TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

DOMESTIC WASTEWATER PERMIT APPLICATION CHECKLIST

Complete and submit this checklist with the application.

APPLICANT: BL 12 Holdings LLC

PERMIT NUMBER: TBD

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

	Y	N		Y	N
Administrative Report 1.0	☒	☐	Original USGS Map	☒	☐
Administrative Report 1.1	☒	☐	Affected Landowners Map	☒	☐
SPIF	☒	☐	Landowner Disk or Labels	☒	☐
Core Data Form	☒	☐	Buffer Zone Map	☒	☐
Public Involvement Plan Form	☒	☐	Flow Diagram	☒	☐
Technical Report 1.0	☒	☐	Site Drawing	☒	☐
Technical Report 1.1	☒	☐	Original Photographs	☒	☐
Worksheet 2.0	☒	☐	Design Calculations	☒	☐
Worksheet 2.1	☐	☒	Solids Management Plan	☒	☐
Worksheet 3.0	☐	☒	Water Balance	☐	☒
Worksheet 3.1	☐	☒			
Worksheet 3.2	☐	☒			
Worksheet 3.3	☐	☒			
Worksheet 4.0	☐	☒			
Worksheet 5.0	☐	☒			
Worksheet 6.0	☐	☒			
Worksheet 7.0	☐	☒			

For TCEQ Use Only

Segment Number _____County _____
Expiration Date _____Region _____
Permit Number _____

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

APPLICATION FOR A DOMESTIC WASTEWATER PERMIT ADMINISTRATIVE REPORT 1.0

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

Section 1. Application Fees (Instructions Page 29)

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: 106616

Check/Money Order Amount: $1,650.00

Name Printed on Check: BGE, Inc.

EPAY Voucher Number: Click here to enter text.

Copy of Payment Voucher enclosed? Yes ☐

Section 2. Type of Application (Instructions Page 29)

☒ New TPDES

☐ Major Amendment *with* Renewal

☐ Major Amendment *without* Renewal

☐ Renewal without changes

☐ New TLAP

☐ Minor Amendment *with* Renewal

☐ Minor Amendment *without* Renewal

☐ Minor Modification of permit

For amendments or modifications, describe the proposed changes: Click here to enter text.

For existing permits:

Permit Number: WQ00 Click here to enter text.

EPA I.D. (TPDES only): TX Click here to enter text.

Expiration Date: Click here to enter text.

Section 3. Facility Owner (Applicant) and Co-Applicant Information (Instructions Page 29)

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

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

BL 12 Holdings LLC

(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: Click here 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 (Mr., Ms., Miss): Mr

First and Last Name: Sudharsan Vembutty

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

Title: Manager

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?

Click here to enter text

(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 here 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 (Mr., Ms., Miss): Click here to enter text

First and Last Name: Click here to enter text

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

Title: Click here to enter text

Provide a brief description of the need for a co-permittee: Click here 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.

Attachment: 1

Section 4. Application Contact Information (Instructions Page 30)

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

First and Last Name: Adan Rangel

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

Title: Project Engineer

Organization Name: BGE, Inc.

Mailing Address: 101 West Louis Henna Blvd., Suite 400

City, State, Zip Code: Austin, TX 78728

Phone No.: (512) 806-0285 Ext.: Click here to enter text Fax No.: Click here to enter text

E-mail Address: arangel@bgeinc.com

Check one or both: ☒ Administrative Contact ☒ Technical Contact

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

First and Last Name: Daniel Lacour

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

Title: EIT

Organization Name: BGE, Inc.

Mailing Address: 101 West Louis Henna Blvd., Suite 400

City, State, Zip Code: Austin, TX 78728

Phone No.: (512) 886-4538 Ext.: Click here to enter text Fax No.: Click here to enter text

E-mail Address: dlacour@bgeinc.com

Check one or both: ☒ Administrative Contact ☒ Technical Contact

Section 5. Permit Contact Information (Instructions Page 30)

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

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

First and Last Name: Travis Janik

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

Title: Project Manager – Land Development

Organization Name: BL 12 Holdings LLC

Mailing Address: 101 Parklane Blvd, Suite 104

City, State, Zip Code: Sugar Land, TX, 77478

Phone No.: (281) 617-6302 Ext.: Click here to enter text Fax No.: Click here to enter text

E-mail Address: travis@ashtongraydev.com

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

First and Last Name: Joseph Yaklin

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

Title: Senior Project Manager, Land Development

Organization Name: BGE Inc.

Mailing Address: 101 West Louis Henna Blvd., Suite 400

City, State, Zip Code: Austin, TX, 78728

Phone No.: +1 (409) 779-9988 Ext.: Click here to enter text Fax No.: Click here to enter text

E-mail Address: jyaklin@bgeinc.com

Section 6. Billing Information (Instructions Page 30)

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

First and Last Name: Travis Janik

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

Title: Project Manager – Land Development

Organization Name: BL 12 Holdings LLC

Mailing Address: 101 Parklane Blvd, Suite 104

City, State, Zip Code: Sugar Land, TX, 77478

Phone No.: (281) 617-6302 Ext.: Click here to enter text Fax No.: Click here to enter text

E-mail Address: travis@ashtongraydev.com

Section 7. DMR/MER Contact Information (Instructions Page 31)

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

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

First and Last Name: Travis Janik

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

Title: Project Manager – Land Development

Organization Name: BL 12 Holdings LLC

Mailing Address: 101 Parklane Blvd, Suite 104

City, State, Zip Code: Sugar Land, TX, 77478

Phone No.: (281) 617-6302 Ext.: Click here to enter text Fax No.: Click here to enter text

E-mail Address: travis@ashtongraydev.com

DMR data is required to be submitted electronically. Create an account at: https://www.tceq.texas.gov/permitting/netdmr/netdmr.html.

Section 8. Public Notice Information (Instructions Page 31)

A. Individual Publishing the Notices

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

First and Last Name: Adan Rangel

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

Title: Project Engineer

Organization Name: BGE, Inc.

Mailing Address: 101 West Louis Henna Blvd., Suite 400

City, State, Zip Code: Austin, TX 78728

Phone No.: (512) 806-4169 Ext.: Click here to enter text Fax No.: Click here to enter text

E-mail Address: arangel@bgeinc.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 person to be listed in the Notices

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

First and Last Name: Adan Rangel

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

Title: Project Engineer

Organization Name: BGE, Inc.

Phone No.: (512) 806-0285 Ext.: Click here to enter text.

E-mail: arangel@bgeinc.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: Dr. Eugene Clark Library

Location within the building: Public Notice Board

Physical Address of Building: 217 S Main st

City: Lockhart County: Caldwell

Contact Name: Click here to enter text.

Phone No.: (512) 398-3223 Ext.: Click here 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. 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: 12

Section 9. Regulated Entity and Permitted Site Information (Instructions Page 33)

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

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):

JK Ranch WWTP

C. Owner of treatment facility: BL 12 Holdings LLC

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

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

Prefix (Mr., Ms., Miss): Click here to enter text

First and Last Name: BL 12 Holdings LLC

Mailing Address: 101 Parklane Blvd, Suite 104

City, State, Zip Code: Sugar Land, TX, 77478

Phone No.: (281) 617-6302 E-mail Address: travis@ashtongraydev.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 here to enter text

E. Owner of effluent disposal site:

Prefix (Mr., Ms., Miss): N/A

First and Last Name: N/A

Mailing Address: N/A

City, State, Zip Code: N/A

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

First and Last Name: TBD

Mailing Address: TBD

City, State, Zip Code: TBD

Phone No.: TBD E-mail Address: TBD

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: TBD

Section 10. TPDES Discharge Information (Instructions Page 34)

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:

The WWTP Site is +/- 3,450LF northeast of the intersection of San Marcos Hwy and Political Rd in Caldwell County, TX .

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:

Discharges to Callihan Creek; thence to the Lower San Marcos River in Segment No. 1808 of the Guadalupe River Basin.

City nearest the outfall(s): Staples

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

Outfall Latitude: 29°46'29.52" N Longitude: 97°46'4.12" W

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: N/A

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

☐ 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: N/A

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.

Click here to enter text.

Section 11. TLAP Disposal Information (Instructions Page 36)

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:

Click here to enter text.

B. City nearest the disposal site: Click here to enter text.

C. County in which the disposal site is located: Click here to enter text.

D. Disposal Site Latitude: Click here to enter text. Longitude: Click here to enter text.

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

Click here to enter text.

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

Click here to enter text.

Section 12. Miscellaneous Information (Instructions Page 37)

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.

N/A

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:

N/A

D. Do you owe any fees to the TCEQ?

☐ Yes ☒ No

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

Account number: N/A Amount past due: N/A

E. Do you owe any penalties to the TCEQ?

☐ Yes ☒ No

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

Enforcement order number: N/A Amount past due: N/A

Section 13. Attachments (Instructions Page 38)

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 here to enter text.

Section 14. Signature Page (Instructions Page 39)

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

Permit Number: TBD

Applicant: BL 12 Holdings 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): Sudharsan Vembutty

Signatory title: Manager

Signature: _____ Date: 3/8/2023

(Use blue ink)

Subscribed and Sworn to before me by the said Sudharshan Vembutty

on this 6 day of March, 20 23.

My commission expires on the 16 day of May, 20 26.

_____

Notary Public

Alex Phillippe Staten
My Commission Expires
5/16/2026
Notary ID
133762187

[SEAL]

Fort Bend

County, Texas

Section 15. Plain Language Summary (Instructions Page 40)

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

ENGLISH TEMPLATE FOR TPDES or TLAP NEW/RENEWAL/AMENDMENT APPLICATIONS

DOMESTIC WASTEWATER

The following summary is provided for this pending water quality permit application being reviewed by the Texas Commission on Environmental Quality as required by 30 Texas Administrative Code Chapter 39. The information provided in this summary may change during the technical review of the application and are not federal enforceable representations of the permit application.
BL 12 Holdings LLC (CN#TBD) proposes to operate JK Ranch Wastewater Treatment Plant RN#TBD. a conventional activated sludge plant with extended nitrification. The facility will be located +/- 3,450LF northeast of the intersection of San Marcos Hwy and Political Rd, in Staples, Caldwell County, Texas 78622.

This is a new application to authorize discharge of treated domestic wastewater at a volume not to exceed 850,000 Gallons Per Day.

Discharges from the facility are expected to contain five-day carbonaceous biochemical oxygen demand (CBOD5), total suspended solids (TSS), ammonia nitrogen (NH3-N), and phosphorus.Domestic wastewater will be treated by five-day carbonaceous biochemical oxygen demand (CBOD5), total suspended solids (TSS), ammonia nitrogen (NH3-N), and phosphorus.

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

AGUAS RESIDUALES DOMÉSTICAS

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

BL 12 Holdings LLC (CN606108637) propone operar la Planta de Tratamiento de Aguas Residuales JK Ranch (RN111669537). Una planta de fango activado convencional con nitrificación prolongada. La instalación estará ubicada aproximadamente 3,450 pies al noreste de la intersección de la Carretera San Marcos y la Carretera Political, en Staples, Condado de Caldwell, Texas 78622.

Esta es una nueva solicitud para autorizar la descargar de aguas residuales domésticas tratadas a un volumen que no exceda los 850,000 galones por día.

Se espera que las descargas de la instalación contengan la demanda de oxígeno bioquímico carbonoso de cinco días (CBOD5) sólidos totalmente suspendidos (TSS), nitrógeno de amoniaco (NH3-N), y fósforo. Las aguas residuales domésticas serán tratadas por fango activado convencional con nitrificación extendida y proceso de orden de componentes de una pantalla fina, tanques de aireación, clarificador final, digestores de fango, tanque de contacto de cloro y adición de coagulante.

DOMESTIC ADMINISTRATIVE REPORT 1.1

The following information is required for new and amendment applications.

Section 1. Affected Landowner Information (Instructions Page 41)

A. Indicate by a check mark that the landowners map or drawing, with scale, includes the following information, as applicable:

- ☒ The applicant's property boundaries
- ☒ The facility site boundaries within the applicant's property boundaries
- ☐ The distance the buffer zone falls into adjacent properties and the property boundaries of the landowners located within the buffer zone
- ☒ The property boundaries of all landowners surrounding the applicant's property (Note: if the application is a major amendment for a lignite mine, the map must include the property boundaries of all landowners adjacent to the new facility (ponds).)
- ☒ The point(s) of discharge and highlighted discharge route(s) clearly shown for one mile downstream
- ☒ The property boundaries of the landowners located on both sides of the discharge route for one full stream mile downstream of the point of discharge
- ☐ The property boundaries of the landowners along the watercourse for a one-half mile radius from the point of discharge if the point of discharge is into a lake, bay, estuary, or affected by tides
- ☐ The boundaries of the effluent disposal site (for example, irrigation area or subsurface drainfield site) and all evaporation/holding ponds within the applicant's property
- ☐ The property boundaries of all landowners surrounding the effluent disposal site
- ☐ The boundaries of the sludge land application site (for land application of sewage sludge for beneficial use) and the property boundaries of landowners surrounding the applicant's property boundaries where the sewage sludge land application site is located
- ☐ The property boundaries of landowners within one-half mile in all directions from the applicant's property boundaries where the sewage sludge disposal site (for example, sludge surface disposal site or sludge monofill) is located

B. ☒ Indicate by a check mark that a separate list with the landowners' names and mailing addresses cross-referenced to the landowner's map has been provided.

C. Indicate by a check mark in which format the landowners list is submitted:

☒ USB Drive ☐ Four sets of labels

D. Provide the source of the landowners' names and mailing addresses: Caldwell County Appraisal District

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

☐ Yes ☒ No

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

Click here to enter text.

Section 2. Original Photographs (Instructions Page 44)

Provide original ground level photographs. Indicate with checkmarks that the following information is provided.

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

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

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

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

Section 3. Buffer Zone Map (Instructions Page 44)

A. Buffer zone map. Provide a buffer zone map on 8.5 x 11-inch paper with all of the following information. The applicant's property line and the buffer zone line may be distinguished by using dashes or symbols and appropriate labels.

- The applicant's property boundary;
- The required buffer zone; and
- Each treatment unit; and
- The distance from each treatment unit to the property boundaries.

B. Buffer zone compliance method. Indicate how the buffer zone requirements will be met. Check all that apply.

☒ Ownership

☐ Restrictive easement

☐ Nuisance odor control

☐ Variance

C. Unsuitable site characteristics. Does the facility comply with the requirements regarding unsuitable site characteristic found in 30 TAC § 309.13(a) through (d)?

☒ Yes ☐ No

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

SUPPLEMENTAL PERMIT INFORMATION FORM (SPIF)

FOR AGENCIES REVIEWING DOMESTIC 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)

The SPIF must be completed as a separate document. The TCEQ will mail a copy of the SPIF to each agency as required by the TCEQ agreement with EPA. If any of the items are not completely addressed or further information is needed, you will be contacted to provide the information before the permit is issued. Each item must be completely addressed.

Do not refer to a response of any item in the permit application form. Each attachment must be provided with this form separately from the administrative report of the application. The application will not be declared administratively complete without this form being completed in its entirety including all attachments.

The following applies to all applications:

1. Permittee: Click here to enter text

   Permit No. WQ00 Click here to enter text EPA ID No. TX Click here to enter text

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

   The WWTP Site is +/- 3,450LF northeast of the intersection of San Marcos Hwy and Political Rd near Fentress in Caldwell County, TX.

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

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

First and Last Name: Travis Janik

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

Title: Project Manager – Land Development

Mailing Address: 101 Parklane Blvd, Suite 104

City, State, Zip Code: Sugar Land, TX, 77478

Phone No.: (281) 617-6302 Ext.: Click here to enter text Fax No.: Click here to enter text

E-mail Address: travis@ashtongraydev.com

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

Discharges to Callihan Creek; thence to the Lower San Marcos River in Segment No. 1808 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

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

About 0.5 acres to be impacted by concrete slabs and a facility road.

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

Existing land use includes cow grazing and hay farming.

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

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

Year built not identified on Appraisal records

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

Rural Farmland. Architect/builder unknown.

WATER QUALITY PERMIT

PAYMENT SUBMITTAL FORM

Use this form to submit the Application Fee, if the mailing the payment.

- Complete items 1 through 5 below.
- Staple the check or money order in the space provided at the bottom of this document.
- **Do not mail this form with the application form.**
- Do not mail this form to the same address as the application.
- Do not submit a copy of the application with this form as it could cause duplicate permit entries.

Mail this form and the check or money order to:

BY REGULAR U.S. MAIL

Texas Commission on Environmental Quality
Financial Administration Division
Cashier's Office, MC-214
P.O. Box 13088
Austin, Texas 78711-3088

BY OVERNIGHT/EXPRESS MAIL

Texas Commission on Environmental Quality
Financial Administration Division
Cashier's Office, MC-214
12100 Park 35 Circle
Austin, Texas 78753

Fee Code: WQP **Waste Permit No:** TBD

1. Check or Money Order Number: 106616
2. Check or Money Order Amount: $1,650.00
3. Date of Check or Money Order: February 8, 2023
4. Name on Check or Money Order: BGE, Inc.
5. APPLICATION INFORMATION

   Name of Project or Site: JK Ranch WWTP

   Physical Address of Project or Site: Click here to enter text

   If the check is for more than one application, attach a list which includes the name of each Project or Site (RE) and Physical Address, exactly as provided on the application.

