declared that she had willingly signed the same for the purposes and consideration therein expressed, and that she did not wish to retract it.

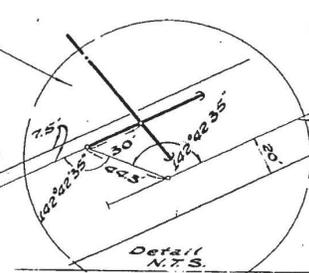
GIVEN UNDER MY HAND AND SEAL OF OFFICE this day of A. D. 19 Notary Public, County, Texas

RETURN TO:
P. O. Kupac
HOUSTON LIGHTING & POWER COMPANY
P. O. BOX 1700
HOUSTON, TEXAS, 77001

NUSGROVE TOWING SERVICE, INC.
 Film Code #129-35-2358
 18.708 AC.



**J. T. HARRELL
 SURVEY A-330**



MARKET ST. RD.
 251.75'

APPROVED:
Richard J. Quinn
 25
 57-2-2

123-12-0588

NOTE:
 THE EXTERIORS OF ALL EASEMENTS ARE TO INTERSECT WITH THE EXTERIORS OF ALL ADJOINING EASEMENTS OR WITH ADJOINING PROPERTY LINES.

REVISIONS	NO. 1	NO. 2
JOB NO.	A.17231	
REVISED BY	LA	
DATE	5-29-75	
CHECKED BY		
DATE		

EASEMENT, Unobstructed
 COUNTY, Harris
 DATE May 19, 1975
 SCALE 1" = 200'

HOUSTON LIGHTING & POWER CO.
 HOUSTON, TEXAS
 ENGINEERING DEPARTMENT
 SKETCH NO. 75-0400

STATE OF TEXAS)
COUNTY OF HARRIS)
PARCEL 1)

FIELD NOTES of a 2.4974 acre tract of land situated in the J. T. Harrell Survey, Abstract 330, Harris County, Texas and being out of and a part of the residue of that certain 18.708 acres conveyed by M. Michael Gordon, et al, to Musgrove Towing Service, Inc. by Deed dated January 28, 1972 and recorded under County Clerk's File #D512429 of the Deed Records of Harris County, Texas. This 2.4974 acres is more particularly described by the following metes and bounds, to-wit:

NOTE: BEARINGS ARE LAMBERT GRID BEARINGS AND ALL COORDINATES REFER TO THE TEXAS STATE PLANE COORDINATE SYSTEM, SOUTH CENTRAL ZONE, NAD 83. ALL DISTANCES ARE ACTUAL DISTANCES. SCALE FACTOR = 1.0000000. REFERENCE IS MADE TO THE MAP OF EVEN DATE ACCOMPANYING THIS METES AND BOUNDS DESCRIPTION.

BEGINNING at a 1 inch iron rod found in the South right-of-way line of Market Street as described in Deed from H. C. Tyrrell, Trustee, to County of Harris by Deed dated October 24, 1927 and recorded in Volume 729 at Page 162 of the Deed Records of Harris County, Texas (right-of-way width varies) at the Northeast corner of said 18.708 acres, the Northwest corner of that certain 2.2911 acres (called 2.292 acres; being a 60 feet wide Private Road conveyed by Frank F. Spata, et al, to Kirby Inland Marine, L.P., Successor-in-Interest to Dixie Carriers, Inc., by Deed dated January 27, 2004 and recorded under County Clerk's File #X353719 of the Official Public Records of Real Property of Harris County, Texas. Said point being the Northeast corner and POINT OF BEGINNING of this tract and has a State Plane Coordinate Value of Y=13,857,011.71 and X=3,216,350.74.

THENCE: South 31°13'18" West along the East line of this tract, the East line of said 18.708 acres and the West line of said Private Road for a distance of 313.03 feet to a ½ inch iron rod, with cap (BHA), set for the Southeast corner of this tract and the Northeast corner of that certain 2.8543 acres conveyed by Lost River Investments, Inc. to New Lost River, LLC by Deed dated March 31, 2008 and recorded under County Clerk's File #20080188496 of the Official Public Records of Real Property of Harris County, Texas. Said point has a State Plane Coordinate Value of Y=13,856,744.02 and X=3,216,188.49.

THENCE: North 58°47'58" West along the South line of this tract and the North line of said 2.8543 acres, over and across said 18.708 acres, and at 391.7 feet pass a ½ inch iron pipe found on line; in all, a total distance of 392.40 feet to a point on the East top bank of Old River Lake for the Southwest corner of this tract and the Northwest corner of the residue of said 2.8543 acres. Said point has a State Plane Coordinate Value of Y=13,856,947.29 and X=3,215,852.85.

THENCE: Along and with the meanders of the East top bank of Old River Lake and the West line of this tract, the following courses and distances, to-wit:

- (143) North 9°10'47" East, 17.25 feet;
- (144) North 58°28'51" East, 14.97 feet;
- (145) North 58°09'16" East, 15.69 feet;
- (146) North 42°26'25" East, 18.26 feet;
- (147) North 54°35'39" East, 17.48 feet;
- (148) North 38°30'53" East, 12.83 feet;
- (149) North 23°16'06" East, 10.88 feet;

- (150) North 31°28'39" East, 19.53 feet;
- (151) North 41°50'33" East, 22.61 feet;
- (152) North 62°15'01" East, 22.28 feet;
- (153) North 66°40'36" East, 17.00 feet;
- (154) North 53°17'15" East, 16.09 feet;
- (155) North 29°22'10" East, 17.50 feet;
- (156) North 32°01'08" East, 21.23 feet;
- (157) North 36°07'31" East, 18.10 feet;
- (158) South 85°03'12" East, 24.19 feet;
- (159) South 80°29'18" East, 22.10 feet;
- (160) South 63°41'17" East, 21.57 feet;
- (161) South 67°42'46" East, 13.32 feet;
- (162) North 75°01'45" East, 24.18 feet;
- (163) North 82°11'05" East, 25.42 feet;
- (164) South 75°30'12" East, 26.41 feet;
- (165) North 86°32'28" East, 13.28 feet to a ½ inch iron rod, with cap (BHA), set

in the South right-of-way line of said Market Street and the North line of said 18.708 acres for the Northwest corner of this tract. Said point has a State Plane Coordinate Value of Y=13,857,115.68 and X=3,216,189.46.

THENCE: South 57°11'25" East along the North line of this tract, the North line of said 18.708 acres and the South right-of-way line of said Market Street for a distance of 191.89 feet to the PLACE OF BEGINNING and containing within these boundaries 2.4974 acres; being a portion of the non-submerged residue land out of said 18.708 acres.

SURVEYOR'S CERTIFICATE

I, Juliene Harrod, Registered Professional Land Surveyor No. 4379, do hereby certify that the foregoing field notes were prepared from an actual survey made on the ground, under my supervision, in July of 2020 and that all lines, boundaries and landmarks are accurately described therein.

WITNESS my hand and seal at Baytown, Texas, this the 3rd day of August, A. D., 2020.

Juliene Harrod

Juliene Harrod
R. P. L. S. No. 4379
20-6417.Parcel1.fdn.docx
Hutchison & Associates, Inc.
1209 Decker Drive, Ste. 100
Baytown, TX 77520
Engineering Firm #F-267
Surveying Firm #100293-00



STATE OF TEXAS)
COUNTY OF HARRIS)
PARCEL 2)

FIELD NOTES of a 10.9791 acre tract of land situated in the J. T. Harrell Survey, Abstract 330, Harris County, Texas and being out of and a part of the residue of that certain 18.708 acres conveyed by M. Michael Gordon, et al, to Musgrove Towing Service, Inc. by Deed dated January 28, 1972 and recorded under County Clerk's File #D512429 of the Deed Records of Harris County, Texas. This 10.9791 acres is more particularly described by the following metes and bounds, to-wit:

NOTE: BEARINGS ARE LAMBERT GRID BEARINGS AND ALL COORDINATES REFER TO THE TEXAS STATE PLANE COORDINATE SYSTEM, SOUTH CENTRAL ZONE, NAD 83. ALL DISTANCES ARE ACTUAL DISTANCES. SCALE FACTOR = 1.0000000. REFERENCE IS MADE TO THE MAP OF EVEN DATE ACCOMPANYING THIS METES AND BOUNDS DESCRIPTION.

