# 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

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# 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, el Aviso de Recepción de Solicitud e Intención de Obtener un Permiso)
   - Inglés
   - Idioma alternativo (español)
3. Solicitud original

**ENGLISH PLS**

Windy Hill Utility Company LLC (CN605145986) proposes to operate WHU-WRRF1 a Membrane Bioreactor (MBR) system that combines the activated sludge process with advanced membrane technology. The facility will be located at 2784 FM2001, in Buda, Hays County, Texas 78610. This application request is to renew a Texas Pollution Discharge Elimination System permit with a 0.68 MGD proposed final phase.

Discharges from the facility are expected to contain five-day biochemical oxygen demand (BOD-5), total suspended solids (TSS), and E.Coli. Domesic wastewater will be treated by an activated sludge process combined with advanced MBR technology and the treatment units include an influent screening system, Anoxic/EQ basin, aeration basin, membrane train, and a chlorination chamber.

**SPANISH PLS**

Windy Hill Utility Company LLC (CN605145986) propone operar WHU-WRRF1, una Sistema de biorreactor de membrana (MBR) que combina el proceso de lodos activados con tecnología avanzada de membranas. La instalación estará ubicada en 2784 FM2001 , en Buda, Condado de Hays, Texas 78610. Esta solicitud es para renovar un permiso del Sistema de Eliminación de Descargas Contaminantes de Texas con una fase final propuesta de 0.68 MGD.

Se espera que las descargas de la instalación contengan demanda bioquímica de oxígeno (DBO-5) de cinco días, sólidos suspendidos totales (SST) y E. Coli. Aguas residuales domésticas. están tratado por un proceso de lodos activados combinado con tecnología MBR avanzada y las unidades de tratamiento incluyen un sistema de cribado de afluentes, una cuenca anóxica/EQ, una balsa de aireación, un tren de membranas y una cámara decloración.

# TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

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

**PERMIT NO. WQ0015478001**

**APPLICATION.** Windy Hill Utility Company LLC, a Texas Limited Liability Company, P.O. Box 701201, San Antonio, Texas 78270, has applied to the Texas Commission on Environmental Quality (TCEQ) to renew Texas Pollutant Discharge Elimination System (TPDES) Permit No. WQ0015478001 (EPA I.D. No. TX0137111) to authorize the discharge of treated wastewater at a volume not to exceed a daily average flow of 680,000 gallons per day. The domestic wastewater treatment facility is located at 2784 Farm-to-Market Road 2001, near the city of Buda, in Hays County, Texas 78610. The discharge route is from the plant site to an unnamed tributary; thence to Brushy Creek; thence to a reservoir; thence to Brushy Creek; thence to Plum Creek. TCEQ received this application on October 30, 2024. The permit application will be available for viewing and copying at Kyle Public Library, 550 Scott Street, Kyle, 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=-97.806666,30.045833&level=18

**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.**

**TCEQ may act on an application to renew a permit for discharge of wastewater without providing an opportunity for a contested case hearing if certain criteria are met.**

**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 Windy Hill Utility Company LLC, a Texas Limited Liability Company at the address stated above or by calling Mr. Bill Fry, General Manager, at 210-209-8029.

Issuance Date: November 21, 2024

# 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**
**RENOVACION**

**PERMISO NO. WQ0015478001**

**SOLICITUD.** Windy Hill Utility Company LLC, a Texas Limited Liability company, P.O. Box 701201, San Antonio, Texas 78270, ha solicitado a la Comisión de Calidad Ambiental del Estado de Texas (TCEQ) para renovar el Permiso No. WQ0015478001 (EPA I.D. No. TX0137111) del Sistema de Eliminación de Descargas de Contaminantes de Texas (TPDES) para autorizar la descarga de aguas residuales tratadas en un volumen que no sobrepasa un flujo promedio diario de 680,000 por día. La planta está ubicada 2784 Farm-to-Market Road 2001, cerca de la ciudad de Buda, en el Condado de Hays, Texas 78610. La ruta de descarga es del sitio de la planta a un afluente sin nombre; Allía Brushy Creek; de allí a un embalse; de allí a Brushy Creek; de allí a Plum Creek. La TCEQ recibió esta solicitud el 30 de octubre 2024. La solicitud para el permiso está disponible para leerla y copiarla en Kyle Public Library, 550 Scott Street, Kyle, Texas. La solicitud (cualquier actualización y aviso inclusive) está disponible electrónicamente en la siguiente página de web: https://www.tceq.texas.gov/permitting/wastewater/pending-permits/tpdes-applications. Este enlace a un mapa electrónico de la ubicación general del sitio o de la instalación es proporcionado como una cortesía y no es parte de la solicitud o del aviso. Para la ubicación exacta, consulte la solicitud. https://gisweb.tceq.texas.gov/LocationMapper/?marker=-97.806666,30.045833&level=18

**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. Si ciertos criterios se cumplen, la TCEQ puede actuar sobre una solicitud para renovar un permiso sin proveer una oportunidad de una audiencia administrativa de lo contencioso.**

**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. Ademas, puede pedir que la TCEQ ponga su nombre en una or mas de las listas correos siguientes (1) la lista de correo permanente para recibir los avisos de el 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 envia por correo su pedido a la Oficina del Secretario Principal de la TCEQ.

**CONTACTOS E INFORMACIÓN DE LA TCEQ. Todos los comentarios escritos del público y los para pedidos una reunión deben ser presentados a la Oficina del Secretario Principal, MC 105, TCEQ, P.O. Box 13087, Austin, TX 78711-3087 o por el internet at www.tceq.texas.gov/about/comments.html.** 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. Si necesita más información en Español sobre esta solicitud para un permiso o el proceso del permiso, por favor llame a El Programa de Educación Pública de la TCEQ, sin cobro, al 1-800-687-4040. La información general sobre la TCEQ puede ser encontrada en nuestro sitio de la red: www.tceq.texas.gov.

También se puede obtener información adicional del Windy Hill Utility Company LLC, a Texas Limited Liability company, a la dirección indicada arriba o llamando a Mr. Bill Fry, General Manager al 210-209-8029.

Fecha de emisión 21 de noviembre de 2024

# Windy Hill Utility Company LLC

## WHU-WRRF1 Renewal

## TPDES No. WQ0015478001

October 29, 2024

# TCEQ ePay Receipt

**Transaction Information**

| | |
|---|---|
| **Trace Number:** | 582EA000631489 |
| **Date:** | 10/28/2024 11:58 AM |
| **Payment Method:** | CC - Authorization 0000B81033 |
| **ePay Actor:** | SAMANTHA MARIN |
| **TCEQ Amount:** | $1,615.00 |
| **Texas.gov Price::** | $1,651.59* |

* This service is provided by Texas.gov, the official website of Texas. The price of this service includes funds that support the ongoing operations and enhancements of Texas.gov, which is provided by a third party in partnership with the State.

**Payment Contact Information**

| | |
|---|---|
| **Name:** | SAMANTHA MARIN |
| **Company:** | WINDY HILL UTILITY COMPANY LLC |
| **Address:** | 503 E RAMSEY RD SUITE 201, SAN ANTONIO, TX 78216 |
| **Phone:** | 210-632-8645 |

**Cart Items**

| Voucher | Fee Description | AR Number | Amount |
|---|---|---|---|
| 727892 | WW PERMIT - FACILITY WITH FLOW >= .50 & < 1.0 MGD - RENEWAL | | $1,600.00 |
| 727893 | 30 TAC 305.53B WQ RENEWAL NOTIFICATION FEE | | $15.00 |
| | | **TCEQ Amount:** | **$1,615.00** |

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

# DOMESTIC WASTEWATER PERMIT APPLICATION CHECKLIST

**Complete and submit this checklist with the application.**

APPLICANT NAME: Windy Hill Utility Company LLC a Texas Limited Liability Company

PERMIT NUMBER (If new, leave blank): WQ00 15478001

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

| | Y | N |
|---|---|---|
| Administrative Report 1.0 | ☒ | ☐ |
| Administrative Report 1.1 | ☐ | ☒ |
| SPIF | ☒ | ☐ |
| Core Data Form | ☒ | ☐ |
| Public Involvement Plan Form | ☐ | ☒ |
| Technical Report 1.0 | ☒ | ☐ |
| Technical Report 1.1 | ☐ | ☒ |
| Worksheet 2.0 | ☒ | ☐ |
| Worksheet 2.1 | ☐ | ☒ |
| Worksheet 3.0 | ☐ | ☒ |
| Worksheet 3.1 | ☐ | ☒ |
| Worksheet 3.2 | ☐ | ☒ |
| Worksheet 3.3 | ☐ | ☒ |
| Worksheet 4.0 | ☐ | ☒ |
| Worksheet 5.0 | ☐ | ☒ |
| Worksheet 6.0 | ☐ | ☒ |
| Worksheet 7.0 | ☐ | ☒ |

| | Y | N |
|---|---|---|
| Original USGS Map | ☐ | ☒ |
| Affected Landowners Map | ☐ | ☒ |
| Landowner Disk or Labels | ☐ | ☒ |
| Buffer Zone Map | ☐ | ☒ |
| Flow Diagram | ☒ | ☐ |
| Site Drawing | ☐ | ☐ |
| Original Photographs | ☐ | ☒ |
| Design Calculations | ☐ | ☒ |
| Solids Management Plan | ☐ | ☒ |
| Water Balance | ☐ | ☒ |

For TCEQ Use Only

Segment Number _____County _____
Expiration Date _____Region_____
Permit Number _____

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

# DOMESTIC WASTEWATER PERMIT APPLICATION ADMINISTRATIVE REPORT 1.0

**For any questions about this form, please contact the Applications Review and Processing Team at 512-239-4671.**

## Section 1. Application Fees (Instructions Page 26)

**Indicate the amount submitted for the application fee (check only one).**

| Flow | New/Major Amendment | Renewal |
|---|---|---|
| <0.05 MGD | $350.00 ☐ | $315.00 ☐ |
| ≥0.05 but <0.10 MGD | $550.00 ☐ | $515.00 ☐ |
| ≥0.10 but <0.25 MGD | $850.00 ☐ | $815.00 ☐ |
| ≥0.25 but <0.50 MGD | $1,250.00 ☐ | $1,215.00 ☐ |
| ≥0.50 but <1.0 MGD | $1,650.00 ☐ | $1,615.00 ☒ |
| ≥1.0 MGD | $2,050.00 ☐ | $2,015.00 ☐ |

Minor Amendment (for any flow) $150.00 ☐

**Payment Information:**

Mailed Check/Money Order Number: Click to enter text.

Check/Money Order Amount: Click to enter text.

Name Printed on Check: Click to enter text.

EPAY Voucher Number: 582EA000631489

Copy of Payment Voucher enclosed? Yes ☒

## Section 2. Type of Application (Instructions Page 26)

**a.** Check the box next to the appropriate authorization type.

☐ Publicly-Owned Domestic Wastewater

☒ Privately-Owned Domestic Wastewater

☐ Conventional Wastewater Treatment

**b.** Check the box next to the appropriate facility status.

☒ Active ☐ Inactive

**c.** Check the box next to the appropriate permit type.

- ☒ TPDES Permit
- ☐ TLAP
- ☐ TPDES Permit with TLAP component
- ☐ Subsurface Area Drip Dispersal System (SADDS)

**d.** Check the box next to the appropriate application type

- ☐ New
- ☐ Major Amendment *with* Renewal
- ☐ Major Amendment *without* Renewal
- ☒ Renewal without changes
- ☐ Minor Amendment *with* Renewal
- ☐ Minor Amendment *without* Renewal
- ☐ Minor Modification of permit

**e.** For amendments or modifications, describe the proposed changes: N/A

**f. For existing permits**:

Permit Number: WQ00 15478001

EPA I.D. (TPDES only): TX 0137111

Expiration Date: May 8, 2025

## Section 3. Facility Owner (Applicant) and Co-Applicant Information (Instructions Page 26)

**A. The owner of the facility must apply for the permit.**

What is the Legal Name of the entity (applicant) applying for this permit?

Windy Hill Utility Company LLC a Texas limited liability company

*(The legal name must be spelled exactly as filed with the Texas Secretary of State, County, or in the legal documents forming the entity.)*

If the applicant is currently a customer with the TCEQ, what is the Customer Number (CN)? You may search for your CN on the TCEQ website at http://www15.tceq.texas.gov/crpub/

CN: 605145986

What is the name and title of the person signing the application? The person must be an executive official meeting signatory requirements in *30 TAC § 305.44*.

Prefix: Click to enter text. Last Name, First Name: Patel, Shilen

Title: President & CEO Credential: Click to enter text.

**B. Co-applicant information.** Complete this section only if another person or entity is required to apply as a co-permittee.

What is the Legal Name of the co-applicant applying for this permit?

N/A

*(The legal name must be spelled exactly as filed with the TX SOS, with the County, or in the legal documents forming the entity.)*

If the co-applicant is currently a customer with the TCEQ, what is the Customer Number (CN)? You may search for your CN on the TCEQ website at: http://www15.tceq.texas.gov/crpub/

CN: Click to enter text.

What is the name and title of the person signing the application? The person must be an executive official meeting signatory requirements in *30 TAC § 305.44*.

Prefix: Click to enter text. Last Name, First Name: Click to enter text.

Title: Click to enter text. Credential: Click to enter text.

Provide a brief description of the need for a co-permittee: Click to enter text.

**C. Core Data Form**

Complete the Core Data Form for each customer and include as an attachment. If the customer type selected on the Core Data Form is **Individual**, complete **Attachment 1** of Administrative Report 1.0. 'Administrative Report 1.0 Attachment 3.C Core Data Form'

## Section 4. Application Contact Information (Instructions Page 27)

This is the person(s) TCEQ will contact if additional information is needed about this application. Provide a contact for administrative questions and technical questions.

**A.** Prefix: Click to enter text. Last Name, First Name: Fry, Bill

Title: General Manager Credential: Click to enter text.

Organization Name: Windy Hill Utility Company LLC

Mailing Address: P.O. Box 701201 City, State, Zip Code: San Antonio, TX 78270

Phone No.: 210-209-8029 E-mail Address: billf@bvrtwater.com

Check one or both: ☒ Administrative Contact ☒ Technical Contact

**B.** Prefix: Click to enter text. Last Name, First Name: Marin, Samantha

Title: Regulatory Manager Credential: Click to enter text.

Organization Name: Windy Hill Utility Company LLC

Mailing Address: P.O. Box 701201 City, State, Zip Code: San Antonio, TX 78270

Phone No.: 210-632-8645 E-mail Address: samantham@bvrtwater.com

Check one or both: ☒ Administrative Contact ☒ Technical Contact

## Section 5. Permit Contact Information (Instructions Page 27)

Provide the names and contact information for two individuals that can be contacted throughout the permit term.

**A.** Prefix: Click to enter text. Last Name, First Name: Fry, Bill

Title: General Manager Credential: Click to enter text.

Organization Name: Windy Hill Utility Company LLC

Mailing Address: P.O. Box 701201 City, State, Zip Code: San Antonio, TX 78270

Phone No.: 210-209-8029 E-mail Address: billf@bvrtwater.com

**B.** Prefix: Click to enter text. Last Name, First Name: Marin, Samantha

Title: Regulatory Manager Credential: Click to enter text.

Organization Name: Windy Hill Utility Company LLC

Mailing Address: P.O. Box 701201 City, State, Zip Code: San Antonio, TX 78270

Phone No.: 210-632-8645 E-mail Address: samantham@bvrtwater.com

## Section 6. Billing Contact Information (Instructions Page 27)

The permittee is responsible for paying the annual fee. The annual fee will be assessed to 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 (using form TCEQ-20029).

Prefix: Click to enter text. Last Name, First Name: Diller, Carol

Title: Director of Accounting Credential: Click to enter text.

Organization Name: Windy Hill Utility Company LLC

Mailing Address: P.O. Box 701201 City, State, Zip Code: San Antonio, TX 78270

Phone No.: 210-209-8029 E-mail Address: accounting@bvrtwater.com

## Section 7. DMR/MER Contact Information (Instructions Page 27)

Provide the name and complete mailing address of the person delegated to receive and submit Discharge Monitoring Reports (DMR) (EPA 3320-1) or maintain Monthly Effluent Reports (MER).

Prefix: Click to enter text. Last Name, First Name: Marin, Samantha

Title: Regulatory Manager Credential: Click to enter text.

Organization Name: Windy Hill Utility Company LLC

Mailing Address: P.O. Box 701201 City, State, Zip Code: San Antonio, TX 78270

Phone No.: 210-632-8645 E-mail Address: samantham@bvrtwater.com

## Section 8. Public Notice Information (Instructions Page 27)

**A. Individual Publishing the Notices**

Prefix: Click to enter text. Last Name, First Name: Marin, Samantha

Title: Regulatory Manager Credential: Click to enter text.

Organization Name: Windy Hill Utility Company LLC

Mailing Address: P.O. Box 701201 City, State, Zip Code: San Antonio, TX 78270

Phone No.: 210-632-8645 E-mail Address: samantham@bvrtwater.com

**B. Method for Receiving Notice of Receipt and Intent to Obtain a Water Quality Permit Package**

Indicate by a check mark the preferred method for receiving the first notice and instructions:

☒ E-mail Address

☐ Fax

☐ Regular Mail

**C. Contact permit to be listed in the Notices**

Prefix: Click to enter text. Last Name, First Name: Fry, Bill

Title: General Manager Credential: Click to enter text.

Organization Name: Windy Hill Utility Company LLC

Mailing Address: P.O. Box 701201 City, State, Zip Code: San Antonio, TX 78270

Phone No.: 210-209-8029 E-mail Address: billf@bvrtwater.com

**D. Public Viewing Information**

*If the facility or outfall is located in more than one county, a public viewing place for each county must be provided.*

Public building name: Kyle Public Library

Location within the building: Click to enter text.

Physical Address of Building: 550 Scott St, Kyle, TX 78640

City: Kyle County: Hays

Contact (Last Name, First Name): N/A

Phone No.: 512-268-7411 Ext.: Click to enter text.

**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.

Please call the bilingual/ESL coordinator at the nearest elementary and middle schools and obtain the following information to determine whether an alternative language notices are 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** Section 9 below.

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

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. Plain Language Summary Template**

Complete the Plain Language Summary (TCEQ Form 20972) and include as an attachment.

**Attachment:** 'Administrative Report 1.0 Attachment 8.F Plain Language Summary'

**G. Public Involvement Plan Form**

Complete the Public Involvement Plan Form (TCEQ Form 20960) for each application for a **new permit or major amendment to a permit** and include as an attachment.

**Attachment:** N/A

## Section 9. Regulated Entity and Permitted Site Information (Instructions Page 29)

**A.** If the site is currently regulated by TCEQ, provide the Regulated Entity Number (RN) issued to this site. **RN** 109208553

Search the TCEQ's Central Registry at http://www15.tceq.texas.gov/crpub/ to determine if the site is currently regulated by TCEQ.

**B.** Name of project or site (the name known by the community where located):

WHU-WRRF1

**C.** Owner of treatment facility: Windy Hill Utility Company LLC

Ownership of Facility: ☐ Public ☒ Private ☐ Both ☐ Federal

**D.** Owner of land where treatment facility is or will be:

Prefix:N/A Last Name, First Name: N/A

Title: N/A Credential: N/A

Organization Name: Windy Hill Utility Company LLC

Mailing Address: P.O. Box 701201 City, State, Zip Code: San Antonio, TX 78270

Phone No.: 210-209-8029 E-mail Address: billf@bvrtwater.com

If the landowner is not the same person as the facility owner or co-applicant, attach a lease agreement or deed recorded easement. See instructions.

**Attachment:** Click to enter text.

**E.** Owner of effluent disposal site:

Prefix: Click to enter text. Last Name, First Name: Click to enter text.

Title: Click to enter text. Credential: Click to enter text.

Organization Name: Windy Hill Utility Company LLC

Mailing Address: Click to enter text. City, State, Zip Code: Click to enter text.

Phone No.: Click to enter text. E-mail Address: Click to enter text.

If the landowner is not the same person as the facility owner or co-applicant, attach a lease agreement or deed recorded easement. See instructions.

**Attachment:** N/A

**F.** Owner sewage sludge disposal site (if authorization is requested for sludge disposal on property owned or controlled by the applicant)::

Prefix: N/A Last Name, First Name: Click to enter text.

Title: Click to enter text. Credential: Click to enter text.

Organization Name: Click to enter text.

Mailing Address: Click to enter text. City, State, Zip Code: Click to enter text.

Phone No.: Click to enter text. E-mail Address: Click to enter text.

If the landowner is not the same person as the facility owner or co-applicant, attach a lease agreement or deed recorded easement. See instructions.

**Attachment:** Click to enter text.

## Section 10. TPDES Discharge Information (Instructions Page 31)

**A.** Is the wastewater treatment facility location in the existing permit accurate?

☒ Yes ☐ No

If **no**, **or a new permit application**, please give an accurate description:

Location is accurate however please note the registered address is 2784 FM 2001, Buda TX 78610

**B.** Are the point(s) of discharge and the discharge route(s) in the existing permit correct?

☒ Yes ☐ No

If **no**, **or a new or amendment permit application**, provide an accurate description of the point of discharge and the discharge route to the nearest classified segment as defined in 30 TAC Chapter 307:

N/A

City nearest the outfall(s): Buda

County in which the outfalls(s) is/are located: Hays

**C.** 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, provide copies of letters that show proof of contact and the approval letter upon receipt.

**Attachment:** Click to enter text.

**D.** 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: N/A

## Section 11. TLAP Disposal Information (Instructions Page 32)

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

☐ Yes ☐ No

If **no, or a new or amendment permit application**, provide an accurate description of the disposal site location:

N/A

**B.** City nearest the disposal site: N/A

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

**D.** For **TLAPs**, describe the routing of effluent from the treatment facility to the disposal site:

N/A

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

## Section 12. Miscellaneous Information (Instructions Page 32)

**A.** Is the facility located on or does the treated effluent cross American Indian Land?

☐ Yes ☒ No

**B.** If the existing permit contains an onsite sludge disposal authorization, is the location of the sewage sludge disposal site in the existing permit accurate?

☐ Yes ☐ No ☒ Not Applicable

If No, or if a new onsite sludge disposal authorization is being requested in this permit application, provide an accurate location description of the sewage sludge disposal site.

Click to enter text.

**C.** 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 formerly employed by the TCEQ who represented your company and was paid for service regarding the application: Click to enter text.

**D.** Do you owe any fees to the TCEQ?

☐ Yes ☒ No

If **yes**, provide the following information:

Account number: Click to enter text.

Amount past due: Click to enter text.

**E.** Do you owe any penalties to the TCEQ?

☐ Yes ☒ No

If **yes**, please provide the following information:

Enforcement order number: Click to enter text.

Amount past due: Click to enter text.

## Section 13. Attachments (Instructions Page 33)

Indicate which attachments are included with the Administrative Report. Check all that apply:

☐ Lease agreement or deed recorded easement, if the land where the treatment facility is located or the effluent disposal site are not owned by the applicant or co-applicant.

☐ Original full-size USGS Topographic Map with the following information:

- Applicant's property boundary
- Treatment facility boundary
- Labeled point of discharge for each discharge point (TPDES only)
- Highlighted discharge route for each discharge point (TPDES only)
- Onsite sewage sludge disposal site (if applicable)
- Effluent disposal site boundaries (TLAP only)
- New and future construction (if applicable)
- 1 mile radius information
- 3 miles downstream information (TPDES only)
- All ponds.

☐ Attachment 1 for Individuals as co-applicants

☐ Other Attachments. Please specify: Click to enter text.

## Section 14. Signature Page (Instructions Page 34)

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

Permit Number: WQ0015478001

Applicant: Windy Hill Utility Company LLC

Certification:

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.

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): Shilen Patel

Signatory title: President & CEO

Signature: _____ Date: 09/23/2024

(Use blue ink)

Subscribed and Sworn to before me by the said Shilen Patel as CEO of Windy Hill Utility Co.

on this 23rd day of September, 20 24.

My commission expires on the 9th day of September, 20 25.

Deborah Smith

Notary Public *[SEAL]*

DEBORAH SMITH
Notary Public, State of Texas
My Comm. Exp. 09-29-2025
ID No. 866910-3

_____

~~County, Texas~~

# DOMESTIC 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:** 'SUPPLEMENTAL PERMIT INFORMATION (SPIF) & USGS MAP'

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

# DOMESTIC WASTEWATER PERMIT APPLICATION TECHNICAL REPORT 1.0

For any questions about this form, please contact the Domestic Wastewater Permitting Team at 512-239-4671.

The following information is required for all renewal, new, and amendment applications.

## Section 1. Permitted or Proposed Flows (Instructions Page 43)

**A. Existing/Interim I Phase**

Design Flow (MGD): 0.12 MGD

2-Hr Peak Flow (MGD): 0.48 MGD

Estimated construction start date: Existing

Estimated waste disposal start date: Existing

**B. Interim II Phase**

Design Flow (MGD): 0.26 MGD

2-Hr Peak Flow (MGD): 1.04 MGD

Estimated construction start date: March 2025

Estimated waste disposal start date: April 2025

**C. Interim II Phase**

Design Flow (MGD): 0.40 MGD

2-Hr Peak Flow (MGD): 1.6 MGD

Estimated construction start date: November 2026

Estimated waste disposal start date: November 2027

**D. Final Phase**

Design Flow (MGD): 0.68 MGD

2-Hr Peak Flow (MGD): 2.72 MGD

Estimated construction start date: October 2028

Estimated waste disposal start date: October 2029

**E. Current Operating Phase**

Provide the startup date of the facility: December 11, 2023

## Section 2. Treatment Process (Instructions Page 43)

### A. Current Operating Phase

Provide a detailed description of the treatment process. **Include the type of treatment plant, mode of operation, and all treatment units.** Start with the plant's head works and finish with the point of discharge. Include all sludge processing and drying units. **If more than one phase exists or is proposed, a description of *each phase* must be provided**.

Please see 'Technical Report 1.0 Attachment 2.B Treatment Process Design Summary'

### B. Treatment Units

In Table 1.0(1), provide the treatment unit type, the number of units, and dimensions (length, width, depth) **of each treatment unit, accounting for *all* phases of operation.**

**Table 1.0(1) - Treatment Units**

| Treatment Unit Type | Number of Units | Dimensions (L x W x D) |
|---|---|---|
| Please see 'Technical Report 1.0 Attachment 2.B Treatment Process Design Summary' | | |
| | | |
| | | |
| | | |
| | | |
| | | |

### C. Process Flow Diagram

Provide flow diagrams for the existing facilities and **each** proposed phase of construction.

**Attachment**: 'Technical Report 1.0 Attachment 2.C Process Flow Diagrams'

## Section 3. Site Information and Drawing (Instructions Page 44)

Provide the TPDES discharge outfall latitude and longitude. Enter N/A if not applicable.

- Latitude: 30.044796
- Longitude: -97.806467

Provide the TLAP disposal site latitude and longitude. Enter N/A if not applicable.

- Latitude: N/A
- Longitude: N/A

Provide a site drawing for the facility that shows the following:

- The boundaries of the treatment facility;
- The boundaries of the area served by the treatment facility;
- If land disposal of effluent, the boundaries of the disposal site and all storage/holding ponds; and
- If sludge disposal is authorized in the permit, the boundaries of the land application or disposal site.