Staple Check or Money Order in This Space

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Section 1. Individual Information (Instructions Page 50)

Complete this attachment if the facility applicant or co-applicant is an individual. Make additional copies of this attachment if both are individuals.

Prefix (Mr., Ms., Miss): Click here to enter text.

Full legal name (first, middle, last): Click here to enter text.

Driver's License or State Identification Number: Click here to enter text.

Date of Birth: Click here to enter text.

Mailing Address: Click here to enter text.

City, State, and Zip Code: Click here to enter text.

Phone Number: Click here to enter text. Fax Number: Click here to enter text.

E-mail Address: Click here to enter text.

CN: Click here to enter text.

For Commission Use Only:
Customer Number:
Regulated Entity Number:
Permit Number:

CHECKLIST OF COMMON DEFICIENCIES

Below is a list of common deficiencies found during the administrative review of domestic wastewater permit applications. To ensure the timely processing of this application, please review the items below and indicate by checking Yes that each item is complete and in accordance applicable rules at 30 TAC Chapters 21, 281, and 305. If an item is not required this application, indicate by checking N/A where appropriate. Please do not submit the application until the items below have been addressed.

Core Data Form (TCEQ Form No. 10400) ☒ Yes
(Required for all applications types. Must be completed in its entirety and signed. Note: Form may be signed by applicant representative.)

Correct and Current Industrial Wastewater Permit Application Forms ☒ Yes
(TCEQ Form Nos. 10053 and 10054. Version dated 6/25/2018 or later.)

Water Quality Permit Payment Submittal Form (Page 19) ☒ Yes
(Original payment sent to TCEQ Revenue Section. See instructions for mailing address.)

7.5 Minute USGS Quadrangle Topographic Map Attached ☒ Yes
(Full-size map if seeking "New" permit. 8 ½ x 11 acceptable for Renewals and Amendments)

Current/Non-Expired, Executed Lease Agreement or Easement Attached ☒ N/A ☐ Yes

Landowners Map ☐ N/A ☒ Yes
(See instructions for landowner requirements)

Things to Know:

- All the items shown on the map must be labeled.
- The applicant's complete property boundaries must be delineated which includes boundaries of contiguous property owned by the applicant.
- The applicant cannot be its own adjacent landowner. You must identify the landowners immediately adjacent to their property, regardless of how far they are from the actual facility.
- If the applicant's property is adjacent to a road, creek, or stream, the landowners on the opposite side must be identified. Although the properties are not adjacent to applicant's property boundary, they are considered potentially affected landowners. If the adjacent road is a divided highway as identified on the USGS topographic map, the applicant does not have to identify the landowners on the opposite side of the highway.

Landowners Cross Reference List ☐ N/A ☒ Yes
(See instructions for landowner requirements)

Landowners Labels or USB Drive attached ☐ N/A ☒ Yes
(See instructions for landowner requirements)

Original signature per 30 TAC § 305.44 – Blue Ink Preferred ☒ Yes
(If signature page is not signed by an elected official or principle executive officer, a copy of signature authority/delegation letter must be attached)

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

DOMESTIC WASTEWATER PERMIT APPLICATION

DOMESTIC TECHNICAL REPORT 1.0

The Following Is Required For All Applications

Renewal, New, And Amendment

Section 1. Permitted or Proposed Flows (Instructions Page 51)

A. Existing/Interim I Phase

Design Flow (MGD): 0.15

2-Hr Peak Flow (MGD): 0.6

Estimated construction start date: Q1 2025

Estimated waste disposal start date: Q1 2026

B. Interim II Phase

Design Flow (MGD): 0.4

2-Hr Peak Flow (MGD): 1.6

Estimated construction start date: Q1 2027

Estimated waste disposal start date: Q1 2028

C. Final Phase

Design Flow (MGD): 0.85

2-Hr Peak Flow (MGD): 3.4

Estimated construction start date: Q1 2036

Estimated waste disposal start date: Q1 2037

D. Current operating phase: N/A

Provide the startup date of the facility: N/A

Section 2. Treatment Process (Instructions Page 51)

A. Treatment process description

Provide a detailed description of the treatment process. **Include the type of**

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 in the permit, a description of *each phase* must be provided**. Process description:

Conventional Activated Sludge with modified extended nitrification, a tertiary filtration system and coagulant addition for phosphorus removal, with anticipated effluent limits of CBOD5 = 5 mg/L, TSS = 5mg/L, Total Ammonia Nitrogen = 2 mg/L, Total Phosphorus = 1mg/L. The initial phase will construct the headworks structure to be utilized by all operational phases. The initial treatment train will be of steel tank type with process component order of aeration basin, sludge tank, clarifier, chlorine contact basin, cloth media filter, and coagulant addition. The treated effluent will gravity flow into a natural stream.

Port or pipe diameter at the discharge point, in inches: 18"

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)
		See Attachment 7 for all phases

C. Process flow diagrams

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

Attachment: 8

Section 3. Site Drawing (Instructions Page 52)

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: 9

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

JK Ranch Development- Single family, multi-family, and retail development.

Section 4. Unbuilt Phases (Instructions Page 52)

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.

N/A

Section 5. Closure Plans (Instructions Page 53)

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.

N/A

Section 6. Permit Specific Requirements (Instructions Page 53)

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: N/A

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.

N/A

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.

Buffe zones are maintained by land ownership.

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*.

N/A

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 here 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 512-239-0000. 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 here 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 512-239-0000.

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

Click here 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 here to enter text or TXRNE Click here 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 here 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 here 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 here 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 here 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, a Sewage Sludge Solids Management Plan is required. See Example 5 in the instructions.

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

1. Acceptance of sludge from other WWTPs

Does the facility accept or will it accept sludge from other treatment plants at the facility site?
Yes ☐ No ☒

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

In addition, provide the date that the plant started accepting sludge 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.

N/A

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 a the date that the plant started accepting septic waste, 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.

N/A

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 the facility accepting or will it 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.

N/A

Section 7. Pollutant Analysis of Treated Effluent (Instructions Page 58)

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).

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

Table 1.0(2) - Pollutant Analysis for Wastewater Treatment Facilities

Pollutant	**Average Conc.**	**Max Conc.**	**No. of Samples**	**Sample Type**	**Sample Date/Time**
$CBOD_5$, mg/l					
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)					

Pollutant	Average Conc.	Max Conc.	No. of Samples	Sample Type	Sample Date/Time
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

Table 1.0(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					
Total Dissolved Solids, mg/l					
pH, standard units					
Fluoride, mg/l					
Aluminum, mg/l					
Alkalinity ($CaCO_3$), mg/l					

Section 8. Facility Operator (Instructions Page 60)

Facility Operator Name: TBD

Facility Operator's License Classification and Level: TBD

Facility Operator's License Number: TBD

Section 9. Sewage Sludge Management and Disposal (Instructions Page 60)

A. Sludge disposal method

Identify the current or anticipated sludge disposal method or methods from the

following list. Check all that apply.

- ☐ Permitted landfill
- ☐ Permitted or Registered land application site for beneficial use
- ☐ Land application for beneficial use authorized in the wastewater permit
- ☐ Permitted sludge processing facility
- ☐ Marketing and distribution as authorized in the wastewater permit
- ☐ Composting as authorized in the wastewater permit
- ☐ Permitted surface disposal site (sludge monofill)
- ☐ Surface disposal site (sludge monofill) authorized in the wastewater permit
- ☒ Transported to another permitted wastewater treatment plant or permitted sludge processing facility. If you selected this method, a written statement or contractual agreement from the wastewater treatment plant or permitted sludge processing facility accepting the sludge must be included with this application.
- ☐ Other: Click here to enter text.

B. Sludge disposal site

Disposal site name: TBD

TCEQ permit or registration number: TBD

County where disposal site is located: TBD

C. Sludge transportation method

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

Name of the hauler: TBD

Hauler registration number: TBD

Sludge is transported as a:

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

Section 10. Permit Authorization for Sewage Sludge Disposal (Instructions Page 60)

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 61)

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 here to enter text.
- USDA Natural Resources Conservation Service Soil Map:

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

  Attachment: Click here to enter text.
- Site map:

  Attachment: Click here 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 here 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 here 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 here to enter text.

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

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

Phosphorus, mg/kg: Click here to enter text.

Potassium, mg/kg: Click here to enter text.

pH, standard units: Click here to enter text.

Ammonia Nitrogen mg/kg: Click here to enter text.

Arsenic: Click here to enter text.

Cadmium: Click here to enter text.

Chromium: Click here to enter text.

Copper: Click here to enter text.

Lead: Click here to enter text.

Mercury: Click here to enter text.

Molybdenum: Click here to enter text.

Nickel: Click here to enter text.

Selenium: Click here to enter text.

Zinc: Click here to enter text.

Total PCBs: Click here to enter text.

Provide the following information:

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

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

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

D. Site development plan

Provide a detailed description of the methods used to deposit sludge in the

lagoon(s):

Click here to enter text

Attach the following documents to the application.

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

  Attachment: Click here to enter text

- Copy of the closure plan

  Attachment: Click here to enter text

- Copy of deed recordation for the site

  Attachment: Click here to enter text

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

  Attachment: Click here to enter text

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

  Attachment: Click here to enter text

- Procedures to prevent the occurrence of nuisance conditions

  Attachment: Click here 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 here to enter text

Section 12. Authorizations/Compliance/Enforcement

(Instructions Page 63)

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:

N/A

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:

N/A

Section 13. RCRA/CERCLA Wastes (Instructions Page 63)

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 64)

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: N/A, Facility currently not in operation, no data included in this application, testing lab to be determined

Title: Click here to enter text

Signature: _____

Date: _____

DOMESTIC TECHNICAL REPORT 1.1

The following is required for new and amendment applications

Section 1. Justification for Permit (Instructions Page 66)

A. Justification of permit need

Provide a detailed discussion regarding the need for any phase(s) not currently permitted. Failure to provide sufficient justification may result in the Executive Director recommending denial of the proposed phase(s) or permit.

This wastewater treatment system will provide sewage treatment for a new 2800 LUE residential development (ultimate) by 2037. Construction of the development is expected to start in Q1 of 2025 and grow at a rate of 200 homes per year. The population growth trends were estimated using trends observed in the US census and Moody's Analytics Population Growth Trends table. Population figures were derived from the TCEQ 217 Wastewater guidelines on population which are 3.5 people per Single Family home (LUE). The treatment plant phases will start construction and have the following capacities: Phase I (Q3 2025, 0.15 MGD), Phase II (Q1 2027, 0.40 MGD), Phase III (Q1 2036, 0.85 MGD).

B. Regionalization of facilities

Provide the following information concerning the potential for regionalization of domestic wastewater treatment facilities:

1. Municipally incorporated areas

If the applicant is a city, then Item 1 is not applicable. Proceed to Item 2 Utility CCN areas.

Is any portion of the proposed service area located in an incorporated city?

Yes ☐ No ☒ Not Applicable ☐

If yes, within the city limits of: Click here to enter text

If yes, attach correspondence from the city.

Attachment: N/A

If consent to provide service is available from the city, attach a justification for the proposed facility and a cost analysis of expenditures that includes the cost of connecting to the city versus the cost of the proposed facility or expansion attached.

Attachment: N/A

2. Utility CCN areas

Is any portion of the proposed service area located inside another utility's CCN area?

Yes ☐ No ☒

If yes, attach a justification for the proposed facility and a cost analysis of expenditures that includes the cost of connecting to the CCN facilities versus the cost of the proposed facility or expansion.

Attachment: N/A

3. Nearby WWTPs or collection systems

Are there any domestic permitted wastewater treatment facilities or collection systems located within a three-mile radius of the proposed facility?

Yes ☐ No ☒

If yes, attach a list of these facilities that includes the permittee's name and permit number, and an area map showing the location of these facilities.

Attachment: N/A

If yes, attach copies of your certified letters to these facilities **and** their response letters concerning connection with their system.

Attachment: N/A

Does a permitted domestic wastewater treatment facility or a collection system located within three (3) miles of the proposed facility currently have the capacity to accept or is willing to expand to accept the volume of wastewater proposed in this application?

Yes ☐ No ☒

If yes, attach an analysis of expenditures required to connect to a permitted wastewater treatment facility or collection system located within 3 miles versus the cost of the proposed facility or expansion.

Attachment: N/A

Section 2. Organic Loading (Instructions Page 67)

Is this facility in operation?

Yes ☐ No ☒

If no, proceed to Item B, Proposed Organic Loading.

If yes, provide organic loading information in Item A, Current Organic Loading

A. Current organic loading

Facility Design Flow (flow being requested in application): Click here to enter text

Average Influent Organic Strength or BOD_5 Concentration in mg/l: Click here to enter text

Average Influent Loading (lbs/day = total average flow X average BOD_5 conc. X 8.34): Click here to enter text

Provide the source of the average organic strength or BOD_5 concentration.

Click here to enter text

B. Proposed organic loading

This table must be completed if this application is for a facility that is not in operation or if this application is to request an increased flow that will impact organic loading.

Table 1.1(1) – Design Organic Loading

Source	Total Average Flow (MGD)	Influent BOD_5 Concentration (mg/l)
Municipality		
Subdivision	0.85	300
Trailer park – transient		
Mobile home park		
School with cafeteria and showers		
School with cafeteria,		

Source	Total Average Flow (MGD)	Influent BOD_5 Concentration (mg/l)
no showers		
Recreational park, overnight use		
Recreational park, day use		
Office building or factory		
Motel		
Restaurant		
Hospital		
Nursing home		
Other		
TOTAL FLOW from all sources	0.85	
AVERAGE BOD_5 from all sources		300

Section 3. Proposed Effluent Quality and Disinfection (Instructions Page 68)

A. Existing/Interim I Phase Design Effluent Quality

Biochemical Oxygen Demand (5-day), mg/l: 5

Total Suspended Solids, mg/l: 5

Ammonia Nitrogen, mg/l: 2

Total Phosphorus, mg/l: 1

Dissolved Oxygen, mg/l: 4

Other: Click here to enter text.

B. Interim II Phase Design Effluent Quality

Biochemical Oxygen Demand (5-day), mg/l: 5

Total Suspended Solids, mg/l: 5

Ammonia Nitrogen, mg/l: 2

Total Phosphorus, mg/l: 1

Dissolved Oxygen, mg/l: 4

Other: Click here to enter text.

C. Final Phase Design Effluent Quality

Biochemical Oxygen Demand (5-day), mg/l: 5

Total Suspended Solids, mg/l: 5

Ammonia Nitrogen, mg/l: 2

Total Phosphorus, mg/l: 1

Dissolved Oxygen, mg/l: 4

Other: Click here to enter text.

D. Disinfection Method

Identify the proposed method of disinfection.

☒ Chlorine: at least 1.0 and shall not exceed 4.0 mg/l after 20 minutes detention time at peak flow

Dechlorination process: Click here to enter text.

☐ Ultraviolet Light: Click here to enter text. seconds contact time at peak flow

☐ Other: Click here to enter text.

Section 4. Design Calculations (Instructions Page 68)

Attach design calculations and plant features for each proposed phase. Example 4 of the instructions includes sample design calculations and plant features.

Attachment: 10

Section 5. Facility Site (Instructions Page 68)

A. 100-year floodplain

Will the proposed facilities be located above the 100-year frequency flood level?

Yes ☒ No ☐

If no, describe measures used to protect the facility during a flood event. Include a site map showing the location of the treatment plant within the 100-year frequency flood level. If applicable, provide the size and types of protective structures.

N/A

Provide the source(s) used to determine 100-year frequency flood plain.

Flood Insurance Rate Map for Caldwell County, Panel 220, Community Map No 48055C0220F Eff. 12/30/2020

For a new or expansion of a facility, will a wetland or part of a wetland be filled?

Yes ☐ No ☒

If yes, has the applicant applied for a US Corps of Engineers 404 Dredge and Fill Permit?

Yes ☐ No ☐

If yes, provide the permit number: Click here to enter text.

If no, provide the approximate date you anticipate submitting your application to the Corps: Click here to enter text.

B. Wind rose

Attach a wind rose. **Attachment**: 11

Section 6. Permit Authorization for Sewage Sludge Disposal (Instructions Page 69)

A. Beneficial use authorization

Are you requesting to include authorization to land apply sewage sludge for beneficial use on property located adjacent to the wastewater treatment facility under the wastewater permit?

Yes ☐ No ☒

If yes, attach the completed Application for Permit for Beneficial Land Use of Sewage Sludge (TCEQ Form No. 10451)

Attachment: N/A

B. Sludge processing authorization

Identify the sludge processing, storage or disposal options that will be conducted at the wastewater treatment facility:

☐ Sludge Composting

☐ Marketing and Distribution of sludge

☐ Sludge Surface Disposal or Sludge Monofill

If any of the above sludge options are selected, attach a completed DOMESTIC WASTEWATER PERMIT APPLICATION: SEWAGE SLUDGE TECHNICAL REPORT (TCEQ Form No. 10056).

Attachment: N/A

Section 7. Sewage Sludge Solids Management Plan (Instructions Page 69)

Attach a solids management plan to the application.

