## Appendix E Design Drawing Package



# SAN JACINTO RIVER WASTE PITS NORTHERN IMPOUNDMENT PRELIMINARY 30% REMEDIAL DESIGN HARRIS COUNTY, TEXAS

MAY 2020 11187072-00(010)



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Plot Date: 28 May 2020 - 8:46 AM

Plotted By: Matt Wolfer

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GHD TEXAS FIRM REGISTRATION NO.	276
JOB NO. 11187072 FILE	<sub>NO.</sub> 010





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GHD SERVICES IN JOB NO. <u>11187072</u> FILE NO. <u>010</u> GHD TEXAS FIRM REGISTRATION NO. <u>276</u>	I <b>C.</b>	neet	No. <b>C-</b>	02		

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50 100 ft GHD 5551 Corporate Boulevard Suite 200 Baton Rouge Louisiana USA T 225 292 9007 F 225 952 2978 W www.ghd.com Reuse of Documents This document and the ideas and designs incorporated herein, as an instrument of professional service, is the property of GHD and shall not be reused in whole or in part for any other project without GHD's written authorization. © 2020 GHD <u>LEGEND</u> 620 EXISTING CONTOUR INTERVAL FENCELINE \_\_\_\_\_ X \_\_\_\_\_ TOP OF BANK — — — — — — TOE OF SLOPE OVERHEAD ELECTRICAL GUARDRAIL \_\_\_\_\_\_ \_\_\_\_\_ \\ \_\_\_\_\_ PIPELINE SJSB002 BORING LOCATION MW MONITORING WELL • P.P. POWER POLE ● L.P. LIGHT POLE O WELL WELL AREA WITH MATERIAL >30 ng/kg TEQ ASPHALT CONCRETE GRAVEL PAZ66/AZ38-700N PILE HZ 1080M A PILE SOURCE: TOPOGRAPHIC, HYDROGRAPHIC, & MAGNETOMETER SURVEY OF SAN JACINTO RIVER WASTE PITS, HARRIS COUNTY, TEXAS, MORRISON SURVEYING INC., 190608, JULY 8, 2019 TO AUGUST 2, 2019 Client SAN JACINTO RIVER WASTE PITS Project NORTHERN IMPOUNDMENT PRELIMINARY 30% REMEDIAL DESIGN HARRIS COUNTY, TEXAS 30% EPA REVIEW MW RH 05/28/2020 MW **30% CLIENT REVIEW** RH 05/15/2020 Date Issue Drawn Approved Drawn MW Designer RH Design Drafting BP Check Check Project **CM** Coordinator Date May 28, 2020 This document shall not be used for construction unless signed and sealed for Scale 1" = 100' construction. Original Size Bar is one inch on original size drawing Arch D 0 1" Project No. **11187072** Title SSA AREA AND NORTHERN IMPOUNDMENT WORKS Sheet No. **C-03** Sheet - of -

NOTES:

LOCATION OF OVERBURDEN STOCKPILE, DECONTAMINATION PAD, SOLIDIFICATION PAD, AND DEWATERING FACILITY ARE PRELIMINARY AND SUBJECT TO CHANGE.

CELL NUMBERS FOR IDENTIFICATION ONLY AND DO NOT REPRESENT ORDER OF EXCAVATION SEQUENCING.

- BMP DESIGN IS SUBJECT TO CHANGE BASED ON ADDITIONAL DATA ANALYSIS AND ENGINEERING EVALUATION, AS WELL AS CHANGES IN POTENTIAL WATER SURFACE ELEVATIONS RESULTING FROM UPSTREAM CONDITIONS CURRENTLY UNDER CONSIDERATION, BUT IS SHOWN AS A CANTILEVERED PILE COFFERDAM WITH A TOP OF PILE HEIGHT OF +9' NAVD88 AND IS COMPOSED OF A PAZ66/AZ38-700N PIPE-Z SYSTEM WITH A PILE TIP DEPTH OF -80' NAVD88 AND A HZ 1080M A HZ-M WALL WITH A PILE
- TIP DEPTH OF -100' NAVD88. PILES SHOWN ON DRAWINGS DO NOT MEET MAXIMUM DEFLECTION CRITERIA TYPICALLY USED FOR PILE WALLS. SECTIONS ARE SHOWN THAT MEET STABILITY AND STRENGTH REQUIREMENTS ONLY. MEETING
- DEFLECTION CRITERIA WILL LEAD TO EITHER MUCH LARGER PILE SECTIONS OR DIFFERENT WALL TYPE CONCEPTS OR A DIFFERENT DESIGN APPROACH.
- BASED ON THE PILE DRIVING ANALYSIS PERFORMED, IT IS UNCERTAIN THAT PILES WILL BE ABLE TO BE DRIVEN COMPLETELY AND PRACTICAL REFUSAL OF THE PILES IS POSSIBLE PRIOR TO REACHING REQUIRED PILE TIP DEPTH.
- HARD PILE DRIVING CONDITIONS COULD LEAD TO LATERAL MOVEMENT OF THE PILES CREATING ALIGNMENT ISSUES.
- HARD DRIVING CONDITIONS WILL CAUSE VIBRATIONS THROUGH SOIL CAUSING SOIL PARTICLE ACCELERATION. THESE ACCELERATIONS MAY CAUSE SLOPE INSTABILITY. PREDICTION OF DESIGN MAGNITUDE OF SOIL ACCELERATION IS HIGHLY VARIABLE DUE TO VARIABILITY OF SOIL
- CONDITIONS, TRANSFER OF FORCES FROM PILE TO SOIL, AND AMOUNT OF PILE DRIVING ENERGY REQUIRED DURING ANY PHASE OF DRIVING. 8. CONSIDERATION OF ADDITIONAL DESIGN SECTIONS ALONG EACH LENGTH OF CELL WALL COULD RESULT IN LARGER PILE SECTIONS, INABILITY TO DRIVE PILES TO REQUIRED DEPTH DUE TO DIFFICULT DRIVING CONDITIONS,
- AND/OR REFUSAL PRIOR TO REQUIRED TIP DEPTH. 9. SCHEDULE AND CONSTRUCTABILITY WILL BE IMPACTED BY THE PREDICTED LARGE PILE SIZES AND DEPTHS AND MAY BE ADDITIONALLY AFFECTED OR DEEMED IMPRACTICAL BY DIFFICULT DRIVING CONDITIONS AND GEOTECHNICAL UNCERTAINTIES.

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JOB NO. <u>11187072</u> FILE NO. <u>010</u>
GHD TEXAS FIRM REGISTRATION NO276_

NG: L	ogan M. Locicero	
TATE:	TEXAS	
IC. NO:	132028	
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NOTES:
1. LOCATION AND TYPE OF SOIL EROSION AND SEDIMENT CONTROLS ARE PRELIMINARY AND SUBJECT TO CHANGE.
PRELIMINARY         NOT       FOR       CONSTRUCTION         ENG:       Locicero         STATE:       TEXAS         LIC. NO:       132028         DATE:       5-15-2020

TURBIDITY CURTAIN — · · · — · · — OIL BOOM SOURCE: TOPOGRAPHIC, HYDROGRAPHIC, & MAGNETOMETER SURVEY OF SAN JACINTO RIVER WASTE PITS, HARRIS COUNTY, TEXAS, MORRISON SURVEYING INC., 190608 , JULY 8, 2019 TO AUGUST 2, 2019 Client SAN JACINTO RIVER WASTE PITS Project NORTHERN IMPOUNDMENT PRELIMINARY 30% REMEDIAL DESIGN HARRIS COUNTY, TEXAS 2 30% EPA REVIEW MW RH 05/28/2020 **30% CLIENT REVIEW** MW 05/15/2020 RH Drawn Date Issue Approved Drawn MW Designer **RH** Drafting Check BP Design Check LL Project **CM** Coordinator Date May 28, 2020 This document shall not be used for construction unless signed and sealed for construction. Original Size Bar is one inch on original size drawing Arch D 0 1"

SOIL EROSION AND

SEDIMENT CONTROL PLAN

(OVERALL)

**C-04** 

Project No. **11187072** 

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----- TCRA CAP PERIMETER 620 EXISTING CONTOUR INTERVAL

OVERHEAD ELECTRICAL

AREA WITH MATERIAL >30 ng/kg TEQ

GUARDRAIL

MONITORING WELL

POWER POLE

LIGHT POLE

WELL

ASPHALT CONCRETE GRAVEL

SJSB002 BORING LOCATION

FENCELINE TOP OF BANK — — — — — — — TOE OF SLOPE

\_\_\_\_\_O/H\_\_\_\_\_

\_\_\_\_O\_\_\_\_O\_\_\_\_\_

MW

• P.P.

● L.P.

O WELL

0 50 100 ft 



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**C-05** 

Sheet No.

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ogan M. Locicero	
TEXAS	
132028	
<u>5-28-2020</u>	
	FOR           ogan W. Locicero           TEXAS           132028           5-28-2020

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PRELIMINARY
NOT FOR CONSTRUCTION
ENG: Logan M. Locicero STATE: TEXAS
LIC. NO: <u>132028</u> DATE: <u>5-28-2020</u>

NOTES: 1. LOCATION AND TYPE OF SOIL EROSION AND SEDIMENT CONTROLS ARE PRELIMINARY AND SUBJECT TO CHANGE.	Arch D	Bar is one inch on original size drawing 0 1"
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NOT FOR CONSTRUCTION	Title	
ENG: <u>Logan V. Locicero</u> STATE: <u>TEXAS</u> LIC. NO: <u>132028</u> DATE: <u>5-28-2020</u>	SOIL ERO SEDIMENT CO	SION AND ONTROL PLAN

	LE         620         X         FEN         SH0         O/H         O/H	GEND RA CAP PE STING CON NCELINE P OF BANK E OF SLOP ERHEAD EI ARDRAIL ELINE RING LOCA NITORING WER POLE HT POLE LL EA WITH M. PHALT NCRETE AVEL T FENCE RBIDITY CL BOOM	RIMETER ITOUR INT E LECTRICAL TION WELL	ERVAL 30 ng/kg TEQ
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Proje <b>Pl</b>	NORTHERN IN RELIMINARY 30% HARRIS COL	E PIT IPOUN REME JNTY. 1	S IDMEN DIAL D FEXAS	T Design
Proje	NORTHERN IN RELIMINARY 30% HARRIS COL	E PIT IPOUN REME JNTY, 1	S IDMEN DIAL D TEXAS	T Design
Proje	NORTHERN IN RELIMINARY 30% HARRIS COL	E PIT	S IDMEN DIAL D TEXAS	T Design
Proje PI	NORTHERN IN RELIMINARY 30% HARRIS COU		S IDMEN DIAL D TEXAS	T ESIGN
Proje Pl	SAN JACI WAST NORTHERN IN RELIMINARY 30% HARRIS COU	E PIT	S IDMEN DIAL D TEXAS	T ESIGN 05/28/2020
Proje PI	SAN JACI WAST NORTHERN IN RELIMINARY 30% HARRIS COU 30% EPA REVIEW 30% CLIENT REVIEW		S IDMEN DIAL D TEXAS RH RH	T ESIGN 05/28/2020 05/15/2020
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5 SEDIMENT LOG

C-05

DETAIL

N.T.S.

STEEL GALVANIZED -TOP TENSION CABLE

NOTES

N.T.S.