**Attachment**: Please see 'Technical Report 1.0 Attachment 3 Site Drawing'

Provide the name **and** a description of the area served by the treatment facility.

| |
|---|
| WHU-WRRF1 is currently serving five subdivisions in northeast Kyle, TX. Estates of Windy Hill (sf, 35-acres), Luxe of Buda (mf, 38-acres), Emma Park (sf, 60-acres), Porter Country (sf, 254-acres), Mansions at Kyle (sf, 68-acres); bounded on the north by Hillside Terrace, on the west by Dacy Lane, and on the east by FM 2001. Future expansion will include 260+ additional acres that are in different stages of development. |

Collection System Information **for wastewater TPDES permits only**: Provide information for each **uniquely owned** collection system, existing and new, served by this facility, including satellite collection systems. **Please see the instructions for a detailed explanation and examples.**

**Collection System Information**

| Collection System Name | Owner Name | Owner Type | Population Served |
|---|---|---|---|
| Estates of Windy Hill | WHU | Privately Owned | 558 |
| Luxe of Buda | Luxe of Buda | Privately Owned | 708 |
| Emma Park | WHU | Privately Owned | 765 |
| Porter Country | WHU | Privately Owned | 2937 |
| Mansions of Buda | Mansions of Buda | Privately Owned | 678 |

## Section 4. Unbuilt Phases (Instructions Page 45)

Is the application for a renewal of a permit that contains an unbuilt phase or phases?

☒ Yes ☐ No

**If yes**, does the existing permit contain a phase that has not been constructed **within five years** of being authorized by the TCEQ?

☒ Yes ☐ No

**If yes**, provide a detailed discussion regarding the continued need for the unbuilt phase. **Failure to provide sufficient justification may result in the Executive Director recommending denial of the unbuilt phase or phases**.

The final phase of is expected to be completed by October 2029 to provide service to 260+ additional acres including multi-family and single-family residential developments that are in different stages of growth.

## Section 5. Closure Plans (Instructions Page 45)

Have any treatment units been taken out of service permanently, or will any units be taken out of service in the next five years?

☐ Yes ☒ No

**If yes**, was a closure plan submitted to the TCEQ?

☐ Yes ☐ No

**If yes**, provide a brief description of the closure and the date of plan approval.

Click to enter text.

## Section 6. Permit Specific Requirements (Instructions Page 45)

**For applicants with an existing permit, check the Other Requirements or Special Provisions of the permit.**

**A. Summary transmittal**

Have plans and specifications been approved for the existing facilities and each proposed phase?

☒ Yes ☐ No

**If yes**, provide the date(s) of approval for each phase: Phase II - June 13, 2022

Provide information, including dates, on any actions taken to meet a *requirement or provision* pertaining to the submission of a summary transmittal letter. **Provide a copy of an approval letter from the TCEQ, if applicable**.

See 'Technical Report 1.0 Attachment 6.A TCEQ Approval Letter'

**B. Buffer zones**

Have the buffer zone requirements been met?

☒ Yes ☐ No

Provide information below, including dates, on any actions taken to meet the conditions of the buffer zone. If available, provide any new documentation relevant to maintaining the buffer zones.

N/A

**C. Other actions required by the current permit**

Does the *Other Requirements* or *Special Provisions* section in the existing permit require submission of any other information or other required actions? Examples include Notification of Completion, progress reports, soil monitoring data, etc.

☒ Yes ☐ No

**If yes**, provide information below on the status of any actions taken to meet the conditions of an *Other Requirement* or *Special Provision*.

See 'Technical Report 1.0 Attachment 6.C Notice of Completion'

**D. Grit and grease treatment**

***1. Acceptance of grit and grease waste***

Does the facility have a grit and/or grease processing facility onsite that treats and decants or accepts transported loads of grit and grease waste that are discharged directly to the wastewater treatment plant prior to any treatment?

☐ Yes ☒ No

**If No**, stop here and continue with Subsection E. Stormwater Management.

### 2. *Grit and grease processing*

Describe below how the grit and grease waste is treated at the facility. In your description, include how and where the grit and grease is introduced to the treatment works and how it is separated or processed. Provide a flow diagram showing how grit and grease is processed at the facility.

Click to enter text.

### 3. *Grit disposal*

Does the facility have a Municipal Solid Waste (MSW) registration or permit for grit disposal?

☐ Yes ☒ No

**If No**, contact the TCEQ Municipal Solid Waste team at 512-239-2335. Note: A registration or permit is required for grit disposal. Grit shall not be combined with treatment plant sludge. See the instruction booklet for additional information on grit disposal requirements and restrictions.

Describe the method of grit disposal.

Click to enter text.

### 4. *Grease and decanted liquid disposal*

Note: A registration or permit is required for grease disposal. Grease shall not be combined with treatment plant sludge. For more information, contact the TCEQ Municipal Solid Waste team at 512-239-2335.

Describe how the decant and grease are treated and disposed of after grit separation.

Click to enter text.

## E. Stormwater management

### *1. Applicability*

Does the facility have a design flow of 1.0 MGD or greater in any phase?

☐ Yes ☒ No

Does the facility have an approved pretreatment program, under 40 CFR Part 403?

☐ Yes ☒ No

**If no to both of the above**, then skip to Subsection F, Other Wastes Received.

### *2. MSGP coverage*

Is the stormwater runoff from the WWTP and dedicated lands for sewage disposal currently permitted under the TPDES Multi-Sector General Permit (MSGP), TXR050000?

☐ Yes ☐ No

**If yes**, please provide MSGP Authorization Number and skip to Subsection F, Other Wastes Received:

TXR05 Click to enter text. or TXRNE Click to enter text.

**If no**, do you intend to seek coverage under TXR050000?

☐ Yes ☐ No

### *3. Conditional exclusion*

Alternatively, do you intend to apply for a conditional exclusion from permitting based TXR050000 (Multi Sector General Permit) Part II B.2 or TXR050000 (Multi Sector General Permit) Part V, Sector T 3(b)?

☐ Yes ☐ No

**If yes**, please explain below then proceed to Subsection F, Other Wastes Received:

Click to enter text.

### *4. Existing coverage in individual permit*

Is your stormwater discharge currently permitted through this individual TPDES or TLAP permit?

☐ Yes ☐ No

**If yes**, provide a description of stormwater runoff management practices at the site that are authorized in the wastewater permit then skip to Subsection F, Other Wastes Received.

Click to enter text.

5. ***Zero stormwater discharge***

Do you intend to have no discharge of stormwater via use of evaporation or other means?

☐ Yes ☐ No

**If yes**, explain below then skip to Subsection F. Other Wastes Received.

Click to enter text.

Note: If there is a potential to discharge any stormwater to surface water in the state as the result of any storm event, then permit coverage is required under the MSGP or an individual discharge permit. This requirement applies to all areas of facilities with treatment plants or systems that treat, store, recycle, or reclaim domestic sewage, wastewater or sewage sludge (including dedicated lands for sewage sludge disposal located within the onsite property boundaries) that meet the applicability criteria of above. You have the option of obtaining coverage under the MSGP for direct discharges, (recommended), or obtaining coverage under this individual permit.

6. ***Request for coverage in individual permit***

Are you requesting coverage of stormwater discharges associated with your treatment plant under this individual permit?

☐ Yes ☐ No

**If yes**, provide a description of stormwater runoff management practices at the site for which you are requesting authorization in this individual wastewater permit and describe whether you intend to comingle this discharge with your treated effluent or discharge it via a separate dedicated stormwater outfall. Please also indicate if you intend to divert stormwater to the treatment plant headworks and indirectly discharge it to water in the state.

Click to enter text.

Note: Direct stormwater discharges to waters in the state authorized through this individual permit will require the development and implementation of a stormwater pollution prevention plan (SWPPP) and will be subject to additional

monitoring and reporting requirements. Indirect discharges of stormwater via headworks recycling will require compliance with all individual permit requirements including 2-hour peak flow limitations. All stormwater discharge authorization requests will require additional information during the technical review of your application.

## F. Discharges to the Lake Houston Watershed

Does the facility discharge in the Lake Houston watershed?

☐ Yes ☒ No

If yes, attach a Sewage Sludge Solids Management Plan. See Example 5 in the instructions. Click to enter text.

## G. Other wastes received including sludge from other WWTPs and septic waste

### *1. Acceptance of sludge from other WWTPs*

Does or will the facility accept sludge from other treatment plants at the facility site?

☐ Yes ☒ No

**If yes, attach sewage sludge solids management plan. See Example 5 of instructions.**

In addition, provide the date the plant started or is anticipated to start accepting sludge, an estimate of monthly sludge acceptance (gallons or millions of gallons), an estimate of the $BOD_5$ concentration of the sludge, and the design $BOD_5$ concentration of the influent from the collection system. Also note if this information has or has not changed since the last permit action.

Click to enter text.

Note: Permits that accept sludge from other wastewater treatment plants may be required to have influent flow and organic loading monitoring.

### *2. Acceptance of septic waste*

Is the facility accepting or will it accept septic waste?

☐ Yes ☒ No

**If yes**, does the facility have a Type V processing unit?

☐ Yes ☐ No

**If yes**, does the unit have a Municipal Solid Waste permit?

☐ Yes ☐ No

**If yes to any of the above**, provide the date the plant started or is anticipated to start accepting septic waste, an estimate of monthly septic waste acceptance (gallons or millions of gallons), an estimate of the $BOD_5$ concentration of the

septic waste, and the design $BOD_5$ concentration of the influent from the collection system. Also note if this information has or has not changed since the last permit action.

Click to enter text.

Note: Permits that accept sludge from other wastewater treatment plants may be required to have influent flow and organic loading monitoring.

3. ***Acceptance of other wastes (not including septic, grease, grit, or RCRA, CERCLA or as discharged by IUs listed in Worksheet 6)***

Is or will the facility accept wastes that are not domestic in nature excluding the categories listed above?

☐ Yes ☒ No

**If yes**, provide the date that the plant started accepting the waste, an estimate how much waste is accepted on a monthly basis (gallons or millions of gallons), a description of the entities generating the waste, and any distinguishing chemical or other physical characteristic of the waste. Also note if this information has or has not changed since the last permit action.

Click to enter text.

## Section 7. Pollutant Analysis of Treated Effluent (Instructions Page 50)

Is the facility in operation?

☒ Yes ☐ No

**If no**, this section is not applicable. Proceed to Section 8.

**If yes**, provide effluent analysis data for the listed pollutants. ***Wastewater treatment facilities*** complete Table 1.0(2). **W*ater treatment facilities*** discharging filter backwash water, complete Table 1.0(3). Provide copies of the laboratory results sheets. **These tables are not applicable for a minor amendment without renewal.** See the instructions for guidance.

Note: The sample date must be within 1 year of application submission.

**Table1.0(2) – Pollutant Analysis for Wastewater Treatment Facilities**

| Pollutant | Average Conc. | Max Conc. | No. of Samples | Sample Type | Sample Date/Time |
|---|---|---|---|---|---|
| $CBOD_5$, mg/l | Please See 'Technical Report 1.0 Attachment 7 Pollution Analysis Results' | | | | |
| Total Suspended Solids, mg/l | | | | | |
| Ammonia Nitrogen, mg/l | | | | | |
| Nitrate Nitrogen, mg/l | | | | | |
| Total Kjeldahl Nitrogen, mg/l | | | | | |
| Sulfate, mg/l | | | | | |
| Chloride, mg/l | | | | | |
| Total Phosphorus, mg/l | | | | | |
| pH, standard units | | | | | |
| Dissolved Oxygen*, mg/l | | | | | |
| Chlorine Residual, mg/l | | | | | |
| *E.coli* (CFU/100ml) freshwater | | | | | |
| Entercocci (CFU/100ml) saltwater | | | | | |
| Total Dissolved Solids, mg/l | | | | | |
| Electrical Conductivity, µmohs/cm, † | | | | | |
| Oil & Grease, mg/l | | | | | |
| Alkalinity ($CaCO_3$)*, mg/l | | | | | |

*TPDES permits only
†TLAP permits only

**Table1.0(3) – Pollutant Analysis for Water Treatment Facilities**

| Pollutant | Average Conc. | Max Conc. | No. of Samples | Sample Type | Sample Date/Time |
|---|---|---|---|---|---|
| Total Suspended Solids, mg/l | N/A | | | | |
| Total Dissolved Solids, mg/l | N/A | | | | |
| pH, standard units | N/A | | | | |
| Fluoride, mg/l | N/A | | | | |
| Aluminum, mg/l | N/A | | | | |
| Alkalinity ($CaCO_3$), mg/l | N/A | | | | |

## Section 8. Facility Operator (Instructions Page 50)

Facility Operator Name: Scott Manuel

Facility Operator's License Classification and Level: Class A Wastewater Treatment Operator

Facility Operator's License Number: WW0056927

## Section 9. Sludge and Biosolids Management and Disposal (Instructions Page 51)

**A. WWTP's Biosolids Management Facility Type**

Check all that apply. See instructions for guidance

- ☐ Design flow>= 1 MGD
- ☐ Serves >= 10,000 people
- ☐ Class I Sludge Management Facility (per 40 CFR § 503.9)
- ☒ Biosolids generator
- ☐ Biosolids end user – land application (onsite)
- ☐ Biosolids end user – surface disposal (onsite)
- ☐ Biosolids end user – incinerator (onsite)

**B. WWTP's Biosolids Treatment Process**

Check all that apply. See instructions for guidance.

- ☒ Aerobic Digestion
- ☐ Air Drying (or sludge drying beds)
- ☐ Lower Temperature Composting
- ☐ Lime Stabilization
- ☐ Higher Temperature Composting
- ☐ Heat Drying
- ☐ Thermophilic Aerobic Digestion
- ☐ Beta Ray Irradiation
- ☐ Gamma Ray Irradiation
- ☐ Pasteurization
- ☐ Preliminary Operation (e.g. grinding, de-gritting, blending)
- ☒ Thickening (e.g. gravity thickening, centrifugation, filter press, vacuum filter)
- ☐ Sludge Lagoon

☐ Temporary Storage (< 2 years)

☐ Long Term Storage (>= 2 years)

☐ Methane or Biogas Recovery

☐ Other Treatment Process: Click to enter text.

### C. Biosolids Management

Provide information on the *intended* biosolids management practice. Do not enter every management practice that you want authorized in the permit, as the permit will authorize all biosolids management practices listed in the instructions. Rather indicate the management practice the facility plans to use.

**Biosolids Management**

| Management Practice | Handler or Preparer Type | Bulk or Bag Container | Amount (dry metric tons) | Pathogen Reduction Options | Vector Attraction Reduction Option |
|---|---|---|---|---|---|
| Other | Off-site Third-Party Handler or Preparer | Not Applicable | Approximately 5 Dry Metric Tons Annually | N/A | N/A |

If "Other" is selected for Management Practice, please explain (e.g. monofill or transport to another WWTP): Biosolids are transported to another facility for further processing.

### D. Disposal site

Disposal site name: Wastewater Residuals Management LLC

TCEQ permit or registration number: 2384

County where disposal site is located: Travis

### E. Transportation method

Method of transportation (truck, train, pipe, other): Truck

Name of the hauler: Wastewater Transport Services

Hauler registration number: 24343

Sludge is transported as a:

Liquid ☐ semi-liquid ☒ semi-solid ☐ solid ☐

## Section 10. Permit Authorization for Sewage Sludge Disposal (Instructions Page 53)

### A. Beneficial use authorization

Does the existing permit include authorization for land application of sewage sludge for beneficial use?

☐ Yes ☒ No

**If yes**, are you requesting to continue this authorization to land apply sewage sludge for beneficial use?

☐ Yes ☐ No

**If yes**, is the completed **Application for Permit for Beneficial Land Use of Sewage Sludge (TCEQ Form No. 10451)** attached to this permit application (see the instructions for details)?

☐ Yes ☐ No

### B. Sludge processing authorization

Does the existing permit include authorization for any of the following sludge processing, storage or disposal options?

| | | |
|---|---|---|
| Sludge Composting | ☐ Yes | ☒ No |
| Marketing and Distribution of sludge | ☐ Yes | ☒ No |
| Sludge Surface Disposal or Sludge Monofill | ☐ Yes | ☒ No |
| Temporary storage in sludge lagoons | ☐ Yes | ☒ No |

**If yes** to any of the above sludge options and the applicant is requesting to continue this authorization, is the completed **Domestic Wastewater Permit Application: Sewage Sludge Technical Report (TCEQ Form No. 10056)** attached to this permit application?

☐ Yes ☐ No

## Section 11. Sewage Sludge Lagoons (Instructions Page 53)

Does this facility include sewage sludge lagoons?

☐ Yes ☒ No

If yes, complete the remainder of this section. If no, proceed to Section 12.

### A. Location information

The following maps are required to be submitted as part of the application. For each map, provide the Attachment Number.

- Original General Highway (County) Map:

  **Attachment**: Click to enter text.
- USDA Natural Resources Conservation Service Soil Map:

  **Attachment**: Click to enter text.
- Federal Emergency Management Map:

  **Attachment**: Click to enter text.

- Site map:

  **Attachment**: Click to enter text.

Discuss in a description if any of the following exist within the lagoon area. Check all that apply.

- ☐ Overlap a designated 100-year frequency flood plain
- ☐ Soils with flooding classification
- ☐ Overlap an unstable area
- ☐ Wetlands
- ☐ Located less than 60 meters from a fault
- ☐ None of the above

**Attachment**: Click to enter text.

If a portion of the lagoon(s) is located within the 100-year frequency flood plain, provide the protective measures to be utilized including type and size of protective structures:

Click to enter text.

**B. Temporary storage information**

Provide the results for the pollutant screening of sludge lagoons. These results are in addition to pollutant results in *Section 7 of Technical Report 1.0.*

Nitrate Nitrogen, mg/kg: Click to enter text.

Total Kjeldahl Nitrogen, mg/kg: Click to enter text.

Total Nitrogen (=nitrate nitrogen + TKN), mg/kg: Click to enter text.

Phosphorus, mg/kg: Click to enter text.

Potassium, mg/kg: Click to enter text.

pH, standard units: Click to enter text.

Ammonia Nitrogen mg/kg: Click to enter text.

Arsenic: Click to enter text.

Cadmium: Click to enter text.

Chromium: Click to enter text.

Copper: Click to enter text.

Lead: Click to enter text.

Mercury: Click to enter text.

Molybdenum: Click to enter text.

Nickel: Click to enter text.

Selenium: Click to enter text.

Zinc: Click to enter text.

Total PCBs: Click to enter text.

Provide the following information:

Volume and frequency of sludge to the lagoon(s): Click to enter text.

Total dry tons stored in the lagoons(s) per 365-day period: Click to enter text.

Total dry tons stored in the lagoons(s) over the life of the unit: Click to enter text.

**C. Liner information**

Does the active/proposed sludge lagoon(s) have a liner with a maximum hydraulic conductivity of $1x10^{-7}$ cm/sec?

☐ Yes ☐ No

**If yes**, describe the liner below. Please note that a liner is required.

Click to enter text.

**D. Site development plan**

Provide a detailed description of the methods used to deposit sludge in the lagoon(s):

Click to enter text.

Attach the following documents to the application.

- Plan view and cross-section of the sludge lagoon(s)

  **Attachment**: Click to enter text.
- Copy of the closure plan

  **Attachment**: Click to enter text.
- Copy of deed recordation for the site

**Attachment**: Click to enter text.

- Size of the sludge lagoon(s) in surface acres and capacity in cubic feet and gallons

  **Attachment**: Click to enter text.

- Description of the method of controlling infiltration of groundwater and surface water from entering the site

  **Attachment**: Click to enter text.

- Procedures to prevent the occurrence of nuisance conditions

  **Attachment**: Click to enter text.

### E. Groundwater monitoring

Is groundwater monitoring currently conducted at this site, or are any wells available for groundwater monitoring, or are groundwater monitoring data otherwise available for the sludge lagoon(s)?

☐ Yes ☐ No

If groundwater monitoring data are available, provide a copy. Provide a profile of soil types encountered down to the groundwater table and the depth to the shallowest groundwater as a separate attachment.

**Attachment:** Click to enter text.

## Section 12. Authorizations/Compliance/Enforcement (Instructions Page 55)

### A. Additional authorizations

Does the permittee have additional authorizations for this facility, such as reuse authorization, sludge permit, etc?

☒ Yes ☐ No

**If yes**, provide the TCEQ authorization number and description of the authorization:

Reclaimed Water Authorization R15478-001

### B. Permittee enforcement status

Is the permittee currently under enforcement for this facility?

☐ Yes ☒ No

Is the permittee required to meet an implementation schedule for compliance or enforcement?

☐ Yes ☒ No

**If yes** to either question, provide a brief summary of the enforcement, the implementation schedule, and the current status:

Click to enter text.

## Section 13. RCRA/CERCLA Wastes (Instructions Page 55)

### A. RCRA hazardous wastes

Has the facility received in the past three years, does it currently receive, or will it receive RCRA hazardous waste?

☐ Yes ☒ No

### B. Remediation activity wastewater

Has the facility received in the past three years, does it currently receive, or will it receive CERCLA wastewater, RCRA remediation/corrective action wastewater or other remediation activity wastewater?

☐ Yes ☒ No

### C. Details about wastes received

**If yes** to either Subsection A or B above, provide detailed information concerning these wastes with the application.

**Attachment:** N/A

## Section 14. Laboratory Accreditation (Instructions Page 56)

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: Shilen Patel

Title: President & CEO

Signature: _____

Date: 09/23/2024

# DOMESTIC WASTEWATER PERMIT APPLICATION WORKSHEET 2.0: RECEIVING WATERS

The following information is required for all TPDES permit applications.

## Section 1. Domestic Drinking Water Supply (Instructions Page 64)

Is there a surface water intake for domestic drinking water supply located within 5 miles downstream from the point or proposed point of discharge?

☐ Yes ☒ No

If **no**, proceed it Section 2. **If yes**, provide the following:

Owner of the drinking water supply: Click to enter text.

Distance and direction to the intake: Click to enter text.

Attach a USGS map that identifies the location of the intake.

**Attachment**: Click to enter text.

## Section 2. Discharge into Tidally Affected Waters (Instructions Page 64)

Does the facility discharge into tidally affected waters?

☐ Yes ☒ No

If **no**, proceed to Section 3. **If yes**, complete the remainder of this section. If no, proceed to Section 3.

### A. Receiving water outfall

Width of the receiving water at the outfall, in feet: Click to enter text.

### B. Oyster waters

Are there oyster waters in the vicinity of the discharge?

☐ Yes ☐ No

**If yes**, provide the distance and direction from outfall(s).

Click to enter text.

### C. Sea grasses

Are there any sea grasses within the vicinity of the point of discharge?

☐ Yes ☐ No

**If yes**, provide the distance and direction from the outfall(s).

Click to enter text.

## Section 3. Classified Segments (Instructions Page 64)

Is the discharge directly into (or within 300 feet of) a classified segment?

☐ Yes ☒ No

**If yes**, this Worksheet is complete.

**If no**, complete Sections 4 and 5 of this Worksheet.

## Section 4. Description of Immediate Receiving Waters (Instructions Page 65)

Name of the immediate receiving waters: Unnamed Tributary

### A. Receiving water type

Identify the appropriate description of the receiving waters.

☐ Stream

☐ Freshwater Swamp or Marsh

☐ Lake or Pond

Surface area, in acres: Click to enter text.

Average depth of the entire water body, in feet: Click to enter text.

Average depth of water body within a 500-foot radius of discharge point, in feet: Click to enter text.

☐ Man-made Channel or Ditch

☐ Open Bay

☐ Tidal Stream, Bayou, or Marsh

☒ Other, specify: Unnamed Tributary

### B. Flow characteristics

If a stream, man-made channel or ditch was checked above, provide the following. For existing discharges, check one of the following that best characterizes the area *upstream* of the discharge. For new discharges, characterize the area *downstream* of the discharge (check one).

☒ Intermittent - dry for at least one week during most years

☐ Intermittent with Perennial Pools - enduring pools with sufficient habitat to maintain significant aquatic life uses

☐ Perennial - normally flowing

Check the method used to characterize the area upstream (or downstream for new dischargers).

☐ USGS flow records

☒ Historical observation by adjacent landowners

☒ Personal observation

☐ Other, specify: Click to enter text.

### C. Downstream perennial confluences

List the names of all perennial streams that join the receiving water within three miles downstream of the discharge point.

N/A – No perennial streams within three miles downstream of discharge point.

### D. Downstream characteristics

Do 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**, discuss how.

Click to enter text.

### E. Normal dry weather characteristics

Provide general observations of the water body during normal dry weather conditions.

The water body appeared to be in normal conditions during observation.

Date and time of observation: October 3, 2024 @ 3:30 pm

Was the water body influenced by stormwater runoff during observations?

☐ Yes ☒ No

## Section 5. General Characteristics of the Waterbody (Instructions Page 66)

### A. Upstream influences

Is the immediate receiving water upstream of the discharge or proposed discharge site influenced by any of the following? Check all that apply.

☐ Oil field activities
☐ Urban runoff
☐ Upstream discharges
☐ Agricultural runoff
☐ Septic tanks
☒ Other(s), specify: N/A – No Upstream

**B. Waterbody uses**

Observed or evidences of the following uses. Check all that apply.

- ☐ Livestock watering
- ☐ Irrigation withdrawal
- ☐ Fishing
- ☐ Domestic water supply
- ☐ Park activities
- ☐ Contact recreation
- ☐ Non-contact recreation
- ☐ Navigation
- ☐ Industrial water supply
- ☒ Other(s), specify: Unnamed tributary appears to be used for conveyance of rainfall runoff.

**C. Waterbody aesthetics**

Check one of the following that best describes the aesthetics of the receiving water and the surrounding area.