Attachment: 10

The sewage sludge solids management plan must contain the following information:

- Treatment units and processes dimensions and capacities
- Solids generated at 100, 75, 50, and 25 percent of design flow
- Mixed liquor suspended solids operating range at design and projected actual flow
- Quantity of solids to be removed and a schedule for solids removal
- Identification and ownership of the ultimate sludge disposal site
- For facultative lagoons, design life calculations, monitoring well locations and depths, and the ultimate disposal method for the sludge from the facultative lagoon

An example of a sewage sludge solids management plan has been included as Example 5 of the instructions.

DOMESTIC TECHNICAL REPORT WORKSHEET 2.0

RECEIVING WATERS

The following is required for all TPDES permit applications

Section 1. Domestic Drinking Water Supply (Instructions Page 73)

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 yes, provide the following:
Owner of the drinking water supply: Click here to enter text.

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

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

Attachment: Click here to enter text.

Section 2. Discharge into Tidally Affected Waters (Instructions Page 73)

Does the facility discharge into tidally affected waters?

Yes ☐ No ☒

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 here 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 here 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 here to enter text

Section 3. Classified Segments (Instructions Page 73)

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 75)

Name of the immediate receiving waters: Callihan Creek

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 here to enter text

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

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

☐ Man-made Channel or Ditch

☐ Open Bay

☐ Tidal Stream, Bayou, or Marsh

☐ Other, specify: Click here to enter text.

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 here 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.

No perennial streams within 3 miles downstream of the 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.

N/A

E. Normal dry weather characteristics

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

Dry creek with sparce pools of water.

Date and time of observation: 2/10/2023 10:00 AM

Was the water body influenced by stormwater runoff during observations?

Yes ☒ No ☐

Section 5. General Characteristics of the Waterbody (Instructions Page 74)

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 Click here to enter text

B. Waterbody uses

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

- ☒ Livestock watering
- ☐ Contact recreation
- ☐ Irrigation withdrawal
- ☐ Non-contact recreation
- ☐ Fishing
- ☐ Navigation

☐ Domestic water supply ☐ Industrial water supply

☐ Park activities ☐ Other(s), specify Click here to enter text.

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

ATTACHMENT 1
TCEQ 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		**RN**

SECTION II: Customer Information

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

☒ 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:*

BL 12 Holdings LLC

7. TX SOS/CPA Filing Number	**8. TX State Tax ID** (11 digits)	**9. Federal Tax ID** (9 digits)	**10. DUNS Number** *(if applicable)*
0804196195		87-2288378	

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:	101 Parklane Blvd, Suite 104						
	City	Sugar Land	**State**	TX	**ZIP**	77478	**ZIP + 4**

16. Country Mailing Information *(if outside USA)*	**17. E-Mail Address** *(if applicable)*
	travis@ashtongraydev.com

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

(281) 617-6302		( ) -

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.)*

JK Ranch WWTP

23. Street Address of the Regulated Entity: ***(No PO Boxes)***								
	City		**State**		**ZIP**		**ZIP + 4**	
24. County								

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

25. Description to Physical Location:	Approximately 3,450 LF northeast of the intersection of San Marcos Hwy and Political Rd.				
26. Nearest City			**State**	**Nearest ZIP Code**	
Staples			TX	78622	

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:	29.775084		**28. Longitude (W) In Decimal:**	97.770974	
Degrees	Minutes	Seconds	Degrees	Minutes	Seconds
29	46	30.3024	97	46	15.5064

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)

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

Domestic Wastewater Treatment

34. Mailing Address:	**101 Parklane Blvd, Suite 104**							
	City	**Sugar Land**	**State**	**TX**	**ZIP**	**77478**	**ZIP + 4**	
35. E-Mail Address:	**travis@ashtongraydev.com**							

36. Telephone Number	**37. Extension or Code**	**38. Fax Number** *(if applicable)*
(281) 617-6302		( ) -

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.

☐ 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:	Daniel LaCour	41. Title:	EIT

42. Telephone Number	43. Ext./Code	44. Fax Number	45. E-Mail Address
(512) 886-4538		( ) -	dlacour@bgeinc.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.

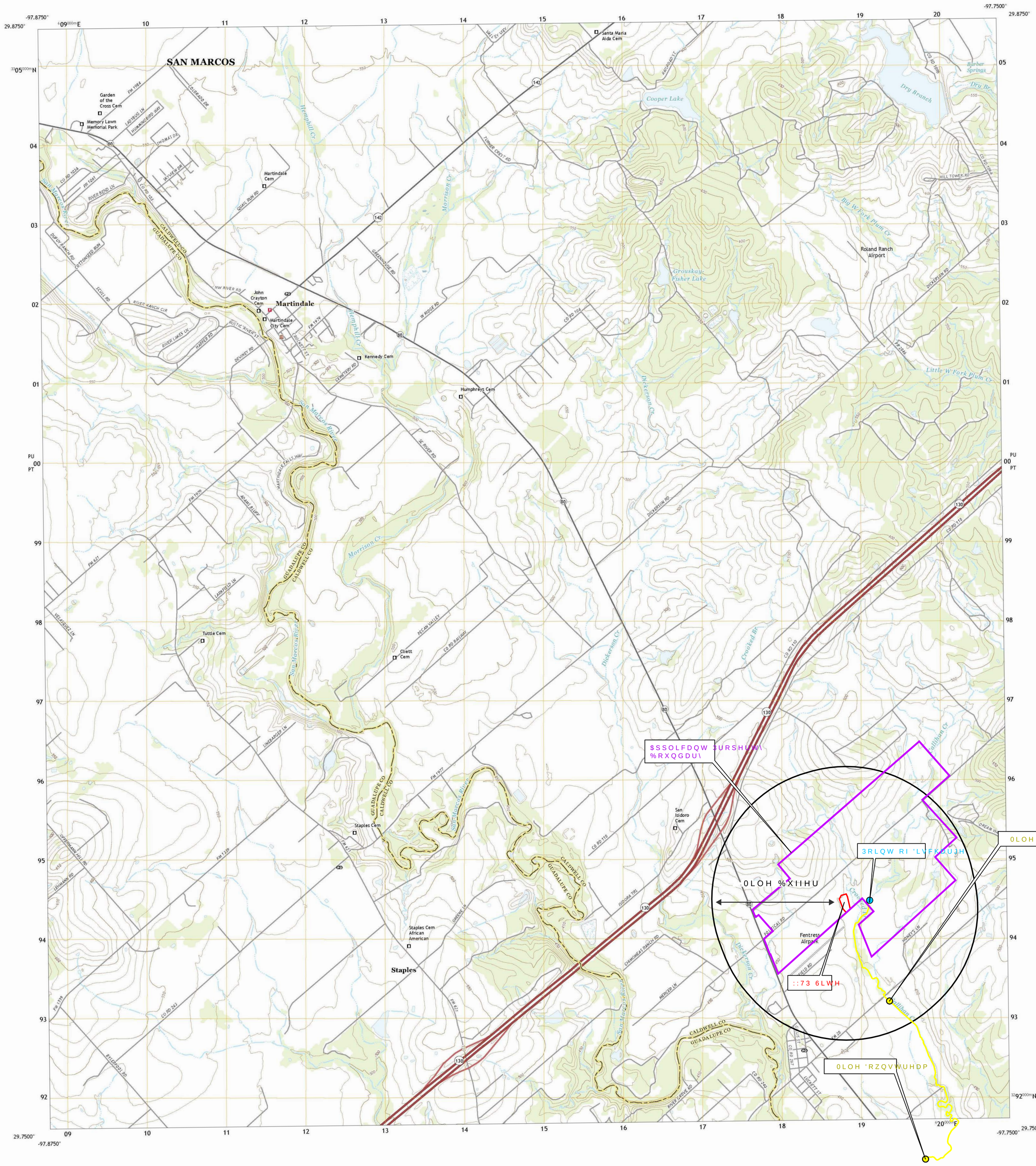
Company:	BL 12 Holdings LLC	Job Title:	Manager
Name *(In Print)*:	Sudharsan Vembutty	Phone:	( ) -
Signature:	SV	Date:	2/7/2023

ATTACHMENT 2
7.5 MINUTE
USGS MAP

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

The National Map US Topo

MARTINDALE QUADRANGLE
TEXAS
7.5-MINUTE SERIES



Produced by the United States Geological Survey
North American Datum of 1983 (NAD83)
World Geodetic System of 1984 (WGS84). Projection and 1 000-meter grid:Universal Transverse Mercator, Zone 14R

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

Imagery	NAIP, September 2016 - November 2016	
Roads	U.S. Census Bureau, 2015 -	2019
Names	GNIS, 2003 -	2021
Hydrography	National Hydrography Dataset, 2002 -	2018
Contours	National Elevation Dataset,	2021
Boundaries	Multiple sources; see metadata file 2019 -	2021

Wetlands: FWS National Wetlands Inventory Not Available

UTM GRID AND 2019 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET
MN 0°35' 10 MILS; GN 3°46' 67 MILS
U.S. National Grid 100,000-m Square ID: PU / PT; 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.

TEXAS
QUADRANGLE LOCATION

1	2	3
4		5
6	7	8

1 San Marcos North
2 Uhland
3 Lockhart North
4 San Marcos South
5 Lockhart South
6 Geronimo
7 Kingsbury
8 Luling
ADJOINING QUADRANGLES

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

MAP NO. USGSX24K27886

^ ˇ 0LQXWH 86*6 0DS

%*(,QF
:HVW /RXLV +HQQD %OYG 6XLWH
7HO ,QF)D[
ZZZ EHLQF FRP

73'(6 3HUPLW

86*6 4XDG &RUUHVSRQGV WR 'RPHV 5HSRUW ,WHP G 3DJH DQG 6XSSOHPHQWDO 3HUPLW ,QI ,WHP ˇ 3DJH ˇ

'DWH -XQH | 3URM 1R | $WWDFKPHQW 00062

0

)HHW

Applicant Property Boundary

1-Mile Downstream

KINGSBURY QUADRANGLE
TEXAS
7.5-MINUTE SERIES

USGS science for a changing world

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

The National Map US Topo

3-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

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

Imagery.....NAIP, September 2016 - November 2016
Roads.....U.S. Census Bureau, 2015 - 2019
Names.....GNIS, 1979 - 2022
Hydrography.....National Hydrography Dataset, 2002 - 2018
Contours.....National Elevation Dataset, 2021
Boundaries.....Multiple sources; see metadata file 2019 - 2021

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

UTM GRID AND 2019 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

MN 3°46' 67 MILS
GN 0°35' 10 MILS

U.S. National Grid
100,000-m Square ID
PT
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 MILES 1
1000 0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10000 FEET

CONTOUR INTERVAL 10 FEET
NORTH AMERICAN VERTICAL DATUM OF 1988

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

TEXAS
QUADRANGLE LOCATION

1 San Marcos South
2 Martindale
3 Lockhart South
4 Geronimo
5 Luling
6 Seguin
7 Darst Creek
8 Belmont
ADJOINING QUADRANGLES

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

N
0 2,000 4,000
Feet

7.5 Minute USGS Map

BGE, Inc.
101 West Louis Henna Blvd, Suite 400, Austin TX 78728
Tel: 281-558-8700 Fax: 281-558-9701
www.bgeinc.com

KINGSBURY, TX
2022

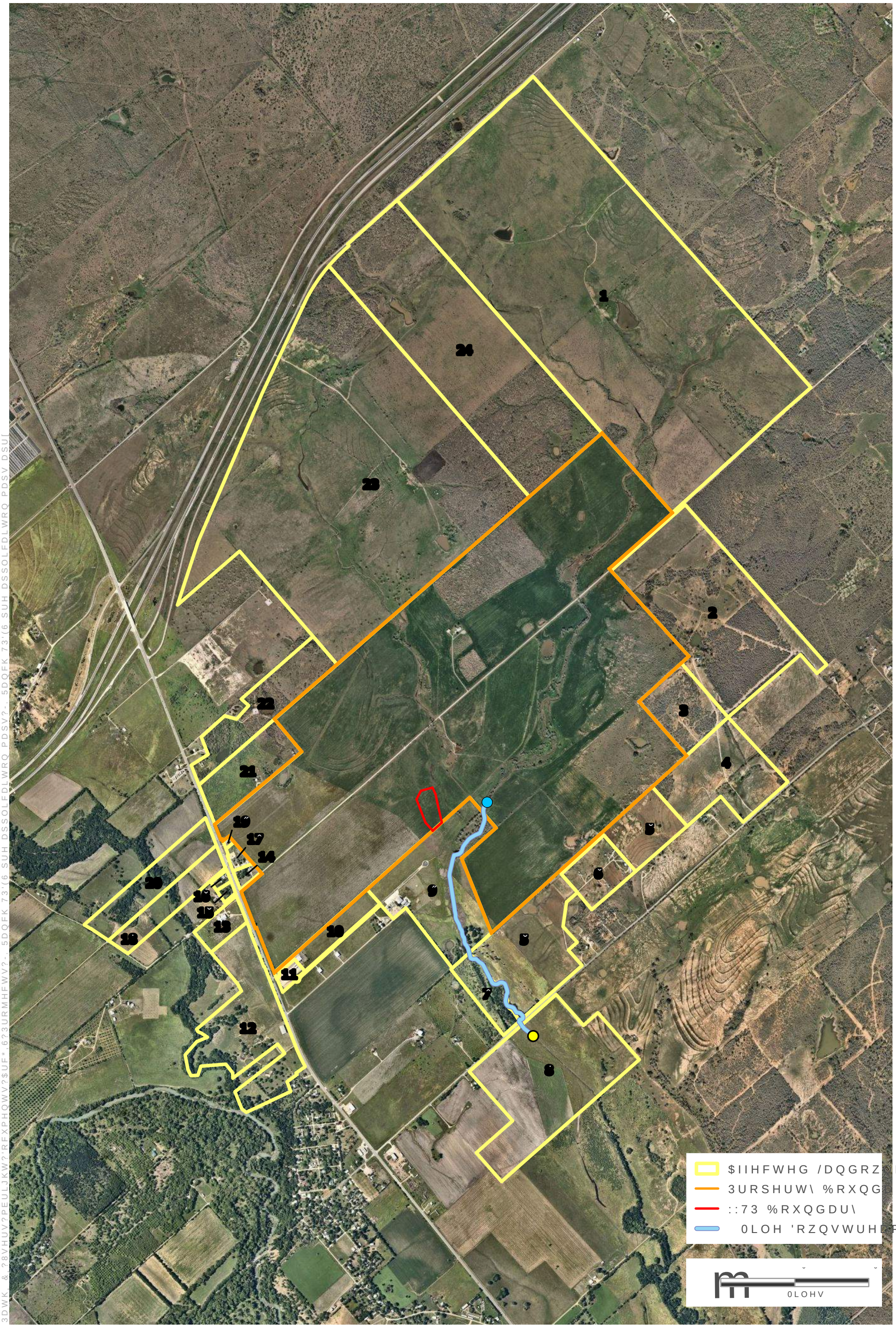
TPDES Permit

USGS Quad Corresponds to Domestic Administrative Report 1.0, Item 13.d, Page 11
and Supplemental Permit Information Form, Item 5, Page 16

Date:	Proj. No:	Attachment:
June 2023	11014-00	00063 2-2

MSN 7433G6 9680A4
NGA REF 24SX23636

ATTACHMENT 3
AFFECTED
LANDOWNERS



BGE

$IIHFWHG /DQGRZQHUV

%*(,QF
7HO ZZZ EJHLQF FRP

3URMHFW 1R
0D\
6FDOH

Label		Address
1	Curry Alfred Iv Trust #2 C/O Roche Gayle	1016 Alta Loma Cir San Angelo TX,76901-4550
2	Arlon L P Attn Sydney Langley	2511 Mccallum Dr Austin TX,78703-2520
3	Arlon L P Attn Sydney Langley	2511 Mccallum Dr Austin TX,78703-2520
4	Arlon L P Attn Sydney Langley	2511 Mccallum Dr Austin TX,78703-2520
5	Banda Joe	Po Box 57 Fentress TX,78622-0057
6	Banda Joe	Po Box 57 Fentress TX,78622-0057
7	West Vivian	14421 28Th St Santa Fe TX,77517-3247
8	Dauchy Enterprises Pc	Po Box 521 Katy TX,77493-0521
9	S M E Properties Llc	Po Box 1121 Rosharon TX,77583-1121
10	Svb Conglomerate Inc Steve Van Buren	Po Box 295 Fentress TX,78622
11	Fen-Tex Llc	30257 Sherri Lea Bulverde TX,78163-4113
12	Dawson Robert O & Jana Z	Po Box 39 Fentress TX,78622-0039
13	Vns & Cls Properties Llc	2155 Fm 1977 Martindale TX,78655-3901
14	Fullilove Lee Ann	Po Box 476 Fentress TX,78622-0476
15	Plant Charman Hall (Bairrington)	3956 Political Rd Lockhart TX,78644-2985
16	Hall Elreta Ann	Po Box 158 Fentress TX,78622-0158
17	Santos Samantha A & Florencio	Po Box 442 Fentress TX,78622-0442
18	Behal Barbara & Patricia B Grigg & Gayle Barnes & Pat L Grigg & Russell Jenkins & Mary Katherine Higgins	1821 Montclair St Seguin TX,78155-5358
19	Rodriguez Pedro E	1430 Hwy 80 San Marcos TX,78666-8125
20	Jenkins Russell Edward	130 Affeld Ln Smithville TX,78957-2269
21	Mccallum Kimberly Bauder	753 Little Bear Rd Buda TX,78610-2946
22	West Avis Marie Desaulnier	10570 San Marcos Hwy Lockhart TX,78622-4353
23	Curry Alfred Iv Trust #2 C/O Roche Gayle	1016 Alta Loma Cir San Angelo TX,76901-4550
24	Curry Alfred Iv Trust #2 C/O Roche Gayle	1016 Alta Loma Cir San Angelo TX,76901-4550

