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TEXAS REGISTERED ENGINEERING FIRM F-181
TBPLS Firm No. 10003700

Domestic Wastewater Discharge Permit Renewal Application

For

LIBERTY HILL REGIONAL WASTEWATER TREATMENT FACILITY
Permit # WQ0014477-001
City of Liberty Hill

In

Williamson County, Texas

Prepared By:

Steger Bizzell
1978 South Austin Avenue
Georgetown, Texas 78626

Job # 21532

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

DOMESTIC WASTEWATER PERMIT APPLICATION CHECKLIST

Complete and submit this checklist with the application.

APPLICANT: City of Liberty Hill

PERMIT NUMBER: WQ0014477-001

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	☐	☒
Technical Report 1.0	☒	☐	Flow Diagram	☒	☐
Technical Report 1.1	☐	☒	Site Drawing	☒	☐
Worksheet 2.0	☒	☐	Original Photographs	☐	☒
Worksheet 2.1	☐	☒	Design Calculations	☐	☒
Worksheet 3.0	☐	☒	Solids Management Plan	☐	☒
Worksheet 3.1	☐	☒	Water Balance	☐	☒
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: 18554
Check/Money Order Amount: $2015.00
Name Printed on Check: Steger Bizzell

EPAY — Voucher Number: [redacted]

Copy of Payment Voucher enclosed? Yes ☐

Section 2. Type of Application (Instructions Page 29)

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

For amendments or modifications, describe the proposed changes: An interim phase of 2.0 MGD average flow/6.5 MGD peak 2-hour flow is being added to the permit.

For existing permits:

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?

City of Liberty Hill

(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/index.cfm?fuseaction=cust.CustSearch

CN: 602959033

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*.

First/Last Name: Rick Hall

Title/Prefix: Mr. Credential: Mayor

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?

(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/index.cfm?fuseaction=cust.CustSearch:

CN:

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*.

First and Last Name:

Title/Prefix: Credential:

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

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:** N/A

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. First and Last Name: Aaron Laughlin, PE — Credential: Project Manager

Organization Name: Steger Bizzell — Title/Prefix: Mr.

Mailing Address: 1978 South Austin Ave

City: Georgetown — State: TX — ZIP Code: 78626

Phone No.: 512-930-9412 — Ext.: — Fax No.:

E-mail Address: alaughlin@stegerbizzell.com

Check one or both: ☐ Administrative Contact ☒ Technical Contact

B. First and Last Name: Wayne Bonnet — Credential: Utility Director

Organization Name: City of Liberty Hill — Title/Prefix: Mr.

Mailing Address: 926 Loop 332

City: Liberty Hill — State: TX — ZIP Code: 78642

Phone No.: 512-778-5449 — Ext.: — Fax No.:

E-mail Address: wbonnet@libertyhilltx.gov

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. First and Last Name: Aaron Laughlin, PE — Credential: Project Manager

Organization Name: Steger Bizzell — Title/Prefix: Mr.

Mailing Address: 1978 South Austin Ave

City: Georgetown — State: TX — ZIP Code: 78626

Phone No.: 512-930-9412 — Ext.: — Fax No.:

E-mail Address: alaughlin@stegerbizzell.com

B. First and Last Name: Wayne Bonnet | Credential: Utility Director

Organization Name: City of Liberty Hill | Title/Prefix: Mr.

Mailing Address: 926 Loop 332

City: Liberty Hill | State: TX | ZIP Code: 78642

Phone No.: 512-778-5449 | Ext.: | Fax No.:

E-mail Address: wbonnet@libertyhilltx.gov

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).

First and Last Name: Michel Sorrell | Credential: Finance Director

Organization Name: City of Liberty Hill | Title/Prefix: Ms.

Mailing Address: 926 Loop 332

City: Liberty Hill | State: TX | ZIP Code: 78642

Phone No.: 512-778-5449 | Ext.: | Fax No.:

E-mail Address: msorrell@libertyhilltx.gov

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.

First and Last Name: Wayne Bonnet | Credential: Utility Director

Organization Name: City of Liberty Hill | Title/Prefix: Mr.

Mailing Address: 926 Loop 332

City: Liberty Hill | State: TX | ZIP Code: 78642

Phone No.: 512-778-5449 | Ext.: | Fax No.:

E-mail Address: wbonnet@libertyhilltx.gov

You can submit DMR data on the TCEQ website at https://www.tceq.texas.gov/field/netdmr/netdmr.html. Establish an electronic reporting account with the permit number.

Section 8. Public Notice Information (Instructions Page 31)

A. Individual Publishing the Notices

First and Last Name: Aaron Laughlin | Credential: Project Manager

Organization Name: Steger Bizzell | Title/Prefix: Mr.

Mailing Address: 1978 South Austin Ave

City: Georgetown | State: TX | ZIP Code: 78626

Phone No.: 512-930-9412 | Ext.: | Fax No.:

E-mail Address: alaughlin@stegerbizzell.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: alaughlin@stegerbizzell.com

☐ Fax No.:

☐ Regular Mail:

Mailing Address:

City: | State: | ZIP Code:

Phone No.: | Ext.: | Fax:

C. Contact person to be listed in the Notices

First and Last Name: Wayne Bonnet | Credential: Utility Director

Organization Name: City of Liberty Hill | Title/Prefix: Mr.

Phone No.: 512-778-5449 | Ext.: | E-mail: wbonnet@libertyhilltx.gov

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: Liberty Hill Public Library

Location within the building: Reference

Physical Address of Building: 355 Loop 332

City: Liberty Hill | County: Williamson

Contact Name: Angela Palmer, Library Director

Phone No.: 512-778-6400 | Ext.:

E. Bilingual Notice Requirements:

This information **is required** for **new, major amendment, and renewal applications**. It is

not required for minor amendment or minor modification 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?

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

Search the TCEQ's Central Registry at http://www15.tceq.texas.gov/crpub/index.cfm?fuseaction=regent.RNSearch to determine the RN.

If the site is found, provide the assigned Regulated Entity Number and provide the information for the site to be authorized through this application below.

TCEQ issued Regulated Entity Number (RN): **RN** 104102132

A. State/TPDES Permit No.: WQ0014477-001 Expiration Date: 12/01/2018

EPA Identification No. (TPDES Permits only): TX 0126195

B. Name of project or site (the name known by the community where located): Liberty Hill Regional Wastewater Treatment Facility

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

C. Owner of treatment facility: City of Liberty Hill

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

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

First and Last Name: City of Liberty Hill

Mailing Address: 926 Loop 332

City: Liberty Hill State: TX ZIP Code: 78642

Phone No.: 512-778-5449 E-mail Address: wbonnet@libertyhilltx.gov

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

Attachment: N/A

E. Owner of effluent disposal site:

First and Last Name: N/A

Mailing Address:

City: State: ZIP Code:

Phone No.: E-mail Address:

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

Attachment: N/A

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

First/Last Name: N/A

Mailing Address:

City: State: ZIP Code:

Phone No.: E-mail Address:

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

Attachment: N/A

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:

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:

City nearest the outfall(s): City of Liberty Hill

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

Outfall Latitude: 30D37M05S Longitude: -97D50M52S

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

F. For all applications involving an average daily discharge of 5 MGD or more, provide the names of all counties located within 100 statute miles downstream of the point(s) of discharge.

N/A

Section 11. TLAP Disposal Information (Instructions Page 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:

B. City nearest the disposal site:

C. County in which the disposal site is located:

D. Disposal Site Latitude: Longitude:

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

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

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.

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:

D. Do you owe any fees to the TCEQ?

☐ Yes ☒ No

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

Account number: Amount past due:

E. Do you owe any penalties to the TCEQ?

☐ Yes ☒ No

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

Enforcement order number: Amount past due:

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: 8.5" x 11" portion USGS Topo Map (Attachment 1)

Section 14. Signature Page (Instructions Page 39)

Permit Number: WQ0014477-001

Applicant: City of Liberty Hill

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): Rick Hall

Signatory title: Mayor

Signature: _____ Date: 6/15/18

(Use blue ink)

Subscribed and Sworn to before me by the said Rick Hall

on this 15th day of June, 2018.

My commission expires on the 29th day of June, 2021.

Notary Public

[SEAL]

KATHERYN MARIE MITCHELL
Notary Public, State of Texas
Comm. Expires 06-28-2021
Notary ID 131190165

Williamson
County, Texas

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

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: City of Liberty Hill

   Permit No. WQ00 14747-001 EPA ID No. TX 0126195

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

   1655 US Hwy 183, Leander, Texas 78641 – Williamson County

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

First and Last Name: Wayne Bonnet | Credential: Utility Director

Organization Name: City of Liberty Hill | Title/Prefix: Mr.

Mailing Address: 926 Loop 332

City: Liberty Hill | State: TX | ZIP Code: 78642

Phone No.: 512-778-5449 | Ext.: | Fax No.:

E-mail Address: wbonnet@libertyhilltx.gov

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

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.

From discharge, the effluent flows, via a 16" diameter force main, approximately 1,600 feet in an easement to County Road 266, then 2,400 feet in an easement along CR 266 to a Pedernales Electric easement where it continues south for 2,400 feet to the outfall at the San Gabriel River South Fork, Segment 1250.

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):

Future phases of construction will disturb less than 3 acres. Excavation will be required for future proposed plant basins, sludge storage tanks, and underground utilities, with an anticipated excavation depth of up to 15 feet below grade.

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

The existing site includes an existing 1.2 MGD wastewater treatment plant on it. Vegetation includes oak trees and native grasses.

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:

The original 0.4 MGD wastewater plant was constructed in 2006 and commissioned in 2008. The recent 0.8 MGD wastewater plant expansion, including a lab/office building and belt press building, was constructed in 2017 and commissioned in 2018.

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

The property was previously owned by the Joe Giddens family and was used for domestic livestock only. No structures other than the existing WWTP facilities (built from 2006 to 2017) exist on the site. Austin Engineering constructed the first phase of the WWTP and Pepper-Lawson constructed the second phase of the WWTP.

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): 1.2

2-Hr Peak Flow (MGD): 3.9

Estimated construction start date: June, 2016

Estimated waste disposal start date: April, 2018

B. Interim II Phase

Design Flow (MGD): 2.0

2-Hr Peak Flow (MGD): 6.5

Estimated construction start date: April, 2019

Estimated waste disposal start date: January, 2021

C. Final Phase

Design Flow (MGD): 4.0

2-Hr Peak Flow (MGD): 13.0

Estimated construction start date: June, 2021

Estimated waste disposal start date: June, 2022

D. Current operating phase: Phase 2 of current permit (1.2 MGD)

Provide the startup date of the facility: 11/1/2006

Section 2. Treatment Process (Instructions Page 51)

A. Treatment process description

Provide a detailed description of the treatment process. **Include the type of treatment plant, mode of operation, and all treatment units.** Start with the

plant's head works and finish with the point of discharge. Include all sludge processing and drying units. **If more than one phase exists or is proposed in the permit, a description of *each phase* must be provided.** Process description:

The existing 1.2 MGD WWTP consists of a 0.4 MGD sequencing batch reactor (SBR) plant, and a 0.8 MGD membrane bio-reactor (MBR) plant. The 0.4 MGD SBR plant includes a mechanical bar screen, an SBR plant consisting of two SBR basins and one digester basin, an alum feed system for phosphorus removal, a post-equalization tank, cloth media filtration, UV disinfection, and step-aeration prior to discharge. The 0.8 MGD MBR plant includes a package headworks unit with screening, grit, and grease removal, an anaerobic tank, an anoxic tank, a pre-aeration tank, two MBR tanks. The MBR plant uses the same alum feed system, UV disinfection, and step-aeration treatment units as the SBR plant. The plant also has a sludge storage tank and a belt press sludge processing unit.

Port or pipe diameter at the discharge point, in inches: 16

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 2		

C. Process flow diagrams

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

Attachment: 3

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: 4

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

The Liberty Hill Regional WWTP serves the entire Liberty Hill Sewer CCN area (#20969), including the City of Liberty Hill. The plant serves MUD #12, MUD #13, MUD #19, MUD #19A, Stonewall Ranch MUD, and Williamson Liberty Hill MUD.

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.

The City of Liberty Hill WWTP service area is currently committed to treat 4 MGD of domestic wastewater from the City of Liberty Hill customers and the MUDs listed in Section 3 of this form. The existing 4 MGD permitted capacity will be needed as these developments reach ultimate build-out.

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.

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: Ph. 1 May, 2006, Ph. 2 May, 2016

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.

All plant treatment units have been designed and constructed within the 150-foot buffer zone requirements.

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*.

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.

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.

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.

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 EB91 or TXRNE

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:

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.

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.

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.

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.

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.

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.

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). ***Water 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	<1	N/A	1	Grab	06/18/18 6:30
Total Suspended Solids, mg/l	<1	N/A	1	Grab	06/18/18 6:30
Ammonia Nitrogen, mg/l	0.05	N/A	1	Grab	06/18/18 6:30
Nitrate Nitrogen, mg/l	3.26	N/A	1	Grab	06/18/18 6:30
Total Kjeldahl Nitrogen, mg/l	1.05	N/A	1	Grab	06/18/18 6:30
Sulfate, mg/l	72.9	N/A	1	Grab	06/18/18 6:30
Chloride, mg/l	128	N/A	1	Grab	06/18/18 6:30
Total Phosphorus, mg/l	<0.05	N/A	1	Grab	06/18/18 6:30
pH, standard units	9.54	N/A	1	Grab	06/18/18 6:30
Dissolved Oxygen*, mg/l	7.42	N/A	1	Grab	08/28/18 6:30
Chlorine Residual, mg/l	N/A (UV)				

Pollutant	Average Conc.	Max Conc.	No. of Samples	Sample Type	Sample Date/Time
E.coli (CFU/100ml) freshwater	7.4	N/A	1	Grab	06/18/18 6:30
Entercocci (CFU/100ml) saltwater	N/A				
Total Dissolved Solids, mg/l	506	N/A	1	Grab	06/18/18 6:30
Electrical Conductivity, µmohs/cm, †	N/A				
Oil & Grease, mg/l	<5.1	N/A	1	Grab	06/18/18 6:30
Alkalinity ($CaCO_3$)*, mg/l	156	N/A	1	Grab	06/18/18 6:30

*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	N/A				
Total Dissolved Solids, mg/l	N/A				
pH, standard units	N/A				
Fluoride, mg/l	N/A				
Aluminum, mg/l	N/A				
Alkalinity ($CaCO_3$), mg/l	N/A				

Section 8.Facility Operator (Instructions Page 60)

Facility Operator Name: Vince Perkins

Facility Operator's License Classification and Level: Class B License

Facility Operator's License Number: WW025923

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: Liberty Hill Uses on-site Mechanical belt press and hauls dried sludge to a permitted landfill

B. Sludge disposal site

Disposal site name: To be determined

TCEQ permit or registration number: To be determined

County where disposal site is located: Williamson

C. Sludge transportation method

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

Name of the hauler: Wastewater Treatment Services

Hauler registration number: 24343

Sludge is transported as a:

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

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

- USDA Natural Resources Conservation Service Soil Map:

  Attachment:

- Federal Emergency Management Map:

  Attachment:

- Site map:

  Attachment:

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:

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:

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:

Total Kjeldahl Nitrogen, mg/kg:

Total Nitrogen (=nitrate nitrogen + TKN), mg/kg:

Phosphorus, mg/kg:

Potassium, mg/kg:

pH, standard units:

Ammonia Nitrogen mg/kg:

Arsenic:

Cadmium:

Chromium:

Copper:

Lead:

Mercury:

Molybdenum:

Nickel:

Selenium:

Zinc:

Total PCBs:

Provide the following information:

Volume and frequency of sludge to the lagoon(s):

Total dry tons stored in the lagoons(s) per 365-day period:

Total dry tons stored in the lagoons(s) over the life of the unit:

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.

D. Site development plan

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

Attach the following documents to the application.

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

  Attachment:
- Copy of the closure plan

  Attachment:
- Copy of deed recordation for the site

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

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

  Attachment:
- Procedures to prevent the occurrence of nuisance conditions

  Attachment:

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:

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:

City of Liberty Hill intends to apply for a Chapter 210 re-use permit application before the end of 2018.

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:

Enforcement Order #2017-0141-MWD-E. Order approved by TCEQ Commissioner's Court on 8/22/18.

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:

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: Rick Hall

Title: Mayor

Signature: _____

Date: 6/15/18

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:

Distance and direction to the intake:

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

Attachment:

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:

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).

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).

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:

A. Receiving water type

Identify the appropriate description of the receiving waters.

☐ Stream

☐ Freshwater Swamp or Marsh

☐ Lake or Pond

Surface area, in acres:

Average depth of the entire water body, in feet:

Average depth of water body within a 500-foot radius of discharge point, in feet:

☐ Man-made Channel or Ditch

☐ Open Bay

☐ Tidal Stream, Bayou, or Marsh

☐ Other, specify:

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:

C. Downstream perennial confluences

List the names of all perennial streams that join the receiving water within three 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.

E. Normal dry weather characteristics

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

Date and time of observation: 08/2/2010 9:00 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

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

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

DOMESTIC WORKSHEET 4.0

POLLUTANT ANALYSES REQUIREMENTS*

The following is required for facilities with a permitted or proposed flow of 1.0 MGD or greater, facilities with an approved pretreatment program, or facilities classified as a major facility. See instructions for further details.

This worksheet is not required for minor amendments without renewal

Section 1. Toxic Pollutants (Instructions Page 87)

For pollutants identified in Table 4.0(1), indicate the type of sample.

Grab ☒ Composite ☐

Date and time sample(s) collected: 06/18/18 06:30

Table 4.0(1) – Toxics Analysis

Pollutant	AVG Effluent Conc. (µg/l)	MAX Effluent Conc. (µg/l)	Number of Samples	MAL (µg/l)
Acrylonitrile	<1.00	N/A	1	50
Aldrin	<0.010	N/A	1	0.01
Aluminum	84.6	N/A	1	2.5
Anthracene	<1.01	N/A	1	10
Antimony	<0.625	N/A	1	5
Arsenic	<0.500	N/A	1	0.5
Barium	7.32	N/A	1	3
Benzene	<1.00	N/A	1	10
Benzidine	<5.05	N/A	1	50
Benzo(a)anthracene	1.03	N/A	1	5

Pollutant	AVG Effluent Conc. (µg/l)	MAX Effluent Conc. (µg/l)	Number of Samples	MAL (µg/l)
Benzo(a)pyrene	0.707	N/A	1	5
Bis(2-chloroethyl)ether	<1.01	N/A	1	10
Bis(2-ethylhexyl)phthalate	<5.05	N/A	1	10
Bromodichloromethane	<1.00	N/A	1	10
Bromoform	<1.00	N/A	1	10
Cadmium	<0.625	N/A	1	1
Carbon Tetrachloride	<1.00	N/A	1	2
Carbaryl	<2.58	N/A	1	5
Chlordane*	<0.200	N/A	1	0.2
Chlorobenzene	<1.00	N/A	1	10
Chlorodibromomethane	<1.00	N/A	1	10
Chloroform	0.450	N/A	1	10
Chlorpyrifos	<0.0413	N/A	1	0.05
Chromium (Total)	2.06	N/A	1	3
Chromium (Tri) **(*1)**	<3.60	N/A	1	N/A
Chromium (Hex)	<3.0	N/A	1	3
Copper	4.58	N/A	1	2
Chrysene	<1.01	N/A	1	5
p-Chloro-m-Cresol	<1.01	N/A	1	10
4,6-Dinitro-o-Cresol	<1.01	N/A	1	50
p-Cresol	<1.01	N/A	1	10
Cyanide **(*2)**	<0.500	N/A	1	10

Pollutant	AVG Effluent Conc. (µg/l)	MAX Effluent Conc. (µg/l)	Number of Samples	MAL (µg/l)
4,4'- DDD	<0.0258	N/A	1	0.1
4,4'- DDE	<0.0258	N/A	1	0.1
4,4'- DDT	<0.0103	N/A	1	0.02
2,4-D	<0.527	N/A	1	0.7
Demeton (O and S)	<0.0516	N/A	1	0.20
Diazinon	<0.0516	N/A	1	0.5/0.1
1,2-Dibromoethane	<1.00	N/A	1	10
m-Dichlorobenzene	<1.00	N/A	1	10
o-Dichlorobenzene	<1.00	N/A	1	10
p-Dichlorobenzene	<1.00	N/A	1	10
3,3'-Dichlorobenzidine	<1.01	N/A	1	5
1,2-Dichloroethane	<1.00	N/A	1	10
1,1-Dichloroethylene	<1.00	N/A	1	10
Dichloromethane	<1.00	N/A	1	20
1,2-Dichloropropane	<1.00	N/A	1	10
1,3-Dichloropropene	<1.00	N/A	1	10
Dicofol	<0.103	N/A	1	1
Dieldrin	<0.0103	N/A	1	0.02
2,4-Dimethylphenol	<2.02	N/A	1	10
Di-n-Butyl Phthalate	<1.01	N/A	1	10
Diuron	No Data			0.09
Endosulfan I (alpha)	<0.010	N/A	1	0.01

Pollutant	AVG Effluent Conc. (µg/l)	MAX Effluent Conc. (µg/l)	Number of Samples	MAL (µg/l)
Endosulfan II (beta)	<0.0103	N/A	1	0.02
Endosulfan Sulfate	<0.0103	N/A	1	0.1
Endrin	<0.0258	N/A	1	0.02
Ethylbenzene	<1.00	N/A	1	10
Fluoride	180	N/A	1	500
Guthion	<0.0516	N/A	1	0.1
Heptachlor	<0.010	N/A	1	0.01
Heptachlor Epoxide	<0.010	N/A	1	0.01
Hexachlorobenzene	<1.01	N/A	1	5
Hexachlorobutadiene	<1.00	N/A	1	10
Hexachlorocyclohexane (alpha)	<0.015	N/A	1	0.05
Hexachlorocyclohexane (beta)	<0.00871	N/A	1	0.05
gamma-Hexachlorocyclohexane (Lindane)	<0.0103	N/A	1	0.05
Hexachlorocyclopentadiene	<0.305	N/A	1	10
Hexachloroethane	<1.01	N/A	1	20
Hexachlorophene	<5.07	N/A	1	10
Lead	<0.500	N/A	1	0.5
Malathion	<0.0516	N/A	1	0.1
Mercury	0.0164	N/A	1	0.005
Methoxychlor	<0.0103	N/A	1	2
Methyl Ethyl Ketone	<5.00	N/A	1	50

Pollutant	AVG Effluent Conc. (µg/l)	MAX Effluent Conc. (µg/l)	Number of Samples	MAL (µg/l)
Mirex	<0.020	N/A	1	0.02
Nickel	3.17	N/A	1	2
Nitrate-Nitrogen	3260	N/A	1	100
Nitrobenzene	<1.01	N/A	1	10
N-Nitrosodiethylamine	<1.01	N/A	1	20
N-Nitroso-di-n-Butylamine	<1.01	N/A	1	20
Nonylphenol	<30.7	N/A	1	333
Parathion (ethyl)	<0.0516	N/A	1	0.1
Pentachlorobenzene	<1.01	N/A	1	20
Pentachlorophenol	<1.01	N/A	1	5
Phenanthrene	1.89	N/A	1	10
Polychlorinated Biphenyls (PCB's) (*3)	<0.200	N/A	1	0.2
Pyridine	<1.01	N/A	1	20
Selenium	<1.25	N/A	1	5
Silver	<0.2	N/A	1	0.5
1,2,4,5-Tetrachlorobenzene	<1.01	N/A	1	20
1,1,2,2-Tetrachloroethane	<1.00	N/A	1	10
Tetrachloroethylene	<1.00	N/A	1	10
Thallium	<0.625	N/A	1	0.5
Toluene	<1.00	N/A	1	10
Toxaphene	<0.0103	N/A	1	0.3

Pollutant	AVG Effluent Conc. (µg/l)	MAX Effluent Conc. (µg/l)	Number of Samples	MAL (µg/l)
2,4,5-TP (Silvex)	<0.300	N/A	1	0.3
Tributyltin (see instructions for explanation)	Not Required	Not Required		0.01
1,1,1-Trichloroethane	<1.00	N/A	1	10
1,1,2-Trichloroethane	<1.00	N/A	1	10
Trichloroethylene	<1.00	N/A	1	10
2,4,5-Trichlorophenol	<1.01	N/A	1	50
TTHM (Total Trihalomethanes)	<1.00	N/A	1	10
Vinyl Chloride	<1.00	N/A	1	10
Zinc	43.7	N/A	1	5

(*1) Determined by subtracting hexavalent Cr from total Cr.

(*2) Cyanide, amenable to chlorination or weak-acid dissociable.

(*3) The sum of seven PCB congeners 1242, 1254, 1221, 1232, 1248, 1260, and 1016.

Section 2. Priority Pollutants

For pollutants identified in Tables 4.0(2)A-E, indicate type of sample.

Grab ☒ Composite ☐

Date and time sample(s) collected: 06/18/18 06:30

Table 4.0(2)A – Metals, Cyanide, Phenols

Pollutant	AVG Effluent Conc. (µg/l)	MAX Effluent Conc. (µg/l)	Number of Samples	MAL (µg/l)
Antimony	<0.625	N/A	1	5
Arsenic	<0.500	N/A	1	0.5
Beryllium	<0.500	N/A	1	0.5
Cadmium	<0.625	N/A	1	1
Chromium (Total)	2.06	N/A	1	3
Chromium (Hex)	<3.0	N/A	1	3
Chromium (Tri) (*1)	<3.6	N/A	1	N/A
Copper	4.58	N/A	1	2
Lead	<0.500	N/A	1	0.5
Mercury	0.0164	N/A	1	0.005
Nickel	3.17	N/A	1	2
Selenium	<1.25	N/A	1	5
Silver	<0.2	N/A	1	0.5
Thallium	<0.625	N/A	1	0.5
Zinc	43.7	N/A	1	5
Cyanide (*2)	<5.00	N/A	1	10
Phenols, Total	4.8	N/A	1	10

(*1) Determined by subtracting hexavalent Cr from total Cr.

(*2) Cyanide, amenable to chlorination or weak-acid dissociable

Table 4.0(2)B – Volatile Compounds

Pollutant	AVG Effluent Conc. (µg/l)	MAX Effluent Conc. (µg/l)	Number of Samples	MAL (µg/l)
Acrolein	<5.00	N/A	1	50
Acrylonitrile	<1.00	N/A	1	50
Benzene	<1.00	N/A	1	10
Bromoform	<1.00	N/A	1	10
Carbon Tetrachloride	<1.00	N/A	1	2
Chlorobenzene	<1.00	N/A	1	10
Chlorodibromomethane	<1.00	N/A	1	10
Chloroethane	<1.00	N/A	1	50
2-Chloroethylvinyl Ether	<1.00	N/A	1	10
Chloroform	0.450	N/A	1	10
Dichlorobromomethane [Bromodichloromethane]	<1.00	N/A	1	10
1,1-Dichloroethane	<1.00	N/A	1	10
1,2-Dichloroethane	<1.00	N/A	1	10
1,1-Dichloroethylene	<1.00	N/A	1	10
1,2-Dichloropropane	<1.00	N/A	1	10
1,3-Dichloropropylene [1,3-Dichloropropene]	<1.00	N/A	1	10
1,2-Trans-Dichloroethylene	<1.00	N/A	1	10
Ethylbenzene	<1.00	N/A	1	10
Methyl Bromide	<1.00	N/A	1	50
Methyl Chloride	<1.00	N/A	1	50
Methylene Chloride	<1.00	N/A	1	20
1,1,2,2-Tetrachloroethane	<1.00	N/A	1	10
Tetrachloroethylene	<1.00	N/A	1	10
Toluene	<1.00	N/A	1	10

Pollutant	AVG Effluent Conc. (µg/l)	MAX Effluent Conc. (µg/l)	Number of Samples	MAL (µg/l)
1,1,1-Trichloroethane	<1.00	N/A	1	10
1,1,2-Trichloroethane	<1.00	N/A	1	10
Trichloroethylene	<1.00	N/A	1	10
Vinyl Chloride	<1.00	N/A	1	10

Table 4.0(2)C – Acid Compounds

Pollutant	AVG Effluent Conc. (µg/l)	MAX Effluent Conc. (µg/l)	Number of Samples	MAL (µg/l)
2-Chlorophenol	<1.01	N/A	1	10
2,4-Dichlorophenol	<1.01	N/A	1	10
2,4-Dimethylphenol	<2.02	N/A	1	10
4,6-Dinitro-o-Cresol	<1.01	N/A	1	50
2,4-Dinitrophenol	<1.01	N/A	1	50
2-Nitrophenol	<1.01	N/A	1	20
4-Nitrophenol	<1.01	N/A	1	50
P-Chloro-m-Cresol	<1.01	N/A	1	10
Pentalchlorophenol	<1.01	N/A	1	5
Phenol	<1.01	N/A	1	10
2,4,6-Trichlorophenol	<1.01	N/A	1	10

Table 4.0(2)D – Base/Neutral Compounds

Pollutant	AVG Effluent Conc. (µg/l)	MAX Effluent Conc. (µg/l)	Number of Samples	MAL (µg/l)
Acenaphthene	<1.01	N/A	1	10
Acenaphthylene	<1.01	N/A	1	10
Anthracene	0.475	N/A	1	10
Benzidine	<5.05	N/A	1	50
Benzo(a)Anthracene	1.03	N/A	1	5
Benzo(a)Pyrene	0.707	N/A	1	5
3,4-Benzofluoranthene	0.657	N/A	1	10
Benzo(ghi)Perylene	0.364	N/A	1	20
Benzo(k)Fluoranthene	0.657	N/A	1	5
Bis(2-Chloroethoxy)Methane	<1.01	N/A	1	10
Bis(2-Chloroethyl)Ether	<1.01	N/A	1	10
Bis(2-Chloroisopropyl)Ether	<1.01	N/A	1	10
Bis(2-Ethylhexyl)Phthalate	<5.05	N/A	1	10
4-Bromophenyl Phenyl Ether	<1.01	N/A	1	10
Butyl benzyl Phthalate	<1.01	N/A	1	10
2-Chloronaphthalene	<1.01	N/A	1	10
4-Chlorophenyl phenyl ether	<1.01	N/A	1	10
Chrysene	0.929	N/A	1	5
Dibenzo(a,h)Anthracene	<1.01	N/A	1	5
1,2-(o)Dichlorobenzene	<1.01	N/A	1	10
1,3-(m)Dichlorobenzene	<1.01	N/A	1	10
1,4-(p)Dichlorobenzene	<1.01	N/A	1	10
3,3-Dichlorobenzidine	<1.01	N/A	1	5
Diethyl Phthalate	<1.01	N/A	1	10
Dimethyl Phthalate	<1.01	N/A	1	10

Pollutant	AVG Effluent Conc. (µg/l)	MAX Effluent Conc. (µg/l)	Number of Samples	MAL (µg/l)
Di-n-Butyl Phthalate	<1.01	N/A	1	10
2,4-Dinitrotoluene	<1.01	N/A	1	10
2,6-Dinitrotoluene	<1.01	N/A	1	10
Di-n-Octyl Phthalate	<1.01	N/A	1	10
1,2-Diphenylhydrazine (as Azo-benzene)	<1.01	N/A	1	20
Fluoranthene	2.28	N/A	1	10
Fluorene	<1.01	N/A	1	10
Hexachlorobenzene	<1.01	N/A	1	5
Hexachlorobutadiene	<1.01	N/A	1	10
Hexachlorocyclo-pentadiene	<1.01	N/A	1	10
Hexachloroethane	<1.01	N/A	1	20
Indeno(1,2,3-cd)pyrene	0.333	N/A	1	5
Isophorone	<1.01	N/A	1	10
Naphthalene	<1.01	N/A	1	10
Nitrobenzene	<1.01	N/A	1	10
N-Nitrosodimethylamine	<1.01	N/A	1	50
N-Nitrosodi-n-Propylamine	<1.01	N/A	1	20
N-Nitrosodiphenylamine	<1.01	N/A	1	20
Phenanthrene	1.89	N/A	1	10
Pyrene	1.87	N/A	1	10
1,2,4-Trichlorobenzene	<1.01	N/A	1	10

Table 4.0(2)E - Pesticides

Pollutant	AVG Effluent Conc. (µg/l)	MAX Effluent Conc. (µg/l)	Number of Samples	MAL (µg/l)
Aldrin	<0.010	N/A	1	0.01
alpha-BHC (Hexachlorocyclohexane)	<0.0258	N/A	1	0.05
beta-BHC (Hexachlorocyclohexane)	<0.0103	N/A	1	0.05
gamma-BHC (Hexachlorocyclohexane)	<0.0103	N/A	1	0.05
delta-BHC (Hexachlorocyclohexane)	<0.0103	N/A	1	0.05
Chlordane	<0.0103	N/A	1	0.2
4,4-DDT	<0.0103	N/A	1	0.02
4,4-DDE	<0.0258	N/A	1	0.1
4,4,-DDD	<0.0258	N/A	1	0.1
Dieldrin	<0.0103	N/A	1	0.02
Endosulfan I (alpha)	<0.010	N/A	1	0.01
Endosulfan II (beta)	<0.0103	N/A	1	0.02
Endosulfan Sulfate	<0.0103	N/A	1	0.1
Endrin	<0.0103	N/A	1	0.02
Endrin Aldehyde	<0.0258	N/A	1	0.1
Heptachlor	<0.010	N/A	1	0.01
Heptachlor Epoxide	<0.010	N/A	1	0.01
PCB-1242	<0.200	N/A	1	0.2
PCB-1254	<0.200	N/A	1	0.2
PCB-1221	<0.200	N/A	1	0.2
PCB-1232	<0.200	N/A	1	0.2

Pollutant	AVG Effluent Conc. (µg/l)	MAX Effluent Conc. (µg/l)	Number of Samples	MAL (µg/l)
PCB-1248	<0.200	N/A	1	0.2
PCB-1260	<0.200	N/A	1	0.2
PCB-1016	<0.200	N/A	1	0.2
Toxaphene	<0.0103	N/A	1	0.3

* For PCBS, if all are non-detects, enter the highest non-detect preceded by a "<".

Section 3. Dioxin/Furan Compounds

A. Indicate which of the following compounds from may be present in the influent from a contributing industrial user or significant industrial user. Check all that apply.

☐ 2,4,5-trichlorophenoxy acetic acid
Common Name 2,4,5-T, CASRN 93-76-5

☐ 2-(2,4,5-trichlorophenoxy) propanoic acid
Common Name Silvex or 2,4,5-TP, CASRN 93-72-1

☐ 2-(2,4,5-trichlorophenoxy) ethyl 2,2-dichloropropionate
Common Name Erbon, CASRN 136-25-4

☐ 0,0-dimethyl 0-(2,4,5-trichlorophenyl) phosphorothioate
Common Name Ronnel, CASRN 299-84-3

☐ 2,4,5-trichlorophenol
Common Name TCP, CASRN 95-95-4

☐ hexachlorophene
Common Name HCP, CASRN 70-30-4

For each compound identified, provide a brief description of the conditions of its/their presence at the facility.

B. Do you know or have any reason to believe that 2,3,7,8 Tetrachlorodibenzo-P-Dioxin (TCDD) or any congeners of TCDD may be present in your effluent?

Yes ☐ No ☒

If **yes**, provide a brief description of the conditions for its presence.

If any of the compounds in Subsection A **or** B are present, complete Table 4.0(2)F.

For pollutants identified in Table 4.0(2)F, indicate the type of sample.

Grab ☐ Composite ☐

Date and time sample(s) collected:

TABLE 4.0(2)F - DIOXIN/FURAN COMPOUNDS

Compound	Toxic Equivalency Factors	Wastewater Concentration (ppq)	Wastewater Equivalents (ppq)	Sludge Concentration (ppt)	Sludge Equivalents (ppt)	MAL (ppq)
2,3,7,8 TCDD	1					10
1,2,3,7,8 PeCDD	0.5					50
2,3,7,8 HxCDDs	0.1					50
1,2,3,4,6,7,8 HpCDD	0.01					50
2,3,7,8 TCDF	0.1					10
1,2,3,7,8 PeCDF	0.05					50
2,3,4,7,8 PeCDF	0.5					50
2,3,7,8 HxCDFs	0.1					50
2,3,4,7,8	0.01					50
OCDD	0.0003					100
OCDF	0.0003					100
PCB 77	0.0001					0.5
PCB 81	0.0003					0.5
PCB 126	0.1					0.5
PCB 169	0.03					0.5
Total						

DOMESTIC WORKSHEET 6.0

INDUSTRIAL WASTE CONTRIBUTION

The following is required for all publicly owned treatment works (POTWs)

Section 1. All POTWs (Instructions Page 99)

A. Industrial users

Provide the number of each of the following types of industrial users (IUs) that discharge to your POTW and the daily flows from each user. See the Instructions for definitions of Categorical IUs, Significant IUs – non-categorical, and Other IUs.

If there are no users, enter 0 (zero).

Categorical IUs:

Number of IUs: 0

Average Daily Flows, in MGD:

Significant IUs – non-categorical:

Number of IUs: 0

Average Daily Flows, in MGD:

Other IUs:

Number of IUs: 1

Average Daily Flows, in MGD: 0.0038

B. Treatment plant interference

In the past three years, has your POTW experienced treatment plant interference (see instructions)?

Yes ☐ No ☒

If yes, identify the dates, duration, description of interference, and probable cause(s) and possible source(s) of each interference event. Include the names of the IUs that may have caused the interference.

C. Treatment plant pass through

In the past three years, has your POTW experienced pass through (see instructions)?

Yes ☐ No ☒

If yes, identify the dates, duration, a description of the pollutants passing through the treatment plant, and probable cause(s) and possible source(s) of each pass through event. Include the names of the IUs that may have caused pass through.

D. Pretreatment program

Does your POTW have an approved pretreatment program?

Yes ☐ No ☒

If yes, complete Section 2 only of this Worksheet.

Is your POTW required to develop an approved pretreatment program?

Yes ☐ No ☒

If yes, complete Section 2.c. and 2.d. only, and skip Section 3.

If no to either question above, skip Section 2 and complete Section 3 for each significant industrial user and categorical industrial user.

Section 2. POTWs with Approved Programs or Those Required to Develop a Program (Instructions Page 100)

A. Substantial modifications

Have there been any **substantial modifications** to the approved pretreatment program that have not been submitted to the TCEQ for approval according to *40 CFR §403.18*?

Yes ☐ No ☐

If yes, identify the modifications that have not been submitted to TCEQ, including the purpose of the modification.

B. Non-substantial modifications

Have there been any **non-substantial modifications** to the approved pretreatment program that have not been submitted to TCEQ for review and acceptance?

Yes ☐ No ☐

If yes, identify all non-substantial modifications that have not been submitted to TCEQ, including the purpose of the modification.

C. Effluent parameters above the MAL

In Table 6.0(1), list all parameters measured above the MAL in the POTW's effluent monitoring during the last three years. Submit an attachment if necessary.

Table 6.0(1) – Parameters Above the MAL

Pollutant	Concentration	MAL	Units	Date

D. Industrial user interruptions

Has any SIU, CIU, or other IU caused or contributed to any problems (excluding interferences or pass throughs) at your POTW in the past three years?

Yes ☐ No ☐

If yes, identify the industry, describe each episode, including dates, duration, description of the problems, and probable pollutants.

Section 3. Significant Industrial User (SIU) Information and Categorical Industrial User (CIU) (Instructions Page 100)

A. General information

Company Name: Van Der Hagen Enterprises

SIC Code: 3991

Telephone number: 512-778-5090 Fax number:

Contact name: Marty Van Der Hagen

Address: 15390 W State Highway 290

City, State, and Zip Code: Liberty Hill TX 78642

B. Process information

Describe the industrial processes or other activities that affect or contribute to the SIU(s) or CIU(s) discharge (i.e., process and non-process wastewater).

First, lime is added to the initial bar soap product and mixed for several minutes. Next, a product called BWT5100 is added, which is a coagulant used to create a floc. Next, polyfer-200 is added to lower the pH of the product back down to a neutral range after lime addition. Additionally, a polymer B-40 is added, which is another coagulant to make the product stick together. The end product is then run through a fine filter paper which separates the product from the process wastewater, which is then sent to the pre-treatment system prior to entering the collection system. The pretreatment system separates out the fats and oils from the process wastewater, which is sent to the collection system.

C. Product and service information

Provide a description of the principal product(s) or services performed.

Bar Soap

D. Flow rate information

See the Instructions for definitions of "process" and "non-process wastewater."

Process Wastewater:

Discharge, in gallons/day: 40 gpd, 2 batches per week

Discharge Type: ☐ Continuous ☒ Batch ☐ Intermittent

Non-Process Wastewater:

Discharge, in gallons/day: 750

Discharge Type: ☒ Continuous ☐ Batch ☐ Intermittent

E. Pretreatment standards

Is the SIU or CIU subject to technically based local limits as defined in the instructions?

Yes ☐ No ☒

Is the SIU or CIU subject to categorical pretreatment standards found in *40 CFR Parts 405-471*?

Yes ☐ No ☒

If subject to categorical pretreatment standards, indicate the applicable category and subcategory for each categorical process.

Category:
Subcategories:

Category:
Subcategories:

Category:
Subcategories:

Category:
Subcategories:

Category:
Subcategories:

F. Industrial user interruptions

Has the SIU or CIU caused or contributed to any problems (e.g., interferences, pass through, odors, corrosion, blockages) at your POTW in the past three years?

Yes ☐ No ☒

If yes, identify the SIU, describe each episode, including dates, duration, description of problems, and probable pollutants.

