Administrative Package Cover Page

This file contains the following documents:

1. Summary of application (in plain language)
   - English
   - Alternative Language (Spanish)
2. First Notice (NORI-Notice of Receipt of Application and Intent to Obtain a Permit)
   - English
   - Alternative Language (Spanish)
3. Application materials

Portada de Paquete Administrativo

Este archivo contiene los siguientes documentos:

1. Resumen en lenguaje sencillo (PLS, por sus siglas en inglés) de la actividad propuesta
   - Inglés
   - Idioma alternativo (español)
2. Primer aviso (NORI, por sus siglas en inglés)
   - Inglés
   - Idioma alternativo (español)
3. Solicitud original

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

SUMMARY OF APPLICATION IN PLAIN LANGUAGE FOR TPDES OR TLAP PERMIT APPLICATIONS

Summary of Application (in plain language) Template and Instructions for Texas Pollutant Discharge Elimination System (TPDES) and Texas Land Application (TLAP) Permit Applications

Applicants should use this template to develop a plain language summary of your facility and application as required by Title 30, Texas Administrative Code (30 TAC), Chapter 39, Subchapter H. You may modify the template as necessary to accurately describe your facility as long as the summary includes the following information: (1) the function of the proposed plant or facility; (2) the expected output of the proposed plant or facility; (3) the expected pollutants that may be emitted or discharged by the proposed plant or facility; and (4) how you will control those pollutants, so that the proposed plant will not have an adverse impact on human health or the environment.

Fill in the highlighted areas below to describe your facility and application in plain language. Instructions and examples are provided below. Make any other edits necessary to improve readability or grammar and to comply with the rule requirements. After filling in the information for your facility delete these instructions.

If you are subject to the alternative language notice requirements in 30 TAC Section 39.426, **you must provide a translated copy of the completed plain language summary in the appropriate alternative language as part of your application package**. For your convenience, a Spanish template has been provided below.

ENGLISH TEMPLATE FOR TPDES or TLAP NEW/RENEWAL/AMENDMENT APPLICATIONS INDUSTRIAL WASTEWATER/STORMWATER

The following summary is provided for this pending water quality permit application being reviewed by the Texas Commission on Environmental Quality as required by 30 TAC Chapter 39. The information provided in this summary may change during the technical review of the application and is not a federal enforceable representation of the permit application.

EPCOR NR Holdings, Inc. proposes to operate Bayshore Desalination Facility, a Seawater Desalination Water Treatment Plant. The facility will be located at 5501 Highway 146, in Texas City, Galveston County, Texas 77518. This application is for a new application to discharge process wastewater (reverse osmosis concentrated blended with raw seawater) on an intermittent and flow-variable basis, at a volume not to exceed a daily average flow of 59.93 million gallons per day.

Discharges from the facility are expected to contain Total Suspended Solids, Total Dissolved Solids, salinity, chloride, sulfate, and trace chemicals used in the water treatment processes. Trace chemicals residual from the water treatment process may be present, including Ferric Sulfate (CAS # 10028-22-5), Anionic Polymer, Sodium Hypochlorite (CAS # 7681-52-9), Liquid Ammonium Sulfate (CAS # 7783-20-2), CO_2 (CAS # 124-38-9), Sodium Hydroxide (CAS # 1310-

73-2), Citric Acid (CAS # 77-92-9), Sodium Bisulfite (CAS # 7631-90-5), Seawater reverse osmosis Antiscalant, Sulfuric Acid (CAS # 7664-93-9), and Lime (calcite)(CAS # 13397-26-7). Concentrate from seawater reverse osmosis treatment will be treated by blending with raw seawater.

PLANTILLA EN ESPAÑOL PARA SOLICITUDES NUEVAS/RENOVACIONES/ENMIENDAS DE TPDES o TLAP

AGUAS RESIDUALES INDUSTRIALES **/AGUAS PLUVIALES**

El siguiente resumen se proporciona para esta solicitud de permiso de calidad del agua pendiente que está siendo revisada por la Comisión de Calidad Ambiental de Texas según lo requerido por el Capítulo 39 del Código Administrativo de Texas 30. La información proporcionada en este resumen puede cambiar durante la revisión técnica de la solicitud y no es una representación ejecutiva fedérale de la solicitud de permiso.

EPCOR NR Holdings, Inc. propone operar Bayshore Desalination Facility, una planta de desalinización de aqua. La instalación estará ubicada en 5501 Highway 146, en Texas City, Condado de Galveston, Texas 77518. Esta solicitud es para una nueva aplicación para descargar aguas residuales de proceso (concentrado de ósmosis inversa mezclado con agua de mar cruda) de manera intermitente y con caudal variable.

Se espera que las descargas de la instalación contengan Sólidos Suspendidos Totales, Sólidos Disueltos Totales, salinidad, cloruro, sulfato y químicos traza utilizados en los procesos de tratamiento de agua. Pueden estar presentes residuos de químicos traza del proceso de tratamiento de agua, incluyendo Sulfato Férrico (CAS # 10028-22-5), Polímero Aniónico, Hipoclorito de Sodio (CAS # 7681-52-9), Sulfato de Amonio Líquido (CAS # 7783-20-2), CO2 (CAS # 124-38-9), Hidróxido de Sodio (CAS # 1310-73-2), Ácido Cítrico (CAS # 77-92-9), Bisulfito de Sodio (CAS # 7631-90-5), Antiincrustante de ósmosis inversa de agua de mar, Ácido Sulfúrico (CAS # 7664-93-9) y Cal (calcita) (CAS # 13397-26-7). Esta solicitud es para una nueva aplicación para descargar aguas residuales del proceso (mezcla de agua concentrada por osmosis inversa con agua del mar) de manera intermitente y con flujo variable, con un volumen que no exceda el promedio diario de 59,93 millones de galones por día.

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

NOTICE OF RECEIPT OF APPLICATION AND INTENT TO OBTAIN WATER QUALITY PERMIT

PROPOSED PERMIT NO. WQ0005502000

APPLICATION. EPCOR NR Holdings Inc., 4801 University Boulevard, Suite 400, Round Rock, Texas 78665, which will own and operate a desalination water treatment facility, has applied to the Texas Commission on Environmental Quality (TCEQ) for proposed Texas Pollutant Discharge Elimination System (TPDES) Permit No. WQ0005502000 (EPA I.D. No. TX0148580) to authorize the discharge of treated wastewater at a volume not to exceed a daily average flow of 59,930,000 gallons per day. The facility will be located at 5501 State Highway 146, approximately 1.15 miles southeast of the intersection of State Highway 146 and Farm-to-Market Road 646, near Bacliff, in Galveston County, Texas 77518. The discharge route will be from the plant site to a canal, thence to Upper Galveston Bay. TCEQ received this application on October 3, 2025. The permit application will be available for viewing and copying at Dickinson Public Library, 4411 State Highway 3, Dickinson, in Galveston County, Texas prior to the date this notice is published in the newspaper. The application is available for viewing and copying at the following webpage: https://www.tceq.texas.gov/permitting/wastewater/pending-permits/tpdes-applications. This link to an electronic map of the site or facility's general location is provided as a public courtesy and not part of the application or notice. For the exact location, refer to the application. https://gisweb.tceq.texas.gov/LocationMapper/?marker=-94.97981,29.48702&level=18

The application is subject to the goals and policies of the Texas Coastal Management Program and must be consistent with the applicable Coastal Management Program goals and policies.

ALTERNATIVE LANGUAGE NOTICE. Alternative language notice in Spanish is available at: https://www.tceq.texas.gov/permitting/wastewater/pending-permits/tpdes-applications. El aviso de idioma alternativo en español está disponible en https://www.tceq.texas.gov/permitting/wastewater/pending-permits/tpdes-applications.

ADDITIONAL NOTICE. TCEQ's Executive Director has determined the application is administratively complete and will conduct a technical review of the application. After technical review of the application is complete, the Executive Director may prepare a draft permit and will issue a preliminary decision on the application. **Notice of the Application and Preliminary Decision will be published and mailed to those who are on the county-wide mailing list and to those who are on the mailing list for this application. That notice will contain the deadline for submitting public comments.**

PUBLIC COMMENT / PUBLIC MEETING. You may submit public comments or request a public meeting on this application. The purpose of a public meeting is to provide the opportunity to submit comments or to ask questions about the application. TCEQ will hold a public meeting if the Executive Director determines that there is a significant degree of public interest in the application or if requested by a local legislator. A public meeting is not a contested case hearing.

OPPORTUNITY FOR A CONTESTED CASE HEARING. After the deadline for submitting public comments, the Executive Director will consider all timely comments and prepare a response to all relevant and material, or significant public comments. **Unless the application is directly referred for a contested case hearing, the response to comments, and the Executive Director's decision on the application, will be mailed to everyone who submitted public comments and to those persons who are on the mailing list for this application. If comments are received, the mailing will also provide instructions for requesting reconsideration of the Executive Director's decision and for requesting a contested case hearing.** A contested case hearing is a legal proceeding similar to a civil trial in state district court.

TO REQUEST A CONTESTED CASE HEARING, YOU MUST INCLUDE THE FOLLOWING ITEMS IN YOUR REQUEST: your name, address, phone number; applicant's name and proposed permit number; the location and distance of your property/activities relative to the proposed facility; a specific description of how you would be adversely affected by the facility in a way not common to the general public; a list of all disputed issues of fact that you submit during the comment period and, the statement "[I/we] request a contested case hearing." If the request for contested case hearing is filed on behalf of a group or association, the request must designate the group's representative for receiving future correspondence; identify by name and physical address an individual member of the group who would be adversely affected by the proposed facility or activity; provide the information discussed above regarding the affected member's location and distance from the facility or activity; explain how and why the member would be affected; and explain how the interests the group seeks to protect are relevant to the group's purpose.

Following the close of all applicable comment and request periods, the Executive Director will forward the application and any requests for reconsideration or for a contested case hearing to the TCEQ Commissioners for their consideration at a scheduled Commission meeting.

The Commission may only grant a request for a contested case hearing on issues the requestor submitted in their timely comments that were not subsequently withdrawn. **If a hearing is granted, the subject of a hearing will be limited to disputed issues of fact or mixed questions of fact and law relating to relevant and material water quality concerns submitted during the comment period.**

MAILING LIST. If you submit public comments, a request for a contested case hearing or a reconsideration of the Executive Director's decision, you will be added to the mailing list for this specific application to receive future public notices mailed by the Office of the Chief Clerk. In addition, you may request to be placed on: (1) the permanent mailing list for a specific applicant name and permit number; and/or (2) the mailing list for a specific county. If you wish to be placed on the permanent and/or the county mailing list, clearly specify which list(s) and send your request to TCEQ Office of the Chief Clerk at the address below.

INFORMATION AVAILABLE ONLINE. For details about the status of the application, visit the Commissioners' Integrated Database at www.tceq.texas.gov/goto/cid. Search the database using the permit number for this application, which is provided at the top of this notice.

AGENCY CONTACTS AND INFORMATION. All public comments and requests must be submitted either electronically at **https://www14.tceq.texas.gov/epic/eComment/**, or in writing to the Texas Commission on Environmental Quality, Office of the Chief Clerk, MC-105, P.O. Box 13087, Austin, Texas 78711-3087. Please be aware that any contact information you provide, including your name, phone number, email address and physical address will become part of the agency's public record. For more information about this permit application or the permitting process, please call the TCEQ Public Education Program, Toll Free, at 1-800-687-4040 or visit their website at www.tceq.texas.gov/goto/pep. Si desea información en Español, puede llamar al 1-800-687-4040.

Further information may also be obtained from EPCOR NR Holdings Inc. at the address stated above or by calling Ms. Rachel Watkins, Environmental Compliance Manager, at 512-745-2095.

Issuance Date: November 3, 2025

Comisión de Calidad Ambiental del Estado de Texas

AVISO DE RECIBO DE LA SOLICITUD Y
EL INTENTO DE OBTENER PERMISO PARA LA CALIDAD DEL AGUA PERMISO

PERMISO PROPUESTO NO. WQ0005502000

SOLICITUD. EPCOR NR Holdings Inc., 4801 University Boulevard, Suite 400, Round Rock, Texas 78665, que planea poseer y operar una instalación de tratamiento de agua de desalinización, ha solicitado a la Comisión de Calidad Ambiental de Texas (TCEQ por sus siglas en inglés) el Permiso No. WQ0005502000 (número de identificación de la EPA TX0148580) para autorizar la descarga de aguas residuales tratadas a un volumen que no exceda un flujo promedio diario de 59,930,000 galones por día. La instalación estará ubicada en 5501 State Highway 146, aproximadamente a 1.15 millas al sureste de la intersección de la carretera estatal 146 y Farm-to-Market Road 646, cerca de Bacliff, en el condado de Galveston, Texas 77518. La ruta de descarga será desde el sitio de la planta a un canal, desde allí a la bahía superior de Galveston. TCEQ recibió esta solicitud el 3 de octubre de 2025. La solicitud de permiso estará disponible para su visualización y copia en la Biblioteca Pública Dickinson, 4411 State Highway 3, Dickinson, en el condado de Galveston, Texas, antes de la fecha en que se publique este aviso en el periódico. La solicitud está disponible para su visualización y copia en la siguiente página web: https://www.tceq.texas.gov/permitting/wastewater/pending-permits/tpdes-applications. Este enlace a un mapa electrónico del sitio o ubicación general de la instalación se ofrece como una cortesía pública y no es parte de la solicitud o notificación. Para la ubicación exacta, consulte la aplicación. https://gisweb.tceq.texas.gov/LocationMapper/?marker=-94.97981,29.48702&level=18

El Director Ejecutivo de la TCEQ ha revisado esta medida para ver si está de acuerdo con los objetivos y las regulaciones del Programa de Administración Costero de Texas (CMP) de acuerdo con las regulaciones del Consejo Coordinador de la Costa (CCC) y ha determinado que la acción es conforme con las metas y regulaciones pertinentes del CMP.

AVISO DE IDIOMA ALTERNATIVO. El aviso de idioma alternativo en español está disponible en https://www.tceq.texas.gov/permitting/wastewater/pending-permits/tpdes-applications.

AVISO ADICIONAL. El Director Ejecutivo de la TCEQ ha determinado que la solicitud es administrativamente completa y conducirá una revisión técnica de la solicitud. Después de completar la revisión técnica, el Director Ejecutivo puede preparar un borrador del permiso y emitirá una Decisión Preliminar sobre la solicitud. **El aviso de la solicitud y la decisión preliminar serán publicados y enviado a los que están en la lista de correo de las personas a lo largo del condado que desean recibir los avisos y los que están en la lista de correo que desean recibir avisos de esta solicitud. El aviso dará la fecha límite para someter**

comentarios públicos.

COMENTARIO PUBLICO / REUNION PUBLICA. Usted puede presentar comentarios públicos o pedir una reunión pública sobre esta solicitud. El propósito de una reunión pública es dar la oportunidad de presentar comentarios o hacer preguntas acerca de la solicitud. La TCEQ realiza una reunión pública si el Director Ejecutivo determina que hay un grado de interés público suficiente en la solicitud o si un legislador local lo pide. Una reunión pública no es una audiencia administrativa de lo contencioso.

OPORTUNIDAD DE UNA AUDIENCIA ADMINISTRATIVA DE LO CONTENCIOSO. Después del plazo para presentar comentarios públicos, el Director Ejecutivo considerará todos los comentarios apropiados y preparará una respuesta a todo los comentarios públicos esenciales, pertinentes, o significativos. **A menos que la solicitud haya sido referida directamente a una audiencia administrativa de lo contencioso, la respuesta a los comentarios y la decisión del Director Ejecutivo sobre la solicitud serán enviados por correo a todos los que presentaron un comentario público y a las personas que están en la lista para recibir avisos sobre esta solicitud. Si se reciben comentarios, el aviso también proveerá instrucciones para pedir una reconsideración de la decisión del Director Ejecutivo y para pedir una audiencia administrativa de lo contencioso.** Una audiencia administrativa de lo contencioso es un procedimiento legal similar a un procedimiento legal civil en un tribunal de distrito del estado.

PARA SOLICITAR UNA AUDIENCIA DE CASO IMPUGNADO, USTED DEBE INCLUIR EN SU SOLICITUD LOS SIGUIENTES DATOS: su nombre, dirección, y número de teléfono; el nombre del solicitante y número del permiso; la ubicación y distancia de su propiedad/actividad con respecto a la instalación; una descripción específica de la forma cómo usted sería afectado adversamente por el sitio de una manera no común al público en general; una lista de todas las cuestiones de hecho en disputa que usted presente durante el período de comentarios; y la declaración "[Yo/nosotros] solicito/solicitamos una audiencia de caso impugnado". Si presenta la petición para una audiencia de caso impugnado de parte de un grupo o asociación, debe identificar una persona que representa al grupo para recibir correspondencia en el futuro; identificar el nombre y la dirección de un miembro del grupo que sería afectado adversamente por la planta o la actividad propuesta; proveer la información indicada anteriormente con respecto a la ubicación del miembro afectado y su distancia de la planta o actividad propuesta; explicar cómo y porqué el miembro sería afectado; y explicar cómo los intereses que el grupo desea proteger son pertinentes al propósito del grupo.

Después del cierre de todos los períodos de comentarios y de petición que aplican, el Director Ejecutivo enviará la solicitud y cualquier petición para reconsideración o para una audiencia de caso impugnado a los Comisionados de la TCEQ para su consideración durante una reunión programada de la Comisión.
La Comisión sólo puede conceder una solicitud de una audiencia de caso impugnado sobre los temas que el solicitante haya presentado en sus comentarios oportunos que no fueron retirados posteriormente. **Si se concede una audiencia, el tema de la audiencia estará limitado a cuestiones de hecho en disputa o cuestiones mixtas de hecho y de derecho relacionadas a intereses pertinentes y materiales de calidad del agua que se hayan presentado durante el período de comentarios.**

LISTA DE CORREO. Si somete comentarios públicos, un pedido para una audiencia administrativa de lo contencioso o una reconsideración de la decisión del Director Ejecutivo, la Oficina del Secretario Principal enviará por correo los avisos públicos en relación con la solicitud. Además, puede pedir que la TCEQ ponga su nombre en una o más de las listas correos siguientes (1) la lista de correo permanente para recibir los avisos del solicitante indicado por nombre y número del permiso específico y/o (2) la lista de correo de todas las solicitudes en un condado especifico. Si desea que se agrega su nombre en una de las listas designe cual lista(s) y envía por correo su pedido a la Oficina del Secretario Principal de la TCEQ.

INFORMACIÓN DISPONIBLE EN LÍNEA. Para detalles sobre el estado de la solicitud, favor de visitar la Base de Datos Integrada de los Comisionados en www.tceq.texas.gov/goto/cid. Para buscar en la base de datos, utilizar el número de permiso para esta solicitud que aparece en la parte superior de este aviso.

CONTACTOS E INFORMACIÓN A LA AGENCIA. Todos los comentarios públicos y solicitudes deben ser presentadas electrónicamente vía http://www14.tceq.texas.gov/epic/eComment/ o por escrito dirigidos a la Comisión de Texas de Calidad Ambiental, Oficial de la Secretaría (Office of Chief Clerk), MC-105, P.O. Box 13087, Austin, Texas 78711-3087. Tenga en cuenta que cualquier información personal que usted proporcione, incluyendo su nombre, número de teléfono, dirección de correo electrónico y dirección física pasarán a formar parte del registro público de la Agencia. Para obtener más información acerca de esta solicitud de permiso o el proceso de permisos, llame al programa de educación pública de la TCEQ, gratis, al 1-800-687-4040. Si desea información en español, puede llamar al 1-800-687-4040.

También se puede obtener más información escribiendo a EPCOR NR Holdings, Inc. a la dirección indicada arriba o llamando a Rachel Watkins, Gerente de Cumplimiento Ambiental, EPCOR al (512) 745-2095.

Fecha de emisión: 3 de noviembre de 2025

Leah Whallon

From: Lyndsey Stovall <lstovall@lglawfirm.com>
Sent: Friday, October 24, 2025 3:52 PM
To: Leah Whallon
Cc: mirlbeck@epcor.com; Mitchell, Americus; dholwerda@epcor.com; matwood@epcor.com; rwatkins@epcor.com; Sara Thornton; Lora Naismith
Subject: EPCOR Response to Notice of Deficiency; Application No. WQ0005502000
Attachments: SRT to TCEQ Response to NOD 2025.10.24.pdf; Exhibit A - Certified Statement.pdf; Exhibit B - AR-07 Affected Landowner Map-Rev 10.17.25.pdf; Exhibit B - AR-07 List of CR Affected Landowners.docx; Exhibit B - AR-07 Mailing Labels.docx; Exhibit C - Plain Language Summary.pdf; Exhibit D - Industrial Discharge New Spanish NORI.docx

Follow Up Flag: Follow up
Flag Status: Flagged

Hi Leah,

Please find attached submission from Sara Thornton on behalf of EPCOR NR Holdings Inc. Please reach out if you have any questions or need additional information.

Thank you,
Lyndsey

Lloyd Gosselink ATTORNEYS AT LAW

LYNDSEY STOVALL
Paralegal
512-322-5817 Direct
Lloyd Gosselink Rochelle & Townsend, P.C.
816 Congress Ave., Suite 1900, Austin, TX 78701
www.lglawfirm.com | 512-322-5800

****ATTENTION TO PUBLIC OFFICIALS AND OFFICIALS WITH OTHER INSTITUTIONS SUBJECT TO THE OPEN MEETINGS ACT ****

A "REPLY TO ALL" OF THIS EMAIL COULD LEAD TO VIOLATIONS OF THE TEXAS OPEN MEETINGS ACT. PLEASE REPLY ONLY TO LEGAL COUNSEL.

CONFIDENTIALITY NOTICE:
This email (and all attachments) is confidential, legally privileged, and covered by the Electronic Communications Privacy Act. Unauthorized use or dissemination is prohibited. If you have received this message in error please delete it immediately. For more detailed information click http://www.lglawfirm.com/email-disclaimer/ .

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Lloyd Gosselink
ATTORNEYS AT LAW

816 Congress Avenue, Suite 1900
Austin, Texas 78701
512.322.5800 p
512.472.0532 f
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Ms. Thornton's Direct Line: (512) 322-5876
Email: sthornton@lglawfirm.com

October 24, 2025

Leah Whallon
Applications Review and Processing Team (MC 148)
Water Quality Division
Texas Commission on Environmental Quality
P.O. Box 13087
Austin, Texas 78711-3087

VIA ELECTRONIC TRANSMISSION
leah.whallon@tceq.texas.gov

Re: Response to TCEQ Notice of Deficiency
Application for Proposed Permit No.: WQ0005502000 (EPA I.D. No. TX0148580)
Applicant Name: EPCOR NR Holdings Inc. (CN606436236)
Site Name: Bayshore Desalination Facility (RN112298781)
Type of Application: New

Dear Ms. Whallon:

This letter is submitted on behalf of my client, EPCOR NR Holdings Inc. ("EPCOR"), regarding the above referenced TPDES Industrial Wastewater Permit Application (the "Application") associated with the proposed Bayshore Desalination Facility. It serves as a response to the items noted in the October 13, 2025 letter to Rachel Watkins transmitting the notice of deficiencies for the Application.

Request 1: Administrative Report 1.0, Item 10.f

Following recent correspondence with TCEQ, the Memorandum of Option Agreement submitted with the Application is sufficient to declare the Application administratively complete. EPCOR will submit an easement with sufficient rights to the land for the operation of the facility, as requested by TCEQ, prior to any issuance of a draft permit. **Exhibit A** provides a written statement certifying that documentation will be provided satisfying ownership requirements during technical review of the Application and prior to the issuance of any draft permit.

Request 2: Administrative Report 1.1

An updated affected landowner map, cross-referenced landowner list, and mailing labels are included as **Exhibit B** and as attachments to the email submitting this response.

Request 3: Summary of Application in Plain Language (TCEQ-20972)

As the technical report includes a flow limit of 59.93 MGD and not 5.93 MGD, EPCOR assumes this was a typographical error. The Plain Language Summary has been updated to include the proposed flow limit of 59.93 million gallons per day. Both the English and Spanish Plain Language Summaries are attached as **Exhibit C** and as an attachment to the email submitting this response.

Request 4: Verify information in draft Notice of Receipt of Application and Intent to Obtain a Water Quality Permit ("NORI")

Please see below for revisions to the provided excerpt of the draft NORI. Revisions have been made in red text.

APPLICATION. EPCOR NR Holdings Inc., 4801 University Boulevard, Suite 400, Round Rock, Texas 78665, which ~~owns~~ plans to own and operate a desalination water treatment facility, has applied to the Texas Commission on Environmental Quality (TCEQ) for proposed Texas Pollutant Discharge Elimination System (TPDES) Permit No. WQ0005502000 (EPA I.D. No. TX0148580) to authorize the discharge of treated wastewater at a volume not to exceed a daily average flow of 59,930,000 gallons per day (pending response). The facility will be located at 5501 State Highway 146, approximately 1.15 miles southeast of the intersection of State Highway 146 and Farm-to-Market Road 646, near Bacliff, in Galveston County, Texas 77518. The discharge route will be from the plant site to a man-made canal, thence to Upper Galveston Bay ~~(pending RWA)~~. TCEQ received this application on October 3, 2025. The permit application will be available for viewing and copying at Dickinson Public Library, 4411 State Highway 3, Dickinson, in Galveston County, Texas prior to the date this notice is published in the newspaper. The application, including any updates, and associated notices are available electronically at the following webpage: https://www.tceq.texas.gov/permitting/wastewater/pending-permits/tpdes-applications.
This link to an electronic map of the site or facility's general location is provided as a public courtesy and not part of the application or notice. For the exact location, refer to the application. https://gisweb.tceq.texas.gov/LocationMapper/?marker=-94.97981,29.48702&level=18

Further information may also be obtained from EPCOR NR Holdings Inc. at the address stated above or by calling ~~Mr. Matthew Atwood, Communications Senior Advisor, at 512-760-5652,~~ Ms. Rachel Watkins, Environmental Compliance Manager, at 512-745-2095.

Request 5: Provision of the translated Spanish NORI

The translated Spanish NORI reflecting the above changes is included as **Exhibit D** and as an attachment to the email submitting this response.

We greatly appreciate your efforts in processing the Application and look forward to working with you during technical review and preparation of a draft permit. Please do not hesitate

to contact me, or Lora Naismith (lnaismith@lglawfirm.com; 512-322-5850), if you have any questions or need additional information.

Sincerely,



Sara R. Thornton

Enclosures

cc: Americus Mitchell, *EPCOR NR Holdings Inc.*
Matthew Atwood, *EPCOR NR Holdings Inc.*
Rachel Watkins, *EPCOR NR Holdings Inc.*
Lora Naismith, *Lloyd Gosselink Rochelle & Townsend, P.C.*

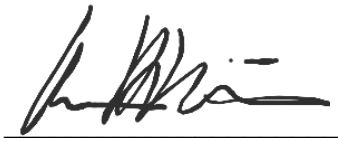
Exhibit A

Leah Whallon
Applications Review and Processing Team (MC 148)
Water Quality Division
Texas Commission on Environmental Quality
P. O. Box 13087
Austin, TX 78711-3087

Re: Certified Statement Acknowledging Ownership Requirement
EPCOR NR Holdings Inc. (CN606436236) for Proposed Permit No. WQ0005502000

Dear Ms. Whallon:

EPCOR NR Holdings Inc. (the "Applicant") acknowledges and affirms that all ownership and property interest requirements necessary for the Texas Pollutant Discharge and Eliminations Systems Application for the Bayshore Desalination Facility will be satisfied prior to the issuance of any draft permit. The Applicant understands that no permit may be issued until documentation demonstrating compliance with all applicable ownership requirements has been provided to and accepted by the Texas Commission on Environmental Quality.



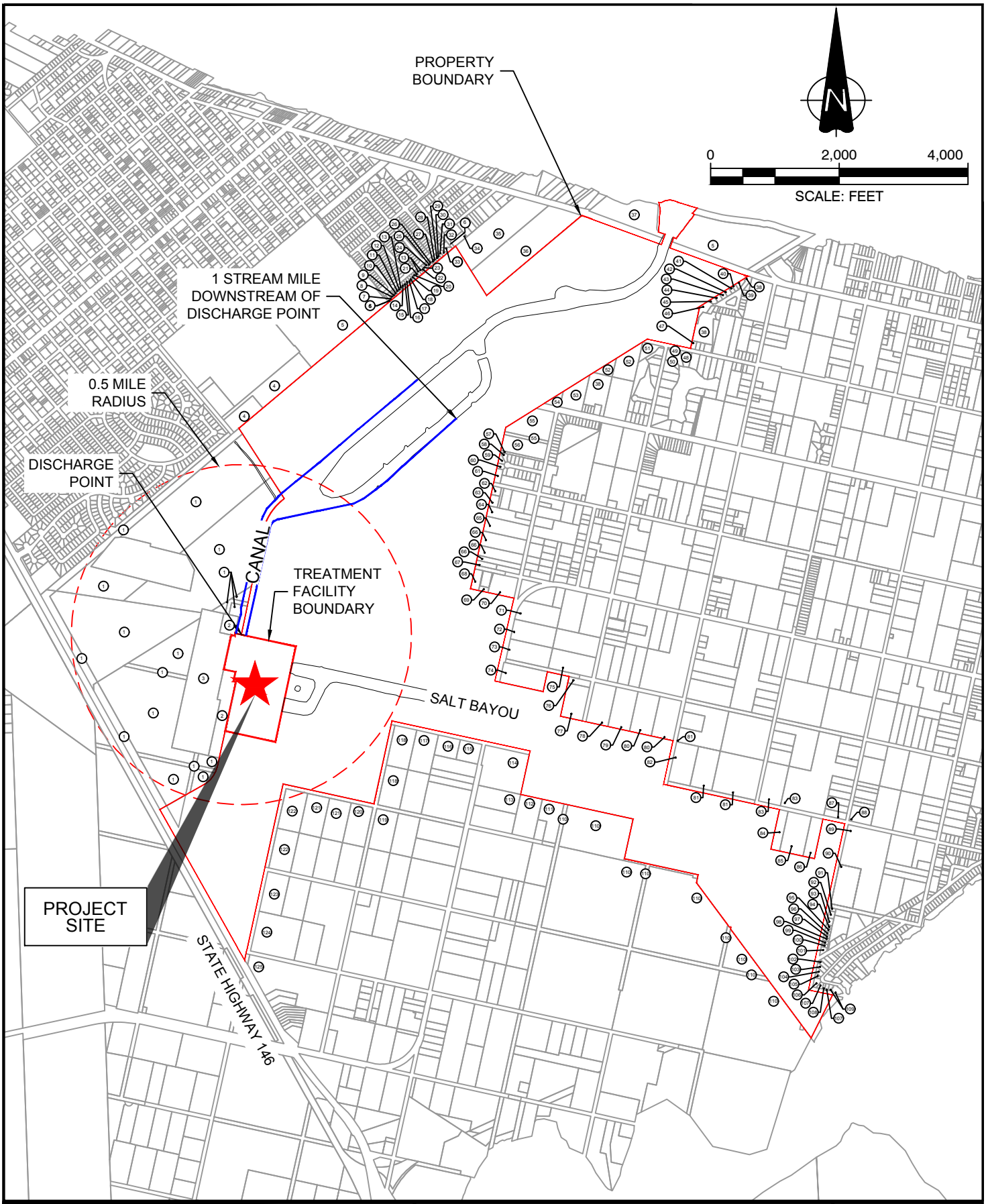
Signature

10-24-2025
Date

Americus M. Mitchell
Name

VP Industrial Water & Engineering
Title

Exhibit B



EPCOR

BAYSHORE DESALINATION FACILITY

AR-07 AFFECTED LANDOWNER MAP

DATE: OCTOBER 2025

SCALE: 1" = 2,000'

ARDURRA
3115 Allen Parkway, Suite 300
Houston, TX 77019
TBPE Firm Registration No. F-10053

Cross-Reference List of Affected Landowners

ID	Owner(s) Name	Physical Address	Mailing Address
1	NRG TEXAS POWER LLC	ABST 10 A EDWARDS HL&P P H ROBINSON PLANT SAN LEON FM HM TRS 78.607 ACRS	804 CARNEGIE CENTER ATTN: TAX DEPARTMENT PRINCETON NJ 08540
2	CENTERPOINT ENERGY HOUSTON ELECTRIC LLC	ABST 10 A EDWARDS SUR PT OF HL&P P H ROBINSON PLANT (42-1000-2) SAN LEON FM HM TRS 5.872 ACS	PO BOX 1700 HOUSTON TX 77251
3	CENTERPOINT ENERGY LLC	5501 HWY 146 SAN LEON TX 77539	PO BOX 1475 ATTN: AD VALOREM TAX DEPT HOUSTON TX 77251
4	EXP – BACLIFF MUD	10TH ST BACLIFF TX 77518	PO BOX R BACLIFF TX 77518
5	COUNTY – GALVESTON	4833 10th ST BACLIFF TX 77518	722 MOODY AVE GALVESTON TX 77550
6	EDGEWATER PARK HOA INC	EDGEWATER PARK DR BACLIFF TX 77518	12818 WILLOW CENTRE STE B C/O BEACON RESIDENTIAL HOUSTON TX 77066
7	PROGRESS RESIDENTIAL BORROWER 19 LLC	339 SEA BREEZE DR BACLIFF TX 77518	PO BOX 4090 SCOTTSDALE AZ 85261
8	CARLOS GOMEZ	335 SEA BREEZE DR BACLIFF TX 77518	335 SEA BREEZE DR BACLIFF TX 77518
9	SHELLY REMMERT	331 SEA BREEZE DR BACLIFF TX 77518	331 SEA BREEZE DR BACLIFF TX 77518
10	DAVID HANER AND LAURA VANNESS	327 SEA BREEZE DR BACLIFF TX 77518	327 SEA BREEZE DR BACLIFF TX 77518
11	OLYMPUS BORROWER LLC	323 SEA BREEZE DR BACLIFF TX 77518	PO BOX 4090 SCOTTSDALE AZ 85261
12	JOSE GUZMAN	319 SEA BREEZE DR BACLIFF TX 77518	319 SEA BREEZE DR BACLIFF TX 77518
13	RESIDENTIAL HOME BUYER HOUSTON LLC	315, 251,247 SEA BREEZE DR BACLIFF TX 77518	PO BOX 4090 SCOTTSDALE AZ 85261
14	SHAWN AND ANNE BATCHELLER	311 SEA BREEZE DR BACLIFF TX 77518	311 SEA BREEZE DR BACLIFF TX 77518
15	PHILLIP AND HEATHER COMER	307 SEA BREEZE DR BACLIFF TX 77518	307 SEA BREEZE DR BACLIFF TX 77518
16	SALVADOR AND MARIA ELIZONDO	303 SEA BREEZE DR BACLIFF TX 77518	303 SEA BREEZE DR BACLIFF TX 77518
17	JOEL SWEENEY	271 SEA BREEZE DR BACLIFF TX 77518	271 SEA BREEZE DR BACLIFF TX 77518

ID	Owner(s) Name	Physical Address	Mailing Address
18	KEITH GOTTSLEBEN	267 SEA BREEZE DR BACLIFF TX 77518	267 SEA BREEZE DR BACLIFF TX 77518
19	1041 THOMAS AVENUE PROPERTIES LLC	263 SEA BREEZE DR BACLIFF TX 77518	1041 THOMAS AVE PASADENA TX 77506
20	SARAH POLLARD	259 SEA BREEZE DR BACLIFF TX 77518	259 SEA BREEZE DR BACLIFF TX 77518
21	SEVEN POINTS BORROWER LLC	255 SEA BREEZE DR BACLIFF TX 77518	PO BOX 4090 SCOTTSDALE AZ 85261
22	D-TRA HILSTOCK	243 SEA BREEZE DR BACLIFF TX 77518	243 SEA BREEZE DR BACLIFF TX 77518
23	RANDON TAMAYO	239 SEA BREEZE DR BACLIFF TX 77518	239 SEA BREEZE DR BACLIFF TX 77518
24	RON TACH	235 SEA BREEZE DR BACLIFF TX 77518	235 SEA BREEZE DR BACLIFF TX 77518
25	STEPHEN AND JUDY FOSTER	231 SEA BREEZE DR BACLIFF TX 77518	231 SEA BREEZE DR BACLIFF TX 77518
26	WALFRID BACHMAN	227 SEA BREEZE DR BACLIFF TX 77518	227 SEA BREEZE DR BACLIFF TX 77518
27	ROBERTO AND LORENA AMBRIZ	223 SEA BREEZE DR BACLIFF TX 77518	223 SEA BREEZE DR BACLIFF TX 77518
28	DUSTIN BREZOVAR	219 SEA BREEZE DR BACLIFF TX 77518	219 SEA BREEZE DR BACLIFF TX 77518
29	RONALD AND NIKKI ADAMS	215 SEA BREEZE DR BACLIFF TX 77518	215 SEA BREEZE DR BACLIFF TX 77518
30	DANETRA EDISON	211 SEA BREEZE DR BACLIFF TX 77518	211 SEA BREEZE DR BACLIFF TX 77518
31	JOSE LOPEZ JR	207 SEA BREEZE DR BACLIFF TX 77518	207 SEA BREEZE DR BACLIFF TX 77518
32	JOSE MALDONADO	203 SEA BREEZE DR BACLIFF TX 77518	203 SEA BREEZE DR BACLIFF TX 77518
33	RUBEN AND LETITIA PEREZ	201 SEA BREEZE DR BACLIFF TX 77518	201 SEA BREEZE DR BACLIFF TX 77518
34	DAVID AND DIANE OTTO	5212 PATRICIA ST BACLIFF TX 77518	5212 PATRICIA ST BACLIFF TX 77518
35	PG ECKELS	5410 W BAYSHORE DR BACLIFF TX 77518	14 GREENWAY PLZ UNIT 27E HOUSTON TX 77046
36	TERESA HOLDREN	5416 W BAYSHORE DR BACLIFF TX 77518	5416 W BAYSHORE DR BACLIFF TX 77518
37	MORGAN SOUTHWEST LAND CO	2800 BAYSHORE DR BACLIFF TX 77518	940 WYCLIFFE DR #5 HOUSTON TX 77079

ID	Owner(s) Name	Physical Address	Mailing Address
38	JARDINA INVESTMENTS LLC	BAY CASA (2013) ABST 10, COMMON AREA & PRVT R.O.W. ACRES 4.823, ABST 10 A EDWARDS PT OF LOT 7 BLK 12 SAN LEON FM	PO BOX 8871 BACLIFF TX 77518
39	CONSTANCE SIRTAUTAS	202 DEBBIE LN SAN LEON TX 77539	202 DEBBIE LN SAN LEON TX 77539
40	NATHAN SHATTO	206 DEBBIE LN SAN LEON TX 77539	206 DEBBIE LN SAN LEON TX 77539
41	JOHNNY HELMS	210 DEBBIE LN SAN LEON TX 77539	210 DEBBIE LN DICKINSON TX 77539
42	LUCY LITTLE	214 DEBBIE LN SAN LEON TX 77539	18323 HICKORY TRUNNEL LN HOUSTON TX 77084
43	OLY SZ LLC	218 DEBBIE LN SAN LEON TX 77539	12604 PEGASUS DR WILLIS TX 77318
44	PATRICIA NELSON	222 DEBBIE LN SAN LEON TX 77539	222 DEBBIE LN SAN LEON TX 77539
45	MICHELE DISSINGER	226 DEBBIE LN SAN LEON TX 77539	226 DEBBIE LN SAN LEON TX 77539
46	MICHAEL AND WANSIRI GUTIERREZ	230 DEBBIE LN SAN LEON TX 77539	230 DEBBIE LN SAN LEON TX 77539
47	EVER SANTOS-VEGA AND NICELY LOPEZ	2734 AVE D SAN LEON TX 77539	2734 AVENUE D SAN LEON TX 77539
48	DAMON AND STEPHANIE ARMSTRONG	2737 AVE D SAN LEON TX 77539	2737 AVENUE D SAN LEON TX 77539
49	DANIELLE TOBIAS	2745 AVE D SAN LEON TX 77539	2745 AVE D DICKINSON TX 77539
50	SCOTT BARNWELL	429 28th ST SAN LEON TX 77539	PO BOX 931 BACLIFF TX 77518
51	ANDREW AND WENDY REITER	2811 AVE D SAN LEON TX 77539	2811 AVE D SAN LEON TX 77539
52	ATC TOWER CORP	ABST 10 A EDWARDS LOT 3 BLK 12 SAN LEON FM HM TR, ABST 10 PAGE 3 LOT 2 BLK 12 SAN LEON FM HM TR	PO BOX 723597 ATLANTA GA 31139
53	GILBERT MENDOZA	2892 BROADWAY ST SAN LEON TX 77539	2892 BROADWAY ST SAN LEON TX 77539
54	MARGARET AND MARCUS MILLER	2902 BROADWAY ST SAN LEON TX 77539	2902 BROADWAY ST DICKINSON TX 77539
55	CYNTHIA STERLING	2915 BROADWAY ST SAN LEON TX 77539 ABST 10 PAGE 4 PT OF LOTS 3 & 4 (1003-3) BLK 25A SAN LEON FM HM TRS	5 TREE FROG DR HOUSTON TX 77074

ID	Owner(s) Name	Physical Address	Mailing Address
56	EDITH DORIA	734 29th ST SAN LEON TX 77539	2604 W ROGERS RD EDINBURG TX 78541
57	LINDA ALLMOND SMITH	2918 AVE H SAN LEON TX 77539	113 17th ST SAN LEON TX 77539
58	ROBERT DAUGHERTY	2938 BUFFALO RUN SAN LEON TX 77539	2938 BUFFALO RUN SAN LEON TX 77539
59	JOSE AND CHRISTINE LUGO	2942 BUFFALO RUN SAN LEON TX 77539	2942 BUFFALO RUN SAN LEON TX 77539
60	CRAIG PETTERSEN	2943 BUFFALO RUN SAN LEON TX 77539	2943 BUFFALO RUN SAN LEON TX 77539
61	PAULA PRYOR	2930 AVE H SAN LEON TX 77539	PO BOX 368 BACLIFF TX 77518
62	MARY KENNEDY	2931 AVE H SAN LEON TX 77539	2931 AVENUE H SAN LEON TX 77539
63	PRESTON BULLARD	2931 AVENUE H SAN LEON TX 77539	2931 AVENUE H SAN LEON TX 77539
64	HILTON HOME STAGING SERVICE LLC	840 29th ST SAN LEON TX 77539	1913 AVENUE A DICKINSON TX 77539
65	RUTH TOLLIVER	902 29th ST SAN LEON TX 77539	902 29th ST DICKINSON TX 77539
66	RYAN AND LEA BAKER	932, 936, 942 29th ST SAN LEON TX 77539	PO BOX 8825 BACLIFF TX 77518
67	DUNG AND KHANH NGUYEN	ABST 10 A EDWARDS SUR PT OF LOT 6 (6-4) BLK 26 SAN LEON FARM HOMES TRACTS	4185 COUNTRY CLUB DR DICKINSON TX 77539
68	MARCO AND ANA CHEVEZ	2945 AVE J SAN LEON TX 77539	2945 AVE J DICKINSON TX 77539
69	WENDY SYMONS	2931 AVE J SAN LEON TX 77539	2931 AVENUE J SAN LEON TX 77539
70	PAUL AND ESTHER OSBORN	950 29th ST REAR SAN LEON TX 77539	950 29th ST SAN LEON TX 77539
71	BRENDA PINCHBECK	ABST 10 A EDWARDS MID PT OF LOT 2 BLK 40 SAN LEON FM HM TRS	2203 PILGRIMS BEND DR FRIENDSWOOD TX 77546
72	LONE STAR STAINLESS INC	ABST 10 PAGE 7 LOT 8 BLK 40 SAN LEON FM HM TRS	2815 AVENUE J DICKINSON TX 77539
73	RICARDO BERRONES	8030 E FM 517 SAN LEON TX 77539	320 9TH ST SAN LEON TX 77539
74	ROBERT WORTHINGTON	AVE J SAN LEON TX 77539	576 MT CARMEL RD STELLA MO 64867
75	SUSAN RICHTER	1128 28th ST SAN LEON TX 77539	1128 28th ST SAN LEON TX 77539

ID	Owner(s) Name	Physical Address	Mailing Address
76	LJ AND MARY SHOSTY	2821 AVE L SAN LEON TX 77539	2821 AVE L SAN LEON TX 77539
77	JAMES AND ALICE NEBLETT	1246 28th ST SAN LEON TX 77539	PO BOX 589 BACLIFF TX 77518
78	EMMETT AND MARY BRANDON	2781 AVE L SAN LEON TX 77539	2711 AVE L SAN LEON TX 77539
79	MARK MORRIS AND TRACY TIPTON	2761 AVE L SAN LEON TX 77539	2761 AVE L SAN LEON TX 77539
80	EMMETT BRANDON III	2711, 2747 AVE L SAN LEON TX 77539	2747 AVE L SAN LEON TX 77539
81	GALVESTON BAY FOUNDATION INC	LOT 3R, 4R GALVESTON BAY FOUNDATION SALT BAYOU RPLT (2024) ABST 10	1725 HIGHWAY 146 KEMAH TX 77565
82	HALILI HAJRULLA TRUSTEE	1337 27th ST SAN LEON TX 77539	PO BOX 8448 BACLIFF TX 77518
83	NEP TEX #3 LLC	ABST 10 A EDWARDS LOT 8 BLK 48 5 ACS SAN LEON FM HM TRS	14411 MAYPORT LANE HOUSTON TX 77077
84	RONALD JACKSON AND SUZANNE KNOTT	ABST 10 A EDWARDS SUR W 138.28 FT LOT 2 (2-1) BLK 54 SAN LEON FM HM TRS	119 BAYOU BEND DR LEAGUE CITY TX 77573
85	SHEILA DAVIS	2525 AVE N SAN LEON TX 77539	2525 AVE N SAN LEON TX 77539
86	JOHNNIE EICHOR	2521 AVE N SAN LEON TX 77539	PO BOX 433 KEMAH TX 77565
87	ARTHUR AND BONNIE COFFMAN	1260 25th ST SAN LEON TX 77539	1260 25th ST SAN LEON TX 77539
88	HAROLD AND CHRISTY KLENK	1229 25th ST SAN LEON TX 77539	1229 25th ST SAN LEON TX 77539
89	KV LAND LLC	ABST 10 A EDWARDS LOTS 1-2 & 7 BLK 53 SAN LEON FM HM TRS	4801 WOODWAY DR STE 410W HOUSTON TX 77056
90	LOVELL LADNER	1525 25th ST SAN LEON TX 77539	278 BRANDY RIDGE DICKINSON TX 77539
91	TIMOTHY CAULEY	ABST 10 A EDWARDS 50 X 95 FT OUT OF 4.400 AC TR IN LOT 1 BLK 69 SAN LEON FM HM TRS	3206 FLOWER REEF CT LEAGUE CITY TX 77573
92	LAURA LEBRUN	1611 25th ST SAN LEON TX 77539	1611 25th ST DICKINSON TX 77539
93	JNP ACQUISTIONS INC	ABST 10 A EDWARDS SUR PT OF LOT 1 (1-1) BLK 69 TRS A, B & FUTURE PH 2 SAN LEON FARM HOME TRS	16002 MANOR SQUARE DR HOUSTON TX 77602

ID	Owner(s) Name	Physical Address	Mailing Address
94	CINNAMON HOWELL	1623 25th ST SAN LEON TX 77539	PO BOX 8731 BACLIFF TX 77518
95	MATTHEW EMMITE	1627 25th ST SAN LEON TX 77539	1627 25th ST SAN LEON TX 77539
96	LAURA WITT	1631 25th ST SAN LEON TX 77539	PO BOX 53 BACLIFF TX 77518
97	EVAN AND AMANDA MACALUSO	1635 25th ST SAN LEON TX 77539	1635 25th ST DICKINSON TX 77539
98	ROGER AND GLORIA WOODEN	1639 25th ST SAN LEON TX 77539	1639 25th ST SAN LEON TX 77539
99	TAYLOR MANGUM	1643 25th ST SAN LEON TX 77539	1643 25th ST SAN LEON TX 77539
100	GRANT AND KRISTINA ROWE	1647 25th ST SAN LEON TX 77539	1647 25th ST SAN LEON TX 77539
101	AUDREY CAULEY	25th ST SAN LEON TX 77539	3206 FLOWER REEF CT LEAGUE CITY TX 77573
102	RONALD AND JESSICA CASADY	1651 RAILROAD ST SAN LEON TX 77539	1651 RAILROAD ST DICKINSON TX 77539
103	SHIRLEY DILLON	1701 25th ST SAN LEON TX 77539	1701 25th ST SAN LEON TX 77539
104	RICHARD AND DEANNE BAILLIE	1703 25th ST SAN LEON TX 77539	1703 25th ST SAN LEON TX 77539
105	PLAINVIEW HOLDINGS LLC	1707 25th ST SAN LEON TX 77539	16516 EL CAMINO REAL #247 HOUSTON TX 77062
106	NADINE DEFFES	1711 25th ST SAN LEON TX 77539	1711 25th ST DICKINSON TX 77539
107	SCOTT AND PATRICIA LOWERY	2410, 2406 AVE Q SAN LEON TX 77539	2410 AVE Q SAN LEON TX 77539
108	COASTAL RENOVATIONS LLC	ABST 10 A EDWARDS SUR E 33 FT OF LOT 83 (83-1) LITTLE RIVIERA SUB	11659 JONES RD PMB 179 HOUSTON TX 77070
109	DAVID AND KATHY PIERCE	2404, 2400 AVE Q SAN LEON TX 77539	2404 AVENUE Q DICKINSON TX 77539
110	DICKINSON BAYOU FLEETING SERVICES LLC	ABST 10 A EDWARDS SUR LOTS 1, 1A, 3, 3A, 4, 4A & SW PT OF 2 & @A BLK 71 & PT of ADJ BLK 70, 25th ST E 1/2 of 26th ST & N 1/2 of AVE R SAN LEON FM HM TRS	2225 FOXGLOVE ST LEAGUE CITY TX 77573
111	ANDRES AND AMANDA VELA	2804 AVE P SAN LEON TX 77539	2804 AVENUE P SAN LEON TX 77539

ID	Owner(s) Name	Physical Address	Mailing Address
112	JOHN TAYLOR JR	ABST 10 A EDWARDS LOT 6 BLK 57 SAN LEON FM HM TRS 5.00 ACS	PO BOX 420 BARKER TX 77413
113	SONGMING LIU AND XIAOLAN WANG	5098 E FM 517 SAN LEON TX 77539	21139 BARRETT CREEK LN RICHMOND TX 77407
114	JIMMY AND CINDY VAN	2825 AVE N SAN LEON TX 77539	2825 AVE N DICKINSON TX 77539
115	STERLING JONES	5021 AVE N SAN LEON TX 77539	5021 AVENUE N DICKINSON TX 77539
116	ANGEL ARCINIEGA	5307 AVE N DICKINSON TX 77539	5307 AVE N DICKINSON TX 77539
117	ANGEL LEYVA	AVE N SAN LEON TX 77539	211 W SEALY ST STE 3 ALVIN TX 77511
118	MAS HOME SALES LLC	ABST 10 A EDWARDS SUR LOT 1 (1-1) BLK 58 SAN LEON FARM HOME TRACTS	8420 AVENUE C SANTA FE TX 77510
119	QUY NGUYEN	ABST 10 A EDWARDS SUR LOT 1 (1-1) BLK 64 SAN LEON FM HM TRS	2935 AVENUE P SAN LEON TX 77539
120	TEXAS LAND & CATTLE CO	ABST 10 AMOS EDWARDS LOT 4 BLK 63 SAN LEON FM HM TRS	TEXAN BLDG 4TH FLOOR 333 WEST LOOP LN HOUSTON TX 77024
121	LUZ JOSE YANEZ AND JOSE YANEZ PARAMO	AVE P LOT 2, LOT 3 SAN LEON TX 77539	2705 OHIO ST DICKINSON TX 77539
122	JOSE AND MARIA DURAN	AVE P SAN LEON TX 77539	1826 ORIOLE DR LEAGUE CITY TX 77573
123	OSCAR DURAN	3001 AVE Q SAN LEON TX 77539	1814 FLAGSTAFF LN LEAGUE CITY TX 77573
124	BOAT CITY STORAGE LLC	3100 AVE R TEXAS CITY TX 77539	4323 STAGHORN LN FRIENDSWOOD TX 77546
125	BLALOCK INC	ABST 10 PAGE 13 & 16 PT OF LOTS 1, 1A & 2 & ALL OF LOT 2A BLK 80 SAN LEON FM HM TRS	1955 W TC JESTER BLVD HOUSTON TX 77008

NRG TEXAS POWER
ATTN: TAX DEPARTMENT
804 CARNEGIE CENTER
PRINCETON NJ 08540

CENTERPOINT ENERGY
HOUSTON ELECTRIC
PO BOX 1700
HOUSTON TX 77251

CENTERPOINT ENERGY
ATTN: AD VALOREM TAX DEPT
PO BOX 1475
HOUSTON TX 77251

EXP – BACLIFF MUD
PO BOX R
BACLIFF TX 77518

COUNTY – GALVESTON
722 MOODY AVE
GALVESTON TX 77550

EDGEWATER PARK HOA INC
C/O BEACON RESIDENTIAL
12818 WILLOW CENTRE STE B
HOUSTON TX 77066

PROGRESS RESIDENTIAL BORROWER
19 LLC
PO BOX 4090
SCOTTSDALE AZ 85261

CARLOS GOMEZ
335 SEA BREEZE DR
BACLIFF TX 77518

SHELLY REMMERT
331 SEA BREEZE DR
BACLIFF TX 77518

DAVID HANER AND LAURA VANNESS
327 SEA BREEZE DR
BACLIFF TX 77518

OLYMPUS BORROWER
PO BOX 4090
SCOTTSDALE AZ 85261

JOSE GUZMAN
319 SEA BREEZE DR
BACLIFF TX 77518

RESIDENTIAL HOME BUYER
HOUSTON LLC
PO BOX 4090
SCOTTSDALE AZ 85261

SHAWN AND ANNE BATCHELLER
311 SEA BREEZE DR
BACLIFF TX 77518

PHILLIP AND HEATHER COMER
307 SEA BREEZE DR
BACLIFF TX 77518

SALVADOR AND MARIA ELIZONDO
303 SEA BREEZE DR
BACLIFF TX 77518

JOEL SWEENEY
271 SEA BREEZE DR
BACLIFF TX 77518

KEITH GOTTSLEBEN
267 SEA BREEZE DR
BACLIFF TX 77518

1041 THOMAS AVENUE PROPERTIES
1041 THOMAS AVE
PASADENA TX 77506

SARAH POLLARD
259 SEA BREEZE DR
BACLIFF TX 77518

SEVEN POINTS BORROWER
PO BOX 4090
SCOTTSDALE AZ 85261

D-TRA HILSTOCK
243 SEA BREEZE DR
BACLIFF TX 77518

RANDON TAMAYO
239 SEA BREEZE DR
BACLIFF TX 77518

RON TACH
235 SEA BREEZE DR
BACLIFF TX 77518

STEPHEN AND JUDY FOSTER
231 SEA BREEZE DR
BACLIFF TX 77518

WALFRID BACHMAN
227 SEA BREEZE DR
BACLIFF TX 77518

ROBERTO AND LORENA AMBRIZ
223 SEA BREEZE DR
BACLIFF TX 77518

DUSTIN BREZOVAR
219 SEA BREEZE DR
BACLIFF TX 77518

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215 SEA BREEZE DR
BACLIFF TX 77518

DANETRA EDISON
211 SEA BREEZE DR
BACLIFF TX 77518

JOSE LOPEZ JR
207 SEA BREEZE DR
BACLIFF TX 77518

JOSE MALDONADO
203 SEA BREEZE DR
BACLIFF TX 77518

RUBEN AND LETITIA PEREZ
201 SEA BREEZE DR
BACLIFF TX 77518

DAVID AND DIANE OTTO
5212 PATRICIA ST
BACLIFF TX 77518

PG ECKELS
14 GREENWAY PLZ
UNIT 27E
HOUSTON TX 77046

TERESA HOLDREN
5416 W BAYSHORE DR
BACLIFF TX 77518

MORGAN SOUTHWEST LAND CO
940 WYCLIFFE DR #5
HOUSTON TX 77079

JARDINA INVESTMENTS
PO BOX 8871
BACLIFF TX 77518

CONSTANCE SIRTAUTAS
202 DEBBIE LN
SAN LEON TX 77539

NATHAN SHATTO
206 DEBBIE LN
SAN LEON TX 77539

JOHNNY HELMS
210 DEBBIE LN
DICKINSON TX 77539

LUCY LITTLE
18323 HICKORY TRUNNEL LN
HOUSTON TX 77084

OLY SZ
12604 PEGASUS DR
WILLIS TX 77318

PATRICIA NELSON
222 DEBBIE LN
SAN LEON TX 77539

MICHELE DISSINGER
226 DEBBIE LN
SAN LEON TX 77539

MICHAEL AND WANSIRI GUTIERREZ
230 DEBBIE LN
SAN LEON TX 77539

EVER SANTOS -VEGA AND NICELY LOPEZ
2734 AVENUE D
SAN LEON TX 77539

DAMON AND STEPHANIE ARMSTRONG
2737 AVENUE D
SAN LEON TX 77539

DANIELLE TOBIAS
2745 AVE D
DICKINSON TX 77539

SCOTT BARNWELL
PO BOX 931
BACLIFF TX 77518

ANDREW AND WENDY REITER
2811 AVE D
SAN LEON TX 77539

ATC TOWER
PO BOX 723597
ATLANTA GA 31139

GILBERT MENDOZA
2892 BROADWAY ST
SAN LEON TX 77539

MARGARET AND MARCUS MILLER
2902 BROADWAY ST
DICKINSON TX 77539

CYNTHIA STERLING
5 TREE FROG DR
HOUSTON TX 77074

EDITH DORIA
2604 W ROGERS RD
EDINBURG TX 78541

LINDA ALLMOND SMITH
113 17th ST
SAN LEON TX 77539

ROBERT DAUGHERTY
2938 BUFFALO RUN
SAN LEON TX 77539

JOSE AND CHRISTINE LUGO
2942 BUFFALO RUN
SAN LEON TX 77539

CRAIG PETTERSEN
2943 BUFFALO RUN
SAN LEON TX 77539

PAULA PRYOR
PO BOX 368
BACLIFF TX 77518

BRENDA PINCHBECK
2203 PILGRIMS BEND DR
FRIENDSWOOD TX 77546

GALVESTON BAY FOUNDATION
1725 HIGHWAY 146
KEMAH TX 77565

MARY KENNEDY
2931 AVENUE H
SAN LEON TX 77539

LONE STAR STAINLESS
2815 AVENUE J
DICKINSON TX 77539

HALILI HAJRULLA TRUSTEE
PO BOX 8448
BACLIFF TX 77518

PRESTON BULLARD
2931 AVENUE H
SAN LEON TX 77539

RICARDO BERRONES
320 9TH ST
SAN LEON TX 77539

NEP TEX #3
14411 MAYPORT LANE
HOUSTON TX 77077

HILTON HOME STAGING SERVICE
1913 AVENUE A
DICKINSON TX 77539

ROBERT WORTHINGTON
576 MT CARMEL RD
STELLA MO 64867

RONALD JACKSON AND SUZANNE KNOTT
119 BAYOU BEND DR
LEAGUE CITY TX 77573

RUTH TOLLIVER
902 29th ST
DICKINSON TX 77539

SUSAN RICHTER
1128 28th ST
SAN LEON TX 77539

SHEILA DAVIS
2525 AVE N
SAN LEON TX 77539

RYAN AND LEA BAKER
PO BOX 8825
BACLIFF TX 77518

LJ AND MARY SHOSTY
2821 AVE L
SAN LEON TX 77539

JOHNNIE EICHOR
PO BOX 433
KEMAH TX 77565

DUNG AND KHANH NGUYEN
4185 COUNTRY CLUB DR
DICKINSON TX 77539

JAMES AND ALICE NEBLETT
PO BOX 589
BACLIFF TX 77518

ARTHUR AND BONNIE COFFMAN
1260 25th ST
SAN LEON TX 77539

MARCO AND ANA CHEVEZ
2945 AVE J
DICKINSON TX 77539

EMMETT AND MARY BRANDON
2711 AVE L
SAN LEON TX 77539

HAROLD AND CHRISTY KLENK
1229 25th ST
SAN LEON TX 77539

WENDY SYMONS
2931 AVENUE J
SAN LEON TX 77539

MARK MORRIS AND TRACY TIPTON
2761 AVE L
SAN LEON TX 77539

KV LAND
4801 WOODWAY DR
STE 410W
HOUSTON TX 77056

PAUL AND ESTHER OSBORN
950 29th ST
SAN LEON TX 77539

EMMETT BRANDON III
2747 AVE L
SAN LEON TX 77539

LOVELL LADNER
278 BRANDY RIDGE
DICKINSON TX 77539

TIMOTHY CAULEY
3206 FLOWER REEF CT
LEAGUE CITY TX 77573

AUDREY CAULEY
3206 FLOWER REEF CT
LEAGUE CITY TX 77573

ANDRES AND AMANDA VELA
2804 AVENUE P
SAN LEON TX 77539

LAURA LEBRUN
1611 25th ST
DICKINSON TX 77539

RONALD AND JESSICA CASADY
1651 RAILROAD ST
DICKINSON TX 77539

JOHN TAYLOR JR
PO BOX 420
BARKER TX 77413

JNP ACQUISTIONS
16002 MANOR SQUARE DR
HOUSTON TX 77602

SHIRLEY DILLON
1701 25th ST
SAN LEON TX 77539

SONGMING LIU AND XIAOLAN WANG
21139 BARRETT CREEK LN
RICHMOND TX 77407

CINNAMON HOWELL
PO BOX 8731
BACLIFF TX 77518

RICHARD AND DEANNE BAILLIE
1703 25th ST
SAN LEON TX 77539

JIMMY AND CINDY VAN
2825 AVE N
DICKINSON TX 77539

MATTHEW EMMITE
1627 25th ST
SAN LEON TX 77539

PLAINVIEW HOLDINGS
16516 EL CAMINO REAL #247
HOUSTON TX 77062

STERLING JONES
5021 AVENUE N
DICKINSON TX 77539

LAURA WITT
PO BOX 53
BACLIFF TX 77518

NADINE DEFFES
1711 25th ST
DICKINSON TX 77539

ANGEL ARCINIEGA
5307 AVE N
DICKINSON TX 77539

EVAN AND AMANDA MACALUSO
1635 25th ST
DICKINSON TX 77539

SCOTT AND PATRICIA LOWERY
2410 AVE Q
SAN LEON TX 77539

ANGEL LEYVA
211 W SEALY ST
STE 3
ALVIN TX 77511

ROGER AND GLORIA WOODEN
1639 25th ST
SAN LEON TX 77539

COASTAL RENOVATIONS
11659 JONES RD
PMB 179
HOUSTON TX 77070

MAS HOME SALES
8420 AVENUE C
SANTA FE TX 77510

TAYLOR MANGUM
1643 25th ST
SAN LEON TX 77539

DAVID AND KATHY PIERCE
2404 AVENUE Q
DICKINSON TX 77539

QUY NGUYEN
2935 AVENUE P
SAN LEON TX 77539

GRANT AND KRISTINA ROWE
1647 25th ST
SAN LEON TX 77539

DICKINSON BAYOU FLEETING SERVICES
2225 FOXGLOVE ST
LEAGUE CITY TX 77573

TEXAS LAND & CATTLE
TEXAN BLDG 4TH FLOOR
333 WEST LOOP LN
HOUSTON TX 77024

LUZ JOSE YANEZ AND JOSE YANEZ
PARAMO
2705 OHIO ST
DICKINSON TX 77539

JOSE AND MARIA DURAN
1826 ORIOLE DR
LEAGUE CITY TX 77573

OSCAR DURAN
1814 FLAGSTAFF LN
LEAGUE CITY TX 77573

BOAT CITY STORAGE
4323 STAGHORN LN
FRIENDSWOOD TX 77546

BLALOCK INC
1955 W TC JESTER BLVD
HOUSTON TX 77008

Exhibit C

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

SUMMARY OF APPLICATION IN PLAIN LANGUAGE FOR TPDES OR TLAP PERMIT APPLICATIONS

Summary of Application (in plain language) Template and Instructions for Texas Pollutant Discharge Elimination System (TPDES) and Texas Land Application (TLAP) Permit Applications

Applicants should use this template to develop a plain language summary of your facility and application as required by Title 30, Texas Administrative Code (30 TAC), Chapter 39, Subchapter H. You may modify the template as necessary to accurately describe your facility as long as the summary includes the following information: (1) the function of the proposed plant or facility; (2) the expected output of the proposed plant or facility; (3) the expected pollutants that may be emitted or discharged by the proposed plant or facility; and (4) how you will control those pollutants, so that the proposed plant will not have an adverse impact on human health or the environment.

Fill in the highlighted areas below to describe your facility and application in plain language. Instructions and examples are provided below. Make any other edits necessary to improve readability or grammar and to comply with the rule requirements. After filling in the information for your facility delete these instructions.

If you are subject to the alternative language notice requirements in 30 TAC Section 39.426, **you must provide a translated copy of the completed plain language summary in the appropriate alternative language as part of your application package**. For your convenience, a Spanish template has been provided below.

ENGLISH TEMPLATE FOR TPDES or TLAP NEW/RENEWAL/AMENDMENT APPLICATIONS INDUSTRIAL WASTEWATER/STORMWATER

The following summary is provided for this pending water quality permit application being reviewed by the Texas Commission on Environmental Quality as required by 30 TAC Chapter 39. The information provided in this summary may change during the technical review of the application and is not a federal enforceable representation of the permit application.

EPCOR NR Holdings, Inc. proposes to operate Bayshore Desalination Facility, a Seawater Desalination Water Treatment Plant. The facility will be located at 5501 Highway 146, in Texas City, Galveston County, Texas 77518. This application is for a new application to discharge process wastewater (reverse osmosis concentrated blended with raw seawater) on an intermittent and flow-variable basis, at a volume not to exceed a daily average flow of 59.93 million gallons per day.

Discharges from the facility are expected to contain Total Suspended Solids, Total Dissolved Solids, salinity, chloride, sulfate, and trace chemicals used in the water treatment processes. Trace chemicals residual from the water treatment process may be present, including Ferric Sulfate (CAS # 10028-22-5), Anionic Polymer, Sodium Hypochlorite (CAS # 7681-52-9), Liquid Ammonium Sulfate (CAS # 7783-20-2), CO_2 (CAS # 124-38-9), Sodium Hydroxide (CAS # 1310-

73-2), Citric Acid (CAS # 77-92-9), Sodium Bisulfite (CAS # 7631-90-5), Seawater reverse osmosis Antiscalant, Sulfuric Acid (CAS # 7664-93-9), and Lime (calcite)(CAS # 13397-26-7). Concentrate from seawater reverse osmosis treatment will be treated by blending with raw seawater.

PLANTILLA EN ESPAÑOL PARA SOLICITUDES NUEVAS/RENOVACIONES/ENMIENDAS DE TPDES o TLAP

AGUAS RESIDUALES INDUSTRIALES **/AGUAS PLUVIALES**

El siguiente resumen se proporciona para esta solicitud de permiso de calidad del agua pendiente que está siendo revisada por la Comisión de Calidad Ambiental de Texas según lo requerido por el Capítulo 39 del Código Administrativo de Texas 30. La información proporcionada en este resumen puede cambiar durante la revisión técnica de la solicitud y no es una representación ejecutiva fedérale de la solicitud de permiso.

EPCOR NR Holdings, Inc. propone operar Bayshore Desalination Facility, una planta de desalinización de aqua. La instalación estará ubicada en 5501 Highway 146, en Texas City, Condado de Galveston, Texas 77518. Esta solicitud es para una nueva aplicación para descargar aguas residuales de proceso (concentrado de ósmosis inversa mezclado con agua de mar cruda) de manera intermitente y con caudal variable.

Se espera que las descargas de la instalación contengan Sólidos Suspendidos Totales, Sólidos Disueltos Totales, salinidad, cloruro, sulfato y químicos traza utilizados en los procesos de tratamiento de agua. Pueden estar presentes residuos de químicos traza del proceso de tratamiento de agua, incluyendo Sulfato Férrico (CAS # 10028-22-5), Polímero Aniónico, Hipoclorito de Sodio (CAS # 7681-52-9), Sulfato de Amonio Líquido (CAS # 7783-20-2), CO2 (CAS # 124-38-9), Hidróxido de Sodio (CAS # 1310-73-2), Ácido Cítrico (CAS # 77-92-9), Bisulfito de Sodio (CAS # 7631-90-5), Antiincrustante de ósmosis inversa de agua de mar, Ácido Sulfúrico (CAS # 7664-93-9) y Cal (calcita) (CAS # 13397-26-7). Esta solicitud es para una nueva aplicación para descargar aguas residuales del proceso (mezcla de agua concentrada por osmosis inversa con agua del mar) de manera intermitente y con flujo variable, con un volumen que no exceda el promedio diario de 59,93 millones de galones por día.

Exhibit D

Comisión de Calidad Ambiental del Estado de Texas

AVISO DE RECIBO DE LA SOLICITUD Y
EL INTENTO DE OBTENER PERMISO PARA LA CALIDAD DEL AGUA PERMISO

PERMISO PROPUESTO NO. WQ000_____

SOLICITUD. EPCOR NR Holdings Inc., 4801 University Boulevard, Suite 400, Round Rock, Texas 78665, que planea poseer y operar una instalación de tratamiento de agua de desalinización, ha solicitado a la Comisión de Calidad Ambiental de Texas (TCEQ por sus siglas en inglés) el Permiso No. WQ0005502000 (número de identificación de la EPA TX0148580) para autorizar la descarga de aguas residuales tratadas a un volumen que no exceda un flujo promedio diario de 59,930,000 galones por día. La instalación estará ubicada en 5501 State Highway 146, aproximadamente a 1.15 millas al sureste de la intersección de la carretera estatal 146 y Farm-to-Market Road 646, cerca de Bacliff, en el condado de Galveston, Texas 77518. La ruta de descarga será desde el sitio de la planta a un canal artificial, desde allí a la bahía superior de Galveston. TCEQ recibió esta solicitud el 3 de octubre de 2025. La solicitud de permiso estará disponible para su visualización y copia en la Biblioteca Pública Dickinson, 4411 State Highway 3, Dickinson, en el condado de Galveston, Texas, antes de la fecha en que se publique este aviso en el periódico. La aplicación, incluidas las actualizaciones, y los avisos asociados están disponibles electrónicamente en la siguiente página web: https://www.tceq.texas.gov/permitting/wastewater/pending-permits/tpdes-applications.

Este enlace a un mapa electrónico del sitio o ubicación general de la instalación se ofrece como una cortesía público y no es parte de la solicitud o notificación. Para la ubicación exacta, consulte la aplicación. https://gisweb.tceq.texas.gov/LocationMapper/?marker=-94.97981,29.48702&level=18

Include the following non-italicized sentence if the facility is located in the Coastal Management Program boundary and is an application for a major amendment which will increase the pollutant loads to coastal waters or would result in relocation of an outfall to a critical area, or a renewal with such a major amendment. The Coastal Management Program boundary is the area along the Texas Coast of the Gulf of México as depicted on the map in 31 TAC §503.1 and includes part or all of the following counties: Cameron, Willacy, Kenedy, Kleberg, Nueces, San Patricio, Aransas, Refugio, Calhoun, Victoria, Jackson, Matagorda, Brazoria, Galveston, Harris, Chambers, Jefferson y Orange. If the application is for amendment that does not meet the above description or a renewal without such a major amendment, do not include the sentence:
El Director Ejecutivo de la TCEQ ha revisado esta medida para ver si está de acuerdo con los objetivos y las regulaciones del Programa de Administración Costero de Texas (CMP) de acuerdo con las regulaciones del Consejo Coordinador de la Costa (CCC) y ha determinado que la acción es conforme con las metas y regulaciones pertinentes del CMP.

AVISO DE IDIOMA ALTERNATIVO. El aviso de idioma alternativo en español está disponible

en https://www.tceq.texas.gov/permitting/wastewater/pending-permits/tpdes-applications.

AVISO ADICIONAL. El Director Ejecutivo de la TCEQ ha determinado que la solicitud es administrativamente completa y conducirá una revisión técnica de la solicitud. Después de completar la revisión técnica, el Director Ejecutivo puede preparar un borrador del permiso y emitirá una Decisión Preliminar sobre la solicitud. **El aviso de la solicitud y la decisión preliminar serán publicados y enviado a los que están en la lista de correo de las personas a lo largo del condado que desean recibir los avisos y los que están en la lista de correo que desean recibir avisos de esta solicitud. El aviso dará la fecha límite para someter comentarios públicos.**

COMENTARIO PUBLICO / REUNION PUBLICA. Usted puede presentar comentarios públicos o pedir una reunión pública sobre esta solicitud. El propósito de una reunión pública es dar la oportunidad de presentar comentarios o hacer preguntas acerca de la solicitud. La TCEQ realiza una reunión pública si el Director Ejecutivo determina que hay un grado de interés público suficiente en la solicitud o si un legislador local lo pide. Una reunión pública no es una audiencia administrativa de lo contencioso.

OPORTUNIDAD DE UNA AUDIENCIA ADMINISTRATIVA DE LO CONTENCIOSO. Después del plazo para presentar comentarios públicos, el Director Ejecutivo considerará todos los comentarios apropiados y preparará una respuesta a todo los comentarios públicos esenciales, pertinentes, o significativos. **A menos que la solicitud haya sido referida directamente a una audiencia administrativa de lo contencioso, la respuesta a los comentarios y la decisión del Director Ejecutivo sobre la solicitud serán enviados por correo a todos los que presentaron un comentario público y a las personas que están en la lista para recibir avisos sobre esta solicitud. Si se reciben comentarios, el aviso también proveerá instrucciones para pedir una reconsideración de la decisión del Director Ejecutivo y para pedir una audiencia administrativa de lo contencioso.** Una audiencia administrativa de lo contencioso es un procedimiento legal similar a un procedimiento legal civil en un tribunal de distrito del estado.

PARA SOLICITAR UNA AUDIENCIA DE CASO IMPUGNADO, USTED DEBE INCLUIR EN SU SOLICITUD LOS SIGUIENTES DATOS: su nombre, dirección, y número de teléfono; el nombre del solicitante y número del permiso; la ubicación y distancia de su propiedad/actividad con respecto a la instalación; una descripción específica de la forma cómo usted sería afectado adversamente por el sitio de una manera no común al público en general; una lista de todas las cuestiones de hecho en disputa que usted presente durante el período de comentarios; y la declaración "[Yo/nosotros] solicito/solicitamos una audiencia de caso impugnado". Si presenta la petición para una audiencia de caso impugnado de parte de un grupo o asociación, debe identificar una persona que representa al grupo para recibir correspondencia en el futuro; identificar el nombre y la dirección de un miembro del grupo que sería afectado adversamente por la planta o la actividad propuesta; proveer la información indicada anteriormente con respecto a la ubicación del miembro afectado y su distancia de la planta o actividad propuesta; explicar cómo y porqué el miembro sería afectado; y explicar cómo los intereses que el grupo desea proteger son pertinentes al propósito del grupo.

Después del cierre de todos los períodos de comentarios y de petición que aplican, el Director Ejecutivo enviará la solicitud y cualquier petición para reconsideración o para una audiencia

de caso impugnado a los Comisionados de la TCEQ para su consideración durante una reunión programada de la Comisión.
La Comisión sólo puede conceder una solicitud de una audiencia de caso impugnado sobre los temas que el solicitante haya presentado en sus comentarios oportunos que no fueron retirados posteriormente. **Si se concede una audiencia, el tema de la audiencia estará limitado a cuestiones de hecho en disputa o cuestiones mixtas de hecho y de derecho relacionadas a intereses pertinentes y materiales de calidad del agua que se hayan presentado durante el período de comentarios.**

LISTA DE CORREO. Si somete comentarios públicos, un pedido para una audiencia administrativa de lo contencioso o una reconsideración de la decisión del Director Ejecutivo, la Oficina del Secretario Principal enviará por correo los avisos públicos en relación con la solicitud. Además, puede pedir que la TCEQ ponga su nombre en una o más de las listas correos siguientes (1) la lista de correo permanente para recibir los avisos del solicitante indicado por nombre y número del permiso específico y/o (2) la lista de correo de todas las solicitudes en un condado especifico. Si desea que se agrega su nombre en una de las listas designe cual lista(s) y envía por correo su pedido a la Oficina del Secretario Principal de la TCEQ.

INFORMACIÓN DISPONIBLE EN LÍNEA. Para detalles sobre el estado de la solicitud, favor de visitar la Base de Datos Integrada de los Comisionados en www.tceq.texas.gov/goto/cid. Para buscar en la base de datos, utilizar el número de permiso para esta solicitud que aparece en la parte superior de este aviso.

CONTACTOS E INFORMACIÓN A LA AGENCIA. Todos los comentarios públicos y solicitudes deben ser presentadas electrónicamente vía http://www14.tceq.texas.gov/epic/eComment/ o por escrito dirigidos a la Comisión de Texas de Calidad Ambiental, Oficial de la Secretaría (Office of Chief Clerk), MC-105, P.O. Box 13087, Austin, Texas 78711-3087. Tenga en cuenta que cualquier información personal que usted proporcione, incluyendo su nombre, número de teléfono, dirección de correo electrónico y dirección física pasarán a formar parte del registro público de la Agencia. Para obtener más información acerca de esta solicitud de permiso o el proceso de permisos, llame al programa de educación pública de la TCEQ, gratis, al 1-800-687-4040. Si desea información en español, puede llamar al 1-800-687-4040.

También se puede obtener más información escribiendo a EPCOR NR Holdings, Inc. en 4801 University Blvd, Suite 400, Round Rock, TX 78665, o llamando a Rachel Watkins, Gerente de Cumplimiento Ambiental, EPCOR al (512) 745-2095.

Fecha de emisión: *[Date notice issued]*

Brooke T. Paup, *Chairwoman*
Bobby Janecka, *Commissioner*
Catarina R. Gonzales, *Commissioner*
Kelly Keel, *Executive Director*

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

October 3, 2025

Re: Confirmation of Submission of the New Industrial Wastewater Individual Permit Application

Dear Applicant:

This is an acknowledgement that you have successfully completed Industrial Wastewater Individual Permit Application.

ER Account Number: ER088811
Application Reference Number: 823266
Authorization Number: WQ0005502000
Site Name: Bayshore Desalination Facility
Regulated Entity: RN101062826 - PH ROBINSON ELECTRIC GENERATING STATION
Customer(s): CN606436236 - Epcor Nr Holdings Inc.

Please be aware that TCEQ staff may contact your designated contact for any additional information.

If you have any questions, you may contact the Applications Review and Processing Team by email at WQ-ARPTeam@tceq.texas.gov or by telephone at (512) 239-4671.

Sincerely,
Applications Review and Processing Team
Water Quality Division

Texas Commission on Environmental Quality

New Domestic or Industrial Individual Permit

Site Information (Regulated Entity)

What is the name of the site to be authorized?	Bayshore Desalination Facility
Does the site have a physical address?	Yes
Physical Address	
Number and Street	5501 HIGHWAY 146
City	BACLIFF
State	TX
ZIP	77518
County	GALVESTON
Latitude (N) (##.######)	29.48516
Longitude (W) (-###.######)	-94.980377
Primary SIC Code	4941
Secondary SIC Code	
Primary NAICS Code	221310
Secondary NAICS Code	
Regulated Entity Site Information	
What is the Regulated Entity's Number (RN)?	RN101062826
What is the name of the Regulated Entity (RE)?	PH ROBINSON ELECTRIC GENERATING STATION
Does the RE site have a physical address?	Yes
Physical Address	
Number and Street	5501 HIGHWAY 146
City	BACLIFF
State	TX
ZIP	77518
County	GALVESTON
Latitude (N) (##.######)	29.485277
Longitude (W) (-###.######)	-94.981388
Facility NAICS Code	221112
What is the primary business of this entity?	INDUSTRIAL

EPCOR N-Customer (Applicant) Information (Owner Operator)

How is this applicant associated with this site?	Owner Operator
What is the applicant's Customer Number (CN)?	
Type of Customer	Corporation
Full legal name of the applicant:	
Legal Name	EPCOR NR HOLDINGS INC.
Texas SOS Filing Number	805852623
Federal Tax ID	920938940
State Franchise Tax ID	32098300588
State Sales Tax ID	
Local Tax ID	
DUNS Number	
Number of Employees	
Independently Owned and Operated?	
I certify that the full legal name of the entity applying for this permit has been provided and is legally authorized to do business in Texas.	Yes
Responsible Authority Contact	
Organization Name	EPCOR NR HOLDINGS INC.
Prefix	
First	Richard
Middle	
Last	Brown
Suffix	
Credentials	
Title	VP Major Projects
Responsible Authority Mailing Address	
Enter new address or copy one from list:	
Address Type	Domestic
Mailing Address (include Suite or Bldg. here, if applicable)	4801 UNIVERSITY BLVD STE 400
Routing (such as Mail Code, Dept., or Attn:)	
City	ROUND ROCK
State	TX
ZIP	78665
Phone (###-###-####)	7802179849
Extension	
Alternate Phone (###-###-####)	
Fax (###-###-####)	
E-mail	rbrown@epcor.com

Billing Contact

Responsible contact for receiving billing statements:	
Select the permittee that is responsible for payment of the annual fee.	EPCOR NR HOLDINGS INC.
Organization Name	EPCOR NR HOLDINGS INC.
Prefix	
First	Rick
Middle	
Last	Kilborn
Suffix	JR
Credentials	
Title	Senior Operations Manager
Enter new address or copy one from list:	
Mailing Address	
Address Type	Domestic
Mailing Address (include Suite or Bldg. here, if applicable)	4801 UNIVERSITY BLVD STE 400
Routing (such as Mail Code, Dept., or Attn:)	
City	ROUND ROCK
State	TX
ZIP	78665
Phone (###-###-####)	5124295712
Extension	
Alternate Phone (###-###-####)	
Fax (###-###-####)	
E-mail	rkilbornjr@epcor.com

Application Contact

Person TCEQ should contact for questions about this application:	
Same as another contact?	EPCOR NR HOLDINGS INC.
Organization Name	EPCOR NR HOLDINGS INC.
Prefix	
First	Rachel
Middle	
Last	Watkins
Suffix	

Credentials	
Title	Environmental Compliance Manager
Enter new address or copy one from list:	
Mailing Address	
Address Type	Domestic
Mailing Address (include Suite or Bldg. here, if applicable)	4801 UNIVERSITY BLVD STE 400
Routing (such as Mail Code, Dept., or Attn:)	
City	ROUND ROCK
State	TX
ZIP	78665
Phone (###-###-####)	7377048664
Extension	
Alternate Phone (###-###-####)	
Fax (###-###-####)	
E-mail	rwatkins@epcor.com

Technical Contact

Person TCEQ should contact for questions about this application:	
Same as another contact?	EPCOR NR HOLDINGS INC.
Organization Name	EPCOR NR HOLDINGS INC.
Prefix	MR
First	Americus
Middle	
Last	Mitchell
Suffix	
Credentials	
Title	VP Industrial Wastewater
Enter new address or copy one from list:	
Mailing Address	
Address Type	Domestic
Mailing Address (include Suite or Bldg. here, if applicable)	4801 UNIVERSITY BLVD STE 400
Routing (such as Mail Code, Dept., or Attn:)	
City	ROUND ROCK
State	TX
ZIP	78665
Phone (###-###-####)	2105792810

Extension	
Alternate Phone (###-###-####)	
Fax (###-###-####)	
E-mail	amitchell1@epcor.com

DMR Contact

Person responsible for submitting Discharge Monitoring Report Forms:

Same as another contact?	Billing Contact
Organization Name	EPCOR NR HOLDINGS INC.
Prefix	
First	Rick
Middle	
Last	Kilborn
Suffix	JR
Credentials	
Title	Senior Operations Manager
Enter new address or copy one from list:	

Mailing Address:

Address Type	Domestic
Mailing Address (include Suite or Bldg. here, if applicable)	4801 UNIVERSITY BLVD STE 400
Routing (such as Mail Code, Dept., or Attn:)	
City	ROUND ROCK
State	TX
ZIP	78665
Phone (###-###-####)	5124295712
Extension	
Alternate Phone (###-###-####)	
Fax (###-###-####)	
E-mail	rkilbornjr@epcor.com

Section 1# Permit Contact

Permit Contact#: 1

Person TCEQ should contact throughout the permit term.

1) Same as another contact?	Application Contact
2) Organization Name	EPCOR NR HOLDINGS INC.

3) Prefix	
4) First	Rachel
5) Middle	
6) Last	Watkins
7) Suffix	
8) Credentials	
9) Title	Environmental Compliance Manager
Mailing Address	
10) Enter new address or copy one from list	
11) Address Type	Domestic
11.1) Mailing Address (include Suite or Bldg. here, if applicable)	4801 UNIVERSITY BLVD STE 400
11.2) Routing (such as Mail Code, Dept., or Attn:)	
11.3) City	ROUND ROCK
11.4) State	TX
11.5) ZIP	78665
12) Phone (###-###-####)	7377048664
13) Extension	
14) Alternate Phone (###-###-####)	
15) Fax (###-###-####)	
16) E-mail	rwatkins@epcor.com

Section 2# Permit Contact

Permit Contact#: 2

Person TCEQ should contact throughout the permit term.

1) Same as another contact?	Technical Contact
2) Organization Name	EPCOR NR HOLDINGS INC.
3) Prefix	MR
4) First	Americus
5) Middle	
6) Last	Mitchell
7) Suffix	
8) Credentials	
9) Title	VP Industrial Wastewater
Mailing Address	
10) Enter new address or copy one from list	
11) Address Type	Domestic

11.1) Mailing Address (include Suite or Bldg. here, if applicable)	4801 UNIVERSITY BLVD STE 400
11.2) Routing (such as Mail Code, Dept., or Attn:)	
11.3) City	ROUND ROCK
11.4) State	TX
11.5) ZIP	78665
12) Phone (###-###-####)	2105792810
13) Extension	
14) Alternate Phone (###-###-####)	
15) Fax (###-###-####)	
16) E-mail	amitchell1@epcor.com

Public Notice Information

Individual Publishing the Notices	
1) Prefix	
2) First and Last Name	Matthew Atwood
3) Credential	
4) Title	Communications Senior Advisor
5) Organization Name	EPCOR NR Holdings INC
6) Mailing Address	4801 UNIVERSITY BLVD
7) Address Line 2	Unit 400
8) City	ROUND ROCK
9) State	TX
10) Zip Code	78665
11) Phone (###-###-####)	5127605652
12) Extension	
13) Fax (###-###-####)	
14) Email	matwood@epcor.com
Contact person to be listed in the Notices	
15) Prefix	
16) First and Last Name	Matthew Atwood
17) Credential	
18) Title	Communications Senior Advisor
19) Organization Name	EPCOR NR Holdings Inc
20) Phone (###-###-####)	5127605652
21) Fax (###-###-####)	
22) Email	matwood@epcor.com

Bilingual Notice Requirements

23) Is a bilingual education program required by the Texas Education Code at the elementary or middle school nearest to the facility or proposed facility?	Yes
23.1) Are the students who attend either the elementary school or the middle school enrolled in a bilingual education program at that school?	Yes
23.2) Do the students at these schools attend a bilingual education program at another location?	No
23.3) Would the school be required to provide a bilingual education program but the school has waived out of this requirement under 19 TAC 89.1205(g)?	No
23.4) Which language is required by the bilingual program?	Spanish

Section 1# Public Viewing Information

County#: 1

1) County	GALVESTON
2) Public building name	Dickinson Public Library
3) Location within the building	Bulletin Board
4) Physical Address of Building	4411 Highway 3
5) City	Dickinson
6) Contact Name	
7) Phone (###-###-####)	2815343812
8) Extension	
9) Is the location open to the public?	Yes

Owner Information

Owner of Treatment Facility

1) Prefix	
2) First and Last Name	
3) Organization Name	EPCOR NR Holdings Inc
4) Mailing Address	4801 University Blvd STE 400
5) City	Round Rock
6) State	TX
7) Zip Code	78665
8) Phone (###-###-####)	5127605652
9) Extension	
10) Email	jgysel@epcor.com
11) What is ownership of the treatment facility?	Private

Owner of Land (where treatment facility is or will be)

12) Prefix	
13) First and Last Name	
14) Organization Name	KV Land LLC
15) Mailing Address	PO BOX 27440
16) City	Houston
17) State	TX
18) Zip Code	77227
19) Phone (###-###-####)	7132923256
20) Extension	
21) Email	michael@captech.us
22) Is the landowner the same person as the facility owner or co-applicant?	No

Admin General Information

1) Is the facility located on or does the treated effluent cross American Indian Land?	No
2) What is the authorization type that you are seeking?	Industrial Wastewater
2.1) Are the discharges at your facility subjected to federal effluent limitation guidelines (ELG) 40 CFR Part 400-471?	No
3) What is your facility operational status?	Inactive
4) What is the classification for your authorization?	TPDES
4.1) City nearest the outfall(s):	Texas City
4.2) County where the outfalls are located:	GALVESTON
4.3) Is or will the treated wastewater discharge to a city, county, or state highway right-of-way, or a flood control district drainage ditch?	No
4.4) Is the daily average discharge at your facility of 5 MGD or more?	Yes
4.4.1) Provide the names of all counties located within 100 statute miles downstream of the point(s) of discharge:	BRAZORIA|CHAMBERS|GALVESTON|HARRIS|JEFFERSON|MATAGORDA
5) Did any person formerly employed by the TCEQ represent your company and get paid for service regarding this application?	No

Lease Agreement or Deed Attachment

1) Attach a lease agreement or deed recorded easement	
[File Properties]	
File Name	LEASE_Lease Agreement.pdf
Hash	CE6EE3818CA79426962785014F02C6C51ACC9B09826138DBEF6A37F87854E2DD
MIME-Type	application/pdf

Plain Language

1) Plain Language

[File Properties]

File Name	LANG_Plain Language.pdf
Hash	71A7D0C96849C88AF16EA9452AC7C336CCBE1EE01D08C5B69070FDB992E92FC3
MIME-Type	application/pdf

Supplemental Permit Information Form

1) Supplemental Permit Information Form (SPIF)

[File Properties]

File Name	SPIF_Supplemental Permit Information Form.pdf
Hash	A66AB238932303E093805D2B68837E2DDDDB37F6AE55FF4A334E2ECB04F828AC
MIME-Type	application/pdf

Industrial Attachments

1) Have you clearly outlined and labeled the required information on the original full size USGS Topographic Map? Yes

1.1) I certify that I have clearly outlined and labeled the required information on the Topographic map and attached here.

[File Properties]

File Name	MAP_USGS Topographic Map.pdf
Hash	21CEB95621E34C837ADE5A58CE9B01FE8548DB95E61840B731711A83A69DDB83
MIME-Type	application/pdf

2) Public Involvement Plan (TCEQ Form 20960)

[File Properties]

File Name	PIP_PIP.pdf
Hash	8E51598DFC6EFB5854F768213FAAECAB9162361B781E62D5D313674B6EB36487
MIME-Type	application/pdf

3) Administrative Report 1.1

[File Properties]

File Name	ARPT_Administrative Report 1.1.pdf

Hash	A2B30E3E34D471BC75ED645C10E56CDEDC21020C0661A19E470F88F083B98701
MIME-Type	application/pdf

4) I confirm that all required sections of Technical Report 1.0 are complete and will be included in the Technical Attachment.	Yes
4.1) I confirm that Worksheet 4.0 (Receiving Waters) is complete and included in the Technical Attachment.	Yes
4.2) Are you planning to include Worksheet 4.1 (Waterbody Physical Characteristics) in the Technical Attachment?	Yes
4.3) Are you planning to include Worksheet 6.0 (Industrial Waste Contribution) in the Technical Attachment?	No
4.4) Are you planning to include Worksheet 7.0 (Stormwater Discharges Associated with Industrial Activities) to the Technical Attachment?	No
4.5) Are you planning to include Worksheet 8.0 (Aquaculture) in the Technical Attachment?	No
4.6) Are you planning to include Worksheet 9.0 (Class V Injection Well Inventory/Authorization) in the Technical Attachment?	No
4.7) Are you planning to include Worksheet 10.0 (Quarries in the John Graves Scenic Riverway) in the Technical Attachment?	No
4.8) Are you planning to include Worksheet 11.0 (Cooling Water System Information) in the Technical Attachment?	No
4.9) Are you planning to include Worksheet 11.1 (Impingement Mortality) in the Technical Attachment?	No
4.10) Are you planning to include Worksheet 11.2 (Source Water Biological Data) in the Technical Attachment?	No
4.11) Are you planning to include Worksheet 11.3 (Entrainment) in the Technical Attachment?	No
4.12) Technical Attachment	
[File Properties]	
File Name	TECH_Technical Report 1.0.pdf
Hash	5C9F36A79E76D4D3A9E374FE026EF78FA4A87197DFBE831DF9031DBB4CC569E9
MIME-Type	application/pdf

5) Affected Landowners Map	
[File Properties]	
File Name	LANDMP_Affected Landowner Map.pdf
Hash	23AABE45C7559B542B7C17808A8184BA60CD6FEBA5959DD1576E235470716C93
MIME-Type	application/pdf

6) Landowners Cross Reference List	
[File Properties]	
File Name	LANDCRL_Landowner Cross Reference List.pdf

Hash	8BB16804ACBC7E2F46ACA39AAF2B6B18F16468FED468C3399DE00839EB667F5F
MIME-Type	application/pdf

7) Landowner Avery Template

[File Properties]	
File Name	LANDAT_Avery Landowner Template.pdf
Hash	5A552A6A3EAC478E66900EAEE622CD6115507374E052871E2494475689449D92
MIME-Type	application/pdf

8) Flow Diagram

[File Properties]	
File Name	FLDIA_Flow Diagram.pdf
Hash	1FF96387BEC9D7E6FEC7B02DE2F3A696C71A275CA56D370E6F1918B7671103CF
MIME-Type	application/pdf

9) Site Drawing

[File Properties]	
File Name	SITEDR_Site Drawing.pdf
Hash	194BEC839B2276E793391204C04380912891BA60B1E221FDB9D3334EC46D4A27
MIME-Type	application/pdf

10) Original Photographs

[File Properties]	
File Name	ORIGPH_Original Photographs.pdf
Hash	7FD449C1E23D3AE777B04572E23B5540906C51BDDE6A35E2727CE43F411BBF66
MIME-Type	application/pdf

11) Design Calculations

12) Solids Management Plan

13) Water Balance

[File Properties]	
File Name	WB_Water balance.pdf
Hash	323603A9940FCF4C21CFA13BD7627FB5431482EAA7DC72FCF96E69A95E72ACF2
MIME-Type	application/pdf

14) Other Attachments

[File Properties]

File Name	OTHER_EPCOR Bayshore Application 2025.10.03 Final_Optimized.pdf
Hash	60C5129CD6C4DF35380F47A5A62D5B7311566ADD4B716647FF055F8D49B46112
MIME-Type	application/pdf

Certification

I certify that I am authorized under 30 Texas Administrative Code 305.44 to sign this document and can provide documentation in proof of such authorization upon request.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

1. I am Richard Brown, the owner of the STEERS account ER088811.
2. I have the authority to sign this data on behalf of the applicant named above.
3. I have personally examined the foregoing and am familiar with its content and the content of any attachments, and based upon my personal knowledge and/or inquiry of any individual responsible for information contained herein, that this information is true, accurate, and complete.
4. I further certify that I have not violated any term in my TCEQ STEERS participation agreement and that I have no reason to believe that the confidentiality or use of my password has been compromised at any time.
5. I understand that use of my password constitutes an electronic signature legally equivalent to my written signature.
6. I also understand that the attestations of fact contained herein pertain to the implementation, oversight and enforcement of a state and/or federal environmental program and must be true and complete to the best of my knowledge.
7. I am aware that criminal penalties may be imposed for statements or omissions that I know or have reason to believe are untrue or misleading.
8. I am knowingly and intentionally signing New Domestic or Industrial Individual Permit.
9. My signature indicates that I am in agreement with the information on this form, and authorize its submittal to the TCEQ.

OWNER OPERATOR Signature: Richard Brown OWNER OPERATOR

Customer Number:	
Legal Name:	EPCOR NR HOLDINGS INC.
Account Number:	ER088811
Signature IP Address:	148.51.213.2
Signature Date:	2025-10-03
Signature Hash:	31B8E13BB8DDFE837255056E8E40061FAF4F9DA701F0819F80F005DB6D6A437B
Form Hash Code at time of Signature:	806D81579F12DB4544B6CAD75FEE595994CC771D73272531C5C42E66B00A4872

Fee Payment

Transaction by:	The application fee payment transaction was made by ER088811/Richard Brown
Paid by:	The application fee was paid by RICHARD BROWN
Fee Amount:	$300.00
Paid Date:	The application fee was paid on 2025-10-03

Transaction/Voucher number:	The transaction number is 582EA000687640 and the voucher number is 786231

Submission

Reference Number:	The application reference number is 823266
Submitted by:	The application was submitted by ER088811/Richard Brown
Submitted Timestamp:	The application was submitted on 2025-10-03 at 16:01:18 CDT
Submitted From:	The application was submitted from IP address 148.51.213.2
Confirmation Number:	The confirmation number is 682831
Steers Version:	The STEERS version is 6.93

Additional Information

Application Creator: This account was created by Rachel Watkins

INDUSTRIAL WASTEWATER PERMIT APPLICATION ADMINISTRATIVE REPORT 1.1

The following information is required for new and amendment applications.

Item 1. Affected Landowner Information (Instructions, Page 35)

a. Attach a landowner map or drawing, with scale, as applicable. Check the box next to each item to confirm it has been provided.

☒ The applicant's property boundaries.

☒ The facility site boundaries within the applicant's property boundaries.

☐ The distance the buffer zone falls into adjacent properties and the property boundaries of the landowners located within the buffer zone.

☒ The property boundaries of all landowners surrounding the applicant's property. (Note: if the application is a major amendment for a lignite mine, the map must include the property boundaries of all landowners adjacent to the new facility (ponds).)