COMMENCING at a 1 inch iron rod found in the South right-of-way line of Market Street as described in Deed from H. C. Tyrrell, Trustee, to County of Harris by Deed dated October 24, 1927 and recorded in Volume 729 at Page 162 of the Deed Records of Harris County, Texas (right-of-way width varies) at the Northeast corner of said 18.708 acres, the Northwest corner of that certain 2.2911 acres (called 2.292 acres; being a 60 feet wide Private Road conveyed by Frank F. Spata, et al, to Kirby Inland Marine, L.P., Successor-in-Interest to Dixie Carriers, Inc., by Deed dated January 27, 2004 and recorded under County Clerk's File #X353719 of the Official Public Records of Real Property of Harris County, Texas. Said point being the Northeast corner of that certain 2.4974 acres (Parcel 1) surveyed this date. Said COMMENCING POINT has a State Plane Coordinate Value of Y=13,857,011.71 and X=3,216,350.74.

THENCE: South 31°13'18" West along the East line of said 2.4974 acre tract, the East line of said 18.708 acres and the West line of said Private Road and at 313.03 feet pass a ½ inch iron rod, with cap (BHA), set for the Southeast corner of said 2.4974 acres and the Northeast corner of that certain 2.8543 acres conveyed by Lost River Investments, Inc. to New Lost River, LLC by Deed dated March 31, 2008 and recorded under County Clerk's File #20080188496 of the Official Public Records of Real Property of Harris County, Texas; said point has a State Plane Coordinate Value of Y=13,856,744.02 and X=3,216,188.49; in all, a total distance of 613.03 feet to a ½ inch iron rod, with cap (BHA), set for the Southeast corner of said 2.8543 acres and the Northeast corner and POINT OF BEGINNING of this tract. Said BEGINNING POINT has a State Plane Coordinate Value of Y=13,856,487.47 and X=6,216,032.98.

THENCE: Continue South 31°13'18" West along the East line of this tract, the East line of said 18.708 acres and the West line of said Private Road for a distance of 1050.31 feet to a ½ inch iron rod, with cap (BHA), set in the North line of that certain 7.3004 acres (Parcel 3) surveyed this date; being the residue of a 10.204 acre tract conveyed by Frank F. Spata, et al, to Kirby Inland Marine, L.P., Successor-in-Trust to Dixie Carriers, Inc. by Correction Deed dated November 20, 1956 and recorded under County Clerk's File #X008312 of the Official Public Records of Real Property of Harris County, Texas. Said point being the Southeast corner of this tract, the Southeast corner of said 18.708 acres and the Southwest corner of said Private Road and has a State Plane Coordinate Value of Y=13,855,589.28 and X=3,215,488.55.

THENCE: North 57°11'25" West along the South line of this tract, the South line of said 18.708 acres, the North line of said 7.3004 acres and the North line of said 10.204 acres for a distance of 249.43 feet to a ½ inch iron rod, with cap (BHA), set at the East top bank of Old River Lake for the Southwest corner of this tract and the Northwest corner of said 7.3004 acres. Said point has a State Plane Coordinate Value of Y=13,855,724.44 and X=3,215,278.91.

THENCE: Along and with the meanders of the East top bank of Old River Lake and the West line of this tract, the following courses and distances, to-wit:

- (73) North 18°10'27" East, 9.43 feet;
- (74) North 38°12'40" East, 0.48 feet;
- (75) North 15°13'53" West, 12.99 feet;
- (76) North 16°51'23" West, 22.95 feet;
- (77) North 23°50'13" West, 12.79 feet;
- (78) North 14°37'19" West, 18.38 feet;
- (79) North 41°17'03" West, 15.66 feet;
- (80) North 89°52'27" West, 21.88 feet;
- (81) North 69°29'47" West, 19.02 feet;
- (82) North 47°51'30" West, 25.67 feet;
- (83) North 0°45'45" West, 28.48 feet;
- (84) North 40°27'17" East, 15.21 feet;
- (85) North 21°15'51" East, 20.42 feet;
- (86) North 19°53'08" East, 23.20 feet;
- (87) North 20°22'54" East, 23.88 feet;
- (88) North 5°55'20" East, 25.36 feet;
- (89) North 0°46'59" East, 20.70 feet;
- (90) North 10°14'45" East, 12.27 feet;
- (91) North 57°39'46" East, 8.24 feet;
- (92) North 28°30'36" East, 14.40 feet;
- (93) North 42°52'15" East, 16.84 feet;
- (94) North 18°58'56" West, 8.38 feet;
- (95) North 22°32'39" East, 26.30 feet;
- (96) North 5°21'21" East, 25.72 feet;
- (97) North 37°11'43" East, 18.06 feet;
- (98) North 29°24'00" East, 18.65 feet;
- (99) North 23°06'56" West, 12.42 feet;
- (100) North 31°23'03" West, 9.75 feet;
- (101) North 2°39'20" East, 9.58 feet;
- (102) North 16°27'52" East, 18.91 feet;
- (103) North 21°43'07" East, 19.01 feet;
- (104) North 1°39'17" East, 21.82 feet;
- (105) North 9°26'53" East, 38.90 feet;
- (106) North 14°49'12" East, 22.48 feet;
- (107) North 33°16'13" East, 21.39 feet;
- (108) North 18°14'52" East, 21.70 feet;
- (109) North 34°04'24" East, 19.81 feet;

- (110) North 56°33'38" East, 19.65 feet;
- (111) North 36°31'53" East, 19.44 feet;
- (112) North 28°02'14" East, 20.31 feet;
- (113) North 50°20'53" East, 8.54 feet;
- (114) South 86°06'02" East, 12.22 feet;
- (115) North 89°05'39" East, 9.61 feet;
- (116) North 32°41'33" East, 10.61 feet;
- (117) North 47°09'48" East, 17.33 feet;
- (118) North 40°25'01" East, 18.43 feet;
- (119) North 4°53'20" West, 10.34 feet;
- (120) North 13°48'03" East, 17.65 feet;
- (121) North 1°06'51" West, 28.08 feet;
- (122) North 2°04'23" East, 15.84 feet;
- (123) North 28°07'34" East, 56.95 feet;
- (124) North 41°55'44" East, 24.26 feet;
- (125) North 34°39'07" East, 23.74 feet;
- (126) North 22°52'20" East, 25.84 feet;
- (127) North 21°15'36" East, 27.52 feet;
- (128) North 25°06'38" East, 26.50 feet;
- (129) North 19°25'42" East, 23.97 feet;
- (130) North 40°09'49" East, 13.44 feet;
- (131) North 30°31'57" East, 14.65 feet;
- (132) North 59°16'52" East, 14.05 feet;
- (133) South 60°24'05" East, 20.26 feet;
- (134) South 57°19'31" East, 16.42 feet;
- (135) North 86°29'44" East, 12.24 feet;
- (136) South 89°12'30" East, 24.54 feet;
- (137) South 65°11'30" East, 8.33 feet;
- (138) South 72°31'25" East, 15.41 feet;
- (139) South 78°44'45" East, 17.69 feet;
- (140) North 85°00'23" East, 18.35 feet;
- (141) North 64°03'54" East, 19.11 feet;
- (142) North 49°53'46" East, 23.77 feet to a ½ inch iron rod, with cap (BHA), set in the South line of said 2.8543 acres for the Northwest corner of this tract. Said point has a State Plane Coordinate Value of Y=13,856,678.92 and X=3,215,716.87.

