

# Port of Corpus Christi Desalination Permitting Technical Briefing

March 6, 2025

Presented by



**PORT CORPUS CHRISTI®**

# Permit Process Overview + Status

Permit Type	Agency	Description	Status
CCSC Discharge Permit (50MGD net)	TCEQ	Addresses potential water quality/environmental impacts of brine discharge	Received; under appeal in Travis County
Offshore Water Rights (100MGD net)	TCEQ	Authorizes intake in Gulf of Mexico	Application submitted and under review
Lease & Easement (Offshore intake)	GLO	Authorizes placement of structures on state-owned submerged lands	Port Commission approved Oct '24; pending GLO execution
Section 10/Section 404 (multiple scope elements)	USACE	Addresses potential habitat impacts (temporary) from activities in Waters of the US	Submitted Feb '25 through FAST 41
» Offshore Discharge Permit (100 MGD net)	TCEQ	Discharge in Gulf of Mexico	Not yet submitted; application under development (submit Mar '25)
» Easement Amendment (Offshore discharge)	GLO	Authorizes placement of structures on state-owned submerged lands	Not yet submitted; submitting 2Q '25

# Regulatory Strategy

## Desalination at Harbor Island

### Objectives:

1. Uphold the Port's commitment to science-based, data-driven design/decision making
2. Uphold the Port's commitment to environmental stewardship
3. Obtain, as expediently and cost effectively as possible, all remaining permits needed to authorize a scalable desalination facility at Harbor Island
4. Maximize optionality in terms of facility configuration and construction

# Six Environmental Precepts

## Environmental Planning and Compliance



### Air Quality

Reduce emissions by 15% in PM, VOCs, NOx, SOx every 3 years



### Climate Action

Reduce GHG emissions per cargo ton by 7.5% annually



### Water Quality

Reduce AL, Fe, Zn, Pb, TSS by 10% annually



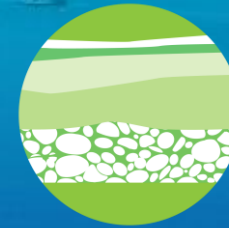
### Climate Adaptation

Implement Life Cycle Assessment tool on Port capital projects



### Habitat Restoration

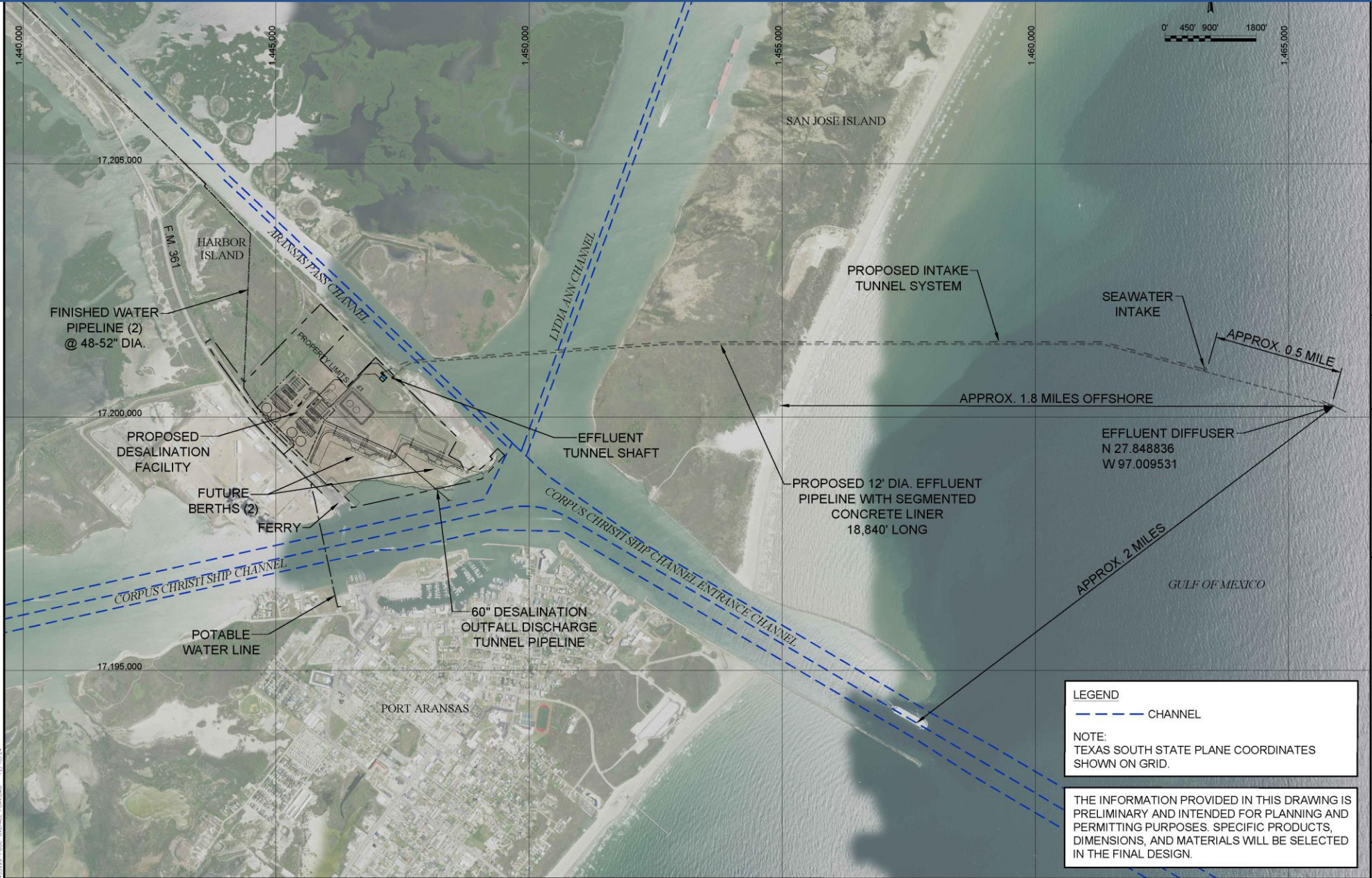
Create/restore 50 acres of habitat every 3 years