- ☐ Wilderness: outstanding natural beauty; usually wooded or unpastured area; water clarity exceptional
- ☒ Natural Area: trees and/or native vegetation; 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

# ADMINISTRATIVE REPORT 1.0
# ATTACHMENT 3.C
# CORE DATA FORM

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)* |
|---|---|---|
| CN 605145986 | | RN 109208553 |

## SECTION II: Customer Information

**4. General Customer Information** | **5. Effective Date for Customer Information Updates** (mm/dd/yyyy) 8/27/2024

☐ 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:*

Windy Hill Utility Company LLC a Texas Limited Liability

| 7. TX SOS/CPA Filing Number | 8. TX State Tax ID (11 digits) | 9. Federal Tax ID (9 digits) | 10. DUNS Number *(if applicable)* |
|---|---|---|---|
| 0802295754 | 32058344485 | 810984 | |

**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:**

P.O. Box 701201

| City | State | ZIP | ZIP + 4 |
|---|---|---|---|
| San Antonio | TX | 78270 | |

| 16. Country Mailing Information *(if outside USA)* | 17. E-Mail Address *(if applicable)* |
|---|---|
| | samantham@bvrtwater.com |

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

| | | |
|---|---|---|
| ( 210 ) 209-8029 | | ( ) - |

## 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.)*

WHU-WRRF1

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **23. Street Address of the Regulated Entity:** ***(No PO Boxes)*** | 2784 FM 2001 | | | | | | | |
| | **City** | Buda | **State** | TX | **ZIP** | 78610 | **ZIP + 4** | |
| **24. County** | Hays | | | | | | | |

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

| | | | | | |
|---|---|---|---|---|---|
| **25. Description to Physical Location:** | | | | | |
| **26. Nearest City** | | | **State** | | **Nearest ZIP Code** |
| Buda | | | TX | | |

***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:** | 30.045833 | | **28. Longitude (W) In Decimal:** | -97.806667 | |
| Degrees | Minutes | Seconds | Degrees | Minutes | Seconds |
| 30 | 02 | 45.0"N | 97 | 48 | 24.0" |

| | | | |
|---|---|---|---|
| **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) |
| 4952 | | 22132 | |

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

Wastewater Treatment

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **34. Mailing Address:** | **P.O. Box 701201** | | | | | | | |
| | **City** | **San Antonio** | **State** | **TX** | **ZIP** | **78270** | **ZIP + 4** | |
| **35. E-Mail Address:** | **billf@bvrtwater.com** | | | | | | | |

| | | |
|---|---|---|
| **36. Telephone Number** | **37. Extension or Code** | **38. Fax Number** *(if applicable)* |
| **( 210 ) 209-8029** | | ( ) - |

**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:** | Samantha Marin | | **41. Title:** | Regulatory Manager |
|---|---|---|---|---|
| **42. Telephone Number** | **43. Ext./Code** | **44. Fax Number** | **45. E-Mail Address** | |
| ( 210 ) 632-8645 | | (  )  - | samantham@bvrtwater.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:** | Windy Hill Utility Company LLC | **Job Title:** | President and CEO | |
|---|---|---|---|---|
| **Name** *(In Print):* | Shilen Patel | | **Phone:** | ( 210 ) 209- **8029** |
| **Signature:** |  | | **Date:** | 09/23/24 |

# ADMINISTRATIVE REPORT 1.0
# ATTACHMENT 8.F
# PLAIN LANGUAGE SUMMARY

**ENGLISH PLS**

Windy Hill Utility Company LLC (CN605145986) proposes to operate WHU-WRRF1 a Membrane Bioreactor (MBR) system that combines the activated sludge process with advanced membrane technology. The facility will be located at 2784 FM2001, in Buda, Hays County, Texas 78610. This application request is to renew a Texas Pollution Discharge Elimination System permit with a 0.68 MGD proposed final phase.

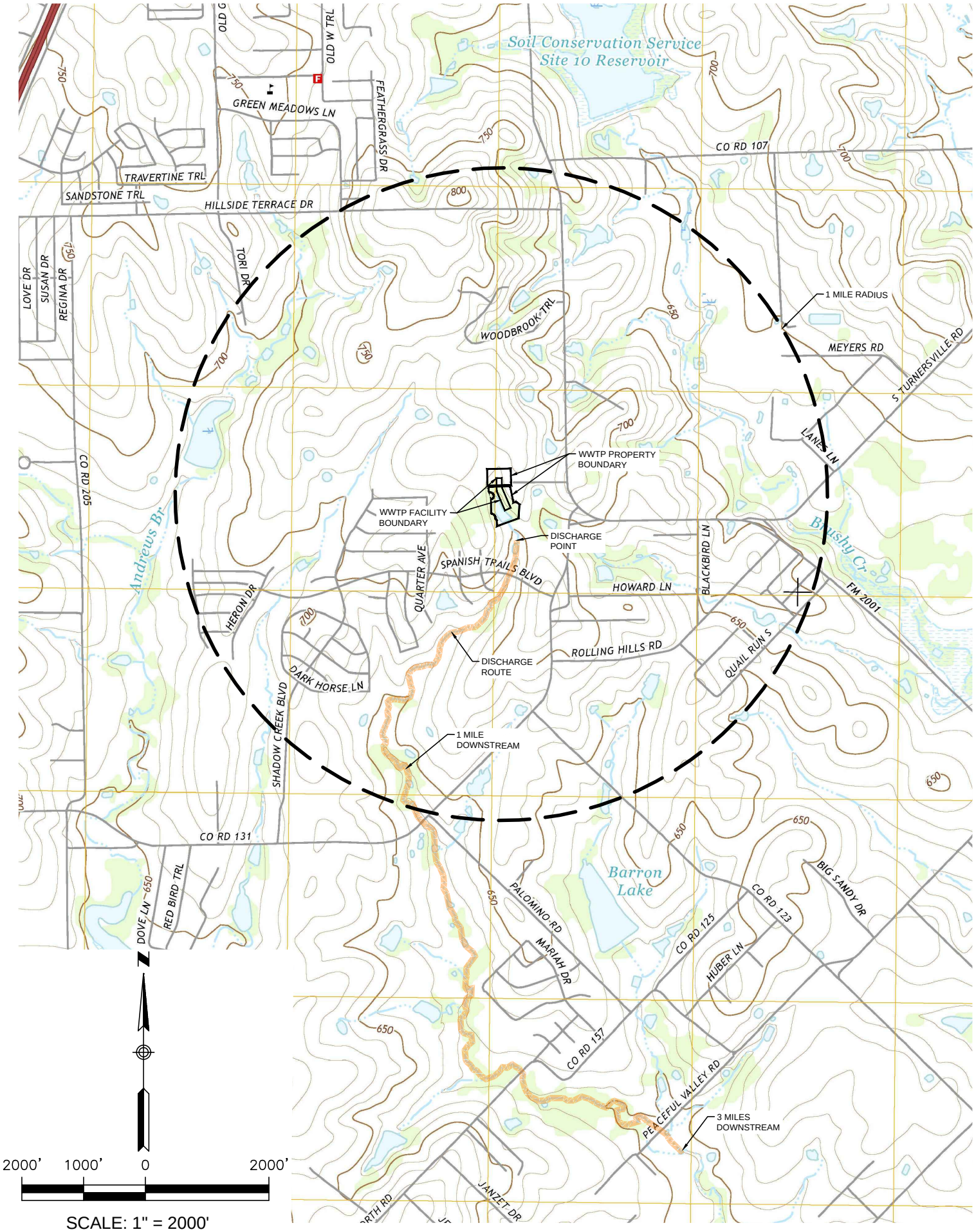
Discharges from the facility are expected to contain five-day biochemical oxygen demand (BOD-5), total suspended solids (TSS), and E.Coli. Domesic wastewater will be treated by an activated sludge process combined with advanced MBR technology and the treatment units include an influent screening system, Anoxic/EQ basin, aeration basin, membrane train, and a chlorination chamber.

**SPANISH PLS**

Windy Hill Utility Company LLC (CN605145986) propone operar WHU-WRRF1, una Sistema de biorreactor de membrana (MBR) que combina el proceso de lodos activados con tecnología avanzada de membranas. La instalación estará ubicada en 2784 FM2001 , en Buda, Condado de Hays, Texas 78610. Esta solicitud es para renovar un permiso del Sistema de Eliminación de Descargas Contaminantes de Texas con una fase final propuesta de 0.68 MGD.

Se espera que las descargas de la instalación contengan demanda bioquímica de oxígeno (DBO-5) de cinco días, sólidos suspendidos totales (SST) y E. Coli. Aguas residuales domésticas. están tratado por un proceso de lodos activados combinado con tecnología MBR avanzada y las unidades de tratamiento incluyen un sistema de cribado de afluentes, una cuenca anóxica/EQ, una balsa de aireación, un tren de membranas y una cámara decloración.

# ADMINISTRATIVE REPORT 1.0
# ATTACHMENT 13
# USGS MAP


Soil Conservation Service
Site 10 Reservoir
1 MILE RADIUS
WWTP PROPERTY
BOUNDARY
WWTP FACILITY
BOUNDARY
DISCHARGE
POINT
DISCHARGE
ROUTE
1 MILE
DOWNSTREAM
3 MILES
DOWNSTREAM
Barron
Lake
Andrews Br
Branshy Cr
CO RD 107
CO RD 205
CO RD 131
CO RD 125
CO RD 123
CO RD 157
GREEN MEADOWS LN
TRAVERTINE TRL
SANDSTONE TRL
HILLSIDE TERRACE DR
FEATHERGRASS DR
OLD W TRL
TORI DR
LOVE DR
SUSAN DR
REGINA DR
WOODBROOK TRL
MEYERS RD
S TURNERSVILLE RD
LANES LN
BLACKBIRD LN
FM 2001
HOWARD LN
SPANISH TRAILS BLVD
QUARTER AVE
HERON DR
ROLLING HILLS RD
QUAIL RUN S
DARK HORSE LN
SHADOW CREEK BLVD
DOVE LN
RED BIRD TRL
PALOMINO RD
MARIAH DR
HUBER LN
BIG SANDY DR
PEACEFUL VALLEY RD
JANZET DR
2000’ 1000’ 0 2000’
SCALE: 1" = 2000'

# SUPPLEMENTAL PERMIT INFORMATION (SPIF) & USGS MAP

# 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: Windy Hill Utility Company LLC

   Permit No. WQ00 15478001 EPA ID No. TX 0137111

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

   2784 FM 2001, Buda, TX 78610

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): Click here to enter text.

First and Last Name: Bill Fry

Credential (P.E, P.G., Ph.D., etc.): Click here to enter text.

Title: General Manager

Mailing Address: PO Box 701201

City, State, Zip Code: San Antonio TX 78270

Phone No.: 210-209-8029 Ext.: Click here to enter text. Fax No.: Click here to enter text.

E-mail Address: billf@bvrtwater.com

2. List the county in which the facility is located: Hays
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.

Discharge flows into an unnamed tributary; thence to Bushy Creek; thence to a reservoir; thence to Bushy Creek; thence to Plum Creek Segment No. 1810 of the Guadalupe River Basin.

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):

The Wastewater Treatment property is currently 5.3-acres and has expanded to include an additional 2 acres to accommodate growth. Excavation is anticipated to be no more than ten (10) feet deep. No caves or karst features are anticipated to be encountered.

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

Existing disturbances include an existing detention area. Vegetation is natural to the area.Land Use includes residential developments

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:

Phase 1 construction was completed September 2018. Phase 2 was completed December 2023.

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

N/A

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

USGS science for a changing world

The National Map US Topo

# BUDA QUADRANGLE
TEXAS
7.5-MINUTE SERIES

97°52'30" 97°45' 30°07'30" 30°00'
3 080 000 FEET (TX C) 2 360 000 FEET (TX SC)
2 330 000 FEET (TX SC) 3 110 000 FEET (TX C)
10 010 000 FEET (TX C) 13 950 000 FEET (TX SC)
13 920 000 FEET (TX SC) 9 980 000 FEET (TX C)

Hays
Creedmoor
Carl Cem
Woods Hill
Turnersville
BUDA
Allen Cem
Antioch Cem
Barton Cem
Martin Church Cem
Niederwald
KYLE
Manchaca Springs
Heep Lake
Soil Conservation Service Site 10 Reservoir
Soil Conservation Service Site 12 Reservoir
Soil Conservation Service Site 5 Reservoir
Soil Conservation Service Site 6 Reservoir
Barron Lake
Lake Number 1
TRAVIS CO
HAYS CO
Garlic Cr
Onion Cr
Rinard Cr
Marble Cr
Brushy Cr
Maha Cr
Elm Cr
Mustang Br
Buntion Br
Plum Cr
Andrews Br
Richmond Br
WWTP PROPERTY BOUNDARY
WWTP FACILITY BOUNDARY
DISCHARGE POINT
DISCHARGE ROUTE
1 MILE DOWNSTREAM

## 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 14R
10 000-foot ticks: Texas Coordinate System of 1983 (south central and central zones)

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, August 2014
Roads..... U.S. Census Bureau, 2014 - 2015
Names.....GNIS, 2015
Hydrography.....National Hydrography Dataset, 2014
Contours.....National Elevation Dataset, 2002
Boundaries.....Multiple sources; see metadata file 1972 - 2015

Wetlands.....FWS National Wetlands Inventory 1977 - 2014

MN GN 4° 7' 73 MILS 0° 36' 11 MILS
UTM GRID AND 2016 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

| U.S. National Grid |
|---|
| 100,000-m Square ID: PU |
| Grid Zone Designation: 14R |

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, 2011.
A metadata file associated with this product is draft version 0.6.19

TEXAS
QUADRANGLE LOCATION

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

| | | |
|---|---|---|
| 1 | 2 | 3 |
| 4 | | 5 |
| 6 | 7 | 8 |

1 Signal Hill
2 Oak Hill
3 Montopolis
4 Mountain City
5 Creedmoor
6 San Marcos North
7 Uhland
8 Lockhart North

ADJOINING QUADRANGLES

**BUDA, TX**
**2016**

NSN 7643016395271
NGA REF NO. USGSX24K5986

# DOMESTIC TECHNICAL REPORT 1.0

# ATTACHMENT 2

# TREATMENT PROCESS DESIGN SUMMARY

# WHU-WRRF1 Treatment Process Design Summary

The following report provides a summary of the process design used for the Membrane Bioreactor (MBR) wastewater treatment system to be supplied for the new Windy Hill Utility WRRF1 (WHU-WRRF1). The proposed Wastewater Treatment Plant is a state-of-the-art Membrane Bioreactor (MBR) system, employing the most advanced membrane technology, and providing a cost-efficient and user-friendly wastewater treatment solution. The system is designed to biodegrade high strength domestic waste into simple compounds, resulting in a high-quality effluent suitable for stream discharge or reuse.

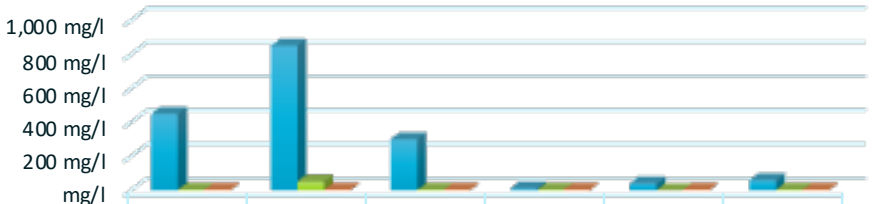
The MBR system is a bioreactor that combines the activated sludge process with advanced membrane technology. The process utilizes naturally occurring microorganisms in an environment where they can biodegrade the organic material present in the wastewater into carbon dioxide and water. The treatment process steps include:

1. Pre-treatment and Equalization
2. Biological Reduction
3. Membrane Filtration
4. 2 Stage Nutrient Removal
5. Effluent Disinfection

There are 3 expansion phases from the existing 0.12 MGD phase for this facility. Phase 1 is a concrete tank system with 120,000 gpd of capacity, Phase 2 will provide 260,000 gpd of capacity and a parallel plant will be added in Phase 3 to achieve a total of 400,000 gpd of capacity, an additional treatment train will be added to provide 680,000 gpd capacity in Phase 4.

# Process Summary for Phase 1 - 120,000 GPD

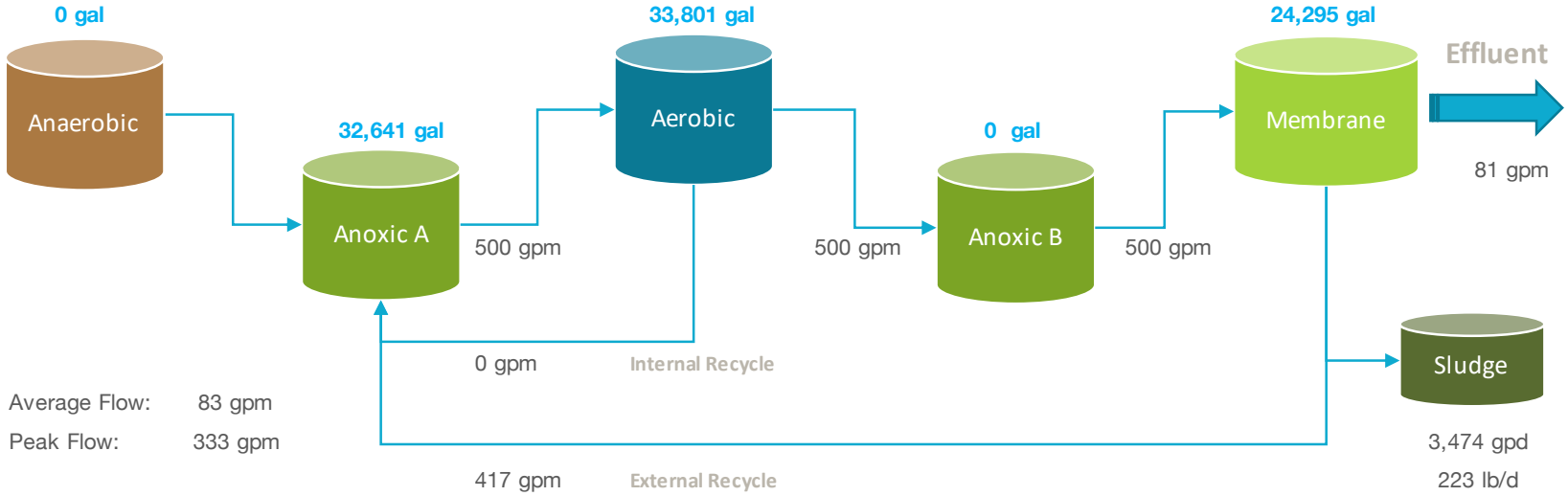
## Influent & Effluent Parameters




| | BOD | COD | TSS | P | NH4 | TN |
|---|---|---|---|---|---|---|
| Influent | 450 mg/l | 850 mg/l | 300 mg/l | 10 mg/l | 40 mg/l | 60 mg/l |
| Effluent | 2.0 mg/l | 51.0 mg/l | 1.0 mg/l | 1.0 mg/l | 0.4 mg/l | 2.2 mg/l |
| Removal | 99.6% | 94.0% | 99.7% | 90.0% | 99.1% | 96.4% |

## PROCESS PARAMETERS

| | |
|---|---|
| Sludge Age | 25 d |
| Total Reactor Volume | 90,737 gal |
| Total SOR | 893 kgO2/d |
| MLSS in Anoxic / Aerobic Tank | 7,652 mg/l |
| MLSS in Membrane Tank | 9,246 mg/l |
| HRT | 18 h |
| F/M RATIO (BOD) | 0.080 |
| F/M RATIO (COD) | 0.152 |
| Total Membrane Surface | 32,550 sf |




| Aeration | Flow | Pressure |
|---|---|---|
| EQ | 29 scfm | 5.5 psi |
| Sludge | 65 scfm | 7.5 psi |
| Aerobic | 287 scfm | 7.5 psi |
| Membrane | 372 scfm | 7.5 psi |

**Applied Options:**

| | |
|---|---|
| NO | DAF |
| NO | RO |

2/16/22

# Biological Process Calculation

| Influent Charateristics | Symbol | Value | Units |
|---|---|---|---|
| Type of wastewater | | municipal | |
| Temperature | T | 20 | °C |
| pH | - | 7.0 | - |
| $H_2CO_3$ alkalinity | $Alk_i$ | 250 | mg/l as $CaCO_3$ |
| Site pressure / elevation | $p_{a,i}$ | 14.7 | psi |
| Average daily flow | $Q_i$ | 120,000 | gpd |
| Peak daily flow | $Q_{i,\ max,d}$ | 240,000 | gpd |
| Hourly peak flow | $Q_{i,\ max,p}$ | 333 | gpm |
| Peak factor | - | 4.0 | - |
| Average daily flow | $Q_i$ | 454 | $m^3/d$ |
| Max. monthly average daily flow | $Q_{i,\ max,d}$ | 908 | $m^3/d$ |
| Hourly peak flow | $Q_{i,\ max,h}$ | 75.7 | $m^3/h$ |
| Total BOD | $S_{BOD,i}$ | 450 | mgBOD/l |
| Total COD | $S_{COD,i}$ | 850 | mgCOD/l |
| COD/BOD ratio | - | 1.89 | - |
| Rapidly biodegradable COD | $S_{s,i}$ | 213 | mgCOD/l |
| Volitale fatty acids (VFA) | $S_{VFA,i}$ | 32 | mgCOD/l |
| Fermentable COD | $S_{F,i}$ | 180 | mgCOD/l |
| Slowly biodegradable COD | $S_{ss,i}$ | 459 | mgCOD/l |
| Biodegradable COD | $S_{bio,i}$ | 672 | mgCOD/l |
| Soluble inert COD | $S_{SIN,i}$ | 51 | mgCOD/l |
| Particulate inert COD | $S_{PIN,i}$ | 128 | mgCOD/l |

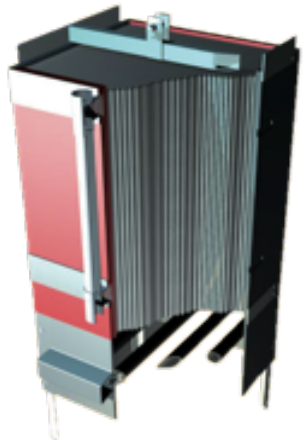
| Influent Charateristics | Symbol | Value | Units |
|---|---|---|---|
| $NO_3$ | $N_{NO3,i}$ | 0.0 | mg/l |
| $NH_4$ | $N_{a,i}$ | 40.0 | mg/l |
| TKN | $N_{TKN,i}$ | 60.0 | mg/l |
| TP | $P_i$ | 10.0 | mg/l |
| Dissolved Oxygen | $S_{O2,i}$ | 0.0 | mg/l |
| FSA fraction | $f_{a/TKN,i}$ | 0.7 | - |
| Fixed (inorganic) suspended solids | $X_{FSS,i}$ | 47.5 | mgISS/l |
| TSS concentration | $S_{TSS,i}$ | 300.0 | mgTSS/l |
| Total BOD mass | $FS_{BOD,i}$ | 204.4 | kgBOD/d |
| Total COD mass | $FS_{COD,i}$ | 386.1 | kgCOD/d |
| Total $NH_4$ mass | $FS_{a,i}$ | 18.2 | kg$NH_4$/d |
| Total TKN mass | $FS_{TKN,i}$ | 27.3 | kgTKN/d |
| Total P mass | $FS_{P,i}$ | 4.5 | kgP/d |

| Effluent Characteristics | Symbol | Value | Units |
|---|---|---|---|
| Waste Sludge | $FX_t$ | 223 | lb/d |
| Waste Sludge | $Q_w$ | 3,474 | gpd |
| Effluent BOD | $S_{BOD,e}$ | < 3 | mgBOD/l |
| Effluent COD | $S_{COD,e}$ | 51 | mgCOD/l |
| Effluent TSS | $S_{TSS,e}$ | 1.0 | mgTSS/l |
| Effluent P | $P_e$ | 1.0 | mgP/l |
| Effluent $NH_4$ | $N_{a,e}$ | 0.4 | mgN/l |
| Effluent $NO_3$ | $N_{NO3,e}$ | 0.0 | mgN/l |
| Effluent TN ($N_{ne}$ + $N_{te}$) | $N_{t,e}$ | 2.2 | mgN/l |

| Bioreactor Characteristics | Symbol | Value | Units |
|---|---|---|---|
| Temperature | $T_{bio}$ | 20 | °C |
| Sludge retention time / Sludge age | SRT | 25 | d |
| Reactor volume | $V_{P,chosen}$ | 90,737 | gallons |
| Reactor volume | $V_{P,chosen}$ | 343 | $m^3$ |
| Reactor volume | $V_{P,calc}$ | 86,852 | gallons |
| Average MLSS concentration | $X_{TSS}$ | 7,750 | mgTSS/l |
| Food to microorganism ratio | $F/M_{BOD,used}$ | 0.080 | kgBOD/kgMLSS |
| Food to microorganism ratio | $F/M_{COD,used}$ | 0.152 | kgCOD/kgMLSS |
| Membrane tank MLSS concentration | $X_M$ | 9,246 | mgTSS/l |
| Aerobic/Anoxic tank MLSS concentration | $X_{Bio}$ | 7,652 | mgTSS/l |
| Number of anaerobic zones | $\#_{AN}$ | 0 | - |
| Number of anoxic zones | $\#_{AO}$ | 1 | - |
| Number of aerobic zones | $\#_{AE}$ | 1 | - |
| External recycle ratio | m | 5 | - |
| Internal recycle ratio | a | 0 | - |
| DO in m recycle | $O_m$ | 0 | $mgO_2/l$ |
| DO in a recycle | $O_a$ | 0 | $mgO_2/l$ |
| Recycle ratio to anaerobic tank (PAO) | s | 0 | - |
| DO in s recycle | $S_{O2,s}$ | 0 | $mgO_2/l$ |
| Nitrate on s recycle | $S_{NO3,s}$ | 0 | mg/l |
| TKN/COD ratio | $f_{TKN/COD}$ | 0.071 | mgTKN/mgCOD |
| Carbon source addition (Micro C) | $B_{MicroC}$ | 0.0 | lb/d |
| Carbon source addition (Micro C) | $S_{MicroC}$ | 0.00 | gpd |
| Nominal hydraulic retention time | $HRT_n$ | 18.1 | h |
| Actual hydraulic retention time | $HRT_a$ | 3.0 | h |

| Biological Oxygen Demand | Symbol | Value | Units |
|---|---|---|---|
| OD for synth & endo respiration (PAO) | $FO_{PAO}$ | 0 | $kgO_2/d$ |
| OD for synth & endo respiration (OHO) | $FO_{OHO}$ | 248 | $kgO_2/d$ |
| Mass carbonaceous oxygen demand | $FO_C$ | 248 | $kgO_2/d$ |
| Carbonaceous oxygen utilization rate | $O_c$ | 72% | - |
| Nitrification oxygen demand | $FO_n$ | 77 | $kgO_2/d$ |
| Total oxygen demand | $FO_t$ | 325 | $kgO_2/d$ |
| Oxygen recovered by denitrification | $FO_d$ | 49 | $kgO_2/d$ |
| Net total oxygen demand (AOR) | $FO_{td}$ | 277 | $kgO_2/d$ |
| Oxygen saturation @ operating temp. | $c_s$ | 9.2 | mg/l |
| Desired oxygen level | $c_x$ | 2.0 | mg/l |
| Transfer coefficient | α | 0.40 | - |
| Diffuser water depth | DWD | 14 | feet |
| Oxygen transfer efficiency | OTE | 2 | % |
| Standard total oxygen demand (SOR) | SOR | 893 | $kgO_2/d$ |
| Required air flow | $Q_{air}$ | **282** | scfm |
| Oxygen requir. per volume & depth | OS | 18.2 | $gO_2/(Nm_3*m_D)$ |

| Membrane Module Design | Symbol | Value | Units |
|---|---|---|---|
| Permeate on cycle | $T_o$ | 8 | minute |
| Permeate off cycle (relaxation) | $T_s$ | 2 | minute |
| Effective membrane module surface | $A_{m,eff}$ | 84.0 | $m^2$ |
| Effective membrane module surface | $A_{m,eff}$ | 904 | $ft^2$ |
| Total number of membrane modules | $N_M$ | 36 | - |
| Total membrane module surface | $A_{total}$ | 3,024 | $m^2$ |
| Total membrane module surface | $A_{total}$ | 32,550 | $ft^2$ |
| Nominal average daily flux | $Q_{ave,n}$ | 7.8 | lmh |
| Nominal max. daily flux | $Q_{ave,n,max,mo}$ | 15.6 | lmh |
| Nominal peak hourly flux | $Q_{peak,n}$ | 31.3 | lmh |
| Average daily flux (excluding rest cycle) | $Q_{ave,n}$ | **3.7** | gfd |
| Max. Daily flux (ex. rest cycle) | $Q_{ave,n,max,mo}$ | **7.4** | gfd |
| Peak hourly flux (ex. rest cycle) | $Q_{peak,n}$ | **14.7** | gfd |
| Total membrane module displacement vol. | $V_{modules}$ | 396 | $ft^3$ |
| Total membrane module displacement vol. | $V_{modules}$ | 2,962 | gallons |
| Aeration modules | A# | 12 | - |
| Membrane module aeration requirement | $Q_{am}$ | 28.5 | acfm |
| Total membrane modules aeration | $Q_{am,total}$ | 342 | acfm |
| Membrane diffuser water depth | $DWD_m$ | 13.3 | feet |
| Oxygen requirement per volume & depth | OS | 14 | $gO_2/(Nm_3{*}m_D)$ |
| Standard oxygen rate, membrane aeration | $SOR_m$ | 1,678 | $lbO_2/d$ |
| Standard oxygen rate, membrane aeration | $SOR_m$ | 769 | $kgO_2/d$ |