TCEQ Core Data Form

TCEQ Use Only

For detailed instructions regarding completion of 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 602959033		RN 100824739

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:*

City of Liberty Hill

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

11. Type of Customer: ☐ Corporation ☐ Individual Partnership: ☐ General ☐ Limited

Government: ☒ City ☐ County ☐ Federal ☐ 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 ☐ Voluntary Cleanup Applicant ☐ Other:

15. Mailing Address: 926 Loop 332

City	Liberty Hill	State	TX	ZIP	78642	ZIP + 4	

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

18. Telephone Number	19. Extension or Code	20. Fax Number *(if applicable)*
(512) 778-5449		( ) -

SECTION III: Regulated Entity Information

21. General Regulated Entity Information *(If 'New Regulated Entity" is selected below this form should be accompanied by a permit application)*

☐ 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 Agency 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.)*

Liberty Hill Regional Wastewater Treatment Plant

23. Street Address of the Regulated Entity: *(No PO Boxes)*	1637 US 183							
	City	Leander	**State**	TX	**ZIP**	78641	**ZIP + 4**	
24. County	Williamson							

Enter Physical Location Description if no street address is provided.

25. Description to Physical Location:								

26. Nearest City	**State**	**Nearest ZIP Code**
Liberty Hill	TX	78529

27. Latitude (N) In Decimal:	30.6325		**28. Longitude (W) In Decimal:**	-97.8614	
Degrees	Minutes	Seconds	Degrees	Minutes	Seconds
30	37	57	-97	51	41

29. Primary SIC Code (4 digits)	**30. Secondary SIC Code** (4 digits)	**31. Primary NAICS Code** (5 or 6 digits)	**32. Secondary NAICS Code** (5 or 6 digits)
4952		22132	

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

City Government

34. Mailing Address:	**926 Loop 332**							
	City	**Liberty Hill**	**State**	**TX**	**ZIP**	**78642**	**ZIP + 4**	

35. E-Mail Address:	**wbonnet@libertyhilltx.gov**

36. Telephone Number	**37. Extension or Code**	**38. Fax Number** *(if applicable)*
(512) 778-5449		**( ) -**

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

☐ Dam Safety	☐ Districts	☐ Edwards Aquifer	☐ Emissions Inventory Air	☐ Industrial Hazardous Waste
☐ Municipal Solid Waste	☐ New Source Review Air	☐ OSSF	☐ Petroleum Storage Tank	☐ PWS
☐ Sludge	☐ Storm Water	☐ Title V Air	☐ Tires	☐ Used Oil
☐ Voluntary Cleanup	☒ Waste Water	☐ Wastewater Agriculture	☐ Water Rights	☐ Other:

SECTION IV: Preparer Information

40. Name:	Aaron Laughlin, PE	**41. Title:**	Project Manager

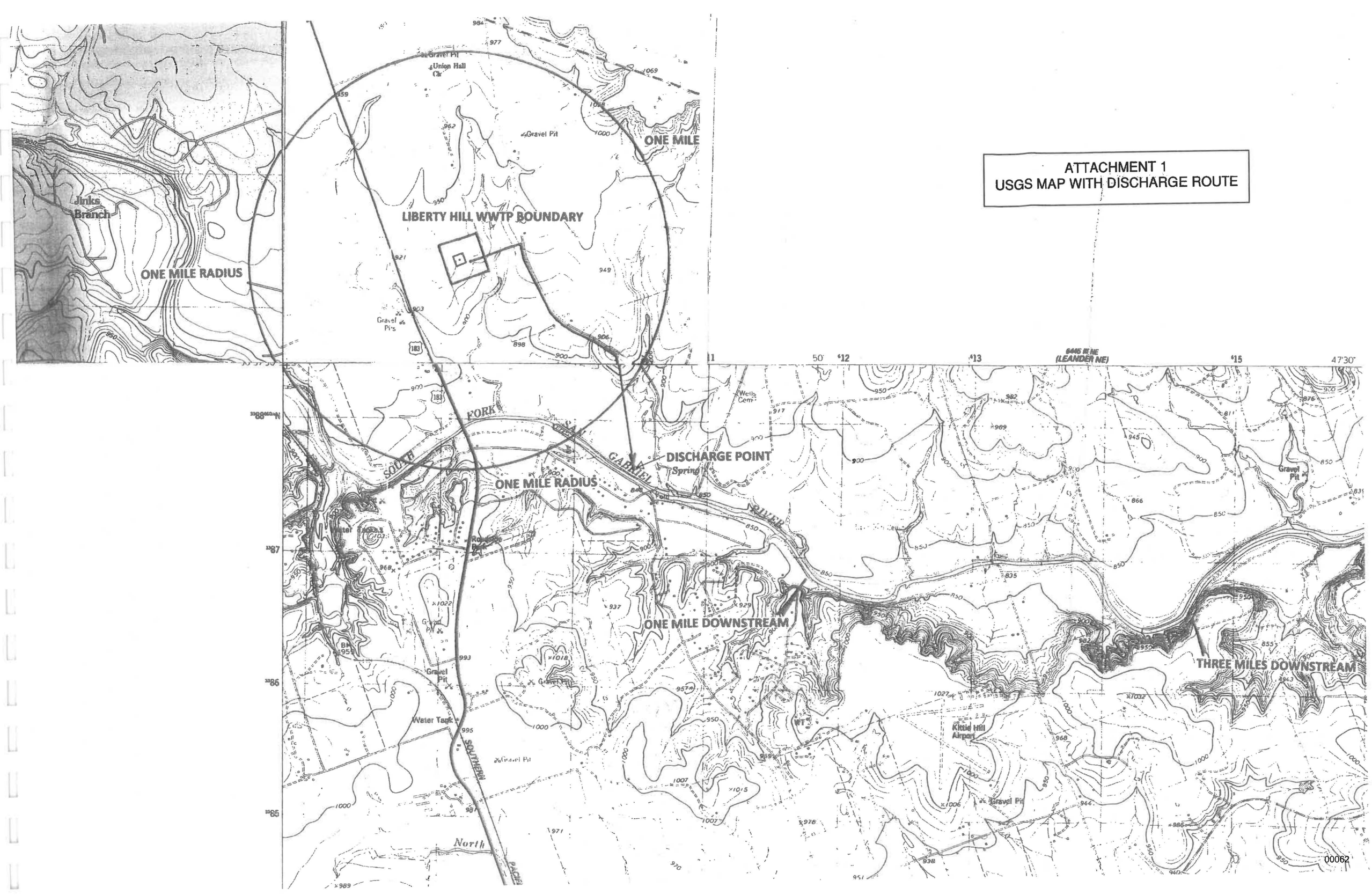
42. Telephone Number	**43. Ext./Code**	**44. Fax Number**	**45. E-Mail Address**
(512) 930-9412		( ) -	alaughlin@stegerbizzell.com

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:	Steger Bizzell	**Job Title:**	Project Manager
Name*(In Print)* :	Aaron Laughlin	**Phone:**	(512) 930-9412
Signature:		**Date:**	4/19/2018

ATTACHMENT 1
USGS MAP WITH DISCHARGE ROUTE



00062

ATTACHMENT 2

Technical Report 1.0 Section 2.B

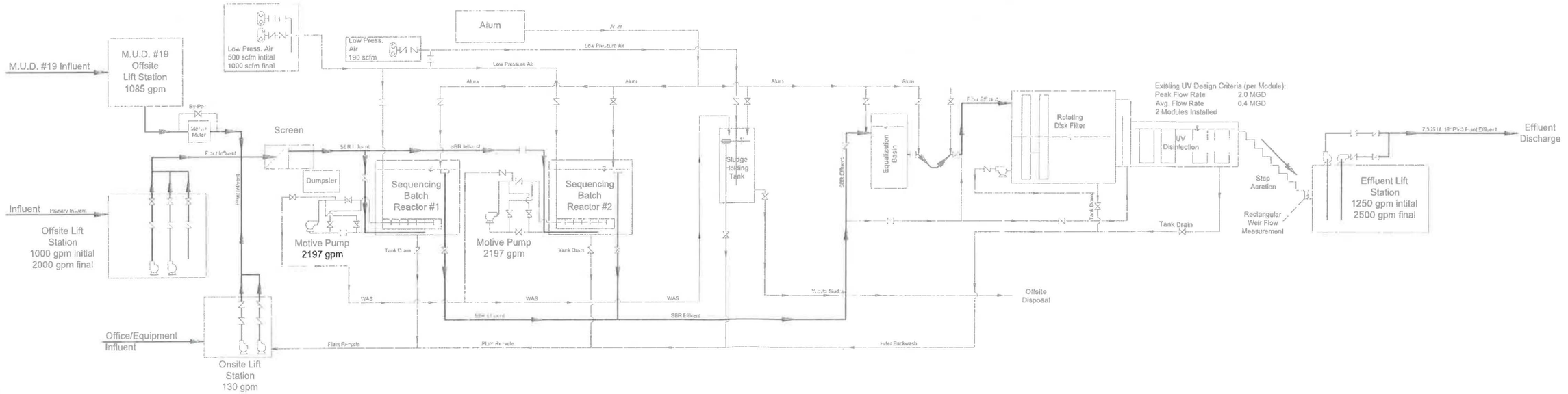
Phase 1 (existing 1.2 MGD):
0.4 MGD SBR Plant:
SBR Reactors (2 reactors split from a single tank): 75' Diameter concentric tank, 14' tall
Aerobic Digester: 25' Inner diameter of SBR tank, 14' tall
Post Equalization Tank: 31' diameter x 10' SWD
Rotating Disk Filter (4 total): 12' x 8.5', 215.2 sq. ft. per filter
UV disinfection channel (2 units): 33.3' x 2' wide
Step-aeration: 8 steps, 11.5' x 8.5' wide

0.8 MGD MBR Plant Phase 1:
Anaerobic Tank: 44' x 12' x 14' SWD
Anoxic Tank: 44' x 45' x 13' SWD
Pre-Aeration Tank: 44' x 21' x 15' SWD
MBR Tanks (2): 29' x 15' x 14' SWD
Sludge Storage Tank: 50' diameter x 15" SWD

Phase 2 (2.0 MGD):
0.4 MGD SBR Plant decommissioned in Phase 2
0.8 MGD MBR Plant Phase 1 to remain in service

1.2 MGD MBR Plant Phase 2:
Anaerobic Tank: 66' x 12' x 14' SWD
Anoxic Tank: 66' x 45' x 13' SWD
Pre-Aeration Tank: 66' x 21' x 15' SWD
MBR Tanks (3): 29' x 15' x 14' SWD

Phase 3 (4.0 MGD):
Two total of 0.8 MGD MBR Plant Phase 1
Two total of 1.2 MGD MBR Plant Phase 2
3 Total Sludge Storage tanks: 50' diameter x 15' SWD



Existing WWTP Flow Diagram
0.4 MGD Avg. Flow Rate
(278 gpm)

ATTACHMENT 3.A - Existing SBR Plant Flow Diagram

APPROVED FOR CONSTRUCTION

NO.	REVISION	BY	DATE

WDD	20-May-16
DESIGNED BY:	DATE
WDD NCH	20-May-16
DRAWN BY:	DATE
CRS	20-May-16
CHECKED BY:	DATE
AJL	20-May-16
APPROVED BY:	DATE

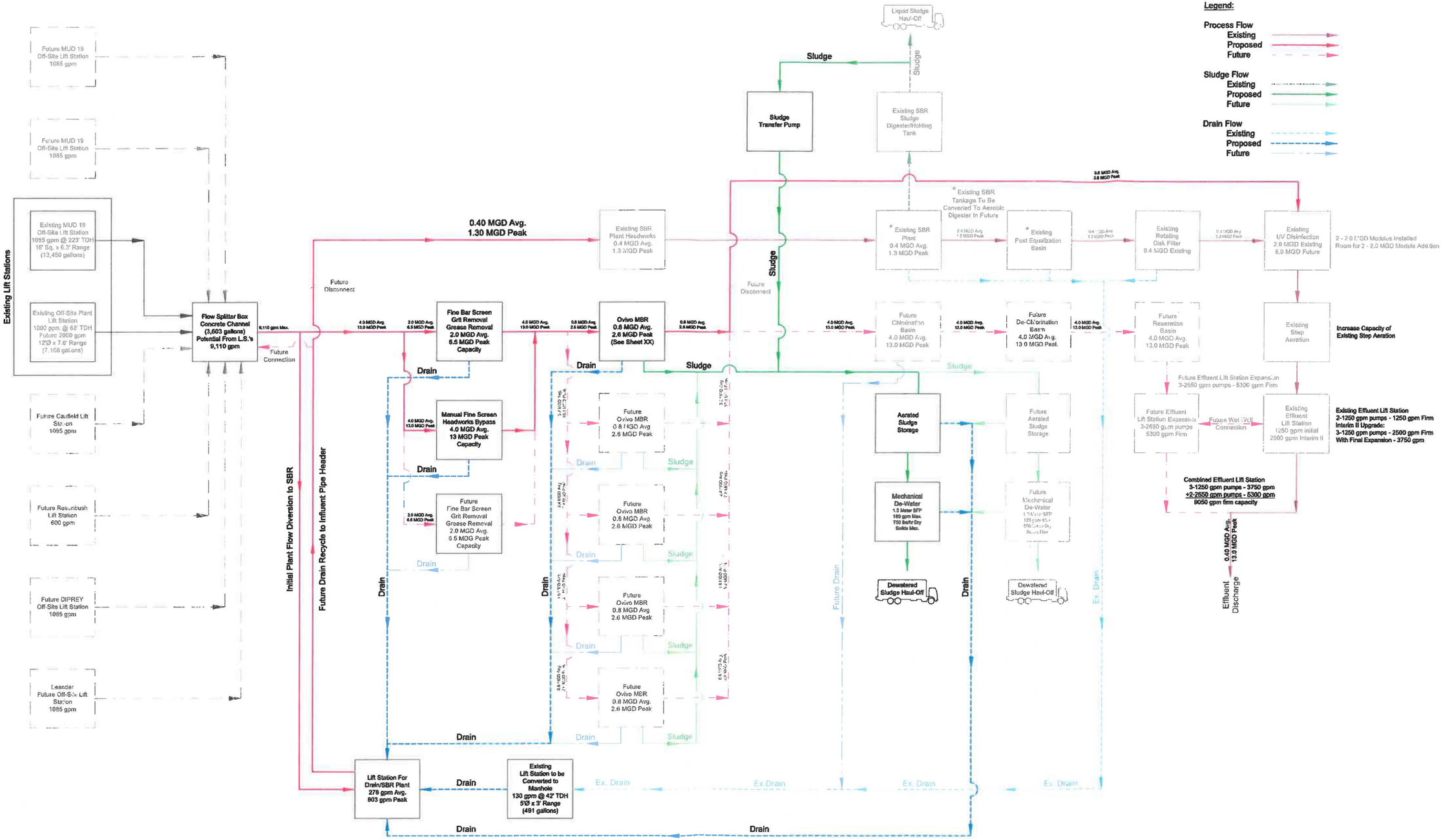
STATE OF TEXAS
AARON LAUGHLIN
102191
REGISTERED
PROFESSIONAL ENGINEER
5/18/16

STEGER BIZZELL
ADDRESS 1978 S. AUSTIN AVENUE GEORGETOWN, TX 78626
METRO 512.930.9412 TEXAS REGISTERED ENGINEERING FIRM F-181 TBPLS FIRM No.10003700 WEB STEGERBIZZELL.COM
SERVICES >>ENGINEERS >>PLANNERS >>SURVEYORS

D-601 - EXISTING FLOW DIAGRAM
for
SOUTH FORK WASTEWATER TREATMENT PLANT - 0.80 MGD EXPANSION
City of Liberty Hill
Williamson County, Texas

Project No: 22254

25 of 218



Proposed WWTP Flow Diagram
0.8 MGD Avg. Flow Rate
(556 gpm)

ATTACHMENT 3.B - Phase II/Phase III MBR WWTP Flow Diagram

APPROVED FOR CONSTRUCTION

NO.	REVISION	BY	DATE

WDD	DESIGNED BY:	20-May-16 DATE
WDD NCH	DRAWN BY:	20-May-16 DATE
CRS	CHECKED BY:	20-May-16 DATE
AJL	APPROVED BY:	20-May-16 DATE

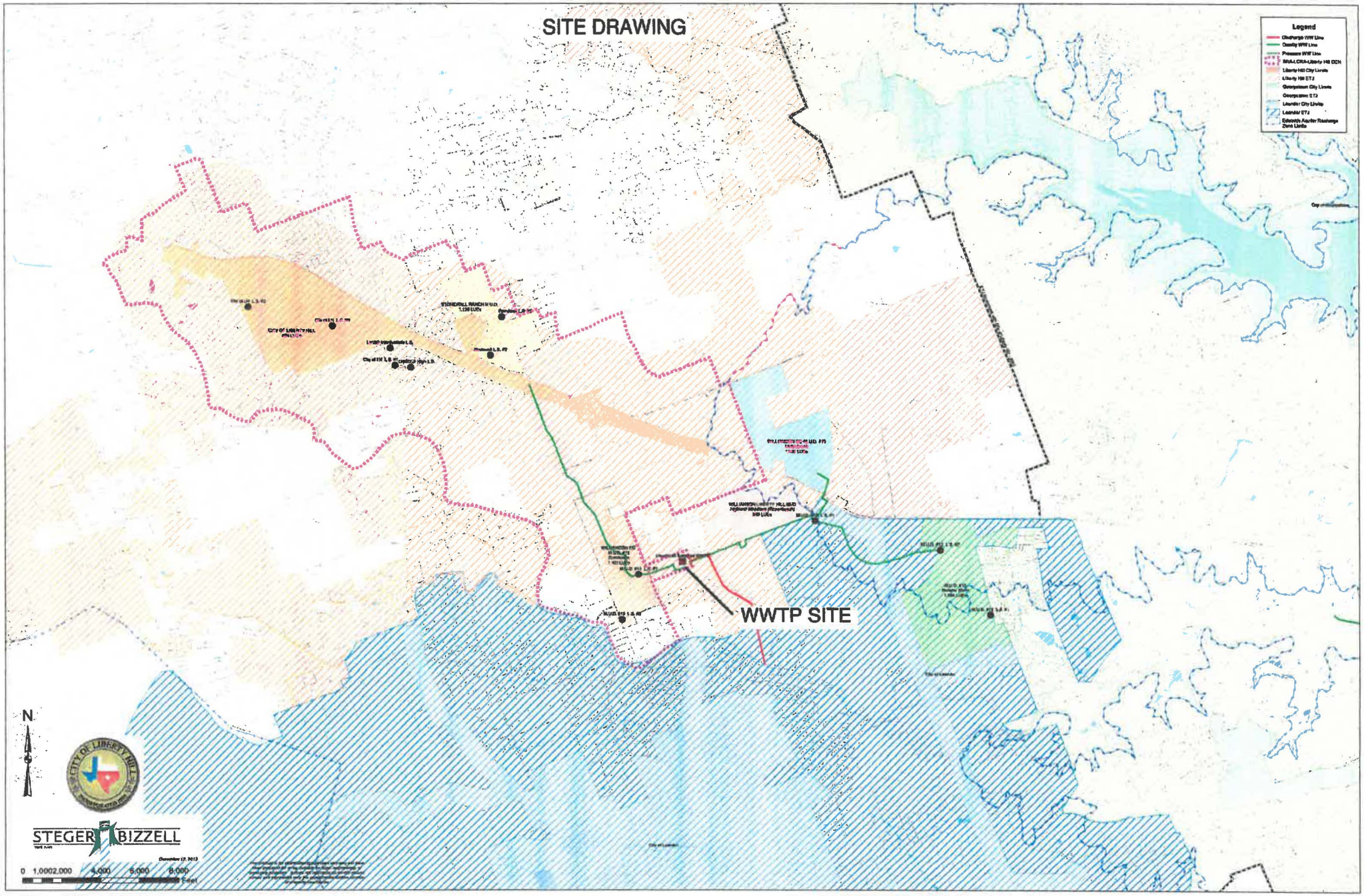
STATE OF TEXAS — AARON LAUGHLIN — 102191 — REGISTERED PROFESSIONAL ENGINEER — 5/18/16

STEGER BIZZELL
ADDRESS 1978 S. AUSTIN AVENUE GEORGETOWN, TX 78626
METRO 512.930.9412 TEXAS REGISTERED ENGINEERING FIRM F-161 TBPLS FIRM No.10003700 WEB STEGERBIZZELL.COM
SERVICES >>ENGINEERS >>PLANNERS >>SURVEYORS

D-602 - TOTAL PLANT PROCESS FLOW DIAGRAM
for
SOUTH FORK WASTEWATER TREATMENT PLANT - 0.80 MGD EXPANSION
City of Liberty Hill
Williamson County, Texas

Project No: 22254

ATTACHMENT 4



Email information for report date:
7/27/18 15:39

B014041

Liberty Hill, City of

Attn: Vince Perkins
vperkins@libertyhilltx.gov

PO Box 1920
Liberty Hill, TX 78642

We at ATL appreciate your business and thank you for allowing us to partner in servicing your environmental needs.

Call or email us today at samplingbryan@aqua-techlabs.com for more information or to set up an event.

Sincerely,
June M. Brien
Executive Technical Director

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

The following abbreviations indicate certification status:

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

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

NELAP ACCREDITED TNI LABORATORY

TCEQ DW Lab ID TX 239

General Definitions:

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

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

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

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

Record Retention:

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

This report was approved by:

June M. Brien, Technical Director

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

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Analytical Report

Liberty Hill, City of

Report Printed: 7/27/18 15:39

B014041

Liberty Hill WWTP Effluent

Collected: 06/18/18 06:30 by CLIENT
Received: 06/18/18 12:53 by Suzanne Rudd

Type Grab | *Matrix* Non Potable | *C-O-C #* B014041

Lab ID# B014041-01	Result	Units	Notes	MDL	Adj MDL	SQL	Lab	Analyzed	Method	Batch	
General Chemistry											
Trivalent Chromium	<0.0036	mg/L	J, D (0.0021)		0.00	0.0036	Bryan	07/06/18 19:57 MRG	EPA 200.8 5.4	[CALC]	NEL
Carbonaceous BOD (5 day)	<1	mg/L		1	1.30	1	Austin	06/18/18 13:00 MSA	SM5210 B 2011	M087691	NEL
Total Suspended Solids	<1	mg/L		1	1.00	1	Bryan	06/20/18 13:20 JDS	SM2540 D 2011	M087771	NEL
Total Dissolved Solids	506	mg/L		25.0	50.00	50.0	Bryan	06/20/18 09:50 BLR	SM2540 C 2011	M087758	NEL
Ammonia as N	0.05	mg/L		0.03	0.03	0.05	Bryan	06/20/18 10:45 MRB	SM4500-NH3 G 1997	M087754	NEL
Total Kjeldahl Nitrogen as N	1.05	mg/L		0.16	0.16	0.20	Bryan	06/26/18 12:25 MRB	EPA 351.2	M087801	NEL
Nitrate as N	3.26	mg/L			0.02	0.0500	Austin	06/22/18 12:03 KT	SM4500-NO3-F 2011	[CALC]	NEL
Nitrite as N	<0.01	mg/L	J (0.006)	0.001	0.00	0.01	Austin	06/19/18 14:44 KT	SM4500 NO2- B 2000	M087740	NEL
Nitrate/Nitrite as N	3.26	mg/L		0.02	0.02	0.05	Bryan	06/22/18 12:03 MRB	SM4500-NO3-F 2011	M087849	NEL
Hexavalent Chromium	<3.0	ug/L		0.72	0.72	3.0	Bryan	07/06/18 10:11 MRG	USGS I 1230-85	M088212	NEL
Total Alkalinity as CaCO3 (pH4.5)	156	mg/L		4.00	16.00	16.0	Bryan	06/26/18 09:15 LAM	SM2320 B 2011	M087914	NEL
Oil & Grease (HEM)	<5.1	mg/L		1.4	1.43	5.1	Bryan	06/22/18 08:27 NAG	EPA 1664B	M087833	NEL
Chloride	128	mg/L		1.60	6.41	20.0	Bryan	06/21/18 09:36 LAM	SM4500-Cl- B 1997	M087798	NEL
Fluoride	0.18	mg/L		0.02	0.02	0.10	Bryan	06/22/18 16:02 PNS	SM4500-F C 2011	M087864	NEL
Sulfate	72.9	mg/L		1.26	5.04	20.0	Bryan	06/25/18 09:14 LAM	ASTM D516 07	M087887	NEL
Microbiological Analyses											
E. Coli	7.4	MPN/100 mL		1.0	1.00	1.0	Austin	06/18/18 13:57 SR	SM9223 B 2004	M087697	NEL
Metals (Total)											
Aluminum	84.6	ug/L		0.299	0.37	2.50	Bryan	07/06/18 19:57 MRG	EPA 200.8 R5.4	M087876	NEL
Antimony	<0.625	ug/L	J (0.568)	0.030	0.04	0.625	Bryan	07/06/18 19:57 MRG	EPA 200.8 R5.4	M087876	NEL
Arsenic	<0.500	ug/L		0.032	0.04	0.500	Bryan	07/06/18 19:57 MRG	EPA 200.8 R5.4	M087876	NEL
Barium	7.32	ug/L		0.065	0.08	0.625	Bryan	07/06/18 19:57 MRG	EPA 200.8 R5.4	M087876	NEL
Beryllium	<0.500	ug/L		0.051	0.06	0.500	Bryan	07/06/18 19:57 MRG	EPA 200.8 R5.4	M087876	NEL
Cadmium	<0.625	ug/L		0.056	0.07	0.625	Bryan	07/06/18 19:57 MRG	EPA 200.8 R5.4	M087876	NEL
Chromium	2.06	ug/L		0.029	0.04	0.625	Bryan	07/06/18 19:57 MRG	EPA 200.8 R5.4	M087876	NEL
Copper	4.58	ug/L		0.029	0.04	0.625	Bryan	07/06/18 19:57 MRG	EPA 200.8 R5.4	M087876	NEL
Lead	<0.500	ug/L	J (0.038)	0.005	0.01	0.500	Bryan	07/06/18 19:57 MRG	EPA 200.8 R5.4	M087876	NEL
Nickel	3.17	ug/L		0.039	0.05	0.625	Bryan	07/06/18 19:57 MRG	EPA 200.8 R5.4	M087876	NEL
Phosphorus-Total	<0.050	mg/L		0.082	0.04	0.050	Bryan	06/25/18 16:28 PNS	EPA 200.7 R4.4	M087768	NEL
Selenium	<1.25	ug/L		0.136	0.17	1.25	Bryan	07/09/18 16:20 MRG	EPA 200.8 R5.4	M087876	NEL
Thallium	<0.625	ug/L		0.073	0.09	0.625	Bryan	07/06/18 19:57 MRG	EPA 200.8 R5.4	M087876	NEL
Zinc	43.7	ug/L		0.379	0.47	5.00	Bryan	07/06/18 19:57 MRG	EPA 200.8 R5.4	M087876	NEL

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B014041-01 continued	Result	Units	Notes	MDL	Adj MDL	SQL	Lab	Analyzed	Method	Batch	
Semi-volatiles											
Acenaphthene	<1.01	ug/L		0.31		1.01	Sub	06/20/18 20:14 ANA	EPA 625	SUB	NEL
Acenaphthylene	<1.01	ug/L		0.31		1.01	Sub	06/20/18 20:14 ANA	EPA 625	SUB	NEL
Anthracene	<1.01	ug/L	J* (0.475)	0.31		1.01	Sub	06/20/18 20:14 ANA	EPA 625	SUB	NEL
Benzidine	<5.05	ug/L		3.96		5.05	Sub	06/20/18 20:14 ANA	EPA 625	SUB	NEL
Benzo (a) anthracene	1.03	ug/L		0.22		1.01	Sub	06/20/18 20:14 ANA	EPA 625	SUB	NEL
Benzo (a) pyrene	<1.01	ug/L	J* (0.707)	0.19		1.01	Sub	06/20/18 20:14 ANA	EPA 625	SUB	NEL
Benzo (b) fluoranthene	<1.01	ug/L	J* (0.657)	0.20		1.01	Sub	06/20/18 20:14 ANA	EPA 625	SUB	NEL
Benzo (g,h,i) perylene	<1.01	ug/L	J* (0.364)	0.35		1.01	Sub	06/20/18 20:14 ANA	EPA 625	SUB	NEL
Benzo (k) fluoranthene	<1.01	ug/L	J* (0.657)	0.34		1.01	Sub	06/20/18 20:14 ANA	EPA 625	SUB	NEL
Butyl benzyl phthalate	<1.01	ug/L		0.36		1.01	Sub	06/20/18 20:14 ANA	EPA 625	SUB	NEL
4-Bromophenyl phenyl ether	<1.01	ug/L		0.27		1.01	Sub	06/20/18 20:14 ANA	EPA 625	SUB	NEL
N-Nitroso-di-n-butylamine	<1.01	ug/L		0.44		1.01	Sub	06/20/18 20:14 ANA	EPA 625	SUB	NEL
Di-n-butyl phthalate	<1.01	ug/L		0.76		1.01	Sub	06/20/18 20:14 ANA	EPA 625	SUB	NEL
Indeno (1,2,3-cd) pyrene	<1.01	ug/L	J* (0.333)	0.32		1.01	Sub	06/20/18 20:14 ANA	EPA 625	SUB	NEL
Bis(2-chloroethoxy)methane	<1.01	ug/L		0.43		1.01	Sub	06/20/18 20:14 ANA	EPA 625	SUB	NEL
Bis(2-chloroethyl)ether	<1.01	ug/L		0.44		1.01	Sub	06/20/18 20:14 ANA	EPA 625	SUB	NEL
Bis(2-chloroisopropyl)ether	<1.01	ug/L		0.44		1.01	Sub	06/20/18 20:14 ANA	EPA 625	SUB	NEL
2-Chloronaphthalene	<1.01	ug/L		0.31		1.01	Sub	06/20/18 20:14 ANA	EPA 625	SUB	NEL
2-Chlorophenol	<1.01	ug/L		0.35		1.01	Sub	06/20/18 20:14 ANA	EPA 625	SUB	NEL
4-Chlorophenyl phenyl ether	<1.01	ug/L		0.30		1.01	Sub	06/20/18 20:14 ANA	EPA 625	SUB	NEL
Chrysene	<1.01	ug/L	J* (0.929)	0.15		1.01	Sub	06/20/18 20:14 ANA	EPA 625	SUB	NEL
3&4-Methylphenol (m&p-Cresol)	<1.01	ug/L		0.30		1.01	Sub	06/20/18 20:14 ANA	EPA 625	SUB	NEL
o-Cresol	<1.01	ug/L		0.33		1.01	Sub	06/20/18 20:14 ANA	EPA 625	SUB	NEL
Dibenz (a,h) anthracene	<1.01	ug/L		0.32		1.01	Sub	06/20/18 20:14 ANA	EPA 625	SUB	NEL
3,3'-Dichlorobenzidine	<1.01	ug/L		0.47		1.01	Sub	06/20/18 20:14 ANA	EPA 625	SUB	NEL
2,4-Dichlorophenol	<1.01	ug/L		0.32		1.01	Sub	06/20/18 20:14 ANA	EPA 625	SUB	NEL
Diethyl phthalate	<1.01	ug/L		0.40		1.01	Sub	06/20/18 20:14 ANA	EPA 625	SUB	NEL
Dimethyl phthalate	<1.01	ug/L		0.36		1.01	Sub	06/20/18 20:14 ANA	EPA 625	SUB	NEL
2,4-Dimethylphenol	<2.02	ug/L		1.10		2.02	Sub	06/20/18 20:14 ANA	EPA 625	SUB	NEL
2,4-Dinitrophenol	<1.01	ug/L		0.41		1.01	Sub	06/20/18 20:14 ANA	EPA 625	SUB	NEL
2,4-Dinitrotoluene	<1.01	ug/L		0.28		1.01	Sub	06/20/18 20:14 ANA	EPA 625	SUB	NEL
2,6-Dinitrotoluene	<1.01	ug/L		0.30		1.01	Sub	06/20/18 20:14 ANA	EPA 625	SUB	NEL
1,2-Diphenylhydrazine	<1.01	ug/L		0.29		1.01	Sub	06/20/18 20:14 ANA	EPA 625	SUB	NEL
Bis(2-ethylhexyl)phthalate	<5.05	ug/L		1.07		5.05	Sub	06/20/18 20:14 ANA	EPA 625	SUB	NEL
Fluoranthene	2.28	ug/L		0.37		1.01	Sub	06/20/18 20:14 ANA	EPA 625	SUB	NEL

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B014041-01 continued	Result	Units	Notes	MDL	Adj MDL	SQL	Lab	Analyzed	Method	Batch	
Semi-volatiles											
Fluorene	<1.01	ug/L		0.33		1.01	Sub	06/20/18 20:14 ANA	EPA 625	SUB	NEL
Hexachlorobenzene	<1.01	ug/L		0.29		1.01	Sub	06/20/18 20:14 ANA	EPA 625	SUB	NEL
Hexachlorobutadiene	<1.01	ug/L		0.28		1.01	Sub	06/20/18 20:14 ANA	EPA 625	SUB	NEL
Hexachlorocyclopentadiene	<1.01	ug/L		0.31		1.01	Sub	06/20/18 20:14 ANA	EPA 625	SUB	NEL
Hexachloroethane	<1.01	ug/L		0.26		1.01	Sub	06/20/18 20:14 ANA	EPA 625	SUB	NEL
Isophorone	<1.01	ug/L		0.41		1.01	Sub	06/20/18 20:14 ANA	EPA 625	SUB	NEL
4-Chloro-3-methylphenol (4-Chloro-m-Cresol)	<1.01	ug/L		0.31		1.01	Sub	06/20/18 20:14 ANA	EPA 625	SUB	NEL
4,6-Dinitro-2-methylphenol (4,6-Dinitro-o-Cresol)	<1.01	ug/L		0.25		1.01	Sub	06/20/18 20:14 ANA	EPA 625	SUB	NEL
Naphthalene	<1.01	ug/L		0.34		1.01	Sub	06/20/18 20:14 ANA	EPA 625	SUB	NEL
Nitrobenzene	<1.01	ug/L		0.38		1.01	Sub	06/20/18 20:14 ANA	EPA 625	SUB	NEL
2-Nitrophenol	<1.01	ug/L		0.40		1.01	Sub	06/20/18 20:14 ANA	EPA 625	SUB	NEL
4-Nitrophenol	<1.01	ug/L		0.11		1.01	Sub	06/20/18 20:14 ANA	EPA 625	SUB	NEL
N-Nitrosodiethylamine	<1.01	ug/L		0.18		1.01	Sub	06/20/18 20:14 ANA	EPA 625	SUB	NEL
N-Nitrosodimethylamine	<1.01	ug/L		0.45		1.01	Sub	06/20/18 20:14 ANA	EPA 625	SUB	NEL
N-Nitrosodiphenylamine	<1.01	ug/L		0.53		1.01	Sub	06/20/18 20:14 ANA	EPA 625	SUB	NEL
Di-n-octyl phthalate	<1.01	ug/L		0.41		1.01	Sub	06/20/18 20:14 ANA	EPA 625	SUB	NEL
Pentachlorobenzene	<1.01	ug/L		0.35		1.01	Sub	06/20/18 20:14 ANA	EPA 625	SUB	NEL
Pentachlorophenol	<1.01	ug/L		0.33		1.01	Sub	06/20/18 20:14 ANA	EPA 625	SUB	NEL
Phenanthrene	1.89	ug/L		0.29		1.01	Sub	06/20/18 20:14 ANA	EPA 625	SUB	NEL
Phenol	<1.01	ug/L		0.60		1.01	Sub	06/20/18 20:14 ANA	EPA 625	SUB	NEL
N-Nitrosodi-n-propylamine	<1.01	ug/L		0.46		1.01	Sub	06/20/18 20:14 ANA	EPA 625	SUB	NEL
Pyrene	1.87	ug/L		0.45		1.01	Sub	06/20/18 20:14 ANA	EPA 625	SUB	NEL
Pyridine	<1.01	ug/L		0.49		1.01	Sub	06/20/18 20:14 ANA	EPA 625	SUB	NEL
1,2,4,5-Tetrachlorobenzene	<1.01	ug/L		0.29		1.01	Sub	06/20/18 20:14 ANA	EPA 625	SUB	NEL
1,2,4-Trichlorobenzene	<1.01	ug/L		0.29		1.01	Sub	06/20/18 20:14 ANA	EPA 625	SUB	NEL
2,4,6-Trichlorophenol	<1.01	ug/L		0.31		1.01	Sub	06/20/18 20:14 ANA	EPA 625	SUB	NEL
2,4,5-Trichlorophenol	<1.01	ug/L		0.20		1.01	Sub	06/20/18 20:14 ANA	EPA 625	SUB	NEL
Cresol(s)	<1.01	ug/L		0.30		1.01	Sub	07/11/18 08:03 ANA	EPA 625	SUB	NEL

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B014041-01 continued	Result	Units	Notes	MDL	Adj MDL	SQL	Lab	Analyzed	Method	Batch	
Volatiles											
Benzene	<1.00	ug/L		0.19		1	Sub	06/21/18 12:29 ANA	EPA 624	SUB	NEL
Bromodichloromethane	<1.00	ug/L		0.31		1	Sub	06/21/18 12:29 ANA	EPA 624	SUB	NEL
Bromoform	<1.00	ug/L		0.29		1	Sub	06/21/18 12:29 ANA	EPA 624	SUB	NEL
Bromomethane	<1	ug/L	D*	0.55		1	Sub	06/21/18 12:29 ANA	EPA 624	SUB	NEL
Methyl Ethyl Ketone (2-Butanone)	<5.00	ug/L		0.38		5	Sub	06/21/18 12:29 ANA	EPA 624	SUB	NEL
Carbon tetrachloride	<1.00	ug/L		0.36		1	Sub	06/21/18 12:29 ANA	EPA 624	SUB	NEL
Chlorobenzene	<1.00	ug/L		0.23		1	Sub	06/21/18 12:29 ANA	EPA 624	SUB	NEL
Chloroethane	<1	ug/L	D*	0.40		1	Sub	06/21/18 12:29 ANA	EPA 624	SUB	NEL
2-Chloroethylvinyl ether	<1.00	ug/L		0.42		1	Sub	06/21/18 12:29 ANA	EPA 624	SUB	NEL
Chloroform	<1	ug/L	J* (0.45)	0.21		1	Sub	06/21/18 12:29 ANA	EPA 624	SUB	NEL
Chloromethane	<1	ug/L	D*	0.39		1	Sub	06/21/18 12:29 ANA	EPA 624	SUB	NEL
Dibromochloromethane	<1.00	ug/L		0.19		1	Sub	06/21/18 12:29 ANA	EPA 624	SUB	NEL
1,2-Dibromoethane (EDB)	<1.00	ug/L		0.28		1	Sub	06/21/18 12:29 ANA	EPA 624	SUB	NEL
1,2-Dichlorobenzene	<1.00	ug/L		0.29		1	Sub	06/21/18 12:29 ANA	EPA 624	SUB	NEL
1,3-Dichlorobenzene	<1.01	ug/L		0.27		1.01	Sub	06/20/18 20:14 ANA	EPA 624	SUB	NEL
1,4-Dichlorobenzene	<1.00	ug/L		0.29		1	Sub	06/21/18 12:29 ANA	EPA 624	SUB	NEL
1,1-Dichloroethane	<1.00	ug/L		0.50		1	Sub	06/21/18 12:29 ANA	EPA 624	SUB	NEL
1,2-Dichloroethane	<1.00	ug/L		0.46		1	Sub	06/21/18 12:29 ANA	EPA 624	SUB	NEL
1,1-Dichloroethene	<1	ug/L	D*	0.40		1	Sub	06/21/18 12:29 ANA	EPA 624	SUB	NEL
trans-1,2-Dichloroethene	<1	ug/L	D*	0.52		1	Sub	06/21/18 12:29 ANA	EPA 624	SUB	NEL
1,2-Dichloropropane	<1.00	ug/L		0.42		1	Sub	06/21/18 12:29 ANA	EPA 624	SUB	NEL
cis-1,3-Dichloropropene	<1.00	ug/L		0.49		1	Sub	06/21/18 12:29 ANA	EPA 624	SUB	NEL
trans-1,3-Dichloropropene	<1.00	ug/L		0.22		1	Sub	06/21/18 12:29 ANA	EPA 624	SUB	NEL
Ethylbenzene	<1.00	ug/L		0.18		1	Sub	06/21/18 12:29 ANA	EPA 624	SUB	NEL
Methylene chloride	<1	ug/L	D*	0.57		1	Sub	06/21/18 12:29 ANA	EPA 624	SUB	NEL
1,1,2,2-Tetrachloroethane	<1.00	ug/L		0.27		1	Sub	06/21/18 12:29 ANA	EPA 624	SUB	NEL
Tetrachloroethene	<1.00	ug/L		0.39		1	Sub	06/21/18 12:29 ANA	EPA 624	SUB	NEL
Toluene	<1.00	ug/L		0.31		1	Sub	06/21/18 12:29 ANA	EPA 624	SUB	NEL
1,1,2-Trichloroethane	<1.00	ug/L		0.43		1	Sub	06/21/18 12:29 ANA	EPA 624	SUB	NEL
1,1,1-Trichloroethane	<1.00	ug/L		0.27		1	Sub	06/21/18 12:29 ANA	EPA 624	SUB	NEL
Trichloroethene	<1.00	ug/L		0.56		1	Sub	06/21/18 12:29 ANA	EPA 624	SUB	NEL
Vinyl chloride	<1	ug/L	D*	0.23		1	Sub	06/21/18 12:29 ANA	EPA 624	SUB	NEL
General Chemistry											
Cyanide, Total	<0.005	mg/L		0.00		0.005	Sub	06/21/18 17:58 ANA	SM20 4500-CN-E	SUB	NEL
Cyanide (amenable)	<0.005	mg/L		0.00		0.005	Sub	07/02/18 13:31 ANA	SM4500 CN G, 1999	SUB	NEL