ATTACHMENT 4
ORIGINAL
PHOTOGRAPHS

ATTACHMENT 5

ORIGINAL PHOTOGRAPHS

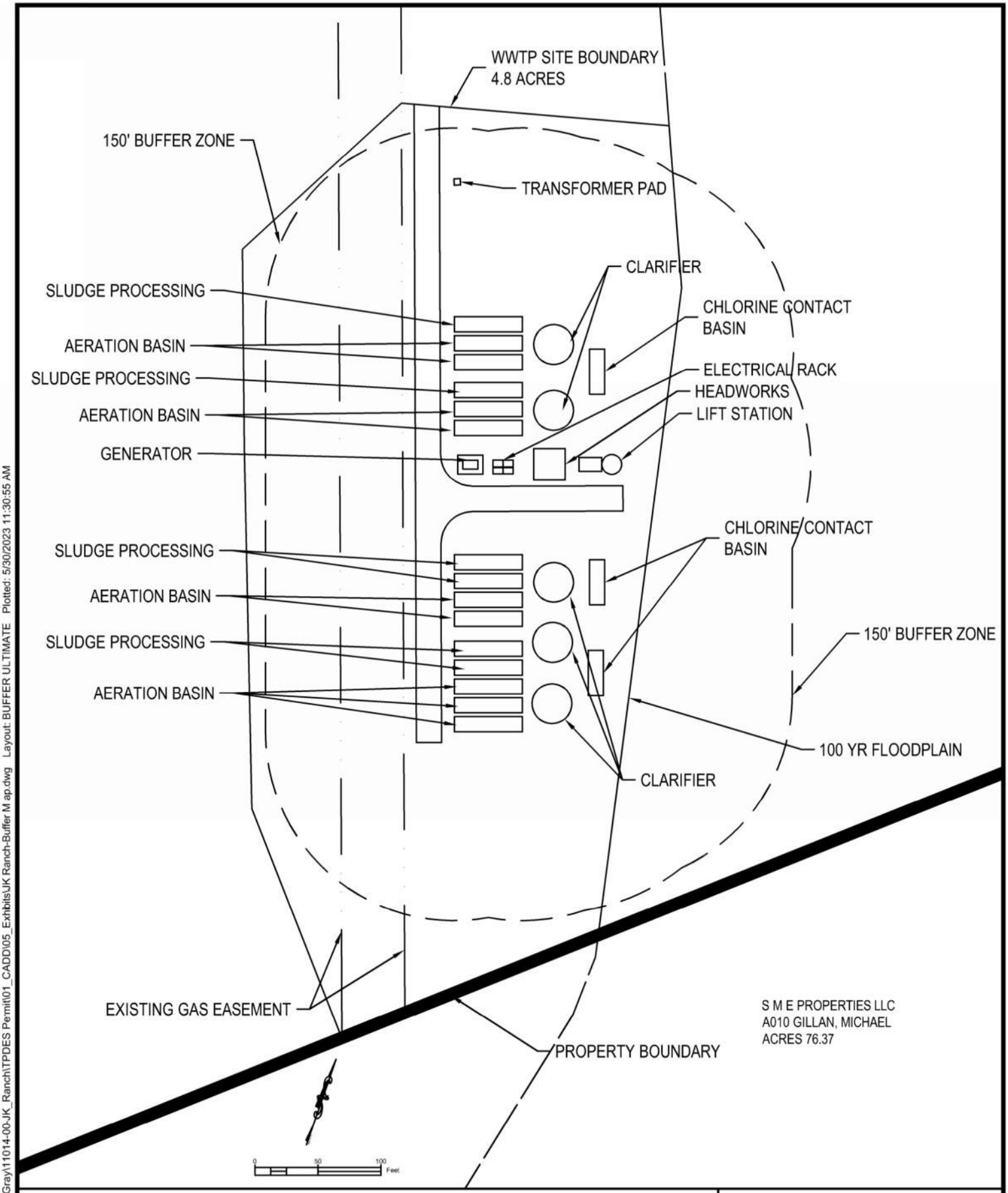
BGE, INC.
101 WEST LOUIS HENNA BLVD, SUITE 400
AUSTIN, TX 78728
TBPE Registration No. F-1046
TEL: 512-879-0400 www.bgeinc.com

Photo 1: WWTP Future Site

Photo 2: Downstream of discharge point

Photo 3: Upstream of discharge point

ATTACHMENT 5
BUFFER ZONE
MAP

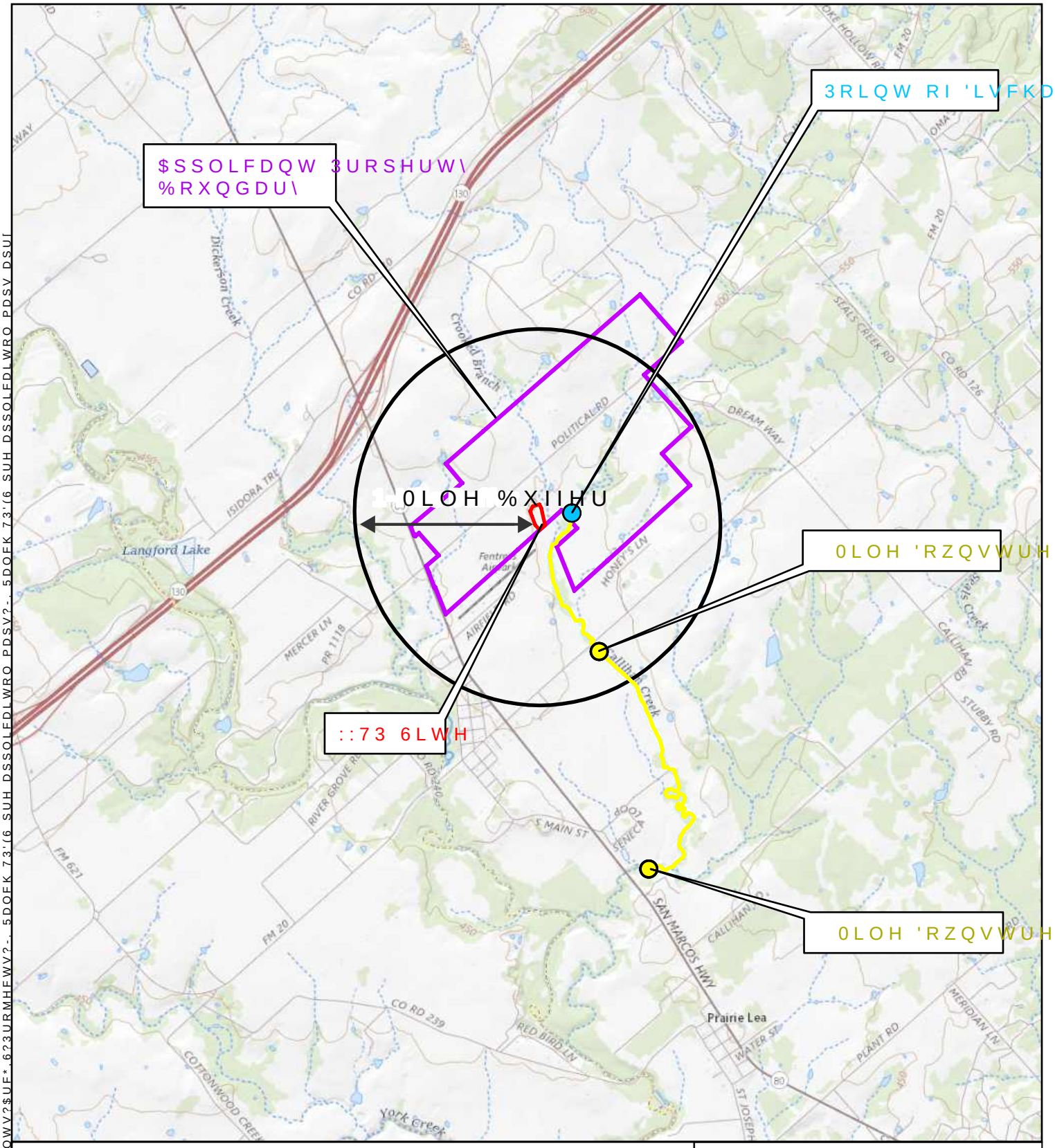


ATTACHMENT 5

BUFFER ZONE EXHIBIT
ULTIMATE PHASE - 0.85 MGD ADF

BGE, INC.
101 WEST LOUIS HENNA BLVD, SUITE 400
AUSTIN, TX 78728
TBPE Registration No. F-1046
TEL: 512-879-0400 www.bgeinc.com

ATTACHMENT 6
USGS MAP (SPIF)



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ZZZ EJHLQF FRP

73'(6 3HUPLW

86*6 4XDG &RUUHVSRQGV WR 'RPHVWLF 5HSRUW ,WHP G 3DJH DQG 6XSSOHPHQWDO 3HUPLW ,QIR ,WHP ˘ 3DJH ˘

DWH, -XQH	3URM 1R, 00075	61

86*6 ˆ ˘ 0LQXWH 7RSRJUDSKLF 0DS, 0DUWLQGDOH 7;

ATTACHMENT 7
TREATMENT
UNITS

ATTACHMENT 7 - Treatment Units

Phase I - 150,000 GPD		
Treatment Unit Type	Number of Units	Dimensions (L x W x H)
Fine Screen	1	Rotary Drum
Aeration Tank	2	54' x 12' x 13.17'
Clarifier	1	32' Ø
Chlorine Contact Tank	1	36' x 12' x 10.17'
Cloth Disk Media Filter	2	10' x 25 ' x 12' (2 disk)
Sludge Digester	1	40' x 12' x 13.17'

*Number represents the total (cumulative) number of units required for this phase

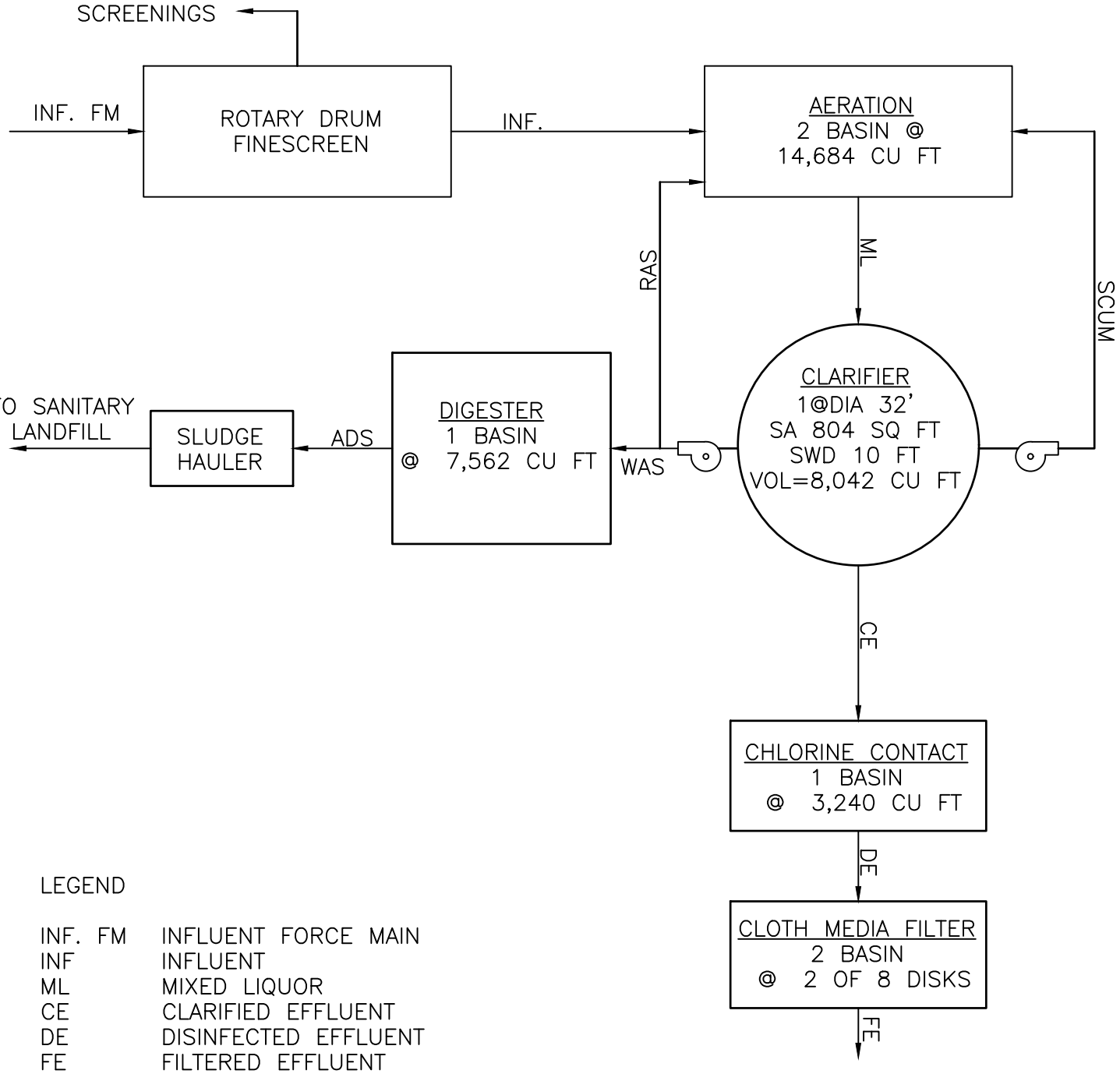
Phase II -400,000 GPD		
Treatment Unit Type	Number of Units	Dimensions (L x W x H)
Fine Screen	1	Rotary Drum
Aeration Tank	4	54' x 12' x 13.17'
Clarifier	2	32' Ø
Chlorine Contact Tank	1	36' x 12' x 10.17'
Cloth Disk Media Filter	2	10' x 25 ' x 12' (4 disk)
Sludge Digester	2	40' x 12' x 13.17'

*Number represents the total (cumulative) number of units required for this phase

Phase III - 850,000 GPD		
Treatment Unit Type	Number of Units	Dimensions (L x W x H)
Fine Screen	1	Rotary Drum
Aeration Tank	9	54' x 12' x 13.17'
Clarifier	5	32' Ø
Chlorine Contact Tank	3	36' x 12' x 10.17'
Cloth Disk Media Filter	2	10' x 25 ' x 12' (8 disk)
Sludge Digester	6	40' x 12' x 13.17'

*Number represents the total (cumulative) number of units required for this phase

ATTACHMENT 8
FLOW
DIAGRAMS



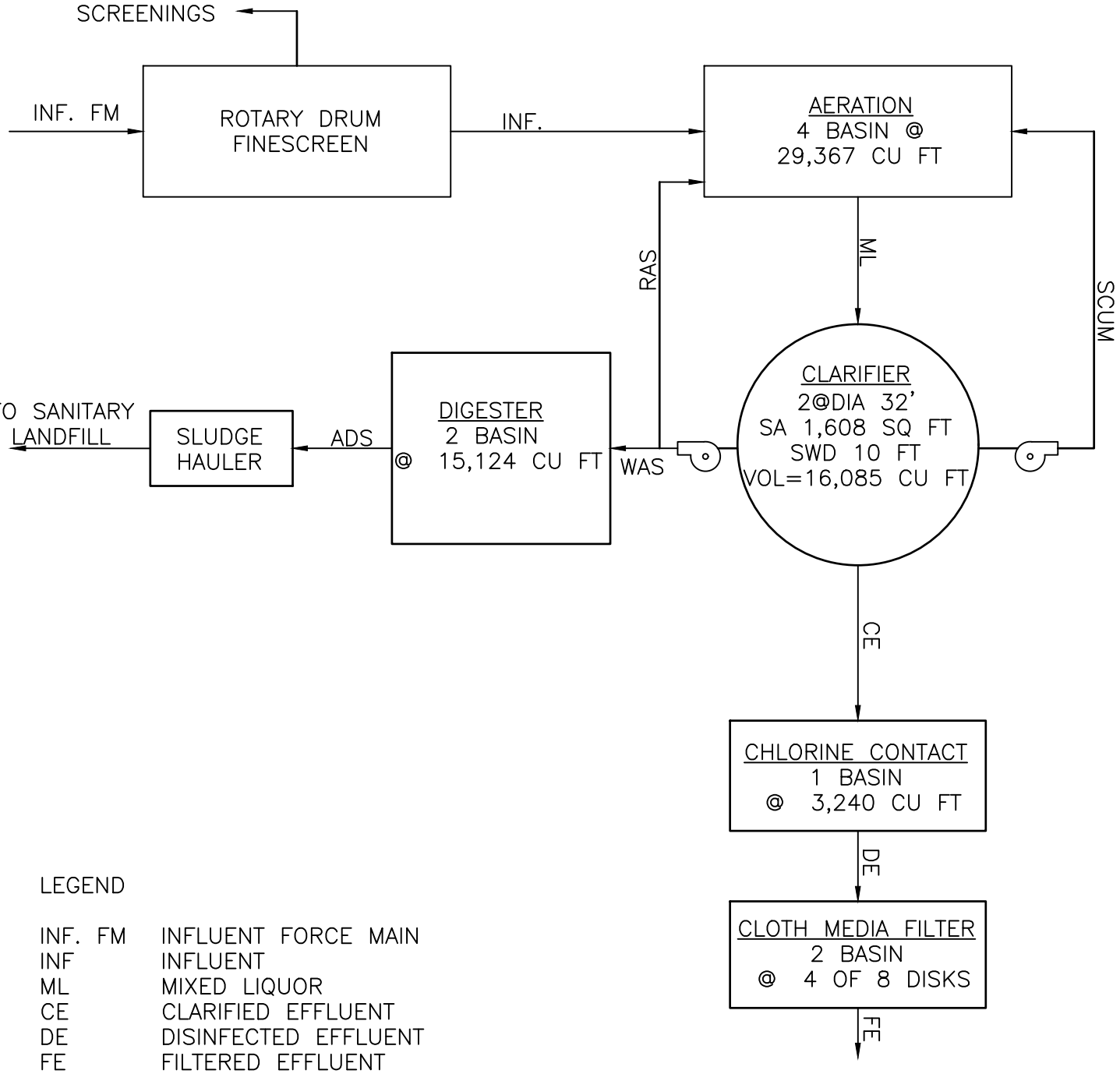
LEGEND

INF. FM	INFLUENT FORCE MAIN
INF	INFLUENT
ML	MIXED LIQUOR
CE	CLARIFIED EFFLUENT
DE	DISINFECTED EFFLUENT
FE	FILTERED EFFLUENT
RAS	RETURN ACTIVATED SLUDGE
WAS	WASTE ACTIVATED SLUDGE
ADS	AEROBICALLY DIGESTED SLUDGE