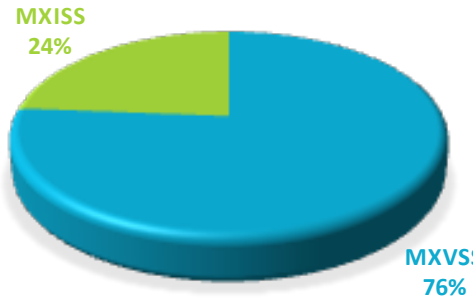
- ✓ Patented, innovative A3's MaxFlow™ membrane filtration modules manufactured in USA.
- ✓ The MaxFlow™ module "open channel design" provides optimal biofilm control, minimizes the quantity of chemical cleaning procedures and avoids module clogging.
- ✓ The compact module design enables dual-stack and triple-stack installations. It allows for a high membrane packing density resulting in a small footprint and high energy efficiency.
- ✓ Most existing conventional treatment plants can be retrofitted with MaxFlow™ membranes due to the

| Kinetic Constants | Symbol | Value | Units |
|---|---|---|---|
| Yield coefficient OHO | $Y_{OHO}$ | 0.40 | mgVSS/mgCOD |
| Yield coefficient OHO,OBS | $Y_{OHO,obs}$ | 0.06 | mgVSS/mgCOD |
| Fermentation rate at 20°C | $k_{F,20}$ | 0.06 | m3/gVSSd |
| Temperature coefficient for $k_{F,T}$ | $\Theta_{kF}$ | 1.029 | - |
| Fermentation rate at T | $k_{F,T}$ | 0.06 | m3/gVSSd |
| Endogenous respiration rate (decay) | $b_{OHO,20}$ | 0.24 | gVSS/gVSSd |
| Endogenous respiration rate T | $b_{OHO,T}$ | 0.24 | gVSS/gVSSd |
| Yield coefficient FSA | $Y_A$ | 0.10 | mgVSS/mgFSA |
| Nitri. pH sensitivity coefficient | $K_I$ | 1.13 | - |
| Nitri. pH sensitivity coefficient | $K_{max}$ | 9.50 | - |
| Nitri. pH sensitivity coefficient | $K_{II}$ | 0.30 | - |
| Max. specific growth rate at 20°C | $\mu_{Am}$ | 0.45 | 1/d |
| Max. spec. growth rate - Temp/pH | $\mu_{AmTpH}$ | 0.38 | 1/d |
| Half saturation coefficient | $K_n$ | 0.75 | mgFSA/l |
| Half saturation coefficient - Temp | $K_{nT}$ | 0.75 | mgFSA/l |
| Endogenous respiration rate (decay) | $b_A$ | 0.04 | 1/d |
| Temperature coefficient for $k_{F,T}$ | $\theta_n$ | 1.123 | - |
| Endogenous respiration rate T | $b_{AT}$ | 0.040 | 1/d |
| Temperature sensitivity coefficient | $\Theta_{nk1}$ | 1.20 | - |
| Temperature sensitivity coefficient | $\Theta_{nk2}$ | 1.05 | - |
| Temperature sensitivity coefficient | $\Theta_{nk3}$ | 1.03 | - |
| Denitrification rates at 20°C | $k_1$ | 0.70 | - |
| Denitrification rates at 20°C | $k_2$ | 0.10 | - |
| Denitrification rates at 20°C | $k_3$ | 0.08 | - |
| Denitrification rates | $k_{1T}$ | 0.700 | - |
| Denitrification rates | $k_{2T}$ | 0.101 | - |
| Denitrification rates | $k_{3T}$ | 0.080 | - |
| Yield coefficient PAO | $Y_{PAO}$ | 0.45 | gAVSS/gCOD |
| Yield coefficient PAO | $Y_{PAO,obs}$ | 0.20 | gAVSS/gCOD |
| Endogenous respiration rate (decay) | $b_{PAO\_20}$ | 0.04 | gEVSS/gCOD |
| Temperature coefficient for $k_{F,T}$ | $\Theta_{b,PAO}$ | 1.029 | - |
| Endogenous respiration rate T | $b_{PAO,T}$ | 0.04 | gEVSS/gVSSd |

| Stoichiometric Constants | Symbol | Value | Units |
|---|---|---|---|
| COD/BOD ratio | - | 1.89 | - |
| Readily biodeg. org. fraction (RBCOD) | $f_{s,COD}$ | 0.25 | g/gTCOD |
| Non-biodegradable particulate COD | $f_{PNb,COD}$ | 0.15 | g/gTCOD |
| Non-biodegradable soluble COD | $f_{SNb,COD}$ | 0.06 | g/gTCOD |
| SVFA fraction of RBCOD | $f_{SVFA,SSi}$ | 0.15 | $g/gCOD_{SS}$ |
| VSS/TSS of activated sludge | $f_{VT}$ | 0.76 | mgVSS/mgTSS |
| COD/VSS of activated sludge | $f_{cv}$ | 1.48 | kgCOD/kgVSS |
| True synthesis fraction | $f_s^0$ | 0.57 | - |
| Endogenous residue fraction | $f_{H/E,OHO}$ | 0.2 | - |
| ISS content of OHOs | $f_{ISS,OHO}$ | 0.15 | - |
| Active fraction - VSS | $f_{avOHO}$ | 23% | - |
| Active fraction - TSS | $f_{at}$ | 17% | - |
| Influent FSA fraction | $f_{FSA,i}$ | 0.67 | - |
| Non-bio. soluble orgN fraction (inerts) | $f_{SNb,N}$ | 0.03 | - |
| Non-bio. particulate orgN fraction | $f_n$ | 0.12 | - |
| Permissible unaer. sludge mass fraction | $f_{xm}$ | 0.75 | - |
| Design unaerated sludge mass fraction | $f_{xt}$ | 0.36 | - |
| Minimum primary anoxic mass fraction | $f_{x1min}$ | 0.04 | - |
| Primary anoxic mass fraction | $f_{x1}$ | 0.36 | - |
| Secondary anoxic mass fraction | $f_{x2}$ | 0.00 | - |
| Anaerobic mass fraction | $f_{AN}$ | 0.00 | - |
| Non-bio. particulate orgP fraction | $f_{P,XE,OHO}$ | 0.05 | mgP/mgVSS |
| Endogenous residue fraction | $f_{XE,PAO}$ | 0.25 | gEVSS/gAVSS |
| P fraction in active PAO mass | $f_{P,PAO}$ | 0.38 | gP/gAVSS |
| VSS/TSS ratio for PAO active mass | $f_{VT,PAO}$ | 0.46 | gVSS/gTSS |
| Ratio of P release /VFA uptake | $f_{PO4,REL}$ | 0.5 | gP/gCOD |
| Frac. of fixed inorganic s. solids of PAO | $f_{FSS,PAO}$ | 1.3 | gFSS/gAVSS |
| P content of TSS | $f_{P,TSS}$ | 0.040 | gP/gTSS |
| P content of VSS | $f_{P,FSS,i}$ | 0.02 | gP/gVSS |
| TKN/COD ratio | $f_{ns}$ | 0.07 | mgTKN/mgCOD |
| Nitrogen content of active biomass | $f_{N,VSS}$ | 0.10 | gN/gAVSS |

| Biological Mass Balance | Symbol | Value | Units |
|---|---|---|---|
| Sludge age | SRT | 25 | d |
| Mixed liquor suspended solids | $X_{TSS}$ | 7,750 | mgTSS/l |
| Readiable biodegradabe COD flux | $FS_{S,i}$ | 97 | kgCOD/d |
| Daily flux of VFAs | $FS_{VFA,i}$ | 15 | kgCOD/d |
| Daily flux of fermentable COD | $FS_{F,i}$ | 82 | kgCOD/d |
| Daily flux of biodegradable COD | $FS_{bio,i}$ | 305 | kgCOD/d |
| Daily flux of particulate inert COD | $FS_{PIN,i}$ | 58 | kgCOD/d |
| Daily flux of fixed inorganic sus. solids | $FS_{ISS,i}$ | 22 | kgISS/d |
| Influent particulate non-bio. COD | $FX_{VSS,i}$ | 39 | kgVSS/d |
| Mass nitrogen into sludge prod. | $FN_{Sludge}$ | 9 | kgN/d |
| Mass of nitrate generated per day | $FN_{NO3}$ | 17 | kgN/d |
| VFAs stored by PAOs | $FS_{S,PAO}$ | 0 | kgCOD/d |
| Remaining biodegradable COD | $FCOD_{b,OHO}$ | 305 | kgCOD/d |
| Mass nitrifiers | $MX_A$ | 21 | kgVSS |
| Active biomass PAO | $MX_{PAO}$ | 0 | KgAVSS |
| Endogenous active biomass PAO | $MX_{E,PAO}$ | 0 | kgEVSS |
| Bio mass | $MX_{bio}$ | 438 | kgVSS |
| Active organism mass | $MX_{OHO}$ | 438 | kgVSS |
| Endogenous residue mass | $MX_{E,OHO}$ | 526 | kgVSS |
| Non-biodegradable particulate mass | $MX_{Iv}$ | 978 | kgVSS |
| Volatile suspended solids mass | $MX_{VSS}$ | 1,943 | kgVSS |
| Inorganic suspended solid mass | $MX_{ISS}$ | 605 | kgISS |
| Total suspended solids mass | $MX_{TSS}$ | 2,548 | kgTSS |
| Mass/Sludge TSS wasted | $FX_t$ | 102 | KgTSS/d |
| Mass/Sludge VSS wasted | $FX_V$ | 78 | kgVSS/d |
| Effluent COD | $S_{COD,e}$ | 51 | mgCOD/l |
| COD mass out (effluent and waste) | $FS_{COD,e}$ | 23 | kgCOD/d |
| Mass/Sludge COD wasted | $FX_{COD,s}$ | 115 | kgCOD/d |

| Alkalinity | Symbol | Value | Units |
|---|---|---|---|
| Alkalinity Nitrification as CaCO3 (consumed) | $Alk_{Nitri}$ | 266 | mg/l as $CaCO_3$ |
| Alkalinity Denitrification as CaCO3 (recovered) | $Alk_{Denitri}$ | 134 | mg/l as $CaCO_3$ |
| Alkalinity ef | $Alk_e$ | 100 | mg/l as $CaCO_3$ |
| Alkalinity inf | $Alk_i$ | 250 | mg/l as $CaCO_3$ |
| Alkalinity Alum (consumed) | $Alk_{Alum}$ | 0.0 | mg/l as $CaCO_3$ |
| Alkalinity Total | $Alk_{total}$ | 118 | mg/l as $CaCO_3$ |
| Alkalinity Added | $Alk_{added}$ | -18 | mg/l as $CaCO_3$ |
| Alkalinity Added | $XAlk_{added}$ | 0 | lb/d |
| Density caustic solution (50%) | - | 12.76 | lb/gal |
| Alkalinity recovered | $Alk_{recovered}$ | 0.4 | lb$CaCO_3$/lb |
| Caustic needed | - | 0.0 | lb/d |
| Caustic needed | - | 0.0 | gpd |




$$V_P = \frac{MX_{TSS}}{X_{TSS}}$$

$$FX_t = \frac{MX_{TSS}}{SRT}$$

$$MX_{TSS} = MX_{ISS} + MX_{VSS}$$

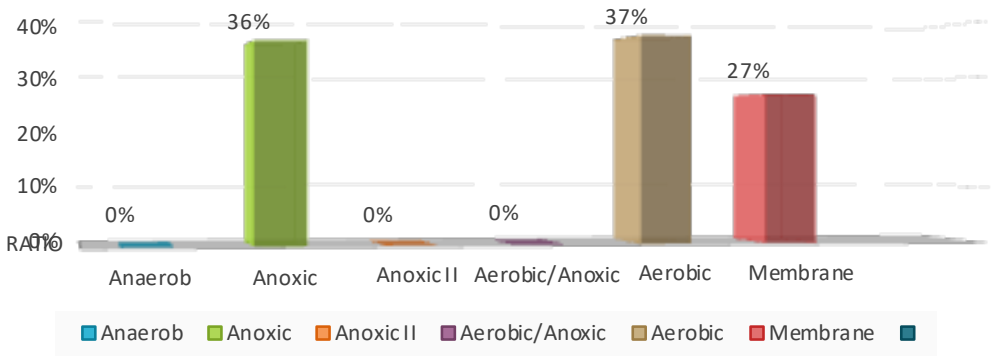
| N Removal | Symbol | Value | Units |
|---|---|---|---|
| Factor of safety | $S_f$ | 1.2 | - |
| Nitrogen requirements | $FN_{synth}$ | 8 | kgN/d |
| Nitrogen requirements | $TKN_{i,synth}$ | 17.11 | gN/m3 |
| Influent non-bio. soluble organic N | $N_{nbios,i}$ | 1.8 | mgN/l |
| Influent non-bio. particulate org. N | $N_{nbiop,i}$ | 10.3 | mgN/l |
| Influent biodegradable organic N | $N_{bio,i}$ | 18.2 | mgN/l |
| Effluent non-bio. soluble organic N | $N_{nbios,e}$ | 1.8 | mgN/l |
| NH4 concentration avail. for nitri. | $N_{an}$ | 37.7 | mgN/l |
| Effluent ammonia | $N_{a,e}$ | 0.4 | mgN/l |
| Effluent TKN | $N_{TKN,e}$ | 2.2 | mgN/l |
| N concentration into sludge prod. | $N_s$ | 20.5 | mgN/l |
| Nitrification capacity | $N_c$ | 37.3 | mgN/l |
| Denitrification potential RBCOD | $D_{p1RBCOD}$ | 30.0 | $mgNO_3$-N/l |
| Denitrification potential SBCOD | $D_{p1SBCOD}$ | 35.1 | $mgNO_3$-N/l |
| Denitrification potential RBCOD | $D_{p3RBCOD}$ | 0.0 | $mgNO_3$-N/l |
| Denitrification potential SBCOD | $D_{p3SBCOD}$ | 0.0 | $mgNO_3$-N/l |
| Minimum sludge age for nitri. | $SRT_m$ | 4.9 | d |
| Denitrification potential primary tank | $D_{p1}$ | 65.1 | mgN/l |
| Denitrification potential secondary tank | $D_{p3}$ | 0.0 | mgN/l |
| Denitri. potential recycle rate ($f_{xm} = f_{xdm}$) | $D_{p^*}$ | 31.1 | mgN/l |
| Effluent nitrate | $N_{NO3,e}$ | 0.0 | mgN/l |
| Effluent nitrate @ $f_{xdm}$ & recycle rate | $N_{NO3,e^*}$ | 6.2 | mgN/l |

| P Removal | Symbol | Value | Units |
|---|---|---|---|
| COD lost in anaerobic reatcor | $S_{F,ANn}$ | 0.0 | $gCOD/m^3$ |
| COD lost in anaerobic reatcor | $S_{F,ANn^*}$ | 0.0 | $gCOD/m^3$ |
| Fermentable COD for AN reactor | $S_{F,I,conv}$ | 0.0 | $gCOD/m^3$ |
| DO in influent | $S_{O2,i}$ | 0.0 | $mgO_2/l$ |
| $PO_4$ release AN reactor | $S_{PO4,rel}$ | 0.0 | $gP/m^3$ |
| P removal by PAOs | $\Delta P_{PAO}$ | 0.0 | $gP/m^3$ |
| P removal by OHOs | $\Delta P_{OHO}$ | 1.2 | $gP/m^3$ |
| P removal by endgeneous biomass | $\Delta P_{XE}$ | 2.3 | $gP/m^3$ |
| P removal by influent inert mass | $\Delta P_{XI}$ | 4.3 | $gP/m^3$ |
| P into sludge production | $P_s$ | 6.9 | $gP/m^3$ |
| Potential P removal by system | $\Delta P_{SYS,POT}$ | 14.7 | $gP/m^3$ |
| Actual P removal by system | $\Delta P_{SYS,ACT}$ | 10.0 | $gP/m^3$ |
| Effluent particulate P from TSS | $X_{P,e}$ | 0.0 | $gP/m^3$ |
| Influent total P | $P_i$ | 10.0 | $gP/m^3$ |
| Effluent total P | $P_{e^*}$ | 0.0 | $gP/m^3$ |
| P precipitated | $P_{prec}$ | 0.0 | mgP/l |
| Precipitation chemical | $B_{Alum}$ | 0.0 | lb/d |
| Precipitation chemical | Solution | 0.0 | gal/d |
| Density Alum | $z_{AL}^{3+}$ | 0.100 | $lb_{AL}/lb_{prec}$ |
| Density Iron | $z_{FE}^{3+}$ | 0.077 | $lb_{FE}/lb_{prec}$ |
| Alum efficiency | - | 40.0 | g/kg |
| Chemical precipitation sludge | - | 0.0 | lb/d |

# Mechanical Process Calculation

| Tank Dimensions | Trains | Length | Width | Dia. | Degree | Height | Liquid level | Volume per train | Volume Total | Volume Total |
|---|---|---|---|---|---|---|---|---|---|---|
| Anaerob | 0 | .00 ft | .00 ft | .00 ft | 0.0 | .00 ft | .00 ft | gal | gal | 0.0 m3 |
| Anoxic I | 1 | 21.00 ft | 14.00 ft | .00 ft | 0.0 | 17.50 ft | 14.84 ft | 32,641 gal | 32,641 gal | 123.5 m3 |
| Aerobic | 1 | 22.00 ft | 14.00 ft | .00 ft | 0.0 | 17.50 ft | 14.67 ft | 33,801 gal | 33,801 gal | 127.9 m3 |
| Anoxic II | 0 | .00 ft | .00 ft | .00 ft | 0.0 | .00 ft | .00 ft | gal | gal | 0.0 m3 |
| Anoxic Buffer | 0 | .00 ft | .00 ft | .00 ft | 0.0 | .00 ft | .00 ft | gal | gal | 0.0 m3 |
| Membrane | 1 | 16.00 ft | 14.00 ft | .00 ft | 0.0 | 17.50 ft | 14.50 ft | 24,295 gal | 24,295 gal | 92.0 m3 |
| Sludge | 1 | 10.00 ft | 14.00 ft | .00 ft | 0.0 | 17.50 ft | 14.75 ft | 15,446 gal | 15,446 gal | 58.5 m3 |
| Post Aeration | 1 | 20.00 ft | 15.00 ft | .00 ft | 0.0 | 12.50 ft | 10.00 ft | 22,440 gal | 22,440 gal | 84.9 m3 |

| Tank Design | Symbol | Value | Units | | | |
|---|---|---|---|---|---|---|
| Total process tank volume | | 90,737 | gallons | Weir level | 2.1 | inches |
| Total process tank volume$_{calc}$ | | **86,852** | gallons | Weir length | 4.0 | ft |
| Unaerated tank percentage | | 36 | % | Velocity | 1.35 | fps |
| Total tank volume | | **128,623** | gallons | Vertical tank | 0 | |
| Membrane modules volume | | 2,962 | gallons | Horz. Tank | 0 | |
| F/M$_{used,BOD}$ | | 0.080 | kgBOD/kgMLSS | Diameter | 0 | ft |
| F/M$_{used,COD}$ | | 0.152 | kgCOD/kgMLSS | | | |




## Process Volume Distribution

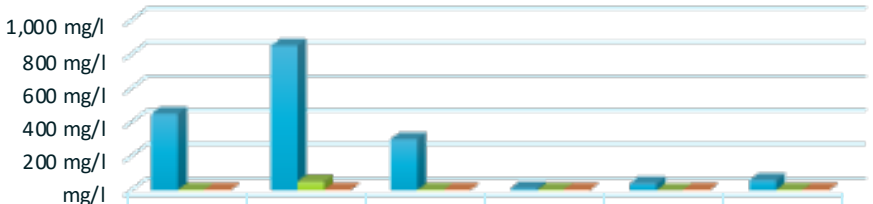
| Air Flow Design | Symbol | Membrane per train | Aerobic per train | Sludge | EQ | Unit |
|---|---|---|---|---|---|---|
| Minimum air flow | $Q_{A,re}$ | 342 | 282 | 62 | 30 | acfm / scfm |
| Chosen air flow - actual | $Q_{A,\ chosen}$ | 343 | 270 | 61 | 27 | acfm |
| Chosen air flow - inlet | $Q_{A,chosen}$ | 631 | 488 | 110 | 49 | $m^3/h$ |
| Chosen air flow - inlet | $Q_{A,chosen}$ | **372** | **287** | **65** | **29** | scfm |
| Chosen air flow - piping | $Q_{A,chosen}$ | 246 | 190 | 43 | 21 | acfm |
| Pipe pressure | $p_b$ | 7.5 | 7.5 | 7.5 | 5.5 | psi |
| Pipe losses | H | 0.25 | 0.16 | 0.30 | 0.04 | psi |
| Equivalent length in pipe looses | $L_p$ | 400 | 400 | 400 | 200 | feet |
| Pipe diameter | d | 4.0 | 4.0 | 2.0 | 2.0 | inches |
| Internal pipe diameter | $d_i$ | 4.26 | 4.26 | 2.16 | 2.16 | inches |
| Standard temperature | $T_1$ | 293 | 293 | 293 | 293 | K |
| Pipe temperature | $T_2$ | 329 | 329 | 329 | 321 | K |
| Constant | f | 0.02 | 0.02 | 0.03 | 0.03 | - |
| Air velocity | v | **41.4** | **32.0** | **28.3** | **13.8** | fps |
| Atmospheric pressure | $p_{a,l}$ | 14.7 | 14.7 | 14.7 | 14.7 | psi |
| Absolute pressure | $p_2$ | 22.2 | 22.2 | 22.2 | 20.2 | psi |
| Pressure due to tank liquid level | $p_{DWD,m}$ | 5.8 | 6.2 | 6.2 | 4.1 | psi |
| Pressure due to aeration device | $p_{DWD}$ | 0.8 | 0.7 | 0.5 | 0.5 | psi |
| Pressure due to pipe losses & elev. | $p_{DWD,S}$ | 0.5 | 0.4 | 0.5 | 0.2 | psi |
| Total pipe losses | $p_t$ | 7.0 | 7.2 | 7.2 | 4.9 | psi |
| Total pipe losses | $p_t$ | 484.2 | 498.3 | 496.5 | 336.4 | mbar |

$$H = 9.82 \cdot 10^{-8} \cdot \frac{\left(f \cdot L_p T_2 Q_{A,chosen}\right)}{\left(p_2 d_i\right)^5}$$

$$f = \frac{\left(0.029 \cdot d_i^{0.027}\right)}{Q_{A,chosen}^{0.148}} \qquad T_2 = T_1 \left(\frac{p_2}{p_{a,1}}\right)^{0.283}$$

# Process Summary for Phases 2 & 3 - 140,000 GPD

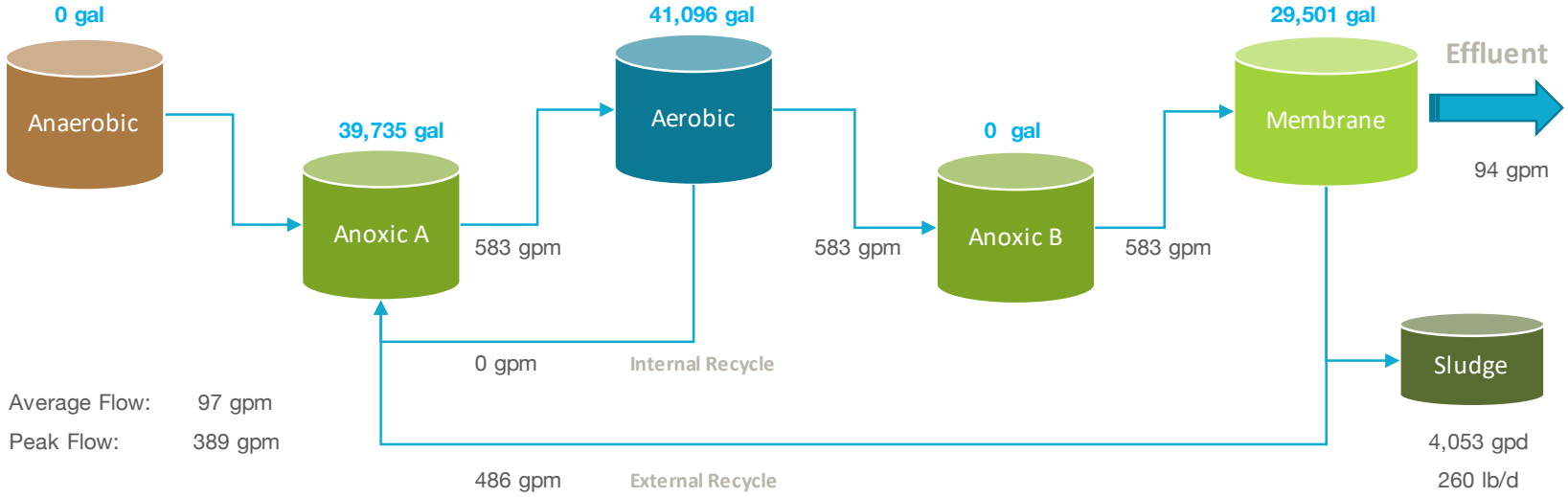
## Influent & Effluent Parameters




| | BOD | COD | TSS | P | NH4 | TN |
|---|---|---|---|---|---|---|
| Influent | 450 mg/l | 850 mg/l | 300 mg/l | 10 mg/l | 40 mg/l | 60 mg/l |
| Effluent | 2.0 mg/l | 51.0 mg/l | 1.0 mg/l | 1.0 mg/l | 0.4 mg/l | 2.2 mg/l |
| Removal | 99.6% | 94.0% | 99.7% | 90.0% | 99.1% | 96.4% |

## PROCESS PARAMETERS

| | |
|---|---|
| Sludge Age | 25 d |
| Total Reactor Volume | 110,332 gal |
| Total SOR | 1,042 kgO2/d |
| MLSS in Anoxic / Aerobic Tank | 7,641 mg/l |
| MLSS in Membrane Tank | 9,246 mg/l |
| HRT | 19 h |
| F/M RATIO (BOD) | 0.080 |
| F/M RATIO (COD) | 0.152 |
| Total Membrane Surface | 37,975 sf |




| Aeration | Flow | Pressure |
|---|---|---|
| EQ | 29 scfm | 5.5 psi |
| Sludge | 65 scfm | 7.5 psi |
| Aerobic | 340 scfm | 7.5 psi |
| Membrane | 433 scfm | 7.5 psi |