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B014041-01 continued	Result	Units	Notes	MDL	Adj MDL	SQL	Lab	Analyzed	Method	Batch	
Herbicides											
2,4-D	<0.527	ug/L	D*	0.24		0.527	*Sub*	06/27/18 18:56 ANA	EPA 615	SUB	NEL
2,4,5-TP (Silvex)	<0.316	ug/L	D*	0.13		0.316	*Sub*	06/27/18 18:56 ANA	EPA 615	SUB	NEL
Metals (Total)											
Silver	<0.0002	mg/L		0.00		0.0002	*Sub*	06/21/18 19:38 ANA	EPA 200.8 R5.4	SUB	NEL
Organics and Radiometrics											
Carbaryl	<2.58	ug/L		0.02		2.58	*Sub*	06/22/18 19:42 ANA	EPA 632	SUB	NEL
Hexachlorophene	<5.07	ug/L		2.26		5.07	*Sub*	06/22/18 19:46 ANA	EPA 604.1	SUB	CNR
Phenolics, Total Recoverable	<0.005	mg/L	J* (0.0048)	0.00		0.005	*Sub*	06/22/18 13:34 ANA	EPA 420.4 R1	SUB	NEL
Nonylphenol	<30.7	ug/L		5.00		30.7	*Sub*	06/22/18 12:50 ANA	ASTM D7065-06	SUB	CNR

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B014041-01 continued	Result	Units	Notes	MDL	Adj MDL	SQL	Lab	Analyzed	Method	Batch	
Pesticides											
Aldrin	<0.010	ug/L		0.00		0.0103	Sub	06/21/18 20:34 ANA	EPA 608	SUB	NEL
alpha-BHC	<0.0258	ug/L		0.02		0.0258	Sub	06/21/18 20:34 ANA	EPA 608	SUB	NEL
beta-BHC	<0.0103	ug/L		0.01		0.0103	Sub	06/21/18 20:34 ANA	EPA 608	SUB	NEL
delta-BHC	<0.0103	ug/L		0.01		0.0103	Sub	06/21/18 20:34 ANA	EPA 608	SUB	NEL
gamma-BHC (Lindane)	<0.0103	ug/L		0.01		0.0103	Sub	06/21/18 20:34 ANA	EPA 608	SUB	NEL
Chlordane	<0.0103	ug/L		0.00		0.0103	Sub	06/21/18 20:34 ANA	EPA 608	SUB	NEL
4,4'-DDD	<0.0258	ug/L		0.02		0.0258	Sub	06/21/18 20:34 ANA	EPA 608	SUB	NEL
4,4'-DDE	<0.0258	ug/L		0.02		0.0258	Sub	06/21/18 20:34 ANA	EPA 608	SUB	NEL
4,4'-DDT	<0.0103	ug/L		0.01		0.0103	Sub	06/21/18 20:34 ANA	EPA 608	SUB	NEL
Dieldrin	<0.0103	ug/L		0.01		0.0103	Sub	06/21/18 20:34 ANA	EPA 608	SUB	NEL
Endosulfan I	<0.010	ug/L		0.01		0.0103	Sub	06/21/18 20:34 ANA	EPA 608	SUB	NEL
Endosulfan II	<0.0103	ug/L		0.01		0.0103	Sub	06/21/18 20:34 ANA	EPA 608	SUB	NEL
Endosulfan sulfate	<0.0103	ug/L		0.00		0.0103	Sub	06/21/18 20:34 ANA	EPA 608	SUB	NEL
Endrin	<0.0103	ug/L		0.01		0.0103	Sub	06/21/18 20:34 ANA	EPA 608	SUB	NEL
Endrin aldehyde	<0.0258	ug/L		0.01		0.0258	Sub	06/21/18 20:34 ANA	EPA 608	SUB	NEL
Heptachlor	<0.010	ug/L		0.00		0.0103	Sub	06/21/18 20:34 ANA	EPA 608	SUB	NEL
Heptachlor epoxide	<0.010	ug/L		0.00		0.0103	Sub	06/21/18 20:34 ANA	EPA 608	SUB	NEL
Chlorpyrifos	<0.0413	ug/L		0.04		0.0413	Sub	06/26/18 05:55 ANA	EPA 622	SUB	NEL
Demeton	<0.0516	ug/L		0.04		0.0516	Sub	06/26/18 05:55 ANA	EPA 614	SUB	NEL
Diazinon	<0.0516	ug/L		0.04		0.0516	Sub	06/26/18 05:55 ANA	EPA 614	SUB	NEL
Guthion	<0.0516	ug/L		0.05		0.0516	Sub	06/26/18 05:55 ANA	EPA 614	SUB	NEL
Malathion	<0.0516	ug/L		0.05		0.0516	Sub	06/26/18 05:55 ANA	EPA 614	SUB	NEL
Parathion-ethyl	<0.0516	ug/L		0.03		0.0516	Sub	06/26/18 05:55 ANA	EPA 614	SUB	NEL
Parathion-methyl	<0.0413	ug/L	XD*	0.04		0.0413	Sub	06/26/18 05:55 ANA	EPA 614	SUB	NEL
PCB-1242	<0.200	ug/L		0.14		0.206	Sub	06/21/18 20:34 ANA	EPA 608	SUB	NEL
PCB-1248	<0.200	ug/L		0.14		0.206	Sub	06/21/18 20:34 ANA	EPA 608	SUB	NEL
PCB-1254	<0.200	ug/L		0.14		0.206	Sub	06/21/18 20:34 ANA	EPA 608	SUB	NEL
PCB-1260	<0.200	ug/L		0.14		0.206	Sub	06/21/18 20:34 ANA	EPA 608	SUB	NEL
Mirex	<0.020	ug/L		0.01		0.0206	Sub	06/21/18 20:34 ANA	EPA 608	SUB	NEL
Dicofol	<0.103	ug/L	S*	0.03		0.103	Sub	06/21/18 20:34 ANA	EPA 608	SUB	NEL
Volatiles											
Acrolein	<5.00	ug/L		0.88		5	Sub	06/19/18 14:56 ANA	EPA 624	SUB	NEL
Acrylonitrile	<1.00	ug/L		0.70		1	Sub	06/19/18 14:56 ANA	EPA 624	SUB	NEL

LL Hg bottles improperly sampled. Analysis cancelled and client will resample.

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Liberty Hill WWTP Effluent MS

Collected: 06/18/18 06:30 by CLIENT
Received: 06/18/18 12:53 by Suzanne Rudd

Type: grab
Matrix: Non Potable
C-O-C #: B014041

Lab ID#	Result	Units	Notes	MDL	Adj MDL	SQL	Lab	Analyzed	Method	Batch
B014041-02										

LL Hg bottles improperly sampled. Analysis cancelled and client will resample.

Liberty Hill WWTP LL Hg Blank

Collected: 06/18/18 06:30 by CLIENT
Received: 06/18/18 12:53 by Suzanne Rudd

Type: Grab
Matrix: Non Potable
C-O-C #: B014041

Lab ID#	Result	Units	Notes	MDL	Adj MDL	SQL	Lab	Analyzed	Method	Batch
B014041-03										

LL Hg bottles improperly sampled. Analysis cancelled and client will resample.

Explanation of Notes

A-01	Optional LCSD was outside expected range, causing RPD to be greater than expected. Results accepted on one required passing LCS and sample matrix RPD.
D	Data reported from a dilution
D*	Duplicate RPD was higher than expected
J	Analyte detected below the SQL but above the MDL.
J*	Analyte detected below quantitation limit
RPD-01	Duplicate RPD is outside acceptable range. Acceptance of run is not based on matrix QC.
RPD-02	RPD was not calculated in LIMS due to one or both of the sample / duplicate pair being less than the MRL.
RPD-03	Sample and/or duplicate is below MRL.
S*	Standard reads lower than desired
XD*	Standard reads higher than desired. Duplicate RPD was higher than expected

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General Chemistry - Quality Control

	Result	Units	Notes	SQL	Analyzed	Spike Amount	Source Result	%R	%R Limits	RPD	RPD Limit	Batch	
Ammonia as N - SM4500-NH3 G 1997													*Bryan*
Initial Cal Check	2.52	mg/L			06/20/18 10:45 MRB	2.40		105	85 - 115			1806116	
Blank	<0.05	mg/L		0.05	06/20/18 10:45 MRB							M087754	
LCS	0.55	mg/L		0.05	06/20/18 10:45 MRB	0.500		110	84.4 - 113			M087754	
LCS Dup	0.55	mg/L		0.05	06/20/18 10:45 MRB	0.500		110	84.4 - 113	0.441	20	M087754	
Matrix Spike	0.61	mg/L		0.05	06/20/18 10:45 MRB	0.500	0.08	106	70.8 - 139			M087754	
Matrix Spike Dup	0.60	mg/L		0.05	06/20/18 10:45 MRB	0.500	0.08	104	70.8 - 139	2.08	5.77	M087754	
Carbonaceous BOD (5 day) - SM5210 B 2011													*Austin*
Diln Water Blk	<0.20	mg/L		1	06/18/18 13:00 MSA		0.08		< or = 0.2 mg/L			M087691	
Duplicate	253	mg/L		98	06/18/18 13:00 MSA		250			1.19	43.7	M087691	
GG Acid 198	189	mg/L		1	06/18/18 13:00 MSA	198		95.4	85 - 115			M087691	
GG Acid 198	218	mg/L		1	06/18/18 13:00 MSA	198		110	85 - 115			M087691	
Seed Blank	<1	mg/L		1	06/18/18 13:00 MSA							M087691	
Seed Blank	<1	mg/L		1	06/18/18 13:00 MSA							M087691	
Chloride - SM4500-Cl- B 1997													*Bryan*
Initial Cal Check	24.8	mg/L			06/21/18 09:36 LAM	25.0		99.0	85 - 115			1806123	
Blank	<5.00	mg/L		5.00	06/21/18 09:36 LAM							M087798	
LCS	25.5	mg/L		5.00	06/21/18 09:36 LAM	24.7		103	90 - 110			M087798	
Matrix Spike	279	mg/L		20.0	06/21/18 09:36 LAM	98.8	178	102	84.1 - 116			M087798	
Matrix Spike Dup	279	mg/L		20.0	06/21/18 09:36 LAM	98.8	178	102	84.1 - 116	0.00	5.25	M087798	
Fluoride - SM4500-F C 2011													*Bryan*
Initial Cal Check	2.01	mg/L			06/22/18 16:02 PNS	2.31		87.0	85 - 115			1806140	
Blank	<0.10	mg/L		0.10	06/22/18 16:02 PNS							M087864	
LCS	0.75	mg/L		0.10	06/22/18 16:02 PNS	0.798		94.1	90 - 110			M087864	
LCS Dup	0.76	mg/L		0.10	06/22/18 16:02 PNS	0.798		94.8	90 - 110	0.796	1.27	M087864	
Matrix Spike	0.93	mg/L		0.10	06/22/18 16:02 PNS	0.798	0.18	93.7	88.3 - 129			M087864	
Matrix Spike Dup	0.92	mg/L		0.10	06/22/18 16:02 PNS	0.798	0.18	93.2	88.3 - 129	0.536	8.39	M087864	
Hexavalent Chromium - USGS I 1230-85													*Bryan*
Initial Cal Check	29	ug/L			05/03/18 14:27 MRG	30.2		96.1	85 - 115			1805030	
Initial Cal Check	51	ug/L			07/06/18 10:11 MRG	50.4		101	85 - 115			1807039	
Blank	<3.0	ug/L		3.0	07/06/18 10:11 MRG							M088212	
Duplicate	<3.0	ug/L		3.0	07/06/18 10:11 MRG		<3.0				15	M088212	
LCS	53	ug/L		3.0	07/06/18 10:11 MRG	50.4		104	81.7 - 125			M088212	
LCS Dup	53	ug/L		3.0	07/06/18 10:11 MRG	50.4		106	81.7 - 125	1.57	8.13	M088212	
Matrix Spike	40	ug/L		3.0	07/06/18 10:11 MRG	50.4	<3.0	79.1	50 - 150			M088212	

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General Chemistry - Quality Control

	Result	Units	Notes	SQL	Analyzed	Spike Amount	Source Result	%R	%R Limits	RPD	RPD Limit	Batch	
Nitrate/Nitrite as N - SM4500-NO3-F 2011													*Bryan*
Initial Cal Check	2.45	mg/L			06/22/18 12:03 MRB	2.30		107	85 - 115			1806134	
Blank	<0.05	mg/L		0.05	06/22/18 12:03 MRB							M087849	
LCS	2.04	mg/L		0.05	06/22/18 12:03 MRB				92.2 - 110			M087849	
LCS Dup	2.07	mg/L		0.05	06/22/18 12:03 MRB				92.2 - 110		10	M087849	
Matrix Spike	2.20	mg/L		0.05	06/22/18 12:03 MRB		0.08		92.3 - 116			M087849	
Matrix Spike Dup	2.24	mg/L		0.05	06/22/18 12:03 MRB		0.08		92.3 - 116		10	M087849	
Nitrite as N - SM4500 NO2- B 2000													*Austin*
Initial Cal Check	0.04	mg/L			06/19/18 14:44 KT	0.0484		90.6	90 - 110			1806110	
Blank	<0.01	mg/L		0.01	06/19/18 14:44 KT							M087740	
LCS	0.04	mg/L		0.01	06/19/18 14:44 KT	0.0484		92.1	90 - 110			M087740	
Matrix Spike	0.05	mg/L		0.01	06/19/18 14:44 KT	0.0484	0.006	91.9	25.9 - 160			M087740	
Matrix Spike Dup	0.05	mg/L		0.01	06/19/18 14:44 KT	0.0484	0.006	90.4	25.9 - 160	1.60	8.68	M087740	
Oil & Grease (HEM) - EPA 1664B													*Bryan*
Blank	<5.3	mg/L	*J (1.8)*	5.3	06/22/18 08:27 NAG							M087833	
LCS	40.5	mg/L		5.3	06/22/18 08:27 NAG	42.6		95.1	78 - 114			M087833	
Matrix Spike	40.1	mg/L		5.3	06/22/18 08:27 NAG	42.5	<5.3	94.3	78 - 114			M087833	
Reference	39.9	mg/L		5.3	06/22/18 08:27 NAG	42.1		94.7	83 - 101			M087833	
Sulfate - ASTM D516 07													*Bryan*
Initial Cal Check	11.2	mg/L			04/02/18 08:53 MCP	10.0		112	80 - 120			1804001	
Initial Cal Check	11.4	mg/L			06/25/18 09:14 LAM	10.0		114	80 - 120			1806147	
Blank	<5.00	mg/L		5.00	06/25/18 09:14 LAM							M087887	
Duplicate	151	mg/L		62.5	06/25/18 09:14 LAM		153			0.852	7.73	M087887	
LCS	11.3	mg/L		5.00	06/25/18 09:14 LAM	10.0		113	80 - 120			M087887	
Matrix Spike	272	mg/L		62.5	06/25/18 09:14 LAM	125	153	95.3	59.3 - 149			M087887	
Matrix Spike Dup	268	mg/L		62.5	06/25/18 09:14 LAM	125	153	92.2	59.3 - 149	3.32	7.73	M087887	
Total Alkalinity as CaCO3 (pH4.5) - SM2320 B 2011													*Bryan*
Initial Cal Check	6.87	mg/L			06/26/18 09:15 LAM	6.86		100	97 - 103			1806152	
Initial Cal Check	9.21	mg/L			06/26/18 09:15 LAM	9.18		100	97 - 103			1806152	
Duplicate	158	mg/L		16.0	06/26/18 09:15 LAM		156			1.27	6.16	M087914	
LCS	78.0	mg/L		16.0	06/26/18 09:15 LAM	80.0		97.5	90.2 - 116			M087914	
LCS Dup	80.0	mg/L		16.0	06/26/18 09:15 LAM	80.0		100	90.2 - 116	2.53	11.3	M087914	

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General Chemistry - Quality Control

	Result	Units	Notes	SQL	Analyzed	Spike Amount	Source Result	%R	%R Limits	RPD	RPD Limit	Batch	
Total Dissolved Solids - SM2540 C 2011													*Bryan*
Blank	<25.0	mg/L		25.0	06/20/18 09:50 BLR							M087758	
Duplicate	890	mg/L		50.0	06/20/18 09:50 BLR		902			1.34	14.9	M087758	
Reference	51.0	mg/L		25.0	06/20/18 09:50 BLR	50.0		102	62 - 132			M087758	
Total Kjeldahl Nitrogen as N - EPA 351.2													*Bryan*
Blank	<0.20	mg/L		0.20	06/26/18 12:25 MRB							M087801	
LCS	7.57	mg/L		0.20	06/26/18 12:25 MRB	8.00		94.7	87.2 - 125			M087801	
LCS Dup	7.86	mg/L		0.20	06/26/18 12:25 MRB	8.00		98.2	87.2 - 125	3.67	7.41	M087801	
Matrix Spike	8.63	mg/L		0.20	06/26/18 12:25 MRB	8.00	0.98	95.6	61.6 - 147			M087801	
Matrix Spike Dup	8.82	mg/L		0.20	06/26/18 12:25 MRB	8.00	0.98	98.0	61.6 - 147	2.50	20.3	M087801	
Reference	5.42	mg/L		0.20	06/26/18 12:25 MRB	5.34		101	85 - 115			M087801	
Total Suspended Solids - SM2540 D 2011													*Bryan*
Blank	<1	mg/L		1	06/20/18 13:20 JDS							M087771	
Blank	<1	mg/L		1	06/20/18 13:20 JDS							M087771	
Duplicate	4	mg/L		1	06/20/18 13:20 JDS		4			1.17	18.5	M087771	
Duplicate	9	mg/L		2	06/20/18 13:20 JDS		9			4.35	18.5	M087771	
Reference	96	mg/L		10	06/20/18 13:20 JDS	100		96.0	84 - 107			M087771	

Metals (Total) - Quality Control

	Result	Units	Notes	SQL	Analyzed	Spike Amount	Source Result	%R	%R Limits	RPD	RPD Limit	Batch	
Aluminum - EPA 200.8 R5.4													*Bryan*
Blank	<2.50	ug/L	*J (2.31)*	2.50	07/06/18 18:56 MRG							M087876	
LCS	53.3	ug/L		2.50	07/06/18 19:03 MRG	52.5		101	84.5 - 115.4			M087876	
LCS Dup	53.6	ug/L		2.50	07/06/18 19:11 MRG	52.5		102	84.5 - 115.4	0.679	20	M087876	
Duplicate	86.0	ug/L		2.50	07/06/18 19:42 MRG		84.6			1.65	20	M087876	
Matrix Spike	141	ug/L		2.50	07/06/18 19:50 MRG	52.5	84.6	108	69.5 - 130.4			M087876	
Antimony - EPA 200.8 R5.4													*Bryan*
Blank	<0.625	ug/L	*J (0.130)*	0.625	07/06/18 18:56 MRG							M087876	
LCS	4.95	ug/L		0.625	07/06/18 19:03 MRG	5.00		98.9	84.5 - 115.4			M087876	
LCS Dup	4.82	ug/L		0.625	07/06/18 19:11 MRG	5.00		96.4	84.5 - 115.4	2.55	20	M087876	
Duplicate	1.06	ug/L	*RPD-03*	0.625	07/06/18 19:42 MRG		<0.625			*60.2*	20	M087876	
Matrix Spike	5.36	ug/L		0.625	07/06/18 19:50 MRG	5.00	0.568	95.9	69.5 - 130.4			M087876	

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Metals (Total) - Quality Control

	Result	Units	Notes	SQL	Analyzed	Spike Amount	Source Result	%R	%R Limits	RPD	RPD Limit	Batch	
Arsenic - EPA 200.8 R5.4													*Bryan*
Blank	<0.500	ug/L		0.500	07/06/18 18:56 MRG							M087876	
LCS	4.60	ug/L		0.500	07/06/18 19:03 MRG	5.00		92.0	84.5 - 115.4			M087876	
LCS Dup	4.23	ug/L		0.500	07/06/18 19:11 MRG	5.00		84.5	84.5 - 115.4	8.50	20	M087876	
Duplicate	<0.500	ug/L	*RPD-02, J (0.199)*	0.500	07/06/18 19:42 MRG		<0.500				20	M087876	
Matrix Spike	4.60	ug/L		0.500	07/06/18 19:50 MRG	5.00	<0.500	92.0	69.5 - 130.4			M087876	
Barium - EPA 200.8 R5.4													*Bryan*
Blank	<0.625	ug/L		0.625	07/06/18 18:56 MRG							M087876	
LCS	4.53	ug/L		0.625	07/06/18 19:03 MRG	5.00		90.7	84.5 - 115.4			M087876	
LCS Dup	4.33	ug/L		0.625	07/06/18 19:11 MRG	5.00		86.6	84.5 - 115.4	4.57	20	M087876	
Duplicate	7.82	ug/L		0.625	07/06/18 19:42 MRG		7.32			6.58	20	M087876	
Matrix Spike	12.2	ug/L		0.625	07/06/18 19:50 MRG	5.00	7.32	97.0	69.5 - 130.4			M087876	
Beryllium - EPA 200.8 R5.4													*Bryan*
Blank	<0.500	ug/L		0.500	07/06/18 18:56 MRG							M087876	
LCS	5.00	ug/L		0.500	07/06/18 19:03 MRG	5.00		100	84.5 - 115.4			M087876	
LCS Dup	4.92	ug/L		0.500	07/06/18 19:11 MRG	5.00		98.5	84.5 - 115.4	1.49	20	M087876	
Duplicate	<0.500	ug/L		0.500	07/06/18 19:42 MRG		<0.500				20	M087876	
Matrix Spike	5.02	ug/L		0.500	07/06/18 19:50 MRG	5.00	<0.500	100	69.5 - 130.4			M087876	
Cadmium - EPA 200.8 R5.4													*Bryan*
Blank	<0.625	ug/L		0.625	07/06/18 18:56 MRG							M087876	
LCS	4.65	ug/L		0.625	07/06/18 19:03 MRG	5.00		92.9	84.5 - 115.4			M087876	
LCS Dup	4.51	ug/L		0.625	07/06/18 19:11 MRG	5.00		90.2	84.5 - 115.4	2.93	20	M087876	
Duplicate	<0.625	ug/L	*RPD-02, J (0.388)*	0.625	07/06/18 19:42 MRG		<0.625				20	M087876	
Matrix Spike	4.45	ug/L		0.625	07/06/18 19:50 MRG	5.00	<0.625	89.0	69.5 - 130.4			M087876	
Chromium - EPA 200.8 R5.4													*Bryan*
Matrix Spike	7.86	ug/L		0.625	07/06/18 19:50 MRG	5.00	2.06	116	69.5 - 130.4			M087876	
Blank	<0.625	ug/L	*J (0.540)*	0.625	07/09/18 15:43 MRG							M087876	
LCS	4.63	ug/L		0.500	07/09/18 15:50 MRG	5.00		92.6	84.5 - 115.4			M087876	
LCS Dup	5.78	ug/L	*A-01*	0.500	07/09/18 15:58 MRG	5.00		*116*	84.5 - 115.4	*22.0*	20	M087876	
Duplicate	2.05	ug/L		0.625	07/09/18 16:20 MRG		2.06			0.724	20	M087876	

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Metals (Total) - Quality Control

	Result	Units	Notes	SQL	Analyzed	Spike Amount	Source Result	%R	%R Limits	RPD	RPD Limit	Batch	
Copper - EPA 200.8 R5.4													*Bryan*
Blank	<0.625	ug/L	*J (0.449)*	0.625	07/06/18 18:56 MRG							M087876	
LCS	31.2	ug/L		0.625	07/06/18 19:03 MRG	30.0		104	84.5 - 115.4			M087876	
LCS Dup	30.4	ug/L		0.625	07/06/18 19:11 MRG	30.0		101	84.5 - 115.4	2.79	20	M087876	
Matrix Spike	34.4	ug/L		0.625	07/06/18 19:50 MRG	30.0	4.58	99.5	69.5 - 130.4			M087876	
Duplicate	4.23	ug/L		0.625	07/09/18 16:20 MRG		4.58			7.94	20	M087876	
Lead - EPA 200.8 R5.4													*Bryan*
Blank	<0.500	ug/L		0.500	07/06/18 18:56 MRG							M087876	
LCS	4.79	ug/L		0.500	07/06/18 19:03 MRG	5.00		95.9	84.5 - 115.4			M087876	
LCS Dup	4.58	ug/L		0.500	07/06/18 19:11 MRG	5.00		91.7	84.5 - 115.4	4.50	20	M087876	
Duplicate	<0.500	ug/L	*RPD-01, J (0.491)*	0.500	07/06/18 19:42 MRG		<0.500			*171*	20	M087876	
Matrix Spike	4.58	ug/L		0.500	07/06/18 19:50 MRG	5.00	0.038	90.8	69.5 - 130.4			M087876	
Nickel - EPA 200.8 R5.4													*Bryan*
Blank	<0.625	ug/L		0.625	07/06/18 18:56 MRG							M087876	
LCS	5.02	ug/L		0.625	07/06/18 19:03 MRG	5.00		100	84.5 - 115.4			M087876	
LCS Dup	4.76	ug/L		0.625	07/06/18 19:11 MRG	5.00		95.2	84.5 - 115.4	5.30	20	M087876	
Duplicate	3.65	ug/L		0.625	07/06/18 19:42 MRG		3.17			14.2	20	M087876	
Matrix Spike	7.95	ug/L		0.625	07/06/18 19:50 MRG	5.00	3.17	95.6	69.5 - 130.4			M087876	
Phosphorus-Total - EPA 200.7 R4.4													*Bryan*
Blank	<0.050	mg/L		0.050	06/25/18 16:13 PNS							M087768	
LCS	2.31	mg/L		0.050	06/25/18 16:16 PNS	2.50		92.2	84.5 - 115.4			M087768	
LCS Dup	2.29	mg/L		0.050	06/25/18 16:19 PNS	2.50		91.7	84.5 - 115.4	0.578	20	M087768	
Duplicate	<0.050	mg/L		0.050	06/25/18 16:22 PNS		<0.050				20	M087768	
Matrix Spike	2.91	mg/L		0.050	06/25/18 16:25 PNS	2.50	<0.050	116	69.5 - 130.4			M087768	
Selenium - EPA 200.8 R5.4													*Bryan*
Blank	<1.25	ug/L	*J (0.963)*	1.25	07/06/18 18:56 MRG							M087876	
LCS	5.64	ug/L		1.25	07/06/18 19:03 MRG	5.00		113	84.5 - 115.4			M087876	
LCS Dup	5.66	ug/L		1.25	07/06/18 19:11 MRG	5.00		113	84.5 - 115.4	0.342	20	M087876	
Duplicate	<1.25	ug/L	*RPD-02, J (0.695)*	1.25	07/09/18 16:05 MRG		<1.25				20	M087876	
Matrix Spike	4.39	ug/L		1.25	07/09/18 16:12 MRG	5.00	<1.25	87.8	69.5 - 130.4			M087876	

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Metals (Total) - Quality Control

	Result	Units	Notes	SQL	Analyzed	Spike Amount	Source Result	%R	%R Limits	RPD	RPD Limit	Batch	
Thallium - EPA 200.8 R5.4													*Bryan*
Blank	<0.625	ug/L		0.625	07/06/18 18:56 MRG							M087876	
LCS	4.75	ug/L		0.625	07/06/18 19:03 MRG	5.00		94.9	84.5 - 115.4			M087876	
LCS Dup	4.32	ug/L		0.625	07/06/18 19:11 MRG	5.00		86.5	84.5 - 115.4	9.32	20	M087876	
Duplicate	<0.625	ug/L		0.625	07/06/18 19:42 MRG		<0.625				20	M087876	
Matrix Spike	4.39	ug/L		0.625	07/06/18 19:50 MRG	5.00	<0.625	87.7	69.5 - 130.4			M087876	
Zinc - EPA 200.8 R5.4													*Bryan*
Blank	<5.00	ug/L	*J (2.25)*	5.00	07/06/18 18:56 MRG							M087876	
LCS	30.0	ug/L		5.00	07/06/18 19:03 MRG	30.0		99.8	84.5 - 115.4			M087876	
LCS Dup	29.5	ug/L		5.00	07/06/18 19:11 MRG	30.0		98.5	84.5 - 115.4	1.40	20	M087876	
Duplicate	44.8	ug/L		5.00	07/06/18 19:42 MRG		43.7			2.56	20	M087876	
Matrix Spike	70.8	ug/L		5.00	07/06/18 19:50 MRG	30.0	43.7	90.3	69.5 - 130.4			M087876	

Microbiological Analyses - Quality Control

	Result	Units	Notes	SQL	Analyzed	Spike Amount	Source Result	%R	%R Limits	RPD	RPD Limit	Batch	
E. Coli - SM9223 B 2004													*Austin*
Blank	<1.0	MPN/100 mL		1.0	06/18/18 13:57 SR							M087697	
Duplicate	81.6	MPN/100 mL		1.0	06/18/18 13:57 SR		80.1			1.86	157	M087697	
Duplicate	2.0	MPN/100 mL	*RPD-02*	1.0	06/18/18 13:57 SR		<1.0				157	M087697	

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Analytical Report

Liberty Hill, City of

Report Printed: 7/27/18 15:39

B014041

Sample Preparation Summary

Sample	Method	Prepared	Lab	Bottle	Initial	Units	Final	Units	External Dilution Factor	Batch
B014041-01										
Aluminum	EPA 200.8 R5.4	6/22/18 16:42 MRG	Bryan	AB	50.0	mL	25.0	mL	2.5	M087876
Ammonia as N	SM4500-NH3 G 1997	6/20/18 8:39 MRB	Bryan	AF	10.0	mL	10.0	mL	1	M087754
Antimony	EPA 200.8 R5.4	6/22/18 16:42 MRG	Bryan	AB	50.0	mL	25.0	mL	2.5	M087876
Arsenic	EPA 200.8 R5.4	6/22/18 16:42 MRG	Bryan	AB	50.0	mL	25.0	mL	2.5	M087876
Barium	EPA 200.8 R5.4	6/22/18 16:42 MRG	Bryan	AB	50.0	mL	25.0	mL	2.5	M087876
Beryllium	EPA 200.8 R5.4	6/22/18 16:42 MRG	Bryan	AB	50.0	mL	25.0	mL	2.5	M087876
Cadmium	EPA 200.8 R5.4	6/22/18 16:42 MRG	Bryan	AB	50.0	mL	25.0	mL	2.5	M087876
Carbonaceous BOD (5 day)	SM5210 B 2011	6/18/18 13:00 SR	Austin	W	300	mL	300	mL	1	M087691
Chloride	SM4500-Cl- B 1997	6/21/18 9:36 LAM	Bryan	Y	25.0	mL	100	mL	1	M087798
Chromium	EPA 200.8 R5.4	6/22/18 16:42 MRG	Bryan	AB	50.0	mL	25.0	mL	2.5	M087876
Copper	EPA 200.8 R5.4	6/22/18 16:42 MRG	Bryan	AB	50.0	mL	25.0	mL	2.5	M087876
E. Coli	SM9223 B 2004	6/18/18 13:46 SR	Austin	D	100	mL	100	mL	1	M087697
Fluoride	SM4500-F C 2011	6/22/18 13:45 PNS	Bryan	AF	25.0	mL	25.0	mL	1	M087864
Hexavalent Chromium	USGS I 1230-85	7/6/18 10:11 MRG	Bryan	V	25.0	mL	25.0	mL	1	M088212
Lead	EPA 200.8 R5.4	6/22/18 16:42 MRG	Bryan	AB	50.0	mL	25.0	mL	2.5	M087876
Nickel	EPA 200.8 R5.4	6/22/18 16:42 MRG	Bryan	AB	50.0	mL	25.0	mL	2.5	M087876
Nitrate/Nitrite as N	SM4500-NO3-F 2011	6/22/18 10:21 MRB	Bryan	AF	10.0	mL	10.0	mL	1	M087849
Nitrite as N	SM4500 NO2- B 2000	6/19/18 14:44 KT	Austin	AD	25.0	mL	25.0	mL	1	M087740
Oil & Grease (HEM)	EPA 1664B	6/22/18 8:27 NAG	Bryan	E	980	mL	1000	mL	1	M087833
Phosphorus-Total	EPA 200.7 R4.4	6/21/18 16:40 AKS	Bryan	B	50.0	mL	25.0	mL	1	M087768
Selenium	EPA 200.8 R5.4	6/22/18 16:42 MRG	Bryan	AB	50.0	mL	25.0	mL	2.5	M087876
Sulfate	ASTM D516 07	6/25/18 9:14 LAM	Bryan	Y	25.0	mL	100	mL	1	M087887
Thallium	EPA 200.8 R5.4	6/22/18 16:42 MRG	Bryan	AB	50.0	mL	25.0	mL	2.5	M087876
Total Alkalinity as CaCO3 (pH4.5)	SM2320 B 2011	6/26/18 9:15 LAM	Bryan	Y	50.0	mL	200	mL	1	M087914
Total Dissolved Solids	SM2540 C 2011	6/20/18 9:50 BLR	Bryan	Y	50.0	mL	100	mL	1	M087758
Total Kjeldahl Nitrogen as N	EPA 351.2	6/21/18 10:51 MRB	Bryan	AF	25.0	mL	25.0	mL	1	M087801
Total Suspended Solids	SM2540 D 2011	6/20/18 13:20 JDS	Bryan	C	1000	mL	1000	mL	1	M087771
Zinc	EPA 200.8 R5.4	6/22/18 16:42 MRG	Bryan	AB	50.0	mL	25.0	mL	2.5	M087876

See sub-contract reports for preparation information of subcontracted analyses.

B014041-02

Sample cancelled - See sample notes for more information

B014041-03

Sample cancelled - See sample notes for more information

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rle_COC 051118.rpl

Liberty Hill, City of

C-O-C # B014041 1/2

Page ~~2 of 3~~ wrong # ckk

Comments:

Lab ID	Description	Start Date	Start Time	End Date	End Time	Composite Type
B014041-01	Liberty Hill WWTP Effluent	6-18-18	6:30 AM	- N/A -	- N/A -	Grab

Y Billing Digest, Metals Aq ICP
Y Billing PCB Congeners
A E.Coli MPN SM9223 B
AcroleinAcrylo. (10054-55) NP GCMS EPA624 [SU
As DW NP ICP-MS EPA 200.8 [NEL]
Carbaryl NP HPLC EPA 632 [SUB]
Cl NP Tit SM 4500 Cl- B [NEL]
CN NP SM20 4500 CN E [SUB]
Cr DW NP ICP-MS EPA 200.8 [NEL]
Nonylphenol NP GC-MS ASTM 7065 CNR [SUB]
Pb DW NP ICP-MS EPA 200.8 [NEL]
Herbicides NP GC-ECD EPA 615 [SUB]
NH3N NP AUTO SM 4500 G [NEL]
Pest Org P NP (10054) GC EPA 614 [SUB]
Se DW NP ICP-MS EPA 200.8 [NEL]
SV 10054/55 GC-MS EPA 625 [SUB]
TL DW NP ICP-MS EPA 200.8 [NEL]
Zn DW NP ICP-MS EPA 200.8 [NEL]

~~Y Billing Digest, Metals Hg~~ (2)
Y Billing Ship to Sub-Contract Lab
A NO2N NP Spec SM4500 NO2 B [NEL]
Al DW NP ICP-MS EPA 200.8 [NEL]
Ba DW NP ICP-MS EPA 200.8 [NEL]
Cd DW NP ICP-MS EPA 200.8 [NEL]
CN Amenable (PKG) NP SM4500 CN E G [SUB]
Cr 3 Calc EPA 200.8 [NEL]
Cu DW NP ICP-MS EPA 200.8 [NEL]
O&G NP Grav EPA 1664 B [NEL]
Dioxin Furan NP SL HR GC-MS EPA 1613B 8290 [
Hexachlorophene NP HPLC EPA 604.1 CNR [SUB]
Ni DW NP ICP-MS EPA 200.8 [NEL]
Phenol DW NP FIA-RFA EPA 420.4 [SUB]
SO4 NP Spec D516-07 [NEL]
TDS NP Grav SM2540 C [NEL]
TSS NP Grav SM 2540 D [NEL]

Y Billing Digest, Metals NP ICP [SUB]
A CBOD NP Probe SM 5210 B [NEL]
A NO3N NP CALC SM4500 [NEL]
Alkalinity NP Probe SM 2320 B [NEL]
Be DW NP ICP-MS EPA 200.8 [NEL]
Chlorpyrifos NP (10054) GC EPA 622 [SUB]
CN Amenable NP SM4500 CN G [SUB]
Cr 6 NP Spec USGS I-1230-85 [NEL]
NO3N + NO2N NP RFA SM4500 NO3 F [NEL]
P NP ICP EPA 200.7 [NEL]
F NP Probe SM 4500 F- C [NEL]
~~Hg NP CVAA AF EPA 245.7 NEL [SUB]~~ (2)
Pest NP (10054) GC EPA 608 [SUB]
Sb DW NP ICP-MS EPA 200.8 [NEL]
SUB Ag ICP-MS EPA 200.8 [SUB]
TKN NP AUTO EPA 351.2 [NEL]
Vol 10054 NP GC-MS EPA 624 [SUB]

Bottles A, AA, AB, AC, AG, AH, AI, AJ, AK, AL, AM, E, F, G, in cooler 25/Cooler 3.
Bottles H-S in cooler 4 (soft cooler). All others in cooler 2 (C1) ckk
(2) Canceled analysis due to improper sampling protocol. ckk
Bottles T, U absent for Chlorine and Sulfide (0121133, 0657570) ckk

Container List
(Checked box indicates bottle arrived in lab)

- [x] A Carbaryl-Diuron 1LG
- [x] AA Hexachlorophene 1LG
- [x] AB Metals 1LP HNO3
- [x] AC Metals 0.25LP HNO3
- [x] AD NO2 0.25LP
- [x] AE Metals Hg LL ANA 1L HCl
- [x] AF AMM NO3 TKN 0.25LP H2SO4
- [x] AG NONYLPHENOL 1LG H2SO4
- [x] AH Phenol 1LG H2SO4
- [x] AI Pest OrgPO4 1LG
- [x] AJ Pesticides 1LG
- [x] AK Pesticides 1LG
- [x] AL Semivolatiles 1LG
- [x] AM U 1 LG
- [x] AN U 1 LG
- [x] AO U 1 LG
- [x] B P 0.25LP H2SO4
- [x] C TSS 2LP
- [x] D Ecoli 0.1L StP Na2S2O3
- [x] E OG - 1LG Amber HCl
- [x] F OG - 1LG Amber HCl
- [x] G OG pH Chk - 1LP HCl
- [x] H V - 40 mL VOA Level 2 HCl
- [x] I V - 40 mL VOA Level 2 HCl
- [x] J V - 40 mL VOA Level 2 HCl
- [x] K V - 40 mL VOA Level 2 HCl 5mm bubble present ckk
- [x] L V - 40 mL VOA Level 2 HCl
- [x] M V - 40 mL VOA Level 2 HCl 5mm bubble present ckk
- [x] N V - 40 mL VOA Level 2
- [x] O V - 40 mL VOA Level 2
- [x] P V - 40 mL VOA Level 2
- [x] Q V - 40 mL VOA Level 2
- [x] R V - 40 mL VOA Level 2
- [x] S V - 40 mL VOA Level 2
- [x] T CN 0.33LG NaOH
- [x] U CN 0.33LG NaOH

AQUA-TECH LABORATORIES, INC.
7500 Hwy 71 W, Suite 105
Austin, TX 78735
PH 512.301.9559
FAX 512.301.9552
rte_COC 051118.rpt

Liberty Hill, City of

C-O-C #
B014041

Page ~~3 of 8~~ 2/2 wrong # 4kh

Page 17 of 67 B014041 ATL 122117 FIN_Is DRAFT 07 27 18 1539

Comments:

Lab ID	Description	Start Date	Start Time	End Date	End Time	Composite Type	Container List (Checked box indicates bottle arrived in lab)
	*(2) Client provided sample date/time via phone call. 4kh						☑ V Cr+6 0.25LP NaOH Acetate pH = ~~9.64~~ 5.4 RR - insuff mixing ... ☑ W CBOD 1LP ☑ X Dioxin/Furan 1LG ☑ Y Alk Cl Cond NO2 SO4 TDS 2LP ☑ Z Herbicides 1LG
B014041-02	Liberty Hill WWTP Effluent MS	* 6/18/18	630	- N/A -	- N/A -	grab	☑ A Metals Hg LL ANA 1L HCl
~~Y Billing Digest, Metals Hg~~	~~Hg-NP-CVAA-AF EPA 245.7 NEL [SUB]~~ NA ⊛						
B014041-03	Liberty Hill WWTP LL Hg Blank	* 6/18/18	630	- N/A -	- N/A -	grab	☑ A Metals Hg LL ANA 1L BLANK
~~Y Billing Digest, Metals Hg~~ NA	~~Hg NP CVAA-AF EPA 245.7 NEL [SUB]~~ ⊛						

By relinquishing the above samples to ATL, the client agrees to the following terms: Samples will be analyzed by a method that is within ATL's' NELAP fields of accreditation. Analytes requiring a certified method that is not within ATL's fields of accreditation will be subcontracted to a NELAP accredited lab that is certified for that method. Clients will be notified of the subcontract lab's details. Other analytes not requiring accreditation will be analyzed by a compendial method. If a specific method is required, the client will note the method on this C-O-C. The client approves all method modifications documented by ATL or the subcontract lab. A current list of ATL's NELAP fields of accreditation and other methods are available on request.