TOP LOAD LINE VINYL COATED CABLE FLOTATION CORE	GHD         5551 Corporate Boulevard Suite 200         Baton Rouge Louisiana USA         T 225 292 9007         F 225 952 2978
BRIGHT COLOR IMPERMEABLE CURTAIN FABRIC 45 MIL THICK 20 oz/ SY CHAIN BALLAST CHAIN BALLAST APPROX 12" RIVER BED	Reuse of Documents This document and the ideas and designs incorporated herein, as an instrument of professional service, is the property of GHD and shall not be reused in whole or in part for any other project without GHD's written authorization. © 2020 GHD
NOTES          1. TURBIDITY CURTAIN SHALL BE TYPE II ACCORDING TO DEPARTMENT OF THE ARMY, US ARMY CORPS OF ENGINEERS WASHINGTON, D.C. ENGINEERSING AND DESIGN "HANDBOOK FOR THE PEPARATION OF STORM WATER POLLUTION PREVENTION PLANS FOR CONSTRUCTION ACTURINES", APPENDIX'C' BMP 27 TURBIDITY CURTAIN, DOCUMENT EP1110-1-16, 1997.          2. CURTAIN SYSTEM SHALL BE COUPPED WITH LOAD TRANSFER TYPE PANEL CONNECTORS, HEAT SALED FABRIC SEAMS AND TIGHT SKIRT JOINTS.         3. INCLUDE MOORING SYSTEM IF REQUIRED. <b>DETAIL</b> 3         ATTURBIDITY CURTAINS         N.T.S.	
	Client SAN JACINTO RIVER WASTE PITS Project NORTHERN IMPOUNDMENT PRELIMINARY 30% REMEDIAL DESIGN HARRIS COUNTY, TEXAS
	2       30% EPA REVIEW       MW       RH       05/28/2020         1       30% CLIENT REVIEW       MW       RH       05/15/2020         No.       Issue       Drawn       Approved       Date         Drawn       MW       Designer       RH         Drafting       BP       Design       LL         Project       CM       Date       May 28, 2020         This document shall not be used for construction.       Scale       N.T.S.         Original Size       Bar is one inch on original size drawing       Date
PRELIMINARY         NOT FOR CONSTRUCTION         ENG:       Locicero         STATE:       TEXAS         LIC. NO:       132028         DATE:       5-28-2020         GHD SERVICES INC.         JOB NO.       11187072       FILE NO.       010         GHD TEXAS FRM REDISTRATION NO.       276	Project No. 11187072 Title SOIL EROSION AND SEDIMENT CONTROL DETAILS Sheet No. C-06
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		MV MC     P.P. PO     L.P. LIG     WELL WF	WER POLE HT POLE	vvell :			
		AS	PHALT NCRETE				
		GR	AVEL AFFIC FLO'	w			
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Plot Date: 28 May 2020 - 8:03 AM

Plotted By: Matt Wolfer

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Plot Date: 28 May 2020 - 8:03 AM

Plotted By: Matt Wolfer



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Plot Date: 28 May 2020 - 7:59 AM

Plotted By: Matt Wolfer

	HZ 1080M A TOP OF PILE WAI +9' ELEVATION					PAZ66/AZ38-700N		HZ 1080M A TOP OF PILE W/ +9' ELEVATIO
		GE	GEOTEXTILE AND/OR EOMEMBRANE BARRIER	ADE				
			BOTTOM OF EXCAVATION (ALONG PILE ALIGNMENT)	Image: section of the sectio				
PILE WALL PILE WALL		Image: Constraint of the sector of	Image: Constraint of the sector of	Image: section of the sectio	Image: Section of the sectio			
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		LL VATION -100'	Image: Constraint of the sector of	Image: section of the sectio	Image: state			PILE WALL TIP ELEVATION -100'
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**PROFILE** HORIZ: 1" = 60' VERT: 1' = 10'

NOTES:

- BOTTOM OF EXCAVATION IS SUBJECT TO CHANGE.
   CELL NUMBERS FOR IDENTIFICATION ONLY AND DO NOT R OF EXCAVATION SEQUENCING.
- OF EXCAVATION SEQUENCING. 3. BMP DESIGN IS SUBJECT TO CHANGE BASED ON ADDITION ANALYSIS AND ENGINEERING EVALUATION, AS WELL AS CONDITIONS AND ENGINEERING EVALUATIONS RESULTING FRO CONDITIONS CURRENTLY UNDER CONSIDERATION, BUT IS CANTILEVERED PILE COFFERDAM WITH A TOP OF PILE HEI NAVD88 AND IS COMPOSED OF A PAZ66/AZ38-700N PIPE-2
- PILE TIP DEPTH OF -80' NAVD88 AND A HZ 1080M A HZ-M WA TIP DEPTH OF -100' NAVD88.
  PILES SHOWN ON DRAWINGS DO NOT MEET MAXIMUM DEF CRITERIA TYPICALLY USED FOR PILE WALLS. SECTIONS AF MEET STABILITY AND STRENGTH REQUIREMENTS ONLY. M DEFLECTION CRITERIA WILL LEAD TO EITHER MUCH LARGE OR DIFFERENT WALL TYPE CONCEPTS OR A DIFFERENT DI
- BASED ON THE PILE DRIVING ANALYSIS PERFORMED, IT IS PILES WILL BE ABLE TO BE DRIVEN COMPLETELY AND PRA OF THE PILES IS POSSIBLE PRIOR TO REACHING REQUIRE
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- 7. HARD DRIVING CONDITIONS WILL CAUSE VIBRATIONS THR CAUSING SOIL PARTICLE ACCELERATION. THESE ACCELER CAUSE SLOPE INSTABILITY. PREDICTION OF DESIGN MAGN ACCELERATION IS HIGHLY VARIABLE DUE TO VARIABILITY CONDITIONS, TRANSFER OF FORCES FROM PILE TO SOIL, J
- PILE DRIVING ENERGY REQUIRED DURING ANY PHASE OF
   8. CONSIDERATION OF ADDITIONAL DESIGN SECTIONS ALON: OF CELL WALL COULD RESULT IN LARGER PILE SECTIONS, DRIVE PILES TO REQUIRED DEPTH DUE TO DIFFICULT DRIV
- AND/OR REFUSAL PRIOR TO REQUIRED TIP DEPTH.
  9. SCHEDULE AND CONSTRUCTABILITY WILL BE IMPACTED B LARGE PILE SIZES AND DEPTHS AND MAY BE ADDITIONALI DEEMED IMPRACTICAL BY DIFFICULT DRIVING CONDITION GEOTECHNICAL UNCERTAINTIES.

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Plot Date: 28 May 2020 - 7:34 AM

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	LEC 	GEND AA CAP PERIMETER STING CONTOUR INTERVAL ICELINE POF BANK OF BANK OF SLOPE SRHEAD ELECTRICAL ARDRAIL ELINE RING LOCATION NITORING WELL VER POLE HT POLE LL EA WITH MATERIAL >30 ng/kg TEQ PHALT NCRETE AVEL 66/AZ38-700N PILE
	SOURCE: TOPOGRAPHIC, HYDRO SURVEY OF SAN JACINTO RIVER TEXAS, MORRISON SURVEYING AUGUST 2, 2019 Client Client Project NORTHERN IN PRELIMINARY 30%	DGRAPHIC, & MAGNETOMETER WASTE PITS, HARRIS COUNTY, INC., 190608 , JULY 8, 2019 TO NTO RIVER E PITS NPOUNDMENT REMEDIAL DESIGN
<ul> <li>NOTES:</li> <li>FINAL EXCAVATION CONTOURS ARE SUBJECT TO CHANGE.</li> <li>CELL NUMBERS FOR IDENTIFICATION ONLY AND DO NOT REPRESENT ORDER OF EXCAVATION SEQUENCING.</li> <li>BMP DESIGN IS SUBJECT TO CHANGE BASED ON ADDITIONAL DATA ANALYSIS AND ENGINEERING EVALUATION, AS WELL AS CHANGES IN POTENTIAL WATER SURFACE ELEVATIONS RESULTING FROM UPSTREAM CONDITIONS CURRENTLY UNDER CONSIDERATION, BUT IS SHOWN AS A CANTILEVERED PILE COFFERDAM WITH A TOP OF PILE HEIGHT OF +9' NAVD88 AND IS COMPOSED OF A PA266/A238-700N PIPE-Z SYSTEM WITH A PILE TIP DEPTH OF -80' NAVD88 AND A HZ 1080M A HZ-M WALL WITH A PILE TIP DEPTH OF -100' NAVD88.</li> <li>PILES SHOWN ON DRAWINGS DO NOT MEET MAXIMUM DEFLECTION CRITERIA TYPICALLY USED FOR PILE WALLS. SECTIONS ARE SHOWN THAT MEET STABILITY AND STRENGTH REQUIREMENTS ONLY. MEETING DEFLECTION CRITERIA WILL LEAD TO EITHER MUCH LARGER PILE SECTIONS OR DIFFERENT WALL TYPE CONCEPTS OR A DIFFERENT DESIGN APPROACH.</li> <li>BASED ON THE PILE DRIVING ANALYSIS PERFORMED, IT IS UNCERTAIN THAT PILES WILL BE ABLE TO BE DRIVEN COMPLETELY AND PRACTICAL REFUSAL OF THE PILES IS POSSIBLE PRIOR TO REACHING REQUIRED PILE TIP DEPTH.</li> <li>HARD PILE DRIVING CONDITIONS COULD LEAD TO LATERAL MOVEMENT OF THE PILES CREATING ALIGNMENT ISSUES.</li> <li>HARD DRIVING CONDITIONS WILL CAUSE VIBRATIONS THROUGH SOIL CAUSING SOIL PARTICLE ACCELERATION. THESE ACCELERATIONS MAY CAUSING SOIL PARTICLE DACCELERATION. THESE ACCELERATIONS MAY CAUSING SOIL PARTICLE ORCELERATION. THESE ACCELERATIONS FOR OF DIFFURENT OF DE DRIVEN CONDITIONS COULD LEAD TO LATERAL MOVEMENT OF THE PILES OF DARTICLE ACCELERATION. THESE ACCELERATIONS MAY CAUSING SOIL PARTICLE ACCELERATION. THESE ACCELERATIONS MAY CAUSING SOIL PARTICLE ORCELERATION. THESE ACCELERATIONS COULD CAUSING SOIL PARTICLE OR DE DESTION ON DESTING ADDITIONS COULD DESTING ADDE INSTRUCTION OF DESTING AND COULS ADDITIONS WILL CAUSING SOIL PARTICLE ACCELERATIONS THROUGH SOIL CAUSING SOIL PARTICLE ACCELERATION. THESE ACCELERATIONS ANALY CAUSES ON DE MANDER DED DED DED TO ATER</li></ul>	HARRIS COU	INTY, TEXAS INTY,
ACCELERATION IS HIGHLY VARIABLE DUE TO VARIABILITY OF SOIL ACCELERATION IS HIGHLY VARIABLE DUE TO VARIABILITY OF SOIL CONDITIONS, TRANSFER OF FORCES FROM PILE TO SOIL, AND AMOUNT OF PILE DRIVING ENERGY REQUIRED DURING ANY PHASE OF DRIVING. 8. CONSIDERATION OF ADDITIONAL DESIGN SECTIONS, IAND AMOUNT OF DRIVE PILES TO REQUIRED DEPTH DUE TO DIFFICULT DRIVING CONDITIONS, AND/OR REFUSAL PRIOR TO REQUIRED TIP DEPTH. 9. SCHEDULE AND CONSTRUCTABILITY WILL BE IMPACTED BY THE PREDICTED LARGE PILE SIZES AND DEPTHS AND MAY BE ADDITIONALLY AFFECTED OR DEEMED IMPRACTICAL BY DIFFICULT DRIVING CONDITIONS AND GEOTECHNICAL UNCERTAINTIES.	Project CM Coordinator This document shall not be used for construction unless signed and sealed for construction. Original Size Arch D Project No. 11187072 Title EXCAVAT CEL	Date May 28, 2020 Scale 1" = 30' Bar is one inch on original size drawing 0 1"
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Plot Date: 28 May 2020 - 8:03 AM

Plotted By: Matt Wolfer

NOTES:

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- SCHEDULE AND CONSTRUCTABILITY WILL BE IMPACTED BY THE PREDICTED LARGE PILE SIZES AND DEPTHS AND MAY BE ADDITIONALLY AFFECTED OR DEEMED IMPRACTICAL BY DIFFICULT DRIVING CONDITIONS AND GEOTECHNICAL UNCERTAINTIES.