☒ The point(s) of discharge and highlighted discharge route(s) clearly shown for one mile downstream.

☒ The property boundaries of the landowners located on both sides of the discharge route for one full stream mile downstream of the point of discharge.

☒ The property boundaries of the landowners along the watercourse for a one-half mile radius from the point of discharge if the point of discharge is into a lake, bay, estuary, or affected by tides.

☐ The boundaries of the effluent disposal site (e.g., irrigation area or subsurface drainfield site) and all evaporation/holding ponds within the applicant's property.

☐ The property boundaries of all landowners surrounding the applicant's property boundaries where the effluent disposal site is located.

☐ The boundaries of the sludge land application site (for land application of sewage sludge for beneficial use) and the property boundaries of landowners within one-quarter mile of the applicant's property boundaries where the sewage sludge land application site is located.

☐ The property boundaries of landowners within one-half mile in all directions from the applicant's property boundaries where the sewage sludge disposal site (e.g., sludge surface disposal site or sludge monofil) is located.

Attachment: AR-07 Affected Landowner Map and List

b. ☒ that the landowners list has also been provided as mailing labels in electronic format (Avery 5160). AR-07 Mailing Labels

c. Check this box to confirm a separate list with the landowners' names and mailing addresses cross-referenced to the landowner's map has been provided.Provide the source of the landowners' names and mailing addresses: Galveston County Appraisal District

e. As required by Texas Water Code § 5.115, is any permanent school fund land affected by this application?

☐ Yes ☒ No

If yes, provide the location and foreseeable impacts and effects this application has on the land(s): N/A

Item 2. Original Photographs (Instructions, Page 37)

Provide original ground level photographs. Check the box next to each of the following items to indicate it is included.

☒ At least one original photograph of the new or expanded treatment unit location.

☒ At least two photographs of the existing/proposed point of discharge and as much area downstream (photo 1) and upstream (photo 2) as can be captured. If the discharge is to an open water body (e.g., lake, bay), the point of discharge should be in the right or left edge of each photograph showing the open water and with as much area on each respective side of the discharge as can be captured.

☐ At least one photograph of the existing/proposed effluent disposal site.

☒ A plot plan or map showing the location and direction of each photograph.

Attachment: AR-08 Original Site Photographs

INDUSTRIAL WASTEWATER PERMIT APPLICATION

SUPPLEMENTAL PERMIT INFORMATION FORM (SPIF)

This form applies to TPDES permit applications only. Complete and attach the Supplemental Permit information Form (SPIF) (TCEQ Form 20971).

Attachment: AR-09 Supplemental Permit Information

Texas Commission on Environmental Quality

Application for a TPDES Industrial Wastewater Permit

EPCOR NR Holdings, Inc.



October 2025

Texas Commission on Environmental Quality

Application for a TPDES Industrial Wastewater Permit

EPCOR NR Holdings, Inc.

Submitted to:

Texas Commission on Environmental Quality
Water Supply Division, Water Rights Permitting (MC-160)
12100 Park 35 Circle
Austin, Texas 78753

Prepared for:

EPCOR NR Holdings, Inc.
4801 University Blvd., Ste. 400
Round Rock, Texas 78665

Prepared by:

Lloyd Gosselink Rochelle & Townsend, P.C.
816 Congress Ave., Suite 1900
Austin, Texas 78701

EPCOR NR HOLDINGS, INC.

BAYSHORE DESALINATION FACILITY
WASTEWATER TREATMENT PLANT

2025 TPDES Industrial Wastewater Permit Application

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TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

INDUSTRIAL WASTEWATER PERMIT APPLICATION CHECKLIST

Complete and submit this checklist with the industrial wastewater permit application.

APPLICANT NAME: EPCOR NR Holdings, Inc.

PERMIT NUMBER (If new, leave blank): WQ00 Click to enter text.

Indicate if each of the following items is included in your application.

	Y	N		Y	N
Administrative Report 1.0	☒	☐	Worksheet 8.0	☐	☒
Administrative Report 1.1	☒	☐	Worksheet 9.0	☐	☒
SPIF	☒	☐	Worksheet 10.0	☐	☒
Core Data Form	☒	☐	Worksheet 11.0	☐	☒
Summary of Application (PLS)	☒	☐	Worksheet 11.1	☐	☒
Public Involvement Plan Form	☒	☐	Worksheet 11.2	☐	☒
Technical Report 1.0	☒	☐	Worksheet 11.3	☐	☒
Worksheet 1.0	☒	☐	Original USGS Map	☒	☐
Worksheet 2.0	☒	☐	Affected Landowners Map	☒	☐
Worksheet 3.0	☐	☒	Landowner Disk or Labels	☒	☐
Worksheet 3.1	☐	☒	Flow Diagram	☒	☐
Worksheet 3.2	☐	☒	Site Drawing	☒	☐
Worksheet 3.3	☐	☒	Original Photographs	☒	☐
Worksheet 4.0	☒	☐	Design Calculations	☒	☐
Worksheet 4.1	☒	☐	Solids Management Plan	☒	☐
Worksheet 5.0	☐	☒	Water Balance	☒	☐
Worksheet 6.0	☐	☒			
Worksheet 7.0	☐	☒			

For TCEQ Use Only

Segment Number _____County _____
Expiration Date _____Region _____
Permit Number _____

Tab 1

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

INDUSTRIAL WASTEWATER PERMIT APPLICATION ADMINISTRATIVE REPORT 1.0

This report is required for all applications for TPDES permits and TLAPs, except applications for oil and gas extraction operations subject to 40 CFR Part 435. Contact the Applications Review and Processing Team at 512-239-4671 with any questions about completing this report.

Applications for oil and gas extraction operations subject to 40 CFR Part 435 must use Oil and Gas Exploration and Production Administrative Report (TCEQ Form-20893 and 20893-inst[1]).

Item 1. Application Information and Fees (Instructions, Page 26)

a. Complete each field with the requested information, if applicable.

Applicant Name: EPCOR NR Holdings, Inc.

Permit No.: WQ000Click to enter text.

EPA ID No.: TX0Click to enter text.

Expiration Date: Click to enter text.

b. Check the box next to the appropriate authorization type.

☒ Industrial Wastewater (wastewater and stormwater)

☐ Industrial Stormwater (stormwater only)

☐ Reverse Osmosis Water Treatment (reverse osmosis water treatment wastewaters only)

c. Check the box next to the appropriate facility status.

☐ Active ☒ Inactive

d. Check the box next to the appropriate permit type.

☒ TPDES Permit ☐ TLAP ☐ TPDES with TLAP component

e. Check the box next to the appropriate application type.

☒ New

☐ Renewal with changes ☐ Renewal without changes

☐ Major amendment with renewal ☐ Major amendment without renewal

☐ Minor amendment without renewal

☐ Minor modification without renewal

f. If applying for an amendment or modification, describe the request: N/A

For TCEQ Use Only

Segment Number _____County _____
Expiration Date _____Region _____
Permit Number _____

[1] https://www.tceq.texas.gov/publications/search_forms.html

g. Application Fee

EPA Classification	New	Major Amend. (with or without renewal)	Renewal (with or without changes)	Minor Amend. / Minor Mod. (without renewal)
Minor facility not subject to EPA categorical effluent guidelines (40 CFR Parts 400-471)	☒ $350	☐ $350	☐ $315	☐ $150
Minor facility subject to EPA categorical effluent guidelines (40 CFR Parts 400-471)	☐ $1,250	☐ $1,250	☐ $1,215	☐ $150
Major facility	N/A [2]	☐ $2,050	☐ $2,015	☐ $450

h. Payment Information

Mailed

Check or money order No.: N/A

Check or money order amt.: N/A

Named printed on check or money order: N/A

Epay

Voucher number: 786042

Copy of voucher attachment: AR-01 Payment Voucher

Item 2. Applicant Information (Instructions, Pages 26)

a. Customer Number, if applicant is an existing customer: _____

Note: Locate the customer number using the TCEQ's Central Registry Customer Search[3].

b. Legal name of the entity (applicant) applying for this permit: EPCOR NR Holdings, Inc.

Note: The owner of the facility must apply for the permit. The legal name must be spelled exactly as filed with the TX SOS, Texas Comptroller of Public Accounts, County, or in the legal documents forming the entity.

c. Name and title of the person signing the application. (**Note:** The person must be an executive official that meets signatory requirements in 30 TAC § 305.44.)

Prefix: Mr. Full Name (Last/First Name): Thomas Loquvam

Title: Director of General Counsel & Public Policy Credential: N/A

d. Will the applicant have overall financial responsibility for the facility?

☒ Yes ☐ No

Note: The entity with overall financial responsibility for the facility must apply as a co-applicant, if not the facility owner.

[2] All facilities are designated as minors until formally classified as a major by EPA.

[3] https://www15.tceq.texas.gov/crpub/index.cfm?fuseaction=cust.CustSearch

Item 3. Co-applicant Information (Instructions, Page 27)

☒ Check this box if there is no co-applicant.; otherwise, complete the below questions.

a. Legal name of the entity (co-applicant) applying for this permit: N/A

Note: The legal name must be spelled exactly as filed with the TX SOS, Texas Comptroller of Public Accounts, County, or in the legal documents forming the entity.

b. Customer Number (if applicant is an existing customer): CN N/A

Note: Locate the customer number using the TCEQ's Central Registry Customer Search.

c. Name and title of the person signing the application. (**Note:** The person must be an executive official that meets signatory requirements in 30 TAC § 305.44.)

Prefix: N/A Full Name (Last/First Name): N/A

Title: N/A Credential: N/A

d. Will the co-applicant have overall financial responsibility for the facility?

☐ Yes ☐ No

Note: The entity with overall financial responsibility for the facility must apply as a co-applicant, if not the facility owner.

Item 4. Core Data Form (Instructions, Pages 27)

a. Complete and attach one Core Data Form (TCEQ Form 10400) for each customer (applicant and co-applicant(s)). If the customer type selected on the Core Data Form is Individual, complete Attachment 1 of the Administrative Report. Attachment: AR-02 Core Data Form

Item 5. Application Contact Information (Instructions, Page 27)

Provide names of two individuals who can be contacted about this application. Indicate if the individual can be contacted about administrative or technical information, or both.

a. ☒ Administrative Contact . ☐ Technical Contact

Prefix: Ms. Full Name (Last/First Name): Rachel Watkins T

itle: Environmental Compliance Manager Credential: N/A

Organization Name: EPCOR NR Holdings, Inc.

Mailing Address: 4801 University Blvd Ste 400 City/State/Zip: Round Rock, TX 78665

Phone No: 737-704-8664 Email: RWatkins@epcor.com

b. ☐ Administrative Contact ☒ Technical Contact

Prefix: Mr. Full Name (Last/First Name): Americus Mitchell

Title: Industrial Water Director Credential: N/A

Organization Name: EPCOR NR Holdings, Inc.

Mailing Address: 4801 University Blvd Ste 400 City/State/Zip: Round Rock, TX 78665

Phone No: 210-579-2810 Email: AMitchell1@epcor.com

Attachment: N/A

Item 6. Permit Contact Information (Instructions, Page 28)

Provide two names of individuals that can be contacted throughout the permit term.

a. Prefix: Mr. Full Name (Last/First Name): Joseph Gysel
Title: President Credential: N/A
Organization Name: EPCOR NR Holdings, Inc.
Mailing Address: 5656 W. Talavi Blvd. City/State/Zip: Glendale, AZ 85306
Phone No: 623-445-2400 Email: JGysel@epcor.com

b. Prefix: Mr. Full Name (Last/First Name): Thomas Loquvam
Title: Director of General Counsel & Public Policy Credential: N/A
Organization Name: EPCOR NR Holdings, Inc.
Mailing Address: 5656 W. Talavi Blvd City/State/Zip: Glendale, AZ 85306
Phone No: 623-445-2449 Email: TLoquvam@epcor.com

Attachment: N/A

Item 7. Billing Contact Information (Instructions, Page 28)

The permittee is responsible for paying the annual fee. The annual fee will be assessed for permits **in effect on September 1 of each year**. The TCEQ will send a bill to the address provided in this section. The permittee is responsible for terminating the permit when it is no longer needed (form TCEQ-20029).

Provide the complete mailing address where the annual fee invoice should be mailed and the name and phone number of the permittee's representative responsible for payment of the invoice.

Prefix: Ms. Full Name (Last/First Name): Rachel Watkins
Title: Environmental Compliance Manager Credential: N/A
Organization Name: EPCOR NR Holdings, Inc.
Mailing Address: 4801 University Blvd. Ste. 400 City/State/Zip: Round Rock, TX 78665
Phone No: 737-704-8664 Email: RWatkins@epcor.com

Item 8. DMR/MER Contact Information (Instructions, Page 28)

Provide the name and mailing address of the person delegated to receive and submit DMRs or MERs. **Note:** DMR data must be submitted through the NetDMR system. An electronic reporting account can be established once the facility has obtained the permit number.

Prefix: Mr. Full Name (Last/First Name): Rick Kilborn, Jr.
Title: Operations Director Credential: N/A
Organization Name: EPCOR NR Holdings, Inc.
Mailing Address: 4801 University Blvd. Ste. 400 City/State/Zip: Round Rock, TX 78665
Phone No: 512-429-5712 Email: RKilbornJr@epcor.com

Item 9. Notice Information (Instructions, Pages 28)

a. Individual Publishing the Notices

Prefix: Mr. Full Name (Last/First Name): Matthew Atwood

Title: Communications Senior Advisor Credential: N/A

Organization Name: EPCOR NR Holdings, Inc.

Mailing Address: 4801 University Blvd. Ste 400 City/State/Zip: Round Rock, TX 78665

Phone No: 512-760-5652 Email: MAtwood@epcor.com

b. Method for Receiving Notice of Receipt and Intent to Obtain a Water Quality Permit Package (only for NORI, NAPD will be sent via regular mail)

☒ E-mail: MAtwood@epcor.com

☐ Fax: N/A

☐ Regular Mail (USPS)

Mailing Address: N/A

City/State/Zip Code: N/A

c. Contact in the Notice

Prefix: Mr. Full Name (Last/First Name): Matthew Atwood

Title: Communications Senior Advisor Credential: N/A

Organization Name: EPCOR NR Holdings, Inc.

Phone No: 512-760-5652 Email: MAtwood@epcor.com

d. Public Viewing Location Information

Note: If the facility or outfall is located in more than one county, provide a public viewing place for each county.

Public building name: Dickinson Public Library Location within the building: Bulletin Board

Physical Address of Building: 4411 Highway 3

City: Dickinson County: Galveston

e. Bilingual Notice Requirements

This information is required for new, major amendment, minor amendment or minor modification, and renewal applications.

This section of the application is only used to determine if alternative language notices will be needed. Complete instructions on publishing the alternative language notices will be in your public notice package.

Call the bilingual/ESL coordinator at the nearest elementary and middle schools and obtain the following information to determine if an alternative language notice(s) is required.

1. Is a bilingual education program required by the Texas Education Code at the elementary or middle school nearest to the facility or proposed facility?

   ☒ Yes ☐ No

If no, publication of an alternative language notice is not required; skip to Item 8 (Regulated Entity and Permitted Site Information.)

2. Are the students who attend either the elementary school or the middle school enrolled in a bilingual education program at that school?

   ☒ Yes ☐ No

3. Do the students at these schools attend a bilingual education program at another location?

   ☐ Yes ☒ No

4. Would the school be required to provide a bilingual education program, but the school has waived out of this requirement under 19 TAC §89.1205(g)?

   ☐ Yes ☒ No ☐ N/A

5. If the answer is yes to question 1, 2, 3, or 4, public notices in an alternative language are required. Which language is required by the bilingual program? Spanish

f. Summary of Application in Plain Language Template – Complete and attach the Summary of Application in Plain Language Template (TCEQ Form 20972), also known as the plain language summary or PLS. Attachment: AR – 03 Plain Language Summary

g. Complete and attach one Public Involvement Plan (PIP) Form (TCEQ Form 20960) for each application for a new permit or major amendment. Attachment: AR-04 Public Involvement Plan

Item 10. Regulated Entity and Permitted Site Information (Instructions Page 29)

a. TCEQ issued Regulated Entity Number (RN), if available: RN N/A

Note: If your business site is part of a larger business site, a Regulated Entity Number (RN) may already be assigned for the larger site. Use the RN assigned for the larger site. Search the TCEQ's Central Registry to determine the RN or to see if the larger site may already be registered as a Regulated Entity. If the site is found, provide the assigned RN.

b. Name of project or site (name known by the community where located): Bayshore Desalination Facility

c. Is the location address of the facility in the existing permit the same?

☐ Yes ☐ No ☒ N/A (new permit)

Note: If the facility is located in Bexar, Comal, Hays, Kinney, Medina, Travis, Uvalde, or Williamson County, additional information concerning protection of the Edwards Aquifer may be required.

d. Owner of treatment facility:

Prefix: N/A Full Name (Last/First Name): N/A

or Organization Name: EPCOR NR Holdings, Inc.

Mailing Address: 4801 University Blvd. Ste. 400 City/State/Zip: Round Rock, TX 78665

Phone No: 623-445-2400 Email: JGysel@epcor.com

e. Ownership of facility: ☐ Public ☒ Private ☐ Both ☐ Federal

f. Owner of land where treatment facility is or will be: KV Land, LLC

Prefix: N/A Full Name (Last/First Name): N/A

or Organization Name: KV Land, LLC

Mailing Address: PO Box 27440 City/State/Zip: Houston, TX 77227

Phone No: Click to enter text. Email: Click to enter text.

Note: If not the same as the facility owner, attach a long-term lease agreement in effect for at least six years (In some cases, a lease may not suffice - see instructions). Attachment: AR-05 Memorandum of Option and Property Restrictions

g. Owner of effluent TLAP disposal site (if applicable): N/A

Prefix: N/A Full Name (Last/First Name): N/A

or Organization Name: N/A

Mailing Address: N/A City/State/Zip: N/A

Phone No: N/A Email: N/A

Note: If not the same as the facility owner, attach a long-term lease agreement in effect for at least six years. Attachment: N/A

h. Owner of sewage sludge disposal site (if applicable):

Prefix: N/A Full Name (Last/First Name): N/A

or Organization Name: N/A

Mailing Address: N/A City/State/Zip: N/A

Phone No: N/A Email: N/A

Note: If not the same as the facility owner, attach a long-term lease agreement in effect for at least six years. Attachment: N/A

Item 11. TDPES Discharge/TLAP Disposal Information (Instructions, Page 31)

a. Is the facility located on or does the treated effluent cross Native American Land?

☐ Yes ☒ No

b. Attach an original full size USGS Topographic Map (or an 8.5"×11" reproduced portion for renewal or amendment applications) with all required information. Check the box next to each item below to confirm it has been included on the map.

☒ One-mile radius ☒ Three-miles downstream information

☒ Applicant's property boundaries ☒ Treatment facility boundaries

☒ Labeled point(s) of discharge ☒ Highlighted discharge route(s)

☐ Effluent disposal site boundaries ☐ All wastewater ponds

☐ Sewage sludge disposal site ☐ New and future construction

Attachment: AR-06 USGS Topographic Map

c. Is the location of the sewage sludge disposal site in the existing permit accurate?

☐ Yes ☒ No or New Permit

If no, or a new application, provide an accurate location description: sewage sludge will not be produced

d. Are the point(s) of discharge in the existing permit correct?

☐ Yes ☒ No or New Permit

If no, or a new application, provide an accurate location description: The outfall is located at the outlet of the pipe at the southwest end of the man-made canal within the property boundaries.

e. Are the discharge route(s) in the existing permit correct?

☐ Yes ☒ No or New Permit

If no, or a new permit, provide an accurate description of the discharge route: The discharge will travel northeast along the man-made canal, flowing around both sides of the former cooling tower island and converging back, continuing to flow through the man-made canal until meeting Galveston Bay two miles downstream of the outfall.

f. City nearest the outfall(s): Texas City

g. County in which the outfalls(s) is/are located: Galveston

h. Is or will the treated wastewater discharge to a city, county, or state highway right-of-way, or a flood control district drainage ditch?

☐ Yes ☒ No

If yes, indicate by a check mark if: ☐ Authorization granted ☐ Authorization pending

For new and amendment applications, attach copies of letters that show proof of contact and provide the approval letter upon receipt. Attachment: N/A

For all applications involving an average daily discharge of 5 MGD or more, provide the names of all counties located within 100 statute miles downstream of the point(s) of discharge: Galveston, Harris, Chambers, Jefferson, Brazoria, Matagorda counties in TX and Cameron County in LA

i. For TLAPs, is the location of the effluent disposal site in the existing permit accurate?

☐ Yes No or New Permit ☒ N/A

If no, or a new application, provide an accurate location description: N/A

j. City nearest the disposal site: N/A

k. County in which the disposal site is located: N/A

l. For TLAPs, describe how effluent is/will be routed from the treatment facility to the disposal site: N/A

m. For TLAPs, identify the nearest watercourse to the disposal site to which rainfall runoff might flow if not contained: N/A

Item 12. Miscellaneous Information (Instructions, Page 33)

a. Did any person formerly employed by the TCEQ represent your company and get paid for service regarding this application?

☐ Yes ☒ No

If yes, list each person: N/A

b. Do you owe any fees to the TCEQ?

☐ Yes ☒ No

If yes, provide the following information:

Account no.: N/A

Total amount due: N/A

c. Do you owe any penalties to the TCEQ?

☐ Yes ☒ No

If yes, provide the following information:

Enforcement order no.: N/A

Amount due: N/A

Item 13. Signature Page (Instructions, Page 33)

Permit No: WQ000Click to enter text.

Applicant Name: EPCOR NR Holdings, Inc.

Certification: I, Thomas Loquvam, certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

I further certify that I am authorized under 30 Texas Administrative Code §305.44 to sign and submit this document and can provide documentation in proof of such authorization upon request.

Signatory name (typed or printed): Thomas Loquvam

Signatory title: Director of General Counsel & Public Policy

Signature: _____ Date: 10/3/25

(Use blue ink)

Subscribed and Sworn to before me by the said Thomas Loquvam

on this third day of October, 20 25.

My commission expires on the fourteenth day of August, 20 26.

Summer Brown

Notary Public [SEAL]

SUMMER BROWN
Notary Public
Commission Number 631877
Expires: August 14, 2026
Maricopa County

_____

County, Texas

Note: *If co-applicants are necessary, each entity must submit an original, separate signature page.*

Tab 2

INDUSTRIAL WASTEWATER PERMIT APPLICATION ADMINISTRATIVE REPORT 1.1

The following information is required for new and amendment applications.

Item 1. Affected Landowner Information (Instructions, Page 35)

a. Attach a landowner map or drawing, with scale, as applicable. Check the box next to each item to confirm it has been provided.

☒ The applicant's property boundaries.

☒ The facility site boundaries within the applicant's property boundaries.

☐ The distance the buffer zone falls into adjacent properties and the property boundaries of the landowners located within the buffer zone.

☒ The property boundaries of all landowners surrounding the applicant's property. (Note: if the application is a major amendment for a lignite mine, the map must include the property boundaries of all landowners adjacent to the new facility (ponds).)

☒ The point(s) of discharge and highlighted discharge route(s) clearly shown for one mile downstream.

☒ The property boundaries of the landowners located on both sides of the discharge route for one full stream mile downstream of the point of discharge.

☒ The property boundaries of the landowners along the watercourse for a one-half mile radius from the point of discharge if the point of discharge is into a lake, bay, estuary, or affected by tides.

☐ The boundaries of the effluent disposal site (e.g., irrigation area or subsurface drainfield site) and all evaporation/holding ponds within the applicant's property.

☐ The property boundaries of all landowners surrounding the applicant's property boundaries where the effluent disposal site is located.

☐ The boundaries of the sludge land application site (for land application of sewage sludge for beneficial use) and the property boundaries of landowners within one-quarter mile of the applicant's property boundaries where the sewage sludge land application site is located.

☐ The property boundaries of landowners within one-half mile in all directions from the applicant's property boundaries where the sewage sludge disposal site (e.g., sludge surface disposal site or sludge monofil) is located.

Attachment: AR-07 Affected Landowner Map and List

b. ☒ that the landowners list has also been provided as mailing labels in electronic format (Avery 5160). AR-07 Mailing Labels

c. Check this box to confirm a separate list with the landowners' names and mailing addresses cross-referenced to the landowner's map has been provided.Provide the source of the landowners' names and mailing addresses: Galveston County Appraisal District

e. As required by Texas Water Code § 5.115, is any permanent school fund land affected by this application?

☐ Yes ☒ No

If yes, provide the location and foreseeable impacts and effects this application has on the land(s): N/A

Item 2. Original Photographs (Instructions, Page 37)

Provide original ground level photographs. Check the box next to each of the following items to indicate it is included.

☒ At least one original photograph of the new or expanded treatment unit location.

☒ At least two photographs of the existing/proposed point of discharge and as much area downstream (photo 1) and upstream (photo 2) as can be captured. If the discharge is to an open water body (e.g., lake, bay), the point of discharge should be in the right or left edge of each photograph showing the open water and with as much area on each respective side of the discharge as can be captured.

☐ At least one photograph of the existing/proposed effluent disposal site.

☒ A plot plan or map showing the location and direction of each photograph.

Attachment: AR-08 Original Site Photographs

INDUSTRIAL WASTEWATER PERMIT APPLICATION

SUPPLEMENTAL PERMIT INFORMATION FORM (SPIF)

This form applies to TPDES permit applications only. Complete and attach the Supplemental Permit information Form (SPIF) (TCEQ Form 20971).

Attachment: AR-09 Supplemental Permit Information

Tab 3

Print this voucher for your records. If you are sending the TCEQ hardcopy documents related to this payment, include a copy of this voucher.

Transaction Information

Voucher Number:	786042
Trace Number:	582EA000687490
Date:	10/03/2025 08:38 AM
Payment Method:	CC - Authorization 0000002007
Voucher Amount:	$300.00
Fee Type:	WW PERMIT - MINOR FACILITY NOT SUBJECT TO 40 CFR 400-471 - NEW
ePay Actor:	RACHEL WATKINS
Actor Email:	rwatkins@epcor.com
IP:	12.11.77.218

Payment Contact Information

Name:	RACHEL WATKINS
Company:	EPCOR NR HOLDINGS INC
Address:	5656 W TAVALI BLVD, GLENDALE, AZ 85306 1876
Phone:	737-704-8664

Site Information

Site Name:	BAYSHORE DESALINATION FACILITY
Site Address:	5504 HIGHWAY 146, TEXAS CITY, TX 77518
Site Location:	BETWEEN AVENUE R AND CHASE PARK DR AT THE FORMER PH ROBINSON PLANT

Customer Information

Customer Name:	EPCOR NR HOLDINGS INC
Customer Address:	4801 UNIVERSITY BLVD, ROUND ROCK, TX 78665

Close

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Print this voucher for your records. If you are sending the TCEQ hardcopy documents related to this payment, include a copy of this voucher.

Transaction Information

Voucher Number:	786043
Trace Number:	582EA000687490
Date:	10/03/2025 08:38 AM
Payment Method:	CC - Authorization 0000002007
Voucher Amount:	$50.00
Fee Type:	30 TAC 305.53B WQ NOTIFICATION FEE
ePay Actor:	RACHEL WATKINS
Actor Email:	rwatkins@epcor.com
IP:	12.11.77.218

Payment Contact Information

Name:	RACHEL WATKINS
Company:	EPCOR NR HOLDINGS INC
Address:	5656 W TAVALI BLVD, GLENDALE, AZ 85306 1876
Phone:	737-704-8664

Close

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Tab 4

TCEQ Use Only

TCEQ CORE DATA FORM

For detailed instructions on completing this form, please read the Core Data Form Instructions or call 512-239-5175.

SECTION I: General Information

1. Reason for Submission (*If other is checked please describe in space provided.)*

☒ New Permit, Registration or Authorization (*Core Data Form should be submitted with the program application.)*

☐ Renewal *(Core Data Form should be submitted with the renewal form)* ☐ Other

2. Customer Reference Number *(if issued)*	Follow this link to search for CN or RN numbers in Central Registry**	**3. Regulated Entity Reference Number** *(if issued)*
TBD		**RN**

SECTION II: Customer Information

4. General Customer Information | **5. Effective Date for Customer Information Updates** (mm/dd/yyyy) 10/3/2025

☒ New Customer ☐ Update to Customer Information ☐ Change in Regulated Entity Ownership
☐ Change in Legal Name (Verifiable with the Texas Secretary of State or Texas Comptroller of Public Accounts)

The Customer Name submitted here may be updated automatically based on what is current and active with the Texas Secretary of State (SOS) or Texas Comptroller of Public Accounts (CPA).

6. Customer Legal Name *(If an individual, print last name first: eg: Doe, John)* *If new Customer, enter previous Customer below:*

EPCOR NR Holdings, Inc.

7. TX SOS/CPA Filing Number	**8. TX State Tax ID** (11 digits)	**9. Federal Tax ID** (9 digits)	**10. DUNS Number** *(if applicable)*
805852623	32098300588	92-0938940	

11. Type of Customer: ☒ Corporation ☐ Individual Partnership: ☐ General ☐ Limited
Government: ☐ City ☐ County ☐ Federal ☐ Local ☐ State ☐ Other ☐ Sole Proprietorship ☐ Other:

12. Number of Employees
☐ 0-20 ☐ 21-100 ☐ 101-250 ☒ 251-500 ☐ 501 and higher

13. Independently Owned and Operated?
☒ **Yes** ☐ **No**

14. Customer Role (Proposed or Actual) – *as it relates to the Regulated Entity listed on this form. Please check one of the following*

☐ Owner ☐ Operator ☒ Owner & Operator
☐ Occupational Licensee ☐ Responsible Party ☐ VCP/BSA Applicant ☐ Other:

15. Mailing Address:								
4801 UNIVERSITY BLVD								
STE 400								
City	ROUND ROCK	**State**	TX	**ZIP**	78665	**ZIP + 4**	2052	

16. Country Mailing Information *(if outside USA)*	**17. E-Mail Address** *(if applicable)*
	AMITCHELL1@EPCOR.COM

18. Telephone Number	**19. Extension or Code**	**20. Fax Number** *(if applicable)*
(623) 445-2400		( ) -

SECTION III: Regulated Entity Information

21. General Regulated Entity Information *(If 'New Regulated Entity" is selected, a new permit application is also required.)*

☒ New Regulated Entity ☐ Update to Regulated Entity Name ☐ Update to Regulated Entity Information

The Regulated Entity Name submitted may be updated, in order to meet TCEQ Core Data Standards (removal of organizational endings such as Inc, LP, or LLC).

22. Regulated Entity Name *(Enter name of the site where the regulated action is taking place.)*

Bayshore Desalination Facility

23. Street Address of the Regulated Entity: ***(No PO Boxes)***	5501 Highway 146							
	City		**State**	TX	**ZIP**	77518	**ZIP + 4**	2523
24. County	GALVESTON							

If no Street Address is provided, fields 25-28 are required.

25. Description to Physical Location:					
26. Nearest City			**State**		**Nearest ZIP Code**

Latitude/Longitude are required and may be added/updated to meet TCEQ Core Data Standards. (Geocoding of the Physical Address may be used to supply coordinates where none have been provided or to gain accuracy).

27. Latitude (N) In Decimal:			**28. Longitude (W) In Decimal:**		
Degrees	Minutes	Seconds	Degrees	Minutes	Seconds

29. Primary SIC Code (4 digits)	**30. Secondary SIC Code** (4 digits)	**31. Primary NAICS Code** (5 or 6 digits)	**32. Secondary NAICS Code** (5 or 6 digits)
4941	N/A	221310	N/A

33. What is the Primary Business of this entity? *(Do not repeat the SIC or NAICS description.)*

Desalination water treatment plant

34. Mailing Address:	**4801 UNIVERSITY BLVD**							
	STE 400							
	City	**ROUND ROCK**	**State**	**TX**	**ZIP**	**78665**	**ZIP + 4**	**2052**
35. E-Mail Address:	**AMITCHELL1@EPCOR.COM**							

36. Telephone Number	**37. Extension or Code**	**38. Fax Number** *(if applicable)*
(623) 445-2400		**( ) -**

39. TCEQ Programs and ID Numbers Check all Programs and write in the permits/registration numbers that will be affected by the updates submitted on this form. See the Core Data Form instructions for additional guidance.

☐ Dam Safety	☐ Districts	☐ Edwards Aquifer	☐ Emissions Inventory Air	☐ Industrial Hazardous Waste

☐ Municipal Solid Waste	☐ New Source Review Air	☐ OSSF	☐ Petroleum Storage Tank	☐ PWS
☐ Sludge	☐ Storm Water	☐ Title V Air	☐ Tires	☐ Used Oil
☐ Voluntary Cleanup	☐ Wastewater	☐ Wastewater Agriculture	☐ Water Rights	☐ Other:

SECTION IV: Preparer Information

40. Name:	RACHEL WATKINS	41. Title:	ENV. COMPLIANCE MANAGER

42. Telephone Number	43. Ext./Code	44. Fax Number	45. E-Mail Address
(737) 704-8664		( ) -	RWATKINS@EPCOR.COM

SECTION V: Authorized Signature

46. By my signature below, I certify, to the best of my knowledge, that the information provided in this form is true and complete, and that I have signature authority to submit this form on behalf of the entity specified in Section II, Field 6 and/or as required for the updates to the ID numbers identified in field 39.

Company:	EPCOR NR Holdings, Inc.	Job Title:	Director of General Counsel & Public Policy
Name *(In Print)*:	Thomas Loquvam	Phone:	(623) 445- 2449
Signature:		Date:	10/3/25

Tab 5

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

SUMMARY OF APPLICATION IN PLAIN LANGUAGE FOR TPDES OR TLAP PERMIT APPLICATIONS

Summary of Application (in plain language) Template and Instructions for Texas Pollutant Discharge Elimination System (TPDES) and Texas Land Application (TLAP) Permit Applications

Applicants should use this template to develop a plain language summary of your facility and application as required by Title 30, Texas Administrative Code (30 TAC), Chapter 39, Subchapter H. You may modify the template as necessary to accurately describe your facility as long as the summary includes the following information: (1) the function of the proposed plant or facility; (2) the expected output of the proposed plant or facility; (3) the expected pollutants that may be emitted or discharged by the proposed plant or facility; and (4) how you will control those pollutants, so that the proposed plant will not have an adverse impact on human health or the environment.

Fill in the highlighted areas below to describe your facility and application in plain language. Instructions and examples are provided below. Make any other edits necessary to improve readability or grammar and to comply with the rule requirements. After filling in the information for your facility delete these instructions.

If you are subject to the alternative language notice requirements in 30 TAC Section 39.426, **you must provide a translated copy of the completed plain language summary in the appropriate alternative language as part of your application package**. For your convenience, a Spanish template has been provided below.

ENGLISH TEMPLATE FOR TPDES or TLAP NEW/RENEWAL/AMENDMENT APPLICATIONS INDUSTRIAL WASTEWATER/STORMWATER
The following summary is provided for this pending water quality permit application being reviewed by the Texas Commission on Environmental Quality as required by 30 TAC Chapter 39. The information provided in this summary may change during the technical review of the application and is not a federal enforceable representation of the permit application.

EPCOR NR Holdings, Inc. proposes to operate Bayshore Desalination Facility, a Seawater Desalination Water Treatment Plant. The facility will be located at 5501 Highway 146, in Texas City, Galveston County, Texas 77518. This application is for a new application to disch arge process wastewater (reverse osmosis concentrated blended with raw seawater) on an intermittent and flow-variable basis.

Discharges from the facility are expected to contain Total Suspended Solids, Total Dissolved Solids, salinity, chloride, sulfate, and trace chemicals used in the water treatment processes. Trace chemicals residual from the water treatment process may be present, including Ferric Sulfate (CAS # 10028-22-5), Anionic Polymer, Sodium Hypochlorite (CAS # 7681-52-9), Liquid Ammonium Sulfate (CAS # 7783-20-2), CO_2 (CAS # 124-38-9), Sodium Hydroxide (CAS # 1310-

73-2), Citric Acid (CAS # 77-92-9), Sodium Bisulfite (CAS # 7631-90-5), Seawater reverse osmosis Antiscalant, Sulfuric Acid (CAS # 7664-93-9), and Lime (calcite)(CAS # 13397-26-7). Concentrate from seawater reverse osmosis treatment will be treated by blending with raw seawater.

PLANTILLA EN ESPAÑOL PARA SOLICITUDES NUEVAS/RENOVACIONES/ENMIENDAS DE TPDES o TLAP

AGUAS RESIDUALES INDUSTRIALES **/AGUAS PLUVIALES**

El siguiente resumen se proporciona para esta solicitud de permiso de calidad del agua pendiente que está siendo revisada por la Comisión de Calidad Ambiental de Texas según lo requerido por el Capítulo 39 del Código Administrativo de Texas 30. La información proporcionada en este resumen puede cambiar durante la revisión técnica de la solicitud y no es una representación ejecutiva fedérale de la solicitud de permiso.

EPCOR NR Holdings, Inc. propone operar Bayshore Desalination Facility, una planta de desalinización de aqua. La instalación estará ubicada en 5501 Highway 146, en Texas City, Condado de Galveston, Texas 77518. Esta solicitud es para una nueva aplicación para descargar aguas residuales de proceso (concentrado de ósmosis inversa mezclado con agua de mar cruda) de manera intermitente y con caudal variable.

Se espera que las descargas de la instalación contengan Sólidos Suspendidos Totales, Sólidos Disueltos Totales, salinidad, cloruro, sulfato y químicos traza utilizados en los procesos de tratamiento de agua. Pueden estar presentes residuos de químicos traza del proceso de tratamiento de agua, incluyendo Sulfato Férrico (CAS # 10028-22-5), Polímero Aniónico, Hipoclorito de Sodio (CAS # 7681-52-9), Sulfato de Amonio Líquido (CAS # 7783-20-2), CO2 (CAS # 124-38-9), Hidróxido de Sodio (CAS # 1310-73-2), Ácido Cítrico (CAS # 77-92-9), Bisulfito de Sodio (CAS # 7631-90-5), Antiincrustante de ósmosis inversa de agua de mar, Ácido Sulfúrico (CAS # 7664-93-9) y Cal (calcita) (CAS # 13397-26-7). El concentrado proveniente del tratamiento de agua de mar por ósmosis inversa. estará tratado por la mezcla del concentrado con agua de mar cruda.

Tab 6

Texas Commission on Environmental Quality

Public Involvement Plan Form for Permit and Registration Applications

The Public Involvement Plan is intended to provide applicants and the agency with information about how public outreach will be accomplished for certain types of applications in certain geographical areas of the state. It is intended to apply to new activities; major changes at existing plants, facilities, and processes; and to activities which are likely to have significant interest from the public. This preliminary screening is designed to identify applications that will benefit from an initial assessment of the need for enhanced public outreach.

All applicable sections of this form should be completed and submitted with the permit or registration application. For instructions on how to complete this form, see TCEQ-20960-inst.

Section 1. Preliminary Screening

☒ New Permit or Registration Application

☐ New Activity – modification, registration, amendment, facility, etc. (see instructions)

If neither of the above boxes are checked, completion of the form is not required and does not need to be submitted.

Section 2. Secondary Screening

☒ Requires public notice,

☒ Considered to have significant public interest, **and**

☒ Located within any of the following geographical locations:

- Austin
- Dallas
- Fort Worth
- Houston
- San Antonio
- West Texas
- Texas Panhandle
- Along the Texas/Mexico Border
- Other geographical locations should be decided on a case-by-case basis

If all the above boxes are not checked, a Public Involvement Plan is not necessary. Stop after Section 2 and submit the form.

☐ Public Involvement Plan not applicable to this application. Provide **brief** explanation.

Section 3. Application Information

Type of Application (check all that apply):

Air ☐ Initial ☐ Federal ☐ Amendment ☐ Standard Permit ☐ Title V

Waste ☐ Municipal Solid Waste ☐ Industrial and Hazardous Waste ☐ Scrap Tire
☐ Radioactive Material Licensing ☐ Underground Injection Control

Water Quality

☒ Texas Pollutant Discharge Elimination System (TPDES)

- ☐ Texas Land Application Permit (TLAP)
- ☐ State Only Concentrated Animal Feeding Operation (CAFO)
- ☐ Water Treatment Plant Residuals Disposal Permit

☐ Class B Biosolids Land Application Permit

☐ Domestic Septage Land Application Registration

Water Rights New Permit

☐ New Appropriation of Water

☐ New or existing reservoir

Amendment to an Existing Water Right

☐ Add a New Appropriation of Water

☐ Add a New or Existing Reservoir

☐ Major Amendment that could affect other water rights or the environment

Section 4. Plain Language Summary

Provide a brief description of planned activities.

Construct a seawater desalination water treatment facility that consists of intake and raw water pump station, pretreatment basins, low pressure membrane and reverse osmosis building, post treatment system, ground storage tank, distribution pump station for water treatment process. The facility also includes a solids handling system with a raw sludge thickener, thickened sludge pump station and a dewatering building.

The project also includes excavation and installation of new piping, construction of foundations of new structures and buildings, installation of utility and pipe racks, and constructions of new roads.

Section 5. Community and Demographic Information

Community information can be found using EPA's EJ Screen, U.S. Census Bureau information, or generally available demographic tools.

Information gathered in this section can assist with the determination of whether alternative language notice is necessary. Please provide the following information.

Texas City

(City)

Galveston

(County)

(Census Tract)

Please indicate which of these three is the level used for gathering the following information.

☐ City ☐ County ☒ Census Tract

(a) Percent of people over 25 years of age who at least graduated from high school

78.1%

(b) Per capita income for population near the specified location

$28,425

(c) Percent of minority population and percent of population by race within the specified location

56.9% minority population, Hispanic or Latino = 45.6%, White (not Hispanic) = 43.1%, Black = 8.2%, Asian = 1.6%, American Indian and Alaska Native = 1.1%, Native Hawaiian and Other Pacific Islander = 0%, Two or more races = 20.9%

(d) Percent of Linguistically Isolated Households by language within the specified location

6.2%

(e) Languages commonly spoken in area by percentage

English and Spanish are the two main languages spoken in the area. Other languages are spoken by less than 0.1% of the population.

(f) Community and/or Stakeholder Groups

This information could not be found.

(g) Historic public interest or involvement

This information could not be found.

Section 6. Planned Public Outreach Activities

(a) Is this application subject to the public participation requirements of Title 30 Texas Administrative Code (30 TAC) Chapter 39?

☐ Yes ☐ No

(b) If yes, do you intend at this time to provide public outreach other than what is required by rule?

☐ Yes ☐ No

If Yes, please describe.

EPCOR intends to incorporate a robust engagement schedule and provide educationa

If you answered "yes" that this application is subject to 30 TAC Chapter 39, answering the remaining questions in Section 6 is not required.

(c) Will you provide notice of this application in alternative languages?

☐ Yes ☐ No

Please refer to Section 5. If more than 5% of the population potentially affected by your application is Limited English Proficient, then you are required to provide notice in the alternative language.

If yes, how will you provide notice in alternative languages?

☐ Publish in alternative language newspaper

☐ Posted on Commissioner's Integrated Database Website

☐ Mailed by TCEQ's Office of the Chief Clerk

☐ Other (specify)

(d) Is there an opportunity for some type of public meeting, including after notice?

☐ Yes ☐ No

(e) If a public meeting is held, will a translator be provided if requested?

☐ Yes ☐ No

(f) Hard copies of the application will be available at the following (check all that apply):

☐ TCEQ Regional Office ☐ TCEQ Central Office

☐ Public Place (specify)

Section 7. Voluntary Submittal

For applicants voluntarily providing this Public Involvement Plan, who are not subject to formal public participation requirements.

Will you provide notice of this application, including notice in alternative languages?

☐ Yes ☐ No

What types of notice will be provided?

☐ Publish in alternative language newspaper

☐ Posted on Commissioner's Integrated Database Website

☐ Mailed by TCEQ's Office of the Chief Clerk

☐ Other (specify)

Tab 7

NOTICE OF CONFIDENTIALITY RIGHTS. IF YOU ARE A NATURAL PERSON, YOU MAY REMOVE OR STRIKE ANY OR ALL OF THE FOLLOWING INFORMATION FROM THIS INSTRUMENT BEFORE IT IS FILED FOR RECORD IN THE PUBLIC RECORDS: YOUR SOCIAL SECURITY NUMBER OR YOUR DRIVER'S LICENSE NUMBER.

STATE OF TEXAS §
§
COUNTY OF GALVESTON §

MEMORANDUM OF OPTION
AND PROPERTY RESTRICTIONS

This Memorandum of Option and Property Restrictions is made and entered into as of February 29, 2024 (the "Effective Date"), by and between EPCOR NR Holdings Inc., a Delaware corporation ("EPCOR"), and KV Land, LLC, a Texas limited liability company ("KV Land").

EPCOR and KV Land have entered into that certain Option Agreement dated February 29, 2024 (the "Option Agreement"), whereby KV Land granted to EPCOR an exclusive option (the "Option") to purchase from KV Land all or portions of that certain real property depicted in yellow on Exhibit A (the "Property") which Property is a part of the real property legally described on Exhibit A attached hereto and incorporated herein by this reference pursuant to the provisions of the Option Agreement.

EPCOR and KV Land desire to give actual and constructive notice to all persons dealing with the Property that EPCOR has a vested, binding and perfected Option to purchase the Property pursuant to the terms of the Option Agreement. Per the Option Agreement, KV Land may not sell, further encumber, or convey any interest in, the Property without first complying with the terms of the Option Agreement.

MEMORANDUM:

The Option shall continue in full force and effect until the earlier of (i) the last day of the eighteenth (18th) month anniversary of the Commencement Date (as defined in the Option Agreement); provided EPCOR may through more than one extension extend this time period up to the last day of the fifty-four (54) month following the Commencement Date, or (ii) the date that the Option Agreement is earlier terminated in accordance with its terms and conditions.

A copy of the Option Agreement is in the possession of both EPCOR and KV Land. In the event of any conflict between this Memorandum and the Option Agreement, the Option Agreement shall control.

[SIGNATURE PAGE FOLLOWS]

IN WITNESS WHEREOF, the parties have executed this Memorandum of Option and Property Restrictions effective as of the Effective Date.

KV LAND:

KV LAND, LLC,
a Texas limited liability company

By: Capital Technologies, LLC,
a Texas limited liability company, its Manager

By: _____
Julianna Havard, its Treasurer

ACKNOWLEDGEMENT

STATE OF TEXAS §
§
COUNTY OF HARRIS §

BEFORE ME, the undersigned authority, on this day personally appeared Julianna Havard, known to me to be the person whose name is subscribed to the foregoing instrument and acknowledged to me that he/she executed the same for the purposes and consideration therein expressed.

GIVEN UNDER MY HAND AND SEAL OF OFFICE this 4th day of March, 2024.

(SEAL)

PATRICIA A. WILDER
My Notary ID # 5838711
Expires September 30, 2024

_____
Notary Public in and for the State of Texas

EPCOR:

EPCOR NR HOLDINGS INC.,
a Delaware corporation

By: _____
Joseph Gysel, its President

ACKNOWLEDGEMENT

STATE OF Arizona §
§
COUNTY OF Maricopa §

BEFORE ME, the undersigned authority, on this day personally appeared Joseph Gysel, known to me to be the person whose name is subscribed to the foregoing instrument and acknowledged to me that he/she executed the same for the purposes and consideration therein expressed.

GIVEN UNDER MY HAND AND SEAL OF OFFICE this 29th day of February, 2024.

(SEAL)

J Ebert
Notary Public in and for the State of Arizona

Notary Public State of Arizona
Maricopa County
Julie Lynn Ebert
My Commission Expires 8/13/2025
Commission Number 610447

NOTARY PUBLIC STATE OF ARIZONA
Julie Lynn Ebert
Maricopa County
Exp. 8/13/2025
610447

DocuSign Envelope ID: 4F5D7B98-BCC3-4780-9C16-06A00E28FD24

EXHIBIT A TO THE MEMORANDUM OF OPTION AGREEMENT

300 Acres out of 819.82 acres of Tract 1 described below:

See attached.

DocuSign Envelope ID: 4F5D7B98-BCC3-4780-9C16-06A00E28FD24

EXHIBIT A

LAND

Metes and Bounds Description
Tract 1
819.82 Acres (35,711,359 Square Feet)
Amos Edwards League, Abstract No. 10
Branch T. Masterson Survey, Abstract No. 642
Anthony Hatch Survey, Abstract No. 88
John Rogers Survey, Abstract No. 168
Galveston County, Texas

Description of an 819.82 acre (35,711,359 square feet) tract of land being out of a called 1,079.700 acre tract referred to as Parcel PS11C-C01 and described in a deed to Texas Genco Holdings, Inc. as recorded under File No. 2002050899 of the Galveston County Official Public Records of Real Property, and also being out of the plat of the San Leon Farm Home Tracts as recorded in Volume 254-A, Page 25 of the Galveston County Deed Records (transferred to Volume 5, Page 51 of the Galveston County Map Records), in the Amos Edwards League, Abstract No. 10, the Branch T. Masterson Survey, Abstract No. 642, the Anthony Hatch Survey, Abstract No. 88 and the John Rogers Survey, Abstract No. 168, in Galveston County, Texas, said 819.82 acre tract being more particularly described as follows (with bearings referenced to the Texas Coordinate System of 1983, South Central Zone):

COMMENCING at a 5/8-inch iron rod with cap found on the northeasterly right-of-way line of State Highway No. 146 which marks the most westerly corner of said 1,079.700 acre tract and the most southerly corner of the plat of Chase Park Section 3 as recorded in Volume 18, Page 929 of the Galveston County Map Records;

THENCE, North 49° 59' 58" East, along the most northwesterly line of said 1,079.700 acre tract, a distance of 4,023.30 feet to a 5/8-inch iron rod with plastic cap stamped "AECOM" set for the northernmost westerly corner and POINT OF BEGINNING of this herein described tract;

THENCE, North 49° 59' 58" East, continuing along the most northwesterly line of said 1,079.700 acre tract, a distance of 4,399.00 feet to a 5/8-inch iron rod with plastic cap stamped "AECOM" set for the westernmost northerly corner of said 1,079,.700 acre tract, and from which a found 5/8-inch iron rod (bent) bears South 52° 26' East, 0.88 foot;

THENCE, South 32° 00' 07" East, along a northeasterly line of said 1,079.700 acre tract, a distance of 902.90 feet to a 5/8-inch iron rod with cap found for an interior corner of said 1,079.700 acre tract;

THENCE, North 50° 01' 58" East, along a northwesterly line of said 1,079.700 acre tract, a distance of 1,930.29 feet to an iron rod found on the southwesterly right-of-way line of F. M. Road 646 which marks the easternmost northerly corner of said 1,079.700 acre tract, said point being on the arc of a non-tangent curve to the right;

THENCE, southeasterly, 166.12 feet along the southwesterly right-of-way line of said F. M. Road 646 and along the arc of said curve to the right (central angle = 01° 40' 33"; radius = 5,679.65 feet; chord bearing and distance = South 70° 31' 42" East, 166.12 feet) to a 5/8-inch iron rod with cap found for end of curve;

THENCE, South 69° 41' 32" East, continuing along the southwesterly right-of-way line of said F. M. Road 646, a distance of 2,515.33 feet to a 5/8-inch iron rod with plastic cap stamped "AECOM" set for the beginning of a non-tangent curve to the left, from which a found 3/4-inch iron rod bears South 89° 17' East, 0.53 foot;

THENCE, southeasterly, 42.84 feet along said southwesterly right-of-way line and along the arc of said curve to the left (central angle = 00° 25' 29"; radius = 5,779.65 feet; chord bearing and distance = South 69° 54' 12" East, 42.84 feet) to a 5/8-inch iron rod with plastic cap stamped "AECOM" set in a tree stump for the northeasterly corner of said 1,079.700 acre tract, said point being in the northwesterly line of the said plat of San Leon Farm Home Tracts;

DocuSign Envelope ID: 4F5D7B98-BCC3-4780-9C16-06A00E28FD24

THENCE, South 58° 02' 03" West, departing said southwesterly right-of-way line and along a southeasterly line of said 1,079.700 acre tract and the northwesterly line of said San Leon Farm Home Tracts, a distance of 944.63 feet to a 5/8-inch iron rod with cap found for corner in the northerly line of Lot 8, Block 11, of said San Leon Farm Home Tracts;

THENCE, South 77° 43' 25" East, along the northerly line of said Lot 8, a distance of 43.56 feet to a 5/8-inch iron rod with plastic cap stamped "AECOM" set for the northeasterly corner of said Lot 8, from which a found 3/4-inch iron pipe bears South 37° 36' West, 1.82 feet;

THENCE, South 12° 16' 35" West, along the common line between Lots 7 and 8 of said Block 11, a distance of 630.00 feet to a point for the southeasterly corner of said Lot 8, from which a found 3/4-inch iron rod bears South 89° 36' East, 0.20 foot;

THENCE, North 77° 43' 25" West, along the southerly line of said Block 11, a distance of 690.46 feet to a 5/8-inch iron rod with plastic cap stamped "AECOM" set in the northwesterly line of said San Leon Farm Home Tracts;

THENCE, South 58° 02' 03" West, along said northwesterly line and a southeasterly line of said 1,079.700 acre tract, a distance of 2,582.74 feet to a point for corner in the westerly line of Lot 3, Block 25A of said San Leon Farm Home Tracts, from which a found 5/8-inch iron rod bears South 63° 13' West, 0.55 foot;

THENCE, South 12° 16' 35" West, along an easterly line of said 1,079.700 acre tract, a distance of 2,572.75 feet to a 5/8-inch iron rod with plastic cap stamped "AECOM" set for the southwesterly corner of Lot 3, Block 41, of said San Leon Farm Home Tracts, from which a found 1/2-iron rod with cap bears North 10° 46' West, 2.06 feet;

THENCE, South 77° 43' 25" East, along the southerly line of said Lot 3, a distance of 690.75 feet to a point on the westerly right-of-way line of F. M. Road 517 (width varies) which marks the southeasterly corner of said Lot 3, from which a found 1/2-inch iron rod bears North 75° 03' East, 0.24 foot, and from which a found 5/8-inch iron rod bears South 70° 41' East, 1.06 feet;

THENCE, South 12° 16' 35" West, along the westerly right-of-way line of said F. M. Road 517, a distance of 2,264.83 feet to a 5/8-inch iron rod with plastic cap stamped "AECOM" which marks the southeasterly corner of Lot 6, Block 44, of said San Leon Farm Home Tracts, and being on the northerly line of Avenue "N" (60 feet wide), from which a found 5/8-inch iron rod bears South 29° 44' East, 0.87 foot;

THENCE, North 77° 43' 25" West, along the northerly line of said Avenue "N", a distance of 1,442.63 feet to a point for an interior corner of said 1,079.700 acre tract on the westerly line of 30th Street (60 feet wide), from which a found 5/8-inch iron rod with cap bears South 53° 22' East, 0.38 foot;

THENCE, South 12° 16' 35" West, along the westerly line of said 30th Street and an easterly line of said 1,079.700 acre tract, a distance of 1,320.20 feet to a 5/8-inch iron rod with plastic cap stamped "AECOM" set for the southeasterly corner of Lot 5, Block 59, of said San Leon Farm Home Tracts on the northerly line of Avenue "P" (60 feet wide), from which a found iron rod bears South 86° 36' West, 0.80 foot;

THENCE, South 77° 43' 25" West, along the northerly line of said Avenue "P" and a southerly line of said 1,079.700 acre tract, a distance of 1,443.12 feet to a cotton spindle set in a wood post for an interior corner of this tract on the westerly line of 31st Street (60 feet wide);

THENCE, South 12° 16' 35" West, along the westerly line of said 31st Street and an easterly line of said 1,079.700 acre tract, a distance of 2,791.16 feet to a point on the northeasterly right-of-way line of State Highway No. 146 which marks the most southerly corner of said 1,079.700 acre tract, from which a found 5/8-inch iron rod bears South 57° 19' West, 0.19 foot;

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THENCE, North 29° 05' 33" West, along the northeasterly right-of-way line of said State Highway No. 146 and the southwesterly line of said 1,079.700 acre tract, a distance of 2,680.67 feet to a 5/8-inch iron rod with plastic cap stamped "AECOM" set for the southernmost westerly corner of this herein described tract;

THENCE, North 60° 33' 29" East, along a westerly line of this tract, a distance of 780.93 feet to a 5/8-inch iron rod with plastic cap stamped "AECOM" set for the beginning of a curve to the left;

THENCE, northeasterly, 356.42 feet along the arc of said curve to the left (central angle = 47° 09' 43"; radius = 433.00 feet; chord bearing and distance = North 36° 58' 38" East, 346.44 feet to a 5/8-inch iron rod with plastic cap stamped "AECOM" set for a point of tangency;

THENCE, North 13° 23' 46" East, continuing along a westerly line of this tract, a distance of 126.84 feet to a 5/8-inch iron rod with plastic cap stamped "AECOM" set for an angle point;

THENCE, North 12° 21' 29" East, continuing along said line, a distance of 856.34 feet to a fence corner post found for an angle point;

THENCE, North 12° 17' 49" East, continuing along said line, a distance of 362.90 feet to a fence corner post found for an angle point;

THENCE, North 14° 23' 17" East, continuing along said line, a distance of 6.32 feet to a fence corner post found for an angle point;

THENCE, North 77° 50' 09" West, along a southerly line of this tract, a distance of 40.39 feet to a fence corner post for corner;

THENCE, North 12° 16' 36" East, along a westerly line of this tract, a distance of 149.95 feet to a fence corner post found for an interior corner;

THENCE, North 77° 31' 05" West, along a southerly line of this tract, a distance of 186.69 feet to a point for corner in an easterly line of a called 26.542 acre tract retained by Reliant Energy, Incorporated, referred to as Parcel PS11D-001 and described in Schedule 2 of the above referenced deed to Texas Genco Holdings, Inc.;

THENCE, North 12° 20' 03" East, along an easterly line of said 26.542 acre tract, a distance of 546.02 feet to a 3/4-inch iron rod found for the most easterly northeast corner of said 26.542 acre tract;

THENCE, South 77° 56' 02" East, along a northerly line of this tract, a distance of 55.90 feet to a fence corner post;

THENCE, North 11° 56' 02" East, a distance of 37.90 feet to an "X" cut in concrete set for corner;

THENCE, South 77° 42' 41" East, a distance of 96.24 feet to a point for corner in the center of a channel;

THENCE, North 11° 53' 46" East, along the centerline of a channel and along an easterly line of this tract, a distance of 1,638.18 feet to a point for the beginning of a curve to the right;

THENCE, northeasterly, 564.87 feet along the arc of said curve to the right (central angle = 38° 23' 32"; radius = 843.00 feet; chord bearing and distance = North 31° 05' 32" East, 554.36 feet) to a point of tangency;

THENCE, North 50° 17' 18" East, along the centerline of a channel, a distance of 55.66 feet to a point for an interior corner of this herein described tract;

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THENCE, North 32° 46' 21" West, along a southwesterly line of this tract, at 150.00 feet pass a 5/8-inch iron rod with plastic cap stamped "AECOM" set for reference, and continuing for a total distance of 1,300.63 feet to the POINT OF BEGINNING and containing a computed area of 819.82 acres (35,711,359 square feet) of land.

Compiled by:
AECOM Technical Services, Inc.
5757 Woodway, Suite 101 West
Houston, TX 77057
Phone: 713.780.4123
Date: August 25, 2010
Job No.: 60160569.11

J:\60160569 P H Robinson Power Plant Update\7.0 Deliverables\Doc\PHROB Tract 1 M&B.doc

FILED AND RECORDED

Instrument Number: *2024017398*

Recording Fee: 53.00

Number Of Pages: 9

Filing and Recording Date: 04/19/2024 3:31PM

I hereby certify that this instrument was FILED on the date and time stamped hereon and RECORDED in the OFFICIAL PUBLIC RECORDS of Galveston County, Texas.

THE STATE OF TEXAS
COUNTY OF GALVESTON

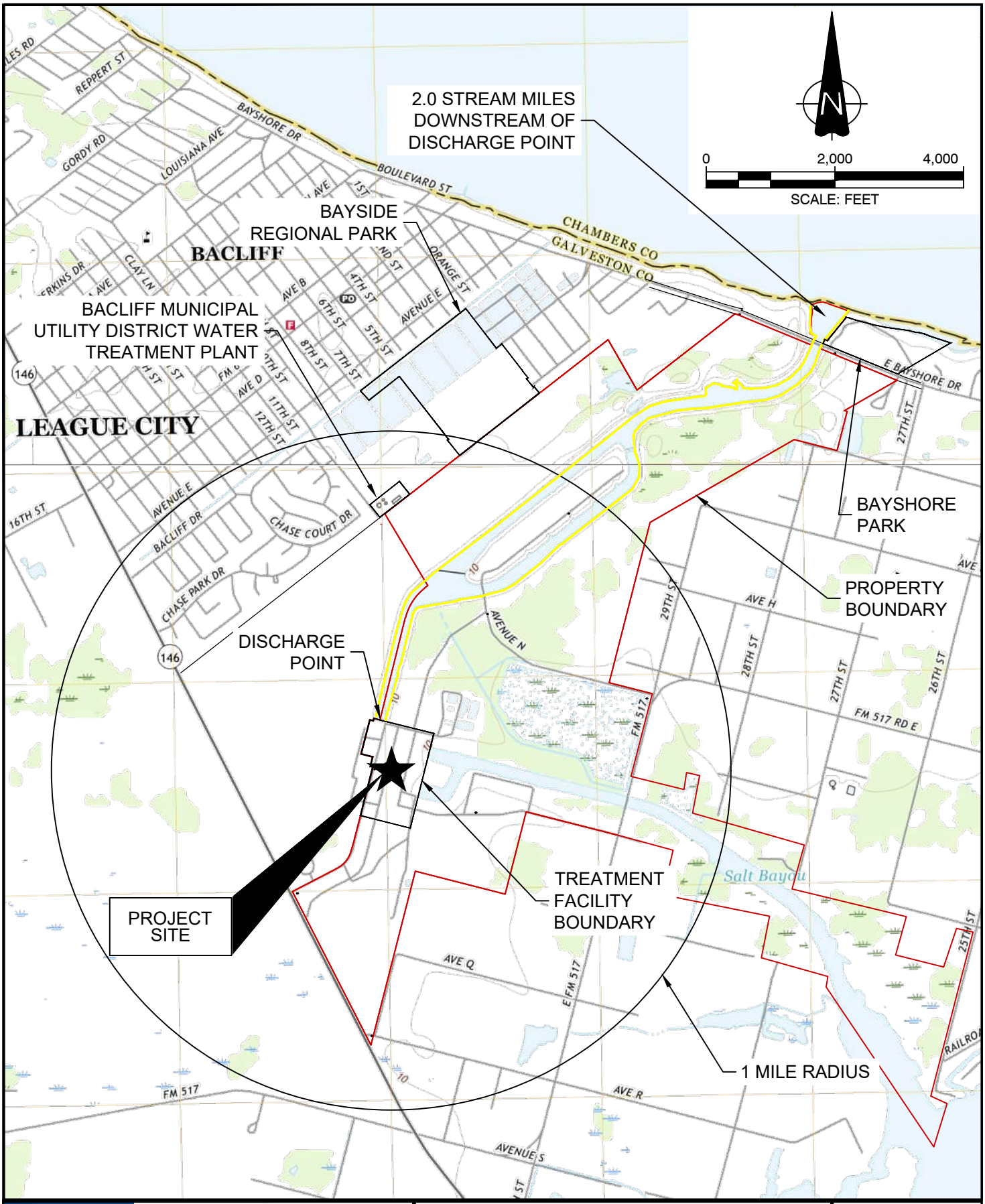
Dwight D. Sullivan

Dwight D. Sullivan, County Clerk
Galveston County, Texas

NOTICE: It is a crime to intentionally or knowingly file a fraudulent court record or instrument with the clerk.

DO NOT DESTROY - *Warning, this document is part of the Official Public Record.*

Tab 8



EPCOR	EPCOR BAYSHORE DESALINATION FACILITY	AR-06 USGS TOPOGRAPHIC MAP	ARDURRA 3115 Allen Parkway, Suite 300 Houston, TX 77019 TBPE Firm Registration No. F-10053
		DATE: JUNE 2025	SCALE: 1" = 2,000'



EPCOR

EPCOR

BAYSHORE DESALINATION FACILITY

LOCATION MAP

DATE: JUNE 2025

SCALE: 1" = 5,000'

ARDURRA

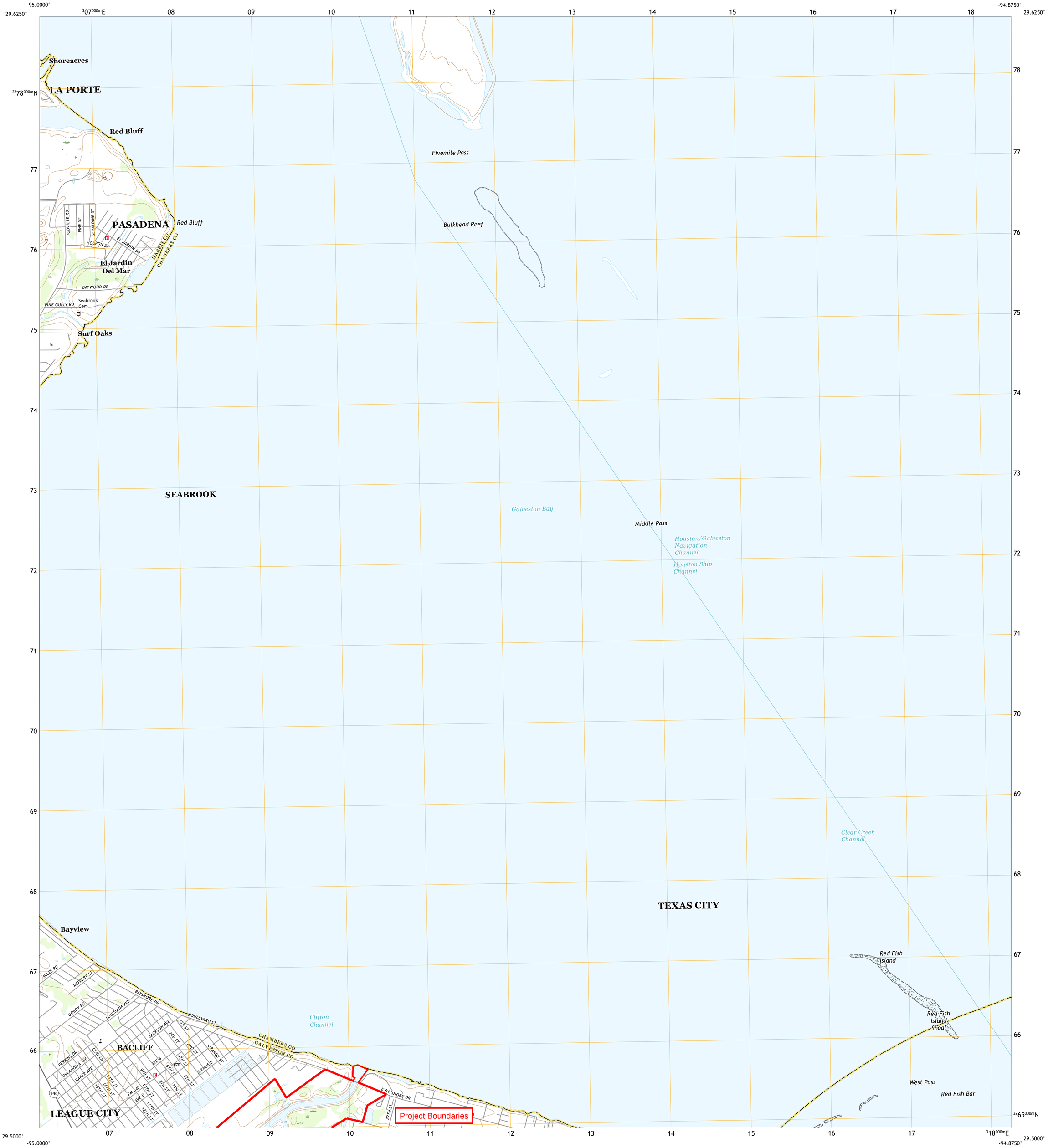
3115 Allen Parkway, Suite 300
Houston, TX 77019
TBPE Firm Registration No. F-10053

U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

USGS science for a changing world

The National Map US Topo

BACLIFF QUADRANGLE
TEXAS
7.5-MINUTE SERIES



Produced by the United States Geological Survey
North American Datum of 1983 (NAD83)
World Geodetic System of 1984 (WGS84). Projection and
1 000-meter grid:Universal Transverse Mercator, Zone 15R

This map is not a legal document. Boundaries may be generalized for this map scale. Private lands within government reservations may not be shown. Obtain permission before entering private lands.

Imagery.....NAIP, September 2016 - November 2016
Roads..... U.S. Census Bureau, 2015 - 2019
Names.....GNIS, 1979 - 2022
Hydrography.....National Hydrography Dataset, 2003 - 2018
Contours.....National Elevation Dataset, 2010
Boundaries.....Multiple sources; see metadata file 2019 - 2021

Wetlands.....FWS National Wetlands Inventory Not Available

MN
GN
2°7′
38 MILS
0°57′
17 MILS
UTM GRID AND 2019 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

U.S. National Grid
100,000-m Square ID
UN
Grid Zone Designation
15R

SCALE 1:24 000

1 0.5 0 KILOMETERS 1 2
1000 500 0 METERS 1000 2000
1 0.5 0 1
MILES
1000 0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10000
FEET

CONTOUR INTERVAL 5 FEET
NORTH AMERICAN VERTICAL DATUM OF 1988

This map was produced to conform with the National Geospatial Program US Topo Product Standard.



QUADRANGLE LOCATION

1	2	3
4		5
6	7	8

ADJOINING QUADRANGLES
1 La Porte
2 Morgans Point
3 Umbrella Point
4 League City
5 Smith Point
6 Dickinson
7 Texas City
8 Port Bolivar

ROAD CLASSIFICATION
Expressway
Secondary Hwy
Ramp
Local Connector
Local Road
4WD
Interstate Route
US Route
State Route

BACLIFF, TX
2022

NSN. 7643016394931
NGA REF NO. USGSX24K76417

U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

The National Map US Topo

TEXAS CITY QUADRANGLE
TEXAS
7.5-MINUTE SERIES

Project Boundaries

San Leon
Eagle Point
Cat Point
April Fool Point
Shell Island
Miller Point
TEXAS CITY
Edwards Point
Dollar Point
Austinia Airport
College of the Mainland
Nadeau
Heights
LA MARQUE
Texas City Memorial Cem
Phillips Memorial Cem
Kelsey Cem
Rising Star Cem
Shoal Point

Salt Bayou
Dickinson Bay
Factory Bayou
Galveston County Water Reservoir
Galveston County Industrial Water Reservoir
Moses Lake
Dollar Bay
Galveston Bay
Marchand Bayou
Moses Bayou
Dickinson Bayou

CHAMBERS CO
GALVESTON CO

Produced by the United States Geological Survey
North American Datum of 1983 (NAD83)
World Geodetic System of 1984 (WGS84). Projection and
1 000-meter grid:Universal Transverse Mercator, Zone 15R

This map is not a legal document. Boundaries may be generalized for this map scale. Private lands within government reservations may not be shown. Obtain permission before entering private lands.

Imagery.....NAIP, September 2016 - November 2016
Roads.....U.S. Census Bureau, 2015
Names.....GNIS, 1979 - 2022
Hydrography.....National Hydrography Dataset, 2003 - 2018
Contours.....National Elevation Dataset, 2008
Boundaries.....Multiple sources; see metadata file 2019 - 2021

Wetlands.....FWS National Wetlands Inventory Not Available

MN
GN
0°57′ 17 MILS
2°7′ 38 MILS
UTM GRID AND 2019 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

U.S. National Grid
100,000 - m Square ID
UN
Grid Zone Designation 15R

SCALE 1:24 000

1 0.5 0 KILOMETERS 1 2
1000 500 0 METERS 1000 2000
1 0.5 0 1
MILES
1000 0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10000
FEET

CONTOUR INTERVAL 10 FEET
NORTH AMERICAN VERTICAL DATUM OF 1988

This map was produced to conform with the National Geospatial Program US Topo Product Standard.

TEXAS
QUADRANGLE LOCATION

1	2	3
4		5
6	7	8

ADJOINING QUADRANGLES
1 League City
2 Bacliff
3 Smith Point
4 Dickinson
5 Port Bolivar
6 Hitchcock
7 Virginia Point
8 Galveston

ROAD CLASSIFICATION
Expressway
Secondary Hwy
Ramp
Local Connector
Local Road
4WD
Interstate Route
US Route
State Route

TEXAS CITY, TX
2022

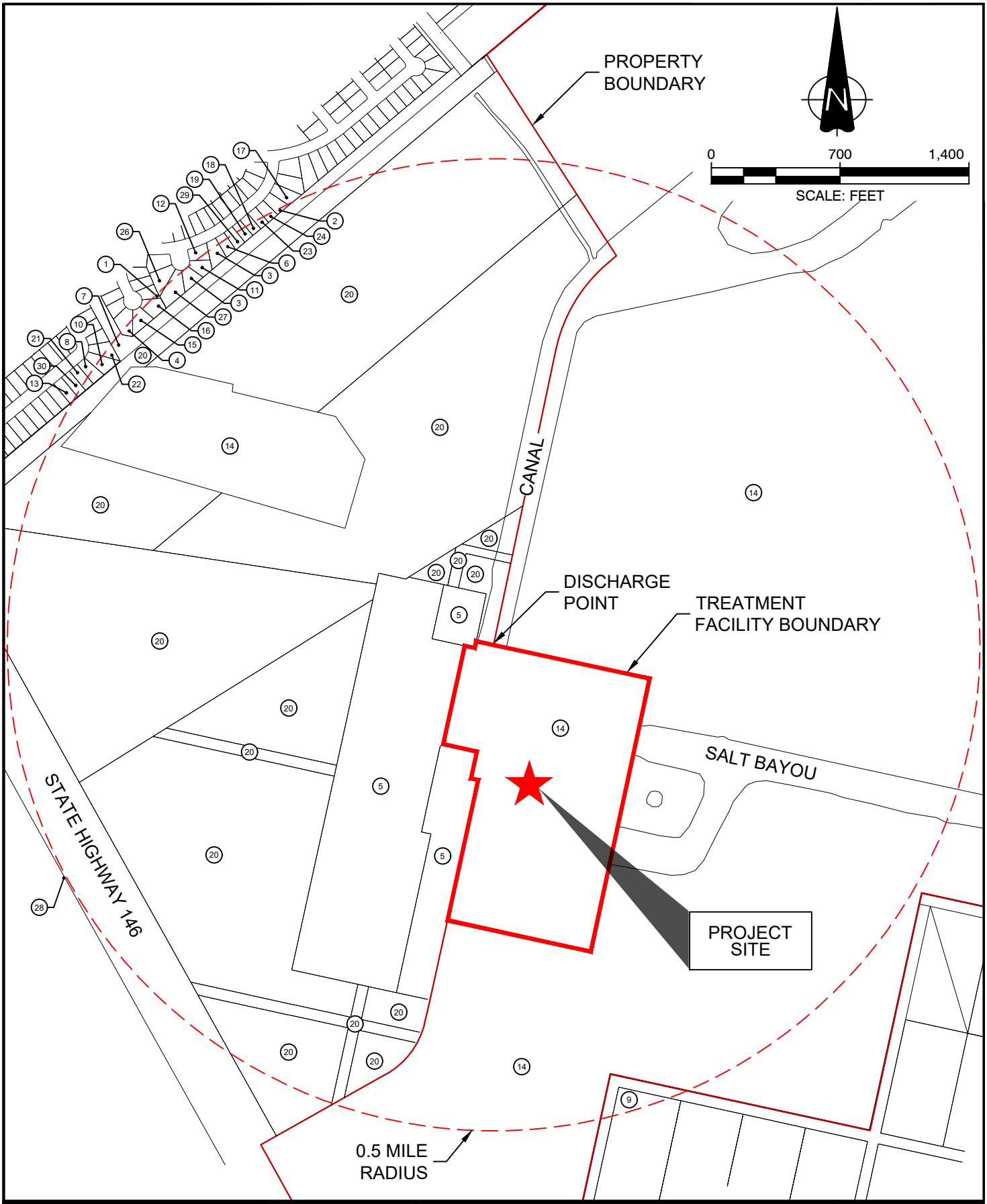
NSN 7643016398575
NGA REF NO.USGSX24K4640

Tab 9



EPCOR	EPCOR BAYSHORE DESALINATION FACILITY	AR-07 AFFECTED LANDOWNER MAP	
		DATE: JUNE 2025	SCALE: 1" = 2,000'

ARDURRA
3115 Allen Parkway, Suite 300
Houston, TX 77019
TBPE Firm Registration No. F-10053



EPCOR

BAYSHORE DESALINATION FACILITY

AR-07 AFFECTED LANDOWNER MAP

DATE: JUNE 2025

SCALE: 1" = 700'

ARDURRA
3115 Allen Parkway, Suite 300
Houston, TX 77019
TBPE Firm Registration No. F-10053

Cross-Reference List of Affected Landowners

ID	Owner(s) Name	Physical Address	Mailing Address
1	AMH 2015-1 BORROWER LLC	5123 CHASE PARK GATE ST BACLIFF, TX 77518	23975 PARK SORRENTO #300 CALABASAS CA 91302
2	RAFAEL & MELISSA BANDA	915 CHASE PARK DR BACLIFF, TX 77518	915 CHASE PARK DR BACLIFF TX 77518
3	SEAN BOLAND	943 CHASE PARK DR BACLIFF, TX 77518	3333 LAKE ST UNIT 11D HOUISTON TX 77518
4	JAMES & OLIVIA BUTLER	5126 CHASE PARK GATE ST BACLIFF, TX 77518	5126 CHASE PARK GATE ST BACLIFF TX 77518
5	CENTERPOINT ENERGY HOUSTON ELECTRIC LLC	5501 HWY 146 SAN LEON, TX 77539	PO BOX 1700 HOUSTON TX 77518
6	NEFTALI PELICO CHUN	939 CHASE PARK DR BACLIFF, TX 77518	939 CHASE PARK DR BACLIFF, TX 77518
7	GALVESTON COUNTY	ABST 88 A HATCH SUR TR 30-2 4.414 ACRES	722 MOODY AVE GALVESTON TX 77550
8	MARCUS & VERONICA CURTIS	5322 CHASE WOOD DR BACLIFF, TX 77518	5322 CHASE WOOD DR BACLIFF, TX 77518
9	JOSE & MARIA DURAN	AVE P SAN LEON, TX 77539	1826 ORIOLE DR LEAGUE CITY TX 77518
10	LORI GAINER	5326 CHASE WOOD DR BACLIFF, TX 77518	5326 CHASE WOOD DR BACLIFF TX 77518
11	FRANCISCA GARCIA	5107 CHASE WIND CT BACLIFF, TX 77518	5107 CHASE WIND CT BACLIFF TX 77518
12	CLARA JASSO	5103 CHASE WIND CT BACLIFF, TX 77518	345 7TH ST DICKINSON TX 77539
13	COURTNEY JUNEMANN	5310 CHASE WOOD DR BACLIFF, TX 77518	5307 AVE N DICKINSON TX 77539
14	KV LAND LLC	5501 HWY 146 SAN LEON, TX 77539	4801 WOODWAY DR #410W HOUSTON TX 77056
15	VINCENT LEAVER	5130 CHASE PARK GATE ST BACLIFF, TX 77518	5130 CHASE PARK GATE ST BACLIFF TX 77518
16	DONALD & NANCY LOUNDS	5127 CHASE PARK GATE ST BACLIFF, TX 77518	5127 CHASE PARK GATE ST BACLIFF TX 77518
17	VICTOR MEDINA	911 CHASE PARK DR BACLIFF, TX 77518	911 CHASE PARK DR BACLIFF TX 77518
18	DAVID & STARLA MORTON	927 CHASE PARK DR BACLIFF, TX 77518	927 CHASE PARK DR BACLIFF TX 77518
19	EDWARD & ANGIE MUNOZ	931 CHASE PARK DR BACLIFF, TX 77518	931 CHASE PARK DR BACLIFF TX 77518
20	NRG TEXAS POWER LLC	5501 HWY 146 SAN LEON, TX 77539	804 CARNEGIE CENTER PRINCETON NJ 08540

21	URIEL OLVERA	5318 CHASE WOOD DR BACLIFF, TX 77518	5318 CHASE WOOD DR BACLIFF TX 77518
22	JOSE & NORMA ORTIZ	5330 CHASE WOOD DR BACLIFF, TX 77518	5330 CHASE WOOD DR BACLIFF TX 77518
23	ROBERT ORTIZ	923 CHASE PARK DR BACLIFF, TX 77518	923 CHASE PARK DR BACLIFF TX 77518
24	DARRYL PAYNE	919 CHASE PARK DR BACLIFF, TX 77518	919 CHASE PARK DR BACLIFF TX 77518
25	PHR HOLDINGS LLC	ABST 88 A HATCH SUR TR 14-2 ACRES 17.618	24 WATERWAY AVE STE 800 THE WOODLANDS TX 77380
26	ANTHONY & TRACI POYNOR	5106 CHASE WIND CT BACLIFF, TX 77518	5106 CHASE WIND CT BACLIFF TX 77518
27	CARL STEPHENS	5110 CHASE WIND CT BACLIFF, TX 77518	5110 WIND CT BACLIFF TX 77518
28	TEXAS NEW MEXICO POWER CO	ABST A EDWARDS SUR PT OF LOTS 9 & 10 (1009-2) BLK 60A SAN LEON FARM HOME TRACTS, ACRES 1.259	PO BOX 8840 BACLIFF TX 77518
29	ALAN TORRES	935 CHASE PARK DR BACLIFF, TX 77518	935 CHASE PARK DR BACLIFF TX 77518
30	RODNEY & YULIA WILLIAMS	935 CHASE PARK DR BACLIFF, TX 77518	935 CHASE PARK DR BACLIFF TX 77518

AMH 2015-1 BORROWER LLC
23975 PARK SORRENTO STE
CALABASAS CA 91302

RAFAEL & MELISSA BANDA
915 CHASE PARK DR
BACLIFF TX 77518

SEAN BOLAND
C/O 946 CHASE TRUST
3333 LAKE ST UNIT 11D
HOUSTON TX 77098

JAMES & OLIVIA BUTLER
5126 CHASE PARK GATE ST
BACLIFF TX 77518

CENTERPOINT ENERGY HOUSTON
ELECTRIC LLC
PO BOX 1700
HOUSTON TX 77251

NEFTALI PELICO CHUN
939 CHASE PARK DR
BACLIFF TX 77518

GALVESTON COUNTY
722 MOODY AVE
GALVESTON TX 77550

MARCUS & VERONICA CURTIS
5322 CHASWOOD DR
BACLIFF TX 77518

JOSE & MARIA DURAN
1826 ORIOLE DR
LEAGUE CITY TX 77573

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5326 CHASEWOOD DR
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ROBERT ORTIZ
923 CHASE PARK DR
BACLIFF TX 77518

DARRYL PAYNE
919 CHASE PARK DR
BACLIFF TX 77518

PHR HOLDINGD LLC
24 WATERWAY AVE #800
THE WOODLANDS TX 77380

ANTHONY & TRACI POYNOR
PO BOX 8840
BACLIFF TX 77518

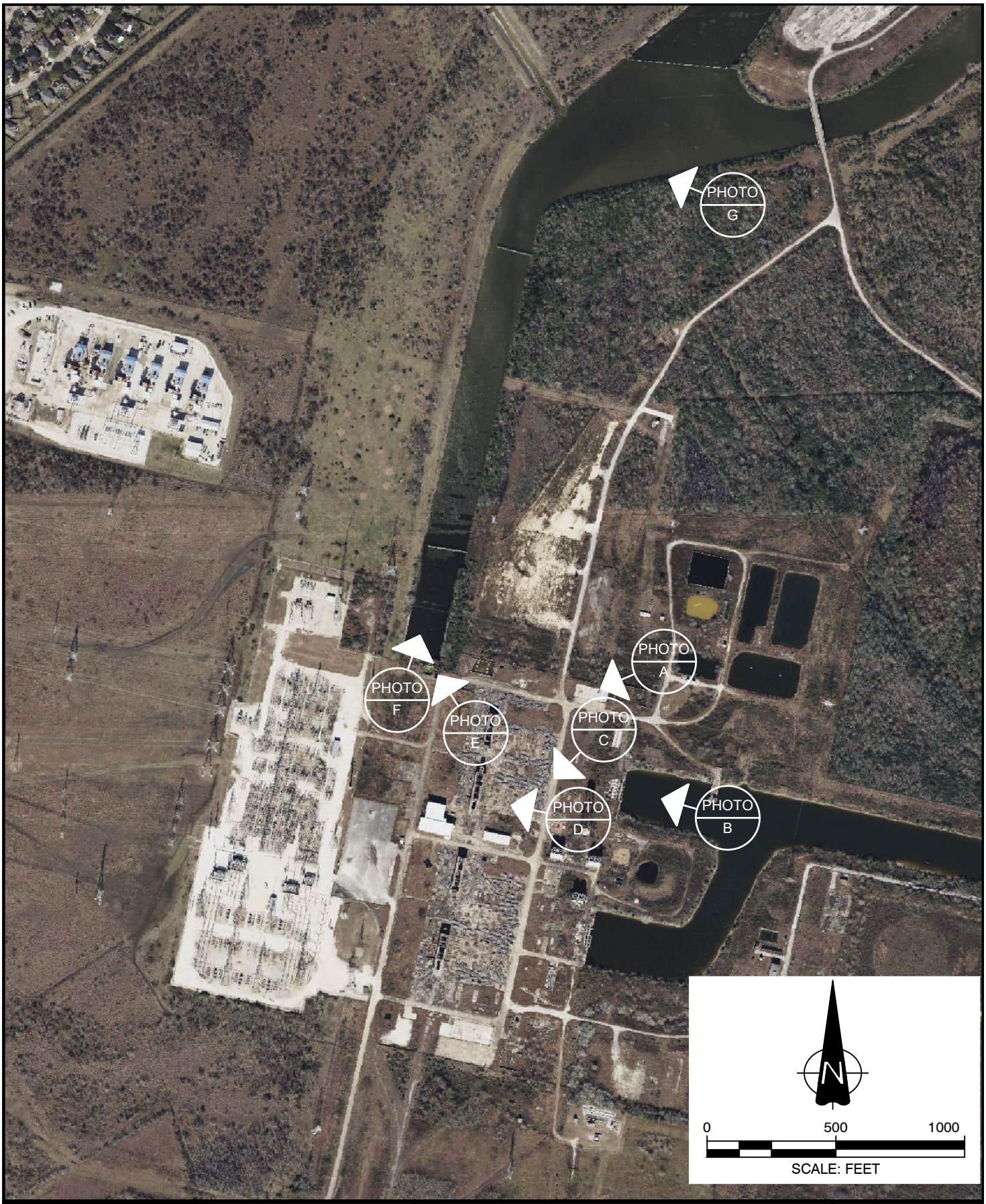
CARL STEPHENS
5110 WIND CT
BACLIFF TX 77518

TEXEAS NEW MEXICO POWER CO
414 SILVER AVE SW
ALBUQUERQUE NM 87102

ALAN TORRES
935 CHASE PARK DR
BACLIFF TX 77518

RODNEY & YULIA WILLIAMS
5314 CHASE WOOD DR
BACLIFF TX 77518

Tab 10



EPCOR

BAYSHORE DESALINATION FACILITY

AR-08 ORIGINAL SITE PHOTOGRAPHS

DATE: JUNE 2025

SCALE: 1" = 500'

ARDURRA
3115 Allen Parkway, Suite 300
Houston, TX 77019
TBPE Firm Registration No. F-10053



OVERALL TREATMENT LOCATION

PHOTOGRAPH A

NOT TO SCALE -



INTAKE AND TREATMENT AREA

PHOTOGRAPH B

NOT TO SCALE -

EPCOR	EPCOR BAYSHORE DESALINATION FACILITY	AR-08 ORIGINAL SITE PHOTOGRAPH STREATMENT AREA LOCATION PHOTOS (1 OF 2)	ARDURRA 3115 Allen Parkway, Suite 300 Houston, TX 77019 TBPE Firm Registration No. F-10053
		DATE: JUNE 2025	SCALE: NTS



TREATMENT LOCATION

PHOTOGRAPH C

NOT TO SCALE -



TREATMENT LOCATION

PHOTOGRAPH D

NOT TO SCALE -

EPCOR

BAYSHORE
DESALINATION FACILITY

AR-08 ORIGINAL SITE PHOTOGRAPH
STREATMENT AREA LOCATION
PHOTOS (2 OF 2)

DATE: JUNE 2025

SCALE: NTS

ARDURRA
3115 Allen Parkway, Suite 300
Houston, TX 77019
TBPE Firm Registration No. F-10053



DISCHARGE LOCATION

PHOTOGRAPH E

NOT TO SCALE

-



DISCHARGE LOCATION

PHOTOGRAPH F

NOT TO SCALE

-

EPCOR	EPCOR BAYSHORE DESALINATION FACILITY	AR-08 ORIGINAL SITE PHOTOGRAPH SDISCHARGE LOCATION PHOTOS (1 OF 2)	ARDURRA 3115 Allen Parkway, Suite 300 Houston, TX 77019 TBPE Firm Registration No. F-10053
		DATE: JUNE 2025	SCALE: NTS



DOWNSTREAM OF DISCHARGE LOCATION

PHOTOGRAPH G

NOT TO SCALE -

EPCOR	EPCOR BAYSHORE DESALINATION FACILITY	AR-08 ORIGINAL SITE PHOTOGRAPH SDISCHARGE LOCATION PHOTOS (2 OF 2)	ARDURRA 3115 Allen Parkway, Suite 300 Houston, TX 77019 TBPE Firm Registration No. F-10053
		DATE: JUNE 2025	SCALE: NTS

Tab 11

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

SUPPLEMENTAL PERMIT INFORMATION FORM (SPIF)

FOR AGENCIES REVIEWING DOMESTIC OR INDUSTRIAL TPDES WASTEWATER PERMIT APPLICATIONS

TCEQ USE ONLY:

Application type: ____Renewal ____Major Amendment ____Minor Amendment ____New

County: _____ Segment Number: _____

Admin Complete Date: _____

Agency Receiving SPIF:

_____ Texas Historical Commission _____ U.S. Fish and Wildlife

_____ Texas Parks and Wildlife Department _____ U.S. Army Corps of Engineers

This form applies to TPDES permit applications only. (Instructions, Page 53)

Complete this form as a separate document. TCEQ will mail a copy to each agency as required by our agreement with EPA. If any of the items are not completely addressed or further information is needed, we will contact you to provide the information before issuing the permit. Address each item completely.

Do not refer to your response to any item in the permit application form. Provide each attachment for this form separately from the Administrative Report of the application. The application will not be declared administratively complete without this SPIF form being completed in its entirety including all attachments. Questions or comments concerning this form may be directed to the Water Quality Division's Application Review and Processing Team by email at WQ-ARPTeam@tceq.texas.gov or by phone at (512) 239-4671.

The following applies to all applications:

1. Permittee: EPCOR NR Holdings, Inc.

   Permit No. WQ00 TBD EPA ID No. TX TBD

   Address of the project (or a location description that includes street/highway, city/vicinity, and county):

   5501 Highway 146 Texas City, TX 77518

Provide the name, address, phone and fax number of an individual that can be contacted to answer specific questions about the property.

Prefix (Mr., Ms., Miss): Mr.

First and Last Name: Joseph Gysel

Credential (P.E, P.G., Ph.D., etc.): N/A

Title: President

Mailing Address: 5656 W. Talavi Blvd

City, State, Zip Code: Glendale, AZ 85306

Phone No.: 623-445-2400 Ext.: N/A Fax No.: N/A

E-mail Address: JGysel@epcor.com

2. List the county in which the facility is located: Galveston
3. If the property is publicly owned and the owner is different than the permittee/applicant, please list the owner of the property.

N/A

4. Provide a description of the effluent discharge route. The discharge route must follow the flow of effluent from the point of discharge to the nearest major watercourse (from the point of discharge to a classified segment as defined in 30 TAC Chapter 307). If known, please identify the classified segment number.

The proposed outfall is located at the outlet of the pipe at the southwest end of the man-made canal within the property boundaries. The discharge will travel northeast along the canal, flowing around both sides of the former cooling tower island and converging back, continuing to flow through the canal until meeting Upper Galveston Bay, two miles downstream of the outfall. Upper Galveston Bay is classified segment number 2421.

5. Please provide a separate 7.5-minute USGS quadrangle map with the project boundaries plotted and a general location map showing the project area. Please highlight the discharge route from the point of discharge for a distance of one mile downstream. (This map is required in addition to the map in the administrative report).

Provide original photographs of any structures 50 years or older on the property.

Does your project involve any of the following? Check all that apply.

☒ Proposed access roads, utility lines, construction easements

☐ Visual effects that could damage or detract from a historic property's integrity

☐ Vibration effects during construction or as a result of project design

☒ Additional phases of development that are planned for the future

☐ Sealing caves, fractures, sinkholes, other karst features

☐ Disturbance of vegetation or wetlands

1. List proposed construction impact (surface acres to be impacted, depth of excavation, sealing of caves, or other karst features):

Surface Acres to be Impacted: 30.87acres. Depth of Excavation: TBD

2. Describe existing disturbances, vegetation, and land use:

The new WTP will be constructed at a decommissioned NRG power plant site. The facility will consist of various treatment processes, structures and buildings.

THE FOLLOWING ITEMS APPLY ONLY TO APPLICATIONS FOR NEW TPDES PERMITS AND MAJOR AMENDMENTS TO TPDES PERMITS

3. List construction dates of all buildings and structures on the property:

It is anticipated that construction will begin in 2028.

4. Provide a brief history of the property, and name of the architect/builder, if known.

The existing site was an NRG power plant, which was decommissioned in 2009.

Tab 12

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

INDUSTRIAL WASTEWATER PERMIT APPLICATION TECHNICAL REPORT 1.0

The following information **is required** for all applications for a TLAP or an individual TPDES discharge permit.

For **additional information** or clarification on the requested information, please refer to the Instructions for Completing the Industrial Wastewater Permit Application[1] available on the TCEQ website. Please contact the Industrial Permits Team at 512-239-4671 with any questions about this form.

If more than one outfall is included in the application, provide applicable information for each individual outfall. **If an item does not apply to the facility, enter N/A** to indicate that the item has been considered. Include separate reports or additional sheets as **clearly cross-referenced attachments** and provide the attachment number in the space provided for the item the attachment addresses.

NOTE: This application is for an industrial wastewater permit only. Additional authorizations from the TCEQ Waste Permits Division or the TCEQ Air Permits Division may be needed.

Item 1. Facility/Site Information (Instructions, Page 39)

a. Describe the general nature of the business and type(s) of industrial and commercial activities. Include all applicable SIC codes (up to 4).

Desalination water treatment plant – SIC Code 4941

b. Describe all wastewater-generating processes at the facility.

The proposed desalination facility will receive raw seawater from Salt Bayou, which is fed from Galveston Bay. Raw water will flow from the bayou through rotating screens and pumped to the pretreatment basins. The pretreatment process consists of rapid mixing, flocculation, an optional dissolved air flotation (DAF) step, and high-rate (HR) clarification. Following clarification, the settled water will be filtered through a low pressure membrane filtration system, and optional gravity media filters, then transferred via high pressure (HP) feed pumps to seawater reverse osmosis (SWRO) membrane skids. SWRO permeate quality will be stabilized with carbon dioxide and calcite, followed by stabilization and disinfection with sodium hypochlorite and optionally, liquid ammonium sulfate, and stored in ground storage tanks (GSTs). The finished water will be pumped from the GSTs by a High Service Pump Station to the distribution system. Spent spray wash water from the rotating screens, backwash water from the low pressure membrane feed strainers, membrane racks, optional media filtration system, calcite contractors, along with supernatant from the sludge thickeners and centrate from the centrifuges will be collected in a residual liquid collection system and discharged to the outfall. Concentrate from the RO skids will be sent to the outfall and blended with raw seawater before discharging into the man-made

[1] https://www.tceq.texas.gov/permitting/wastewater/industrial/TPDES_industrial_wastewater_steps.html

discharge canal returning to Galveston Bay. The pretreatment and SWRO membrane clean in-place (CIP) systems will generate spent, neutralized cleaning solution, which will be disposed of through the domestic wastewater system.

c. Provide a list of raw materials, major intermediates, and final products handled at the facility.

Materials List

Raw Materials	Intermediate Products	Final Products
The chemicals listed below will be used in the water treatment process.		
Ferric sulfate (CAS # 10028-22-5)		
Anionic polymer (CAS # N/A)		
Sodium hypochlorite (CAS # 7681-52-9)		
Liquid ammonium sulfate (CAS # 7783-20-2)		
CO_2 (CAS # 124-38-9)		
Sodium hydroxide (CAS # 1310-73-2)		
Citric acid (CAS # 77-92-9)		
Sodium bisulfite (CAS # 7631-90-5)		
SWRO antiscalant (CAS # N/A)		
Sulfuric acid (CAS # 7664-93-9)		
Lime (calcite) (CAS # 13397-26-7)		

Attachment: N/A

d. Attach a facility map (drawn to scale) with the following information:

- Production areas, maintenance areas, materials-handling areas, waste-disposal areas, and water intake structures.
- The location of each unit of the WWTP including the location of wastewater collection sumps, impoundments, outfalls, and sampling points, if significantly different from outfall locations.

Attachment: TR-01 Facility Map

e. Is this a new permit application for an existing facility?

☐ Yes ☒ No

If **yes**, provide background discussion: N/A

f. Is/will the treatment facility/disposal site be located above the 100-year frequency flood level.

☒ Yes ☐ No

List source(s) used to determine 100-year frequency flood plain: National Flood Insurance Program Flood Insurance Rate Map

If **no**, provide the elevation of the 100-year frequency flood plain and describe what protective measures are used/proposed to prevent flooding (including tail water and rainfall run-on controls) of the treatment facility and disposal area: N/A

Attachment: TR-02 FEMA Map

g. For **new** or **major amendment** permit applications, will any construction operations result in a discharge of fill material into a water in the state?