⊛ (2) Canceled analysis due to improper sampling protocol. 4kh

DEFINITIONS:

ATL = Aqua-Tech Laboratories, Inc.

Matrix designations:
NP = Non-Potable, DW = Drinking Water, SL = Solid

Analyses Ordered:
"A" prefix indicates Austin, all others Bryan or Subcontracted, indicated by [SUB]. Name format: Analysis-Matrix-Technology-Method.

[CNR] = No NELAP certification required or available
[INF] = Informational only (not NELAC certified)
[NEL] = NELAP certified parameter
[SUB] = NELAP certified subcontracted parameter

Reagent tracking is available upon request.

CUSTODY TRANSFER:

Sample Info: "X" all that appply

	Name / Signature	Type	Date	Time	Sample Info
Relinquished by (print & sign)	Dewey Pierce [signature]	☒ Sampler ☐ Client	6-18-18	7:05	☐ Iced / Chilled / Refrigerated ☐ Custody Sealed
Received by (print and sign)	Sarita Hedgepeth [signature]	☒ ATL Field ☐ Client	6-18-18	1040	☐ Received Chilled / Iced ☑ Custody Transfer Unbroken
Relinquished by (print & sign)	NFE LSK47	☐ ATL Field ☐ Client			☐ Iced / Chilled / Refrigerated ☐ Custody Sealed
Received by (print and sign)		☐ ATL Field ☐ Client			☐ Received Chilled / Iced ☐ Custody Transfer Unbroken

Do not write below this line (Laboratory use only)

SAMPLE RECEIPT SUMMARY FOR WORK ORDER B014041

Lab Comments:

	Signature	Name	Type	Date	Time	Sample Info
Relinquished by (print and sign)	[signature]	Sarita Hedgepeth	☐ Client ☒ ATL Field	06/18/18	12:53	☒ Iced / Chilled / Refrigerated ☐ Custody Sealed
Received by (print & sign)	Suzanne Rudd [signature]	Suzanne Rudd	☒ Lab	06/18/18	12:53	☒ Received Chilled / Iced ☒ Custody Transfer Unbroken

Corrected Temperature, °C: 1.0
Thermometer ID: 0715570
Sample condition good? Yes
Preservation correct? Yes
pH Paper ID: 0721941
Post-Preservatives: N/A

Ana-Lab Corp.
P.O. Box 9000
Kilgore, TX 75663
903/984-0551

LELAP-accredited #02008

Report

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Aqua-Tech Laboratories (Austin
John Brien
635 Phil Gramm Blvd.
Bryan, TX 77807-9104

Account
AQU5 -C

Project
835582

Additional Testing

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Report Name	Description	Pages
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835582_r03_06__ProjectTRRP	Ana-Lab Project P:835582 C:AQU5 Project TRRP Results Report for Class	12
835582_r10_05_ProjectQC	Ana-Lab Project P:835582 C:AQU5 Project Quality Control Groups	23
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Results

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Report To

Aqua-Tech Laboratories (Austin
John Brien
635 Phil Gramm Blvd.
Bryan, TX 77807-9104

Additional Testing

Account	*Project*
AQU5-C	835582

Results

1699289 **B014041-01** *Received:* 06/19/2018

Non-Potable Water *Collected by:* Client Aqua-Tech Laboratori *PO:*
Taken: 06/18/2018 06:30:00

Supplement to Test Report 1693934

ASTM D7065-06 *Prepared:* 784872 06/21/2018 09:00:00 *Analyzed* 785296 06/22/2018 12:50:00 DWL

	Parameter	Results	Units	RL	Flag	CAS	Bottle
z	Nonylphenol	<30.7	ug/L	30.7		25154-52-3	24

EPA 200.8 5.4 *Prepared:* 784798 06/20/2018 14:30:00 *Analyzed* 785029 06/21/2018 19:38:00 LPS

	Parameter	Results	Units	RL	Flag	CAS	Bottle
N	Silver, Total	<0.0002	mg/L	0.0002		7440-22-4	23

EPA 420.4 1 *Prepared:* 784963 06/21/2018 15:30:00 *Analyzed* 785227 06/22/2018 13:34:00 MLC

	Parameter	Results	Units	RL	Flag	CAS	Bottle
N	Phenolics, Total Recoverable	0.0048	mg/L	0.005	J		28

EPA 604.1 *Prepared:* 785104 06/22/2018 08:35:00 *Analyzed* 785471 06/22/2018 19:46:00 BRU

	Parameter	Results	Units	RL	Flag	CAS	Bottle
	Hexachlorophene	<5.07	ug/L	5.07		70-30-4	29

EPA 608 *Prepared:* 784703 06/20/2018 12:00:00 *Analyzed* 785325 06/21/2018 20:34:00 EMT

	Parameter	Results	Units	RL	Flag	CAS	Bottle
N	4,4-DDD	<0.0258	ug/L	0.0258		72-54-8	21
N	4,4-DDE	<0.0258	ug/L	0.0258		72-55-9	21
N	4,4-DDT	<0.0103	ug/L	0.0103		50-29-3	21
N	Aldrin	<0.010	ug/L	0.010		309-00-2	21
N	Alpha-BHC(hexachlorocyclohexane)	<0.0258	ug/L	0.0258		319-84-6	21
N	Beta-BHC(hexachlorocyclohexane)	<0.0103	ug/L	0.0103		319-85-7	21
N	Chlordane	<0.0103	ug/L	0.0103		57-74-9	21
N	Delta-BHC(hexachlorocyclohexane)	<0.0103	ug/L	0.0103		319-86-8	21
N	Dieldrin	<0.0103	ug/L	0.0103		60-57-1	21
N	Endosulfan I (alpha)	<0.010	ug/L	0.010		959-98-8	21
N	Endosulfan II (beta)	<0.0103	ug/L	0.0103		33213-65-9	21
N	Endosulfan sulfate	<0.0103	ug/L	0.0103		1031-07-8	21
N	Endrin	<0.0103	ug/L	0.0103		72-20-8	21
N	Endrin aldehyde	<0.0258	ug/L	0.0258		7421-93-4	21

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1699289 **B014041-01** *Received:* 06/19/2018

Non-Potable Water *Collected by:* Client Aqua-Tech Laboratori *PO:*

Taken: 06/18/2018 06:30:00

Supplement to Test Report 1693934

EPA 608 *Prepared:* 784703 06/20/2018 12:00:00 *Analyzed* 785325 06/21/2018 20:34:00 EMT

	Parameter	Results	Units	RL	Flag	CAS	Bottle
N	Gamma-BHC(Lindane)	<0.0103	ug/L	0.0103		58-89-9	21
N	Heptachlor	<0.010	ug/L	0.010		76-44-8	21
N	Heptachlor epoxide	<0.010	ug/L	0.010		1024-57-3	21
N	Methoxychlor	<0.0103	ug/L	0.0103		72-43-5	21
N	PCB-1016	<0.200	ug/L	0.200		12674-11-2	21
N	PCB-1221	<0.200	ug/L	0.200		11104-28-2	21
N	PCB-1232	<0.200	ug/L	0.200		11141-16-5	21
N	PCB-1242	<0.200	ug/L	0.200		53469-21-9	21
N	PCB-1248	<0.200	ug/L	0.200		12672-29-6	21
N	PCB-1254	<0.200	ug/L	0.200		11097-69-1	21
N	PCB-1260	<0.200	ug/L	0.200		11096-82-5	21
N	Toxaphene	<0.0103	ug/L	0.0103		8001-35-2	21

EPA 614 *Prepared:* 784705 06/20/2018 12:00:00 *Analyzed* 785750 06/26/2018 05:55:00 EMT

	Parameter	Results	Units	RL	Flag	CAS	Bottle
N	Azinphos-methyl (Guthion)	<0.0516	ug/L	0.0516		86-50-0	22
N	Demeton	<0.0516	ug/L	0.0516		8065-48-3	22
N	Diazinon	<0.0516	ug/L	0.0516		333-41-5	22
N	Malathion	<0.0516	ug/L	0.0516		121-75-5	22
N	Parathion, ethyl	<0.0516	ug/L	0.0516		56-38-2	22
N	Parathion, methyl	<0.0413	ug/L	0.0413	XD	298-00-0	22

EPA 615 *Prepared:* 785127 06/22/2018 09:00:00 *Analyzed* 786013 06/27/2018 18:56:00 EMT

	Parameter	Results	Units	RL	Flag	CAS	Bottle
N	2,4 Dichlorophenoxyacetic acid	<0.527	ug/L	0.527	D	94-75-7	30
N	2,4,5-TP (Silvex)	<0.300	ug/L	0.300	D	93-72-1	30

EPA 617 *Prepared:* 784703 06/20/2018 12:00:00 *Analyzed* 785326 06/21/2018 20:34:00 EMT

	Parameter	Results	Units	RL	Flag	CAS	Bottle
z	Kelthane (Dicofol)	<0.103	ug/L	0.103	S	115-32-2	21
z	Methoxychlor	<0.0103	ug/L	0.0103		72-43-5	21
z	Mirex	<0.020	ug/L	0.020		2385-85-5	21

EPA 622 *Prepared:* 784705 06/20/2018 12:00:00 *Analyzed* 785751 06/26/2018 05:55:00 EMT

	Parameter	Results	Units	RL	Flag	CAS	Bottle
N	Chlorpyrifos	<0.0413	ug/L	0.0413		2921-88-2	22

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1699289 **B014041-01** *Received:* 06/19/2018

Non-Potable Water *Collected by:* Client Aqua-Tech Laboratori *PO:*

Taken: 06/18/2018 06:30:00

Supplement to Test Report 1693934

EPA 624 *Prepared:* 784634 06/19/2018 14:56:00 *Analyzed* 784634 06/19/2018 14:56:00 JRH

	Parameter	Results	Units	RL	Flag	CAS	Bottle
N	Acrolein	<5.00	ug/L	5.00		107-02-8	15
N	Acrylonitrile	<1.00	ug/L	1.00		107-13-1	15

EPA 624 *Prepared:* 785061 06/21/2018 12:29:00 *Analyzed* 785061 06/21/2018 12:29:00 JRH

	Parameter	Results	Units	RL	Flag	CAS	Bottle
N	1,1,1,2-Tetrachloroethane	<1.00	ug/L	1.00		630-20-6	14
N	1,1,1-Trichloroethane	<1.00	ug/L	1.00		71-55-6	14
N	1,1,2,2-Tetrachloroethane	<1.00	ug/L	1.00		79-34-5	14
N	1,1,2-Trichloroethane	<1.00	ug/L	1.00		79-00-5	14
N	1,1-Dichloroethane	<1.00	ug/L	1.00		75-34-3	14
N	1,1-Dichloroethylene	<1.00	ug/L	1.00	D	75-35-4	14
N	1,1-Dichloropropene	<1.00	ug/L	1.00	S	563-58-6	14
N	1,2,3-Trichlorobenzene	<1.00	ug/L	1.00		87-61-6	14
N	1,2,3-Trichloropropane	<1.00	ug/L	1.00		96-18-4	14
N	1,2,4-Trichlorobenzene	<1.00	ug/L	1.00		120-82-1	14
N	1,2,4-Trimethylbenzene	<1.00	ug/L	1.00		95-63-6	14
N	1,2-Dibromo-3-chloropropane	<5.00	ug/L	5.00		96-12-8	14
N	1,2-Dibromoethane (EDB)	<1.00	ug/L	1.00		106-93-4	14
N	1,2-Dichloroethane	<1.00	ug/L	1.00		107-06-2	14
N	1,2-Dichloropropane	<1.00	ug/L	1.00		78-87-5	14
N	1,3,5-Trimethylbenzene	<1.00	ug/L	1.00		108-67-8	14
N	1,3-Dichloropropane	<1.00	ug/L	1.00	S	142-28-9	14
N	2,2-Dichloropropane	<1.00	ug/L	1.00		594-20-7	14
N	2-Chloroethylvinyl ether	<1.00	ug/L	1.00		110-75-8	14
N	2-Chlorotoluene	<1.00	ug/L	1.00		95-49-8	14
N	4-Chlorotoluene	<1.00	ug/L	1.00		106-43-4	14
N	Acetone	5.31	ug/L	5.00	D	67-64-1	14
N	Benzene	<1.00	ug/L	1.00		71-43-2	14
N	Bromobenzene	<1.00	ug/L	1.00		108-86-1	14
N	Bromochloromethane	<1.00	ug/L	1.00		74-97-5	14
N	Bromodichloromethane	<1.00	ug/L	1.00		75-27-4	14
N	Bromoform	<1.00	ug/L	1.00		75-25-2	14
N	Bromomethane (Methyl Bromi	<1.00	ug/L	1.00	D	74-83-9	14
N	Carbon Tetrachloride	<1.00	ug/L	1.00		56-23-5	14
N	Chlorobenzene	<1.00	ug/L	1.00		108-90-7	14
N	Chloroethane	<1.00	ug/L	1.00	D	75-00-3	14
N	Chloroform	0.450	ug/L	1.00	J	67-66-3	14
N	Chloromethane	<1.00	ug/L	1.00	D	74-87-3	14
N	cis-1,2-Dichloroethylene	<1.00	ug/L	1.00	SD	156-59-2	14
N	cis-1,3-Dichloropropene	<1.00	ug/L	1.00		10061-01-5	14
N	Dibromochloromethane	<1.00	ug/L	1.00		124-48- 1	14
N	Dibromomethane	<1.00	ug/L	1.00	S	74-95-3	14
N	Dichlorodifluoromethane	<1.00	ug/L	1.00	D	75-71-8	14

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Results

Printed: 07/11/2018

1699289 **B014041-01** *Received:* 06/19/2018

Non-Potable Water *Collected by:* Client Aqua-Tech Laboratori *PO:*

Taken: 06/18/2018 06:30:00

Supplement to Test Report 1693934

EPA 624 *Prepared:* 785061 06/21/2018 12:29:00 *Analyzed* 785061 06/21/2018 12:29:00 JRH

	Parameter	Results	Units	RL	Flag	CAS	Bottle
N	Dichloromethane	<1.00	ug/L	1.00	D	75-09-2	14
N	Ethylbenzene	<1.00	ug/L	1.00		100-41-4	14
N	Hexachlorobutadiene	<1.00	ug/L	1.00		87-68-3	14
N	Isopropylbenzene (Cumene)	<1.00	ug/L	1.00	S	98-82-8	14
N	m- and p-Xylene	<1.00	ug/L	1.00		ARC-mpXyl	14
N	m-Dichlorobenzene (1,3-DCB)	<1.00	ug/L	1.00		541-73-1	14
N	Methyl ethyl ketone (Butanone)	<5.00	ug/L	5.00		78-93-3	14
N	Methyl Isobutyl Ketone	<1.00	ug/L	1.00		108-10-1	14
N	Naphthalene	<1.00	ug/L	1.00		91-20-3	14
N	n-Butylbenzene	<1.00	ug/L	1.00		104-51-8	14
N	n-Propylbenzene	<1.00	ug/L	1.00		103-65-1	14
N	o-Dichlorobenzene (1,2-DCB)	<1.00	ug/L	1.00		95-50-1	14
N	o-Xylene	<1.00	ug/L	1.00		95-47-6	14
N	p-Dichlorobenzene (1,4-DCB)	<1.00	ug/L	1.00		106-46-7	14
N	p-Isopropyltoluene	<1.00	ug/L	1.00		99-87-6	14
N	sec-Butylbenzene	<1.00	ug/L	1.00		135-98-8	14
N	Styrene	<1.00	ug/L	1.00		100-42-5	14
N	tert-Butylbenzene	<1.00	ug/L	1.00		98-06-6	14
N	tert-Butylmethylether (MTBE)	<1.00	ug/L	1.00		1634-04-4	14
N	Tetrachloroethylene	<1.00	ug/L	1.00		127-18-4	14
N	Toluene	<1.00	ug/L	1.00		108-88-3	14
N	trans-1,2-Dichloroethylene	<1.00	ug/L	1.00	D	156-60-5	14
N	trans-1,3-Dichloropropene	<1.00	ug/L	1.00		10061-02-6	14
N	Trichloroethylene	<1.00	ug/L	1.00		79-01-6	14
N	Trichlorofluoromethane	<1.00	ug/L	1.00		75-69-4	14
N	Vinyl chloride	<1.00	ug/L	1.00	D	75-01-4	14

EPA 624 *Prepared:* 785061 07/02/2018 13:31:09 *Calculated* 785061 07/02/2018 13:31:09 CAL

	Parameter	Results	Units	RL	Flag	CAS	Bottle
N	Xylenes, Total	<1.00	ug/L	1.00		1330-20-7	14

EPA 625 *Prepared:* 784425 06/20/2018 09:00:00 *Analyzed* 784890 06/20/2018 20:14:00 DWL

	Parameter	Results	Units	RL	Flag	CAS	Bottle
N	1,2,4,5-Tetrachlorobenzene	<1.01	ug/L	1.01		95-94-3	19
N	1,2,4-Trichlorobenzene	<1.01	ug/L	1.01		120-82-1	19
N	1,2-Dichlorobenzene	<1.01	ug/L	1.01		95-50-1	19
N	1,2-DPH (as azobenzene)	<1.01	ug/L	1.01		122-66-7	19
N	1,3-Dichlorobenzene	<1.01	ug/L	1.01		541-73-1	19
N	1,4-Dichlorobenzene	<1.01	ug/L	1.01		106-46-7	19
N	2,4,5-Trichlorophenol	<1.01	ug/L	1.01		95-95-4	19
N	2,4,6-Trichlorophenol	<1.01	ug/L	1.01		88-06-2	19
N	2,4-Dichlorophenol	<1.01	ug/L	1.01		120-83-2	19

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Results

Printed: 07/11/2018 Page 5 of 10

1699289 **B014041-01** *Received:* 06/19/2018

Non-Potable Water *Collected by:* Client Aqua-Tech Laboratori *PO:*

Taken: 06/18/2018 06:30:00

Supplement to Test Report 1693934

EPA 625 *Prepared:* 784425 06/20/2018 09:00:00 *Analyzed* 784890 06/20/2018 20:14:00 *DWL*

	Parameter	Results	Units	RL	Flag	CAS	Bottle
N	2,4-Dimethylphenol	<2.02	ug/L	2.02		105-67-9	19
N	2,4-Dinitrophenol	<1.01	ug/L	1.01		51-28-5	19
N	2,4-Dinitrotoluene	<1.01	ug/L	1.01		121-14-2	19
N	2,6-Dichlorophenol	<1.01	ug/L	1.01		87-65-0	19
N	2,6-Dinitrotoluene	<1.01	ug/L	1.01		606-20-2	19
N	2-Chloronaphthalene	<1.01	ug/L	1.01		91-58-7	19
N	2-Chlorophenol	<1.01	ug/L	1.01		95-57-8	19
N	2-Methylnaphthalene	<1.01	ug/L	1.01		91-57-6	19
N	2-Methylphenol (o-Cresol)	<1.01	ug/L	1.01		95-48-7	19
N	2-Nitrophenol	<1.01	ug/L	1.01		88-75-5	19
N	3&4-Methylphenol (m&p-Cresol)	<1.01	ug/L	1.01		MEPH34	19
N	3,3'-Dichlorobenzidine	<1.01	ug/L	1.01		91-94-1	19
N	4,6-Dinitro-2-methylphenol	<1.01	ug/L	1.01		534-52-1	19
N	4-Bromophenyl phenyl ether	<1.01	ug/L	1.01		101-55-3	19
N	4-Chlorophenyl phenyl ethe	<1.01	ug/L	1.01		7005-72-3	19
N	4-Nitrophenol	<1.01	ug/L	1.01		100-02-7	19
N	Acenaphthene	<1.01	ug/L	1.01		83-32-9	19
N	Acenaphthylene	<1.01	ug/L	1.01		208-96-8	19
N	Anthracene	0.475	ug/L	1.01	J	120-12-7	19
N	Benzidine	<5.05	ug/L	5.05		92-87-5	19
N	Benzo(a)anthracene	1.03	ug/L	1.01		56-55-3	19
N	Benzo(a)pyrene	0.707	ug/L	1.01	J	50-32-8	19
N	Benzo(b)fluoranthene	0.657	ug/L	1.01	J	205-99-2	19
N	Benzo(ghi)perylene	0.364	ug/L	1.01	J	191-24-2	19
N	Benzo(k)fluoranthene	0.657	ug/L	1.01	J	207-08-9	19
N	Benzoic Acid	<1.01	ug/L	1.01		65-85-0	19
N	Benzyl Butyl phthalate	<1.01	ug/L	1.01		85-68-7	19
N	Bis(2-chloroethoxy)methane	<1.01	ug/L	1.01		111-91-1	19
N	Bis(2-chloroethyl)ether	<1.01	ug/L	1.01		111-44-4	19
N	Bis(2-chloroisopropyl)ether	<1.01	ug/L	1.01		108-60-1	19
N	Bis(2-ethylhexyl)phthalate	<5.05	ug/L	5.05		117-81-7	19
N	Chrysene (Benzo(a)phenanthrene)	0.929	ug/L	1.01	J	218-01-9	19
N	Dibenz(a,h)anthracene	<1.01	ug/L	1.01		53-70-3	19
N	Dibenzofuran	<1.01	ug/L	1.01		132-64-9	19
N	Diethyl phthalate	<1.01	ug/L	1.01		84-66-2	19
N	Dimethyl phthalate	<1.01	ug/L	1.01		131-11-3	19
N	Di-n-butylphthalate	<1.01	ug/L	1.01		84-74-2	19
N	Di-n-octylphthalate	<1.01	ug/L	1.01		117-84-0	19
N	Fluoranthene(Benzo(j,k)fluorene)	2.28	ug/L	1.01		206-44-0	19
N	Fluorene	<1.01	ug/L	1.01		86-73-7	19
N	Hexachlorobenzene	<1.01	ug/L	1.01		118-74-1	19
N	Hexachlorobutadiene	<1.01	ug/L	1.01		87-68-3	19
N	Hexachlorocyclopentadiene	<1.01	ug/L	1.01		77-47-4	19

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Results

Printed: 07/11/2018

1699289 **B014041-01** *Received:* 06/19/2018

Non-Potable Water *Collected by:* Client Aqua-Tech Laboratori *PO:*

Taken: 06/18/2018 06:30:00

Supplement to Test Report 1693934

EPA 625 *Prepared:* 784425 06/20/2018 09:00:00 *Analyzed* 784890 06/20/2018 20:14:00 DWL

	Parameter	Results	Units	RL	Flag	CAS	Bottle
N	Hexachloroethane	<1.01	ug/L	1.01		67-72-1	19
N	Indeno(1,2,3-cd)pyrene	0.333	ug/L	1.01	J	193-39-5	19
N	Isophorone	<1.01	ug/L	1.01		78-59-1	19
N	Naphthalene	<1.01	ug/L	1.01		91-20-3	19
N	Nitrobenzene	<1.01	ug/L	1.01		98-95-3	19
N	n-Nitrosodiethylamine	<1.01	ug/L	1.01		55-18-5	19
N	N-Nitrosodimethylamine	<1.01	ug/L	1.01		62-75-9	19
N	n-Nitroso-di-n-butylamine	<1.01	ug/L	1.01		924-16-3	19
N	N-Nitrosodi-n-propylamine	<1.01	ug/L	1.01		621-64-7	19
N	N-Nitrosodiphenylamine (as DPA	<1.01	ug/L	1.01		86-30-6	19
N	p-Chloro-m-Cresol (4-Chloro-3-me	<1.01	ug/L	1.01		59-50-7	19
N	Pentachlorobenzene	<1.01	ug/L	1.01		608-93-5	19
N	Pentachlorophenol	<1.01	ug/L	1.01		87-86-5	19
N	Phenanthrene	1.89	ug/L	1.01		85-01-8	19
N	Phenol	<1.01	ug/L	1.01		108-95-2	19
N	Pyrene	1.87	ug/L	1.01		129-00-0	19
N	Pyridine	<1.01	ug/L	1.01		110-86-1	19

EPA 625 *Prepared:* 784425 06/20/2018 09:00:00 *Calculated* 784890 07/11/2018 08:03:09 CAL

	Parameter	Results	Units	RL	Flag	CAS	Bottle
N	Cresols Total	<1.01	ug/L	1.01		1319-77-3, etc.	19

EPA 632 *Prepared:* 784702 06/20/2018 12:00:00 *Analyzed* 785254 06/22/2018 19:42:00 BRU

	Parameter	Results	Units	RL	Flag	CAS	Bottle
N	Carbaryl (Sevin)	<2.58	ug/L	2.58		63-25-2	20

SM 4500-CN⁻ E-2011 *Prepared:* 784922 06/21/2018 13:00:00 *Analyzed* 785215 06/21/2018 17:20:00 MLC

	Parameter	Results	Units	RL	Flag	CAS	Bottle
N	Cyanide After Chlorination	0.00614	mg/L	0.005			27

SM 4500-CN⁻ E-2011 *Prepared:* 784923 06/21/2018 13:00:00 *Analyzed* 785216 06/21/2018 17:58:00 MLC

	Parameter	Results	Units	RL	Flag	CAS	Bottle
N	Cyanide, total	<0.005	mg/L	0.005			26

SM 4500-CN⁻ G-2011 *Prepared:* 07/02/2018 13:31:09 *Calculated* 07/02/2018 13:31:09 CAL

	Parameter	Results	Units	RL	Flag	CAS	Bottle
N	Cyanide - Available/Amenable	<0.005	mg/L	0.005			

Sample Preparation

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Results

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1699289 **B014041-01** *Received:* 06/19/2018

		Prepared:	*784431*	*06/19/2018*	*00:00:00*	*Analyzed*	*784431*	*06/19/2018*	*00:00:00*	*AAJ*
z	Bottle pH	>10	SU						10	
z	Bottle pH	>10	SU						09	
z	Bottle pH	<2	SU						08	
z	Bottle pH	<2	SU						07	
	Cooler Temperature	0.4	degrees						10	
	Cooler Temperature	0.4	degrees						09	
	Cooler Temperature	0.4	degrees						08	
	Cooler Temperature	0.4	degrees						06	
	Cooler Temperature	0.4	degrees						05	
	Cooler Temperature	0.4	degrees						04	
	Cooler Temperature	0.4	degrees						03	
	Cooler Temperature	0.4	degrees						02	
	Cooler Temperature	0.4	degrees						01	
	Cooler Temperature	0.4	degrees						07	
	Cooler Temperature	2.1	degrees						11	
	Cooler Temperature	2.1	degrees						12	
	Cooler Temperature	2.1	degrees						13	
	Cooler Temperature	2.1	degrees						14	
	Cooler Temperature	2.1	degrees						15	
	Cooler Temperature	2.1	degrees						16	
	Cooler Temperature	2.1	degrees						17	
	Cooler Temperature	2.1	degrees						18	
	ASTM D7065-11	*Prepared:*	*784872*	*06/21/2018*	*09:00:00*	*Analyzed*	*785296*	*06/22/2018*	*12:50:00*	*DWL*
z	Nonyl Phenol Expansion	Entered							24	
	Cooler Return	*Prepared:*		*06/20/2018*	*17:00:00*	*Analyzed*		*06/20/2018*	*17:00:00*	*MG3*
z	Return Cooler/No bottles Require	Returned								
z	Return Cooler/No bottles Require	Returned								
	EPA 200.2 2.8	*Prepared:*	*784798*	*06/20/2018*	*14:30:00*	*Analyzed*	*784798*	*06/20/2018*	*14:30:00*	*TES*
N	Liquid Metals Digestion	50/50	ml						08	
	EPA 420.4 1	*Prepared:*	*784963*	*06/21/2018*	*15:30:00*	*Analyzed*	*784963*	*06/21/2018*	*15:30:00*	*CRS*
N	Phenol Distillation	50/50	ml						25	

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1699289 **B014041-01** *Received:* 06/19/2018

EPA 604.1	*Prepared:*	*785104*	*06/22/2018*	*08:35:00*	*Analyzed*	*785104*	*06/22/2018*	*08:35:00*		*TNK*
Hexachlorophene Extraction	**5/986**	**ml**							**01**	
EPA 604.1	*Prepared:*	*785104*	*06/22/2018*	*08:35:00*	*Analyzed*	*785471*	*06/22/2018*	*19:46:00*		*BRU*
Hexachlorophene Expansion	**Entered**						**70-30-4**		**29**	
EPA 608	*Prepared:*	*784703*	*06/20/2018*	*12:00:00*	*Analyzed*	*785325*	*06/21/2018*	*20:34:00*		*EMT*
N **Pesticides by GC**	**Entered**								**21**	
N **Polychlorinated Biphenyls**	**Entered**								**21**	
EPA 614	*Prepared:*	*784705*	*06/20/2018*	*12:00:00*	*Analyzed*	*785750*	*06/26/2018*	*05:55:00*		*EMT*
N **Permit Organophos. Pesticides**	**Entered**								**22**	
EPA 614/608/617/1657	*Prepared:*	*784703*	*06/20/2018*	*12:00:00*	*Analyzed*	*784703*	*06/20/2018*	*12:00:00*		*TNK*
Liquid-Liquid Extr. W/Hex Ex	**1/969**	**ml**							**03**	
EPA 614/608/617/1657	*Prepared:*	*784705*	*06/20/2018*	*12:00:00*	*Analyzed*	*784705*	*06/20/2018*	*12:00:00*		*TNK*
Solvent Extraction	**1/969**	**ml**							**03**	
EPA 614/608/617/1657	*Prepared:*	*785532*	*06/26/2018*	*13:00:00*	*Analyzed*	*785532*	*06/26/2018*	*13:00:00*		*TNK*
Liquid-Liquid Extr. W/Hex Ex	**10/681**	**ml**							**06**	
EPA 615	*Prepared:*	*785127*	*06/22/2018*	*09:00:00*	*Analyzed*	*785127*	*06/22/2018*	*09:00:00*		*MCC*
N **Esterification of Sample**	**10/949**	**ml**							**04**	
EPA 615	*Prepared:*	*785127*	*06/22/2018*	*09:00:00*	*Analyzed*	*786013*	*06/27/2018*	*18:56:00*		*EMT*
N **Herbicides by GC**	**Entered**								**30**	
EPA 617	*Prepared:*	*784703*	*06/20/2018*	*12:00:00*	*Analyzed*	*785326*	*06/21/2018*	*20:34:00*		*EMT*

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Results

Printed: 07/11/2018

1699289 **B014041-01** *Received:* 06/19/2018

EPA 617	*Prepared:*	*784703*	*06/20/2018*	*12:00:00*	*Analyzed*	*785326*	*06/21/2018*	*20:34:00*		*EMT*
For use with !PPR only	**Entered**								**21**	
EPA 622	*Prepared:*	*784705*	*06/20/2018*	*12:00:00*	*Analyzed*	*785751*	*06/26/2018*	*05:55:00*		*EMT*
N **For use with EXP !CPP only**	**Entered**								**22**	
EPA 624	*Prepared:*	*784634*	*06/19/2018*	*14:56:00*	*Analyzed*	*784634*	*06/19/2018*	*14:56:00*		*JRH*
N **Acrolein/Acrylonitrile Exp.**	**Entered**								**15**	
EPA 624	*Prepared:*	*785061*	*06/21/2018*	*12:29:00*	*Analyzed*	*785061*	*06/21/2018*	*12:29:00*		*JRH*
N **Volatiles by GC/MS**	**Entered**								**14**	
EPA 625	*Prepared:*	*784425*	*06/20/2018*	*09:00:00*	*Analyzed*	*784425*	*06/20/2018*	*09:00:00*		*TNK*
Liquid-Liquid Extraction, BNA	**1/990**		**ml**						**02**	
EPA 625	*Prepared:*	*784425*	*06/20/2018*	*09:00:00*	*Analyzed*	*784890*	*06/20/2018*	*20:14:00*		*DWL*
N **Semivolatile Hydrocarbons**	**Entered**								**19**	
EPA 625	*Prepared:*	*784872*	*06/21/2018*	*09:00:00*	*Analyzed*	*784872*	*06/21/2018*	*09:00:00*		*MCC*
Nonylphenol Liq-Liq Extract	**1/978**		**ml**						**07**	
EPA 632	*Prepared:*	*784702*	*06/20/2018*	*12:00:00*	*Analyzed*	*784702*	*06/20/2018*	*12:00:00*		*TNK*
Liquid-Liquid Extr. W/Hex Ex	**1/969**		**ml**						**03**	
EPA 632	*Prepared:*	*784702*	*06/20/2018*	*12:00:00*	*Analyzed*	*785254*	*06/22/2018*	*19:42:00*		*BRU*
N **Carbaryl (Sevin) Expansion**	**Entered**							**63-25-2**	**20**	
SM 4500-CN⁻ C-2011	*Prepared:*	*784922*	*06/21/2018*	*13:00:00*	*Analyzed*	*784922*	*06/21/2018*	*13:00:00*		*CRS*
N **CN Dist After Chlorination**	**10/5**		**ml**						**09**	

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Results

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1699289 **B014041-01** *Received:* 06/19/2018

SM 4500-CN⁻ E-2011	*Prepared:*	*784923*	*06/21/2018*	*13:00:00*	*Analyzed*	*784923*	*06/21/2018*	*13:00:00*	*CRS*
N **Cyanide Distillation**	**10/5**		**ml**					**10**	

Qualifiers:

J - Analyte detected below quantitation limit
D - Duplicate RPD was higher than expected
X - Standard reads higher than desired.
S - Standard reads lower than desired

We report results on an 'As Received' or wet basis unless marked 'Dry Weight'. Unless otherwise noted, testing was performed at Ana-lab's corporate laboratory that holds the following Federal and State certificates: Texas Department of Health Lead Firm Certificate 2110076, US Department of Agriculture Soil Import Permit S-37592, Texas Commisson on Environmental Quality Drinking Water Laboratory Certificate TX219, Texas Commission on Environmental Quality NELAP T104704201-18, Oklahoma Department of Environmental Quality Drinking Water Certification Lab ID# D9913, EPA Lab Number TX00063, USEPA Approved Perchlorate Testing Lab, Oklahoma Department of Environmental Quality Laboratory Certificate 8125, Arkansas Department of Environmental Quality Certification #03-070-0, Louisiana Department of Environmental Quality Laboratory Certification (NELAP, LELAP) #02008, Louisiana Department of Health and Hospitals Drinking Water (NELAP) # LA030020, US Department of Energy Approved. The Accredited column designates accreditation by N -- NELAC, or z -- not covered under NELAC scope of accreditation.
These analytical results relate to the sample tested. This report may NOT be reproduced EXCEPT in FULL without written approval of Ana-Lab Corp. Unless otherwise specified, these test results meet the requirements of NELAC.
RL is the Reporting Limit (sample specific quantitation limit) and is at or above the Method Detection Limit (MDL). CAS is Chemical Abstract Service number. RL is our Reporting Limit, or Minimum Quantitation Level. The RL takes into account the Instrument Detection Limit (IDL), Method Detection Limit (MDL), and Practical Quantitation Limit (PQL), and any dilutions and/or concentrations performed during sample preparation (EQL). Our analytical result must be above this RL before we report a value in the 'Results' column of our report (without a 'J' flag). Otherwise, we report ND (Not Detected above RL), because the result is "<" (less than) the number in the RL column. MAL is Minimum Analytical Level and is typically from regulatory agencies. Unless we report a result in the result column, or interferences prevent it, we work to have our RL at or below the MAL.

Paul Zhang, Ph.D., Quality Director

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Results Summary

Project 835582

Report To

Aqua-Tech Laboratories (Austin
John Brien
635 Phil Gramm Blvd.
Bryan, TX 77807-9104

Additional Testing

CAS	Parameter	Results	MDL	SDL	MQL	MQLAdj	Flag	Units	Target	Bottle	Dilute
Non-Potable Water	**Administrative**								**SM 4500-CN⁻ G-2011**		
1699289	**B014041-01**										
		Collection:	06/18/2018		06:30:00	Client			*Received:*	06/19/2018	
Supplement to Test Report 1693934											
Prepared:											
				Analyzed:				7/2/18	13:31:09		
	Cyanide - Available/Amenable	**ND**	0.00372	0.00372	0.005	0.005		mg/L	0.010		1.00
Non-Potable Water	**Distillations**								**EPA 420.4 1**		
1699289	**B014041-01**										
		Collection:	06/18/2018		06:30:00	Client			*Received:*	06/19/2018	
Supplement to Test Report 1693934											
Prepared:	784963										
				Analyzed:	785227			6/22/18	13:34:00		
	Phenolics, Total Recoverable	**0.0048**	0.00377	0.00377	0.005	0.005	J	mg/L	0.005	28	1.00
Non-Potable Water	**Distillations**								**SM 4500-CN⁻ E-2011**		
1699289	**B014041-01**										
		Collection:	06/18/2018		06:30:00	Client			*Received:*	06/19/2018	
Supplement to Test Report 1693934											
Prepared:	784922										
				Analyzed:	785215			6/21/18	17:20:00		
	Cyanide After Chlorination	**0.00614**	0.00372	0.00372	0.005	0.005		mg/L		27	1.00
Prepared:	784923										
				Analyzed:	785216			6/21/18	17:58:00		
	Cyanide, total	**ND**	0.00372	0.00372	0.005	0.005		mg/L	0.010	26	1.00

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Results Summary

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Project 835582

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Additional Testing

CAS	Parameter	Results	MDL	SDL	MQL	MQLAdj	Flag	Units	Target	Bottle	Dilute
Non-Potable Water	**Metals**								**EPA 200.8 5.4**		
1699289	**B014041-01**										
		Collection:	06/18/2018		06:30:00	Client			*Received:*	06/19/2018	
Supplement to Test Report 1693934											
Prepared:	784798										
				Analyzed:	785029			6/21/18	19:38:00		
7440-22-4	Silver, Total	ND	0.0000628	0.0000628	0.0002	0.0002		mg/L	0.0005	23	1.00
Non-Potable Water	**Organics**								**ASTM D7065-06**		
1699289	**B014041-01**										
		Collection:	06/18/2018		06:30:00	Client			*Received:*	06/19/2018	
Supplement to Test Report 1693934											
Prepared:	784872										
				Analyzed:	785296			6/22/18	12:50:00		
25154-52-3	Nonylphenol	ND	5.00	5.11	30.0	30.7		ug/L	333	24	1.02
Non-Potable Water	**Organics**								**EPA 604.1**		
1699289	**B014041-01**										
		Collection:	06/18/2018		06:30:00	Client			*Received:*	06/19/2018	
Supplement to Test Report 1693934											
Prepared:	785104										
				Analyzed:	785471			6/22/18	19:46:00		
70-30-4	Hexachlorophene	ND	2.26	2.29	5.00	5.07		ug/L	10.0	29	1.01
Non-Potable Water	**Organics**								**EPA 608**		
1699289	**B014041-01**										
		Collection:	06/18/2018		06:30:00	Client			*Received:*	06/19/2018	

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Results Summary

Project 835582

Report To

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Additional Testing

CAS	Parameter	Results	MDL	SDL	MQL	MQLAdj	Flag	Units	Target	Bottle	Dilute
Non-Potable Water	**Organics**					**EPA 608**					
Supplement to Test Report 1693934											
Prepared:	784703										
				Analyzed:		785325		6/21/18	20:34:00		
72-54-8	4,4-DDD	ND	0.0194	0.020	0.025	0.0258		ug/L	0.100	21	1.03
72-55-9	4,4-DDE	ND	0.0161	0.0166	0.025	0.0258		ug/L	0.100	21	1.03
50-29-3	4,4-DDT	ND	0.00591	0.0061	0.010	0.0103		ug/L	0.020	21	1.03
309-00-2	Aldrin	ND	0.00253	0.00261	0.010	0.0103		ug/L	0.010	21	1.03
319-84-6	Alpha-BHC(hexachlorocyclohexane)	ND	0.015	0.0155	0.025	0.0258		ug/L	0.050	21	1.03
319-85-7	Beta-BHC(hexachlorocyclohexane)	ND	0.00871	0.00899	0.010	0.0103		ug/L	0.050	21	1.03
57-74-9	Chlordane	ND	0.00188	0.00194	0.010	0.0103		ug/L	0.200	21	1.03
319-86-8	Delta-BHC(hexachlorocyclohexane)	ND	0.00523	0.0054	0.010	0.0103		ug/L	0.050	21	1.03
60-57-1	Dieldrin	ND	0.00653	0.00674	0.010	0.0103		ug/L	0.020	21	1.03
959-98-8	Endosulfan I (alpha)	ND	0.00719	0.00742	0.010	0.0103		ug/L	0.010	21	1.03
33213-65-9	Endosulfan II (beta)	ND	0.00767	0.00792	0.010	0.0103		ug/L	0.020	21	1.03
1031-07-8	Endosulfan sulfate	ND	0.00333	0.00344	0.010	0.0103		ug/L	0.100	21	1.03
72-20-8	Endrin	ND	0.00857	0.00884	0.010	0.0103		ug/L	0.020	21	1.03
7421-93-4	Endrin aldehyde	ND	0.0144	0.0149	0.025	0.0258		ug/L	0.100	21	1.03
58-89-9	Gamma-BHC(Lindane)	ND	0.00897	0.00926	0.010	0.0103		ug/L	0.050	21	1.03
76-44-8	Heptachlor	ND	0.00147	0.00152	0.010	0.0103		ug/L	0.010	21	1.03
1024-57-3	Heptachlor epoxide	ND	0.00128	0.00132	0.010	0.0103		ug/L	0.010	21	1.03
72-43-5	Methoxychlor	ND	0.00563	0.00581	0.010	0.0103		ug/L	2.00	21	1.03
8001-35-2	Toxaphene	ND	0.00373	0.00385	0.010	0.0103		ug/L	0.300	21	1.03
				Analyzed:		787700		6/21/18	20:34:00		
12674-11-2	PCB-1016	ND	0.155	0.160	0.200	0.206		ug/L	0.200	21	1.03
11104-28-2	PCB-1221	ND	0.143	0.148	0.200	0.206		ug/L	0.200	21	1.03
11141-16-5	PCB-1232	ND	0.143	0.148	0.200	0.206		ug/L	0.200	21	1.03
53469-21-9	PCB-1242	ND	0.143	0.148	0.200	0.206		ug/L	0.200	21	1.03