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STATE:	<u>132028</u>		
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4	GHD GHE	D SERVICES INC.	
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	CONDITIONS CURRENTLY UNDER CONSIDERATION, BUT IS SHOWN AS A CANTILEVERED PILE COFFERDAM WITH A TOP OF PILE HEIGHT OF +9'		
	PILE TIP DEPTH OF -80' NAVD88 AND A HZ 1080M A HZ-M WALL WITH A PILE TIP DEPTH OF -100' NAVD88	2 30% EPA REVIEW	MW SC 05/28/2020
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NOTES:

- BOTTOM OF EXCAVATION IS SUBJECT TO CHANGE.
   CELL NUMBERS FOR IDENTIFICATION ONLY AND DO NOT REPRESENT ORDER OF EXCAVATION SEQUENCING.
- 3. BMP DESIGN IS SUBJECT TO CHANGE BASED ON ADDITIONAL DATA ANALYSIS AND ENGINEERING EVALUATION, AS WELL AS CHANGES IN POTENTIAL WATER SURFACE ELEVATIONS RESULTING FROM UPSTREAM CONDITIONS CURRENTLY UNDER CONSIDERATION, BUT IS SHOWN AS A CANTILEVERED PILE COFFERDAM WITH A TOP OF PILE HEIGHT OF +9' NAVD88 AND IS COMPOSED OF A PAZ66/AZ38-700N PIPE-Z SYSTEM WITH A
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- PILES WILL BE ABLE TO BE DRIVEN COMPLETELY AND PRACTICAL REFUSAL OF THE PILES IS POSSIBLE PRIOR TO REACHING REQUIRED PILE TIP DEPTH. 6. HARD PILE DRIVING CONDITIONS COULD LEAD TO LATERAL MOVEMENT OF THE PILES CREATING ALIGNMENT ISSUES.
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![](_page_17_Picture_11.jpeg)

![](_page_17_Figure_12.jpeg)

HZ 1080M A

TOP OF PILE WALL

+9' ELEVATION

5. BASED ON THE PILE DRIVING ANALYSIS PERFORMED, IT IS UNCERTAIN THAT

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PRELIMINARY	Project No.
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ENG: <u>Logan V. Locicero</u> STATE: <u>TEXAS</u> LIC. NO: <u>132028</u> DATE: <u>5-28-2020</u>	
GHD GHD SERVICES INC.	
JOB NO, <u>11187072</u> FILE NO, <u>010</u> GHD TEXAS FIRM REGISTRATION NO. <u>276</u>	Sheet No.

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<ul> <li>CONDITIONS, TRANSPER OF FORCES FROM FILE TO SOIL, AND AMOUNT OF PILE DRIVING ENERGY REQUIRED DURING ANY PHASE OF DRIVING.</li> <li>8. CONSIDERATION OF ADDITIONAL DESIGN SECTIONS ALONG EACH LENGTH OF CELL WALL COLOUR RESULT IN LARGER FILE SECTIONS, INABILITY TO</li> </ul>	This document shall not be used for construction unless signed and sealed for	Scale 1" = 30'
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Plot Date: 28 May 2020 - 8:04 AM

Plotted By: Matt Wolfer

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- 1. BOTTOM OF EXCAVATION IS SUBJECT TO CHANGE. CELL NUMBERS FOR IDENTIFICATION ONLY AND DO NO OF EXCAVATION SEQUENCING.
- 3. BMP DESIGN IS SUBJECT TO CHANGE BASED ON ADDITIONAL DATA ANALYSIS AND ENGINEERING EVALUATION, AS WELL AS CHANGES IN POTENTIAL WATER SURFACE ELEVATIONS RESULTING FROM UPSTREAM CONDITIONS CURRENTLY UNDER CONSIDERATION, BUT IS SHOWN AS A CANTILEVERED PILE COFFERDAM WITH A TOP OF PILE HEIGHT OF +9' NAVD88 AND IS COMPOSED OF A PAZ66/AZ38-700N PIPE-Z SYSTEM WITH A
- PILE TIP DEPTH OF -80' NAVD88 AND A HZ 1080M A HZ-M WALL WITH A PILE TIP DEPTH OF -100' NAVD88.
  PILES SHOWN ON DRAWINGS DO NOT MEET MAXIMUM DEFLECTION CRITERIA TYPICALLY USED FOR PILE WALLS. SECTIONS ARE SHOWN THAT MEET STABILITY AND STRENGTH REQUIREMENTS ONLY. MEETING DEFLECTION CRITERIA WILL LEAD TO EITHER MUCH LARGER PILE SECTIONS OR DIFFERENT WALL TYPE CONCEPTS OR A DIFFERENT DESIGN APPROACH.
- 5. BASED ON THE PILE DRIVING ANALYSIS PERFORMED, IT IS UNCERTAIN THAT PILES WILL BE ABLE TO BE DRIVEN COMPLETELY AND PRACTICAL REFUSAL OF THE PILES IS POSSIBLE PRIOR TO REACHING REQUIRED PILE TIP DEPTH. 6. HARD PILE DRIVING CONDITIONS COULD LEAD TO LATERAL MOVEMENT OF THE PILES CREATING ALIGNMENT ISSUES.
- 7. HARD DRIVING CONDITIONS WILL CAUSE VIBRATIONS THROUGH SOIL CAUSING SOIL PARTICLE ACCELERATION. THESE ACCELERATIONS MAY CAUSE SLOPE INSTABILITY. PREDICTION OF DESIGN MAGNITUDE OF SOIL ACCELERATION IS HIGHLY VARIABLE DUE TO VARIABILITY OF SOIL CONDITIONS, TRANSFER OF FORCES FROM PILE TO SOIL, AND AMOUNT OF
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GHD SERVICES INC.	

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Plot Date: 28 May 2020 - 7:57 AM

Plotted By: Matt Wolfer

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NOTES:

- 1. BOTTOM OF EXCAVATION IS SUBJECT TO CHANGE. CELL NUMBERS FOR IDENTIFICATION ONLY AND DO NOT REPRESENT ORDER OF EXCAVATION SEQUENCING.
- 3. BMP DESIGN IS SUBJECT TO CHANGE BASED ON ADDITIONAL DATA ANALYSIS AND ENGINEERING EVALUATION, AS WELL AS CHANGES IN POTENTIAL WATER SURFACE ELEVATIONS RESULTING FROM UPSTREAM CONDITIONS CURRENTLY UNDER CONSIDERATION, BUT IS SHOWN AS A CANTILEVERED PILE COFFERDAM WITH A TOP OF PILE HEIGHT OF +9' NAVD88 AND IS COMPOSED OF A PAZ66/AZ38-700N PIPE-Z SYSTEM WITH A
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- 9. SCHEDULE AND CONSTRUCTABILITY WILL BE IMPACTED BY THE PREDICTED LARGE PILE SIZES AND DEPTHS AND MAY BE ADDITIONALLY AFFECTED OR DEEMED IMPRACTICAL BY DIFFICULT DRIVING CONDITIONS AND GEOTECHNICAL UNCERTAINTIES.

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GHD

5551 Corporate Boulevard Suite 200 Baton Rouge Louisiana USA

T 225 292 9007 F 225 952 2978 W www.ghd.com

![](_page_22_Figure_0.jpeg)

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₹ <sup>SJ</sup> SB050	Reuse of Documents This document and the ideas and designs professional service, is the property of GHE for any other project without GHD's written a	s incorporated and shall no authorization.	I herein, as t be reused i © 2020 GHD	an instrument of n whole or in part
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N:\US\Baton Rouge\Legacy\BAT\Shared\Project Work Area\11180000s\11187072 - San Jacinto River Waste Pits Superfund Site - Remedial Filename: Design\Design\CAD\Sheets\11187072-00(010)\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187070Cl\11187072-00(010)Cl\11187072-0

Plot Date: 28 May 2020 - 8:04 AM

Plotted By: Matt Wolfer

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### NOTES:

- 1. BOTTOM OF EXCAVATION IS SUBJECT TO CHANGE. CELL NUMBERS FOR IDENTIFICATION ONLY AND DO NO OF EXCAVATION SEQUENCING.
- 3. BMP DESIGN IS SUBJECT TO CHANGE BASED ON ADDITIONAL DATA ANALYSIS AND ENGINEERING EVALUATION, AS WELL AS CHANGES IN POTENTIAL WATER SURFACE ELEVATIONS RESULTING FROM UPSTREAM CONDITIONS CURRENTLY UNDER CONSIDERATION, BUT IS SHOWN AS A CANTILEVERED PILE COFFERDAM WITH A TOP OF PILE HEIGHT OF +9' NAVD88 AND IS COMPOSED OF A PAZ66/AZ38-700N PIPE-Z SYSTEM WITH A
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- 5. BASED ON THE PILE DRIVING ANALYSIS PERFORMED, IT IS UNCERTAIN THAT PILES WILL BE ABLE TO BE DRIVEN COMPLETELY AND PRACTICAL REFUSAL OF THE PILES IS POSSIBLE PRIOR TO REACHING REQUIRED PILE TIP DEPTH. 6. HARD PILE DRIVING CONDITIONS COULD LEAD TO LATERAL MOVEMENT OF
- THE PILES CREATING ALIGNMENT ISSUES. 7. HARD DRIVING CONDITIONS WILL CAUSE VIBRATIONS THROUGH SOIL CAUSING SOIL PARTICLE ACCELERATION. THESE ACCELERATIONS MAY CAUSE SLOPE INSTABILITY. PREDICTION OF DESIGN MAGNITUDE OF SOIL ACCELERATION IS HIGHLY VARIABLE DUE TO VARIABILITY OF SOIL CONDITIONS, TRANSFER OF FORCES FROM PILE TO SOIL, AND AMOUNT OF
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**PROFILE** HORIZ: 1" = 60' VERT: 1' = 10'

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Plot Date: 28 May 2020 - 8:13 AM

Plotted By: Matt Wolfer

NOTES:

- BOTTOM OF EXCAVATION IS SUBJECT TO CHANGE.
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Plotted By: Matt Wolfer

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Plot Date: 28 May 2020 - 8:11 AM

Plotted By: Matt Wolfer

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5. BASED ON THE PILE DRIVING ANALYSIS PERFORMED, IT IS UNCERTAIN THAT

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Sheet - of -

PROFILE

CELL 5

Sheet No.