PAGE 4 – 10.9791 ACRES, PARCEL 2.

THENCE: South 58°47'58" East along the North line of this tract and the South line of said 2.8543 acres, over and across said 18.708 acres, for a distance of 369.57 feet to the PLACE OF BEGINNING and containing within these boundaries 10.9791 acres; being a portion of the non-submerged residue land out of said 18.708 acres.

SURVEYOR'S CERTIFICATE

I, Juliene Harrod, Registered Professional Land Surveyor No. 4379, do hereby certify that the foregoing field notes were prepared from an actual survey made on the ground, under my supervision, in July of 2020 and that all lines, boundaries and landmarks are accurately described therein.

WITNESS my hand and seal at Baytown, Texas, this the 3rd day of August, A. D., 2020.

Juliene Harrod

Juliene Harrod
R. P. L. S. No. 4379
20-6417.Parcel2.fdn.docx
Hutchison & Associates, Inc.
1209 Decker Drive, Ste. 100
Baytown, TX 77520
Engineering Firm #F-267
Surveying Firm #100293-00



Appendix C

Market Street Property Title Documents

Conce

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X008312
09/10/03 100287657

\$22.00

CORRECTION DEED

THE STATE OF TEXAS
COUNTY OF HARRIS

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KNOW ALL MEN BY THESE PRESENTS:

That FRANK P. SPATA and FLOY SPATA of Harris County, Texas, and PATRICIA A. SCHULLER of Harris County, Texas, by and through, Michael M. Gordon, deceased, thence to his brother, Emanuel A. Gordon, by Will and then to Emanuel's wife, Lillian Mason Gordon, by Will and then to Patricia A. Schuller, only daughter of Lillian Mason Gordon, individually and as the sole heir of M. MICHAEL GORDON, (collectively, "Grantors"), for and in consideration of the sum of TEN DOLLARS (\$10.00) and other valuable consideration paid to the undersigned by KIRBY INLAND MARINE, L.P., a Delaware limited partnership and successor in interest to DIXIE CARRIERS, INC. (hereinafter referred to as "Grantee"), the receipt of which is hereby acknowledged, hereby reconfirm that they have GRANTED, SOLD and CONVEYED, and by these presents do GRANT, SELL and CONVEY, unto Grantee, all that certain tract of land situated in Harris County, Texas, and more fully described in Exhibit "A" the original tract and Exhibit "B"-- the additional tract attached hereto and made a part hereof, together with all buildings, structures, fixtures, and improvements located thereon.

in

TO HAVE AND TO HOLD the property in Exhibit "A", together with all and singular the rights and appurtenances thereunto in anywise belonging unto Grantee, its successors and assigns forever; all and singular the Property unto Grantee, its successors and assigns, against every person whomsoever lawfully claiming or to claim the same or any part thereof. Provided, however, that not withstanding the foregoing, the Property above described as additional tract is transferred, conveyed, and accepted, without warranty of title or otherwise either expressed or implied.

For the same consideration, Grantors hereby GRANT, SELL and CONVEY, all interest, if any, of Grantors in strips or gores between the property in Exhibit "A" and the property in Exhibit "B" and abutting properties and any land lying in or under the bed of any stream, river, lake, street, alley, road, or right-of-way, opened or proposed, abutting or adjacent to the Property described in Exhibit "A" or Exhibit "B."

This Deed is executed to correct, if necessary, that certain General Warranty Deed, dated November 20, 1956, and recorded in Volume 3253, Page 106 in the Deed Records of Harris County, Texas, in which Frank Spata and wife, Floy Spata, and M. Michael Gordon originally intended to convey all of their respective right, title and interest in the Property in the J. T. Harrell Survey along the San Jacinto River down to the south line of the J. T. Harrell Survey. This is the land described in Exhibit "A." However, the legal description in said 1956 General Warranty Deed failed to specifically include the legal description of the strip of land extending south approximately 300 feet along the bank of the San Jacinto River which was owned by Grantors. The inadvertently omitted legal description is included in the legal description attached hereto as Exhibit "B." In all other respects the prior Deed is confirmed.

This same land was conveyed into Frank Spata, Floy Spata and M. Michael Gordon by Edward Shields and his wife by Warranty Deed dated September 16, 1942 and recorded in

574-87-2376

Volume 1271, Page 106, and by Warranty Deed, Volume 1297, Page 16 dated August 25, 1943, in the deed records of Harris County, Texas extending down to where the South line of the Joe MaGee 842 1/2 acre track, the South line of the J.T. Harrell Survey.

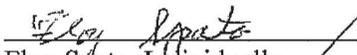
Executed this 10th day of September, 2003, but effective as of the 20th day of November, 1956.

"GRANTOR"



Frank P. Spata, Individually

(5)
292



Floy Spata, Individually

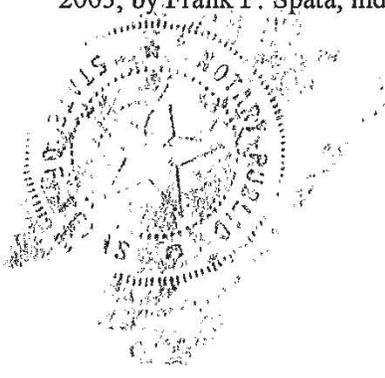


Patricia A. Schuller, Individually and heir of
M. Michael Gordon, through Emanuel A. Gordon,
then Lillian Mason Gordon to Patricia A. Schuller

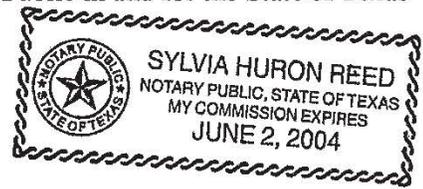
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THE STATE OF TEXAS §
 §
COUNTY OF HARRIS §

This instrument was acknowledged before me on the 10th day of September, 2003, by Frank P. Spata, individually.

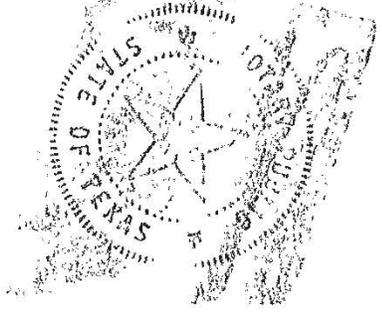


Sylvia Huron Reed
Notary Public in and for the State of Texas

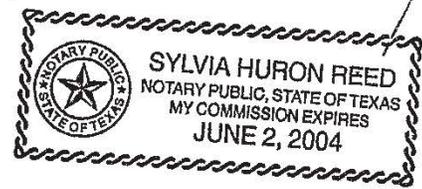


THE STATE OF TEXAS §
 §
COUNTY OF HARRIS §

This instrument was acknowledged before me on the 10th day of September, 2003, by Floy Spata, individually.



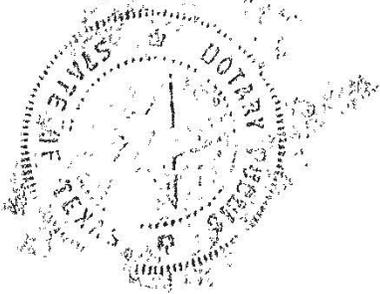
Sylvia Huron Reed
Notary Public in and for the State of Texas



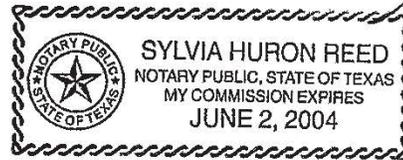
574-87-2378

THE STATE OF TEXAS §
 §
COUNTY OF HARRIS §

This instrument was acknowledged before me on the 16th day of September, 2003, by Patricia A. Schuller, individually and heir of M. Michael Gordon through Emanuel A. Gordon then Lillian Mason Gordon to Patricia A. Schuller.