### Soils & Sediments

Remediate spills to residential standard

# Overall Plan



Rev	Date	Description

Issue Certification

**PARSONS**  
 TYPE REG. NO. F-8008  
 8101 EURNET RD  
 AUSTIN, TX  
 (512) 719-8000

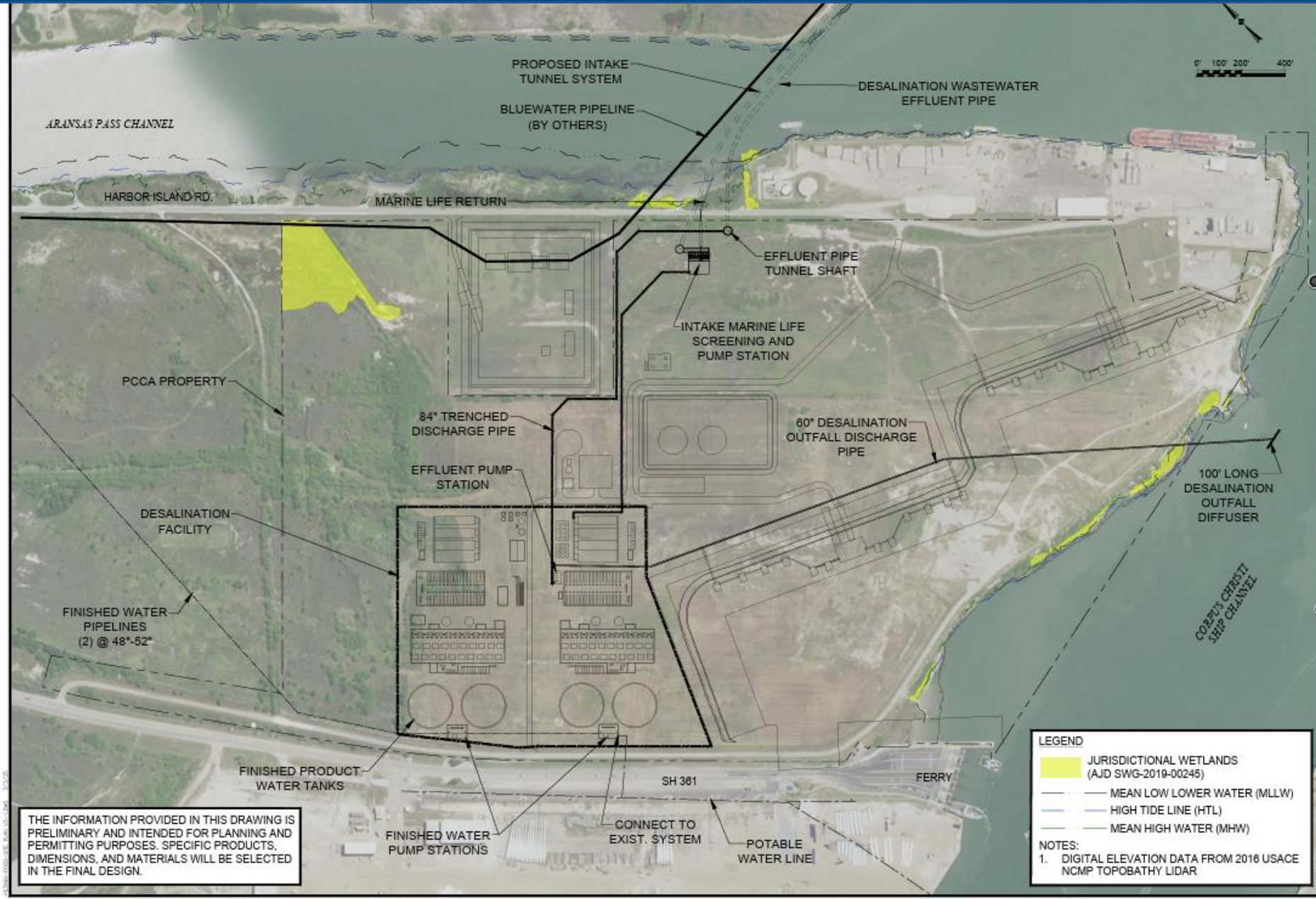


PORT OF CORPUS CHRISTI AUTHORITY  
 PROPOSED HARBOR ISLAND DESALINATION FACILITY

**OVERALL PLAN**

DRAWING NO.      REV

# Harbor Island Detail



THE INFORMATION PROVIDED IN THIS DRAWING IS PRELIMINARY AND INTENDED FOR PLANNING AND PERMITTING PURPOSES. SPECIFIC PRODUCTS, DIMENSIONS, AND MATERIALS WILL BE SELECTED IN THE FINAL DESIGN.

**LEGEND**

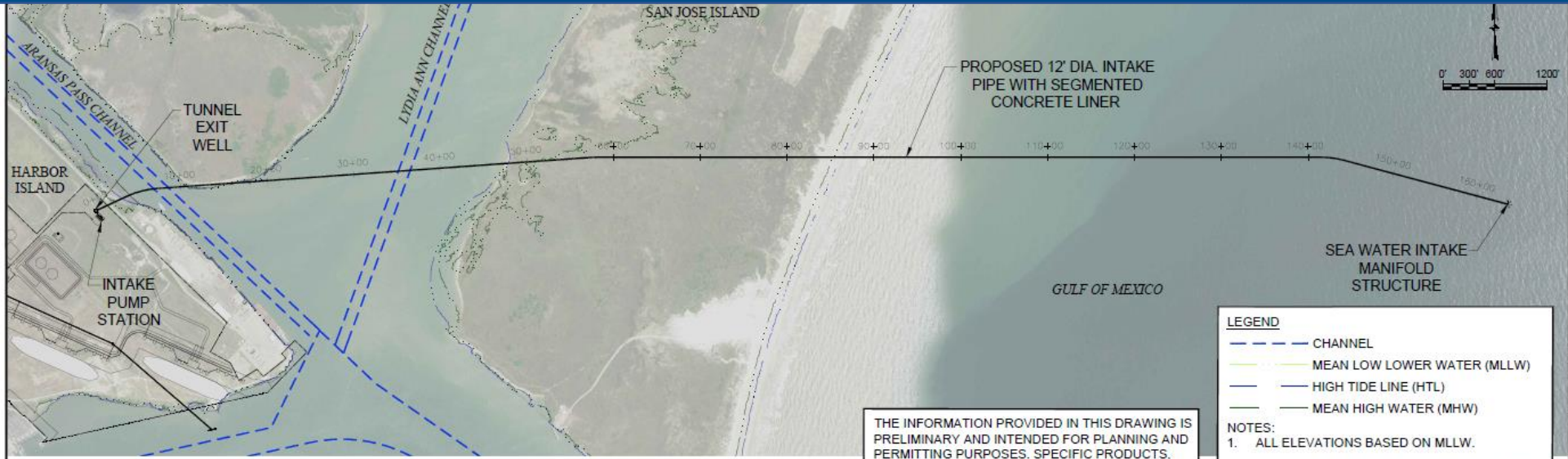
- JURISDICTIONAL WETLANDS (AJD SWG-2019-00245)
- MEAN LOW LOWER WATER (MLLW)
- HIGH TIDE LINE (HTL)
- MEAN HIGH WATER (MHW)

**NOTES:**

1. DIGITAL ELEVATION DATA FROM 2016 USACE NCMF TOPOBATHY LIDAR

Title: Contract Date: _____ Description: _____	
 <b>PAISONSIS</b> TIDAL REC. NO. F-8028 9101 BURNET RD. SUITE 4200 HOUSTON, TX 77060 (281) 714-8000	 PORT OF CORPUS CHRISTI AUTHORITY
PORT OF CORPUS CHRISTI AUTHORITY PROPOSED HARBOR ISLAND DESALINATION FACILITY <b>PROPOSED HARBOR ISLAND FACILITY</b> PLAN VIEW	
DRAWING NO. <b>1</b>	REV. _____