![](_page_30_Figure_0.jpeg)

![](_page_30_Figure_1.jpeg)

![](_page_30_Figure_2.jpeg)

NOTES:

- 1. BOTTOM OF EXCAVATION IS SUBJECT TO CHANGE. 2. BMP DESIGN IS SUBJECT TO CHANGE BASED ON ADDITIONAL DATA ANALYSIS AND ENGINEERING EVALUATION, AS WELL AS CHANGES IN POTENTIAL WATER SURFACE ELEVATIONS RESULTING FROM UPSTREAM CONDITIONS CURRENTLY UNDER CONSIDERATION, BUT IS SHOWN AS A CANTILEVERED PILE COFFERDAM WITH A TOP OF PILE HEIGHT OF +9' NAVD88 AND IS COMPOSED OF A PAZ66/AZ38-700N PIPE-Z SYSTEM WITH A PILE TIP DEPTH OF -80' NAVD88 AND A HZ 1080M A HZ-M WALL WITH A PILE TIP DEPTH OF -100' NAVD88.
- 3. PILES SHOWN ON DRAWINGS DO NOT MEET MAXIMUM DEFLECTION CRITERIA TYPICALLY USED FOR PILE WALLS. SECTIONS ARE SHOWN THAT MEET STABILITY AND STRENGTH REQUIREMENTS ONLY. MEETING DEFLECTION CRITERIA WILL LEAD TO EITHER MUCH LARGER PILE SECTIONS
- OR DIFFERENT WALL TYPE CONCEPTS OR A DIFFERENT DESIGN APPROACH. 4. BASED ON THE PILE DRIVING ANALYSIS PERFORMED, IT IS UNCERTAIN THAT PILES WILL BE ABLE TO BE DRIVEN COMPLETELY AND PRACTICAL REFUSAL OF THE PILES IS POSSIBLE PRIOR TO REACHING REQUIRED PILE TIP DEPTH.
- 5. HARD PILE DRIVING CONDITIONS COULD LEAD TO LATERAL MOVEMENT OF THE PILES CREATING ALIGNMENT ISSUES. 6. HARD DRIVING CONDITIONS WILL CAUSE VIBRATIONS THROUGH SOIL
- CAUSING SOIL PARTICLE ACCELERATION. THESE ACCELERATIONS MAY CAUSE SLOPE INSTABILITY. PREDICTION OF DESIGN MAGNITUDE OF SOIL ACCELERATION IS HIGHLY VARIABLE DUE TO VARIABILITY OF SOIL CONDITIONS, TRANSFER OF FORCES FROM PILE TO SOIL, AND AMOUNT OF PILE DRIVING ENERGY REQUIRED DURING ANY PHASE OF DRIVING.
- 7. CONSIDERATION OF ADDITIONAL DESIGN SECTIONS ALONG EACH LENGTH OF CELL WALL COULD RESULT IN LARGER PILE SECTIONS, INABILITY TO DRIVE PILES TO REQUIRED DEPTH DUE TO DIFFICULT DRIVING CONDITIONS, AND/OR REFUSAL PRIOR TO REQUIRED TIP DEPTH.
- 8. SCHEDULE AND CONSTRUCTABILITY WILL BE IMPACTED BY THE PREDICTED LARGE PILE SIZES AND DEPTHS AND MAY BE ADDITIONALLY AFFECTED OR DEEMED IMPRACTICAL BY DIFFICULT DRIVING CONDITIONS AND GEOTECHNICAL UNCERTAINTIES.

PRELIMINARY
NOT FOR CONSTRUCTION
ENG: Logan M. Locicero State. TEXAS
LIC. NO: $132028$
DATE:
GHD SERVICES INC.
JOB NO. 11187072 FILE NO. 010
GHD TEXAS FIRM REGISTRATION NO

	GHD         551 Corporate Boulevard Suite 200         Baton Rouge Louisiana USA         T 225 292 9007         F 225 952 2978         W www.ghd.com									
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1	30% CLIENT REVIEW	MW	sc	05/15/2020						
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Draw	m <b>MW</b>	Designer	RH							
Drafti Chec	<sup>ng</sup> BP	Design Check	LL							
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Project No. 1118/0/2 Title PILE DETAILS										
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![](_page_31_Figure_0.jpeg)

![](_page_32_Figure_0.jpeg)

PLAN

EXISTING GRADE —  $\overline{}$ 

N:\US\Baton Rouge\Legacy\BAT\Shared\Project Work Area\11180000s\11187072 - San Jacinto River Waste Pits Superfund Site - Remedial Filename: Design\CAD\Sheets\11187072-00(010)\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187072-00(010)Cl\11187070Cl\11187072-00(010)Cl\11187072-00(010)C

NOTES:

Plot Date: 28 May 2020 - 8:34 AM

Plotted By: Matt Wolfer

1. TYPICAL DETAILS SHOWN AT DEWATERING AND SOLIDIFICATION AREA MAY BE REVISED BY THE CONTRACTOR. CONTRACTOR'S REVISED DETAILS SHALL BE SUBMITTED FOR REVIEW PRIOR TO CONSTRUCTION.

![](_page_32_Figure_4.jpeg)

![](_page_32_Figure_5.jpeg)

DRUM DIAMETER

![](_page_32_Figure_6.jpeg)

![](_page_32_Figure_7.jpeg)

![](_page_32_Picture_8.jpeg)

## - GEOTEXTILE FABRIC AROUND DRUM HOLES

— AGGREGATE

INER ANCHOR TRENCH	
NEEDLE PUNCHED WT: 12oz / sq.yd (TYP.)	

PRELIMINA	ARY
NOT FOR	CONSTRUCTION
ENG: <u>logan M. Locicero</u> STATE: <u>TEXAS</u> LIC. NO: <u>132028</u> DATE: <u>5–28–2020</u>	
Б сн	D SERVICES INC.

JOB NO. 11187072 FILE NO. 010 ghd texas firm registration no. 276

![](_page_32_Picture_14.jpeg)

Sheet - of -

**C-31** 

![](_page_33_Figure_0.jpeg)

![](_page_34_Figure_0.jpeg)

Streams		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	20	21	22	23	24
	Units	Contact Water	Storage Tank Effluent	Rapid Mix Tank Influent	Coagulant Feed	Organosulfide Feed	Polymer Feed	Flocculation Tank Influent	Flocculation Tank Effluent	Clarifier Effluent	Clarifier Underflow	Sludge Recycle	Sludge to Thickener	Sludge to Solidification	Decant to Storage Tank(s)	Polymer Feed	Mulitmedia Filter	Multimedia Filter Effluent	Multimedia Filter Backwash	Absolute Filter Feed	GAC Adsorber Feed	Effluent Storage Tank Feed	Service Water Storage Tank Effluent	Discharge
Volumetric Flow	gpm	600	421	772	0.02	0.03	0.2	773	773	304	468	351	117	17	100	0.059	304	21	21	304	304	304	304	284
Total Mass Flow	lb/hr	300,240	210,805	386,519	14	14	107	394,369	386,660	152,351	241,313	180,985	60,328	10,013	50,227	30	152,351	10,458	10,458	152,347	152,347	152,347	152,347	141,888
Suspended Solids	%	0.41%	0.29%	0.61%	0.50%	0.50%	1.00%	0.61%	0.61%	0.00%	1.00%	1.00%	1.00%	6.00%	0.01%	1.00%	0.00%	0.00%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%
Chemical Feed	ppm				50.0	50.0	500.0									500.0								
Chem Solids Generation	lb/lb				0.3	0.3	0.01									0.01								
Chem Solids Generation	lb/hr				3.2	3.2	1.1									0.0								
Mass Flow Liquid	lb/hr	299,024	210, 193	384,150	11	11	105	391,951	384,290	152,347	238,900	179,175	59,725	9,412	50,225	29	0	10,458	10,457	152,347	152,347	152,347	152,347	141,888
Mass Flow Solids	lb/hr	1,216	612	2,369	3.2	3.2	1.1	2,418	2,370	4.6	2,413	1,810	603	601	2.5	0.3	4.6	0.02	1.5	0.6	0.3	0.3	0.3	0.3
Specific Gravity		1.0	1.0	1.0	1.3	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.2	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Density	lb/cf	62.4	62.4	62.4	81.1	62.4	62.4	63.6	62.4	62.4	64.3	64.3	64.3	74.9	62.4	62.4	62.4	62.4	62.4	62.4	62.4	62.4	62.4	62.4

NOTE: 1. SOME PROCESS FLOWS ARE AVERAGED OVER ESTIMATED TOTAL OPERATING CYCLE. PROCESS FLOW/MASS BALANCE SHOULD NOT BE USED FOR EQUIPMENT SIZING PURPOSES 2. TREATMENT IS 300 GPM PLUS RECYCLE FLOWS. 3. THE TREATMENT SYSTEM DESIGNS ARE PRELIMINARY AND SUBJECT TO CHANGE.

![](_page_34_Picture_9.jpeg)

PREI	LIMIN	ARY
NOT	FOR	CONSTRUCTION
ENG: Ke	eith Brecheen	
STATE:	TEXAS	
LIC. NO:	<u>130378</u>	
DATE:	<u>5–28–2020</u>	
L		

![](_page_34_Picture_11.jpeg)

![](_page_34_Picture_12.jpeg)

![](_page_35_Figure_0.jpeg)

![](_page_36_Figure_0.jpeg)

![](_page_36_Figure_3.jpeg)

![](_page_36_Picture_4.jpeg)

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P-02 TO TK-2000 OR STORAGE TANK 012	Project NORTHERN IMPOUNDMENT PRELIMINARY 30% REMEDIAL DESIGN HARRIS COUNTY, TEXAS
DGE R PUMP D13 THICKENED SLUDGE HOLDING TANK(S) TK-3004 P-02	Image: constraint of the systemImage: constraint of the systemImage: constraint of the systemImage: constraint of the system130% CLIENT REVIEWBPNF05/15/2020130% CLIENT REVIEWBPNFDateNo.IssueDrawnApprovedDateNo.IssueDrawnApprovedDateDrawnBPDesignerKJDraftingMWDesign CheckNFProjectCMDateMay 28, 2020
	This document shall not be used for construction unless signed and sealed for construction.       Scale       N.T.S.         Original Size       Bar is one inch on original size drawing       0       1"         Project No.       11187072       1"         Title       WATER TREATMENT SYSTEM APPROACH A P&ID (2 OF 2)       P&ID (2 OF 2)
CONSTRUCTION       GHD SERVICES INC.         JOB NO. 11187072       FILE NO. 010         GHD TEXAS FIRM REGISTRATION NO. 276	Sheet No. P-03 Sheet - of -

![](_page_37_Figure_0.jpeg)

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	LIMINA FOR eith Brecheen TEXAS 130378 5–28–2020

GHD SERVICES INC.

JOB NO. 11187072 FILE NO. 010

GHD TEXAS FIRM REGISTRATION NO. 276

![](_page_38_Figure_0.jpeg)