Sylvia Huron Reed
Notary Public in and for the State of Texas



574-87-2379

EXHIBIT "A"

ORIGINAL TRACT

All that certain 10.204 acres of land located in the southerly end of a tract described at Tract No. 2 in deed to M. Michael Gordon, et al, dated November 15, 1943, and recorded in Volume 1297, Page 16 of the deed records, said 10.204 acres being located between the San Jacinto River and Old River Lake in the J. T. Harrell Survey, Abstract No. 330, Harris County, Texas, and being more particularly described as follows:

BEGINNING at a 1/2 inch pipe on the west bank of the San Jacinto River located at the end of an old barb wire fence (approximately 25 feet from a pasture gate) from which an 8 inch Catalpa tree bears N. 2° 52' W. 34 feet, a double 6 inch Bois d' Arc tree bears N. 57° 23' W. 50 feet, and the San Jacinto Monument bears S. 14° 44' W., said 1/2 inch pipe being located N. 42° 01' E. 309.67 feet from a 1 inch pipe located on the west bank of the San Jacinto River at the northeast corner of the Mary Niedermeyer Survey, Abstract No. 1736, and the southeast corner of the J. T. Harrell Survey;

THENCE N. 45° 23' W. a distance of 111 feet along an old down fence to a 1/2 inch iron pipe on the east bank of Old River Lake;

THENCE N. 29° 47' E. a distance of 61 feet to a 1/2 inch pipe on the south side of a private cut from San Jacinto River to Old River Lake where it intersects the east bank of Old River Lake;

THENCE N. 29° 46' E. a distance of 229.56 feet across said private cut to a 1/2 inch pipe where the north bank of said private cut intersects the east bank of Old River Lake;

THENCE N. 0° 18' W. a distance of 319.86 feet to a 1/2 inch pipe on the east bank of Old River Lake;

THENCE N. 22° 35' E. a distance of 398.30 feet to a 1/2 inch pipe on the east bank of Old River Lake;

THENCE N. 10° 07' E. a distance of 119.38 feet to a 3/4 inch pipe on the east bank of Old River lake marking the northwest corner of the 10.204 acres herein described;

THENCE S. 55° 13' E., passing a 3/4 inch pipe at 384.84 feet, another 3/4 inch pipe at 444.86 feet, and continuing in all a distance of 824.85 feet to a 3/4 inch pipe on the west bank of the San Jacinto River from which a 12 inch elm bears N. 71° 16' W. 69.6 feet, a 10 inch elm bear N. 12° 08' E. 65' and the San Jacinto monument bears S. 17° 18' W.;

THENCE S. 58° 40' W. a distance of 734.43 feet to a 1/2 inch pipe on the west bank of Old River;

THENCE S. 47° 02' W. a distance of 100 feet to a 1/2 inch pipe on the north bank of a private cut from San Jacinto River to Old River Lake where it intersects the west bank of Old River;

HOUSTON 288597v4 99999-00001

THENCE S. 48° 51' W. a distance of 240.27 feet to a 1/2 inch pipe on the south bank of said private cut where it intersects the west bank of the San Jacinto River;

THENCE S. 30° 37' W. a distance of 65.8 feet to the PLACE OF BEGINNING, and containing 10.204 acres, consisting of 0.157 acre locate south of the aforementioned private cut, 0.704 acre in the private cut, and 9.343 acres north of the private cut.

And that easement described as:

ROADWAY EASEMENT TRACT

A perpetual right-of-way and easement for the purpose of constructing, using and maintaining a road over and across the following property:

Being all that certain tract or parcel of land located in the J. T. Harrell Survey, Abstract No. 330, Harris County, Texas, being part of Tract No. 2 as described in deed to M. Michael Gordon, et al, by deed dated November 15, 1943, and recorded in Volume 1297, Page 16 of the deed records, more particularly described as follows:

BEGINNING at a point in the south right-of-way line of Market Street Road located N. 55° 13' W. 553.9 feet, S. 34° 47' W. 75 feet and N. 55° 13' W. 171.76 feet from a 1/2 inch pipe on the west bank of the San Jacinto River where the south right-of-way line of Market Street Road intersects same;

THENCE S. 33° 05' W. a distance of 1663.92 feet to a 3/4 inch pipe located N. 55° 13' W. 379.99 feet from another 3/4 inch pipe on the west bank of the San Jacinto River from which a 12 inch elm bears N. 71° 16' W. 69.6 feet and a 10 inch elm bears N. 12° 08' E. 65 feet;

THENCE N. 55° 13' W. a distance of 60.02 feet to a 3/4 inch pipe;

THENCE N. 33° 05' E. a distance of 1663.92 feet to a point in the south right-of-way line of Market Street Road;

THENCE S. 55° 13' E. a distance of 60.02 feet to the PLACE OF BEGINNING, and containing 2.292 acres of land. °

EXHIBIT "B"

ADDITIONAL TRACT

All of Grantors' right, title and interest in the parcel of land in the J. T. Harrell Survey along the San Jacinto River bounded on the east by the San Jacinto River and on the west by Old River and by any extension of the line dividing the Jones and Hare tracts to which it might abut, beginning at the south line of the tract described in "Fee Simple Tract" above and extending south to the south line of the J. T. Harrell Survey, believed to be approximately 300 feet, but including all such property north of the south line of the J. T. Harrell Survey, including all accretions thereto, regardless of the distance.

John
Mark Lowes
1401 McKinney
Suite 2700
Houston TX, 77010

Grantee:
Kirby Corp.
55 Waugh Dr.
Suite 1000
Houston TX, 77017
ATTN: Amy Husted

ANY PROVISION HEREIN WHICH RESTRICTS THE SALE, RENTAL, OR USE OF THE DESCRIBED REAL PROPERTY BECAUSE OF COLOR OR RACE IS INVALID AND UNENFORCEABLE UNDER FEDERAL LAW
THE STATE OF TEXAS
COUNTY OF HARRIS
I hereby certify that this instrument was FILED in File Number Sequence on the date and at the time stamped herein by me; and was duly RECORDED in the Official Public Records of Real Property of Harris County, Texas on

SEP 10 2003



Beverly B. Kaufman
COUNTY CLERK
HARRIS COUNTY, TEXAS

Beverly B. Kaufman
COUNTY CLERK
HARRIS COUNTY, TEXAS

2003 SEP 10 PM 2:38

FILED

288597v4

FILED

2004 JAN 27 PM 2:51

Beverly B. Kaufman
COUNTY CLERK
HARRIS COUNTY, TEXAS

THIS INSTRUMENT PREPARED BY AND
AFTER RECORDING, PLEASE RETURN TO:
Carrie Cavalier, Esq.
Jenkins & Gilchrist
1401 McKinney, Suite 2700
Houston, Texas 77010

✓

Space above reserved for recorder's use only

NOTICE OF CONFIDENTIALITY RIGHTS: IF YOU ARE A NATURAL PERSON, YOU MAY REMOVE OR STRIKE ANY OF THE FOLLOWING INFORMATION FROM THIS INSTRUMENT BEFORE IT IS FILED FOR RECORD IN THE PUBLIC RECORDS: YOUR SOCIAL SECURITY NUMBER OR YOUR DRIVER'S LICENSE NUMBER.