# Intake Structure



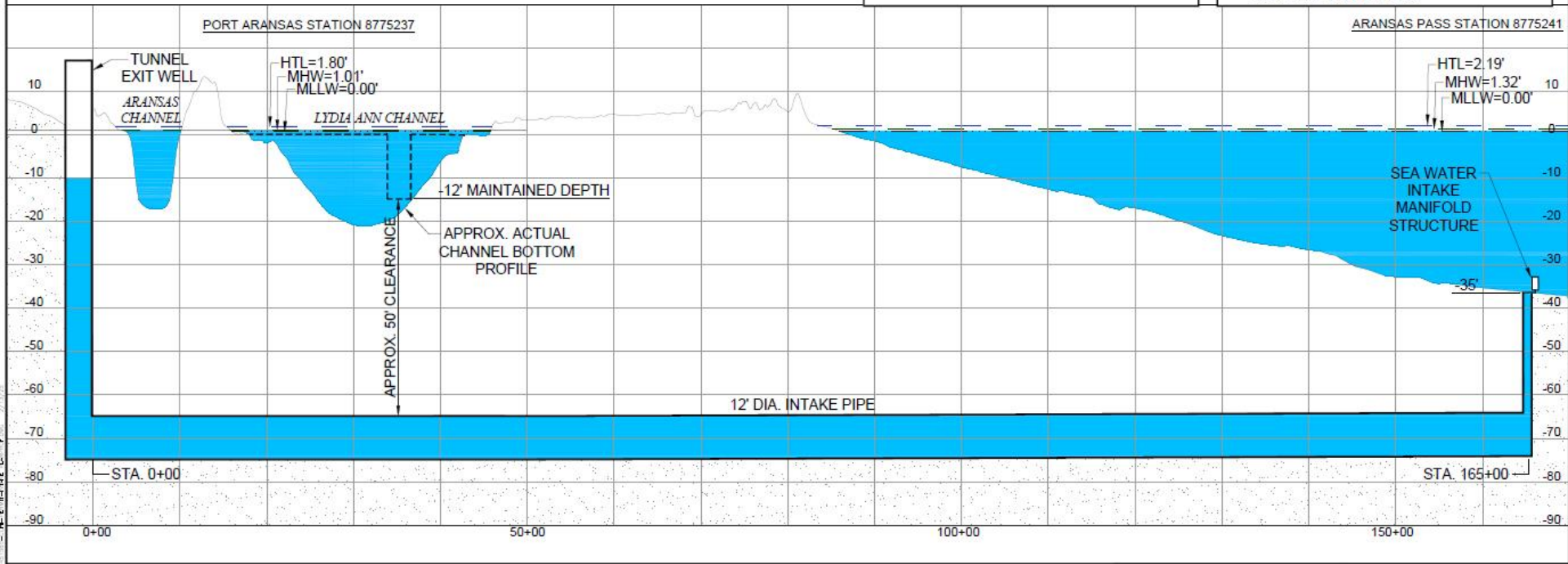
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**LEGEND**

- CHANNEL
- MEAN LOW LOWER WATER (MLLW)
- HIGH TIDE LINE (HTL)
- MEAN HIGH WATER (MHW)

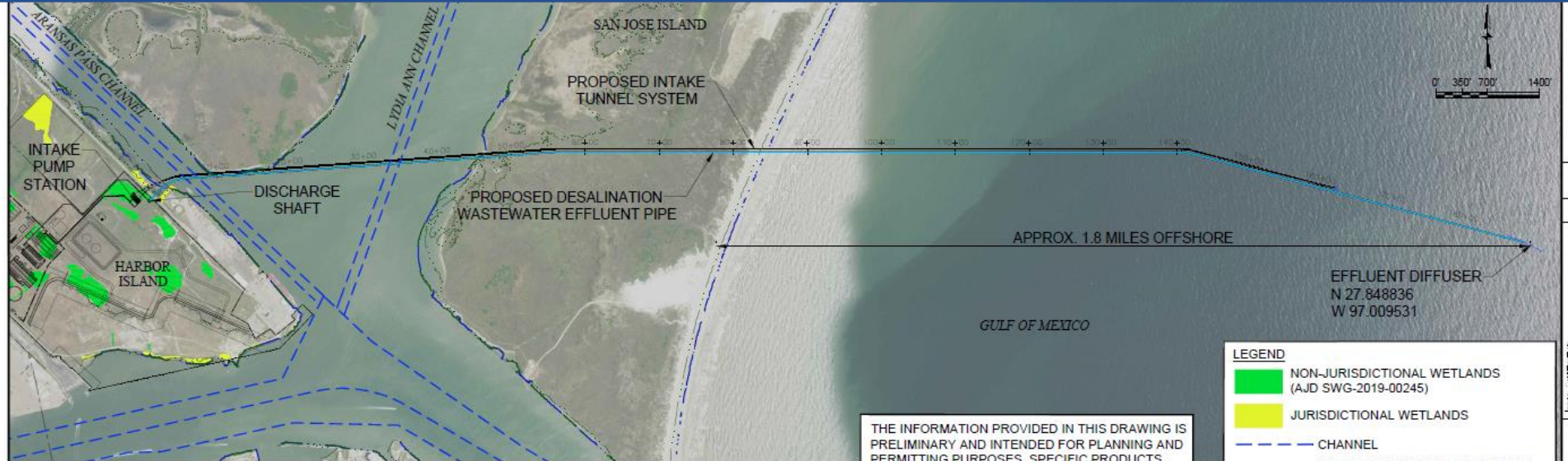
**NOTES:**

1. ALL ELEVATIONS BASED ON MLLW.
2. DIGITAL ELEVATION DATA FROM 2016 USACE NCMPT TOPOBATHY LIDAR



	Description
	Rev. Date
<p><b>PARSONS</b></p> <p>TYPE REG. NO. F-8008          5100 WILSON BLVD          SUITE 400          AUSTIN, TX          (512) 719-6000</p>	
<p>PORT OF CORPUS CHRISTI AUTHORITY          PROPOSED HARBOR ISLAND DESTABILIZATION FACILITY</p>	
<p><b>INTAKE ROUTE PLAN AND PROFILE</b></p>	
DRAWING NO. <b>3</b>	

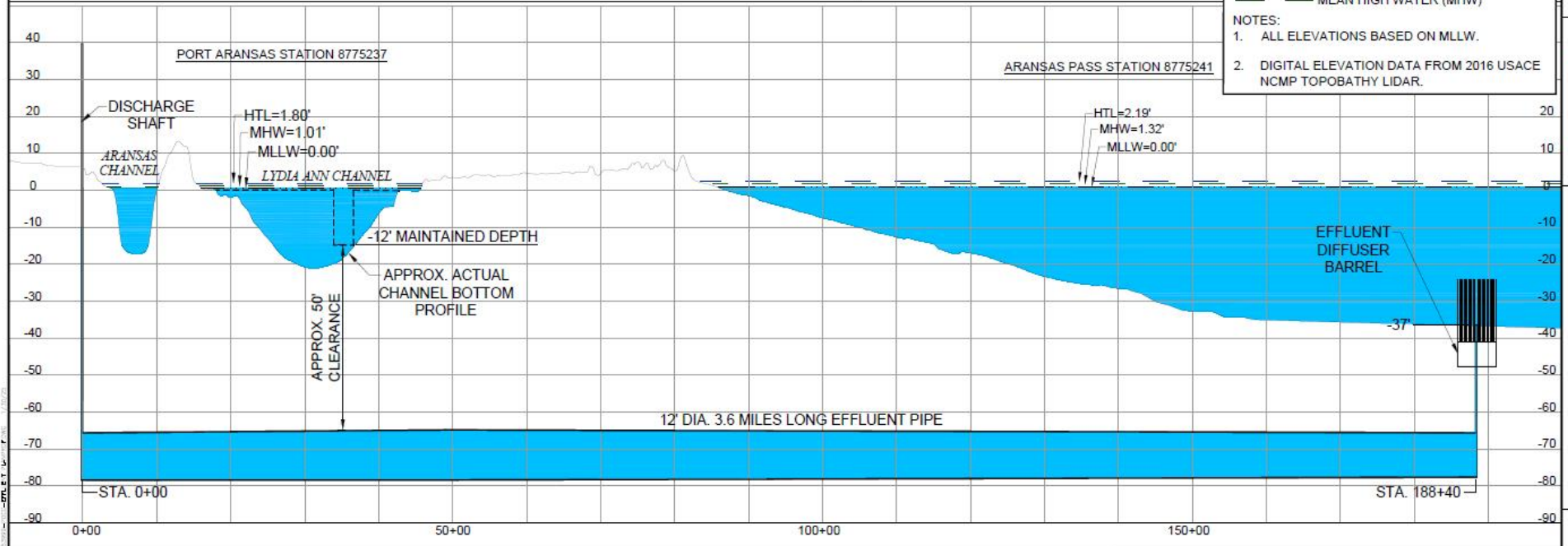
# Diffuser



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- LEGEND**
- NON-JURISDICTIONAL WETLANDS (AJD SWG-2019-00245)
  - JURISDICTIONAL WETLANDS
  - CHANNEL
  - MEAN LOW WATER (MLLW)
  - HIGH TIDE LINE (HTL)
  - MEAN HIGH WATER (MHW)