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A STATE AND IT PRAY       Image: Device And It Pray       Image: Devic	<sup>1</sup> Stramp <sup>1</sup> St		ORGANOSI	SULFIDE COAGULANT POLYI	F MER 4 IN-LINE MIXII AND FLOCCULA	5 I NG ATION		DEWATER GEO DEWATER DEWATER	RING BOX I			ML	JLTIMEDIA FILTER(S)	7 NOMINA FILTE	AL BAG ER(S)	ABSC FILTI	DLUTE PER(S)	9	GAC ADSORBE (LEAD/LA	ERS (G) 10	LISCHARGE TO RIVER	Reuse of Documents This document and the ideas and design professional service, is the property of GHD for any other project without GHD's written a	s incorporated herein, as an instr D and shall not be reused in whole authorization. © 2020 GHD
NINCR PROCESS FLOW       SUBJECT PROCESS FLOW       SUBJECT PROCESS STRAMS       Subject	- MORTPROCESS FLow       Differential Flow       0 mm       0 mm </th <th>Image: control display in the second display in the seco</th> <th>ACTIVE CELL</th> <th></th> <th></th> <th></th> <th></th> <th>GEO</th> <th>OTUBE RING BOX IV 16 DEWATERED SOLIDS TO DISPOSED BASED O ABAB CHIDELINES</th> <th>O BE</th> <th>15</th> <th>-</th> <th></th> <th>1: PLANT SERV (LINE FLUSH</th> <th>2 /ICE WATER HING, ETC)</th> <th></th> <th></th> <th></th> <th>WATER TANK NEEDED)</th> <th></th> <th></th> <th></th> <th></th>	Image: control display in the second display in the seco	ACTIVE CELL					GEO	OTUBE RING BOX IV 16 DEWATERED SOLIDS TO DISPOSED BASED O ABAB CHIDELINES	O BE	15	-		1: PLANT SERV (LINE FLUSH	2 /ICE WATER HING, ETC)				WATER TANK NEEDED)				
Streams         1         2         3         4         5         6         7         8         9         10         11         12         13         14         15         16           Linits         Linits         Contact Water         Organosulfide         Cogulant         Peed         Polymer         Geotube         Filter(s) Feed         Absolute         Filter(s) Feed         Absolute         Filter(s) Feed	Streams         1         2         3         4         5         6         7         8         9         10         11         12         13         14         15         16           Line         Line         Contact Water         Organosulfide         Coaguint         Feed         Polymer         Contact Water         Polymer         Feed         Geotube(s) Feed         Geotube(s) Feed         Filter(s) Feed         Filter(s) Feed         GAC         Adsorber(s)         Feed         Dirty         Dirty         Dirty         Dirty         Dirty         Solidification           Volumetric Flow         gpm         2,000         0.010         0.028         1.002,007         2.097         2.097         2.097         2.097         2.097         2.097         2.097         2.097         2.097         2.097         2.097         2.097         2.097         2.097         2.097         2.097         2.097         2.097         2.097         2.097         2.097         2.097         2.097         2.097         2.097         2.097         2.097         2.097         2.097         2.097         2.097         2.097         2.097         2.097         2.097         2.097         2.097         7.0141         140         <	Steams         i         2         3         4         5         6         7         8         9         10         11         12         13         14         16         16           Line         Contact Ward         Openantific         Contact Ward         Contact Ward         Provide         Pro	MAJOR PROCESS FLOW						ARAR GOIDELINES		13 R	RETURN TO THE A	CTIVE CELL									Client	
Huris         And Section         Organosulfie         Organosulfie         Polyme	Lunis         And Section         Organization         Ore	Initial Section         Organization         Organicion         Organization         Organization	<ul> <li>MAJOR PROCESS FLOW</li> <li>MINOR PROCESS FLOW</li> </ul>							WATER TREATM		CESS STREAMS	CTIVE CELL									Client SAN JACIN WAST Project	NTO RIVER E PITS
Volumetric Flow       opp       2,000       0.000       0.000       0.000       2,000       2,000       2,000       2,000       2,000       1,000,000       1,000,000       0.000       0.000       0.000       0.000       0.000       0.000       0.000       0.000       0.000       0.000       0.000       0.000       0.000       0.000       0.000       0.000       0.000       0.000       0.000       0.000       0.000       0.000       0.000       0.000       0.000       0.000       0.000       0.000       0.000       0.000       0.000       0.000       0.000       0.000       0.000       0.000       0.000       0.000       0.000       0.000       0.000       0.000       0.000       0.000       0.000       0.000       0.000       0.000       0.000       0.000       0.000       0.000       0.000       0.000       0.000       0.000       0.000       0.000       0.000       0.000       0.000       0.000       0.000       0.000       0.000       0.000       0.000       0.000       0.000       0.000       0.000       0.000       0.000       0.000       0.000       0.000       0.000       0.000       0.000       0.000       0.000       0.000       0.0	Volumetric Flow       gpm       2,000       0.0       0.008       1.00       2,142       2,097       2,097       2,097       2,097       2,097       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       2.142       2.097       2.097       2.097       2.097       2.097       2.097       2.097       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00	noimatic Flow       gpm       2.00       0.01       0.00       1.00       2.44       2.09       2.09       2.09       2.09       4.00       4.00       4.00       1.09       2.05       1.01       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00 </th <th><ul> <li>MAJOR PROCESS FLOW</li> <li>MINOR PROCESS FLOW</li> <li>Streams</li> </ul></th> <th></th> <th>1</th> <th>2</th> <th>3</th> <th>4</th> <th>S</th> <th>WATER TREATM</th> <th>ENT PLANT PROC</th> <th>CESS STREAMS</th> <th>9</th> <th>10</th> <th>11</th> <th>12</th> <th>13</th> <th>14</th> <th>15</th> <th>16</th> <th></th> <th>Client SAN JACIN WAST Project NORTHERN IN PRELIMINARY 30%</th> <th>NTO RIVER E PITS NPOUNDMENT REMEDIAL DESI</th>	<ul> <li>MAJOR PROCESS FLOW</li> <li>MINOR PROCESS FLOW</li> <li>Streams</li> </ul>		1	2	3	4	S	WATER TREATM	ENT PLANT PROC	CESS STREAMS	9	10	11	12	13	14	15	16		Client SAN JACIN WAST Project NORTHERN IN PRELIMINARY 30%	NTO RIVER E PITS NPOUNDMENT REMEDIAL DESI
Total Mass Flow       Ib/hr       1,000,800       5.00       5.00       1,072,077       1,049,323       1,049,133       1,049,139       1,049,139       70,056       70,056       70,141       979,073       22,845         Suspended Solids       %       0.01%       0.00%       0.01%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.01%       0.01%       0.01%       0.01%       0.01%       0.01%       0.01%       0.01%       0.01%       0.01%       0.01%       0.01%       0.01%       0.01%       0.01%       0.01%       0.01%       0.01%       0.01%       0.01%       0.01%       0.01%       0.01%       0.01%       0.01%       0.01%       0.01%       0.01%       0.01%       0.01%       0.01%       0.01%       0.01%       0.01%       0.01%       0.01%       0.01%       0.01%       0.01%       0.01%       0.01%       0.01%       0.01%       0.01%       0.01%       0.01%       0.01%       0.01%       0.01%       0.01%       0.01%       0.01%       0.01%       0.01%       0.01%       0.01%       0.01%       0.01%       0.01%       0.01%       0.01%       0.01%       0.01%       0.01%       0.01%       0.01%       0.01% <t< th=""><td>Total Mass Flow       Ibbr       1,000,800       500       500       1,072,077       1,049,232       1,049,147       1,049,130       1,049,120       70,066       70,016       70,141       70,141       979,073       22,845         Suspended Solids       %       0.41%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       <th< td=""><td>indim       1,000,00       50       50       50       1,072,07       1,049,122       1,049,123       1,049,128       1,049,128       1,049,128       1,049,128       1,049,128       1,049,128       1,049,128       1,049,128       1,049,128       1,049,128       1,049,128       1,049,128       1,049,128       1,049,128       1,049,128       1,049,128       1,049,128       1,049,128       1,049,128       1,049,128       1,049,128       0,006       0,006       0,018       0,018       0,018       0,006       0,008       0,008       0,018       0,018       0,008       0,008       0,008       0,018       0,018       0,008       0,008       0,008       0,018       0,018       0,018       0,008       0,008       0,018       0,018       0,018       0,018       0,018       0,018       0,018       0,018       0,018       0,018       0,018       0,018       0,018       0,018       0,018       0,018       0,018       0,018       0,018       0,018       0,018       0,018       0,018       0,018       0,018       0,018       0,018       0,018       0,018       0,018       0,018       0,018       0,018       0,018       0,018       0,018       0,018       0,018       0,018       0,018</td><td><ul> <li>MAJOR PROCESS FLOW</li> <li>MINOR PROCESS FLOW</li> <li>Streams</li> </ul></td><td>Units</td><td>1 Contact Water</td><td>2 Organosulfide Feed</td><td>3 Coagulant Feed</td><td>4 Polymer Feed</td><td>5 Geotube(s) Feed</td><td>WATER TREATMI 6 Geotube Effluent</td><td>ENT PLANT PROC 7 Nominal Bag Filter(s) Feed</td><td>ESS STREAMS 8 Absolute Filter(s) Feed</td><td>9 GAC Adsorber(s) Feed</td><td>10 GAC Adsorber(s) Effluent</td><td>11 Service Water Tank Feed</td><td>12 Plant Service Water Feed</td><td>13 Dirty Backwash to Storage Tank</td><td>14 Dirty Backwash Return</td><td>15 Treated Water Return to the Active Cell</td><td>16 Dewaterd Solids to Solidification</td><td></td><td>Client SAN JACIN WAST Project NORTHERN IN PRELIMINARY 30% HARRIS COL</td><td>NTO RIVER E PITS MPOUNDMENT REMEDIAL DESI JNTY, TEXAS</td></th<></td></t<>	Total Mass Flow       Ibbr       1,000,800       500       500       1,072,077       1,049,232       1,049,147       1,049,130       1,049,120       70,066       70,016       70,141       70,141       979,073       22,845         Suspended Solids       %       0.41%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00% <th< td=""><td>indim       1,000,00       50       50       50       1,072,07       1,049,122       1,049,123       1,049,128       1,049,128       1,049,128       1,049,128       1,049,128       1,049,128       1,049,128       1,049,128       1,049,128       1,049,128       1,049,128       1,049,128       1,049,128       1,049,128       1,049,128       1,049,128       1,049,128       1,049,128       1,049,128       1,049,128       1,049,128       0,006       0,006       0,018       0,018       0,018       0,006       0,008       0,008       0,018       0,018       0,008       0,008       0,008       0,018       0,018       0,008       0,008       0,008       0,018       0,018       0,018       0,008       0,008       0,018       0,018       0,018       0,018       0,018       0,018       0,018       0,018       0,018       0,018       0,018       0,018       0,018       0,018       0,018       0,018       0,018       0,018       0,018       0,018       0,018       0,018       0,018       0,018       0,018       0,018       0,018       0,018       0,018       0,018       0,018       0,018       0,018       0,018       0,018       0,018       0,018       0,018       0,018       0,018</td><td><ul> <li>MAJOR PROCESS FLOW</li> <li>MINOR PROCESS FLOW</li> <li>Streams</li> </ul></td><td>Units</td><td>1 Contact Water</td><td>2 Organosulfide Feed</td><td>3 Coagulant Feed</td><td>4 Polymer Feed</td><td>5 Geotube(s) Feed</td><td>WATER TREATMI 6 Geotube Effluent</td><td>ENT PLANT PROC 7 Nominal Bag Filter(s) Feed</td><td>ESS STREAMS 8 Absolute Filter(s) Feed</td><td>9 GAC Adsorber(s) Feed</td><td>10 GAC Adsorber(s) Effluent</td><td>11 Service Water Tank Feed</td><td>12 Plant Service Water Feed</td><td>13 Dirty Backwash to Storage Tank</td><td>14 Dirty Backwash Return</td><td>15 Treated Water Return to the Active Cell</td><td>16 Dewaterd Solids to Solidification</td><td></td><td>Client SAN JACIN WAST Project NORTHERN IN PRELIMINARY 30% HARRIS COL</td><td>NTO RIVER E PITS MPOUNDMENT REMEDIAL DESI JNTY, TEXAS</td></th<>	indim       1,000,00       50       50       50       1,072,07       1,049,122       1,049,123       1,049,128       1,049,128       1,049,128       1,049,128       1,049,128       1,049,128       1,049,128       1,049,128       1,049,128       1,049,128       1,049,128       1,049,128       1,049,128       1,049,128       1,049,128       1,049,128       1,049,128       1,049,128       1,049,128       1,049,128       1,049,128       0,006       0,006       0,018       0,018       0,018       0,006       0,008       0,008       0,018       0,018       0,008       0,008       0,008       0,018       0,018       0,008       0,008       0,008       0,018       0,018       0,018       0,008       0,008       0,018       0,018       0,018       0,018       0,018       0,018       0,018       0,018       0,018       0,018       0,018       0,018       0,018       0,018       0,018       0,018       0,018       0,018       0,018       0,018       0,018       0,018       0,018       0,018       0,018       0,018       0,018       0,018       0,018       0,018       0,018       0,018       0,018       0,018       0,018       0,018       0,018       0,018       0,018       0,018	<ul> <li>MAJOR PROCESS FLOW</li> <li>MINOR PROCESS FLOW</li> <li>Streams</li> </ul>	Units	1 Contact Water	2 Organosulfide Feed	3 Coagulant Feed	4 Polymer Feed	5 Geotube(s) Feed	WATER TREATMI 6 Geotube Effluent	ENT PLANT PROC 7 Nominal Bag Filter(s) Feed	ESS STREAMS 8 Absolute Filter(s) Feed	9 GAC Adsorber(s) Feed	10 GAC Adsorber(s) Effluent	11 Service Water Tank Feed	12 Plant Service Water Feed	13 Dirty Backwash to Storage Tank	14 Dirty Backwash Return	15 Treated Water Return to the Active Cell	16 Dewaterd Solids to Solidification		Client SAN JACIN WAST Project NORTHERN IN PRELIMINARY 30% HARRIS COL	NTO RIVER E PITS MPOUNDMENT REMEDIAL DESI JNTY, TEXAS