**Applied Options:**

| | |
|---|---|
| NO | DAF |
| NO | RO |

2/16/22

# Biological Process Calculation

| Influent Charateristics | Symbol | Value | Units |
|---|---|---|---|
| Type of wastewater | | municipal | |
| Temperature | T | 20 | °C |
| pH | - | 7.0 | - |
| $H_2CO_3$ alkalinity | $Alk_i$ | 250 | mg/l as $CaCO_3$ |
| Site pressure / elevation | $p_{a,i}$ | 14.7 | psi |
| Average daily flow | $Q_i$ | 140,000 | gpd |
| Peak daily flow | $Q_{i,\ max,d}$ | 280,000 | gpd |
| Hourly peak flow | $Q_{i,\ max,p}$ | 389 | gpm |
| Peak factor | - | 4.0 | - |
| Average daily flow | $Q_i$ | 530 | $m^3/d$ |
| Max. monthly average daily flow | $Q_{i,\ max,d}$ | 1,060 | $m^3/d$ |
| Hourly peak flow | $Q_{i,\ max,h}$ | 88.3 | $m^3/h$ |
| Total BOD | $S_{BOD,i}$ | 450 | mgBOD/l |
| Total COD | $S_{COD,i}$ | 850 | mgCOD/l |
| COD/BOD ratio | - | 1.89 | - |
| Rapidly biodegradable COD | $S_{s,i}$ | 213 | mgCOD/l |
| Volitale fatty acids (VFA) | $S_{VFA,i}$ | 32 | mgCOD/l |
| Fermentable COD | $S_{F,i}$ | 180 | mgCOD/l |
| Slowly biodegradable COD | $S_{ss,i}$ | 459 | mgCOD/l |
| Biodegradable COD | $S_{bio,i}$ | 672 | mgCOD/l |
| Soluble inert COD | $S_{SIN,i}$ | 51 | mgCOD/l |
| Particulate inert COD | $S_{PIN,i}$ | 128 | mgCOD/l |

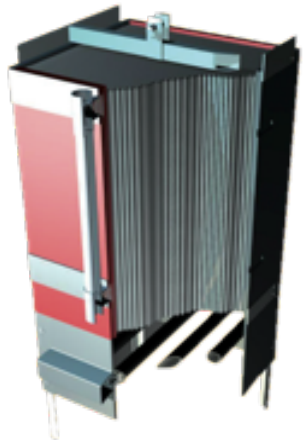
| Influent Charateristics | Symbol | Value | Units |
|---|---|---|---|
| $NO_3$ | $N_{NO3,i}$ | 0.0 | mg/l |
| $NH_4$ | $N_{a,i}$ | 40.0 | mg/l |
| TKN | $N_{TKN,i}$ | 60.0 | mg/l |
| TP | $P_i$ | 10.0 | mg/l |
| Dissolved Oxygen | $S_{O2,i}$ | 0.0 | mg/l |
| FSA fraction | $f_{a/TKN,i}$ | 0.7 | - |
| Fixed (inorganic) suspended solids | $X_{FSS,i}$ | 47.5 | mgISS/l |
| TSS concentration | $S_{TSS,i}$ | 300.0 | mgTSS/l |
| Total BOD mass | $FS_{BOD,i}$ | 238.5 | kgBOD/d |
| Total COD mass | $FS_{COD,i}$ | 450.4 | kgCOD/d |
| Total $NH_4$ mass | $FS_{a,i}$ | 21.2 | $kgNH_4/d$ |
| Total TKN mass | $FS_{TKN,i}$ | 31.8 | kgTKN/d |
| Total P mass | $FS_{P,i}$ | 5.3 | kgP/d |

| Effluent Characteristics | Symbol | Value | Units |
|---|---|---|---|
| Waste Sludge | $FX_t$ | 260 | lb/d |
| Waste Sludge | $Q_w$ | 4,053 | gpd |
| Effluent BOD | $S_{BOD,e}$ | < 3 | mgBOD/l |
| Effluent COD | $S_{COD,e}$ | 51 | mgCOD/l |
| Effluent TSS | $S_{TSS,e}$ | 1.0 | mgTSS/l |
| Effluent P | $P_e$ | 1.0 | mgP/l |
| Effluent $NH_4$ | $N_{a,e}$ | 0.4 | mgN/l |
| Effluent $NO_3$ | $N_{NO3,e}$ | 0.0 | mgN/l |
| Effluent TN ($N_{ne}$ + $N_{te}$) | $N_{t,e}$ | 2.2 | mgN/l |

| Bioreactor Characteristics | Symbol | Value | Units |
|---|---|---|---|
| Temperature | $T_{bio}$ | 20 | °C |
| Sludge retention time / Sludge age | SRT | 25 | d |
| Reactor volume | $V_{P,chosen}$ | 110,332 | gallons |
| Reactor volume | $V_{P,chosen}$ | 418 | $m^3$ |
| Reactor volume | $V_{P,calc}$ | 101,327 | gallons |
| Average MLSS concentration | $X_{TSS}$ | 7,750 | mgTSS/l |
| Food to microorganism ratio | $F/M_{BOD,used}$ | 0.080 | kgBOD/kgMLSS |
| Food to microorganism ratio | $F/M_{COD,used}$ | 0.152 | kgCOD/kgMLSS |
| Membrane tank MLSS concentration | $X_M$ | 9,246 | mgTSS/l |
| Aerobic/Anoxic tank MLSS concentration | $X_{Bio}$ | 7,641 | mgTSS/l |
| Number of anaerobic zones | $\#_{AN}$ | 0 | - |
| Number of anoxic zones | $\#_{AO}$ | 1 | - |
| Number of aerobic zones | $\#_{AE}$ | 1 | - |
| External recycle ratio | m | 5 | - |
| Internal recycle ratio | a | 0 | - |
| DO in m recycle | $O_m$ | 0 | $mgO_2/l$ |
| DO in a recycle | $O_a$ | 0 | $mgO_2/l$ |
| Recycle ratio to anaerobic tank (PAO) | s | 0 | - |
| DO in s recycle | $S_{O2,s}$ | 0 | $mgO_2/l$ |
| Nitrate on s recycle | $S_{NO3,s}$ | 0 | mg/l |
| TKN/COD ratio | $f_{TKN/COD}$ | 0.071 | mgTKN/mgCOD |
| Carbon source addition (Micro C) | $B_{MicroC}$ | 0.0 | lb/d |
| Carbon source addition (Micro C) | $S_{MicroC}$ | 0.00 | gpd |
| Nominal hydraulic retention time | $HRT_n$ | 18.9 | h |
| Actual hydraulic retention time | $HRT_a$ | 3.2 | h |

| Biological Oxygen Demand | Symbol | Value | Units |
|---|---|---|---|
| OD for synth & endo respiration (PAO) | $FO_{PAO}$ | 0 | $kgO_2/d$ |
| OD for synth & endo respiration (OHO) | $FO_{OHO}$ | 289 | $kgO_2/d$ |
| Mass carbonaceous oxygen demand | $FO_C$ | 289 | $kgO_2/d$ |
| Carbonaceous oxygen utilization rate | $O_c$ | 69% | - |
| Nitrification oxygen demand | $FO_n$ | 90 | $kgO_2/d$ |
| Total oxygen demand | $FO_t$ | 380 | $kgO_2/d$ |
| Oxygen recovered by denitrification | $FO_d$ | 57 | $kgO_2/d$ |
| Net total oxygen demand (AOR) | $FO_{td}$ | 323 | $kgO_2/d$ |
| Oxygen saturation @ operating temp. | $c_s$ | 9.2 | mg/l |
| Desired oxygen level | $c_x$ | 2.0 | mg/l |
| Transfer coefficient | α | 0.40 | - |
| Diffuser water depth | DWD | 14 | feet |
| Oxygen transfer efficiency | OTE | 2 | % |
| Standard total oxygen demand (SOR) | SOR | 1,042 | $kgO_2/d$ |
| Required air flow | $Q_{air}$ | **329** | scfm |
| Oxygen requir. per volume & depth | OS | 18.2 | $gO_2/(Nm_3*m_D)$ |

| Membrane Module Design | Symbol | Value | Units |
|---|---|---|---|
| Permeate on cycle | $T_o$ | 8 | minute |
| Permeate off cycle (relaxation) | $T_s$ | 2 | minute |
| Effective membrane module surface | $A_{m,eff}$ | 84.0 | $m^2$ |
| Effective membrane module surface | $A_{m,eff}$ | 904 | $ft^2$ |
| Total number of membrane modules | $N_M$ | 42 | - |
| Total membrane module surface | $A_{total}$ | 3,528 | $m^2$ |
| Total membrane module surface | $A_{total}$ | 37,975 | $ft^2$ |
| Nominal average daily flux | $Q_{ave,n}$ | 7.8 | lmh |
| Nominal max. daily flux | $Q_{ave,n,max,mo}$ | 15.6 | lmh |
| Nominal peak hourly flux | $Q_{peak,n}$ | 31.3 | lmh |
| Average daily flux (excluding rest cycle) | $Q_{ave,n}$ | **3.7** | gfd |
| Max. Daily flux (ex. rest cycle) | $Q_{ave,n,max,mo}$ | **7.4** | gfd |
| Peak hourly flux (ex. rest cycle) | $Q_{peak,n}$ | **14.7** | gfd |
| Total membrane module displacement vol. | $V_{modules}$ | 462 | $ft^3$ |
| Total membrane module displacement vol. | $V_{modules}$ | 3,456 | gallons |
| Aeration modules | A# | 14 | - |
| Membrane module aeration requirement | $Q_{am}$ | 28.5 | acfm |
| Total membrane modules aeration | $Q_{am,total}$ | 399 | acfm |
| Membrane diffuser water depth | $DWD_m$ | 13.3 | feet |
| Oxygen requirement per volume & depth | OS | 14 | $gO_2/(Nm_3{*}m_D)$ |
| Standard oxygen rate, membrane aeration | $SOR_m$ | 1,958 | $lbO_2/d$ |
| Standard oxygen rate, membrane aeration | $SOR_m$ | 897 | $kgO_2/d$ |



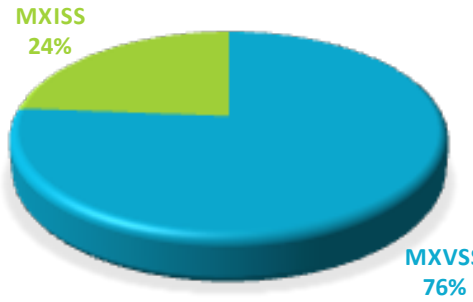
- ✓ Patented, innovative A3's MaxFlow™ membrane filtration modules manufactured in USA.
- ✓ The MaxFlow™ module "open channel design" provides optimal biofilm control, minimizes the quantity of chemical cleaning procedures and avoids module clogging.
- ✓ The compact module design enables dual-stack and triple-stack installations. It allows for a high membrane packing density resulting in a small footprint and high energy efficiency.
- ✓ Most existing conventional treatment plants can be retrofitted with MaxFlow™ membranes due to the

| Kinetic Constants | Symbol | Value | Units |
|---|---|---|---|
| Yield coefficient OHO | $Y_{OHO}$ | 0.40 | mgVSS/mgCOD |
| Yield coefficient OHO,OBS | $Y_{OHO,obs}$ | 0.06 | mgVSS/mgCOD |
| Fermentation rate at 20°C | $k_{F,20}$ | 0.06 | m3/gVSSd |
| Temperature coefficient for $k_{F,T}$ | $\Theta_{kF}$ | 1.029 | - |
| Fermentation rate at T | $k_{F,T}$ | 0.06 | m3/gVSSd |
| Endogenous respiration rate (decay) | $b_{OHO,20}$ | 0.24 | gVSS/gVSSd |
| Endogenous respiration rate T | $b_{OHO,T}$ | 0.24 | gVSS/gVSSd |
| Yield coefficient FSA | $Y_A$ | 0.10 | mgVSS/mgFSA |
| Nitri. pH sensitivity coefficient | $K_I$ | 1.13 | - |
| Nitri. pH sensitivity coefficient | $K_{max}$ | 9.50 | - |
| Nitri. pH sensitivity coefficient | $K_{II}$ | 0.30 | - |
| Max. specific growth rate at 20°C | $\mu_{Am}$ | 0.45 | 1/d |
| Max. spec. growth rate - Temp/pH | $\mu_{AmTpH}$ | 0.38 | 1/d |
| Half saturation coefficient | $K_n$ | 0.75 | mgFSA/l |
| Half saturation coefficient - Temp | $K_{nT}$ | 0.75 | mgFSA/l |
| Endogenous respiration rate (decay) | $b_A$ | 0.04 | 1/d |
| Temperature coefficient for $k_{F,T}$ | $\theta_n$ | 1.123 | - |
| Endogenous respiration rate T | $b_{AT}$ | 0.040 | 1/d |
| Temperature sensitivity coefficient | $\Theta_{nk1}$ | 1.20 | - |
| Temperature sensitivity coefficient | $\Theta_{nk2}$ | 1.05 | - |
| Temperature sensitivity coefficient | $\Theta_{nk3}$ | 1.03 | - |
| Denitrification rates at 20°C | $k_1$ | 0.70 | - |
| Denitrification rates at 20°C | $k_2$ | 0.10 | - |
| Denitrification rates at 20°C | $k_3$ | 0.08 | - |
| Denitrification rates | $k_{1T}$ | 0.700 | - |
| Denitrification rates | $k_{2T}$ | 0.101 | - |
| Denitrification rates | $k_{3T}$ | 0.080 | - |
| Yield coefficient PAO | $Y_{PAO}$ | 0.45 | gAVSS/gCOD |
| Yield coefficient PAO | $Y_{PAO,obs}$ | 0.20 | gAVSS/gCOD |
| Endogenous respiration rate (decay) | $b_{PAO\_20}$ | 0.04 | gEVSS/gCOD |
| Temperature coefficient for $k_{F,T}$ | $\Theta_{b,PAO}$ | 1.029 | - |
| Endogenous respiration rate T | $b_{PAO,T}$ | 0.04 | gEVSS/gVSSd |

| Stoichiometric Constants | Symbol | Value | Units |
|---|---|---|---|
| COD/BOD ratio | - | 1.89 | - |
| Readily biodeg. org. fraction (RBCOD) | $f_{s,COD}$ | 0.25 | g/gTCOD |
| Non-biodegradable particulate COD | $f_{PNb,COD}$ | 0.15 | g/gTCOD |
| Non-biodegradable soluble COD | $f_{SNb,COD}$ | 0.06 | g/gTCOD |
| SVFA fraction of RBCOD | $f_{SVFA,SSi}$ | 0.15 | $g/gCOD_{SS}$ |
| VSS/TSS of activated sludge | $f_{VT}$ | 0.76 | mgVSS/mgTSS |
| COD/VSS of activated sludge | $f_{cv}$ | 1.48 | kgCOD/kgVSS |
| True synthesis fraction | $f_s^0$ | 0.57 | - |
| Endogenous residue fraction | $f_{H/E,OHO}$ | 0.2 | - |
| ISS content of OHOs | $f_{ISS,OHO}$ | 0.15 | - |
| Active fraction - VSS | $f_{avOHO}$ | 23% | - |
| Active fraction - TSS | $f_{at}$ | 17% | - |
| Influent FSA fraction | $f_{FSA,i}$ | 0.67 | - |
| Non-bio. soluble orgN fraction (inerts) | $f_{SNb,N}$ | 0.03 | - |
| Non-bio. particulate orgN fraction | $f_n$ | 0.12 | - |
| Permissible unaer. sludge mass fraction | $f_{xm}$ | 0.75 | - |
| Design unaerated sludge mass fraction | $f_{xt}$ | 0.36 | - |
| Minimum primary anoxic mass fraction | $f_{x1min}$ | 0.04 | - |
| Primary anoxic mass fraction | $f_{x1}$ | 0.36 | - |
| Secondary anoxic mass fraction | $f_{x2}$ | 0.00 | - |
| Anaerobic mass fraction | $f_{AN}$ | 0.00 | - |
| Non-bio. particulate orgP fraction | $f_{P,XE,OHO}$ | 0.05 | mgP/mgVSS |
| Endogenous residue fraction | $f_{XE,PAO}$ | 0.25 | gEVSS/gAVSS |
| P fraction in active PAO mass | $f_{P,PAO}$ | 0.38 | gP/gAVSS |
| VSS/TSS ratio for PAO active mass | $f_{VT,PAO}$ | 0.46 | gVSS/gTSS |
| Ratio of P release /VFA uptake | $f_{PO4,REL}$ | 0.5 | gP/gCOD |
| Frac. of fixed inorganic s. solids of PAO | $f_{FSS,PAO}$ | 1.3 | gFSS/gAVSS |
| P content of TSS | $f_{P,TSS}$ | 0.040 | gP/gTSS |
| P content of VSS | $f_{P,FSS,i}$ | 0.02 | gP/gVSS |
| TKN/COD ratio | $f_{ns}$ | 0.07 | mgTKN/mgCOD |
| Nitrogen content of active biomass | $f_{N,VSS}$ | 0.10 | gN/gAVSS |

| Biological Mass Balance | Symbol | Value | Units |
|---|---|---|---|
| Sludge age | SRT | 25 | d |
| Mixed liquor suspended solids | $X_{TSS}$ | 7,750 | mgTSS/l |
| Readiable biodegradabe COD flux | $FS_{S,i}$ | 113 | kgCOD/d |
| Daily flux of VFAs | $FS_{VFA,i}$ | 17 | kgCOD/d |
| Daily flux of fermentable COD | $FS_{F,i}$ | 96 | kgCOD/d |
| Daily flux of biodegradable COD | $FS_{bio,i}$ | 356 | kgCOD/d |
| Daily flux of particulate inert COD | $FS_{PIN,i}$ | 68 | kgCOD/d |
| Daily flux of fixed inorganic sus. solids | $FS_{ISS,i}$ | 25 | kgISS/d |
| Influent particulate non-bio. COD | $FX_{VSS,i}$ | 46 | kgVSS/d |
| Mass nitrogen into sludge prod. | $FN_{Sludge}$ | 11 | kgN/d |
| Mass of nitrate generated per day | $FN_{NO3}$ | 20 | kgN/d |
| VFAs stored by PAOs | $FS_{S,PAO}$ | 0 | kgCOD/d |
| Remaining biodegradable COD | $FCOD_{b,OHO}$ | 356 | kgCOD/d |
| Mass nitrifiers | $MX_A$ | 25 | kgVSS |
| Active biomass PAO | $MX_{PAO}$ | 0 | KgAVSS |
| Endogenous active biomass PAO | $MX_{E,PAO}$ | 0 | kgEVSS |
| Bio mass | $MX_{bio}$ | 511 | kgVSS |
| Active organism mass | $MX_{OHO}$ | 511 | kgVSS |
| Endogenous residue mass | $MX_{E,OHO}$ | 614 | kgVSS |
| Non-biodegradable particulate mass | $MX_{Iv}$ | 1,141 | kgVSS |
| Volatile suspended solids mass | $MX_{VSS}$ | 2,266 | kgVSS |
| Inorganic suspended solid mass | $MX_{ISS}$ | 706 | kgISS |
| Total suspended solids mass | $MX_{TSS}$ | 2,972 | kgTSS |
| Mass/Sludge TSS wasted | $FX_t$ | 119 | KgTSS/d |
| Mass/Sludge VSS wasted | $FX_V$ | 91 | kgVSS/d |
| Effluent COD | $S_{COD,e}$ | 51 | mgCOD/l |
| COD mass out (effluent and waste) | $FS_{COD,e}$ | 27 | kgCOD/d |
| Mass/Sludge COD wasted | $FX_{COD,s}$ | 134 | kgCOD/d |

| Alkalinity | Symbol | Value | Units |
|---|---|---|---|
| Alkalinity Nitrification as CaCO3 (consumed) | $Alk_{Nitri}$ | 266 | mg/l as $CaCO_3$ |
| Alkalinity Denitrification as CaCO3 (recovered) | $Alk_{Denitri}$ | 134 | mg/l as $CaCO_3$ |
| Alkalinity ef | $Alk_e$ | 100 | mg/l as $CaCO_3$ |
| Alkalinity inf | $Alk_i$ | 250 | mg/l as $CaCO_3$ |
| Alkalinity Alum (consumed) | $Alk_{Alum}$ | 0.0 | mg/l as $CaCO_3$ |
| Alkalinity Total | $Alk_{total}$ | 118 | mg/l as $CaCO_3$ |
| Alkalinity Added | $Alk_{added}$ | -18 | mg/l as $CaCO_3$ |
| Alkalinity Added | $XAlk_{added}$ | 0 | lb/d |
| Density caustic solution (50%) | - | 12.76 | lb/gal |
| Alkalinity recovered | $Alk_{recovered}$ | 0.4 | lb$CaCO_3$/lb |
| Caustic needed | - | 0.0 | lb/d |
| Caustic needed | - | 0.0 | gpd |




$$V_P = \frac{MX_{TSS}}{X_{TSS}}$$

$$FX_t = \frac{MX_{TSS}}{SRT}$$

$$MX_{TSS} = MX_{ISS} + MX_{VSS}$$

| N Removal | Symbol | Value | Units |
|---|---|---|---|
| Factor of safety | $S_f$ | 1.2 | - |
| Nitrogen requirements | $FN_{synth}$ | 9 | kgN/d |
| Nitrogen requirements | $TKN_{i,synth}$ | 17.11 | gN/m3 |
| Influent non-bio. soluble organic N | $N_{nbios,i}$ | 1.8 | mgN/l |
| Influent non-bio. particulate org. N | $N_{nbiop,i}$ | 10.3 | mgN/l |
| Influent biodegradable organic N | $N_{bio,i}$ | 18.2 | mgN/l |
| Effluent non-bio. soluble organic N | $N_{nbios,e}$ | 1.8 | mgN/l |
| NH4 concentration avail. for nitri. | $N_{an}$ | 37.7 | mgN/l |
| Effluent ammonia | $N_{a,e}$ | 0.4 | mgN/l |
| Effluent TKN | $N_{TKN,e}$ | 2.2 | mgN/l |
| N concentration into sludge prod. | $N_s$ | 20.5 | mgN/l |
| Nitrification capacity | $N_c$ | 37.3 | mgN/l |
| Denitrification potential RBCOD | $D_{p1RBCOD}$ | 30.0 | $mgNO_3$-N/l |
| Denitrification potential SBCOD | $D_{p1SBCOD}$ | 35.1 | $mgNO_3$-N/l |
| Denitrification potential RBCOD | $D_{p3RBCOD}$ | 0.0 | $mgNO_3$-N/l |
| Denitrification potential SBCOD | $D_{p3SBCOD}$ | 0.0 | $mgNO_3$-N/l |
| Minimum sludge age for nitri. | $SRT_m$ | 4.9 | d |
| Denitrification potential primary tank | $D_{p1}$ | 65.2 | mgN/l |
| Denitrification potential secondary tank | $D_{p3}$ | 0.0 | mgN/l |
| Denitri. potential recycle rate ($f_{xm} = f_{xdm}$) | $D_{p^*}$ | 31.1 | mgN/l |
| Effluent nitrate | $N_{NO3,e}$ | 0.0 | mgN/l |
| Effluent nitrate @ $f_{xdm}$ & recycle rate | $N_{NO3,e^*}$ | 6.2 | mgN/l |

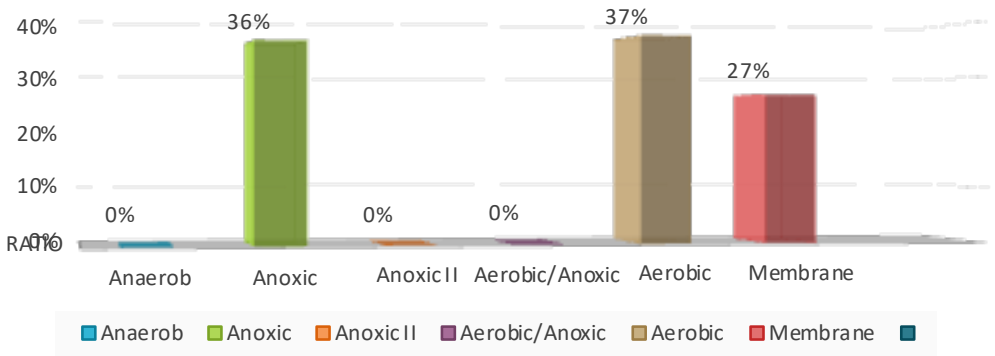
| P Removal | Symbol | Value | Units |
|---|---|---|---|
| COD lost in anaerobic reatcor | $S_{F,ANn}$ | 0.0 | $gCOD/m^3$ |
| COD lost in anaerobic reatcor | $S_{F,ANn^*}$ | 0.0 | $gCOD/m^3$ |
| Fermentable COD for AN reactor | $S_{F,I,conv}$ | 0.0 | $gCOD/m^3$ |
| DO in influent | $S_{O2,i}$ | 0.0 | $mgO_2/l$ |
| $PO_4$ release AN reactor | $S_{PO4,rel}$ | 0.0 | $gP/m^3$ |
| P removal by PAOs | $\Delta P_{PAO}$ | 0.0 | $gP/m^3$ |
| P removal by OHOs | $\Delta P_{OHO}$ | 1.2 | $gP/m^3$ |
| P removal by endgeneous biomass | $\Delta P_{XE}$ | 2.3 | $gP/m^3$ |
| P removal by influent inert mass | $\Delta P_{XI}$ | 4.3 | $gP/m^3$ |
| P into sludge production | $P_s$ | 6.9 | $gP/m^3$ |
| Potential P removal by system | $\Delta P_{SYS,POT}$ | 14.7 | $gP/m^3$ |
| Actual P removal by system | $\Delta P_{SYS,ACT}$ | 10.0 | $gP/m^3$ |
| Effluent particulate P from TSS | $X_{P,e}$ | 0.0 | $gP/m^3$ |
| Influent total P | $P_i$ | 10.0 | $gP/m^3$ |
| Effluent total P | $P_{e^*}$ | 0.0 | $gP/m^3$ |
| P precipitated | $P_{prec}$ | 0.0 | mgP/l |
| Precipitation chemical | $B_{Alum}$ | 0.0 | lb/d |
| Precipitation chemical | Solution | 0.0 | gal/d |
| Density Alum | $z_{AL}^{3+}$ | 0.100 | $lb_{AL}/lb_{prec}$ |
| Density Iron | $z_{FE}^{3+}$ | 0.077 | $lb_{FE}/lb_{prec}$ |
| Alum efficiency | - | 40.0 | g/kg |
| Chemical precipitation sludge | - | 0.0 | lb/d |