☐ Yes ☒ No ☐ N/A (renewal only)

h. If **yes** to Item 1.g, has the applicant applied for a USACE CWA Chapter 404 Dredge and Fill permit?

☐ Yes ☐ No

If **yes**, provide the permit number: N/A

If **no**, provide an approximate date of application submittal to the USACE: N/A

Item 2. Treatment System (Instructions, Page 40)

a. List any physical, chemical, or biological treatment process(es) used/proposed to treat wastewater at this facility. Include a description of each treatment process, starting with initial treatment and finishing with the outfall/point of disposal.

Refer to Attachment TR-03 Treatment System List

b. Attach a flow schematic **with a water balance** showing all sources of water and wastewater flow into the facility, wastewater flow into and from each treatment unit, and wastewater flow to each outfall/point of disposal.

Attachment: TR-04 Water Balance

Item 3. Impoundments (Instructions, Page 40)

Does the facility use or plan to use any wastewater impoundments (e.g., lagoons or ponds?)

☐ Yes ☒ No

If **no**, proceed to Item 4. If **yes**, complete **Item 3.a** for **existing** impoundments and **Items 3.a - 3.e** for **new or proposed** impoundments. **NOTE:** See instructions, Pages 40-42, for additional information on the attachments required by Items 3.a – 3.e.

a. Complete the table with the following information for each existing, new, or proposed impoundment. Attach additional copies of the Impoundment Information table, if needed.

Use Designation: Indicate the use designation for each impoundment as Treatment (**T**), Disposal (**D**), Containment (**C**), or Evaporation (**E**).

Associated Outfall Number: Provide an outfall number if a discharge occurs or will occur.

Liner Type: Indicate the liner type as Compacted clay liner (**C**), In-situ clay liner (**I**), Synthetic/plastic/rubber liner (**S**), or Alternate liner (**A**). **NOTE:** See instructions for further detail on liner specifications. If an alternate liner (A) is selected, include an attachment that provides a description of the alternate liner and any additional technical information necessary for an evaluation.

Leak Detection System: If any leak detection systems are in place/planned, enter **Y** for yes. Otherwise, enter **N** for no.

Groundwater Monitoring Wells and Data: If groundwater monitoring wells are in place/planned, enter **Y** for yes. Otherwise, enter **N** for no. Attach any existing groundwater monitoring data.

Dimensions: Provide the dimensions, freeboard, surface area, storage capacity of the impoundments, and the maximum depth (not including freeboard). For impoundments with irregular shapes, submit surface area instead of length and width.

Compliance with 40 CFR Part 257, Subpart D: If the impoundment is required to be in compliance with 40 CFR Part 257, Subpart D, enter **Y** for yes. Otherwise, enter **N** for no.

Date of Construction: Enter the date construction of the impoundment commenced (mm/dd/yy).

Impoundment Information

Parameter	**Pond #**	**Pond #**	**Pond #**	**Pond #**
Use Designation: (T) (D) (C) or (E)	N/A			
Associated Outfall Number				
Liner Type (C) (I) (S) or (A)				
Alt. Liner Attachment Reference				
Leak Detection System, Y/N				
Groundwater Monitoring Wells, Y/N				

Parameter	Pond #	Pond #	Pond #	Pond #
Groundwater Monitoring Data Attachment				
Pond Bottom Located Above The Seasonal High-Water Table, Y/N				
Length (ft)				
Width (ft)				
Max Depth From Water Surface (ft), Not Including Freeboard				
Freeboard (ft)				
Surface Area (acres)				
Storage Capacity (gallons)				
40 CFR Part 257, Subpart D, Y/N				
Date of Construction				

Attachment: N/A

The following information (**Items 3.b – 3.e**) is required only for **new or proposed** impoundments.

b. For new or proposed impoundments, attach any available information on the following items. If attached, check **yes** in the appropriate box. Otherwise, check **no** or **not yet designed**.

1. Liner data

   ☐ Yes ☐ No ☐ Not yet designed

2. Leak detection system or groundwater monitoring data

   ☐ Yes ☐ No ☐ Not yet designed

3. Groundwater impacts

   ☐ Yes ☐ No ☐ Not yet designed

   NOTE: Item b.3 is required if the bottom of the pond is not above the seasonal high-water table in the shallowest water-bearing zone.

Attachment: N/A

For TLAP applications: Items 3.c – 3.e are **not required**, continue to Item 4.

c. Attach a USGS map or a color copy of original quality and scale which accurately locates and identifies all known water supply wells and monitor wells within ½-mile of the impoundments.

Attachment: N/A

d. Attach copies of State Water Well Reports (e.g., driller's logs, completion data, etc.), and data on depths to groundwater for all known water supply wells including a description of how the depths to groundwater were obtained.

Attachment: N/A

e. Attach information pertaining to the groundwater, soils, geology, pond liner, etc. used to assess the potential for migration of wastes from the impoundments or the potential for contamination of groundwater or surface water.

Attachment: N/A

Item 4. Outfall/Disposal Method Information (Instructions, Page 42)

Complete the following tables to describe the location and wastewater discharge or disposal operations for each outfall for discharge, and for each point of disposal for TLAP operations.

If there are more outfalls/points of disposal at the facility than the spaces provided, copies of pages 6 and/0r numbered accordingly (i.e., page 6a, 6b, etc.) may be used to provide information on the additional outfalls.

For TLAP applications: Indicate the disposal method and each individual irrigation area **I**, evaporation pond **E**, or subsurface drainage system **S** by providing the appropriate letter designation for the disposal method followed by a numerical designation for each disposal area in the space provided for **Outfall** number (e.g. **E1** for evaporation pond 1, **I2** for irrigation area No. 2, etc.).

Outfall Longitude and Latitude

Outfall No.	Latitude (Decimal Degrees)	Longitude (Decimal Degrees)
001	29.48916	-94.98076

Outfall Location Description

Outfall No.	Location Description
001	At the outlet of the pipe at the southwest end of the man-made canal within the property boundaries

Description of Sampling Point(s) (if different from Outfall location)

Outfall No.	Description of sampling point
001	N/A

Outfall Flow Information – Permitted and Proposed

Outfall No.	Permitted Daily Avg Flow (MGD)	Permitted Daily Max Flow (MGD)	Proposed Daily Avg Flow (MGD)	Proposed Daily Max Flow (MGD)	Anticipated Discharge Date (mm/dd/yy)
001	N/A	N/A	59.93	N/A	01/01/2031

Outfall No.	Permitted Daily Avg Flow (MGD)	Permitted Daily Max Flow (MGD)	Proposed Daily Avg Flow (MGD)	Proposed Daily Max Flow (MGD)	Anticipated Discharge Date (mm/dd/yy)

Outfall Discharge – Method and Measurement

Outfall No.	Pumped Discharge? Y/N	Gravity Discharge? Y/N	Type of Flow Measurement Device Used
001	N	Y	Totalizing Flow Meter

Outfall Discharge – Flow Characteristics

Outfall No.	Intermittent Discharge? Y/N	Continuous Discharge? Y/N	Seasonal Discharge? Y/N	Discharge Duration (hrs/day)	Discharge Duration (days/mo)	Discharge Duration (mo/yr)
001	N	Y	N	24	31	12

Outfall Wastestream Contributions

Outfall No. 001

Contributing Wastestream	Volume (MGD)	Percent (%) of Total Flow
RO Concentrate	28.13	46.9
Raw water for blending	31.80	53.1

Outfall No. N/A

Contributing Wastestream	Volume (MGD)	Percent (%) of Total Flow

Contributing Wastestream	Volume (MGD)	Percent (%) of Total Flow

Outfall No. **N/A**

Contributing Wastestream	Volume (MGD)	Percent (%) of Total Flow

Attachment: N/A

Item 5. Blowdown and Once-Through Cooling Water Discharges (Instructions, Page 43)

a. Indicate if the facility currently or proposes to:

☐ Yes ☒ No Use cooling towers that discharge blowdown or other wastestreams

☐ Yes ☒ No Use boilers that discharge blowdown or other wastestreams

☐ Yes ☒ No Discharge once-through cooling water

NOTE: If the facility uses or plans to use cooling towers or once-through cooling water, Item 12 **is required**.

b. If **yes** to any of the above, attach an SDS with the following information for each chemical additive.

- Manufacturers Product Identification Number
- Product use (e.g., biocide, fungicide, corrosion inhibitor, etc.)
- Chemical composition including CASRN for each ingredient
- Classify product as non-persistent, persistent, or bioaccumulative
- Product or active ingredient half-life
- Frequency of product use (e.g., 2 hours/day once every two weeks)

- Product toxicity data specific to fish and aquatic invertebrate organisms
- Concentration of whole product or active ingredient, as appropriate, in wastestream.

In addition to each SDS, attach a summary of the above information for each specific wastestream and the associated chemical additives. Specify which outfalls are affected.

Attachment: N/A

c. Cooling Towers and Boilers

If the facility currently or proposes to use cooling towers or boilers that discharge blowdown or other wastestreams to the outfall(s), complete the following table.

Cooling Towers and Boilers

Type of Unit	Number of Units	Daily Avg Blowdown (gallons/day)	Daily Max Blowdown (gallons/day)
Cooling Towers	N/A		
Boilers	N/A		

Item 6. Stormwater Management (Instructions, Page 44)

Will any existing/proposed outfalls discharge stormwater associated with industrial activities, as defined at *40 CFR § 122.26(b)(14)*, commingled with any other wastestream?

☐ Yes ☒ No

If **yes**, briefly describe the industrial processes and activities that occur outdoors or in a manner which may result in exposure of the activities or materials to stormwater: N/A

Item 7. Domestic Sewage, Sewage Sludge, and Septage Management and Disposal (Instructions, Page 44)

Domestic Sewage - Waste and wastewater from humans or household operations that is discharged to a wastewater collection system or otherwise enters a treatment works.

a. Check the box next to the appropriate method of domestic sewage and domestic sewage sludge treatment or disposal. Complete Worksheet 5.0 or Item 7.b if directed to do so.

☒ Domestic sewage is routed (i.e., connected to or transported to) to a WWTP permitted to receive domestic sewage for treatment, disposal, or both. Complete Item 7.b.

☐ Domestic sewage disposed of by an on-site septic tank and drainfield system. Complete Item 7.b.

☐ Domestic and industrial treatment sludge ARE commingled prior to use or disposal.

☐ Industrial wastewater and domestic sewage are treated separately, and the respective sludge IS NOT commingled prior to sludge use or disposal. Complete Worksheet 5.0.

☐ Facility is a POTW. Complete Worksheet 5.0.

☐ Domestic sewage is not generated on-site.

☐ Other (e.g., portable toilets), specify and Complete Item 7.b: N/A

b. Provide the name and TCEQ, NPDES, or TPDES Permit No. of the waste-disposal facility which receives the domestic sewage/septage. If hauled by motorized vehicle, provide the name and TCEQ Registration No. of the hauler.

Domestic Sewage Plant/Hauler Name

Plant/Hauler Name	Permit/Registration No.
Bacliff MUD	WQ0010627001

Item 8. Improvements or Compliance/Enforcement Requirements (Instructions, Page 45)

a. Is the permittee currently required to meet any implementation schedule for compliance or enforcement?

☐ Yes ☒ No

b. Has the permittee completed or planned for any improvements or construction projects?

☐ Yes ☒ No

c. If **yes** to either 8.a **or** 8.b, provide a brief summary of the requirements and a status update: N/A

Item 9. Toxicity Testing (Instructions, Page 45)

Have any biological tests for acute or chronic toxicity been made on any of the discharges or on a receiving water in relation to the discharge within the last three years?

☐ Yes ☒ No

If **yes**, identify the tests and describe their purposes: N/A

Additionally, attach a copy of all tests performed which **have not** been submitted to the TCEQ or EPA. **Attachment:** N/A

Item 10. Off-Site/Third Party Wastes (Instructions, Page 45)

a. Does or will the facility receive wastes from off-site sources for treatment at the facility, disposal on-site via land application, or discharge via a permitted outfall?

☐ Yes ☒ No

If **yes**, provide responses to Items 10.b through 10.d below.

If **no**, proceed to Item 11.

b. Attach the following information to the application:

- List of wastes received (including volumes, characterization, and capability with on-site wastes).
- Identify the sources of wastes received (including the legal name and addresses of the generators).
- Description of the relationship of waste source(s) with the facility's activities.

Attachment: N/A

c. Is or will wastewater from another TCEQ, NPDES, or TPDES permitted facility commingled with this facility's wastewater after final treatment and prior to discharge via the final outfall/point of disposal?

☐ Yes ☒ No

If **yes**, provide the name, address, and TCEQ, NPDES, or TPDES permit number of the contributing facility and a copy of any agreements or contracts relating to this activity.

Attachment: N/A

d. Is this facility a POTW that accepts/will accept process wastewater from any SIU and has/is required to have an approved pretreatment program under the NPDES/TPDES program?

☐ Yes ☒ No

If **yes**, **Worksheet 6.0** of this application **is required**.

Item 11. Radioactive Materials (Instructions, Page 46)

a. Are/will radioactive materials be mined, used, stored, or processed at this facility?

☐ Yes ☒ No

If **yes**, use the following table to provide the results of one analysis of the effluent for all radioactive materials that may be present. Provide results in pCi/L.

Radioactive Materials Mined, Used, Stored, or Processed

Radioactive Material Name	Concentration (pCi/L)
N/A	

b. Does the applicant or anyone at the facility have any knowledge or reason to believe that radioactive materials may be present in the discharge, including naturally occurring radioactive materials in the source waters or on the facility property?

☐ Yes ☒ No

If **yes**, use the following table to provide the results of one analysis of the effluent for all radioactive materials that may be present. Provide results in pCi/L. Do not include information provided in response to Item 11.a.

Radioactive Materials Present in the Discharge

Radioactive Material Name	Concentration (pCi/L)
N/A	

Item 12. Cooling Water (Instructions, Page 46)

a. Does the facility use or propose to use water for cooling purposes?

☐ Yes

☒ No

☐ Decommissioned: N/A

☐ To Be Decommissioned: N/A

If **yes**, complete Items 12.b thru 12.f. If **no**, stop here.

If **decommissioned**, provide the date operation ceased and stop here.

If to **be decommissioned**, provide the date operation is anticipated to cease and stop here.

b. Cooling water is/will be obtained from a groundwater source (e.g., on-site well).

☐ Yes ☐ No

If **yes**, stop here. If **no**, continue.

c. Cooling Water Supplier

1. Provide the name of the owner(s) and operator(s) for the CWIS that supplies or will supply water for cooling purposes to the facility.

Cooling Water Intake Structure(s) Owner(s) and Operator(s)

CWIS ID	N/A			
Owner				
Operator				

2. Cooling water is/will be obtained from a Public Water Supplier (PWS)

☐ No ☐ Yes; PWS No.: N/A

If **no**, continue. If **yes**, provide the PWS Registration No. and stop here.

3. Cooling water is/will be obtained from a reclaimed water source?

☐ No ☐ Yes; Auth No.: N/A

If **no**, continue. If **yes**, provide the Reuse Authorization No. and stop here.

4. Cooling water is/will be obtained from an Independent Supplier

☐ No ☐ Yes; AIF: N/A

If **no**, proceed to Item 12.d. If **yes**, provide the actual intake flow of the Independent Supplier's CWIS that is/will be used to provide water for cooling purposes and proceed.

d. 316(b) General Criteria

1. The CWIS(s) used to provide water for cooling purposes to the facility has or will have a cumulative design intake flow of 2 MGD or greater.

☐ Yes ☐ No

2. At least 25% of the total water withdrawn by the CWIS(s) is/will be used at the facility exclusively for cooling purposes on an annual average basis.

   ☐ Yes ☐ No

3. The CWIS(s) withdraw(s)/propose(s) to withdraw water for cooling purposes from surface waters that meet the definition of Waters of the United States in *40 CFR § 122.2*.

   ☐ Yes ☐ No. Explanation: N/A

   If **no**, provide an explanation of how the waterbody does not meet the definition of Waters of the United States in *40 CFR § 122.2*.

If **yes** to all three questions in Item 12.d, the facility **meets** the minimum criteria to be subject to the full requirements of Section 316(b) of the CWA. Proceed to **Item 12.f**.

If **no** to any of the questions in Item 12.d, the facility **does not meet** the minimum criteria to be subject to the full requirements of Section 316(b) of the CWA; however, a determination is required based upon BPJ. Proceed to **Item 12.e**.

e. The facility does not meet the minimum requirements to be subject to the fill requirements of Section 316(b) **and uses**/proposes **to use cooling towers**.

   ☐ Yes ☐ No

   If **yes**, stop here. If **no**, complete Worksheet 11.0, Items 1.a, 1.b.1-3 and 6, 2.b.1, and 3.a to allow for a determination based upon BPJ.

f. Oil and Gas Exploration and Production

   1. The facility is subject to requirements at 40 CFR Part 435, Subparts A or D.

      ☐ Yes ☐ No

      If **yes**, continue. If **no**, skip to Item 12.g.

   2. The facility is an existing facility as defined at 40 CFR § 125.92(k) or a new unit at an existing facility as defined at 40 CFR § 125.92(u).

      ☐ Yes ☐ No

      If **yes**, complete Worksheet 11.0, Items 1.a, 1.b.1-3 and 6, 2.b.1, and 3.a to allow for a determination based upon BPJ. If **no**, skip to Item 12.g.3.

g. Compliance Phase and Track Selection

   1. Phase I – New facility subject to 40 CFR Part 125, Subpart I

      ☐ Yes ☐ No

      If **yes**, check the box next to the compliance track selection, attach the requested information, and complete Worksheet 11.0, Items 2 and 3, and Worksheet 11.2.

      ☐ Track I – AIF greater than 2 MGD, but less than 10 MGD

      - Attach information required by *40 CFR §§ 125.86(b)(2)-(4)*.

      ☐ Track I – AIF greater than 10 MGD

      - Attach information required by *40 CFR § 125.86(b)*.

☐ Track II

- Attach information required by *40 CFR § 125.86(c)*.

Attachment: N/A

2. Phase II – Existing facility subject to 40 CFR Part 125, Subpart J

   ☐ Yes ☐ No

   If **yes**, complete Worksheets 11.0 through 11.3, as applicable.

3. Phase III – New facility subject to 40 CFR Part 125, Subpart N

   ☐ Yes ☐ No

   If **yes**, check the box next to the compliance track selection and provide the requested information.

   ☐ Track I – Fixed facility

   - Attach information required by 40 CFR § 125.136(b) and complete Worksheet 11.0, Items 2 and 3, and Worksheet 11.2.

   ☐ Track I – Not a fixed facility

   - Attach information required by 40 CFR § 125.136(b) and complete Worksheet 11.0, Item 2 (except CWIS latitude/longitude under Item 2.a).

   ☐ Track II – Fixed facility

   - Attach information required by 40 CFR § 125.136(c) and complete Worksheet 11.0, Items 2 and 3.

   Attachment: N/A

Item 13. Permit Change Requests (Instructions, Page 48)

This item is only applicable to existing permitted facilities.

a. Is the facility requesting a **major amendment** of an existing permit?

   ☐ Yes ☒ No

   If **yes**, list each request individually and provide the following information: 1) detailed information regarding the scope of each request and 2) a justification for each request. Attach any supplemental information or additional data to support each request.

N/A

b. Is the facility requesting any **minor amendments** to the permit?

   ☐ Yes ☒ No

If **yes**, list and describe each change individually.

N/A

c. Is the facility requesting any **minor modifications** to the permit?

☐ Yes ☒ No

If **yes**, list and describe each change individually.

N/A

Item 14. Laboratory Accreditation (Instructions, Page 49)

All laboratory tests performed must meet the requirements of *30 TAC Chapter 25, Environmental Testing Laboratory Accreditation and Certification*, which includes the following general exemptions from National Environmental Laboratory Accreditation Program (NELAP) certification requirements:

- The laboratory is an in-house laboratory and is:
  - periodically inspected by the TCEQ; or
  - located in another state and is accredited or inspected by that state; or
  - performing work for another company with a unit located in the same site; or
  - performing pro bono work for a governmental agency or charitable organization.
- The laboratory is accredited under federal law.
- The data are needed for emergency-response activities, and a laboratory accredited under the Texas Laboratory Accreditation Program is not available.
- The laboratory supplies data for which the TCEQ does not offer accreditation.

The applicant should review *30 TAC Chapter 25* for specific requirements.

The following certification statement shall be signed and submitted with every application. See the *Signature Page* section in the Instructions, for a list of designated representatives who may sign the certification.

CERTIFICATION:

I certify that all laboratory tests submitted with this application meet the requirements of *30 TAC Chapter 25, Environmental Testing Laboratory Accreditation and Certification.*

Printed Name: Thomas Loquvam

Title: Director of General Counsel & Public Policy

Signature: _____

Date: 10/3/25

INDUSTRIAL WASTEWATER PERMIT APPLICATION WORKSHEET 1.0: EPA CATEGORICAL EFFLUENT GUIDELINES

This worksheet **is required** for all applications for TPDES permits for discharges of wastewaters subject to EPA categorical effluent limitation guidelines (ELGs).

Item 1. Categorical Industries (Instructions, Page 53)

Is this facility subject to any 40 CFR categorical ELGs outlined on page 53 of the instructions?

☐ Yes ☒ No

If **no**, this worksheet is not required. If **yes**, provide the appropriate information below.

40 CFR Effluent Guideline

Industry	40 CFR Part
N/A	

Item 2. Production/Process Data (Instructions, Page 54)

NOTE: For all TPDES permit applications requesting individual permit coverage for discharges of oil and gas exploration and production wastewater (discharges into or adjacent to water in the state, falling under the Oil and Gas Extraction Effluent Guidelines – 40 CFR Part 435), see Worksheet 12.0, Item 2 instead.

a. Production Data

Provide appropriate data for effluent guidelines with production-based effluent limitations.

Production Data

Subcategory	Actual Quantity/Day	Design Quantity/Day	Units
N/A			

b. Organic Chemicals, Plastics, and Synthetic Fibers Manufacturing Data (40 CFR Part 414)

Provide each applicable subpart and the percent of total production. Provide data for metal-bearing and cyanide-bearing wastestreams, as required by *40 CFR Part 414, Appendices A and B*.

Percentage of Total Production

Subcategory	Percent of Total Production	Appendix A and B - Metals	Appendix A - Cyanide
N/A			

c. Refineries (40 CFR Part 419)

Provide the applicable subcategory and a brief justification.

N/A

Item 3. Process/Non-Process Wastewater Flows (Instructions, Page 54)

Provide a breakdown of wastewater flow(s) generated by the facility, including both process and non-process wastewater flow(s). Specify which wastewater flows are to be authorized for discharge under this permit and the disposal practices for wastewater flows, excluding domestic, which are not to be authorized for discharge under this permit.

N/A

Item 4. New Source Determination (Instructions, Page 54)

Provide a list of all wastewater-generating processes subject to EPA categorical ELGs, identify the appropriate guideline Part and Subpart, and provide the date the process/construction commenced.

Wastewater Generating Processes Subject to Effluent Guidelines

Process	EPA Guideline Part	EPA Guideline Subpart	Date Process/ Construction Commenced
N/A			

Tab 13

INDUSTRIAL WASTEWATER PERMIT APPLICATION WORKSHEET 2.0: POLLUTANT ANALYSIS

Worksheet 2.0 **is required** for all applications submitted for a TPDES permit. Worksheet 2.0 is not required for applications for a permit to dispose of all wastewater by land disposal or for discharges solely of stormwater associated with industrial activities.

Item 1. General Testing Requirements (Instructions, Page 55)

a. Provide the date range of all sampling events conducted to obtain the analytical data submitted with this application (e.g., 05/01/2018-05/30/2018): Data based on a conceptual design and desktop analysis.

b. ☒ Check the box to confirm all samples were collected no more than 12 months prior to the date of application submittal.

c. Read the general testing requirements in the instructions for important information about sampling, test methods, and MALs. If a contact laboratory was used, attach a list which includes the name, contact information, and pollutants analyzed for each laboratory/firm. **Attachment:** N/A

Item 2. Specific Testing Requirements (Instructions, Page 56)

Attach correspondence from TCEQ approving submittal of less than the required number of samples, if applicable. **Attachment:** N/A

No sampling data available for constituents listed as N/A.

TABLE 1 and TABLE 2 (Instructions, Page 58)

Completion of Tables 1 and 2 is required for all external outfalls for all TPDES permit applications.

Table 1 for Outfall No.: 001 **Samples are (check one): ☐ Composite ☒ Grab**

Pollutant	Sample 1 (mg/L)	Sample 2 (mg/L)	Sample 3 (mg/L)	Sample 4 (mg/L)
BOD (5-day)	N/A			
CBOD (5-day)	N/A			
Chemical oxygen demand	N/A			
Total organic carbon	N/A			
Dissolved oxygen	N/A			
Ammonia nitrogen	0			
Total suspended solids	N/A			
Nitrate nitrogen	0.03			
Total organic nitrogen	N/A			
Total phosphorus	N/A			
Oil and grease	N/A			

Pollutant	Sample 1 (mg/L)	Sample 2 (mg/L)	Sample 3 (mg/L)	Sample 4 (mg/L)
Total residual chlorine	N/A			
Total dissolved solids	39,083			
Sulfate	2,944			
Chloride	21,325			
Fluoride	0.44			
Total alkalinity (mg/L as CaCO3)	175.0			
Temperature (°F)	N/A			
pH (standard units)	8.15			

Table 2 for Outfall No.: 001 **Samples are (check one): ☐ Composite ☒ Grab**

Pollutant	Sample 1 (µg/L)	Sample 2 (µg/L)	Sample 3 (µg/L)	Sample 4 (µg/L)	MAL (µg/L)
Aluminum, total	N/A				2.5
Antimony, total	N/A				5
Arsenic, total	N/A				0.5
Barium, total	0.07				3
Beryllium, total	N/A				0.5
Cadmium, total	N/A				1
Chromium, total	N/A				3
Chromium, hexavalent	N/A				3
Chromium, trivalent	N/A				N/A
Copper, total	N/A				2
Cyanide, available	N/A				2/10
Lead, total	N/A				0.5
Mercury, total	N/A				0.005/0.0005
Nickel, total	N/A				2
Selenium, total	N/A				5
Silver, total	N/A				0.5
Thallium, total	N/A				0.5
Zinc, total	N/A				5.0

TABLE 3 (Instructions, Page 58)

Completion of Table 3 **is required** for all **external outfalls** which discharge process wastewater.

Partial completion of Table 3 **is required** for all **external outfalls** which discharge non-process wastewater and stormwater associated with industrial activities commingled with other wastestreams (see instructions for additional guidance).

Table 3 for Outfall No.: 001 **Samples are (check one): ☐ Composite ☒ Grab**

Pollutant	Sample 1 (µg/L)*	Sample 2 (µg/L)*	Sample 3 (µg/L)*	Sample 4 (µg/L)*	MAL (µg/L)*
Acrylonitrile	N/A				50
Anthracene	N/A				10
Benzene	N/A				10
Benzidine	N/A				50
Benzo(a)anthracene	N/A				5
Benzo(a)pyrene	N/A				5
Bis(2-chloroethyl)ether	N/A				10
Bis(2-ethylhexyl)phthalate	N/A				10
Bromodichloromethane [Dichlorobromomethane]	N/A				10
Bromoform	N/A				10
Carbon tetrachloride	N/A				2
Chlorobenzene	N/A				10
Chlorodibromomethane [Dibromochloromethane]	N/A				10
Chloroform	N/A				10
Chrysene	N/A				5
m-Cresol [3-Methylphenol]	N/A				10
o-Cresol [2-Methylphenol]	N/A				10
p-Cresol [4-Methylphenol]	N/A				10
1,2-Dibromoethane	N/A				10
m-Dichlorobenzene [1,3-Dichlorobenzene]	N/A				10
o-Dichlorobenzene [1,2-Dichlorobenzene]	N/A				10
p-Dichlorobenzene [1,4-Dichlorobenzene]	N/A				10
3,3'-Dichlorobenzidine	N/A				5
1,2-Dichloroethane	N/A				10

Pollutant	Sample 1 (µg/L)*	Sample 2 (µg/L)*	Sample 3 (µg/L)*	Sample 4 (µg/L)*	MAL (µg/L)*
1,1-Dichloroethene [1,1-Dichloroethylene]	N/A				10
Dichloromethane [Methylene chloride]	N/A				20
1,2-Dichloropropane	N/A				10
1,3-Dichloropropene [1,3-Dichloropropylene]	N/A				10
2,4-Dimethylphenol	N/A				10
Di-n-Butyl phthalate	N/A				10
Epichlorohydrin (1-Chloro-2,3-epoxypropane)	N/A				---
Ethylbenzene	N/A				10
Ethylene Glycol	N/A				---
Fluoride	440				500
Hexachlorobenzene	N/A				5
Hexachlorobutadiene	N/A				10
Hexachlorocyclopentadiene	N/A				10
Hexachloroethane	N/A				20
4,4'-Isopropylidenediphenol (bisphenol A)	N/A				1
Methyl ethyl ketone	N/A				50
Methyl tert-butyl ether (MTBE)	N/A				---
Nitrobenzene	N/A				10
N-Nitrosodiethylamine	N/A				20
N-Nitroso-di-n-butylamine	N/A				20
Nonylphenol	N/A				333
Pentachlorobenzene	N/A				20
Pentachlorophenol	N/A				5
Phenanthrene	N/A				10
Polychlorinated biphenyls (PCBs) (**)	N/A				0.2
Pyridine	N/A				20
1,2,4,5-Tetrachlorobenzene	N/A				20
1,1,2,2-Tetrachloroethane	N/A				10
Tetrachloroethene [Tetrachloroethylene]	N/A				10

Pollutant	Sample 1 (µg/L)*	Sample 2 (µg/L)*	Sample 3 (µg/L)*	Sample 4 (µg/L)*	MAL (µg/L)*
Toluene	N/A				10
1,1,1-Trichloroethane	N/A				10
1,1,2-Trichloroethane	N/A				10
Trichloroethene [Trichloroethylene]	N/A				10
2,4,5-Trichlorophenol	N/A				50
TTHM (Total trihalomethanes)	N/A				10
Vinyl chloride	N/A				10

(*) Indicate units if different from µg/L.

(**) Total of detects for PCB-1242, PCB-1254, PCB-1221, PCB-1232, PCB-1248, PCB-1260, and PCB-1016. If all non-detects, enter the highest non-detect preceded by a "<".

TABLE 4 (Instructions, Pages 58-59)

Partial completion of Table 4 **is required** for each **external outfall** based on the conditions below.

a. **Tributyltin**

Is this facility an industrial/commercial facility which currently or proposes to directly dispose of wastewater from the types of operations listed below or a domestic facility which currently or proposes to receive wastewater from the types of industrial/commercial operations listed below?

☐ Yes ☒ No

If **yes**, check the box next to each of the following criteria which apply and provide the appropriate testing results in Table 4 below (check all that apply).

☐ Manufacturers and formulators of tributyltin or related compounds.

☐ Painting of ships, boats and marine structures.

☐ Ship and boat building and repairing.

☐ Ship and boat cleaning, salvage, wrecking and scaling.

☐ Operation and maintenance of marine cargo handling facilities and marinas.

☐ Facilities engaged in wood preserving.

☐ Any other industrial/commercial facility for which tributyltin is known to be present, or for which there is any reason to believe that tributyltin may be present in the effluent.

b. **Enterococci (discharge to saltwater)**

This facility discharges/proposes to discharge directly into saltwater receiving waters **and** Enterococci bacteria are expected to be present in the discharge based on facility processes.

☐ Yes ☒ No

Domestic wastewater is/will be discharged.

☐ Yes ☒ No

If **yes to either** question, provide the appropriate testing results in Table 4 below.

c. E. coli (discharge to freshwater)

This facility discharges/proposes to discharge directly into freshwater receiving waters **and** *E. coli* bacteria are expected to be present in the discharge based on facility processes.

☐ Yes ☒ No

Domestic wastewater is/will be discharged.

☐ Yes ☒ No

If **yes to either** question, provide the appropriate testing results in Table 4 below.

Table 4 for Outfall No.: N/A **Samples are (check one): ☐ Composite ☐ Grab**

Pollutant	Sample 1	Sample 2	Sample 3	Sample 4	MAL
Tributyltin (µg/L)	N/A				0.010
Enterococci (cfu or MPN/100 mL)	N/A				N/A
E. coli (cfu or MPN/100 mL)	N/A				N/A

TABLE 5 (Instructions, Page 59)

Completion of Table 5 **is required** for all **external outfalls** which discharge process wastewater from a facility which manufactures or formulates pesticides or herbicides or other wastewaters which may contain pesticides or herbicides.

If this facility does not/will not manufacture or formulate pesticides or herbicides and does not/will not discharge other wastewaters that may contain pesticides or herbicides, check N/A.

☒ N/A

Table 5 for Outfall No.: N/A **Samples are (check one): ☐ Composite ☐ Grab**

Pollutant	Sample 1 (µg/L)*	Sample 2 (µg/L)*	Sample 3 (µg/L)*	Sample 4 (µg/L)*	MAL (µg/L)*
Aldrin	N/A				0.01
Carbaryl	N/A				5
Chlordane	N/A				0.2
Chlorpyrifos	N/A				0.05
4,4'-DDD	N/A				0.1
4,4'-DDE	N/A				0.1
4,4'-DDT	N/A				0.02
2,4-D	N/A				0.7
Danitol [Fenpropathrin]	N/A				—
Demeton	N/A				0.20
Diazinon	N/A				0.5/0.1

Pollutant	Sample 1 (µg/L)*	Sample 2 (µg/L)*	Sample 3 (µg/L)*	Sample 4 (µg/L)*	MAL (µg/L)*
Dicofol [Kelthane]	N/A				1
Dieldrin	N/A				0.02
Diuron	N/A				0.090
Endosulfan I (*alpha*)	N/A				0.01
Endosulfan II (*beta*)	N/A				0.02
Endosulfan sulfate	N/A				0.1
Endrin	N/A				0.02
Guthion [Azinphos methyl]	N/A				0.1
Heptachlor	N/A				0.01
Heptachlor epoxide	N/A				0.01
Hexachlorocyclohexane (*alpha*)	N/A				0.05
Hexachlorocyclohexane (*beta*)	N/A				0.05
Hexachlorocyclohexane (*gamma*) [Lindane]	N/A				0.05
Hexachlorophene	N/A				10
Malathion	N/A				0.1
Methoxychlor	N/A				2.0
Mirex	N/A				0.02
Parathion (ethyl)	N/A				0.1
Toxaphene	N/A				0.3
2,4,5-TP [Silvex]	N/A				0.3

* Indicate units if different from µg/L.

TABLE 6 (Instructions, Page 59)

Completion of Table 6 **is required** for all **external outfalls**.

Table 6 for Outfall No.: 001 **Samples are (check one): ☐ Composite ☒ Grab**

Pollutants	Believed Present	Believed Absent	Sample 1 (mg/L)	Sample 2 (mg/L)	Sample 3 (mg/L)	Sample 4 (mg/L)	MAL (µg/L)*
Bromide	☐	☒					400
Color (PCU)	☐	☒					—
Nitrate-Nitrite (as N)	☒	☐	0.03				—
Sulfide (as S)	☐	☒					—
Sulfite (as SO3)	☐	☒					—
Surfactants	☐	☒					—
Boron, total	☐	☒					20
Cobalt, total	☐	☒					0.3
Iron, total	☐	☒					7
Magnesium, total	☒	☐	1,214				20
Manganese, total	☐	☒					0.5
Molybdenum, total	☐	☒					1
Tin, total	☐	☒					5
Titanium, total	☐	☒					30

TABLE 7 (Instructions, Page 60)

Check the box next to any of the industrial categories applicable to this facility. If no categories are applicable, check N/A. If GC/MS testing is required, check the box provided to confirm the testing results for the appropriate parameters are provided with the application.

☒ N/A

Table 7 for Applicable Industrial Categories

Industrial Category	40 CFR Part	Volatiles Table 8	Acids Table 9	Bases/ Neutrals Table 10	Pesticides Table 11
☐ Adhesives and Sealants		☐ Yes	☐ Yes	☐ Yes	No
☐ Aluminum Forming	467	☐ Yes	☐ Yes	☐ Yes	No
☐ Auto and Other Laundries		☐ Yes	☐ Yes	☐ Yes	☐ Yes
☐ Battery Manufacturing	461	☐ Yes	No	☐ Yes	No
☐ Coal Mining	434	No	No	No	No
☐ Coil Coating	465	☐ Yes	☐ Yes	☐ Yes	No
☐ Copper Forming	468	☐ Yes	☐ Yes	☐ Yes	No
☐ Electric and Electronic Components	469	☐ Yes	☐ Yes	☐ Yes	☐ Yes
☐ Electroplating	413	☐ Yes	☐ Yes	☐ Yes	No
☐ Explosives Manufacturing	457	No	☐ Yes	☐ Yes	No
☐ Foundries		☐ Yes	☐ Yes	☐ Yes	No
☐ Gum and Wood Chemicals - Subparts A,B,C,E	454	☐ Yes	☐ Yes	No	No
☐ Gum and Wood Chemicals - Subparts D,F	454	☐ Yes	☐ Yes	☐ Yes	No
☐ Inorganic Chemicals Manufacturing	415	☐ Yes	☐ Yes	☐ Yes	No
☐ Iron and Steel Manufacturing	420	☐ Yes	☐ Yes	☐ Yes	No
☐ Leather Tanning and Finishing	425	☐ Yes	☐ Yes	☐ Yes	No
☐ Mechanical Products Manufacturing		☐ Yes	☐ Yes	☐ Yes	No
☐ Nonferrous Metals Manufacturing	421,471	☐ Yes	☐ Yes	☐ Yes	☐ Yes
☐ Oil and Gas Extraction - Subparts A, D, E, F, G, H	435	☐ Yes	☐ Yes	☐ Yes	No
☐ Ore Mining - Subpart B	440	No	☐ Yes	No	No
☐ Organic Chemicals Manufacturing	414	☐ Yes	☐ Yes	☐ Yes	☐ Yes
☐ Paint and Ink Formulation	446,447	☐ Yes	☐ Yes	☐ Yes	No
☐ Pesticides	455	☐ Yes	☐ Yes	☐ Yes	☐ Yes
☐ Petroleum Refining	419	☐ Yes	No	No	No
☐ Pharmaceutical Preparations	439	☐ Yes	☐ Yes	☐ Yes	No
☐ Photographic Equipment and Supplies	459	☐ Yes	☐ Yes	☐ Yes	No
☐ Plastic and Synthetic Materials Manufacturing	414	☐ Yes	☐ Yes	☐ Yes	☐ Yes
☐ Plastic Processing	463	☐ Yes	No	No	No
☐ Porcelain Enameling	466	No	No	No	No
☐ Printing and Publishing		☐ Yes	☐ Yes	☐ Yes	☐ Yes
☐ Pulp and Paperboard Mills - Subpart C	430	☐ *	☐ Yes	☐ *	☐ Yes
☐ Pulp and Paperboard Mills - Subparts F, K	430	☐ *	☐ Yes	☐ *	☐ *
☐ Pulp and Paperboard Mills - Subparts A, B, D, G, H	430	☐ Yes	☐ Yes	☐ *	☐ *
☐ Pulp and Paperboard Mills - Subparts I, J, L	430	☐ Yes	☐ Yes	☐ *	☐ Yes
☐ Pulp and Paperboard Mills - Subpart E	430	☐ Yes	☐ Yes	☐ Yes	☐ *
☐ Rubber Processing	428	☐ Yes	☐ Yes	☐ Yes	No
☐ Soap and Detergent Manufacturing	417	☐ Yes	☐ Yes	☐ Yes	No
☐ Steam Electric Power Plants	423	☐ Yes	☐ Yes	No	No
☐ Textile Mills (Not Subpart C)	410	☐ Yes	☐ Yes	☐ Yes	No
☐ Timber Products Processing	429	☐ Yes	☐ Yes	☐ Yes	☐ Yes

* Test if believed present.

TABLES 8, 9, 10, and 11 (Instructions, Page 60)

Completion of Tables 8, 9, 10, and 11 **is required** as specified in Table 7 for all **external outfalls** that contain process wastewater.

Completion of Tables 8, 9, 10, and 11 **may be required** for types of industry not specified in Table 7 for specific parameters that are believed to be present in the wastewater.

Table 8 for Outfall No.: 001 **Samples are (check one): ☐ Composite ☐ Grab**

Pollutant	Sample 1 (µg/L)*	Sample 2 (µg/L)*	Sample 3 (µg/L)*	Sample 4 (µg/L)*	MAL (µg/L)
Acrolein	N/A				50
Acrylonitrile	N/A				50
Benzene	N/A				10
Bromoform	N/A				10
Carbon tetrachloride	N/A				2
Chlorobenzene	N/A				10
Chlorodibromomethane	N/A				10
Chloroethane	N/A				50
2-Chloroethylvinyl ether	N/A				10
Chloroform	N/A				10
Dichlorobromomethane [Bromodichloromethane]	N/A				10
1,1-Dichloroethane	N/A				10
1,2-Dichloroethane	N/A				10
1,1-Dichloroethylene [1,1-Dichloroethene]	N/A				10
1,2-Dichloropropane	N/A				10
1,3-Dichloropropylene [1,3-Dichloropropene]	N/A				10
Ethylbenzene	N/A				10
Methyl bromide [Bromomethane]	N/A				50
Methyl chloride [Chloromethane]	N/A				50
Methylene chloride [Dichloromethane]	N/A				20
1,1,2,2-Tetrachloroethane	N/A				10
Tetrachloroethylene [Tetrachloroethene]	N/A				10
Toluene	N/A				10
1,2-Trans-dichloroethylene [1,2-Trans-dichloroethene]	N/A				10

Pollutant	Sample 1 (µg/L)*	Sample 2 (µg/L)*	Sample 3 (µg/L)*	Sample 4 (µg/L)*	MAL (µg/L)
1,1,1-Trichloroethane	N/A				10
1,1,2-Trichloroethane	N/A				10
Trichloroethylene [Trichloroethene]	N/A				10
Vinyl chloride	N/A				10

* Indicate units if different from µg/L.

Table 9 for Outfall No.: 001 **Samples are (check one): ☐ Composite ☐ Grab**

Pollutant	Sample 1 (µg/L)*	Sample 2 (µg/L)*	Sample 3 (µg/L)*	Sample 4 (µg/L)*	MAL (µg/L)
2-Chlorophenol	N/A				10
2,4-Dichlorophenol	N/A				10
2,4-Dimethylphenol	N/A				10
4,6-Dinitro-o-cresol	N/A				50
2,4-Dinitrophenol	N/A				50
2-Nitrophenol	N/A				20
4-Nitrophenol	N/A				50
p-Chloro-m-cresol	N/A				10
Pentachlorophenol	N/A				5
Phenol	N/A				10
2,4,6-Trichlorophenol	N/A				10

* Indicate units if different from µg/L.

Table 10 for Outfall No.: 001 **Samples are (check one): ☐ Composite ☐ Grab**

Pollutant	Sample 1 (µg/L)*	Sample 2 (µg/L)*	Sample 3 (µg/L)*	Sample 4 (µg/L)*	MAL (µg/L)
Acenaphthene	N/A				10
Acenaphthylene	N/A				10
Anthracene	N/A				10
Benzidine	N/A				50
Benzo(a)anthracene	N/A				5
Benzo(a)pyrene	N/A				5
3,4-Benzofluoranthene [Benzo(b)fluoranthene]	N/A				10
Benzo(ghi)perylene	N/A				20
Benzo(k)fluoranthene	N/A				5
Bis(2-chloroethoxy)methane	N/A				10

Pollutant	Sample 1 (µg/L)*	Sample 2 (µg/L)*	Sample 3 (µg/L)*	Sample 4 (µg/L)*	MAL (µg/L)
Bis(2-chloroethyl)ether	N/A				10
Bis(2-chloroisopropyl)ether	N/A				10
Bis(2-ethylhexyl)phthalate	N/A				10
4-Bromophenyl phenyl ether	N/A				10
Butylbenzyl phthalate	N/A				10
2-Chloronaphthalene	N/A				10
4-Chlorophenyl phenyl ether	N/A				10
Chrysene	N/A				5
Dibenzo(a,h)anthracene	N/A				5
1,2-Dichlorobenzene [o-Dichlorobenzene]	N/A				10
1,3-Dichlorobenzene [m-Dichlorobenzene]	N/A				10
1,4-Dichlorobenzene [p-Dichlorobenzene]	N/A				10
3,3'-Dichlorobenzidine	N/A				5
Diethyl phthalate	N/A				10
Dimethyl phthalate	N/A				10
Di-n-butyl phthalate	N/A				10
2,4-Dinitrotoluene	N/A				10
2,6-Dinitrotoluene	N/A				10
Di-n-octyl phthalate	N/A				10
1,2-Diphenylhydrazine (as Azobenzene)	N/A				20
Fluoranthene	N/A				10
Fluorene	N/A				10
Hexachlorobenzene	N/A				5
Hexachlorobutadiene	N/A				10
Hexachlorocyclopentadiene	N/A				10
Hexachloroethane	N/A				20
Indeno(1,2,3-cd)pyrene	N/A				5
Isophorone	N/A				10
Naphthalene	N/A				10
Nitrobenzene	N/A				10
N-Nitrosodimethylamine	N/A				50

Pollutant	Sample 1 (µg/L)*	Sample 2 (µg/L)*	Sample 3 (µg/L)*	Sample 4 (µg/L)*	MAL (µg/L)
N-Nitrosodi-n-propylamine	N/A				20
N-Nitrosodiphenylamine	N/A				20
Phenanthrene	N/A				10
Pyrene	N/A				10
1,2,4-Trichlorobenzene	N/A				10

* Indicate units if different from µg/L.

Table 11 for Outfall No.: 001 **Samples are (check one): ☐ Composite ☐ Grab**

Pollutant	Sample 1 (µg/L)*	Sample 2 (µg/L)*	Sample 3 (µg/L)*	Sample 4 (µg/L)*	MAL (µg/L)
Aldrin	N/A				0.01
alpha-BHC [alpha-Hexachlorocyclohexane]	N/A				0.05
beta-BHC [beta-Hexachlorocyclohexane]	N/A				0.05
gamma-BHC [gamma-Hexachlorocyclohexane]	N/A				0.05
delta-BHC [delta-Hexachlorocyclohexane]	N/A				0.05
Chlordane	N/A				0.2
4,4'-DDT	N/A				0.02
4,4'-DDE	N/A				0.1
4,4'-DDD	N/A				0.1
Dieldrin	N/A				0.02
Endosulfan I (alpha)	N/A				0.01
Endosulfan II (beta)	N/A				0.02
Endosulfan sulfate	N/A				0.1
Endrin	N/A				0.02
Endrin aldehyde	N/A				0.1
Heptachlor	N/A				0.01
Heptachlor epoxide	N/A				0.01
PCB 1242	N/A				0.2
PCB 1254	N/A				0.2
PCB 1221	N/A				0.2
PCB 1232	N/A				0.2
PCB 1248	N/A				0.2

Pollutant	Sample 1 (µg/L)*	Sample 2 (µg/L)*	Sample 3 (µg/L)*	Sample 4 (µg/L)*	MAL (µg/L)
PCB 1260	N/A				0.2
PCB 1016	N/A				0.2
Toxaphene	N/A				0.3

* Indicate units if different from µg/L.

Attachment: N/A

TABLE 12 (DIOXINS/FURAN COMPOUNDS)

Complete of Table 12 **is required** for **external outfalls**, as directed below. (Instructions, Pages 59-60)

Indicate which compound(s) are manufactured or used at the facility and provide a brief description of the conditions of its/their presence at the facility (check all that apply).

☐ 2,4,5-trichlorophenoxy acetic acid (2,4,5-T) CASRN 93-76-5

☐ 2-(2,4,5-trichlorophenoxy) propanoic acid (Silvex, 2,4,5-TP) CASRN 93-72-1

☐ 2-(2,4,5-trichlorophenoxy) ethyl 2,2-dichloropropionate (Erbon) CASRN 136-25-4

☐ 0,0-dimethyl 0-(2,4,5-trichlorophenyl) phosphorothioate (Ronnel) CASRN 299-84-3

☐ 2,4,5-trichlorophenol (TCP) CASRN 95-95-4

☐ hexachlorophene (HCP) CASRN 70-30-4

☒ None of the above

Description: N/A

Does the applicant or anyone at the facility know or have any reason to believe that 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD) or any congeners of TCDD may be present in the effluent proposed for discharge?

☐ Yes ☒ No

Description: N/A

If **yes** to either Items a **or** b, complete Table 12 as instructed.

Table 12 for Outfall No.: N/A **Samples are (check one): ☐ Composite ☐ Grab**

Compound	Toxicity Equivalent Factors	Wastewater Concentration (ppq)	Wastewater Toxicity Equivalents (ppq)	Sludge Concentration (ppt)	Sludge Toxicity Equivalents (ppt)	MAL (ppq)
2,3,7,8-TCDD	1	N/A				10
1,2,3,7,8-PeCDD	1.0	N/A				50
2,3,7,8-HxCDDs	0.1	N/A				50
1,2,3,4,6,7,8-HpCDD	0.01	N/A				50

Compound	Toxicity Equivalent Factors	Wastewater Concentration (ppq)	Wastewater Toxicity Equivalents (ppq)	Sludge Concentration (ppt)	Sludge Toxicity Equivalents (ppt)	MAL (ppq)
2,3,7,8-TCDF	0.1	N/A				10
1,2,3,7,8-PeCDF	0.03	N/A				50
2,3,4,7,8-PeCDF	0.3	N/A				50
2,3,7,8-HxCDFs	0.1	N/A				50
2,3,4,7,8-HpCDFs	0.01	N/A				50
OCDD	0.0003	N/A				100
OCDF	0.0003	N/A				100
PCB 77	0.0001	N/A				500
PCB 81	0.0003	N/A				500
PCB 126	0.1	N/A				500
PCB 169	0.03	N/A				500
Total		N/A				

TABLE 13 (HAZARDOUS SUBSTANCES)

Complete Table 13 **is required** for all **external outfalls** as directed below. (Instructions, Pages 60-61)

Are there any pollutants listed in the instructions (pages 55-62) believed present in the discharge?

☐ Yes ☒ No

Are there pollutants listed in Item 1.c. of Technical Report 1.0 which are believed present in the discharge and have not been analytically quantified elsewhere in this application?

☒ Yes ☐ No

If **yes** to either Items a **or** b, complete Table 13 as instructed.

Table 13 for Outfall No.: 001 **Samples are (check one): ☐ Composite ☐ Grab**

Pollutant	CASRN	Sample 1 (µg/L)	Sample 2 (µg/L)	Sample 3 (µg/L)	Sample 4 (µg/L)	Analytical Method
Ferric sulfate	10028-22-5					
Anionic polymer	N/A					
Sodium hypochlorite	7681-52-9					

Pollutant	CASRN	Sample 1 (µg/L)	Sample 2 (µg/L)	Sample 3 (µg/L)	Sample 4 (µg/L)	Analytical Method
Liquid ammonium sulfate	7783-20-2					
Carbon dioxide	124-38-9					
Sodium hydroxide	1310-73-2					
Citric acid	77-92-9					
Sodium bisulfite	7631-90-5					
Seawater RO antiscalant	N/A					
Sulfuric acid	7664-93-9					
Lime (calcite)	13397-26-7					

Tab 14

INDUSTRIAL WASTEWATER PERMIT APPLICATION WORKSHEET 4.0: RECEIVING WATERS

This worksheet **is required** for all TPDES permit applications.

Item 1. Domestic Drinking Water Supply (Instructions, Page 80)

a. There is a surface water intake for domestic drinking water supply located within 5 (five) miles downstream from the point/proposed point of discharge.

☐ Yes ☒ No

If **no**, stop here and proceed to Item 2. If **yes**, provide the following information:

1. The legal name of the owner of the drinking water supply intake: N/A
2. The distance and direction from the outfall to the drinking water supply intake: N/A

b. Locate and identify the intake on the USGS 7.5-minute topographic map provided for Administrative Report 1.0.

☐ Check this box to confirm the above requested information is provided.

Item 2. Discharge Into Tidally Influenced Waters (Instructions, Page 80)

If the discharge is to tidally influenced waters, complete this section. Otherwise, proceed to Item 3.

a. Width of the receiving water at the outfall: 162 feet

b. Are there oyster reefs in the vicinity of the discharge?

☐ Yes ☒ No

If **yes**, provide the distance and direction from the outfall(s) to the oyster reefs: N/A

c. Are there sea grasses within the vicinity of the point of discharge?

☐ Yes ☒ No

If **yes**, provide the distance and direction from the outfall(s) to the grasses: N/A

Item 3. Classified Segment (Instructions, Page 80)

The discharge is/will be directly into (or within 300 feet of) a classified segment.

☐ Yes ☒ No

If **yes**, stop here and do not complete Items 4 and 5 of this worksheet or Worksheet 4.1.

If **no**, complete Items 4 and 5 and Worksheet 4.1 may be required.

Item 4. Description of Immediate Receiving Waters (Instructions, Page 80)

a. Name of the immediate receiving waters: N/A

b. Check the appropriate description of the immediate receiving waters:

☐ Lake or Pond

- Surface area (acres): N/A
- Average depth of the entire water body (feet): N/A
- Average depth of water body within a 500-foot radius of the discharge point (feet): N/A

☒ Man-Made Channel or Ditch

☐ Stream or Creek

☐ Freshwater Swamp or Marsh

☐ Tidal Stream, Bayou, or Marsh

☐ Open Bay

☐ Other, specify:

If **Man-Made Channel or Ditch** or **Stream or Creek** were selected above, provide responses to Items 4.c – 4.g below:

c. For **existing discharges**, check the description below that best characterizes the area **upstream** of the discharge.

For **new discharges**, check the description below that best characterizes the area **downstream** of the discharge.

☐ Intermittent (dry for at least one week during most years)

☐ Intermittent with Perennial Pools (enduring pools containing habitat to maintain aquatic life uses)

☒ Perennial (normally flowing) Flow due to tidal inflow.

Check the source(s) of the information used to characterize the area upstream (existing discharge) or downstream (new discharge):

☒ USGS flow records

☐ personal observation

☐ historical observation by adjacent landowner(s)

☐ other, specify: N/A

d. List the names of all perennial streams that join the receiving water within three miles downstream of the discharge point: Bacliff MUD outfall

e. The receiving water characteristics change within three miles downstream of the discharge (e.g., natural or man-made dams, ponds, reservoirs, etc.).

☒ Yes ☐ No

If **yes**, describe how: Weir two miles downstream of outfall. There is also a dam/levee on the southwest side of the man-made island that goes to the west bank, which impedes flow and forces most of the water east under the man-made island bridge where it eventually exits through a culvert on the north side of the island.

f. General observations of the water body during normal dry weather conditions: Water flowing at a slow, steady pace solely due to tidal inflow. Dense vegetation at the banks, along the length of the man-made canal. Deep canal with turbid water.

Date and time of observation: 06/19/2025 12:55

g. The water body was influenced by stormwater runoff during observations.

☐ Yes ☒ No

If **yes**, describe how: N/A

Item 5. General Characteristics of Water Body (Instructions, Page 81)

a. Is the receiving water upstream of the existing discharge or proposed discharge site influenced by any of the following (check all that apply):

☐ oil field activities
☒ urban runoff
☐ agricultural runoff
☐ septic tanks
☐ upstream discharges
☐ other, specify: N/A

b. Uses of water body observed or evidence of such uses (check all that apply):

☐ livestock watering
☐ industrial water supply
☐ non-contact recreation
☐ irrigation withdrawal
☐ domestic water supply
☐ navigation
☐ contact recreation
☐ picnic/park activities
☒ fishing
☐ other, specify: N/A

c. Description which best describes the aesthetics of the receiving water and the surrounding area (check only one):

☐ **Wilderness:** outstanding natural beauty; usually wooded or un-pastured area: water clarity exceptional

☒ **Natural Area:** trees or native vegetation common; some development evident (from fields, pastures, dwellings); water clarity discolored

☐ **Common Setting:** not offensive, developed but uncluttered; water may be colored or turbid

☐ **Offensive:** stream does not enhance aesthetics; cluttered; highly developed; dumping areas; water discolored

Tab 15

INDUSTRIAL WASTEWATER PERMIT APPLICATION WORKSHEET 4.1: WATERBODY PHYSICAL CHARACTERISTICS

The following information **is required** for new applications, EPA-designated Major facilities, and major amendment applications requesting to add an outfall if the receiving waters are perennial or intermittent with perennial pools (including impoundments) for a TDPES permit.

Complete the transects downstream of the existing or proposed discharges.

Item 1. Data Collection (Instructions, Page 82)

a. Date of study: 08/21/2025 Time of study: 4:00 PM

Waterbody name: N/A

General location: Discharge point to 0.5 miles downstream of discharge point.

b. Type of stream upstream of an existing discharge or downstream of a proposed discharge (check only one):

☒ perennial ☐ intermittent with perennial pools ☐ impoundment Flow due to tidal inflow.

c. No. of defined stream bends:

Well: 1 Moderately: 2 Poorly: 0

d. No. of riffles: 0

e. Evidence of flow fluctuations (check one):

☒ Minor ☐ Moderate ☐ Severe

f. Provide the observed stream uses and where there is evidence of channel obstructions/modifications: Defunct cooling towers on man-made island in the canal

g. Complete the following table with information regarding the transect measurements.

Stream Transect Data

Transect Location	Habitat Type*	Water Surface Width (ft)	Stream Depths (ft)**								
Outfall	Glide	154.5	1.00	4.25	4.25	2.50					
293.3 ft downstream of outfall	Glide	157.5	2.50	4.50	4.50	2.50					
586.7 ft downstream of outfall	Glide	169	1.25	4.75	5.00	1.75					
880.0 ft downstream of outfall	Glide	175	4.00	5.25	5.25	2.00					
1,173.3 ft	Glide	189.5	2.50	4.75	5.00	2.75					

Transect Location	Habitat Type*	Water Surface Width (ft)	Stream Depths (ft)**								
downstream of outfall											
1,466.7 ft downstream of outfall	Glide	178	2.50	4.25	4.75	2.50					
1,760.0 ft downstream of outfall	Glide	176.5	2.25	3.25	4.50	2.00					
2,053.3 ft downstream of outfall	Pool	397.7	0.75	1.25	3.50	2.00					
2,346.7 ft downstream of outfall	Pool	565.25	1.00	2.50	3.75	1.75					
2,640.0 ft downstream of outfall	Pool	705.7	1.00	2.00	4.00	1.50					

* riffle, run, glide, or pool
** channel bed to water surface

Item 2. Summarize Measurements (Instructions, Page 83)

Provide the following information regarding the transect measurements:

Streambed slope of entire reach (from USGS map in ft. /ft.): -0.0001

Approximate drainage area above the most downstream transect from USGS map or county highway map (square miles): 0.077

Length of stream evaluated (ft): 2,640

Number of lateral transects made: 10

Average stream width (ft): 286.87

Average stream depth (ft): 3.03

Average stream velocity (ft/sec): 0.21

Instantaneous stream flow (ft^3/sec): 93.28

Indicate flow measurement method (VERY IMPORTANT – type of meter, floating chip timed over a fixed distance, etc.): N/A

Flow fluctuations (i.e., minor, moderate, or severe): Minor

Size of pools (i.e., large, small, moderate, or none): Moderate

Maximum pool depth (ft): 4.00

Total number of stream bends: 3

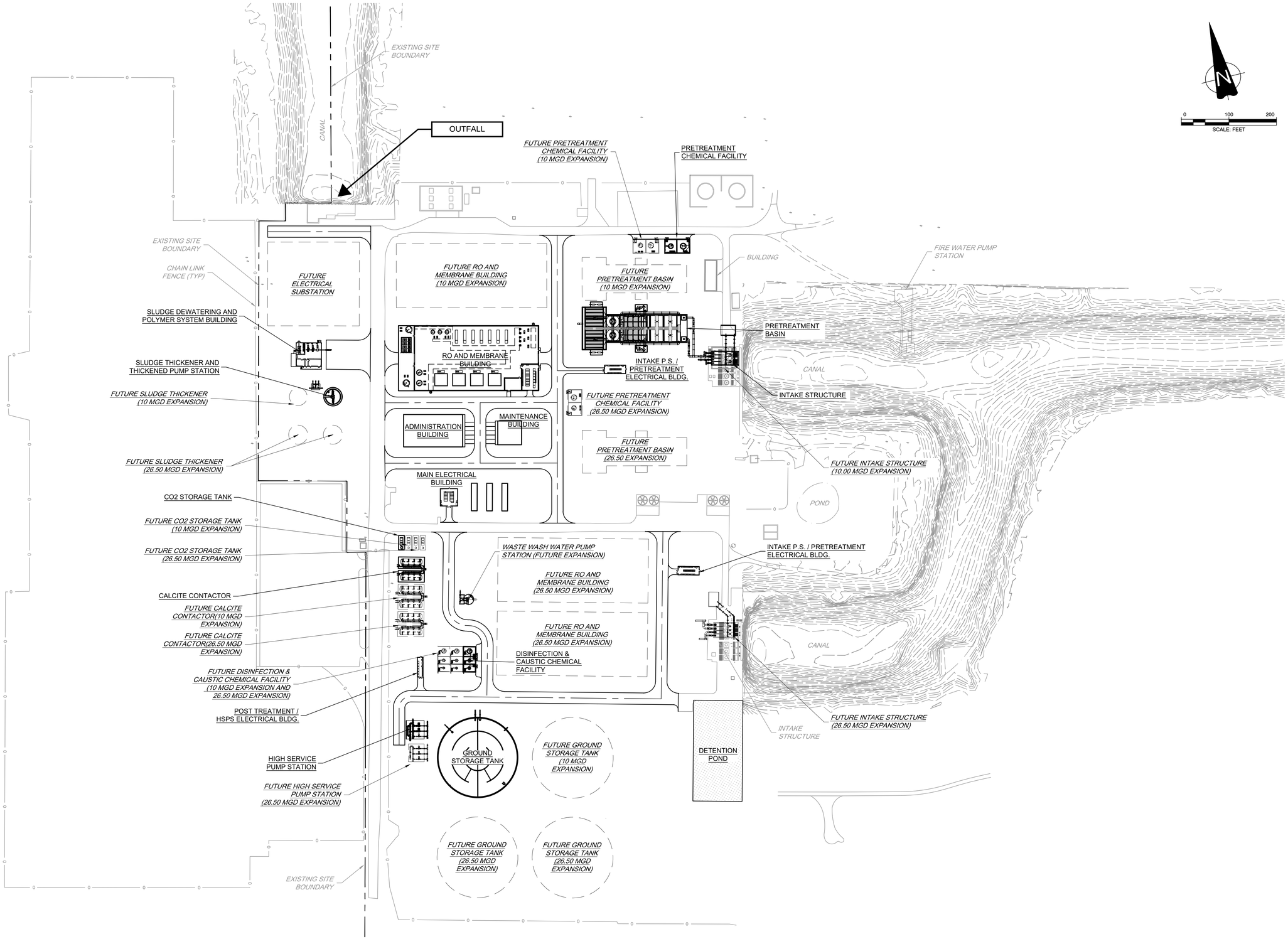
Number well defined: 1

Number moderately defined: 2

Number poorly defined: 0

Total number of riffles: 0

Tab 16



PLAN

SCALE: 1"=100'

ARDURRA
3115 Allen Parkway, Suite 300
Houston, TX 77019
TBPE Firm Registration No.: F-10053

Client

Revision	By	Appd	YYYY.MM.DD

Issued	By	Appd	YYYY.MM.DD

Permit/Seal

PRELIMINARY NOT FOR CONSTRUCTION

Not for permits, pricing or other official purposes. This document has not been completed or checked and is for general information or comment only.

Client/Project

Project No.: BACL

File Name: BACL-000-CL-001-004.dwg

Scale: 1" = 100'

JJG	YS	YS	YYYY.MM.DD
Dwn.	Dsgn.	Chkd.	

Title

000
PROPOSED OVERALL SITE PLAN

Revision: Sheet: of

Drawing No.

000-CL-002

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ORIGINAL SHEET - ANSI D

Tab 17

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988. Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 'Flood Protection Measures' of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was STATE PLANE TEXAS SOUTH CENTRAL FIPS 4204. The **horizontal datum** was the North American Datum of 1983 (NAD 83), GRS1980 Spheroid. Differences in datum, spheroid, projection or State Plane zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at https://www.ngs.noaa.gov/ or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland, 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713-3242**, or visit its website at https://www.ngs.noaa.gov/.

Base Map information shown on this FIRM was derived from Galveston Central Appraisal District, NOAA, National Geodetic Survey, Texas Natural Resources Information System, U.S. Fish and Wildlife Service and the U.S. Geological Survey and were provided in digital format using source material at a scale of 1:20,000 or better.

Based on updated topographic information, this map reflects more detailed and up-to-date **stream channel configurations and floodplain delineations** than those shown on the previous FIRM for this jurisdiction. As a result, the Flood Profiles and Floodway Data tables may reflect stream channel distances that differ from what is shown on the map. Also, the road to floodplain relationships for unrevised streams may differ from what is shown on previous maps.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

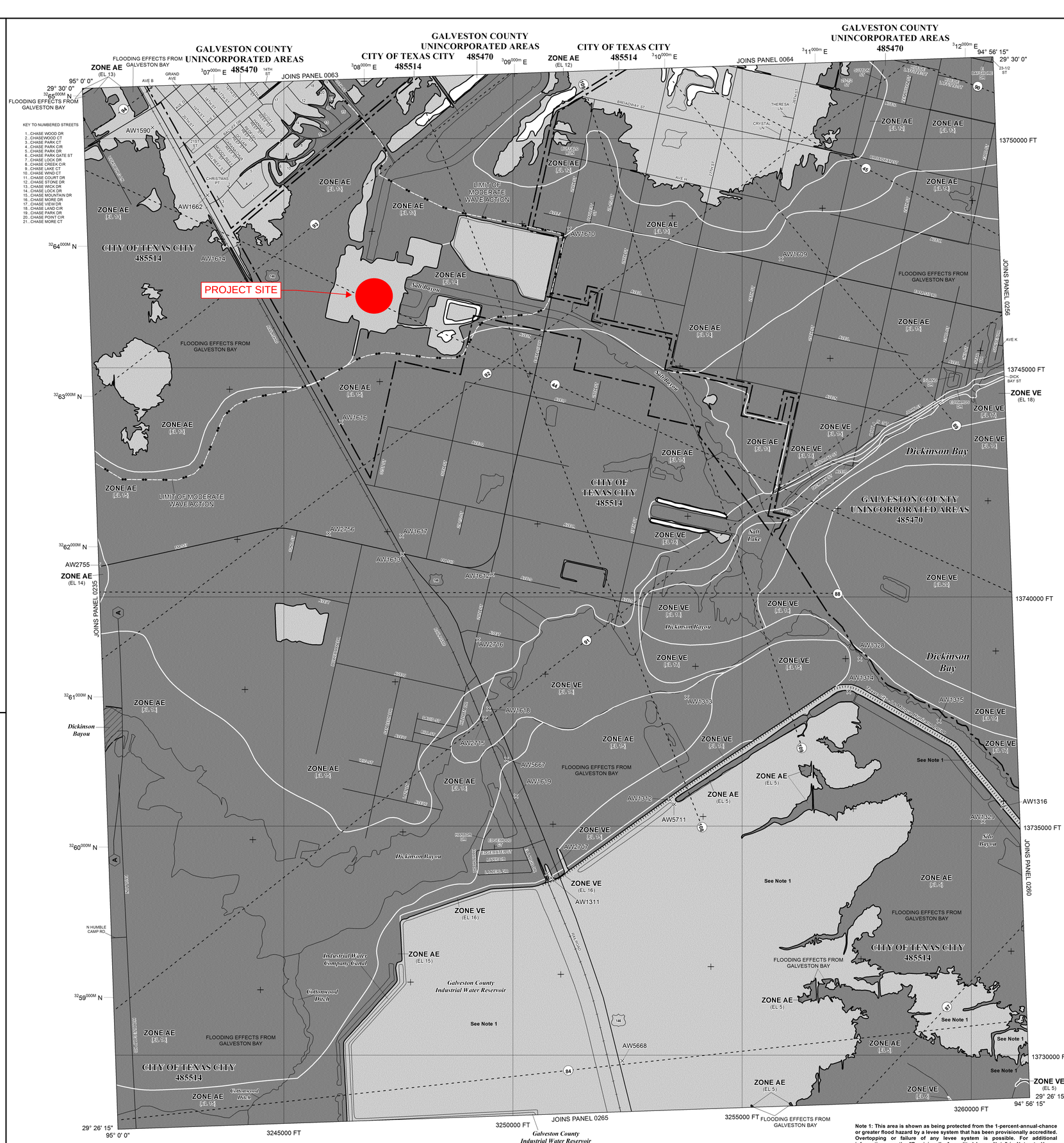
Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

Contact the **FEMA Map Information eXchange** at 1-877-336-2627 for information on available products associated with this FIRM. Available products may include previously issed Letter of Map Change, a Flood Insurance Study report, and/or digital versions of this map. The FEMA Map Information eXchange may also be reached by Fax at 1-800-358-9620 and their website at https://www.msc.fema.gov/.

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1-877-FEMA MAP** (1-877-336-2627) or visit the FEMA website at https://www.fema.gov/national-flood-insurance-program.

The AE Zone category has been divided by a Limit of Moderate Wave Action (LiMWA). The LiMWA represents the approximate landward limit of the 1.5-foot breaking wave. The effects of wave hazards between the VE Zone and the LiMWA (or between the shoreline and the LiMWA for areas where VE Zones are not identified) will be similar to, but less severe than those in the VE Zone.

Provisionally Accredited Levee Notes to Users: Check with your local community to obtain more information, such as the estimated level of protection provided (which may exceed the 1-percent-annual-chance level) and Emergency Action Plan, on the levee system(s) shown as providing protection for areas on this panel. To maintain accreditation, the levee owner or community is required to submit the data and documentation necessary to comply with Section 65.10 of the NFIP regulations by October 11, 2013. If the community or owner does not provide the necessary data and documentation or if the data and documentation provided indicate the levee system does not comply with Section 65.10 requirements, FEMA will revise the flood hazard and risk information for this area to reflect de-accreditation of the levee system. To mitigate flood risk in residual risk area, property owners and residents are encouraged to consider flood insurance and floodproofing or other protective measures. For more information on flood insurance, interested parties should visit the FEMA Website at http://www.fema.gov/business/nfip/index.shtm.



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A No Base Flood Elevations determined.

ZONE AE Base Flood Elevations determined.

ZONE AH Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.

ZONE AO Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.

ZONE AR Special Flood Hazard Areas formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.

ZONE A99 Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.

ZONE V Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.

ZONE VE Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X Areas determined to be outside the 0.2% annual chance floodplain.

ZONE D Areas in which flood hazards are undetermined, but possible.

- Floodplain Boundary
- Floodway Boundary
- Zone D Boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
- Limit of Moderate Wave Action
- 513 — Base Flood Elevation line and value; elevation in feet*
- (EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the North American Vertical Datum of 1988

- A — A — Cross section line
- 23 — 23 — Transect line
- Culvert
- Bridge
- Footbridge
- 45° 02' 08", 93° 02' 12" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83) Western Hemisphere
- 3988000mN — 1000-meter Universal Transverse Mercator grid ticks, zone 15
- 4989000FT — 5000-foot grid values: Texas State Plane Coordinate System, (FIPS Zone 4204), Lambert Conformal Conic
- DX5510 × — Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 — River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
AUGUST 15, 2019

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 1000'

500 0 1000 2000 FEET
300 0 300 600 METERS

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0255G

FIRM
FLOOD INSURANCE RATE MAP

GALVESTON COUNTY, TEXAS
AND INCORPORATED AREAS

PANEL 255 OF 600
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
TEXAS CITY, CITY OF	485514	0255	G
GALVESTON COUNTY	485470	0255	G

MAP NUMBER
48167C0255G

EFFECTIVE DATE
AUGUST 15, 2019

Federal Emergency Management Agency

Tab 18

Attachment TR-03 Treatment System List

The process begins at the Intake, where seawater is physically screened with coarse screens and fine screens. The raw seawater is then pumped by Raw Water Pumps to the Pretreatment process. Additionally, raw seawater will be pumped to blend with Reverse Osmosis (RO) concentrate prior to discharging into the outfall.

The first section of the Pretreatment process includes Rapid Mixing, Flocculation Basins, Dissolved Air Floatation, and High-Rate Clarifiers. The High-Rate Clarifiers will be accompanied by Sludge Recycle Pumps and Sludge Waste Pumps.

Pretreatment will continue with either a Low Pressure Membrane Filtration process or a Gravity Media Filters process. The Low Pressure Membrane Filtration includes Feed Pumps, Membrane Feed Strainers, Low Pressure Membrane Filtration Modules, Clean-in-Place (CIP) Tanks and Pumps, CIP Chemical Pumps, Backwash Tank and Pumps, Neutralization Tank and Pumps, and Compressed Air System Compressors and Receiver.

The Gravity Media Filters process would include Gravity Media Filters, Filter Backwash Pumps, Air Scour Blowers, and Transfer Pumps to the RO system.

There will be a RO process that receives pretreated water from Pretreatment. The RO process includes prefilters, High Pressure Feed Pumps, RO membranes, Pressure Exchangers, booster pumps, Anti-Scalant System, CIP Tank with Pumps and Filters, Flush Tank, Bag Filters, and Neutralization Tank.

Post-Treatment will utilize CO_2 Tanks and Calcite Contactors.

Treated water will continue to a Ground Storage Tank and a High Service Pump Station.

There will be Chemical Storage and Feed Systems. These systems will house Ferric Sulfate Tank and Pumps, Polymer Activating Units and Tank, Sodium Hypochlorite Tank and Pumps, Liquid Ammonia Sulfate Tank and Pumps, and Caustic Tank and Pumps.

The plant will contain a Solids and Residual Liquid Handling System. This step in the process will have a raw sludge thickener, Sludge Dewatering Feed Pumps and Sludge Dewatering Centrifuges. Sludge generated from the facility will be transported and disposed of at a TCEQ-approved disposal facility.

Concentrate from the RO process will be blended with raw seawater from the intake, remaining water from the Residual Liquid Handling System and discharge into Outfall 1.

Preliminary process unit quantity and dimensions are summarized as follows. As design evolves, design criteria will be further developed.

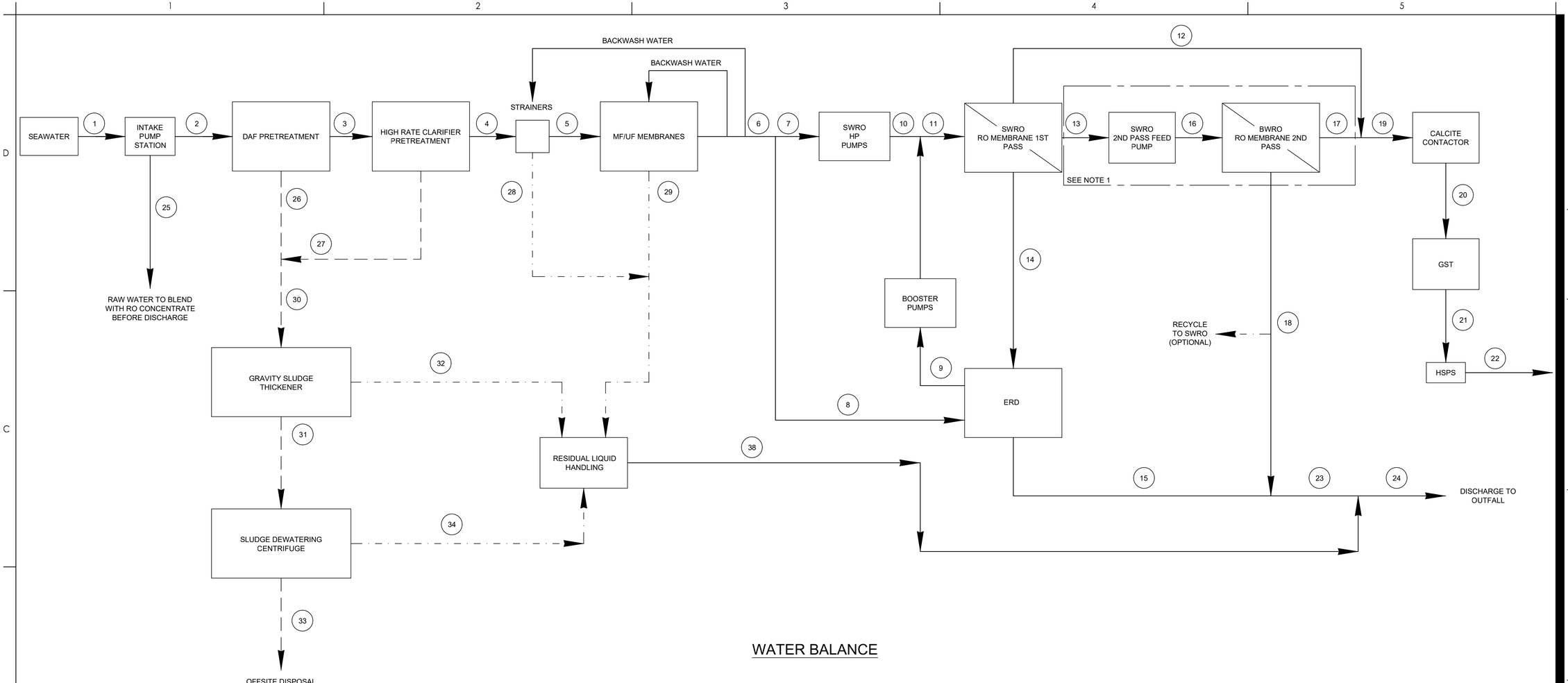
Table 1: Process Units Quantity and Dimensions

Treatment System	Unit	Quantity	Unit Dimensions
Raw Water Intake	Raw Water Pump	6	Design Flow: 8,563 gpm
	Blending Water Pump	6	Design Flow: 4,743 gpm
	Intake Coarse Screens	6	Total Screen Area: 59.4 sf Slot Opening Size: 1 mm Individual Screen Capacity: 13,333 gpm
	Intake Fine Screens	6	Total Screen Area: 59.4 sf Slot Opening Size: 1 mm Individual Screen Capacity: 13,333 gpm
Pretreatment	Rapid Mixing Basin	5 on duty, 1 standby	Volume: 12,118 gallons
	Flocculation Basins	5 on duty, 1 standby	Volume: 105,064 gallons
	Dissolved Air Floatation (DAF)	5 on duty, 1 standby	Volume: 161,561 gallons
	Reactor Chamber	5 on duty, 1 standby	Volume: 109,066 gallons
	High-Rate Clarifier	5 on duty, 1 standby	Volume: 249,047 gallons
	Sludge Recycle Pump	5 on duty, 1 standby	Design Flow: 900 gpm
	Sludge Waste Pump	5 on duty, 1 standby	Design Flow: 900 gpm
Pretreatment – Filtration -Low Pressure Membrane Filtration	Membrane Feed Pumps	17 on duty, 2 standby	Design Flow: 2,370 gpm
	Membrane Feed Strainers	17 on duty, 2 standby	Screen Size: 250 µm
	Low Pressure Membrane Filtration Racks	29 on duty, 2 standby	6" Diameter x 80" Length for individual module Surface Area: 538 sf; 120 modules per rack
	Backwash Tank	2	Volume: 3,000 gallons Diameter: 7' 6"
	Backwash Pump	2 on duty, 2 standby	Design Flow: 960 gpm
	CIP Tank	4 (2 for acid CIP use, and 2 for caustic CIP use)	Volume: 3,000 gallons Diameter: 7' 6"
	CIP Pump	2 on duty, 2 standby	Design Flow: 348 gpm

	Neutralization Tank	2	Volume: 15,000 gallons Diameter: 12' 0"
	Neutralization Pump	2 on duty, 2 standby	Design Flow: 348 gpm
	Sodium Hypochlorite Transfer Pump	2 on duty, 2 standby	Design Flow: 11 gpm
	Caustic Transfer Pump	2 on duty, 2 standby	Design Flow: 11 gpm
	Citric Acid Transfer Pump	2 on duty, 2 standby	Design Flow: 11 gpm
	Sodium Bisulfite Transfer Pump	2 on duty, 2 standby	Design Flow: 11 gpm
	Compressed Air System Compressors	5 on duty, 2 standby	Design Flow: 90 scfm
	Compressed Air System Receiver	5	Volume: 1,040 gallons
Pretreatment – Filtration -Gravity Media Filters	Gravity Media Filters	20 on duty, 2 standby	50 ft Length x 14' 11"Width Surface Area: 746 sf
	Filter Backwash Pumps	2 on duty, 2 standby	Design Flow: 16,408 gpm
	Air Scour Blowers	2 on duty, 2 standby	Capacity: 2,233 scfm
	Transfer Pump	5 on duty, 2 standby	Design Flow: 8,935 gpm
Reverse Osmosis	RO Prefilters	16 duty, 2 standby	Design Flow: 2,655 gpm
	High Pressure Pump	16 duty, 2 standby	Design Flow: 1,264 gpm
	Booster Pump	16 duty, 2 standby	Design Flow: 1,238 gpm
	Reverse Osmosis Membrane Trains	16 duty, 2 standby	Surface Area: 440 sf; 560 modules per rack
	Pressure Exchanger	16 duty, 2 standby	Design Flow: 1,239 gpm
	Anti-Scalant System	2	15-Day Storage: 110 gallons
	CIP Tank	2	Volume: 6,000 gallons 11' 10" Diameter x 13' 3" Height
	CIP Pump	2 duty, 2 standby	Design Flow: 3,220 gpm
	CIP Bag Filter	2 duty, 2 standby	Nominal Micron Rating: 5 µm
	Flush Tank	2	Volume: 6,000 gallons 11' 10" Diameter x 13' 3" Height

	Neutralization Tank	2	Volume: 15,000 gallons 12' 0" Diameter
Post-Treatment	CO_2 Tank	4	Volume: 4,280 gallons ; 7' 4" Diameter x 20' Length
	Calcite Contactors	8	Volume: 5,224 cf 12' Diameter x 45' Length
Ground Storage Tank	Ground Storage Tank	4	Volume: 7.6 MG 166' Diameter x 47' Height
High Service Pump Station	High Service Pump Station Pump	5 on duty, 1 standby	Design Flow: 3,820 gpm
Chemical Storage and Feed Systems	Ferric Sulfate Metering Pump	5 on duty, 1 standby	Design Flow: 14.06 gph
	Ferric Sulfate Bulk Storage Tank	5	Volume: 6,000 gallons 10' Diameter x 10' 6" Height
	Polymer Coagulant Polymer Activating Unit	5 on duty, 1 standby	Design Feed Rate: 2.70 gph
	Polymer Coagulant Bulk Storage Tank	5	Volume: 1,000 gallons 6' Diameter x 5' Height
	Sodium Hypochlorite Metering Pump	5 on duty, 5 standby	Design Flow: 7.64 gph
	Sodium Hypochlorite Bulk Storage Tank	5	Volume: 2,000 gallons 7' Diameter x 7' Height
	Liquid Ammonia Sulfate Metering Pump	5 on duty, 5 standby	Design Flow: 2.69 gph
	Liquid Ammonia Sulfate Bulk Storage Tank	5	Volume: 750 gallons 5' Diameter x 5' 6" Height
	Caustic Metering Pump	5 on duty, 5 standby	Design Flow: 2.58 gph
	Caustic Bulk Storage Tank	5	Volume: 1,000 gallons 5' Diameter x 7' Height
Solids and Residual Liquid Handling System	Gravity Thickener	5	32' Diameter x 13' SWD
	Sludge Dewatering Feed Pump	5 on duty, 2 standby	Design Flow: 12 gpm
	Sludge Dewatering Centrifuge	5 on duty, 2 standby	Design Capacity: 12 gpm
Outfall 001	Man-made Canal		N/A

Tab 19



NOTES:

1. RO SECOND PASS IS OPTIONAL.
2. FLOWS SHOWN REPRESENT AVERAGE DAILY FLOWS. DESIGN FOR INDIVIDUAL PROCESSES WILL CONSIDER INSTANTANEOUS FLOW AS APPLICABLE.
3. BLENDING RATIO FOR RO REJECT = 1:1.

LEGEND:

- LIQUID FLOW
- RESIDUAL SOLIDS
- BACKWASH WASTE STREAM, DRAIN, AND WASTE STREAM

WATER BALANCE

FORWARD FLOW

DESCRIPTION	STREAM NUMBER	1	2	3	4	5	6	7	8	9	10	11
LOCATION	DESCRIPTION	SEAWATER INTAKE	FEED WATER TO DAF PRETREATMENT	FEED TO HIGH RATE CLARIFIER PRETREATMENT	FEED TO MF STRAINER	FEED TO MF	MF PERMEATE (FEED TO RO)	FEED WATER TO HP PUMPS	FEED TO ERD UNITS	ERD UNITS TO RO FEED	HP PUMP DISCHARGE	FEED TO 1ST PASS RO MEMBRANES
FLOW	MGD	86.89	58.74	58.12	58.09	57.51	54.64	27.27	27.27	27.27	27.27	54.53
FLOW	GPM	60,342	40,795	40,362	40,342	39,939	37,942	18,935	18,935	18,935	18,935	37,871
SOLIDS	PPD											
SOLIDS %	%											
PRESSURE	PSIG						30	30	30	606	641	641
TOTAL DISSOLVED SOLIDS	MG/L	26,573	26,573	26,573	26,573	26,573	26,573	26,573	26,573	27,411	26,573	26,623

FORWARD FLOW

DESCRIPTION	STREAM NUMBER	12	13	14	15	16	17	18	19	20	21	22	23	24	25
LOCATION	DESCRIPTION	1ST PASS FRONT PERMEATE	RO 1ST PASS REAR PERMEATE	RO 1ST PASS REJECT	ERD LOW PRESSURE OUTLET	2ND PASS PUMP DISCHARGE	2ND PASS PERMEATE	2ND PASS REJECT	RO SYSTEM PERMEATE	CALCITE CONTACTOR DISCHARGE	FEED WATER TO GST	PRODUCT WATER TO DISTRIBUTION SYSTEM	COMBINED REJECT	DISCHARGE TO OUTFALL	RAW WATER TO BLEND RO REJECT
FLOW	MGD	21.84	5.48	27.28	27.28	5.48	4.66	0.82	26.50	26.50	26.50	26.50	28.15	32.24	28.15
FLOW	GPM	15,167	3,808	18,944	18,944	3,806	3,236	571	18,404	18,403	18,403	18,403	19,548	22,389	19,548
SOLIDS															
SOLIDS %															
PRESSURE	PSIG	30	14	615	42	99	30	80	30	15	15	80	42	ATM	TBD
TOTAL DISSOLVED SOLIDS	MG/L	89.12	323.50	53,082	53,009	323.50	13.54	2,080	75.82	209.56	209.56	209.56	51,504	48,340	26,573

RESIDUAL HANDLING

DESCRIPTION	STREAM NUMBER	26	27	28	29	30	31	32	33	34	38
LOCATION	DESCRIPTION	DAF SLUDGE	HIGH RATE CLARIFIER SLUDGE	MF STRAINER BACKWASH WASTE	MF BACKWASH WASTE	GRAVITY SLUDGE THICKENER FEED	GRAVITY SLUDGE THICKENER THICKENED SLUDGE	GRAVITY SLUDGE THICKENER SUPERNATANT	DEWATERED SLUDGE	CENTRIFUGE SUPERNATANT	RESIDUAL LIQUID
FLOW	MGD	0.623	0.029	0.581	2.876	0.652	0.057	0.595	0.017	0.040	4.091
FLOW	GPM	432	20	403	1,997	453	40	412.90	12	27.85	2,841
SOLIDS	PPD	26,040	1,212			27,251	24,526	2,725	23,300	1,226	3,951
SOLIDS%	%	0.50%	0.50%				5.0%		15.0%		
PRESSURE	PSIG	TBD	TBD	ATM	ATM	TBD	TBD	ATM	ATM	ATM	ATM
TOTAL DISSOLVED SOLIDS	MG/L	26,573	26,573	26,573	26,573	26,573	26,573	26,573	26,573	26,573	26,573

ARDURRA
3115 Allen Parkway, Suite 300
Houston, TX 77019
TBPE Firm Registration No. F-10053

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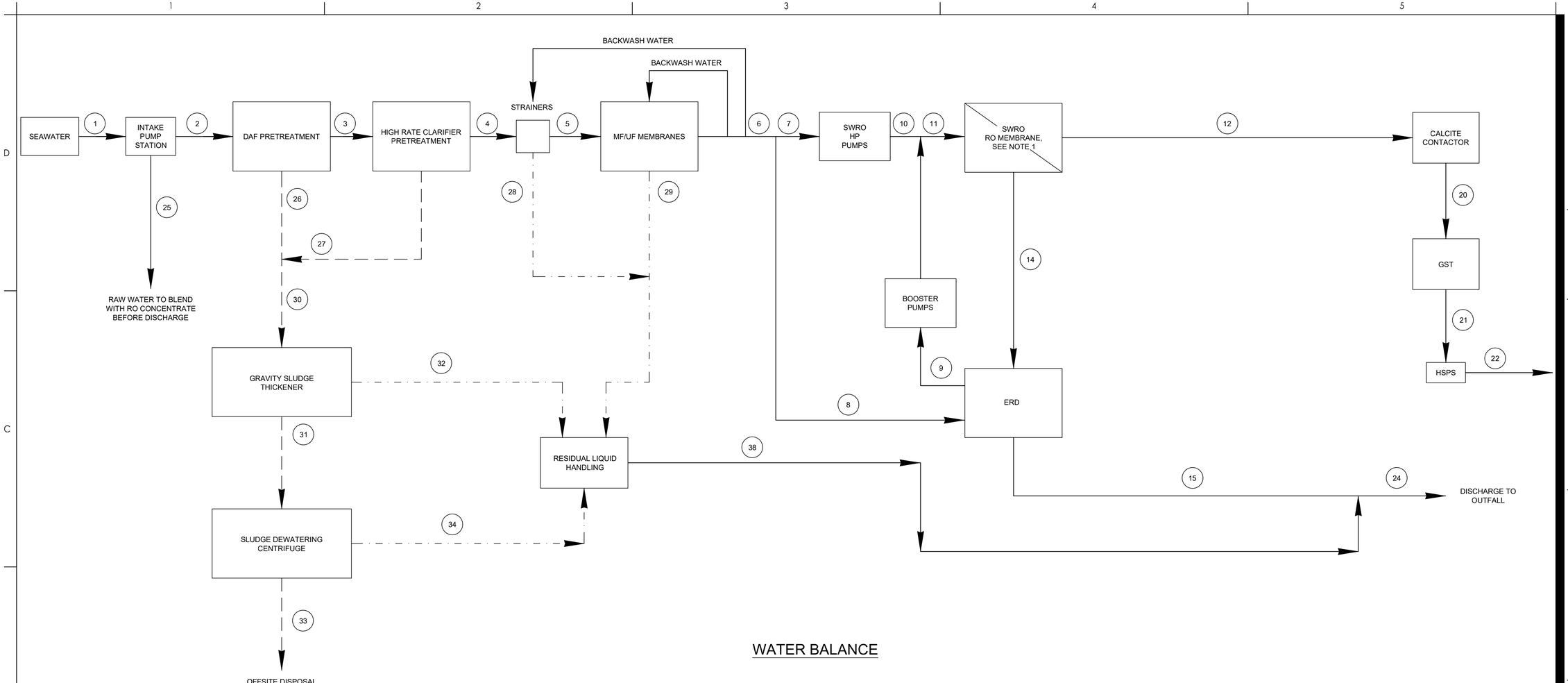
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WATER BALANCE BLOCK DIAGRAM

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Drawing No.

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NOTES:

1. RO SINGLE PASS.
2. FLOWS SHOWN REPRESENT AVERAGE DAILY FLOWS. DESIGN FOR INDIVIDUAL PROCESSES WILL CONSIDER INSTANTANEOUS FLOW AS APPLICABLE.
3. BLENDING RATIO FOR RO REJECT = 1:1.

LEGEND:

LIQUID FLOW

RESIDUAL SOLIDS

BACKWASH WASTE STREAM, DRAIN, AND WASTE STREAM

WATER BALANCE

FORWARD FLOW

DESCRIPTION	STREAM NUMBER	1	2	3	4	5	6	7	8	9	10	11
LOCATION	DESCRIPTION	SEAWATER INTAKE	FEED WATER TO DAF PRETREATMENT	FEED TO HIGH RATE CLARIFIER PRETREATMENT	FEED TO MF STRAINER	FEED TO MF	MF PERMEATE (FEED TO RO)	FEED WATER TO HP PUMPS	FEED TO ERD UNITS	ERD UNITS TO RO FEED	HP PUMP DISCHARGE	FEED TO RO MEMBRANES
FLOW	MGD	86.85	58.74	58.12	58.09	57.51	54.64	27.27	27.27	27.27	27.27	54.53
FLOW	GPM	60,309	40,795	40,362	40,342	39,939	37,942	18,935	18,935	18,935	18,935	37,871
SOLIDS	PPD											
SOLIDS %	%											
PRESSURE	PSIG						30	30	30	606	663.10	663.10
TOTAL DISSOLVED SOLIDS	MG/L	26,573	26,573	26,573	26,573	26,573	26,753	26,573	26,573	27,411	26,573	26,625

FORWARD FLOW

DESCRIPTION	STREAM NUMBER	12	13	14	15	16	17	18	19	20	21	22	23	24	25
LOCATION	DESCRIPTION	RO PERMEATE	NOT USED	RO REJECT	ERD LOW PRESSURE OUTLET	NOT USED	NOT USED	NOT USED	NOT USED	CALCITE CONTACTOR DISCHARGE	FEED WATER TO GST	PRODUCT WATER TO DISTRIBUTION SYSTEM	NOT USED	DISCHARGE TO OUTFALL	RAW WATER TO BLEND RO REJECT
FLOW	MGD	26.50	N/A	28.10	28.10	N/A	N/A	N/A	N/A	26.50	26.50	26.50	N/A	32.19	28.10
FLOW	GPM	18,404	N/A	19,515	19,515	N/A	N/A	N/A	N/A	18,403	18,403	18,403	N/A	22,356	19,515
SOLIDS															
SOLIDS %															
PRESSURE	PSIG	30	N/A	641	42	N/A	N/A	N/A	N/A	15	15	80	N/A	ATM	TBD
TOTAL DISSOLVED SOLIDS	MG/L	105.50	N/A	51,567	51,567	N/A	N/A	N/A	N/A	209.56	209.56	209.56	N/A	48,391	26,573

RESIDUAL HANDLING

DESCRIPTION	STREAM NUMBER	26	27	28	29	30	31	32	33	34	38
LOCATION	DESCRIPTION	DAF SLUDGE	HIGH RATE CLARIFIER SLUDGE	MF STRAINER BACKWASH WASTE	MF BACKWASH WASTE	GRAVITY SLUDGE THICKENER FEED	GRAVITY SLUDGE THICKENER THICKENED SLUDGE	GRAVITY SLUDGE THICKENER SUPERNATANT	DEWATERED SLUDGE	CENTRIFUGE SUPERNATANT	RESIDUAL LIQUID
FLOW	MGD	0.623	0.029	0.581	2.876	0.652	0.057	0.595	0.017	0.040	4.091
FLOW	GPM	432	20	403	1,997	453	40	412.90	12	27.85	2,841
SOLIDS	PPD	26,040	1,212			27,251	24,526	2,725	23,300	1,226	3,951
SOLIDS%	%	0.50%	0.50%				5.0%		15.0%		
PRESSURE	PSIG	TBD	TBD	ATM	ATM	TBD	TBD	ATM	ATM	ATM	ATM
TOTAL DISSOLVED SOLIDS	MG/L	26,573	26,573	26,573	26,573	26,573	26,573	26,573	26,573	26,573	26,573

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WATER BALANCE BLOCK DIAGRAM

Revision: Sheet: of

Drawing No.

000-PR-002

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Tab 20

Modeling brine salinity from a proposed seawater desalination facility in Galveston Bay

Report prepared by
Jiabi Du, Ph.D.

Department of Marine and Coastal Environmental Sciences
College of Marine Sciences & Maritime Studies
Texas A&M University, Galveston, TX 77554

August 2025

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LIST OF FIGURES/TABLES ..... **III**

PROJECT SUMMARY **1**

1. INTRODUCTION **3**

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Project Summary

Before developing the proposed Bayshore Desalination Facility in Texas City, Texas, EPCOR requested Texas A&M University at Galveston to assess the impact of brine water discharge on the salinity near the outflow location and of the entire Galveston Bay. Salinity is a fundamental water quality parameter that can determine how this project may impact the ecosystem.

Objective 1: Conduct numerical simulations for a base case (without brine discharge) and a scenario case (intake of 82.8 million gallons/day from Dickinson Bayou and discharge of 56.3 million gallons/day near Bayshore Park) using a reliable high-resolution ocean model to examine how salinity near the outflow area is affected.

Key Findings: Within 1 km of the tidal dam that connects the discharge channel to the bay, mean surface salinity increases by approximately 0.12 ppt, with the impact diminishing rapidly offshore. Within the discharge channel itself, salinity can increase by up to 5 ppt. The intake/discharge scheme can also be interpreted as a net reduction of approximately 26.5 MGD (or 1.39 m^3/s) of freshwater to the system. When compared to the total freshwater inflow into Galveston Bay—typically ~300 m^3/s from the San Jacinto River, Trinity River, and Buffalo Bayou (Marshall and Montagna, 2025)—this reduction is unlikely to significantly alter bay-wide salinity patterns.

A notable and somewhat unexpected finding is that the salinity impact is more pronounced near the intake channel (close to Dickinson Bayou) than near the discharge location, with salinity increasing by 0–1 ppt in Dickinson Bayou near the intake channel when averaged over a two-year simulation period (2018–2019). This is dynamically reasonable, as the intake channel acts as a sink, enhancing the landward movement of high-salinity seawater from the bay into Dickinson Bayou.