Suspended Solids       %       0.41%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%	Supported Solids       %       0.41%       0.00%       0.00%       0.00%       0.00%       0.00%       0.00%       0.12%       0.12%       0.00%       20.00%       20.00%         Chemical Feed       ppm       50.0       50.0       500.0       Col       Col <td>Singer of Solids       Singer of Solids       <th< td=""><td>MAJOR PROCESS FLOW MINOR PROCESS FLOW Streams olumetric Flow</td><td><b>Units</b> gpm</td><td>1 Contact Water 2,000</td><td>2 Organosulfide Feed 0.10</td><td>3 Coagulant Feed</td><td>4 Polymer Feed 1.00</td><td>5 Geotube(s) Feed</td><td>WATER TREATMI 6 Geotube Effluent 2,097</td><td>ENT PLANT PROC 7 Nominal Bag Filter(s) Feed 2,097</td><td>ESS STREAMS 8 Absolute Filter(s) Feed 2,097</td><td>9 GAC Adsorber(s) Feed 2,097</td><td>10 GAC Adsorber(s) Effluent</td><td>11ServiceWater TankFeed</td><td>12 Plant Service Water Feed</td><td>13 Dirty Backwash to Storage Tank</td><td>14 Dirty Backwash Return</td><td>15TreatedWater Returnto the ActiveCell01,957</td><td>16 Dewaterd Solids to Solidification</td><td>n 12</td><td>Client SAN JACIN WAST Project NORTHERN IN PRELIMINARY 30% HARRIS COL</td><td>NTO RIVER E PITS MPOUNDMENT REMEDIAL DESI JNTY, TEXAS</td></th<></td>	Singer of Solids       Singer of Solids <th< td=""><td>MAJOR PROCESS FLOW MINOR PROCESS FLOW Streams olumetric Flow</td><td><b>Units</b> gpm</td><td>1 Contact Water 2,000</td><td>2 Organosulfide Feed 0.10</td><td>3 Coagulant Feed</td><td>4 Polymer Feed 1.00</td><td>5 Geotube(s) Feed</td><td>WATER TREATMI 6 Geotube Effluent 2,097</td><td>ENT PLANT PROC 7 Nominal Bag Filter(s) Feed 2,097</td><td>ESS STREAMS 8 Absolute Filter(s) Feed 2,097</td><td>9 GAC Adsorber(s) Feed 2,097</td><td>10 GAC Adsorber(s) Effluent</td><td>11ServiceWater TankFeed</td><td>12 Plant Service Water Feed</td><td>13 Dirty Backwash to Storage Tank</td><td>14 Dirty Backwash Return</td><td>15TreatedWater Returnto the ActiveCell01,957</td><td>16 Dewaterd Solids to Solidification</td><td>n 12</td><td>Client SAN JACIN WAST Project NORTHERN IN PRELIMINARY 30% HARRIS COL</td><td>NTO RIVER E PITS MPOUNDMENT REMEDIAL DESI JNTY, TEXAS</td></th<>	MAJOR PROCESS FLOW MINOR PROCESS FLOW Streams olumetric Flow	<b>Units</b> gpm	1 Contact Water 2,000	2 Organosulfide Feed 0.10	3 Coagulant Feed	4 Polymer Feed 1.00	5 Geotube(s) Feed	WATER TREATMI 6 Geotube Effluent 2,097	ENT PLANT PROC 7 Nominal Bag Filter(s) Feed 2,097	ESS STREAMS 8 Absolute Filter(s) Feed 2,097	9 GAC Adsorber(s) Feed 2,097	10 GAC Adsorber(s) Effluent	11ServiceWater TankFeed	12 Plant Service Water Feed	13 Dirty Backwash to Storage Tank	14 Dirty Backwash Return	15TreatedWater Returnto the ActiveCell01,957	16 Dewaterd Solids to Solidification	n 12	Client SAN JACIN WAST Project NORTHERN IN PRELIMINARY 30% HARRIS COL	NTO RIVER E PITS MPOUNDMENT REMEDIAL DESI JNTY, TEXAS
	Chem Solids Generation       Ib/Ib       Sol.0       Sol	nemericand record       ppm       50.0       50.0       50.0       50.0       50.0       50.0       50.0       50.0       50.0       50.0       50.0       50.0       50.0       50.0       50.0       50.0       50.0       50.0       50.0       50.0       50.0       50.0       50.0       50.0       50.0       50.0       50.0       50.0       50.0       50.0       50.0       50.0       50.0       50.0       50.0       50.0       50.0       50.0       50.0       50.0       50.0       50.0       50.0       50.0       50.0       50.0       50.0       50.0       50.0       50.0       50.0       50.0       50.0       50.0       50.0       50.0       50.0       50.0       50.0       50.0       50.0       50.0       50.0       50.0       50.0       50.0       50.0       50.0       50.0       50.0       50.0       50.0       50.0       50.0       50.0       50.0       50.0       50.0       50.0       50.0       50.0       50.0       50.0       50.0       50.0       50.0       50.0       50.0       50.0       50.0       50.0       50.0       50.0       50.0       50.0       50.0       50.0       50.0       50.	<ul> <li>MAJOR PROCESS FLOW</li> <li>MINOR PROCESS FLOW</li> <li>Streams</li> <li>olumetric Flow</li> <li>otal Mass Flow</li> </ul>	Units gpm lb/hr	1 Contact Water 2,000 1,000,800	2 Organosulfide Feed 0.10 50	3 Coagulant Feed 0.08 50	4 Polymer Feed 1.00 501	S         S           Geotube(s) Feed         2,142           1,072,077         1,072,077	WATER TREATMI 6 Geotube Effluent 2,097 1,049,232	ENT PLANT PROC 7 Nominal Bag Filter(s) Feed 2,097 1,049,147	ESS STREAMS 8 Absolute Filter(s) Feed 2,097 1,049,131	9 GAC Adsorber(s) Feed 2,097 1,049,129	10           GAC           Adsorber(s)           Effluent           7         2,097           9         1,049,129	11ServiceWater TankFeed714070,056	12         Plant Service         Water Feed         0         140         5         70,056	13DirtyBackwash toStorage Tank0140670,141	14DirtyBackwashReturn1470,14	15TreatedWater Returnto the ActiveCell01,9571979,073	16DewaterdSolids toSolidification35.122,84	n 12 45	Client SAN JACIN WAST Project NORTHERN IN PRELIMINARY 30% HARRIS COL	NTO RIVER E PITS MPOUNDMENT REMEDIAL DESI JNTY, TEXAS INTY, TEXAS BP NF 05/2 BP NF 05/1
Chem Solids Generation Ib/Ib Docimentation Decimentation Decimentation	Chem Solids Generation         Ib/hr         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0 <td>Name       No.       No.</td> <td><ul> <li>MAJOR PROCESS FLOW</li> <li>MINOR PROCESS FLOW</li> <li>Streams</li> <li>Olumetric Flow</li> <li>otal Mass Flow</li> <li>uspended Solids</li> </ul></td> <td>Units gpm lb/hr %</td> <td>1 Contact Water 2,000 1,000,800 0.41%</td> <td>2 Organosulfide Feed 0.10 50 0.00%</td> <td>3 Coagulant Feed 0.08 50 0.00%</td> <td>4 Polymer Feed 1.00 501 0.00%</td> <td>S         Geotube(s) Feed         2,142         1,072,077         0.44%</td> <td>WATER TREATMI 6 Geotube Effluent 2,097 1,049,232 0.01%</td> <td>ENT PLANT PROC 7 Nominal Bag Filter(s) Feed 2,097 1,049,147 0.00%</td> <td>ESS STREAMS 8 Absolute Filter(s) Feed 2,097 1,049,131 0.00%</td> <td>9 GAC Adsorber(s) Feed 2,097 1,049,129 0.00%</td> <td>10           GAC           Adsorber(s)           Effluent           7         2,097           9         1,049,129           5         0.00%</td> <td>11           Service           Water Tank           Feed           7           140           70,056           0.00%</td> <td>12           Plant Service           Water Feed           0           140           6           70,056           0.00%</td> <td>13Dirty Backwash to Storage Tank0140670,14160.12%</td> <td>14           Dirty           Backwash           Return           14           70,14           0.12%</td> <td>15           Treated           Water Return           to the Active           Cell           0         1,957           1         979,073           %         0.00%</td> <td>16Dewaterd Solids to Solidification735.122,8420.00%</td> <td>n 12 45 9%</td> <td>Client SAN JACIN WAST Project NORTHERN IN PRELIMINARY 30% HARRIS COU 2 30% EPA REVIEW 1 30% CLIENT REVIEW No. Issue</td> <td>ATO RIVER E PITS</td>	Name       No.	<ul> <li>MAJOR PROCESS FLOW</li> <li>MINOR PROCESS FLOW</li> <li>Streams</li> <li>Olumetric Flow</li> <li>otal Mass Flow</li> <li>uspended Solids</li> </ul>	Units gpm lb/hr %	1 Contact Water 2,000 1,000,800 0.41%	2 Organosulfide Feed 0.10 50 0.00%	3 Coagulant Feed 0.08 50 0.00%	4 Polymer Feed 1.00 501 0.00%	S         Geotube(s) Feed         2,142         1,072,077         0.44%	WATER TREATMI 6 Geotube Effluent 2,097 1,049,232 0.01%	ENT PLANT PROC 7 Nominal Bag Filter(s) Feed 2,097 1,049,147 0.00%	ESS STREAMS 8 Absolute Filter(s) Feed 2,097 1,049,131 0.00%	9 GAC Adsorber(s) Feed 2,097 1,049,129 0.00%	10           GAC           Adsorber(s)           Effluent           7         2,097           9         1,049,129           5         0.00%	11           Service           Water Tank           Feed           7           140           70,056           0.00%	12           Plant Service           Water Feed           0           140           6           70,056           0.00%	13Dirty Backwash to Storage Tank0140670,14160.12%	14           Dirty           Backwash           Return           14           70,14           0.12%	15           Treated           Water Return           to the Active           Cell           0         1,957           1         979,073           %         0.00%	16Dewaterd Solids to Solidification735.122,8420.00%	n 12 45 9%	Client SAN JACIN WAST Project NORTHERN IN PRELIMINARY 30% HARRIS COU 2 30% EPA REVIEW 1 30% CLIENT REVIEW No. Issue	ATO RIVER E PITS
Draw of a constraint         Draw of a constraint         Draw of a constraint         Design MW	Mass Flow Liquid       Ib/hr       996,747       50       50       501       1,067,403       1,049,127       1,049,127       1,049,127       70,056       70,056       70,056       979,071       18,276         Mass Flow Liquid       Ib/hr       996,747       50       501       1,067,403       1,049,127       1,049,127       1,049,127       70,056       70,056       70,056       979,071       18,276	Mass Flow Liquid       Ib/r       996,747       56       50       500       1,067,433       1,049,127       1,049,127       1,049,127       7,0.56       70,056       70,056       70,056       979,071       18,276         Mass Flow Solids       Ib/r       4,053       0       0       4,674       105       20       0.1       0.1       0.1       850       2.0       4,659       2.0       4,659       0.0       4,659       0.0       4,659       0.0       1.0       1.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       <	<ul> <li>MAJOR PROCESS FLOW</li> <li>MINOR PROCESS FLOW</li> <li>Streams</li> <li>Olumetric Flow</li> <li>otal Mass Flow</li> <li>uspended Solids</li> <li>hemical Feed</li> <li>hem Solids Generation</li> </ul>	Units gpm lb/hr % ppm	1 Contact Water 2,000 1,000,800 0.41%	2 Organosulfide Feed 0.10 0.2	3 Coagulant Feed 0.08 50 0.00% 50.0	4 Polymer Feed 1.00 501 0.00% 500.0	S         Geotube(s) Feed         0         2,142         1,072,077         0.44%	WATER TREATMI	ENT PLANT PROC 7 Nominal Bag Filter(s) Feed 2,097 1,049,147 0.00%	ESS STREAMS 8 Absolute Filter(s) Feed 2,097 1,049,131 0.00%	9 GAC Adsorber(s) Feed 2,097 1,049,129 0.00%	10         GAC         Adsorber(s)         Effluent         7       2,097         9       1,049,129         5       0.00%	11         Service         Water Tank         Feed         140         70,056         0.00%	12           Plant Service           Water Feed           0           140           6           70,056           6           0.00%	13Dirty Backwash to Storage Tank0140670,14160.12%	14DirtyBackwashReturn1470,140.12%	15           Treated           Water Return           to the Active           Cell           0         1,957           1         979,073           %         0.00%	16         Dewaterd         Solids to         Solidification         35.1         22,84         20.009	n 12 45 9%	Client SAN JACIN VAST Project NORTHERN IN PRELIMINARY 30% HARRIS COU	ATO RIVER E PITS APOUNDMENT REMEDIAL DESI JNTY, TEXAS
Mass Flow Liquid         lb/hr         996,747         50         50         501         1,049,127         1,049,127         1,049,127         70,056         70,056         70,056         979,071         18,276		Mass Flow Solids       Ib/hr       4.053       0       0       4.674       105       20       4.0       2.0       0.1       0.1       85.0       2.0       4.569         Specific Gravity       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0	MAJOR PROCESS FLOW MINOR PROCESS FLOW  Streams  Olumetric Flow otal Mass Flow uspended Solids hemical Feed hem Solids Generation hem Solids Generation	Units gpm lb/hr % ppm lb/lb lb/hr	1 Contact Water 2,000 1,000,800 0.41%	2 Organosulfide Feed 0.10 0.10 50 0.00% 50.0 0.3 15.0	3 Coagulant Feed 0.08 50 0.00% 50.0 0.3 15.0	4 Polymer Feed 1.00 501 0.00% 500.0 0.0 5.0	Similar       5       Geotube(s) Feed       2,142       1,072,077       0.44%       0	WATER TREATMI 6 Geotube Effluent 2,097 1,049,232 0.01%	ENT PLANT PROC 7 Nominal Bag Filter(s) Feed 2,097 1,049,147 0.00%	ESS STREAMS 8 Absolute Filter(s) Feed 2,097 1,049,131 0.00%	9 GAC Adsorber(s) Feed 2,097 1,049,129 0.00%	10 GAC Adsorber(s) Effluent 7 2,097 9 1,049,129 5 0.00%	11 Service Water Tank Feed 140 70,056 0.00%	12         Plant Service         Water Feed         0       140         5       70,056         6       0.00%	13      Dirty      Backwash to      Storage Tank      0      140      6      70,141      6      0.12%	14     Dirty     Backwash     Return     14     70,14     0.129	15         Treated         Water Return         to the Active         Cell         0       1,957         1       979,073         %       0.00%	16      Dewaterd      Solids to      Solidification      35.1      22,84      20.009	n 12 45 9%	Client SAN JACIN WASS Project NORTHERN IN PRELIMINARY 30% HARRIS COU HARRIS COU	ATO RIVER E PITS APOUNDMENT REMEDIAL DESI JNTY, TEXAS INTY, TEXAS INTY INTY INTY INTY INTY INTY INTY INTY