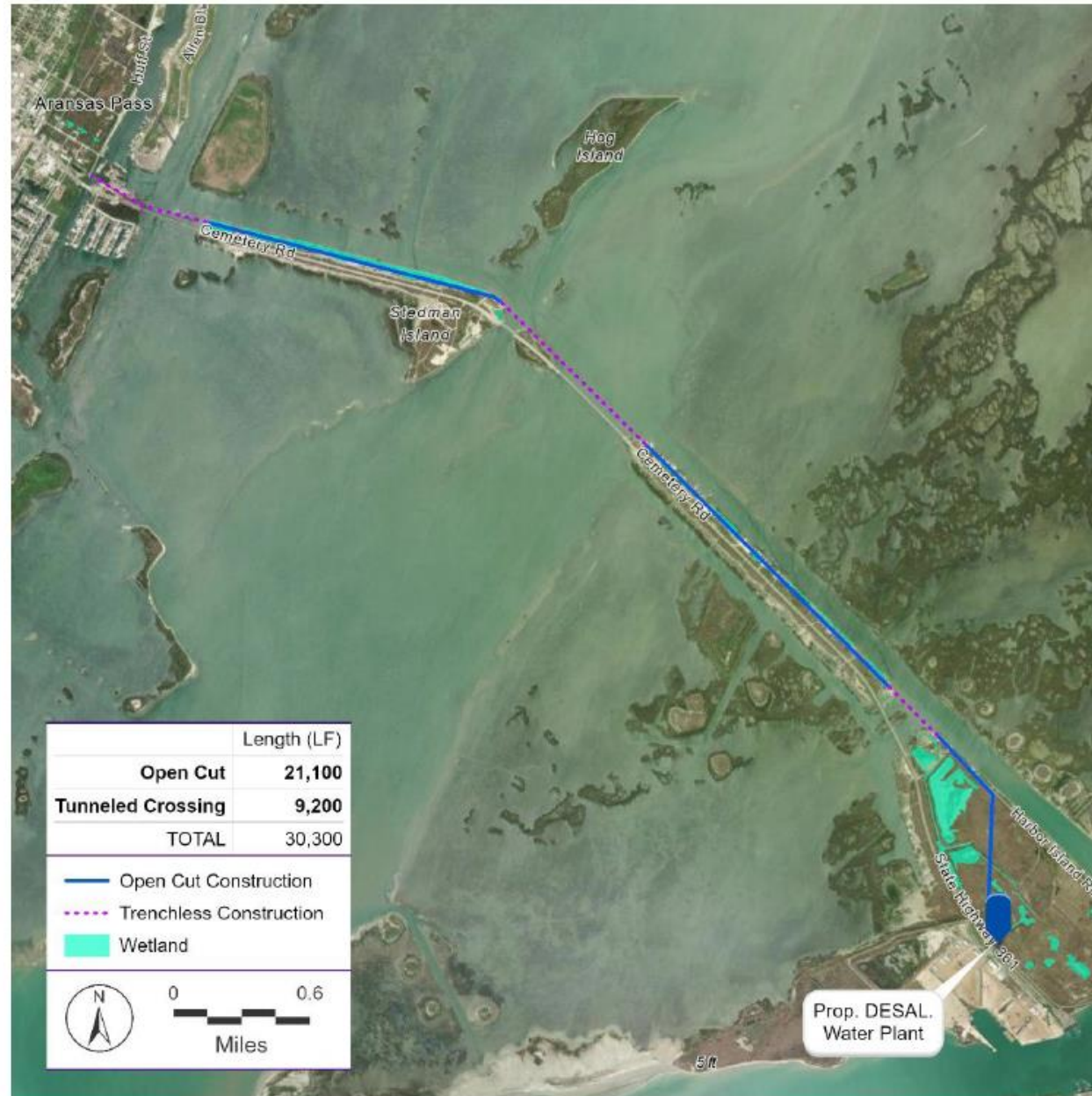
- NOTES:**
1. ALL ELEVATIONS BASED ON MLLW.
  2. DIGITAL ELEVATION DATA FROM 2016 USACE NCMPTOPOBATHY LIDAR.



	Date: _____ Drawn: _____
 <b>PARSONS</b> TIRE REG. NO. F-808 9101 BURLETT RD SUITE #210 AUSTIN, TX 512.719.6000	
 PORT OF CORPUS CHRISTI AUTHORITY PROPOSED HARBOR ISLAND DESALINATION FACILITY	
<b>EFFLUENT ROUTE PLAN AND PROFILE</b>	
DRAWING NO. <b>X</b>	PC



# Distribution Line



# Summary of Potential Impacts (Avoided or Minimized)

Potential Impact	Avoided or Minimized	Description of Measures
Jurisdictional Wetlands, SAV, oysters	Avoided	<ul style="list-style-type: none"> <li>○ Situate facilities to avoid impacts</li> <li>○ Utilize HDD/micro-tunneling/tunneling</li> </ul>
Larval Fish	Minimized	<ul style="list-style-type: none"> <li>○ Locate intake / discharge in Gulf of Mexico in 35'+ of water               <ul style="list-style-type: none"> <li>○ Locate intake ~20' below surface</li> <li>○ Reduce flow velocity (<math>\leq 0.5</math> ft/s)</li> </ul> </li> </ul>
Marine Life / T&E Species	Avoided	<ul style="list-style-type: none"> <li>○ Locate intake / discharge in Gulf of Mexico in 35'+               <ul style="list-style-type: none"> <li>○ Locate intake ~20' below surface</li> <li>○ Reduce flow velocity (<math>\leq 0.5</math> ft/s)</li> <li>○ Intake includes bar screens</li> </ul> </li> </ul>
Benthic Organisms	Avoided	<ul style="list-style-type: none"> <li>○ Locate intake and discharge at least 5' above sea floor</li> </ul>
Salinity	Minimized	<ul style="list-style-type: none"> <li>○ Use of diffuser technology to mix salinity to diffuse brine to less than 2 ppt over ambient 100 meters from discharge point               <ul style="list-style-type: none"> <li>○ Discharge in Gulf of Mexico</li> </ul> </li> </ul>
Cultural Resources	Avoided	<ul style="list-style-type: none"> <li>○ Designed to avoid identified cultural resources</li> </ul>