The salinity impact from brine discharge can also be negative, depending on the difference between the intake salinity and the ambient salinity at the discharge location. For example, when intake salinity is low (e.g., after a freshwater pulse into Dickinson Bayou), the discharged brine may be less saline than nearby bay water, thereby reducing salinity at the discharge site..

Objective 2: Examine how brine discharge will affect the salinity stratification and its potential impact on dissolved oxygen conditions.

Key Findings: Brine discharge can substantially increase the percentage of time with continuous stratification (defined as a surface–bottom salinity difference > 2 ppt sustained for over 24 hours) in the nearshore region. Within 1 km of the tidal dam, the percentage of time with continuous stratification can increase by up to 30%. This elevated stratification is primarily induced by density flow as denser brine water moves downslope along the bottom. However, the denser brine water also contains high levels of dissolved oxygen, making it unlikely that brine discharge will significantly impact the nearshore dissolved oxygen concentration. Similar to its effect on salinity, the impact of brine discharge on stratification decreases rapidly beyond 1 km from the tidal dam.

1. Introduction

EPCOR is conducting a development and feasibility assessment to potentially build and operate the Bayshore Desalination Facility in Texas City, TX. To evaluate the potential impacts of desalination on water quality and the ecosystem, EPCOR has requested Texas A&M University at Galveston (TAMUG) assess the effects of the proposed brine discharge on salinity levels near the desalination site and throughout the entire bay. Brine discharge is expected to influence salinity in the vicinity of the outfall location. The extent of this impact depends on the discharge rate, physical/thermodynamic characteristics of the brine, and how quickly it is diluted and dispersed into the surrounding coastal waters.

To accurately assess the effect of brine discharge on receiving waters, we used a well-calibrated hydrodynamic model (Du et al., 2019) and completed the following tasks:

1) Upgraded the model grid to better represent the seawater intake channel and the shoreline near the discharge location.
2) Validated the model by comparing the baseline simulation (without brine discharge) to observations of water level and salinity.
3) Conducted a scenario simulation that included an intake of 82.8 million gallons per day and a discharge of 56.3 million gallons per day of diluted brine.
4) Analyzed the differences between the baseline and scenario simulations, focusing on changes in salinity near the discharge site and across the bay.
5) Assessed the impact of brine discharge on salinity stratification, specifically the frequency and duration of events where the bottom-to-surface salinity difference exceeds 2 ppt for more than 24 hours.

In this report, we describe the model setup, demonstrate its reliability, and present results on the salinity impacts of the proposed brine discharge.

2. Methods

2.1 Numerical model

In this study, we employed the **S**emi-implicit **C**ross-scale **H**ydroscience **I**ntegrated **S**ystem **M**odel (SCHISM; Zhang et al., 2015, 2016), an open-source, community-supported modeling system based on unstructured grids and derived from the earlier SELFE model (Zhang and Baptista, 2008). SCHISM uses a highly efficient semi-implicit finite-element/finite-volume method with a Eulerian–Lagrangian algorithm to solve the turbulence-averaged Navier–Stokes equations under the hydrostatic and Boussinesq approximations. For turbulence closure, it uses the generic length-scale model of Umlauf and Burchard (2003) along with the stability function of Kantha and Clayson (1994). One of the major advantages of SCHISM is its flexible vertical grid system, which robustly and accurately resolves complex topography in estuarine and oceanic systems without the need for smoothing (Zhang et al., 2016; Du et al., 2018; Ye et al., 2018).

The model has been applied globally (see examples at: https://ccrm.vims.edu/schismweb/). The modeling team at TAMUG has been developing model applications for the northern Gulf of Mexico since 2017 and has validated and applied the model in multiple studies (Du et al., 2019; Du and Park, 2019; Du et al., 2020; Summers et al., 2023; Hua et al., 2025). SCHISM has demonstrated high reliability in simulating water level, salinity, temperature, and ocean circulation in coastal bays and across the Texas–Louisiana shelf under both typical conditions and extreme weather events. Recently, the model has also been adopted by the Texas Water Development Board for short-term forecasting in their daily operation (https://midgewater.twdb.texas.gov/index.html).

2.2 Model grid

The hydrodynamic model used in this study is largely based on the configuration presented in Du et al. (2019), where the model domain covers the entire Texas, Louisiana, Mississippi, and Alabama coasts (Fig. 1a). However, the original setup lacked fine resolution for coastal bays other than Galveston Bay. To address this limitation, we upgraded the model mesh by:

1) Resolving geometric and bathymetric features such as deep and narrow ship channels present in all major coastal bays along the northern Gulf of Mexico;
2) Extending the model domain approximately 100 km farther south (the previous southern boundary was near the U.S.–Mexico border);
3) Refining the resolution in the deep Gulf from 10 km to 5 km to better capture shelf-wide circulations (Hua et al., 2025); and
4) Including additional coastal bays, such as Perdido and Pensacola bays in the Florida Panhandle.

Mesh resolution was improved for all 13 major coastal bays, including (from west to east): Lower Laguna Madre, Upper Laguna Madre, Corpus Christi Bay, Mission–Aransas Estuary, San Antonio Bay, Matagorda Bay, East Matagorda Bay, Galveston Bay, Sabine Lake, Calcasieu Lake, Mobile Bay, Perdido Bay, and Pensacola Bay (Fig. 1a). The grid resolution ranges from 10 meters in small creeks and tidal channels to an average of 2.5 km over the continental shelf and 5 km in the open ocean.

For Galveston Bay, the model grid accurately resolves ship channels and major rivers (Fig. 1b, 1c). A hybrid grid, combining rectangular and triangular elements, was used to enhance computational performance and more accurately represent salt transport along major channels. Well resolving the deep but narrow ship channel is vitally important for salt intrusion simulation.

To examine the impact of brine discharge from the proposed desalination facility, we further refined the grid by:

1) Explicitly resolving the intake and discharge channels near the desalination facility; and
2) Reducing grid size in the vicinity of the intake and discharge points (Fig. 2). Finer resolution near the discharge location ensures smoother transitions between small grids in the channels and coarser grids along the bay's shoreline, improving the simulation of salinity in that region.

The updated model grid consists of 129,157 grid nodes and 214,080 grid elements. An *element* refers to a basic computational unit (e.g., a triangle or rectangle) over which governing equations

(e.g., for fluid flow, temperature, or salinity) are solved. *Grid nodes* are the vertices that define the boundaries of these elements.

Vertically, we implemented the Localized Sigma Coordinates with Shaved Cells (LSC^2), a hybrid vertical coordinate system, instead of the hybrid s–z grid used in Du et al. (2019). Unlike traditional sigma grids, which use a fixed number of layers regardless of depth, LSC^2 dynamically adjusts the number of layers based on local bathymetry. This leads to improved computational efficiency, especially in coastal systems with extensive shallow regions (Zhang et al., 2015; Ye et al., 2020). LSC^2 is particularly effective in handling sharp bathymetric features, such as the narrow (~100–200 m wide) but deep (~15 m) ship channels common in northern Gulf coastal bays. For example, in the Houston Ship Channel, the model includes approximately 27 vertical layers, while in shallow shoals, it uses about 10 layers.

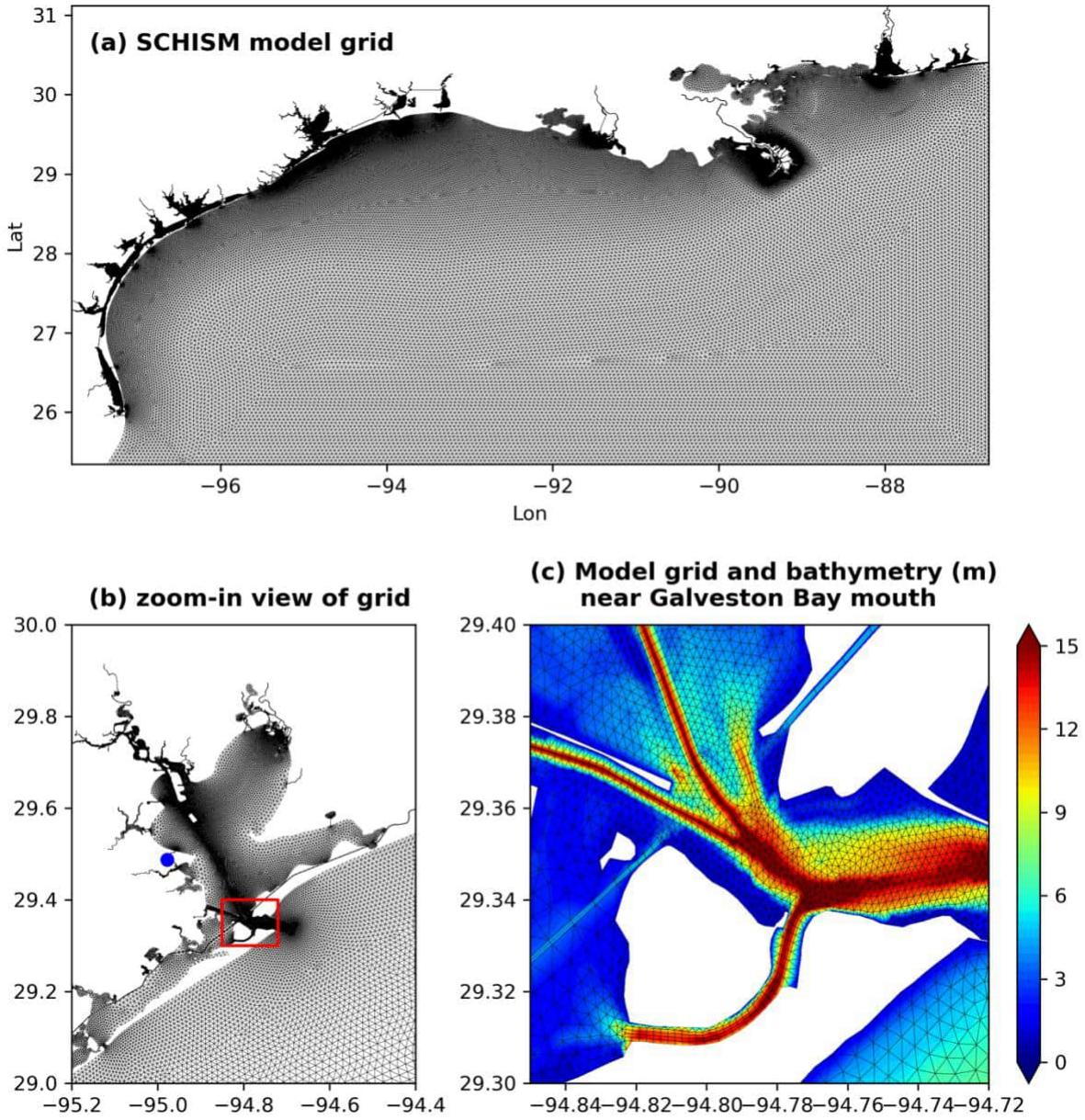


Figure 1: (a) Horizontal model grid; (b) zoom-in view of the model grid for Galveston Bay, with blue dot indicating the intake location; (c) zoom-in view of the model grid near the bay mouth, with bathymetry indicated by color.

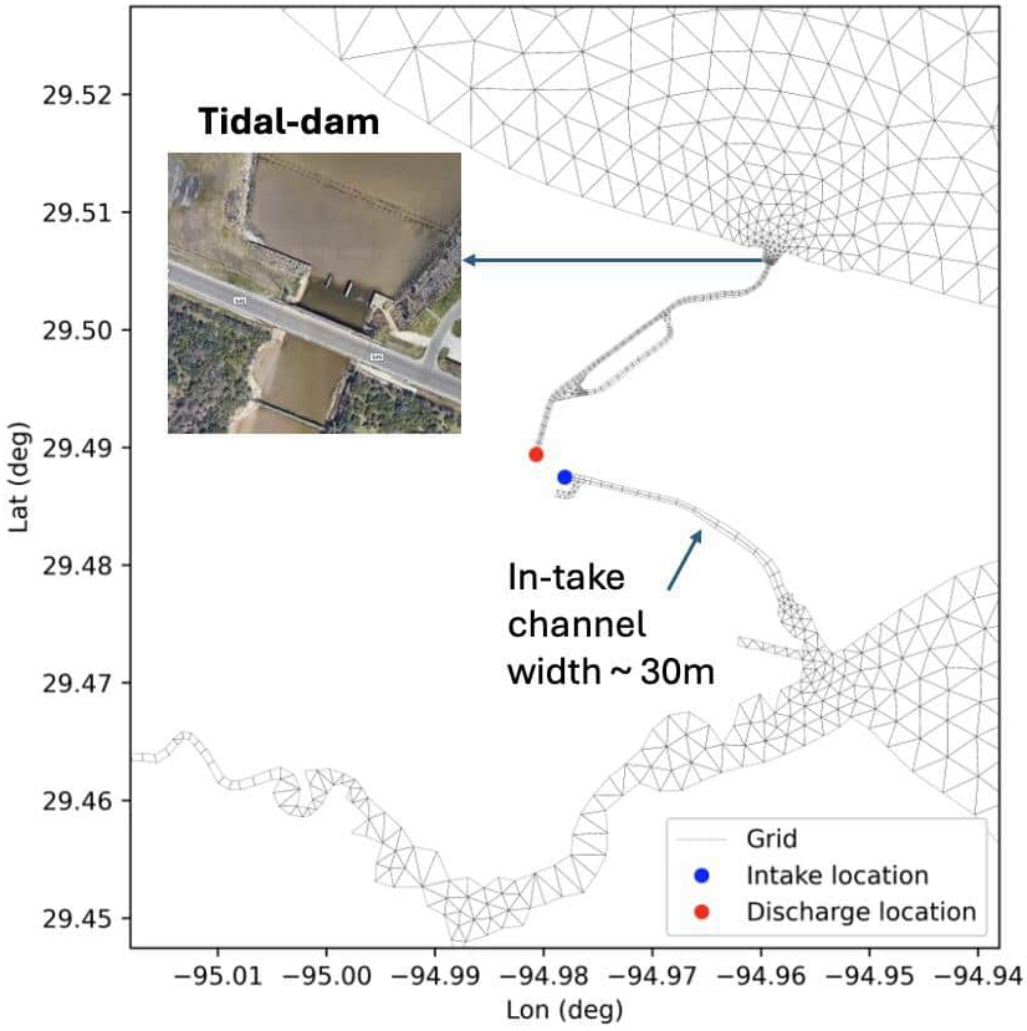


Figure 2: Zoom-in view of the model grid near the proposed desalination plant. Blue and red dots indicate the intake and discharge locations, respectively.

2.3 Model bathymetry

Bathymetric data from two primary sources were used: ETOPO1 (1 arc-minute global relief model, developed by the National Geophysical Data Center; https://www.ncei.noaa.gov/products/etopo-global-relief-model) and CUDEM (1/9 arc-second Continuously Updated Digital Elevation Model, maintained by NOAA; https://chs.coast.noaa.gov/htdata/raster2/elevation/NCEI_ninth_Topobathy_2014_8483).

ETOPO1 is primarily used for representing the continental shelf and deep Gulf, while CUDEM, with its finer resolution (~3 meters), is employed in nearshore areas and coastal bays. The high resolution of CUDEM allows the model to resolve fine-scale bathymetric features, including narrow ship channels.

2.4 Model input forcings

To drive the model, several input forcings are incorporated, including: 1) freshwater discharge at major rivers; 2) atmospheric forcings, such as solar radiation, precipitation, wind, air temperature, and surface pressure; and 3) open boundary conditions for water level, temperature, salinity, and velocity along the southern and eastern boundaries of the model domain.

River discharge at 29 locations is derived from USGS gauging data. The river names and discharge locations are provided in Table 1. For Galveston Bay, the major contributing rivers include Buffalo Bayou, Chocolate Bayou, San Jacinto River, Trinity River, Clear Creek, and Dickinson Bayou.

Atmospheric forcing is derived from the North American Regional Reanalysis (NARR; https://psl.noaa.gov/data/gridded/data.narr.html) produced by the National Centers for Environmental Prediction (NCEP). NARR provides data at ~32 km spatial resolution with a 3-hour temporal interval.

At the open boundary, water level is specified separately for tidal and subtidal components. The tidal component is derived from the global tidal product FES2014 (Carrere et al., 2015) and includes eight tidal constituents: O1, K1, Q1, P1, M2, S2, K2, and N2. Among these, the diurnal tides (O1 and K1) are dominant in the model domain, with significantly larger amplitudes compared to semidiurnal constituents (M2 and S2). The subtidal component is derived from a low-pass filtered version (with a cutoff period of 50 hours) of the HYCOM 3-hourly global water level product (https://www.hycom.org). Although the northern Gulf is generally classified as a microtidal regime, tides still play a critical role in estuarine transport and mixing processes.

Subtidal temperature, salinity, and velocity are also specified at the open boundary using HYCOM output. In addition, a temperature and salinity nudging scheme is applied along the

boundary to prevent the model from drifting away from prescribed values (Chen et al., 2013). Nudging is particularly useful for stabilizing boundary zones and ensuring consistency when waves or flow propagate outward from the region of interest. A ~50 km-wide nudging zone is used, with stronger nudging (i.e., faster adjustment) closer to the boundary (see Fig. 3).

Table 1: Freshwater input locations at major rivers included in the model.

NO.	River Name	Lon	Lat
1	San Fernando Creek	-97.773	27.401
2	Nueces River	-97.605	27.869
3	Rio Grande	-97.290	25.936
4	Aransas River	-97.284	28.095
5	Mission River	-97.196	28.186
6	Guadalupe River	-96.842	28.468
7	Lavaca River	-96.576	28.870
8	Carancahua Creek	-96.422	28.772
9	Tres Palacios River	-96.147	28.812
10	Colorado River	-96.035	28.862
11	Caney Creek	-95.670	28.829
12	San Bernard River	-95.557	28.951
13	Brazos River	-95.530	29.036
14	Buffalo Bayou	-95.355	29.762
15	Chocolate Bayou	-95.229	29.260
16	San Jancinto River	-95.131	29.918
17	Clear Creek	-95.179	29.520
18	Dickinson Bayou	-95.102	29.430
19	Trinity River	-94.745	29.877
20	Neches River	-94.087	30.103
21	Sabine River	-93.702	30.114
22	Calcasieu River	-93.284	30.200
23	Atchafalaya River	-91.490	30.040
24	Mississippi River	-91.198	30.491
25	Pearl River	-89.638	30.287
26	Alabama River	-87.952	31.115
27	Tombigbee River	-87.952	31.115
28	Fish River	-87.810	30.443
29	Bon Secour River	-87.709	30.319

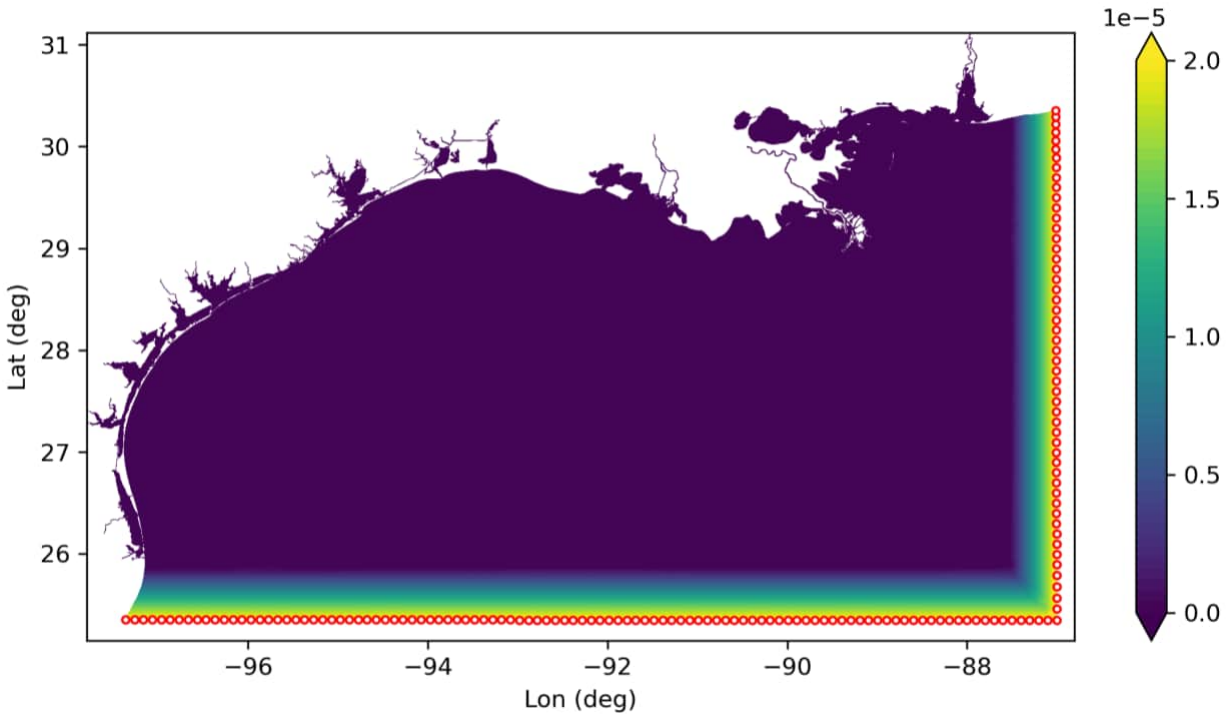


Figure 3: Nudging coefficient (filled color) within the nudging zone. Red open circles mark the open boundary nodes.

2.5 Intake and discharge salinity

After upgrading the model grid, we conducted a base model run covering the period from 2018 to 2019. We chose 2018-2019 because the modelled salinity has been well validated throughout the Galveston Bay for these two years (see model validations in Section 3 and in previous studies including Summers et al., 2024 and Hua et al., 2025). This base run did not include seawater intake or brine water discharge. We extracted salinity values near the proposed intake location. Salinity at the intake location ranged from a maximum of 22 ppt in the summer of 2018 to nearly 0 ppt in May 2019 (approximately day 500 since January 1, 2018; see Fig. 4). These variations were primarily driven by freshwater inflow and wind-driven circulation patterns in the bay and on the shelf. This wide range of salinity provides a valuable opportunity to evaluate the impact of brine discharge under diverse environmental conditions.

Based on the intake salinity, we calculated the salinity of the brine discharge (i.e., the outflow salinity) using a salt balance approach:

$$S_{in}F_{in} = S_{out}F_{out} \quad (1)$$

Or

$$S_{out} = S_{in}\frac{F_{in}}{F_{out}} \quad (2)$$

Where S_{in} is the intake salinity, S_{out} is the outflow (brine) salinity, F_{in} is the intake flow rate, and F_{out} is the outflow rate.

Given a constant intake flow of 82.8 million gallons per day (MGD) and an outflow rate of 56.3 MGD, the outflow salinity is approximately 147% of the intake salinity. Consequently, the brine salinity varies over time and is in phase with the intake salinity. The maximum difference between intake and brine salinity occurs during the summer of 2018, reaching approximately 10 ppt.

We also examined the ambient salinity near the outflow location (green line in Fig. 4) and noted that the brine water salinity could be occasionally smaller than the ambient salinity near outflow location (e.g., around day 340, 500, 620).

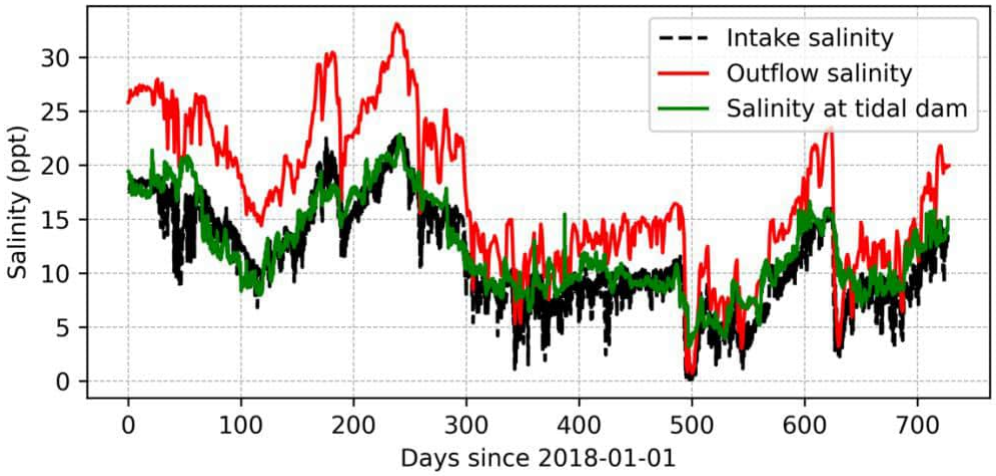


Figure 4: Intake (black) and outflow (red) salinity over the two-year period (2018–2019). Also shown is the modeled salinity at the tidal dam. The outflow salinity is calculated as 147% of the intake salinity.

3 Model calibration

Before applying the model for any numerical experiments, we conducted a thorough validation by comparing model results with observed ocean data to ensure the model accurately reproduces real-world conditions. While model validation has been presented in previous studies (Du et al., 2019; Du and Park, 2019; Summers et al., 2023; Summers et al., 2024; Hua et al., 2025), updates to the model grid—especially improvements to the resolution near the seawater intake and brine discharge channels—necessitate re-evaluation. Below, we present validation results for both water level and salinity within Galveston Bay.

3.1 Water level

Comparisons between modeled and observed water levels at two stations within the bay demonstrate strong model performance. The mean absolute error (MAE) is 0.05 m at both the bay mouth and upper bay stations (Fig. 5). The root mean square error (RMSE) is 0.07 m and 0.06 m, respectively. In coastal ocean modeling, an RMSE below 0.10 m is generally considered indicative of good model performance.

At both stations, the model effectively captures both tidal and subtidal components of water level. Despite the relatively short distance between the bay mouth and upper bay, water levels exhibit spatial variability. Notably, the upper bay station displays distinctly different subtidal variations. For example, around day 42, the upper bay experienced a more pronounced drop in water level compared to the bay mouth, likely due to wind-driven processes. The model's ability to reproduce these differences suggests that both the hydrodynamic model and the atmospheric forcing data are reliable.

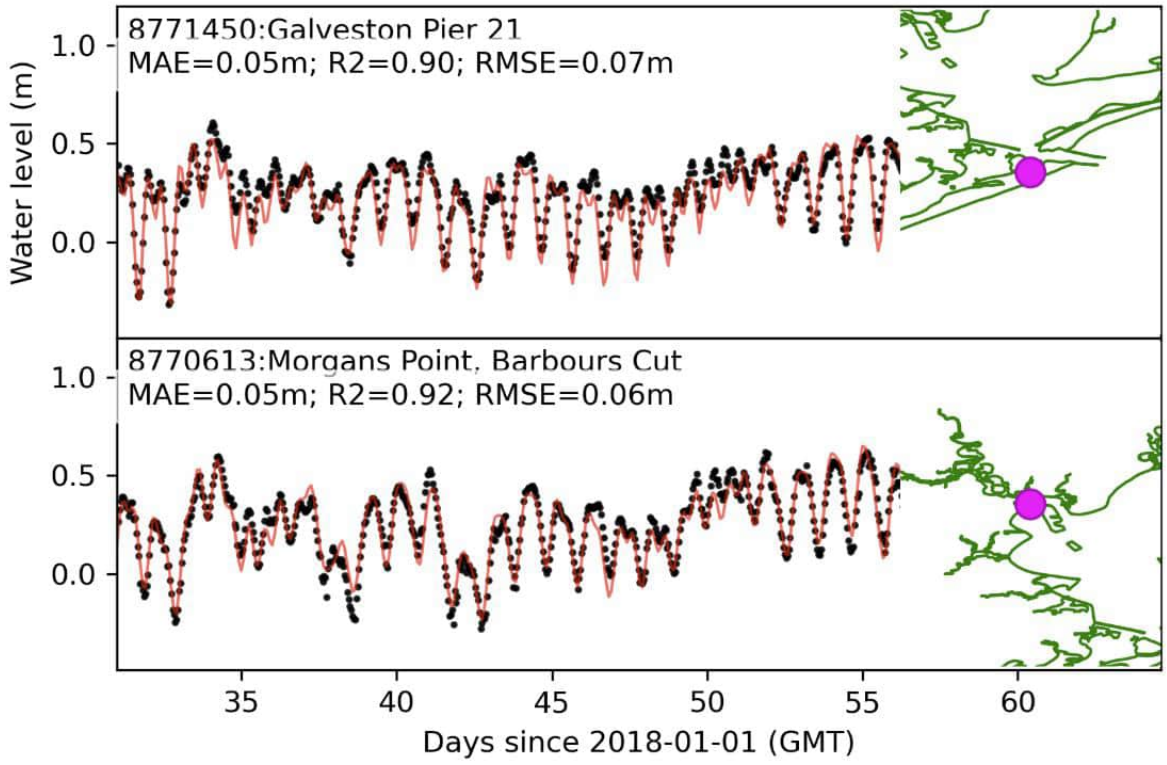


Figure 5: Comparison of water levels between model results and observations. Mean absolute error (MAE), R^2, and root mean square error (RMSE) are shown at the top of each panel. Monitoring station locations are marked with magenta dots in the right subplots. Statistical metrics are based on the full two-year period (2018–2019), though only 25 days are shown in the plot.

3.2 Salinity

Salinity is one of the most critical variables in hydrodynamic modeling of coastal systems. Accurate salinity simulation reflects the model's capability to capture physical transport processes, which are influenced by advection, diffusion, mixing, freshwater inflows, and coastal ocean dynamics.

The model performs particularly well in Galveston Bay (Fig. 6). The mean absolute error in salinity is 2–3 ppt across multiple stations with long-term, high-quality hourly observational data. At the bay mouth, the model accurately reproduces strong salinity variations influenced by both local freshwater inflow and remote freshwater transport along the coast, notably from the Mississippi and Atchafalaya Rivers (Du et al., 2019).

The model also successfully replicates spatial differences in the strength of tidal salinity signals across the bay. Tidal salinity variability is strongest at the bay mouth, weaker in the middle bay, and minimal to negligible in Trinity Bay. This gradient reflects both the salinity distribution and the efficiency of water exchange, with the bay mouth known to have more vigorous tidal exchange compared to the upper bay and Trinity Bay.

In summary, the model demonstrates reliable performance in simulating spatial salinity gradients, temporal variability, and regional differences in tidal influence across Galveston Bay.

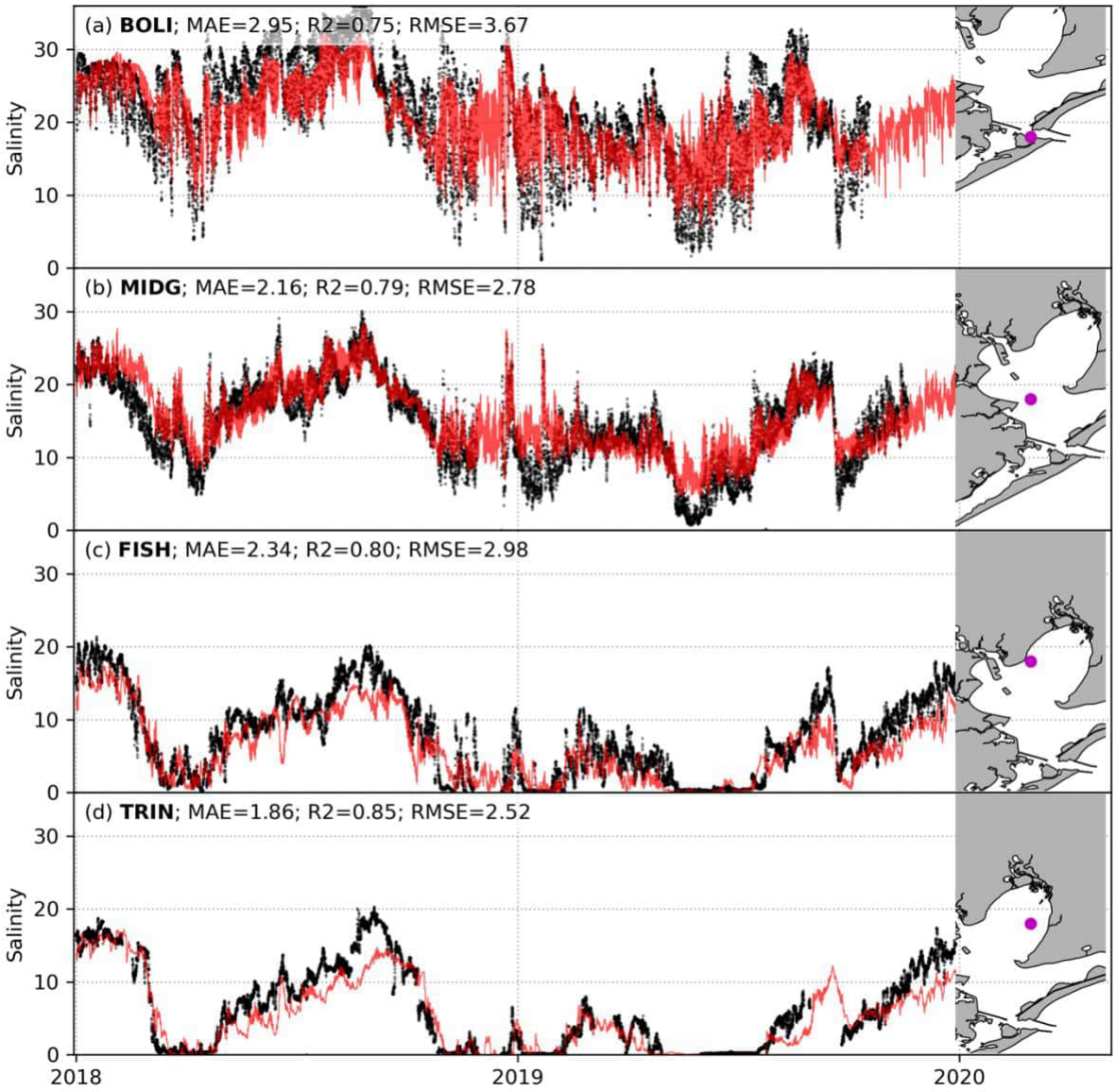


Figure 6: Salinity comparison between model (red) and observation (black) at stations in Galveston Bay. Mean absolute error (MAE), R^2, and RMSE are shown at the top of each panel. Monitoring station locations are marked with magenta dots in the right subplots.

4. Impact of brine discharge on salinity

4.1 Long-term mean

A comparison between surface salinity in the base run and the scenario run (with brine discharge) shows that the impact of brine discharge is most pronounced near the intake and discharge channels (Fig. 7). In other areas of the bay (e.g., Trinity Bay, Upper Galveston Bay, East Bay), the salinity increases slightly—by less than 1 ppt. In contrast, salinity slightly decreases in lower Galveston Bay and in the adjacent inner shelf ocean.

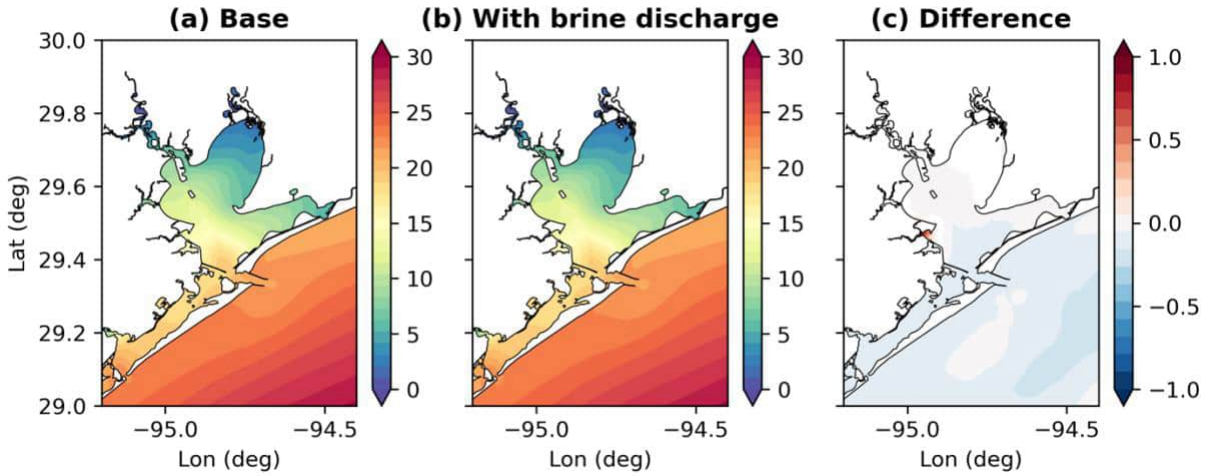


Figure 7: Two-year mean surface salinity from the base run (left panel) and scenario run (middle panel). The right panel shows the difference (scenario minus base), with positive values indicating salinity increase due to brine discharge.

Zooming into the area around the proposed desalination plant (Fig. 8), salinity increases are observed near the tidal dam, with the impact diminishing quickly offshore. A noticeable increase (greater than 0.1 ppt) is confined to a 7 km (along the shore) × 1 km (toward offshore) region around the tidal dam. The impact area extends more toward the northwest than the southeast. Interestingly, the increase is stronger near the intake channel (close to Dickinson Bayou), where salinity increases by at least 0.1 ppt along the entire ~10 km length of the bayou. Within the intake channel itself, salinity increases exceed 1 ppt.

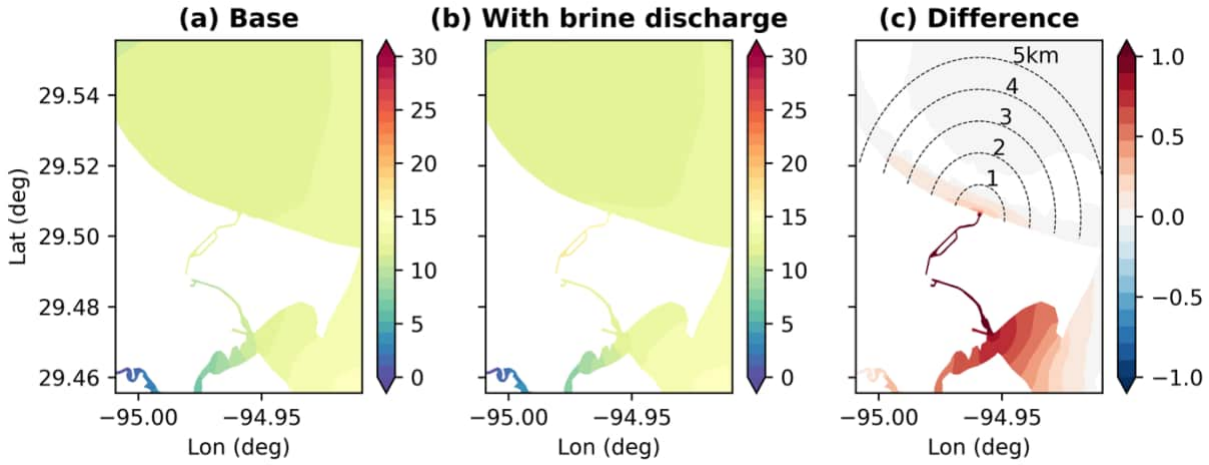


Figure 8: Same as Figure 7 but showing a zoomed-in view of salinity near the desalination plant.

However, the greatest salinity change occurs in the discharge channel, where increases reach up to 5 ppt (Fig. 9), compared to a maximum increase of ~2 ppt in the intake channel. Brine discharged from the proposed desalination plant is rapidly diluted by the larger volume of bay water, resulting in a sharp decline in the salinity impact offshore.

The increase in salinity near the intake channel is due to the water loss caused by the intake mechanism, which behaves like a “sinkhole” drawing in seawater. This promotes increased seawater intrusion into Dickinson Bayou to compensate for the withdrawal, thereby raising salinity. The impact region is larger near the intake channel than near the discharge channel, likely due to the restricted geometry of the bayou compared to the more open outflow area.

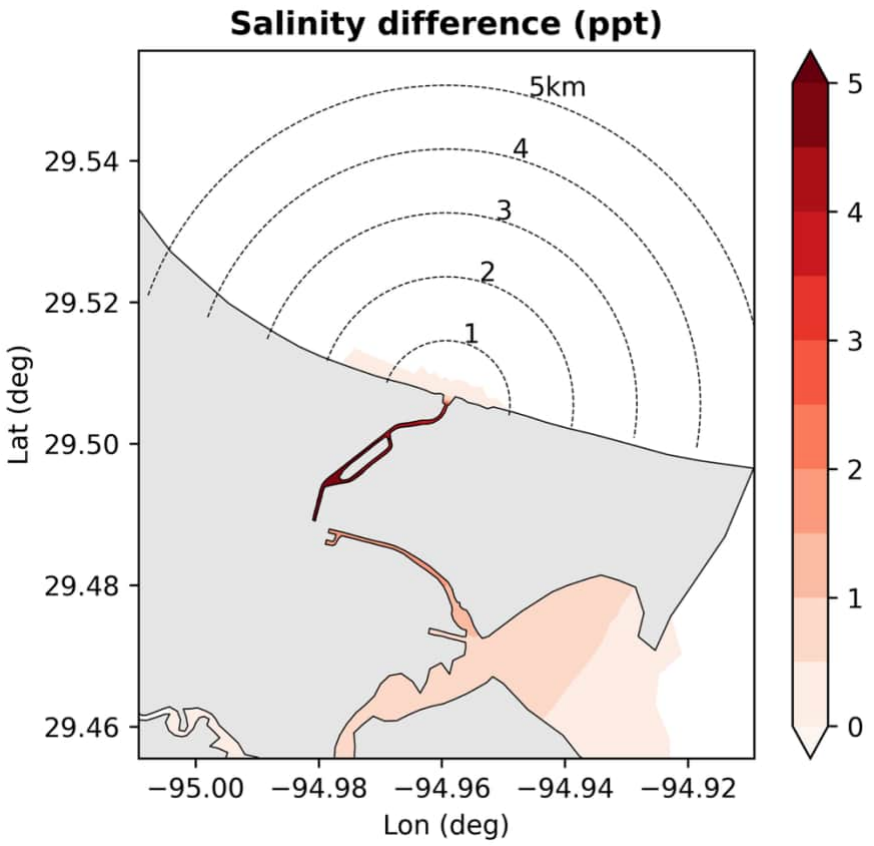


Figure 9: Zoom-in view of the salinity difference (scenario minus base), same as the right panel of Figure 8 but using a different color scale. Differences smaller than 0.1 ppt are shown in white. The color interval is 0.5 ppt. Dashed curves indicate radii from 1 to 5 km centered at the tidal dam.

4.2 Time series over different distances from the discharge location

To further assess the temporal behavior of salinity impact, we examined the time series of salinity differences (scenario run minus base run) averaged over different radii (1–10 km) from the tidal dam (i.e., mouth of the outflow channel). As illustrated in Fig. 10, we excluded the discharge channel from the analysis to focus on offshore impacts. For each day and radius, we computed the daily mean salinity difference and then averaged it over the given area. The resulting time series for the two-year simulation is shown in Fig. 11.

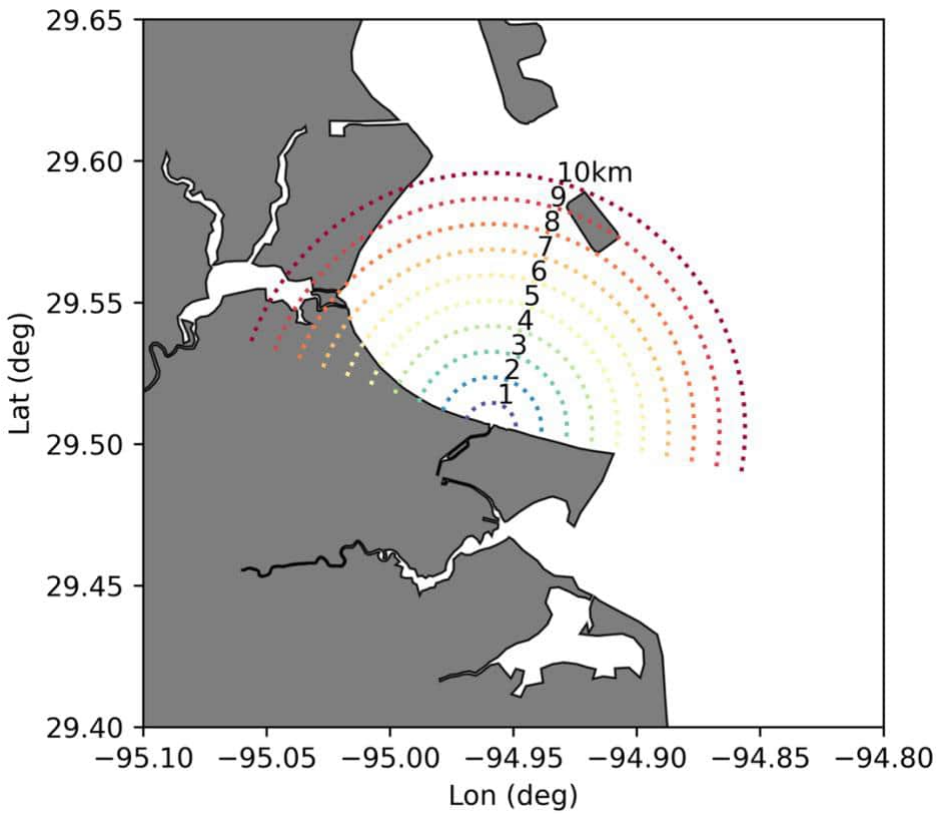


Figure 10: Regions within different radii (1–10 km) used for calculating regional mean salinity difference between the two model runs.

As expected, salinity increases are greater closer to the shoreline. For example, within a 1 km radius, the salinity increase can occasionally reach 1.25 ppt (Figs. 11 and Fig. 12). However, this level of increase is rare. On average, over the two-year period, the mean salinity increase within the 1 km radius is 0.12 ppt.

Interestingly, negative salinity impacts (i.e., scenario run salinity lower than base run) are also observed. In the latter half of the simulation (2019), multiple prolonged periods show negative salinity differences, such as between days 500–600. This occurs when the ambient salinity near the intake is significantly lower than that at the discharge site. As shown in Fig. 4, salinity at the intake (black line) and at the tidal dam (green line) are nearly identical under normal conditions. Since the brine has 147% of the intake salinity, it has higher salinity than the ambient discharge

location. However, for example, around day 500, the intake salinity drops to near 0 ppt, making the salinity of the discharged brine less than the surrounding bay water near the tidal dam. Effectively, the system behaves as though it is extracting freshwater from Dickinson Bay and releasing it near the shoreline—causing a local freshening.

This negative salinity impact accumulates. Starting around day 500, salinity differences decline sharply until day 530, then gradually increase. Similar negative events also occur around days 360, 600, and 700. These events are driven by differing hydrologic responses to freshwater pulses or rainfall in the small, enclosed Dickinson Bayou compared to the larger bay system. Small tidal creeks and bayous like Dickinson respond more sharply to precipitation events, leading to rapid salinity drops.

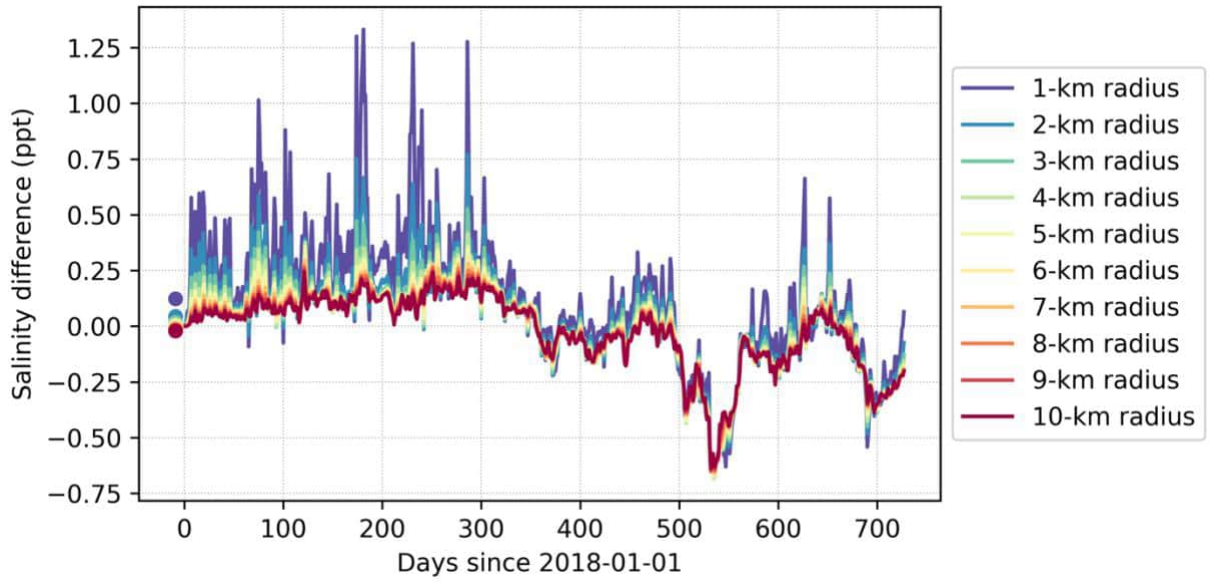


Figure 11: Time series of salinity difference (scenario minus base) averaged over different radii. Colored lines represent different averaging radii. Long-term mean differences are indicated by colored dots at the left of the plot.

To further understand the variability, we analyzed the distribution of regional salinity differences using violin plots. These plots display the maximum, minimum, median, and interquartile ranges. The median salinity difference decreases with distance—from the 1-km to the 10-km radius.

While most values are positive, negative impacts as large as −0.7 ppt are also seen. Notably, maximum positive impacts decline substantially with distance, whereas minimum (i.e., negative) impacts remain relatively consistent across radii.

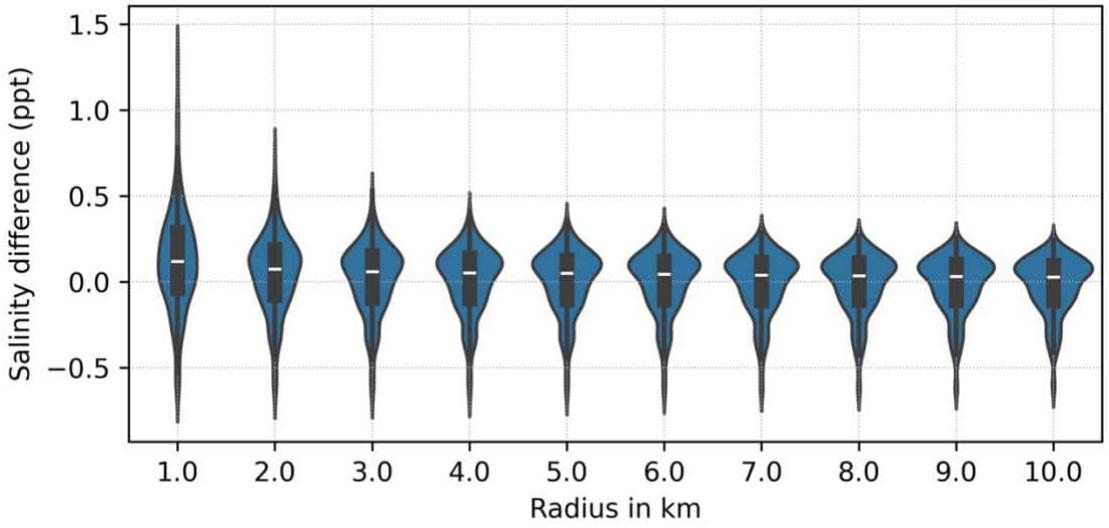


Figure 12: Violin plot showing the distribution of regional mean salinity differences due to brine discharge. The white bar marks the median, the black rectangle shows the interquartile range, the vertical line indicates the full range, and the outer shape illustrates the data distribution.

We also investigated finer-scale impacts using radii from 100 m to 1000 m (0.1–1 km), shown in Figs. 13 and Fig. 14. The pattern is consistent with the larger-radius analysis but with stronger impacts. For example, at a 100-m radius, salinity increases can reach up to 6 ppt.

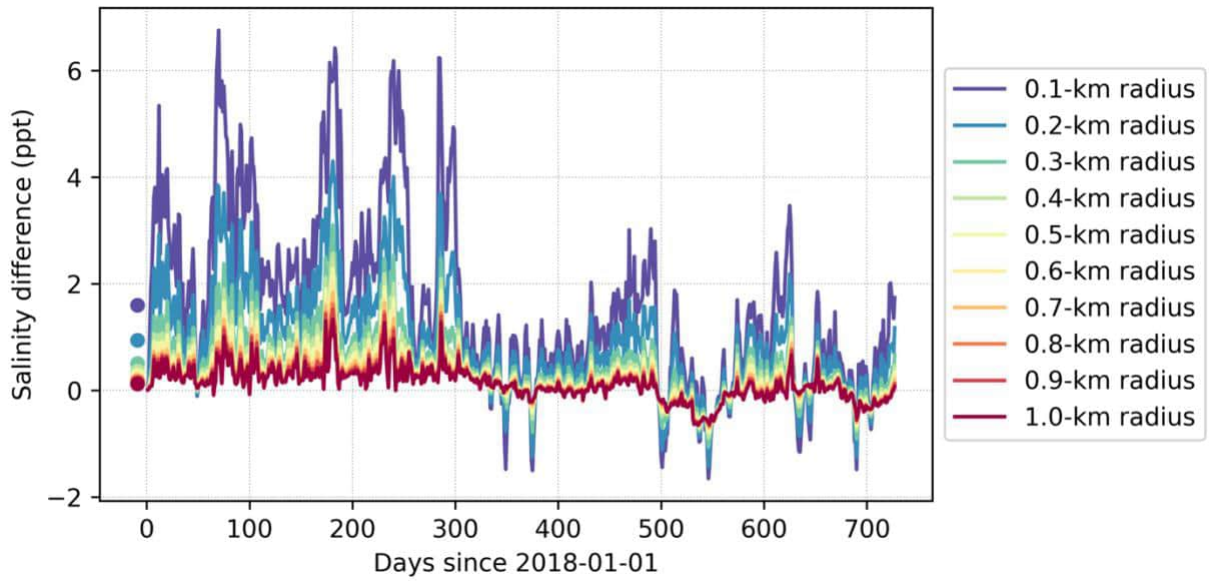


Figure 13: Same as Figure 11, but for smaller averaging radii from 100 m to 1 km.

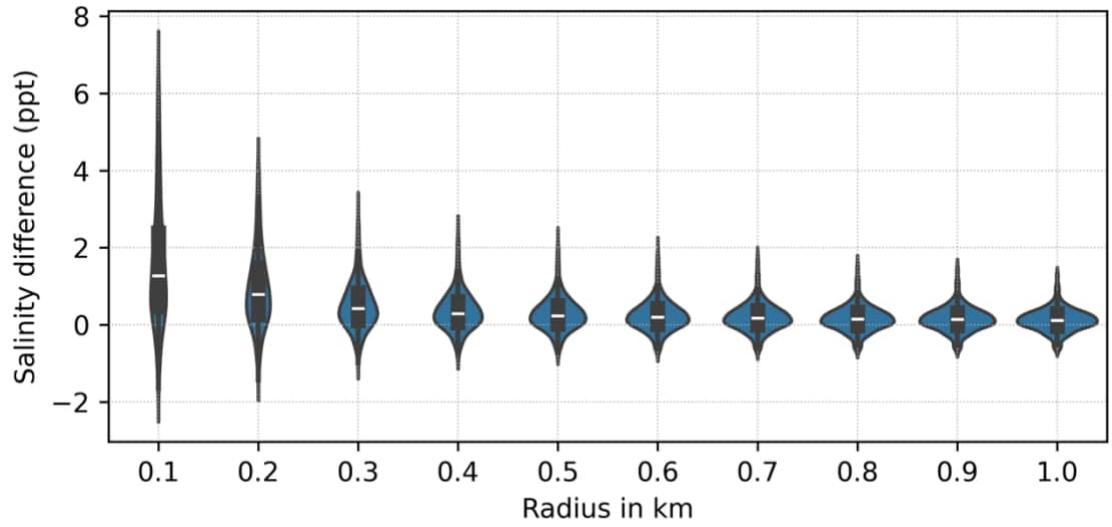


Figure 14: Same as Figure 12, but for smaller averaging radii from 100 m to 1 km.

Finally, Fig. 15 summarizes long-term mean salinity differences over various distances. As expected, the impact diminishes rapidly with distance from the discharge point. The mean salinity difference decreases from 0.12 ppt at 1 km to 0.04 ppt at 2 km. Beyond 5 km, negative salinity differences dominate due to the inclusion of parts of the lower bay where salinity tends to decrease (Fig. 7).

In conclusion, numerical experiments suggest a localized salinity increase near the brine outflow area, with the effect diminishing rapidly offshore. While increases up to 6 ppt can occur within 100 m, the long-term average impact is generally less than 0.2 ppt beyond 1 km, with some areas even experiencing slight salinity reductions.

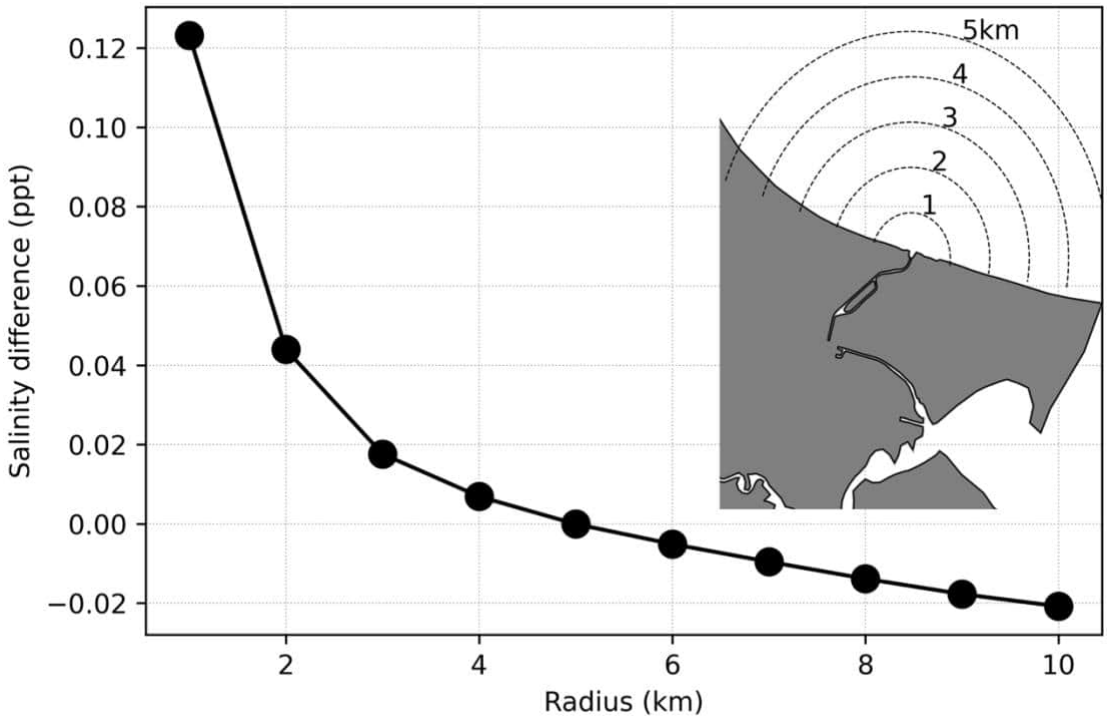


Figure 15: Long-term mean salinity difference averaged over the two-year period and over various radii. The inset at top right shows the 1–5 km radii used for regional averaging.

5. Impact of brine discharge on stratification

Brine discharge has higher salinity—and therefore higher density—than ambient bay water. As a result, discharged brine may enhance water column stratification by promoting denser water to settle near the bottom and move along the slope from the shoreline into the bay. Increased stratification can reduce vertical mixing, which may lead to lower bottom dissolved oxygen levels. This is of critical concern for benthic organisms that rely on adequate oxygen concentrations.

To assess this potential effect, we analyze the percentage of time with continuous stratification. Here, *continuous stratification* is defined as:

1) A surface-to-bottom salinity difference greater than 2 ppt, and
2) This condition must persist for at least 24 consecutive hours.

This index is commonly used to infer the risk of hypoxia, typically defined as bottom dissolved oxygen less than 2 mg/L. It is important to note that continuous stratification does not necessarily imply hypoxia, since bottom oxygen concentration also depends on surface temperature, biological oxygen demand, and total water depth. Also, the location of stratification matters. Areas that are close to the source of the brine tend to have higher DO due to recent formation of stratification and limited isolation time is available to deplete the bottom oxygen concentration to hypoxic levels. Furthermore, areas with significant bed slope can facilitate gravity flow of the brine. This movement entrains ambient waters into the brine, thereby diluting the brine and resupplying dissolved oxygen (Hodges, 2010). In Oso Bay, hypoxic events are typically found more than 1 km away from the brine source where the bottom topography is relatively flat and movement of the brine is limited (Hodges, 2010). Nevertheless, continuous stratification serves as a practical and interpretable proxy for identifying areas and periods with elevated hypoxia risk due to inhibited vertical mixing.

5.1 Percentage of time with continuous stratification

To quantify stratification over time, we follow the steps below for each grid point in the model domain:

1) Extract time series of surface and bottom salinity.
2) Compute the salinity difference between surface and bottom.
3) Identify periods when the salinity difference exceeds 2 ppt and persists for more than 24 hours.
4) Sum the duration beyond 24 hours of all such periods and divide by the total simulation time to obtain the percentage of time with continuous stratification.

The spatial distribution of this metric is shown in Fig. 16, for the base run, the scenario run (with brine discharge), and their difference. The overall pattern closely resembles the salinity difference, with a clear impact localized near the discharge region and negligible influence elsewhere in the bay.

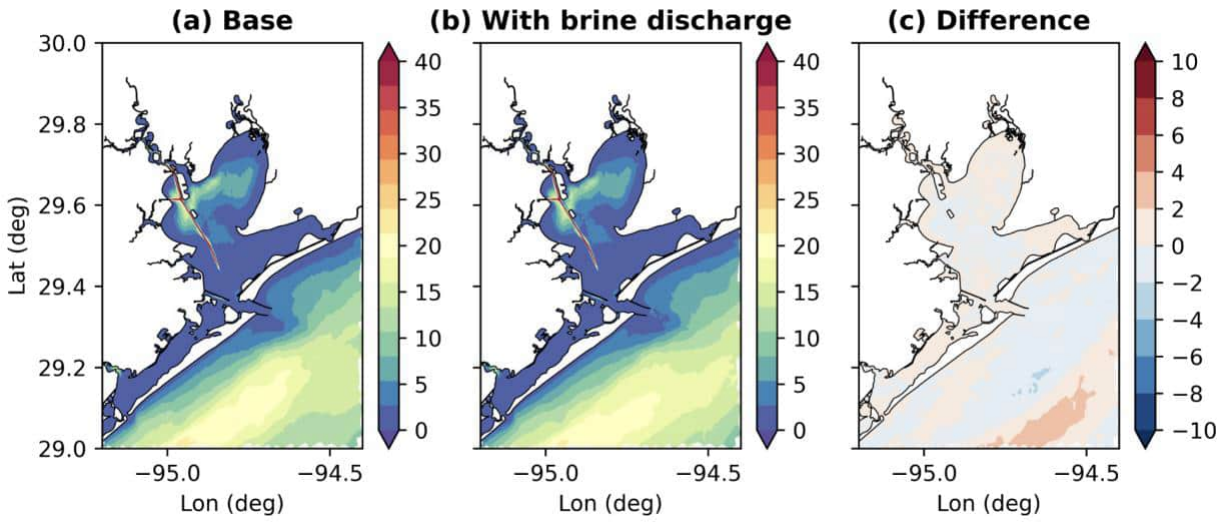


Figure 16: Percentage of time (%) when bottom–surface salinity difference exceeded 2 ppt for more than 24 hours. Left: base run; middle: scenario run; right: difference between the two, with positive values indicating a greater percentage in the scenario run.

A zoomed-in view (Fig. 17) highlights a substantial increase in the percentage of time with continuous stratification within a 1 km radius from the tidal dam, with increases reaching as high

as 30%. Beyond a 1 km radius, the effect becomes negligible, suggesting the stratification enhancement is strongly localized near the outflow channel.

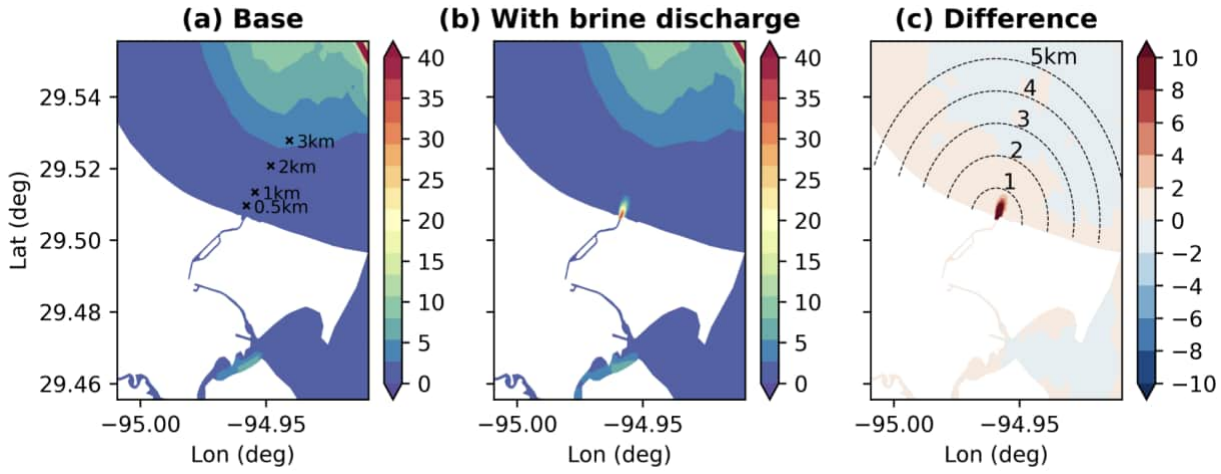


Figure 17: Same as Figure 16, but showing a zoomed-in view near the desalination plant. In (a), the cross marks indicate four sampling locations, at 0.5 km, 1 km, 2 km, and 3 km off the tidal dam. Time series of bottom-surface salinity difference at these two locations are shown in Figure 18 and Figure 21.

5.2 Time series at a selected location

We further examined the time series of stratification at two sampling locations located 0.5 km, 1 km, 2 km, and 3 km from the tidal dam, respectively. The results clearly indicate that stratification is strengthened in the brine discharge scenario, and the impact is much stronger at the nearshore location than at the offshore location. For the nearshore location 0.5 km off the tidal dam, the bottom-surface salinity difference could be as large as 8 ppt in the scenario run, compared to a maximum of 5 ppt in the base run. Impact on stratification at 1 km sampling location is still notable. Beyond 2 km off the tidal dam, the influence of brine discharge is negligible. At the offshore locations (e.g., 2 km and 3 km from the tidal dam), a strong increase of stratification also occurs, but it is not continuous throughout the simulation period. Instead, periods of enhanced stratification are intermittent.

It is essential to note that the elevated stratification in the nearshore region does not immediately imply a risk of hypoxia. The strong stratification in the nearshore region is primarily induced by higher-density brine water that tends to move downslope at the bottom under the influence of gravity, thereby increasing the bottom salinity. While the density flow has a larger salinity, it also carries a high concentration of dissolved oxygen. Furthermore, the nearshore region contains a sloping bottom portion where bottom elevation declines from 0 m NAVD88 at the tidal dam to -3 m NAVD88 at 1 km offshore. As mentioned earlier, the downslope movement of the density flow can cause DO entrainment, thereby reducing hypoxia risk. The current analysis can be refined further to conclude how brine discharge affects the dissolved oxygen condition in the nearshore region. We believe the nearshore region is unlikely to experience any hypoxia since the bay is shallow with a mean depth of 2.5 m and water can be easily mixed. A follow-up modeling effort using a fully coupled physical-biogeochemical model can help assess the impact on dissolved oxygen more thoroughly.

The frequency and duration of stratified events are notably reduced in 2019 compared to 2018. This observation is consistent with the previously discussed salinity impacts, which showed smaller or even negative differences in 2019 due to varying freshwater inputs and ambient conditions near the intake and discharge locations. These results reinforce the conclusion that the strength and duration of brine-induced stratification depend heavily on background hydrological and meteorological conditions.

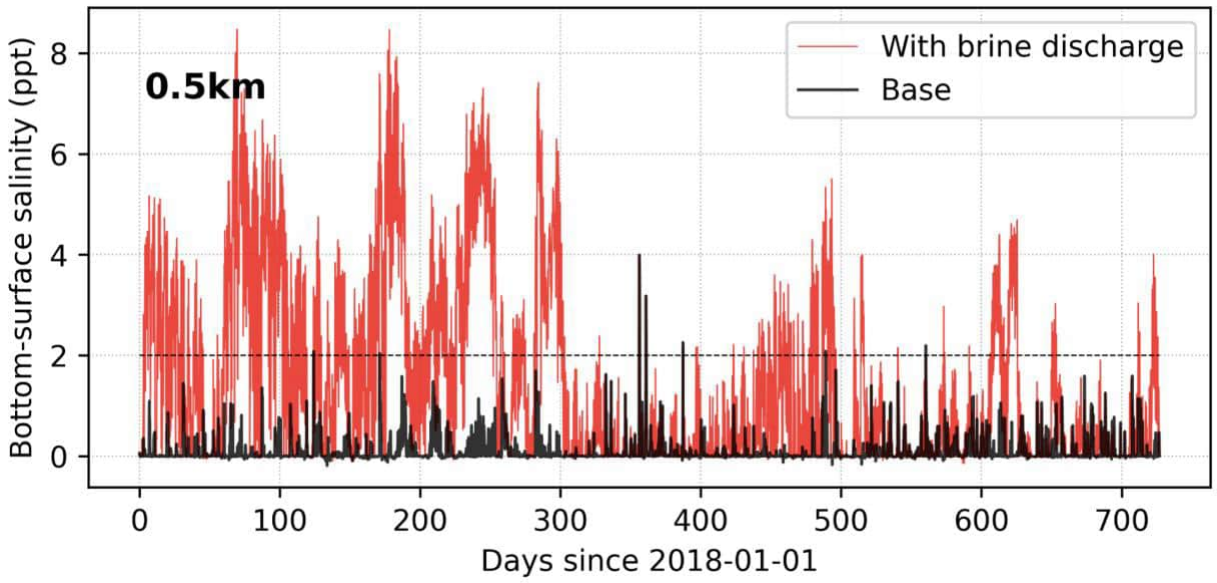


Figure 18: Time series of bottom–surface salinity difference at a sampling location 0.5 km offshore from the tidal dam near the desalination plant.

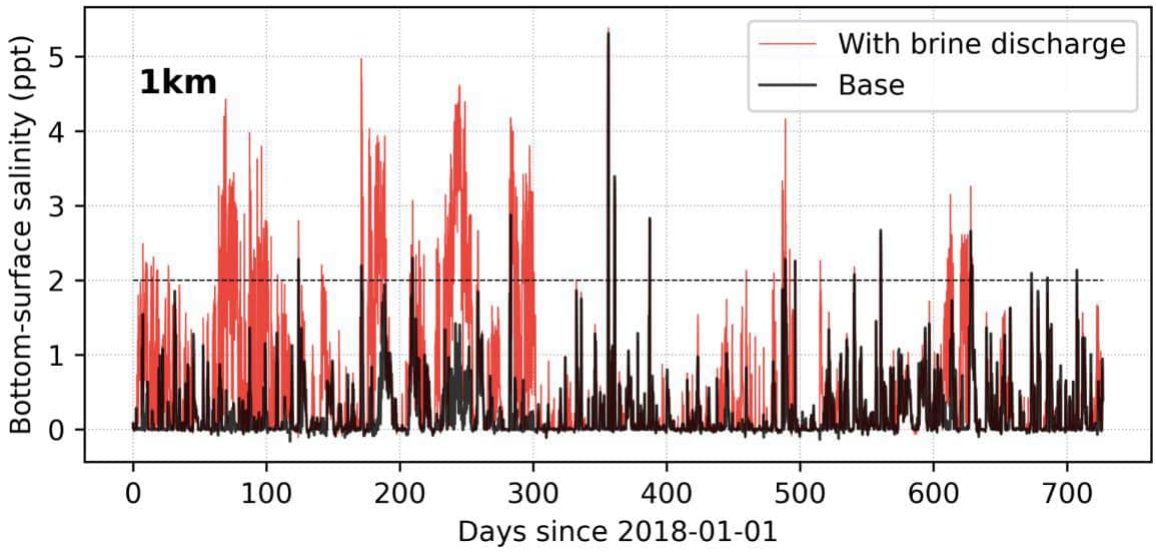


Figure 19: Time series of bottom–surface salinity difference at a sampling location 1 km offshore from the tidal dam near the desalination plant.

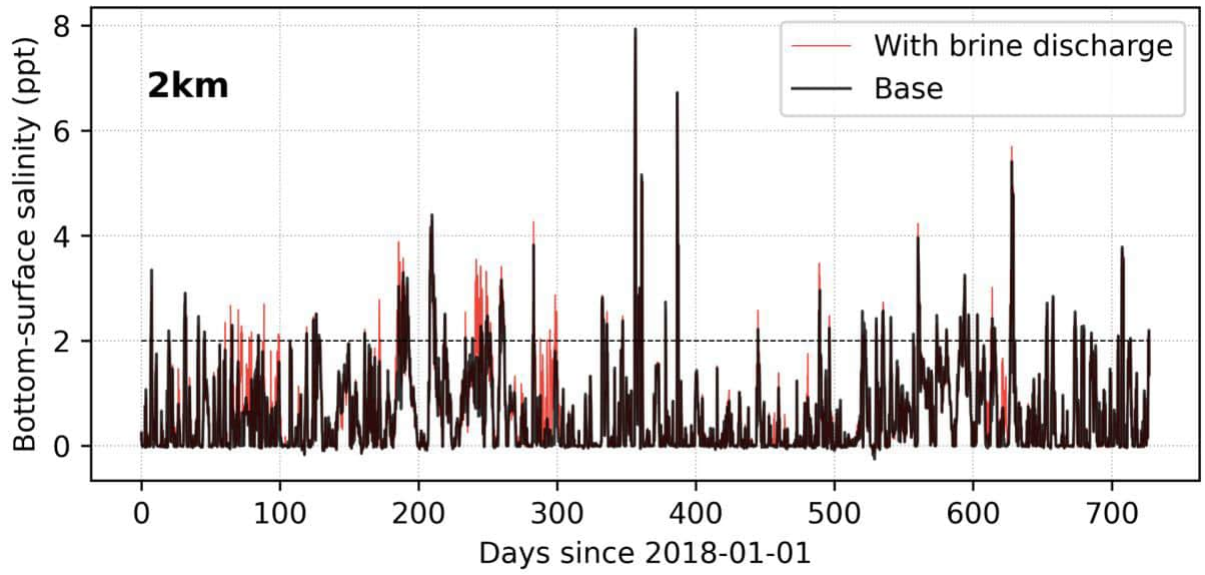


Figure 20: Time series of bottom–surface salinity difference at a sampling location 2 km offshore from the tidal dam near the desalination plant.

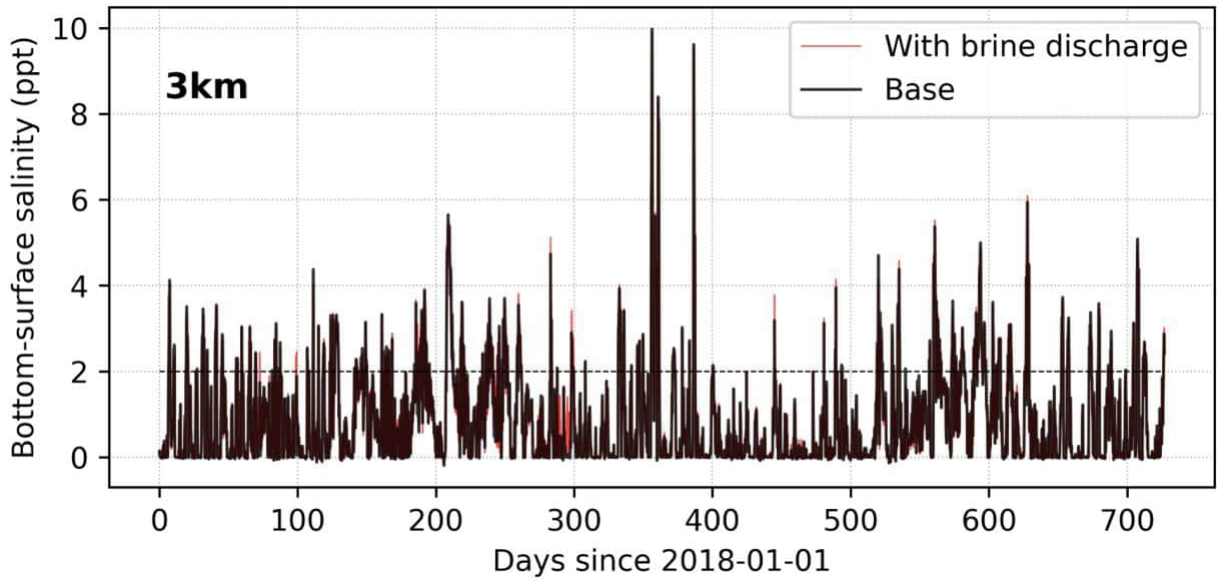


Figure 21: Time series of bottom–surface salinity difference at a sampling location 3 km offshore from the tidal dam near the desalination plant.

6. Discussion and summary

Using a validated and reliable ocean model, this study assessed the impact of brine water discharge from a proposed desalination plant in Galveston Bay. Two model scenarios were compared: one without any intake or discharge and another with seawater intake of 82.8 million gallons per day (MGD) from Dickinson Bayou and discharge of 56.3 MGD of diluted brine water. Results indicate that the salinity impact is spatially limited, primarily confined to the vicinity of the outflow location.

Within 1 km of the tidal dam that connects the discharge channel to the bay, the mean surface salinity increases by approximately **0.12 ppt**, and the impact diminishes rapidly offshore. Within the discharge channel itself, salinity can increase by up to 5 ppt. This relatively modest effect is due to the discharge rate, which corresponds to only 2.96 m^3/s.

The intake/discharge scheme can also be interpreted as a net reduction of approximately 26.5 MGD (or 1.39 m^3/s) of freshwater to the system. When compared to the total freshwater inflow into Galveston Bay—typically ~300 m^3/s from the San Jacinto River, Trinity River, and Buffalo Bayou (Marshall and Montagna, 2025) —this reduction is unlikely to significantly alter bay-wide salinity patterns.

A notable and somewhat unexpected finding is that the salinity impact is more pronounced near the intake channel than near the discharge location. Using a threshold of 0.1 ppt, the impact region around the intake extends farther than that near the discharge. This is physically reasonable: the intake acts as a localized “sink,” drawing additional seawater into Dickinson Bayou to compensate for water extraction, which leads to elevated salinity along the bayou.

Another important insight is that the salinity impact can be negative, depending on the difference between the intake salinity and the ambient salinity at the discharge location. For example, when freshwater inflow significantly reduces intake salinity (e.g., near 0 ppt), the discharged brine may be less saline than nearby bay water, thereby reducing salinity at the discharge site.

With regard to stratification and potential hypoxia risk, we found that brine discharge can substantially increase the percentage of time with continuous stratification (defined as surface-bottom salinity difference > 2 ppt sustained for over 24 hours) in the nearshore region. Within 1 km of the tidal dam, the percentage of time with stratification can increase by up to 30%. However, this elevated stratification in the nearshore is primarily induced by density flow as the denser brine water moves downslope at the bottom. It is challenging to determine how elevated nearshore stratification affects dissolved oxygen, as the brine water also contains a high concentration of dissolved oxygen and that downslope movement can also entrain ambient waters and resupply dissolved oxygen. Impact on nearshore dissolved oxygen needs to be further assessed with a fully coupled physical biogeochemical modeling system. However, we believe the brine discharge is unlikely to impact dissolved oxygen beyond 1 km off the tidal dam, as the impact on stratification also diminishes quickly with distance from shore and is generally negligible beyond 2 km from the tidal dam.

Summary from numerical experiments

1) The proposed intake and discharge scheme has a localized and relatively small salinity impact, generally less than 1 ppt in both intake and discharge regions.
2) The system's response is sensitive to background hydrology; for example, the salinity impact is reduced or even negative under wet conditions.

Limitations of this study

It is important to note several limitations of the present study, including:

1) The simulation period only covers two years (2018–2019). It does not include extreme drought or wet years. We selected these two years as the hydrodynamic simulation have been well validated and the base simulation (without discharge) has been used in several studies (e.g., Summers et al., 2024; Hua et al. 2025)
2) We assume the tidal dam does not exist and that there is no elevated bathymetry at the dam, as information on how the tidal dam operates is lacking. The tidal dam has an elevation close to 0 meter at datum of NAVD 88 (i.e., close to mean sea level), meaning

bay water would only enter the discharge channel when the sea level is higher than the mean sea level. In this case, tidal mixing in the outflow channel would be less than an open channel without a dam, potentially leading to the accumulation of brine water in the discharge channel. If feasible, it may be better to remove the dam, allowing bay water to enter the discharge channel freely. The impact of the tidal dam needs further evaluation.

3) The impact of future conditions, such as sea level rise, should be considered, as sea level rise will affect the transport and mixing of salt, as well as the exchange between bay water and ocean water.

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Tab 21

Habitat Assessment for a proposed seawater desalination facility in Galveston Bay

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June 2025

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Project Summary

Before developing the proposed Bayshore Desalination Facility in Texas City, Texas, EPCOR requested Texas A&M University at Galveston to evaluate the discharge area for suitable habitat for identified species and to assess the potential impacts (i.e. salinity changes) the proposed discharge may have. The project was established to conduct a habitat assessment for a portion of Galveston Bay that may be impacted by the discharge plume, as well as the intake channel. Requested species to be evaluated included: red drum (*Sciaenops ocellatus*), brown shrimp (*Farfantepenaeus aztecus*), flounder (primarily southern flounder [*Paralichthys lethostigma*]), oysters (primarily eastern oyster [*Crassostrea virginica*]) and seagrass. The proposed intake flow is 82.8 million gallons/day, with a proposed discharge flow of 56.3 million gallons/day and an expected discharge averate salinity of 21.2 ppt to the plume area. The objectives of this project were:

Objective 1: Conduct a literature search to determine if the identified species reside in the area of the desalination plant and if the proposed discharge would impact essential habitat requirements.

A literature search was conducted for all species identified above to determine habitat preferences and environmental requirements. Four species were added to the above identified species: black drum (*Pogonias cromis*), spotted seatrout (*Cynoscion nebulosus*), white shrimp (*Litopenaeus setiferus*) and blue crab (*Callinectes sapidus*). These species were added due to their importance as a recreational or commercial fishery in Galveston Bay. The literature search was also expanded to assess ranges of salinity tolerance and thresholds of osmotic shock for each species.

Key Findings: Each species identified above is present in Galveston Bay. Spawning occurs outside of the bay for red drum, southern flounder, brown shrimp, white shrimp and blue crab, while spotted seatrout, black drum (can also spawn out of bay) and eastern oyster spawn within the bay. All of the above identified species utilize Galveston Bay as a nursery area, with seagrass being an important habitat for newly settled recruits of red drum, southern flounder, spotted seatrout and brown shrimp. Seagrass has not been present in Upper Bay near the proposed discharge and intake area since 1961, with West Bay maintaining the only remaining seagrass in

Galveston Bay. All species are euryhaline and documented to tolerate a wide range of salinities. While salinity ranges varied for peak recruitment and larval development for each species, each optimal salinity range included 17-24 ppt based on the literature review. Further, the optimal salinity range for each of the fish (red drum, southern flounder, spotted seatrout and black drum) and invertebrate (brown shrimp, white shrimp, and blue crab) species included 15-25 ppt, while eastern oyster optimal salinity ranged from 17-24 ppt. Therefore, the expected discharge average salinity of 21.2 ppt falls within the range of documented salinity for larval recruitment and development of the identified species.

Objective 2: Utilize long-term monitoring data from Texas Parks and Wildlife Department (TPWD) to determine abundance of identified species in the proposed discharge and intake area.

TPWD has conducted surveys throughout Galveston Bay since 1982 using bag seines, bay trawls, gill nets, and oyster dredges. Datasets were combined to assess the abundance of the identified species in the proposed discharge and intake area from 1982 through 2024. Further, two timeframes from 1982-2008 and 2009-2024 were evaluated separately to determine if the closure of a power plant (PH Robinson) operating at the same location had a potential impact on the abundance of the identified species. Environmental data recorded during these surveys was examined to determine the range of parameters correlated to each species presence.

Key Findings: For the TPWD surveys, each identified species collected around the discharge and intake area accounted for less than 5% of the overall species collection across the entire Galveston Bay. One exception was eastern oyster, in which collections around the discharge and intake area accounted for 15.5% of the total survey catch in Galveston Bay due to the proximity of the discharge and intake area to oyster reefs. All species were collected in salinities ranging from 0.9 – 27.9 ppt, with some species being collected in salinities as low as 0 ppt or as high as 35 ppt. Thus, the expected discharge salinity of 21.2 ppt falls within the range of salinity the identified species were collected in. Differences were observed in the abundance of certain identified species between 1982-2008 and 2009-2024; however, it does not appear these differences are linked to the closure of the facility but instead to overall declines or increases in population abundance bay wide.

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Introduction

Desalination plants can provide a vital service by using reverse osmosis to produce fresh water from seawater suitable for human consumption, irrigation, and industrial use. This is beneficial in areas heavily impacted by drought. However, this process poses concerns on the effect of the brine discharge to marine ecosystem and the potential to harm marine life during water uptake and discharge. Plans are being made to develop a desalination plant in Texas City, Texas using a discharge and intake channel previously used by the PH Robinson Power Plant that closed in September 2008. The current proposed intake flow is 82.8 million gallons/day, with a proposed discharge flow of 56.3 million gallons/day and an expected discharge average salinity of 21.2 ppt to the plume area.

Galveston Bay is a critical nursery habitat for various fish and shellfish species that are important commercial and recreational fisheries. The top commercial fisheries in Galveston Bay include shrimp (both brown [*Farfantepenaeus aztecus*] and white [*Litopenaeus setiferus*]), eastern oyster (*Crassostrea virginica*), blue crab (*Callinectes sapidus*), and black drum (*Pogonias cromis*). Whereas, the top recreational species in Galveston Bay are red drum (*Sciaenops ocellatus*), spotted seatrout (*Cynoscion nebulosus*), and southern flounder (*Paralichthys lethostigma*). An assessment of habitat requirements and salinity tolerances is necessary to determine if the proposed desalination plant would impose any potential impacts to local fish and shellfish species. The above identified species were selected for assessment based on their commercial or recreational importance to the area. Further, it is necessary to determine if any seagrass habitat is available near the proposed desalination site as seagrass provides valuable juvenile habitat for several species. To assess the habitat requirements, salinity tolerances and abundance of the identified species near the proposed desalination site, the following objectives were proposed:

Objective 1: Conduct a literature search to determine if the identified species reside in the area of the desalination plant and if the proposed discharge would impact essential habitat requirements.

Objective 2: Utilize long-term monitoring data from TPWD to determine abundance of identified species in the proposed discharge and intake area.

Methods

A. Literature Review

A literature review was conducted for the species requested: red drum (*Sciaenops ocellatus*), brown shrimp (*Farfantepenaeus aztecus*), flounder (primarily southern flounder [*Paralichthys lethostigma*]), oysters (primarily eastern oyster [*Crassostrea virginica*]) and seagrass to determine habitat preferences and environmental requirements. Due to their commercial and/or recreational importance to Galveston Bay, four additional species were added to the identified species: black drum (*Pogonias cromis*), spotted seatrout (*Cynoscion nebulosus*), white shrimp (*Litopenaeus setiferus*) and blue crab (*Callinectes sapidus*). An excel spreadsheet was created to organize literature review information, including: objective of the manuscript, methods used, key findings, presence in the discharge area and citations of interest.

B. TPWD Long-Term Data

The TPWD Coastal Fisheries Division long-term monitoring program has been conducting bag seine, bay trawl, gill net and oyster dredge surveys throughout Galveston Bay since 1982. Water depth and hydrological data are collected at each sample survey. During bag seine surveys, hydrological data is collected 3.1 m (10 ft) from shore at the surface (0-15 cm). For bay trawls and oyster dredge surveys, hydrological data is collected 0.3 m (12 in) off the sea floor before trawling/dredging begins. For gill net surveys, hydrological data is collected at the offshore end of the gill net from the surface (0-15 cm). How each survey is conducted is briefly described below based on the Marine Resource Monitoring Operations Manual (Martinez-Andrade 2018).

Bag seine surveys are conducted monthly, with the first half of sampling locations to be completed during the 1st through 15th of the month and the second half to be completed from the 16th through the end of the month. Bag seins used by the Coastal Fisheries Division are 18.3 m (60 ft) long and 1.8 m (6 ft) deep with 19 mm (0.75 in) mesh in the wings and 13 mm (0.5 in) mesh in the bag. Sampling occurs half an hour before sunrise and ends half an hour after sunset. When deploying the bag seine, one person remains on shore while the second person pulls the seine perpendicular to the shoreline to the full extent. Both people then proceed to pull the net 15.2 m (50 ft), at which time the person on shore stops and allows the person offshore to

maintain the full extent of the seine while bringing it to shore. Counts of all species are recorded. Lengths are recorded to the nearest mm of up to 19 randomly selected individuals of each species, with total length being the preference. A total of 240 samples were collected each year via bag seine in Galveston Bay, with 20 occurring each month.

Bay trawl surveys are also conducted monthly, with the first half of sampling locations to be completed during the 1st through 15th of the month and the second half to be completed from the 16th through the end of the month. This allows for temporal distribution of the samples. Sampling begins half an hour before sunrise and ends half an hour after sunset. Coastal Fisheries Division is equipped with 6.1 m (20 ft) wide otter trawls consisting of 38 mm (1.5 in) mesh. Galveston Bay is a larger bay system that is stratified into upper and lower bay zones, with half of the monthly trawls conducted in each zone to ensure good spatial distribution of samples. The trawl is towed at 3 mph for 10 minutes in a circular manner. Counts of all species are recorded, 19 individuals for each species is randomly chosen to be measured to the nearest mm. A total of 240 bay trawl samples are collected each year, with 10 occurring in the upper bay and 10 occurring in the lower bay each month.

Gill net sampling is conducted in the spring and the fall, beginning the second full week of April or September, respectively, and continuing for 10 consecutive weeks. The Coastal Fisheries Division is equipped with gillnets that are 182.9 m (600 ft) in length, consisting of four panels of varying mesh sizes (152 mm [6 in], 127 mm [5 in], 102 mm [4 in] and 76 mm [3 in]). Gill nets are placed perpendicular to shore starting one hour before sunset, with the smallest mesh size closest to shore. The nets are then retrieved no sooner than sunrise, with the last gill net retrieved within four hours of sunrise. Counts of all species are recorded. Species length is recorded to the nearest mm of up to 19 randomly selected individuals of each species per mesh size per day. A total of 90 samples are collected each year by gill nets, with 45 occurring each season.

Oyster dredge sampling occurs monthly, with the first half of sampling locations to be completed during the 1st through 15th of the month and the second half to be completed from the 16th through the end of the month. Again, sampling occurs half an hour before sunrise to half an hour

after sunset. Oyster dredges used by the Coastal Fisheries Division consist of a steel rod frame (0.5 m [19.5 in] wide, 0.24 m [9.5 in] high and 1 m [39 in] long) and a bag made with metal rings, s-hooks and nylon rope (0.36 m [14 in] deep with 76 mm webbing). Sampling with oyster dredges occurs in areas where Eastern oysters form consolidated reef/habitat with at least 0.2 m (6 in) or more vertical relief for a continuous distance (at least 91.4 m [300 ft] long by 0.5 m [1.5 ft] wide) and is in water at least 1 m or greater from mean low tide. The dredge is towed at 3 mph for 30 seconds following the contour of the reef. All oysters are counted and 19 oysters are randomly measured if length is greater than 25 mm. Dead oyster shells and fragments greater than 25 mm in length are also counted, and oyster spat is counted in the range of 5-25 mm. Any other species collected is counted and measured up to 19 randomly individuals for each species to the nearest mm. A total of 360 oyster dredge samples are collected annually, with 30 occurring each month.

For Galveston Bay, all data sets for each gear set survey were combined for the years 1982-2024, except gill nets in which the data set was complete through 2023. Coordinates for each sampling survey were added into QGIS to determine where sampling events occurred near the discharge and intake area, in addition to where the various gear types were deployed in that area (Figure 1). Heatmaps of catch abundance were created for each species for all years combined, as well as for 1982-2008 and 2009-2024 to determine if the closure of a previous facility (September 2008) in the area impacted catch of any species. Data points for where each species were collected near the discharge and intake channels were extracted to determine overall catch and salinity ranges of each species in the area. This data was also used to plot overall catch by year and catch by salinity.

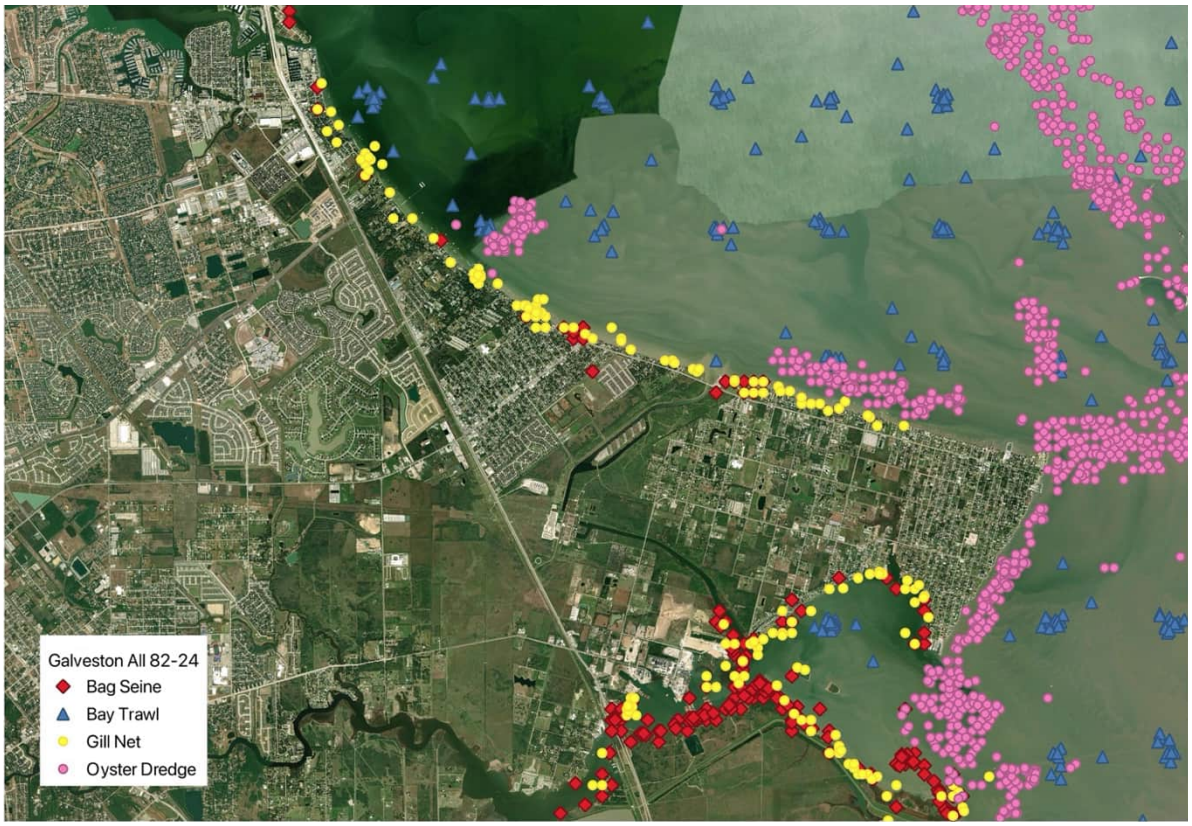


Figure 1. Sampling locations for TPWD long-term monitoring surveys that utilize four gear types near the discharge plume and intake channel.

In addition to the long-term monitoring program, TPWD's Coastal Fisheries Division Habitat Assessment Team applied aerial photography and ground truthing to determine the presence of seagrass in Galveston Bay. Aerial photography was collected on January 16, 2015, and the area was ground truthed for the presence of seagrass in March 2015. Polygons were digitized where areas of seagrass were present and a resulting shapefile was created. This shapefile was updated on March 19, 2025. Likewise, TPWD completed sidescan surveys from 2008-2016 to delineated oyster habitat in Galveston Bay and areas were ground truthed. Local restoration sites were surveyed in 2019, with a total of 117,000 acres scanned. West Bay was surveyed from September 11, 2024 through September 21, 2016, with 39,000 acres scanned. These shapefiles were added to a map in QGIS to display where seagrass and oyster habitat is present in Galveston Bay.

Results and Discussion

This project focused on recreationally and commercially important species that inhabit Galveston Bay. Spawning occurs outside of the bay for most identified species, except spotted seatrout, black drum (can also spawn out of bay) and eastern oyster spawn which spawn within the bay. All of the identified species utilize Galveston Bay as a nursery area, with seagrass being an important habitat for newly settled recruits of red drum, southern flounder, spotted seatrout and brown shrimp. West Bay maintains the only remaining seagrass in Galveston Bay and seagrass has not been present near the proposed discharge and intake area since 1961. While all identified species have been collected in the proposed discharge and intake area, their presence accounted for less than 5% of the entire collection across Galveston Bay from 1982-2024. The exception is eastern oyster, which accounted for 15.5% of the entire Galveston Bay collection due to the proximity of oyster reefs to the discharge and intake area.

All species investigated in the project are euryhaline (tolerate a wide range of salinity), with each species collected over a wide array of salinities ranging from 0.9-27.9 ppt and some species being collected at salinities as low as 0 ppt or as high as 35 ppt. Documented salinity ranges varied for peak recruitment and larval development for each species, with all optimal salinity ranges for each species comprising of 17-24 ppt. Therefore, the expected discharge salinity of 21.2 ppt falls within the range of collection salinities and documented salinities for larval recruitment and development of the identified species. While shifts in abundance were evident for species between 1982-2008 and 2009-2024, these shift do not appear to be linked to the closure of PH Robinson Power Plant but instead due to overall increases or declines in population catches bay wide.