Mass Flow Solids         Ib/hr         4,053         0         0         0         4,674         105         20         4.0         85.0         85.0         2.0         4,569	$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	Specific Gravity       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0 <td><ul> <li>MAJOR PROCESS FLOW</li> <li>MINOR PROCESS FLOW</li> <li>Streams</li> <li>Olumetric Flow</li> <li>otal Mass Flow</li> <li>uspended Solids</li> <li>hemical Feed</li> <li>hem Solids Generation</li> <li>hem Solids Generation</li> <li>hem Solids Generation</li> <li>hem Solids Generation</li> <li>hass Flow Liquid</li> </ul></td> <td>Units gpm lb/hr % ppm lb/lb lb/hr lb/hr</td> <td>1 Contact Water 2,000 1,000,800 0.41%</td> <td>2 Organosulfide Feed 0.10 0.00% 0.00% 50.0 0.3 15.0 50</td> <td>3 Coagulant Feed 0.08 50 0.00% 50.0 0.3 15.0 50</td> <td>4 Polymer Feed 1.00 501 0.00% 500.0 0.0 500.0 0.0 500.0 500.0</td> <td>S         Geotube(s) Feed         0       2,142         1,072,077       0.44%         0       0         1,067,403       1,067,403</td> <td>WATER TREATMI 6 Geotube Effluent 2,097 1,049,232 0.01%</td> <td>ENT PLANT PROC 7 Nominal Bag Filter(s) Feed 2,097 1,049,147 0.00%</td> <td>ESS STREAMS 8 Absolute Filter(s) Feed 2,097 1,049,131 0.00%</td> <td>9 GAC Adsorber(s) Feed 2,097 1,049,129 0.00%</td> <td>10 GAC Adsorber(s) Effluent 7 2,097 9 1,049,129 6 0.00%</td> <td>11 Service Water Tank Feed 7 140 70,056</td> <td>12         Plant Service         Water Feed         0       140         5       70,056         6       70,056         70,056       140</td> <td>13         Dirty         Backwash to         Storage Tank         0       140         6       70,141         6       70,056</td> <td>14         Dirty         Backwash         Return         14         70,14         0.129         70,05</td> <td>15         Treated         Water Return         to the Active         Cell         0       1,957         1       979,073         %       0.00%         6       979,071</td> <td>16         Dewaterd         Solids to         Solidification         35.1         22,84         20.009         18,27</td> <td>n 12 45 9%</td> <td>Client SANJACIN WASS Project Project NORTHERNIN PRELIMINARY 30% HARRIS COU HARRIS COU</td> <td>NTO RIVER   POUNDMENT   REMEDIAL DESI   JNTY, TEXAS   JNTY, TEXAS   BP   NF   Orawn   Approved   Designer   KJ   Designer   NF   Designer   NF   Date   May 28, 2020</td>	<ul> <li>MAJOR PROCESS FLOW</li> <li>MINOR PROCESS FLOW</li> <li>Streams</li> <li>Olumetric Flow</li> <li>otal Mass Flow</li> <li>uspended Solids</li> <li>hemical Feed</li> <li>hem Solids Generation</li> <li>hem Solids Generation</li> <li>hem Solids Generation</li> <li>hem Solids Generation</li> <li>hass Flow Liquid</li> </ul>	Units gpm lb/hr % ppm lb/lb lb/hr lb/hr	1 Contact Water 2,000 1,000,800 0.41%	2 Organosulfide Feed 0.10 0.00% 0.00% 50.0 0.3 15.0 50	3 Coagulant Feed 0.08 50 0.00% 50.0 0.3 15.0 50	4 Polymer Feed 1.00 501 0.00% 500.0 0.0 500.0 0.0 500.0 500.0	S         Geotube(s) Feed         0       2,142         1,072,077       0.44%         0       0         1,067,403       1,067,403	WATER TREATMI 6 Geotube Effluent 2,097 1,049,232 0.01%	ENT PLANT PROC 7 Nominal Bag Filter(s) Feed 2,097 1,049,147 0.00%	ESS STREAMS 8 Absolute Filter(s) Feed 2,097 1,049,131 0.00%	9 GAC Adsorber(s) Feed 2,097 1,049,129 0.00%	10 GAC Adsorber(s) Effluent 7 2,097 9 1,049,129 6 0.00%	11 Service Water Tank Feed 7 140 70,056	12         Plant Service         Water Feed         0       140         5       70,056         6       70,056         70,056       140	13         Dirty         Backwash to         Storage Tank         0       140         6       70,141         6       70,056	14         Dirty         Backwash         Return         14         70,14         0.129         70,05	15         Treated         Water Return         to the Active         Cell         0       1,957         1       979,073         %       0.00%         6       979,071	16         Dewaterd         Solids to         Solidification         35.1         22,84         20.009         18,27	n 12 45 9%	Client SANJACIN WASS Project Project NORTHERNIN PRELIMINARY 30% HARRIS COU HARRIS COU	NTO RIVER   POUNDMENT   REMEDIAL DESI   JNTY, TEXAS   JNTY, TEXAS   BP   NF   Orawn   Approved   Designer   KJ   Designer   NF   Designer   NF   Date   May 28, 2020
Specific Gravity       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0 <td>Specific Gravity         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0</td> <td>Density       Ib/cf       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4</td> <td><ul> <li>MAJOR PROCESS FLOW</li> <li>MINOR PROCESS FLOW</li> <li>Streams</li> <li>Olumetric Flow</li> <li>otal Mass Flow</li> <li>uspended Solids</li> <li>hemical Feed</li> <li>hem Solids Generation</li> <li>hem Solids Generation</li> <li>lass Flow Liquid</li> <li>lass Flow Solids</li> </ul></td> <td>Units gpm lb/hr % ppm lb/lb lb/hr lb/hr lb/hr</td> <td>1 Contact Water 2,000 1,000,800 0.41% </td> <td>2 Organosulfide Feed 0.10 0.10 50 0.00% 50.0 0.3 15.0 50 0.0 300 0.3</td> <td>3 Coagulant Feed 0.08 0.08 50 0.00% 50.0 0.00% 50.0 0.00% 50.0 0.00% 50.0</td> <td>4 Polymer Feed 1.00 501 0.00% 500.0 0.0 500.0 0.0 500.0 0.0 501 0.0</td> <td>S         S         Geotube(s) Feed         2,142         1,072,077         0         0         1,067,403         0         1,067,403         0</td> <td>WATER TREATMI 6 Geotube Effluent 2,097 1,049,232 0.01% 1,049,127 1,049,127 105</td> <td>ENT PLANT PROC 7 Nominal Bag Filter(s) Feed 2,097 1,049,147 0.00% 1,049,127 20</td> <td>RETURN TO THE A         CESS STREAMS         8         Absolute         Filter(s) Feed         2,097         1,049,131         0.00%         1,049,127         4.0</td> <td>9 GAC Adsorber(s) Feed 2,097 1,049,129 0.00%</td> <td>10         GAC         Adsorber(s)         Effluent         7       2,097         9       1,049,129         5       0.00%         7       1,049,127         7       2.0</td> <td>11 Service Water Tank Feed 0 70,056 0 0.00%</td> <td>12         Plant Service         Water Feed         0       140         5       70,056         6       70,056         70       0.140         70       0.140         70       0.140         70       0.140         70       0.140         70       0.140         70       0.140         70       0.140         70       0.140         70       0.140         70       0.140</td> <td>13         Dirty         Backwash to         Storage Tank         0       140         6       70,141         6       70,056         1       85.0</td> <td>14         Dirty         Backwash         Return         14         70,14         0.129         70,05         85.</td> <td>15         Treated         Water Return         to the Active         Cell         0       1,957         1       979,073         %       0.00%         6       979,071         0       2.0</td> <td>16         Dewaterd         Solids to         Solidification         7       35.1         3       22,84         20.009         18,27         18,27         4,56</td> <td>n 12 45 9% 76 69</td> <td>Client       SAN JACIN WAST         Project       NORTHERN IN PRELIMINARY 30% HARRIS COL         0       Image: Color of the second secon</td> <td>NTO RIVER   POUNDMENT   REMEDIAL DESI   JUNTY, TEXAS   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I  <tr< td=""></tr<></td>	Specific Gravity         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0	Density       Ib/cf       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4	<ul> <li>MAJOR PROCESS FLOW</li> <li>MINOR PROCESS FLOW</li> <li>Streams</li> <li>Olumetric Flow</li> <li>otal Mass Flow</li> <li>uspended Solids</li> <li>hemical Feed</li> <li>hem Solids Generation</li> <li>hem Solids Generation</li> <li>lass Flow Liquid</li> <li>lass Flow Solids</li> </ul>	Units gpm lb/hr % ppm lb/lb lb/hr lb/hr lb/hr	1 Contact Water 2,000 1,000,800 0.41% 	2 Organosulfide Feed 0.10 0.10 50 0.00% 50.0 0.3 15.0 50 0.0 300 0.3	3 Coagulant Feed 0.08 0.08 50 0.00% 50.0 0.00% 50.0 0.00% 50.0 0.00% 50.0	4 Polymer Feed 1.00 501 0.00% 500.0 0.0 500.0 0.0 500.0 0.0 501 0.0	S         S         Geotube(s) Feed         2,142         1,072,077         0         0         1,067,403         0         1,067,403         0	WATER TREATMI 6 Geotube Effluent 2,097 1,049,232 0.01% 1,049,127 1,049,127 105	ENT PLANT PROC 7 Nominal Bag Filter(s) Feed 2,097 1,049,147 0.00% 1,049,127 20	RETURN TO THE A         CESS STREAMS         8         Absolute         Filter(s) Feed         2,097         1,049,131         0.00%         1,049,127         4.0	9 GAC Adsorber(s) Feed 2,097 1,049,129 0.00%	10         GAC         Adsorber(s)         Effluent         7       2,097         9       1,049,129         5       0.00%         7       1,049,127         7       2.0	11 Service Water Tank Feed 0 70,056 0 0.00%	12         Plant Service         Water Feed         0       140         5       70,056         6       70,056         70       0.140         70       0.140         70       0.140         70       0.140         70       0.140         70       0.140         70       0.140         70       0.140         70       0.140         70       0.140         70       0.140	13         Dirty         Backwash to         Storage Tank         0       140         6       70,141         6       70,056         1       85.0	14         Dirty         Backwash         Return         14         70,14         0.129         70,05         85.	15         Treated         Water Return         to the Active         Cell         0       1,957         1       979,073         %       0.00%         6       979,071         0       2.0	16         Dewaterd         Solids to         Solidification         7       35.1         3       22,84         20.009         18,27         18,27         4,56	n 12 45 9% 76 69	Client       SAN JACIN WAST         Project       NORTHERN IN PRELIMINARY 30% HARRIS COL         0       Image: Color of the second secon	NTO RIVER   POUNDMENT   REMEDIAL DESI   JUNTY, TEXAS   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I <tr< td=""></tr<>
Density       Ib/cf $62.4$ $62.4$ $62.4$ $62.4$ $62.4$ $62.4$ $62.4$ $62.4$ $62.4$ $62.4$ $62.4$ $62.4$ $62.4$ $62.4$ $62.4$ $62.4$ $62.4$ $62.4$ $62.4$ $62.4$ $62.4$ $62.4$ $62.4$ $62.4$ $62.4$ $62.4$ $62.4$ $62.4$ $62.4$ $62.4$ $62.4$ $62.4$ $62.4$ $62.4$ $62.4$ $62.4$ $62.4$ $62.4$ $62.4$ $62.4$ $62.4$ $62.4$ $62.4$ $62.4$ $62.4$ $62.4$ $62.4$ $62.4$ $62.4$ $62.4$ $62.4$ $62.4$ $62.4$ $62.4$ $62.4$ $62.4$ $62.4$ $62.4$ $62.4$ $62.4$ $62.4$ $62.4$ $62.4$ $62.4$ $62.4$ $62.4$ $62.4$ $62.4$ $62.4$ $62.4$ $62.4$ $62.4$ $62.4$ $62.4$ $62.4$ $62.4$ $62.4$ $62.4$ $62.4$ $62.4$ $62.4$ $62.4$ $62.4$ $62.4$ $62.4$ $62.4$ $62.4$ $62.4$ $62.4$ $62.4$	Density       Ib/cf       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4       62.4	PRELIMINARY       Project No.       11187072         NOT FOR CONSTRUCTION       Trile         ENG:       TEXAS       TILXAS         STATE:       TEXAS       TILXAS         LO: 00:       130378       APPROACH B         DATE:       5-28-2020       PROCESS FLOW DIACE	MAJOR PROCESS FLOW MINOR PROCESS FLOW  Streams  Olumetric Flow Otal Mass Flow Uspended Solids hemical Feed hem Solids Generation hem Solids Generation lass Flow Liquid lass Flow Solids pecific Gravity	Units gpm lb/hr % ppm lb/lb lb/hr lb/hr lb/hr	1 Contact Water 2,000 1,000,800 0.41% 996,747 4,053 1.0	2 Organosulfide Feed 0.10 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 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0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00	3 Coagulant Feed 0.08 0.08 0.08 0.08 0.08 0.08 0.08 0.0	4 Polymer Feed 1.00 501 0.00% 500.0 0.0 500.0 0.0 500.0 0.0 500.0 0.0	S         Geotube(s) Feed         0       2,142         1,072,077       0.44%         0       1,067,403         0       4,674         0       1.0	WATER TREATMI 6 Geotube Effluent 2,097 1,049,232 0.01% 1,049,127 105 1.0	ENT PLANT PROC 7 Nominal Bag Filter(s) Feed 2,097 1,049,147 0.00% 1,049,127 1,049,127 20 1.0	2,097 2,097 1,049,131 0.00% 1,049,127 4.0 1.0	9 GAC Adsorber(s) Feed 2,097 1,049,129 0.00% 1,049,127 2.0 1.0 1.0	10         GAC         Adsorber(s)         Effluent         7       2,097         9       1,049,129         5       0.00%         6       0.00%         7       1,049,127         0       2.0         0       1.0	11 Service Water Tank Feed 70,056 0.00% 70,056 0.00%	12         Plant Service         Water Feed         0       140         6       70,056         6       70,056         1       0.10         1       0.10         0       1.0	13         Dirty         Backwash to         Storage Tank         0       140         6       70,141         6       70,056         1       85.0         0       1.0	14         Dirty         Backwash         Return         14         70,14         0.12%         70,05         85.         1.	15           Treated           Water Return           to the Active           Cell           0         1,957           1         979,073           %         0.00%           6         979,071           0         2.0           0         1.0	16         Dewaterd         Solids to         Solidification         22,84         20.009         18,27         18,27         1,56         1,56	n 12 45 9% 76 69	Client       SAN JACIN VASSI         Project       NORTHERN IN PRELIMINARY 30% HARRIS COL         Project       NORTHERN IN PRELIMINARY 30% HARRIS COL         2       30% EPA REVIEW         1       30% CLIENT REVIEW         No.       Issue         Drawn       BP         Drafting       MW         Project       CM         Original Size       Original Size	NTO RIVER   E PITS   MPOUNDMENT   REMEDIAL DESI   JUNTY, TEXAS   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I   I