SPECIAL WARRANTY DEED

THE STATE OF TEXAS §
 § KNOW ALL MEN BY THESE PRESENTS:
COUNTY OF HARRIS §

That FRANK F. SPATA and FLOY SPATA of Harris County, Texas, and PATRICIA A. SCHULLER of Harris County, Texas, by and through, Michael M. Gordon, deceased, thence to his brother, Emanuel A. Gordon, by Will and then to Emanuel's wife, Lillian Mason Gordon, by Will and then to Patricia A. Schuller, only daughter of Lillian Mason Gordon, individually and as the sole heir of M. MICHAEL GORDON (collectively, jointly and severally, "**Grantors**"), for and in consideration of the sum of TEN DOLLARS (\$10.00) and other valuable consideration paid to the undersigned by KIRBY INLAND MARINE, L.P., a Delaware limited partnership and successor in interest to DIXIE CARRIERS, INC. ("**Grantee**"), the receipt of which is hereby acknowledged, has GRANTED, BARGAINED, SOLD and CONVEYED, and by these presents does hereby GRANT, BARGAIN, SELL and CONVEY unto Grantee all of the following property (collectively, the "**Property**"): all of that certain tract of land situated in Harris County, Texas, and more fully described in Exhibit A attached to and made a part of this instrument for all purposes;

lee

SAVE and EXCEPT, and there is hereby reserved unto Grantors, its successors and assigns, all of the oil, gas and other minerals in and under and that may be produced from the Property, without a reservation of surface rights. Grantor hereby waives all surface rights over the Property and agrees not to use or occupy any portion of the surface of the Property and not to place any fixtures, equipment, buildings, or other structures or improvements of any type on the surface of the Property.

The address of Grantee for all purposes under this instrument is Dixie Carriers, Inc., c/o Kirby Corporation, 55 Waugh Drive, Suite 1000, Houston, Texas 77007.

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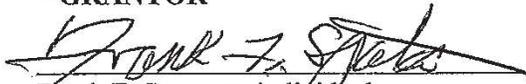
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TO HAVE AND TO HOLD the Property, together with all and singular any other rights and appurtenances thereto in anywise belonging unto Grantee, its successors and assigns FOREVER; and Grantor, jointly and severally, does hereby bind itself and its successors and assigns to WARRANT AND FOREVER DEFEND all and singular the Property, unto Grantee, its successors, legal representatives, and assigns, against every person whomsoever lawfully claiming or to claim the same or any part thereof, by, through or under Grantor, but not otherwise; subject only to the exceptions of record in the real property records of Harris County, Texas as of the date of this instrument, including, without limitation, the terms of (i) that certain right of way easement described in the general warranty deed dated November 20, 1956 recorded in the real property records of Harris County in Volume 3253, Page 106; corrected under that certain Correction Deed dated September 10, 2003 recorded in the real property records of Harris County, Texas in Clerk's File No. X008312; (ii) that certain right of way easement and use of said easement as described in the general warranty deed dated July 18, 1958, recorded in the real property records of Harris County, Texas in Volume 3535, Page 277; (iii) that certain right of way easement granted to Houston Lighting and Power Company in the document dated October 31, 1968, recorded in the real property records of Harris County, Texas in Volume 7414, Page 208, Clerk's File No. 099-32-1997; and (iv) that certain right of way easement granted to Houston Lighting and Power Company in the document dated November 5, 1968 recorded in the real property records of Harris County, Texas in Volume 7414, Page 212, Clerk's File No. 099-32-2004.

This same land, among other property, was conveyed into Frank Spata, Floy Spata and M. Michael Gordon by Edward Shields and his wife by Warranty Deed dated September 16, 1942 and recorded in the real property records of Harris County, Texas in Volume 1271, Page 106, and by Warranty Deed dated August 25, 1943, recorded in the real property records of Harris County, Texas in Volume 1297, Page 16, extending down to where the South line of the Joe MaGee 842 1/2 acre track, the South line of the J.T. Harrell Survey.

This Special Warranty Deed has been executed by Grantor on the date of the taking of its acknowledgment, but the effective date of this instrument for all purposes shall be deemed to be January 27th 2004, and it shall be effective as of that date.

"GRANTOR"

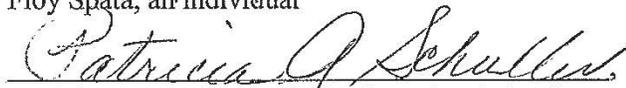


Frank F. Spata, an individual

Con



Floy Spata, an individual



Patricia A. Schuller, individually and as heir of
M. Michael Gordon, through Emanuel A. Gordon,
then Lillian Mason Gordon to Patricia A. Schuller

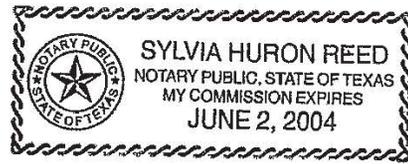
THE STATE OF TEXAS

COUNTY OF HARRIS

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This instrument was acknowledged before me on the 27th day of January, 2004, by Frank F. Spata, an individual.

Sylvia Huron Reed
Notary Public in and for the State of Texas



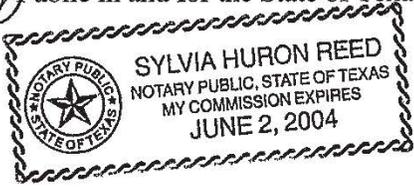
531-16-2875

THE STATE OF TEXAS §
 §
COUNTY OF HARRIS §

This instrument was acknowledged before me on the 27th day of January,
2004, by Floy Spata, individually.



Sylvia Huron Reed
Notary Public in and for the State of Texas

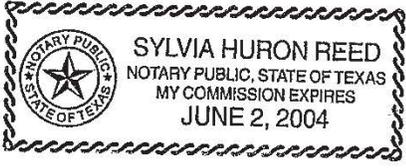


001-16-2076

THE STATE OF TEXAS §
 §
COUNTY OF HARRIS §

This instrument was acknowledged before me on the 27th day of January, 2004, by Patricia A. Schuller, individually and heir of M. Michael Gordon through Emanuel A. Gordon then Lillian Mason Gordon to Patricia A. Schuller.

Sylvia Huron Reed
Notary Public in and for the State of Texas



501-16-2877

EXHIBIT A
LEGAL DESCRIPTION

Being all that certain tract or parcel of land located in the J. T. Harrell Survey, Abstract No. 330, Harris County, Texas, being part of Tract No. 2 as described in deed to M. Michael Gordon, et al, by deed dated November 15, 1943, and recorded in Volume 1297, Page 16 of the deed records, more particularly described as follows:

D

BEGINNING at a point in the south right-of-way line of Market Street Road located N. 55° 13' W. 553.9 feet, S. 34° 47' W. 75 feet and N. 55° 13' W. 171.76 feet from a 1/2 inch pipe on the west bank of the San Jacinto River where the south right-of-way line of Market Street Road intersects same;

THENCE S. 33° 05' W. a distance of 1663.92 feet to a 3/4 inch pipe located N. 55° 13' W. 379.99 feet from another 3/4 inch pipe on the west bank of the San Jacinto River from which a 12 inch elm bears N. 71° 16' W. 69.6 feet and a 10 inch elm bears N. 12° 08' E. 65 feet;

THENCE N. 55° 13' W. a distance of 60.02 feet to a 3/4 inch pipe;

THENCE N. 33° 05' E. a distance of 1663.92 feet to a point in the south right-of-way line of Market Street Road;

THENCE S. 55° 13' E. a distance of 60.02 feet to the PLACE OF BEGINNING, and containing 2.292 acres of land. °

591-16-2873

ANY PROVISION HEREIN WHICH RESTRICTS THE SALE, RENTAL, OR USE OF THE DESCRIBED REAL PROPERTY BECAUSE OF COLOR OR RACE IS INVALID AND UNENFORCEABLE UNDER FEDERAL LAW
THE STATE OF TEXAS
COUNTY OF HARRIS
I hereby certify that this instrument was FILED in File Number Sequence on the date and at the time stamped hereon by me, and was duly RECORDED in the Official Public Records of Real Property of Harris County, Texas on

JAN 27 2004



Dorothy B. Kayman
COUNTY CLERK
HARRIS COUNTY, TEXAS

Appendix D
San Jacinto River Landowners Association
Articles of Association and Declaration of
Covenants Conditions and Restrictions

I.