# Thank you



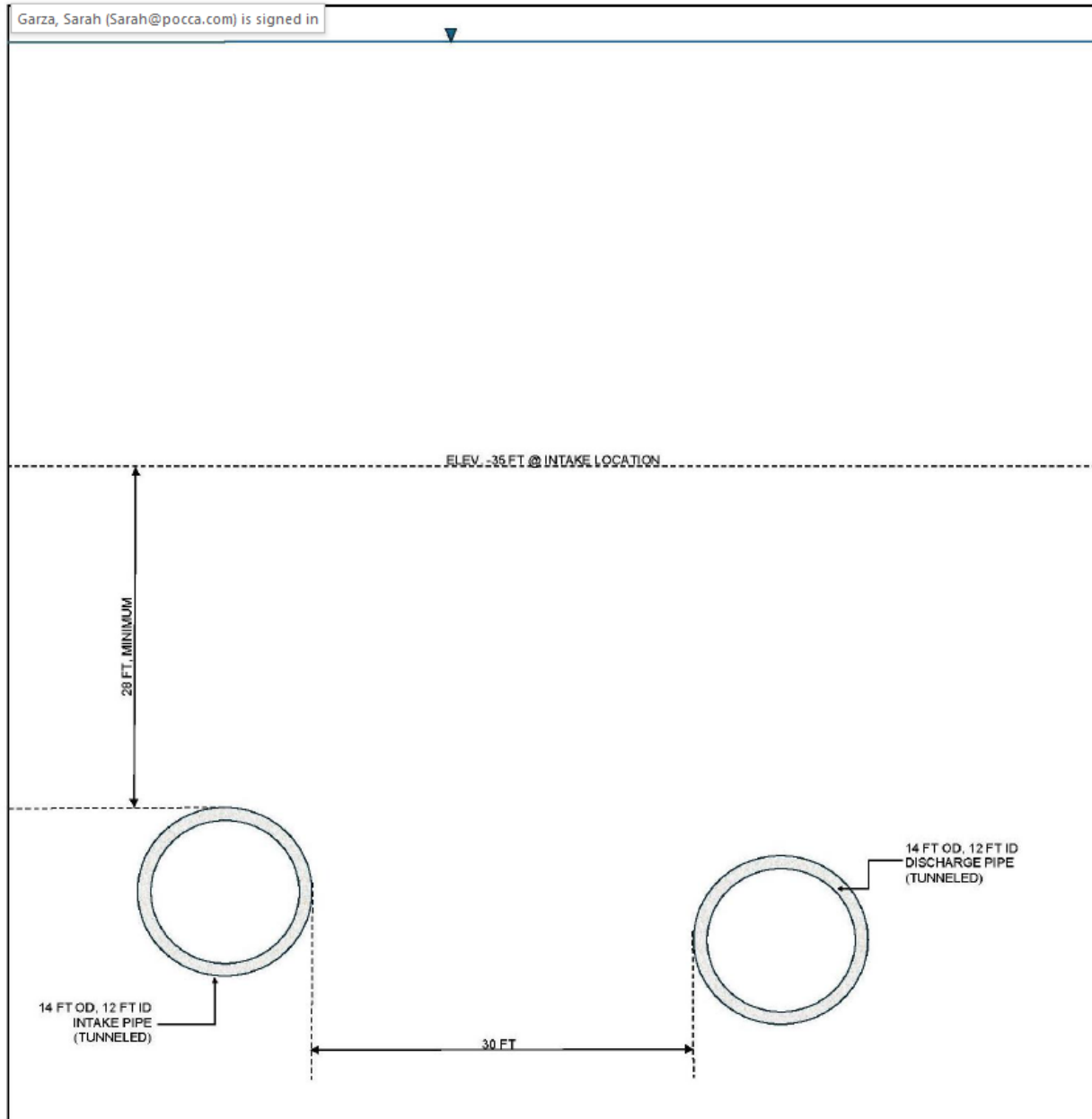
**PORTCORPUS CHRISTI®**



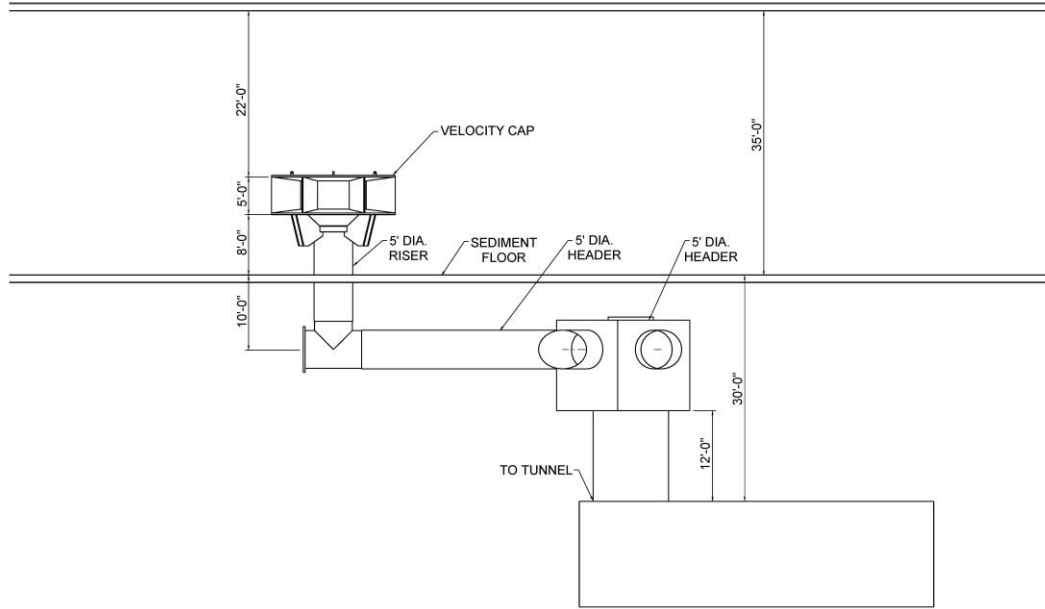
# Studies + Reports Completed to Date

Document Title / Document Link	Author	Date	Study Focus	Geographic Location	Desal Component	Study Highlights
<a href="#">White Paper - Background / Technical detail for Application</a>	Port of Corpus Christi Authority	20-Aug-18	Permit requirements for brine discharge	Port Area	Plant	
<a href="#">Literature Review - Best Practices for Intake Structure Placement</a>	Wood Environment & Infrastructure Solutions, Inc.	11-Dec-18	Best practices of intake structure planning and design	Port Area	Intake	
<a href="#">Desalination Brine Discharge Modeling - Corpus Christi Bay System</a>	LRE Water, LLC	21-Oct-19	Modeling for brine discharge in Corpus Christi Bay	Corpus Christi Bay System	Discharge	
<a href="#">Bathymetry of Harbor Island Area</a>	Lloyd Engineering / T Baker Smith	13-Aug-19	Survey data	Harbor Island	Plant	
<a href="#">Project Turnpike - Water and Sediment Sampling and Analysis Report</a>	Wood Environment & Infrastructure Solutions, Inc.	1-Jun-19	Results of benthic, sediment and water quality sampling	Harbor Island	Sediments	
<a href="#">Joint Evaluation Meeting Presentation with Corps of Engineers, Texas General Land Office, and Texas Parks and Wildlife Department</a>	Port of Corpus Christi Authority	7-Feb-23	Overview of proposed desal facility for resource agencies	Harbor Island	Plant	
<a href="#">Process Design Basis and Narrative Port of Corpus Christi Industrial Seawater Desalination</a>	Amecc Foster Wheeler	1-Dec-17	Basis of design for proposed desal at Harbor Island	Harbor Island	Plant	
<a href="#">Harbor Island Desalination Plant - Effluent Diffuser Conceptual Design</a>	Lial Tischler, P.E., B.C.E.E.	24-Jun-21	Conceptual Design of high-rate diffuser for Harbor Island desal discharge	Harbor Island	Discharge	
<a href="#">Review of Entrainment Survival Studies: 1970-2000</a>	Electric Power Research Institute	1-Dec-00	Compiles field studies on impingement and entrainment	Hudson River, California, Florida	Intake	
<a href="#">Do Power Plant Impingement and Entrainment Cause Changes in Fish Populations? A Review of the Scientific Evidence</a>	Electric Power Research Institute	1-Jul-11	Literature review of I&E studies	North America, Europe	Intake	
<a href="#">TCER Interoffice Memorandum - Port of Corpus Christi Authority of Nueces County Permit No. W00005253000 New Application Received: March 7, 2018</a>	Texas Commission on Environmental Quality	19-Aug-21	Tier 1 Anti-degradation Review against Texas Surface Water Quality Standards	Harbor Island	Discharge	The cross-sectional area of the ship channel at this location is 5574 m <sup>2</sup> which leaves a 35.6% area for zone of passage in which there would be no measurable increase in salinity above ambient. Under slack tide conditions, effluent plume modeling indicates a zone of passage of 32.6% of the cross-sectional
<a href="#">TCER Interoffice Memorandum - Port of Corpus Christi Authority of Nueces County Permit No. W00005253000 Critical Conditions Recommendation</a>	Texas Commission on Environmental Quality	10-Aug-21	Review of revised diffuser design and outfall location	Harbor Island	Discharge	Maintain 14.6% effluent at the edge of the ZID
<a href="#">TCER Interoffice Memorandum - Port of Corpus Christi Authority of Nueces County Wastewater Permit No. W00005253000 / TX0138347 (new) Discharge directly to Corpus Christi Bay, Segment 2481 of the Bays and Estuaries</a>	Texas Commission on Environmental Quality	26-Aug-21	TMDL Review	Harbor Island	Discharge	
<a href="#">Mixing Analysis for the Port of Corpus Christi Authority of Nueces County TPDES Permit No. W00005253000</a>	Texas Commission on Environmental Quality	10-Aug-21	Evaluation of performance of proposed diffuser	Harbor Island	Discharge	