GHD

<u>NOTE:</u>
 SOME PROCESS FLOWS ARE AVERAGED OVER
 FOR CLARITY, THE NUMBER OF GEOTUBES ON
 THE MAXIMUM OPERATION FLOW OF 2000 GPM BE PROVIDED BY TWO 1000 GPM TRAINS.
 CAPTURED SOLIDS INSIDE THE GEOTUBES WIL
 THE TREATMENT SYSTEM DESIGNS ARE PRELING

١	WATER TREATME	ENT PLANT PROC	CESS STREAMS	
		_		

![](_page_39_Figure_0.jpeg)

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GAC DSORBERS LEAD/LAG)	DISCHARGE TO RIVER		
		Client SAN JACIN WAST Project NORTHERN IN PRELIMINARY 30% HARRIS COL	NTO RIVER E PITS NPOUNDMENT REMEDIAL DESIGN INTY, TEXAS
	P-07 SERVICE WATER STORAGE TANK (IF NEEDED)		
		2     30% EPA REVIEW       1     30% CLIENT REVIEW       No.     Issue       Drawn     BP	BPNF05/28/2020BPNF05/15/2020DrawnApprovedDateDesignerKJ
		Drafting Check MW	Design Check NF
		Project <b>CM</b> Coordinator	Date May 28, 2020
		This document shall not be used for construction unless signed and sealed for construction.	Scale N.T.S.
		Original Size	Bar is one inch on original size drawing
			U 1"
	Internation         NOT FOR CONSTRUCTION         ENG:       Keith Brecheen         STATE:       TEXAS         LIC. NO:       130378         DATE:       5-28-2020	Title WATER TREAT APPRC P8 (1 0	MENT SYSTEM ACH B ID F 2)
	GHD SERVICES INC.       JOB NO. 11187072       FILE NO. 010       CHD TEXAS FIRM REGISTRATION NO. 276	Sheet No.	06
			Sheet - of -

![](_page_40_Figure_0.jpeg)

Plotted By: Bruce Pletz

![](_page_40_Picture_3.jpeg)

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P-06 SERVICE WATER	Reuse of Documents This document and the ideas and design professional service, is the property of GHI for any other project without GHD's written a	s incorporated hereir 2 and shall not be reu authorization. © 2020	n, as an instrument of used in whole or in part GHD
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	Project No. 11187072 Title WATER TREAT APPRC P8 (2 O	MENT S ACH B ID F 2)	YSTEM
GHD SERVICES INC. JOB NO. <u>11187072</u> FILE NO. <u>010</u> GHD TEXAS FIRM REGISTRATION NO. <u>276</u>	Sheet No.	• <b>-</b> , <b>07</b>	- of -

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ļ	NOTE:	
	<ol> <li>THE MAXIMUM WATER TREATMENT FLOW IN APPROACH B WILL BE AT 2000 GPM. TWO TREATMENT TRAINS WILL OPERATE IN PARALLEL AND THE TOTAL FOOTPRINT WILL BE 75 FEET BY 150 FEET.</li> <li>MAXIMUM TREATMENT FLOW IS 1000 GPM. FOR EACH TREATMENT TRAIN.</li> <li>LOCATION OF WATER TREATMENT SYSTEM PENDING ACCESS ACREEMENTS.</li> </ol>	
Plot D	CONTINUENT OF WATER TREATMENT STOLEN FEIDING ACCESS AGREENEINTS.     THE TREATMENT SYSTEM DESIGNS ARE PRELIMINARY AND SUBJECT TO CHANGE.     N:IUS\Baton Rouge\Legacy\BAT\Shared\Project Work Area\11180000s\11187072 - San Jacinto River Waste Pits Super     State: 28 May 2020 - 8:55 AM     Plotted By: Bruce Pletz     Filename: Design\Design(CAD)Shared\Project Work Area\11180000s\11187072 - 00(010)\DED14497072 - 0	fund Site - Remedial

![](_page_41_Figure_1.jpeg)

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STATE:	TEXAS 130378	
STATE: LIC. NO: DATE:	TEXAS 130378 <b>5–28–2020</b>	
STATE: LIC. NO: DATE:	TEXAS 130378 <b>5–28–2020</b>	

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