# Mechanical Process Calculation

| Tank Dimensions | Trains | Length | Width | Dia. | Degree | Height | Liquid level | Volume per train | Volume Total | Volume Total |
|---|---|---|---|---|---|---|---|---|---|---|
| Anaerob | 0 | .00 ft | .00 ft | .00 ft | 0.0 | .00 ft | .00 ft | gal | gal | 0.0 m3 |
| Anoxic I | 1 | 21.00 ft | 17.00 ft | .00 ft | 0.0 | 17.50 ft | 14.88 ft | 39,735 gal | 39,735 gal | 150.4 m3 |
| Aerobic | 1 | 22.00 ft | 17.00 ft | .00 ft | 0.0 | 17.50 ft | 14.69 ft | 41,096 gal | 41,096 gal | 155.5 m3 |
| Anoxic II | 0 | .00 ft | .00 ft | .00 ft | 0.0 | .00 ft | .00 ft | gal | gal | 0.0 m3 |
| Anoxic Buffer | 0 | .00 ft | .00 ft | .00 ft | 0.0 | .00 ft | .00 ft | gal | gal | 0.0 m3 |
| Membrane | 1 | 16.00 ft | 17.00 ft | .00 ft | 0.0 | 17.50 ft | 14.50 ft | 29,501 gal | 29,501 gal | 111.7 m3 |
| Sludge | 1 | 10.00 ft | 14.00 ft | .00 ft | 0.0 | 17.50 ft | 14.75 ft | 15,446 gal | 15,446 gal | 58.5 m3 |
| Post Aeration | 1 | 20.00 ft | 15.00 ft | .00 ft | 0.0 | 12.50 ft | 10.00 ft | 22,440 gal | 22,440 gal | 84.9 m3 |

| Tank Design | Symbol | Value | Units |
|---|---|---|---|
| Total process tank volume | 110,332 | gallons | |
| Total process tank volume$_{calc}$ | **101,327** | gallons | |
| Unaerated tank percentage | 36 | % | |
| Total tank volume | **148,218** | gallons | |
| Membrane modules volume | 3,456 | gallons | |
| F/M$_{used,BOD}$ | 0.080 | kgBOD/kgMLSS | |
| F/M$_{used,COD}$ | 0.152 | kgCOD/kgMLSS | |

| | | |
|---|---|---|
| Weir level | 2.3 | inches |
| Weir length | 4.0 | ft |
| Velocity | 1.43 | fps |
| Vertical tank | 0 | |
| Horz. Tank | 0 | |
| Diameter | 0 | ft |




Process Volume Distribution

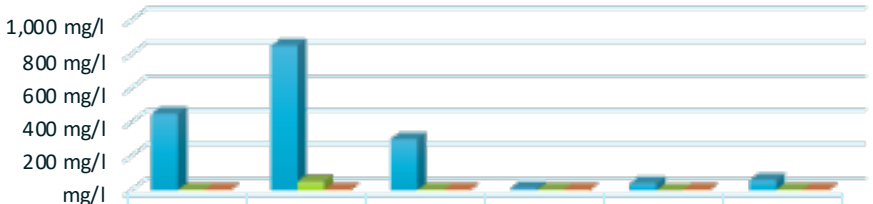
| Air Flow Design | Symbol | Membrane per train | Aerobic per train | Sludge | EQ | Unit |
|---|---|---|---|---|---|---|
| Minimum air flow | $Q_{A,re}$ | 399 | 329 | 62 | 30 | acfm / scfm |
| Chosen air flow - actual | $Q_{A,\ chosen}$ | 400 | 320 | 61 | 27 | acfm |
| Chosen air flow - inlet | $Q_{A,chosen}$ | 736 | 577 | 110 | 49 | $m^3/h$ |
| Chosen air flow - inlet | $Q_{A,chosen}$ | **433** | **340** | **65** | **29** | scfm |
| Chosen air flow - piping | $Q_{A,chosen}$ | 287 | 225 | 43 | 21 | acfm |
| Pipe pressure | $p_b$ | 7.5 | 7.5 | 7.5 | 5.5 | psi |
| Pipe losses | H | 0.34 | 0.22 | 0.30 | 0.04 | psi |
| Equivalent length in pipe looses | $L_p$ | 400 | 400 | 400 | 200 | feet |
| Pipe diameter | d | 4.0 | 4.0 | 2.0 | 2.0 | inches |
| Internal pipe diameter | $d_i$ | 4.26 | 4.26 | 2.16 | 2.16 | inches |
| Standard temperature | $T_1$ | 293 | 293 | 293 | 293 | K |
| Pipe temperature | $T_2$ | 329 | 329 | 329 | 321 | K |
| Constant | f | 0.02 | 0.02 | 0.03 | 0.03 | - |
| Air velocity | v | **48.4** | **37.9** | **28.3** | **13.8** | fps |
| Atmospheric pressure | $p_{a,l}$ | 14.7 | 14.7 | 14.7 | 14.7 | psi |
| Absolute pressure | $p_2$ | 22.2 | 22.2 | 22.2 | 20.2 | psi |
| Pressure due to tank liquid level | $p_{DWD,m}$ | 5.8 | 6.2 | 6.2 | 4.1 | psi |
| Pressure due to aeration device | $p_{DWD}$ | 0.8 | 0.7 | 0.5 | 0.5 | psi |
| Pressure due to pipe losses & elev. | $p_{DWD,S}$ | 0.5 | 0.4 | 0.5 | 0.2 | psi |
| Total pipe losses | $p_t$ | 7.1 | 7.3 | 7.2 | 4.9 | psi |
| Total pipe losses | $p_t$ | 490.0 | 502.9 | 496.5 | 336.4 | mbar |

$$H = 9.82 \cdot 10^{-8} \cdot \frac{\left(f \cdot L_p T_2 Q_{A,chosen}\right)}{\left(p_2 d_i\right)^5}$$

$$f = \frac{\left(0.029 \cdot d_i^{0.027}\right)}{Q_{A,chosen}^{0.148}} \qquad T_2 = T_1 \left(\frac{p_2}{p_{a,1}}\right)^{0.283}$$

# Process Summary for Phase 4 - 280,000 GPD

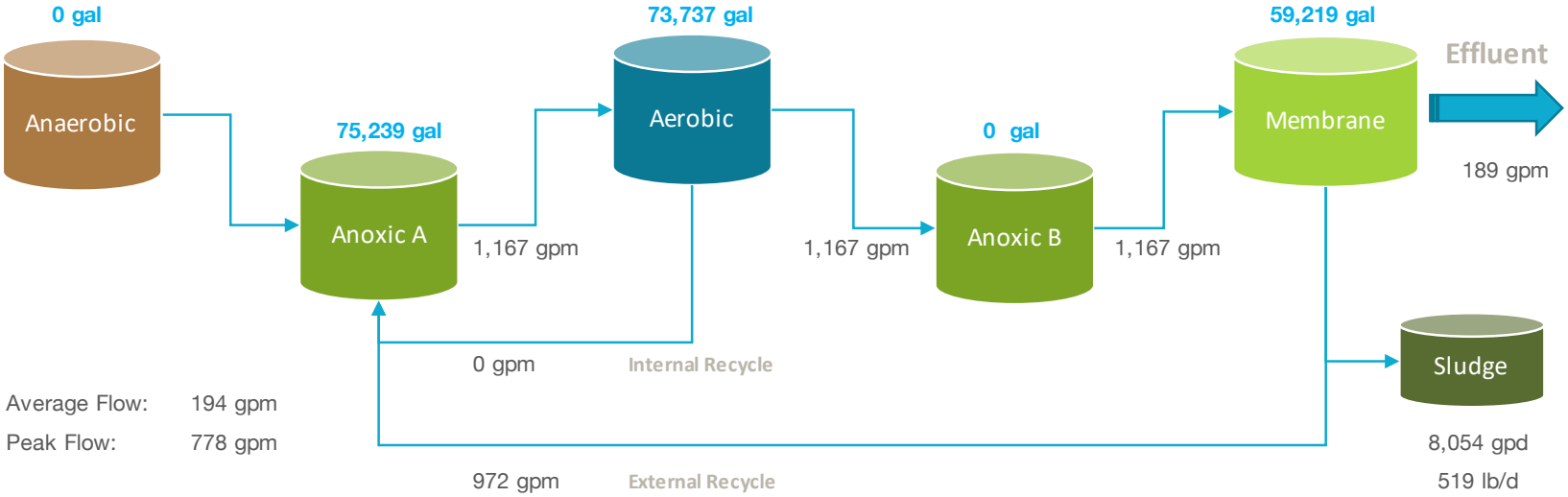
## Influent & Effluent Parameters




| | BOD | COD | TSS | P | NH4 | TN |
|---|---|---|---|---|---|---|
| Influent | 450 mg/l | 850 mg/l | 300 mg/l | 10 mg/l | 40 mg/l | 60 mg/l |
| Effluent | 2.0 mg/l | 51.0 mg/l | 1.0 mg/l | 1.0 mg/l | 0.4 mg/l | 2.2 mg/l |
| Removal | 99.6% | 94.0% | 99.7% | 90.0% | 99.1% | 96.4% |

## PROCESS PARAMETERS

| | |
|---|---|
| Sludge Age | 25 d |
| Total Reactor Volume | 208,195 gal |
| Total SOR | 2,084 kgO2/d |
| MLSS in Anoxic / Aerobic Tank | 7,682 mg/l |
| MLSS in Membrane Tank | 9,306 mg/l |
| HRT | 18 h |
| F/M RATIO (BOD) | 0.080 |
| F/M RATIO (COD) | 0.152 |
| Total Membrane Surface | 75,950 sf |




| Aeration | Flow | Pressure |
|---|---|---|
| EQ | 0 scfm | 5.5 psi |
| Sludge | 0 scfm | 7.5 psi |
| Aerobic | 664 scfm | 7.5 psi |
| Membrane | 799 scfm | 7.5 psi |

**Applied Options:**

| | |
|---|---|
| NO | DAF |
| NO | RO |

10/29/24

# Biological Process Calculation

| Influent Charateristics | Symbol | Value | Units |
|---|---|---|---|
| Type of wastewater | | municipal | |
| Temperature | T | 20 | °C |
| pH | - | 7.0 | - |
| $H_2CO_3$ alkalinity | $Alk_i$ | 250 | mg/l as $CaCO_3$ |
| Site pressure / elevation | $p_{a,i}$ | 14.7 | psi |
| Average daily flow | $Q_i$ | 280,000 | gpd |
| Peak daily flow | $Q_{i,\ max,d}$ | 560,000 | gpd |
| Hourly peak flow | $Q_{i,\ max,p}$ | 778 | gpm |
| Peak factor | - | 4.0 | - |
| Average daily flow | $Q_i$ | 1,060 | $m^3/d$ |
| Max. monthly average daily flow | $Q_{i,\ max,d}$ | 2,120 | $m^3/d$ |
| Hourly peak flow | $Q_{i,\ max,h}$ | 176.6 | $m^3/h$ |
| Total BOD | $S_{BOD,i}$ | 450 | mgBOD/l |
| Total COD | $S_{COD,i}$ | 850 | mgCOD/l |
| COD/BOD ratio | - | 1.89 | - |
| Rapidly biodegradable COD | $S_{s,i}$ | 213 | mgCOD/l |
| Volitale fatty acids (VFA) | $S_{VFA,i}$ | 32 | mgCOD/l |
| Fermentable COD | $S_{F,i}$ | 180 | mgCOD/l |
| Slowly biodegradable COD | $S_{ss,i}$ | 459 | mgCOD/l |
| Biodegradable COD | $S_{bio,i}$ | 672 | mgCOD/l |
| Soluble inert COD | $S_{SIN,i}$ | 51 | mgCOD/l |
| Particulate inert COD | $S_{PIN,i}$ | 128 | mgCOD/l |

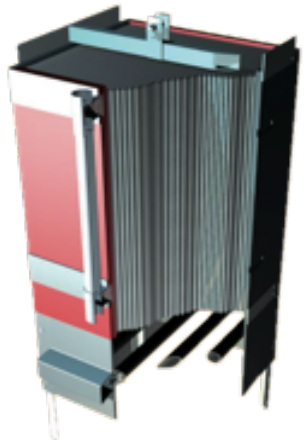
| Influent Charateristics | Symbol | Value | Units |
|---|---|---|---|
| $NO_3$ | $N_{NO3,i}$ | 0.0 | mg/l |
| $NH_4$ | $N_{a,i}$ | 40.0 | mg/l |
| TKN | $N_{TKN,i}$ | 60.0 | mg/l |
| TP | $P_i$ | 10.0 | mg/l |
| Dissolved Oxygen | $S_{O2,i}$ | 0.0 | mg/l |
| FSA fraction | $f_{a/TKN,i}$ | 0.7 | - |
| Fixed (inorganic) suspended solids | $X_{FSS,i}$ | 47.5 | mgISS/l |
| TSS concentration | $S_{TSS,i}$ | 300.0 | mgTSS/l |
| Total BOD mass | $FS_{BOD,i}$ | 476.9 | kgBOD/d |
| Total COD mass | $FS_{COD,i}$ | 900.8 | kgCOD/d |
| Total $NH_4$ mass | $FS_{a,i}$ | 42.4 | $kgNH_4/d$ |
| Total TKN mass | $FS_{TKN,i}$ | 63.6 | kgTKN/d |
| Total P mass | $FS_{P,i}$ | 10.6 | kgP/d |

| Effluent Characteristics | Symbol | Value | Units |
|---|---|---|---|
| Waste Sludge | $FX_t$ | 519 | lb/d |
| Waste Sludge | $Q_w$ | 8,054 | gpd |
| Effluent BOD | $S_{BOD,e}$ | < 3 | mgBOD/l |
| Effluent COD | $S_{COD,e}$ | 51 | mgCOD/l |
| Effluent TSS | $S_{TSS,e}$ | 1.0 | mgTSS/l |
| Effluent P | $P_e$ | 1.0 | mgP/l |
| Effluent $NH_4$ | $N_{a,e}$ | 0.4 | mgN/l |
| Effluent $NO_3$ | $N_{NO3,e}$ | 0.0 | mgN/l |
| Effluent TN ($N_{ne}$ + $N_{te}$) | $N_{t,e}$ | 2.2 | mgN/l |

| Bioreactor Characteristics | Symbol | Value | Units |
|---|---|---|---|
| Temperature | $T_{bio}$ | 20 | °C |
| Sludge retention time / Sludge age | SRT | 25 | d |
| Reactor volume | $V_{P,chosen}$ | 208,195 | gallons |
| Reactor volume | $V_{P,chosen}$ | 788 | $m^3$ |
| Reactor volume | $V_{P,calc}$ | 201,355 | gallons |
| Average MLSS concentration | $X_{TSS}$ | 7,800 | mgTSS/l |
| Food to microorganism ratio | $F/M_{BOD,used}$ | 0.080 | kgBOD/kgMLSS |
| Food to microorganism ratio | $F/M_{COD,used}$ | 0.152 | kgCOD/kgMLSS |
| Membrane tank MLSS concentration | $X_M$ | 9,306 | mgTSS/l |
| Aerobic/Anoxic tank MLSS concentration | $X_{Bio}$ | 7,682 | mgTSS/l |
| Number of anaerobic zones | $\#_{AN}$ | 0 | - |
| Number of anoxic zones | $\#_{AO}$ | 1 | - |
| Number of aerobic zones | $\#_{AE}$ | 1 | - |
| External recycle ratio | m | 5 | - |
| Internal recycle ratio | a | 0 | - |
| DO in m recycle | $O_m$ | 0 | $mgO_2/l$ |
| DO in a recycle | $O_a$ | 0 | $mgO_2/l$ |
| Recycle ratio to anaerobic tank (PAO) | s | 0 | - |
| DO in s recycle | $S_{O2,s}$ | 0 | $mgO_2/l$ |
| Nitrate on s recycle | $S_{NO3,s}$ | 0 | mg/l |
| TKN/COD ratio | $f_{TKN/COD}$ | 0.071 | mgTKN/mgCOD |
| Carbon source addition (Micro C) | $B_{MicroC}$ | 0.0 | lb/d |
| Carbon source addition (Micro C) | $S_{MicroC}$ | 0.00 | gpd |
| Nominal hydraulic retention time | $HRT_n$ | 17.8 | h |
| Actual hydraulic retention time | $HRT_a$ | 3.0 | h |

| Biological Oxygen Demand | Symbol | Value | Units |
|---|---|---|---|
| OD for synth & endo respiration (PAO) | $FO_{PAO}$ | 0 | $kgO_2/d$ |
| OD for synth & endo respiration (OHO) | $FO_{OHO}$ | 578 | $kgO_2/d$ |
| Mass carbonaceous oxygen demand | $FO_C$ | 578 | $kgO_2/d$ |
| Carbonaceous oxygen utilization rate | $O_c$ | 73% | - |
| Nitrification oxygen demand | $FO_n$ | 181 | $kgO_2/d$ |
| Total oxygen demand | $FO_t$ | 759 | $kgO_2/d$ |
| Oxygen recovered by denitrification | $FO_d$ | 113 | $kgO_2/d$ |
| Net total oxygen demand (AOR) | $FO_{td}$ | 646 | $kgO_2/d$ |
| Oxygen saturation @ operating temp. | $c_s$ | 9.2 | mg/l |
| Desired oxygen level | $c_x$ | 2.0 | mg/l |
| Transfer coefficient | α | 0.40 | - |
| Diffuser water depth | DWD | 14 | feet |
| Oxygen transfer efficiency | OTE | 2 | % |
| Standard total oxygen demand (SOR) | SOR | 2,084 | $kgO_2/d$ |
| Required air flow | $Q_{air}$ | **659** | scfm |
| Oxygen requir. per volume & depth | OS | 18.2 | $gO_2/(Nm_3*m_D)$ |

| Membrane Module Design | Symbol | Value | Units |
|---|---|---|---|
| Permeate on cycle | $T_o$ | 8 | minute |
| Permeate off cycle (relaxation) | $T_s$ | 2 | minute |
| Effective membrane module surface | $A_{m,eff}$ | 84.0 | $m^2$ |
| Effective membrane module surface | $A_{m,eff}$ | 904 | $ft^2$ |
| Total number of membrane modules | $N_M$ | 84 | - |
| Total membrane module surface | $A_{total}$ | 7,056 | $m^2$ |
| Total membrane module surface | $A_{total}$ | 75,950 | $ft^2$ |
| Nominal average daily flux | $Q_{ave,n}$ | 7.8 | lmh |
| Nominal max. daily flux | $Q_{ave,n,max,mo}$ | 15.6 | lmh |
| Nominal peak hourly flux | $Q_{peak,n}$ | 31.3 | lmh |
| Average daily flux (excluding rest cycle) | $Q_{ave,n}$ | **3.7** | gfd |
| Max. Daily flux (ex. rest cycle) | $Q_{ave,n,max,mo}$ | **7.4** | gfd |
| Peak hourly flux (ex. rest cycle) | $Q_{peak,n}$ | **14.7** | gfd |
| Total membrane module displacement vol. | $V_{modules}$ | 924 | $ft^3$ |
| Total membrane module displacement vol. | $V_{modules}$ | 6,912 | gallons |
| Aeration modules | A# | 28 | - |
| Membrane module aeration requirement | $Q_{am}$ | 28.5 | acfm |
| Total membrane modules aeration | $Q_{am,total}$ | 798 | acfm |
| Membrane diffuser water depth | $DWD_m$ | 13.3 | feet |
| Oxygen requirement per volume & depth | OS | 14 | $gO_2/(Nm_3{*}m_D)$ |
| Standard oxygen rate, membrane aeration | $SOR_m$ | 3,916 | $lbO_2/d$ |
| Standard oxygen rate, membrane aeration | $SOR_m$ | 1,793 | $kgO_2/d$ |



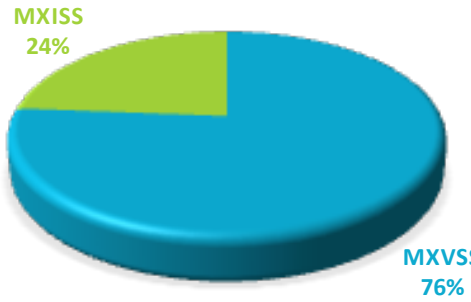
- ✓ Patented, innovative A3's MaxFlow™ membrane filtration modules manufactured in USA.
- ✓ The MaxFlow™ module "open channel design" provides optimal biofilm control, minimizes the quantity of chemical cleaning procedures and avoids module clogging.
- ✓ The compact module design enables dual-stack and triple-stack installations. It allows for a high membrane packing density resulting in a small footprint and high energy efficiency.
- ✓ Most existing conventional treatment plants can be retrofitted with MaxFlow™ membranes due to the

| Kinetic Constants | Symbol | Value | Units |
|---|---|---|---|
| Yield coefficient OHO | $Y_{OHO}$ | 0.40 | mgVSS/mgCOD |
| Yield coefficient OHO,OBS | $Y_{OHO,obs}$ | 0.06 | mgVSS/mgCOD |
| Fermentation rate at 20°C | $k_{F,20}$ | 0.06 | m3/gVSSd |
| Temperature coefficient for $k_{F,T}$ | $\Theta_{kF}$ | 1.029 | - |
| Fermentation rate at T | $k_{F,T}$ | 0.06 | m3/gVSSd |
| Endogenous respiration rate (decay) | $b_{OHO,20}$ | 0.24 | gVSS/gVSSd |
| Endogenous respiration rate T | $b_{OHO,T}$ | 0.24 | gVSS/gVSSd |
| Yield coefficient FSA | $Y_A$ | 0.10 | mgVSS/mgFSA |
| Nitri. pH sensitivity coefficient | $K_I$ | 1.13 | - |
| Nitri. pH sensitivity coefficient | $K_{max}$ | 9.50 | - |
| Nitri. pH sensitivity coefficient | $K_{II}$ | 0.30 | - |
| Max. specific growth rate at 20°C | $\mu_{Am}$ | 0.45 | 1/d |
| Max. spec. growth rate - Temp/pH | $\mu_{AmTpH}$ | 0.38 | 1/d |
| Half saturation coefficient | $K_n$ | 0.75 | mgFSA/l |
| Half saturation coefficient - Temp | $K_{nT}$ | 0.75 | mgFSA/l |
| Endogenous respiration rate (decay) | $b_A$ | 0.04 | 1/d |
| Temperature coefficient for $k_{F,T}$ | $\theta_n$ | 1.123 | - |
| Endogenous respiration rate T | $b_{AT}$ | 0.040 | 1/d |
| Temperature sensitivity coefficient | $\Theta_{nk1}$ | 1.20 | - |
| Temperature sensitivity coefficient | $\Theta_{nk2}$ | 1.05 | - |
| Temperature sensitivity coefficient | $\Theta_{nk3}$ | 1.03 | - |
| Denitrification rates at 20°C | $k_1$ | 0.70 | - |
| Denitrification rates at 20°C | $k_2$ | 0.10 | - |
| Denitrification rates at 20°C | $k_3$ | 0.08 | - |
| Denitrification rates | $k_{1T}$ | 0.700 | - |
| Denitrification rates | $k_{2T}$ | 0.101 | - |
| Denitrification rates | $k_{3T}$ | 0.080 | - |
| Yield coefficient PAO | $Y_{PAO}$ | 0.45 | gAVSS/gCOD |
| Yield coefficient PAO | $Y_{PAO,obs}$ | 0.20 | gAVSS/gCOD |
| Endogenous respiration rate (decay) | $b_{PAO\_20}$ | 0.04 | gEVSS/gCOD |
| Temperature coefficient for $k_{F,T}$ | $\Theta_{b,PAO}$ | 1.029 | - |
| Endogenous respiration rate T | $b_{PAO,T}$ | 0.04 | gEVSS/gVSSd |

| Stoichiometric Constants | Symbol | Value | Units |
|---|---|---|---|
| COD/BOD ratio | - | 1.89 | - |
| Readily biodeg. org. fraction (RBCOD) | $f_{s,COD}$ | 0.25 | g/gTCOD |
| Non-biodegradable particulate COD | $f_{PNb,COD}$ | 0.15 | g/gTCOD |
| Non-biodegradable soluble COD | $f_{SNb,COD}$ | 0.06 | g/gTCOD |
| SVFA fraction of RBCOD | $f_{SVFA,SSi}$ | 0.15 | $g/gCOD_{SS}$ |
| VSS/TSS of activated sludge | $f_{VT}$ | 0.76 | mgVSS/mgTSS |
| COD/VSS of activated sludge | $f_{cv}$ | 1.48 | kgCOD/kgVSS |
| True synthesis fraction | $f_s^0$ | 0.57 | - |
| Endogenous residue fraction | $f_{H/E,OHO}$ | 0.2 | - |
| ISS content of OHOs | $f_{ISS,OHO}$ | 0.15 | - |
| Active fraction - VSS | $f_{avOHO}$ | 23% | - |
| Active fraction - TSS | $f_{at}$ | 17% | - |
| Influent FSA fraction | $f_{FSA,i}$ | 0.67 | - |
| Non-bio. soluble orgN fraction (inerts) | $f_{SNb,N}$ | 0.03 | - |
| Non-bio. particulate orgN fraction | $f_n$ | 0.12 | - |
| Permissible unaer. sludge mass fraction | $f_{xm}$ | 0.75 | - |
| Design unaerated sludge mass fraction | $f_{xt}$ | 0.36 | - |
| Minimum primary anoxic mass fraction | $f_{x1min}$ | 0.04 | - |
| Primary anoxic mass fraction | $f_{x1}$ | 0.36 | - |
| Secondary anoxic mass fraction | $f_{x2}$ | 0.00 | - |
| Anaerobic mass fraction | $f_{AN}$ | 0.00 | - |
| Non-bio. particulate orgP fraction | $f_{P,XE,OHO}$ | 0.05 | mgP/mgVSS |
| Endogenous residue fraction | $f_{XE,PAO}$ | 0.25 | gEVSS/gAVSS |
| P fraction in active PAO mass | $f_{P,PAO}$ | 0.38 | gP/gAVSS |
| VSS/TSS ratio for PAO active mass | $f_{VT,PAO}$ | 0.46 | gVSS/gTSS |
| Ratio of P release /VFA uptake | $f_{PO4,REL}$ | 0.5 | gP/gCOD |
| Frac. of fixed inorganic s. solids of PAO | $f_{FSS,PAO}$ | 1.3 | gFSS/gAVSS |
| P content of TSS | $f_{P,TSS}$ | 0.040 | gP/gTSS |
| P content of VSS | $f_{P,FSS,i}$ | 0.02 | gP/gVSS |
| TKN/COD ratio | $f_{ns}$ | 0.07 | mgTKN/mgCOD |
| Nitrogen content of active biomass | $f_{N,VSS}$ | 0.10 | gN/gAVSS |

| Biological Mass Balance | Symbol | Value | Units |
|---|---|---|---|
| Sludge age | SRT | 25 | d |
| Mixed liquor suspended solids | $X_{TSS}$ | 7,800 | mgTSS/l |
| Readiable biodegradabe COD flux | $FS_{S,i}$ | 225 | kgCOD/d |
| Daily flux of VFAs | $FS_{VFA,i}$ | 34 | kgCOD/d |
| Daily flux of fermentable COD | $FS_{F,i}$ | 191 | kgCOD/d |
| Daily flux of biodegradable COD | $FS_{bio,i}$ | 712 | kgCOD/d |
| Daily flux of particulate inert COD | $FS_{PIN,i}$ | 135 | kgCOD/d |
| Daily flux of fixed inorganic sus. solids | $FS_{ISS,i}$ | 50 | kgISS/d |
| Influent particulate non-bio. COD | $FX_{VSS,i}$ | 91 | kgVSS/d |
| Mass nitrogen into sludge prod. | $FN_{Sludge}$ | 22 | kgN/d |
| Mass of nitrate generated per day | $FN_{NO3}$ | 40 | kgN/d |
| VFAs stored by PAOs | $FS_{S,PAO}$ | 0 | kgCOD/d |
| Remaining biodegradable COD | $FCOD_{b,OHO}$ | 712 | kgCOD/d |
| Mass nitrifiers | $MX_A$ | 49 | kgVSS |
| Active biomass PAO | $MX_{PAO}$ | 0 | KgAVSS |
| Endogenous active biomass PAO | $MX_{E,PAO}$ | 0 | kgEVSS |
| Bio mass | $MX_{bio}$ | 1,023 | kgVSS |
| Active organism mass | $MX_{OHO}$ | 1,023 | kgVSS |
| Endogenous residue mass | $MX_{E,OHO}$ | 1,227 | kgVSS |
| Non-biodegradable particulate mass | $MX_{Iv}$ | 2,283 | kgVSS |
| Volatile suspended solids mass | $MX_{VSS}$ | 4,533 | kgVSS |
| Inorganic suspended solid mass | $MX_{ISS}$ | 1,412 | kgISS |
| Total suspended solids mass | $MX_{TSS}$ | 5,945 | kgTSS |
| Mass/Sludge TSS wasted | $FX_t$ | 238 | KgTSS/d |
| Mass/Sludge VSS wasted | $FX_V$ | 181 | kgVSS/d |
| Effluent COD | $S_{COD,e}$ | 51 | mgCOD/l |
| COD mass out (effluent and waste) | $FS_{COD,e}$ | 54 | kgCOD/d |
| Mass/Sludge COD wasted | $FX_{COD,s}$ | 268 | kgCOD/d |