PHASE I PROPOSED FLOW DIAGRAM
ADF 0.15 MGD

ATTACHMENT 8

BROWN & GAY ENGINEERS, INC.
101 WEST LOUIS HENNA BLVD, SUITE 400
AUSTIN, TX 78728
TBPE Registration No. F-1046
TEL: 512-879-0400 www.BGEINC.com



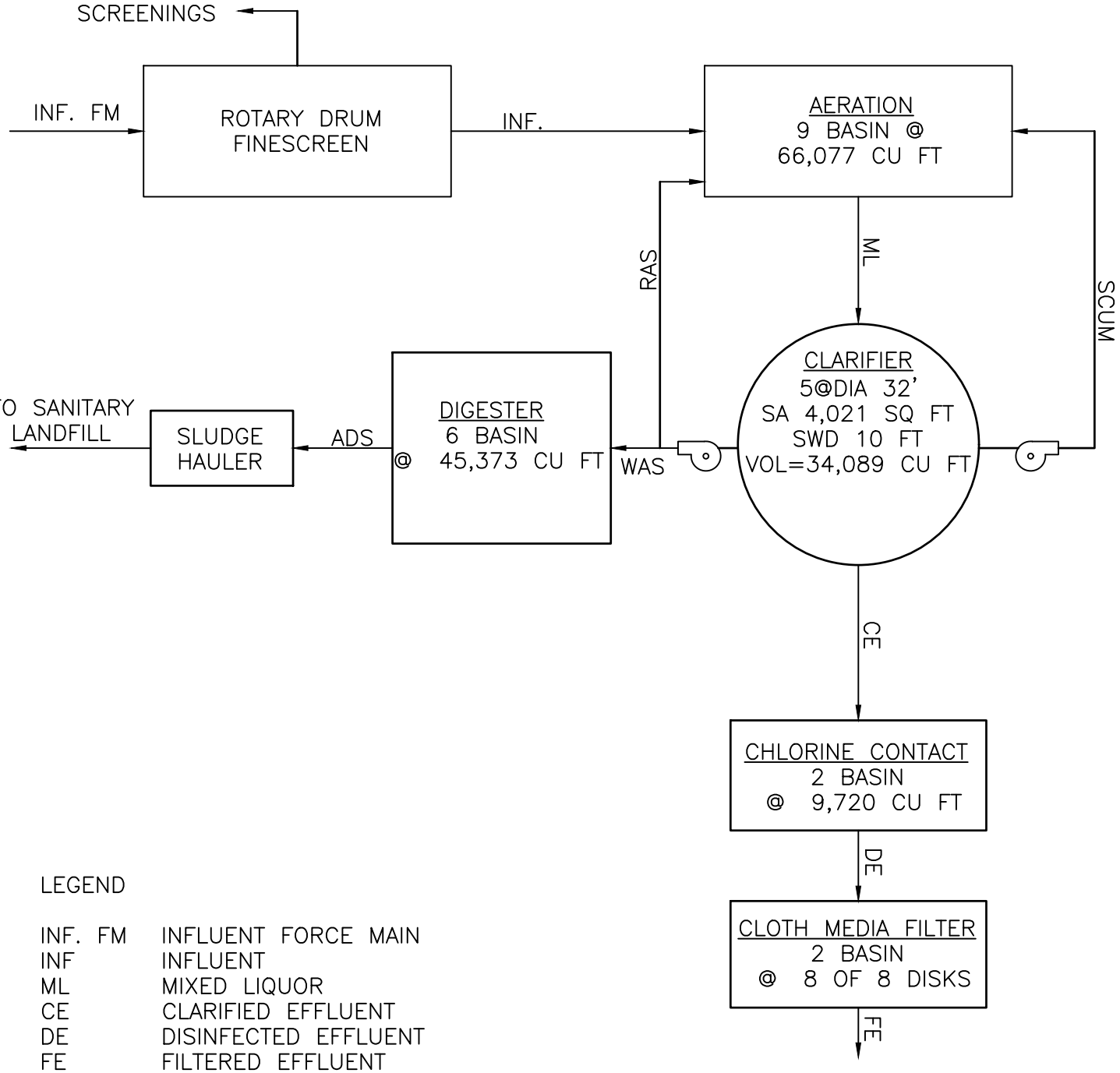
LEGEND

INF. FM	INFLUENT FORCE MAIN
INF	INFLUENT
ML	MIXED LIQUOR
CE	CLARIFIED EFFLUENT
DE	DISINFECTED EFFLUENT
FE	FILTERED EFFLUENT
RAS	RETURN ACTIVATED SLUDGE
WAS	WASTE ACTIVATED SLUDGE
ADS	AEROBICALLY DIGESTED SLUDGE

PHASE II PROPOSED FLOW DIAGRAM
ADF 0.40 MGD

ATTACHMENT 8

BROWN & GAY ENGINEERS, INC.
101 WEST LOUIS HENNA BLVD, SUITE 400
AUSTIN, TX 78728
TBPE Registration No. F-1046
TEL: 512-879-0400 www.BGEINC.com



LEGEND

INF. FM	INFLUENT FORCE MAIN
INF	INFLUENT
ML	MIXED LIQUOR
CE	CLARIFIED EFFLUENT
DE	DISINFECTED EFFLUENT
FE	FILTERED EFFLUENT
RAS	RETURN ACTIVATED SLUDGE
WAS	WASTE ACTIVATED SLUDGE
ADS	AEROBICALLY DIGESTED SLUDGE

PHASE III PROPOSED FLOW DIAGRAM
ADF 0.85 MGD

ATTACHMENT 8

BROWN & GAY ENGINEERS, INC.
101 WEST LOUIS HENNA BLVD, SUITE 400
AUSTIN, TX 78728
TBPE Registration No. F-1046
TEL: 512-879-0400 www.BGEINC.com

ATTACHMENT 9
SITE LAYOUT

Site Drawing
JK Ranch Development

AREA SERVICED BY
PROPOSED WWTP

PROPOSED WWTP

LAND USE
SINGLE FAMILY LOTS (TYP 40') [147.7 AC]
SINGLE FAMILY LOTS (TYP 45') [82.4 AC]
SINGLE FAMILY LOTS (TYP 50') [255.3 AC]
MULTI-FAMILY LOTS [15.0 AC]
MULTI-USE LOTS [25.0 AC]
BUILT TO RENT [24.1 AC]

N

0 500' 1000' 2000'
SCALE: 1" = 1000'

BGE, INC.
101 W Louis Henna Blvd, Suite 400
AUSTIN, TX 78728
TBPE Registration No. F-1046
TEL: 512-879-0400 www.bgeinc.com

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ATTACHMENT 10 DESIGN CALCULATIONS/ SLUDGE MANAGEMENT PLAN

JK RANCH
DESIGN CALCULATIONS
SUMMARY

PARAMETERS

Description: Interim I thru Final: Activated sludge process utilizing the conventional aeration to treat municipal wastewater. System to include aeration, clarifier, chlorine contact, and sludge holding basins.

Influent Flows:

	Interim I	Interim II	Final
Average Daily (gpd):	150,000	400,000	850,000
Peak Daily (2-Hr Peak) (gpd):	600,000	1,600,000	3,400,000

Influent Flow Characteristics:

BOD_5 (mg/l)=	300	300	300
TSS (mg/l)=	300	300	300
NH3N (mg/l)=	45	45	45
Total Nitrogen (mg/l)=	70	70	70

Effluent Water Quality Parameters:

BOD_5 (mg/l)=	5	5	5
TSS (mg/l)=	5	5	5
NH3N (mg/l)=	2	2	2
Chorine Residual (after 20 minutes) (mg/l)=	1	1	1
Dissolved Oxygen (mg/l)	4	4	4
Total Phosphorus (mg/l)	1	1	1
E. coli (cfu)	126	126	126

PROPOSED FACILITIES

	Interim I	Interim II	Final
Process:			
Total Plant BOD5 Loading (lbs/day):	369.0	984.1	2091.3
TSS Loading (lbs/day):	369.0	984.1	2091.3
MLSS (mg/l):	3,000	3,000	3,000
Hydraulic Retention Time (days):	0.73	0.55	0.58
Sludge Residence Time (days):	11.76	11.76	11.76
Food to Mass Ratio:	0.137	0.182	0.172
Sludge Yield (lbs/day):	168	448	952
Sludge Yield (gpd) @ 1.5%:	1,343	3,581	7,609
Aeration Basin:			
Max Organic Loading (lbs/day/1,000 cf):	35	35	35
Proposed Organic Loading (lbs/day/1,000 cf):	25.13	33.51	31.65
Minimum Required Volume (cf):	10,544	28,118	59,750
Proposed Volume (cf):	14,684	29,367	66,077

JK RANCH
DESIGN CALCULATIONS
SUMMARY

	Interim I	Interim II	Final
Clarifier:			
Max Surface Loading at PDF (gpd/sf):	1,200	1,200	1,200
Proposed Surface Loading at PDF (gpd/sf):	746	995	846
Max Surface Loading at ADF (gpd/sf):	600	600	600
Proposed Surface Loading at ADF (gpd/sf):	187	249	211
Min Detention Time at PDF (hrs):	1.8	1.8	1.8
Proposed Detention Time at PDF (hrs):	2.41	1.80	2.12
Min Detention Time at ADF (hrs):	3.6	3.6	3.6
Proposed Detention Time at ADF (hrs):	9.63	7.22	8.49
Minimum Required Surface Area (sf):	500	1,333	2,833
Proposed Surface Area (sf):	804	1,608	4,021
Minimum Required Volume (cf):	6,016	16,042	34,089
Proposed Volume (cf):	8,042	16,085	40,212
Stilling Well Diameter (ft)	6.00	6.00	6.00
Stilling Well Velocity at PDF (ft/s)	0.033	0.088	0.186
Minimum Required Weir Length (ft)	30.000	80.000	170.000
Proposed Weir Length (ft)	94.248	94.248	94.248
Chlorine Contact Basin:			
Min Detention Time at PDF (min):	20	20	20
Detention Time Provided at PDF (min):	58.17	21.81	30.80
Minimum Required Volume (cf):	1,114.0	2,970.7	6,312.7
Proposed Volume (cf):	3,240.0	3,240.0	9,720.0
Sludge Holding Basin:			
Minimum Required Volume (cf):	7,381	19,682	41,825
Proposed Volume (cf):	7,562	15,124	45,373
Proposed Detention Time (days):	42.13	31.60	44.60
Air Supply:			
Min Air Supply - Aeration (scfm):	1,279	7,250	7,250
Min Air Supply - Digester (scfm):	227	454	1361
Min Air Supply - Air Lift Pumps (scfm):	105	245	525
Min Total Air Supply (scfm):	1,611	7,948	9,136

JK RANCH
DESIGN CALCULATIONS
SIZING CALCULATIONS

AERATION BASIN

	Interim I	Interim II	Final
Minimum Volume Required:	10,544 cf	28,118 cf	59,750 cf
No. of Basins:	2	4	9
Proposed SWD:	11.33 ft	11.33 ft	11.33 ft
Length (Ea. Basin):	54 ft	54 ft	54 ft
Width (Ea. Basin):	12 ft	12 ft	12 ft
Proposed Volume:	**14,684 cf**	**29,367 cf**	**66,077 cf**

SLUDGE DIGESTER

	Interim I	Interim II	Final
Minimum Volume Required:	7,381 cf	19,682 cf	41,825 cf
No. of Basins:	1	2	6
Proposed SWD:	11.67 ft	11.67 ft	11.67 ft
Length (Ea. Basin):	54 ft	54 ft	54 ft
Width (Ea. Basin):	12 ft	12 ft	12 ft
Proposed Volume:	**7,562 cf**	**15,124 cf**	**45,373 cf**

CLARIFIER

	Interim I	Interim II	Final
Minimum Surface Area Required:	500 sf	1,333 sf	2,833 sf
Minimum Volume Required:	6,016 cf	16,042 cf	34,089 cf
No. of Clarifiers:	1	2	5
Proposed SWD:	10 ft	10 ft	10 ft
Proposed Diameter:	32 ft	32 ft	32 ft
Proposed Stilling Well Diameter:	6 ft	6 ft	6 ft
Proposed Weir Diameter	30 ft	30 ft	30 ft
Proposed Weir Length	94.25 ft	94.25 ft	94.25 ft
Proposed Area:	**804 sf**	**1,608 sf**	**4,021 sf**
Proposed Volume:	**8,042 cf**	**16,085 cf**	**40,212 cf**

CHLORINE CONTACT

	Interim I	Interim II	Final
Minimum Volume Required:	1,114.0 cf	2,970.7 cf	6,312.7 cf
No. of Basins	1	1	3
Proposed SWD:	7.5 ft	7.5 ft	7.5 ft
Width (Ea. Basin):	12 ft	12 ft	12 ft
Length (Ea. Basin):	36 ft	36 ft	36 ft
Total Volume:	3,240.00 cf	3,240.00 cf	9,720.00 cf
Proposed Volume:	**3,240.00 cf**	**3,240.00 cf**	**9,720.00 cf**

JK RANCH
PRELIMINARY DESIGN CALCULATIONS
INTERIM PHASE I

PARAMETERS

Influent:			*Effluent:*		
Q =	150,000	GPD	S =	5	mg/l, BOD_{5eff}
Qp_1 =	600,000	GPD to Headworks	TSSeff =	5	mg/l
Qp_2 =	600,000	GPD downstream of Infl EQ (N/A)	NH_3N =	2	mg/l
So =	300	mg/l, BOD_5infl	Chlorine Residual =	1	mg/l @ 20 min det
TSSinf =	300	mg/l	Total Phosphorus =	1	mg/l
Chemical Oxygen Demand (COD) =	545	mg/l	.3-.8 (BOD/COD), used 0.55		
TKN =	70	mg/l			
NH_3N =	45	mg/l			
Organic $N_{14° C}$ =	25	mg/l			
Winter Temp. Min. =	14	°C			
Summer Temp. Max. =	29	°C			
MLSS =	3,000	mg/l, conc. Of suspended solids in aeration tank			
MLVSS =	70	% of MLSS			
MLVSS (X) =	2100	mg/l, conc. Of volatile suspended solids in aeration tank			

COEFFICIENTS

θc =	30	days, mean cell residence time
Y =	0.4	maximum yield coefficient, range: 0.3 - 0.5 (Metcalf & Eddy Table 8-10)
Y_n =	0.12	g VSS / g NH4-N, range: 0.1 - 0.15 (Metcalf & Eddy Table 8-11)
K_o =	0.5	g / m^3, range: 0.40 - 0.60 (Metcalf & Eddy Table 8-11)
k_d =	0.12	day^-1, endogenous decay coefficient, range: 0.06 - 0.2 (Metcalf & Eddy Table 8-10)
k_d =	1.04	unitless, range: 1.03 - 1.08 (Metcalf & Eddy Table 8-10)
$k_{d,\ 14°C}$ =	0.095	g/g*d
K_{dn} =	0.080	g VSS / g VSS*d, range: 0.05 - 0.15 (Metcalf & Eddy Table 8-10)
K_{dn} =	1.04	unitless, range: 1.03 - 1.08 (Metcalf & Eddy Table 8-11)
$K_{dn,\ 14°C}$ =	0.063	g/g*d
K_n =	0.740	g NH4-N / m^3, range: 0.5 - 1.0 (Metcalf & Eddy Table 8-11)
K_n =	1.053	unitless, range: 1.03 - 1.123 (Metcalf & Eddy Table 8-11)
$K_{n,\ 14°}C$ =	0.543	g / m^3
μ_{mn} =	0.750	g VSS / g VSS*d, range: 0.20 - 0.90 (Metcalf & Eddy Table 8-11)
μ_n =	1.070	unitless, range: 1.06 - 1.123 (Metcalf & Eddy Table 8-11)
$\mu_{m,\ 14°C}$ =	0.500	g /g*d
f_d =	0.150	unitless, range: 0.08 - 0.2 (Metcalf & Eddy Table 8-10)