There is hereby formed an association of all the Owners, which shall be known as the San Jacinto River Landowners Association. At any time hereafter, a majority of the Owners may, by affirmative vote, appoint and elect three of the Owners to be known as the Owners' Committee of the San Jacinto River Landowners Association. Each Owner of real property on the Peninsula shall be entitled to one vote. The election of such Owners' Committee may be evidenced by the execution of an appropriate instrument, signed and acknowledged by a majority of said Owners and the execution of such instrument will be conclusive evidence of the authority of said Owners' Committee to collect and expend in the joint interest of all the Owners as a whole, the maintenance fund hereinafter provided for, and the right and authority to use such funds for the following purposes: to maintain, repair and replace, as may be needed, the common roadway, to contract, provide and pay for security services on a continuing basis to protect all the Owners' property, and to maintain, insofar as may be possible, a desirable and safe area in which the Owners may carry on their respective businesses, and to enforce the covenants, conditions and restrictions herein contained. Members of said Owners' Committee may at any time be relieved of their position and substitute or successor members may be appointed by a vote of a majority of said Owners and the execution and acknowledgment of an appropriate instrument by a majority of said Owners shall be evidence thereof as set out above.

II.

In order to accomplish the purposes for which the Association is formed and these Articles, Covenants, Conditions and Restrictions are entered into, each Owner hereby agrees, on behalf of itself, its successors and assigns, to pay to the Association a monthly assessment which shall be an equal amount for each Owner. Said monthly assessment shall be an amount as is determined from time to time by the Owners' Committee to be sufficient to carry out the purposes for which these Articles and the covenants, conditions and restrictions were adopted.

185-84-1753

The amount of said charge shall be determined periodically by the Owners' Committee, and the amount so determined shall be assessed and shall be payable by Owners monthly, in advance, upon the first day of each month on and after the date hereof. Said charge shall be paid to the Association and shall be held by it in trust, and expended for the repair, maintenance or replacement, when and as needed of the common road, and any gate or gates thereto, to provide security services, to enforce the restrictions, covenants and conditions herein contained, and for any and other such things necessary or desirable, in the opinion of the Owners' Committee, to carry out the purposes for which the Association was formed and these covenants, conditions and restrictions are adopted.

III.

All of the property described above shall be held, sold and conveyed subject to the restrictions, covenants and conditions contained herein, which are for the purpose of protecting the value and desirability of the property, and which shall run with the real property and shall be binding on all parties having any right, title, or interest in or to the above described property or any part thereof, and their heirs, successors, and assigns, and which restrictions, covenants, and conditions shall inure to the benefit of each owner thereof.

IV.

The Committee, or any Owner, shall have the right to enforce, by any proceeding at law or in equity, all restrictions, covenants, conditions, and reservations now or hereafter imposed by the provisions of these Articles. Failure to enforce any covenant, restriction, condition or reservation herein contained shall in no event be deemed a waiver of the right to do so thereafter.

V.

Invalidation of any one of these restrictions, covenants, conditions or reservations by judgment or court order shall in no way affect any other provision, and all other provisions shall remain in full force and effect.

185-84-1754

VI.

The covenants, conditions, and restrictions of these Articles shall run with and bind the land, and shall inure to the benefit of, and be enforceable by the Committee or the Owner of any property subject to these Articles, and their respective legal representatives, heirs, successors, and assigns, and, unless amended as provided herein, shall be effective for a term of twenty (20) years from the date these Articles are recorded, after which time said covenants, conditions, and restrictions shall be automatically extended for successive periods of ten (10) years. The covenants, conditions, and restrictions of these Articles may be amended during the first twenty (20) year period by an instrument signed by not less than 80 percent of the Owners; during any succeeding ten (10) year period, the covenants, conditions, and restrictions of this Declaration may be amended during the last year of any such ten (10) year period by an instrument signed by not less than 60 percent of the Owners. No amendment shall be effective until recorded in the Deed Records of Harris County, Texas, nor until the approval of any governmental regulatory body which is required shall have been obtained.

WITNESS the hands of each of the Owners by and through their respective duly authorized officers, on this 16th day of April, 1981.

MUSGROVE TOWING SERVICE, INC.

By R. W. Musgrave
President

SOUTHWESTERN BARGE & FLEET SERVICE, INC.

By Henry J. Hilliard
President

MARINE ENGINE SERVICE, INC.

By M. O. Panner
President

185-84-1755

GLENDALE BOAT WORKS, INC.

By *McParsons Jr* *201*
President

DIXIE CARRIERS, INC.

By _____
President

STATE OF TEXAS §
§
COUNTY OF HARRIS §

On this 23 day of April, 1981, before me, the under-
signed authority, personally appeared *J.M. Musgrave*,
known to me to be the President of Musgrove Towing Service, Inc., whose
name is subscribed to the foregoing Agreement and acknowledged to me
that he executed same for the purposes and considerations therein
expressed by the authority of the Board of Directors as the act and
deed of said corporation, and in the capacity therein stated.



Holly Formic
Notary Public in and for
Harris County, Texas
My Commission expires 12/1/82

STATE OF TEXAS §
§
COUNTY OF HARRIS §

On this 23 day of April, 1981, before me, the under-
signed authority, personally appeared *Wm. J. Hilliard Jr.*,
known to me to be the President of Southwestern Barge & Fleet Service,
Inc., whose name is subscribed to the foregoing Agreement and acknowledged
to me that he executed same for the purposes and considerations therein
expressed by the authority of the Board of Directors as the act and
deed of said corporation, and in the capacity therein stated.



Holly Formic
Notary Public in and for
Harris County, Texas
My Commission expires 12/1/82

STATE OF TEXAS §
§
COUNTY OF HARRIS §

On this 23 day of April, 1981, before me, the under-
signed authority, personally appeared *W.M. Palmer*,
known to me to be the President of Marine Engine Service, Inc., whose
name is subscribed to the foregoing Agreement and acknowledged to me
that he executed same for the purposes and considerations therein
expressed by the authority of the Board of Directors as the act and
deed of said corporation, and in the capacity therein stated.



Holly Formic
Notary Public in and for
Harris County, Texas
My Commission expires 12/1/82

185-84-1756

STATE OF TEXAS §
§
COUNTY OF HARRIS §

On this 27 day of April, 1981, before me, the undersigned authority, personally appeared Richard J. [Signature] known to me to be the President of Glendale Boat Works, Inc., whose name is subscribed to the foregoing Agreement and acknowledged to me that he executed same for the purposes and considerations therein expressed by the authority of the Board of Directors as the act and deed of said corporation, and in the capacity therein stated.



[Signature]
Notary Public in and for
Harris County, Texas
My Commission Expires January 31, 1981

STATE OF TEXAS §
§
COUNTY OF HARRIS §

On this 16th day of April, 1981, before me, the undersigned authority, personally appeared Robert L. [Signature] known to me to be the President of Dixie Carriers, Inc., whose name is subscribed to the foregoing Agreement and acknowledged to me that he executed same for the purposes and considerations therein expressed by the authority of the Board of Directors as the act and deed of said corporation, and in the capacity therein stated.



[Signature]
Notary Public in and for
Harris County, Texas
My Commission Expires January 31, 1981

185-84-1757

MUSGROVE TOWING SERVICE, INC.