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Results Summary

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Project 835582

Report To

Aqua-Tech Laboratories (Austin
John Brien
635 Phil Gramm Blvd.
Bryan, TX 77807-9104

Additional Testing

CAS	Parameter	Results	MDL	SDL	MQL	MQLAdj	Flag	Units	Target	Bottle	Dilute
Non-Potable Water	**Organics**								**EPA 608**		
12672-29-6	PCB-1248	ND	0.143	0.148	0.200	0.206		ug/L	0.200	21	1.03
11097-69-1	PCB-1254	ND	0.143	0.148	0.200	0.206		ug/L	0.200	21	1.03
11096-82-5	PCB-1260	ND	0.143	0.148	0.200	0.206		ug/L	0.200	21	1.03
Non-Potable Water	**Organics**								**EPA 614**		
1699289	**B014041-01**										
		Collection:	06/18/2018	06:30:00	Client			*Received:*	06/19/2018		
Supplement to Test Report 1693934											
Prepared:	784705				*Analyzed:*	785750		6/26/18	05:55:00		
86-50-0	Azinphos-methyl (Guthion)	ND	0.0461	0.0476	0.050	0.0516		ug/L	0.100	22	1.03
8065-48-3	Demeton	ND	0.0407	0.042	0.050	0.0516		ug/L	0.200	22	1.03
333-41-5	Diazinon	ND	0.0432	0.0446	0.050	0.0516		ug/L	0.100	22	1.03
121-75-5	Malathion	ND	0.0466	0.0481	0.050	0.0516		ug/L	0.100	22	1.03
56-38-2	Parathion, ethyl	ND	0.0292	0.0301	0.050	0.0516		ug/L	0.100	22	1.03
298-00-0	Parathion, methyl	ND	0.0395	0.0408	0.040	0.0413	XD	ug/L	0.050	22	1.03
Non-Potable Water	**Organics**								**EPA 615**		
1699289	**B014041-01**										
		Collection:	06/18/2018	06:30:00	Client			*Received:*	06/19/2018		
Supplement to Test Report 1693934											
Prepared:	785127				*Analyzed:*	786013		6/27/18	18:56:00		
94-75-7	2,4 Dichlorophenoxyacetic acid	ND	0.237	0.250	0.500	0.527	D	ug/L	0.700	30	1.05
93-72-1	2,4,5-TP (Silvex)	ND	0.130	0.137	0.300	0.316	D	ug/L	0.300	30	1.05
Non-Potable Water	**Organics**								**EPA 617**		

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Results Summary

Project 835582

Report To

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Additional Testing

CAS	Parameter	Results	MDL	SDL	MQL	MQLAdj	Flag	Units	Target	Bottle	Dilute
Non-Potable Water	**Organics**								**EPA 617**		
1699289	**B014041-01**										
		Collection:	06/18/2018		06:30:00	Client			*Received:*	06/19/2018	
Supplement to Test Report 1693934											
	Prepared: 784703										
				Analyzed:	785326			6/21/18	20:34:00		
115-32-2	Kelthane (Dicofol)	ND	0.028	0.0289	0.100	0.103	S	ug/L	1.00	21	1.03
72-43-5	Methoxychlor	ND	0.00563	0.00581	0.010	0.0103		ug/L	2.00	21	1.03
2385-85-5	Mirex	ND	0.00889	0.00917	0.020	0.0206		ug/L	0.020	21	1.03
Non-Potable Water	**Organics**								**EPA 622**		
1699289	**B014041-01**										
		Collection:	06/18/2018		06:30:00	Client			*Received:*	06/19/2018	
Supplement to Test Report 1693934											
	Prepared: 784705										
				Analyzed:	785751			6/26/18	05:55:00		
2921-88-2	Chlorpyrifos	ND	0.0394	0.0407	0.040	0.0413		ug/L	0.050	22	1.03
Non-Potable Water	**Organics**								**EPA 624**		
1699289	**B014041-01**										
		Collection:	06/18/2018		06:30:00	Client			*Received:*	06/19/2018	
Supplement to Test Report 1693934											
	Prepared: 784634										
				Analyzed:	784634			6/19/18	14:56:00		
107-02-8	Acrolein	ND	0.883	0.883	5.00	5.00		ug/L	50.0	15	1.00
107-13-1	Acrylonitrile	ND	0.697	0.697	1.00	1.00		ug/L	50.0	15	1.00
	Prepared: 785061										
				Analyzed:	785061			6/21/18	12:29:00		

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Results Summary

Project 835582

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Additional Testing

CAS	Parameter	Results	MDL	SDL	MQL	MQLAdj	Flag	Units	Target	Bottle	Dilute
Non-Potable Water	**Organics**						**EPA 624**				
630-20-6	1,1,1,2-Tetrachloroethane	ND	0.388	0.388	1.00	1.00		ug/L		14	1.00
71-55-6	1,1,1-Trichloroethane	ND	0.265	0.265	1.00	1.00		ug/L	10.0	14	1.00
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.270	0.270	1.00	1.00		ug/L	10.0	14	1.00
79-00-5	1,1,2-Trichloroethane	ND	0.425	0.425	1.00	1.00		ug/L	10.0	14	1.00
75-34-3	1,1-Dichloroethane	ND	0.496	0.496	1.00	1.00		ug/L	10.0	14	1.00
75-35-4	1,1-Dichloroethylene	ND	0.404	0.404	1.00	1.00	D	ug/L	10.0	14	1.00
563-58-6	1,1-Dichloropropene	ND	0.514	0.514	1.00	1.00	S	ug/L		14	1.00
87-61-6	1,2,3-Trichlorobenzene	ND	0.411	0.411	1.00	1.00		ug/L	5.00	14	1.00
96-18-4	1,2,3-Trichloropropane	ND	0.956	0.956	1.00	1.00		ug/L	5.00	14	1.00
120-82-1	1,2,4-Trichlorobenzene	ND	0.499	0.499	1.00	1.00		ug/L	5.00	14	1.00
95-63-6	1,2,4-Trimethylbenzene	ND	0.302	0.302	1.00	1.00		ug/L	5.00	14	1.00
96-12-8	1,2-Dibromo-3-chloropropane	ND	2.09	2.09	5.00	5.00		ug/L	5.00	14	1.00
106-93-4	1,2-Dibromoethane (EDB)	ND	0.275	0.275	1.00	1.00		ug/L	10.0	14	1.00
107-06-2	1,2-Dichloroethane	ND	0.456	0.456	1.00	1.00		ug/L	10.0	14	1.00
78-87-5	1,2-Dichloropropane	ND	0.415	0.415	1.00	1.00		ug/L	10.0	14	1.00
108-67-8	1,3,5-Trimethylbenzene	ND	0.243	0.243	1.00	1.00		ug/L	5.00	14	1.00
142-28-9	1,3-Dichloropropane	ND	0.334	0.334	1.00	1.00	S	ug/L	5.00	14	1.00
594-20-7	2,2-Dichloropropane	ND	0.484	0.484	1.00	1.00		ug/L	5.00	14	1.00
110-75-8	2-Chloroethylvinyl ether	ND	0.423	0.423	1.00	1.00		ug/L	10.0	14	1.00
95-49-8	2-Chlorotoluene	ND	0.318	0.318	1.00	1.00		ug/L	5.00	14	1.00
106-43-4	4-Chlorotoluene	ND	0.354	0.354	1.00	1.00		ug/L	5.00	14	1.00
67-64-1	Acetone	5.31	2.07	2.07	5.00	5.00	D	ug/L	20.0	14	1.00
71-43-2	Benzene	ND	0.187	0.187	1.00	1.00		ug/L	10.0	14	1.00
108-86-1	Bromobenzene	ND	0.585	0.585	1.00	1.00		ug/L	5.00	14	1.00
74-97-5	Bromochloromethane	ND	0.476	0.476	1.00	1.00		ug/L	5.00	14	1.00
75-27-4	Bromodichloromethane	ND	0.307	0.307	1.00	1.00		ug/L	10.0	14	1.00
75-25-2	Bromoform	ND	0.288	0.288	1.00	1.00		ug/L	10.0	14	1.00

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Results Summary

Project 835582

Report To

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Additional Testing

CAS	Parameter	Results	MDL	SDL	MQL	MQLAdj	Flag	Units	Target	Bottle	Dilute
Non-Potable Water	Organics						EPA 624				
74-83-9	Bromomethane (Methyl Bromi	ND	0.554	0.554	1.00	1.00	D	ug/L	50.0	14	1.00
56-23-5	Carbon Tetrachloride	ND	0.359	0.359	1.00	1.00		ug/L	2.00	14	1.00
108-90-7	Chlorobenzene	ND	0.226	0.226	1.00	1.00		ug/L	10.0	14	1.00
75-00-3	Chloroethane	ND	0.396	0.396	1.00	1.00	D	ug/L	50.0	14	1.00
67-66-3	Chloroform	0.450	0.211	0.211	1.00	1.00	J	ug/L	10.0	14	1.00
74-87-3	Chloromethane	ND	0.391	0.391	1.00	1.00	D	ug/L	50.0	14	1.00
156-59-2	cis-1,2-Dichloroethylene	ND	0.502	0.502	1.00	1.00	SD	ug/L	70.0	14	1.00
10061-01-5	cis-1,3-Dichloropropene	ND	0.488	0.488	1.00	1.00		ug/L	10.0	14	1.00
124-48- 1	Dibromochloromethane	ND	0.185	0.185	1.00	1.00		ug/L	10.0	14	1.00
74-95-3	Dibromomethane	ND	0.382	0.382	1.00	1.00	S	ug/L	70.0	14	1.00
75-71-8	Dichlorodifluoromethane	ND	0.405	0.405	1.00	1.00	D	ug/L	5.00	14	1.00
75-09-2	Dichloromethane	ND	0.570	0.570	1.00	1.00	D	ug/L	20.0	14	1.00
100-41-4	Ethylbenzene	ND	0.180	0.180	1.00	1.00		ug/L	10.0	14	1.00
87-68-3	Hexachlorobutadiene	ND	0.793	0.793	1.00	1.00		ug/L	10.0	14	1.00
98-82-8	Isopropylbenzene (Cumene)	ND	0.383	0.383	1.00	1.00	S	ug/L	5.00	14	1.00
ARC-mpXyl	m- and p-Xylene	ND	0.325	0.325	1.00	1.00		ug/L	10.0	14	1.00
541-73-1	m-Dichlorobenzene (1,3-DCB)	ND	0.315	0.315	1.00	1.00		ug/L	10.0	14	1.00
78-93-3	Methyl ethyl ketone (Butanone)	ND	0.382	0.382	5.00	5.00		ug/L	50.0	14	1.00
108-10-1	Methyl Isobutyl Ketone	ND	0.458	0.458	1.00	1.00		ug/L	5.00	14	1.00
91-20-3	Naphthalene	ND	0.194	0.194	1.00	1.00		ug/L	10.0	14	1.00
104-51-8	n-Butylbenzene	ND	0.493	0.493	1.00	1.00		ug/L	5.00	14	1.00
103-65-1	n-Propylbenzene	ND	0.277	0.277	1.00	1.00		ug/L	5.00	14	1.00
95-50-1	o-Dichlorobenzene (1,2-DCB)	ND	0.292	0.292	1.00	1.00		ug/L	10.0	14	1.00
95-47-6	o-Xylene	ND	0.190	0.190	1.00	1.00		ug/L	10.0	14	1.00
106-46-7	p-Dichlorobenzene (1,4-DCB)	ND	0.294	0.294	1.00	1.00		ug/L	10.0	14	1.00
99-87-6	p-Isopropyltoluene	ND	0.261	0.261	1.00	1.00		ug/L	5.00	14	1.00
135-98-8	sec-Butylbenzene	ND	0.182	0.182	1.00	1.00		ug/L	5.00	14	1.00

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Results Summary

Project 835582

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Additional Testing

CAS	Parameter	Results	MDL	SDL	MQL	MQLAdj	Flag	Units	Target	Bottle	Dilute
Non-Potable Water	**Organics**						**EPA 624**				
100-42-5	Styrene	ND	0.254	0.254	1.00	1.00		ug/L	10.0	14	1.00
98-06-6	tert-Butylbenzene	ND	0.217	0.217	1.00	1.00		ug/L	5.00	14	1.00
1634-04-4	tert-Butylmethylether (MTBE)	ND	0.348	0.348	1.00	1.00		ug/L	70.0	14	1.00
127-18-4	Tetrachloroethylene	ND	0.391	0.391	1.00	1.00		ug/L	10.0	14	1.00
108-88-3	Toluene	ND	0.314	0.314	1.00	1.00		ug/L	10.0	14	1.00
156-60-5	trans-1,2-Dichloroethylene	ND	0.518	0.518	1.00	1.00	D	ug/L	10.0	14	1.00
10061-02-6	trans-1,3-Dichloropropene	ND	0.223	0.223	1.00	1.00		ug/L	10.0	14	1.00
79-01-6	Trichloroethylene	ND	0.562	0.562	1.00	1.00		ug/L	10.0	14	1.00
75-69-4	Trichlorofluoromethane	ND	0.514	0.514	1.00	1.00		ug/L	5.00	14	1.00
75-01-4	Vinyl chloride	ND	0.228	0.228	1.00	1.00	D	ug/L	10.0	14	1.00
1330-20-7	Xylenes, Total	ND	0.325	0.325	1.00	1.00		ug/L	10.0	14	1.00
Non-Potable Water	**Organics**						**EPA 625**				

1699289 **B014041-01**

Collection: 06/18/2018 06:30:00 Client *Received:* 06/19/2018

Supplement to Test Report 1693934

Prepared: 784425

Analyzed: 784890 6/20/18 20:14:00

95-94-3	1,2,4,5-Tetrachlorobenzene	ND	0.288	0.291	1.00	1.01		ug/L	20.0	19	1.01
120-82-1	1,2,4-Trichlorobenzene	ND	0.286	0.289	1.00	1.01		ug/L	10.0	19	1.01
95-50-1	1,2-Dichlorobenzene	ND	0.291	0.294	1.00	1.01		ug/L	10.0	19	1.01
122-66-7	1,2-DPH (as azobenzene)	ND	0.290	0.293	1.00	1.01		ug/L	20.0	19	1.01
541-73-1	1,3-Dichlorobenzene	ND	0.265	0.268	1.00	1.01		ug/L	10.0	19	1.01
106-46-7	1,4-Dichlorobenzene	ND	0.271	0.274	1.00	1.01		ug/L	10.0	19	1.01
95-95-4	2,4,5-Trichlorophenol	ND	0.201	0.203	1.00	1.01		ug/L	50.0	19	1.01
88-06-2	2,4,6-Trichlorophenol	ND	0.308	0.311	1.00	1.01		ug/L	10.0	19	1.01
120-83-2	2,4-Dichlorophenol	ND	0.321	0.324	1.00	1.01		ug/L	10.0	19	1.01

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CAS	Parameter	Results	MDL	SDL	MQL	MQLAdj	Flag	Units	Target	Bottle	Dilute
Non-Potable Water	Organics							EPA 625			
105-67-9	2,4-Dimethylphenol	ND	1.10	1.11	2.00	2.02		ug/L	10.0	19	1.01
51-28-5	2,4-Dinitrophenol	ND	0.413	0.417	1.00	1.01		ug/L	50.0	19	1.01
121-14-2	2,4-Dinitrotoluene	ND	0.282	0.285	1.00	1.01		ug/L	10.0	19	1.01
87-65-0	2,6-Dichlorophenol	ND	0.357	0.361	1.00	1.01		ug/L		19	1.01
606-20-2	2,6-Dinitrotoluene	ND	0.295	0.298	1.00	1.01		ug/L	10.0	19	1.01
91-58-7	2-Chloronaphthalene	ND	0.307	0.310	1.00	1.01		ug/L	10.0	19	1.01
95-57-8	2-Chlorophenol	ND	0.354	0.358	1.00	1.01		ug/L	10.0	19	1.01
91-57-6	2-Methylnaphthalene	ND	0.348	0.352	1.00	1.01		ug/L		19	1.01
95-48-7	2-Methylphenol (o-Cresol)	ND	0.330	0.333	1.00	1.01		ug/L	10.0	19	1.01
88-75-5	2-Nitrophenol	ND	0.397	0.401	1.00	1.01		ug/L	20.0	19	1.01
MEPH34	3&4-Methylphenol (m&p-Cresol)	ND	0.297	0.300	1.00	1.01		ug/L	10.0	19	1.01
91-94-1	3,3'-Dichlorobenzidine	ND	0.467	0.472	1.00	1.01		ug/L	5.00	19	1.01
534-52-1	4,6-Dinitro-2-methylphenol	ND	0.246	0.248	1.00	1.01		ug/L	50.0	19	1.01
101-55-3	4-Bromophenyl phenyl ether	ND	0.266	0.269	1.00	1.01		ug/L	10.0	19	1.01
7005-72-3	4-Chlorophenyl phenyl ethe	ND	0.303	0.306	1.00	1.01		ug/L	10.0	19	1.01
100-02-7	4-Nitrophenol	ND	0.109	0.110	1.00	1.01		ug/L	50.0	19	1.01
83-32-9	Acenaphthene	ND	0.309	0.312	1.00	1.01		ug/L	10.0	19	1.01
208-96-8	Acenaphthylene	ND	0.308	0.311	1.00	1.01		ug/L	10.0	19	1.01
120-12-7	Anthracene	0.475	0.309	0.312	1.00	1.01	J	ug/L	10.0	19	1.01
92-87-5	Benzidine	ND	3.96	4.00	5.00	5.05		ug/L	50.0	19	1.01
56-55-3	Benzo(a)anthracene	1.03	0.218	0.220	1.00	1.01		ug/L	5.00	19	1.01
50-32-8	Benzo(a)pyrene	0.707	0.186	0.188	1.00	1.01	J	ug/L	5.00	19	1.01
205-99-2	Benzo(b)fluoranthene	0.657	0.200	0.202	1.00	1.01	J	ug/L	10.0	19	1.01
191-24-2	Benzo(ghi)perylene	0.364	0.348	0.352	1.00	1.01	J	ug/L	20.0	19	1.01
207-08-9	Benzo(k)fluoranthene	0.657	0.341	0.344	1.00	1.01	J	ug/L	5.00	19	1.01
65-85-0	Benzoic Acid	ND	0.235	0.238	1.00	1.01		ug/L		19	1.01
85-68-7	Benzyl Butyl phthalate	ND	0.359	0.363	1.00	1.01		ug/L	10.0	19	1.01

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Results Summary

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Project 835582

Report To

Aqua-Tech Laboratories (Austin
John Brien
635 Phil Gramm Blvd.
Bryan, TX 77807-9104

Additional Testing

CAS	Parameter	Results	MDL	SDL	MQL	MQLAdj	Flag	Units	Target	Bottle	Dilute
Non-Potable Water	Organics						EPA 625				
111-91-1	Bis(2-chloroethoxy)methane	ND	0.427	0.431	1.00	1.01		ug/L	10.0	19	1.01
111-44-4	Bis(2-chloroethyl)ether	ND	0.443	0.447	1.00	1.01		ug/L	10.0	19	1.01
108-60-1	Bis(2-chloroisopropyl)ether	ND	0.440	0.444	1.00	1.01		ug/L	10.0	19	1.01
117-81-7	Bis(2-ethylhexyl)phthalate	ND	1.07	1.08	5.00	5.05		ug/L	10.0	19	1.01
218-01-9	Chrysene (Benzo(a)phenanthrene)	0.929	0.149	0.151	1.00	1.01	J	ug/L	5.00	19	1.01
1319-77-3, etc.	Cresols Total	ND	0.297	0.300	1.00	1.01		ug/L	10.0	19	1.00
53-70-3	Dibenz(a,h)anthracene	ND	0.318	0.321	1.00	1.01		ug/L	5.00	19	1.01
132-64-9	Dibenzofuran	ND	0.349	0.353	1.00	1.01		ug/L		19	1.01
84-66-2	Diethyl phthalate	ND	0.396	0.400	1.00	1.01		ug/L	10.0	19	1.01
131-11-3	Dimethyl phthalate	ND	0.355	0.359	1.00	1.01		ug/L	10.0	19	1.01
84-74-2	Di-n-butylphthalate	ND	0.761	0.769	1.00	1.01		ug/L	10.0	19	1.01
117-84-0	Di-n-octylphthalate	ND	0.411	0.415	1.00	1.01		ug/L	10.0	19	1.01
206-44-0	Fluoranthene(Benzo(j,k)fluorene)	2.28	0.367	0.371	1.00	1.01		ug/L	10.0	19	1.01
86-73-7	Fluorene	ND	0.326	0.329	1.00	1.01		ug/L	10.0	19	1.01
118-74-1	Hexachlorobenzene	ND	0.292	0.295	1.00	1.01		ug/L	5.00	19	1.01
87-68-3	Hexachlorobutadiene	ND	0.276	0.279	1.00	1.01		ug/L	10.0	19	1.01
77-47-4	Hexachlorocyclopentadiene	ND	0.305	0.308	1.00	1.01		ug/L	10.0	19	1.01
67-72-1	Hexachloroethane	ND	0.258	0.261	1.00	1.01		ug/L	20.0	19	1.01
193-39-5	Indeno(1,2,3-cd)pyrene	0.333	0.320	0.323	1.00	1.01	J	ug/L	5.00	19	1.01
78-59-1	Isophorone	ND	0.413	0.417	1.00	1.01		ug/L	10.0	19	1.01
91-20-3	Naphthalene	ND	0.335	0.338	1.00	1.01		ug/L	10.0	19	1.01
98-95-3	Nitrobenzene	ND	0.380	0.384	1.00	1.01		ug/L	10.0	19	1.01
55-18-5	n-Nitrosodiethylamine	ND	0.183	0.185	1.00	1.01		ug/L	20.0	19	1.01
62-75-9	N-Nitrosodimethylamine	ND	0.447	0.452	1.00	1.01		ug/L	50.0	19	1.01
924-16-3	n-Nitroso-di-n-butylamine	ND	0.437	0.441	1.00	1.01		ug/L	20.0	19	1.01
621-64-7	N-Nitrosodi-n-propylamine	ND	0.460	0.465	1.00	1.01		ug/L	20.0	19	1.01
86-30-6	N-Nitrosodiphenylamine (as DPA	ND	0.531	0.536	1.00	1.01		ug/L	20.0	19	1.01

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Results Summary

Project 835582

Report To

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Additional Testing

CAS	Parameter	Results	MDL	SDL	MQL	MQLAdj	Flag	Units	Target	Bottle	Dilute
Non-Potable Water	**Organics**								**EPA 625**		
59-50-7	p-Chloro-m-Cresol (4-Chloro-3-me	ND	0.308	0.311	1.00	1.01		ug/L	10.0	19	1.01
608-93-5	Pentachlorobenzene	ND	0.351	0.355	1.00	1.01		ug/L	20.0	19	1.01
87-86-5	Pentachlorophenol	ND	0.332	0.335	1.00	1.01		ug/L	5.00	19	1.01
85-01-8	Phenanthrene	1.89	0.291	0.294	1.00	1.01		ug/L	10.0	19	1.01
108-95-2	Phenol	ND	0.597	0.603	1.00	1.01		ug/L	10.0	19	1.01
129-00-0	Pyrene	1.87	0.448	0.453	1.00	1.01		ug/L	10.0	19	1.01
110-86-1	Pyridine	ND	0.492	0.497	1.00	1.01		ug/L	20.0	19	1.01
Non-Potable Water	**Organics**								**EPA 632**		
1699289	**B014041-01**										

Collection: 06/18/2018 06:30:00 Client *Received:* 06/19/2018

Supplement to Test Report 1693934

Prepared: 784702

Analyzed: 785254 6/22/18 19:42:00

63-25-2	Carbaryl (Sevin)	ND	0.018	0.0186	2.50	2.58		ug/L	5.00	20	1.03

MDL is Method Detection Limit (40 CFR 136 Appendix B)

SDL is Sample Detection Limit and is the adjusted MDL (sample specific dilutions, dry weight)

MQL is the Method Quantitation Limit and corresponds to a low standard

MQLADJ is the Adjusted Method Quantitation Limit (dilutions, dry weight)

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Results Summary

Project 835582

Report To

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Bryan, TX 77807-9104

Additional Testing

Qualifiers:

J - Analyte detected below quantitation limit
D - Duplicate RPD was higher than expected
X - Standard reads higher than desired.
S - Standard reads lower than desired

We report results on an 'As Received' or wet basis unless marked 'Dry Weight'. Unless otherwise noted, testing was performed at Ana-lab's corporate laboratory that holds the following Federal and State certificates: Texas Department of Health Lead Firm Certificate 2110076, US Department of Agriculture Soil Import Permit S-37592, Texas Commisson on Environmental Quality Drinking Water Laboratory Certificate TX219, Texas Commission on Environmental Quality NELAP T104704201-18. Oklahoma Department of Environmental Quality Drinking Water Certification Lab ID# D9913. EPA Lab Number TX00063, USEPA Approved Perchlorate Testing Lab, Oklahoma Department of Environmental Quality Laboratory Certificate 8125, Arkansas Department of Environmental Quality Certification #03-070-0, Louisiana Department of Environmental Quality Laboratory Certification (NELAP, LELAP) #02008, Louisiana Department of Health and Hospitals Drinking Water (NELAP) # LA030020, US Department of Energy Approved. The Accredited coiumn designates accreditation by N -- NELAC, or z -- not covered under NELAC scope of accreditation.
These analytical results relate to the sample tested. This report may NOT be reproduced EXCEPT in FULL without written approval of Ana-Lab Corp. Unless otherwise specified, these test results meet the requirements of NELAC.

Paul Zhang, Ph.D., Quality Director

Ethics Service Quality IACIL Environmental

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Report To

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Bryan, TX 77807-9104

Additional Testing

Account	*Project*
AQU5 -C	835582

Analytical Set 785215 — SM 4500-CN⁻ E-2011

Blank

Parameter	*PrepSet*	*Reading*	*MDL*	*MQL*	*Units*	*File*
Cyanide After Chlorination	784922	ND	0.00372	0.005	mg/L	118839968

CCV

Parameter	*Reading*	*Known*	*Units*	*Recover%*	*Limits%*	*File*
Cyanide After Chlorination	0.472	0.500	mg/L	94.4	90.0 - 110	118839967
	0.470	0.500	mg/L	94.0	90.0 - 110	118839978
	0.491	0.500	mg/L	98.2	90.0 - 110	118839986
	0.462	0.500	mg/L	92.4	90.0 - 110	118839987

Duplicate

Parameter	*Sample*	*Result*	*Unknown*	*Unit*	*RPD*	*Limit%*
Cyanide After Chlorination	1692993	0.00374	0.00388	mg/L	3.67	20.0

ICV

Parameter	*Reading*	*Known*	*Units*	*Recover%*	*Limits%*	*File*
Cyanide After Chlorination	0.205	0.200	mg/L	102	90.0 - 110	118839966

LCS Dup

Parameter	*PrepSet*	*LCS*	*LCSD*	*Known*	*Limits%*	*LCS%*	*LCSD%*	*Units*	*RPD*	*Limit%*
Cyanide After Chlorination	784922	0.420	0.389	0.400	90.0 - 110	105	97.2	mg/L	7.66	20.0

Mat. Spike

Parameter	*Sample*	*Spike*	*Unknown*	*Known*	*Units*	*Recovery %*	*Limits %*	*File*
Cyanide After Chlorination	1692993	0.392	0.00388	0.400	mg/L	98.0	90.0 - 110	118839973

Analytical Set 785216 — SM 4500-CN⁻ E-2011

Blank

Parameter	*PrepSet*	*Reading*	*MDL*	*MQL*	*Units*	*File*
Cyanide, total	784923	ND	0.00372	0.005	mg/L	118839997

CCV

Parameter	*Reading*	*Known*	*Units*	*Recover%*	*Limits%*	*File*
Cyanide, total	0.472	0.500	mg/L	94.4	90.0 - 110	118839989
	0.470	0.500	mg/L	94.0	90.0 - 110	118839996
	0.491	0.500	mg/L	98.2	90.0 - 110	118840006
	0.462	0.500	mg/L	92.4	90.0 - 110	118840010

Duplicate

Parameter	*Sample*	*Result*	*Unknown*	*Unit*	*RPD*	*Limit%*
Cyanide, total	1693448	0.00444	0.005	mg/L	11.9	20.0

ICV

Parameter	*Reading*	*Known*	*Units*	*Recover%*	*Limits%*	*File*
Cyanide, total	0.205	0.200	mg/L	102	90.0 - 110	118839988

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LCS Dup

Parameter	PrepSet	LCS	LCSD	Known	Limits%	LCS%	LCSD%	Units	RPD	Limit%
Cyanide, total	784923	0.414	0.396	0.400	90.0 - 110	104	99.0	mg/L	4.44	20.0

Mat. Spike

Parameter	Sample	Spike	Unknown	Known	Units	Recovery %	Limits %	File
Cyanide, total	1693448	0.386	0.005	0.400	mg/L	95.2	90.0 - 110	118840002

Analytical Set 785227 — EPA 420.4 1

Blank

Parameter	PrepSet	Reading	MDL	MQL	Units	File
Phenolics, Total Recoverable	784963	ND	0.00377	0.005	mg/L	118840101

CCV

Parameter	Reading	Known	Units	Recover%	Limits%	File
Phenolics, Total Recoverable	0.190	0.200	mg/L	95.0	90.0 - 110	118840100
	0.195	0.200	mg/L	97.5	90.0 - 110	118840111
	0.197	0.200	mg/L	98.5	90.0 - 110	118840122
	0.220	0.200	mg/L	110	90.0 - 110	118840125

Duplicate

Parameter	Sample	Result	Unknown	Unit	RPD	Limit%
Phenolics, Total Recoverable	1693715	ND	ND	mg/L		20.0
	1694099	0.0375	0.0348	mg/L	7.47	20.0

ICV

Parameter	Reading	Known	Units	Recover%	Limits%	File
Phenolics, Total Recoverable	0.196	0.200	mg/L	98.0	90.0 - 110	118840099

LCS Dup

Parameter	PrepSet	LCS	LCSD	Known	Limits%	LCS%	LCSD%	Units	RPD	Limit%
Phenolics, Total Recoverable	784963	0.201	0.200	0.200	90.0 - 110	100	100	mg/L	0.499	20.0

Mat. Spike

Parameter	Sample	Spike	Unknown	Known	Units	Recovery %	Limits %	File
Phenolics, Total Recoverable	1693715	0.204	ND	0.200	mg/L	102	90.0 - 110	118840106
	1694099	0.226	0.0348	0.200	mg/L	95.6	90.0 - 110	118840109

Analytical Set 785029 — EPA 200.8 5.4

Blank

Parameter	PrepSet	Reading	MDL	MQL	Units	File
Silver, Total	784798	ND	0.0000628	0.0002	mg/L	118835454

CCV

Parameter	Reading	Known	Units	Recover%	Limits%	File
Silver, Total	0.0493	0.05	mg/L	98.6	90.0 - 110	118835424
	0.0499	0.05	mg/L	99.8	90.0 - 110	118835429
	0.0497	0.05	mg/L	99.4	90.0 - 110	118835440
	0.0496	0.05	mg/L	99.2	90.0 - 110	118835451
	0.0497	0.05	mg/L	99.4	90.0 - 110	118835461
	0.0492	0.05	mg/L	98.4	90.0 - 110	118835466
	0.0496	0.05	mg/L	99.2	90.0 - 110	118835476

ICV

Parameter	Reading	Known	Units	Recover%	Limits%	File

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Printed 07/11/2018

ICV

Parameter	Reading	Known	Units	Recover%	Limits%	File
Silver, Total	0.0481	0.05	mg/L	96.2	90.0 - 110	118835404

LCS Dup

Parameter	PrepSet	LCS	LCSD	Known	Limits%	LCS%	LCSD%	Units	RPD	Limit%
Silver, Total	784798	0.0978	0.0999	0.100	85.0 - 115	97.8	99.9	mg/L	2.12	20.0

MSD

Parameter	Sample	MS	MSD	UNK	Known	Limits	MS%	MSD%	Units	RPD	Limit%
Silver, Total	1693892	0.0962	0.103	ND	0.100	70.0 - 130	96.2	103	mg/L	6.83	20.0
	1694012	0.0975	0.100	ND	0.100	70.0 - 130	97.5	100	mg/L	2.53	20.0

Analytical Set 784634 EPA 624

BFB

Parameter	Sample	RefMass	Reading	%	Limits%	File
BFB Mass 173	784634	174	14	1.6	0 - 2.00	118827313
BFB Mass 174	784634	95.0	895	72.8	50.0 - 100	118827313
BFB Mass 175	784634	174	71	7.9	5.00 - 9.00	118827313
BFB Mass 176	784634	174	878	98.1	95.0 - 101	118827313
BFB Mass 177	784634	176	60	6.8	5.00 - 9.00	118827313
BFB Mass 50	784634	95.0	235	19.1	15.0 - 40.0	118827313
BFB Mass 75	784634	95.0	491	39.9	30.0 - 60.0	118827313
BFB Mass 95	784634	95.0	1230	100.0	100 - 100	118827313
BFB Mass 96	784634	95.0	85	6.9	5.00 - 9.00	118827313

Blank

Parameter	PrepSet	Reading	MDL	MQL	Units	File
Acrolein	784634	ND	0.883	5.00	ug/L	118827318
Acrylonitrile	784634	ND	0.697	1.00	ug/L	118827318

CCV

Parameter	Reading	Known	Units	Recover%	Limits%	File
Acrolein	32.1	40.0	ug/L	80.3	70.0 - 130	118827314
Acrylonitrile	42.6	40.0	ug/L	106	70.0 - 130	118827314

IS Areas

Parameter	Sample	Type	Reading	CCVISM	Low	High	File	PrepSet
1,4-DichlorobenzeneD4 (ISTD)	784634	LCS	22990	22280	11140	33410	118827315	784634
	784634	LCS Dup	22740	22280	11140	33410	118827317	784634
	784634	Blank	17570	22280	11140	33410	118827318	784634
ChlorobenzeneD5 (ISTD)	784634	LCS	72490	73300	36650	110000	118827315	784634
	784634	LCS Dup	70190	73300	36650	110000	118827317	784634
	784634	Blank	67180	73300	36650	110000	118827318	784634

IS RetTime

Parameter	Sample	Type	Reading	CCVISM	Low	High	File	PrepSet
1,4-DichlorobenzeneD4 (ISTD)	784634	LCS	14.23	14.22	14.16	14.28	118827315	784634
	784634	LCS Dup	14.23	14.22	14.16	14.28	118827317	784634
	784634	Blank	14.23	14.22	14.16	14.28	118827318	784634
ChlorobenzeneD5 (ISTD)	784634	LCS	10.58	10.57	10.51	10.63	118827315	784634
	784634	LCS Dup	10.58	10.57	10.51	10.63	118827317	784634
	784634	Blank	10.58	10.57	10.51	10.63	118827318	784634

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LCS Dup

Parameter	PrepSet	LCS	LCSD		Known	Limits%	LCS%	LCSD%	Units	RPD	Limit%
Acrolein	784634	29.5	30.4		40.0	0.100 - 425	73.8	76.0	ug/L	2.94	30.0
Acrylonitrile	784634	45.4	46.2		40.0	71.0 - 117	114	116	ug/L	1.74	30.0

MSD

Parameter	Sample	MS	MSD	UNK	Known	Limits	MS%	MSD%	Units	RPD	Limit%
Acrolein	1691901	312	353	2.70	400	70.0 - 130	77.3	87.6	ug/L	12.4	30.0
Acrylonitrile	1691901	495	549	ND	400	70.0 - 130	124	137 *	ug/L	10.3	30.0

Surrogate

Parameter	Sample	Type	Reading	Known	Units	Recover%	Limits%	File
1,2-DCA-d4 (SURR)	784634	CCV	18.5	20.0	ug/L	92.5	70.0 - 130	118827314
	784634	LCS	18.9	20.0	ug/L	94.5	70.0 - 130	118827315
	784634	LCS Dup	18.8	20.0	ug/L	94.0	70.0 - 130	118827317
	784634	Blank	19.1	20.0	ug/L	95.5	70.0 - 130	118827318
Bromofluorobenzene (SURR)	784634	CCV	21.5	20.0	ug/L	108	70.0 - 142	118827314
	784634	LCS	20.8	20.0	ug/L	104	70.0 - 142	118827315
	784634	LCS Dup	21.0	20.0	ug/L	105	70.0 - 142	118827317
	784634	Blank	19.6	20.0	ug/L	98.0	70.0 - 142	118827318
Dibromofluoromethane (SURR)	784634	CCV	20.4	20.0	ug/L	102	70.0 - 140	118827314
	784634	LCS	19.2	20.0	ug/L	96.0	70.0 - 140	118827315
	784634	LCS Dup	19.4	20.0	ug/L	97.0	70.0 - 140	118827317
	784634	Blank	20.5	20.0	ug/L	102	70.0 - 140	118827318
TolueneD8 (SURR)	784634	CCV	20.1	20.0	ug/L	100	70.0 - 140	118827314
	784634	LCS	20.4	20.0	ug/L	102	70.0 - 140	118827315
	784634	LCS Dup	20.3	20.0	ug/L	102	70.0 - 140	118827317
	784634	Blank	20.2	20.0	ug/L	101	70.0 - 140	118827318
1,2-DCA-d4 (SURR)	1691901	MS	19.0	20.0	ug/L	95.0	70.0 - 130	118827323
	1691901	MSD	19.2	20.0	ug/L	96.0	70.0 - 130	118827325
Bromofluorobenzene (SURR)	1691901	MS	20.1	20.0	ug/L	100	70.0 - 142	118827323
	1691901	MSD	20.9	20.0	ug/L	104	70.0 - 142	118827325
Dibromofluoromethane (SURR)	1691901	MS	20.9	20.0	ug/L	104	70.0 - 140	118827323
	1691901	MSD	20.8	20.0	ug/L	104	70.0 - 140	118827325
TolueneD8 (SURR)	1691901	MS	21.0	20.0	ug/L	105	70.0 - 140	118827323
	1691901	MSD	20.7	20.0	ug/L	104	70.0 - 140	118827325

Analytical Set **784836** **EPA 625**

Blank

Parameter	PrepSet	Reading	MDL	MQL	Units	File
1,2,4-Trichlorobenzene	784425	ND	0.941	1.00	ug/L	118831431
1,2-Dichlorobenzene	784425	ND	1.04	5.00	ug/L	118831431
1,2-DPH (as azobenzene)	784425	ND	0.238	1.00	ug/L	118831431
1,3-Dichlorobenzene	784425	ND	0.954	5.00	ug/L	118831431
1,4-Dichlorobenzene	784425	ND	1.01	5.00	ug/L	118831431
2,4,5-Trichlorophenol	784425	ND	0.961	5.00	ug/L	118831431
2,4,6-Trichlorophenol	784425	ND	1.24	2.00	ug/L	118831431
2,4-Dichlorophenol	784425	ND	0.222	1.00	ug/L	118831431
2,4-Dimethylphenol	784425	ND	0.536	1.00	ug/L	118831431
2,4-Dinitrophenol	784425	ND	1.34	2.00	ug/L	118831431