| Alkalinity | Symbol | Value | Units |
|---|---|---|---|
| Alkalinity Nitrification as CaCO3 (consumed) | $Alk_{Nitri}$ | 266 | mg/l as $CaCO_3$ |
| Alkalinity Denitrification as CaCO3 (recovered) | $Alk_{Denitri}$ | 134 | mg/l as $CaCO_3$ |
| Alkalinity ef | $Alk_e$ | 100 | mg/l as $CaCO_3$ |
| Alkalinity inf | $Alk_i$ | 250 | mg/l as $CaCO_3$ |
| Alkalinity Alum (consumed) | $Alk_{Alum}$ | 0.0 | mg/l as $CaCO_3$ |
| Alkalinity Total | $Alk_{total}$ | 118 | mg/l as $CaCO_3$ |
| Alkalinity Added | $Alk_{added}$ | -18 | mg/l as $CaCO_3$ |
| Alkalinity Added | $XAlk_{added}$ | 0 | lb/d |
| Density caustic solution (50%) | - | 12.76 | lb/gal |
| Alkalinity recovered | $Alk_{recovered}$ | 0.4 | lb$CaCO_3$/lb |
| Caustic needed | - | 0.0 | lb/d |
| Caustic needed | - | 0.0 | gpd |




$$V_P = \frac{MX_{TSS}}{X_{TSS}}$$

$$FX_t = \frac{MX_{TSS}}{SRT}$$

$$MX_{TSS} = MX_{ISS} + MX_{VSS}$$

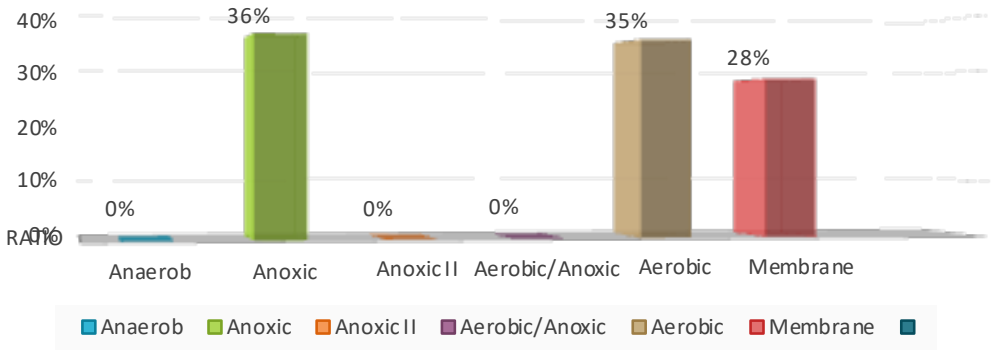
| N Removal | Symbol | Value | Units |
|---|---|---|---|
| Factor of safety | $S_f$ | 1.2 | - |
| Nitrogen requirements | $FN_{synth}$ | 18 | kgN/d |
| Nitrogen requirements | $TKN_{i,synth}$ | 17.11 | gN/m3 |
| Influent non-bio. soluble organic N | $N_{nbios,i}$ | 1.8 | mgN/l |
| Influent non-bio. particulate org. N | $N_{nbiop,i}$ | 10.3 | mgN/l |
| Influent biodegradable organic N | $N_{bio,i}$ | 18.2 | mgN/l |
| Effluent non-bio. soluble organic N | $N_{nbios,e}$ | 1.8 | mgN/l |
| NH4 concentration avail. for nitri. | $N_{an}$ | 37.7 | mgN/l |
| Effluent ammonia | $N_{a,e}$ | 0.4 | mgN/l |
| Effluent TKN | $N_{TKN,e}$ | 2.2 | mgN/l |
| N concentration into sludge prod. | $N_s$ | 20.5 | mgN/l |
| Nitrification capacity | $N_c$ | 37.3 | mgN/l |
| Denitrification potential RBCOD | $D_{p1RBCOD}$ | 30.0 | $mgNO_3$-N/l |
| Denitrification potential SBCOD | $D_{p1SBCOD}$ | 35.2 | $mgNO_3$-N/l |
| Denitrification potential RBCOD | $D_{p3RBCOD}$ | 0.0 | $mgNO_3$-N/l |
| Denitrification potential SBCOD | $D_{p3SBCOD}$ | 0.0 | $mgNO_3$-N/l |
| Minimum sludge age for nitri. | $SRT_m$ | 4.9 | d |
| Denitrification potential primary tank | $D_{p1}$ | 65.3 | mgN/l |
| Denitrification potential secondary tank | $D_{p3}$ | 0.0 | mgN/l |
| Denitri. potential recycle rate ($f_{xm} = f_{xdm}$) | $D_{p^*}$ | 31.1 | mgN/l |
| Effluent nitrate | $N_{NO3,e}$ | 0.0 | mgN/l |
| Effluent nitrate @ $f_{xdm}$ & recycle rate | $N_{NO3,e^*}$ | 6.2 | mgN/l |

| P Removal | Symbol | Value | Units |
|---|---|---|---|
| COD lost in anaerobic reatcor | $S_{F,ANn}$ | 0.0 | $gCOD/m^3$ |
| COD lost in anaerobic reatcor | $S_{F,ANn^*}$ | 0.0 | $gCOD/m^3$ |
| Fermentable COD for AN reactor | $S_{F,I,conv}$ | 0.0 | $gCOD/m^3$ |
| DO in influent | $S_{O2,i}$ | 0.0 | $mgO_2/l$ |
| $PO_4$ release AN reactor | $S_{PO4,rel}$ | 0.0 | $gP/m^3$ |
| P removal by PAOs | $\Delta P_{PAO}$ | 0.0 | $gP/m^3$ |
| P removal by OHOs | $\Delta P_{OHO}$ | 1.2 | $gP/m^3$ |
| P removal by endgeneous biomass | $\Delta P_{XE}$ | 2.3 | $gP/m^3$ |
| P removal by influent inert mass | $\Delta P_{XI}$ | 4.3 | $gP/m^3$ |
| P into sludge production | $P_s$ | 6.9 | $gP/m^3$ |
| Potential P removal by system | $\Delta P_{SYS,POT}$ | 14.7 | $gP/m^3$ |
| Actual P removal by system | $\Delta P_{SYS,ACT}$ | 10.0 | $gP/m^3$ |
| Effluent particulate P from TSS | $X_{P,e}$ | 0.0 | $gP/m^3$ |
| Influent total P | $P_i$ | 10.0 | $gP/m^3$ |
| Effluent total P | $P_{e^*}$ | 0.0 | $gP/m^3$ |
| P precipitated | $P_{prec}$ | 0.0 | mgP/l |
| Precipitation chemical | $B_{Alum}$ | 0.0 | lb/d |
| Precipitation chemical | Solution | 0.0 | gal/d |
| Density Alum | $z_{AL}^{3+}$ | 0.100 | $lb_{AL}/lb_{prec}$ |
| Density Iron | $z_{FE}^{3+}$ | 0.077 | $lb_{FE}/lb_{prec}$ |
| Alum efficiency | - | 40.0 | g/kg |
| Chemical precipitation sludge | - | 0.0 | lb/d |

# Mechanical Process Calculation

| Tank Dimensions | Trains | Length | Width | Dia. | Degree | Height | Liquid level | Volume per train | Volume Total | Volume Total |
|---|---|---|---|---|---|---|---|---|---|---|
| Anaerob | 0 | .00 ft | .00 ft | .00 ft | 0.0 | .00 ft | .00 ft | gal | gal | 0.0 m3 |
| Anoxic I | 1 | 37.00 ft | 18.00 ft | .00 ft | 0.0 | 17.50 ft | 15.10 ft | 75,239 gal | 75,239 gal | 284.8 m3 |
| Aerobic | 1 | 37.00 ft | 18.00 ft | .00 ft | 0.0 | 17.50 ft | 14.80 ft | 73,737 gal | 73,737 gal | 279.1 m3 |
| Anoxic II | 0 | .00 ft | .00 ft | .00 ft | 0.0 | .00 ft | .00 ft | gal | gal | 0.0 m3 |
| Anoxic Buffer | 0 | .00 ft | .00 ft | .00 ft | 0.0 | .00 ft | .00 ft | gal | gal | 0.0 m3 |
| Membrane | 1 | 42.00 ft | 13.00 ft | .00 ft | 0.0 | 17.50 ft | 14.50 ft | 59,219 gal | 59,219 gal | 224.1 m3 |
| Sludge | 0 | .00 ft | .00 ft | .00 ft | 0.0 | .00 ft | .00 ft | gal | gal | 0.0 m3 |
| Post Aeration | 0 | .00 ft | .00 ft | .00 ft | 0.0 | .00 ft | .00 ft | gal | gal | 0.0 m3 |

| Tank Design | Symbol | Value | Units | | | |
|---|---|---|---|---|---|---|
| Total process tank volume | | 208,195 | gallons | Weir level | 3.6 | inches |
| Total process tank volume$_{calc}$ | | **201,355** | gallons | Weir length | 4.0 | ft |
| Unaerated tank percentage | | 36 | % | Velocity | 1.80 | fps |
| Total tank volume | | **208,195** | gallons | Vertical tank | 0 | |
| Membrane modules volume | | 6,912 | gallons | Horz. Tank | 0 | |
| F/M$_{used,BOD}$ | | 0.080 | kgBOD/kgMLSS | Diameter | 0 | ft |
| F/M$_{used,COD}$ | | 0.152 | kgCOD/kgMLSS | | | |



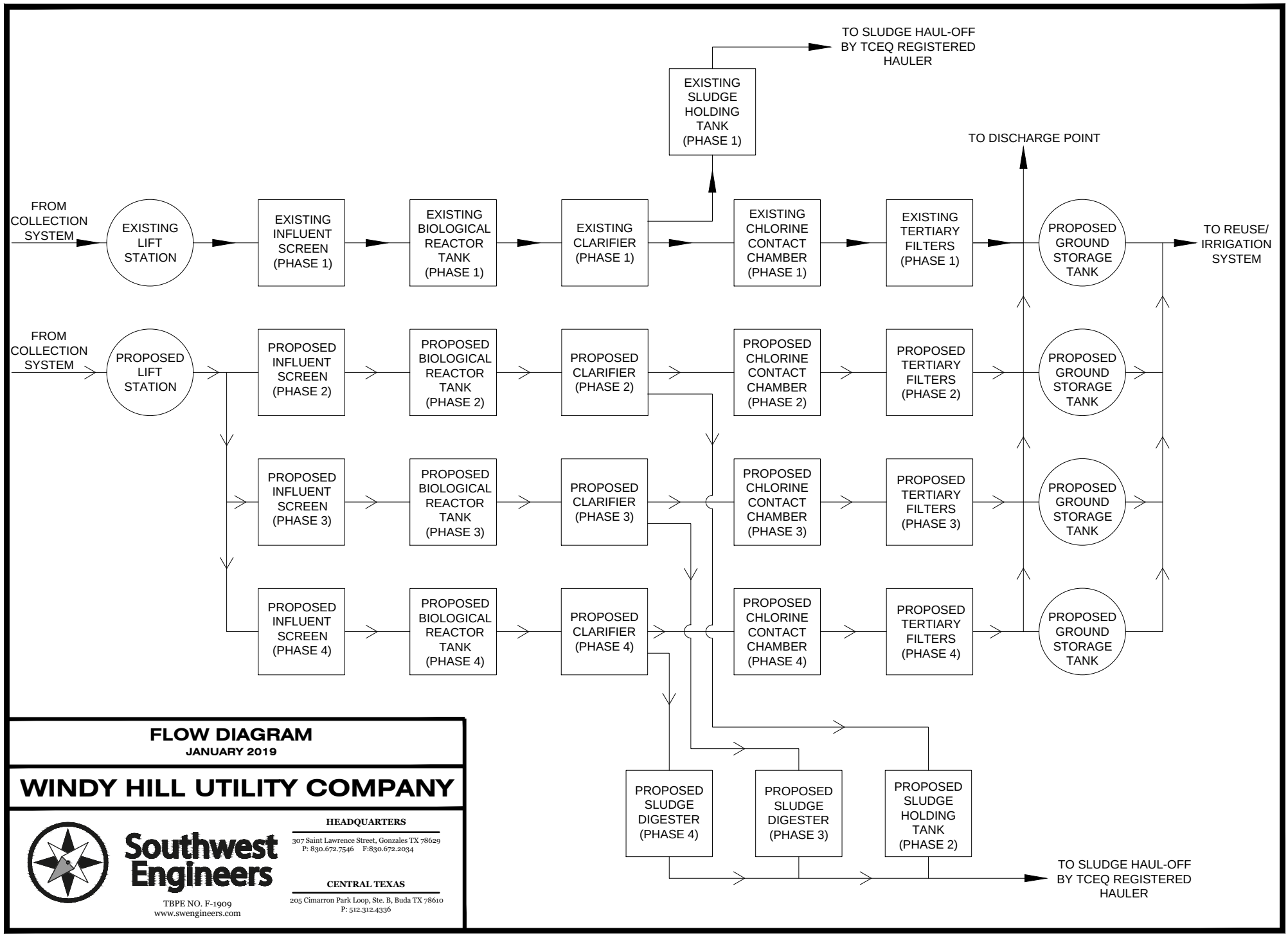

## Process Volume Distribution

| Air Flow Design | Symbol | Membrane per train | Aerobic per train | Sludge | EQ | Unit |
|---|---|---|---|---|---|---|
| Minimum air flow | $Q_{A,re}$ | 798 | 659 | 0 | 0 | acfm / scfm |
| Chosen air flow - actual | $Q_{A,\ chosen}$ | 737 | 626 | 0 | 0 | acfm |
| Chosen air flow - inlet | $Q_{A,chosen}$ | 1,357 | 1,129 | 0 | 0 | $m^3/h$ |
| Chosen air flow - inlet | $Q_{A,chosen}$ | **799** | **664** | **0** | **0** | scfm |
| Chosen air flow - piping | $Q_{A,chosen}$ | 529 | 440 | 0 | 0 | acfm |
| Pipe pressure | $p_b$ | 7.5 | 7.5 | 7.5 | 5.5 | psi |
| Pipe losses | H | 0.14 | 0.10 | 0.00 | 0.00 | psi |
| Equivalent length in pipe looses | $L_p$ | 400 | 400 | 400 | 200 | feet |
| Pipe diameter | d | 6.0 | 6.0 | 2.0 | 2.0 | inches |
| Internal pipe diameter | $d_i$ | 6.36 | 6.36 | 2.16 | 2.16 | inches |
| Standard temperature | $T_1$ | 293 | 293 | 293 | 293 | K |
| Pipe temperature | $T_2$ | 329 | 329 | 329 | 321 | K |
| Constant | f | 0.02 | 0.02 | 0.09 | 0.09 | - |
| Air velocity | v | **40.0** | **33.3** | **0.0** | **0.0** | fps |
| Atmospheric pressure | $p_{a,l}$ | 14.7 | 14.7 | 14.7 | 14.7 | psi |
| Absolute pressure | $p_2$ | 22.2 | 22.2 | 22.2 | 20.2 | psi |
| Pressure due to tank liquid level | $p_{DWD,m}$ | 5.8 | 6.2 | 0.0 | 0.0 | psi |
| Pressure due to aeration device | $p_{DWD}$ | 0.8 | 0.7 | 0.5 | 0.5 | psi |
| Pressure due to pipe losses & elev. | $p_{DWD,S}$ | 0.3 | 0.3 | 0.2 | 0.2 | psi |
| Total pipe losses | $p_t$ | 6.9 | 7.2 | 0.7 | 0.7 | psi |
| Total pipe losses | $p_t$ | 476.6 | 498.4 | 48.3 | 48.3 | mbar |

$$H = 9.82 \cdot 10^{-8} \cdot \frac{\left(f \cdot L_p T_2 Q_{A,chosen}\right)}{\left(p_2 d_i\right)^5}$$

$$f = \frac{\left(0.029 \cdot d_i^{0.027}\right)}{Q_{A,chosen}^{0.148}} \qquad T_2 = T_1 \left(\frac{p_2}{p_{a,1}}\right)^{0.283}$$

# DOMESTIC TECHNICAL REPORT 1.0
# ATTACHMENT 2.C
# PROCESS FLOW DIAGRAMS




**FLOW DIAGRAM**
**JANUARY 2019**

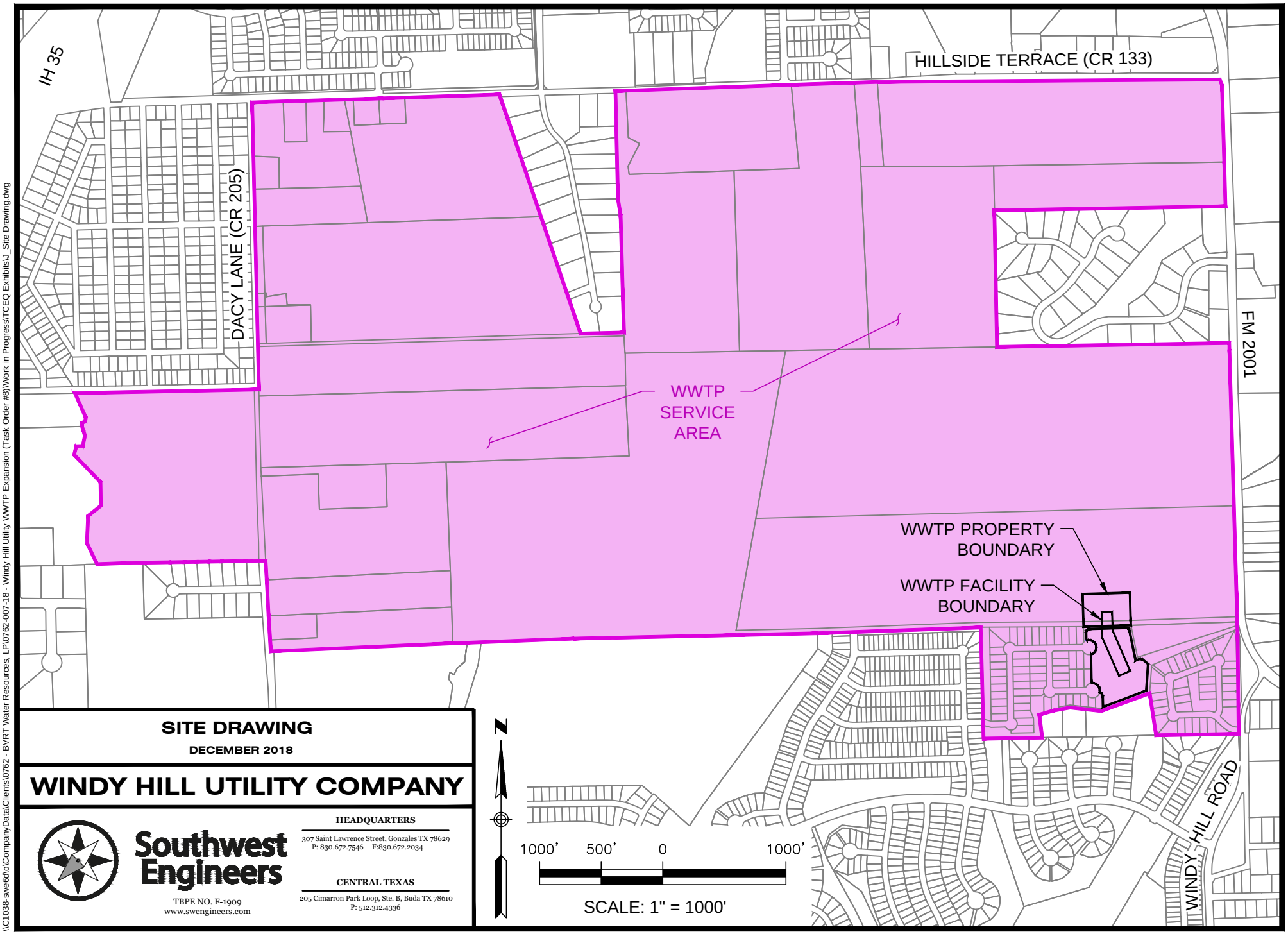
# WINDY HILL UTILITY COMPANY


Southwest Engineers
TBPE NO. F-1909
www.swengineers.com

**HEADQUARTERS**
307 Saint Lawrence Street, Gonzales TX 78629
P: 830.672.7546 F:830.672.2034

**CENTRAL TEXAS**
205 Cimarron Park Loop, Ste. B, Buda TX 78610
P: 512.312.4336

# DOMESTIC TECHNICAL REPORT 1.0
# ATTACHMENT 3
# SITE DRAWING




# SITE DRAWING

**DECEMBER 2018**

# WINDY HILL UTILITY COMPANY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\\C1038-swe6d\o\CompanyData\Clients\0762 - BVRT Water Resources, LP\0762-007-18 - Windy Hill Utility WWTP Expansion (Task Order #8)\Work in Progress\TCEQ Exhibits\J_Site Drawing.dwg

# DOMESTIC TECHNICAL REPORT 1.0
# ATTACHMENT 6.A
# TCEQ APPROVAL LETTER

# TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

*Protecting Texas by Reducing and Preventing Pollution*



June 7, 2022

Allison M. Nieto, P.E.
SOUTHWEST ENGINEERS, INC.
307 Saint Lawrence Street
Gonzales, TX 78628

Re: Windy Hill Utility Company, LLC
WHU WRRF #1 - Phase 2
Permit No. WQ0015478-001
WWPR Log No. 0622/013
CN605145986, RN109208553
Hays County

Dear Ms. Nieto:

TCEQ received the project summary transmittal letter dated 5/31/2022.

The rules which regulate the design, installation and testing of domestic wastewater projects are found in 30 TAC, Chapter 217, of the Texas Commission on Environmental Quality (TCEQ) rules titled, Design Criteria for Wastewater Systems.

Section 217.6(e), relating to case-by-case reviews, states in part that upon submittal of a summary transmittal letter, the executive director may approve of the project without reviewing a complete set of plans and specifications.

Under the authority of §217.6(e) a technical review of complete plans and specifications is not required. **However, the project proposed in the summary transmittal letter is approved for construction. Please note, that this conditional approval does not relieve the applicant of any responsibilities to obtain all other necessary permits or authorizations, such as wastewater treatment permit or other authorization as required by Chapter 26 of the Texas Water Code.** Below are provisions of the Chapter 217 regulations, which must be met as a condition of approval. These items are provided as a reminder. If you have already met these requirements, please disregard this additional notice.

- You must keep certain materials on file for the life of the project and provide them to TCEQ upon request. These materials include an engineering report, test results, a summary transmittal letter, and the final version of the project plans and specifications. These materials shall be prepared and sealed by a Professional Engineer licensed in the State of Texas and must show substantial compliance with Chapter 217. All plans and specifications must conform to any waste discharge requirements authorized in a permit by the TCEQ. Certain specific items which shall be addressed in the engineering report are discussed in §217.6(d). Additionally, the engineering report must include all constants, graphs,

equations, and calculations needed to show substantial compliance with Chapter 217. The items which shall be included in the summary transmittal letter are addressed in §217.6(d)(1)-(9).

- Any deviations from Chapter 217 shall be disclosed in the summary transmittal letter and the technical justifications for those deviations shall be provided in the engineering report. Any deviations from Chapter 217 shall be based on the best professional judgement of the licensed professional engineer sealing the materials and the engineer's judgement that the design would not result in a threat to public health or the environment.

- Any variance from a Chapter 217 requirement disclosed in your summary transmittal letter is approved. If in the future, additional variances from the Chapter 217 requirements are desired for the project, each variance must be requested in writing by the design engineer. Then, the TCEQ will consider granting a written approval to the variance from the rules for the specific project and the specific circumstances.

- Within 60 days of the completion of construction, an appointed engineer shall notify both the Wastewater Permits Section of the TCEQ and the appropriate Region Office of the date of completion. The engineer shall also provide written certification that all construction, materials, and equipment were substantially in accordance with the approved project, the rules of the TCEQ, and any change orders filed with the TCEQ. All notifications, certifications, and change orders must include the signed and dated seal of a Professional Engineer licensed in the State of Texas.

This approval does not mean that future projects will be approved without a complete plans and specifications review. The TCEQ will provide a notification of intent to review whenever a project is to undergo a complete plans and specifications review. Please be reminded of 30 TAC §217.7(a) of the rules which states, "Approval given by the executive director or other authorized review authority does not relieve an owner of any liability or responsibility with respect to designing, constructing, or operating a collection system or treatment facility in accordance with applicable commission rules and the associated wastewater permit".

If you have any questions, or if we can be of any further assistance, please call me at (512) 239-4924.

Sincerely,

Baltazar Lucero-Ramirez, P.E.
Wastewater Permits Section (MC 148)
Water Quality Division
Texas Commission on Environmental Quality

BLR/tc

cc: TCEQ, Region 11 Office

# DOMESTIC TECHNICAL REPORT 1.0
# ATTACHMENT 6.C
# NOTICE OF COMPLETION

# TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
# NOTIFICATION OF COMPLETION/PHASE OF WASTEWATER TREATMENT FACILITY

If you have questions about completing this form please contact the Applications Review and Processing Team at 512-239-4671.

## Current Permit Information

What is the TCEQ Water Quality Permit Number? WQ0015478001

What is the EPA I.D. Number? TX 0137111

Current Name on Permit: Windy Hill Utility Co. LLC

## Notification

Indicate the phase the facility will be operating.

- ☒ Interim Phase I Flow
- ☐ Interim Phase II Flow
- ☐ Interim Phase III Flow
- ☐ Final Phase Flow

Indicate the date that the operation began or will begin operating under the selected phase: Month/Day/Year: 09/24/2018

Comments:

## Certification and Signature

Responsible Official Name (Print or Type): Mia Natalino, P.E.

Responsible Official Title: General Manager

Responsible Official Email: mian@bvrtwater.com

I 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.

Signature (use blue ink): Mia Natalino Date: 10.4.18

Email completed form to: **WQ-ARPTeam@tceq.texas.gov**
or

**Fax completed form to:** **512-239-0884**
or mail completed form to: Texas Commission on Environmental Quality
Applications Review and Processing Team (MC-148)
P.O. Box 13087
Austin TX 78711-3087

# TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
# NOTIFICATION OF COMPLETION/PHASE OF WASTEWATER TREATMENT FACILITY

If you have questions about completing this form please contact the Applications Review and Processing Team at 512-239-4671.

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Current Name on Permit: Windy Hill Utility Co., LLC

## Notification

Indicate the phase the facility will be operating.