18.708 acres of land in the J.T. Harrell Survey, Abstract No. 330, Harris County, Texas, more particularly described as follow:

COMMENCING at an iron pipe on the west bank of the San Jacinto River and in the south line of Market Street Road;

THENCE North 55 deg. 13 min. West 553.9 feet along the south line of said road to an offset point in the south line of said road;

THENCE South 74 deg. 47 min. West 27 feet to another offset point in the South line of said road;

THENCE North 55 deg. 13 min. West 74.78 feet along the south line of said road to a stake at the place of beginning from which an iron pipe bears North 33 deg. 05 min. East 75.03 feet;

THENCE South 33 deg. 05 min. West 1,963.92 feet to an iron pipe;

THENCE North 55 deg. 13 min. West 184.84 feet to an iron pipe on the east bank of Old River Lake;

THENCE up the bank of Old River lake with the following meanders: North 10 deg. 07 min. East 300.92 feet to an iron pipe; North 26 deg. 54 min. East 718 feet to an iron pipe; South 68 deg. 27 min. East 185 feet to a stake; north 27 deg. 26 min. East 610 feet to a stake; North 60 deg. 37 min. West 127.62 feet to an iron pipe; South 75 deg. 54 min. West 202 feet to an iron pipe at the mouth of a ditch flowing into said lake;

THENCE North 14 deg. 49 min. East 137.58 feet to a stake in the south line of Market Street Road on the east bank of said ditch from which an iron pipe bears North 14 deg. 49 min. East 62.92 feet;

THENCE along the South line of said road following a curve to the right having a radius of 1,021 feet for a distance of 368.1 feet to a stake at the end of said curve;

THENCE South 55 deg. 13 min. East 402.22 feet to the PLACE OF BEGINNING.

RECORDER'S MEMORANDUM:

At the time of recordation, this instrument was found to be inadequate for the best photographic reproduction because of illegibility, carbon or photo copy, discolored paper, etc. All blockouts, additions and changes were present at the time the instrument was filed and recorded.

185-84-1758

SOUTHWESTERN BARGE & FLEET SERVICE, INC.

Being 23.500 acres of land (call 23.511) located in the Josiah T. Harrell Survey, Abstract 330. Harris County, Texas, and being the Northeasterly portion of a tract of land described as Tract No. 2 in deed to M. Michael Gordon, et al, dated November 15, 1943, and recorded in Volume 1297, Page 16, of the Deed Records of Harris County, Texas, said 23.500 acres of land being described as follows:

BEGINNING at a 2 x 2 wood stake found marking the Southerly Southwest corner (set a 4 x 4 oak post beside 2 x 2) from which a 12 inch Elm marked "X" bears North 71° 16' 00" West, a distance of 69.60 feet and a 10 inch Elm stump bears North 12° 08' 00" East, 65.00 feet and the San Jacinto Monument bears South 17° 18' 00" West;

THENCE North 55° 13' 00" West, along the Northeasterly line of a 9.343 acre tract and Southwesterly line of this tract, at 87.58 feet passing a found disturbed 1/2 inch iron rod (reset with a 1 inch iron rod) and continuing in all 379.99 feet to a 1 inch iron rod set in the Southeasterly line of a 60 foot private road right-of-way;

THENCE North 33° 05' 00" East, along the Easterly line of said road 1663.92 feet to a 1 inch iron rod set for corner in the Southerly line of Market Street Road (I-10);

THENCE South 55° 13' 00" East, along the Southerly line of said road 171.76 feet to a point for corner being an offset corner of Market Street Road;

THENCE North 34° 47' 00" East with said road 75.00 feet to a 1 inch iron rod set for an offset corner in the Southerly line of Market Street Road;

THENCE South 55° 13' 00" East, along said Southerly line of Market Street Road, 553.90 feet to a point for corner, being approximately 23.00 feet South of the North washed bank of the San Jacinto River;

THENCE along the deed call line and generally along the Northerly line of said river the following calls:

South 40° 07' 00" West - 876.55 feet to a 5/8 inch iron rod set for angle point

South 45° 36' 30" West - 587.70 feet to a 5/8 inch iron rod set for angle point in a sunken barge

South 52° 57' 12" West - 211.81 feet to a 1 inch iron rod set for angle point

South 58° 40' 00" West - 95.07 feet to the PLACE OF BEGINNING and containing within these calls 23.500 acres of land.

LESS AND EXCEPT

BEING 0.500 acres of land located in the Josiah T. Harrell Survey, Abstract No. 330, Harris County, Texas, and being out of the southwest corner of a 23.500 acre tract, (call 23.511) said 23.511 acre tract being the northeasterly portion of a tract of land described as Tract No. 2 in deed to M. Micheal Gordon, et al, dated November 15, 1943, and recorded in Volume 1297, Page 16, of the Deed Records of Harris County, Texas, said 0.500 acres being described by metes and bounds as follows:

185-84-1759

BEGINNING at a 1 inch iron set for the most westerly southwest corner of said 23.500 acre tract, being in the northerly line of a 9.343 acre tract and in the east line of a 60 foot private roadway, said iron rod being located North 55 deg. 13 min. West, 379.99 feet from a 2 x 2 found marking the most southerly southeast corner of said 23.500 acre tract from which a 12 inch elm tree mkd. X brs. N 71 deg. 16 min. W - 69.6 feet, a 16 inch Elm stump brs. N 12 deg. 08 min. E - 65.0 feet and the San Jacinto Monument bears South 17 deg. 18 min. West;

THENCE North 33 deg. 05 min. East, along the northwesterly line of said 23.500 acre tract and the southeasterly line of said 60 foot private roadway a distance of 147.61 feet to a 1 inch iron rod set for corner;

THENCE South 55 deg. 13 min. East, a distance of 147.62 feet to a 1 inch iron rod set for corner;

THENCE South 33 deg. 05 min. West, a distance of 147.62 feet to a 1 inch iron rod set in the southerly line of said 23.500 acre tract and the northerly line of the said 9.343 acre tract;

THENCE North 55 deg. 13 min. West, along the southerly line of said 23.500 acre tract and the northerly line of said 9.343 acre tract, a distance of 147.62 feet to the PLACE OF BEGINNING and containing within these calls 0.500 acres of land.

RECORDER'S MEMORANDUM:

At the time of recordation, this instrument was found to be inadequate for the best photographic reproduction because of illegibility, carbon or photo copy, discolored paper, etc. All blockouts, additions and changes were present at the time the instrument was filed and recorded.

185-84-1760

MARINE ENGINE SERVICE, INC.

BEING 0.500 acres of land located in the Josiah T. Harrell Survey, Abstract No. 330, Harris County, Texas, and being out of the southwest corner of a of a 23.500 acre tract, (call 23.511) said 23.511 acre tract being the northeasterly portion of a tract of land described as Tract No. 2 in deed to M. Micheal Gordon, et al, dated November 15, 1943, and recorded in Volume 1297, Page 16, of the Deed Records of Harris County, Texas, said 0.500 acres being described by metes and bounds as follows:

BEGINNING at a 1 inch iron set for the most westerly southwest corner of said 23.500 acre tract, being in the northerly line of a 9.343 acre tract and in the east line of a 60 foot private roadway, said iron rod being located North 55 deg. 13 min. West, 379.99 feet from a 2 x 2 found marking the most southerly southeast corner of said 23.500 acre tract from which a 12 inch elm tree mkd. X brs. N 71 deg. 16 min. W - 69.6 feet, a 10 inch Elm stump brs. N 12 deg. 08 min. E - 65.0 feet and the San Jacinto Monument bears South 17 deg. 18 min. West;

THENCE North 33 deg. 05 min. East, along the northwesterly line of said 23.500 acre tract and the southeasterly line of said 60 foot private roadway a distance of 147.61 feet to a 1 inch iron rod set for corner;

THENCE South 55 deg. 13 min. East, a distance of 147.62 feet to a 1 inch iron rod set for corner;

THENCE South 33 deg. 05 min. West, a distance of 147.62 feet to a 1 inch iron rod set in the southerly line of said 23.500 acre tract and the northerly line of the said 9.343 acre tract;

THENCE North 55 deg. 13 min. West, along the southerly line of said 23.500 acre tract and the northerly line of said 9.343 acre tract, a distance of 147.62 feet to the PLACE OF BEGINNING and containing within these calls 0.500 acres of land.