1. Fish Species

i. Red Drum

A total of 1,167 red drum were collected around the discharge and intake area primarily through TPWD gill net surveys (followed by bag seine and then bay trawl surveys) from 1982-2024 (Figure 2). Red drum collected around the discharge and intake area represent 2.5% of the total red drum catch in Galveston Bay (n = 47,614) over the same time period (Supplemental Figure

1). The average total length varied among surveys (gill net: 477 mm [18.8 in], bag seine; 126 mm [5 in], and bay trawl; 47 mm [1.9 in]) due to differences in mesh sizes of the various gear. Adult red drum spawn near tidal passes in coastal waters in the fall, with juveniles then settling into estuarine habitats where they remain through adolescence (~ 3 years [584 mm or 23 in]; Powers 2012). Peak post-settlement of red drum occurs in Galveston Bay from November to December with positive abundance correlated to seagrass coverage (Dance and Rooker 2016). Further, juvenile red drum abundance is typically higher in areas where oyster reef habitat is absent, as this habitat does not provide adequate foraging resources compared to submerged aquatic vegetation (Stunz et al. 2022; Dance and Rooker 2016). Overall red drum collections across the entire Galveston Bay complex were heavily concentrated in West Bay near seagrass habitats (Supplemental Figure 1).

The total number of red drum collected near the discharge and intake area varied from year to year (Figure 3). Red drum were collected in this area with salinity ranging from 0 – 33 ppt and an overall mean salinity of 13.6 ppt (Figure 4). Red drum can tolerate a wide range of salinities, with moderate salinities (15-25 ppt) enhancing growth in juveniles and oxygen consumption is minimal at an intermediate salinity (~20 ppt; Lanier and Scharf 2007). Martin and Esbaugh (2021) transferred juvenile red drum from tanks with 30 ppt of seawater to hypersaline tanks (60 ppt). Red drum exhibited initial increase in plasma osmolality by four hours with decreased muscle water by the four- and 24-hour mark, but recovered to control levels within 72 hours with increase to intestinal water volume. Mild differences were observed between peak abundance areas of red drum collected from 1982-2008 and 2009-2024 around the discharge and intake area (Figure 5). Average salinities at time of collection differed slightly from an average 14.1 ppt (range: 0-33 ppt) for 1982-2008 to an average of 14.0 ppt (range: 0.4-28.1 ppt) for 2009-2024.

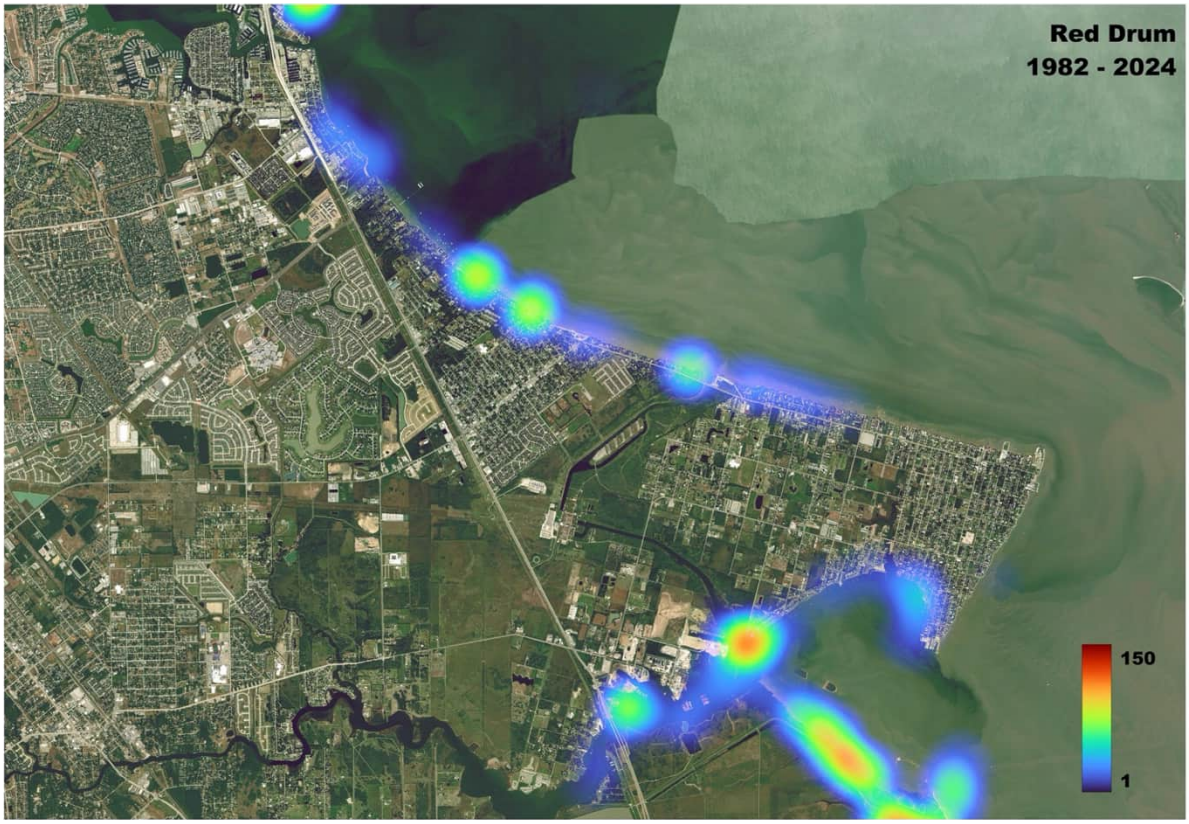


Figure 2. Heatmap of red drum catch from TPWD long-term monitoring program from 1982-2024 conducted near the discharge and intake area. During the time of collection salinity ranged from 0-33 ppt.

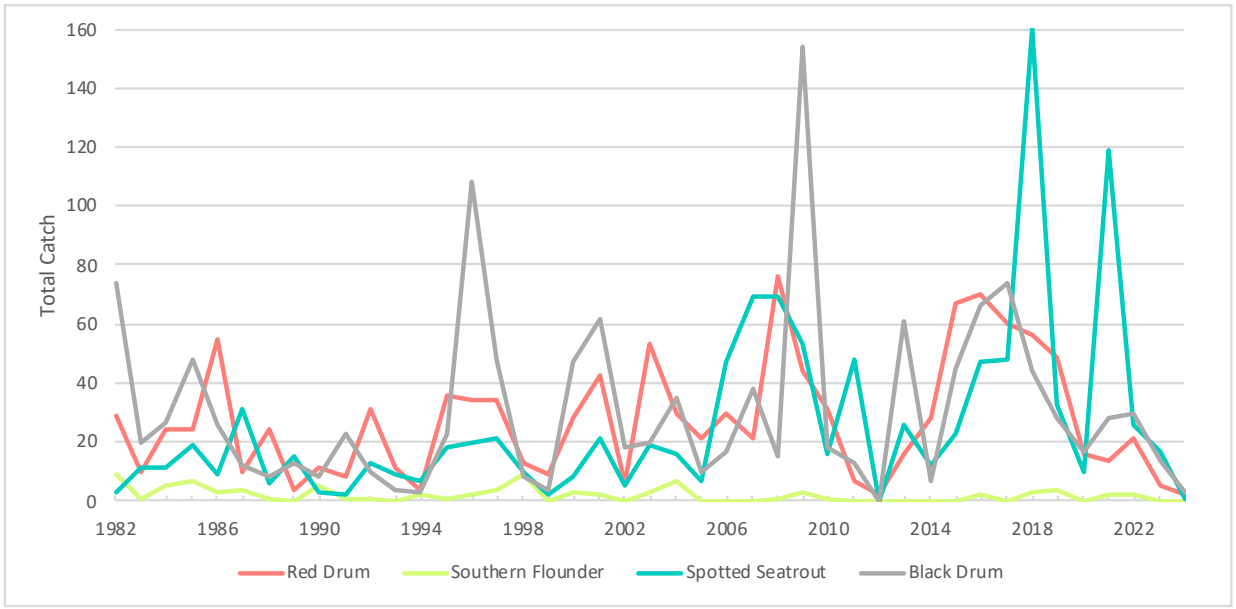


Figure 3. Total catch by year of fish species of interest collected from 1982-2024 during TPWD long-term monitoring surveys conducted near the discharge and intake area.

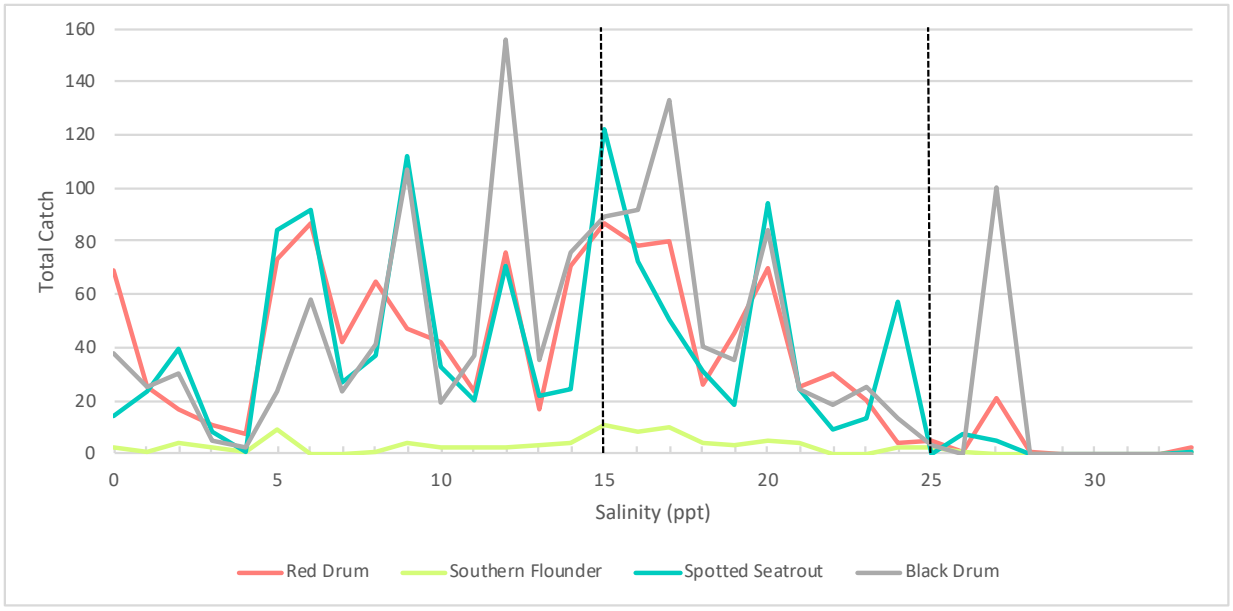


Figure 4. Total catch by salinity of fish species of interest collected from 1982-2024 during TPWD long-term monitoring surveys conducted near the discharge and intake area. While salinity ranges varied for larval development for each species, each optimal salinity range included 15-25 ppt (dashed vertical lines) based on the literature review.

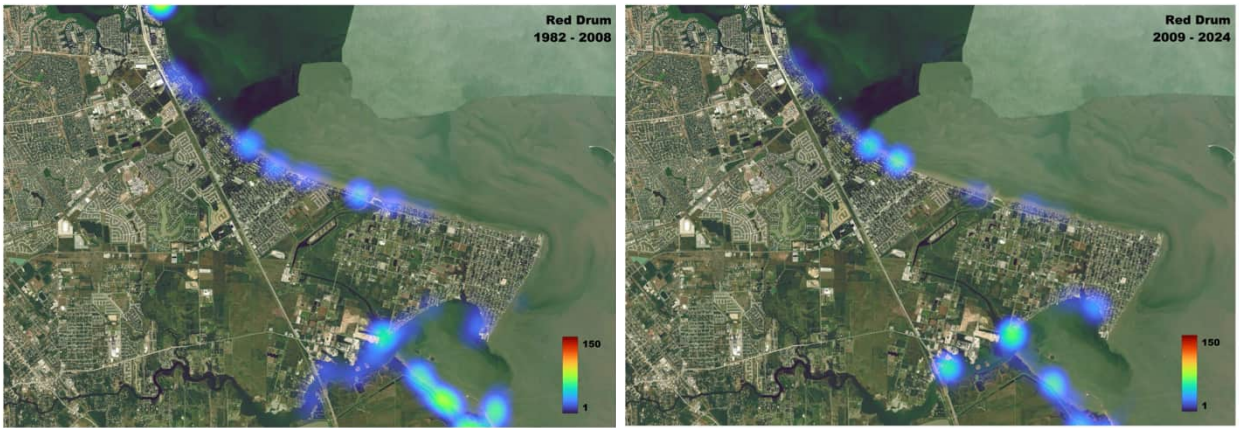


Figure 5. Heatmaps of red drum catch from TPWD long-term monitoring program illustrating differences in catch between 1982-2008 and 2009-2024 conducted near the discharge and intake area. During the time collection, salinity ranged from 0-33 ppt for 1982-2008 and from 0.4-28.1 ppt 2009-2024.

ii. Southern Flounder

Southern flounder were less prevalent with a total of 88 individuals collected from TPWD surveys around the discharge and uptake area from 1982-2024 (Figure 6). This accounts for 1.7% of the total southern flounder collected in Galveston Bay (n = 5,179) over the same time frame (Supplemental Figure 2). The majority of southern flounder were collected from gill nets (average TL = 336 mm [13.2 in]) followed by bay trawl (average TL = 240 mm [9.4 in]), bag

seine (average TL = 206 mm [8.1 in]) and 1 individual collected in an oyster dredge (TL = 197 mm [7.8 in]). Residents (individuals who overwinter) and migrators (those who leave the tidal pass in the late fall/early winter to spawn [maturity reached at age 2, with females averaging 15 in]) are both present in Galveston Bay (Steffen et al. 2023). Peak recruitment of southern flounder into the estuary occurs in winter or early spring when larvae are transported back into the estuary (Glass et al. 2008), with newly settled flounder more abundant near seagrass beds (Furey and Rooker 2013). Overall southern flounder collections across the entire Galveston Bay complex were largely concentrated in West Bay near seagrass habitats (Supplemental Figure 2).

The total number of southern flounder collected near the discharge and intake area each year was less than 10 individuals (Figure 3). Southern flounder were collected in this area at an average salinity of 14.0 ppt that ranged from 0.9-33 ppt (Figure 4). This species is known to be able to tolerate a wide range of salinities, although eggs and recently metamorphosed fish (50 days old) are less tolerant of fresh water conditions (≤ 10 ppt) as they transition from coastal waters into the estuary. Post-metamorphosis southern flounder are more likely to survive at salinities ranging from 5-30 ppt, with salinity tolerance increasing with age (by 220 days old) to be able to survive lower salinities (0-10 ppt; Smith et al. 1999). Further, Tipsmark et al. (2008) demonstrated that juvenile southern flounder exposed to an abrupt salinity change (freshwater to saltwater [35 ppt] and vice versa) experienced an initial crisis period that alleviated in 1-4 days. Southern flounder populations have been declining along the Texas coast due to overfishing, along with increased water temperatures and decreased freshwater inflows (primarily in southern bay systems; Torres Ceron et al. 2023; Zapp Sluis et al. 2025). This trend is noticeable in the shifts in collection abundance between 1982-2008 and 2009-2024 around the discharge and intake area (Figure 7). Average salinities at time of collection differed from an average 14.7 ppt (range: 2-33 ppt) for 1982-2008 to an average of 11.3 ppt (range: 0.9-21 ppt) for 2009-2024.



Figure 6. Heatmap of southern flounder catch from TPWD long-term monitoring program from 1982-2024 conducted near the discharge and intake area. During the time of collection salinity ranged from 0.9-33 ppt.

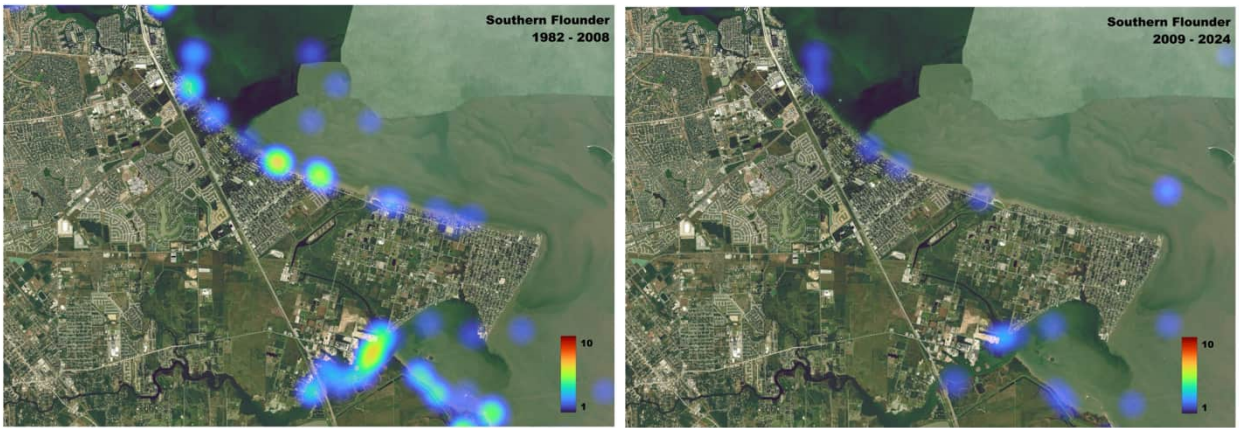


Figure 7. Heatmaps of southern flounder catch from TPWD long-term monitoring program illustrating differences in catch between 1982-2008 and 2009-2024 conducted near the discharge and intake area. During the time collection, salinity ranged from 2-33 ppt for 1982-2008 and from 0.9-21 ppt 2009-2024.

iii. Spotted Seatrout

A total of 1,110 spotted seatrout were collected from 1982-2024 around the discharge and intake area as part of the TPWD long-term monitoring program surveys (Figure 8). Catch around this

area accounts for 3.3% of the total spotted seatrout collected throughout Galveston Bay (n = 33,154) over the same time period (Supplemental Figure 3). Gill net sampling accounted for the majority of spotted seatrout collections in the area (average TL = 465 mm [18.3 in]), followed by bay seine surveys (average TL = 84 mm [3.3 in]) and bay trawl surveys (average TL = 166 mm [6.5 in]). Spotted seatrout spawn within the estuary from April to October with newly settled individuals present in seagrass habitats (Rooker et al. 1998). The abundance of juvenile spotted seatrout throughout Texas estuaries peaks in October (Froeschke and Froeschke 2011). Overall spotted seatrout collections across the entire Galveston Bay complex were concentrated in East and West Bay (Supplemental Figure 3).

The total number of spotted seatrout collected each year around the discharge and intake area began to increase in 2006 (Figure 3). TPWD began regularly stocking Galveston Bay with spotted seatrout in 1998 (https://tpwd.texas.gov) and additional catch regulations were put into effect in 2003 that may have aided this increase in production. This observed increase in abundance is also evident between collections from 1982-2008 and 2009-2024 around the discharge and intake area (Figure 9). Average salinities during these time frames differed slightly from an average of 13.3 ppt (range: 0-33 ppt) for 1982-2008 and an average of 13.9 ppt (range: 0.7-27.9 ppt) for 2009-2024. The overall average salinity during spotted seatrout collections in this area was 13.6 ppt and ranged from 0-33 ppt (Figure 4). Spotted seatrout have been observed in a wide array of salinities (0.2-75 ppt), as well as spawn in salinities ranging from 21-45 ppt with varying salinities having no effect on hatch size (Kucera et al. 2002).



Figure 8. Heatmap of spotted seatrout catch from TPWD long-term monitoring program from 1982-2024 conducted near the discharge and intake area. During the time of collection salinity ranged from 0-33 ppt.

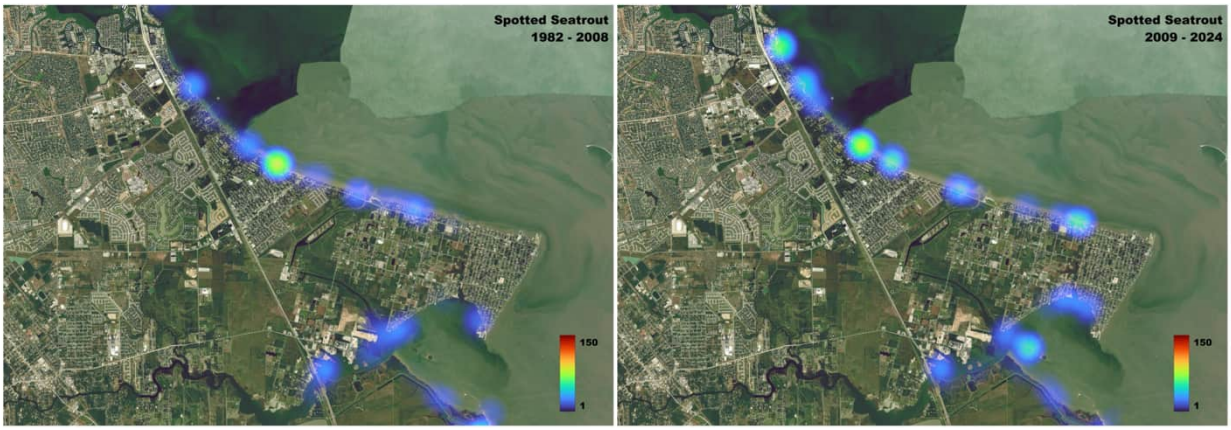


Figure 9. Heatmaps of spotted seatrout catch from TPWD long-term monitoring program illustrating differences in catch between 1982-2008 and 2009-2024 conducted near the discharge and intake area. During the time of collection, salinity ranged from 0-33 ppt for 1982-2008 and from 0.7-27.9 ppt 2009-2024.

iv. Black Drum

Black drum were the most abundant fish species around the discharge and intake area with a total of 1,331 individuals collected from 1982-2024 as part of the TPWD long-term monitoring program (Figure 10). This accounts for 4.6% of the total black drum samples collected across Galveston Bay (n = 28,800) during the same time period (Supplemental Figure 4). The majority of black drum samples were collected through gill net samples (average TL = 374 mm [14.7 in]), followed by bay trawl surveys (average TL = 474 mm [18.7 in]) and bag seine surveys (average TL = 163 mm [6.4 in]). Black drum spawn in the estuaries, connecting passes or nearshore regions, with spawning primarily occurring from February – April as well as late spawning in June and July. Juvenile black drum are abundant by early summer and commonly found in shallow, muddy creeks (www.tpwd.texas.gov). In fact, black drum are not considered seagrass dependent like other estuarine species (Patillo et al. 1997). Overall black drum collections across the entire Galveston Bay complex were also concentrated in East and West Bay (Supplemental Figure 4).

The total number of black drum collected around the discharge and intake area varied annually with a peak in 1996 and 2009 (Figure 3). Differences in the location peak abundance collection areas are evident between surveys from 1982-2008 and 2009-2024 (Figure 11) correlating to the locations of increased samples collected in 1996 and 2009, respectively. Black drum were collected around the discharge and intake area at an average salinity of 13.5 ppt and ranging from 0-27.9 ppt (Figure 4). From 1982-2008, the average salinity was 13.7 ppt (range: 0-27 ppt) and 14.1 ppt (range: 0.4-27.9 ppt) from 2009-2024. Juvenile black drum in Tampa Bay were collected at a variety of salinities, but were most often found in low to moderate salinities (7-30 ppt) with unvegetated mud bottom (Peters and McMichael 1990). A study in 2014 used acoustic telemetry to track black drum in a hypersaline, reverse estuary (salinities increasing upstream; Baffin Bay) with salinities ranging from 40.2-63.6 ppt. While black drum can tolerate a variety of salinity levels, under these conditions black drum predominately remained in the interior of the bay where food sources were limited and exhibited reduced movement with increased salinity (>35 ppt; Ajemian et al. 2018).

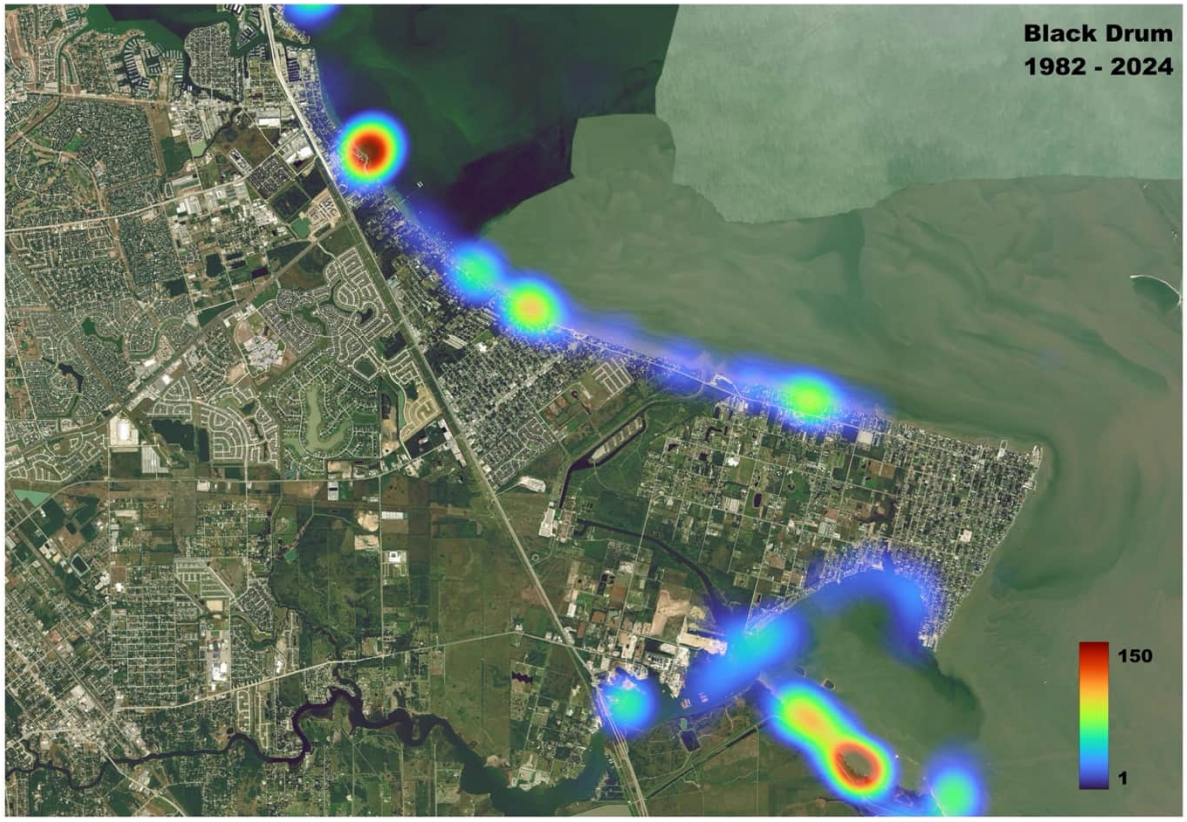


Figure 10. Heatmap of black drum catch from TPWD long-term monitoring program from 1982-2024 conducted near the discharge and intake area. During the time of collection salinity ranged from 0-27.9 ppt.

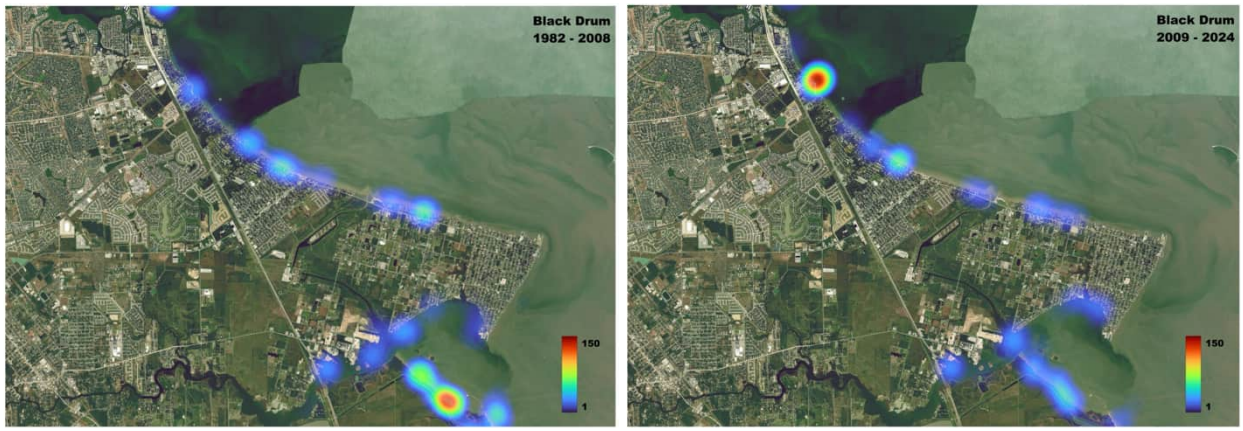


Figure 11. Heatmaps of black drum catch from TPWD long-term monitoring program illustrating differences in catch between 1982-2008 and 2009-2024 conducted near the discharge and intake area. During the time of collection, salinity ranged from 0-27 ppt for 1982-2008 and from 0.4-27.9 ppt 2009-2024.

2. Invertebrates

i. Brown Shrimp

A total of 4,638 brown shrimp were collected around the discharge and uptake area from 1982-2024 during the TPWD long-term monitoring surveys (Figure 12). This accounts for 2.5% of the total catch of brown shrimp in Galveston Bay (n = 184,789) over the same time period (Supplemental Figure 5). Brown shrimp were predominantly collected during bay trawl surveys (average TL = 89 mm [3.5 in]), followed by bag seine (average TL = 60 mm [2.4 in]) and oyster dredge (average TL = 63 mm [2.5 in]) surveys. Spawning occurs offshore with postlarve settling into estuarine habitats before emigrating back offshore as subadults (Renfro and Brusher 1982). The overall density of brown shrimp in Galveston Bay is highest in the spring and declines throughout the year. Juvenile brown shrimp (<100 mm) are more abundant in lower Galveston Bay where vegetation is more prevalent, preferring seagrass over marsh edge when they co-occur (Clark et al. 2004). Overall brown shrimp collections across the entire Galveston Bay complex were heavily concentrated in West Bay among seagrass habitats and East Bay (Supplemental Figure 5).

The total number of brown shrimp collected near the discharge and intake area varied annually, with peaks occurring in 2015 and 2019 (Figure 13). Brown shrimp can tolerate a wide range of salinities, with collections in this area occurring in salinity ranging from 0 – 30.1 ppt and an overall mean salinity of 14.9 ppt (Figure 14). Juvenile brown shrimp prefer habitats with salinity ranging from 15-25 ppt, and densities on nonvegetated bottom habitats were greatest at salinity >25 ppt and declined as salinity declined (Clark et al. 2004). Doerr et al. (2016) performed experiments in gradient tanks to examine salinity preferences of shrimp and although juvenile brown shrimp where present at all salinity levels, they preferred salinities ranging from 17-35 ppt. From 1982-2008, peak abundance collection sites were evenly spaced throughout the discharge and intake area with salinity averaging 14.3 ppt (range: 0-30 ppt) during this time. From 2009-2024, the peak abundance collection areas are more concentrated near the intake area with salinity averaging 14.4 ppt (range: 0.1-30.1 ppt) during this time (Figure 15). Collections around the discharge and intake area increased to an average of 122 individuals a year between 2009-2024 from an average of 99 individuals a year between 1982-2008. Further, brown shrimp reside in Moses Lake (which borders the Texas City Prairie Preserve) and its inlet to Galveston

Bay is located just south of the intake area. Growth rates of brown shrimp collected in Moses Lake were significantly higher compared to those collected from areas in the Galveston Island State Park due to a higher benthic infauna (important food source) abundance (Leo et al. 2018). Proximity of the intake area to Moses Lake may result in higher collections in this area as shrimp move in and out of the inlet.

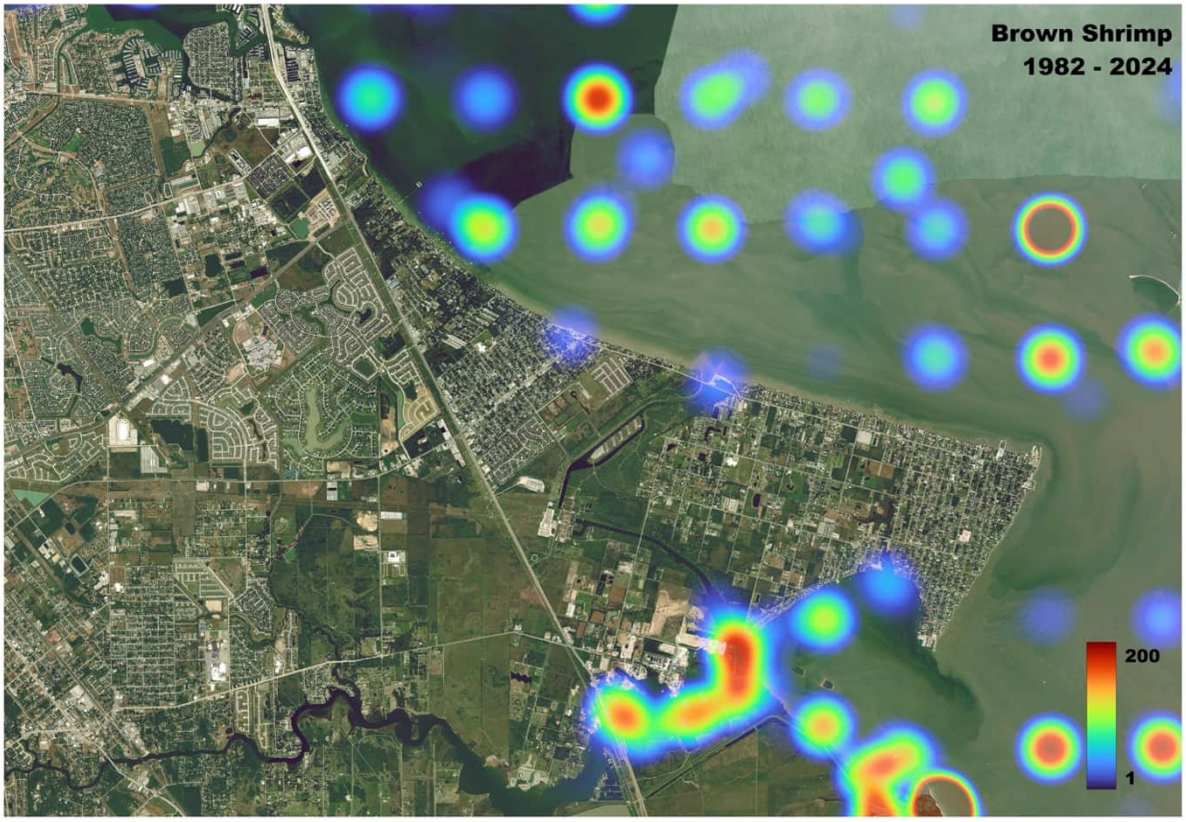


Figure 12. Heatmap of brown shrimp catch from TPWD long-term monitoring program from 1982-2024 conducted near the discharge and intake area. During the time of collection salinity ranged from 0-30.1 ppt.

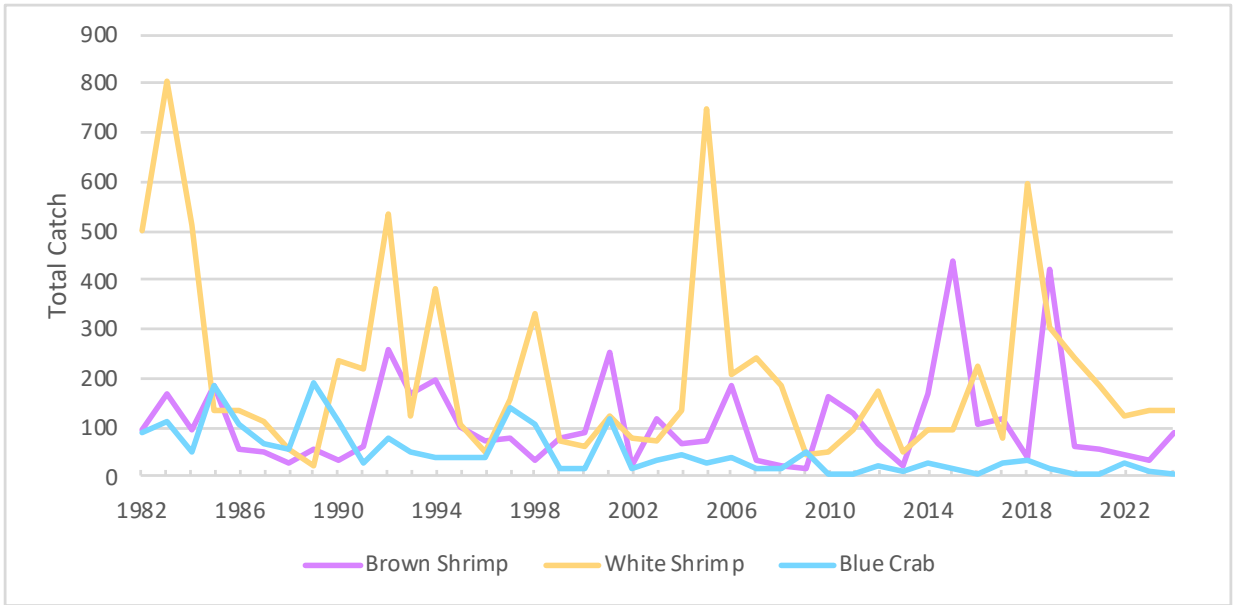


Figure 13. Total catch by year of invertebrate species of interest collected from 1982-2024 during TPWD long-term monitoring surveys conducted near the discharge and intake area.

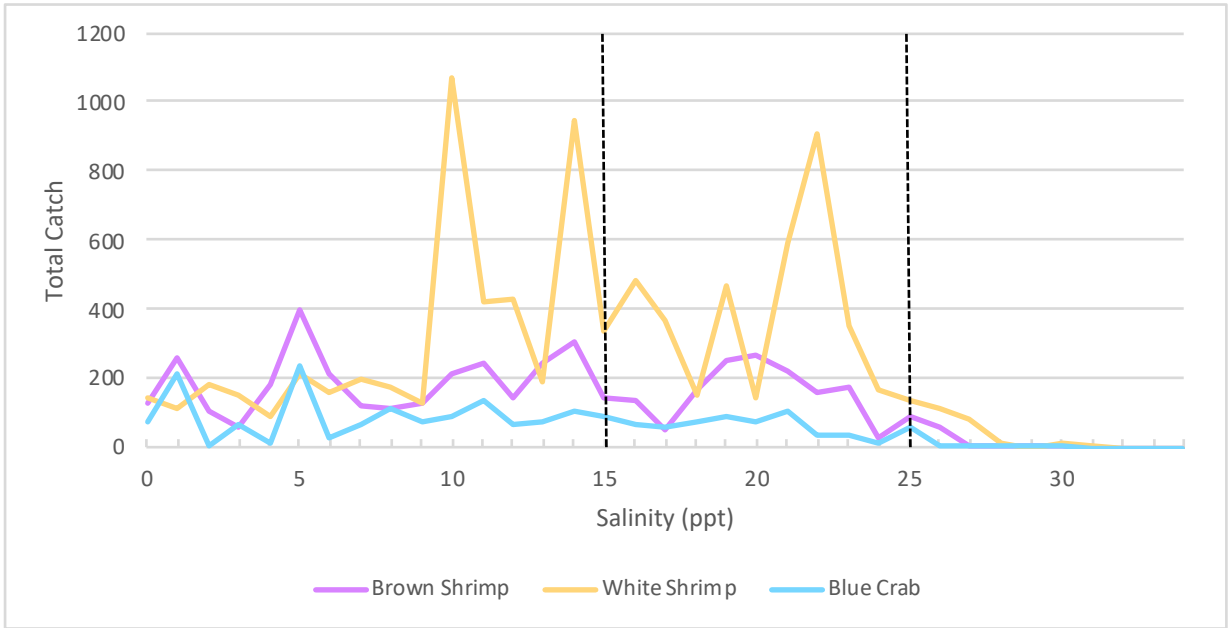


Figure 14. Total catch by salinity of invertebrate species of interest collected from 1982-2024 during TPWD long-term monitoring surveys conducted near the discharge and intake area. While salinity ranges varied for larval development for each species, each optimal salinity range included 15-25 ppt (dashed vertical lines) based on the literature review.

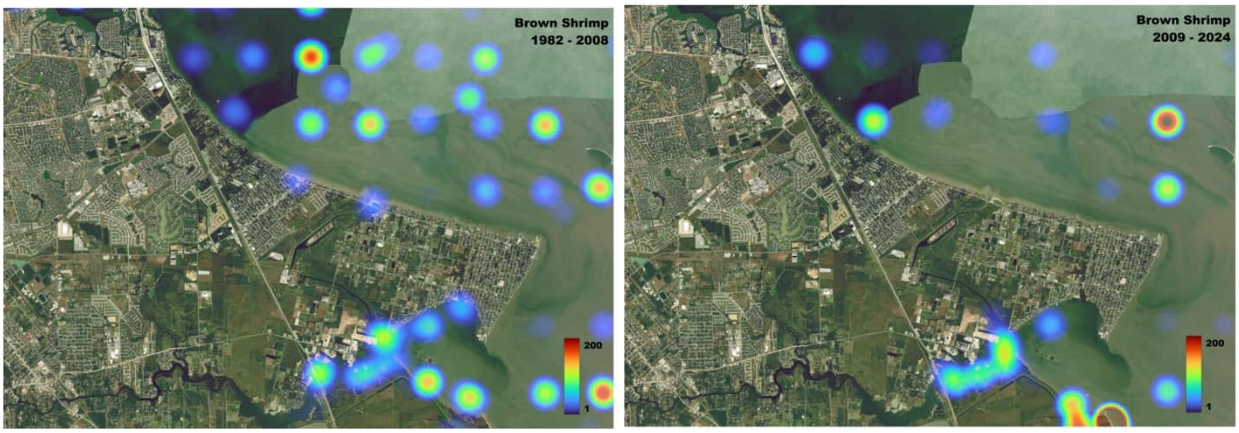


Figure 15. Heatmaps of brown shrimp catch from TPWD long-term monitoring program illustrating differences in catch between 1982-2008 and 2009-2024 conducted near the discharge and intake area. During the time of collection, salinity ranged from 0-30 ppt for 1982-2008 and from 0.1-30.1 ppt 2009-2024.

ii. White Shrimp

White shrimp were more abundant than brown shrimp collected from TPWD long-term monitoring surveys around the discharge and intake area with a total of 8,969 individuals collected from 1982-2024 (Figure 16). Catch from this area accounts for 2.5% of the total white shrimp collected across Galveston Bay (n = 361,138) for the same time period (Supplemental Figure 6). White shrimp were predominately collected in bay trawl surveys (average TL = 103 mm [4.1 in]), followed by bag seine (average TL = 55 mm [2.2 in]), gill net (average TL = 146 mm [5.7 in]), and oyster dredge (average TL = 94 mm [3.7 in]) surveys. Spawning also occurs offshore, however while brown shrimp recruit to the estuaries in the early spring, white shrimp postlarvae appear in the late spring, early summer, with both continuing recruitment into early fall (Baxter and Renfro 1967) utilizing shallow salt marsh habitats. Subadult shrimp will transition to the open bay before moving offshore (Minello et al. 1989). Overall white shrimp collections across the entire Galveston Bay complex were primarily concentrated in West Bay among seagrass habitats, East Bay, and the southern portion of Trinity Bay (Supplemental Figure 6).

The abundance of white shrimp collected near the discharge and intake area varied annually with peaks occurring in 1983, 2005, and 2018 (Figure 13). White shrimp can also tolerate a wide range of salinities and were collected in the area at an average salinity of 15.3 ppt, ranging from 0-31.5 ppt (Figure 14). Both brown and white shrimp have been reported in salinities of 1-45 ppt

(Zein-Eldin and Renaud 1986). In the same gradient tank experiment as the brown shrimp, juvenile white shrimp did not show a salinity preference and did not avoid lower salinities (Doerr et al. 2016). After 2008, catches of white shrimp in TPWD surveys have been low, other than a spike in 2018. Declines in white shrimp population has been observed bay wide, with warming waters potentially limiting shrimp growth (Olsen et al. 2022). This is evident in differences in catch abundance between 1982-2008 and 2009-2024 (Figure 17). Salinities during these time periods varied slightly from an average of 14.6 ppt (range: 0-30 ppt) in 1982-2008 and to an average of 16.2 ppt (range: 0.5-31.5 ppt) in 2009-2024.

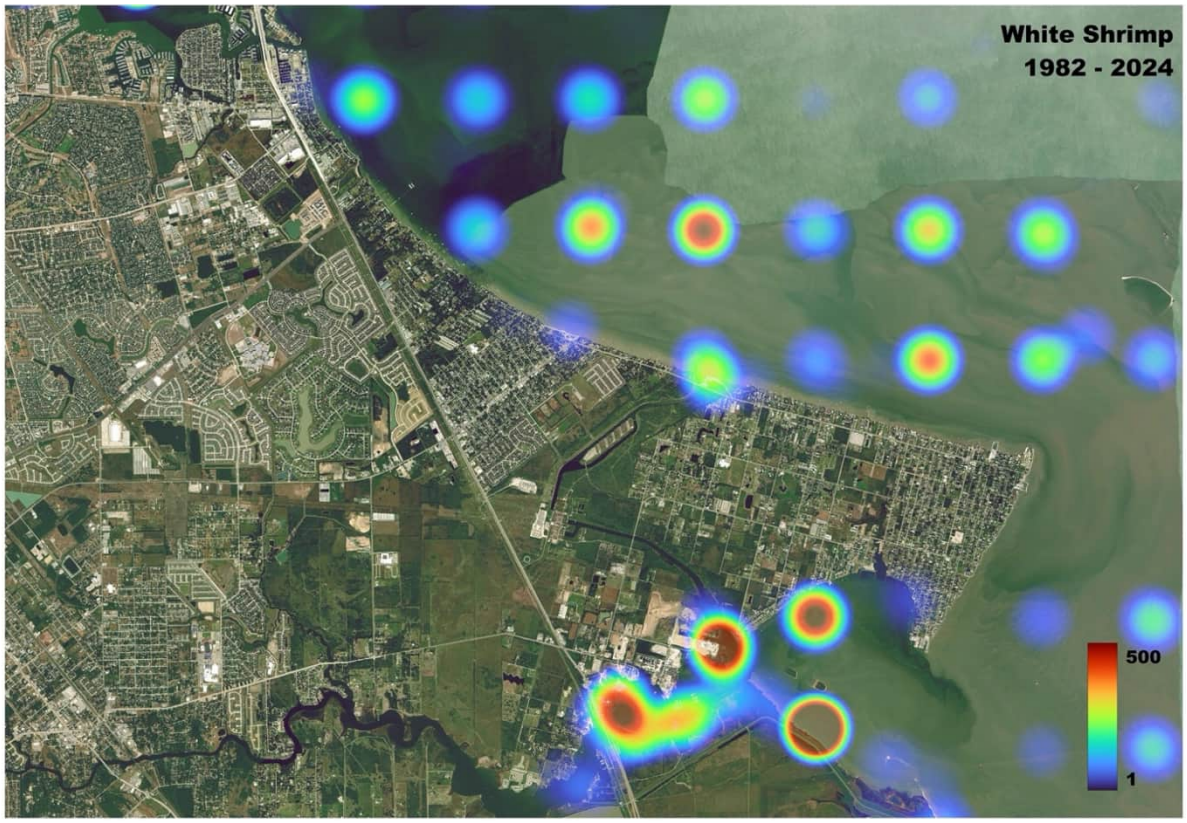


Figure 16. Heatmap of white shrimp catch from TPWD long-term monitoring program from 1982-2024 conducted near the discharge and intake area. During the time of collection salinity ranged from 0-31.5 ppt.

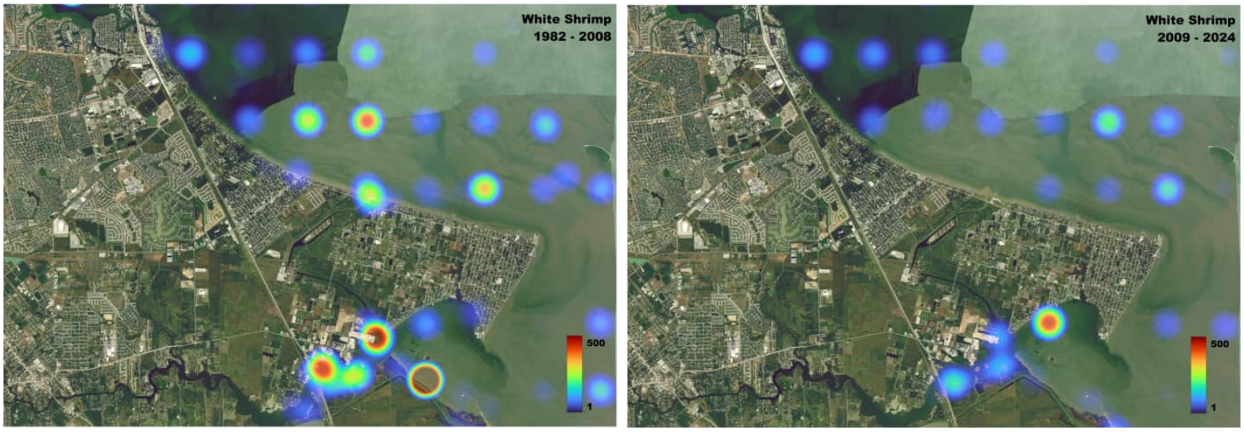


Figure 17. Heatmaps of white shrimp catch from TPWD long-term monitoring program illustrating differences in catch between 1982-2008 and 2009-2024 conducted near the discharge and intake area. During the time of collection, salinity ranged from 0-30 ppt for 1982-2008 and from 0.5-31.5 ppt 2009-2024.

iii. Blue Crab

A total of 2,108 blue crab were collected around the discharge and intake area from 1982-2024 as part of the TPWD long-term monitoring program. This catch accounts for 4.1% of the overall blue crab catch in Galveston Bay (n = 51,262) during the same time period (Supplemental Figure 7). The majority of blue crab collected in the area was from bay trawl surveys (average TL = 77 mm [3 in]), followed by bag seine (average TL = 47 mm [1.9 in]), gill net (average TL = 137 mm [5.4 in]) and oyster dredge (average TL = 124 mm [4.9 in]). Blue crab megalopae settlement into the estuary peaks in late summer and fall, with adult females spawning offshore (Rabalais et al. 1995). The abundance of juvenile blue crab in lower Galveston Bay was 4.2 times higher in the marsh edge compared to shallow, open water areas (Minello et al. 2008). Overall blue crab collections occurred across the entire Galveston Bay complex with higher collections located just inside the connecting pass to the Gulf (Supplemental Figure 7).

Blue crab collections near the discharge and intake area varied annually and steadily declined after 2001 (Figure 13). Declines in blue crab populations in Galveston Bay have been linked to

overfishing and habitat loss (Rozas et al. 2007). This decline in catch is also evident in abundance heatmaps between 1982-2008 and 2009-2024 (Figure 19). Blue crab collections in the area occurred across a wide range of salinity (0-31.5 ppt), with average catch occurring at 13.4 ppt (Figure 14). The optimal salinity for blue crab to hatch is 23-28 ppt, with megalopae developing the most rapidly at salinities of 15-35 ppt (Tankersely and Forward 2007). Minimal differences in salinities at time of collection occurred from 1982-2008 (average: 13.8; range: 0-30 ppt) and 2009-2024 (average: 13.9; range: 0.4-31.5 ppt).



Figure 18. Heatmap of blue crab catch from TPWD long-term monitoring program from 1982-2024 conducted near the discharge and intake area. During the time of collection salinity ranged from 0-31.5 ppt.

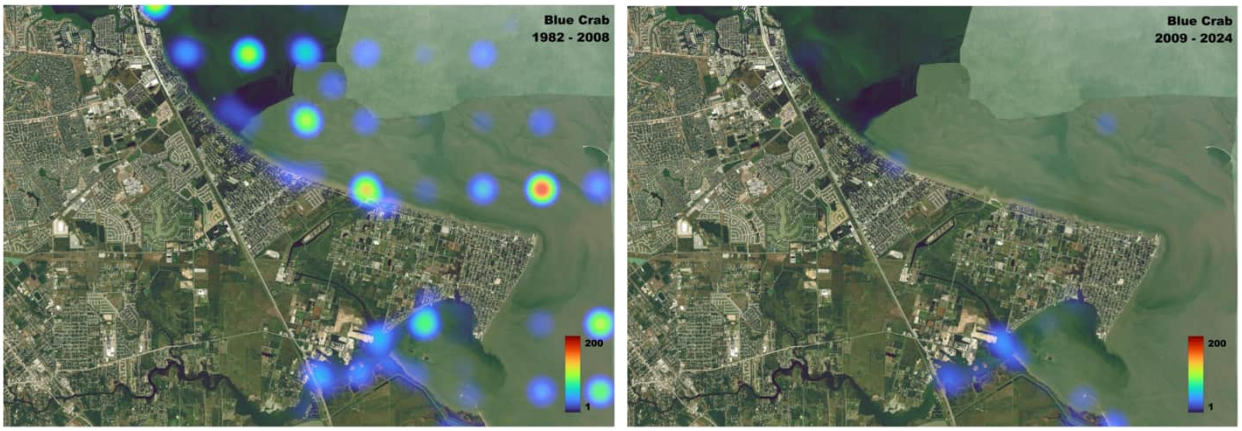


Figure 19. Heatmaps of blue crab catch from TPWD long-term monitoring program illustrating differences in catch between 1982-2008 and 2009-2024 conducted near the discharge and intake area. During the time of collection, salinity ranged from 0-30 ppt for 1982-2008 and from 0.4-31.5 ppt 2009-2024.

3. Seagrass and Oyster Habitat

i. Seagrass

Seagrass was once present in the Upper Bay of Galveston Bay, with *Ruppia maritima* being the only species to occur near the discharge and intake area. In 1961, Hurricane Carla impacted the area causing extensive damage to the submerged vegetation (SV). By the winter of 1961, all SV disappeared and did not reestablish. Pulich and Write (1991) used historical photos to calculate changes in SV in the Upper Bay from 1956 and 1962. It was concluded that after Hurricane Carla, turbidity and water quality factors potentially contributed to the lack of reestablishment, along with subsidence and shoreline erosion. To date, seagrass is only present in the West Bay of Galveston Bay, with no seagrass present around the proposed discharge and intake area (Figure 20).



Figure 20. Seagrass (yellow) and oyster (pink) habitat locations in Galveston Bay. The light blue square insert highlights the proposed discharge and intake area.

ii. Eastern Oyster

Oyster habitat in Galveston Bay is primarily located in the mid-bay area (Figure 20). Eastern oyster was the most abundant species collected around the discharge and intake area with a total of 43,658 samples collected from 1982-2024 through the TPWD long-term monitoring program (Figure 21). This accounts for 15.5% of the total eastern oyster samples collected throughout Galveston Bay (n = 281,554) during the same time period (Supplemental Figure 8). Eastern oysters were primarily collected by oyster dredge surveys (average TL = 66 mm [2.6 in]), followed by bay trawl (average TL = 70 mm [2.8 in]), bag seine (average TL = 67 mm [2.6 in]), and gill net (average TL = 74 mm [2.9 in]) surveys. Spawning is linked to temperature, occurring in Galveston Bay from late spring to early fall when weather is warmer (www.tpwd.texas.gov). Overall eastern oyster collections across the entire Galveston Bay complex were heavily concentrated in Upper/Mid Bay along known oyster habitat, with a portion of this habitat located near the discharge and intake area (Supplemental Figure 8).

The annual total catch of eastern oyster has steadily declined around the discharge and intake area since 1991 (Figure 22) and this decline has been observed bay wide due to overfishing, habitat loss and weather events (Du et al. 2021). While eastern oysters were collected over a range of salinities (range: 0-35 ppt; average: 16 ppt), this was the only species that displayed a single peak in abundance for a salinity value (20 ppt; Figure 23). Decreases in oyster production are a result of high freshwater inflow as salinity in the primary factor controlling oyster distribution, with higher salinities resulting in increased larval growth rate (Dekshenieks et al. 2000). Stronger recruitment events occur when salinities range from 17-24 ppt and recruitment ceases when salinity drops below 8 ppt (Hofstetter 1983). The decline in eastern oyster abundance is evident when comparing catch between 1982-2008 and 2009-2024 (Figure 24). Salinities varied over these collection periods with salinity averaging 14.5 ppt (range: 0-35ppt) from 1982-2008, and salinity averaging 7.3 ppt (0.5-32.5 ppt) from 2009-2024. Reduction in oyster populations has been linked to overharvesting, hurricanes, and spring flooding events in the upper bay (Dekshenieks et al. 2000).



Figure 21. Heatmap of eastern oyster catch from TPWD long-term monitoring program from 1982-2024 conducted near the discharge and intake area. During the time of collection salinity ranged from 0-35 ppt.

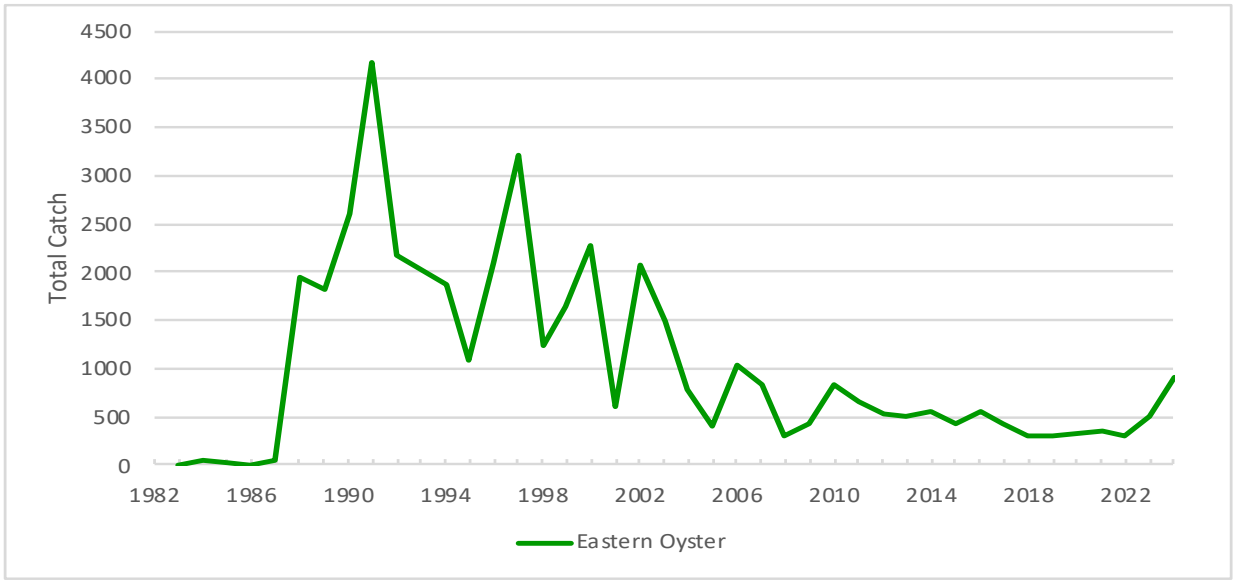


Figure 22. Total catch by year of eastern oyster collected from 1982-2024 during TPWD long-term monitoring surveys conducted near the discharge and intake area.

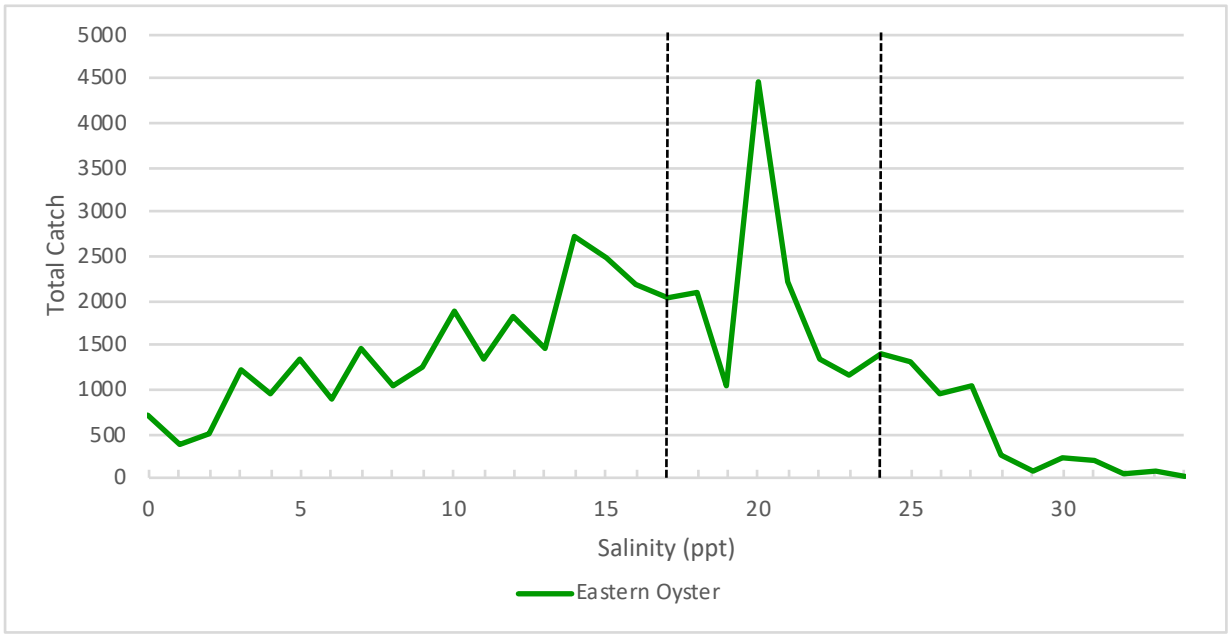


Figure 23. Total catch by salinity of eastern oyster collected from 1982-2024 during TPWD long-term monitoring surveys conducted near the discharge and intake area. The optimal salinity range is 17-24 ppt (dashed vertical lines) based on the literature review.

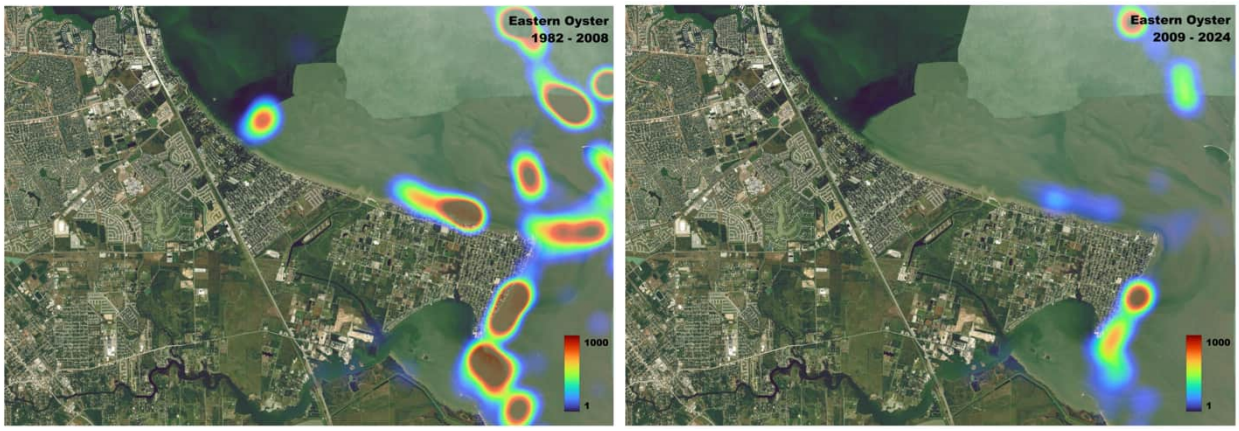


Figure 24. Heatmaps of eastern oyster catch from TPWD long-term monitoring program illustrating differences in catch between 1982-2008 and 2009-2024 conducted near the discharge and intake area. During the time of collection, salinity ranged from 0-35 ppt for 1982-2008 and from 0.5-32.5 ppt 2009-2024.

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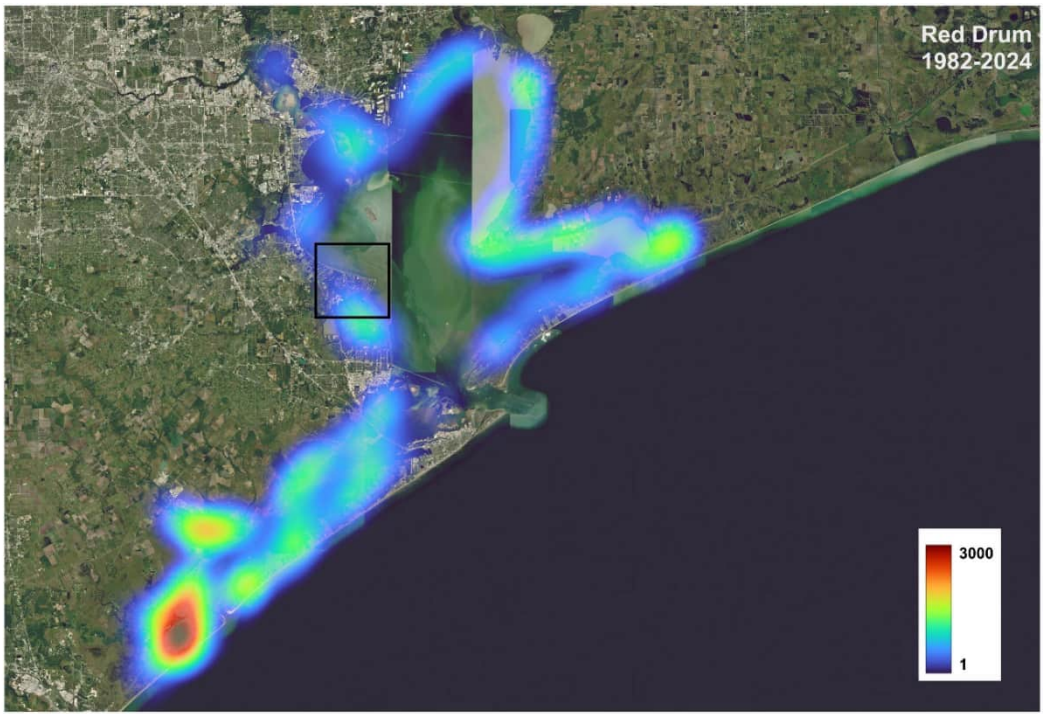
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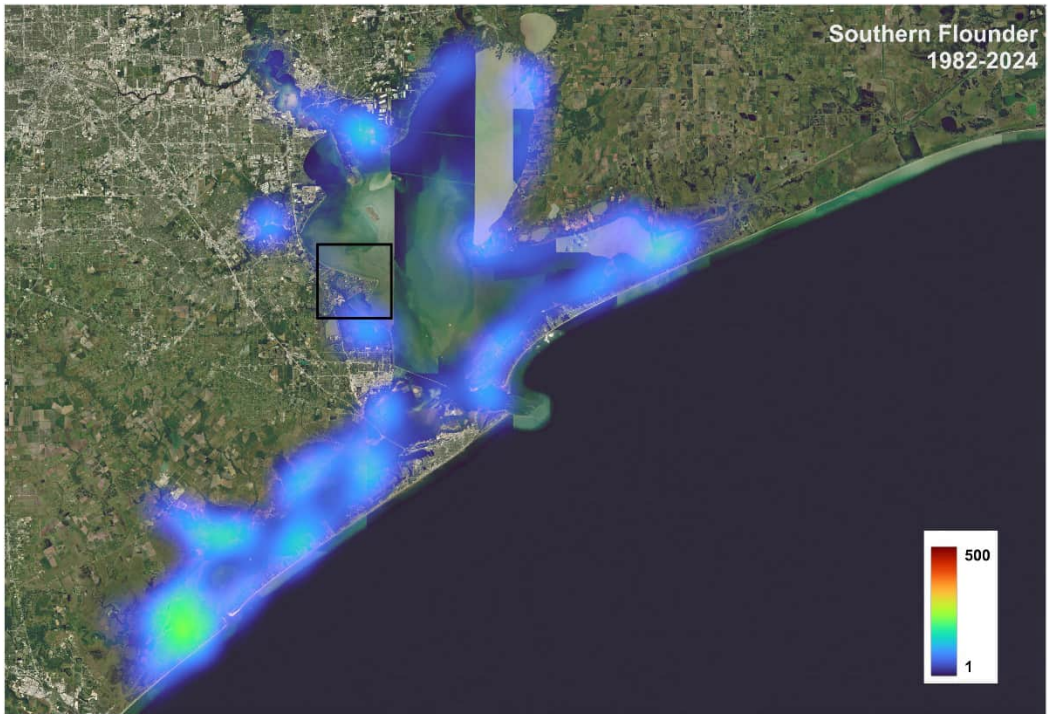
Supplemental Data

Supplemental Table 1. Total catch, salinity, temperature, dissolved oxygen (DO), and turbidity of species collected near the discharge and intake area from 1982-2024 from TPWD long-term monitoring program.

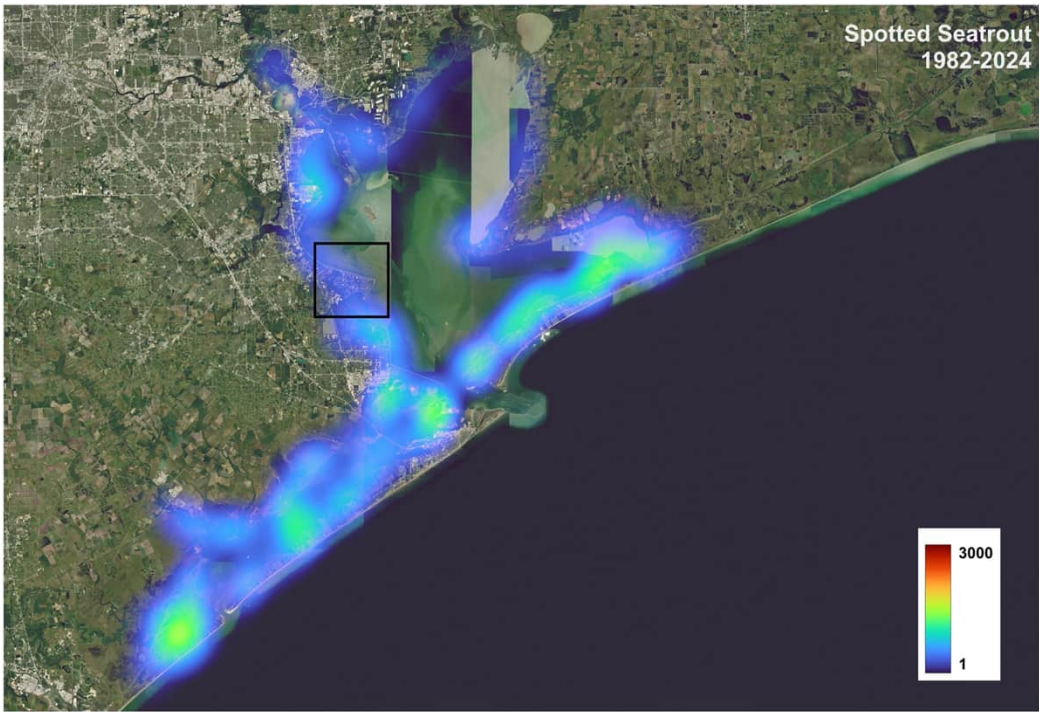
Species	Total Catch	Salinity (ppt)			Temperature (◦C)			DO (ppm)			Turbidity (NTU)		
		Mean	Mode	Range	Mean	Mode	Range	Mean	Mode	Range	Mean	Mode	Range
Red Drum	1,167	13.6	5.0	0-33	24.4	28.0	10-31.7	7.8	8.3	2-14	24.8	11.0	3-170
Southern Flounder	88	14.0	17.0	0.9-33	24.6	25.5	10.2-31.8	7.9	6.6	4.3-14	34.6	24.0	4-170
Spotted Seatrout	1,110	13.6	5.0	0-33	24.5	26.0	8.2-35.2	7.8	8.3	2.5-14	24.2	20.0	3-170
Black Drum	1,331	13.5	15.0	0-27.9	24.8	28.0	8.6-31.9	7.8	8.3	2-14.3	23.6	11.0	1-170
Brown Shrimp	4,638	14.9	11.0	0-30.1	26.4	29.5	11.1-35.2	7.0	8.0	2.3-14	25.9	24.0	1-270
White Shrimp	8,969	15.3	20.0	0-31.5	22.4	23.5	6.0-35.2	7.7	7.0	2.3-17	26.3	24.0	1-270
Blue Crab	2,108	13.4	10.0	0-31.5	23.9	29.0	9.0-35.2	7.7	9.0	2-16	28.6	24.0	1-270
Eastern Oyster	43,658	16.0	20.0	0-35	22.1	29.5	5.3-34.1	7.6	7.1	0.9-20.6	18.8	10.0	0-850



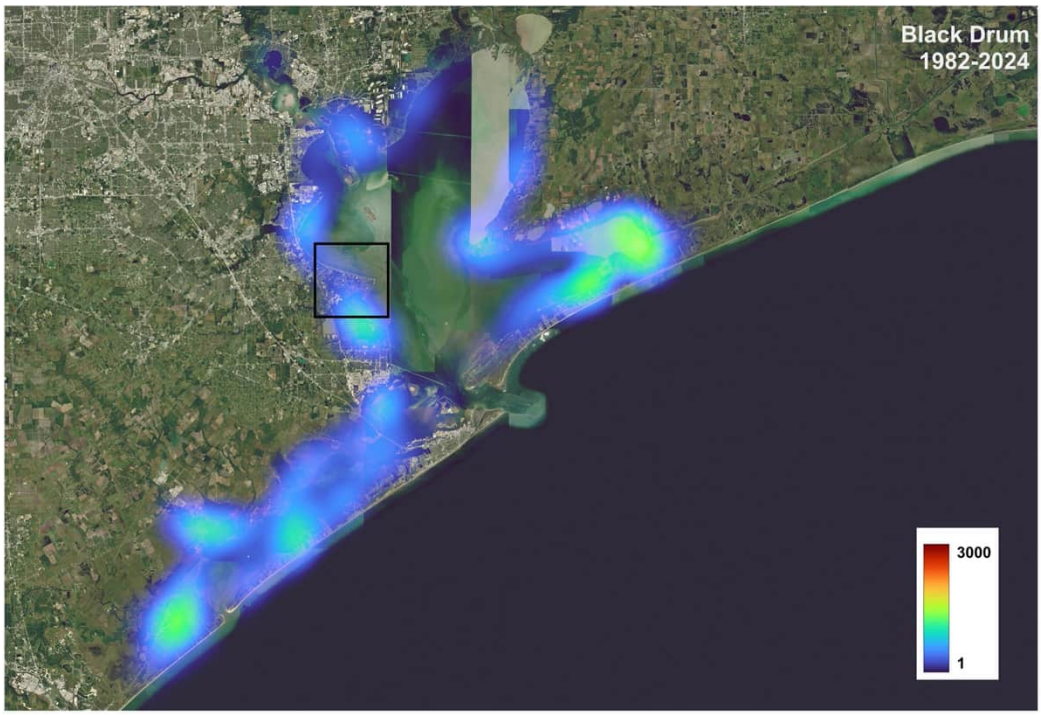
Supplemental Figure 1: Total red drum catch (n = 47,614) across Galveston Bay through the TPWD long-term monitoring program from 1982-2024. Black box highlights proposed intake and discharge area.



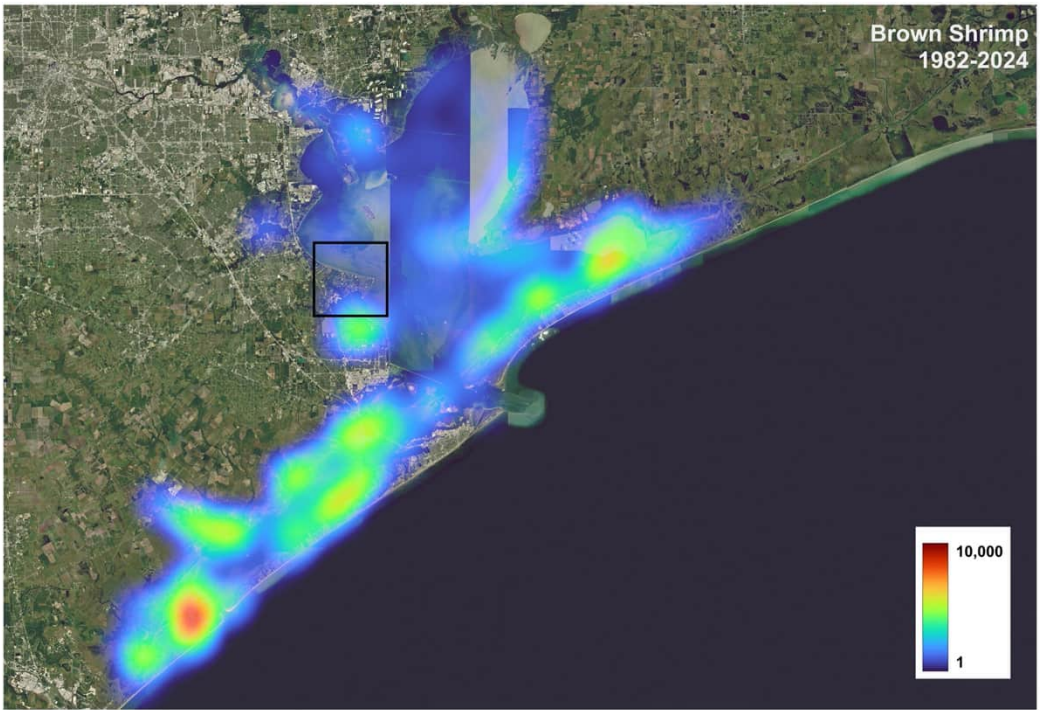
Supplemental Figure 2: Total southern flounder catch (n = 5,179) across Galveston Bay through the TPWD long-term monitoring program from 1982-2024. Black box highlights proposed intake and discharge area.



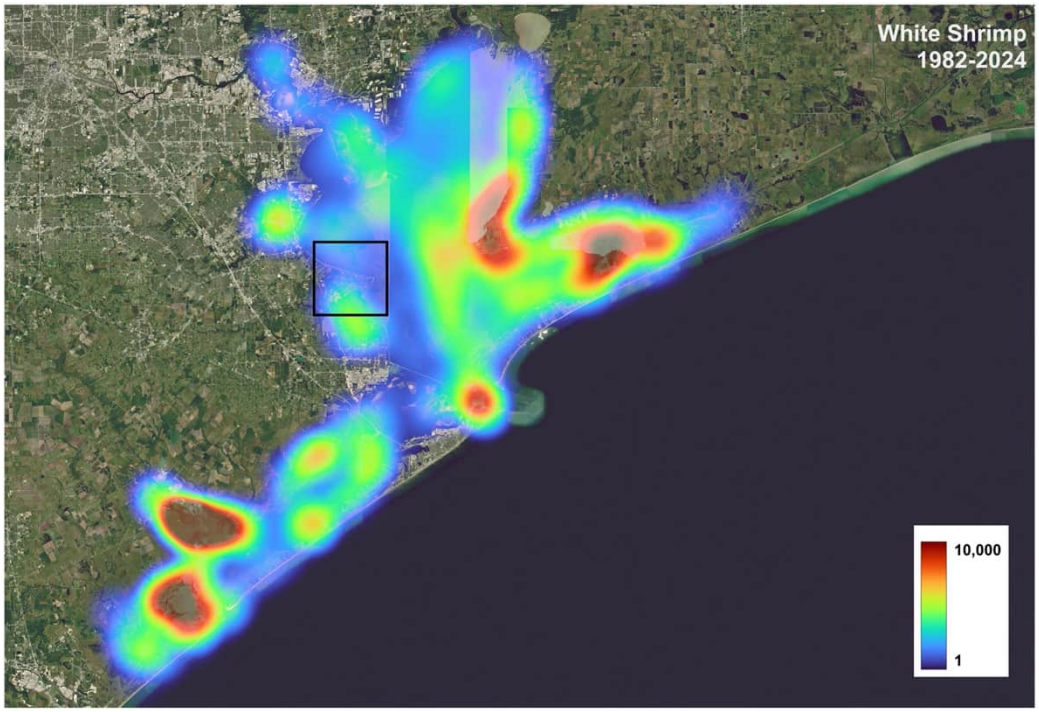
Supplemental Figure 3: Total spotted seatrout catch (n = 33,154) across Galveston Bay through the TPWD long-term monitoring program from 1982-2024. Black box highlights proposed intake and discharge area.



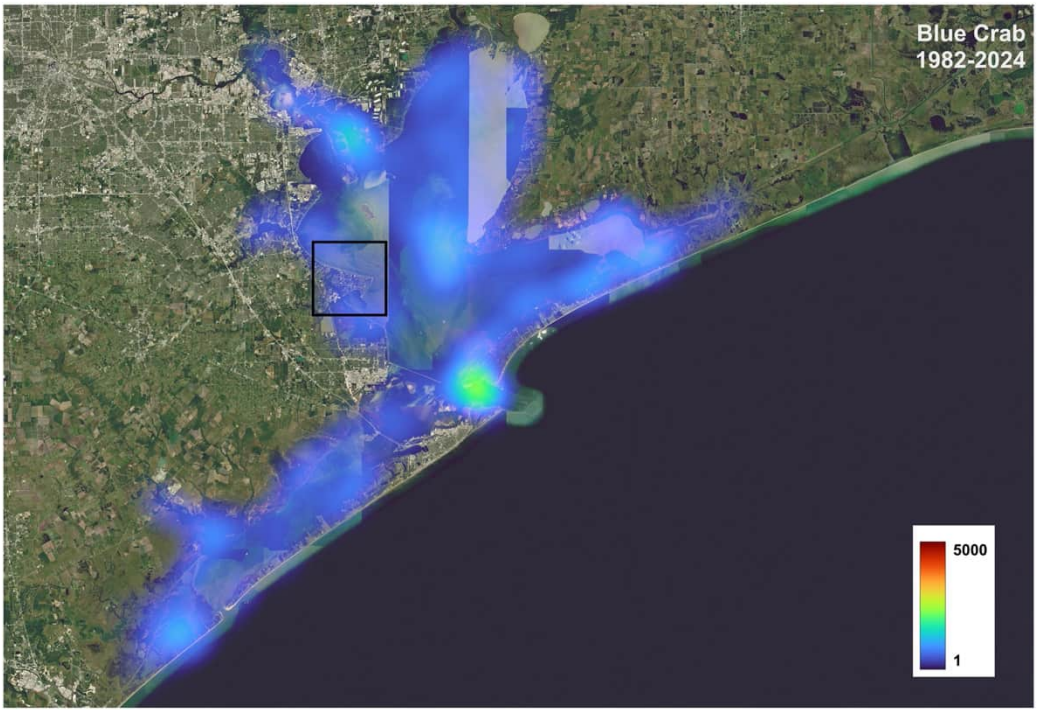
Supplemental Figure 4: Total black drum catch (n = 28,800) across Galveston Bay through the TPWD long-term monitoring program from 1982-2024. Black box highlights proposed intake and discharge area.



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Supplemental Figure 7: Total blue crab catch (n = 51,262) across Galveston Bay through the TPWD long-term monitoring program from 1982-2024. Black box highlights proposed intake and discharge area.



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Tab 22

EPCOR

Bayshore Desalination Facility

TECHNICAL MEMORANDUM

Water Quality Analysis of Near-Field and Far-Field Impacts of the Proposed Bayshore Desalination Facility Discharge

Prepared by:	Ernest Sin Chit To, Ph.D., P.E.
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WATERMODSTER

Texas Registered Engineering Firm F-24905

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LIST OF ABBREVIATONS

ALMZ	Aquatic Life Mixing Zone
Facility	Bayshore Desalination Facility
MGD	Million Gallons per Day
ppt	Parts per Thousand
RO	Reverse Osmosis
SOP	Standard Operating Procedures
Station	P.H. Robinson Electric Generating Station
SWQM	Surface Water Quality Monitoring
TCEQ	Texas Commission on Environmental Quality
TPDES	Texas Pollutant Discharge Elimination System
USEPA	United States Environmental Protection Agency
ZID	Zone of Initial Dilution

1.0 EXECUTIVE SUMMARY

EPCOR is developing a seawater desalination project in the Houston-Galveston area. This technical memorandum is prepared for EPCOR by WaterModster to support the Texas Pollutant Discharge Elimination System (TPDES) permitting application for the proposed desalination plant ("Facility"). The goal is to provide water quality analysis of the Facility discharge and the potential impacts on local aquatic life in the near-field and the far-field.

The proposed location of the Facility is in Texas City, Texas on the site of the now-decommissioned P.H. Robinson Electric Generating Station ("station"). The TPDES permit number for the station was WQ0001050000. The station was decommissioned in 2008. While in operation from 1961 to 2008, the station was permitted to pump up to 1,728 MGD of water (daily average limit) from Lower Galveston Bay into the station. The water was used to cool the station and then discharged into the Facilities' outfall man-made canal and out into Upper Galveston Bay.

Baseline Conditions

The Facility is expected to utilize the existing intake channel of the station for withdrawal of source water. The intake channel connects to Dickinson Bay, which is a part of Lower Galveston Bay (Texas Commission on Environmental Quality (TCEQ) Water Quality Segment 2439). Based on historical Surface Water Quality Monitoring (SWQM) data collected by TCEQ in the vicinity of the intake from 2009 to 2025 (after the decommissioning of the station), the average source water salinity is 14.4 ppt. Standard deviation is 8.0 ppt. The 5^{th-} percentile to 95^{th}-percentile TDS range is 2.0 to 26.4 ppt.

The Facility is expected to utilize the existing outfall man-made canal of the station for discharge. The proposed discharge will be introduced into the upstream end of a 2.0-mile outfall man-made canal which terminates downstream at a tidal dam that then spills into Upper Galveston Bay (TCEQ Segment 2421). Based on TCEQ Surface Water Quality Monitoring (SWQM) data the average Total Dissolved Solids (TDS) is 18.0 ppt in Upper Galveston Bay near the tidal dam. Standard deviation is 6.7 ppt. The 5^{th-} percentile to 95^{th}-percentile range is 6.6 to 25.6 ppt.

Both source and receiving waters regularly experience wide TDS fluctuations due to the estuarine environment. As such local aquatic species are accustomed to large TDS

ranges. TDS in the source waters tends to be lower than in the receiving waters due to freshwater runoff from the Dickinson Bayou watershed.

The State of Texas does not define TDS standards for Upper Galveston Bay (Segment 2421). This is common for tidal water quality segments along the Gulf coast. However, in prior desalination facility permit applications on other saltwater segments (i.e., City of Corpus Christi desalination facilities at Inner Harbor WQ00005289000 and La Quinta WQ00005290000), TCEQ has requested applicants to identify TDS targets that would minimize impacts to local aquatic life in the near-field and the far-field. The purpose of this request is to support the antidegradation review of the permit application.

Consequently, TDS targets were developed for the receiving waters of the Facility and water quality analysis and near-field and far-field modeling were performed to demonstrate the meeting of those targets.

Near-Field Discharge Analysis
The near field covers the regulatory mixing zones surrounding the discharge outfall. The two key mixing zones are the zone of initial dilution (ZID) and the aquatic health mixing zone (ALMZ).

The ZID covers an area typically within 50 feet of the outfall. The acute TDS target of 42 ppt for the Facility is identified for the edge of the ZID. The 42 ppt target value is based on 48-hour survival rates of mysid shrimp and inland silverside minnow (Pillard, et. al., 1999). These two aquatic species are used in whole effluent toxicity tests for other TPDES permittees in Upper Galveston Bay. The acute TDS target of 42 ppt for the Facility is the same as the acute TDS target adopted for the Corpus Christi Inner Harbor Desalination Plant application (FNI, 2020).

The ALMZ is outside the ZID and typically within 200 ft of the outfall. The chronic TDS target of 23.3 ppt for the Facility is identified at the edge of the ALMZ. The 23.3 ppt is derived from TCEQ's formula to determine TDS standards. The formula calculates the target value as a function of arithmetic mean, standard deviation, number of observations and Student's t value of historical ambient data. The chronic TDS target represents a long-term average TDS target.

The Facility is proposed to produce up to 26.5 MGD of product water through seawater reverse osmosis (RO). The maximum RO recovery rate of the Facility is 50%, which

results in a RO feed rate of 53 MGD and a RO reject flow rate of 26.5 MGD. RO reject TDS is expected to be twice (2x) the intake TDS.

To lessen the salinity impact on the receiving water bodies from the discharge, the Facility will use flow augmentation to reduce the discharge TDS prior to discharge. Flow augmentation is where additional source water is pumped from the intake channel to blend with the RO reject. The Facility's target blend ratio is 1:1.13 and therefore the final discharge will be 47% RO reject water and 53% source water by volume. After flow augmentation, the resulting discharge TDS is expected to be only 1.47 times the intake TDS. Therefore, the overall expected intake flow rate for the Facility is 82.8 MGD and the expected overall discharge rate is 56.3 MGD.

Flow augmentation is a well-established brine-management practice for desalination plants. The Claude "Bud" Lewis Carlsbad Desalination Plant (CDP) in Carlsbad, California uses flow augmentation to achieve salinities protective of marine life (CRWQB, 2019). The advantages of flow augmentation over more conventional means of dilution like using diffusers, is that dilution is achieved at the end-of-pipe before discharge instead of in the marine environment, thus lessening TDS impact on aquatic life in the mixing zones. Also, flow augmentation performance is potentially more consistent than diffusers in that dilution effectiveness is not dependent on receiving water conditions such as background flow, TDS and temperature.

Multiplying the flow augmented factor of 1.47 to the source water TDS yields an expected average effluent TDS of 21.2 ppt for the Facility discharge. Expected effluent TDS standard deviation is 12 ppt. The expected 5^{th-} percentile to 95th-percentile effluent TDS range is 2.94 to 38.8 ppt.

The above statistics demonstrate that at the end-of-pipe:

- The average TDS of 21.2 ppt can meet the chronic TDS target of 23.3 ppt.
- The 95th-percentile TDS of 38.8 ppt can meet the acute TDS target of 42 ppt.

An independent study conducted by Texas A&M University at Galveston (Du, J., 2025) indicated potential for the source water TDS to increase by up to 0.8 ppt as a result of the Facility operation. This potential increase in source water salinity is due to the movement of more saline water into Dickinson Bay. A sensitivity analysis of the Facility discharge was conducted and showed that even under source water TDS rise, the near-field acute and chronic TDS target criteria will still be met.

Texas A&M at Galveston also evaluated the discharge area for suitable habitat for important species and assessed the potential impacts (i.e. salinity changes) that the proposed discharge may have (Sluis, 2025). Forty years of catch data near the intake and discharge areas were evaluated for nine species, including red drum (Sciaenops ocellatus), flounder (primarily southern flounder [Paralichthys lethostigma]), black drum (Pogonias cromis), spotted seatrout (Cynoscion nebulosus), brown shrimp (Farfantepenaeus aztecus), white shrimp (Litopenaeus setiferus), blue crab (Callinectes sapidus), oysters (primarily eastern oyster [Crassostrea virginica]) and seagrass. Each of these species are euryhaline and documented to tolerate a wide range of salinities. While salinity ranges varied for peak recruitment and larval development for each species in the study area, each optimal salinity range included 17 to 24 ppt, so the expected Facility discharge salinity of 21.2 ppt falls within the documented salinity range for larval recruitment and development of the identified species.

Far-Field Discharge Analysis

In the far-field, TCEQ requested an evaluation of the potential risk of stratification-induced hypoxia and salinity accumulation. The far-field refers to areas along the discharge path beyond the regulatory mixing zones typically to the point where the plume dissipates to background.

Salinity stratification is a phenomenon that happens when more saline water encounters less saline ambient water and creates a denser bottom layer below the ambient waters. If movement of the bottom layer is very slow, such as in the flat bottom region of a bay, the density stratification can inhibit downward transfer dissolved oxygen (DO) into the bottom layer. If stratification persists for a long time, the DO at the bottom can potentially deplete, thereby increasing hypoxia risk. However, strong ambient currents and/or significant bottom slope can facilitate movement and dissipation of the bottom layer and prevent the onset of hypoxia.

Based on literature (Hodges, 2010), the following criteria are identified to screen for stratification events that can have higher hypoxia risk:

- Location: in the flat bottom region of Upper Galveston Bay
- Strength: top and bottom TDS difference > 2 ppt
- Duration: more than 24 hours.

The values above are based on the minimum observed TDS difference and stratification duration for hypoxia events in Oso Bay, Corpus Christi. These criteria should be viewed

as conservative and that exceeding screening criteria may not equate the occurrence of actual hypoxia. As such, the criteria provide a useful tool to assess the *risk* of hypoxia occurrence based on TDS patterns.

"Exceedance events" are events that meet the above criteria. To evaluate the potential increase in frequency of exceedance events, a far-field model was developed to simulate TDS from the proposed outfall out into a portion of Upper Galveston Bay.

The far-field model was developed using the EFDC+ modeling platform and simulates TDS over three-dimensional space and time. The two-year simulation period runs from 1/2023 to 1/2025 and captures both a dry (2023) and wet year (2024). Events where TDS differences between the top and bottom layer exceeded 2 ppt were identified as stratification events. Stratification events that exceeded 24 hours and were in the flat bottom region of the bay were highlighted as "exceedance" events. The duration of exceedance events beyond 24 hours were summed and then divided by the simulation period to calculate the frequency of exceedance events.

The frequencies of exceedance events were computed for two scenarios: 1) the baseline (no discharge) scenario and 2) the blended discharge scenario. Comparison of the two scenarios shows minimal increases in frequencies. Changes in exceedance frequency varies spatially in the Bay, including areas of increases and decreases. The maximum regional increase in exceedance frequency is 0.4%. The maximum increase of 0.4% in exceedance events is well below 10% which is the typical pass/fail rate used by TCEQ for dissolved oxygen standard compliance (TCEQ, 2020). The 10% threshold is also a commonly used for identifying *de minimis* impact.

An independent study conducted by Texas A&M University at Galveston (Du, 2025) confirmed that far-field impacts on the risk of hypoxia in Galveston Bay from the Facility are minimal.

Conclusion

In conclusion, mixing analysis and far-field modeling demonstrate that

- In the near-field, flow augmentation protects the acute TDS target of 42 ppt and chronic TDS target of 23.3 ppt at the end-of-pipe; and,
- In the far-field, flow augmentation results in minimal increase in exceedance events and therefore minimizes increase in hypoxia risk.

The results from the water quality analysis are presented to TCEQ for the technical evaluation of the permit. In alignment with preceding desalination permits (City of Corpus Christi Inner Harbor Desalination Plant), it is proposed that reporting limits for TDS be adopted as effluent TDS limits for the Facility permit. Meanwhile, requirements for brine management measures – operation of the Facility at the maximum RO recovery rate of 50% with flow augmentation of 1:1.13 – can be specified in the "Other Requirements" section to ensure protection of aquatic life in the near field and the far field.

2.0 INTRODUCTION

EPCOR is developing a seawater desalination project to augment reliable water supplies for the Houston-Galveston area. The proposed location of the Facility is in Texas City, Texas at the site of the now-decommissioned P.H. Robinson Electric Generating Station ("station") (see map in Figure 1). The TPDES permit number for the station was WQ0001050000 (now inactive). The station was decommissioned in 2008 following Hurricane Ike. While in operation from 1961 to 2008, the station was permitted to pump up to 1,728 MGD of water (daily average limit) from Lower Galveston Bay into the station. The used water was sent through cooling towers, discharged into the outfall man-made canal, and then subsequently flow out into Upper Galveston Bay.

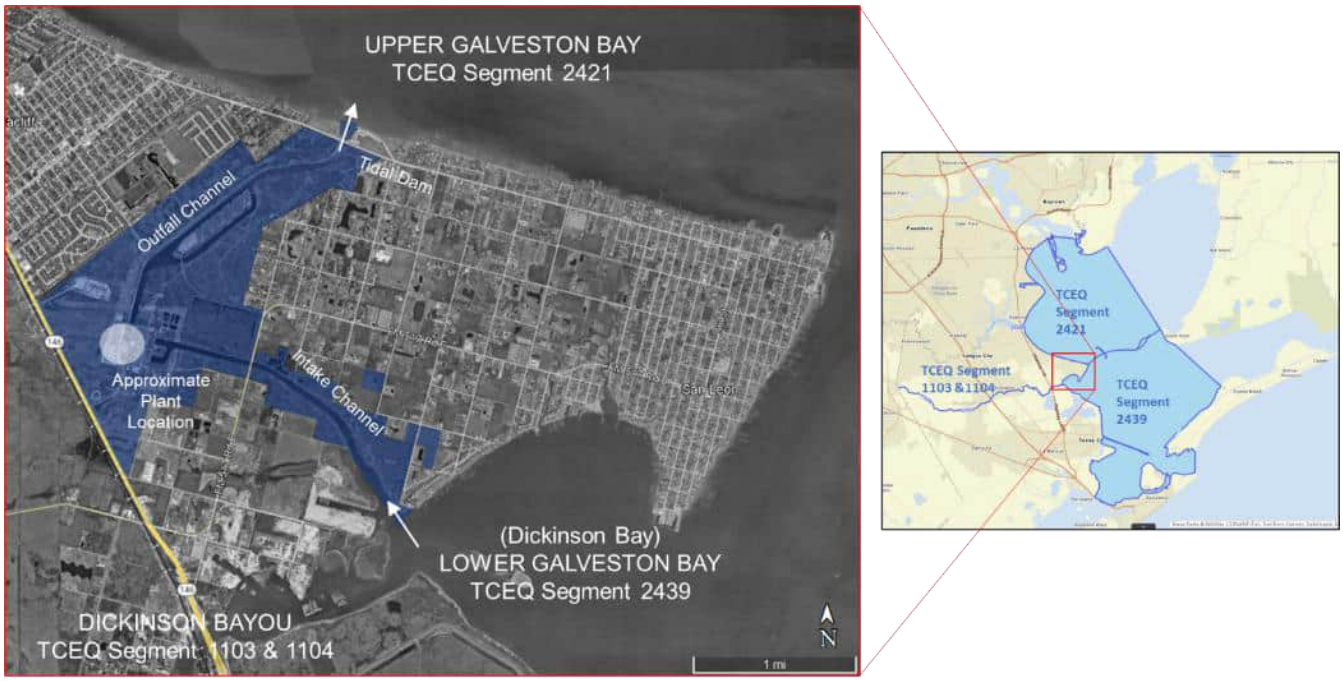


Figure 1. Map of the proposed Bayshore Desalination Facility.