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Parameter	PrepSet	Reading	MDL	MQL	Units	File
2,4-Dinitrotoluene	784425	ND	1.53	2.00	ug/L	118831431
2,6-Dinitrotoluene	784425	ND	1.29	2.00	ug/L	118831431
2-Chloronaphthalene	784425	ND	0.150	1.00	ug/L	118831431
2-Chlorophenol	784425	ND	0.275	1.00	ug/L	118831431
2-Methylphenol (o-Cresol)	784425	ND	8.48	10.0	ug/L	118831431
2-Nitrophenol	784425	ND	0.554	1.00	ug/L	118831431
3&4-Methylphenol (m&p-Cresol)	784425	ND	7.78	8.00	ug/L	118831431
3,3'-Dichlorobenzidine	784425	ND	1.39	2.00	ug/L	118831431
4,6-Dinitro-2-methylphenol	784425	ND	1.15	2.00	ug/L	118831431
4-Bromophenyl phenyl ether	784425	ND	0.772	1.00	ug/L	118831431
4-Chlorophenyl phenyl ethe	784425	ND	0.202	1.00	ug/L	118831431
4-Nitrophenol	784425	ND	0.789	1.00	ug/L	118831431
Acenaphthene	784425	ND	0.177	1.00	ug/L	118831431
Acenaphthylene	784425	ND	0.240	1.00	ug/L	118831431
Anthracene	784425	ND	0.241	1.00	ug/L	118831431
Benzidine	784425	ND	1.40	1.50	ug/L	118831431
Benzo(a)anthracene	784425	ND	0.225	1.00	ug/L	118831431
Benzo(a)pyrene	784425	ND	0.900	1.00	ug/L	118831431
Benzo(b)fluoranthene	784425	ND	0.547	1.00	ug/L	118831431
Benzo(ghi)perylene	784425	ND	0.881	1.00	ug/L	118831431
Benzo(k)fluoranthene	784425	ND	0.252	1.00	ug/L	118831431
Benzoic Acid	784425	ND	1510	1510	ug/L	118831431
Benzyl Butyl phthalate	784425	ND	0.204	1.00	ug/L	118831431
Bis(2-chloroethoxy)methane	784425	ND	0.277	1.00	ug/L	118831431
Bis(2-chloroethyl)ether	784425	ND	0.348	1.00	ug/L	118831431
Bis(2-chloroisopropyl)ether	784425	ND	0.738	1.00	ug/L	118831431
Bis(2-ethylhexyl)phthalate	784425	ND	1.12	5.00	ug/L	118831431
Chrysene (Benzo(a)phenanthrene)	784425	ND	0.289	1.00	ug/L	118831431
Dibenz(a,h)anthracene	784425	ND	0.689	1.00	ug/L	118831431
Diethyl phthalate	784425	ND	0.253	1.00	ug/L	118831431
Dimethyl phthalate	784425	ND	0.540	1.00	ug/L	118831431
Di-n-butylphthalate	784425	ND	0.978	1.00	ug/L	118831431
Di-n-octylphthalate	784425	ND	1.92	2.00	ug/L	118831431
Fluoranthene(Benzo(j,k)fluorene)	784425	ND	0.318	1.00	ug/L	118831431
Fluorene	784425	ND	0.275	1.00	ug/L	118831431
Hexachlorobenzene	784425	ND	0.871	1.00	ug/L	118831431
Hexachlorobutadiene	784425	ND	1.03	1.03	ug/L	118831431
Hexachlorocyclopentadiene	784425	ND	0.536	1.00	ug/L	118831431
Hexachloroethane	784425	ND	1.05	2.00	ug/L	118831431
Indeno(1,2,3-cd)pyrene	784425	ND	0.596	1.00	ug/L	118831431
Isophorone	784425	ND	0.429	1.00	ug/L	118831431
Naphthalene	784425	ND	0.225	1.00	ug/L	118831431
Nitrobenzene	784425	ND	0.271	1.00	ug/L	118831431
N-Nitrosodimethylamine	784425	ND	0.542	1.00	ug/L	118831431
N-Nitrosodi-n-propylamine	784425	ND	0.425	1.00	ug/L	118831431
N-Nitrosodiphenylamine (as DPA	784425	ND	0.404	1.00	ug/L	118831431

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Parameter	PrepSet	Reading	MDL	MQL	Units	File
p-Chloro-m-Cresol	784425	ND	0.588	1.00	ug/L	118831431
(4-Chloro-3-me						
Pentachlorophenol	784425	ND	0.960	5.00	ug/L	118831431
Phenanthrene	784425	ND	0.269	1.00	ug/L	118831431
Phenol	784425	ND	0.332	1.00	ug/L	118831431
Pyrene	784425	ND	0.291	1.00	ug/L	118831431
Pyridine	784425	ND	1.35	1.35	ug/L	118831431

LCS Dup

Parameter	PrepSet	LCS	LCSD	Known	Limits%	LCS%	LCSD%	Units	RPD	Limit%
1,2,4,5-Tetrachlorobenzene	784425	15.3	17.7	25.0	28.4 - 100	61.2	70.8	ug/L	14.5	30.0
1,2,4-Trichlorobenzene	784425	14.3	17.6	25.0	28.1 - 91.3	57.2	70.4	ug/L	20.7	30.0
1,2-Dichlorobenzene	784425	13.6	16.9	25.0	25.3 - 89.3	54.4	67.6	ug/L	21.6	30.0
1,2-DPH (as azobenzene)	784425	16.9	17.1	25.0	38.2 - 126	67.6	68.4	ug/L	1.18	30.0
1,3-Dichlorobenzene	784425	12.1	14.6	25.0	22.8 - 85.3	48.4	58.4	ug/L	18.7	30.0
1,4-Dichlorobenzene	784425	12.9	15.2	25.0	22.3 - 90.7	51.6	60.8	ug/L	16.4	30.0
2,4,5-Trichlorophenol	784425	17.1	18.7	25.0	35.8 - 112	68.4	74.8	ug/L	8.94	30.0
2,4,6-Trichlorophenol	784425	15.4	17.2	25.0	37.3 - 111	61.6	68.8	ug/L	11.0	30.0
2,4-Dichlorophenol	784425	15.2	16.4	25.0	33.2 - 113	60.8	65.6	ug/L	7.59	30.0
2,4-Dimethylphenol	784425	9.38	14.6	25.0	0.100 - 74.2	37.5	58.4	ug/L	43.6 *	30.0
2,4-Dinitrophenol	784425	10.7	13.2	25.0	6.36 - 115	42.8	52.8	ug/L	20.9	30.0
2,4-Dinitrotoluene	784425	21.4	23.7	25.0	40.4 - 122	85.6	94.8	ug/L	10.2	30.0
2,6-Dinitrotoluene	784425	19.3	20.7	25.0	43.4 - 117	77.2	82.8	ug/L	7.00	30.0
2-Chloronaphthalene	784425	13.9	19.2	25.0	31.9 - 108	55.6	76.8	ug/L	32.0 *	30.0
2-Chlorophenol	784425	14.2	15.1	25.0	32.5 - 103	56.8	60.4	ug/L	6.14	30.0
2-Methylphenol (o-Cresol)	784425	12.3	13.4	25.0	22.5 - 89.1	49.2	53.6	ug/L	8.56	30.0
2-Nitrophenol	784425	14.8	16.1	25.0	31.0 - 111	59.2	64.4	ug/L	8.41	30.0
3&4-Methylphenol	784425	11.2	12.5	25.0	15.7 - 88.3	44.8	50.0	ug/L	11.0	30.0
(m&p-Cresol)										
3,3'-Dichlorobenzidine	784425	14.6	13.3	25.0	23.8 - 116	58.4	53.2	ug/L	9.32	30.0
4,6-Dinitro-2-methylphenol	784425	13.6	16.9	25.0	20.0 - 125	54.4	67.6	ug/L	21.6	30.0
4-Bromophenyl phenyl ether	784425	17.2	20.2	25.0	40.1 - 116	68.8	80.8	ug/L	16.0	30.0
4-Chlorophenyl phenyl ethe	784425	22.4	24.9	25.0	38.8 - 120	89.6	99.6	ug/L	10.6	30.0
4-Nitrophenol	784425	6.66	7.62	25.0	2.12 - 76.3	26.6	30.5	ug/L	13.7	30.0
Acenaphthene	784425	18.0	21.0	25.0	36.9 - 113	72.0	84.0	ug/L	15.4	30.0
Acenaphthylene	784425	17.4	18.8	25.0	42.0 - 110	69.6	75.2	ug/L	7.73	30.0
Anthracene	784425	17.9	19.1	25.0	43.6 - 121	71.6	76.4	ug/L	6.49	30.0
Benzidine	784425	0.100	0.100	25.0	0.100 - 115	0.400	0.400	ug/L	0	30.0
Benzo(a)anthracene	784425	17.3	18.8	25.0	46.8 - 112	69.2	75.2	ug/L	8.31	30.0
Benzo(a)pyrene	784425	19.9	21.9	25.0	48.2 - 117	79.6	87.6	ug/L	9.57	30.0
Benzo(b)fluoranthene	784425	19.4	21.6	25.0	41.3 - 126	77.6	86.4	ug/L	10.7	30.0
Benzo(ghi)perylene	784425	25.0	21.9	25.0	35.2 - 134	100	87.6	ug/L	13.2	30.0
Benzo(k)fluoranthene	784425	20.4	22.6	25.0	44.9 - 137	81.6	90.4	ug/L	10.2	30.0
Benzyl Butyl phthalate	784425	18.8	21.1	25.0	33.7 - 137	75.2	84.4	ug/L	11.5	30.0
Bis(2-chloroethoxy)methane	784425	17.4	18.5	25.0	32.4 - 120	69.6	74.0	ug/L	6.13	30.0
Bis(2-chloroethyl)ether	784425	15.5	17.1	25.0	17.3 - 126	62.0	68.4	ug/L	9.82	30.0
Bis(2-chloroisopropyl)ether	784425	17.1	18.5	25.0	18.9 - 134	68.4	74.0	ug/L	7.87	30.0
Bis(2-ethylhexyl)phthalate	784425	21.8	22.3	25.0	43.4 - 147	87.2	89.2	ug/L	2.27	30.0
Chrysene	784425	18.6	20.2	25.0	47.2 - 114	74.4	80.8	ug/L	8.25	30.0
(Benzo(a)phenanthrene)										
Dibenz(a,h)anthracene	784425	23.3	21.5	25.0	40.4 - 122	93.2	86.0	ug/L	8.04	30.0

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LCS Dup

Parameter	PrepSet	LCS	LCSD	Known	Limits%	LCS%	LCSD%	Units	RPD	Limit%
Diethyl phthalate	784425	19.7	21.6	25.0	43.6 - 124	78.8	86.4	ug/L	9.20	30.0
Dimethyl phthalate	784425	18.1	19.9	25.0	46.2 - 112	72.4	79.6	ug/L	9.47	30.0
Di-n-butylphthalate	784425	19.2	20.4	25.0	42.7 - 131	76.8	81.6	ug/L	6.06	30.0
Di-n-octylphthalate	784425	20.1	20.0	25.0	32.4 - 147	80.4	80.0	ug/L	0.499	30.0
Fluoranthene(Benzo(j,k)fluorene)	784425	20.0	19.7	25.0	36.7 - 126	80.0	78.8	ug/L	1.51	30.0
Fluorene	784425	22.2	24.8	25.0	39.2 - 130	88.8	99.2	ug/L	11.1	30.0
Hexachlorobenzene	784425	18.1	20.3	25.0	47.1 - 114	72.4	81.2	ug/L	11.5	30.0
Hexachlorobutadiene	784425	12.4	18.6	25.0	24.1 - 85.5	49.6	74.4	ug/L	40.0 *	30.0
Hexachlorocyclopentadiene	784425	7.67	11.6	25.0	1.57 - 87.2	30.7	46.4	ug/L	40.7 *	30.0
Hexachloroethane	784425	11.9	16.0	25.0	19.4 - 87.8	47.6	64.0	ug/L	29.4	30.0
Indeno(1,2,3-cd)pyrene	784425	19.8	18.8	25.0	31.2 - 125	79.2	75.2	ug/L	5.18	30.0
Isophorone	784425	17.5	18.4	25.0	34.5 - 127	70.0	73.6	ug/L	5.01	30.0
Naphthalene	784425	15.0	17.7	25.0	32.5 - 105	60.0	70.8	ug/L	16.5	30.0
Nitrobenzene	784425	17.0	17.7	25.0	32.6 - 114	68.0	70.8	ug/L	4.03	30.0
n-Nitrosodiethylamine	784425	15.1	16.0	25.0	22.0 - 109	60.4	64.0	ug/L	5.79	30.0
N-Nitrosodimethylamine	784425	11.7	11.7	25.0	0.100 - 112	46.8	46.8	ug/L	0	30.0
n-Nitroso-di-n-butylamine	784425	16.1	17.6	25.0	39.0 - 107	64.4	70.4	ug/L	8.90	30.0
N-Nitrosodi-n-propylamine	784425	19.5	21.0	25.0	33.4 - 125	78.0	84.0	ug/L	7.41	30.0
N-Nitrosodiphenylamine (as DPA	784425	17.8	19.3	25.0	40.2 - 128	71.2	77.2	ug/L	8.09	30.0
p-Chloro-m-Cresol (4-Chloro-3-me	784425	15.0	17.5	25.0	33.6 - 114	60.0	70.0	ug/L	15.4	30.0
Pentachlorobenzene	784425	17.0	19.4	25.0	35.4 - 109	68.0	77.6	ug/L	13.2	30.0
Pentachlorophenol	784425	10.6	16.4	25.0	16.2 - 126	42.4	65.6	ug/L	43.0 *	30.0
Phenanthrene	784425	19.0	20.7	25.0	41.8 - 122	76.0	82.8	ug/L	8.56	30.0
Phenol	784425	4.59	5.12	25.0	8.07 - 58.4	18.4	20.5	ug/L	10.8	30.0
Pyrene	784425	17.7	20.5	25.0	32.9 - 133	70.8	82.0	ug/L	14.7	30.0

Analytical Set **784890** **EPA 625**

CCV

Parameter	Reading	Known	Units	Recover%	Limits%	File
1,2,4,5-Tetrachlorobenzene	53200	50000	ug/L	106	70.0 - 130	118832518
1,2,4-Trichlorobenzene	51300	50000	ug/L	103	70.0 - 130	118832518
1,2-Dichlorobenzene	49600	50000	ug/L	99.1	70.0 - 130	118832518
1,2-DPH (as azobenzene)	62100	50000	ug/L	124	70.0 - 130	118832518
1,3-Dichlorobenzene	50500	50000	ug/L	101	70.0 - 130	118832518
1,4-Dichlorobenzene	50400	50000	ug/L	101	70.0 - 130	118832518
2,4,5-Trichlorophenol	55800	50000	ug/L	112	70.0 - 130	118832518
2,4,6-Trichlorophenol	54800	50000	ug/L	110	70.0 - 130	118832518
2,4-Dichlorophenol	54300	50000	ug/L	109	70.0 - 130	118832518
2,4-Dimethylphenol	52500	50000	ug/L	105	70.0 - 130	118832518
2,4-Dinitrophenol	44300	50000	ug/L	88.5	70.0 - 130	118832518
2,4-Dinitrotoluene	52600	50000	ug/L	105	70.0 - 130	118832518
2,6-Dinitrotoluene	53700	50000	ug/L	107	70.0 - 130	118832518
2-Chloronaphthalene	51500	50000	ug/L	103	70.0 - 130	118832518
2-Chlorophenol	53300	50000	ug/L	107	70.0 - 130	118832518
2-Methylphenol (o-Cresol)	55600	50000	ug/L	111	70.0 - 130	118832518
2-Nitrophenol	53300	50000	ug/L	107	70.0 - 130	118832518
3&4-Methylphenol (m&p-Cresol)	53200	50000	ug/L	106	70.0 - 130	118832518

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Parameter	Reading	Known	Units	Recover%	Limits%	File
3,3'-Dichlorobenzidine	53900	50000	ug/L	108	70.0 - 130	118832518
4,6-Dinitro-2-methylphenol	46700	50000	ug/L	93.3	70.0 - 130	118832518
4-Bromophenyl phenyl ether	53000	50000	ug/L	106	70.0 - 130	118832518
4-Chlorophenyl phenyl ethe	50000	50000	ug/L	100	70.0 - 130	118832518
4-Nitrophenol	50500	50000	ug/L	101	70.0 - 130	118832518
Acenaphthene	50100	50000	ug/L	100	70.0 - 130	118832518
Acenaphthylene	49400	50000	ug/L	98.8	70.0 - 130	118832518
Anthracene	47800	50000	ug/L	95.6	70.0 - 130	118832518
Benzidine	43300	50000	ug/L	86.6	70.0 - 130	118832518
Benzo(a)anthracene	51100	50000	ug/L	102	70.0 - 130	118832518
Benzo(a)pyrene	53300	50000	ug/L	107	70.0 - 130	118832518
Benzo(b)fluoranthene	51400	50000	ug/L	103	70.0 - 130	118832518
Benzo(ghi)perylene	59400	50000	ug/L	119	70.0 - 130	118832518
Benzo(k)fluoranthene	51300	50000	ug/L	103	70.0 - 130	118832518
Benzoic Acid	48900	50000	ug/L	97.9	70.0 - 130	118832518
Benzyl Butyl phthalate	53400	50000	ug/L	107	70.0 - 130	118832518
Bis(2-chloroethoxy)methane	56500	50000	ug/L	113	70.0 - 130	118832518
Bis(2-chloroethyl)ether	58800	50000	ug/L	118	70.0 - 130	118832518
Bis(2-chloroisopropyl)ether	54500	50000	ug/L	109	70.0 - 130	118832518
Bis(2-ethylhexyl)phthalate	53200	50000	ug/L	106	70.0 - 130	118832518
Chrysene (Benzo(a)phenanthrene)	51600	50000	ug/L	103	70.0 - 130	118832518
Dibenz(a,h)anthracene	51900	50000	ug/L	104	70.0 - 130	118832518
Diethyl phthalate	48100	50000	ug/L	96.2	70.0 - 130	118832518
Dimethyl phthalate	50400	50000	ug/L	101	70.0 - 130	118832518
Di-n-butylphthalate	49700	50000	ug/L	99.5	70.0 - 130	118832518
Di-n-octylphthalate	45900	50000	ug/L	91.8	70.0 - 130	118832518
Fluoranthene(Benzo(j,k)fluor ene)	48000	50000	ug/L	95.9	70.0 - 130	118832518
Fluorene	49500	50000	ug/L	99.1	70.0 - 130	118832518
Hexachlorobenzene	52000	50000	ug/L	104	70.0 - 130	118832518
Hexachlorobutadiene	53900	50000	ug/L	108	70.0 - 130	118832518
Hexachlorocyclopentadiene	60000	50000	ug/L	120	70.0 - 130	118832518
Hexachloroethane	52500	50000	ug/L	105	70.0 - 130	118832518
Indeno(1,2,3-cd)pyrene	58200	50000	ug/L	116	70.0 - 130	118832518
Isophorone	58100	50000	ug/L	116	70.0 - 130	118832518
Naphthalene	50400	50000	ug/L	101	70.0 - 130	118832518
Nitrobenzene	58700	50000	ug/L	117	70.0 - 130	118832518
n-Nitrosodiethylamine	57600	50000	ug/L	115	70.0 - 130	118832518
N-Nitrosodimethylamine	60100	50000	ug/L	120	70.0 - 130	118832518
n-Nitroso-di-n-butylamine	58000	50000	ug/L	116	70.0 - 130	118832518
N-Nitrosodi-n-propylamine	56300	50000	ug/L	113	70.0 - 130	118832518
N-Nitrosodiphenylamine (as DPA	49700	50000	ug/L	99.4	70.0 - 130	118832518
p-Chloro-m-Cresol (4-Chloro-3-me	58800	50000	ug/L	118	70.0 - 130	118832518
Pentachlorobenzene	51400	50000	ug/L	103	70.0 - 130	118832518
Pentachlorophenol	48200	50000	ug/L	96.4	70.0 - 130	118832518
Phenanthrene	43800	50000	ug/L	87.7	70.0 - 130	118832518
Phenol	54600	50000	ug/L	109	70.0 - 130	118832518
Pyrene	53400	50000	ug/L	107	70.0 - 130	118832518

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CCV

Parameter	Reading	Known	Units	Recover%	Limits%	File
Pyridine	59600	50000	ug/L	119	70.0 - 130	118832518

DFTPP

Parameter		RefMass	Reading	%	Limits%	File
DFTPP Mass 127	585706	198	9220	56.3	40.0 - 60.0	118832517
DFTPP Mass 197	585706	198	2	0.0	0 - 1.00	118832517
DFTPP Mass 198	585706	198	16366	100.0	100 - 100	118832517
DFTPP Mass 199	585706	198	1117	6.8	5.00 - 9.00	118832517
DFTPP Mass 275	585706	198	3844	23.5	10.0 - 30.0	118832517
DFTPP Mass 365	585706	198	439	2.7	1.00 - 100	118832517
DFTPP Mass 441	585706	443	67	2.8	0 - 100	118832517
DFTPP Mass 442	585706	198	12263	74.9	40.0 - 100	118832517
DFTPP Mass 443	585706	442	2355	19.2	17.0 - 23.0	118832517
DFTPP Mass 51	585706	198	7639	46.7	30.0 - 60.0	118832517
DFTPP Mass 68	585706	69.0	8	0.1	0 - 2.00	118832517
DFTPP Mass 69	585706	198	10568	64.6	0 - 100	118832517
DFTPP Mass 70	585706	69.0	36	0.3	0 - 2.00	118832517

Surrogate

Parameter	Sample	Type	Reading	Known	Units	Recover%	Limits%	File
2,4,6-Tribromophenol	585658	CCV	49400	100000	ug/L	49.4	10.0 - 150	118832518
2-Fluorobiphenyl-SURR	585658	CCV	51200	50000	ug/L	102	30.0 - 150	118832518
2-Fluorophenol-SURR	585658	CCV	56600	100000	ug/L	56.6	10.0 - 150	118832518
4-Terphenyl-d14-SURR	585658	CCV	52000	50000	ug/L	104	30.0 - 150	118832518
Nitrobenzene-d5-SURR	585658	CCV	52600	50000	ug/L	105	30.0 - 150	118832518
Phenol-d6-SURR	585658	CCV	55700	100000	ug/L	55.7	10.0 - 150	118832518

Analytical Set 785061 EPA 624

BFB

Parameter	Sample	RefMass	Reading	%	Limits%	File
BFB Mass 173	785061	174	165	1.1	0 - 2.00	118837282
BFB Mass 174	785061	95.0	15082	80.4	50.0 - 100	118837282
BFB Mass 175	785061	174	1157	7.7	5.00 - 9.00	118837282
BFB Mass 176	785061	174	14765	97.9	95.0 - 101	118837282
BFB Mass 177	785061	176	1029	7.0	5.00 - 9.00	118837282
BFB Mass 50	785061	95.0	4132	22.0	15.0 - 40.0	118837282
BFB Mass 75	785061	95.0	8950	47.7	30.0 - 60.0	118837282
BFB Mass 95	785061	95.0	18753	100.0	100 - 100	118837282
BFB Mass 96	785061	95.0	1261	6.7	5.00 - 9.00	118837282

Blank

Parameter	PrepSet	Reading	MDL	MQL	Units	File
1,1,1,2-Tetrachloroethane	785061	ND	0.388	1.00	ug/L	118837286
1,1,1-Trichloroethane	785061	ND	0.265	1.00	ug/L	118837286
1,1,2,2-Tetrachloroethane	785061	ND	0.270	1.00	ug/L	118837286
1,1,2-Trichloroethane	785061	ND	0.425	1.00	ug/L	118837286
1,1-Dichloroethane	785061	ND	0.496	1.00	ug/L	118837286
1,1-Dichloroethylene	785061	ND	0.404	1.00	ug/L	118837286
1,1-Dichloropropene	785061	ND	0.514	1.00	ug/L	118837286
1,2,3-Trichlorobenzene	785061	ND	0.411	1.00	ug/L	118837286
1,2,3-Trichloropropane	785061	ND	0.956	1.00	ug/L	118837286

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Parameter	PrepSet	Reading	MDL	MQL	Units	File
1,2,4-Trichlorobenzene	785061	ND	0.499	1.00	ug/L	118837286
1,2,4-Trimethylbenzene	785061	ND	0.302	1.00	ug/L	118837286
1,2-Dibromo-3-chloropropane	785061	ND	2.09	5.00	ug/L	118837286
1,2-Dibromoethane (EDB)	785061	ND	0.275	1.00	ug/L	118837286
1,2-Dichloroethane	785061	ND	0.456	1.00	ug/L	118837286
1,2-Dichloropropane	785061	ND	0.415	1.00	ug/L	118837286
1,3,5-Trimethylbenzene	785061	ND	0.243	1.00	ug/L	118837286
1,3-Dichloropropane	785061	ND	0.334	1.00	ug/L	118837286
2,2-Dichloropropane	785061	ND	0.484	1.00	ug/L	118837286
2-Chloroethylvinyl ether	785061	ND	0.423	1.00	ug/L	118837286
2-Chlorotoluene	785061	ND	0.318	1.00	ug/L	118837286
4-Chlorotoluene	785061	ND	0.354	1.00	ug/L	118837286
Acetone	785061	ND	2.07	5.00	ug/L	118837286
Acrolein	785061	ND	4.78	5.00	ug/L	118837286
Acrylonitrile	785061	ND	0.698	1.00	ug/L	118837286
Benzene	785061	ND	0.187	1.00	ug/L	118837286
Bromobenzene	785061	ND	0.585	1.00	ug/L	118837286
Bromochloromethane	785061	ND	0.476	1.00	ug/L	118837286
Bromodichloromethane	785061	ND	0.307	1.00	ug/L	118837286
Bromoform	785061	ND	0.288	1.00	ug/L	118837286
Bromomethane (Methyl Bromi	785061	ND	0.554	1.00	ug/L	118837286
Carbon Tetrachloride	785061	ND	0.359	1.00	ug/L	118837286
Chlorobenzene	785061	ND	0.226	1.00	ug/L	118837286
Chloroethane	785061	ND	0.396	1.00	ug/L	118837286
Chloroform	785061	ND	0.211	1.00	ug/L	118837286
Chloromethane	785061	ND	0.391	1.00	ug/L	118837286
cis-1,2-Dichloroethylene	785061	ND	0.502	1.00	ug/L	118837286
cis-1,3-Dichloropropene	785061	ND	0.488	1.00	ug/L	118837286
Dibromochloromethane	785061	ND	0.185	1.00	ug/L	118837286
Dibromomethane	785061	ND	0.382	1.00	ug/L	118837286
Dichlorodifluoromethane	785061	ND	0.405	1.00	ug/L	118837286
Dichloromethane	785061	ND	0.570	1.00	ug/L	118837286
Ethylbenzene	785061	ND	0.180	1.00	ug/L	118837286
Hexachlorobutadiene	785061	ND	0.793	1.00	ug/L	118837286
Isopropylbenzene (Cumene)	785061	ND	0.383	1.00	ug/L	118837286
m- and p-Xylene	785061	ND	0.325	1.00	ug/L	118837286
m-Dichlorobenzene (1,3-DCB)	785061	ND	0.315	1.00	ug/L	118837286
Methyl ethyl ketone (Butanone)	785061	ND	0.382	5.00	ug/L	118837286
Methyl Isobutyl Ketone	785061	ND	0.458	1.00	ug/L	118837286
Naphthalene	785061	ND	0.194	1.00	ug/L	118837286
n-Butylbenzene	785061	ND	0.493	1.00	ug/L	118837286
n-Propylbenzene	785061	ND	0.277	1.00	ug/L	118837286
o-Dichlorobenzene (1,2-DCB)	785061	ND	0.292	1.00	ug/L	118837286
o-Xylene	785061	ND	0.190	1.00	ug/L	118837286
p-Dichlorobenzene (1,4-DCB)	785061	ND	0.294	1.00	ug/L	118837286
p-Isopropyltoluene	785061	ND	0.261	1.00	ug/L	118837286

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Parameter	PrepSet	Reading	MDL	MQL	Units	File
sec-Butylbenzene	785061	ND	0.182	1.00	ug/L	118837286
Styrene	785061	ND	0.254	1.00	ug/L	118837286
tert-Butylbenzene	785061	ND	0.217	1.00	ug/L	118837286
Tetrachloroethylene	785061	ND	0.391	1.00	ug/L	118837286
Toluene	785061	ND	0.314	1.00	ug/L	118837286
trans-1,2-Dichloroethylene	785061	ND	0.518	1.00	ug/L	118837286
trans-1,3-Dichloropropene	785061	ND	0.223	1.00	ug/L	118837286
Trichloroethylene	785061	ND	0.562	1.00	ug/L	118837286
Trichlorofluoromethane	785061	ND	0.514	1.00	ug/L	118837286
Vinyl chloride	785061	ND	0.228	1.00	ug/L	118837286

CCV

Parameter	Reading	Known	Units	Recover%	Limits%	File
1,1,1,2-Tetrachloroethane	17.3	20.0	ug/L	86.6	70.0 - 130	118837283
1,1,1-Trichloroethane	18.5	20.0	ug/L	92.4	70.0 - 130	118837283
1,1,2,2-Tetrachloroethane	16.7	20.0	ug/L	83.4	70.0 - 130	118837283
1,1,2-Trichloroethane	17.6	20.0	ug/L	88.2	70.0 - 130	118837283
1,1-Dichloroethane	18.2	20.0	ug/L	90.8	70.0 - 130	118837283
1,1-Dichloroethylene	15.2	20.0	ug/L	76.2	70.0 - 130	118837283
1,1-Dichloropropene	18.6	20.0	ug/L	92.8	70.0 - 130	118837283
1,2,3-Trichlorobenzene	17.8	20.0	ug/L	89.0	70.0 - 130	118837283
1,2,3-Trichloropropane	17.8	20.0	ug/L	89.2	70.0 - 130	118837283
1,2,4-Trichlorobenzene	17.8	20.0	ug/L	89.0	70.0 - 130	118837283
1,2,4-Trimethylbenzene	18.3	20.0	ug/L	91.7	70.0 - 130	118837283
1,2-Dibromo-3-chloropropane	18.1	20.0	ug/L	90.3	70.0 - 130	118837283
1,2-Dibromoethane (EDB)	17.3	20.0	ug/L	86.7	70.0 - 130	118837283
1,2-Dichloroethane	18.5	20.0	ug/L	92.4	70.0 - 130	118837283
1,2-Dichloropropane	17.8	20.0	ug/L	89.2	70.0 - 130	118837283
1,3,5-Trimethylbenzene	18.4	20.0	ug/L	92.2	70.0 - 130	118837283
1,3-Dichloropropane	17.6	20.0	ug/L	87.8	70.0 - 130	118837283
2,2-Dichloropropane	19.0	20.0	ug/L	95.2	70.0 - 130	118837283
2-Chloroethylvinyl ether	22.9	20.0	ug/L	114	70.0 - 130	118837283
2-Chlorotoluene	19.2	20.0	ug/L	96.0	70.0 - 130	118837283
4-Chlorotoluene	18.2	20.0	ug/L	90.8	70.0 - 130	118837283
Acetone	16.6	20.0	ug/L	83.2	70.0 - 130	118837283
Acrolein	32.0	40.0	ug/L	79.9	70.0 - 130	118837283
Acrylonitrile	35.7	40.0	ug/L	89.3	70.0 - 130	118837283
Benzene	18.1	20.0	ug/L	90.3	70.0 - 130	118837283
Bromobenzene	17.5	20.0	ug/L	87.7	70.0 - 130	118837283
Bromochloromethane	18.1	20.0	ug/L	90.6	70.0 - 130	118837283
Bromodichloromethane	17.6	20.0	ug/L	88.1	70.0 - 130	118837283
Bromoform	16.6	20.0	ug/L	82.9	70.0 - 130	118837283
Bromomethane (Methyl Bromi	22.8	20.0	ug/L	114	70.0 - 130	118837283
Carbon Tetrachloride	17.9	20.0	ug/L	89.5	70.0 - 130	118837283
Chlorobenzene	17.2	20.0	ug/L	85.8	70.0 - 130	118837283
Chloroethane	20.4	20.0	ug/L	102	70.0 - 130	118837283
Chloroform	18.4	20.0	ug/L	92.0	70.0 - 130	118837283
Chloromethane	19.2	20.0	ug/L	96.2	70.0 - 130	118837283
cis-1,2-Dichloroethylene	18.2	20.0	ug/L	91.2	70.0 - 130	118837283

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Parameter	Reading	Known	Units	Recover%	Limits%	File
cis-1,3-Dichloropropene	17.5	20.0	ug/L	87.6	70.0 - 130	118837283
Dibromochloromethane	17.5	20.0	ug/L	87.4	70.0 - 130	118837283
Dibromomethane	18.1	20.0	ug/L	90.6	70.0 - 130	118837283
Dichlorodifluoromethane	17.8	20.0	ug/L	89.1	70.0 - 130	118837283
Dichloromethane	17.2	20.0	ug/L	85.9	70.0 - 130	118837283
Ethylbenzene	17.7	20.0	ug/L	88.6	70.0 - 130	118837283
Hexachlorobutadiene	18.5	20.0	ug/L	92.4	70.0 - 130	118837283
Isopropylbenzene (Cumene)	18.1	20.0	ug/L	90.6	70.0 - 130	118837283
m- and p-Xylene	36.3	40.0	ug/L	90.7	70.0 - 130	118837283
m-Dichlorobenzene (1,3-DCB)	18.1	20.0	ug/L	90.4	70.0 - 130	118837283
Methyl ethyl ketone (Butanone)	18.5	20.0	ug/L	92.4	70.0 - 130	118837283
Methyl Isobutyl Ketone	16.8	20.0	ug/L	84.0	70.0 - 130	118837283
Naphthalene	17.1	20.0	ug/L	85.6	70.0 - 130	118837283
n-Butylbenzene	18.0	20.0	ug/L	90.0	70.0 - 130	118837283
n-Propylbenzene	17.8	20.0	ug/L	89.1	70.0 - 130	118837283
o-Dichlorobenzene (1,2-DCB)	17.8	20.0	ug/L	89.1	70.0 - 130	118837283
o-Xylene	17.8	20.0	ug/L	89.2	70.0 - 130	118837283
p-Dichlorobenzene (1,4-DCB)	16.8	20.0	ug/L	84.0	70.0 - 130	118837283
p-Isopropyltoluene	18.3	20.0	ug/L	91.4	70.0 - 130	118837283
sec-Butylbenzene	18.1	20.0	ug/L	90.3	70.0 - 130	118837283
Styrene	16.7	20.0	ug/L	83.3	70.0 - 130	118837283
tert-Butylbenzene	18.3	20.0	ug/L	91.3	70.0 - 130	118837283
tert-Butylmethylether (MTBE)	19.2	20.0	ug/L	95.8	70.0 - 130	118837283
Tetrachloroethylene	18.3	20.0	ug/L	91.4	70.0 - 130	118837283
Toluene	17.0	20.0	ug/L	85.0	70.0 - 130	118837283
trans-1,2-Dichloroethylene	18.6	20.0	ug/L	93.0	70.0 - 130	118837283
trans-1,3-Dichloropropene	17.5	20.0	ug/L	87.6	70.0 - 130	118837283
Trichloroethylene	18.1	20.0	ug/L	90.6	70.0 - 130	118837283
Trichlorofluoromethane	18.2	20.0	ug/L	90.8	70.0 - 130	118837283
Vinyl chloride	19.9	20.0	ug/L	99.6	70.0 - 130	118837283

IS Areas

Parameter	Sample	Type	Reading	CCVISM	Low	High	File	PrepSet
1,4-DichlorobenzeneD4 (ISTD)	785061	LCS	133100	141600	70800	212400	118837284	785061
	785061	LCS Dup	105900	141600	70800	212400	118837285	785061
	785061	Blank	88860	141600	70800	212400	118837286	785061
ChlorobenzeneD5 (ISTD)	785061	LCS	222000	232000	116000	348000	118837284	785061
	785061	LCS Dup	165700	232000	116000	348000	118837285	785061
	785061	Blank	157700	232000	116000	348000	118837286	785061

IS RetTime

Parameter	Sample	Type	Reading	CCVISM	Low	High	File	PrepSet
1,4-DichlorobenzeneD4 (ISTD)	785061	LCS	11.94	11.94	11.88	12.00	118837284	785061
	785061	LCS Dup	11.94	11.94	11.88	12.00	118837285	785061
	785061	Blank	11.94	11.94	11.88	12.00	118837286	785061
ChlorobenzeneD5 (ISTD)	785061	LCS	9.568	9.568	9.508	9.628	118837284	785061

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IS RetTime

Parameter	Sample	Type	Reading	CCVISM	Low	High	File	PrepSet
ChlorobenzeneD5 (ISTD)	785061	LCS Dup	9.568	9.568	9.508	9.628	118837285	785061
	785061	Blank	9.568	9.568	9.508	9.628	118837286	785061

LCS Dup

Parameter	PrepSet	LCS	LCSD	Known	Limits%	LCS%	LCSD%	Units	RPD	Limit%
1,1,1,2-Tetrachloroethane	785061	18.6	19.2	20.0	81.0 - 118	93.0	96.0	ug/L	3.17	14.0
1,1,1-Trichloroethane	785061	17.1	21.4	20.0	75.0 - 125	85.5	107	ug/L	22.3	30.0
1,1,2,2-Tetrachloroethane	785061	18.0	16.1	20.0	60.0 - 140	90.0	80.5	ug/L	11.1	30.0
1,1,2-Trichloroethane	785061	16.2	18.7	20.0	71.0 - 129	81.0	93.5	ug/L	14.3	30.0
1,1-Dichloroethane	785061	14.5	19.5	20.0	72.0 - 128	72.5	97.5	ug/L	29.4	30.0
1,1-Dichloroethylene	785061	16.2	22.4	20.0	50.0 - 150	81.0	112	ug/L	32.1 *	30.0
1,1-Dichloropropene	785061	15.7	20.0	20.0	81.0 - 120	78.5 *	100	ug/L	24.1	30.0
1,2,3-Trichlorobenzene	785061	20.4	22.9	20.0	60.0 - 145	102	114	ug/L	11.1	30.0
1,2,3-Trichloropropane	785061	19.4	20.3	20.0	75.0 - 126	97.0	102	ug/L	5.03	30.0
1,2,4-Trichlorobenzene	785061	19.7	22.0	20.0	70.0 - 134	98.5	110	ug/L	11.0	30.0
1,2,4-Trimethylbenzene	785061	20.3	20.6	20.0	82.0 - 112	102	103	ug/L	0.976	30.0
1,2-Dibromo-3-chloropropane	785061	19.6	19.6	20.0	57.0 - 144	98.0	98.0	ug/L	0	30.0
1,2-Dibromoethane (EDB)	785061	18.1	19.6	20.0	79.0 - 116	90.5	98.0	ug/L	7.96	30.0
1,2-Dichloroethane	785061	16.6	21.3	20.0	68.0 - 132	83.0	106	ug/L	24.3	30.0
1,2-Dichloropropane	785061	15.8	19.2	20.0	34.0 - 166	79.0	96.0	ug/L	19.4	30.0
1,3,5-Trimethylbenzene	785061	20.9	20.5	20.0	83.0 - 115	104	102	ug/L	1.94	30.0
1,3-Dichloropropane	785061	15.8	17.9	20.0	83.0 - 116	79.0 *	89.5	ug/L	12.5	30.0
2,2-Dichloropropane	785061	16.5	21.1	20.0	46.0 - 171	82.5	106	ug/L	24.9	30.0
2-Chloroethylvinyl ether	785061	23.2	25.7	20.0	10.0 - 224	116	128	ug/L	9.84	30.0
2-Chlorotoluene	785061	20.5	19.0	20.0	82.0 - 115	102	95.0	ug/L	7.11	30.0
4-Chlorotoluene	785061	19.5	18.8	20.0	82.0 - 118	97.5	94.0	ug/L	3.66	30.0
Acetone	785061	21.2	30.7	20.0	45.0 - 185	106	154	ug/L	36.9 *	30.0
Acrolein	785061	29.3	41.2	40.0	0.100 - 425	73.2	103	ug/L	33.8 *	30.0
Acrylonitrile	785061	34.0	50.3	40.0	71.0 - 117	85.0	126 *	ug/L	38.9 *	30.0
Benzene	785061	14.8	18.9	20.0	64.0 - 136	74.0	94.5	ug/L	24.3	30.0
Bromobenzene	785061	19.6	19.3	20.0	83.0 - 116	98.0	96.5	ug/L	1.54	30.0
Bromochloromethane	785061	16.5	21.7	20.0	82.0 - 124	82.5	108	ug/L	26.8	30.0
Bromodichloromethane	785061	16.7	20.9	20.0	65.0 - 135	83.5	104	ug/L	21.9	30.0
Bromoform	785061	18.8	19.9	20.0	71.0 - 129	94.0	99.5	ug/L	5.68	30.0
Bromomethane (Methyl Bromi	785061	18.7	25.9	20.0	14.0 - 186	93.5	130	ug/L	32.7 *	30.0
Carbon Tetrachloride	785061	17.5	22.7	20.0	73.0 - 127	87.5	114	ug/L	26.3	30.0
Chlorobenzene	785061	18.5	18.7	20.0	66.0 - 134	92.5	93.5	ug/L	1.08	30.0
Chloroethane	785061	17.4	24.8	20.0	38.0 - 162	87.0	124	ug/L	35.1 *	30.0
Chloroform	785061	15.6	20.0	20.0	67.0 - 133	78.0	100	ug/L	24.7	30.0
Chloromethane	785061	16.0	22.2	20.0	10.0 - 204	80.0	111	ug/L	32.5 *	30.0
cis-1,2-Dichloroethylene	785061	15.1	19.9	20.0	78.0 - 114	75.5 *	99.5	ug/L	27.4 *	14.0
cis-1,3-Dichloropropene	785061	14.4	17.1	20.0	24.0 - 176	72.0	85.5	ug/L	17.1	30.0
Dibromochloromethane	785061	17.6	21.2	20.0	67.0 - 133	88.0	106	ug/L	18.6	30.0
Dibromomethane	785061	16.6	21.1	20.0	87.0 - 117	83.0 *	106	ug/L	24.3	30.0
Dichlorodifluoromethane	785061	19.7	25.7	20.0	45.0 - 146	98.5	128	ug/L	26.0 *	14.0
Dichloromethane	785061	16.5	22.9	20.0	60.0 - 140	82.5	114	ug/L	32.1 *	30.0
Ethylbenzene	785061	19.4	19.2	20.0	59.0 - 141	97.0	96.0	ug/L	1.04	30.0
Hexachlorobutadiene	785061	21.4	25.2	20.0	71.0 - 132	107	126	ug/L	16.3	30.0
Isopropylbenzene (Cumene)	785061	19.1	17.9	20.0	91.0 - 125	95.5	89.5 *	ug/L	6.49	30.0