DESIGN CALCULATIONS

A. BOD_5 Loading

$$F = \frac{8.34 \times Q \times (S_o - S)}{10^6}$$

F = **369.0** lb BOD_5 /day

B. TSS Loading

$$TSS = \frac{8.34 \times Q \times (TSS_{\text{inf}} - TSS_{eff})}{10^6}$$

TSS = **369.0** lb TSS /day

C. Micro-organism Mass in Aeration Basin

$$M_v = F \times \frac{\theta_c \times Y}{1 + (k_d \times \theta_c)}$$

Mv = **963** lb

D. Aeration Volume

$$V = \frac{Q \times \theta_c}{X} \times \frac{Y \times (S_o - S)}{1 + (k_d \times \theta_c)}$$

V = 54,968.94 gal
7,348 cf

Max. Organic Loading: 35 lbs BOD5/day/1000 cf
(TCEQ Chap. 217.154, Conventional)

V = 10,544 cf

Minimum V = 10,544 cf

E. Wastewater Characteristics

bCOD = 1.6(BOD) = 480 mg/l (Biodegradable COD)
nbCOD = COD - bCOD = 65 mg/l (non-biodegradable COD)

iTSS = TSS - VSS
TSS = 300 mg/l
VSS = 210 mg/l
iTSS = 90 mg/l

$$\frac{bpCOD}{pCOD} = \frac{(bCOD \div BOD) \times (BOD - sBOD)}{COD - sCOD}$$

sBOD: soluble BOD
sCOD: soluble COD
bpCOD: Biodegradable particulate COD
pCOD: Particulate COD

Assume: sCOD = 33% of COD = 180 mg/l
Assume: sBOD = 33% of BOD = 99 mg/l

bpCOD/pCOD = 0.88

$$nbVSS = \left[1 - \left(\frac{bpCOD}{pCOD}\right)\right] \times BOD$$

nbVSS = 36.0 mg/l (non-biodegradable VSS)

F. Sludge Retention Time

$$(P_{X,TSS})SRT = \frac{QY(S_O - S)SRT}{[1 + (k_d)SRT](0.85)} + Q(nbVSS)SRT + \frac{QY_n(NO_x)SRT}{[1 + (k_{dn})SRT](0.85)} + \frac{(f_d)(k_d)Q(Y)(S_O - S)SRT^2}{[1 + (k_d)SRT](0.85)} + Q(TSS_O - VSS_O)SRT$$

$$(P_{X,TSS}) \times SRT = (V) \times (X_{MISS})$$

X_{MLSS} = 3,000 g/m^3
V = 14,684 cf = 415.80 m^3

$(P_{X,TSS})SRT$ = 1,247,385 g

Assume So ≈ So -S
So = bCOD = 480 g/m^3

Assume Nox ≈ 80% of TKN = 56.0 g/m^3

SRT = 11.755285 days

H. Sludge Yield

$$P_{X,TSS} = \frac{(V)(MLSS)}{SRT}$$

$P_{X,TSS}$ = 168 lbs/day

$$Q_{Sludge} = \frac{P_{X,TSS}}{8.34 \times PercentSolids}$$

Assume Percent Solids = 1.5 %

Q_{sludge} = 1,343 gal/day

JK RANCH
PRELIMINARY DESIGN CALCULATIONS
INTERIM PHASE I

I. Nitrification

$$K_n \ln\frac{N_o}{N_t} + (N_o - N_t) = X_n\left(\frac{\mu_{mn}}{Y_n}\right)\left(\frac{DO}{k_o + DO}\right)t$$

No = Initial NH4-N concentration (mg/L)
Nt = NH4-N concentration at time t (mg/L)
Xn = Nitrifying bacteria concentration (mg/L)
DO = Dissolved Oxygen concentration= 4.0 mg/L

$$NO_x = TKN_o - N_e - 0.12P_{x,bio}/Q$$

NOx = Nitrogen oxidized (mg/L)
TKNo = Influent TKN (mg/L)
Ne = Effluent NH4-N (mg/L)
Px,bio = Nitrogen in cell tissue

$$P_{x,bio} = \frac{QY(S_o - S)}{1 + (k_d)SRT} + \frac{QY_n(NO_x)}{1 + (k_{dn})SRT} + \frac{(f_d)(k_d)QY(S_o - S)SRT}{1 + (k_d)SRT}$$

Q =	150,000	gpd =	567.8	m^3/day
So - S =	480	g/m^3 (from SRT calculation)		
Nox =	56.0	g/m^3 (from SRT calculation)		
SRT =	11.755285	days		
Px,bio =	62,359	g/day =	62.4	kg/day

NOx = 54.8 g/m^3

$$P_{X,TSS} = \left(\frac{P_{X,BIO}}{0.85}\right) + Q\times(nbVSS) + Q\times(T_{SSo} - V_{SSo})$$

TSSo =	300	mg/l
VSSo = TSSo x MLVSS(%) =	210	mg/l
$P_{X,TSS}$ =	144.91	kg/day

$$V = \frac{(P_{X,TSS} \times SRT)}{MLSS}$$

Minimum Volume Required= 567.8 m^3 = **20,049.4** cf

E. Nitrification

pH:	7.2		
DO (mg/L):	4.0	Dissolved Oxygen	
Ko:	0.5	Half-Saturation coefficient for DO (Metcalf & Eddy Table 8-11)	
Temp (°C):	14.0		
Effluent NH3 (mg/L):	2.0		
Temperature Term, Tt:	0.91		Tt=e^(0.098*(T-15))
DO Term, DOt:	0.89		DOt=DO/(Ko+DO)
pH Term, pHt:	1.00		pHt=1-0.833*(7.2-pH)
Kn:	0.36	Half-Saturation coefficient for oxidation of ammonia	Kn=10^(0.051*T-1.158)
NH3 Term, NH3t:	0.85		NH3t=NH3/(Kn+NH3)
Nitrifier Growth Rate (days^-1):	0.34		Growth Rate=0.5*Tt*pHt*DOt*NH3t
Aerobic SRT Required (days):	2.93		SRT=1/Nitrifier Growth Rate
Safety Factor:	2.0	Typical Range: 1.5 - 2.5	
Min Required Aerobic SRT (days):	**5.9**		
Minimum Aerobic Volume (cf):	**5,252.71**	**For Nitrification**	

J. Clarifier

Max Surface Loading:	1,200	gpd/sf at Peak Flow	(TCEQ Chap. 217.154, Conventional, secondary enhanced)
Max Surface Loading:	600	gpd/sf at Design Flow	
Min Detention Time:	1.8	hrs at Peak Flow	
Min Detention Time:	3.6	hrs at Design Flow	
Max Weir Loading:	20,000	gpd/lf at Peak Flow	
Minimum Surface Area:	**500**	**sf**	
Minimum Volume:	**45,000**	**gallons =**	**6015.6 cf**
Minimum Weir Length:	**30**	**lf**	

K. Return Activated Sludge

Minimum Rate:	**50%**	**of Design Flow =**	**52.1**	**gpm**
Maximum Rate:	**100%**	**of Design Flow =**	**104.2**	**gpm**

Provide: 3 6" Air Lift Pumps or 2 8" Air Lift Pumps

JK RANCH
PRELIMINARY DESIGN CALCULATIONS
INTERIM PHASE I

L. Sludge Holding Basin

Minimum SRT:	15	days
- SRT w/Treatment:	11.755285	days
Minimum Sludge Holding SRT:	3.2447146	days

Minimum Sludge Holding Detention Time: 7 days (for operations)

Minimum Sludge Holding Volume using SRT	9,400	**gallons =**	**1,256.6**	**cf**
Minimum Sludge Holding Volume using 20-cf/lbs BOD/Day	55,213	**gallons =**	**7,380.9**	**cf**
Minimum Sludge Holding Volume:	**55,213**	**gallons =**	**7,380.9**	**cf**

M. Chlorine Contact Basin

Minimum Detention Time: 20 minutes at Peak Flow

Minimum Volume:	**8,333.33**	**gallons =**	**1,114.0**	**cf**

JK RANCH
PRELIMINARY DESIGN CALCULATIONS
INTERIM PHASE I

N. Aeration

1. Aeration Basins

Minimum oxygen requirement = 3,200 scf per lb BOD_5 per day @ 10' submergence and 20 deg C

Diffuser Submergence Depth (ft)	Airflow Correction Factor
8	1.82
10	1.56
12	1.00
15	0.91
18	0.73
20	0.64

Diffuser Submergence Depth = 10 ft
Correction Factor = 1.56

Minimum oxygen requirement = 1,279 scfm @ 20 deg C

2. Digester

Oxygen Requirement = 30 scfm per 1,000 ft^3

Minimum oxygen requirement = 227 scfm

3. Air Lift Pumps

Minimum air requirement = 105 scfm

4. Other

Initial Mixing = 25 scfm
Post Aeration = 64.80 scfm (20 scfm per 1,000-cf)
Minimum air requirement = 89.8 scfm

4. Total

Total Air Flow Requirement = 1,701 scfm
Proposed Blower = 3,000 SCFM

JK RANCH
PRELIMINARY DESIGN CALCULATIONS
INTERIM PHASE I

O. Fine Screen

Bar Spacing:	0.25	in		
Average Flow Rate:	0.2	MGD		
Approximate Volume of Screenings:	13	cf/MG		
Anticipated Volume of Screenings:	1.95	cf per day	0.51	CY Per Week

COARSE SCREEN (BYPASS/OVERFLOW BAR SCREEN)

Influent Flow Rate

Average Influent Flow Rate:	0.15	MGD	=	104	gpm	=	0.232	cfs
Peak Influent Flow Rate:	0.60	MGD	=	417	gpm	=	0.928	cfs

Channel Geometry

Channel Width:	3.00	ft
Design Channel Flow Depth:	0.2	ft
Max. Channel Depth:	0.3	ft

Bar Rack Geometry

Bar Size:	0.250	in
Clear Space Between Bars:	0.750	in
Incline Angle:	45	degrees
No. of Bars in Rack:	35	
Clear Space:	2.2708333	sf per ft of channel depth

Headloss thru Bar Screen

Channel Area (Avg):	0.5	sf
Channel Area (Max):	1.0	sf
Approach Velocity (Avg):	0.464	fps (using design channel depth)
Approach Velocity (Peak):	0.928	fps (using max. channel depth)
Bar Screen Area (Avg):	0.38	sf
Bar Screen Area (Max):	0.76	sf
Velocity Through Bars (Avg):	0.61	fps (using design channel depth)
Velocity Through Bars (Max):	1.23	fps (using max. channel depth)

$$HeadLoss = \frac{V^2 - v^2}{0.7 \times 2 \times g}$$

V= Velocity of flow through openings in rack
v= Approach velocity
g= Acceleration of gravity, 32.2

Assuming No Clogging:			*Assuming Clogging:*		
			Clogging Factor:	0.500	
Head Loss (Design):	0.0036	ft	Head Loss (Design):	0.014	ft
Head Loss (Max):	0.0142	ft	Head Loss (Max):	0.057	ft

JK RANCH
PRELIMINARY DESIGN CALCULATIONS
SLUDGE MANAGEMENT PLAN
INTERIM I PHASE

Dimensions and Capacities of Sludge Holding

Average Anticipated Sludge Yield:	1,343	gal/day		
Minimum Sludge Retention Time:	15	days		
SRT from Treatment Basins:	11.75529	days		
Minimum SRT needed in Sludge Holding:	3.244715	days		
Prop Sludge Holding Basins:	56,569	gal =	7,562	cubic feet
Proposed Sludge Holding SRT:	42.13	days		
Total Proposed Sludge Retention Time:	53.88	days		

Solids Generated

BOD_5 Removal	Influent concentration =	300	mg/l
	Effluent concentration =	5	mg/l
	Net removal =	295	mg/l

MLSS Operating Range =	3,000	mg/l
BOD_5 removed	369	lbs/day
Dry Sludge Produced	168	lbs/day
Wet Sludge Produced*	112	lbs/day
Wet Sludge Produced*	1,343	gal/day

*Assuming Percent Solids in Sludge: 1.5 % Solids

Length of Sustainded Peak (days)	Peaking Factor	Waste Sludge Mass Loading (lbs/day)	Total Sustained Loading (lb)
1	2.4	403	403
2	2.1	353	706
3	1.9	319	958
4	1.8	302	1,210
5	1.7	286	1,428
7	1.65	277	1,940
14	1.32	222	3,104
15	1.3	218	3,276
365	1	168	61,315

Process:
Activated sludge process utilizing the conventional aeration mode will be utilized. Sludge will be wasted from the clarifiers to the sludge digester basin. Sludge will be hauled by a licensed hauler to a TCEQ registered disposal site.

JK RANCH
PRELIMINARY DESIGN CALCULATIONS
INTERIM PHASE II

PARAMETERS

Influent:			*Effluent:*		
Q =	400,000	GPD	S =	5	mg/l, BOD_{5eff}
Qp_1 =	1,600,000	GPD to Headworks	TSSeff =	5	mg/l
Qp_2 =	1,600,000	GPD downstream of Infl EQ (N/A)	NH_3N =	2	mg/l
So =	300	mg/l, BOD_5infl	Chlorine Residual =	1	mg/l @ 20 min det
TSSinf =	300	mg/l	Total Phosphorus =	1	mg/l
Chemical Oxygen Demand (COD) =	545	mg/l	.3-.8 (BOD/COD), used 0.55		
TKN =	70	mg/l			
NH_3N =	45	mg/l			
Organic $N_{14° C}$ =	25	mg/l			
Winter Temp. Min. =	14	°C			
Summer Temp. Max. =	29	°C			
MLSS =	3,000	mg/l, conc. Of suspended solids in aeration tank			
MLVSS =	70	% of MLSS			
MLVSS (X) =	2100	mg/l, conc. Of volatile suspended solids in aeration tank			

COEFFICIENTS

θc =	30	days, mean cell residence time
Y =	0.4	maximum yield coefficient, range: 0.3 - 0.5 (Metcalf & Eddy Table 8-10)
Y_n =	0.12	g VSS / g NH4-N, range: 0.1 - 0.15 (Metcalf & Eddy Table 8-11)
K_o =	0.5	g / m^3, range: 0.40 - 0.60 (Metcalf & Eddy Table 8-11)
k_d =	0.12	day^-1, endogenous decay coefficient, range: 0.06 - 0.2 (Metcalf & Eddy Table 8-10)
k_d =	1.04	unitless, range: 1.03 - 1.08 (Metcalf & Eddy Table 8-10)
$k_{d,\ 14°C}$ =	0.095	g/g*d
K_{dn} =	0.080	g VSS / g VSS*d, range: 0.05 - 0.15 (Metcalf & Eddy Table 8-10)
K_{dn} =	1.04	unitless, range: 1.03 - 1.08 (Metcalf & Eddy Table 8-11)
$K_{dn,\ 14°C}$ =	0.063	g/g*d
K_n =	0.740	g NH4-N / m^3, range: 0.5 - 1.0 (Metcalf & Eddy Table 8-11)
K_n =	1.053	unitless, range: 1.03 - 1.123 (Metcalf & Eddy Table 8-11)
$K_{n,\ 14°}C$ =	0.543	g / m^3
μ_{mn} =	0.750	g VSS / g VSS*d, range: 0.20 - 0.90 (Metcalf & Eddy Table 8-11)
μ_n =	1.070	unitless, range: 1.06 - 1.123 (Metcalf & Eddy Table 8-11)
$\mu_{m,\ 14°C}$ =	0.500	g /g*d
f_d =	0.150	unitless, range: 0.08 - 0.2 (Metcalf & Eddy Table 8-10)

DESIGN CALCULATIONS

A. BOD_5 Loading

$$F = \frac{8.34 \times Q \times (S_o - S)}{10^6}$$

F = **984.1** lb BOD_5 /day

B. TSS Loading

$$TSS = \frac{8.34 \times Q \times (TSS_{\text{inf}} - TSS_{eff})}{10^6}$$

TSS = **984.1** lb TSS /day

C. Micro-organism Mass in Aeration Basin

$$M_v = F \times \frac{\theta_c \times Y}{1 + (k_d \times \theta_c)}$$

Mv = **2567** lb

D. Aeration Volume

$$V = \frac{Q \times \theta_c}{X} \times \frac{Y \times (S_o - S)}{1 + (k_d \times \theta_c)}$$

V = 146,583.85 gal
19,595 cf

Max. Organic Loading: 35 lbs BOD5/day/1000 cf
(TCEQ Chap. 217.154, Conventional)