2.1 Intake and source water characteristics

The Facility is expected to utilize the existing 1.9-mile-long intake channel of the station for withdrawal of source water. The intake channel connects to Dickinson Bay, which is a part of Lower Galveston Bay (TCEQ Water Quality Segment 2439).

To characterize the source water TDS, SWQM conductivity data from stations near the intake are extracted from TCEQ's Clean Rivers Program (CRP) database (TCEQ, 2025). The SWQM stations are SWQM 16983, 13365, 11445, 16984, 13374, 15219, 14577, 15224, 16220, 18703 (see map in Figure 2). To eliminate potential bias and interference from the period when the station transferred large amounts of water from Dickinson Bay, only data collected after the decommissioning of the station (i.e., 1/1/2009 to present) are used to characterize baseline source water TDS conditions.



Figure 2. Map of source water TCEQ SWQM stations with conductivity data.

Conductivity data (in units of µmhos/cm) are converted to TDS (ppt) using the formulae from TCEQ's CORMIX Modeling Standard Operating Procedure (TCEQ, 2018a) (see Equations 1 and 2).

- Equation 1 is for conductivities < 17,000 µmhos/cm:
  TDS (ppt) = 0.000589 × conductivity (µmhos/cm)
- Equation 2 is for conductivities ≥ 17,000 µmhos/cm:
  TDS (ppt) = (0.000682 × conductivity) - 1.7 (µmhos/cm)

Since conductivities were sometimes measured in depth profiles, TDS values belonging to the same profile were averaged to yield an average profile value. Figure 3 plots the time series of average profile TDS in the source water.

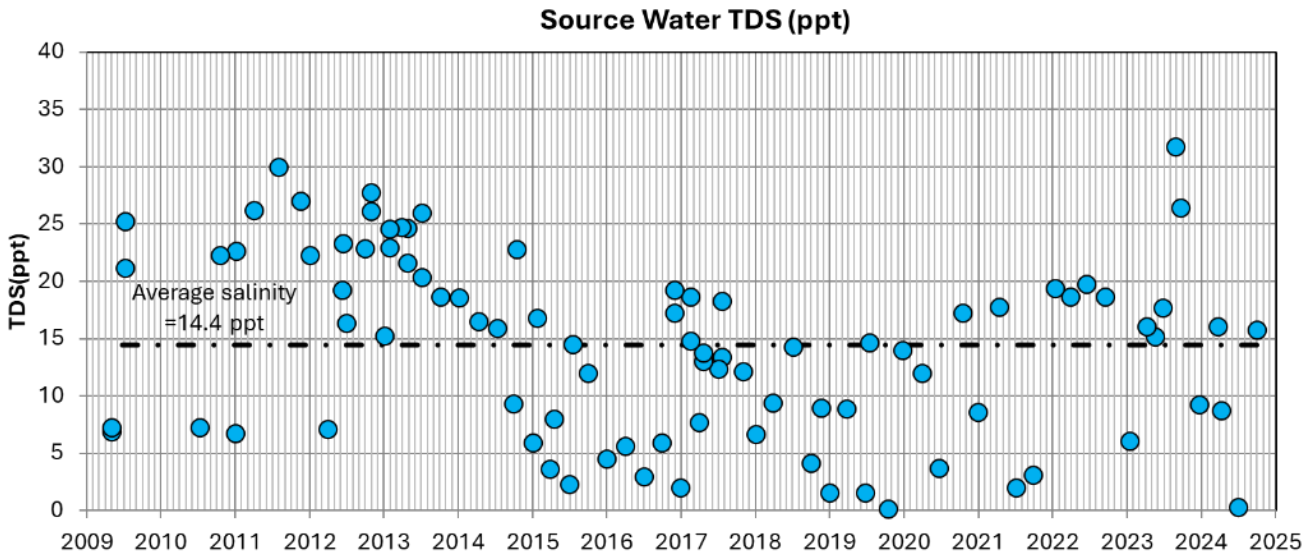


Figure 3. Average profile TDS in source water.

A total of 89 profiles were collected from 1/1/2009 to present. The average source water TDS is 14.4 ppt. Standard deviation is 8.0 ppt. The 5^{th-} percentile to 95th-percentile TDS range is 2.0 to 26.4 ppt. Additional statistics can be found in Table 1.

Table 1. Source Water TDS Statistics

Statistic	Value	Units
Average	**14.4**	**ppt**
Std Deviation	8.0	ppt
Minimum	0.2	ppt
5th percentile	2.0	ppt
25th percentile	7.3	ppt
Median	15.2	ppt
75th percentile	19.8	ppt
95th percentile	26.4	ppt
Maximum	31.8	ppt
Number of profiles	89	count

2.2 Outfall and receiving water characteristics

The Facility is expected to utilize the existing outfall man-made canal of the station for discharge. The proposed discharge is into the upstream end of a 2.0-mile-long outfall man-made canal which terminates downstream at a tidal dam which then spills into Upper Galveston Bay (TCEQ Segment 2421).

To characterize the receiving water TDS, SWQM conductivity data from stations near the tidal dam are extracted from TCEQ's Clean Rivers Program (CRP) database (TCEQ, 2025). The SWQM stations are SWQM 15913, 16516, 16213, 15246, 14581 (see map in Figure 4).



Figure 4. Map of receiving water TCEQ SWQM stations with conductivity data.

Similar to the treatment of source water TDS data, only data collected after the decommissioning of the station (i.e., 1/1/2009 to present) are used to characterize baseline receiving water TDS conditions. Average profile TDS for receiving waters is computed in the same manner as that for source waters. Figure 5 plots the time series of average profile TDS in the receiving water.

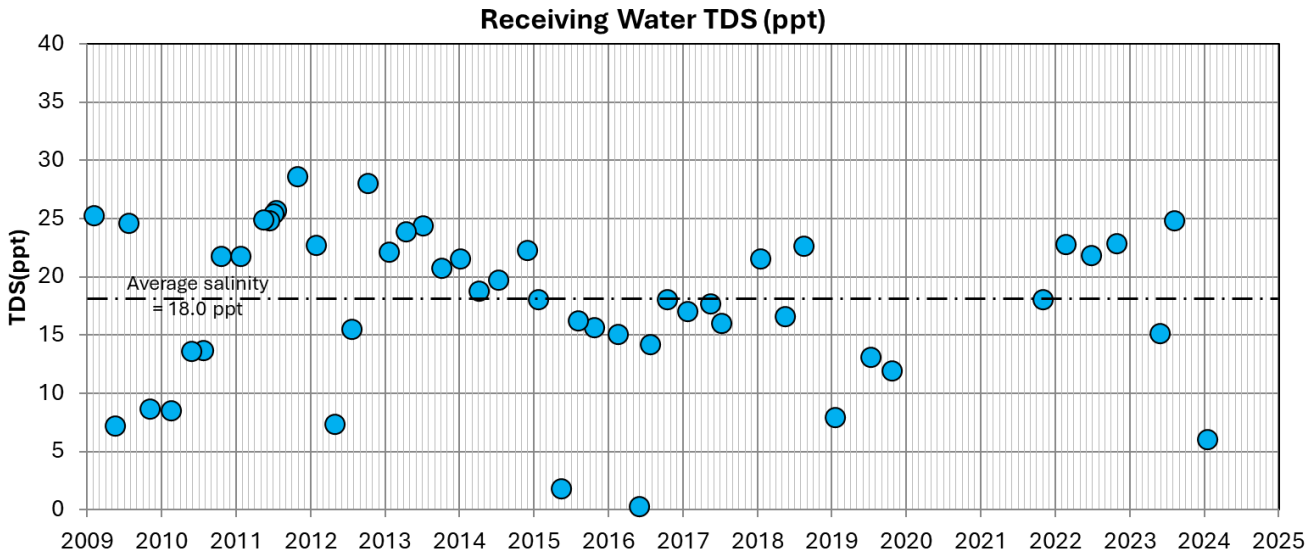


Figure 5. Average profile TDS in receiving waters.

A total of 50 profiles were collected from 1/1/2009 to present. The average receiving water TDS is 18.0 ppt. Standard deviation is 6.7 ppt. The 5^{th-} percentile to 95th-percentile range is 6.6 to 25.6 ppt. Additional statistics can be found in Table 2.

Table 2. Receiving Water TDS Statistics

Statistic	Value	Units
Average	**18.0**	**ppt**
Std Deviation	6.7	ppt
Minimum	0.3	ppt
5th percentile	6.6	ppt
25th percentile	14.5	ppt
Median	18.4	ppt
75th percentile	22.8	ppt
95th percentile	25.6	ppt
Maximum	28.7	ppt
Number of profiles	50	count

2.3 Comparison of source water and receiving water salinities

Both source and receiving waters regularly experience wide TDS fluctuations (standard deviation > 6.7 ppt) due to the estuarine environment. As such local aquatic species are accustomed to large TDS ranges.

Average source water TDS (14.4 ppt) is lower than that of receiving waters (18.0 ppt). Also, the source water TDS standard deviation (8.0 ppt) is higher than that of receiving waters (6.7 ppt).

The difference in TDS behavior in the source water can be attributed to freshwater runoff from the Dickinson Bayou watershed. According to the USEPA NHDPlus version 2.1 database (USEPA, 2025a), the area of the Dickinson Bayou watershed is 99 square miles (see Figure 6) and contributes an estimated annual runoff of 94 cfs (or approximately 60

MGD). This source of freshwater can lower the average source water TDS and widen the TDS range.



Figure 6. Map of Dickinson Bayou watershed delineated using EPA NHDPlus version 2.1.

3.0 DEVELOPMENT OF NEAR-FIELD TDS TARGETS

3.1 Rationale and approach

The State of Texas does not define total dissolved solids (TDS) standards for Upper Galveston Bay (Segment 2421) (TCEQ, 2022) as typical for tidal segments. However, in prior desalination facility permit applications on saltwater segments (i.e., City of Corpus Christi desalination facilities at Inner Harbor WQ00005289000 and La Quinta WQ00005289000), TCEQ has requested applicants to identify TDS targets that would minimize impacts to local aquatic life in the near field. Near-field targets are therefore based on TDS tolerances of aquatic species.

3.2 Definition of near field

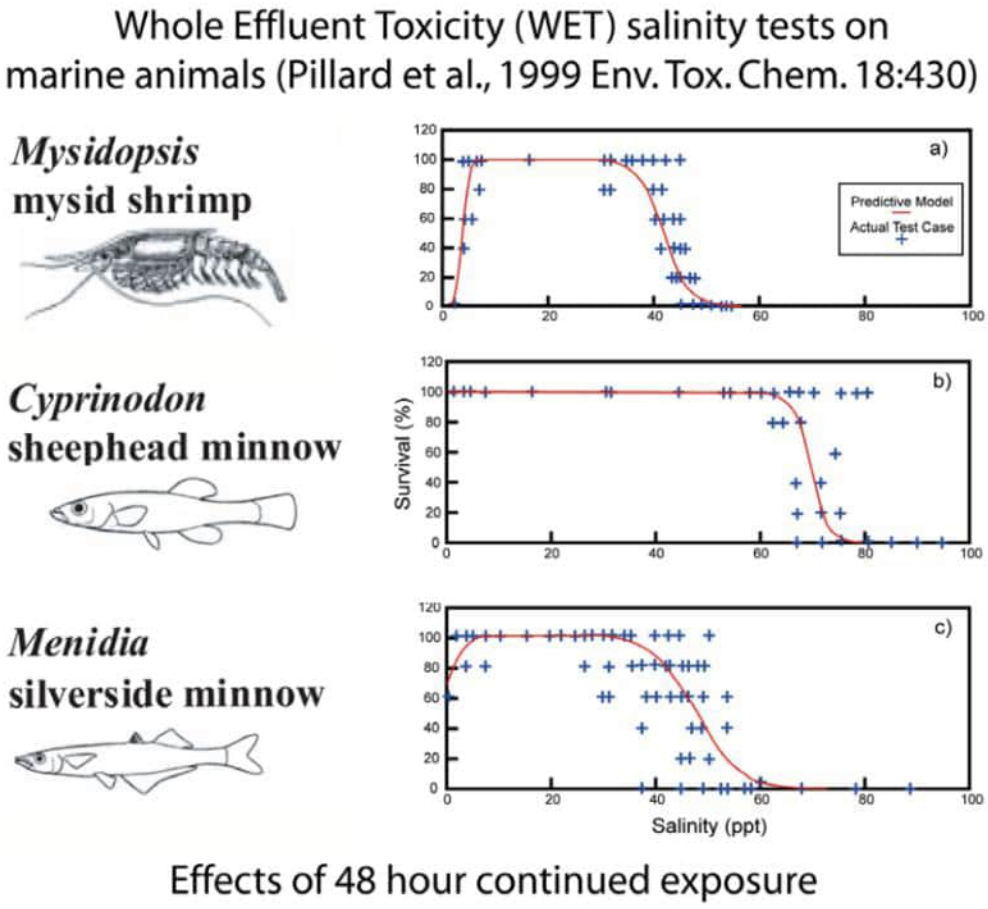
The near field covers the regulatory mixing zones surrounding the discharge outfall. It comprises of two key mixing zones, which are the zone of initial dilution (ZID) and the aquatic health mixing zone (ALMZ).

For wide estuaries, the ZID typically is defined as an area within 50 feet of the outfall (TCEQ, 2012). The ALMZ is typically defined as an area within 200 feet of the outfall. Dimensions of the ZID and ALMZ can be adjusted by TCEQ based on on-the-ground conditions such as receiving water body dimensions, outfall configuration and presence of mixing zones of other TPDES permittees.

Two TDS targets are identified. The acute TDS target is defined for the ZID and the chronic TDS target is defined for the ALMZ. The derivation of the target values is described in the following.

3.3 Acute TDS target value

The acute TDS target value is defined based on survival rates of WET test species over a 24-hour time period. Based on TCEQ precedence for past permits for the Station, as well as, for present permit for the neighboring Bacliff Municipal Utility District (MUD) wastewater treatment plant, mysid shrimp and inland silverside minnow are identified as the WET test species for the Facility (TCEQ, 2024). Compilation of toxicity tests by Pillard, et. al. (Pillard, et. al., 1999, WateReuse, 2011) show that at the TDS of 42 ppt, more than 50% mysid shrimp and inland silverside minnow can survive over a 48-hour period (see Figure 7). This means a much higher percentage can survive TDS of 42 ppt over a 24-hour period.



Source: Dr. Scott Jenkins

Figure 3
Mortality Of Three Keystone Marine Species In Response To Salinity Variation; Where Mortality Is Quantified In % Survival On Vertical Axis In Response To Salinity In Parts Per Thousand (ppt) On Horizontal Axis.

Figure 7. 48-hr survival graphs of Mysid Shrimp, Sheephead Minnow and Inland Silverside Minnow (Pillard et al, 1999, adapted from WateReuse, 2011).

As such, the TDS target 42 ppt is a conservative value in terms of protecting aquatic species against acute toxicity. This value also has regulatory precedence as the acute TDS target approved for the Corpus Christi Inner Harbor Desalination Plant discharge permit (FNI, 2020).

3.4 Chronic TDS target value

The chronic TDS target value is derived from relative change to TDS in receiving waters. Therefore, it depends on historical ambient data and TDS patterns. To establish TDS targets for the receiving waters, TCEQ recommended a formula (TCEQ, 2019) which calculates a criterion for the long-term average TDS as a function of arithmetic mean, standard deviation, number of observations and Student's t value of historical ambient data. The formula is described in Equation 3 below:

Equation 3:

$$\text{Criterion} = O_1 + t_{(1)(0.05)}(S_{O1\text{-}O2})$$

Where:

Criterion	=	the value the annual mean should not exceed
O_1	=	mean of the baseline data set
$t_{(1)(0.05)}$	=	critical value of Student's t-distribution at significance level of 0.05 (one- tailed at $n_1 + 10$ degrees of freedom)
$S_{O1\text{-}O2}$	=	standard error for the difference of two means
	=	$\sqrt{s_p{}^2/n_1 + s_p{}^2/n_2}$
n_1	=	number of samples in baseline data set
n_2	=	10 = number of samples used to calculate annual mean
$s_p{}^2$	=	$2*(s^2(n_1\text{-}1))/(n_1+2)$
s	=	standard deviation of the baseline data

Based on the receiving water TDS statistics calculated from TCEQ data in Table 2, the calculation of the chronic TDS target (i.e., "Criterion") is presented in Table 3.

Table 3. Calculation of Chronic TDS Target.

Variable	Value
O_1 mean of the baseline data set	18.0 ppt
n_1 number of samples in baseline dataset	50.0
n_2 number of samples used to calculate annual mean (12 monthly samples minus upper and lower extreme values)	10.0
s standard deviation of the baseline data	6.7 ppt
$s_p^2 = 2(s^2(n_1-1))/(n_1+2)$	85.740
s_{O1-O2} standard error for the difference of two means = $\sqrt{s_p^2/n_1 + s_p^2/n_2}$	3.208
$t_{(1)(0.05)}$ critical value of the t distribution where % = 0.05 one tailed at n + 10	1.671
Chronic TDS target = Criterion = $O_1 + t_{(1)(0.05)}(S_{O1-O2})$	**23.3 ppt**

Hence, the chronic TDS target of 23.3 ppt is identified at the edge of the ALMZ.

3.4 Summary of near-field TDS targets

The acute TDS target of 42 ppt is identified for the edge of the Facility ZID. The edge of the ZID is typically within 50 feet of the outfall.

The chronic TDS target of 23.3 ppt is identified at the edge of the Facility ALMZ. The ALMZ is typically within 200 ft of the outfall.

4.0 DESALINATION AND FLOW AUGMENTATION

The proposed desalination process will be comprised of two main components:

1. Reverse osmosis process to generate product water.
2. Flow augmentation process to reduce discharge TDS.

4.1 Reverse osmosis process

The Facility is proposed to use reverse osmosis (RO) to produce up to 26.5 MGD of water with maximum TDS of 500 mg/L or (0.5 ppt TDS) (see Figure 8). The expected RO recovery rate is 50%. This translates to a RO feed flow rate of 54.6 MGD and a reject flow rate of 28.14 MGD. The expected TDS in the RO reject flow is 1.94 times that of the intake TDS. A diagram of the RO process with expected RO feed and reject flows and salinities is provided in Figure 8.

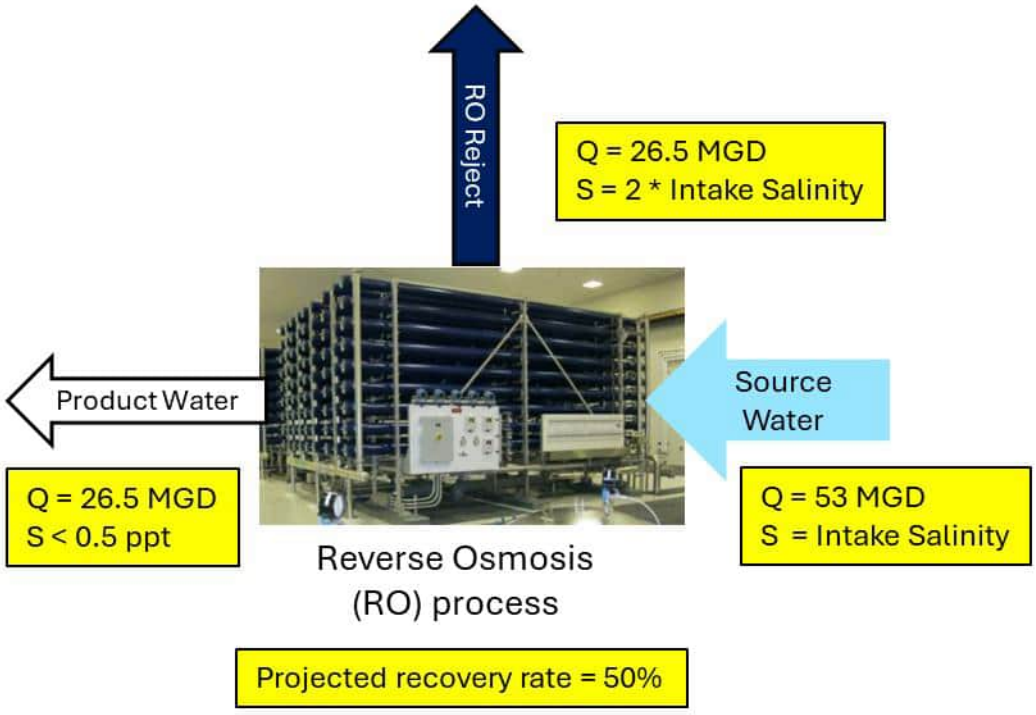


Figure 8. Expected RO feed and reject flows and salinities

4.2 Flow augmentation process

Flow augmentation involves source water blending to reduce RO reject TDS to levels protective of the acute and chronic criteria targets described in the previous chapter. The Facility's flow augmented discharge will consist of 47% RO reject water and 53% source water (i.e., 1:1.13 flow augmentation). Therefore, an additional 28.14 MGD of source water will be pumped from the intake channel. After blending, the discharge TDS is expected to be 1.47 times the intake TDS. With the addition pumping of blending water, the expected intake flow rate is 82.8 MGD and the expected discharge rate is 56.3 MGD.

A diagram of the overall desalination process with both RO and flow augmentation components are provided in Figure 9.

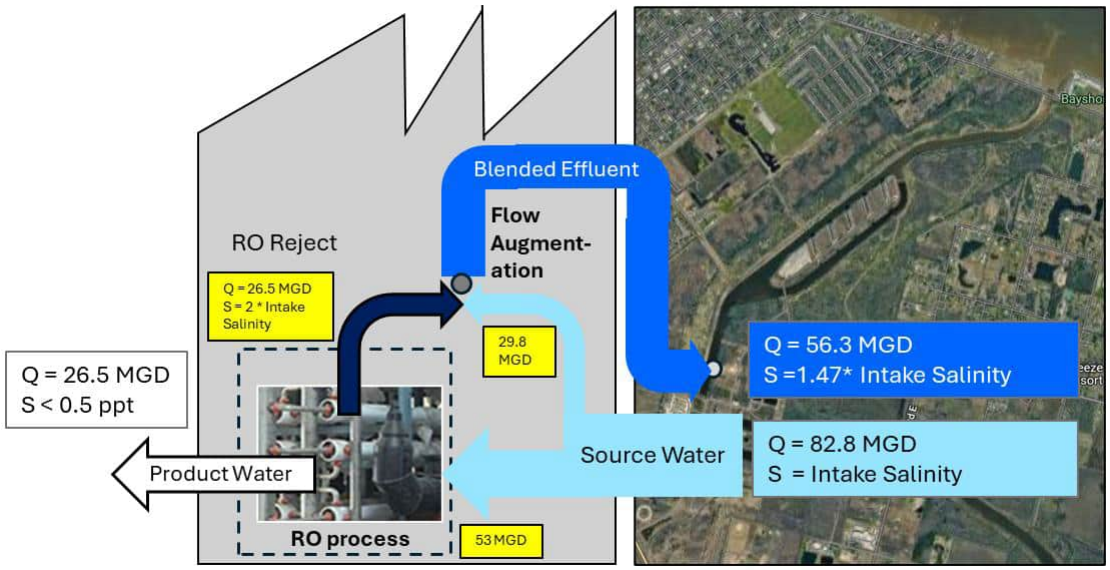


Figure 9. Expected overall intake and discharge flows and salinities

The flow balance of the overall desalination process is provided in Table 4.

Table 4. Flow balance of desalination process.

	Item	Value	Units	Comments
Production Rate	Production Rate	26.5	MGD	Finished water for consumption
RO Process	RO Recovery Rate	50%		
	RO Feed	53	MGD	= Production Rate/RO Recovery Rate
	RO Reject Flow	26.5	MGD	= RO Feed - Production Rate
Flow Augmentation Process	Blend Ratio for Brine Dilution	1.126	:1.0	= Brine dilution pump flow: RO Reject flow
	Brine Dilution Pump Flow	29.8	MGD	= Blend Ratio for Brine Dilution * RO Reject Flow
Overall	Total Intake Flow	82.8	MGD	= RO Feed + Brine Dilution Pump Flow
	Total Discharge Flow	56.3	MGD	= RO Reject + Brine Dilution Pump Flow
	Discharge Salinity/Intake Salinity	1.47		= Total Intake Flow/Total Discharge Flow

Using flow augmentation to blend RO reject water with raw water is a well-established brine-management practice for desalination plants. The Claude "Bud" Lewis Carlsbad Desalination Plant in Carlsbad, California blends RO reject and source water to achieve salinities protective of marine life (CRWQB, 2019, 2025). The advantage of blending over using diffusers is that blending can achieve TDS targets at the end-of-pipe instead of dilution with receiving waters in the mixing zones. This can result in less TDS impact on aquatic life in the mixing zones. Blending performance is potentially more consistent than diffusers in that dilution effectiveness is not dependent on receiving water conditions such as background flow, TDS and temperature.

4.3 Compliance with near-field TDS targets

With flow augmentation, the Facility discharge is expected to be only 1.47 times the intake TDS. The projected time series of blended discharge TDS for hydrological period 2009 to present is shown in Figure 10.

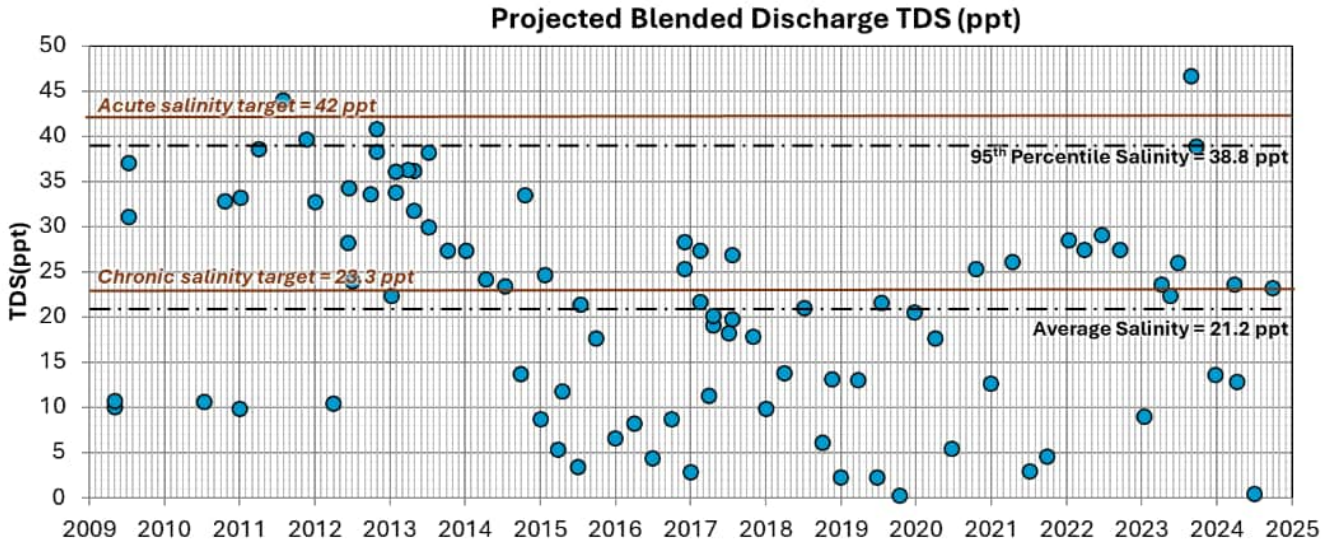


Figure 10. Projected blended discharge salinities for hydrological period 2009 to present.

The average blended discharge TDS is 21.2 ppt. This is below the chronic TDS target of 23.3 ppt. The 95th-percentile TDS 38.8 ppt. This is below the acute TDS target of 42 ppt. Additional statistics are shown in Table 5.

Table 5. Projected blended discharge TDS statistics.

Statistic	Value	Units
Average	**21.2**	**ppt**
Std Deviation	11.7	ppt
Minimum	0.2	ppt
5th percentile	3.0	ppt
25th percentile	10.7	ppt
Median	22.4	ppt
75th percentile	29.1	ppt
95th percentile	38.8	ppt
Maximum	46.7	ppt
Number of profiles	50	count

The above statistics show that at the end-of-pipe:

- The average TDS of 21.2 ppt can meet the chronic TDS target of 23.3 ppt.
- The 95th-percentile TDS of 38.8 ppt can meet the acute TDS target of 42 ppt.

Once discharged into the outfall man-made canal, the effluent will be further diluted in the mixing zones, and the TDS of the effluent is expected to decrease before it exits the outfall man-made canal.

Texas A&M at Galveston evaluated the discharge area for suitable habitat for important species and assessed the potential impacts (i.e. salinity changes) that the proposed Facility discharge may have (Sluis, 2025). Forty years of catch data near the intake and discharge areas were evaluated for the following selected species:

Fish

- red drum (Sciaenops ocellatus)
- flounder (primarily southern flounder [Paralichthys lethostigma])
- black drum (Pogonias cromis)
- spotted seatrout (Cynoscion nebulosus)

Invertebrates

- brown shrimp (Farfantepenaeus aztecus)
- white shrimp (Litopenaeus setiferus)
- blue crab (Callinectes sapidus)
- oysters (primarily eastern oyster [Crassostrea virginica])

Plants

- seagrass

Each species identified above is present in Galveston Bay. Spawning occurs outside of the bay for red drum, southern flounder, brown shrimp, white shrimp and blue crab, while spotted seatrout, black drum (can also spawn out of bay) and eastern oyster spawn within the bay.

All of the above identified species utilize Galveston Bay as a nursery area, with seagrass being an important habitat for newly settled recruits of red drum, southern flounder, spotted seatrout and brown shrimp. Seagrass has not been present in Upper Bay near the proposed discharge and intake area since 1961, with West Bay maintaining the only remaining seagrass in Galveston Bay.

Each of these species are euryhaline and documented to tolerate a wide range of salinities. While salinity ranges varied for peak recruitment and larval development for each species in the study area, each optimal salinity range included 17 to 24 ppt. Therefore, the expected Facility discharge salinity of 21.2 ppt falls within the documented salinity range for larval recruitment and development of the identified species (Sluis, 2025).

5.0 DEVELOPMENT OF FAR-FIELD TDS TARGETS

5.1 Rationale and approach

The far-field refers to areas beyond the regulatory mixing zones. While near-field TDS targets minimize direct toxicity effects to aquatic species, far-field targets minimize indirect water quality impacts from the discharge - namely stratification-induced hypoxia.

5.2 Explanation of stratification-induced hypoxia

Salinity stratification is a phenomenon that happens when more saline water encounters less saline ambient water and creates a denser bottom layer below the ambient waters. If movement of the bottom layer is very slow, such as in the flat bottom region of a bay, the density stratification can inhibit downward transfer dissolved oxygen (DO) into the bottom layer. If stratification persists for a long time, the DO at the bottom can potentially deplete, thereby increasing hypoxia risk. However, strong ambient currents and/or significant bottom slope can facilitate movement and dissipation of the bottom layer and prevent the onset of hypoxia.

Dr. Ben Hodges from the University of Texas at Austin breaks down the evolution of offshore desalination discharge plume into multiple regions (see Figure 11) (Hodges, 2010).

1. The first region is the near-field of the discharge. This is where the discharge plume forms a bottom layer below the ambient waters.
2. Next is the inertial far-field where the inclined bay bottom causes downslope movement of the plume. The movement entrains ambient fluid into the plume which resupplies DO and dilutes the TDS. Because of the relatively high DO content of the plume due to recent formation and additional DO resupply from entrainment, bottom DO seldom depletes to hypoxic levels in this region
3. As the bay bottom flattens out, the plume enters the transitional far-field zone, where there is less advective movement and the plume spreads out in two-dimensions. Here entrainment of ambient fluid lessens and DO resupply into the plume decreases.
4. Further along is the spreading far field, the plume movement continues to slow due to flatter topography. If the plume is not dissipated before the DO content depletes, hypoxia can happen.
5. Finally the frontal far-field is where the plume completely dissipates into the ambient waters. After this point, stratification and stratification-induced hypoxia ceases.

Generally, a well-sited outfall would allow dissipation of the plume on the slopes while DO resupply is present, making hypoxia less likely.

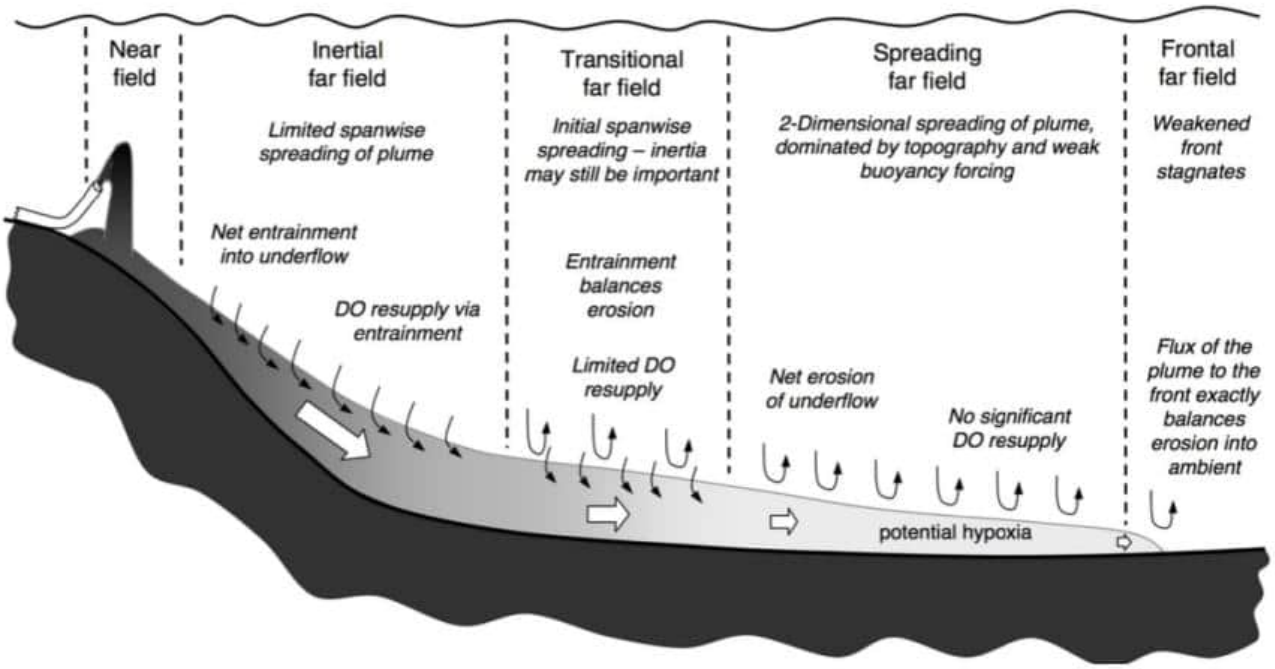


Figure 11. Effluent plume evolution in the far field for offshore brine disposal (from Hodges, 2010).

5.3 Numerical targets for screening for hypoxia risk

Dr. Hodges notes that hypoxic events in Oso Bay in Corpus Christi have been observed in cases where the stratification strength (i.e., the difference between top and bottom TDS) is as low as 2 ppt and that the duration of the stratification is as low as 24 hours (Hodges, 2010, Hodges, et al., 2011). Observed events happen within the flat bottom region of Corpus Christi Bay and typically are located between 1000 to 1800 m (0.6 to 1.1 miles) from where flat bottom commences.

In light of the above information, the following criteria are identified to screen for stratification events with higher hypoxia risk in Upper Galveston Bay.

- Location: in the flat bottom part of Upper Galveston Bay
- Strength: top and bottom TDS difference > 2 ppt
- Duration: more than 24 hours.

A caveat is hereby provided that exceeding screening criteria does not necessarily equate occurrence of hypoxia. Hypoxia is dependent on site-specific conditions such as ambient currents and sediment oxygen demand. The far-field targets here should be considered conservative since they are based on minimum observed TDS difference and duration of hypoxia events in Oso Bay.

5.4 Evaluation of exceedance events

"Exceedance events" are events that meet the above criteria and provide insight into how often periods with elevated hypoxia risk can happen.

The frequency of exceedance events in the flat bottom region of Upper Galveston Bay is calculated by summing the durations of exceedance events past 24 hours and then dividing by the length of the time period (see Equation 4 below):

$$\text{Frequency of exceedance} = \frac{\sum_{i=0}^{n} \text{Exceedance duration beyond 24 hours}}{\text{Simulation Period}} \times 100\%$$

where n = number of exceedance events

For Bacliff, the frequency of exceedance events is quantified with the use of a far-field TDS model. The far-field TDS model is a three-dimensional, time-varying model that predicts TDS concentrations in Upper Galveston Bay. Predicted top and bottom salinities in the flat bottom region of the bay are compared to identify stratifications events where top and bottom TDS difference > 2 ppt. Those that exceed 24 hours are identified as exceedance events and the duration of the events beyond 24 hours are summed up to calculate the frequency of exceedance events.

A detailed description of the model and its results is provided in the next section.

6.0 FAR-FIELD MODELING RESULTS

6.1 Description of the far-field model

To evaluate the potential increase in frequency of exceedance events, a far-field model was developed to simulate TDS in the receiving waters. The far-field model utilizes the EFDC+ modeling platform - which is a widely used platform that is accepted by the USEPA for water quality modeling (USEPA, 2025b). EFDC+ has been used for discharge dilution studies in the Potomac, James and York Rivers; and, salinity intrusion studies in the York River, Indian River Lagoon and Lake Worth (USEPA, 2025).

6.1.1 MODEL DOMAIN AND GRID RESOLUTION

The far-field model covers the receiving waters starting from the outfall, through the outfall man-made canal to the tidal dam, and then into a semi-circular region in the receiving waters (see Figure 12). The radius of the semi-circular region is two (2) miles. This semi-circular region captures the dissipation of the desalination discharge plume to background conditions.

Hydraulic structures in the outfall man-made canal – namely an internal weir, a culvert dam and a tidal dam – are simulated in the model. The model also simulates two outfalls: the existing outfall of Bacliff MUD Central Wastewater Treatment Facility ("Bacliff MUD") (TPDES permit number WQ0010627001) and the proposed Facility outfall.

In the outfall man-made canal, the model grid size is 27m x 27 m (89 ft x 89 ft = 7921 sq ft) to properly represent the narrow channel width and hydraulic structures. Past the tidal dam, the grid size increases gradually from 27m x 27m to just under 200 m x 200 m (656 ft x 656 ft = 435,556 sq.ft = 9.9 acres). Therefore, the largest grid cell is within the maximum grid size of 10 acres – which is the maximum grid size specified in TCEQ's water quality modeling standard operating procedures (TCEQ, 2018b).

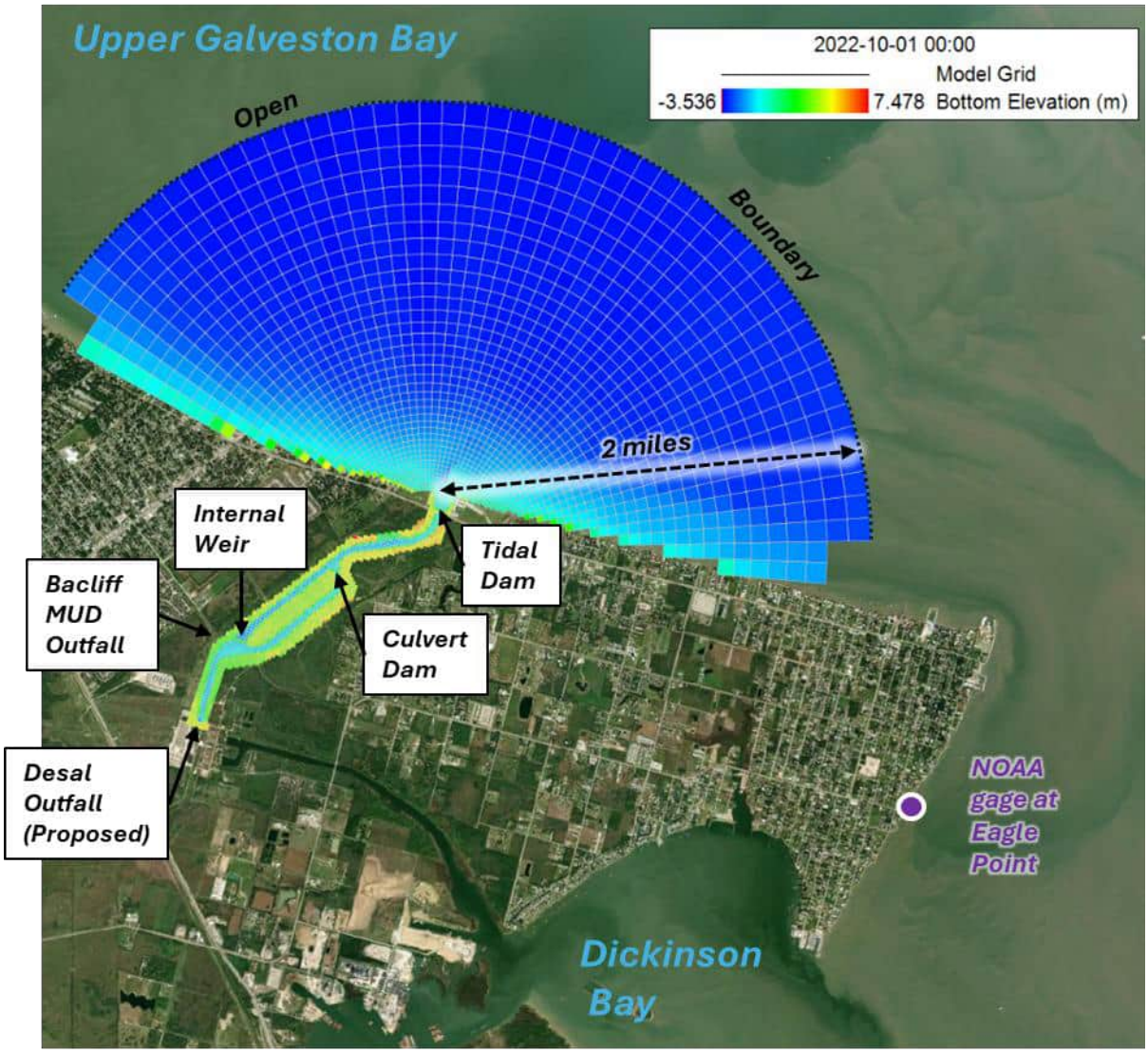


Figure 12. Model domain of the far-field model.

Figure 13 illustrates the vertical layering of the far-field model along a path from the desalination outfall, through the outfall man-made canal all the way to the edge of the model domain. The grid is divided into ten (10) vertical layers. The thickness of the vertical layers is dynamic and changes according to the water level during simulation.

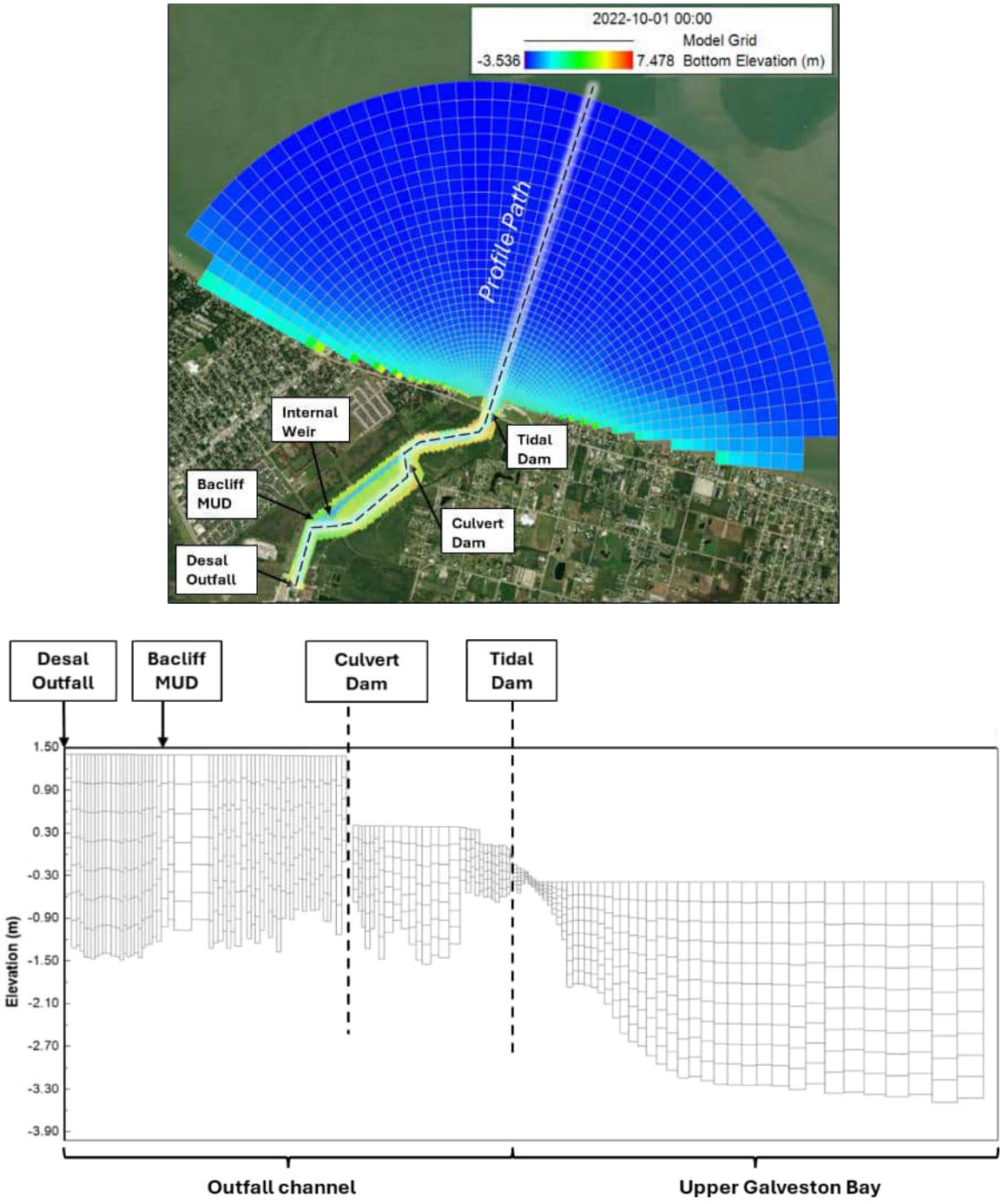


Figure 13. Illustration of vertical layering in the far-field model along profile path.

6.1.2 SIMULATION PERIOD

The simulation period of the far-field model is from January 1st, 2023 to January 1st, 2025. It also includes a 3-month simulated "spin-up" time from October 1, December 31st, 2022 for numerical stability. The average residence time of Galveston Bay is 40 days (Solis and Powell, 1999) and hence the two-year simulation period spans more than 20 flushing cycles of the Bay. This allows sufficient time to model the cumulative effects of the discharge.

Further, the selected modeling period includes a relatively "dry" year (2023) with reduced precipitation and a relatively "wet" year (2024) with large storms into the bay system – namely Hurricane Beryl and Tropical Storm Beta. Figure 14 shows the historical annual precipitation in the Bacliff area from 1955 to 2024 (TWDB, 2025).

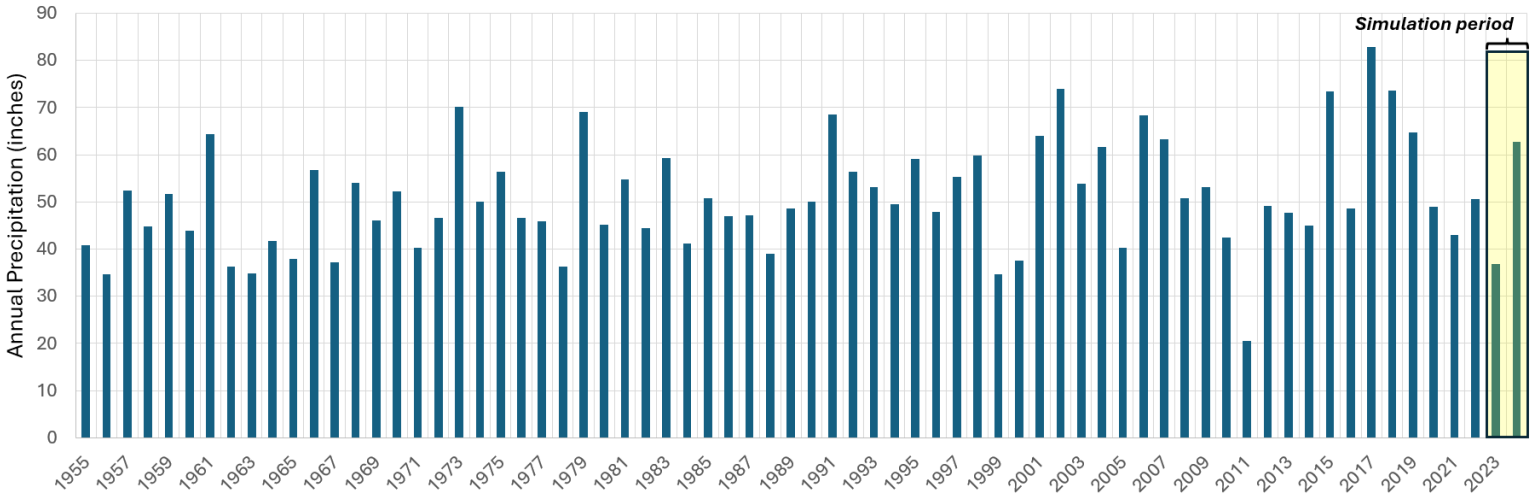


Figure 14. Annual precipitation (inches) from TWDB Quadrangle 813 (Bacliff Area).

In terms of precipitation, 2023 ranks as the 7th driest year (12th percentile precipitation) and 2024 ranks as the 12th wettest year (80th percentile precipitation) of the 60-year period of record. The selected simulation period therefore captures reasonably representative salinities patterns for both dry and wet years in the Bay.

6.1.3 BOUNDARY CONDITIONS

An open boundary is defined for the northern edge of the model grid in Upper Galveston Bay. Temperature, TDS and water levels are defined based on continuous data collected

at the NOAA (National Oceanic and Atmospheric Administration) gage at Eagle Point (see Figure 15) from 2022 to 2025. Water levels and temperature are applied directly to the boundary. However, because of the spatial variability in TDS in the Bay, the Eagle Point TDS is adjusted based on a regression between the Eagle Point TDS and receiving water SWQM TDS. The regression graph is shown in Figure 16 and the equation is in Equation 5 below:

Receiving waters SWQM TDS = 1.085 * Eagle Point TDS (Equation 5)

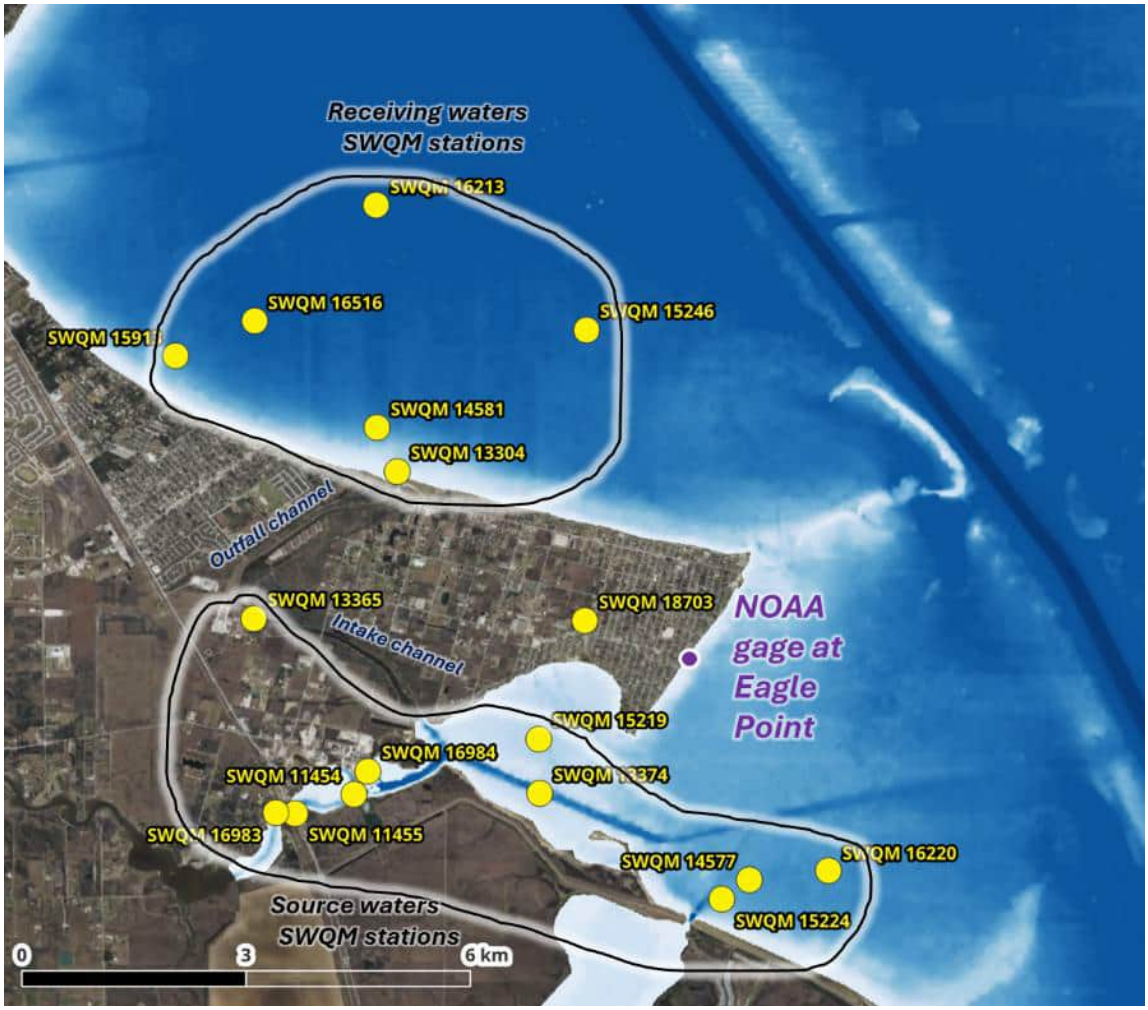


Figure 15. Location of NOAA Eagle Point gage. Source waters SWQM stations and receiving waters SWQM stations are plotted for reference.

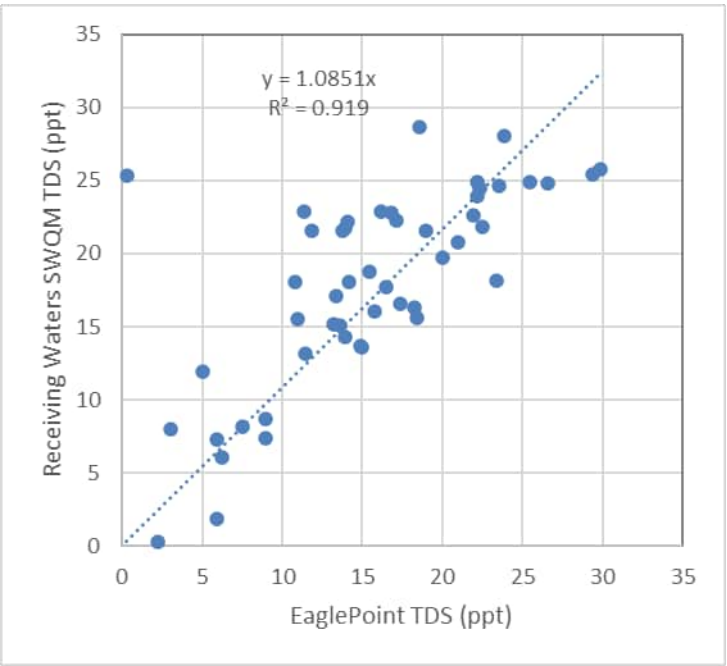


Figure 16. Regression between Receiving Waters SWQM TDS and Eagle Point TDS.

6.1.4 INFLOW CONDITIONS

The far-field model simulates up to two inflows: one existing and the other proposed. The existing discharge is from Bacliff MUD which is simulated at the permitted annual average flow rate of 1.24 MGD (TCEQ, 2024). The TDS of the Bacliff MUD discharge is assumed to be 0.5 ppt which is the default TDS concentration for freshwater inflows used in TCEQ modeling (TCEQ, 2018).

The proposed discharge is the blended discharge from the Facility. The discharge is simulated at 56.3 MGD which is expected at the production rate of 26.5 MGD. The expected TDS is 1.47 times the source water TDS as discussed in previous sections. Source water TDS is calculated from the Eagle Point TDS based on a regression between the Eagle Point TDS and source water SWQM TDS. The regression graph is shown in Figure 16 and the equation is in Equation 6 below:

$$\text{Receiving waters SWQM TDS} = 0.923 * \text{Eagle Point TDS} \qquad \text{(Equation 6)}$$

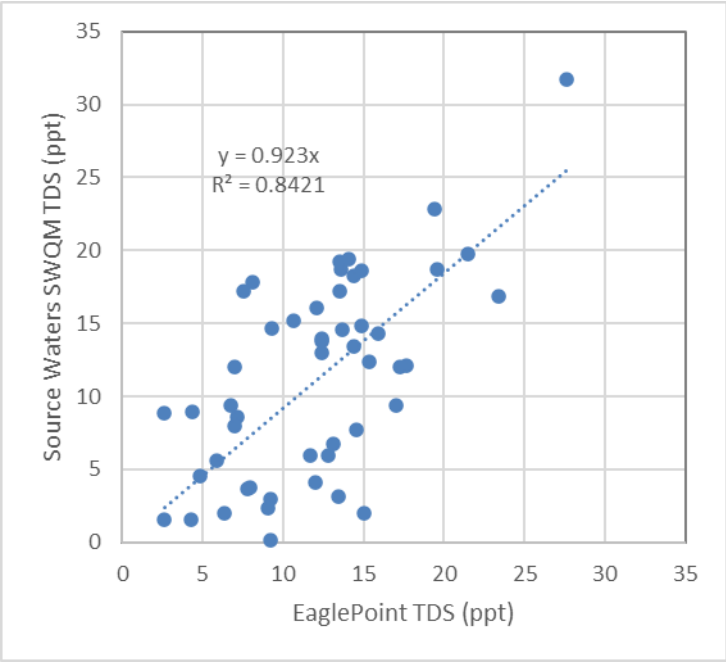


Figure 17. Regression between source waters SWQM TDS and Eagle Point TDS.

Applying the 1.47 multiplier provides the following relationship between Eagle Point TDS and blended discharge TDS (Equation 7):

Blended Discharge TDS = 1.47 * 0.923 * Eagle Point TDS
= 1.36 * Eagle Point TDS (Equation 7)

The temperature of the proposed Facility discharge is assumed to be 2 degrees F (1.1 deg C) above the ambient temperature measured at Eagle Point due to heat introduced during the RO process.

6.2 Far-field modeling scenarios

Two scenarios are simulated by the far field model:

1. No Discharge (baseline) scenario
2. Discharge scenario

The baseline scenario only includes the Bacliff MUD discharge, whereas the blended discharge scenario includes both the Bacliff MUD discharge and Facility discharge. An illustration of the modeling conditions for No Discharge (Baseline) scenario and Discharge scenario is provided in Figure 18.

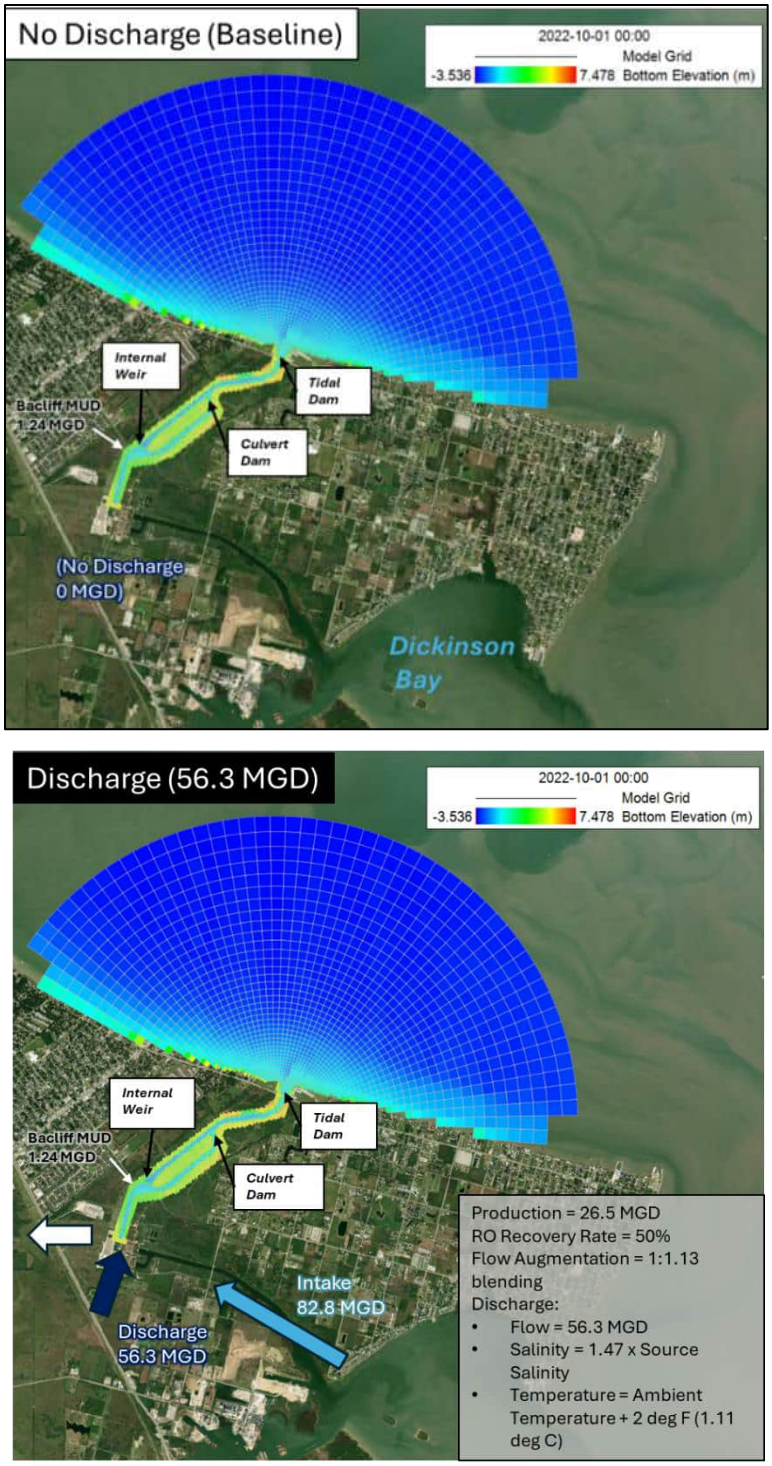


Figure 18. Comparison of modeling conditions for No Discharge scenario (top) and Discharge scenario (bottom).

Figure 19 and Figure 20 provide examples of the far-field modeling results for the two scenarios. Figure 19 shows maps of the bottom TDS on 7/27/2023. The top panel is from the baseline scenario. The bottom panel is from the discharge scenario. The contours represent bottom TDS concentrations.

It can be observed that the water in the outfall man-made canal under the baseline scenario is fresher than the discharge scenario. This is the result of the Bacliff MUD discharge being the main contributor of water in the under the baseline scenario. Some tidal intrusion can be observed at the tidal dam, where a salinity gradient appears where water from Upper Galveston Bay enters the channel. The low relatively discharge rate (1.24 MGD) Bacliff MUD meant that there is negligible freshwater signature in Upper Galveston Bay.

Under the discharge scenario, the Facility discharge (54.3 MGD) dominates the salinity pattern in the outfall man-made canal but creates a limited salinity signature in downstream of the tidal dam and into Galveston Bay. The discharge plume gradually dissipates to background conditions.

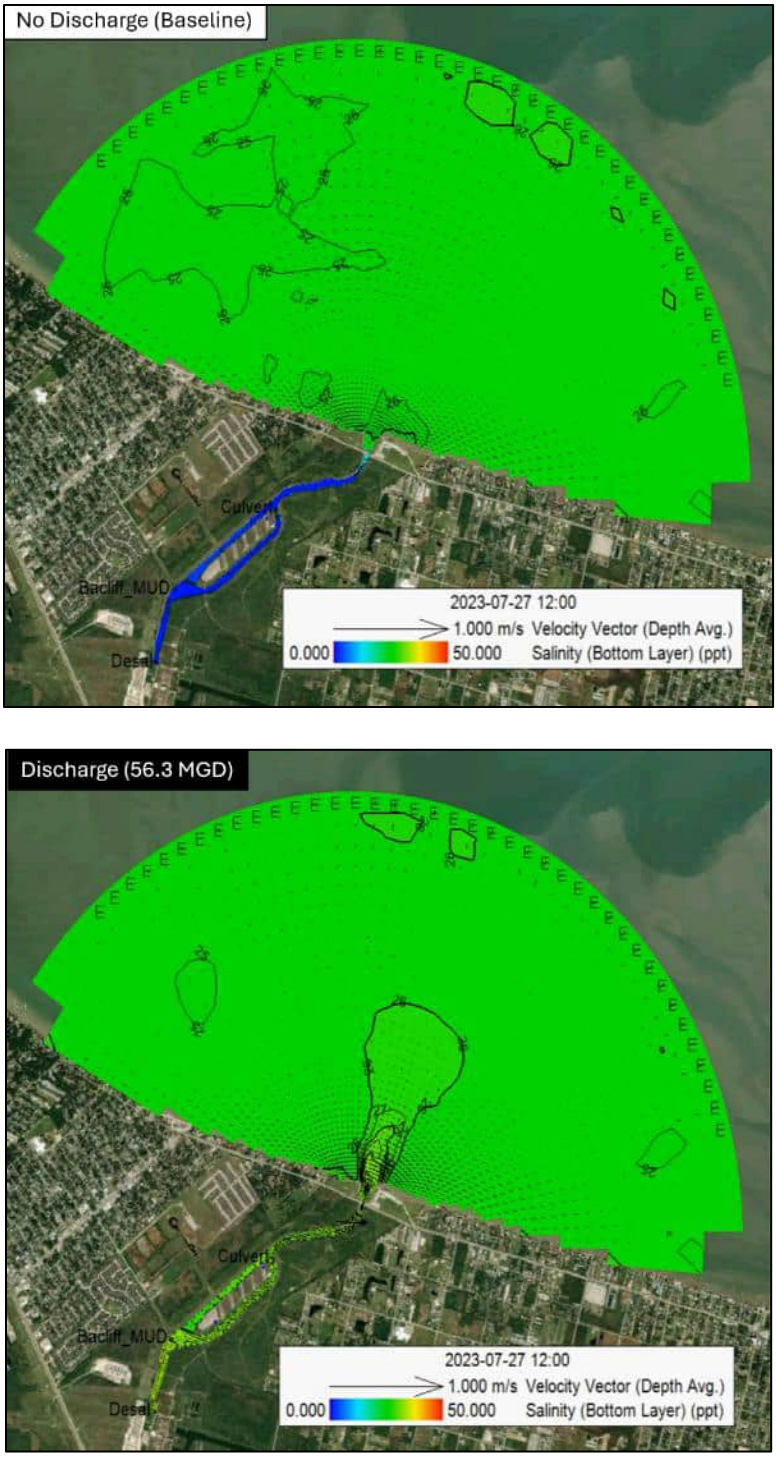


Figure 19. Map of bottom TDS on 7/27/2023. Baseline scenario (top). Discharge scenario (bottom).

Figure 20 shows the depth profile of TDS on 7/27/2023. The upper panel is from the baseline scenario. The lower panel is from the discharge scenario. The contours represent TDS concentrations. The bottom panel shows the formation of a more saline bottom layer from the discharge that dissipates as it moves into the Bay.

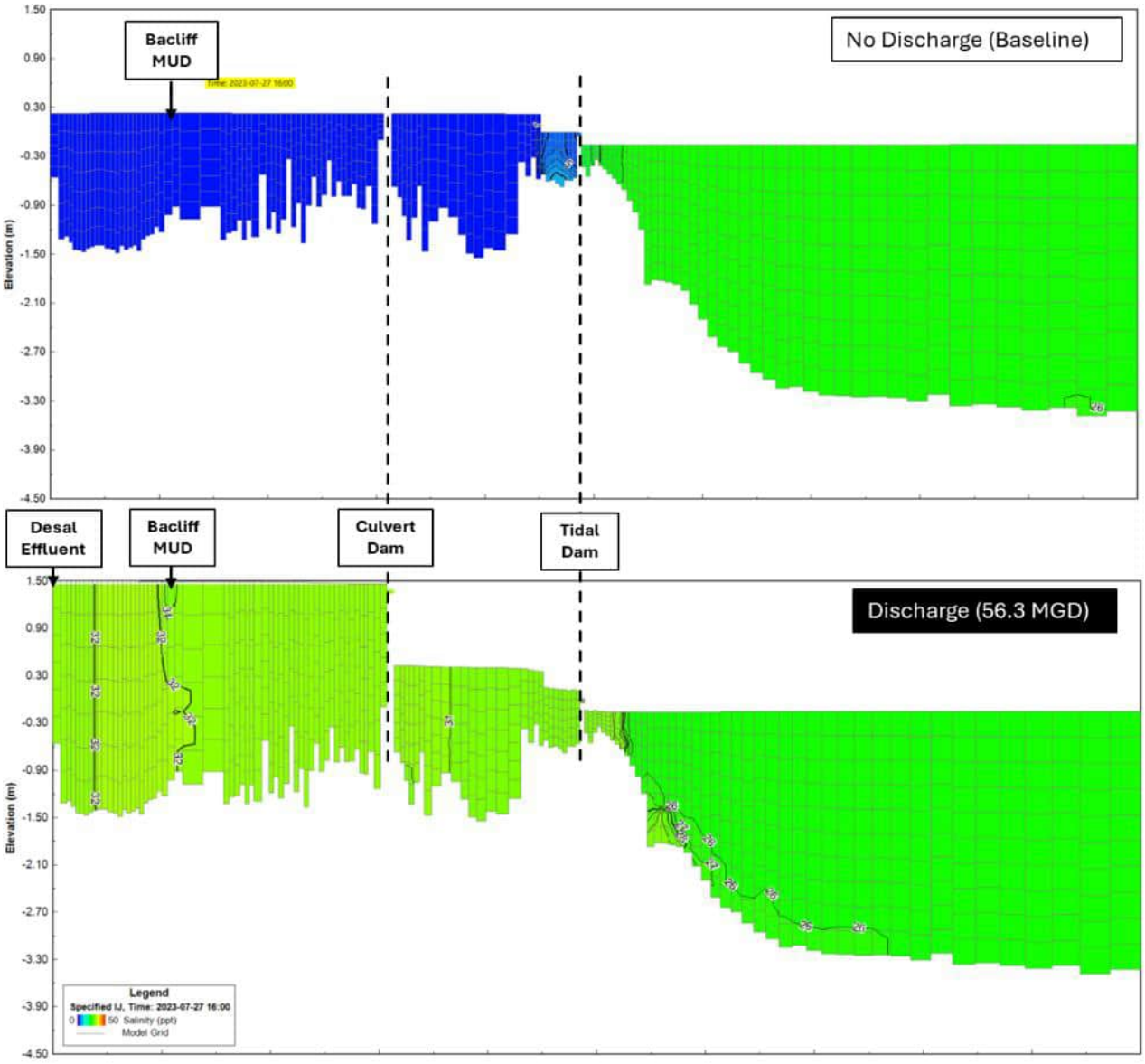


Figure 20. Depth profile plots of TDS along discharge path. Upper panel: Baseline scenario. Lower panel: Discharge scenario (snapshot from 7/27/2023).

Figure 21 shows a map of the average effluent percentages in the bottom layer from the discharge scenario. The averaging period is from 1/1/2023 to 1/1/2025. It shows that the effluent percentage dissipates to 5% within 1 mile of the tidal dam – thus indicating that limited areal impacts to Upper Galveston Bay.

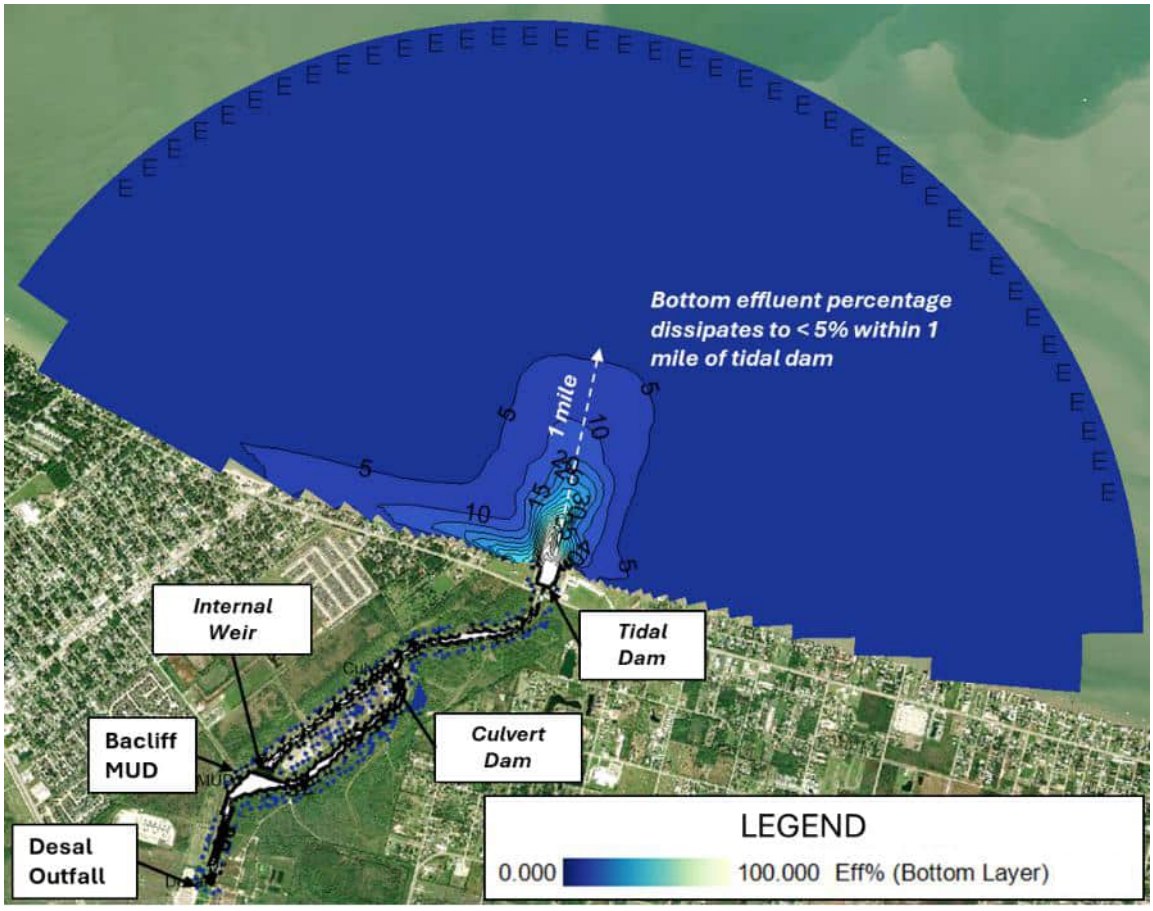


Figure 21. Map of average effluent percentages (bottom layer) from the discharge scenario.

6.3 Screening for hypoxia risk

6.3.1 EXCEEDANCE CRITERIA

As described earlier on, the following criteria are identified to screen for stratification events with potentially higher hypoxia risk.

- Location: in the flat bottom part of Upper Galveston Bay
- Strength: top and bottom TDS difference > 2 ppt

- Duration: more than 24 hours.

6.3.2 DEFINITION OF FLAT BOTTOM REGION

The flat bottom region of the bay starts where the sloping portion of the bay bottom ends. The starting location is approximately along the -2.9 m (9.5 ft) contour line. An illustration is provided in Figure 22. The distance from the tidal dam to the beginning of the flat bottom region is approximately 0.6 miles (or 1 km).

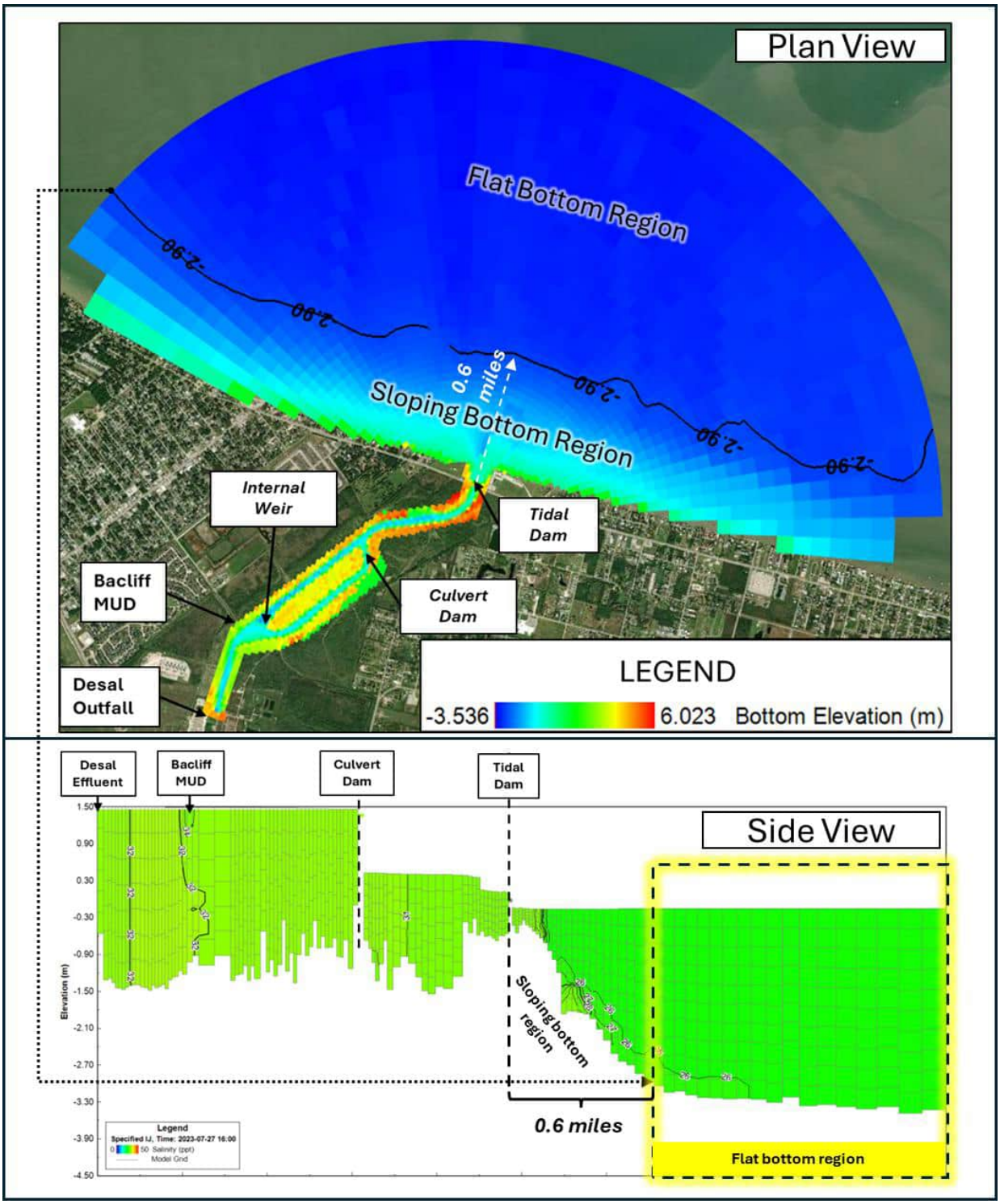


Figure 22. Boundary between flat bottom and sloping bottom region in Upper Galveston Bay (Contour line -2.9 m NAVD88 or -9.5 ft NAVD88).

6.3.3 COMPARISON OF EXCEEDANCE EVENTS

The duration of stratifications events beyond 24 hours were summed and then divided by the simulation period to calculate the frequency of exceedance events. The frequency of exceedance changes with location.

For the baseline scenario, the contour plot of the frequency of exceedance (as percentage of the total simulation period of 1/2023 to 1/2025) is shown in Figure 23. The results show the baseline risk of hypoxia in Galveston Bay, and that the maximum frequency of exceedance is very low (about 1.5%). Most exceedance events are found near the northern and northwestern boundary of model domain. This may be due to the prevailing southeasterly winds pushing water towards the northwest which can cause stratification if the TDS in the currents differs from TDS at the northwest boundary.

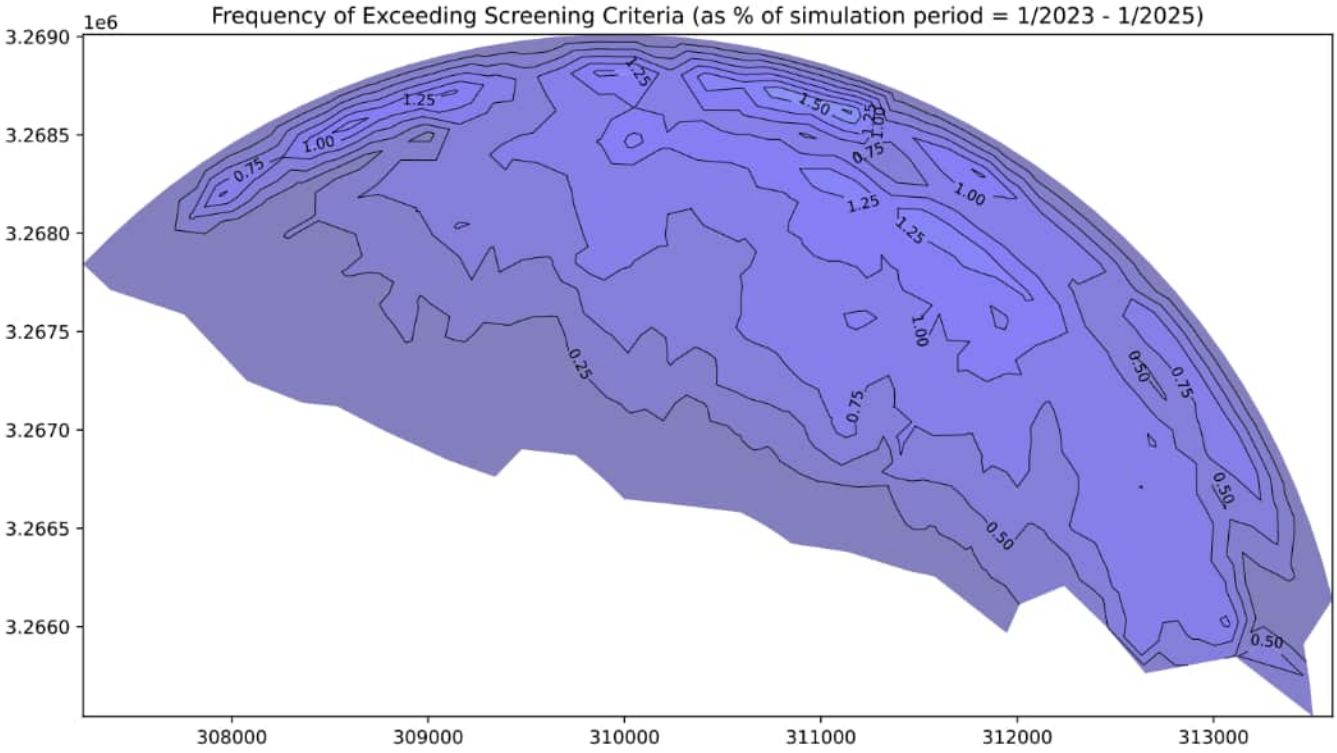


Figure 23. Frequency of exceedance events as percentage of simulation period for baseline scenario.

For the discharge scenario, the contour plot of the frequency of exceedance (as percentage of the total simulation period of 1/2023 to 1/2025) is shown in Figure 23. The

results show that the maximum frequency of exceedance with the Facility discharge is also low (about 1.5%).

The spatial pattern of exceedance events differs slightly from baseline in that exceedance events happen less along the northwest boundary and more in the middle-northern part of flat bottom region. This middle-northern region is where the discharge plume dissipates towards background conditions.

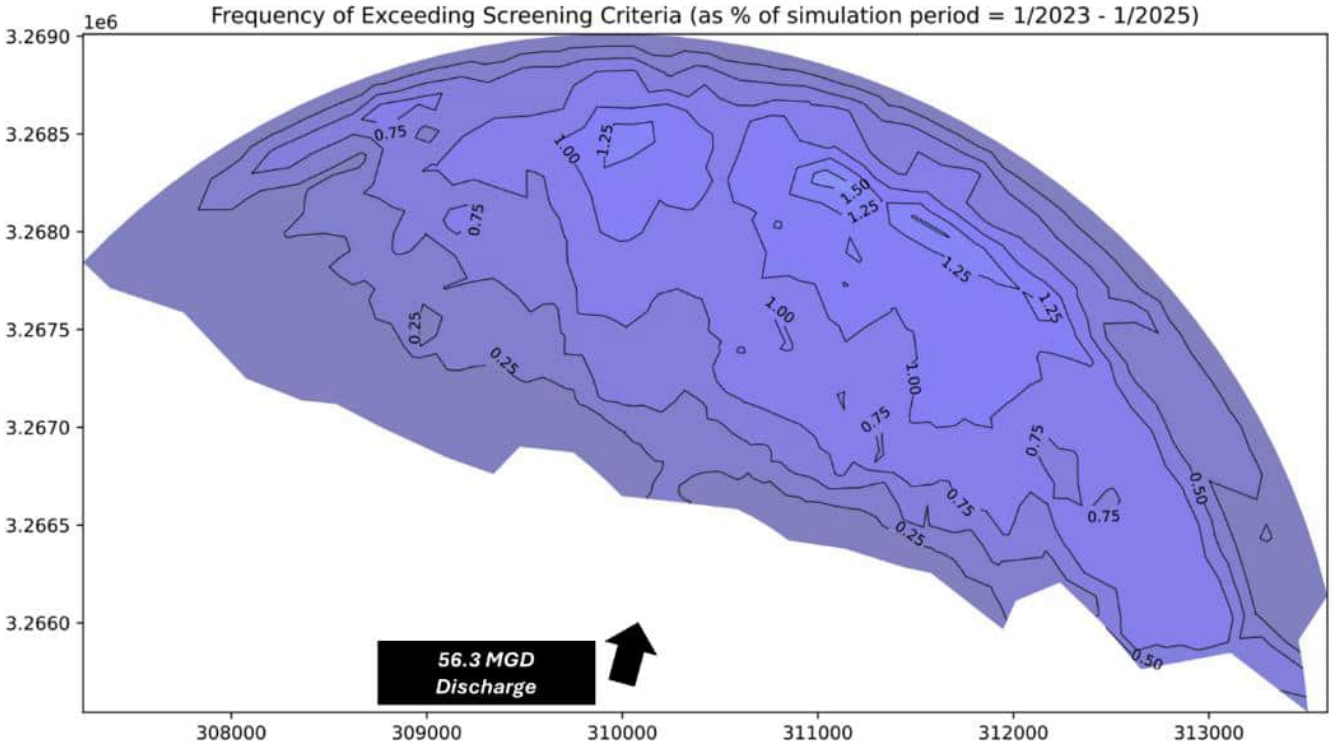


Figure 24. Frequency of exceedance events as percentage of simulation period for discharge scenario.

To compare the discharge scenario with the baseline scenario, the increase in frequency of exceedance is calculated using Equation 8:

$$\text{Increase} = \text{Frequency of exceedance}_{\text{discharge}} - \text{Frequency of exceedance}_{\text{baseline}}$$

(Equation 8)

The contour plot of the increase in frequency of exceedance is shown in Figure 25.

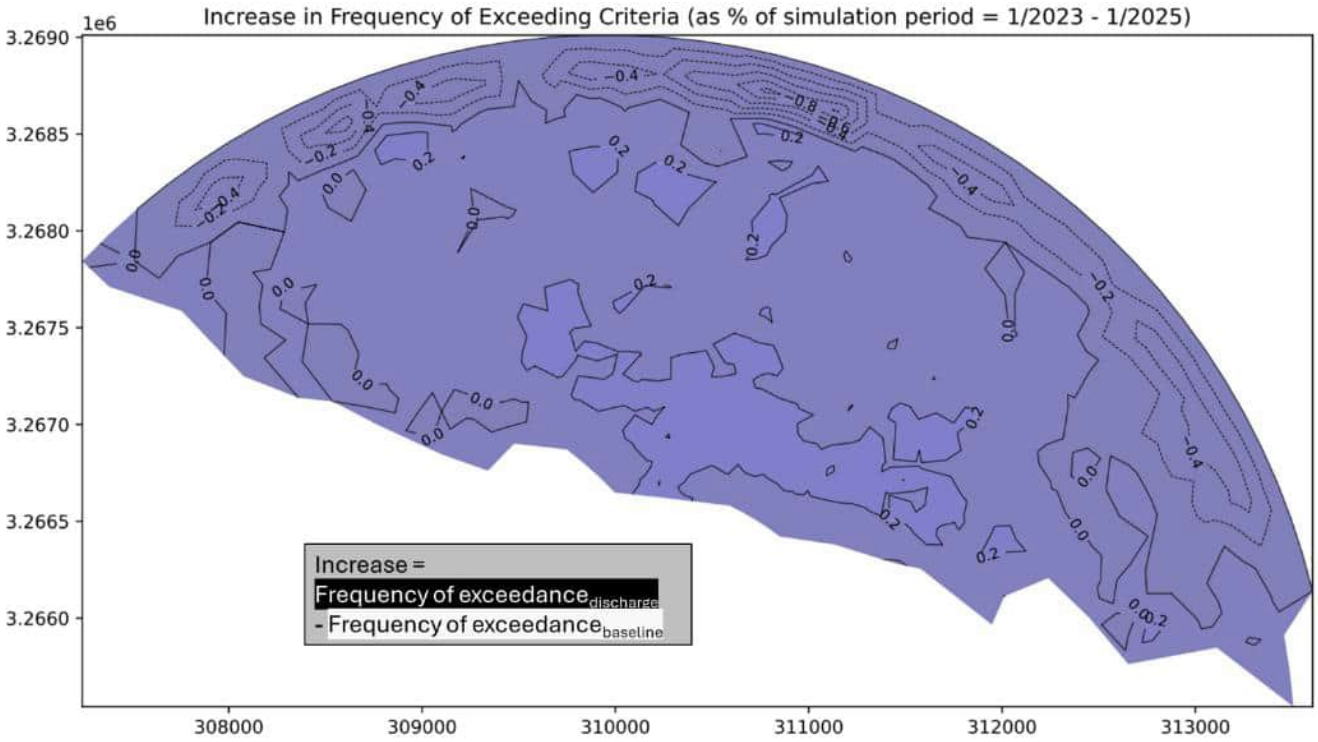


Figure 25. Increase in frequency of exceedance for discharge over baseline scenario.

Comparison of the two scenarios show minimal increases in exceedance frequencies resulting from the Facility. Frequency in exceedance events varies spatially in the Bay, and the maximum regional increase in exceedance frequency is about 0.4%. In some regions of the Bay, the model predicted decreases in exceedance frequency, presumably from the increased circulation caused by operation of the Facility.

The increase in circulation is consistent with prior circulation modeling by the Texas Water Development Board, which found that power plant operation at Cedar Bayou and P.H. Robinson has a bay-wide salinity-leveling effect by promoting the mixing of bay water in withdrawing and discharging the cooling water, and that this salinity leveling impact is more effective during dry periods than wet periods (Matsumoto et. al., 2005).

The maximum increase of 0.4% in exceedance events is well below 10% which is the typical pass/fail rate used by TCEQ for dissolved oxygen standard compliance (TCEQ, 2020). 10% is also a commonly-used threshold for identifying *de minimis* impact.

7.0 SENSITIVITY ANALYSIS

An independent study by Texas A&M University at Galveston (TAMUG) (Du, 2025) indicated that operation of the Facility may draw more seawater into Dickinson Bay, thereby increasing the source water TDS. TDS model results from TAMUG showed a long-term average source water TDS rise of 0.8 ppt and 95th-percentile rise of 1.6 ppt. The average percentage rise is 7%.

Increases in source water TDS can result in increased discharge TDS for the Facility. Therefore, a sensitivity analysis is conducted to evaluate near-field and far-field impacts with the projected TDS rise.

7.1 Near field impacts of potential intake TDS rise

Considering the RO recovery rate of 50%, 1:1.13 blending, and accounting for a 7% increase in source water TDS, the discharge TDS after intake salinity rise is computed as shown in Table 6.

Table 6. Intake and Blended discharge TDS after intake salinity rise

	Intake TDS = S_0*107% (ppt)	Expected discharge TDS (1.47 * Intake TDS)[1] (ppt)	Comments
Average	15.4	22.6	Meets chronic target of 23.3 ppt
95th percentile	28.2	41.5	Meets acute target of 42 ppt

The average discharge TDS after intake salinity rise is 22.6 ppt which still meets the chronic TDS target.

The 95th-percentile discharge TDS after intake salinity rise is 41.5 ppt which still meets the acute TDS target.

Therefore near-field impacts are still protective of aquatic life.

7.2 Far field impacts of potential intake TDS rise

To evaluate far-field impacts, the increase in discharge TDS is incorporated into the far-field model. The discharge model predicts an increase in frequency of exceeding criteria (discharge - baseline scenario) ranging from 1.2% to -0.8% (see Figure 26).

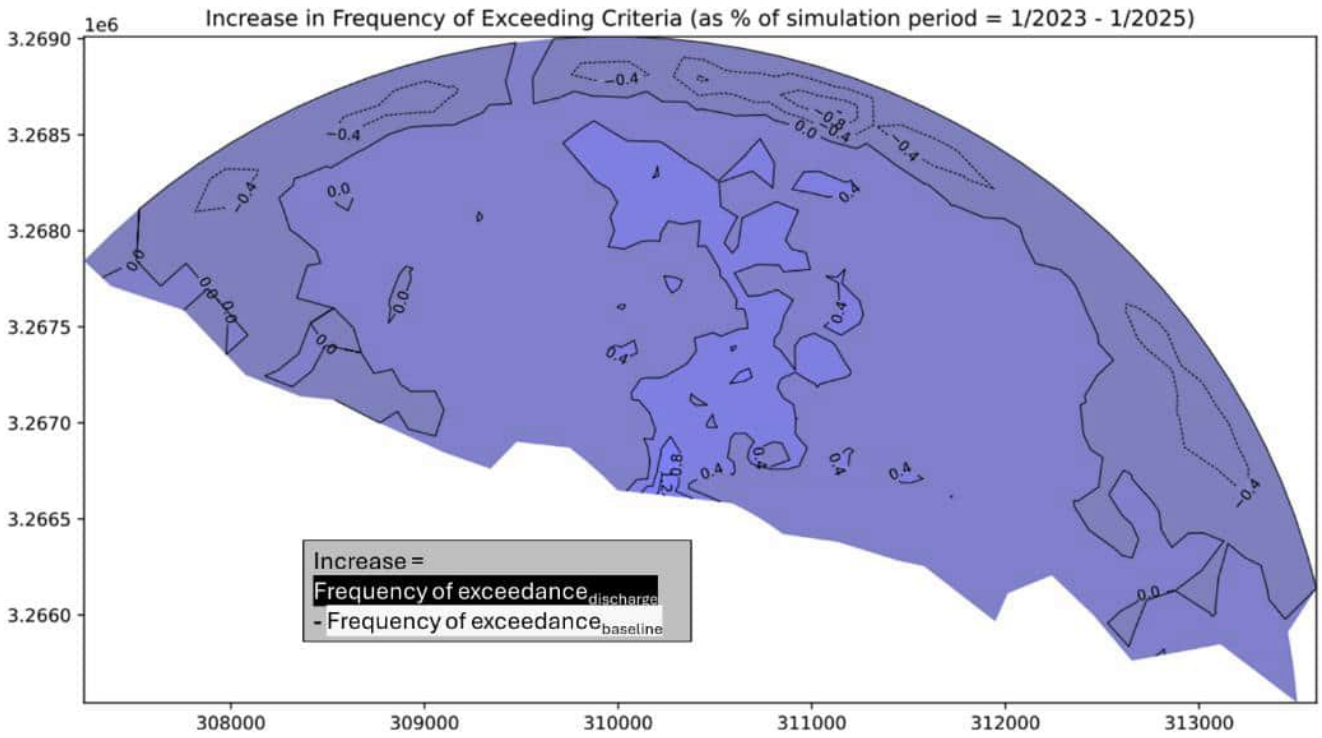


Figure 26. Increase in frequency of exceedance for discharge over baseline scenario <u>after accounting for potential intake TDS rise</u>.

Recall that without the potential intake TDS rise, the increase in frequency of exceeding criteria (discharge - baseline scenario) ranges from 0.4% to -0.8% (Figure 25). The risk of hypoxia increases slightly with the potential intake TDS rise, however the increase is still small compared to typical antidegradation thresholds (<10%) .

All in all, the sensitivity analysis shows that even with the potential intake TDS rise, near-field TDS targets can still be met with the RO recovery rate of 50% and 1: 1.13 flow augmentation. Far field impacts are still minimal with respect to typical antidegradation thresholds.