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LCS Dup

Parameter	PrepSet	LCS	LCSD	Known	Limits%	LCS%	LCSD%	Units	RPD	Limit%
m- and p-Xylene	785061	38.7	38.6	40.0	80.0 - 117	96.8	96.5	ug/L	0.310	14.0
m-Dichlorobenzene (1,3-DCB)	785061	19.5	20.1	20.0	73.0 - 127	97.5	100	ug/L	2.53	30.0
Methyl ethyl ketone (Butanone)	785061	16.8	22.3	20.0	61.0 - 139	84.0	112	ug/L	28.6	30.0
Methyl Isobutyl Ketone	785061	17.4	20.9	20.0	61.0 - 120	87.0	104	ug/L	17.8	30.0
Naphthalene	785061	19.8	21.5	20.0	62.0 - 138	99.0	108	ug/L	8.70	30.0
n-Butylbenzene	785061	19.7	19.2	20.0	86.0 - 120	98.5	96.0	ug/L	2.57	30.0
n-Propylbenzene	785061	19.7	18.0	20.0	87.0 - 118	98.5	90.0	ug/L	9.02	30.0
o-Dichlorobenzene (1,2-DCB)	785061	19.2	20.1	20.0	63.0 - 137	96.0	100	ug/L	4.08	30.0
o-Xylene	785061	18.6	18.4	20.0	82.0 - 118	93.0	92.0	ug/L	1.08	14.0
p-Dichlorobenzene (1,4-DCB)	785061	18.1	18.5	20.0	63.0 - 137	90.5	92.5	ug/L	2.19	30.0
p-Isopropyltoluene	785061	19.8	20.2	20.0	90.0 - 121	99.0	101	ug/L	2.00	30.0
sec-Butylbenzene	785061	20.1	19.4	20.0	85.0 - 114	100	97.0	ug/L	3.05	30.0
Styrene	785061	17.6	17.8	20.0	83.0 - 111	88.0	89.0	ug/L	1.13	30.0
tert-Butylbenzene	785061	20.0	20.4	20.0	83.0 - 118	100	102	ug/L	1.98	30.0
tert-Butylmethylether (MTBE)	785061	16.6	21.5	20.0	70.0 - 138	83.0	108	ug/L	26.2	30.0
Tetrachloroethylene	785061	19.2	21.5	20.0	73.0 - 126	96.0	108	ug/L	11.8	30.0
Toluene	785061	16.2	18.8	20.0	74.0 - 126	81.0	94.0	ug/L	14.9	30.0
trans-1,2-Dichloroethylene	785061	15.2	20.7	20.0	69.0 - 131	76.0	104	ug/L	31.1 *	30.0
trans-1,3-Dichloropropene	785061	15.8	19.4	20.0	50.0 - 150	79.0	97.0	ug/L	20.5	30.0
Trichloroethylene	785061	17.1	21.0	20.0	66.0 - 133	85.5	105	ug/L	20.5	30.0
Trichlorofluoromethane	785061	16.2	21.8	20.0	48.0 - 152	81.0	109	ug/L	29.5	30.0
Vinyl chloride	785061	15.7	21.7	20.0	10.0 - 196	78.5	108	ug/L	31.6 *	30.0

MSD

Parameter	Sample	MS	MSD	UNK	Known	Limits	MS%	MSD%	Units	RPD	Limit%
1,1,1,2-Tetrachloroethane	1693731	18.4	14.4	ND	20.0	70.0 - 130	92.0	72.0	ug/L	24.4	30.0
1,1,1-Trichloroethane	1693731	23.1	17.9	ND	20.0	52.0 - 162	116	89.5	ug/L	25.4	30.0
1,1,2,2-Tetrachloroethane	1693731	15.6	11.8	ND	20.0	46.0 - 157	78.0	59.0	ug/L	27.7	30.0
1,1,2-Trichloroethane	1693731	18.6	13.3	ND	20.0	52.0 - 150	93.0	66.5	ug/L	33.2 *	30.0
1,1-Dichloroethane	1693731	18.9	14.7	ND	20.0	59.0 - 155	94.5	73.5	ug/L	25.0	30.0
1,1-Dichloroethylene	1693731	21.0	16.9	ND	20.0	0.100 - 234	105	84.5	ug/L	21.6	30.0
1,1-Dichloropropene	1693731	19.1	14.6	ND	20.0	70.0 - 130	95.5	73.0	ug/L	26.7	30.0
1,2,3-Trichlorobenzene	1693731	18.7	15.3	ND	20.0	70.0 - 130	93.5	76.5	ug/L	20.0	30.0
1,2,3-Trichloropropane	1693731	19.8	14.3	ND	20.0	70.0 - 130	99.0	71.5	ug/L	32.3 *	30.0
1,2,4-Trichlorobenzene	1693731	17.0	13.9	ND	20.0	70.0 - 130	85.0	69.5 *	ug/L	20.1	30.0
1,2,4-Trimethylbenzene	1693731	18.3	13.8	ND	20.0	70.0 - 130	91.5	69.0 *	ug/L	28.0	30.0
1,2-Dibromo-3-chloropropane	1693731	19.3	16.0	ND	20.0	70.0 - 130	96.5	80.0	ug/L	18.7	30.0
1,2-Dibromoethane (EDB)	1693731	20.1	14.5	ND	20.0	70.0 - 130	100	72.5	ug/L	32.4 *	30.0
1,2-Dichloroethane	1693731	22.9	17.6	ND	20.0	49.0 - 155	114	88.0	ug/L	26.2	30.0
1,2-Dichloropropane	1693731	18.4	14.0	ND	20.0	0.100 - 210	92.0	70.0	ug/L	27.2	30.0
1,3,5-Trimethylbenzene	1693731	19.0	14.8	ND	20.0	70.0 - 130	95.0	74.0	ug/L	24.9	30.0
1,3-Dichloropropane	1693731	17.5	12.6	ND	20.0	70.0 - 130	87.5	63.0 *	ug/L	32.6 *	30.0
2,2-Dichloropropane	1693731	21.6	16.7	ND	20.0	70.0 - 130	108	83.5	ug/L	25.6	30.0
2-Chloroethylvinyl ether	1693731	65.6	52.4	ND	20.0	0.100 - 305	328 *	262	ug/L	22.4	30.0
2-Chlorotoluene	1693731	18.6	14.5	ND	20.0	70.0 - 130	93.0	72.5	ug/L	24.8	30.0
4-Chlorotoluene	1693731	17.8	13.0	ND	20.0	70.0 - 130	89.0	65.0 *	ug/L	31.2 *	30.0

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MSD

Parameter	Sample	MS	MSD	UNK	Known	Limits	MS%	MSD%	Units	RPD	Limit%
Acetone	1693731	29.5	26.2	3.65	20.0	70.0 - 130	129	113	ug/L	13.6	30.0
Acrolein	1693731	27.4	34.1	ND	40.0	70.0 - 130	68.5 *	85.2	ug/L	21.8	30.0
Acrylonitrile	1693731	40.3	34.2	ND	40.0	70.0 - 130	101	85.5	ug/L	16.4	30.0
Benzene	1693731	18.2	13.5	ND	20.0	37.0 - 151	91.0	67.5	ug/L	29.7	30.0
Bromobenzene	1693731	18.2	14.3	ND	20.0	70.0 - 130	91.0	71.5	ug/L	24.0	30.0
Bromochloromethane	1693731	21.0	16.3	ND	20.0	70.0 - 130	105	81.5	ug/L	25.2	30.0
Bromodichloromethane	1693731	21.5	16.4	ND	20.0	35.0 - 155	108	82.0	ug/L	26.9	30.0
Bromoform	1693731	20.0	14.8	ND	20.0	45.0 - 169	100	74.0	ug/L	29.9	30.0
Bromomethane (Methyl Bromi	1693731	25.1	20.7	ND	20.0	0.100 - 242	126	104	ug/L	19.2	30.0
Carbon Tetrachloride	1693731	26.0	20.5	ND	20.0	70.0 - 140	130	102	ug/L	23.7	30.0
Chlorobenzene	1693731	19.0	13.8	ND	20.0	37.0 - 160	95.0	69.0	ug/L	31.7 *	30.0
Chloroethane	1693731	24.0	19.4	ND	20.0	14.0 - 230	120	97.0	ug/L	21.2	30.0
Chloroform	1693731	21.6	16.4	ND	20.0	51.0 - 138	108	82.0	ug/L	27.4	30.0
Chloromethane	1693731	21.9	18.5	ND	20.0	0.100 - 273	110	92.5	ug/L	16.8	30.0
cis-1,2-Dichloroethylene	1693731	19.1	13.9	ND	20.0	70.0 - 130	95.5	69.5 *	ug/L	31.5 *	30.0
cis-1,3-Dichloropropene	1693731	15.5	11.4	ND	20.0	0.100 - 227	77.5	57.0	ug/L	30.5 *	30.0
Dibromochloromethane	1693731	22.5	16.4	ND	20.0	53.0 - 149	112	82.0	ug/L	31.4 *	30.0
Dibromomethane	1693731	20.2	15.2	ND	20.0	70.0 - 130	101	76.0	ug/L	28.2	30.0
Dichlorodifluoromethane	1693731	20.5	18.1	ND	20.0	70.0 - 130	102	90.5	ug/L	12.4	30.0
Dichloromethane	1693731	21.8	17.3	2.63	20.0	0.100 - 221	95.8	73.4	ug/L	26.6	30.0
Ethylbenzene	1693731	19.2	14.0	ND	20.0	37.0 - 162	96.0	70.0	ug/L	31.3 *	30.0
Hexachlorobutadiene	1693731	22.0	18.3	ND	20.0	70.0 - 130	110	91.5	ug/L	18.4	30.0
Isopropylbenzene (Cumene)	1693731	16.1	12.5	ND	20.0	70.0 - 130	80.5	62.5 *	ug/L	25.2	30.0
m- and p-Xylene	1693731	39.7	29.2	ND	40.0	70.0 - 130	99.2	73.0	ug/L	30.5 *	30.0
m-Dichlorobenzene (1,3-DCB)	1693731	18.6	14.3	ND	20.0	59.0 - 156	93.0	71.5	ug/L	26.1	30.0
Methyl ethyl ketone (Butanone)	1693731	20.2	17.5	ND	20.0	70.0 - 130	101	87.5	ug/L	14.3	30.0
Methyl Isobutyl Ketone	1693731	17.1	14.0	ND	20.0	70.0 - 130	85.5	70.0	ug/L	19.9	30.0
Naphthalene	1693731	16.2	12.7	ND	20.0	70.0 - 130	81.0	63.5 *	ug/L	24.2	30.0
n-Butylbenzene	1693731	16.7	12.9	ND	20.0	70.0 - 130	83.5	64.5 *	ug/L	25.7	30.0
n-Propylbenzene	1693731	16.5	12.7	ND	20.0	70.0 - 130	82.5	63.5 *	ug/L	26.0	30.0
o-Dichlorobenzene (1,2-DCB)	1693731	18.1	13.9	ND	20.0	18.0 - 190	90.5	69.5	ug/L	26.2	30.0
o-Xylene	1693731	18.9	13.4	ND	20.0	70.0 - 130	94.5	67.0 *	ug/L	34.1 *	30.0
p-Dichlorobenzene (1,4-DCB)	1693731	17.8	14.0	ND	20.0	18.0 - 190	89.0	70.0	ug/L	23.9	30.0
p-Isopropyltoluene	1693731	18.0	14.3	ND	20.0	70.0 - 130	90.0	71.5	ug/L	22.9	30.0
sec-Butylbenzene	1693731	17.4	13.4	ND	20.0	70.0 - 130	87.0	67.0 *	ug/L	26.0	30.0
Styrene	1693731	17.0	13.0	ND	20.0	70.0 - 130	85.0	65.0 *	ug/L	26.7	30.0
tert-Butylbenzene	1693731	18.0	14.0	ND	20.0	70.0 - 130	90.0	70.0	ug/L	25.0	30.0
tert-Butylmethylether (MTBE)	1693731	18.4	15.3	ND	20.0	70.0 - 130	92.0	76.5	ug/L	18.4	30.0
Tetrachloroethylene	1693731	22.1	17.4	ND	20.0	64.0 - 148	110	87.0	ug/L	23.8	30.0
Toluene	1693731	18.3	13.3	ND	20.0	47.0 - 150	91.5	66.5	ug/L	31.6 *	30.0
trans-1,2-Dichloroethylene	1693731	19.4	15.4	ND	20.0	54.0 - 156	97.0	77.0	ug/L	23.0	30.0
trans-1,3-Dichloropropene	1693731	17.7	13.4	ND	20.0	17.0 - 183	88.5	67.0	ug/L	27.7	30.0
Trichloroethylene	1693731	19.8	14.6	ND	20.0	71.0 - 157	99.0	73.0	ug/L	30.2 *	30.0
Trichlorofluoromethane	1693731	24.0	19.9	ND	20.0	17.0 - 181	120	99.5	ug/L	18.7	30.0
Vinyl chloride	1693731	0	18.0	ND	20.0	70.0 - 130	*	90.0	ug/L		30.0

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Surrogate

Parameter	Sample	Type	Reading	Known	Units	Recover%	Limits%	File
1,2-DCA-d4 (SURR)	785061	CCV	20.7	20.0	ug/L	104	70.0 - 130	118837283
	785061	LCS	17.4	20.0	ug/L	87.0	70.0 - 130	118837284
	785061	LCS Dup	22.8	20.0	ug/L	114	70.0 - 130	118837285
	785061	Blank	23.0	20.0	ug/L	115	70.0 - 130	118837286
Bromofluorobenzene (SURR)	785061	CCV	19.6	20.0	ug/L	98.0	70.0 - 142	118837283
	785061	LCS	20.4	20.0	ug/L	102	70.0 - 142	118837284
	785061	LCS Dup	19.2	20.0	ug/L	96.0	70.0 - 142	118837285
	785061	Blank	19.2	20.0	ug/L	96.0	70.0 - 142	118837286
Dibromofluoromethane (SURR)	785061	CCV	21.3	20.0	ug/L	106	70.0 - 140	118837283
	785061	LCS	17.0	20.0	ug/L	85.0	70.0 - 140	118837284
	785061	LCS Dup	22.4	20.0	ug/L	112	70.0 - 140	118837285
	785061	Blank	21.6	20.0	ug/L	108	70.0 - 140	118837286
TolueneD8 (SURR)	785061	CCV	20.8	20.0	ug/L	104	70.0 - 140	118837283
	785061	LCS	18.0	20.0	ug/L	90.0	70.0 - 140	118837284
	785061	LCS Dup	20.9	20.0	ug/L	104	70.0 - 140	118837285
	785061	Blank	18.7	20.0	ug/L	93.5	70.0 - 140	118837286
1,2-DCA-d4 (SURR)	1693731	MS	24.1	20.0	ug/L	120	70.0 - 130	118837289
	1693731	MSD	25.7	20.0	ug/L	128	70.0 - 130	118837290
Bromofluorobenzene (SURR)	1693731	MS	18.2	20.0	ug/L	91.0	70.0 - 142	118837289
	1693731	MSD	18.9	20.0	ug/L	94.5	70.0 - 142	118837290
Dibromofluoromethane (SURR)	1693731	MS	23.4	20.0	ug/L	117	70.0 - 140	118837289
	1693731	MSD	23.5	20.0	ug/L	118	70.0 - 140	118837290
TolueneD8 (SURR)	1693731	MS	19.5	20.0	ug/L	97.5	70.0 - 140	118837289
	1693731	MSD	19.5	20.0	ug/L	97.5	70.0 - 140	118837290

Analytical Set 785254 — EPA 632

Blank

Parameter	PrepSet	Reading	MDL	MQL	Units	File
Carbaryl (Sevin)	784702	ND	0.018	2.50	ug/L	118840718

CCV

Parameter	Reading	Known	Units	Recover%	Limits%	File
Carbaryl (Sevin)	902	1000	ug/L	90.2	70.0 - 130	118840717
	917	1000	ug/L	91.7	70.0 - 130	118840723
	923	1000	ug/L	92.3	70.0 - 130	118840725

LCS Dup

Parameter	PrepSet	LCS	LCSD	Known	Limits%	LCS%	LCSD%	Units	RPD	Limit%
Carbaryl (Sevin)	784702	0.875	0.971	1.00	41.1 - 134	87.5	97.1	ug/L	10.4	30.0

Analytical Set 785296 — ASTM D7065-11

Blank

Parameter	PrepSet	Reading	MDL	MQL	Units	File
Nonylphenol	784872	ND	5.00	30.0	ug/L	118841531

CCV

Parameter	Reading	Known	Units	Recover%	Limits%	File
Nonylphenol	333000	300000	ug/L	111	70.0 - 130	118841530

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CCV

Parameter	Reading	Known	Units	Recover%	Limits%	File
Nonylphenol	258000	300000	ug/L	86.0	70.0 - 130	118841538

IS Areas

Parameter	Sample	Type	Reading	CCVISM	Low	High	File	PrepSet
Acenaphthene-d10-ISTD	585431	CCV	698800	698800	349400	1048000	118841530	585431
	585431	CCV	595800	698800	349400	1048000	118841538	585431
Phenanthrene-d10-ISTD	585431	CCV	987000	987000	493500	1481000	118841530	585431
	585431	CCV	759400	987000	493500	1481000	118841538	585431
Acenaphthene-d10-ISTD	784872	Blank	650700	698800	349400	1048000	118841531	784872
	784872	LCS	618800	698800	349400	1048000	118841532	784872
	784872	LCS Dup	521300	698800	349400	1048000	118841533	784872
Phenanthrene-d10-ISTD	784872	Blank	980300	987000	493500	1481000	118841531	784872
	784872	LCS	865200	987000	493500	1481000	118841532	784872
	784872	LCS Dup	772600	987000	493500	1481000	118841533	784872

IS RetTime

Parameter	Sample	Type	Reading	CCVISM	Low	High	File	PrepSet
Acenaphthene-d10-ISTD	585431	CCV	6.640	6.640	6.580	6.700	118841530	585431
	585431	CCV	6.640	6.640	6.580	6.700	118841538	585431
Phenanthrene-d10-ISTD	585431	CCV	7.850	7.850	7.790	7.910	118841530	585431
	585431	CCV	7.850	7.850	7.790	7.910	118841538	585431
Acenaphthene-d10-ISTD	784872	Blank	6.640	6.640	6.580	6.700	118841531	784872
	784872	LCS	6.640	6.640	6.580	6.700	118841532	784872
	784872	LCS Dup	6.640	6.640	6.580	6.700	118841533	784872
Phenanthrene-d10-ISTD	784872	Blank	7.850	7.850	7.790	7.910	118841531	784872
	784872	LCS	7.850	7.850	7.790	7.910	118841532	784872
	784872	LCS Dup	7.850	7.850	7.790	7.910	118841533	784872

LCS Dup

Parameter	PrepSet	LCS	LCSD	Known	Limits%	LCS%	LCSD%	Units	RPD	Limit%
Nonylphenol	784872	114	122	150	56.0 - 112	76.0	81.3	ug/L	6.74	30.0

Surrogate

Parameter	Sample	Type	Reading	Known	Units	Recover%	Limits%	File
4-Nonylphenol-SURR	585431	CCV	58800	50000	ug/L	118	50.0 - 130	118841530
	585431	CCV	49200	50000	ug/L	98.4	50.0 - 130	118841538
	784872	Blank	20800	25000	ug/L	83.2	50.0 - 130	118841531
	784872	LCS	20200	25000	ug/L	80.8	50.0 - 130	118841532
	784872	LCS Dup	19600	25000	ug/L	78.4	50.0 - 130	118841533

Analytical Set **785325** **EPA 608**

Blank

Parameter	PrepSet	Reading	MDL	MQL	Units	File
4,4-DDD	784703	ND	0.0194	0.025	ug/L	118842106
4,4-DDE	784703	ND	0.0161	0.025	ug/L	118842106
4,4-DDT	784703	ND	0.00591	0.010	ug/L	118842106
Aldrin	784703	ND	0.00253	0.010	ug/L	118842106
Alpha-BHC(hexachlorocyclohexane)	784703	ND	0.015	0.025	ug/L	118842106
Beta-BHC(hexachlorocyclohexane)	784703	ND	0.00871	0.010	ug/L	118842106
Chlordane	784703	ND	0.00188	0.010	ug/L	118842106

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Parameter	PrepSet	Reading	MDL	MQL	Units	File
Delta-BHC(hexachlorocyclohexane)	784703	ND	0.00523	0.010	ug/L	118842106
Dieldrin	784703	ND	0.00653	0.010	ug/L	118842106
Endosulfan I (alpha)	784703	ND	0.00719	0.010	ug/L	118842106
Endosulfan II (beta)	784703	ND	0.00767	0.010	ug/L	118842106
Endosulfan sulfate	784703	ND	0.00333	0.010	ug/L	118842106
Endrin	784703	ND	0.00857	0.010	ug/L	118842106
Endrin aldehyde	784703	ND	0.0144	0.025	ug/L	118842106
Gamma-BHC(Lindane)	784703	ND	0.00897	0.010	ug/L	118842106
Heptachlor	784703	ND	0.00147	0.010	ug/L	118842106
Heptachlor epoxide	784703	ND	0.00128	0.010	ug/L	118842106
Methoxychlor	784703	ND	0.00563	0.010	ug/L	118842106
Toxaphene	784703	ND	0.00373	0.010	ug/L	118842106

CCV

Parameter	Reading	Known	Units	Recover%	Limits%	File
4,4-DDD	103	100	ug/L	103	-3900 - 4100	118842101
	126	100	ug/L	126	-3900 - 4100	118842116
4,4-DDE	95.2	100	ug/L	95.2	-3900 - 4100	118842101
	113	100	ug/L	113	-3900 - 4100	118842116
4,4-DDT	102	100	ug/L	102	-3900 - 4100	118842101
	120	100	ug/L	120	-3900 - 4100	118842116
Aldrin	95.7	100	ug/L	95.7	-3900 - 4100	118842101
	111	100	ug/L	111	-3900 - 4100	118842116
Alpha-BHC(hexachlorocyclohexane)	98.0	100	ug/L	98.0	-3900 - 4100	118842101
	97.8	100	ug/L	97.8	-3900 - 4100	118842116
Beta-BHC(hexachlorocyclohexane)	107	100	ug/L	107	-3900 - 4100	118842101
	114	100	ug/L	114	-3900 - 4100	118842116
Delta-BHC(hexachlorocyclohexane)	99.5	100	ug/L	99.5	-3900 - 4100	118842101
	111	100	ug/L	111	-3900 - 4100	118842116
Dieldrin	97.8	100	ug/L	97.8	-3900 - 4100	118842101
	113	100	ug/L	113	-3900 - 4100	118842116
Endosulfan I (alpha)	95.7	100	ug/L	95.7	-3900 - 4100	118842101
	113	100	ug/L	113	-3900 - 4100	118842116
Endosulfan II (beta)	103	100	ug/L	103	-3900 - 4100	118842101
	123	100	ug/L	123	-3900 - 4100	118842116
Endosulfan sulfate	101	100	ug/L	101	-3900 - 4100	118842101
	133	100	ug/L	133	-3900 - 4100	118842116
Endrin	101	100	ug/L	101	-3900 - 4100	118842101
	118	100	ug/L	118	-3900 - 4100	118842116
Endrin aldehyde	102	100	ug/L	102	-3900 - 4100	118842101
	124	100	ug/L	124	-3900 - 4100	118842116
Gamma-BHC(Lindane)	107	100	ug/L	107	-3900 - 4100	118842101
	103	100	ug/L	103	-3900 - 4100	118842116
Heptachlor	108	100	ug/L	108	-3900 - 4100	118842101
	117	100	ug/L	117	-3900 - 4100	118842116
Heptachlor epoxide	95.7	100	ug/L	95.7	-3900 - 4100	118842101
	114	100	ug/L	114	-3900 - 4100	118842116
Methoxychlor	96.7	100	ug/L	96.7	-3900 - 4100	118842101

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Parameter	Reading	Known	Units	Recover%	Limits%		File
Methoxychlor	117	100	ug/L	117	-3900 - 4100		118842116

LCS Dup

Parameter	PrepSet	LCS	LCSD	Known	Limits%	LCS%	LCSD%	Units	RPD	Limit%
4,4-DDD	784703	0.846	1.03	1.00	50.1 - 132	84.6	103	ug/L	19.6	40.0
4,4-DDE	784703	0.815	1.00	1.00	54.1 - 123	81.5	100	ug/L	20.4	40.0
4,4-DDT	784703	0.829	1.07	1.00	38.1 - 136	82.9	107	ug/L	25.4	40.0
Aldrin	784703	0.766	0.950	1.00	43.6 - 117	76.6	95.0	ug/L	21.4	40.0
Alpha-BHC(hexachlorocyclohexane)	784703	0.907	0.962	1.00	48.0 - 122	90.7	96.2	ug/L	5.89	40.0
Beta-BHC(hexachlorocyclohexane)	784703	1.05	1.13	1.00	52.7 - 131	105	113	ug/L	7.34	40.0
Delta-BHC(hexachlorocyclohexane)	784703	1.11	1.19	1.00	52.1 - 130	111	119	ug/L	6.96	40.0
Dieldrin	784703	0.959	1.07	1.00	54.8 - 131	95.9	107	ug/L	10.9	40.0
Endosulfan I (alpha)	784703	1.02	1.12	1.00	47.5 - 120	102	112	ug/L	9.35	40.0
Endosulfan II (beta)	784703	1.14	1.25	1.00	51.4 - 126	114	125	ug/L	9.21	40.0
Endosulfan sulfate	784703	1.11	1.22	1.00	56.8 - 130	111	122	ug/L	9.44	40.0
Endrin	784703	0.987	1.10	1.00	54.4 - 135	98.7	110	ug/L	10.8	40.0
Endrin aldehyde	784703	1.05	1.15	1.00	55.8 - 129	105	115	ug/L	9.09	40.0
Gamma-BHC(Lindane)	784703	0.939	1.00	1.00	44.2 - 127	93.9	100	ug/L	6.29	40.0
Heptachlor	784703	0.783	0.965	1.00	37.5 - 125	78.3	96.5	ug/L	20.8	40.0
Heptachlor epoxide	784703	1.01	1.09	1.00	53.5 - 124	101	109	ug/L	7.62	40.0
Methoxychlor	784703	0.907	1.09	1.00	38.1 - 145	90.7	109	ug/L	18.3	40.0

Surrogate

Parameter	Sample	Type	Reading	Known	Units	Recover%	Limits%	File
Decachlorobiphenyl		CCV	94.6	100	ug/L	94.6	4.40 - 155	118842101
		CCV	112	100	ug/L	112	4.40 - 155	118842116
Tetrachloro-m-Xylene (Surr)		CCV	95.3	100	ug/L	95.3	0.100 - 137	118842101
		CCV	93.9	100	ug/L	93.9	0.100 - 137	118842116
Decachlorobiphenyl	784703	Blank	60.8	100	ug/L	60.8	4.40 - 155	118842106
	784703	LCS	79.0	100	ug/L	79.0	4.40 - 155	118842329
	784703	LCS Dup	87.7	100	ug/L	87.7	4.40 - 155	118842330
Tetrachloro-m-Xylene (Surr)	784703	Blank	61.3	100	ug/L	61.3	0.100 - 137	118842106
	784703	LCS	68.0	100	ug/L	68.0	0.100 - 137	118842329
	784703	LCS Dup	74.7	100	ug/L	74.7	0.100 - 137	118842330

Analytical Set 785326 EPA 617

Blank

Parameter	PrepSet	Reading	MDL	MQL	Units	File
Kelthane (Dicofol)	784703	ND	0.028	0.100	ug/L	118842133
Methoxychlor	784703	ND	0.563	1.00	ug/L	118842133
Mirex	784703	ND	0.00889	0.020	ug/L	118842133

CCV

Parameter	Reading	Known	Units	Recover%	Limits%		File
Kelthane (Dicofol)	200	200	ug/L	100	70.0 - 130		118842128
	118	200	ug/L	59.2	70.0 - 130	*	118842142
Methoxychlor	96.7	100	ug/L	96.7	70.0 - 130		118842128
	117	100	ug/L	117	70.0 - 130		118842142
Mirex	96.3	100	ug/L	96.3	70.0 - 130		118842128

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CCV

Parameter	Reading	Known	Units	Recover%	Limits%	File
Mirex	129	100	ug/L	129	70.0 - 130	118842142

LCS Dup

Parameter	PrepSet	LCS	LCSD	Known	Limits%	LCS%	LCSD%	Units	RPD	Limit%
Kelthane (Dicofol)	784703	1.05	1.26	2.00	0.100 - 148	52.5	63.0	ug/L	18.2	30.0
Methoxychlor	784703	90.7	109	100	32.8 - 151	90.7	109	ug/L	18.3	30.0
Mirex	784703	0.888	1.10	1.00	42.6 - 135	88.8	110	ug/L	21.3	30.0

Surrogate

Parameter	Sample	Type	Reading	Known	Units	Recover%	Limits%	File
Decachlorobiphenyl		CCV	94.6	100	ug/L	94.6	10.0 - 150	118842128
		CCV	112	100	ug/L	112	10.0 - 150	118842142
Tetrachloro-m-Xylene (Surr)		CCV	95.3	100	ug/L	95.3	10.0 - 150	118842128
		CCV	93.9	100	ug/L	93.9	10.0 - 150	118842142
Decachlorobiphenyl	784703	Blank	60.8	100	ug/L	60.8	10.0 - 150	118842133
	784703	LCS	79.0	100	ug/L	79.0	10.0 - 150	118842331
	784703	LCS Dup	87.7	100	ug/L	87.7	10.0 - 150	118842332
Tetrachloro-m-Xylene (Surr)	784703	Blank	61.3	100	ug/L	61.3	10.0 - 150	118842133
	784703	LCS	68.0	100	ug/L	68.0	10.0 - 150	118842331
	784703	LCS Dup	74.7	100	ug/L	74.7	10.0 - 150	118842332

Analytical Set 785471 — EPA 604.1

Blank

Parameter	PrepSet	Reading	MDL	MQL	Units	File
Hexachlorophene	785104	ND	2.26	5.00	ug/L	118845586

CCV

Parameter	Reading	Known	Units	Recover%	Limits%	File
Hexachlorophene	5550	5000	ug/L	111	70.0 - 130	118845585
	5340	5000	ug/L	107	70.0 - 130	118845591
	4540	5000	ug/L	90.9	70.0 - 130	118845596

LCS Dup

Parameter	PrepSet	LCS	LCSD	Known	Limits%	LCS%	LCSD%	Units	RPD	Limit%
Hexachlorophene	785104	37.3	30.3	50.0	30.9 - 148	74.6	60.6	ug/L	20.7	50.0

Analytical Set 785750 — EPA 614

Blank

Parameter	PrepSet	Reading	MDL	MQL	Units	File
Azinphos-methyl (Guthion)	784705	ND	0.0461	0.050	ug/L	118849722
Demeton	784705	ND	0.0407	0.050	ug/L	118849722
Diazinon	784705	ND	0.0432	0.050	ug/L	118849722
Malathion	784705	ND	0.0466	0.050	ug/L	118849722
Parathion, ethyl	784705	ND	0.0292	0.050	ug/L	118849722
Parathion, methyl	784705	ND	0.0395	0.040	ug/L	118849722

CCV

Parameter	Reading	Known	Units	Recover%	Limits%	File
Azinphos-methyl (Guthion)	971	1000	ug/L	97.1	61.9 - 142	118849721
	1270	1000	ug/L	127	61.9 - 142	118849730
Demeton	1080	1000	ug/L	108	61.9 - 145	118849721
	1140	1000	ug/L	114	61.9 - 145	118849730

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Parameter	Reading	Known	Units	Recover%	Limits%	File
Diazinon	1040	1000	ug/L	104	68.7 - 145	118849721
	1260	1000	ug/L	126	68.7 - 145	118849730
Malathion	1070	1000	ug/L	107	69.6 - 144	118849721
	1270	1000	ug/L	127	69.6 - 144	118849730
Parathion, ethyl	1060	1000	ug/L	106	68.5 - 145	118849721
	1180	1000	ug/L	118	68.5 - 145	118849730
Parathion, methyl	830	1000	ug/L	83.0	64.6 - 151	118849721
	1490	1000	ug/L	149	64.6 - 151	118849730

LCS Dup

Parameter	PrepSet	LCS	LCSD	Known	Limits%	LCS%	LCSD%	Units	RPD	Limit%
Azinphos-methyl (Guthion)	784705	0.753	0.645	1.00	0.100 - 183	75.3	64.5	ug/L	15.5	30.0
Demeton	784705	0.620	0.527	1.00	0.100 - 118	62.0	52.7	ug/L	16.2	30.0
Diazinon	784705	0.848	0.738	1.00	12.4 - 120	84.8	73.8	ug/L	13.9	30.0
Malathion	784705	0.838	0.719	1.00	6.56 - 144	83.8	71.9	ug/L	15.3	30.0
Parathion, ethyl	784705	0.856	0.754	1.00	6.18 - 144	85.6	75.4	ug/L	12.7	30.0
Parathion, methyl	784705	1.99	0.960	1.00	6.62 - 150	199 *	96.0	ug/L	69.8 *	30.0

Surrogate

Parameter	Sample	Type	Reading	Known	Units	Recover%	Limits%	File
Tributylphosphate		CCV	1080	1000	ug/L	108	0.100 - 148	118849721
		CCV	1140	1000	ug/L	114	0.100 - 148	118849730
Triphenylphosphate		CCV	1020	1000	ug/L	102	0.100 - 406	118849721
		CCV	1250	1000	ug/L	125	0.100 - 406	118849730
Tributylphosphate	784705	Blank	278	1000	ug/L	27.8	0.100 - 148	118849722
	784705	LCS	853	1000	ug/L	85.3	0.100 - 148	118849723
	784705	LCS Dup	730	1000	ug/L	73.0	0.100 - 148	118849724
Triphenylphosphate	784705	Blank	745	1000	ug/L	74.5	0.100 - 406	118849722
	784705	LCS	855	1000	ug/L	85.5	0.100 - 406	118849723
	784705	LCS Dup	746	1000	ug/L	74.6	0.100 - 406	118849724

Analytical Set 785751 — EPA 622

Blank

Parameter	PrepSet	Reading	MDL	MQL	Units	File
Chlorpyrifos	784705	ND	0.0394	0.040	ug/L	118849737

CCV

Parameter	Reading	Known	Units	Recover%	Limits%	File
Chlorpyrifos	1050	1000	ug/L	105	70.0 - 130	118849736
	1210	1000	ug/L	121	70.0 - 130	118849745

LCS Dup

Parameter	PrepSet	LCS	LCSD	Known	Limits%	LCS%	LCSD%	Units	RPD	Limit%
Chlorpyrifos	784705	0.850	0.735	1.00	11.4 - 120	85.0	73.5	ug/L	14.5	30.0

Surrogate

Parameter	Sample	Type	Reading	Known	Units	Recover%	Limits%	File
Tributylphosphate		CCV	1080	1000	ug/L	108	0.100 - 148	118849736
		CCV	1140	1000	ug/L	114	0.100 - 148	118849745
Triphenylphosphate		CCV	1020	1000	ug/L	102	0.100 - 406	118849736
		CCV	1250	1000	ug/L	125	0.100 - 406	118849745
Tributylphosphate	784705	Blank	278	1000	ug/L	27.8	0.100 - 148	118849737

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Surrogate

Parameter	Sample	Type	Reading	Known	Units	Recover%	Limits%	File
Tributylphosphate	784705	LCS	853	1000	ug/L	85.3	0.100 - 148	118849738
	784705	LCS Dup	730	1000	ug/L	73.0	0.100 - 148	118849739
Triphenylphosphate	784705	Blank	745	1000	ug/L	74.5	0.100 - 406	118849737
	784705	LCS	855	1000	ug/L	85.5	0.100 - 406	118849738
	784705	LCS Dup	746	1000	ug/L	74.6	0.100 - 406	118849739

Analytical Set 786013 EPA 615

Blank

Parameter	PrepSet	Reading	MDL	MQL	Units	File
2,4 Dichlorophenoxyacetic acid	785127	ND	0.237	0.500	ug/L	118854705
2,4,5-TP (Silvex)	785127	ND	0.130	0.300	ug/L	118854705

CCV

Parameter	Reading	Known	Units	Recover%	Limits%	File
2,4 Dichlorophenoxyacetic acid	145	150	ug/L	96.9	-5850 - 6150	118854704
	161	150	ug/L	107	-5850 - 6150	118854716
	154	150	ug/L	102	-5850 - 6150	118854717
	150	150	ug/L	99.9	-5850 - 6150	118854718
	160	150	ug/L	107	-5850 - 6150	118854720
	165	150	ug/L	110	-5850 - 6150	118854722
2,4,5-TP (Silvex)	145	150	ug/L	96.6	-5850 - 6150	118854704
	172	150	ug/L	115	-5850 - 6150	118854716
	146	150	ug/L	97.2	-5850 - 6150	118854717
	157	150	ug/L	105	-5850 - 6150	118854718
	171	150	ug/L	114	-5850 - 6150	118854720
	181	150	ug/L	121	-5850 - 6150	118854722

LCS Dup

Parameter	PrepSet	LCS	LCSD	Known	Limits%	LCS%	LCSD%	Units	RPD	Limit%
2,4 Dichlorophenoxyacetic acid	785127	0.404	1.20	1.00	11.1 - 183	40.4	120	ug/L	99.3 *	30.0
2,4,5-TP (Silvex)	785127	0.247	0.818	1.00	12.3 - 167	24.7	81.8	ug/L	107 *	30.0

Surrogate

Parameter	Sample	Type	Reading	Known	Units	Recover%	Limits%	File
2,4-Dichlorophenylacetic Acid	584962	CCV	144	100	ug/L	144	24.7 - 223	118854704
	584962	CCV	170	100	ug/L	170	24.7 - 223	118854716
	584962	CCV	153	100	ug/L	153	24.7 - 223	118854717
	584962	CCV	143	100	ug/L	143	24.7 - 223	118854718
	584962	CCV	175	100	ug/L	175	24.7 - 223	118854720
	584962	CCV	177	100	ug/L	177	24.7 - 223	118854722
	785127	Blank	68.7	100	ug/L	68.7	24.7 - 223	118854705
	785127	LCS	28.1	100	ug/L	28.1	24.7 - 223	118854706
	785127	LCS Dup	91.3	100	ug/L	91.3	24.7 - 223	118854707

Analytical Set 787700 EPA 608

CCV

Parameter	Reading	Known	Units	Recover%	Limits%	File
PCB-1016	1190	1000	ug/L	119	-39000 - 4100(	118885996

ANA-LAB CORP. THE COMPLETE SERVICE LAB

Ana-Lab Corp. P.O. Box 9000 Kilgore, TX 75663

Phone 903/984-0551 FAX 903/984-5914 e-Mail corp@ana-lab.com LELAP-accredited #02008

Employee Owned Integrity Caring Continual Improvement

Quality Control

Printed 07/11/2018

CCV

Parameter	Reading	Known	Units	Recover%	Limits%	File
PCB-1016	1320	1000	ug/L	132	-39000 - 4100(	118886001
	1170	1000	ug/L	117	-39000 - 4100(	118886002
PCB-1260	1170	1000	ug/L	117	-39000 - 4100(	118885996
	1460	1000	ug/L	146	-39000 - 4100(	118886001
	1320	1000	ug/L	132	-39000 - 4100(	118886002

* Out RPD is Relative Percent Difference: abs(r1-r2) / mean(r1,r2) * 100% Recover% is Recovery Percent: result / known * 100%

Blank - Method Blank; CCV - Continuing Calibration Verification; BFB - GC/MS Tuning Compound; DFTPP - GC/MS Tuning Compound; ICV - Initial Calibration Verification

AQUA-TECH LABORATORIES, INC.

ATL - Bryan Facility:
635 Phil Gramm Blvd.
Bryan, TX 77807
(979) 778-3707
Fax (979) 778-3183

ATL - Austin Facility:
7500 Hwy 71 W, Suite 105
Austin, TX 78735
(512) 301-9559
Fax (512) 301-9552

Chain-of-Custody & Analysis Request

T104704371

SHIPPED TO:
Ana-Lab Corp. (NELAP Cert. T104704201)
2600 Dudley Road
Kilgore, TX 75662
Phone: (903) 984-0551
Fax: (903) 984-5914

IC9 3934

C-O-C #
144 - B014041

All analyses must be performed by a TNI approved method certified by the TCEQ. Contact ATL's sample custodian via voice and email if your methods do not meet this criteria.

Analysis Request for: | **Sample ID: B014041-01** | Sampled: 06/18/18 06:30 | Matrix: Non Potable | **Laboratory ID >>**

Nonylphenol - ASTM D7065-06	Ag - EPA 200.8 R5.4	~~Hg - EPA 245.7~~ Not submitted ckb	Phenol - EPA 420.4 R1
Hexachlorophene - EPA 604.1	Pesticides 10054 - EPA 608	Organophoshorus Pesticides 10054 - EPA 614	Herbicides - EPA 615
Chlorpyrifos 10054 - EPA 622	Acrolein & Acrylonitrile - EPA 624	Vol 10054 - EPA 624	Semivolatiles (10054/55) - EPA 625
Carbaryl - EPA 632	CN NP - SM20 4500-CN-E	CN Amenable NP - SM4500 CN G, 1999	

~~Analysis Request for:~~ | ~~Sample ID: B014041-02~~ | Sampled: 06/18/18 00:00 | Matrix: Non Potable | **Laboratory ID >>**

~~Hg - EPA 245.7~~ Not submitted ckb

~~Analysis Request for:~~ | ~~Sample ID: B014041-03~~ | Sampled: 06/18/18 00:00 | Matrix: Non Potable | **Laboratory ID >>**

~~Hg - EPA 245.7~~ Not submitted ckb

CONTAINERS SUPPLIED: (ATL indicates cooler number in parentheses for each container - only required if more than one cooler listed below.)