<a href="#">Field Sampling Technical Memorandum for Port of Corpus Christi Draft TPDES Permit No. W00005253000</a>	Parsons	24-Jun-21	Summary of ambient velocity, bathymetry, and water quality sampling	Harbor Island	Discharge	
<a href="#">Short-Term Chronic Toxicity of Salinity to the Mysid Shrimp (Mysidopsis bahia)</a>	StillMeadow, Inc.	23-Jun-21	EPA Whole Effluent Toxicity Testing on Shrimp	Not Applicable	Discharge	
<a href="#">Short-Term Chronic Toxicity of Salinity to the Inland Silverside (Menidia beryllina)</a>	StillMeadow, Inc.	23-Jun-21	EPA Whole Effluent Toxicity Testing on Inland Silverside	Not Applicable	Discharge	
<a href="#">Short-Term Chronic Toxicity of Salinity to the Sheepshead Minnow (Cyprinodon variegatus)</a>	StillMeadow, Inc.	23-Jun-21	EPA Whole Effluent Toxicity Testing on Sheepshead Minnow	Not Applicable	Discharge	
<a href="#">Acute Toxicity Salinity to the Inland Silverside (Menidia beryllina) and Mysid Shrimp (Mysidopsis bahia)</a>	StillMeadow, Inc.	18-Jul-21	EPA Whole Effluent Toxicity Testing on Inland Silverside and Shrimp	Not Applicable	Discharge	
<a href="#">DBAFT - Desalination Brine Discharge Modeling - Corpus Christi Bay System EFDC+ Modeling Report</a>	LRE Water, LLC	30-Oct-23	Assessment of relative effect on ambient conditions resulting from brine discharges in vicinity of La Quinta Channel	La Quinta	Discharge	
<a href="#">Evaluation of Potential Impingement and Entrainment Associated with the Intake Structure for the Proposed Harbor Island Desalination Facility</a>	Integral Consulting Inc.	3-Feb-23	Evaluates I&E potential for marine life in Gulf of Mexico for Harbor Island desal intake structure	Harbor Island, Gulf of Mexico	Intake	
<a href="#">Proposed Construction Methods for the Harbor Island Desalination Facility Intake Tunnel</a>	Parsons & KIT	3-Feb-23	Construction methodology for intake in Gulf of Mexico	Harbor Island, Gulf of Mexico	Intake	
<a href="#">Proposed Intake for Desalination Plant Basis of Design Report</a>	Parsons & KIT	3-Feb-23	Basis of design for the water intake structure, tunnel, and intake screens for intake in Gulf of Mexico	Harbor Island, Gulf of Mexico	Intake	
<a href="#">Particle Simulation Animation - 3D In Water</a>	Integral Consulting Inc.	2023	Simulation of particle passing through discharge	Harbor Island	Discharge	
<a href="#">Particle Simulation Animation - Simplified Particles</a>	Integral Consulting Inc.	2023	Simulation of particle passing through discharge	Harbor Island	Discharge	
<a href="#">Particle Simulation Animation - Top Down</a>	Integral Consulting Inc.	2023	Simulation of particle passing through discharge	Harbor Island	Discharge	
<a href="#">Impacts of Channel Dredging on Storm Surge, Tidal Flows, and Salinity in Corpus Christi Bay</a>	Texas A&M HRI - Mukesh Subedee & Jim Gibesux, Ph.D.	1-Apr-21	Assessment of relative effect of channel deepening scenarios on salinity, storm surge, and tidal velocity	Corpus Christi Bay System	Plant	
<a href="#">Dr. Lance Fontenot Direct Testimony on Remand</a>	Dr. Lance Fontenot, Integral Consulting Inc.	13-Jan-22	Evaluation of potential impacts from effluent related to biological and ecotoxicological	Harbor Island	Discharge	
<a href="#">Receiving Water Monitoring Plan</a>	Port of Corpus Christi Authority	1-Nov-23	Monitoring Plan to demonstrate compliance with monitoring requirement in Discharge Permit	Harbor Island	Intake	

# Intake & Diffuser Tunnels



# Intake Structure



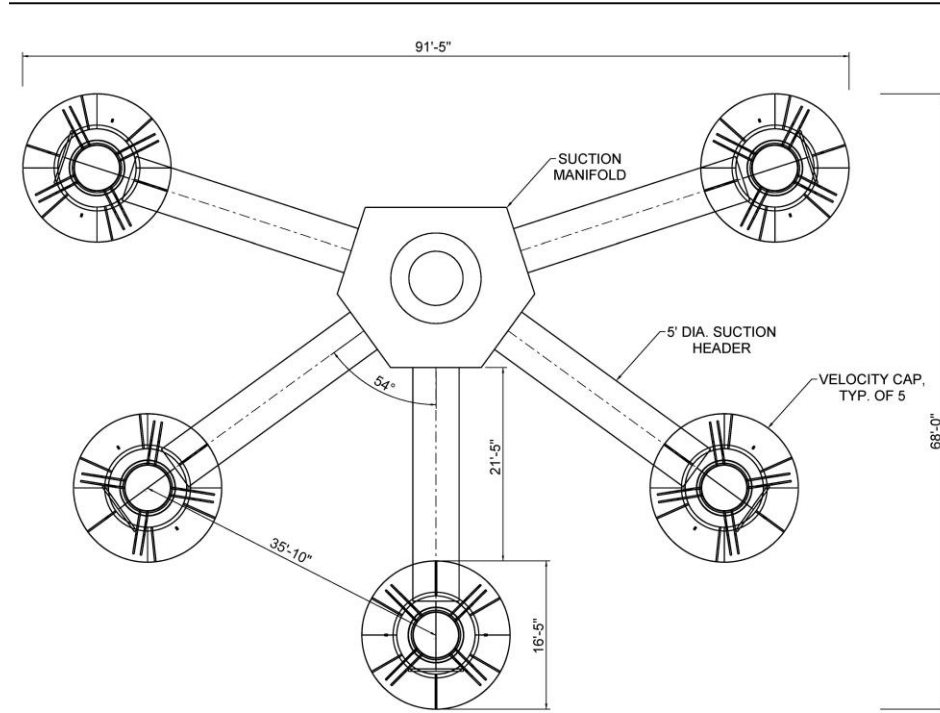
INTAKE STRUCTURE SECTION  
NOT TO SCALE

NOTES:  
1. DIMENSIONS PRESENTED FOR PRELIMINARY LAYOUT AND APPROXIMATE SIZING ONLY. NOT INTENDED FOR CONSTRUCTION.