RECORDER'S MEMORANDUM:

At the time of recordation, this instrument was found to be inadequate for the best photographic reproduction because of illegibility, carbon or photo copy, discolored paper, etc. All blockouts, additions and changes were present at the time the instrument was filed and recorded.

185-84-1761

LENDALE BOAT WORKS

Field notes describing a 2.5143 acre tract of land out of the J. T. Harrell survey, abstract No. 330, Harris County, Texas and being out of a 18.208 acre tract of land as recorded in Vol. 3535 Page 277, Deed Records of Harris County, Texas. More particularly described as follows:

Commencing at an iron pipe on the west bank of the San Jacinto River and in the south line of Market Street Road;

THENCE North 55 deg. 13 min. West 553.9 feet along the south line of said road to an offset point in the south line of said road;

THENCE South 34 deg. 47 min. West 75 feet to another offset point in the South line of said road;

THENCE North 55 deg. 13 min. West 171.76 feet along the south line of said road to a stake which an iron pipe bears North 33 deg. 05 min. East 75.03 feet;

THENCE South 33 deg. 05 min. West 310.00 feet to a 3/8" iron rod;

THENCE North 56 deg. 55 min. West 60.37 feet to the PLACE OF BEGINNING and being the North East corner of the tract herein described.

THENCE North 56 deg. 55 min. West along the north line of the above mentioned tract a distance of 421.17 feet to a point for the Northwest corner and being in Cut River Lake proper.

THENCE South 27 deg. 26 min. West a distance of 361.46 feet to the Southwest corner.

THENCE South 56 deg. 55 min. East a distance of 327.61 feet to a point for the Southeast corner.

THENCE North 33 deg. 05 min. East along the East property line a distance of 309.00 feet to the PLACE OF BEGINNING.

RECORDER'S MEMORANDUM:

At the time of recordation, this instrument was found to be inadequate for the best photographic reproduction because of illegibility, carbon or photo copy, discolored paper, etc. All blockouts, additions and changes were present at the time the instrument was filed and recorded.

DIXIE CARRIERS, INC.

All that certain 10.204 acres of land located in the southerly end of a tract described as Tract No. 2 in deed to M. Michael Gordon, et al, dated November 15, 1943, and recorded in Volume 1297, Page 16 of the deed records, said 10.204 acres being located between the San Jacinto River and Old River Lake in the J. T. Harrell Survey, Abstract No. 330, Harris County, Texas, and being more particularly described as follows:

RECORDERS MEMORANDUM:
At the time of recording, this instrument was found to be inadequate for the best photographic reproduction, because of illegible carbon or photo copy, discolored pages, etc. All blockouts, additions and corrections were present at the time the instrument was filed and recorded.

BEGINNING at a 1/2 inch pipe on the west bank of the San Jacinto River located at the end of an old barb wire fence (approximately 25 feet from a pasture gate) from which an 8 inch Catalpa tree bears N. 2° 52' W. 34 feet, a double 6 inch Bois d' Arc trees bears N. 57° 23' W. 50 feet, and the San Jacinto Monument bears S. 14° 44' W., said 1/2 inch pipe being also located N. 42° 01' E. 309.01 feet from a 1 inch pipe located on the west bank of the San Jacinto River at the northeast corner of the Mary Niedermeyer Survey, Abstract No. 1736, and the southeast corner of the J. T. Harrell Survey;

THENCE N. 45° 23' W., a distance of 111 feet along an old down fence to a 1/2 inch pipe on the east bank of Old River Lake;

THENCE N. 29° 47' E. a distance of 61 feet to a 1/2 inch pipe on the south side of a private cut from San Jacinto River to Old River Lake where it intersects the east bank of Old River Lake;

THENCE N. 29° 40' E. a distance of 229.56 feet across said private cut to a 1/2 inch pipe where the north bank of said private cut intersects the east bank of Old River Lake;

THENCE N. 0° 10' W. a distance of 319.66 feet to a 1/2 inch pipe on the east bank of Old River Lake;

THENCE N. 28° 35' E. a distance of 396.30 feet to a 1/2 inch pipe on the east bank of Old River Lake;

THENCE N. 10° 07' E. a distance of 119.38 feet to a 3/4 inch pipe on the east bank of Old River Lake marking the northwest corner of the 10.204 acres herein described;

THENCE S. 55° 13' E., passing a 3/4 inch pipe at 384.84 feet, another 3/4 inch pipe at 444.86 feet, and continuing in all a distance of 824.85 feet to a 3/8 inch pipe on the west bank of the San Jacinto River from which a 12 inch elm bears N. 71° 16' W. 69.6 feet, a 10 inch elm bears N. 12° 08' E. 65 feet, and the San Jacinto Monument bears S. 17° 18' W.;

THENCE S. 58° 40' W. a distance of 734.43 feet to a 1/2 inch pipe on the west bank of Old River;

THENCE S. 47° 02' W. a distance of 100 feet to a 1/2 inch pipe on the north bank of a private cut from San Jacinto River to Old River Lake where it intersects the west bank of Old River;

THENCE S. 48° 51' W. a distance of 240.27 feet to a 1/2 inch pipe on the south bank of said private cut where it intersects the west bank of the San Jacinto River;

THENCE S. 30° 37' W. a distance of 65.8 feet to the PLACE OF BEGINNING, and containing 10.204 acres, consisting of 0.157 acre located south of the aforementioned private cut, 0.704 acre in the private cut, and 9.343 acres north of the private cut;

*Walter H. ...
L. H. ...
2-7 ...
Houston, Texas
7-7-44
H. H. ...*

185-84-1763

STATE OF TEXAS }
COUNTY OF HARRIS }

I hereby certify that this instrument was FILED in
File Number Sequence on the date and at the time stamped
hereon by me; and was duly RECORDED, in the Official
Public Records of Real Property of Harris County, Texas on

MAY 19 1981



Anita Lockwood
COUNTY CLERK,
HARRIS COUNTY, TEXAS

Attachment 10

Operation & Maintenance Manual



Attachment 10 - Operation and Maintenance Manual - Southern Impoundment

*Provided with Final 100% Remedial Design - Southern
Impoundment (Amended April 2021)*

San Jacinto River Waste Pits Site
Harris County, Texas

International Paper Company

GHD | 5551 Corporate Boulevard Suite 200 Baton Rouge Louisiana 70808 USA
11215131 | Report No 3

WATER | ENERGY & RESOURCES | ENVIRONMENT | PROPERTY & BUILDINGS | TRANSPORTATION



Per discussion with the United States Environmental Protection Agency (EPA), this plan is not anticipated to be necessary based on the Remedial Design (RD) of the selected remedy.

Attachment 11

Operation & Maintenance Plan



Attachment 11 - Operation and Maintenance Plan - Southern Impoundment

*Provided with Final 100% Remedial Design - Southern
Impoundment (Amended April 2021)*

San Jacinto River Waste Pits Site
Harris County, Texas

International Paper Company

GHD | 5551 Corporate Boulevard Suite 200 Baton Rouge Louisiana 70808 USA
11215131 | Report No 3

WATER | ENERGY & RESOURCES | ENVIRONMENT | PROPERTY & BUILDINGS | TRANSPORTATION



Per discussion with the United States Environmental Protection Agency (EPA), this plan is not anticipated to be necessary based on the Remedial Design (RD) of the selected remedy.