8.0 CONCLUSIONS

In conclusion, the mixing analysis and far-field modeling described in this technical memorandum demonstrate:

- In the near field, flow augmentation of 1:13 source water blending meets both the acute TDS target of 42 ppt and the chronic TDS target of 23.3 ppt at the end-of-pipe prior to discharge into the regulatory mixing zones; and,
- In the far field, flow augmentation results in a minimal increase in exceedance events (0.4%) and therefore a minimal increase in hypoxia risk.

These results are presented to TCEQ for the technical evaluation of the permit.

In alignment with previous desalination permits (City of Corpus Christi Inner Harbor Desalination Plant) (TCEQ, 2025), it is proposed that reporting limits be adopted for the Facility.

Figure 27 shows an excerpt of the "Effluent Limitations and Monitoring Requirements" section of the Inner Harbor permit. No numerical TDS effluent limits are specified, but the permittee is required to report effluent TDS.

EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS — Outfall Number 001 Final

1. During the period beginning upon the date of expansion to the final phase and lasting through the date of permit expiration, the permittee is authorized to discharge water treatment wastes [1] subject to the following effluent limitations:

   The daily average flow of effluent shall not exceed 51.5 million gallons per day (MGD). The daily maximum flow shall not exceed 62 MGD.

Effluent Characteristics	Discharge Limitations					Minimum Self-Monitoring Requirements	
	Daily Average		Daily Maximum		Single Grab	Report Daily Average and Daily Maximum	
	lbs/day	mg/L	lbs/day	mg/L	mg/L	Measurement Frequency	Sample Type
Flow	51.5 MGD		62 MGD		N/A	Continuous	Totalizer
Total Suspended Solids	Report	Report	Report	Report	N/A	1/week	Grab
Total Dissolved Solids	Report	Report	Report	Report	N/A	1/week	Grab
Chloride	Report	Report	Report	Report	N/A	1/week	Grab
Sulfate	Report	Report	Report	Report	N/A	1/week	Grab
Salinity [2]	Report	Report, ppt	Report	Report, ppt	N/A	1/week	Grab

2. The pH must not be less than 6.5 standard units nor greater than 9.0 standard units and must be monitored 1/day by grab sample.

3. There must be no discharge of floating solids or visible foam in other than trace amounts and no discharge of visible oil.

4. Effluent monitoring samples must be taken at the following location: At Outfall 001, following commingling of all wastewater and prior to the start-of-pipe to diffuser.

Figure 27. Excerpt from TPDES permit for the Corpus Christi Inner Harbor Desalination Plant (WQ00005289000) showing reporting TDS limits for the effluent (TCEQ, 2025).

Meanwhile, in the "Other Requirements" section (see Figure 28), provisions for meeting maximum effluent percentages at the edges of mixing zones are specified for the diffuser to achieve to protect aquatic life.

Final Phase:

The permittee shall maintain the diffuser at Outfall 001 to achieve a maximum effluent percentage of 8.74 percent at the edge of the ZID. The ZID is defined as a 117.1-foot by 67.1-foot rectangle centered on the diffuser barrel with the longer edge running parallel to the diffuser barrel. This area is approximately equal to the area of a 50-foot radius circle.

The permittee shall maintain the diffuser at Outfall 001 to achieve a maximum effluent percentage of 6.24 percent at the edge of the chronic aquatic life mixing zone. The chronic aquatic life mixing zone is defined as a 380.4-foot by 330.4-foot rectangle centered on the diffuser with the longer edge running parallel to the diffuser barrel. This area is approximately equal to the area of a 200-foot radius circle.

The permittee shall maintain the diffuser at Outfall 001 to achieve a maximum effluent percentage of 4.85 percent at the edge of the human health mixing zone. The human health mixing zone is defined as a 734.4-foot by 684.4-foot rectangle centered on the diffuser with the longer edge running parallel to the diffuser barrel. This area is approximately equal to the area of a 400-foot radius circle.

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Figure 28. Excerpt from TPDES permit for the Corpus Christi Inner Harbor Desalination Plant (WQ00005289000) showing requirements for achieving effluent percentages at edges of mixing zones (TCEQ, 2025).

A similar approach can be adopted for the Facility TPDES permit. Since flow augmentation instead of diffusion is proposed for brine management, the flow augmentation strategy can be specified in place of maximum effluent percentages.

In summary, it is proposed that:

- Reporting limits be adopted for the "Effluent Limitations and Monitoring Requirements" section of the Facility permit; and
- A flow augmentation strategy of operating the Facility at an RO recovery rate of 50% source water blending ratio of 1:1.13 be specified in the "Other Requirements" section.

9.0 REFERENCES

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Tab 23

Proposed Use of Flow Augmentation
Bayshore Desalination Facility

The Bayshore Desalination Facility (the "Facility") will use flow augmentation to blend the effluent discharge, and the following statement explains why this alternative approach is better suited to the Facility's site conditions. The use of a diffuser is not a suitable method for meeting effluent limits in the proposed Facility's man-made discharge canal because the physical characteristics of the man-made canal do not support the conditions required for a diffuser to function properly. While a diffuser has been the proposed technology for the brine discharges in the Port of Corpus Christi and City of Corpus Christi desalination Texas Pollutant Discharge and Elimination System ("TPDES") permits (TPDES Permit Nos. WQ0005253000 and WQ005289000, respectively), both applications proposed designs that included a diffuser that would discharge into a deep and wide receiving water body. In this Application, the proposed receiving man-made canal is narrow and shallow (see Figure 1), meaning the use of a diffuser would result in limited mixing and no benefit to the ecology of the man-made canal.

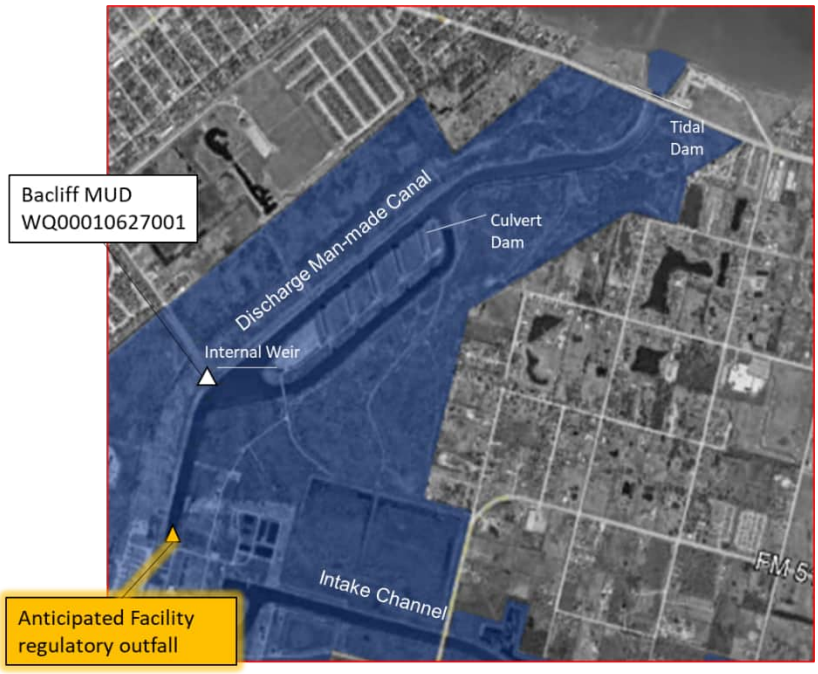


Figure 1. Location of Anticipated Regulatory Outfall of Bayshore Facility

To lessen the salinity impact on the receiving water bodies from the discharge, the Facility will use flow augmentation to reduce the total dissolved solids ("TDS") of the effluent prior to discharge. Flow augmentation is where additional source water is pumped from the intake channel to blend with the reverse osmosis reject. Despite the general limitations on the use of flow augmentation, both flow augmentation and diffusers accomplish the same function, and both operate as non-treatment techniques. Flow augmentation is a well-established brine-management practice for desalination plants, and the State of California approved the use of flow augmentation

to achieve salinities protective of marine life at the Claude "Bud" Lewis Carlsbad Desalination Plant in Carlsbad, California.[1]

A diffuser uses a single jet, or multiple jets in the case of multiport diffusers, to engage ambient water and rapidly dilute and mix the concentrated discharge (see Figure 2). Diffusers operate best when the receiving water is sizeable, such as an open bay or wide tidal estuary where there is a sufficiently large volume of water to mix with the discharge. Diffuser performance is also dependent on the availability of background flow, and the maximum possible dilution is a uniform blend between the background flow and the discharge flow.

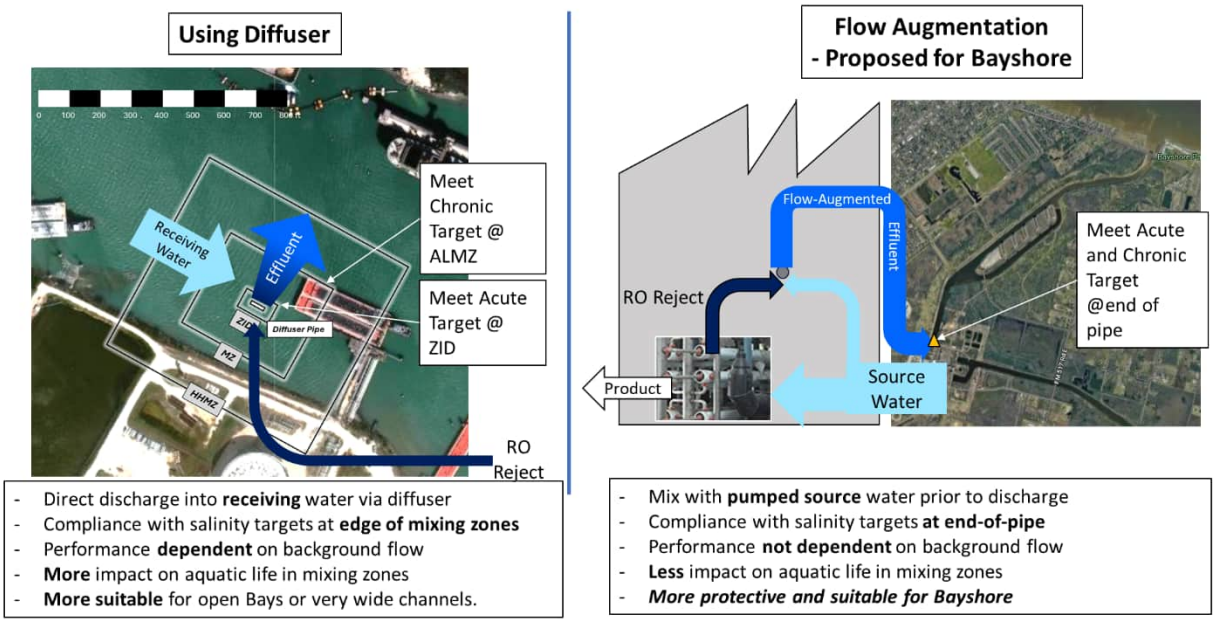


Figure 2. Comparison of Brine Management using Diffuser vs. Flow Augmentation.

In the case of the Facility, the volume of receiving water available for mixing is restricted by the narrow channel width. In addition, the presence of a neighboring permitted outfall (Bacliff MUD Central Wastewater Treatment Facility, TPDES Permit No. WQ00010627001) further decreases the mixing zone areas available for a diffuser to achieve required dilutions. Volume aside, background flow is limited due to the location of the outfall at the upstream end of a two-mile man-made canal where little tidal flow exchange occurs. Several man-made hydraulic structures along the man-made canal further restrict tidal flow to the outfall location. Employing a diffuser in such an environment cannot enhance dilution because of the lack of background flow

[1] California Regional Water Quality Control Board, San Diego Region, *Waste Discharge Requirements for the Poseidon Resources (Channelside) LP Claude "Bud" Lewis Carlsbad Desalination Plant Discharge to the Pacific Ocean, Order No. R9-2019-0003, as amended by Order No. R9-2020-0004, NPDES No. CA0109223* (May 8, 2019), available at https://www.waterboards.ca.gov/sandiego/water_issues/programs/regulatory/docs/Amended_R9-2019-0003.pdf. The Carlsbad plant was using discharge cooling water from a nearby power plant for flow augmentation of the brine discharge, and after the power plant's decommissioning, the California State Board granted an allowance for flow augmentation using additional intake water following the discharger's demonstration that flow augmentation would be no more impactful than a diffuser, pursuant to California Water Code Section 13142.5(b) and the California Ocean Plan Amendment, approved by EPA.

for mixing. As such, the Facility will implement flow augmentation as an alternate method of blending.

Flow augmentation solves the problem of limited background flow and receiving water volume by pumping additional source water to blend with the discharge. The advantages of flow augmentation over more conventional means of dilution, like using diffusers, is that dilution is achieved at the end-of-pipe before discharge instead of in the receiving waters, thus lessening TDS impact on aquatic life in the mixing zones. Also, flow augmentation performance is potentially more consistent than diffusers as dilution effectiveness is not dependent on receiving water conditions such as background flow, TDS, and temperature. The Facility's target blend ratio is 1:1.13 and therefore the final discharge will be 47% RO reject water and 53% source water by volume. After flow augmentation, the resulting discharge TDS is expected to be only 1.47 times the intake TDS. The overall expected intake flow rate for the Facility is 82.8 MGD, and the expected overall discharge rate is 56.3 MGD.

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

SUMMARY OF APPLICATION IN PLAIN LANGUAGE FOR TPDES OR TLAP PERMIT APPLICATIONS

Summary of Application (in plain language) Template and Instructions for Texas Pollutant Discharge Elimination System (TPDES) and Texas Land Application (TLAP) Permit Applications

Applicants should use this template to develop a plain language summary of your facility and application as required by Title 30, Texas Administrative Code (30 TAC), Chapter 39, Subchapter H. You may modify the template as necessary to accurately describe your facility as long as the summary includes the following information: (1) the function of the proposed plant or facility; (2) the expected output of the proposed plant or facility; (3) the expected pollutants that may be emitted or discharged by the proposed plant or facility; and (4) how you will control those pollutants, so that the proposed plant will not have an adverse impact on human health or the environment.

Fill in the highlighted areas below to describe your facility and application in plain language. Instructions and examples are provided below. Make any other edits necessary to improve readability or grammar and to comply with the rule requirements. After filling in the information for your facility delete these instructions.

If you are subject to the alternative language notice requirements in 30 TAC Section 39.426, **you must provide a translated copy of the completed plain language summary in the appropriate alternative language as part of your application package**. For your convenience, a Spanish template has been provided below.

ENGLISH TEMPLATE FOR TPDES or TLAP NEW/RENEWAL/AMENDMENT APPLICATIONS INDUSTRIAL WASTEWATER/STORMWATER
The following summary is provided for this pending water quality permit application being reviewed by the Texas Commission on Environmental Quality as required by 30 TAC Chapter 39. The information provided in this summary may change during the technical review of the application and is not a federal enforceable representation of the permit application.

EPCOR NR Holdings, Inc. proposes to operate Bayshore Desalination Facility, a Seawater Desalination Water Treatment Plant. The facility will be located at 5501 Highway 146, in Texas City, Galveston County, Texas 77518. This application is for a new application to disch arge process wastewater (reverse osmosis concentrated blended with raw seawater) on an intermittent and flow-variable basis.

Discharges from the facility are expected to contain Total Suspended Solids, Total Dissolved Solids, salinity, chloride, sulfate, and trace chemicals used in the water treatment processes. Trace chemicals residual from the water treatment process may be present, including Ferric Sulfate (CAS # 10028-22-5), Anionic Polymer, Sodium Hypochlorite (CAS # 7681-52-9), Liquid Ammonium Sulfate (CAS # 7783-20-2), CO_2 (CAS # 124-38-9), Sodium Hydroxide (CAS # 1310-

73-2), Citric Acid (CAS # 77-92-9), Sodium Bisulfite (CAS # 7631-90-5), Seawater reverse osmosis Antiscalant, Sulfuric Acid (CAS # 7664-93-9), and Lime (calcite)(CAS # 13397-26-7). Concentrate from seawater reverse osmosis treatment will be treated by blending with raw seawater.

PLANTILLA EN ESPAÑOL PARA SOLICITUDES NUEVAS/RENOVACIONES/ENMIENDAS DE TPDES o TLAP

AGUAS RESIDUALES INDUSTRIALES **/AGUAS PLUVIALES**

El siguiente resumen se proporciona para esta solicitud de permiso de calidad del agua pendiente que está siendo revisada por la Comisión de Calidad Ambiental de Texas según lo requerido por el Capítulo 39 del Código Administrativo de Texas 30. La información proporcionada en este resumen puede cambiar durante la revisión técnica de la solicitud y no es una representación ejecutiva fedérale de la solicitud de permiso.

EPCOR NR Holdings, Inc. propone operar Bayshore Desalination Facility, una planta de desalinización de aqua. La instalación estará ubicada en 5501 Highway 146, en Texas City, Condado de Galveston, Texas 77518. Esta solicitud es para una nueva aplicación para descargar aguas residuales de proceso (concentrado de ósmosis inversa mezclado con agua de mar cruda) de manera intermitente y con caudal variable.

Se espera que las descargas de la instalación contengan Sólidos Suspendidos Totales, Sólidos Disueltos Totales, salinidad, cloruro, sulfato y químicos traza utilizados en los procesos de tratamiento de agua. Pueden estar presentes residuos de químicos traza del proceso de tratamiento de agua, incluyendo Sulfato Férrico (CAS # 10028-22-5), Polímero Aniónico, Hipoclorito de Sodio (CAS # 7681-52-9), Sulfato de Amonio Líquido (CAS # 7783-20-2), CO2 (CAS # 124-38-9), Hidróxido de Sodio (CAS # 1310-73-2), Ácido Cítrico (CAS # 77-92-9), Bisulfito de Sodio (CAS # 7631-90-5), Antiincrustante de ósmosis inversa de agua de mar, Ácido Sulfúrico (CAS # 7664-93-9) y Cal (calcita) (CAS # 13397-26-7). El concentrado proveniente del tratamiento de agua de mar por ósmosis inversa. estará tratado por la mezcla del concentrado con agua de mar cruda.

Texas Commission on Environmental Quality

Public Involvement Plan Form for Permit and Registration Applications

The Public Involvement Plan is intended to provide applicants and the agency with information about how public outreach will be accomplished for certain types of applications in certain geographical areas of the state. It is intended to apply to new activities; major changes at existing plants, facilities, and processes; and to activities which are likely to have significant interest from the public. This preliminary screening is designed to identify applications that will benefit from an initial assessment of the need for enhanced public outreach.

All applicable sections of this form should be completed and submitted with the permit or registration application. For instructions on how to complete this form, see TCEQ-20960-inst.

Section 1. Preliminary Screening

☒ New Permit or Registration Application

☐ New Activity – modification, registration, amendment, facility, etc. (see instructions)

If neither of the above boxes are checked, completion of the form is not required and does not need to be submitted.

Section 2. Secondary Screening

☒ Requires public notice,

☒ Considered to have significant public interest, **and**

☒ Located within any of the following geographical locations:

- Austin
- Dallas
- Fort Worth
- Houston
- San Antonio
- West Texas
- Texas Panhandle
- Along the Texas/Mexico Border
- Other geographical locations should be decided on a case-by-case basis

If all the above boxes are not checked, a Public Involvement Plan is not necessary. Stop after Section 2 and submit the form.

☐ Public Involvement Plan not applicable to this application. Provide **brief** explanation.

Section 3. Application Information

Type of Application (check all that apply):

Air ☐ Initial ☐ Federal ☐ Amendment ☐ Standard Permit ☐ Title V

Waste ☐ Municipal Solid Waste ☐ Industrial and Hazardous Waste ☐ Scrap Tire
☐ Radioactive Material Licensing ☐ Underground Injection Control

Water Quality

☒ Texas Pollutant Discharge Elimination System (TPDES)

- ☐ Texas Land Application Permit (TLAP)
- ☐ State Only Concentrated Animal Feeding Operation (CAFO)
- ☐ Water Treatment Plant Residuals Disposal Permit

☐ Class B Biosolids Land Application Permit

☐ Domestic Septage Land Application Registration

Water Rights New Permit

☐ New Appropriation of Water

☐ New or existing reservoir

Amendment to an Existing Water Right

☐ Add a New Appropriation of Water

☐ Add a New or Existing Reservoir

☐ Major Amendment that could affect other water rights or the environment

Section 4. Plain Language Summary

Provide a brief description of planned activities.

Construct a seawater desalination water treatment facility that consists of intake and raw water pump station, pretreatment basins, low pressure membrane and reverse osmosis building, post treatment system, ground storage tank, distribution pump station for water treatment process. The facility also includes a solids handling system with a raw sludge thickener, thickened sludge pump station and a dewatering building.

The project also includes excavation and installation of new piping, construction of foundations of new structures and buildings, installation of utility and pipe racks, and constructions of new roads.

Section 5. Community and Demographic Information

Community information can be found using EPA's EJ Screen, U.S. Census Bureau information, or generally available demographic tools.

Information gathered in this section can assist with the determination of whether alternative language notice is necessary. Please provide the following information.

Texas City

(City)

Galveston

(County)

(Census Tract)

Please indicate which of these three is the level used for gathering the following information.

☐ City ☐ County ☒ Census Tract

(a) Percent of people over 25 years of age who at least graduated from high school

78.1%

(b) Per capita income for population near the specified location

$28,425

(c) Percent of minority population and percent of population by race within the specified location

56.9% minority population, Hispanic or Latino = 45.6%, White (not Hispanic) = 43.1%, Black = 8.2%, Asian = 1.6%, American Indian and Alaska Native = 1.1%, Native Hawaiian and Other Pacific Islander = 0%, Two or more races = 20.9%

(d) Percent of Linguistically Isolated Households by language within the specified location

6.2%

(e) Languages commonly spoken in area by percentage

English and Spanish are the two main languages spoken in the area. Other languages are spoken by less than 0.1% of the population.

(f) Community and/or Stakeholder Groups

This information could not be found.

(g) Historic public interest or involvement

This information could not be found.

Section 6. Planned Public Outreach Activities

(a) Is this application subject to the public participation requirements of Title 30 Texas Administrative Code (30 TAC) Chapter 39?

☒ Yes ☐ No

(b) If yes, do you intend at this time to provide public outreach other than what is required by rule?

☒ Yes ☐ No

If Yes, please describe.

EPCOR intends to incorporate a robust engagement schedule and provide educationa

If you answered "yes" that this application is subject to 30 TAC Chapter 39, answering the remaining questions in Section 6 is not required.

(c) Will you provide notice of this application in alternative languages?

☐ Yes ☐ No

Please refer to Section 5. If more than 5% of the population potentially affected by your application is Limited English Proficient, then you are required to provide notice in the alternative language.

If yes, how will you provide notice in alternative languages?

☐ Publish in alternative language newspaper
☐ Posted on Commissioner's Integrated Database Website
☐ Mailed by TCEQ's Office of the Chief Clerk
☐ Other (specify)

(d) Is there an opportunity for some type of public meeting, including after notice?

☐ Yes ☐ No

(e) If a public meeting is held, will a translator be provided if requested?

☐ Yes ☐ No

(f) Hard copies of the application will be available at the following (check all that apply):

☐ TCEQ Regional Office ☐ TCEQ Central Office
☐ Public Place (specify)

Section 7. Voluntary Submittal

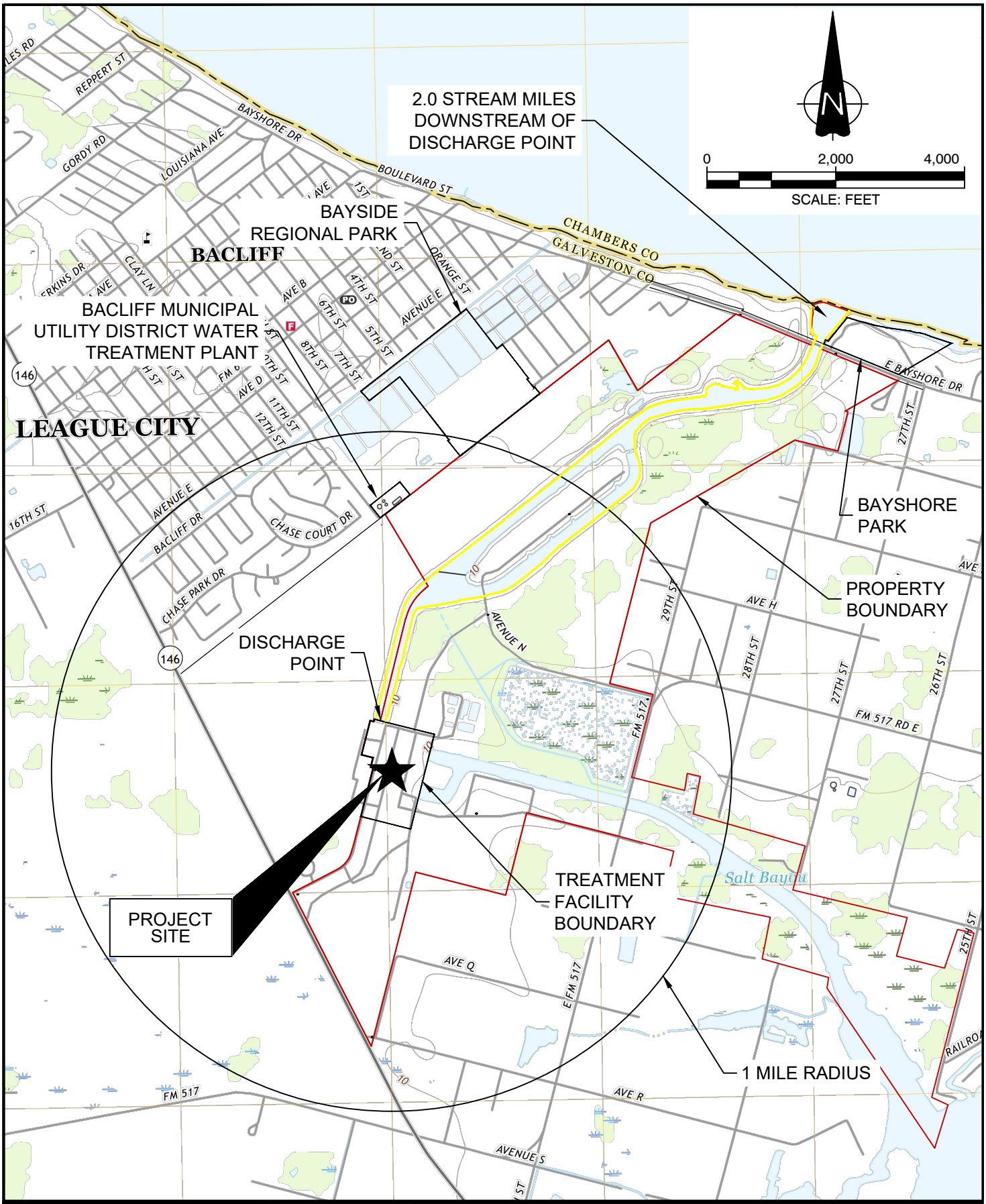
For applicants voluntarily providing this Public Involvement Plan, who are not subject to formal public participation requirements.

Will you provide notice of this application, including notice in alternative languages?

☐ Yes ☐ No

What types of notice will be provided?

☐ Publish in alternative language newspaper
☐ Posted on Commissioner's Integrated Database Website
☐ Mailed by TCEQ's Office of the Chief Clerk
☐ Other (specify)



EPCOR

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BAYSHORE DESALINATION FACILITY

AR-06 USGS TOPOGRAPHIC MAP

DATE: JUNE 2025

SCALE: 1" = 2,000'

ARDURRA

3115 Allen Parkway, Suite 300
Houston, TX 77019
TBPE Firm Registration No. F-10053



EPCOR

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BAYSHORE DESALINATION FACILITY

AR-07 AFFECTED LANDOWNER MAP

DATE: JUNE 2025

SCALE: 1" = 2,000'

ARDURRA

3115 Allen Parkway, Suite 300
Houston, TX 77019
TBPE Firm Registration No. F-10053

Cross-Reference List of Affected Landowners

ID	Owner(s) Name	Physical Address	Mailing Address
1	AMH 2015-1 BORROWER LLC	5123 CHASE PARK GATE ST BACLIFF, TX 77518	23975 PARK SORRENTO #300 CALABASAS CA 91302
2	RAFAEL & MELISSA BANDA	915 CHASE PARK DR BACLIFF, TX 77518	915 CHASE PARK DR BACLIFF TX 77518
3	SEAN BOLAND	943 CHASE PARK DR BACLIFF, TX 77518	3333 LAKE ST UNIT 11D HOUISTON TX 77518
4	JAMES & OLIVIA BUTLER	5126 CHASE PARK GATE ST BACLIFF, TX 77518	5126 CHASE PARK GATE ST BACLIFF TX 77518
5	CENTERPOINT ENERGY HOUSTON ELECTRIC LLC	5501 HWY 146 SAN LEON, TX 77539	PO BOX 1700 HOUSTON TX 77518
6	NEFTALI PELICO CHUN	939 CHASE PARK DR BACLIFF, TX 77518	939 CHASE PARK DR BACLIFF, TX 77518
7	GALVESTON COUNTY	ABST 88 A HATCH SUR TR 30-2 4.414 ACRES	722 MOODY AVE GALVESTON TX 77550
8	MARCUS & VERONICA CURTIS	5322 CHASE WOOD DR BACLIFF, TX 77518	5322 CHASE WOOD DR BACLIFF, TX 77518
9	JOSE & MARIA DURAN	AVE P SAN LEON, TX 77539	1826 ORIOLE DR LEAGUE CITY TX 77518
10	LORI GAINER	5326 CHASE WOOD DR BACLIFF, TX 77518	5326 CHASE WOOD DR BACLIFF TX 77518
11	FRANCISCA GARCIA	5107 CHASE WIND CT BACLIFF, TX 77518	5107 CHASE WIND CT BACLIFF TX 77518
12	CLARA JASSO	5103 CHASE WIND CT BACLIFF, TX 77518	345 7TH ST DICKINSON TX 77539
13	COURTNEY JUNEMANN	5310 CHASE WOOD DR BACLIFF, TX 77518	5307 AVE N DICKINSON TX 77539
14	KV LAND LLC	5501 HWY 146 SAN LEON, TX 77539	4801 WOODWAY DR #410W HOUSTON TX 77056
15	VINCENT LEAVER	5130 CHASE PARK GATE ST BACLIFF, TX 77518	5130 CHASE PARK GATE ST BACLIFF TX 77518
16	DONALD & NANCY LOUNDS	5127 CHASE PARK GATE ST BACLIFF, TX 77518	5127 CHASE PARK GATE ST BACLIFF TX 77518
17	VICTOR MEDINA	911 CHASE PARK DR BACLIFF, TX 77518	911 CHASE PARK DR BACLIFF TX 77518
18	DAVID & STARLA MORTON	927 CHASE PARK DR BACLIFF, TX 77518	927 CHASE PARK DR BACLIFF TX 77518
19	EDWARD & ANGIE MUNOZ	931 CHASE PARK DR BACLIFF, TX 77518	931 CHASE PARK DR BACLIFF TX 77518
20	NRG TEXAS POWER LLC	5501 HWY 146 SAN LEON, TX 77539	804 CARNEGIE CENTER PRINCETON NJ 08540

21	URIEL OLVERA	5318 CHASE WOOD DR BACLIFF, TX 77518	5318 CHASE WOOD DR BACLIFF TX 77518
22	JOSE & NORMA ORTIZ	5330 CHASE WOOD DR BACLIFF, TX 77518	5330 CHASE WOOD DR BACLIFF TX 77518
23	ROBERT ORTIZ	923 CHASE PARK DR BACLIFF, TX 77518	923 CHASE PARK DR BACLIFF TX 77518
24	DARRYL PAYNE	919 CHASE PARK DR BACLIFF, TX 77518	919 CHASE PARK DR BACLIFF TX 77518
25	PHR HOLDINGS LLC	ABST 88 A HATCH SUR TR 14-2 ACRES 17.618	24 WATERWAY AVE STE 800 THE WOODLANDS TX 77380
26	ANTHONY & TRACI POYNOR	5106 CHASE WIND CT BACLIFF, TX 77518	5106 CHASE WIND CT BACLIFF TX 77518
27	CARL STEPHENS	5110 CHASE WIND CT BACLIFF, TX 77518	5110 WIND CT BACLIFF TX 77518
28	TEXAS NEW MEXICO POWER CO	ABST A EDWARDS SUR PT OF LOTS 9 & 10 (1009-2) BLK 60A SAN LEON FARM HOME TRACTS, ACRES 1.259	PO BOX 8840 BACLIFF TX 77518
29	ALAN TORRES	935 CHASE PARK DR BACLIFF, TX 77518	935 CHASE PARK DR BACLIFF TX 77518
30	RODNEY & YULIA WILLIAMS	935 CHASE PARK DR BACLIFF, TX 77518	935 CHASE PARK DR BACLIFF TX 77518

AMH 2015-1 BORROWER LLC
23975 PARK SORRENTO STE
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915 CHASE PARK DR
BACLIFF TX 77518

SEAN BOLAND
C/O 946 CHASE TRUST
3333 LAKE ST UNIT 11D
HOUSTON TX 77098

JAMES & OLIVIA BUTLER
5126 CHASE PARK GATE ST
BACLIFF TX 77518

CENTERPOINT ENERGY HOUSTON
ELECTRIC LLC
PO BOX 1700
HOUSTON TX 77251

NEFTALI PELICO CHUN
939 CHASE PARK DR
BACLIFF TX 77518

GALVESTON COUNTY
722 MOODY AVE
GALVESTON TX 77550

MARCUS & VERONICA CURTIS
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BACLIFF TX 77518

DARRYL PAYNE
919 CHASE PARK DR
BACLIFF TX 77518

PHR HOLDINGD LLC
24 WATERWAY AVE #800
THE WOODLANDS TX 77380

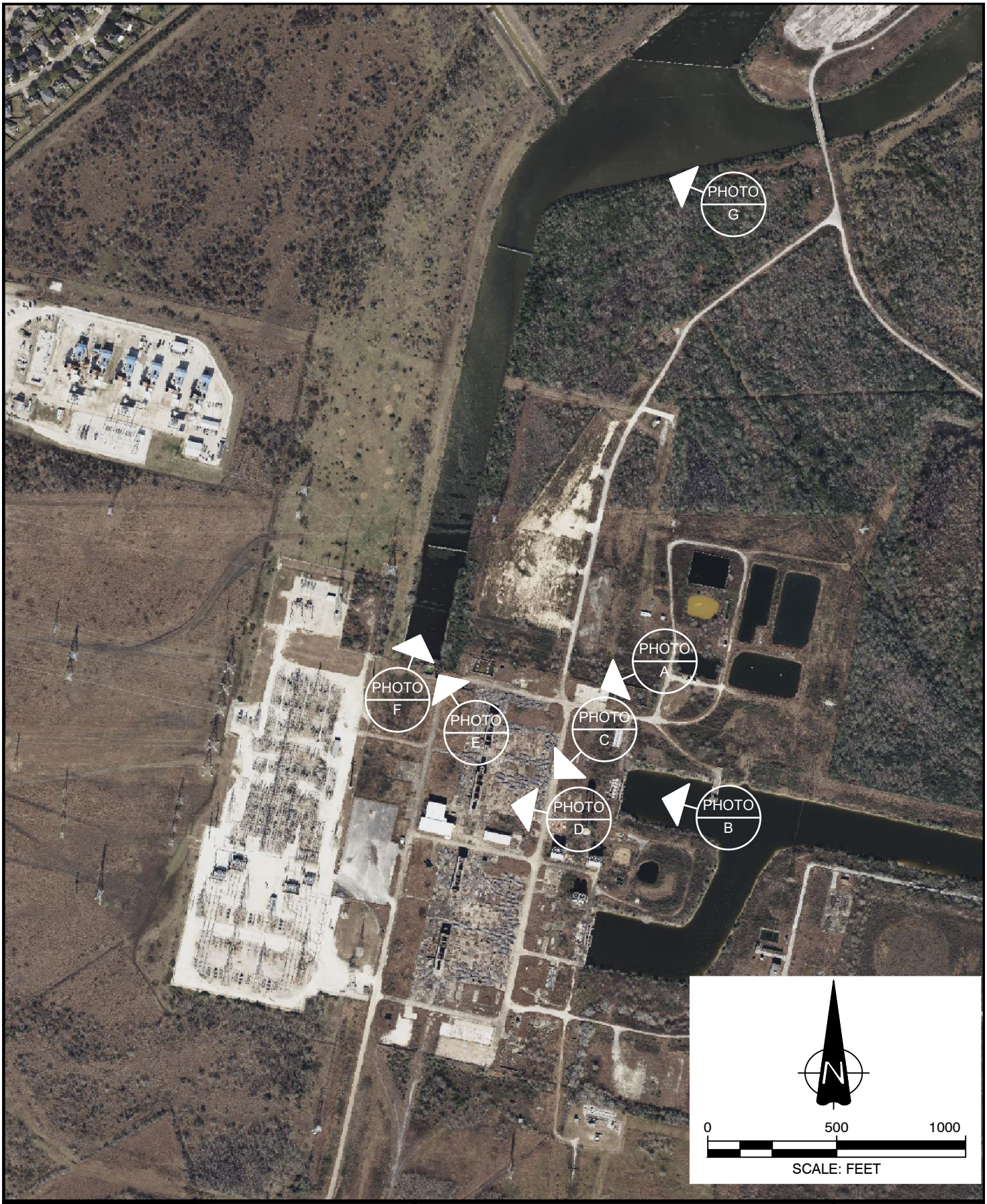
ANTHONY & TRACI POYNOR
PO BOX 8840
BACLIFF TX 77518

CARL STEPHENS
5110 WIND CT
BACLIFF TX 77518

TEXEAS NEW MEXICO POWER CO
414 SILVER AVE SW
ALBUQUERQUE NM 87102

ALAN TORRES
935 CHASE PARK DR
BACLIFF TX 77518

RODNEY & YULIA WILLIAMS
5314 CHASE WOOD DR
BACLIFF TX 77518



EPCOR

BAYSHORE DESALINATION FACILITY

AR-08 ORIGINAL SITE PHOTOGRAPHS

DATE: JUNE 2025

SCALE: 1" = 500'

ARDURRA
3115 Allen Parkway, Suite 300
Houston, TX 77019
TBPE Firm Registration No. F-10053



OVERALL TREATMENT LOCATION

PHOTOGRAPH A

NOT TO SCALE -



INTAKE AND TREATMENT AREA

PHOTOGRAPH B

NOT TO SCALE -

EPCOR	EPCOR BAYSHORE DESALINATION FACILITY	AR-08 ORIGINAL SITE PHOTOGRAPH STREATMENT AREA LOCATION PHOTOS (1 OF 2)	ARDURRA 3115 Allen Parkway, Suite 300 Houston, TX 77019 TBPE Firm Registration No. F-10053
		DATE: JUNE 2025	SCALE: NTS



TREATMENT LOCATION

PHOTOGRAPH C

NOT TO SCALE -



TREATMENT LOCATION

PHOTOGRAPH D

NOT TO SCALE -

EPCOR

BAYSHORE
DESALINATION FACILITY

AR-08 ORIGINAL SITE PHOTOGRAPH
STREATMENT AREA LOCATION
PHOTOS (2 OF 2)

DATE: JUNE 2025

SCALE: NTS

ARDURRA
3115 Allen Parkway, Suite 300
Houston, TX 77019
TBPE Firm Registration No. F-10053



DISCHARGE LOCATION

PHOTOGRAPH E

NOT TO SCALE -



DISCHARGE LOCATION

PHOTOGRAPH F

NOT TO SCALE -

EPCOR	EPCOR BAYSHORE DESALINATION FACILITY	AR-08 ORIGINAL SITE PHOTOGRAPH SDISCHARGE LOCATION PHOTOS (1 OF 2)	ARDURRA 3115 Allen Parkway, Suite 300 Houston, TX 77019 TBPE Firm Registration No. F-10053
		DATE: JUNE 2025	SCALE: NTS



DOWNSTREAM OF DISCHARGE LOCATION

PHOTOGRAPH G

NOT TO SCALE -

EPCOR	EPCOR BAYSHORE DESALINATION FACILITY	AR-08 ORIGINAL SITE PHOTOGRAPH SDISCHARGE LOCATION PHOTOS (2 OF 2)	ARDURRA 3115 Allen Parkway, Suite 300 Houston, TX 77019 TBPE Firm Registration No. F-10053
		DATE: JUNE 2025	SCALE: NTS

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

SUPPLEMENTAL PERMIT INFORMATION FORM (SPIF)

FOR AGENCIES REVIEWING DOMESTIC OR INDUSTRIAL TPDES WASTEWATER PERMIT APPLICATIONS

TCEQ USE ONLY:

Application type: _____Renewal _____Major Amendment ____Minor Amendment _____New

County: _____ Segment Number: _____

Admin Complete Date: _____

Agency Receiving SPIF:

_____ Texas Historical Commission _____ U.S. Fish and Wildlife

_____ Texas Parks and Wildlife Department _____ U.S. Army Corps of Engineers

This form applies to TPDES permit applications only. (Instructions, Page 53)

Complete this form as a separate document. TCEQ will mail a copy to each agency as required by our agreement with EPA. If any of the items are not completely addressed or further information is needed, we will contact you to provide the information before issuing the permit. Address each item completely.

Do not refer to your response to any item in the permit application form. Provide each attachment for this form separately from the Administrative Report of the application. The application will not be declared administratively complete without this SPIF form being completed in its entirety including all attachments. Questions or comments concerning this form may be directed to the Water Quality Division's Application Review and Processing Team by email at WQ-ARPTeam@tceq.texas.gov or by phone at (512) 239-4671.

The following applies to all applications:

1. Permittee: EPCOR NR Holdings, Inc.

   Permit No. WQ00 TBD EPA ID No. TX TBD

   Address of the project (or a location description that includes street/highway, city/vicinity, and county):

   5501 Highway 146 Texas City, TX 77518

Provide the name, address, phone and fax number of an individual that can be contacted to answer specific questions about the property.

Prefix (Mr., Ms., Miss): Mr.

First and Last Name: Joseph Gysel

Credential (P.E, P.G., Ph.D., etc.): N/A

Title: President

Mailing Address: 5656 W. Talavi Blvd

City, State, Zip Code: Glendale, AZ 85306

Phone No.: 623-445-2400 Ext.: N/A Fax No.: N/A

E-mail Address: JGysel@epcor.com

2. List the county in which the facility is located: Galveston
3. If the property is publicly owned and the owner is different than the permittee/applicant, please list the owner of the property.

N/A

4. Provide a description of the effluent discharge route. The discharge route must follow the flow of effluent from the point of discharge to the nearest major watercourse (from the point of discharge to a classified segment as defined in 30 TAC Chapter 307). If known, please identify the classified segment number.

The proposed outfall is located at the outlet of the pipe at the southwest end of the man-made canal within the property boundaries. The discharge will travel northeast along the canal, flowing around both sides of the former cooling tower island and converging back, continuing to flow through the canal until meeting Upper Galveston Bay, two miles downstream of the outfall. Upper Galveston Bay is classified segment number 2421.

5. Please provide a separate 7.5-minute USGS quadrangle map with the project boundaries plotted and a general location map showing the project area. Please highlight the discharge route from the point of discharge for a distance of one mile downstream. (This map is required in addition to the map in the administrative report).

Provide original photographs of any structures 50 years or older on the property.

Does your project involve any of the following? Check all that apply.

☒ Proposed access roads, utility lines, construction easements

☐ Visual effects that could damage or detract from a historic property's integrity

☐ Vibration effects during construction or as a result of project design

☒ Additional phases of development that are planned for the future

☐ Sealing caves, fractures, sinkholes, other karst features

☐ Disturbance of vegetation or wetlands

1. List proposed construction impact (surface acres to be impacted, depth of excavation, sealing of caves, or other karst features):

Surface Acres to be Impacted: 30.87acres. Depth of Excavation: TBD

2. Describe existing disturbances, vegetation, and land use:

The new WTP will be constructed at a decommissioned NRG power plant site. The facility will consist of various treatment processes, structures and buildings.

THE FOLLOWING ITEMS APPLY ONLY TO APPLICATIONS FOR NEW TPDES PERMITS AND MAJOR AMENDMENTS TO TPDES PERMITS

3. List construction dates of all buildings and structures on the property:

It is anticipated that construction will begin in 2028.

4. Provide a brief history of the property, and name of the architect/builder, if known.

The existing site was an NRG power plant, which was decommissioned in 2009.

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

INDUSTRIAL WASTEWATER PERMIT APPLICATION TECHNICAL REPORT 1.0

The following information **is required** for all applications for a TLAP or an individual TPDES discharge permit.

For **additional information** or clarification on the requested information, please refer to the Instructions for Completing the Industrial Wastewater Permit Application[1] available on the TCEQ website. Please contact the Industrial Permits Team at 512-239-4671 with any questions about this form.

If more than one outfall is included in the application, provide applicable information for each individual outfall. **If an item does not apply to the facility, enter N/A** to indicate that the item has been considered. Include separate reports or additional sheets as **clearly cross-referenced attachments** and provide the attachment number in the space provided for the item the attachment addresses.

NOTE: This application is for an industrial wastewater permit only. Additional authorizations from the TCEQ Waste Permits Division or the TCEQ Air Permits Division may be needed.

Item 1. Facility/Site Information (Instructions, Page 39)

a. Describe the general nature of the business and type(s) of industrial and commercial activities. Include all applicable SIC codes (up to 4).

Desalination water treatment plant – SIC Code 4941

b. Describe all wastewater-generating processes at the facility.

The proposed desalination facility will receive raw seawater from Salt Bayou, which is fed from Galveston Bay. Raw water will flow from the bayou through rotating screens and pumped to the pretreatment basins. The pretreatment process consists of rapid mixing, flocculation, an optional dissolved air flotation (DAF) step, and high-rate (HR) clarification. Following clarification, the settled water will be filtered through a low pressure membrane filtration system, and optional gravity media filters, then transferred via high pressure (HP) feed pumps to seawater reverse osmosis (SWRO) membrane skids. SWRO permeate quality will be stabilized with carbon dioxide and calcite, followed by stabilization and disinfection with sodium hypochlorite and optionally, liquid ammonium sulfate, and stored in ground storage tanks (GSTs). The finished water will be pumped from the GSTs by a High Service Pump Station to the distribution system. Spent spray wash water from the rotating screens, backwash water from the low pressure membrane feed strainers, membrane racks, optional media filtration system, calcite contractors, along with supernatant from the sludge thickeners and centrate from the centrifuges will be collected in a residual liquid collection system and discharged to the outfall. Concentrate from the RO skids will be sent to the outfall and blended with raw seawater before discharging into the man-made

[1] https://www.tceq.texas.gov/permitting/wastewater/industrial/TPDES_industrial_wastewater_steps.html

discharge canal returning to Galveston Bay. The pretreatment and SWRO membrane clean in-place (CIP) systems will generate spent, neutralized cleaning solution, which will be disposed of through the domestic wastewater system.

c. Provide a list of raw materials, major intermediates, and final products handled at the facility.

Materials List

Raw Materials	Intermediate Products	Final Products
The chemicals listed below will be used in the water treatment process.		
Ferric sulfate (CAS # 10028-22-5)		
Anionic polymer (CAS # N/A)		
Sodium hypochlorite (CAS # 7681-52-9)		
Liquid ammonium sulfate (CAS # 7783-20-2)		
CO_2 (CAS # 124-38-9)		
Sodium hydroxide (CAS # 1310-73-2)		
Citric acid (CAS # 77-92-9)		
Sodium bisulfite (CAS # 7631-90-5)		
SWRO antiscalant (CAS # N/A)		
Sulfuric acid (CAS # 7664-93-9)		
Lime (calcite) (CAS # 13397-26-7)		

Attachment: N/A

d. Attach a facility map (drawn to scale) with the following information:

- Production areas, maintenance areas, materials-handling areas, waste-disposal areas, and water intake structures.
- The location of each unit of the WWTP including the location of wastewater collection sumps, impoundments, outfalls, and sampling points, if significantly different from outfall locations.

Attachment: TR-01 Facility Map

e. Is this a new permit application for an existing facility?

☐ Yes ☒ No

If **yes**, provide background discussion: N/A

f. Is/will the treatment facility/disposal site be located above the 100-year frequency flood level.

☒ Yes ☐ No

List source(s) used to determine 100-year frequency flood plain: National Flood Insurance Program Flood Insurance Rate Map

If **no**, provide the elevation of the 100-year frequency flood plain and describe what protective measures are used/proposed to prevent flooding (including tail water and rainfall run-on controls) of the treatment facility and disposal area: N/A

Attachment: TR-02 FEMA Map

g. For **new** or **major amendment** permit applications, will any construction operations result in a discharge of fill material into a water in the state?

☐ Yes ☒ No ☐ N/A (renewal only)

h. If **yes** to Item 1.g, has the applicant applied for a USACE CWA Chapter 404 Dredge and Fill permit?

☐ Yes ☐ No

If **yes**, provide the permit number: N/A

If **no**, provide an approximate date of application submittal to the USACE: N/A

Item 2. Treatment System (Instructions, Page 40)

a. List any physical, chemical, or biological treatment process(es) used/proposed to treat wastewater at this facility. Include a description of each treatment process, starting with initial treatment and finishing with the outfall/point of disposal.

Refer to Attachment TR-03 Treatment System List

b. Attach a flow schematic **with a water balance** showing all sources of water and wastewater flow into the facility, wastewater flow into and from each treatment unit, and wastewater flow to each outfall/point of disposal.

Attachment: TR-04 Water Balance

Item 3. Impoundments (Instructions, Page 40)

Does the facility use or plan to use any wastewater impoundments (e.g., lagoons or ponds?)

☐ Yes ☒ No

If **no**, proceed to Item 4. If **yes**, complete **Item 3.a** for **existing** impoundments and **Items 3.a - 3.e** for **new or proposed** impoundments. **NOTE:** See instructions, Pages 40-42, for additional information on the attachments required by Items 3.a – 3.e.

a. Complete the table with the following information for each existing, new, or proposed impoundment. Attach additional copies of the Impoundment Information table, if needed.

Use Designation: Indicate the use designation for each impoundment as Treatment (**T**), Disposal (**D**), Containment (**C**), or Evaporation (**E**).

Associated Outfall Number: Provide an outfall number if a discharge occurs or will occur.

Liner Type: Indicate the liner type as Compacted clay liner (**C**), In-situ clay liner (**I**), Synthetic/plastic/rubber liner (**S**), or Alternate liner (**A**). **NOTE:** See instructions for further detail on liner specifications. If an alternate liner (A) is selected, include an attachment that provides a description of the alternate liner and any additional technical information necessary for an evaluation.

Leak Detection System: If any leak detection systems are in place/planned, enter **Y** for yes. Otherwise, enter **N** for no.

Groundwater Monitoring Wells and Data: If groundwater monitoring wells are in place/planned, enter **Y** for yes. Otherwise, enter **N** for no. Attach any existing groundwater monitoring data.

Dimensions: Provide the dimensions, freeboard, surface area, storage capacity of the impoundments, and the maximum depth (not including freeboard). For impoundments with irregular shapes, submit surface area instead of length and width.

Compliance with 40 CFR Part 257, Subpart D: If the impoundment is required to be in compliance with 40 CFR Part 257, Subpart D, enter **Y** for yes. Otherwise, enter **N** for no.

Date of Construction: Enter the date construction of the impoundment commenced (mm/dd/yy).

Impoundment Information

Parameter	**Pond #**	**Pond #**	**Pond #**	**Pond #**
Use Designation: (T) (D) (C) or (E)	N/A			
Associated Outfall Number				
Liner Type (C) (I) (S) or (A)				
Alt. Liner Attachment Reference				
Leak Detection System, Y/N				
Groundwater Monitoring Wells, Y/N				

Parameter	Pond #	Pond #	Pond #	Pond #
Groundwater Monitoring Data Attachment				
Pond Bottom Located Above The Seasonal High-Water Table, Y/N				
Length (ft)				
Width (ft)				
Max Depth From Water Surface (ft), Not Including Freeboard				
Freeboard (ft)				
Surface Area (acres)				
Storage Capacity (gallons)				
40 CFR Part 257, Subpart D, Y/N				
Date of Construction				

Attachment: N/A

The following information (**Items 3.b – 3.e**) is required only for **new or proposed** impoundments.

b. For new or proposed impoundments, attach any available information on the following items. If attached, check **yes** in the appropriate box. Otherwise, check **no** or **not yet designed**.

1. Liner data

   ☐ Yes ☐ No ☐ Not yet designed

2. Leak detection system or groundwater monitoring data

   ☐ Yes ☐ No ☐ Not yet designed

3. Groundwater impacts

   ☐ Yes ☐ No ☐ Not yet designed

   NOTE: Item b.3 is required if the bottom of the pond is not above the seasonal high-water table in the shallowest water-bearing zone.

Attachment: N/A

For TLAP applications: Items 3.c – 3.e are **not required**, continue to Item 4.

c. Attach a USGS map or a color copy of original quality and scale which accurately locates and identifies all known water supply wells and monitor wells within ½-mile of the impoundments.

Attachment: N/A

d. Attach copies of State Water Well Reports (e.g., driller's logs, completion data, etc.), and data on depths to groundwater for all known water supply wells including a description of how the depths to groundwater were obtained.

Attachment: N/A

e. Attach information pertaining to the groundwater, soils, geology, pond liner, etc. used to assess the potential for migration of wastes from the impoundments or the potential for contamination of groundwater or surface water.

Attachment: N/A

Item 4. Outfall/Disposal Method Information (Instructions, Page 42)

Complete the following tables to describe the location and wastewater discharge or disposal operations for each outfall for discharge, and for each point of disposal for TLAP operations.

If there are more outfalls/points of disposal at the facility than the spaces provided, copies of pages 6 and/0r numbered accordingly (i.e., page 6a, 6b, etc.) may be used to provide information on the additional outfalls.

For TLAP applications: Indicate the disposal method and each individual irrigation area **I**, evaporation pond **E**, or subsurface drainage system **S** by providing the appropriate letter designation for the disposal method followed by a numerical designation for each disposal area in the space provided for **Outfall** number (e.g. **E1** for evaporation pond 1, **I2** for irrigation area No. 2, etc.).

Outfall Longitude and Latitude

Outfall No.	Latitude (Decimal Degrees)	Longitude (Decimal Degrees)
001	29.48916	-94.98076

Outfall Location Description

Outfall No.	Location Description
001	At the outlet of the pipe at the southwest end of the man-made canal within the property boundaries

Description of Sampling Point(s) (if different from Outfall location)

Outfall No.	Description of sampling point
001	N/A

Outfall Flow Information – Permitted and Proposed

Outfall No.	Permitted Daily Avg Flow (MGD)	Permitted Daily Max Flow (MGD)	Proposed Daily Avg Flow (MGD)	Proposed Daily Max Flow (MGD)	Anticipated Discharge Date (mm/dd/yy)
001	N/A	N/A	59.93	N/A	01/01/2031

Outfall No.	Permitted Daily Avg Flow (MGD)	Permitted Daily Max Flow (MGD)	Proposed Daily Avg Flow (MGD)	Proposed Daily Max Flow (MGD)	Anticipated Discharge Date (mm/dd/yy)

Outfall Discharge – Method and Measurement

Outfall No.	Pumped Discharge? Y/N	Gravity Discharge? Y/N	Type of Flow Measurement Device Used
001	N	Y	Totalizing Flow Meter

Outfall Discharge – Flow Characteristics

Outfall No.	Intermittent Discharge? Y/N	Continuous Discharge? Y/N	Seasonal Discharge? Y/N	Discharge Duration (hrs/day)	Discharge Duration (days/mo)	Discharge Duration (mo/yr)
001	N	Y	N	24	31	12

Outfall Wastestream Contributions

Outfall No. 001

Contributing Wastestream	Volume (MGD)	Percent (%) of Total Flow
RO Concentrate	28.13	46.9
Raw water for blending	31.80	53.1

Outfall No. N/A

Contributing Wastestream	Volume (MGD)	Percent (%) of Total Flow

Contributing Wastestream	Volume (MGD)	Percent (%) of Total Flow

Outfall No. **N/A**

Contributing Wastestream	Volume (MGD)	Percent (%) of Total Flow

Attachment: N/A

Item 5. Blowdown and Once-Through Cooling Water Discharges (Instructions, Page 43)

a. Indicate if the facility currently or proposes to:

☐ Yes ☒ No Use cooling towers that discharge blowdown or other wastestreams

☐ Yes ☒ No Use boilers that discharge blowdown or other wastestreams

☐ Yes ☒ No Discharge once-through cooling water

NOTE: If the facility uses or plans to use cooling towers or once-through cooling water, Item 12 **is required**.

b. If **yes** to any of the above, attach an SDS with the following information for each chemical additive.

- Manufacturers Product Identification Number
- Product use (e.g., biocide, fungicide, corrosion inhibitor, etc.)
- Chemical composition including CASRN for each ingredient
- Classify product as non-persistent, persistent, or bioaccumulative
- Product or active ingredient half-life
- Frequency of product use (e.g., 2 hours/day once every two weeks)

- Product toxicity data specific to fish and aquatic invertebrate organisms
- Concentration of whole product or active ingredient, as appropriate, in wastestream.

In addition to each SDS, attach a summary of the above information for each specific wastestream and the associated chemical additives. Specify which outfalls are affected.

Attachment: N/A

c. Cooling Towers and Boilers

If the facility currently or proposes to use cooling towers or boilers that discharge blowdown or other wastestreams to the outfall(s), complete the following table.

Cooling Towers and Boilers

Type of Unit	Number of Units	Daily Avg Blowdown (gallons/day)	Daily Max Blowdown (gallons/day)
Cooling Towers	N/A		
Boilers	N/A		

Item 6. Stormwater Management (Instructions, Page 44)

Will any existing/proposed outfalls discharge stormwater associated with industrial activities, as defined at *40 CFR § 122.26(b)(14)*, commingled with any other wastestream?

☐ Yes ☒ No

If **yes**, briefly describe the industrial processes and activities that occur outdoors or in a manner which may result in exposure of the activities or materials to stormwater: N/A

Item 7. Domestic Sewage, Sewage Sludge, and Septage Management and Disposal (Instructions, Page 44)

Domestic Sewage - Waste and wastewater from humans or household operations that is discharged to a wastewater collection system or otherwise enters a treatment works.

a. Check the box next to the appropriate method of domestic sewage and domestic sewage sludge treatment or disposal. Complete Worksheet 5.0 or Item 7.b if directed to do so.

☒ Domestic sewage is routed (i.e., connected to or transported to) to a WWTP permitted to receive domestic sewage for treatment, disposal, or both. Complete Item 7.b.

☐ Domestic sewage disposed of by an on-site septic tank and drainfield system. Complete Item 7.b.

☐ Domestic and industrial treatment sludge ARE commingled prior to use or disposal.

☐ Industrial wastewater and domestic sewage are treated separately, and the respective sludge IS NOT commingled prior to sludge use or disposal. Complete Worksheet 5.0.

☐ Facility is a POTW. Complete Worksheet 5.0.

☐ Domestic sewage is not generated on-site.

☐ Other (e.g., portable toilets), specify and Complete Item 7.b: N/A

b. Provide the name and TCEQ, NPDES, or TPDES Permit No. of the waste-disposal facility which receives the domestic sewage/septage. If hauled by motorized vehicle, provide the name and TCEQ Registration No. of the hauler.

Domestic Sewage Plant/Hauler Name

Plant/Hauler Name	Permit/Registration No.
Bacliff MUD	WQ0010627001

Item 8. Improvements or Compliance/Enforcement Requirements (Instructions, Page 45)

a. Is the permittee currently required to meet any implementation schedule for compliance or enforcement?

☐ Yes ☒ No

b. Has the permittee completed or planned for any improvements or construction projects?

☐ Yes ☒ No

c. If **yes** to either 8.a **or** 8.b, provide a brief summary of the requirements and a status update: N/A

Item 9. Toxicity Testing (Instructions, Page 45)

Have any biological tests for acute or chronic toxicity been made on any of the discharges or on a receiving water in relation to the discharge within the last three years?

☐ Yes ☒ No

If **yes**, identify the tests and describe their purposes: N/A

Additionally, attach a copy of all tests performed which **have not** been submitted to the TCEQ or EPA. **Attachment:** N/A

Item 10. Off-Site/Third Party Wastes (Instructions, Page 45)

a. Does or will the facility receive wastes from off-site sources for treatment at the facility, disposal on-site via land application, or discharge via a permitted outfall?

☐ Yes ☒ No

If **yes**, provide responses to Items 10.b through 10.d below.

If **no**, proceed to Item 11.

b. Attach the following information to the application:

- List of wastes received (including volumes, characterization, and capability with on-site wastes).
- Identify the sources of wastes received (including the legal name and addresses of the generators).
- Description of the relationship of waste source(s) with the facility's activities.

Attachment: N/A

c. Is or will wastewater from another TCEQ, NPDES, or TPDES permitted facility commingled with this facility's wastewater after final treatment and prior to discharge via the final outfall/point of disposal?

☐ Yes ☒ No

If **yes**, provide the name, address, and TCEQ, NPDES, or TPDES permit number of the contributing facility and a copy of any agreements or contracts relating to this activity.

Attachment: N/A

d. Is this facility a POTW that accepts/will accept process wastewater from any SIU and has/is required to have an approved pretreatment program under the NPDES/TPDES program?

☐ Yes ☒ No

If **yes**, **Worksheet 6.0** of this application **is required**.

Item 11. Radioactive Materials (Instructions, Page 46)

a. Are/will radioactive materials be mined, used, stored, or processed at this facility?

☐ Yes ☒ No

If **yes**, use the following table to provide the results of one analysis of the effluent for all radioactive materials that may be present. Provide results in pCi/L.

Radioactive Materials Mined, Used, Stored, or Processed

Radioactive Material Name	Concentration (pCi/L)
N/A	

b. Does the applicant or anyone at the facility have any knowledge or reason to believe that radioactive materials may be present in the discharge, including naturally occurring radioactive materials in the source waters or on the facility property?

☐ Yes ☒ No

If **yes**, use the following table to provide the results of one analysis of the effluent for all radioactive materials that may be present. Provide results in pCi/L. Do not include information provided in response to Item 11.a.

Radioactive Materials Present in the Discharge

Radioactive Material Name	Concentration (pCi/L)
N/A	

Item 12. Cooling Water (Instructions, Page 46)

a. Does the facility use or propose to use water for cooling purposes?

☐ Yes

☒ No

☐ Decommissioned: N/A

☐ To Be Decommissioned: N/A

If **yes**, complete Items 12.b thru 12.f. If **no**, stop here.

If **decommissioned**, provide the date operation ceased and stop here.

If to **be decommissioned**, provide the date operation is anticipated to cease and stop here.

b. Cooling water is/will be obtained from a groundwater source (e.g., on-site well).

☐ Yes ☐ No

If **yes**, stop here. If **no**, continue.

c. Cooling Water Supplier

1. Provide the name of the owner(s) and operator(s) for the CWIS that supplies or will supply water for cooling purposes to the facility.

Cooling Water Intake Structure(s) Owner(s) and Operator(s)

CWIS ID	N/A			
Owner				
Operator				

2. Cooling water is/will be obtained from a Public Water Supplier (PWS)

☐ No ☐ Yes; PWS No.: N/A

If **no**, continue. If **yes**, provide the PWS Registration No. and stop here.

3. Cooling water is/will be obtained from a reclaimed water source?

☐ No ☐ Yes; Auth No.: N/A

If **no**, continue. If **yes**, provide the Reuse Authorization No. and stop here.

4. Cooling water is/will be obtained from an Independent Supplier

☐ No ☐ Yes; AIF: N/A

If **no**, proceed to Item 12.d. If **yes**, provide the actual intake flow of the Independent Supplier's CWIS that is/will be used to provide water for cooling purposes and proceed.

d. 316(b) General Criteria

1. The CWIS(s) used to provide water for cooling purposes to the facility has or will have a cumulative design intake flow of 2 MGD or greater.

☐ Yes ☐ No

2. At least 25% of the total water withdrawn by the CWIS(s) is/will be used at the facility exclusively for cooling purposes on an annual average basis.

   ☐ Yes ☐ No

3. The CWIS(s) withdraw(s)/propose(s) to withdraw water for cooling purposes from surface waters that meet the definition of Waters of the United States in *40 CFR § 122.2*.

   ☐ Yes ☐ No. Explanation: N/A

   If **no**, provide an explanation of how the waterbody does not meet the definition of Waters of the United States in *40 CFR § 122.2*.

If **yes** to all three questions in Item 12.d, the facility **meets** the minimum criteria to be subject to the full requirements of Section 316(b) of the CWA. Proceed to **Item 12.f**.

If **no** to any of the questions in Item 12.d, the facility **does not meet** the minimum criteria to be subject to the full requirements of Section 316(b) of the CWA; however, a determination is required based upon BPJ. Proceed to **Item 12.e**.

e. The facility does not meet the minimum requirements to be subject to the fill requirements of Section 316(b) **and uses**/proposes **to use cooling towers**.

   ☐ Yes ☐ No

   If **yes**, stop here. If **no**, complete Worksheet 11.0, Items 1.a, 1.b.1-3 and 6, 2.b.1, and 3.a to allow for a determination based upon BPJ.

f. Oil and Gas Exploration and Production

   1. The facility is subject to requirements at 40 CFR Part 435, Subparts A or D.

      ☐ Yes ☐ No

      If **yes**, continue. If **no**, skip to Item 12.g.

   2. The facility is an existing facility as defined at 40 CFR § 125.92(k) or a new unit at an existing facility as defined at 40 CFR § 125.92(u).

      ☐ Yes ☐ No

      If **yes**, complete Worksheet 11.0, Items 1.a, 1.b.1-3 and 6, 2.b.1, and 3.a to allow for a determination based upon BPJ. If **no**, skip to Item 12.g.3.

g. Compliance Phase and Track Selection

   1. Phase I – New facility subject to 40 CFR Part 125, Subpart I

      ☐ Yes ☐ No

      If **yes**, check the box next to the compliance track selection, attach the requested information, and complete Worksheet 11.0, Items 2 and 3, and Worksheet 11.2.

      ☐ Track I – AIF greater than 2 MGD, but less than 10 MGD

      - Attach information required by *40 CFR §§ 125.86(b)(2)-(4)*.

      ☐ Track I – AIF greater than 10 MGD

      - Attach information required by *40 CFR § 125.86(b)*.

☐ Track II

- Attach information required by *40 CFR § 125.86(c)*.

Attachment: N/A

2. Phase II – Existing facility subject to 40 CFR Part 125, Subpart J

   ☐ Yes ☐ No

   If **yes**, complete Worksheets 11.0 through 11.3, as applicable.

3. Phase III – New facility subject to 40 CFR Part 125, Subpart N

   ☐ Yes ☐ No

   If **yes**, check the box next to the compliance track selection and provide the requested information.

   ☐ Track I – Fixed facility

   - Attach information required by 40 CFR § 125.136(b) and complete Worksheet 11.0, Items 2 and 3, and Worksheet 11.2.

   ☐ Track I – Not a fixed facility

   - Attach information required by 40 CFR § 125.136(b) and complete Worksheet 11.0, Item 2 (except CWIS latitude/longitude under Item 2.a).

   ☐ Track II – Fixed facility

   - Attach information required by 40 CFR § 125.136(c) and complete Worksheet 11.0, Items 2 and 3.

   Attachment: N/A

Item 13. Permit Change Requests (Instructions, Page 48)

This item is only applicable to existing permitted facilities.

a. Is the facility requesting a **major amendment** of an existing permit?

   ☐ Yes ☒ No

   If **yes**, list each request individually and provide the following information: 1) detailed information regarding the scope of each request and 2) a justification for each request. Attach any supplemental information or additional data to support each request.

N/A

b. Is the facility requesting any **minor amendments** to the permit?

   ☐ Yes ☒ No

If **yes**, list and describe each change individually.

N/A

c. Is the facility requesting any **minor modifications** to the permit?

☐ Yes ☒ No

If **yes**, list and describe each change individually.

N/A

Item 14. Laboratory Accreditation (Instructions, Page 49)

All laboratory tests performed must meet the requirements of *30 TAC Chapter 25, Environmental Testing Laboratory Accreditation and Certification*, which includes the following general exemptions from National Environmental Laboratory Accreditation Program (NELAP) certification requirements:

- The laboratory is an in-house laboratory and is:
  - periodically inspected by the TCEQ; or
  - located in another state and is accredited or inspected by that state; or
  - performing work for another company with a unit located in the same site; or
  - performing pro bono work for a governmental agency or charitable organization.
- The laboratory is accredited under federal law.
- The data are needed for emergency-response activities, and a laboratory accredited under the Texas Laboratory Accreditation Program is not available.
- The laboratory supplies data for which the TCEQ does not offer accreditation.

The applicant should review *30 TAC Chapter 25* for specific requirements.

The following certification statement shall be signed and submitted with every application. See the *Signature Page* section in the Instructions, for a list of designated representatives who may sign the certification.

CERTIFICATION:

I certify that all laboratory tests submitted with this application meet the requirements of *30 TAC Chapter 25, Environmental Testing Laboratory Accreditation and Certification.*

Printed Name: Thomas Loquvam

Title: Director of General Counsel & Public Policy

Signature: _____

Date: 10/3/25

INDUSTRIAL WASTEWATER PERMIT APPLICATION WORKSHEET 1.0: EPA CATEGORICAL EFFLUENT GUIDELINES

This worksheet **is required** for all applications for TPDES permits for discharges of wastewaters subject to EPA categorical effluent limitation guidelines (ELGs).

Item 1. Categorical Industries (Instructions, Page 53)

Is this facility subject to any 40 CFR categorical ELGs outlined on page 53 of the instructions?

☐ Yes ☒ No

If **no**, this worksheet is not required. If **yes**, provide the appropriate information below.

40 CFR Effluent Guideline

Industry	40 CFR Part
N/A	

Item 2. Production/Process Data (Instructions, Page 54)

NOTE: For all TPDES permit applications requesting individual permit coverage for discharges of oil and gas exploration and production wastewater (discharges into or adjacent to water in the state, falling under the Oil and Gas Extraction Effluent Guidelines – 40 CFR Part 435), see Worksheet 12.0, Item 2 instead.

a. Production Data

Provide appropriate data for effluent guidelines with production-based effluent limitations.

Production Data

Subcategory	Actual Quantity/Day	Design Quantity/Day	Units
N/A			

b. Organic Chemicals, Plastics, and Synthetic Fibers Manufacturing Data (40 CFR Part 414)

Provide each applicable subpart and the percent of total production. Provide data for metal-bearing and cyanide-bearing wastestreams, as required by *40 CFR Part 414, Appendices A and B*.

Percentage of Total Production

Subcategory	Percent of Total Production	Appendix A and B - Metals	Appendix A - Cyanide
N/A			

c. Refineries (40 CFR Part 419)

Provide the applicable subcategory and a brief justification.

N/A

Item 3. Process/Non-Process Wastewater Flows (Instructions, Page 54)

Provide a breakdown of wastewater flow(s) generated by the facility, including both process and non-process wastewater flow(s). Specify which wastewater flows are to be authorized for discharge under this permit and the disposal practices for wastewater flows, excluding domestic, which are not to be authorized for discharge under this permit.

N/A

Item 4. New Source Determination (Instructions, Page 54)

Provide a list of all wastewater-generating processes subject to EPA categorical ELGs, identify the appropriate guideline Part and Subpart, and provide the date the process/construction commenced.

Wastewater Generating Processes Subject to Effluent Guidelines

Process	EPA Guideline Part	EPA Guideline Subpart	Date Process/ Construction Commenced
N/A			

INDUSTRIAL WASTEWATER PERMIT APPLICATION WORKSHEET 2.0: POLLUTANT ANALYSIS

Worksheet 2.0 **is required** for all applications submitted for a TPDES permit. Worksheet 2.0 is not required for applications for a permit to dispose of all wastewater by land disposal or for discharges solely of stormwater associated with industrial activities.

Item 1. General Testing Requirements (Instructions, Page 55)

a. Provide the date range of all sampling events conducted to obtain the analytical data submitted with this application (e.g., 05/01/2018-05/30/2018): Data based on a conceptual design and desktop analysis.

b. ☒ Check the box to confirm all samples were collected no more than 12 months prior to the date of application submittal.

c. Read the general testing requirements in the instructions for important information about sampling, test methods, and MALs. If a contact laboratory was used, attach a list which includes the name, contact information, and pollutants analyzed for each laboratory/firm. **Attachment:** N/A

Item 2. Specific Testing Requirements (Instructions, Page 56)

Attach correspondence from TCEQ approving submittal of less than the required number of samples, if applicable. **Attachment:** N/A

No sampling data available for constituents listed as N/A.

TABLE 1 and TABLE 2 (Instructions, Page 58)

Completion of Tables 1 and 2 is required for all external outfalls for all TPDES permit applications.

Table 1 for Outfall No.: 001 **Samples are (check one): ☐ Composite ☒ Grab**

Pollutant	Sample 1 (mg/L)	Sample 2 (mg/L)	Sample 3 (mg/L)	Sample 4 (mg/L)
BOD (5-day)	N/A			
CBOD (5-day)	N/A			
Chemical oxygen demand	N/A			
Total organic carbon	N/A			
Dissolved oxygen	N/A			
Ammonia nitrogen	0			
Total suspended solids	N/A			
Nitrate nitrogen	0.03			
Total organic nitrogen	N/A			
Total phosphorus	N/A			
Oil and grease	N/A			

Pollutant	Sample 1 (mg/L)	Sample 2 (mg/L)	Sample 3 (mg/L)	Sample 4 (mg/L)
Total residual chlorine	N/A			
Total dissolved solids	39,083			
Sulfate	2,944			
Chloride	21,325			
Fluoride	0.44			
Total alkalinity (mg/L as CaCO3)	175.0			
Temperature (°F)	N/A			
pH (standard units)	8.15			

Table 2 for Outfall No.: 001 **Samples are (check one): ☐ Composite ☒ Grab**

Pollutant	Sample 1 (µg/L)	Sample 2 (µg/L)	Sample 3 (µg/L)	Sample 4 (µg/L)	MAL (µg/L)
Aluminum, total	N/A				2.5
Antimony, total	N/A				5
Arsenic, total	N/A				0.5
Barium, total	0.07				3
Beryllium, total	N/A				0.5
Cadmium, total	N/A				1
Chromium, total	N/A				3
Chromium, hexavalent	N/A				3
Chromium, trivalent	N/A				N/A
Copper, total	N/A				2
Cyanide, available	N/A				2/10
Lead, total	N/A				0.5
Mercury, total	N/A				0.005/0.0005
Nickel, total	N/A				2
Selenium, total	N/A				5
Silver, total	N/A				0.5
Thallium, total	N/A				0.5
Zinc, total	N/A				5.0

TABLE 3 (Instructions, Page 58)

Completion of Table 3 **is required** for all **external outfalls** which discharge process wastewater.

Partial completion of Table 3 **is required** for all **external outfalls** which discharge non-process wastewater and stormwater associated with industrial activities commingled with other wastestreams (see instructions for additional guidance).

Table 3 for Outfall No.: 001 **Samples are (check one): ☐ Composite ☒ Grab**

Pollutant	Sample 1 (µg/L)*	Sample 2 (µg/L)*	Sample 3 (µg/L)*	Sample 4 (µg/L)*	MAL (µg/L)*
Acrylonitrile	N/A				50
Anthracene	N/A				10
Benzene	N/A				10
Benzidine	N/A				50
Benzo(a)anthracene	N/A				5
Benzo(a)pyrene	N/A				5
Bis(2-chloroethyl)ether	N/A				10
Bis(2-ethylhexyl)phthalate	N/A				10
Bromodichloromethane [Dichlorobromomethane]	N/A				10
Bromoform	N/A				10
Carbon tetrachloride	N/A				2
Chlorobenzene	N/A				10
Chlorodibromomethane [Dibromochloromethane]	N/A				10
Chloroform	N/A				10
Chrysene	N/A				5
m-Cresol [3-Methylphenol]	N/A				10
o-Cresol [2-Methylphenol]	N/A				10
p-Cresol [4-Methylphenol]	N/A				10
1,2-Dibromoethane	N/A				10
m-Dichlorobenzene [1,3-Dichlorobenzene]	N/A				10
o-Dichlorobenzene [1,2-Dichlorobenzene]	N/A				10
p-Dichlorobenzene [1,4-Dichlorobenzene]	N/A				10
3,3'-Dichlorobenzidine	N/A				5
1,2-Dichloroethane	N/A				10

Pollutant	Sample 1 (µg/L)*	Sample 2 (µg/L)*	Sample 3 (µg/L)*	Sample 4 (µg/L)*	MAL (µg/L)*
1,1-Dichloroethene [1,1-Dichloroethylene]	N/A				10
Dichloromethane [Methylene chloride]	N/A				20
1,2-Dichloropropane	N/A				10
1,3-Dichloropropene [1,3-Dichloropropylene]	N/A				10
2,4-Dimethylphenol	N/A				10
Di-n-Butyl phthalate	N/A				10
Epichlorohydrin (1-Chloro-2,3-epoxypropane)	N/A				---
Ethylbenzene	N/A				10
Ethylene Glycol	N/A				---
Fluoride	440				500
Hexachlorobenzene	N/A				5
Hexachlorobutadiene	N/A				10
Hexachlorocyclopentadiene	N/A				10
Hexachloroethane	N/A				20
4,4'-Isopropylidenediphenol (bisphenol A)	N/A				1
Methyl ethyl ketone	N/A				50
Methyl tert-butyl ether (MTBE)	N/A				---
Nitrobenzene	N/A				10
N-Nitrosodiethylamine	N/A				20
N-Nitroso-di-n-butylamine	N/A				20
Nonylphenol	N/A				333
Pentachlorobenzene	N/A				20
Pentachlorophenol	N/A				5
Phenanthrene	N/A				10
Polychlorinated biphenyls (PCBs) (**)	N/A				0.2
Pyridine	N/A				20
1,2,4,5-Tetrachlorobenzene	N/A				20
1,1,2,2-Tetrachloroethane	N/A				10
Tetrachloroethene [Tetrachloroethylene]	N/A				10

Pollutant	Sample 1 (µg/L)*	Sample 2 (µg/L)*	Sample 3 (µg/L)*	Sample 4 (µg/L)*	MAL (µg/L)*
Toluene	N/A				10
1,1,1-Trichloroethane	N/A				10
1,1,2-Trichloroethane	N/A				10
Trichloroethene [Trichloroethylene]	N/A				10
2,4,5-Trichlorophenol	N/A				50
TTHM (Total trihalomethanes)	N/A				10
Vinyl chloride	N/A				10

(*) Indicate units if different from µg/L.

(**) Total of detects for PCB-1242, PCB-1254, PCB-1221, PCB-1232, PCB-1248, PCB-1260, and PCB-1016. If all non-detects, enter the highest non-detect preceded by a "<".

TABLE 4 (Instructions, Pages 58-59)

Partial completion of Table 4 **is required** for each **external outfall** based on the conditions below.

a. **Tributyltin**

Is this facility an industrial/commercial facility which currently or proposes to directly dispose of wastewater from the types of operations listed below or a domestic facility which currently or proposes to receive wastewater from the types of industrial/commercial operations listed below?

☐ Yes ☒ No

If **yes**, check the box next to each of the following criteria which apply and provide the appropriate testing results in Table 4 below (check all that apply).

☐ Manufacturers and formulators of tributyltin or related compounds.

☐ Painting of ships, boats and marine structures.

☐ Ship and boat building and repairing.

☐ Ship and boat cleaning, salvage, wrecking and scaling.

☐ Operation and maintenance of marine cargo handling facilities and marinas.

☐ Facilities engaged in wood preserving.

☐ Any other industrial/commercial facility for which tributyltin is known to be present, or for which there is any reason to believe that tributyltin may be present in the effluent.

b. **Enterococci (discharge to saltwater)**

This facility discharges/proposes to discharge directly into saltwater receiving waters **and** Enterococci bacteria are expected to be present in the discharge based on facility processes.

☐ Yes ☒ No

Domestic wastewater is/will be discharged.

☐ Yes ☒ No

If **yes to either** question, provide the appropriate testing results in Table 4 below.

c. E. coli (discharge to freshwater)

This facility discharges/proposes to discharge directly into freshwater receiving waters **and** *E. coli* bacteria are expected to be present in the discharge based on facility processes.

☐ Yes ☒ No

Domestic wastewater is/will be discharged.

☐ Yes ☒ No

If **yes to either** question, provide the appropriate testing results in Table 4 below.

Table 4 for Outfall No.: N/A **Samples are (check one): ☐ Composite ☐ Grab**

Pollutant	Sample 1	Sample 2	Sample 3	Sample 4	MAL
Tributyltin (µg/L)	N/A				0.010
Enterococci (cfu or MPN/100 mL)	N/A				N/A
E. coli (cfu or MPN/100 mL)	N/A				N/A

TABLE 5 (Instructions, Page 59)

Completion of Table 5 **is required** for all **external outfalls** which discharge process wastewater from a facility which manufactures or formulates pesticides or herbicides or other wastewaters which may contain pesticides or herbicides.

If this facility does not/will not manufacture or formulate pesticides or herbicides and does not/will not discharge other wastewaters that may contain pesticides or herbicides, check N/A.

☒ N/A

Table 5 for Outfall No.: N/A **Samples are (check one): ☐ Composite ☐ Grab**

Pollutant	Sample 1 (µg/L)*	Sample 2 (µg/L)*	Sample 3 (µg/L)*	Sample 4 (µg/L)*	MAL (µg/L)*
Aldrin	N/A				0.01
Carbaryl	N/A				5
Chlordane	N/A				0.2
Chlorpyrifos	N/A				0.05
4,4'-DDD	N/A				0.1
4,4'-DDE	N/A				0.1
4,4'-DDT	N/A				0.02
2,4-D	N/A				0.7
Danitol [Fenpropathrin]	N/A				—
Demeton	N/A				0.20
Diazinon	N/A				0.5/0.1

Pollutant	Sample 1 (µg/L)*	Sample 2 (µg/L)*	Sample 3 (µg/L)*	Sample 4 (µg/L)*	MAL (µg/L)*
Dicofol [Kelthane]	N/A				1
Dieldrin	N/A				0.02
Diuron	N/A				0.090
Endosulfan I (*alpha*)	N/A				0.01
Endosulfan II (*beta*)	N/A				0.02
Endosulfan sulfate	N/A				0.1
Endrin	N/A				0.02
Guthion [Azinphos methyl]	N/A				0.1
Heptachlor	N/A				0.01
Heptachlor epoxide	N/A				0.01
Hexachlorocyclohexane (*alpha*)	N/A				0.05
Hexachlorocyclohexane (*beta*)	N/A				0.05
Hexachlorocyclohexane (*gamma*) [Lindane]	N/A				0.05
Hexachlorophene	N/A				10
Malathion	N/A				0.1
Methoxychlor	N/A				2.0
Mirex	N/A				0.02
Parathion (ethyl)	N/A				0.1
Toxaphene	N/A				0.3
2,4,5-TP [Silvex]	N/A				0.3

* Indicate units if different from µg/L.

TABLE 6 (Instructions, Page 59)

Completion of Table 6 **is required** for all **external outfalls**.

Table 6 for Outfall No.: 001 **Samples are (check one): ☐ Composite ☒ Grab**

Pollutants	Believed Present	Believed Absent	Sample 1 (mg/L)	Sample 2 (mg/L)	Sample 3 (mg/L)	Sample 4 (mg/L)	MAL (µg/L)*
Bromide	☐	☒					400
Color (PCU)	☐	☒					—
Nitrate-Nitrite (as N)	☒	☐	0.03				—
Sulfide (as S)	☐	☒					—
Sulfite (as SO3)	☐	☒					—
Surfactants	☐	☒					—
Boron, total	☐	☒					20
Cobalt, total	☐	☒					0.3
Iron, total	☐	☒					7
Magnesium, total	☒	☐	1,214				20
Manganese, total	☐	☒					0.5
Molybdenum, total	☐	☒					1
Tin, total	☐	☒					5
Titanium, total	☐	☒					30

TABLE 7 (Instructions, Page 60)

Check the box next to any of the industrial categories applicable to this facility. If no categories are applicable, check N/A. If GC/MS testing is required, check the box provided to confirm the testing results for the appropriate parameters are provided with the application.

☒ N/A

Table 7 for Applicable Industrial Categories

Industrial Category	40 CFR Part	Volatiles Table 8	Acids Table 9	Bases/ Neutrals Table 10	Pesticides Table 11
☐ Adhesives and Sealants		☐ Yes	☐ Yes	☐ Yes	No
☐ Aluminum Forming	467	☐ Yes	☐ Yes	☐ Yes	No
☐ Auto and Other Laundries		☐ Yes	☐ Yes	☐ Yes	☐ Yes
☐ Battery Manufacturing	461	☐ Yes	No	☐ Yes	No
☐ Coal Mining	434	No	No	No	No
☐ Coil Coating	465	☐ Yes	☐ Yes	☐ Yes	No
☐ Copper Forming	468	☐ Yes	☐ Yes	☐ Yes	No
☐ Electric and Electronic Components	469	☐ Yes	☐ Yes	☐ Yes	☐ Yes
☐ Electroplating	413	☐ Yes	☐ Yes	☐ Yes	No
☐ Explosives Manufacturing	457	No	☐ Yes	☐ Yes	No
☐ Foundries		☐ Yes	☐ Yes	☐ Yes	No
☐ Gum and Wood Chemicals - Subparts A,B,C,E	454	☐ Yes	☐ Yes	No	No
☐ Gum and Wood Chemicals - Subparts D,F	454	☐ Yes	☐ Yes	☐ Yes	No
☐ Inorganic Chemicals Manufacturing	415	☐ Yes	☐ Yes	☐ Yes	No
☐ Iron and Steel Manufacturing	420	☐ Yes	☐ Yes	☐ Yes	No
☐ Leather Tanning and Finishing	425	☐ Yes	☐ Yes	☐ Yes	No
☐ Mechanical Products Manufacturing		☐ Yes	☐ Yes	☐ Yes	No
☐ Nonferrous Metals Manufacturing	421,471	☐ Yes	☐ Yes	☐ Yes	☐ Yes
☐ Oil and Gas Extraction - Subparts A, D, E, F, G, H	435	☐ Yes	☐ Yes	☐ Yes	No
☐ Ore Mining - Subpart B	440	No	☐ Yes	No	No
☐ Organic Chemicals Manufacturing	414	☐ Yes	☐ Yes	☐ Yes	☐ Yes
☐ Paint and Ink Formulation	446,447	☐ Yes	☐ Yes	☐ Yes	No
☐ Pesticides	455	☐ Yes	☐ Yes	☐ Yes	☐ Yes
☐ Petroleum Refining	419	☐ Yes	No	No	No
☐ Pharmaceutical Preparations	439	☐ Yes	☐ Yes	☐ Yes	No
☐ Photographic Equipment and Supplies	459	☐ Yes	☐ Yes	☐ Yes	No
☐ Plastic and Synthetic Materials Manufacturing	414	☐ Yes	☐ Yes	☐ Yes	☐ Yes
☐ Plastic Processing	463	☐ Yes	No	No	No
☐ Porcelain Enameling	466	No	No	No	No
☐ Printing and Publishing		☐ Yes	☐ Yes	☐ Yes	☐ Yes
☐ Pulp and Paperboard Mills - Subpart C	430	☐ *	☐ Yes	☐ *	☐ Yes
☐ Pulp and Paperboard Mills - Subparts F, K	430	☐ *	☐ Yes	☐ *	☐ *
☐ Pulp and Paperboard Mills - Subparts A, B, D, G, H	430	☐ Yes	☐ Yes	☐ *	☐ *
☐ Pulp and Paperboard Mills - Subparts I, J, L	430	☐ Yes	☐ Yes	☐ *	☐ Yes
☐ Pulp and Paperboard Mills - Subpart E	430	☐ Yes	☐ Yes	☐ Yes	☐ *
☐ Rubber Processing	428	☐ Yes	☐ Yes	☐ Yes	No
☐ Soap and Detergent Manufacturing	417	☐ Yes	☐ Yes	☐ Yes	No
☐ Steam Electric Power Plants	423	☐ Yes	☐ Yes	No	No
☐ Textile Mills (Not Subpart C)	410	☐ Yes	☐ Yes	☐ Yes	No
☐ Timber Products Processing	429	☐ Yes	☐ Yes	☐ Yes	☐ Yes

* Test if believed present.

TABLES 8, 9, 10, and 11 (Instructions, Page 60)

Completion of Tables 8, 9, 10, and 11 **is required** as specified in Table 7 for all **external outfalls** that contain process wastewater.

Completion of Tables 8, 9, 10, and 11 **may be required** for types of industry not specified in Table 7 for specific parameters that are believed to be present in the wastewater.

Table 8 for Outfall No.: 001 **Samples are (check one): ☐ Composite ☐ Grab**

Pollutant	Sample 1 (µg/L)*	Sample 2 (µg/L)*	Sample 3 (µg/L)*	Sample 4 (µg/L)*	MAL (µg/L)
Acrolein	N/A				50
Acrylonitrile	N/A				50
Benzene	N/A				10
Bromoform	N/A				10
Carbon tetrachloride	N/A				2
Chlorobenzene	N/A				10
Chlorodibromomethane	N/A				10
Chloroethane	N/A				50
2-Chloroethylvinyl ether	N/A				10
Chloroform	N/A				10
Dichlorobromomethane [Bromodichloromethane]	N/A				10
1,1-Dichloroethane	N/A				10
1,2-Dichloroethane	N/A				10
1,1-Dichloroethylene [1,1-Dichloroethene]	N/A				10
1,2-Dichloropropane	N/A				10
1,3-Dichloropropylene [1,3-Dichloropropene]	N/A				10
Ethylbenzene	N/A				10
Methyl bromide [Bromomethane]	N/A				50
Methyl chloride [Chloromethane]	N/A				50
Methylene chloride [Dichloromethane]	N/A				20
1,1,2,2-Tetrachloroethane	N/A				10
Tetrachloroethylene [Tetrachloroethene]	N/A				10
Toluene	N/A				10
1,2-Trans-dichloroethylene [1,2-Trans-dichloroethene]	N/A				10

Pollutant	Sample 1 (µg/L)*	Sample 2 (µg/L)*	Sample 3 (µg/L)*	Sample 4 (µg/L)*	MAL (µg/L)
1,1,1-Trichloroethane	N/A				10
1,1,2-Trichloroethane	N/A				10
Trichloroethylene [Trichloroethene]	N/A				10
Vinyl chloride	N/A				10

* Indicate units if different from µg/L.

Table 9 for Outfall No.: 001 **Samples are (check one): ☐ Composite ☐ Grab**

Pollutant	Sample 1 (µg/L)*	Sample 2 (µg/L)*	Sample 3 (µg/L)*	Sample 4 (µg/L)*	MAL (µg/L)
2-Chlorophenol	N/A				10
2,4-Dichlorophenol	N/A				10
2,4-Dimethylphenol	N/A				10
4,6-Dinitro-o-cresol	N/A				50
2,4-Dinitrophenol	N/A				50
2-Nitrophenol	N/A				20
4-Nitrophenol	N/A				50
p-Chloro-m-cresol	N/A				10
Pentachlorophenol	N/A				5
Phenol	N/A				10
2,4,6-Trichlorophenol	N/A				10

* Indicate units if different from µg/L.

Table 10 for Outfall No.: 001 **Samples are (check one): ☐ Composite ☐ Grab**

Pollutant	Sample 1 (µg/L)*	Sample 2 (µg/L)*	Sample 3 (µg/L)*	Sample 4 (µg/L)*	MAL (µg/L)
Acenaphthene	N/A				10
Acenaphthylene	N/A				10
Anthracene	N/A				10
Benzidine	N/A				50
Benzo(a)anthracene	N/A				5
Benzo(a)pyrene	N/A				5
3,4-Benzofluoranthene [Benzo(b)fluoranthene]	N/A				10
Benzo(ghi)perylene	N/A				20
Benzo(k)fluoranthene	N/A				5
Bis(2-chloroethoxy)methane	N/A				10

Pollutant	Sample 1 (µg/L)*	Sample 2 (µg/L)*	Sample 3 (µg/L)*	Sample 4 (µg/L)*	MAL (µg/L)
Bis(2-chloroethyl)ether	N/A				10
Bis(2-chloroisopropyl)ether	N/A				10
Bis(2-ethylhexyl)phthalate	N/A				10
4-Bromophenyl phenyl ether	N/A				10
Butylbenzyl phthalate	N/A				10
2-Chloronaphthalene	N/A				10
4-Chlorophenyl phenyl ether	N/A				10
Chrysene	N/A				5
Dibenzo(a,h)anthracene	N/A				5
1,2-Dichlorobenzene [o-Dichlorobenzene]	N/A				10
1,3-Dichlorobenzene [m-Dichlorobenzene]	N/A				10
1,4-Dichlorobenzene [p-Dichlorobenzene]	N/A				10
3,3'-Dichlorobenzidine	N/A				5
Diethyl phthalate	N/A				10
Dimethyl phthalate	N/A				10
Di-n-butyl phthalate	N/A				10
2,4-Dinitrotoluene	N/A				10
2,6-Dinitrotoluene	N/A				10
Di-n-octyl phthalate	N/A				10
1,2-Diphenylhydrazine (as Azobenzene)	N/A				20
Fluoranthene	N/A				10
Fluorene	N/A				10
Hexachlorobenzene	N/A				5
Hexachlorobutadiene	N/A				10
Hexachlorocyclopentadiene	N/A				10
Hexachloroethane	N/A				20
Indeno(1,2,3-cd)pyrene	N/A				5
Isophorone	N/A				10
Naphthalene	N/A				10
Nitrobenzene	N/A				10
N-Nitrosodimethylamine	N/A				50

Pollutant	Sample 1 (µg/L)*	Sample 2 (µg/L)*	Sample 3 (µg/L)*	Sample 4 (µg/L)*	MAL (µg/L)
N-Nitrosodi-n-propylamine	N/A				20
N-Nitrosodiphenylamine	N/A				20
Phenanthrene	N/A				10
Pyrene	N/A				10
1,2,4-Trichlorobenzene	N/A				10

* Indicate units if different from µg/L.

Table 11 for Outfall No.: 001 **Samples are (check one): ☐ Composite ☐ Grab**

Pollutant	Sample 1 (µg/L)*	Sample 2 (µg/L)*	Sample 3 (µg/L)*	Sample 4 (µg/L)*	MAL (µg/L)
Aldrin	N/A				0.01
alpha-BHC [alpha-Hexachlorocyclohexane]	N/A				0.05
beta-BHC [beta-Hexachlorocyclohexane]	N/A				0.05
gamma-BHC [gamma-Hexachlorocyclohexane]	N/A				0.05
delta-BHC [delta-Hexachlorocyclohexane]	N/A				0.05
Chlordane	N/A				0.2
4,4'-DDT	N/A				0.02
4,4'-DDE	N/A				0.1
4,4'-DDD	N/A				0.1
Dieldrin	N/A				0.02
Endosulfan I (alpha)	N/A				0.01
Endosulfan II (beta)	N/A				0.02
Endosulfan sulfate	N/A				0.1
Endrin	N/A				0.02
Endrin aldehyde	N/A				0.1
Heptachlor	N/A				0.01
Heptachlor epoxide	N/A				0.01
PCB 1242	N/A				0.2
PCB 1254	N/A				0.2
PCB 1221	N/A				0.2
PCB 1232	N/A				0.2
PCB 1248	N/A				0.2

Pollutant	Sample 1 (µg/L)*	Sample 2 (µg/L)*	Sample 3 (µg/L)*	Sample 4 (µg/L)*	MAL (µg/L)
PCB 1260	N/A				0.2
PCB 1016	N/A				0.2
Toxaphene	N/A				0.3

* Indicate units if different from µg/L.

Attachment: N/A

TABLE 12 (DIOXINS/FURAN COMPOUNDS)

Complete of Table 12 **is required** for **external outfalls**, as directed below. (Instructions, Pages 59-60)

Indicate which compound(s) are manufactured or used at the facility and provide a brief description of the conditions of its/their presence at the facility (check all that apply).

☐ 2,4,5-trichlorophenoxy acetic acid (2,4,5-T) CASRN 93-76-5

☐ 2-(2,4,5-trichlorophenoxy) propanoic acid (Silvex, 2,4,5-TP) CASRN 93-72-1

☐ 2-(2,4,5-trichlorophenoxy) ethyl 2,2-dichloropropionate (Erbon) CASRN 136-25-4

☐ 0,0-dimethyl 0-(2,4,5-trichlorophenyl) phosphorothioate (Ronnel) CASRN 299-84-3

☐ 2,4,5-trichlorophenol (TCP) CASRN 95-95-4

☐ hexachlorophene (HCP) CASRN 70-30-4

☒ None of the above

Description: N/A

Does the applicant or anyone at the facility know or have any reason to believe that 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD) or any congeners of TCDD may be present in the effluent proposed for discharge?

☐ Yes ☒ No

Description: N/A

If **yes** to either Items a **or** b, complete Table 12 as instructed.

Table 12 for Outfall No.: N/A **Samples are (check one): ☐ Composite ☐ Grab**

Compound	Toxicity Equivalent Factors	Wastewater Concentration (ppq)	Wastewater Toxicity Equivalents (ppq)	Sludge Concentration (ppt)	Sludge Toxicity Equivalents (ppt)	MAL (ppq)
2,3,7,8-TCDD	1	N/A				10
1,2,3,7,8-PeCDD	1.0	N/A				50
2,3,7,8-HxCDDs	0.1	N/A				50
1,2,3,4,6,7,8-HpCDD	0.01	N/A				50

Compound	Toxicity Equivalent Factors	Wastewater Concentration (ppq)	Wastewater Toxicity Equivalents (ppq)	Sludge Concentration (ppt)	Sludge Toxicity Equivalents (ppt)	MAL (ppq)
2,3,7,8-TCDF	0.1	N/A				10
1,2,3,7,8-PeCDF	0.03	N/A				50
2,3,4,7,8-PeCDF	0.3	N/A				50
2,3,7,8-HxCDFs	0.1	N/A				50
2,3,4,7,8-HpCDFs	0.01	N/A				50
OCDD	0.0003	N/A				100
OCDF	0.0003	N/A				100
PCB 77	0.0001	N/A				500
PCB 81	0.0003	N/A				500
PCB 126	0.1	N/A				500
PCB 169	0.03	N/A				500
Total		N/A				

TABLE 13 (HAZARDOUS SUBSTANCES)

Complete Table 13 **is required** for all **external outfalls** as directed below. (Instructions, Pages 60-61)

Are there any pollutants listed in the instructions (pages 55-62) believed present in the discharge?