- ☐ Interim Phase I Flow
- ☒ Interim Phase II Flow
- ☐ Interim Phase III Flow
- ☐ Final Phase Flow

Indicate the date that the operation began or will begin operating under the selected phase: Month/Day/Year: 12/11/23

Comments: Phase II 0.12 MGD

## Certification and Signature

Responsible Official Name (Print or Type): Paul Townsley

Responsible Official Title: Authorized Signatory

Responsible Official Email: pault@bvrtwater.com

I 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.

Signature (use blue ink): _____ Date: 12/20/23

Email completed form to: **WQ-ARPTeam@tceq.texas.gov**
or

**Fax completed form to:** **512-239-0884**
or mail completed form to: Texas Commission on Environmental Quality
Applications Review and Processing Team (MC-148)
P.O. Box 13087
Austin TX 78711-3087

# DOMESTIC TECHNICAL REPORT 1.0
# ATTACHMENT 7
# POLLUTION ANALYSIS

Email information for report date:
10/17/24 11:50

H032473

**O & M Management Services**

Attn: Bill Fry
billf@bvrtwater.com

PO Box 701201
San Antonio, TX 78270

**Please contact us for your sampling needs or if you have any questions. Some convenient contacts are listed below. You can also access your results and reports through our ClientConnect ™ portal on our website (www.aqua-techlabs.com).**

For sampling questions:

samplingbryan@aqua-techlabs.com (Bryan area)
samplingaustin@aqua-techlabs.com (Austin area)

reporting@aqua-techlabs.com (report questions)

Aqua-Tech values you as a customer and encourages you to speak with our staff at 979-778-3707 or the above emails if you have questions.

Thank you for your business,
June M. Brien
Executive Technical Director

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The analyses summarized in this report were performed by Aqua-Tech Laboratories, Inc. unless otherwise noted. Aqua-Tech Laboratories, Inc. holds accreditation from the State of Texas in accordance with TNI and/or through the TCEQ Drinking Water Commercial Laboratory Approval Program.

**The following abbreviations indicate certification status:**

| | |
|---|---|
| NEL | TNI accredited parameter. |
| ANR | Accreditation not offered by the State of Texas. |
| DWP | Approval through the TCEQ Drinking Water Commercial Laboratory Approval Program. |
| INF | Aqua-Tech Laboratories, Inc. is not accredited for this parameter. It is reported on an informational basis only. |

Subcontracted data summarized in this report is indicated by "Sub" in the Lab column.

**Certificate: TX-C24-00311**

**TCEQ Lab ID T104704371**

**General Definitions:**

| | |
|---|---|
| NR | Not Reported. |
| RPD | Relative Percent Difference. |
| % R | Percent Recovery. |
| dry | Results with the "dry" unit designation are reported on a "dry weight" basis. |
| SQL | The Sample Quantitation Limit is the value below which the parameter cannot reliably be detected. The SQL includes all sample preparations, dilutions and / or concentrations. |
| Adj MDL | The Adjusted Method Detection Limit is the MDL value adjusted for any sample dilutions or concentrations . |
| MDL | The Method Detection Limit is the lowest theoretical value that is statistically different from zero for a specific method, taking into account all preparation steps and instrument settings. |

All samples are reported on an "as received" basis unless the designation "dry" is added to the reported unit.

Copies of Aqua-Tech Laboratories, Inc. procedures and individual sampling plans are available upon request. Note that samples are collected by Aqua-Tech Laboratories, Inc. personnel unless otherwise noted in the "Sample Collected" field of this report as "Client" or "CLT".

Samples included in this report were received in acceptable condition according to Aqua-Tech Laboratories, Inc. procedures and 40 CFR, Chapter I, Subchapter D, Part 136.3, TABLE II. - *Required containers, preservation techniques, and holding times*, unless otherwise noted in this report.

**Record Retention:**

All reports, raw data, and associated quality control data are kept on file for 10 years before being destroyed. Any client that would like copies of records must contact Aqua-Tech Laboratories, Inc. no later than six months prior to the scheduled disposal. An administrative fee for retrieval and distribution will apply.

This report was approved by:

June M. Brien, Technical Director



corp@aqua-techlabs.com www.aqua-techlabs.com

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# Analytical Report

**O & M Management Services**

**Report Printed:** **10/17/24** **11:50**

**H032473**

## Windy Hill WWTP Permit Effluent

Collected: 10/02/24 13:03 by Mitchell Mindieta
Received: 10/02/24 15:20 by Mitchell Mindieta

*Type*: Grab
*Matrix*: Non Potable
*C-O-C #*: N/A

| Lab ID# H032473-01 | Result | Units | Notes | MDL | Adj MDL | SQL | Lab | Analyzed | Method | Batch | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Field Parameters*** | | | | | | | | | | | |
| **Total Residual Chlorine** | **1.4** | mg Cl as CL2/L | | | 0.10 | 0.10 | *Calc* | At Collection | SM4500-Cl F 2011 | [CALC] | *ANR* |
| ***General Chemistry*** | | | | | | | | | | | |
| **Total Dissolved Solids** | **556** | mg/L | C-02 | 25.0 | 50.0 | 50.0 | *Austin* | 10/03/24 10:14 KHA | SM2540 C 2015 | M183638 | *NEL* |
| **Total Kjeldahl Nitrogen as N** | **0.38** | mg/L | | 0.13 | 0.13 | 0.20 | *Bryan* | 10/15/24 13:03 KMA | EPA 351.2 R2.0 | M184070 | *NEL* |
| **Nitrate as N** | **3.0** | mg/L | | | 0.10 | 0.12 | *Calc* | 10/16/24 13:34 MSA | SM4500-NO3-F 2011 | [CALC] | *NEL* |
| **Nitrite as N** | **<0.01** | mg/L | | 0.002 | 0.002 | 0.01 | *Austin* | 10/03/24 11:15 MSA | SM4500 NO2- B 2011 | M183652 | *NEL* |
| **Nitrate/Nitrite as N** | **3.0** | mg/L | | 0.02 | 0.10 | 0.12 | *Bryan* | 10/16/24 13:34 KMA | SM4500-NO3-F 2011 | M184238 | *ANR* |
| **Total Alkalinity as CaCO3 (pH4.5)** | **164** | mg/L | | 5.00 | 20.0 | 20.0 | *Austin* | 10/04/24 10:53 MSA | SM2320 B 2011 | M183675 | *DWP* |
| **Oil & Grease (HEM)** | **<4.9** | mg/L | | 4.4 | 4.9 | 4.9 | *Bryan* | 10/08/24 09:19 HDH | EPA 1664B | M183838 | *NEL* |
| **Chloride** | **93.0** | mg/L | | 0.60 | 2.41 | 20.0 | *Austin* | 10/07/24 10:30 MSA | SM4500-Cl- B 2011 | M183779 | *NEL* |
| **Sulfate as SO4(2-)** | **133** | mg/L | | 2.63 | 10.5 | 20.0 | *Austin* | 10/07/24 09:36 BEB | ASTM D516-16 | M183789 | *NEL* |
| ***Metals (Total)*** | | | | | | | | | | | |
| **Phosphorus (Total)** | **<0.050** | mg/L | | 0.082 | 0.041 | 0.050 | *Austin* | 10/08/24 12:53 KT | EPA 200.7 R4.4 | M183750 | *NEL* |

## Explanation of Notes

| | |
|---|---|
| C-02 | Result confirmed by re-analysis. |
| J | Analyte detected below the SQL but above the MDL. |

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# Analytical Report

**O & M Management Services**

**Report Printed:** **10/17/24** **11:50**

**H032473**

## Field Parameters - Quality Control

| | Result | Units | Notes | MDL | SQL | Analyzed | Spike Amount | Source Result | %R | %R Limits | RPD | RPD Limit | Batch | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Chlorine Residual, Total - SM4500-Cl F 2011** | | | | | | | | | | | | | | *Austin* |
| Duplicate | 3.0 | mg/L | | 0.1 | 0.1 | 10/02/24 09:15 MAM | | 6.0 | | | 66.7 | 10.2 | M183420 | |

## General Chemistry - Quality Control

| | Result | Units | Notes | MDL | SQL | Analyzed | Spike Amount | Source Result | %R | %R Limits | RPD | RPD Limit | Batch | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Chloride - SM4500-Cl- B 2011** | | | | | | | | | | | | | | *Austin* |
| Initial Cal Check | 49.8 | mg/L | | | | 10/07/24 10:30 MSA | 50.0 | | 99.5 | 90 - 110 | | | 2410092 | |
| Low Cal Check | 5.11 | mg/L | | | | 10/07/24 10:30 MSA | 4.95 | | 103 | 70 - 130 | | | 2410092 | |
| Blank | <5.00 | mg/L | | 0.60 | 5.00 | 10/07/24 10:30 MSA | | | | | | | M183779 | |
| LCS | 20.5 | mg/L | | 0.60 | 5.00 | 10/07/24 10:30 MSA | 19.8 | | 103 | 90 - 110 | | | M183779 | |
| LCS Dup | 20.5 | mg/L | | 0.60 | 5.00 | 10/07/24 10:30 MSA | 19.8 | | 103 | 90 - 110 | 0.00 | 5.86 | M183779 | |
| Matrix Spike | 223 | mg/L | | 2.41 | 20.0 | 10/07/24 10:30 MSA | 79.2 | 139 | 106 | 83.4 - 113 | | | M183779 | |
| Matrix Spike Dup | 223 | mg/L | | 2.41 | 20.0 | 10/07/24 10:30 MSA | 79.2 | 139 | 106 | 83.4 - 113 | 0.00 | 10.7 | M183779 | |
| MRL Check | 5.11 | mg/L | | 0.60 | 5.00 | 10/07/24 10:30 MSA | 4.95 | | 103 | 70 - 130 | | | M183779 | |
| **Mn Interference - SM4500-Cl F 2011** | | | | | | | | | | | | | | *Austin* |
| Duplicate | 0.4 | mg/L | | 0.1 | 0.1 | 10/08/24 07:09 BAL | | 0.4 | | | 0.00 | 7.47 | M183836 | |
| **Nitrate/Nitrite as N - SM4500-NO3-F 2011** | | | | | | | | | | | | | | *Bryan* |
| Initial Cal Check | 1.0 | mg/L | | | | 10/16/24 13:34 KMA | 0.959 | | 105 | 90 - 110 | | | 2410239 | |
| Interference Check A | 2.0 | mg/L | | | | 10/16/24 13:34 KMA | 2.00 | | 99.2 | 0 - 200 | | | 2410239 | |
| Low Cal Check | 0.02 | mg/L | | | | 10/16/24 13:34 KMA | 0.0200 | | 95.0 | 70 - 130 | | | 2410239 | |
| Blank | <0.02 | mg/L | | 0.02 | 0.02 | 10/16/24 13:34 KMA | | | | | | | M184238 | |
| LCS | 0.50 | mg/L | | 0.02 | 0.02 | 10/16/24 13:34 KMA | 0.500 | | 101 | 92.6 - 108 | | | M184238 | |
| LCS Dup | 0.51 | mg/L | | 0.02 | 0.02 | 10/16/24 13:34 KMA | 0.500 | | 102 | 92.6 - 108 | 0.989 | 2.2 | M184238 | |
| Matrix Spike | 10 | mg/L | | 0.17 | 0.20 | 10/16/24 13:34 KMA | 5.00 | 5.3 | 103 | 79.4 - 122 | | | M184238 | |
| Matrix Spike Dup | 11 | mg/L | | 0.17 | 0.20 | 10/16/24 13:34 KMA | 5.00 | 5.3 | 105 | 79.4 - 122 | 2.25 | 7.62 | M184238 | |

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# Analytical Report

**O & M Management Services**

**Report Printed:** **10/17/24** **11:50**

**H032473**

## General Chemistry - Quality Control

| | Result | Units | Notes | MDL | SQL | Analyzed | Spike Amount | Source Result | %R | %R Limits | RPD | RPD Limit | Batch | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Nitrite as N - SM4500 NO2- B 2011** | | | | | | | | | | | | | | *Austin* |
| Initial Cal Check | 0.08 | mg/L | | | | 10/03/24 11:15 MSA | 0.0740 | | 104 | 90 - 110 | | | 2410052 | |
| Blank | <0.01 | mg/L | | 0.002 | 0.01 | 10/03/24 11:15 MSA | | | | | | | M183652 | |
| LCS | 0.08 | mg/L | | 0.002 | 0.01 | 10/03/24 11:15 MSA | 0.0800 | | 102 | 90 - 110 | | | M183652 | |
| LCS Dup | 0.08 | mg/L | | 0.002 | 0.01 | 10/03/24 11:15 MSA | 0.0800 | | 102 | 90 - 110 | 0.440 | 10 | M183652 | |
| Matrix Spike | 0.07 | mg/L | | 0.002 | 0.01 | 10/03/24 11:15 MSA | 0.0800 | <0.01 | 87.2 | 57 - 116 | | | M183652 | |
| Matrix Spike Dup | 0.07 | mg/L | | 0.002 | 0.01 | 10/03/24 11:15 MSA | 0.0800 | <0.01 | 86.8 | 57 - 116 | 0.515 | 10 | M183652 | |
| MRL Check | <0.01 | mg/L | *J (0.009)* | 0.002 | 0.01 | 10/03/24 11:15 MSA | 0.0100 | | 91.6 | 70 - 130 | | | M183652 | |
| Initial Cal Check | 0.08 | mg/L | | | | 10/06/23 11:00 MSA | 0.0800 | | 106 | 90 - 110 | | | 2310075 | |
| **Oil & Grease (HEM) - EPA 1664B** | | | | | | | | | | | | | | *Bryan* |
| Blank | <5.0 | mg/L | | 5.0 | 5.0 | 10/08/24 09:19 HDH | | | | | | | M183838 | |
| LCS | 33.9 | mg/L | | 5.0 | 5.0 | 10/08/24 09:19 HDH | 40.1 | | 84.5 | 78 - 114 | | | M183838 | |
| LCS Dup | 33.8 | mg/L | | 5.0 | 5.0 | 10/08/24 09:19 HDH | 40.0 | | 84.5 | 78 - 114 | 0.000027 | 200 | M183838 | |
| Matrix Spike | 33.9 | mg/L | | 4.9 | 4.9 | 10/08/24 09:19 HDH | 39.3 | <4.9 | 86.3 | 78 - 114 | | | M183838 | |
| **Sulfate as SO4(2-) - ASTM D516-16** | | | | | | | | | | | | | | *Austin* |
| Initial Cal Check | 27.8 | mg/L | | | | 09/13/24 09:10 BEB | 30.0 | | 92.7 | 90 - 110 | | | 2409181 | |
| Initial Cal Check | 29.3 | mg/L | | | | 10/07/24 09:36 BEB | 30.0 | | 97.6 | 90 - 110 | | | 2410096 | |
| Low Cal Check | 4.23 | mg/L | | | | 10/07/24 09:36 BEB | 5.00 | | 84.5 | 70 - 130 | | | 2410096 | |
| Blank | <5.00 | mg/L | | 2.63 | 5.00 | 10/07/24 09:36 BEB | | | | | | | M183789 | |
| Duplicate | 90.5 | mg/L | | 10.5 | 20.0 | 10/07/24 09:36 BEB | | 91.7 | | | 1.32 | 11.9 | M183789 | |
| Filtered Blank | <5.00 | mg/L | | 2.63 | 5.00 | 10/07/24 09:36 BEB | | | | | | | M183789 | |
| LCS | 8.84 | mg/L | | 2.63 | 5.00 | 10/07/24 09:36 BEB | 10.0 | | 88.4 | 85 - 115 | | | M183789 | |
| Matrix Spike | 126 | mg/L | | 10.5 | 20.0 | 10/07/24 09:36 BEB | 40.0 | 91.7 | 84.6 | 61.6 - 137 | | | M183789 | |
| Matrix Spike Dup | 123 | mg/L | | 10.5 | 20.0 | 10/07/24 09:36 BEB | 40.0 | 91.7 | 79.0 | 61.6 - 137 | 6.87 | 17.1 | M183789 | |
| MRL Check | <5.00 | mg/L | *J (4.23)* | 2.63 | 5.00 | 10/07/24 09:36 BEB | 5.00 | | 84.5 | 70 - 130 | | | M183789 | |
| **Total Alkalinity as CaCO3 (pH4.5) - SM2320 B 2011** | | | | | | | | | | | | | | *Austin* |
| Initial Cal Check | 6.84 | mg/L | | | | 10/04/24 10:53 MSA | 6.86 | | 99.7 | 97 - 103 | | | 2410064 | |
| Initial Cal Check | 9.08 | mg/L | | | | 10/04/24 10:53 MSA | 9.18 | | 98.9 | 97 - 103 | | | 2410064 | |
| Low Cal Check | 20.5 | mg/L | | | | 10/04/24 10:53 MSA | 18.8 | | 109 | 0 - 200 | | | 2410064 | |
| Duplicate | 363 | mg/L | | 20.0 | 20.0 | 10/04/24 10:53 MSA | | 362 | | | 0.331 | 5.52 | M183675 | |
| LCS | 77.3 | mg/L | | 20.0 | 20.0 | 10/04/24 10:53 MSA | 75.4 | | 103 | 95.5 - 105 | | | M183675 | |
| LCS Dup | 76.7 | mg/L | | 20.0 | 20.0 | 10/04/24 10:53 MSA | 75.4 | | 102 | 95.5 - 105 | 0.779 | 4.76 | M183675 | |
| MRL Check | 20.5 | mg/L | | 20.0 | 20.0 | 10/04/24 10:53 MSA | 18.8 | | 109 | 70 - 130 | | | M183675 | |

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# Analytical Report

**O & M Management Services**

**Report Printed:** **10/17/24** **11:50**

**H032473**

## General Chemistry - Quality Control

| | Result | Units | Notes | MDL | SQL | Analyzed | Spike Amount | Source Result | %R | %R Limits | RPD | RPD Limit | Batch | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Total Dissolved Solids - SM2540 C 2015** | | | | | | | | | | | | | | *Austin* |
| Blank | <25.0 | mg/L | | 25.0 | 25.0 | 10/03/24 10:14 KHA | | | | | | | M183638 | |
| Duplicate | 550 | mg/L | | 50.0 | 50.0 | 10/03/24 10:14 KHA | | 556 | | | 1.08 | 11.2 | M183638 | |
| Reference | 504 | mg/L | | 100 | 100 | 10/03/24 10:14 KHA | 501 | | 101 | 75 - 127 | | | M183638 | |
| **Total Kjeldahl Nitrogen as N - EPA 351.2 R2.0** | | | | | | | | | | | | | | *Bryan* |
| Initial Cal Check | 1.72 | mg/L | | | | 10/15/24 13:03 KMA | 1.69 | | 102 | 90 - 110 | | | 2410219 | |
| Low Cal Check | 0.22 | mg/L | | | | 10/15/24 13:03 KMA | 0.200 | | 108 | 70 - 130 | | | 2410219 | |
| Blank | <0.20 | mg/L | | 0.13 | 0.20 | 10/15/24 13:03 KMA | | | | | | | M184070 | |
| LCS | 4.09 | mg/L | | 0.13 | 0.20 | 10/15/24 13:03 KMA | 4.00 | | 102 | 87.4 - 119 | | | M184070 | |
| LCS Dup | 4.14 | mg/L | | 0.13 | 0.20 | 10/15/24 13:03 KMA | 4.00 | | 104 | 87.4 - 119 | 1.24 | 5.44 | M184070 | |
| Matrix Spike | 168 | mg/L | | 3.25 | 5.00 | 10/15/24 13:03 KMA | 100 | 68.2 | 100 | 62.1 - 130 | | | M184070 | |
| Matrix Spike Dup | 169 | mg/L | | 3.25 | 5.00 | 10/15/24 13:03 KMA | 100 | 68.2 | 100 | 62.1 - 130 | 0.349 | 17.5 | M184070 | |

## Metals (Total) - Quality Control

| | Result | Units | Notes | MDL | SQL | Analyzed | Spike Amount | Source Result | %R | %R Limits | RPD | RPD Limit | Batch | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Phosphorus (Total) - EPA 200.7 R4.4** | | | | | | | | | | | | | | *Austin* |
| Blank | <0.050 | mg/L | | 0.041 | 0.050 | 10/08/24 12:13 KT | | | | | | | M183750 | |
| LCS | 2.47 | mg/L | | 0.041 | 0.050 | 10/08/24 12:15 KT | 2.50 | | 98.7 | 84.5 - 115.4 | | | M183750 | |
| LCS Dup | 2.47 | mg/L | | 0.041 | 0.050 | 10/08/24 12:18 KT | 2.50 | | 99.0 | 84.5 - 115.4 | 0.283 | 20 | M183750 | |
| Duplicate | 12.7 | mg/L | | 0.041 | 0.050 | 10/08/24 12:20 KT | | 12.5 | | | 1.79 | 20 | M183750 | |
| Matrix Spike | 15.2 | mg/L | | 0.041 | 0.050 | 10/08/24 12:23 KT | 2.50 | 12.5 | 110 | 69.5 - 130.4 | | | M183750 | |

## Sample Preparation Summary

| Sample | Method | Prepared | Lab | Bottle | Initial | Units | Final | Units | External Dilution Factor | Batch |
|---|---|---|---|---|---|---|---|---|---|---|
| **H032473-01** | | | | | | | | | | |
| Chloride | SM4500-Cl- B 2011 | 10/7/24 10:30 MSA | Austin | F | 25.0 | mL | 100 | mL | 1 | M183779 |
| Nitrate/Nitrite as N | SM4500-NO3-F 2011 | 10/16/24 10:00 KMA | Bryan | B | 1.00 | mL | 6.00 | mL | 1 | M184238 |
| Nitrite as N | SM4500 NO2- B 2011 | 10/3/24 11:15 MSA | Austin | C | 25.0 | mL | 25.0 | mL | 1 | M183652 |
| Oil & Grease (HEM) | EPA 1664B | 10/8/24 9:19 HDH | Bryan | K | 1020 | mL | 1000 | mL | 1 | M183838 |
| Phosphorus (Total) | EPA 200.7 R4.4 | 10/4/24 12:22 KT | Austin | I | 50.0 | mL | 25.0 | mL | 1 | M183750 |
| Sulfate as SO4(2-) | ASTM D516-16 | 10/7/24 9:36 BEB | Austin | F | 25.0 | mL | 100 | mL | 1 | M183789 |
| Total Alkalinity as CaCO3 (pH4.5) | SM2320 B 2011 | 10/4/24 10:53 MSA | Austin | D | 50.0 | mL | 200 | mL | 1 | M183675 |
| Total Dissolved Solids | SM2540 C 2015 | 10/3/24 10:14 KHA | Austin | F | 50.0 | mL | 100 | mL | 1 | M183638 |
| Total Kjeldahl Nitrogen as N | EPA 351.2 R2.0 | 10/14/24 8:26 CTG | Bryan | B | 25.0 | mL | 25.0 | mL | 1 | M184070 |

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# Analytical Report

**O & M Management Services**

**Report Printed:** **10/17/24** **11:50**

**H032473**

## Chain-of-Custody Summary

The following record summarizes custody for work orders sampled by Aqua-Tech Laboratories, Inc. personnel on route.

Original signatures are kept on file by Aqua-Tech Laboratories, Inc. and are available upon request.

## WORK ORDER H032473

| Cooler ID | Temperature °C | Condition Good? | On Ice? | Preservation Correct? | Custody Maintained by ATL? | See comments below or comments and qualifiers with analytical results explaining any "No" answers. |
|---|---|---|---|---|---|---|
| T02 | 5.7 | Yes | Yes | Yes | Yes | |

**H032473-01** Grab Sampling Begun: 10/2/24 13:03 Sampling Ended: 10/2/24 13:03

| Container & Description | pH Checks / Comments | Container & Description | pH Checks / Comments | Container & Description | pH Checks / Comments |
|---|---|---|---|---|---|
| A Dechlor 0.5 LP | | B NO3 TKN 0.25LP H2SO4 | pH < 2 | C NO2 0.25LP | |
| D ALK 0.25LP | | F CL SO4 TDS 1LP | | H Mn Corr 0.25 LP | |
| I P 0.25LP H2SO4 | pH < 2 | K OG - 1LG Amber HCl | | L OG - 1LG Amber HCl | |
| M OG pH Chk - 1LP HCl | pH < 2 | | | | |

Sampled & Submitted to Lab by: Mitchell Mindieta (Route Driver)

Received: 10/2/24 15:20 By Mitchell Mindieta ( Austin )

# 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**
**RENOVACION**

**PERMISO NO. WQ0015478001**

**SOLICITUD.** Windy Hill Utility Company LLC, A Texas Limited Liability Company, P.O. Box 701201, San Antonio, Texas 78270, ha solicitado a la Comisión de Calidad Ambiental del Estado de Texas (TCEQ) para renovar el Permiso No. WQ0015478001 (EPA I.D. No. TX0137111) del Sistema de Eliminación de Descargas de Contaminantes de Texas (TPDES) para autorizar la descarga de aguas residuales tratadas en un volumen que no sobrepasa un flujo promedio diario de 680,000 por día. La planta está ubicada 2784 Farm-to-Market Road 2001, cerca de la ciudad de Buda, en el Condado de Hays, Texas. La ruta de descarga es del sitio de la planta a un afluente sin nombre; Allí a Brushy Creek; de allí a un embalse; de allí a Brushy Creek; de allí a Plum Creek. La TCEQ recibió esta solicitud el 30 de Octubre 2024. La solicitud para el permiso está disponible para leerla y copiarla en 550 Scott Street, Kyle, Texas. La solicitud (cualquier actualización y aviso inclusive) está disponible electrónicamente en la siguiente página de web: https://www.tceq.texas.gov/permitting/wastewater/pending-permits/tpdes-applications. Este enlace a un mapa electrónico de la ubicación general del sitio o de la instalación es proporcionado como una cortesía y no es parte de la solicitud o del aviso. Para la ubicación exacta, consulte la solicitud.
https://gisweb.tceq.texas.gov/LocationMapper/?marker=-97.806666,30.045833&level=18

**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. Si ciertos criterios se cumplen, la TCEQ puede actuar sobre una solicitud para renovar un permiso sin proveer una oportunidad de una audiencia administrativa de lo contencioso.**

**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. Ademas, puede pedir que la TCEQ ponga su nombre en una or mas de las listas correos siguientes (1) la lista de correo permanente para recibir los avisos de el 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 envia por correo su pedido a la Oficina del Secretario Principal de la TCEQ.

**CONTACTOS E INFORMACIÓN DE LA TCEQ. Todos los comentarios escritos del público y los para pedidos una reunión deben ser presentados a la Oficina del Secretario Principal, MC 105, TCEQ, P.O. Box 13087, Austin, TX 78711-3087 o por el internet at www.tceq.texas.gov/about/comments.html.** 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. Si necesita más información en Español sobre esta solicitud para un permiso o el proceso del permiso, por favor llame a El Programa de Educación Pública de la TCEQ, sin cobro, al 1-800-687-4040. La información general sobre la TCEQ puede ser encontrada en nuestro sitio de la red: www.tceq.texas.gov.

También se puede obtener información adicional del Windy Hill Utility Company LLC, A Texas Limited Liability Company, a la dirección indicada arriba o llamando a Mr. Bill Fry, General Manager al 210-209-8029.

Fecha de emisión _____ *[Date notice issued]*