V = 28,118 cf

Minimum V = 28,118 cf

E. Wastewater Characteristics

bCOD = 1.6(BOD) = 480 mg/l (Biodegradable COD)
nbCOD = COD - bCOD = 65 mg/l (non-biodegradable COD)

iTSS = TSS - VSS
TSS = 300 mg/l
VSS = 210 mg/l
iTSS = 90 mg/l

$$\frac{bpCOD}{pCOD} = \frac{(bCOD \div BOD) \times (BOD - sBOD)}{COD - sCOD}$$

sBOD: soluble BOD
sCOD: soluble COD
bpCOD: Biodegradable particulate COD
pCOD: Particulate COD

Assume: sCOD = 33% of COD = 180 mg/l
Assume: sBOD = 33% of BOD = 99 mg/l

bpCOD/pCOD = 0.88

$$nbVSS = \left[1 - \left(\frac{bpCOD}{pCOD}\right)\right] \times BOD$$

nbVSS = 36.0 mg/l (non-biodegradable VSS)

F. Sludge Retention Time

$$(P_{X,TSS})SRT = \frac{QY(S_O - S)SRT}{[1 + (k_d)SRT](0.85)} + Q(nbVSS)SRT + \frac{QY_n(NO_x)SRT}{[1 + (k_{dn})SRT](0.85)} + \frac{(f_d)(k_d)Q(Y)(S_O - S)SRT^2}{[1 + (k_d)SRT](0.85)} + Q(TSS_O - VSS_O)SRT$$

$$(P_{X,TSS}) \times SRT = (V) \times (X_{MISS})$$

X_{MLSS} = 3,000 g/m^3
V = 29,367 cf = 831.59 m^3

$(P_{X,TSS})SRT$ = 2,494,771 g

Assume So ≈ So -S
So = bCOD = 480 g/m^3

Assume Nox ≈ 80% of TKN = 56.0 g/m^3

SRT = 11.755285 days

H. Sludge Yield

$$P_{X,TSS} = \frac{(V)(MLSS)}{SRT}$$

$P_{X,TSS}$ = 448 lbs/day

$$Q_{Sludge} = \frac{P_{X,TSS}}{8.34 \times PercentSolids}$$

Assume Percent Solids = 1.5 %

Q_{sludge} = 3,581 gal/day

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PRELIMINARY DESIGN CALCULATIONS
INTERIM PHASE II

I. Nitrification

$$K_n \ln\frac{N_o}{N_t} + (N_o - N_t) = X_n\left(\frac{\mu_{mn}}{Y_n}\right)\left(\frac{DO}{k_o + DO}\right)t$$

No = Initial NH4-N concentration (mg/L)
Nt = NH4-N concentration at time t (mg/L)
Xn = Nitrifying bacteria concentration (mg/L)
DO = Dissolved Oxygen concentration= 4.0 mg/L

$$NO_x = TKN_o - N_e - 0.12P_{x,bio}/Q$$

NOx = Nitrogen oxidized (mg/L)
TKNo = Influent TKN (mg/L)
Ne = Effluent NH4-N (mg/L)
Px,bio = Nitrogen in cell tissue

$$P_{x,bio} = \frac{QY(S_o - S)}{1 + (k_d)SRT} + \frac{QY_n(NO_x)}{1 + (k_{dn})SRT} + \frac{(f_d)(k_d)QY(S_o - S)SRT}{1 + (k_d)SRT}$$

Q =	400,000	gpd =	1,514.2	m^3/day
So - S =	480	g/m^3 (from SRT calculation)		
Nox =	56.0	g/m^3 (from SRT calculation)		
SRT =	11.755285	days		
Px,bio =	166,291	g/day =	166.3	kg/day

NOx = 54.8 g/m^3

$$P_{X,TSS} = \left(\frac{P_{X,BIO}}{0.85}\right) + Q\times(nbVSS) + Q\times(T_{SSo} - V_{SSo})$$

TSSo = 300 mg/l
VSSo = TSSo x MLVSS(%) = 210 mg/l

$P_{X,TSS}$ = 386.42 kg/day

$$V = \frac{(P_{X,TSS} \times SRT)}{MLSS}$$

Minimum Volume Required= 1,514.2 m^3 = **53,465.1** cf

E. Nitrification

pH:	7.2		
DO (mg/L):	4.0	Dissolved Oxygen	
Ko:	0.5	Half-Saturation coefficient for DO (Metcalf & Eddy Table 8-11)	
Temp (°C):	14.0		
Effluent NH3 (mg/L):	2.0		
Temperature Term, Tt:	0.91		Tt=e^(0.098*(T-15))
DO Term, DOt:	0.89		DOt=DO/(Ko+DO)
pH Term, pHt:	1.00		pHt=1-0.833*(7.2-pH)
Kn:	0.36	Half-Saturation coefficient for oxidation of ammonia	Kn=10^(0.051*T-1.158)
NH3 Term, NH3t:	0.85		NH3t=NH3/(Kn+NH3)
Nitrifier Growth Rate (days^-1):	0.34		Growth Rate=0.5*Tt*pHt*DOt*NH3t
Aerobic SRT Required (days):	2.93		SRT=1/Nitrifier Growth Rate
Safety Factor:	2.0	Typical Range: 1.5 - 2.5	
Min Required Aerobic SRT (days):	**5.9**		
Minimum Aerobic Volume (cf):	**14,007.23**	**For Nitrification**	

J. Clarifier

Max Surface Loading:	1,200	gpd/sf at Peak Flow	(TCEQ Chap. 217.154, Conventional, secondary enhanced)
Max Surface Loading:	600	gpd/sf at Design Flow	
Min Detention Time:	1.8	hrs at Peak Flow	
Min Detention Time:	3.6	hrs at Design Flow	
Max Weir Loading:	20,000	gpd/lf at Peak Flow	
Minimum Surface Area:	**1,333**	**sf**	
Minimum Volume:	**120,000**	**gallons =**	**16041.7 cf**
Minimum Weir Length:	**80**	**lf**	

K. Return Activated Sludge

Minimum Rate:	**50%**	**of Design Flow =**	**138.9**	**gpm**
Maximum Rate:	**100%**	**of Design Flow =**	**277.8**	**gpm**

Provide: 7 6" Air Lift Pumps or 4 8" Air Lift Pumps

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PRELIMINARY DESIGN CALCULATIONS
INTERIM PHASE II

L. Sludge Holding Basin

Minimum SRT:	15	days
- SRT w/Treatment:	11.755285	days
Minimum Sludge Holding SRT:	3.2447146	days

Minimum Sludge Holding Detention Time: 7 days (for operations)

Minimum Sludge Holding Volume using SRT	25,066	**gallons =**	**3,350.8 cf**
Minimum Sludge Holding Volume using 20-cf/lbs BOD/Day	147,234	**gallons =**	**19,682.4 cf**
Minimum Sludge Holding Volume:	**147,234**	**gallons =**	**19,682.4 cf**

M. Chlorine Contact Basin

Minimum Detention Time: 20 minutes at Peak Flow

Minimum Volume:	**22,222.22**	**gallons =**	**2,970.7 cf**

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PRELIMINARY DESIGN CALCULATIONS
INTERIM PHASE II

N. Aeration

1. Aeration Basins

Minimum oxygen requirement = 3,200 scf per lb BOD_5 per day @ 10' submergence and 20 deg C

Diffuser Submergence Depth (ft)	Airflow Correction Factor
8	1.82
10	1.56
12	1.00
15	0.91
18	0.73
20	0.64

Diffuser Submergence Depth = 10 ft
Correction Factor = 1.56

Minimum oxygen requirement = 3,412 scfm @ 20 deg C

2. Digester

Oxygen Requirement = 30 scfm per 1,000 ft^3

Minimum oxygen requirement = 454 scfm

3. Air Lift Pumps

Minimum air requirement = 245 scfm

4. Other

Initial Mixing = 25 scfm
Post Aeration = 64.80 scfm (20 scfm per 1,000-cf)
Minimum air requirement = 89.8 scfm

4. Total

Total Air Flow Requirement = 4,200 scfm
Proposed Blower = 3,000 SCFM

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INTERIM PHASE II

O. Fine Screen

Bar Spacing:	0.25	in	
Average Flow Rate:	0.4	MGD	
Approximate Volume of Screenings:	13	cf/MG	
Anticipated Volume of Screenings:	5.2	cf per day	1.35 CY Per Week

COARSE SCREEN (BYPASS/OVERFLOW BAR SCREEN)

Influent Flow Rate

Average Influent Flow Rate:	0.40	MGD	=	278	gpm	=	0.619	cfs
Peak Influent Flow Rate:	1.60	MGD	=	1111	gpm	=	2.476	cfs

Channel Geometry

Channel Width:	3.00	ft
Design Channel Flow Depth:	0.2	ft
Max. Channel Depth:	0.3	ft

Bar Rack Geometry

Bar Size:	0.250	in
Clear Space Between Bars:	0.750	in
Incline Angle:	45	degrees
No. of Bars in Rack:	35	
Clear Space:	2.2708333	sf per ft of channel depth

Headloss thru Bar Screen

Channel Area (Avg):	0.5	sf
Channel Area (Max):	1.0	sf
Approach Velocity (Avg):	1.238	fps (using design channel depth)
Approach Velocity (Peak):	2.476	fps (using max. channel depth)
Bar Screen Area (Avg):	0.38	sf
Bar Screen Area (Max):	0.76	sf
Velocity Through Bars (Avg):	1.64	fps (using design channel depth)
Velocity Through Bars (Max):	3.27	fps (using max. channel depth)

$$HeadLoss = \frac{V^2 - v^2}{0.7 \times 2 \times g}$$

V= Velocity of flow through openings in rack
v= Approach velocity
g= Acceleration of gravity, 32.2

Assuming No Clogging:			*Assuming Clogging:*		
			Clogging Factor:	0.500	
Head Loss (Design):	0.0253	ft	Head Loss (Design):	0.101	ft
Head Loss (Max):	0.1013	ft	Head Loss (Max):	0.405	ft

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PRELIMINARY DESIGN CALCULATIONS
SLUDGE MANAGEMENT PLAN
INTERIM II PHASE

Dimensions and Capacities of Sludge Holding

Average Anticipated Sludge Yield:	3,581	gal/day		
Minimum Sludge Retention Time:	15	days		
SRT from Treatment Basins:	11.76	days		
Minimum SRT needed in Sludge Holding:	3.244715	days		
Prop Sludge Holding Basins:	113,137	gal =	15,124	cubic feet
Proposed Sludge Holding SRT:	31.60	days		
Total Proposed Sludge Retention Time:	43.35	days		

Solids Generated

BOD_5 Removal	Influent concentration =	300	mg/l
	Effluent concentration =	5	mg/l
	Net removal =	295	mg/l

MLSS Operating Range = 3,000 mg/l

BOD_5 removed	984	lbs/day
Dry Sludge Produced	448	lbs/day
Wet Sludge Produced*	299	lbs/day
Wet Sludge Produced*	3,581	gal/day

*Assuming Percent Solids in Sludge: 1.5 % Solids

Length of Sustainded Peak (days)	Peaking Factor	Waste Sludge Mass Loading (lbs/day)	Total Sustained Loading (lb)
1	2.4	1,075	1,075
2	2.1	941	1,881
3	1.9	851	2,553
4	1.8	806	3,225
5	1.7	762	3,808
7	1.65	739	5,174
14	1.32	591	8,278
15	1.3	582	8,735
365	1	448	163,507

Process:
Activated sludge process utilizing the conventional aeration mode will be utilized. Sludge will be wasted from the clarifiers to the sludge digester basin. Sludge will be hauled by a licensed hauler to a TCEQ registered disposal site.

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PRELIMINARY DESIGN CALCULATIONS
FINAL PHASE

PARAMETERS

Influent:			*Effluent:*		
Q =	850,000	GPD	S =	5	mg/l, BOD_{5eff}
Qp_1 =	3,400,000	GPD to Headworks	TSSeff =	5	mg/l
Qp_2 =	3,400,000	GPD downstream of Infl EQ (N/A)	NH_3N =	2	mg/l
So =	300	mg/l, BOD_5infl	Chlorine Residual =	1	mg/l @ 20 min det
TSSinf =	300	mg/l	Total Phosphorus =	1	mg/l
Chemical Oxygen Demand (COD) =	545	mg/l .3-.8 (BOD/COD), used 0.55			
TKN =	70	mg/l			
NH_3N =	45	mg/l			
Organic $N_{14° C}$ =	25	mg/l			
Winter Temp. Min. =	14	°C			
Summer Temp. Max. =	29	°C			
MLSS =	3,000	mg/l, conc. Of suspended solids in aeration tank			
MLVSS =	70	% of MLSS			
MLVSS (X) =	2100	mg/l, conc. Of volatile suspended solids in aeration tank			

COEFFICIENTS

θc =	30	days, mean cell residence time
Y =	0.4	maximum yield coefficient, range: 0.3 - 0.5 (Metcalf & Eddy Table 8-10)
Y_n =	0.12	g VSS / g NH4-N, range: 0.1 - 0.15 (Metcalf & Eddy Table 8-11)
K_o =	0.5	g / m^3, range: 0.40 - 0.60 (Metcalf & Eddy Table 8-11)
k_d =	0.12	day^-1, endogenous decay coefficient, range: 0.06 - 0.2 (Metcalf & Eddy Table 8-10)
k_d =	1.04	unitless, range: 1.03 - 1.08 (Metcalf & Eddy Table 8-10)
$k_{d,\ 14°C}$ =	0.095	g/g*d
K_{dn} =	0.080	g VSS / g VSS*d, range: 0.05 - 0.15 (Metcalf & Eddy Table 8-10)
K_{dn} =	1.04	unitless, range: 1.03 - 1.08 (Metcalf & Eddy Table 8-11)
$K_{dn,\ 14°C}$ =	0.063	g/g*d
K_n =	0.740	g NH4-N / m^3, range: 0.5 - 1.0 (Metcalf & Eddy Table 8-11)
K_n =	1.053	unitless, range: 1.03 - 1.123 (Metcalf & Eddy Table 8-11)
$K_{n,\ 14°}C$ =	0.543	g / m^3
μ_{mn} =	0.750	g VSS / g VSS*d, range: 0.20 - 0.90 (Metcalf & Eddy Table 8-11)
μ_n =	1.070	unitless, range: 1.06 - 1.123 (Metcalf & Eddy Table 8-11)
$\mu_{m,\ 14°C}$ =	0.500	g /g*d
f_d =	0.150	unitless, range: 0.08 - 0.2 (Metcalf & Eddy Table 8-10)

DESIGN CALCULATIONS

A. BOD_5 Loading

$$F = \frac{8.34 \times Q \times (S_o - S)}{10^6}$$

F = **2091.3** lb BOD_5 /day

B. TSS Loading

$$TSS = \frac{8.34 \times Q \times (TSS_{\text{inf}} - TSS_{eff})}{10^6}$$

TSS = **2091.3** lb TSS /day

C. Micro-organism Mass in Aeration Basin

$$M_v = F \times \frac{\theta_c \times Y}{1 + (k_d \times \theta_c)}$$

Mv = **5455** lb

D. Aeration Volume

$$V = \frac{Q \times \theta_c}{X} \times \frac{Y \times (S_o - S)}{1 + (k_d \times \theta_c)}$$

V = 311,490.68 gal
41,640 cf

Max. Organic Loading: 35 lbs BOD5/day/1000 cf
(TCEQ Chap. 217.154, Conventional)

V = 59,750 cf

Minimum V = 59,750 cf

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PRELIMINARY DESIGN CALCULATIONS
FINAL PHASE

E. Wastewater Characteristics

bCOD = 1.6(BOD) = 480 mg/l (Biodegradable COD)
nbCOD = COD - bCOD = 65 mg/l (non-biodegradable COD)

iTSS = TSS - VSS
TSS = 300 mg/l
VSS = 210 mg/l
iTSS = 90 mg/l

$$\frac{bpCOD}{pCOD} = \frac{(bCOD \div BOD) \times (BOD - sBOD)}{COD - sCOD}$$

sBOD: soluble BOD
sCOD: soluble COD
bpCOD: Biodegradable particulate COD
pCOD: Particulate COD

Assume: sCOD = 33% of COD = 180 mg/l
Assume: sBOD = 33% of BOD = 99 mg/l

bpCOD/pCOD = 0.88

$$nbVSS = \left[1 - \left(\frac{bpCOD}{pCOD}\right)\right] \times BOD$$

nbVSS = 36.0 mg/l (non-biodegradable VSS)

F. Sludge Retention Time

$$(P_{X,TSS})SRT = \frac{QY(S_O - S)SRT}{[1 + (k_d)SRT](0.85)} + Q(nbVSS)SRT + \frac{QY_n(NO_x)SRT}{[1 + (k_{dn})SRT](0.85)} + \frac{(f_d)(k_d)Q(Y)(S_O - S)SRT^2}{[1 + (k_d)SRT](0.85)} + Q(TSS_O - VSS_O)SRT$$

$$(P_{X,TSS}) \times SRT = (V) \times (X_{MISS})$$

XMLSS = 3,000 g/m^3
V = 14,684 cf = 415.80 m^3

(PX,TSS)SRT = 1,247,385 g

Assume So ≈ So -S
So = bCOD = 480 g/m^3

Assume Nox ≈ 80% of TKN = 56.0 g/m^3

SRT = 11.755285 days

H. Sludge Yield

$$P_{X,TSS} = \frac{(V)(MLSS)}{SRT}$$

PX,TSS = 952 lbs/day

$$Q_{Sludge} = \frac{P_{X,TSS}}{8.34 \times PercentSolids}$$

Assume Percent Solids = 1.5 %

Qsludge = 7,609 gal/day

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PRELIMINARY DESIGN CALCULATIONS
FINAL PHASE

I. Nitrification

$$K_n \ln\frac{N_o}{N_t} + (N_o - N_t) = X_n\left(\frac{\mu_{mn}}{Y_n}\right)\left(\frac{DO}{k_o + DO}\right)t$$