☐ Yes ☒ No

Are there pollutants listed in Item 1.c. of Technical Report 1.0 which are believed present in the discharge and have not been analytically quantified elsewhere in this application?

☒ Yes ☐ No

If **yes** to either Items a **or** b, complete Table 13 as instructed.

Table 13 for Outfall No.: 001 **Samples are (check one): ☐ Composite ☐ Grab**

Pollutant	CASRN	Sample 1 (µg/L)	Sample 2 (µg/L)	Sample 3 (µg/L)	Sample 4 (µg/L)	Analytical Method
Ferric sulfate	10028-22-5					
Anionic polymer	N/A					
Sodium hypochlorite	7681-52-9					

Pollutant	CASRN	Sample 1 (µg/L)	Sample 2 (µg/L)	Sample 3 (µg/L)	Sample 4 (µg/L)	Analytical Method
Liquid ammonium sulfate	7783-20-2					
Carbon dioxide	124-38-9					
Sodium hydroxide	1310-73-2					
Citric acid	77-92-9					
Sodium bisulfite	7631-90-5					
Seawater RO antiscalant	N/A					
Sulfuric acid	7664-93-9					
Lime (calcite)	13397-26-7					

INDUSTRIAL WASTEWATER PERMIT APPLICATION WORKSHEET 4.0: RECEIVING WATERS

This worksheet **is required** for all TPDES permit applications.

Item 1. Domestic Drinking Water Supply (Instructions, Page 80)

a. There is a surface water intake for domestic drinking water supply located within 5 (five) miles downstream from the point/proposed point of discharge.

☐ Yes ☒ No

If **no**, stop here and proceed to Item 2. If **yes**, provide the following information:

1. The legal name of the owner of the drinking water supply intake: N/A
2. The distance and direction from the outfall to the drinking water supply intake: N/A

b. Locate and identify the intake on the USGS 7.5-minute topographic map provided for Administrative Report 1.0.

☐ Check this box to confirm the above requested information is provided.

Item 2. Discharge Into Tidally Influenced Waters (Instructions, Page 80)

If the discharge is to tidally influenced waters, complete this section. Otherwise, proceed to Item 3.

a. Width of the receiving water at the outfall: 162 feet

b. Are there oyster reefs in the vicinity of the discharge?

☐ Yes ☒ No

If **yes**, provide the distance and direction from the outfall(s) to the oyster reefs: N/A

c. Are there sea grasses within the vicinity of the point of discharge?

☐ Yes ☒ No

If **yes**, provide the distance and direction from the outfall(s) to the grasses: N/A

Item 3. Classified Segment (Instructions, Page 80)

The discharge is/will be directly into (or within 300 feet of) a classified segment.

☐ Yes ☒ No

If **yes**, stop here and do not complete Items 4 and 5 of this worksheet or Worksheet 4.1.

If **no**, complete Items 4 and 5 and Worksheet 4.1 may be required.

Item 4. Description of Immediate Receiving Waters (Instructions, Page 80)

a. Name of the immediate receiving waters: N/A

b. Check the appropriate description of the immediate receiving waters:

☐ Lake or Pond

- Surface area (acres): N/A
- Average depth of the entire water body (feet): N/A
- Average depth of water body within a 500-foot radius of the discharge point (feet): N/A

☒ Man-Made Channel or Ditch

☐ Stream or Creek

☐ Freshwater Swamp or Marsh

☐ Tidal Stream, Bayou, or Marsh

☐ Open Bay

☐ Other, specify:

If **Man-Made Channel or Ditch** or **Stream or Creek** were selected above, provide responses to Items 4.c – 4.g below:

c. For **existing discharges**, check the description below that best characterizes the area **upstream** of the discharge.

For **new discharges**, check the description below that best characterizes the area **downstream** of the discharge.

☐ Intermittent (dry for at least one week during most years)

☐ Intermittent with Perennial Pools (enduring pools containing habitat to maintain aquatic life uses)

☒ Perennial (normally flowing) Flow due to tidal inflow.

Check the source(s) of the information used to characterize the area upstream (existing discharge) or downstream (new discharge):

☒ USGS flow records

☐ personal observation

☐ historical observation by adjacent landowner(s)

☐ other, specify: N/A

d. List the names of all perennial streams that join the receiving water within three miles downstream of the discharge point: Bacliff MUD outfall

e. The receiving water characteristics change within three miles downstream of the discharge (e.g., natural or man-made dams, ponds, reservoirs, etc.).

☒ Yes ☐ No

If **yes**, describe how: Weir two miles downstream of outfall. There is also a dam/levee on the southwest side of the man-made island that goes to the west bank, which impedes flow and forces most of the water east under the man-made island bridge where it eventually exits through a culvert on the north side of the island.

f. General observations of the water body during normal dry weather conditions: Water flowing at a slow, steady pace solely due to tidal inflow. Dense vegetation at the banks, along the length of the man-made canal. Deep canal with turbid water.

Date and time of observation: 06/19/2025 12:55

g. The water body was influenced by stormwater runoff during observations.

☐ Yes ☒ No

If **yes**, describe how: N/A

Item 5. General Characteristics of Water Body (Instructions, Page 81)

a. Is the receiving water upstream of the existing discharge or proposed discharge site influenced by any of the following (check all that apply):

☐ oil field activities
☒ urban runoff
☐ agricultural runoff
☐ septic tanks
☐ upstream discharges
☐ other, specify: N/A

b. Uses of water body observed or evidence of such uses (check all that apply):

☐ livestock watering
☐ industrial water supply
☐ non-contact recreation
☐ irrigation withdrawal
☐ domestic water supply
☐ navigation
☐ contact recreation
☐ picnic/park activities
☒ fishing
☐ other, specify: N/A

c. Description which best describes the aesthetics of the receiving water and the surrounding area (check only one):

☐ **Wilderness:** outstanding natural beauty; usually wooded or un-pastured area: water clarity exceptional

☒ **Natural Area:** trees or native vegetation common; some development evident (from fields, pastures, dwellings); water clarity discolored

☐ **Common Setting:** not offensive, developed but uncluttered; water may be colored or turbid

☐ **Offensive:** stream does not enhance aesthetics; cluttered; highly developed; dumping areas; water discolored

INDUSTRIAL WASTEWATER PERMIT APPLICATION WORKSHEET 4.1: WATERBODY PHYSICAL CHARACTERISTICS

The following information **is required** for new applications, EPA-designated Major facilities, and major amendment applications requesting to add an outfall if the receiving waters are perennial or intermittent with perennial pools (including impoundments) for a TDPES permit.

Complete the transects downstream of the existing or proposed discharges.

Item 1. Data Collection (Instructions, Page 82)

a. Date of study: 08/21/2025 Time of study: 4:00 PM

Waterbody name: N/A

General location: Discharge point to 0.5 miles downstream of discharge point.

b. Type of stream upstream of an existing discharge or downstream of a proposed discharge (check only one):

☒ perennial ☐ intermittent with perennial pools ☐ impoundment Flow due to tidal inflow.

c. No. of defined stream bends:

Well: 1 Moderately: 2 Poorly: 0

d. No. of riffles: 0

e. Evidence of flow fluctuations (check one):

☒ Minor ☐ Moderate ☐ Severe

f. Provide the observed stream uses and where there is evidence of channel obstructions/modifications: Defunct cooling towers on man-made island in the canal

g. Complete the following table with information regarding the transect measurements.

Stream Transect Data

Transect Location	Habitat Type*	Water Surface Width (ft)	Stream Depths (ft)**								
Outfall	Glide	154.5	1.00	4.25	4.25	2.50					
293.3 ft downstream of outfall	Glide	157.5	2.50	4.50	4.50	2.50					
586.7 ft downstream of outfall	Glide	169	1.25	4.75	5.00	1.75					
880.0 ft downstream of outfall	Glide	175	4.00	5.25	5.25	2.00					
1,173.3 ft	Glide	189.5	2.50	4.75	5.00	2.75					

Transect Location	Habitat Type*	Water Surface Width (ft)	Stream Depths (ft)**								
downstream of outfall											
1,466.7 ft downstream of outfall	Glide	178	2.50	4.25	4.75	2.50					
1,760.0 ft downstream of outfall	Glide	176.5	2.25	3.25	4.50	2.00					
2,053.3 ft downstream of outfall	Pool	397.7	0.75	1.25	3.50	2.00					
2,346.7 ft downstream of outfall	Pool	565.25	1.00	2.50	3.75	1.75					
2,640.0 ft downstream of outfall	Pool	705.7	1.00	2.00	4.00	1.50					

* riffle, run, glide, or pool
** channel bed to water surface

Item 2. Summarize Measurements (Instructions, Page 83)

Provide the following information regarding the transect measurements:

Streambed slope of entire reach (from USGS map in ft. /ft.): -0.0001

Approximate drainage area above the most downstream transect from USGS map or county highway map (square miles): 0.077

Length of stream evaluated (ft): 2,640

Number of lateral transects made: 10

Average stream width (ft): 286.87

Average stream depth (ft): 3.03

Average stream velocity (ft/sec): 0.21

Instantaneous stream flow (ft^3/sec): 93.28

Indicate flow measurement method (VERY IMPORTANT – type of meter, floating chip timed over a fixed distance, etc.): N/A

Flow fluctuations (i.e., minor, moderate, or severe): Minor

Size of pools (i.e., large, small, moderate, or none): Moderate

Maximum pool depth (ft): 4.00

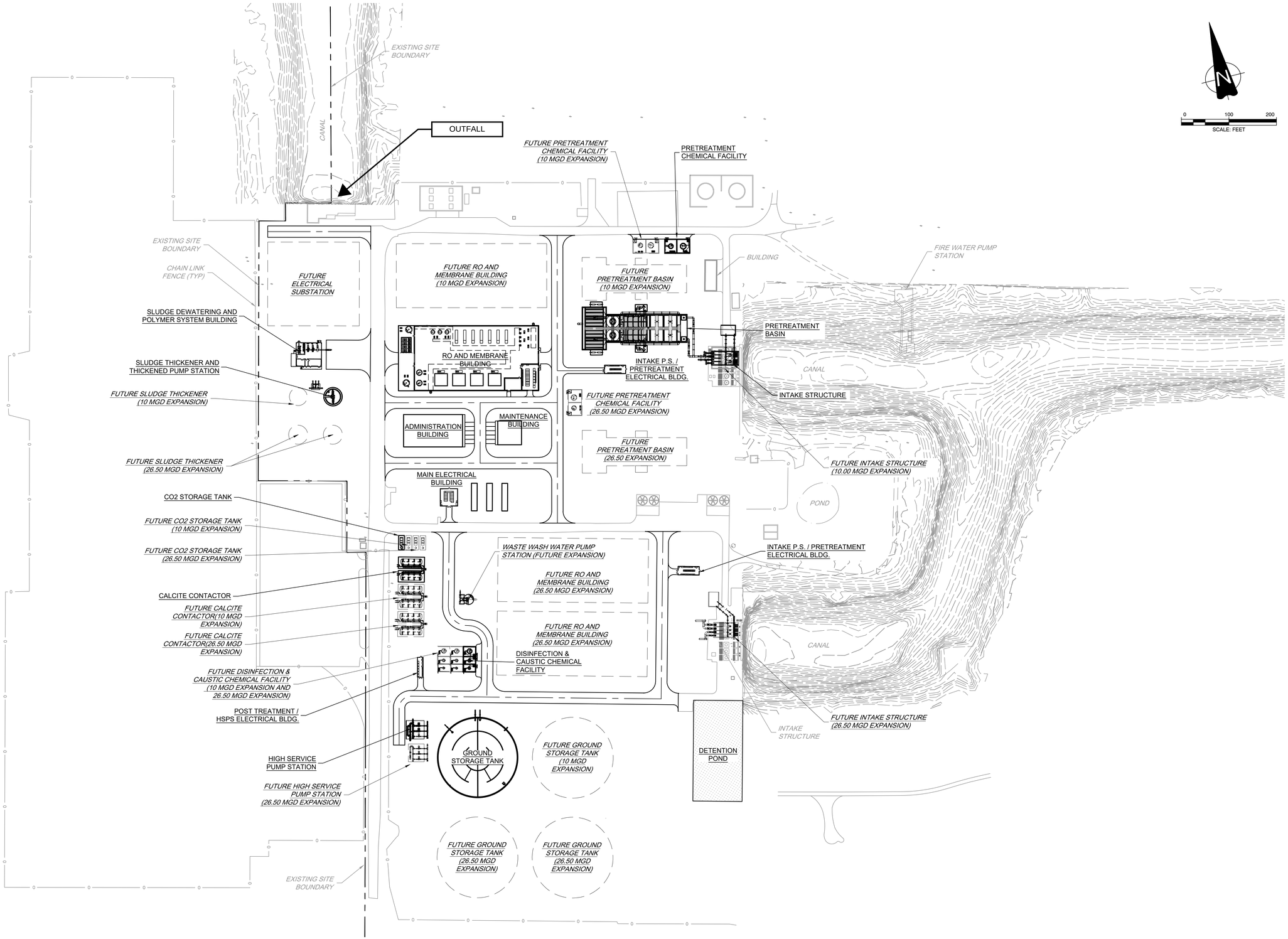
Total number of stream bends: 3

Number well defined: 1

Number moderately defined: 2

Number poorly defined: 0

Total number of riffles: 0



PLAN

SCALE: 1"=100'

ARDURRA
3115 Allen Parkway, Suite 300
Houston, TX 77019
TBPE Firm Registration No.: F-10053

Client

Revision	By	Appd	YYYY.MM.DD
Issued	By	Appd	YYYY.MM.DD

Permit/Seal

PRELIMINARY NOT FOR CONSTRUCTION

Not for permits, pricing or other official purposes. This document has not been completed or checked and is for general information or comment only.

Client/Project

Project No.: BACL

File Name: BACL-000-CL-001-004.dwg

Scale: 1" = 100'

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Dwn.	Dsgn.	Chkd.	

Title

000
PROPOSED OVERALL SITE PLAN

Revision: Sheet: of

Drawing No.

000-CL-002

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ORIGINAL SHEET - ANSI D

Tab 17

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988. Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 'Flood Protection Measures' of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was STATE PLANE TEXAS SOUTH CENTRAL FIPS 4204. The **horizontal datum** was the North American Datum of 1983 (NAD 83), GRS1980 Spheroid. Differences in datum, spheroid, projection or State Plane zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at https://www.ngs.noaa.gov/ or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland, 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713-3242**, or visit its website at https://www.ngs.noaa.gov/.

Base Map information shown on this FIRM was derived from Galveston Central Appraisal District, NOAA, National Geodetic Survey, Texas Natural Resources Information System, U.S. Fish and Wildlife Service and the U.S. Geological Survey and were provided in digital format using source material at a scale of 1:20,000 or better.

Based on updated topographic information, this map reflects more detailed and up-to-date **stream channel configurations and floodplain delineations** than those shown on the previous FIRM for this jurisdiction. As a result, the Flood Profiles and Floodway Data tables may reflect stream channel distances that differ from what is shown on the map. Also, the road to floodplain relationships for unrevised streams may differ from what is shown on previous maps.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

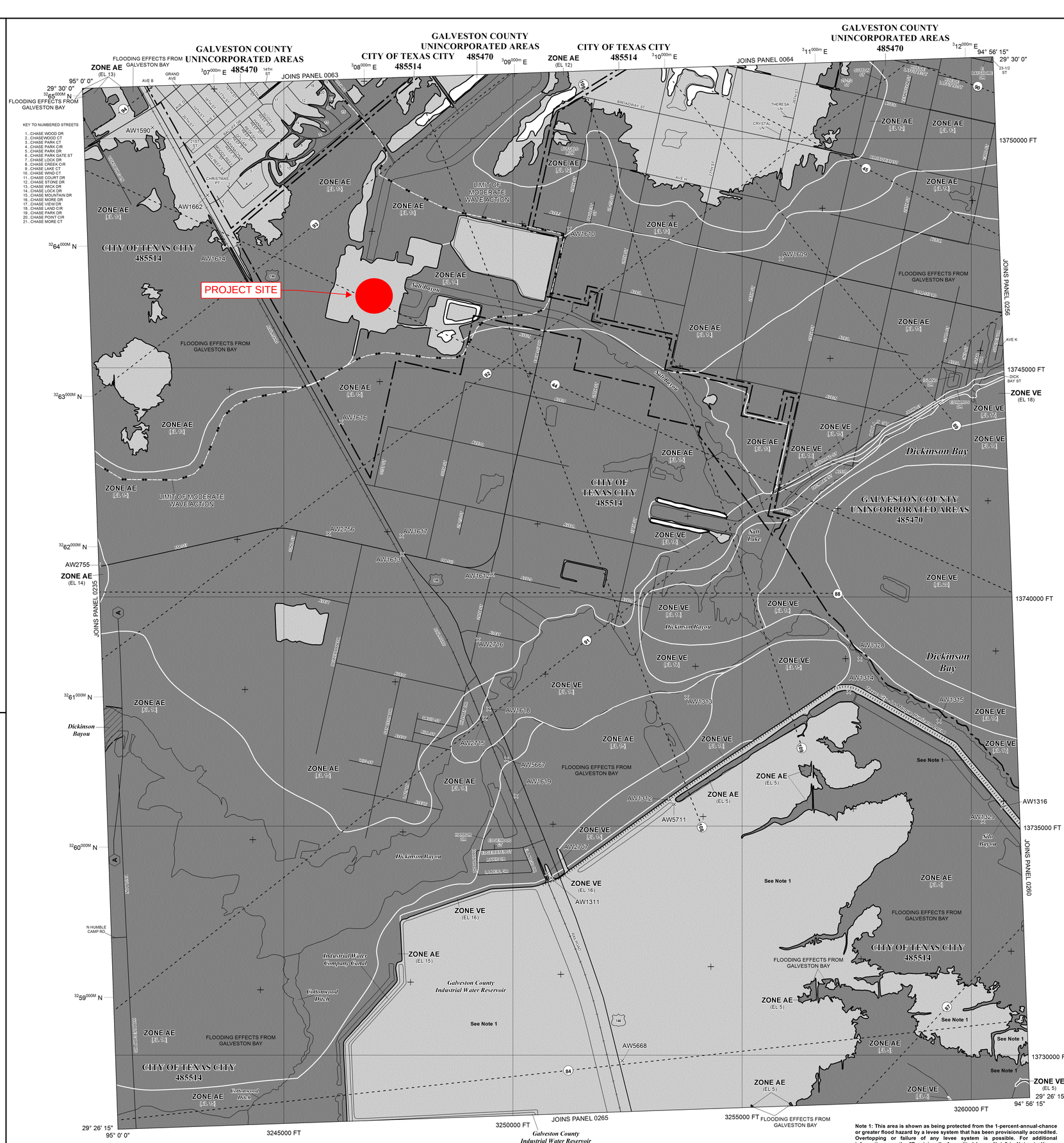
Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

Contact the **FEMA Map Information eXchange** at 1-877-336-2627 for information on available products associated with this FIRM. Available products may include previously issed Letter of Map Change, a Flood Insurance Study report, and/or digital versions of this map. The FEMA Map Information eXchange may also be reached by Fax at 1-800-358-9620 and their website at https://www.msc.fema.gov/.

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1-877-FEMA MAP** (1-877-336-2627) or visit the FEMA website at https://www.fema.gov/national-flood-insurance-program.

The AE Zone category has been divided by a Limit of Moderate Wave Action (LiMWA). The LiMWA represents the approximate landward limit of the 1.5-foot breaking wave. The effects of wave hazards between the VE Zone and the LiMWA (or between the shoreline and the LiMWA for areas where VE Zones are not identified) will be similar to, but less severe than those in the VE Zone.

Provisionally Accredited Levee Notes to Users: Check with your local community to obtain more information, such as the estimated level of protection provided (which may exceed the 1-percent-annual-chance level) and Emergency Action Plan, on the levee system(s) shown as providing protection for areas on this panel. To maintain accreditation, the levee owner or community is required to submit the data and documentation necessary to comply with Section 65.10 of the NFIP regulations by October 11, 2013. If the community or owner does not provide the necessary data and documentation or if the data and documentation provided indicate the levee system does not comply with Section 65.10 requirements, FEMA will revise the flood hazard and risk information for this area to reflect de-accreditation of the levee system. To mitigate flood risk in residual risk area, property owners and residents are encouraged to consider flood insurance and floodproofing or other protective measures. For more information on flood insurance, interested parties should visit the FEMA Website at http://www.fema.gov/business/nfip/index.shtm.



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A No Base Flood Elevations determined.

ZONE AE Base Flood Elevations determined.

ZONE AH Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.

ZONE AO Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.

ZONE AR Special Flood Hazard Areas formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.

ZONE A99 Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.

ZONE V Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.

ZONE VE Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X Areas determined to be outside the 0.2% annual chance floodplain.

ZONE D Areas in which flood hazards are undetermined, but possible.

- Floodplain Boundary
- Floodway Boundary
- Zone D Boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
- Limit of Moderate Wave Action
- 513 — Base Flood Elevation line and value; elevation in feet*
- (EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the North American Vertical Datum of 1988

- A — A — Cross section line
- 23 — 23 — Transect line
- Culvert
- Bridge
- Footbridge
- 45° 02' 08", 93° 02' 12" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83) Western Hemisphere
- 4988000mN — 1000-meter Universal Transverse Mercator grid ticks, zone 15
- 4989000FT — 5000-foot grid values: Texas State Plane Coordinate System, (FIPS Zone 4204), Lambert Conformal Conic
- DX5510 × — Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 — River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
AUGUST 15, 2019

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 1000'

500 0 1000 2000 FEET
300 0 300 600 METERS

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0255G

FIRM
FLOOD INSURANCE RATE MAP

GALVESTON COUNTY, TEXAS
AND INCORPORATED AREAS

PANEL 255 OF 600
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
TEXAS CITY, CITY OF	485514	0255	G
GALVESTON COUNTY	485470	0255	G

MAP NUMBER
48167C0255G

EFFECTIVE DATE
AUGUST 15, 2019

Federal Emergency Management Agency

Tab 18

Attachment TR-03 Treatment System List

The process begins at the Intake, where seawater is physically screened with coarse screens and fine screens. The raw seawater is then pumped by Raw Water Pumps to the Pretreatment process. Additionally, raw seawater will be pumped to blend with Reverse Osmosis (RO) concentrate prior to discharging into the outfall.

The first section of the Pretreatment process includes Rapid Mixing, Flocculation Basins, Dissolved Air Floatation, and High-Rate Clarifiers. The High-Rate Clarifiers will be accompanied by Sludge Recycle Pumps and Sludge Waste Pumps.

Pretreatment will continue with either a Low Pressure Membrane Filtration process or a Gravity Media Filters process. The Low Pressure Membrane Filtration includes Feed Pumps, Membrane Feed Strainers, Low Pressure Membrane Filtration Modules, Clean-in-Place (CIP) Tanks and Pumps, CIP Chemical Pumps, Backwash Tank and Pumps, Neutralization Tank and Pumps, and Compressed Air System Compressors and Receiver.

The Gravity Media Filters process would include Gravity Media Filters, Filter Backwash Pumps, Air Scour Blowers, and Transfer Pumps to the RO system.

There will be a RO process that receives pretreated water from Pretreatment. The RO process includes prefilters, High Pressure Feed Pumps, RO membranes, Pressure Exchangers, booster pumps, Anti-Scalant System, CIP Tank with Pumps and Filters, Flush Tank, Bag Filters, and Neutralization Tank.

Post-Treatment will utilize CO_2 Tanks and Calcite Contactors.

Treated water will continue to a Ground Storage Tank and a High Service Pump Station.

There will be Chemical Storage and Feed Systems. These systems will house Ferric Sulfate Tank and Pumps, Polymer Activating Units and Tank, Sodium Hypochlorite Tank and Pumps, Liquid Ammonia Sulfate Tank and Pumps, and Caustic Tank and Pumps.

The plant will contain a Solids and Residual Liquid Handling System. This step in the process will have a raw sludge thickener, Sludge Dewatering Feed Pumps and Sludge Dewatering Centrifuges. Sludge generated from the facility will be transported and disposed of at a TCEQ-approved disposal facility.

Concentrate from the RO process will be blended with raw seawater from the intake, remaining water from the Residual Liquid Handling System and discharge into Outfall 1.

Preliminary process unit quantity and dimensions are summarized as follows. As design evolves, design criteria will be further developed.

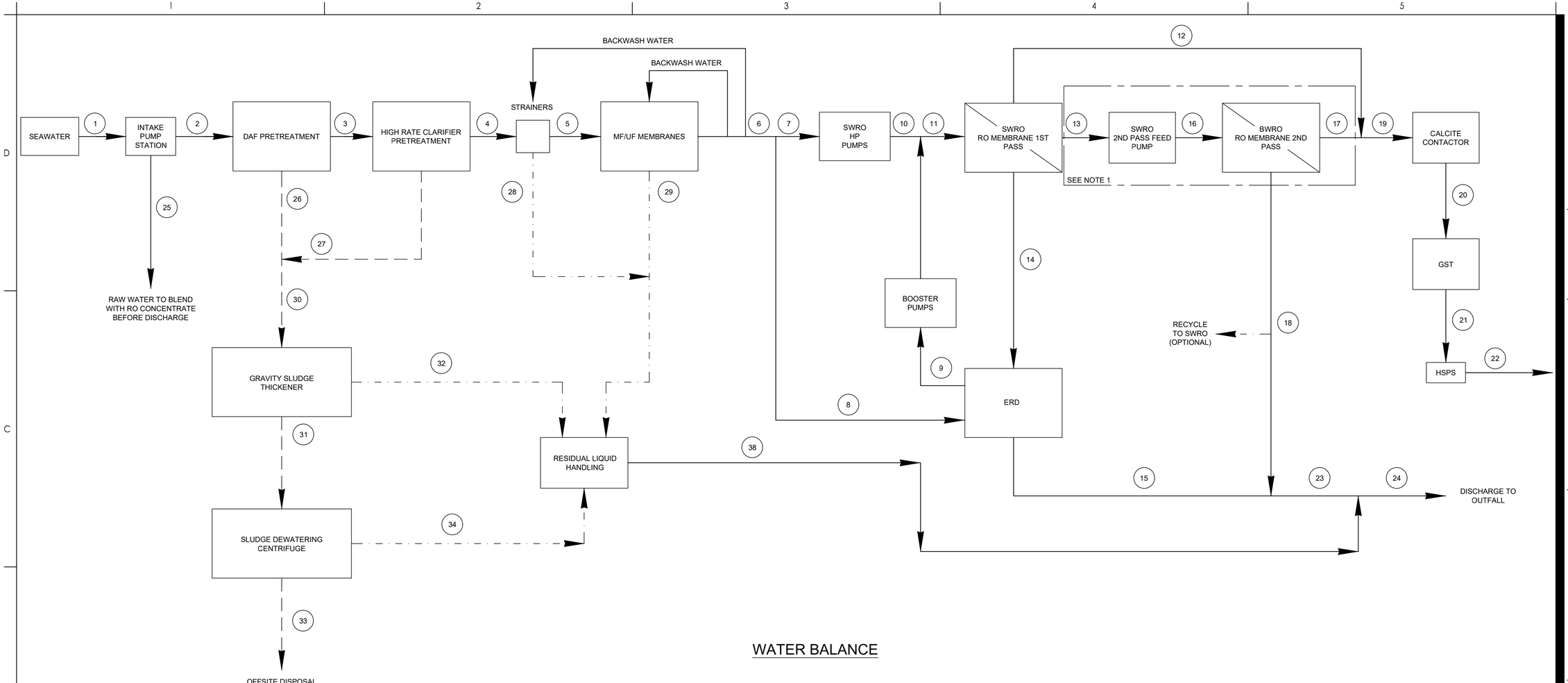
Table 1: Process Units Quantity and Dimensions

Treatment System	Unit	Quantity	Unit Dimensions
Raw Water Intake	Raw Water Pump	6	Design Flow: 8,563 gpm
	Blending Water Pump	6	Design Flow: 4,743 gpm
	Intake Coarse Screens	6	Total Screen Area: 59.4 sf Slot Opening Size: 1 mm Individual Screen Capacity: 13,333 gpm
	Intake Fine Screens	6	Total Screen Area: 59.4 sf Slot Opening Size: 1 mm Individual Screen Capacity: 13,333 gpm
Pretreatment	Rapid Mixing Basin	5 on duty, 1 standby	Volume: 12,118 gallons
	Flocculation Basins	5 on duty, 1 standby	Volume: 105,064 gallons
	Dissolved Air Floatation (DAF)	5 on duty, 1 standby	Volume: 161,561 gallons
	Reactor Chamber	5 on duty, 1 standby	Volume: 109,066 gallons
	High-Rate Clarifier	5 on duty, 1 standby	Volume: 249,047 gallons
	Sludge Recycle Pump	5 on duty, 1 standby	Design Flow: 900 gpm
	Sludge Waste Pump	5 on duty, 1 standby	Design Flow: 900 gpm
Pretreatment – Filtration -Low Pressure Membrane Filtration	Membrane Feed Pumps	17 on duty, 2 standby	Design Flow: 2,370 gpm
	Membrane Feed Strainers	17 on duty, 2 standby	Screen Size: 250 µm
	Low Pressure Membrane Filtration Racks	29 on duty, 2 standby	6" Diameter x 80" Length for individual module Surface Area: 538 sf; 120 modules per rack
	Backwash Tank	2	Volume: 3,000 gallons Diameter: 7' 6"
	Backwash Pump	2 on duty, 2 standby	Design Flow: 960 gpm
	CIP Tank	4 (2 for acid CIP use, and 2 for caustic CIP use)	Volume: 3,000 gallons Diameter: 7' 6"
	CIP Pump	2 on duty, 2 standby	Design Flow: 348 gpm

	Neutralization Tank	2	Volume: 15,000 gallons Diameter: 12' 0"
	Neutralization Pump	2 on duty, 2 standby	Design Flow: 348 gpm
	Sodium Hypochlorite Transfer Pump	2 on duty, 2 standby	Design Flow: 11 gpm
	Caustic Transfer Pump	2 on duty, 2 standby	Design Flow: 11 gpm
	Citric Acid Transfer Pump	2 on duty, 2 standby	Design Flow: 11 gpm
	Sodium Bisulfite Transfer Pump	2 on duty, 2 standby	Design Flow: 11 gpm
	Compressed Air System Compressors	5 on duty, 2 standby	Design Flow: 90 scfm
	Compressed Air System Receiver	5	Volume: 1,040 gallons
Pretreatment – Filtration -Gravity Media Filters	Gravity Media Filters	20 on duty, 2 standby	50 ft Length x 14' 11"Width Surface Area: 746 sf
	Filter Backwash Pumps	2 on duty, 2 standby	Design Flow: 16,408 gpm
	Air Scour Blowers	2 on duty, 2 standby	Capacity: 2,233 scfm
	Transfer Pump	5 on duty, 2 standby	Design Flow: 8,935 gpm
Reverse Osmosis	RO Prefilters	16 duty, 2 standby	Design Flow: 2,655 gpm
	High Pressure Pump	16 duty, 2 standby	Design Flow: 1,264 gpm
	Booster Pump	16 duty, 2 standby	Design Flow: 1,238 gpm
	Reverse Osmosis Membrane Trains	16 duty, 2 standby	Surface Area: 440 sf; 560 modules per rack
	Pressure Exchanger	16 duty, 2 standby	Design Flow: 1,239 gpm
	Anti-Scalant System	2	15-Day Storage: 110 gallons
	CIP Tank	2	Volume: 6,000 gallons 11' 10" Diameter x 13' 3" Height
	CIP Pump	2 duty, 2 standby	Design Flow: 3,220 gpm
	CIP Bag Filter	2 duty, 2 standby	Nominal Micron Rating: 5 µm
	Flush Tank	2	Volume: 6,000 gallons 11' 10" Diameter x 13' 3" Height

	Neutralization Tank	2	Volume: 15,000 gallons 12' 0" Diameter
Post-Treatment	CO_2 Tank	4	Volume: 4,280 gallons ; 7' 4" Diameter x 20' Length
	Calcite Contactors	8	Volume: 5,224 cf 12' Diameter x 45' Length
Ground Storage Tank	Ground Storage Tank	4	Volume: 7.6 MG 166' Diameter x 47' Height
High Service Pump Station	High Service Pump Station Pump	5 on duty, 1 standby	Design Flow: 3,820 gpm
Chemical Storage and Feed Systems	Ferric Sulfate Metering Pump	5 on duty, 1 standby	Design Flow: 14.06 gph
	Ferric Sulfate Bulk Storage Tank	5	Volume: 6,000 gallons 10' Diameter x 10' 6" Height
	Polymer Coagulant Polymer Activating Unit	5 on duty, 1 standby	Design Feed Rate: 2.70 gph
	Polymer Coagulant Bulk Storage Tank	5	Volume: 1,000 gallons 6' Diameter x 5' Height
	Sodium Hypochlorite Metering Pump	5 on duty, 5 standby	Design Flow: 7.64 gph
	Sodium Hypochlorite Bulk Storage Tank	5	Volume: 2,000 gallons 7' Diameter x 7' Height
	Liquid Ammonia Sulfate Metering Pump	5 on duty, 5 standby	Design Flow: 2.69 gph
	Liquid Ammonia Sulfate Bulk Storage Tank	5	Volume: 750 gallons 5' Diameter x 5' 6" Height
	Caustic Metering Pump	5 on duty, 5 standby	Design Flow: 2.58 gph
	Caustic Bulk Storage Tank	5	Volume: 1,000 gallons 5' Diameter x 7' Height
Solids and Residual Liquid Handling System	Gravity Thickener	5	32' Diameter x 13' SWD
	Sludge Dewatering Feed Pump	5 on duty, 2 standby	Design Flow: 12 gpm
	Sludge Dewatering Centrifuge	5 on duty, 2 standby	Design Capacity: 12 gpm
Outfall 001	Man-made Canal		N/A

Tab 19



WATER BALANCE

FORWARD FLOW

DESCRIPTION	STREAM NUMBER	1	2	3	4	5	6	7	8	9	10	11
LOCATION	DESCRIPTION	SEAWATER INTAKE	FEED WATER TO DAF PRETREATMENT	FEED TO HIGH RATE CLARIFIER PRETREATMENT	FEED TO MF STRAINER	FEED TO MF	MF PERMEATE (FEED TO RO)	FEED WATER TO HP PUMPS	FEED TO ERD UNITS	ERD UNITS TO RO FEED	HP PUMP DISCHARGE	FEED TO 1ST PASS RO MEMBRANES
FLOW	MGD	86.89	58.74	58.12	58.09	57.51	54.64	27.27	27.27	27.27	27.27	54.53
FLOW	GPM	60,342	40,795	40,362	40,342	39,939	37,942	18,935	18,935	18,935	18,935	37,871
SOLIDS	PPD											
SOLIDS %	%											
PRESSURE	PSIG						30	30	30	606	641	641
TOTAL DISSOLVED SOLIDS	MG/L	26,573	26,573	26,573	26,573	26,573	26,573	26,573	26,573	27,411	26,573	26,623

FORWARD FLOW

DESCRIPTION	STREAM NUMBER	12	13	14	15	16	17	18	19	20	21	22	23	24	25
LOCATION	DESCRIPTION	1ST PASS FRONT PERMEATE	RO 1ST PASS REAR PERMEATE	RO 1ST PASS REJECT	ERD LOW PRESSURE OUTLET	2ND PASS PUMP DISCHARGE	2ND PASS PERMEATE	2ND PASS REJECT	RO SYSTEM PERMEATE	CALCITE CONTACTOR DISCHARGE	FEED WATER TO GST	PRODUCT WATER TO DISTRIBUTION SYSTEM	COMBINED REJECT	DISCHARGE TO OUTFALL	RAW WATER TO BLEND RO REJECT
FLOW	MGD	21.84	5.48	27.28	27.28	5.48	4.66	0.82	26.50	26.50	26.50	26.50	28.15	32.24	28.15
FLOW	GPM	15,167	3,808	18,944	18,944	3,806	3,236	571	18,404	18,403	18,403	18,403	19,548	22,389	19,548
SOLIDS															
SOLIDS %															
PRESSURE	PSIG	30	14	615	42	99	30	80	30	15	15	80	42	ATM	TBD
TOTAL DISSOLVED SOLIDS	MG/L	89.12	323.50	53,082	53,009	323.50	13.54	2,080	75.82	209.56	209.56	209.56	51,504	48,340	26,573

RESIDUAL HANDLING

DESCRIPTION	STREAM NUMBER	26	27	28	29	30	31	32	33	34	38
LOCATION	DESCRIPTION	DAF SLUDGE	HIGH RATE CLARIFIER SLUDGE	MF STRAINER BACKWASH WASTE	MF BACKWASH WASTE	GRAVITY SLUDGE THICKENER FEED	GRAVITY SLUDGE THICKENER THICKENED SLUDGE	GRAVITY SLUDGE THICKENER SUPERNATANT	DEWATERED SLUDGE	CENTRIFUGE SUPERNATANT	RESIDUAL LIQUID
FLOW	MGD	0.623	0.029	0.581	2.876	0.652	0.057	0.595	0.017	0.040	4.091
FLOW	GPM	432	20	403	1,997	453	40	412.90	12	27.85	2,841
SOLIDS	PPD	26,040	1,212			27,251	24,526	2,725	23,300	1,226	3,951
SOLIDS%	%	0.50%	0.50%				5.0%		15.0%		
PRESSURE	PSIG	TBD	TBD	ATM	ATM	TBD	TBD	ATM	ATM	ATM	ATM
TOTAL DISSOLVED SOLIDS	MG/L	26,573	26,573	26,573	26,573	26,573	26,573	26,573	26,573	26,573	26,573

NOTES:

1. RO SECOND PASS IS OPTIONAL.
2. FLOWS SHOWN REPRESENT AVERAGE DAILY FLOWS. DESIGN FOR INDIVIDUAL PROCESSES WILL CONSIDER INSTANTANEOUS FLOW AS APPLICABLE.
3. BLENDING RATIO FOR RO REJECT = 1:1.

LEGEND:

LIQUID FLOW

RESIDUAL SOLIDS

BACKWASH WASTE STREAM, DRAIN, AND WASTE STREAM

ARDURRA
3115 Allen Parkway, Suite 300
Houston, TX 77019
TBPE Firm Registration No.: F-10053

Client

Revision	YYYY.MM.DD	Appd	By
Issued	YYYY.MM.DD	Appd	By

Permit/Seal

PRELIMINARY NOT FOR CONSTRUCTION

Not for permits, pricing or other official purposes. This document has not been completed or checked and is for general information or comment only.

Client/Project

Project No.: BACL

File Name: BACL-000-PR-002.dwg

Scale: NTS

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Dwn.	Dsgn.	Chkd.	YYYY.MM.DD

Title

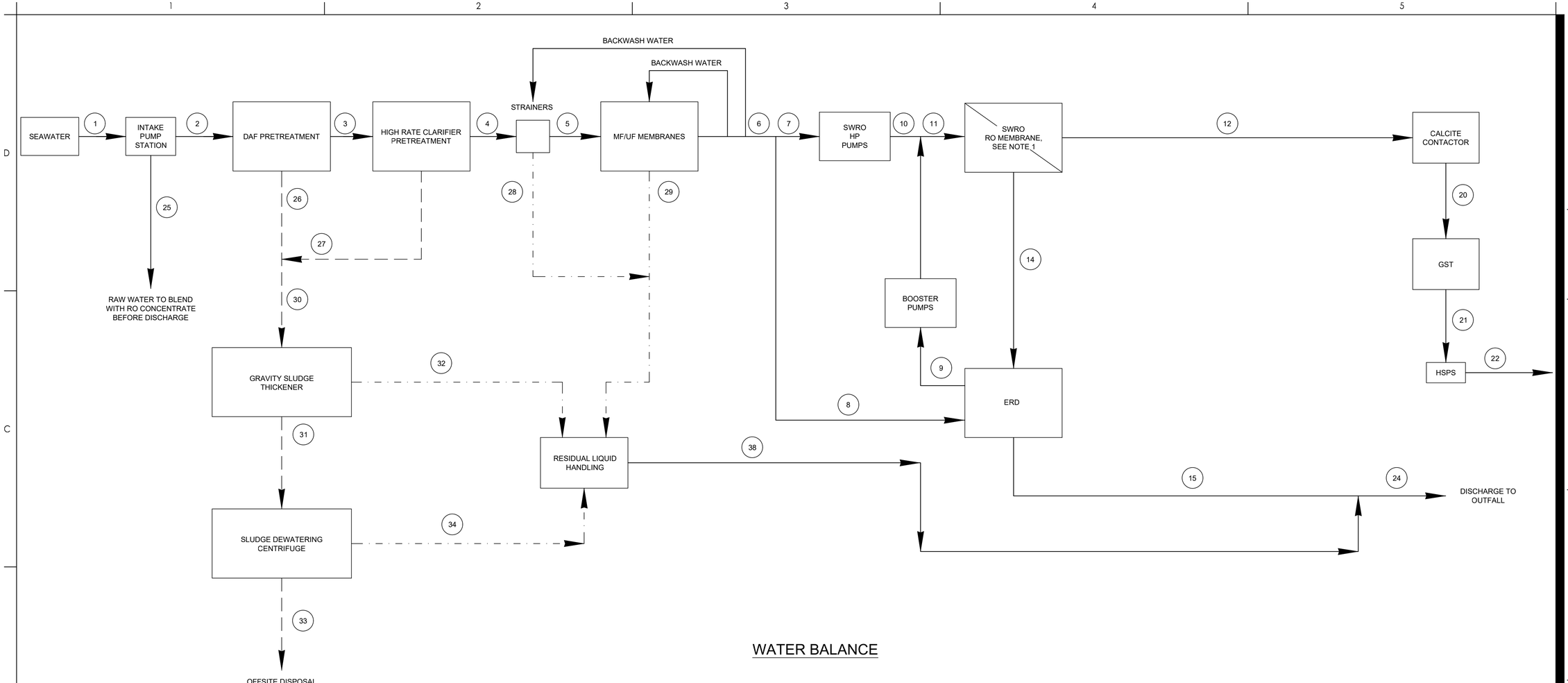
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WATER BALANCE BLOCK DIAGRAM

Revision: Sheet: of

Drawing No.

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WATER BALANCE

FORWARD FLOW

DESCRIPTION	STREAM NUMBER	1	2	3	4	5	6	7	8	9	10	11
LOCATION	DESCRIPTION	SEAWATER INTAKE	FEED WATER TO DAF PRETREATMENT	FEED TO HIGH RATE CLARIFIER PRETREATMENT	FEED TO MF STRAINER	FEED TO MF	MF PERMEATE (FEED TO RO)	FEED WATER TO HP PUMPS	FEED TO ERD UNITS	ERD UNITS TO RO FEED	HP PUMP DISCHARGE	FEED TO RO MEMBRANES
FLOW	MGD	86.85	58.74	58.12	58.09	57.51	54.64	27.27	27.27	27.27	27.27	54.53
FLOW	GPM	60,309	40,795	40,362	40,342	39,939	37,942	18,935	18,935	18,935	18,935	37,871
SOLIDS	PPD											
SOLIDS %	%											
PRESSURE	PSIG						30	30	30	606	663.10	663.10
TOTAL DISSOLVED SOLIDS	MG/L	26,573	26,573	26,573	26,573	26,573	26,753	26,573	26,573	27,411	26,573	26,625

FORWARD FLOW

DESCRIPTION	STREAM NUMBER	12	13	14	15	16	17	18	19	20	21	22	23	24	25
LOCATION	DESCRIPTION	RO PERMEATE	NOT USED	RO REJECT	ERD LOW PRESSURE OUTLET	NOT USED	NOT USED	NOT USED	NOT USED	CALCITE CONTACTOR DISCHARGE	FEED WATER TO GST	PRODUCT WATER TO DISTRIBUTION SYSTEM	NOT USED	DISCHARGE TO OUTFALL	RAW WATER TO BLEND RO REJECT
FLOW	MGD	26.50	N/A	28.10	28.10	N/A	N/A	N/A	N/A	26.50	26.50	26.50	N/A	32.19	28.10
FLOW	GPM	18,404	N/A	19,515	19,515	N/A	N/A	N/A	N/A	18,403	18,403	18,403	N/A	22,356	19,515
SOLIDS															
SOLIDS %															
PRESSURE	PSIG	30	N/A	641	42	N/A	N/A	N/A	N/A	15	15	80	N/A	ATM	TBD
TOTAL DISSOLVED SOLIDS	MG/L	105.50	N/A	51,567	51,567	N/A	N/A	N/A	N/A	209.56	209.56	209.56	N/A	48,391	26,573

RESIDUAL HANDLING

DESCRIPTION	STREAM NUMBER	26	27	28	29	30	31	32	33	34	38
LOCATION	DESCRIPTION	DAF SLUDGE	HIGH RATE CLARIFIER SLUDGE	MF STRAINER BACKWASH WASTE	MF BACKWASH WASTE	GRAVITY SLUDGE THICKENER FEED	GRAVITY SLUDGE THICKENER THICKENED SLUDGE	GRAVITY SLUDGE THICKENER SUPERNATANT	DEWATERED SLUDGE	CENTRIFUGE SUPERNATANT	RESIDUAL LIQUID
FLOW	MGD	0.623	0.029	0.581	2.876	0.652	0.057	0.595	0.017	0.040	4.091
FLOW	GPM	432	20	403	1,997	453	40	412.90	12	27.85	2,841
SOLIDS	PPD	26,040	1,212			27,251	24,526	2,725	23,300	1,226	3,951
SOLIDS%	%	0.50%	0.50%				5.0%		15.0%		
PRESSURE	PSIG	TBD	TBD	ATM	ATM	TBD	TBD	ATM	ATM	ATM	ATM
TOTAL DISSOLVED SOLIDS	MG/L	26,573	26,573	26,573	26,573	26,573	26,573	26,573	26,573	26,573	26,573

NOTES:

1. RO SINGLE PASS.
2. FLOWS SHOWN REPRESENT AVERAGE DAILY FLOWS. DESIGN FOR INDIVIDUAL PROCESSES WILL CONSIDER INSTANTANEOUS FLOW AS APPLICABLE.
3. BLENDING RATIO FOR RO REJECT = 1:1.

LEGEND:

- LIQUID FLOW
- RESIDUAL SOLIDS
- BACKWASH WASTE STREAM, DRAIN, AND WASTE STREAM

ARDURRA
3115 Allen Parkway, Suite 300
Houston, TX 77019
TBPE Firm Registration No. F-10053

Client

Issued	YYYY.MM.DD	Appd	By
Revision			

Permit/Seal

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Client/Project

Project No.: BACL
File Name: BACL-000-PR-002.dwg
Scale: NTS

JJG	YS	YS	
Dwn.	Dsgn.	Chkd.	YYYY.MM.DD

Title
000
WATER BALANCE BLOCK DIAGRAM

Revision: Sheet: of

Drawing No.
000-PR-002

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NOTICE OF CONFIDENTIALITY RIGHTS. IF YOU ARE A NATURAL PERSON, YOU MAY REMOVE OR STRIKE ANY OR ALL OF THE FOLLOWING INFORMATION FROM THIS INSTRUMENT BEFORE IT IS FILED FOR RECORD IN THE PUBLIC RECORDS: YOUR SOCIAL SECURITY NUMBER OR YOUR DRIVER'S LICENSE NUMBER.

STATE OF TEXAS §
§
COUNTY OF GALVESTON §

MEMORANDUM OF OPTION
AND PROPERTY RESTRICTIONS

This Memorandum of Option and Property Restrictions is made and entered into as of February 29, 2024 (the "Effective Date"), by and between EPCOR NR Holdings Inc., a Delaware corporation ("EPCOR"), and KV Land, LLC, a Texas limited liability company ("KV Land").

EPCOR and KV Land have entered into that certain Option Agreement dated February 29, 2024 (the "Option Agreement"), whereby KV Land granted to EPCOR an exclusive option (the "Option") to purchase from KV Land all or portions of that certain real property depicted in yellow on Exhibit A (the "Property") which Property is a part of the real property legally described on Exhibit A attached hereto and incorporated herein by this reference pursuant to the provisions of the Option Agreement.

EPCOR and KV Land desire to give actual and constructive notice to all persons dealing with the Property that EPCOR has a vested, binding and perfected Option to purchase the Property pursuant to the terms of the Option Agreement. Per the Option Agreement, KV Land may not sell, further encumber, or convey any interest in, the Property without first complying with the terms of the Option Agreement.

MEMORANDUM:

The Option shall continue in full force and effect until the earlier of (i) the last day of the eighteenth (18th) month anniversary of the Commencement Date (as defined in the Option Agreement); provided EPCOR may through more than one extension extend this time period up to the last day of the fifty-four (54) month following the Commencement Date, or (ii) the date that the Option Agreement is earlier terminated in accordance with its terms and conditions.

A copy of the Option Agreement is in the possession of both EPCOR and KV Land. In the event of any conflict between this Memorandum and the Option Agreement, the Option Agreement shall control.

[SIGNATURE PAGE FOLLOWS]

IN WITNESS WHEREOF, the parties have executed this Memorandum of Option and Property Restrictions effective as of the Effective Date.

KV LAND:

KV LAND, LLC,
a Texas limited liability company

By: Capital Technologies, LLC,
a Texas limited liability company, its Manager

By: _____
Julianna Havard, its Treasurer

ACKNOWLEDGEMENT

STATE OF TEXAS §
§
COUNTY OF HARRIS §

BEFORE ME, the undersigned authority, on this day personally appeared Julianna Havard, known to me to be the person whose name is subscribed to the foregoing instrument and acknowledged to me that he/she executed the same for the purposes and consideration therein expressed.

GIVEN UNDER MY HAND AND SEAL OF OFFICE this 4th day of March, 2024.

(SEAL)

PATRICIA A. WILDER
My Notary ID # 5838711
Expires September 30, 2024

_____
Notary Public in and for the State of Texas

EPCOR:

EPCOR NR HOLDINGS INC.,
a Delaware corporation

By: _____
Joseph Gysel, its President

ACKNOWLEDGEMENT

STATE OF Arizona §
§
COUNTY OF Maricopa §

BEFORE ME, the undersigned authority, on this day personally appeared Joseph Gysel, known to me to be the person whose name is subscribed to the foregoing instrument and acknowledged to me that he/she executed the same for the purposes and consideration therein expressed.

GIVEN UNDER MY HAND AND SEAL OF OFFICE this 29th day of February, 2024.

(SEAL)

_____
Notary Public in and for the State of Arizona

Notary Public State of Arizona
Maricopa County
Julie Lynn Ebert
My Commission Expires 8/13/2025
Commission Number 610447

NOTARY PUBLIC STATE OF ARIZONA
Julie Lynn Ebert
Maricopa County
Exp. 8/13/2025
610447

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EXHIBIT A TO THE MEMORANDUM OF OPTION AGREEMENT

300 Acres out of 819.82 acres of Tract 1 described below:

See attached.

DocuSign Envelope ID: 4F5D7B98-BCC3-4780-9C16-06A00E28FD24

EXHIBIT A

LAND

Metes and Bounds Description
Tract 1
819.82 Acres (35,711,359 Square Feet)
Amos Edwards League, Abstract No. 10
Branch T. Masterson Survey, Abstract No. 642
Anthony Hatch Survey, Abstract No. 88
John Rogers Survey, Abstract No. 168
Galveston County, Texas

Description of an 819.82 acre (35,711,359 square feet) tract of land being out of a called 1,079.700 acre tract referred to as Parcel PS11C-C01 and described in a deed to Texas Genco Holdings, Inc. as recorded under File No. 2002050899 of the Galveston County Official Public Records of Real Property, and also being out of the plat of the San Leon Farm Home Tracts as recorded in Volume 254-A, Page 25 of the Galveston County Deed Records (transferred to Volume 5, Page 51 of the Galveston County Map Records), in the Amos Edwards League, Abstract No. 10, the Branch T. Masterson Survey, Abstract No. 642, the Anthony Hatch Survey, Abstract No. 88 and the John Rogers Survey, Abstract No. 168, in Galveston County, Texas, said 819.82 acre tract being more particularly described as follows (with bearings referenced to the Texas Coordinate System of 1983, South Central Zone):

COMMENCING at a 5/8-inch iron rod with cap found on the northeasterly right-of-way line of State Highway No. 146 which marks the most westerly corner of said 1,079.700 acre tract and the most southerly corner of the plat of Chase Park Section 3 as recorded in Volume 18, Page 929 of the Galveston County Map Records;

THENCE, North 49° 59' 58" East, along the most northwesterly line of said 1,079.700 acre tract, a distance of 4,023.30 feet to a 5/8-inch iron rod with plastic cap stamped "AECOM" set for the northernmost westerly corner and POINT OF BEGINNING of this herein described tract;

THENCE, North 49° 59' 58" East, continuing along the most northwesterly line of said 1,079.700 acre tract, a distance of 4,399.00 feet to a 5/8-inch iron rod with plastic cap stamped "AECOM" set for the westernmost northerly corner of said 1,079,.700 acre tract, and from which a found 5/8-inch iron rod (bent) bears South 52° 26' East, 0.88 foot;

THENCE, South 32° 00' 07" East, along a northeasterly line of said 1,079.700 acre tract, a distance of 902.90 feet to a 5/8-inch iron rod with cap found for an interior corner of said 1,079.700 acre tract;

THENCE, North 50° 01' 58" East, along a northwesterly line of said 1,079.700 acre tract, a distance of 1,930.29 feet to an iron rod found on the southwesterly right-of-way line of F. M. Road 646 which marks the easternmost northerly corner of said 1,079.700 acre tract, said point being on the arc of a non-tangent curve to the right;

THENCE, southeasterly, 166.12 feet along the southwesterly right-of-way line of said F. M. Road 646 and along the arc of said curve to the right (central angle = 01° 40' 33"; radius = 5,679.65 feet; chord bearing and distance = South 70° 31' 42" East, 166.12 feet) to a 5/8-inch iron rod with cap found for end of curve;

THENCE, South 69° 41' 32" East, continuing along the southwesterly right-of-way line of said F. M. Road 646, a distance of 2,515.33 feet to a 5/8-inch iron rod with plastic cap stamped "AECOM" set for the beginning of a non-tangent curve to the left, from which a found 3/4-inch iron rod bears South 89° 17' East, 0.53 foot;

THENCE, southeasterly, 42.84 feet along said southwesterly right-of-way line and along the arc of said curve to the left (central angle = 00° 25' 29"; radius = 5,779.65 feet; chord bearing and distance = South 69° 54' 12" East, 42.84 feet) to a 5/8-inch iron rod with plastic cap stamped "AECOM" set in a tree stump for the northeasterly corner of said 1,079.700 acre tract, said point being in the northwesterly line of the said plat of San Leon Farm Home Tracts;

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THENCE, South 58° 02' 03" West, departing said southwesterly right-of-way line and along a southeasterly line of said 1,079.700 acre tract and the northwesterly line of said San Leon Farm Home Tracts, a distance of 944.63 feet to a 5/8-inch iron rod with cap found for corner in the northerly line of Lot 8, Block 11, of said San Leon Farm Home Tracts;

THENCE, South 77° 43' 25" East, along the northerly line of said Lot 8, a distance of 43.56 feet to a 5/8-inch iron rod with plastic cap stamped "AECOM" set for the northeasterly corner of said Lot 8, from which a found 3/4-inch iron pipe bears South 37° 36' West, 1.82 feet;

THENCE, South 12° 16' 35" West, along the common line between Lots 7 and 8 of said Block 11, a distance of 630.00 feet to a point for the southeasterly corner of said Lot 8, from which a found 3/4-inch iron rod bears South 89° 36' East, 0.20 foot;

THENCE, North 77° 43' 25" West, along the southerly line of said Block 11, a distance of 690.46 feet to a 5/8-inch iron rod with plastic cap stamped "AECOM" set in the northwesterly line of said San Leon Farm Home Tracts;

THENCE, South 58° 02' 03" West, along said northwesterly line and a southeasterly line of said 1,079.700 acre tract, a distance of 2,582.74 feet to a point for corner in the westerly line of Lot 3, Block 25A of said San Leon Farm Home Tracts, from which a found 5/8-inch iron rod bears South 63° 13' West, 0.55 foot;

THENCE, South 12° 16' 35" West, along an easterly line of said 1,079.700 acre tract, a distance of 2,572.75 feet to a 5/8-inch iron rod with plastic cap stamped "AECOM" set for the southwesterly corner of Lot 3, Block 41, of said San Leon Farm Home Tracts, from which a found 1/2-iron rod with cap bears North 10° 46' West, 2.06 feet;

THENCE, South 77° 43' 25" East, along the southerly line of said Lot 3, a distance of 690.75 feet to a point on the westerly right-of-way line of F. M. Road 517 (width varies) which marks the southeasterly corner of said Lot 3, from which a found 1/2-inch iron rod bears North 75° 03' East, 0.24 foot, and from which a found 5/8-inch iron rod bears South 70° 41' East, 1.06 feet;

THENCE, South 12° 16' 35" West, along the westerly right-of-way line of said F. M. Road 517, a distance of 2,264.83 feet to a 5/8-inch iron rod with plastic cap stamped "AECOM" which marks the southeasterly corner of Lot 6, Block 44, of said San Leon Farm Home Tracts, and being on the northerly line of Avenue "N" (60 feet wide), from which a found 5/8-inch iron rod bears South 29° 44' East, 0.87 foot;

THENCE, North 77° 43' 25" West, along the northerly line of said Avenue "N", a distance of 1,442.63 feet to a point for an interior corner of said 1,079.700 acre tract on the westerly line of 30th Street (60 feet wide), from which a found 5/8-inch iron rod with cap bears South 53° 22' East, 0.38 foot;

THENCE, South 12° 16' 35" West, along the westerly line of said 30th Street and an easterly line of said 1,079.700 acre tract, a distance of 1,320.20 feet to a 5/8-inch iron rod with plastic cap stamped "AECOM" set for the southeasterly corner of Lot 5, Block 59, of said San Leon Farm Home Tracts on the northerly line of Avenue "P" (60 feet wide), from which a found iron rod bears South 86° 36' West, 0.80 foot;

THENCE, South 77° 43' 25" West, along the northerly line of said Avenue "P" and a southerly line of said 1,079.700 acre tract, a distance of 1,443.12 feet to a cotton spindle set in a wood post for an interior corner of this tract on the westerly line of 31st Street (60 feet wide);

THENCE, South 12° 16' 35" West, along the westerly line of said 31st Street and an easterly line of said 1,079.700 acre tract, a distance of 2,791.16 feet to a point on the northeasterly right-of-way line of State Highway No. 146 which marks the most southerly corner of said 1,079.700 acre tract, from which a found 5/8-inch iron rod bears South 57° 19' West, 0.19 foot;

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THENCE, North 29° 05' 33" West, along the northeasterly right-of-way line of said State Highway No. 146 and the southwesterly line of said 1,079.700 acre tract, a distance of 2,680.67 feet to a 5/8-inch iron rod with plastic cap stamped "AECOM" set for the southernmost westerly corner of this herein described tract;

THENCE, North 60° 33' 29" East, along a westerly line of this tract, a distance of 780.93 feet to a 5/8-inch iron rod with plastic cap stamped "AECOM" set for the beginning of a curve to the left;

THENCE, northeasterly, 356.42 feet along the arc of said curve to the left (central angle = 47° 09' 43"; radius = 433.00 feet; chord bearing and distance = North 36° 58' 38" East, 346.44 feet to a 5/8-inch iron rod with plastic cap stamped "AECOM" set for a point of tangency;

THENCE, North 13° 23' 46" East, continuing along a westerly line of this tract, a distance of 126.84 feet to a 5/8-inch iron rod with plastic cap stamped "AECOM" set for an angle point;

THENCE, North 12° 21' 29" East, continuing along said line, a distance of 856.34 feet to a fence corner post found for an angle point;

THENCE, North 12° 17' 49" East, continuing along said line, a distance of 362.90 feet to a fence corner post found for an angle point;

THENCE, North 14° 23' 17" East, continuing along said line, a distance of 6.32 feet to a fence corner post found for an angle point;

THENCE, North 77° 50' 09" West, along a southerly line of this tract, a distance of 40.39 feet to a fence corner post for corner;

THENCE, North 12° 16' 36" East, along a westerly line of this tract, a distance of 149.95 feet to a fence corner post found for an interior corner;

THENCE, North 77° 31' 05" West, along a southerly line of this tract, a distance of 186.69 feet to a point for corner in an easterly line of a called 26.542 acre tract retained by Reliant Energy, Incorporated, referred to as Parcel PS11D-001 and described in Schedule 2 of the above referenced deed to Texas Genco Holdings, Inc.;

THENCE, North 12° 20' 03" East, along an easterly line of said 26.542 acre tract, a distance of 546.02 feet to a 3/4-inch iron rod found for the most easterly northeast corner of said 26.542 acre tract;

THENCE, South 77° 56' 02" East, along a northerly line of this tract, a distance of 55.90 feet to a fence corner post;

THENCE, North 11° 56' 02" East, a distance of 37.90 feet to an "X" cut in concrete set for corner;

THENCE, South 77° 42' 41" East, a distance of 96.24 feet to a point for corner in the center of a channel;

THENCE, North 11° 53' 46" East, along the centerline of a channel and along an easterly line of this tract, a distance of 1,638.18 feet to a point for the beginning of a curve to the right;

THENCE, northeasterly, 564.87 feet along the arc of said curve to the right (central angle = 38° 23' 32"; radius = 843.00 feet; chord bearing and distance = North 31° 05' 32" East, 554.36 feet) to a point of tangency;

THENCE, North 50° 17' 18" East, along the centerline of a channel, a distance of 55.66 feet to a point for an interior corner of this herein described tract;

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THENCE, North 32° 46' 21" West, along a southwesterly line of this tract, at 150.00 feet pass a 5/8-inch iron rod with plastic cap stamped "AECOM" set for reference, and continuing for a total distance of 1,300.63 feet to the POINT OF BEGINNING and containing a computed area of 819.82 acres (35,711,359 square feet) of land.

Compiled by:
AECOM Technical Services, Inc.
5757 Woodway, Suite 101 West
Houston, TX 77057
Phone: 713.780.4123
Date: August 25, 2010
Job No.: 60160569.11

J:\60160569 P H Robinson Power Plant Update\7.0 Deliverables\Doc\PHROB Tract 1 M&B.doc

FILED AND RECORDED

Instrument Number: *2024017398*

Recording Fee: 53.00

Number Of Pages: 9

Filing and Recording Date: 04/19/2024 3:31PM

I hereby certify that this instrument was FILED on the date and time stamped hereon and RECORDED in the OFFICIAL PUBLIC RECORDS of Galveston County, Texas.

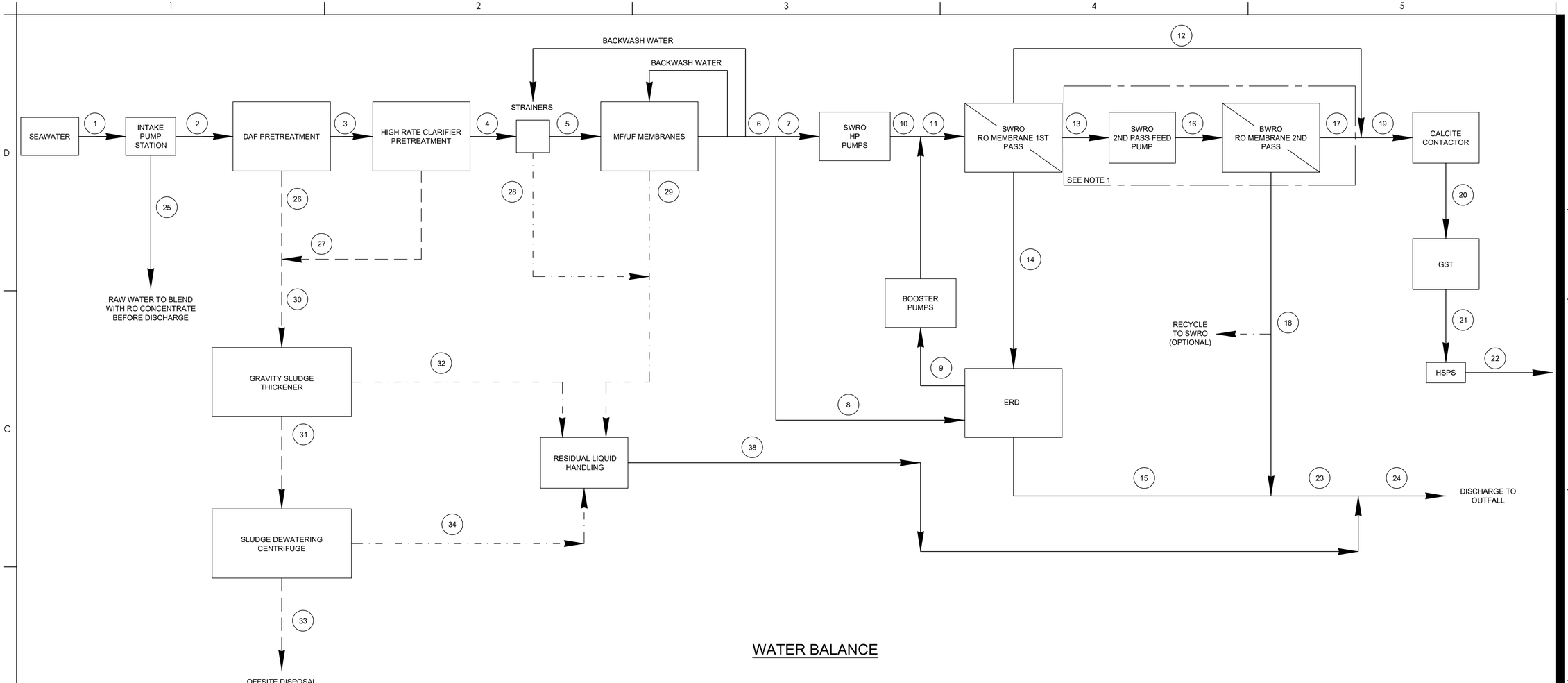
THE STATE OF TEXAS
COUNTY OF GALVESTON

Dwight D. Sullivan

Dwight D. Sullivan, County Clerk
Galveston County, Texas

NOTICE: It is a crime to intentionally or knowingly file a fraudulent court record or instrument with the clerk.

DO NOT DESTROY - *Warning, this document is part of the Official Public Record.*



WATER BALANCE

FORWARD FLOW

DESCRIPTION	STREAM NUMBER	1	2	3	4	5	6	7	8	9	10	11
LOCATION	DESCRIPTION	SEAWATER INTAKE	FEED WATER TO DAF PRETREATMENT	FEED TO HIGH RATE CLARIFIER PRETREATMENT	FEED TO MF STRAINER	FEED TO MF	MF PERMEATE (FEED TO RO)	FEED WATER TO HP PUMPS	FEED TO ERD UNITS	ERD UNITS TO RO FEED	HP PUMP DISCHARGE	FEED TO 1ST PASS RO MEMBRANES
FLOW	MGD	86.89	58.74	58.12	58.09	57.51	54.64	27.27	27.27	27.27	27.27	54.53
FLOW	GPM	60,342	40,795	40,362	40,342	39,939	37,942	18,935	18,935	18,935	18,935	37,871
SOLIDS	PPD											
SOLIDS %	%											
PRESSURE	PSIG						30	30	30	606	641	641
TOTAL DISSOLVED SOLIDS	MG/L	26,573	26,573	26,573	26,573	26,573	26,573	26,573	26,573	27,411	26,573	26,623

FORWARD FLOW

DESCRIPTION	STREAM NUMBER	12	13	14	15	16	17	18	19	20	21	22	23	24	25
LOCATION	DESCRIPTION	1ST PASS FRONT PERMEATE	RO 1ST PASS REAR PERMEATE	RO 1ST PASS REJECT	ERD LOW PRESSURE OUTLET	2ND PASS PUMP DISCHARGE	2ND PASS PERMEATE	2ND PASS REJECT	RO SYSTEM PERMEATE	CALCITE CONTACTOR DISCHARGE	FEED WATER TO GST	PRODUCT WATER TO DISTRIBUTION SYSTEM	COMBINED REJECT	DISCHARGE TO OUTFALL	RAW WATER TO BLEND RO REJECT
FLOW	MGD	21.84	5.48	27.28	27.28	5.48	4.66	0.82	26.50	26.50	26.50	26.50	28.15	32.24	28.15
FLOW	GPM	15,167	3,808	18,944	18,944	3,806	3,236	571	18,404	18,403	18,403	18,403	19,548	22,389	19,548
SOLIDS															
SOLIDS %															
PRESSURE	PSIG	30	14	615	42	99	30	80	30	15	15	80	42	ATM	TBD
TOTAL DISSOLVED SOLIDS	MG/L	89.12	323.50	53,082	53,009	323.50	13.54	2,080	75.82	209.56	209.56	209.56	51,504	48,340	26,573

RESIDUAL HANDLING

DESCRIPTION	STREAM NUMBER	26	27	28	29	30	31	32	33	34	38
LOCATION	DESCRIPTION	DAF SLUDGE	HIGH RATE CLARIFIER SLUDGE	MF STRAINER BACKWASH WASTE	MF BACKWASH WASTE	GRAVITY SLUDGE THICKENER FEED	GRAVITY SLUDGE THICKENER THICKENED SLUDGE	GRAVITY SLUDGE THICKENER SUPERNATANT	DEWATERED SLUDGE	CENTRIFUGE SUPERNATANT	RESIDUAL LIQUID
FLOW	MGD	0.623	0.029	0.581	2.876	0.652	0.057	0.595	0.017	0.040	4.091
FLOW	GPM	432	20	403	1,997	453	40	412.90	12	27.85	2,841
SOLIDS	PPD	26,040	1,212			27,251	24,526	2,725	23,300	1,226	3,951
SOLIDS%	%	0.50%	0.50%				5.0%		15.0%		
PRESSURE	PSIG	TBD	TBD	ATM	ATM	TBD	TBD	ATM	ATM	ATM	ATM
TOTAL DISSOLVED SOLIDS	MG/L	26,573	26,573	26,573	26,573	26,573	26,573	26,573	26,573	26,573	26,573

NOTES:

1. RO SECOND PASS IS OPTIONAL.
2. FLOWS SHOWN REPRESENT AVERAGE DAILY FLOWS. DESIGN FOR INDIVIDUAL PROCESSES WILL CONSIDER INSTANTANEOUS FLOW AS APPLICABLE.
3. BLENDING RATIO FOR RO REJECT = 1:1.

LEGEND:

LIQUID FLOW

RESIDUAL SOLIDS

BACKWASH WASTE STREAM, DRAIN, AND WASTE STREAM

ARDURRA
3115 Allen Parkway, Suite 300
Houston, TX 77019
TBPE Firm Registration No.: F-10053

Client

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Client/Project

Project No.: BACL

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Title

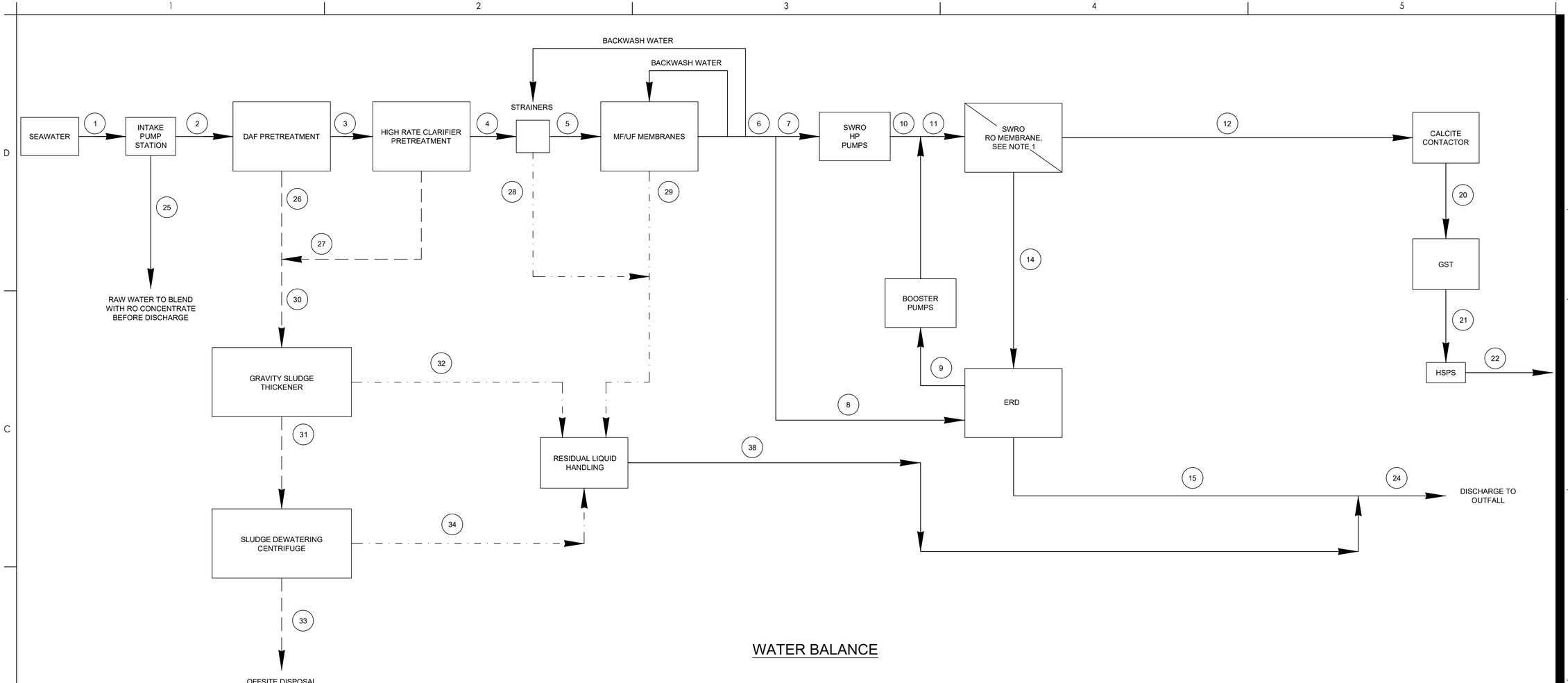
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WATER BALANCE BLOCK DIAGRAM

Revision: Sheet: of

Drawing No.

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WATER BALANCE

FORWARD FLOW

DESCRIPTION	STREAM NUMBER	1	2	3	4	5	6	7	8	9	10	11
LOCATION	DESCRIPTION	SEAWATER INTAKE	FEED WATER TO DAF PRETREATMENT	FEED TO HIGH RATE CLARIFIER PRETREATMENT	FEED TO MF STRAINER	FEED TO MF	MF PERMEATE (FEED TO RO)	FEED WATER TO HP PUMPS	FEED TO ERD UNITS	ERD UNITS TO RO FEED	HP PUMP DISCHARGE	FEED TO RO MEMBRANES
FLOW	MGD	86.85	58.74	58.12	58.09	57.51	54.64	27.27	27.27	27.27	27.27	54.53
FLOW	GPM	60,309	40,795	40,362	40,342	39,939	37,942	18,935	18,935	18,935	18,935	37,871
SOLIDS	PPD											
SOLIDS %	%											
PRESSURE	PSIG						30	30	30	606	663.10	663.10
TOTAL DISSOLVED SOLIDS	MG/L	26,573	26,573	26,573	26,573	26,573	26,753	26,573	26,573	27,411	26,573	26,625

FORWARD FLOW

DESCRIPTION	STREAM NUMBER	12	13	14	15	16	17	18	19	20	21	22	23	24	25
LOCATION	DESCRIPTION	RO PERMEATE	NOT USED	RO REJECT	ERD LOW PRESSURE OUTLET	NOT USED	NOT USED	NOT USED	NOT USED	CALCITE CONTACTOR DISCHARGE	FEED WATER TO GST	PRODUCT WATER TO DISTRIBUTION SYSTEM	NOT USED	DISCHARGE TO OUTFALL	RAW WATER TO BLEND RO REJECT
FLOW	MGD	26.50	N/A	28.10	28.10	N/A	N/A	N/A	N/A	26.50	26.50	26.50	N/A	32.19	28.10
FLOW	GPM	18,404	N/A	19,515	19,515	N/A	N/A	N/A	N/A	18,403	18,403	18,403	N/A	22,356	19,515
SOLIDS															
SOLIDS %															
PRESSURE	PSIG	30	N/A	641	42	N/A	N/A	N/A	N/A	15	15	80	N/A	ATM	TBD
TOTAL DISSOLVED SOLIDS	MG/L	105.50	N/A	51,567	51,567	N/A	N/A	N/A	N/A	209.56	209.56	209.56	N/A	48,391	26,573

RESIDUAL HANDLING

DESCRIPTION	STREAM NUMBER	26	27	28	29	30	31	32	33	34	38
LOCATION	DESCRIPTION	DAF SLUDGE	HIGH RATE CLARIFIER SLUDGE	MF STRAINER BACKWASH WASTE	MF BACKWASH WASTE	GRAVITY SLUDGE THICKENER FEED	GRAVITY SLUDGE THICKENER THICKENED SLUDGE	GRAVITY SLUDGE THICKENER SUPERNATANT	DEWATERED SLUDGE	CENTRIFUGE SUPERNATANT	RESIDUAL LIQUID
FLOW	MGD	0.623	0.029	0.581	2.876	0.652	0.057	0.595	0.017	0.040	4.091
FLOW	GPM	432	20	403	1,997	453	40	412.90	12	27.85	2,841
SOLIDS	PPD	26,040	1,212			27,251	24,526	2,725	23,300	1,226	3,951
SOLIDS%	%	0.50%	0.50%				5.0%		15.0%		
PRESSURE	PSIG	TBD	TBD	ATM	ATM	TBD	TBD	ATM	ATM	ATM	ATM
TOTAL DISSOLVED SOLIDS	MG/L	26,573	26,573	26,573	26,573	26,573	26,573	26,573	26,573	26,573	26,573

NOTES:

1. RO SINGLE PASS.
2. FLOWS SHOWN REPRESENT AVERAGE DAILY FLOWS. DESIGN FOR INDIVIDUAL PROCESSES WILL CONSIDER INSTANTANEOUS FLOW AS APPLICABLE.
3. BLENDING RATIO FOR RO REJECT = 1:1.

LEGEND:

- LIQUID FLOW
- RESIDUAL SOLIDS
- BACKWASH WASTE STREAM, DRAIN, AND WASTE STREAM

ARDURRA
3115 Allen Parkway, Suite 300
Houston, TX 77019
TBPE Firm Registration No. F-10053

Client

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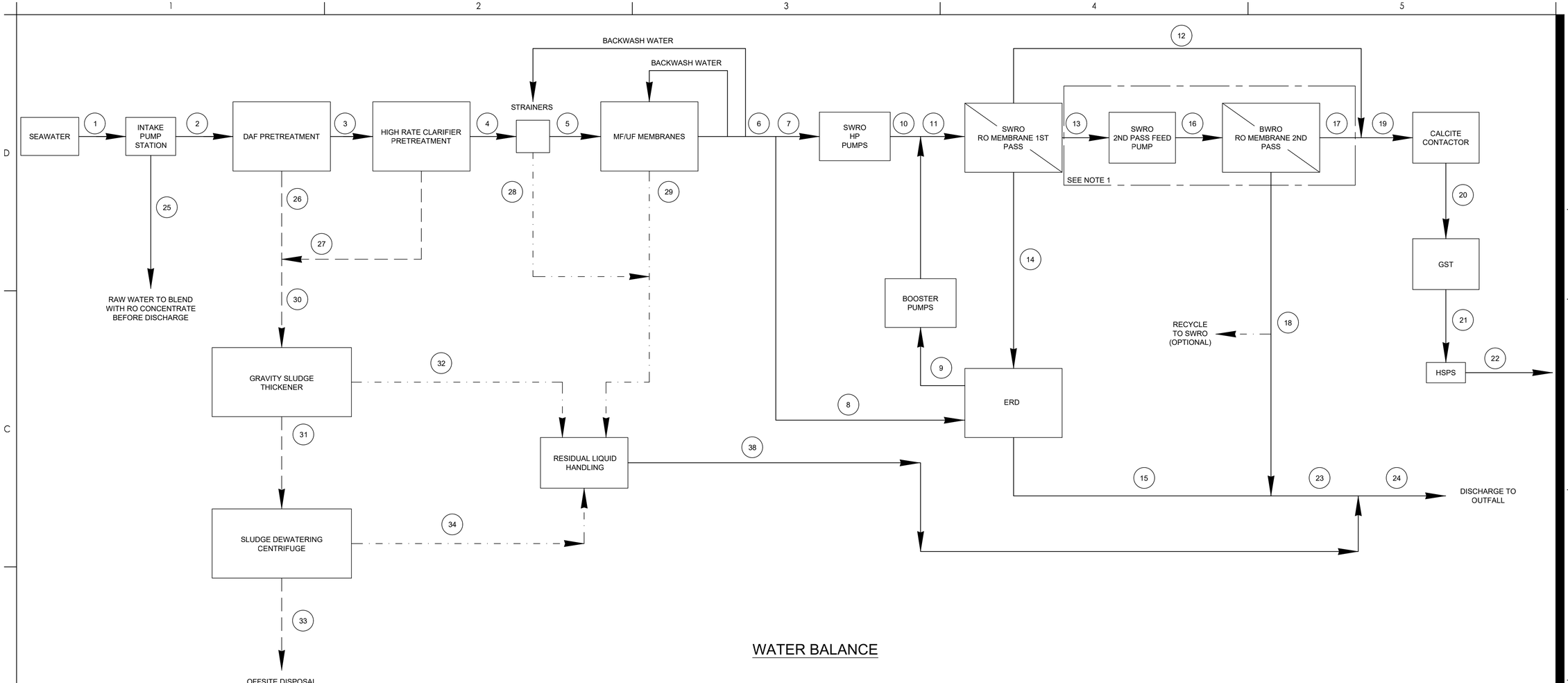
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Title
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WATER BALANCE BLOCK DIAGRAM

Revision: Sheet: of

Drawing No.
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WATER BALANCE

FORWARD FLOW

DESCRIPTION	STREAM NUMBER	1	2	3	4	5	6	7	8	9	10	11
LOCATION	DESCRIPTION	SEAWATER INTAKE	FEED WATER TO DAF PRETREATMENT	FEED TO HIGH RATE CLARIFIER PRETREATMENT	FEED TO MF STRAINER	FEED TO MF	MF PERMEATE (FEED TO RO)	FEED WATER TO HP PUMPS	FEED TO ERD UNITS	ERD UNITS TO RO FEED	HP PUMP DISCHARGE	FEED TO 1ST PASS RO MEMBRANES
FLOW	MGD	86.89	58.74	58.12	58.09	57.51	54.64	27.27	27.27	27.27	27.27	54.53
FLOW	GPM	60,342	40,795	40,362	40,342	39,939	37,942	18,935	18,935	18,935	18,935	37,871
SOLIDS	PPD											
SOLIDS %	%											
PRESSURE	PSIG						30	30	30	606	641	641
TOTAL DISSOLVED SOLIDS	MG/L	26,573	26,573	26,573	26,573	26,573	26,573	26,573	26,573	27,411	26,573	26,623

FORWARD FLOW

DESCRIPTION	STREAM NUMBER	12	13	14	15	16	17	18	19	20	21	22	23	24	25
LOCATION	DESCRIPTION	1ST PASS FRONT PERMEATE	RO 1ST PASS REAR PERMEATE	RO 1ST PASS REJECT	ERD LOW PRESSURE OUTLET	2ND PASS PUMP DISCHARGE	2ND PASS PERMEATE	2ND PASS REJECT	RO SYSTEM PERMEATE	CALCITE CONTACTOR DISCHARGE	FEED WATER TO GST	PRODUCT WATER TO DISTRIBUTION SYSTEM	COMBINED REJECT	DISCHARGE TO OUTFALL	RAW WATER TO BLEND RO REJECT
FLOW	MGD	21.84	5.48	27.28	27.28	5.48	4.66	0.82	26.50	26.50	26.50	26.50	28.15	32.24	28.15
FLOW	GPM	15,167	3,808	18,944	18,944	3,806	3,236	571	18,404	18,403	18,403	18,403	19,548	22,389	19,548
SOLIDS															
SOLIDS %															
PRESSURE	PSIG	30	14	615	42	99	30	80	30	15	15	80	42	ATM	TBD
TOTAL DISSOLVED SOLIDS	MG/L	89.12	323.50	53,082	53,009	323.50	13.54	2,080	75.82	209.56	209.56	209.56	51,504	48,340	26,573

RESIDUAL HANDLING

DESCRIPTION	STREAM NUMBER	26	27	28	29	30	31	32	33	34	38
LOCATION	DESCRIPTION	DAF SLUDGE	HIGH RATE CLARIFIER SLUDGE	MF STRAINER BACKWASH WASTE	MF BACKWASH WASTE	GRAVITY SLUDGE THICKENER FEED	GRAVITY SLUDGE THICKENER THICKENED SLUDGE	GRAVITY SLUDGE THICKENER SUPERNATANT	DEWATERED SLUDGE	CENTRIFUGE SUPERNATANT	RESIDUAL LIQUID
FLOW	MGD	0.623	0.029	0.581	2.876	0.652	0.057	0.595	0.017	0.040	4.091
FLOW	GPM	432	20	403	1,997	453	40	412.90	12	27.85	2,841
SOLIDS	PPD	26,040	1,212			27,251	24,526	2,725	23,300	1,226	3,951
SOLIDS%	%	0.50%	0.50%				5.0%		15.0%		
PRESSURE	PSIG	TBD	TBD	ATM	ATM	TBD	TBD	ATM	ATM	ATM	ATM
TOTAL DISSOLVED SOLIDS	MG/L	26,573	26,573	26,573	26,573	26,573	26,573	26,573	26,573	26,573	26,573

NOTES:

1. RO SECOND PASS IS OPTIONAL.
2. FLOWS SHOWN REPRESENT AVERAGE DAILY FLOWS. DESIGN FOR INDIVIDUAL PROCESSES WILL CONSIDER INSTANTANEOUS FLOW AS APPLICABLE.
3. BLENDING RATIO FOR RO REJECT = 1:1.

LEGEND:

LIQUID FLOW

RESIDUAL SOLIDS

BACKWASH WASTE STREAM, DRAIN, AND WASTE STREAM

ARDURRA
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Houston, TX 77019
TBPE Firm Registration No.: F-10053

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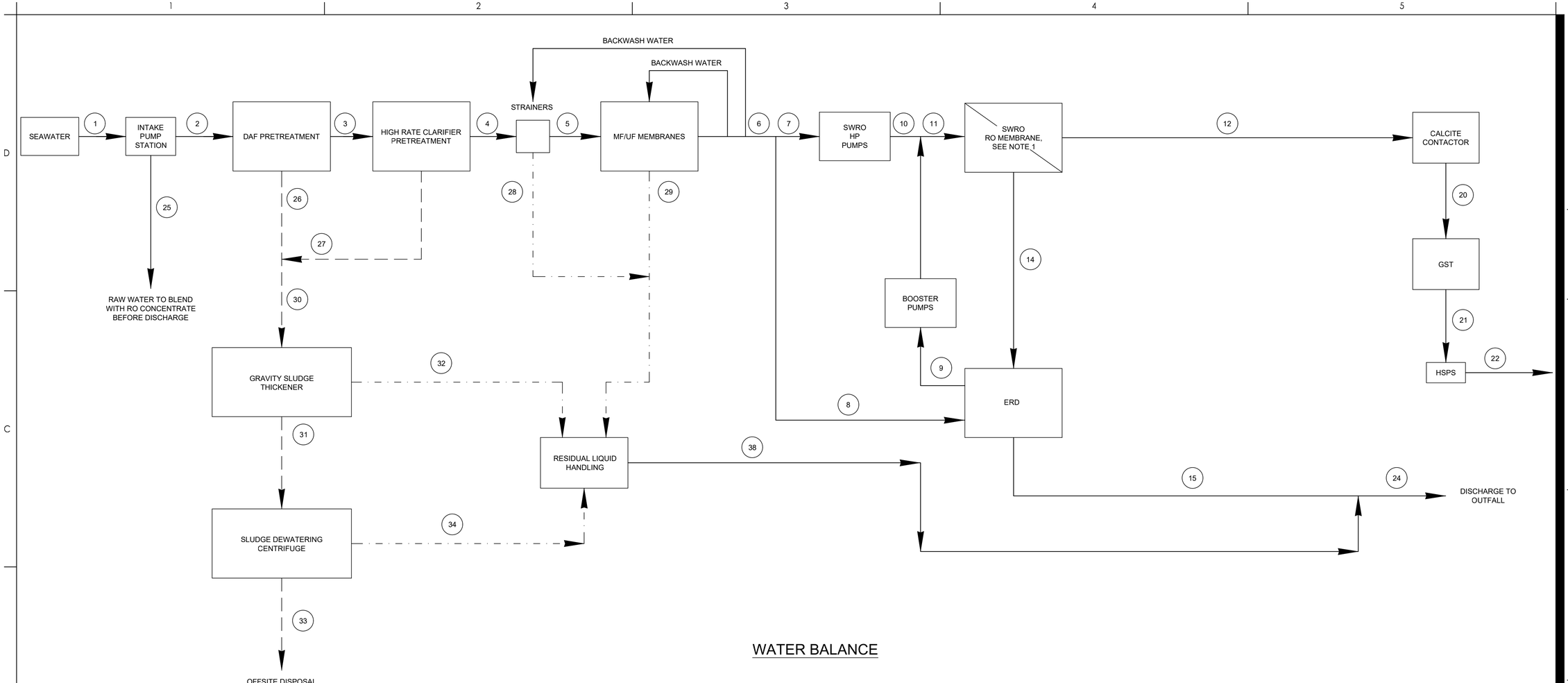
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WATER BALANCE BLOCK DIAGRAM

Revision: Sheet: of

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WATER BALANCE

FORWARD FLOW

DESCRIPTION	STREAM NUMBER	1	2	3	4	5	6	7	8	9	10	11
LOCATION	DESCRIPTION	SEAWATER INTAKE	FEED WATER TO DAF PRETREATMENT	FEED TO HIGH RATE CLARIFIER PRETREATMENT	FEED TO MF STRAINER	FEED TO MF	MF PERMEATE (FEED TO RO)	FEED WATER TO HP PUMPS	FEED TO ERD UNITS	ERD UNITS TO RO FEED	HP PUMP DISCHARGE	FEED TO RO MEMBRANES
FLOW	MGD	86.85	58.74	58.12	58.09	57.51	54.64	27.27	27.27	27.27	27.27	54.53
FLOW	GPM	60,309	40,795	40,362	40,342	39,939	37,942	18,935	18,935	18,935	18,935	37,871
SOLIDS	PPD											
SOLIDS %	%											
PRESSURE	PSIG						30	30	30	606	663.10	663.10
TOTAL DISSOLVED SOLIDS	MG/L	26,573	26,573	26,573	26,573	26,573	26,753	26,573	26,573	27,411	26,573	26,625

FORWARD FLOW

DESCRIPTION	STREAM NUMBER	12	13	14	15	16	17	18	19	20	21	22	23	24	25
LOCATION	DESCRIPTION	RO PERMEATE	NOT USED	RO REJECT	ERD LOW PRESSURE OUTLET	NOT USED	NOT USED	NOT USED	NOT USED	CALCITE CONTACTOR DISCHARGE	FEED WATER TO GST	PRODUCT WATER TO DISTRIBUTION SYSTEM	NOT USED	DISCHARGE TO OUTFALL	RAW WATER TO BLEND RO REJECT
FLOW	MGD	26.50	N/A	28.10	28.10	N/A	N/A	N/A	N/A	26.50	26.50	26.50	N/A	32.19	28.10
FLOW	GPM	18,404	N/A	19,515	19,515	N/A	N/A	N/A	N/A	18,403	18,403	18,403	N/A	22,356	19,515
SOLIDS															
SOLIDS %															
PRESSURE	PSIG	30	N/A	641	42	N/A	N/A	N/A	N/A	15	15	80	N/A	ATM	TBD
TOTAL DISSOLVED SOLIDS	MG/L	105.50	N/A	51,567	51,567	N/A	N/A	N/A	N/A	209.56	209.56	209.56	N/A	48,391	26,573

RESIDUAL HANDLING

DESCRIPTION	STREAM NUMBER	26	27	28	29	30	31	32	33	34	38
LOCATION	DESCRIPTION	DAF SLUDGE	HIGH RATE CLARIFIER SLUDGE	MF STRAINER BACKWASH WASTE	MF BACKWASH WASTE	GRAVITY SLUDGE THICKENER FEED	GRAVITY SLUDGE THICKENER THICKENED SLUDGE	GRAVITY SLUDGE THICKENER SUPERNATANT	DEWATERED SLUDGE	CENTRIFUGE SUPERNATANT	RESIDUAL LIQUID
FLOW	MGD	0.623	0.029	0.581	2.876	0.652	0.057	0.595	0.017	0.040	4.091
FLOW	GPM	432	20	403	1,997	453	40	412.90	12	27.85	2,841
SOLIDS	PPD	26,040	1,212			27,251	24,526	2,725	23,300	1,226	3,951
SOLIDS%	%	0.50%	0.50%				5.0%		15.0%		
PRESSURE	PSIG	TBD	TBD	ATM	ATM	TBD	TBD	ATM	ATM	ATM	ATM
TOTAL DISSOLVED SOLIDS	MG/L	26,573	26,573	26,573	26,573	26,573	26,573	26,573	26,573	26,573	26,573

NOTES:

1. RO SINGLE PASS.
2. FLOWS SHOWN REPRESENT AVERAGE DAILY FLOWS. DESIGN FOR INDIVIDUAL PROCESSES WILL CONSIDER INSTANTANEOUS FLOW AS APPLICABLE.
3. BLENDING RATIO FOR RO REJECT = 1:1.

LEGEND:

- LIQUID FLOW
- RESIDUAL SOLIDS
- BACKWASH WASTE STREAM, DRAIN, AND WASTE STREAM

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Houston, TX 77019
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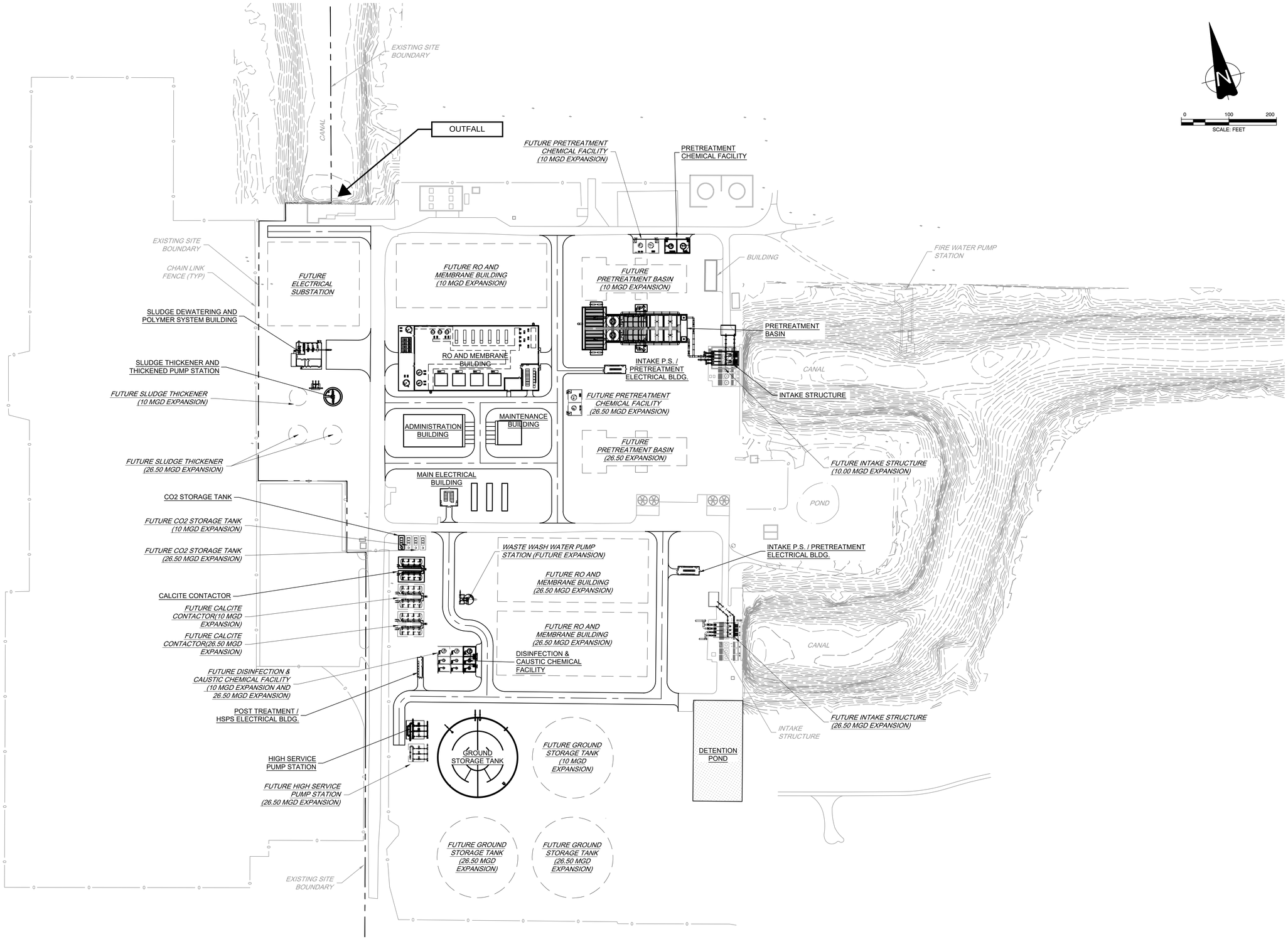
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WATER BALANCE BLOCK DIAGRAM

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PLAN

SCALE: 1"=100'

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PROPOSED OVERALL SITE PLAN

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