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**SKIT**  
Innovative Solutions. Trusted Experts.  
2000 W. Sam Houston Pkwy S., Suite 1400 Houston, Texas 77042  
Phone: (713) 783-8700  
100% Firm Registration No. F-4991

DATE: 02/01/2017	DESIGNER: J. J. JONES	DATE: 02/01/2017	DESIGNER: J. J. JONES
PROJECT: PORT OF CORPUS CHRISTI AUTHORITY PROPOSED HARBOUR ISLAND DESALINATION FACILITY	PROJECT: PORT OF CORPUS CHRISTI AUTHORITY PROPOSED HARBOUR ISLAND DESALINATION FACILITY	PROJECT: PORT OF CORPUS CHRISTI AUTHORITY PROPOSED HARBOUR ISLAND DESALINATION FACILITY	PROJECT: PORT OF CORPUS CHRISTI AUTHORITY PROPOSED HARBOUR ISLAND DESALINATION FACILITY
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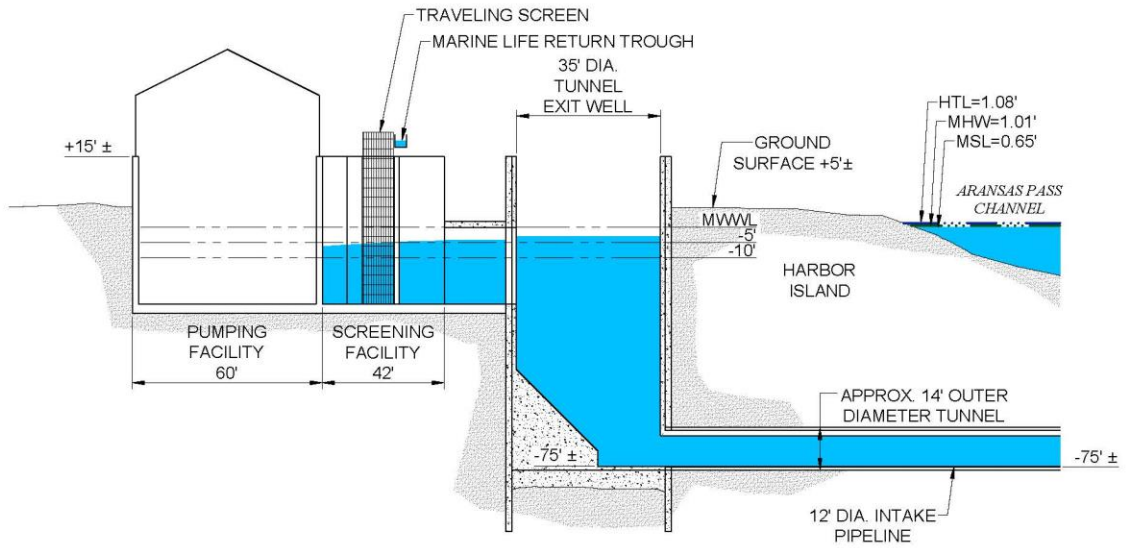
TYPICAL INTAKE STRUCTURE PLAN  
NOT TO SCALE

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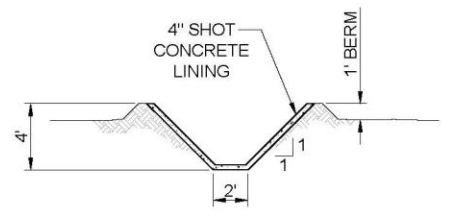
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DATE: 02/01/2017	DESIGNER: J. J. JONES	DATE: 02/01/2017	DESIGNER: J. J. JONES
PROJECT: PORT OF CORPUS CHRISTI AUTHORITY PROPOSED HARBOUR ISLAND DESALINATION FACILITY	PROJECT: PORT OF CORPUS CHRISTI AUTHORITY PROPOSED HARBOUR ISLAND DESALINATION FACILITY	PROJECT: PORT OF CORPUS CHRISTI AUTHORITY PROPOSED HARBOUR ISLAND DESALINATION FACILITY	PROJECT: PORT OF CORPUS CHRISTI AUTHORITY PROPOSED HARBOUR ISLAND DESALINATION FACILITY
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# Marine Life Return System

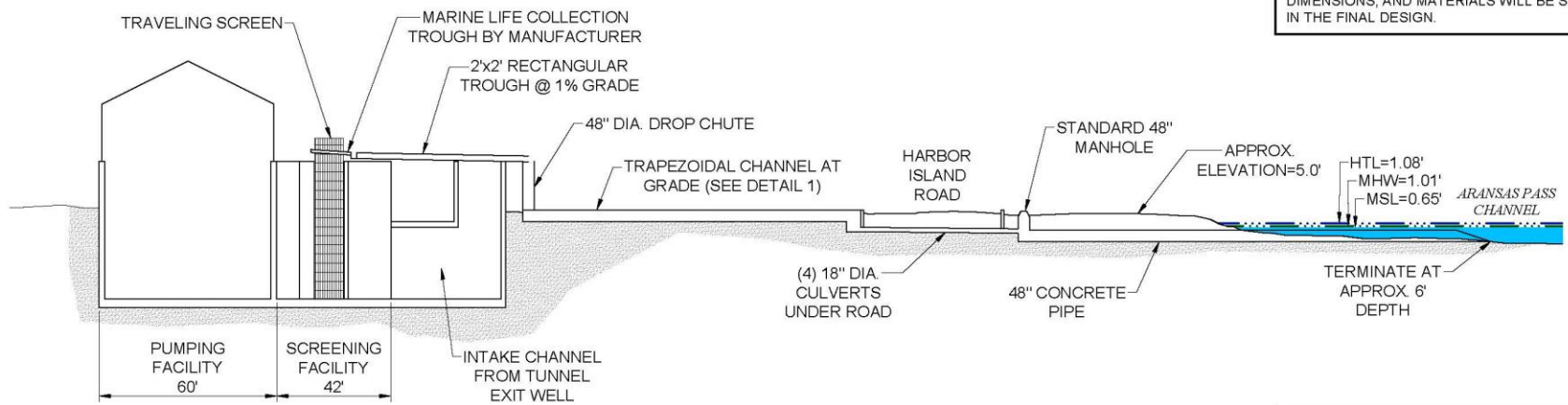


**SCHMATIC CROSS-SECTION OF SCREEN AND PUMPING FACILITY** A



**TYPICAL MARINE LIFE RETURN CHANNEL DETAIL** 1

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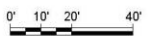
**SCHMATIC TYPICAL CROSS-SECTION OF MARINE LIFE RETURN CHANNEL** B

**LEGEND**

- HIGH TIDE LINE (HTL)
- MEAN HIGH WATER (MHW)

**NOTES:**

- ALL DIMENSIONS PRELIMINARY.
- ALL ELEVATIONS BASED ON MLLW.