No = Initial NH4-N concentration (mg/L)
Nt = NH4-N concentration at time t (mg/L)
Xn = Nitrifying bacteria concentration (mg/L)
DO = Dissolved Oxygen concentration= 4.0 mg/L

$$NO_x = TKN_o - N_e - 0.12P_{x,bio}/Q$$

NOx = Nitrogen oxidized (mg/L)
TKNo = Influent TKN (mg/L)
Ne = Effluent NH4-N (mg/L)
Px,bio = Nitrogen in cell tissue

$$P_{x,bio} = \frac{QY(S_o - S)}{1+(k_d)SRT} + \frac{QY_n(NO_x)}{1+(k_{dn})SRT} + \frac{(f_d)(k_d)QY(S_o - S)SRT}{1+(k_d)SRT}$$

Q =	850,000	gpd =	3,217.6	m^3/day
So - S =	480	g/m^3 (from SRT calculation)		
Nox =	56.0	g/m^3 (from SRT calculation)		
SRT =	11.7552854	days		
Px,bio =	353,369	g/day =	353.4	kg/day

NOx = 54.8 g/m^3

$$P_{X,TSS} = \left(\frac{P_{X,BIO}}{0.85}\right) + Q\times(nbVSS) + Q\times(T_{SSo} - V_{SSo})$$

TSSo =	300	mg/l
VSSo = TSSo x MLVSS(%) =	210	mg/l

$P_{X,TSS}$ = 821.15 kg/day

$$V = \frac{(P_{X,TSS}\times SRT)}{MLSS}$$

Minimum Volume Required= 3,217.6 m^3 = ######## cf

E. Nitrification

pH:	7.2		
DO (mg/L):	4.0	Dissolved Oxygen	
Ko:	0.5	Half-Saturation coefficient for DO (Metcalf & Eddy Table 8-11)	
Temp (°C):	14.0		
Effluent NH3 (mg/L):	2.0		
Temperature Term, Tt:	0.91		Tt=e^(0.098*(T-15))
DO Term, DOt:	0.89		DOt=DO/(Ko+DO)
pH Term, pHt:	1.00		pHt=1-0.833*(7.2-pH)
Kn:	0.36	Half-Saturation coefficient for oxidation of ammonia	Kn=10^(0.051*T-1.158)
NH3 Term, NH3t:	0.85		NH3t=NH3/(Kn+NH3)
Nitrifier Growth Rate (days^-1):	0.34		Growth Rate=0.5*Tt*pHt*DOt*NH3t
Aerobic SRT Required (days):	2.93		SRT=1/Nitrifier Growth Rate
Safety Factor:	2.0	Typical Range: 1.5 - 2.5	
Min Required Aerobic SRT (days):	**5.9**		
Minimum Aerobic Volume (cf):	**29,765.37**	**For Nitrification**	

J. Clarifier

Max Surface Loading:	1,200	gpd/sf at Peak Flow	(TCEQ Chap. 217.154, Conventional, secondary enhanced)
Max Surface Loading:	600	gpd/sf at Design Flow	
Min Detention Time:	1.8	hrs at Peak Flow	
Min Detention Time:	3.6	hrs at Design Flow	
Max Weir Loading:	20,000	gpd/lf at Peak Flow	
Minimum Surface Area:	**2,833**	**sf**	
Minimum Volume:	**255,000**	**gallons =**	**34088.6 cf**

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PRELIMINARY DESIGN CALCULATIONS
FINAL PHASE

Minimum Weir Length: **170** **lf**

K. Return Activated Sludge

Minimum Rate:	**50%**	**of Design Flow =**	**295.1**	**gpm**
Maximum Rate:	**100%**	**of Design Flow =**	**590.3**	**gpm**

Provide: **15** **6" Air Lift Pumps or** **9** **8" Air Lift Pumps**

L. Sludge Holding Basin

Minimum SRT:	15	days
- SRT w/Treatment:	11.755285	days
Minimum Sludge Holding SRT:	3.2447146	days

Minimum Sludge Holding Detention Time: 7 days (for operations)

Minimum Sludge Holding Volume using SRT	53,265	**gallons =**	**7,120.5**	**cf**
Minimum Sludge Holding Volume using 20-cf/lbs BOD/Day	312,873	**gallons =**	**41,825.1**	**cf**
Minimum Sludge Holding Volume:	**312,873**	**gallons =**	**41,825.1**	**cf**

M. Chlorine Contact Basin

Minimum Detention Time: 20 minutes at Peak Flow

Minimum Volume:	**47,222.22**	**gallons =**	**6,312.7**	**cf**

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FINAL PHASE

N. Aeration

1. Aeration Basins

Minimum oxygen requirement = 3,200 scf per lb BOD_5 per day @ 10' submergence and 20 deg C

Diffuser Submergence Depth (ft)	Airflow Correction Factor
8	1.82
10	1.56
12	1.00
15	0.91
18	0.73
20	0.64

Diffuser Submergence Depth = 10 ft
Correction Factor = 1.56

Minimum oxygen requirement = 7,250 scfm @ 20 deg C

2. Digester

Oxygen Requirement = 30 scfm per 1,000 ft^3

Minimum oxygen requirement = 1361 scfm

3. Air Lift Pumps

Minimum air requirement = 525 scfm

4. Other

Initial Mixing = 25 scfm
Post Aeration = 194.40 scfm (20 scfm per 1,000-cf)
Minimum air requirement = 219.4 scfm

4. Total

Total Air Flow Requirement = 9,355 scfm
Proposed Blower = 3,000 SCFM

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FINAL PHASE

O. Fine Screen

Bar Spacing:	0.25	in		
Average Flow Rate:	0.9	MGD		
Approximate Volume of Screenings:	13	cf/MG		
Anticipated Volume of Screenings:	11.05	cf per day	2.86	CY Per Week

COARSE SCREEN (BYPASS/OVERFLOW BAR SCREEN)

Influent Flow Rate

Average Influent Flow Rate:	0.85	MGD	=	590	gpm	=	1.315	cfs
Peak Influent Flow Rate:	3.40	MGD	=	2361	gpm	=	5.261	cfs

Channel Geometry

Channel Width:	3.00	ft
Design Channel Flow Depth:	0.2	ft
Max. Channel Depth:	0.3	ft

Bar Rack Geometry

Bar Size:	0.250	in
Clear Space Between Bars:	0.750	in
Incline Angle:	45	degrees
No. of Bars in Rack:	35	
Clear Space:	2.2708333	sf per ft of channel depth

Headloss thru Bar Screen

Channel Area (Avg):	0.5	sf
Channel Area (Max):	1.0	sf
Approach Velocity (Avg):	2.630	fps (using design channel depth)
Approach Velocity (Peak):	5.261	fps (using max. channel depth)
Bar Screen Area (Avg):	0.38	sf
Bar Screen Area (Max):	0.76	sf
Velocity Through Bars (Avg):	3.47	fps (using design channel depth)
Velocity Through Bars (Max):	6.95	fps (using max. channel depth)

$$HeadLoss = \frac{V^2 - v^2}{0.7 \times 2 \times g}$$

V= Velocity of flow through openings in rack
v= Approach velocity
g= Acceleration of gravity, 32.2

Assuming No Clogging:			*Assuming Clogging:*		
			Clogging Factor:	0.500	
Head Loss (Design):	0.1144	ft	Head Loss (Design):	0.458	ft
Head Loss (Max):	0.4575	ft	Head Loss (Max):	1.830	ft

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PRELIMINARY DESIGN CALCULATIONS
SLUDGE MANAGEMENT PLAN
FINAL PHASE

Dimensions and Capacities of Sludge Holding

Average Anticipated Sludge Yield:	7,609	gal/day		
Minimum Sludge Retention Time:	15	days		
SRT from Treatment Basins:	11.76	days		
Minimum SRT needed in Sludge Holding:	3.244715	days		
Prop Sludge Holding Basins:	339,412	gal =	45,373	cubic feet
Proposed Sludge Holding SRT:	44.60	days		
Total Proposed Sludge Retention Time:	56.36	days		

Solids Generated

BOD_5 Removal	Influent concentration =	300	mg/l
	Effluent concentration =	5	mg/l
	Net removal =	295	mg/l

MLSS Operating Range =	3,000	mg/l
BOD_5 removed	2,091	lbs/day
Dry Sludge Produced	952	lbs/day
Wet Sludge Produced*	635	lbs/day
Wet Sludge Produced*	7,609	gal/day

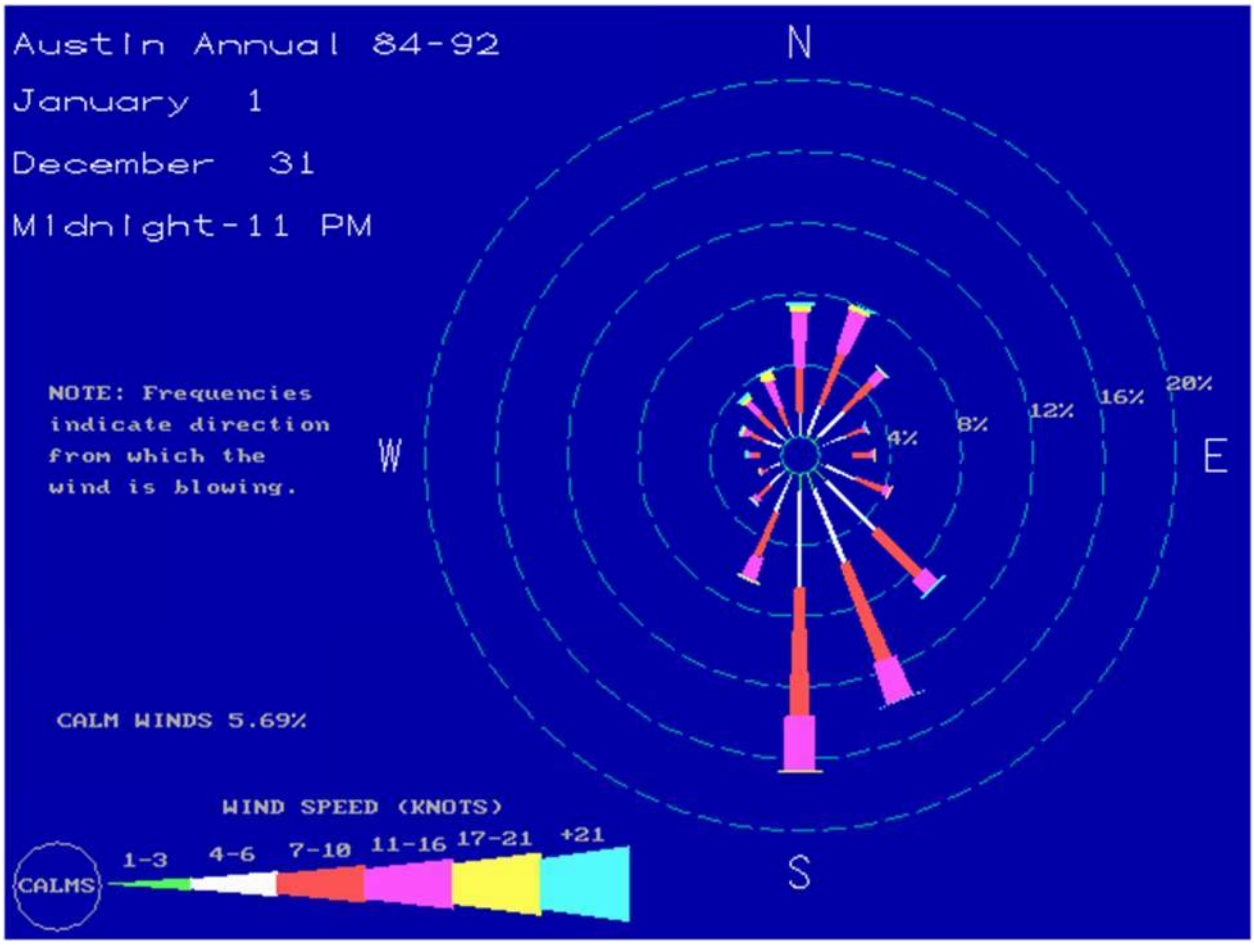
*Assuming Percent Solids in Sludge: 1.5 % Solids

Length of Sustainded Peak (days)	Peaking Factor	Waste Sludge Mass Loading (lbs/day)	Total Sustained Loading (lb)
1	2.4	2,285	2,285
2	2.1	1,999	3,998
3	1.9	1,809	5,426
4	1.8	1,713	6,854
5	1.7	1,618	8,091
7	1.65	1,571	10,995
14	1.32	1,257	17,592
15	1.3	1,238	18,563
365	1	952	347,452

Process:
Activated sludge process utilizing the conventional aeration mode will be utilized. Sludge will be wasted from the clarifiers to the sludge digester basin. Sludge will be hauled by a licensed hauler to a TCEQ registered disposal site.

ATTACHMENT 11
WIND ROSE

Attachment 11 – Wind Rose – Austin, Texas



ATTACHMENT 12
PUBLIC INVOLVEMENT PLAN

Texas Commission on Environmental Quality

Public Involvement Plan Form for Permit and Registration Applications

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

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

Section 1. Preliminary Screening

☑ New Permit or Registration Application
☐ New Activity – modification, registration, amendment, facility, etc. (see instructions)

If neither of the above boxes are checked, a Public Involvement Plan is not necessary. Completion of the remaining sections not required.

Section 2. Secondary Screening

☑ Requires public notice,
☐ Considered to have significant public interest, **and**
☐ Located within any of the following geographical locations:

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

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

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

Section 3. Application Information

Type of Application (check all that apply):

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

Waste ☐ Municipal Solid Waste ☐ Industrial and Hazardous Waste
☐ Radioactive Materials Licensing ☐ Underground Injection Controls

Water Quality

☑ Texas Pollutant Discharge Elimination System (TPDES)

☐ Texas Land Application Permit (TLAP)

☐ State Only Concentrated Animal Feeding Operation (CAFO)

☐ Water Treatment Plant Residuals Disposal Permit

☐ Class B Biosolids Land Application Permit

☐ Domestic Septage Land Application Registration

Water Rights New Permit

☐ New Appropriation of Water

☐ New or existing reservoir

Amendment to an Existing Water Right

☐ Add a New Appropriation of Water

☐ Add a New or Existing Reservoir

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

Section 4. Plain Language Summary

Provide a brief description of planned activities.

The applicant proposes to operate a conventional activated sludge plant with modified extended nitrification. The facility will be located +/- 3,450LF northeast of the intersection of San Marcos Hwy and Political Rd, in Caldwell County, Texas 78622. This is a new application to authorize discharge of treated domestic wastewater at a volume not to exceed 850,000 Gallons Per Day.

Discharges from the facility are expected to contain five-day carbonaceous biochemical oxygen demand (CBOD5), total suspended solids (TSS), ammonia nitrogen (NH3-N), and phosphorus. Domestic wastewater will be treated by five-day carbonaceous biochemical oxygen demand (CBOD5), total suspended solids (TSS), ammonia nitrogen (NH3-N), and phosphorus

Section 5. Community and Demographic Information

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

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

Staples

(City)

Caldwell

(County)

9605.02, Caldwell County, TX

(Census Tract)

Please indicate which of these three is the level used for gathering the following information.
☐ City
☐ County
☑ Census Tract

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

84.8%

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

$69,375

(c) Percent of minority population and percent of population by race within the specified location Minority Population: 57.9%
White: 75.4%, Black or African American: 2.6%, American Indian or Alaska Native: 0%, Asian: 0%, Other: 3.3%, Two or more races: 18.8%

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

16.4%

(e) Languages commonly spoken in area by percentage

English: 78.4%, Spanish: 13.2%, Indo-European: 3.8%, Asian and Pacific: 3.5%, Other: 1.2%

(f) Community and/or Stakeholder Groups

Fentress, Prairie Lea ISD, Lockhart ISD

(g) Historic public interest or involvement

N/A

Section 6. Planned Public Outreach Activities

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

☑ Yes ☐ No

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

☐ Yes ☑ No

If Yes, please describe.

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

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

☐ Yes ☐ No

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

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

☐ Publish in alternative language newspaper

☐ Posted on Commissioner's Integrated Database Website

☐ Mailed by TCEQ's Office of the Chief Clerk

☐ Other (specify)

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

☐ Yes ☐ No

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

☐ Yes ☐ No

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

☐ TCEQ Regional Office

☐ TCEQ Central Office

☐ Public Place (specify)

Section 7. Voluntary Submittal

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

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

☑ Yes ☐ No

What types of notice will be provided?

☑ Publish in alternative language newspaper

☐ Posted on Commissioner's Integrated Database Website

☐ Mailed by TCEQ's Office of the Chief Clerk

☐ Other (specify)