Rev	Date	Description

Issue Certification

**PARSONS**  
 TYPE REG. NO. F-8008  
 9101 BURNET RD  
 SUITE #210  
 AUSTIN, TX  
 (512) 719-0000

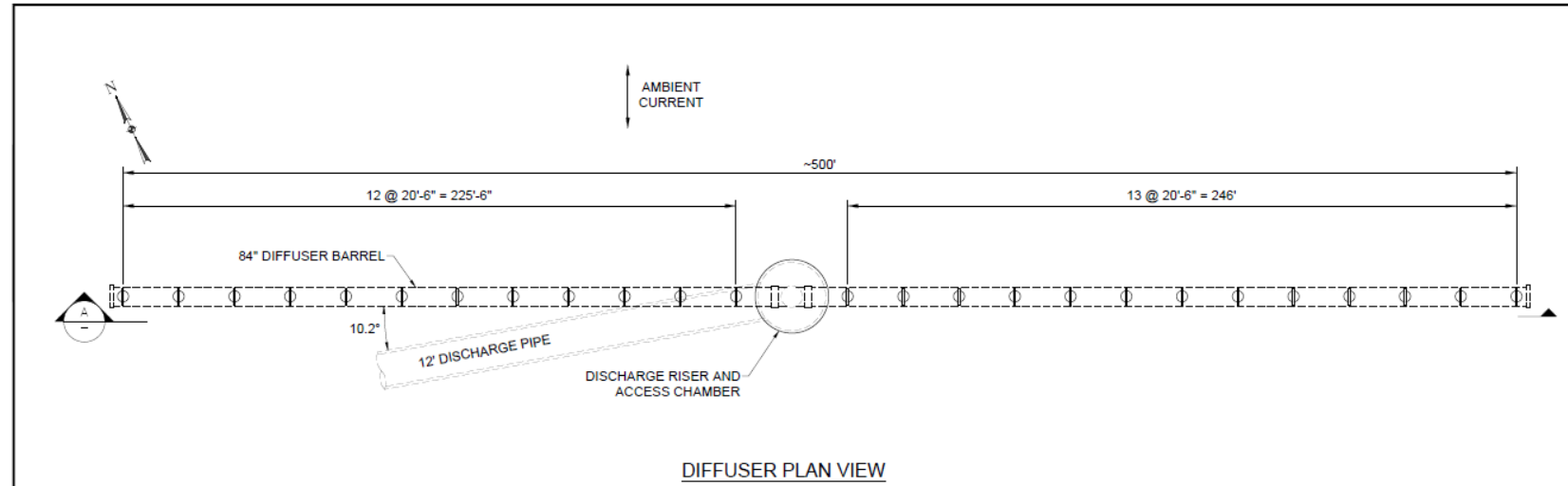
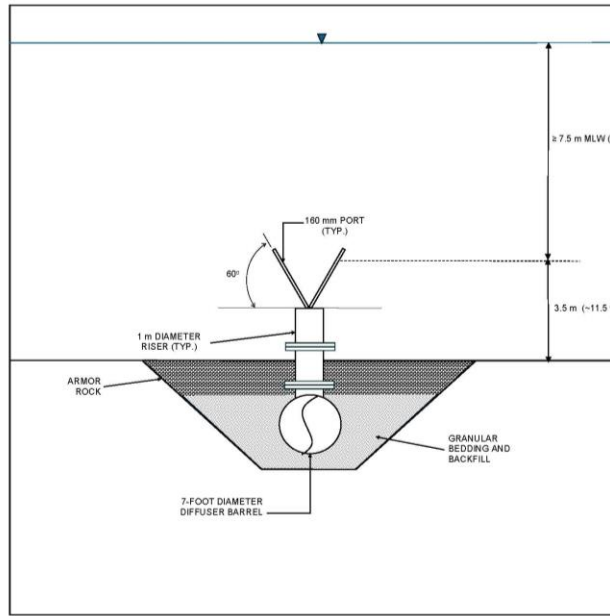


PORT OF CORPUS CHRISTI AUTHORITY  
 PROPOSED HARBOR ISLAND DESALINATION FACILITY

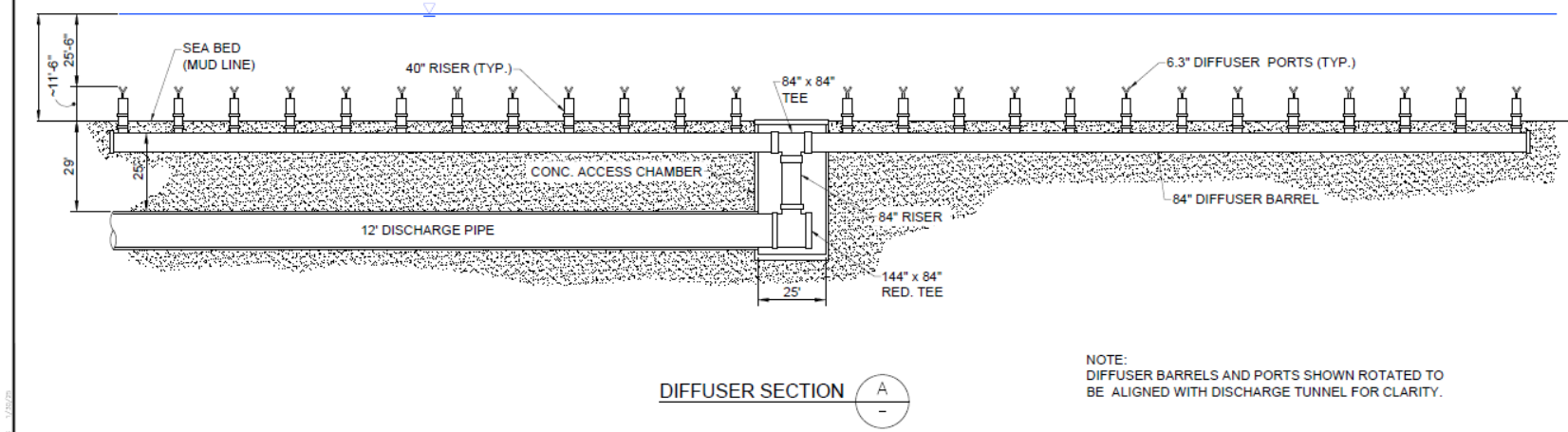
INTAKE SECTION

DRAWING NO. **5** REV.

# Diffuser Detail



DIFFUSER PLAN VIEW



DIFFUSER SECTION

NOTE:  
DIFFUSER BARRELS AND PORTS SHOWN ROTATED TO  
BE ALIGNED WITH DISCHARGE TUNNEL FOR CLARITY.

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<p>PARSONS TYPE REG. NO. F-4008 901 BURNET RD SUITE #210 AUSTIN, TX (512) 719-6000</p>	
<p>PORT OF CORPUS CHRISTI AUTHORITY PROPOSED HARBOR ISLAND RECREATION FACILITY</p>	
<p>EFFLUENT DIFFUSER</p>	
<p>DRAWING NO. 9</p>	<p>REV.</p>