(1) B014041-01 [A] - Carbaryl-Diuron 1LG	(2) B014041-01 [H] - V - 40 mL VOA Level 2 HCl	(2) B014041-01 [I] - V - 40 mL VOA Level 2 HCl
(2) B014041-01 [J] - V - 40 mL VOA Level 2 HCl	(2) B014041-01 [K] - V - 40 mL VOA Level 2 HCl	(2) B014041-01 [N] - V - 40 mL VOA Level 2
(2) B014041-01 [O] - V - 40 mL VOA Level 2	(2) B014041-01 [P] - V - 40 mL VOA Level 2	(2) B014041-01 [Q] - V - 40 mL VOA Level 2
(1) B014041-01 [T] - CN 0.33LG NaOH	(1) B014041-01 [U] - CN 0.33LG NaOH	(1) B014041-01 [Z] - Herbicides 1LG
(1) B014041-01 [AA] - Hexachlorophene 1LG	(1) B014041-01 [AC] - Metals 0.25LP HNO3	~~(1) B014041-01 [AE] - Metals Hg LLANA 1L HCl~~ *
(1) B014041-01 [AG] - NONYLPHENOL 1LG H2SO4	(1) B014041-01 [AI] - Pest OrgPO4 1LG	(1) B014041-01 [AJ] - Pesticides 1LG
(1) B014041-01 [AL] - Semivolatiles 1LG		

~~(1) B014041-02 [A] - Metals Hg LLANA 1L HCl~~ *

~~(1) B014041-03 [A] - Metals Hg LLANA 1L BLANK~~ *

* (3) Not submitted ckb

* Wrong letter ckb

AQUA-TECH LABORATORIES, INC.

ATL - Bryan Facility:
635 Phil Gramm Blvd.
Bryan, TX 77807
(979) 778-3707
Fax (979) 778-3193

ATL - Austin Facility:
7500 Hwy 71 W, Suite 105
Austin, TX 78735
(512) 301-9559
Fax (512) 301-9552

Chain-of-Custody & Analysis Request

C:\ELMNT\Print\sco_ATL 081216.rpt

T104704371

C-O-C #

144 - B014041

All analyses must be performed by a TNI approved method certified by the TCEQ. Contact ATL's sample custodian via voice and email if your methods do not meet this criteria.

Relinquished by: (print & sign) ☑ ATL-Austin ☐ ATL-Bryan ☐ Sampler Kelly Kukowski [signature]	Date 6/18/18	Time 1535	☑ Iced ☑ Custody Sealed ☐ Not Chilled	
Carrier & Tracking Number: Lone Star Cooler 1: aqu5 - zx618310 Cooler 2: aqu5 - zx618312			Sample Info: "X" all that apply	
Received by: (print & sign) ☑ Received in Lab 6/6/2018 ~~L.S.~~ Christi Parker Ana-Lab [signature]	Date 6/19/18	Time 0940	☐ Received Iced ☐ CTU ☐ Condition Good ☐ Not Rec'd Iced	

Line below documents condition at receipt in lab (shipped to) listed above.

Cooler Temperature (°C)	Temp. Read (TR)	Corrected Temp. (CT)	Thermometer ID
Cooler 1	0.4 °C	0.4 °C	
Cooler 2	2.1 °C	2.1 °C	6092

Please email reports to:
corp@aqua-techlabs.com

Please return cooler(s) to:
AUSTIN

Abbreviations:
DW - Drinking Water
NP - Non-Potable Water
S - Solid
CTU - Custody Transfer Unbroken
StP - Sterile Plastic
LP - Liter Plastic
LG - Liter Glass

Aqua-Tech Comments and Special Instructions

5 DAY TAT
Need New 2010 MALs

See Attached for Tracking # and Temp

BRET

LSO
It's all in the delivery.

Airbill No. ZX618310

LSO
1-800-800-8984
www.lso.com

SHIP TO:
RECEIVING
ANA LAB CORP
2600 DUDLEY RD
KILGORE, TX 75662
9039840551

From:
KELLY KUKOWSKI
AQUA-TECH LABS
7500 W HWY 71
105
AUSTIN, TX 78735
5123019569

6205 ☐
6092 ☑ 0.0
6093 ☐

0.4°C

WGGG **LSO GROUND**
END OF BUSINESS DAY DELIVERY

PRINT DATE: 6/18/2018
QUICKCODE: **WEIGHT: 40.00LBS**
REF 1: 1D00V.0000 REF 2:

Fold on above line and place shipping label in pouch on package. Please be sure the barcodes and addresses can be read and scanned. Shipping Instructions

1. Fold this page along the horizontal line above.
2. Place this Airbill in the shipping label pouch on the package you are shipping. Please be sure the barcodes and addresses can be read and scanned.
3. To locate a drop box near you, click on **Find A Drop Box** from the home page main menu.
4. To schedule a pickup, click on **Request Pickup.**

WARNING: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your Lone Star Overnight account number.

This label is valid for use for 3 months from the date printed. Use of expired labels may result in delayed billing and / or additional research charges. LIMIT OF LIABILITY: We are not responsible for claims in excess of $100 for any reason unless you: 1) declare a greater value (not to exceed $25,000); 2) pay an additional fee; 3) and document your actual loss in a timely manner. We will not pay any claim in excess of the actual loss. We are not liable for any special or consequential damages. Additional limitations of liability are contained in our current Service Guide. If you ask us to deliver a package without obtaining a delivery signature, you release us of all liability for claims resulting from such service. NO DELIVERY SIGNATURE WILL BE OBTAINED FOR 8:30 AM DELIVERIES OR RESIDENTIAL DELIVERIES.

LSO
It's all in the delivery.

Airbill No. ZX618312

LSO
1-800-800-8984
www.lso.com

SHIP TO:
RECEIVING
ANA LAB CORP
2600 DUDLEY RD
KILGORE, TX 75662
9039840551

6205 ☐
6092 ☐ LSO
6093 ☐

From:
KELLY KUKOWSKI
AQUA-TECH LABS
7500 W HWY 71
105
AUSTIN, TX 78735
5123019559

2.1 °C

WGGG **LSO GROUND**
END OF BUSINESS DAY DELIVERY

PRINT DATE: 6/18/2018
QUICKCODE: **WEIGHT: 10.00LBS**
REF 1: 1D00V.0000 REF 2:

Fold on above line and place shipping label in pouch on package. Please be sure the barcodes and addresses can be read and scanned. Shipping Instructions

1. Fold this page along the horizontal line above.
2. Place this Airbill in the shipping label pouch on the package you are shipping. Please be sure the barcodes and addresses can be read and scanned.
3. To locate a drop box near you, click on **Find A Drop Box** from the home page main menu.
4. To schedule a pickup, click on **Request Pickup.**

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Email information for report date:
7/13/18 16:12

B015634

Liberty Hill, City of

Attn: Vince Perkins
vperkins@libertyhilltx.gov

PO Box 1920
Liberty Hill, TX 78642

We at ATL appreciate your business and thank you for allowing us to partner in servicing your environmental needs.

Call or email us today at samplingbryan@aqua-techlabs.com for more information or to set up an event.

Sincerely,
June M. Brien
Executive Technical Director

CORPORATE OFFICE
635 Phil Gramm Boulevard
Bryan, TX 77807
Phone: (979) 778-3707
Fax: (979) 778-3193

AQUA-TECH LABORATORIES, INC.

AUSTIN OFFICE
7500 Hwy 71 W, Suite 105
Austin, TX 78735
Phone: (512) 301-9559
Fax: (512) 301-9552

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

The following abbreviations indicate certification status:

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

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

NELAP ACCREDITED TNI LABORATORY

TCEQ DW Lab ID TX 239

General Definitions:

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

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

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

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

Record Retention:

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

This report was approved by:

June M. Brien, Technical Director

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

CORPORATE OFFICE
635 Phil Gramm Boulevard
Bryan, TX 77807
Phone: (979) 778-3707
Fax: (979) 778-3193

AQUA-TECH LABORATORIES, INC.

AUSTIN OFFICE
7500 Hwy 71 W, Suite 105
Austin, TX 78735
Phone: (512) 301-9559
Fax: (512) 301-9562

Liberty Hill WWTP Effluent

Collected: 07/03/18 09:00 by CLIENT
Received: 07/03/18 15:50 by Kelly Kukowski

Type Grab | *Matrix* Non Potable | *C-O-C #* B015634

Lab ID# B015634-01	Result	Units	Notes	MDL	Adj MDL	SQL	Lab	Analyzed	Method	Batch	
Metals (Total)											
Mercury	16.4	ng/L		1.65		4.26	*Sub*	07/12/18 11:30 ANA	EPA 245.7	SUB	NEL

Liberty Hill WWTP Effluent MS

Collected: 07/03/18 09:00 by CLIENT
Received: 07/03/18 15:50 by Kelly Kukowski

Type grab | *Matrix* Non Potable | *C-O-C #* B015634

Lab ID# B015634-02	Result	Units	Notes	MDL	Adj MDL	SQL	Lab	Analyzed	Method	Batch	
Metals (Total)											
Mercury	6.22	ng/L		1.65		4.26	*Sub*	07/12/18 11:40 ANA	EPA 245.7	SUB	NEL

Liberty Hill WWTP LL Hg Blank

Collected: 07/03/18 09:00 by CLIENT
Received: 07/03/18 15:50 by Kelly Kukowski

Type grab | *Matrix* Non Potable | *C-O-C #* B015634

Lab ID# B015634-03	Result	Units	Notes	MDL	Adj MDL	SQL	Lab	Analyzed	Method	Batch	
Metals (Total)											
Mercury	7.09	ng/L		1.65		4.26	*Sub*	07/12/18 11:44 ANA	EPA 245.7	SUB	NEL

Sample Preparation Summary

Sample	Method	Prepared	Lab	Bottle	Initial	Units	Final	Units	External Dilution Factor	Batch
B015634-01										
See sub-contract reports for preparation information of subcontracted analyses.										
B015634-02										
See sub-contract reports for preparation information of subcontracted analyses.										
B015634-03										
See sub-contract reports for preparation information of subcontracted analyses.										

AQUA-TECH LABORATORIES, INC.
7500 Hwy 71 W, Suite 105
Austin, TX 78735
PH 512.301.9559
FAX 512.301.9552

rte_COC 051118.rpt

Liberty Hill, City of

C-O-C # B015634

Lab ID	Description	Start Date	Start Time	End Date	End Time	Composite Type	Container List (Checked box indicates bottle arrived in lab)
B015634-01	Liberty Hill WWTP Effluent	7.3-18	9:00	- N/A -	- N/A -	Grab	☑ A Metals Hg LL ANA 1L HCl
Y Billing Digest, Metals Hg	Hg NP CVAA-AF EPA 245.7 NEL [SUB]						
B015634-02	Liberty Hill WWTP Effluent MS	7.3-18	9:00	- N/A -	- N/A -	grab	☑ A Metals Hg LL ANA 1L HCl
Y Billing Digest, Metals Hg	Hg NP CVAA-AF EPA 245.7 NEL [SUB]						
B015634-03	Liberty Hill WWTP LL Hg Blank	7.3-18	9:00	- N/A -	- N/A -	grab	☑ A Metals Hg LL ANA 1L BLANK
Y Billing Digest, Metals Hg	Hg NP CVAA-AF EPA 245.7 NEL [SUB]						

By relinquishing the above samples to ATL, the client agrees to the following terms: Samples will be analyzed by a method that is within ATL's' NELAP fields of accreditation. Analytes requiring a certified method that is not within ATL's fields of accreditation will be subcontracted to a NELAP accredited lab that is certified for that method. Clients will be notified of the subcontract lab's details. Other analytes not requiring accreditation will be analyzed by a compendial method. If a specific method is required, the client will note the method on this C-O-C. The client approves all method modifications documented by ATL or the subcontract lab. A current list of ATL's NELAP fields of accreditation and other methods are available on request.

DEFINITIONS:

ATL = Aqua-Tech Laboratories, Inc.

Matrix designations:
NP = Non-Potable, DW = Drinking Water, SL = Solid

Analyses Ordered:
"A" prefix indicates Austin, all others Bryan or Subcontracted, indicated by [SUB]. Name format: Analysis-Matrix-Technology-Method.

[CNR] = No NELAP certification required or available
[INF] = Informational only (not NELAC certified)
[NEL] = NELAP certified parameter
[SUB] = NELAP certified subcontracted parameter

Reagent tracking is available upon request.

CUSTODY TRANSFER:

Sample Info: "X" all that apply

			Date	Time	Sample Info
Relinquished by (print & sign) Dewey Pierce	☐ Sampler ☐ Client		7-3-18	9:10	☑ Iced / Chilled / Refrigerated ☐ Custody Sealed
Received by (print and sign) Mark Asher	☒ ATL Field ☐ Client		7-3-18	1055	☒ Received Chilled / Iced ☐ Custody Transfer Unbroken
Relinquished by (print & sign)	☐ ATL Field ☐ Client		Date	Time	☐ Iced / Chilled / Refrigerated ☐ Custody Sealed
Received by (print and sign) NPE CNR	☒ ATL Field ☐ Client		Date	Time	☐ Received Chilled / Iced ☐ Custody Transfer Unbroken

Do not write below this line (Laboratory use only)

SAMPLE RECEIPT SUMMARY FOR WORK ORDER B015634

Lab Comments:

			Date	Time	
Relinquished by (print and sign)	Mark Asher	☐ Client ☒ ATL Field	07/03/18	15:50	☒ Iced / Chilled / Refrigerated ☐ Custody Sealed
Received by (print & sign)	Kelly Kukowski	☒ Lab	07/03/18	15:50	☒ Received Chilled / Iced ☒ Custody Transfer Unbroken

Corrected Temperature, °C: ~~3.1~~ 1.7 w/in temp Sample condition good? Yes pH Paper ID: 0721941

Thermometer ID: 0715672 Preservation correct? Yes Post-Preservatives: N/A

Ana-Lab Corp.
P.O. Box 9000
Kilgore, TX 75663
903/984-0551

LELAP-accredited #02008

Report

Table of Contents

Printed 07/13/2018 Page 1 of 1

Aqua-Tech Laboratories (Austin
John Brien
635 Phil Gramm Blvd.
Bryan, TX 77807-9104

Account
AQU5-C

Project
835226

This report consists of this Table of Contents and the following pages:

Report Name	Description	Pages
835226_r03_03_ProjectResults	Ana-Lab Project P:835226 C:AQU5 Project Results t:304	3
835226_r03_06__ProjectTRRP	Ana-Lab Project P:835226 C:AQU5 Project TRRP Results Report for Class	2
835226_r10_05_ProjectQC	Ana-Lab Project P:835226 C:AQU5 Project Quality Control Groups	1
835226_r99_09_CoC__1_of_1	Ana-Lab CoC AQU5 835226_1_of_1	2
	Total Pages:	8

Ana-Lab Corp. P.O. Box 9000 Kilgore, TX 75663
Phone 903/984-0551 FAX 903/984-5914 e-Mail corp@ana-lab.com
Employee Owned Integrity Caring Continual Improvement

Results

Printed: 07/13/2018

Account	*Project*
AQU5-C	835226

Report To

Aqua-Tech Laboratories (Austin
John Brien
635 Phil Gramm Blvd.
Bryan, TX 77807-9104

Results

1698568 **B015634-01** *Received:* 07/06/2018

Non-Potable Water *Collected by:* Client Aqua-Tech Laboratori *PO:*
Taken: 07/03/2018 09:00:00

EPA 245.7 *Prepared:* 787877 07/12/2018 06:20:46 *Analyzed* 788035 07/12/2018 11:30:00 LPS

	Parameter	*Results*	*Units*	*RL*	*Flag*	*CAS*	*Bottle*
N	Mercury, Total (low level)	16.4	ng/L	4.26		7439-97-6	02

1698569 **B015634-02** *Received:* 07/06/2018

Non-Potable Water *Collected by:* Client Aqua-Tech Laboratori *PO:*
Taken: 07/03/2018 09:00:00

EPA 245.7 *Prepared:* 787877 07/12/2018 06:20:46 *Analyzed* 788035 07/12/2018 11:40:00 LPS

	Parameter	*Results*	*Units*	*RL*	*Flag*	*CAS*	*Bottle*
N	Mercury, Total (low level)	6.22	ng/L	4.26		7439-97-6	02

1698570 **B015634-03** *Received:* 07/06/2018

Non-Potable Water *Collected by:* Client Aqua-Tech Laboratori *PO:*
Taken: 07/03/2018 09:00:00

EPA 245.7 *Prepared:* 787877 07/12/2018 06:20:46 *Analyzed* 788035 07/12/2018 11:44:00 LPS

	Parameter	*Results*	*Units*	*RL*	*Flag*	*CAS*	*Bottle*
N	Mercury, Total (low level)	7.09	ng/L	4.26		7439-97-6	02

Sample Preparation

1698568 **B015634-01** *Received:* 07/06/2018

ANA-LAB CORP. THE COMPLETE SERVICE LAB

Ana-Lab Corp. P.O. Box 9000 Kilgore, TX 75663

Phone 903/984-0551 FAX 903/984-5914 e-Mail corp@ana-lab.com

Employee Owned Integrity Caring Continual Improvement

Results

Printed: 07/13/2018

1698568 **B015634-01** *Received:* 07/06/2018

	Prepared:	*787103*	*07/06/2018*	*00:00:00*	*Analyzed*	*787103*	*07/06/2018*	*00:00:00*	*CCP*
Cooler Temperature	**1.4**	**degrees**						**01**	
EPA 245.7 2	*Prepared:*	*787877*	*07/12/2018*	*06:20:46*	*Analyzed*	*787877*	*07/12/2018*	*06:20:46*	*LPS*
N **Low Level Mercury Liquid Metals**	**50/47**	**ml**						**01**	

1698569 **B015634-02** *Received:* 07/06/2018

	Prepared:	*787103*	*07/06/2018*	*00:00:00*	*Analyzed*	*787103*	*07/06/2018*	*00:00:00*	*CCP*
Cooler Temperature	**1.4**	**degrees**						**01**	
EPA 245.7 2	*Prepared:*	*787877*	*07/12/2018*	*06:20:46*	*Analyzed*	*787877*	*07/12/2018*	*06:20:46*	*LPS*
N **Low Level Mercury Liquid Metals**	**50/47**	**ml**						**01**	

1698570 **B015634-03** *Received:* 07/06/2018

	Prepared:	*787103*	*07/06/2018*	*00:00:00*	*Analyzed*	*787103*	*07/06/2018*	*00:00:00*	*CCP*
Cooler Temperature	**1.4**	**degrees**						**01**	
EPA 245.7 2	*Prepared:*	*787877*	*07/12/2018*	*06:20:46*	*Analyzed*	*787877*	*07/12/2018*	*06:20:46*	*LPS*
N **Low Level Mercury Liquid Metals**	**50/47**	**ml**						**01**	

ANA-LAB CORP. THE COMPLETE SERVICE LAB

Ana-Lab Corp. P.O. Box 9000 Kilgore, TX 75663

Phone 903/984-0551 FAX 903/984-5914 e-Mail corp@ana-lab.com

Employee Owned Integrity Caring Continual Improvement

Results

Printed: 07/13/2018

Qualifiers:

We report results on an 'As Received' or wet basis unless marked 'Dry Weight'. Unless otherwise noted, testing was performed at Ana-lab's corporate laboratory that holds the following Federal and State certificates: Texas Department of Health Lead Firm Certificate 2110076, US Department of Agriculture Soil Import Permit S-37592, Texas Commisson on Environmental Quality Drinking Water Laboratory Certificate TX219, Texas Commission on Environmental Quality NELAP T104704201-18, Oklahoma Department of Environmental Quality Drinking Water Certification Lab ID# D9913, EPA Lab Number TX00063, USEPA Approved Perchlorate Testing Lab, Oklahoma Department of Environmental Quality Laboratory Certificate 8125, Arkansas Department of Environmental Quality Certification #03-070-0, Louisiana Department of Environmental Quality Laboratory Certification (NELAP, LELAP) #02008, Louisiana Department of Health and Hospitals Drinking Water (NELAP) # LA030020, US Department of Energy Approved. The Accredited column designates accreditation by N -- NELAC, or z -- not covered under NELAC scope of accreditation.

These analytical results relate to the sample tested. This report may NOT be reproduced EXCEPT in FULL without written approval of Ana-Lab Corp. Unless otherwise specified, these test results meet the requirements of NELAC.

RL is the Reporting Limit (sample specific quantitation limit) and is at or above the Method Detection Limit (MDL). CAS is Chemical Abstract Service number. RL is our Reporting Limit, or Minimum Quantitation Level. The RL takes into account the Instrument Detection Limit (IDL), Method Detection Limit (MDL), and Practical Quantitation Limit (PQL), and any dilutions and/or concentrations performed during sample preparation (EQL). Our analytical result must be above this RL before we report a value in the 'Results' column of our report (without a 'J' flag). Otherwise, we report ND (Not Detected above RL), because the result is "<" (less than) the number in the RL column. MAL is Minimum Analytical Level and is typically from regulatory agencies. Unless we report a result in the result column, or interferences prevent it, we work to have our RL at or below the MAL.

Paul Zhang, Ph.D., Quality Director

ANA-LAB CORP.® THE COMPLETE SERVICE LAB

Ana-Lab Corp. P.O. Box 9000 Kilgore, TX 75663

Phone 903/984-0551 FAX 903/984-5914 e-Mail corp@ana-lab.com

LELAP-accredited #02008

Results Summary

Printed 07/13/2018 Page 1 of 2

Project 835226

Report To

Aqua-Tech Laboratories (Austin
John Brien
635 Phil Gramm Blvd.
Bryan, TX 77807-9104

WW

CAS	Parameter	Results	MDL	SDL	MQL	MQLAdj	Flag	Units	Target	Bottle	Dilute
Non-Potable Water	Metals					EPA 245.7					
1698568	**B015634-01**										
	Collection: 07/03/2018 09:00:00 Client								Received: 07/06/2018		
	Prepared: 787877										
	Analyzed: 788035							7/12/18	11:30:00		
7439-97-6	Mercury, Total (low level)	16.4	1.65	1.76	4.00	4.26		ng/L	5.00	02	1.06
1698569	**B015634-02**										
	Collection: 07/03/2018 09:00:00 Client								Received: 07/06/2018		
	Prepared: 787877										
	Analyzed: 788035							7/12/18	11:40:00		
7439-97-6	Mercury, Total (low level)	6.22	1.65	1.76	4.00	4.26		ng/L	5.00	02	1.06
1698570	**B015634-03**										
	Collection: 07/03/2018 09:00:00 Client								Received: 07/06/2018		
	Prepared: 787877										
	Analyzed: 788035							7/12/18	11:44:00		
7439-97-6	Mercury, Total (low level)	7.09	1.65	1.76	4.00	4.26		ng/L	5.00	02	1.06

MDL is Method Detection Limit (40 CFR 136 Appendix B)

SDL is Sample Detection Limit and is the adjusted MDL (sample specific dilutions, dry weight)

MQL is the Method Quantitation Limit and corresponds to a low standard

MQLADJ is the Adjusted Method Quantitation Limit (dilutions, dry weight)

Ana-Lab Corp. P.O. Box 9000 Kilgore, TX 75663

Phone 903/984-0551 FAX 903/984-5914 e-Mail corp@ana-lab.com

LELAP-accredited #02008

Printed 07/13/2018 Page 2 of 2

Results Summary

Project 835226

Report To

Aqua-Tech Laboratories (Austin
John Brien
635 Phil Gramm Blvd.
Bryan, TX 77807-9104

ww

Qualifiers:

We report results on an 'As Received' or wet basis unless marked 'Dry Weight'. Unless otherwise noted, testing was performed at Ana-lab's corporate laboratory that holds the following Federal and State certificates: Texas Department of Health Lead Firm Certificate 2110076, US Department of Agriculture Soil Import Permit S-37592, Texas Commisson on Environmental Quality Drinking Water Laboratory Certificate TX219, Texas Commission on Environmental Quality NELAP T104704201-18, Oklahoma Department of Environmental Quality Drinking Water Certification Lab ID# D9913, EPA Lab Number TX00063, USEPA Approved Perchlorate Testing Lab, Oklahoma Department of Environmental Quality Laboratory Certificate 8125, Arkansas Department of Environmental Quality Certification #03-070-0, Louisiana Department of Environmental Quality Laboratory Certification (NELAP, LELAP) #02008, Louisiana Department of Health and Hospitals Drinking Water (NELAP) # LA030020, US Department of Energy Approved. The Accredited column designates accreditation by N -- NELAC, or z -- not covered under NELAC scope of accreditation.
These analytical results relate to the sample tested. This report may NOT be reproduced EXCEPT in FULL without written approval of Ana-Lab Corp. Unless otherwise specified, these test results meet the requirements of NELAC.

Paul Zhang, Ph.D., Quality Director

ANA-LAB CORP. THE COMPLETE SERVICE LAB

Ana-Lab Corp. P.O. Box 9000 Kilgore, TX 75663

Phone 903/984-0551 FAX 903/984-5914 e-Mail corp@ana-lab.com LELAP-accredited #02008

Employee Owned Integrity Caring Continual Improvement

Quality Control

Printed 07/13/2018 Page 1 of 1

WW

Account	Project
AQU5-C	835226

Report To

Aqua-Tech Laboratories (Austin
John Brien
635 Phil Gramm Blvd.
Bryan, TX 77807-9104

Analytical Set 788035 EPA 245.7

Blank

Parameter	PrepSet	Reading	MDL	MQL	Units	File
Mercury, Total (low level)	787877	ND	1.65	4.00	ng/L	118891916

CCV

Parameter	Reading	Known	Units	Recover%	Limits%	File
Mercury, Total (low level)	50.3	50.00000	ng/L	101	76.0 - 124	118891915
	50.0	50.00000	ng/L	100	76.0 - 124	118891926
	48.7	50.00000	ng/L	97.4	76.0 - 124	118891937
	46.9	50.00000	ng/L	93.8	76.0 - 124	118891945
	48.3	50.00000	ng/L	96.6	76.0 - 124	118891950

ICL

Parameter	Reading	Known	Units	Recover%	Limits%	File
Mercury, Total (low level)	103	100.0000	ng/L	103	90.0 - 110	118891914

ICV

Parameter	Reading	Known	Units	Recover%	Limits%	File
Mercury, Total (low level)	48.5	50.00000	ng/L	97.0	90.0 - 110	118891913

LCS Dup

Parameter	PrepSet	LCS	LCSD	Known	Limits%	LCS%	LCSD%	Units	RPD	Limit%
Mercury, Total (low level)	787877	24.3	23.9	25.0	76.0 - 113	97.2	95.6	ng/L	1.66	50.0

MSD

Parameter	Sample	MS	MSD	UNK	Known	Limits	MS%	MSD%	Units	RPD	Limit%
Mercury, Total (low level)	1698568	45.9	43.6	16.4	26.6	67.0 - 111	111	102	ng/L	8.11	18.0
	1698975	32.0	33.3	9.30	26.6	67.0 - 111	85.3	90.2	ng/L	5.57	18.0

* Out RPD is Relative Percent Difference: abs(r1-r2) / mean(r1,r2) * 100% Recover% is Recovery Percent: result / known * 100%

Blank - Method Blank; CCV - Continuing Calibration Verification; ICV - Initial Calibration Verification

835226 CoC Print Group 001 of 001

AQUA-TECH LABORATORIES, INC.

ATL - Bryan Facility:
635 Phil Gramm Blvd.
Bryan, TX 77807
(979) 778-3707
Fax (979) 778-3193

ATL - Austin Facility:
7500 Hwy 71 W, Suite 105
Austin, TX 78735
(512) 301-9559
Fax (512) 301-9552

Chain-of-Custody & Analysis Request

SHIPPED TO:
Ana-Lab Corp. (NELAP Cert. T104704201)
2600 Dudley Road
Kilgore, TX 75662
Phone: (903) 984-0551
Fax: (903) 984-5914

C-O-C #

354 - B015634

T104704371

Page 1 of 1

All analyses must be performed by a TNI approved method certified by the TCEQ. Contact ATL's sample custodian via voice and email if your methods do not meet this criteria.

Analysis Request for: Sample ID: B015634-01 Sampled: 07/03/18 09:00 Matrix: Non Potable Laboratory ID>> 1698568
Hg - EPA 245.7

Analysis Request for: Sample ID: B015634-02 Sampled: 07/03/18 09:00 Matrix: Non Potable Laboratory ID>> 569
Hg - EPA 245.7

Analysis Request for: Sample ID: B015634-03 Sampled: 07/03/18 09:00 Matrix: Non Potable Laboratory ID>> 570
Hg - EPA 245.7

CONTAINERS SUPPLIED: (ATL indicates cooler number in parentheses for each container - only required if more than one cooler listed below.)

( ) B015634-01 [A] - Metals Hg LL ANA 1L HCl
( ) B015634-02 [A] - Metals Hg LL ANA 1L HCl
( ) B015634-03 [A] - Metals Hg LL ANA 1L BLANK

Relinquished by: (print & sign) [X] ATL-Austin [ ] ATL-Bryan [ ] Sampler	Date	Time	
Kelly Kukowski [signature]	7/5/18	1630	Iced / Custody Sealed / Not Chilled
Carrier & Tracking Number: Lone Star — Cooler 1: AQU5 - ZX700439			Sample ids "X" will not apply
Received by: (print & sign) [ ] Received in Lab — Kelly Overman Ana-Lab Corp [signature: Kelly Overman]	7/6/18	0935	Received Iced / Condition Good / Not Rec'd Iced

Line below documents condition at receipt of coolers shipped to listed above.

Cooler Temperature (°C)	Temp. Read (TR)	Corrected Temp. (CT)	Thermometer ID
Cooler 1			
N/A	N/A	N/A	

Please email reports to: corp@aqua-techlabs.com

Please return cooler(s) to: Austin Facility

Abbreviations: DW - Drinking Water; NP - Non-Potable Water; S - Solid; CTU - Custody Transfer Unbroken; StP - Sterile Plastic; LP - Liter Plastic; LG - Liter Glass

Aqua-Tech Comments and Special Instructions

5 DAY TAT

See Attached for Tracking # and Temp

BRET

2 of 2

835226 CoC Print Group 001 of 001

LSO
It's all in the delivery.

Airbill No. ZX700439

LSO
1-800-800-8984
www.lso.com

SHIP TO:
RECEIVING
ANA LAB CORP
2600 DUDLEY RD
KILGORE, TX 75662
9039840551

6205 ☐
6092 ☑ 00
6093 ☐

From:
KELLY KUKOWSKI
AQUA-TECH LABS
7500 W HWY 71
105
AUSTIN, TX 78735
5123019559

W GGG **LSO GROUND**
END OF BUSINESS DAY DELIVERY

PRINT DATE: 7/5/2018
QUICKCODE: WEIGHT: 25.00LBS
REF 1: 1[illegible]0000 REF 2:

1.49

Fold on above line and place shipping label in pouch on package. Please be sure the barcodes and addresses can be read and scanned. Shipping Instructions

1. Fold this page along the horizontal line above.
2. Place this Airbill in the shipping label pouch on the package you are shipping. Please be sure the barcodes and addresses can be read and scanned.
3. To locate a drop box near you, click on **Find A Drop Box** from the home page main menu.
4. To schedule a pickup, click on **Request Pickup**.

WARNING: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your Lone Star Overnight account number.

This label is valid for use for 3 months from the date printed. Use of expired labels may result in delayed billing and / or additional research charges. LIMIT OF LIABILITY: We are not responsible for claims in excess of $100 for any reason unless you: 1) declare a greater value (not to exceed $25,000); 2) pay an additional fee; 3) and document your actual loss in a timely manner. We will not pay any claim in excess of the actual loss. We are not liable for any special or consequential damages. Additional limitations of liability are contained in our current Service Guide. If you ask us to deliver a package without obtaining a delivery signature, you release us of all liability for claims resulting from such service. NO DELIVERY SIGNATURE WILL BE OBTAINED FOR 8:30 AM DELIVERIES OR RESIDENTIAL DELIVERIES.

STEGER BIZZELL

October 17, 2018

Texas Commission on Environmental Quality
ATTN: Ms. Adriene McClarron
Applications and Review Processing Team, MC 148
P.O. Box 13087
Austin, Texas 78711-3087

RE: Domestic Wastewater Permit Application Response to Comments
City of Liberty Hill
Liberty Hill Regional Wastewater Treatment Facility
Permit No. WQ0014477-001 (TX0126195)

Dear Ms. McClarron:

This letter is in response to your correspondence back to us listing a total of five administrative and ten technical review comments for the City of Liberty Hill Regional Wastewater Treatment Facility permit renewal application. A copy of the letter you sent to us is included with this correspondence. All comments in your letter have been responded to, and all required attachments are enclosed with this letter. Each comment and the response are listed below:

Administrative Comments

1. Item 17 on page 1 of the Core Data Form (CDF): An email address was not provided.

A revised copy of the CDF is included with this correspondence with an email added to the form for Item 17.

2. Items 23 and 26 on page 2 of the CDF and Item 1 on page 15 of the Administrative Report. The physical addressed on the CDF and the SPIF differ, and neither one appears to be correct for locating the treatment facility.

The 911 address for the WWTP site is 1637 US 183 North, Leander, Texas 78741. The plant is located on LCRA Road in Leander, Texas.

To clear up any confusion, I have revised all permit application documents to only list the physical location of the plant, which is defined as the following: The

plant is located approximately 5,000 feet north of the South San Gabriel River and 2,000 feet east of US Highway 183 in Williamson County, Texas.

3. Item 46 on page 2 of the CDF: The form must be signed by an authorized officer that meets the signatory requirements for a municipality specified in 30 TAC 305.44. Provide a new page signed by an authorized officer of Liberty Hill.

As requested, a new Core Data Form has been submitted signed by the mayor of Liberty Hill.

4. Section 13 – USGS Map, on page 11 of the administrative report: The applicant's property boundary is not labeled. The WWTP is labeled; however, we cannot assume that the WWTP boundary and the applicants property boundary are the same. Each boundary should be labeled. Please verify if boundaries are the same. Also, the point of discharge is a distance away from the treatment facility. Please verify if the effluent travels through an underground pipe before reaching the point of discharge.

The boundary shown on the USGS map is both the WWTP boundary and the applicant's property boundary. Yes, the effluent travels through an underground 16" pipe from the plant to the outfall location.

5. The following is a portion of the Notice of Receipt of Application and Intent to Obtain a Water Quality Permit which contains information relevant to your application. Please read it carefully and indicate if it contains any errors or omissions. The complete notice will be sent to you once the application is declared administratively complete.

The Notice of Receipt of Application and Intent to Obtain a Water Quality Permit does not contain any errors or omissions.

Technical Comments

1. Section 2 on page 2 of the administrative report 1.0: The applicant marked "Renewal without changes" as the type of application. The type of application should be "Minor amendment with renewal" or "Renewal with changes," because a new Interim II phase for 2.0 MGD is being requested.

A revised page 2 of administrative report 1.0 is included with this correspondence. The type of application is revised to "Minor amendment with renewal."

2. Section 2.A on pages 1 and 2 of the technical report 1.0: To complete the response to this item, we need for you to please provide a detailed description of the proposed Interim II phase of 2.0 MGD and the Final phase of 4.0 MGD. In

addition, please provide the process design calculations for the proposed 2.0 MGD Interim II phase. Finally, please provide a description of the design features (auxiliary power, alarm systems, standby and duplicate units, etc.) and functional arrangements (flexibility of piping and of valves to control flow through the plant, reliability of power, etc.) to prevent bypassing or overflows of untreated wastewater that might result from (A) excessive inflow or infiltration, (B) power failure, (C) equipment malfunction, and (D) plant unit maintenance and repair for the proposed 2.0 MGD Interim II phase.

A process description for the Interim II phase 2.0 MGD plant and the Final phase 4.0 MGD plant is included with this correspondence. Design calculations for the Interim II phase 2.0 MGD plant is included with this correspondence. A description of the design features for the Interim II phase 2.0 MGD plant is included with this correspondence.

3. Section 2.B on page 2 of the technical report 1.0 (referring to Attachment 2): Please verify that for the Proposed Final phase, (i) there will be a new 0.8 MGD MBR facility similar to and in addition to the existing 0.8 MGD MBR facility constructed for the Interim I phase; (ii) there will be a new 1.2 MGD MBR facility in addition to and similar to the 1.2 MGD MBR facility added for the Interim II phase.

Your description of the phasing is correct. The Proposed Final phase 4.0 MGD plant is currently planned to consist of a total of two 0.8 MGD treatment trains and two 1.2 MGD treatment trains.

4. Section 2.C on page 2 of the technical report 1.0 (referring to Attachment 3): To complete the response to this item, we need you to please provide the process flow diagram for the proposed 1.2 MGD MBR facility.

A flow diagram for the proposed 1.2 MGD MBR facility is included with this correspondence.

5. Section 4 on page 3 of the technical report 1.0: The applicant makes a reference to Attachment A. However, Attachment A of the application is the USGS map. To complete the application, we need you to please revise the reference.

This comment appears to not be accurate. There are no references to any attachments in Section 4 of technical report 1.0. The only attachments that are referred to on page 3 of the technical report 1.0 is Attachment 4, which is the Site Drawing for Section 3 of technical report 1.0.

6. Section 4 on page 3 of the technical report 1.0: To complete the response to this item, we need for you to please show how the proposed Interim II design

flow of 2.0 MGD was derived. Please provide the population projections and development schedule used to derive the requested flow and the source and basis upon which the population figures were derived. Please include the unit wastewater generation rate and the basis for using this rate.

Enclosed with this correspondence, please find a copy of our historical and projected flow rates for flows coming to the plant. The proposed next phase plant expansion of 1.2 MGD and subsequent decommissioning of the existing 0.4 MGD SBR plant, bringing the total plant capacity to 2.0 MGD.

The Liberty Hill sewer service area experienced a 29.2% annual growth rate from 2013—018. As this historical flow data chart shows, with a projected annual growth rate of 24% (slower projected growth than what the City has experienced over the last five years), the plant is expected to meet his full existing capacity of 1.2 MGD by February, 2021. If the City builds the proposed 1.2 MGD plant expansion to take the plant to a total plant capacity of 2.0 MGD, the 2.0 MGD plant will reach full capacity by July, 2023. An expansion of 1.2 MGD was chosen as the best balance of staying ahead of future demands without building too large of an expansion in the event that growth and development in the area slows down. The Liberty Hill wastewater service area is one of the fastest growing areas in the entire country.

7. Section 6.B on page 4 of the technical report 1.0: To complete the response to this item, we need for you to please provide a buffer zone map showing the proposed 2.0 MGD facility. Indicate how the buffer zone requirements will be met.

A buffer zone map for the proposed 2.0 MGD interim phase in included with this correspondence. The buffer zone requirements will be met by ownership of the plant site property by the City of Liberty Hill.

8. Section 7 on page 10 of the technical report 1.0: To complete the application, we need for you to please provide the laboratory report for the analyses of pH and dissolved oxygen for verification purposes.

The City of Liberty Hill performed their own testing of pH and dissolved oxygen, just as they do for all of their monthly DMRs which are submitted to the TCEQ monthly. An accredited lab is not required to provide testing and results for pH and dissolved oxygen, and it is not possible to test for dissolved oxygen/pH in an accredited lab. The sample must be tested immediately after the sample is collected for dissolved oxygen/pH or the dissolved oxygen/pH concentration will change significantly before the sample arrives at the lab.

9. Section 12.B on page 17 of the technical report 1.0: To complete the response to this item, we need for you to please provide the status of the Agreed Order Docket No. 2017-0141-MWD-E.

The status of the Agreed Order referenced above is that the agreed order was formally approved at the TCEQ Commissioners Court agenda on August 22, 2018. The City of Liberty Hill has already completed their SEP project to address the fine, as the SEP project was completed in July, 2017, and the City has already submitted their paperwork verifying completion of the SEP project to the TCEQ. The City is currently working towards completing three consecutive months of compliant data since the Agreed Order was approved in August, 2018.

10. Domestic Worksheet 4.0: To complete the response to this item, we need for you to please provide the laboratory report for Total Trihalomethanes for verification purposes.

The laboratory report including a lab testing result for Total Trihalomethanes is enclosed with this correspondence. Additionally, a new page 55 of the Domestic Worksheet 4.0 is included with this correspondence.

If you should have any additional questions or concerns regarding this permit, please feel free to contact me.

Sincerely,

Aaron J. Laughlin, PE
Project Manager

Enclosures

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

September 21, 2018 9489 0090 0027 6008 0923 19

CERTIFIED MAIL

Mr. Wayne Bonnet
Utility Director
City of Liberty Hill
926 Loop 332
Liberty Hill, Texas 78642

Re: Application to Renew Permit No. WQ0014477001 (EPA I.D TX0126195)
Issued to City of Liberty Hill
CN602959033, RN104102132

Dear Mr. Bonnet:

We have received the application for the above referenced permit and it is currently under review. Your attention to the following items is requested before we can declare the application administratively complete. Please submit one original and two copies (including a cover letter) of the complete response.

1. Item 17 on page 1 of the Core Data Form (CDF): An email address was not provided; however, one is preferred. Please provide an email address for the City of Liberty. If one cannot be provided, Mr. Bonnet's email address will be used.

2. Items 23 and 26 on page 2 of the CDF and Item 1 on page 15 of the administrative report: The physical addresses on the CDF and the SPIF differ, and neither one appears to be correct for locating the treatment facility. The addresses are for a different site than the one located using the latitude and longitude coordinates. Furthermore, verify the nearest city and zip code to the treatment facility. The address references Leander 78641 but, the nearest city and zip code is indicated as Liberty Hill, 78529. If the treatment facility is located in the Leander, Leander 78641 is the nearest city and zip code. The treatment facility information must be accurate. Provide revised pages indicating the correct facility location information. If an address is not available, provide a revised facility location description (Item 25) because the one used in the current is not correct. It must be described using the direction and distance in feet and miles from road intersections, not a waterbody.

3. Item 46 on page 2 of the CDF: The form must be signed by an authorized officer that meets the signatory requirements for a municipality specified in 30 Texas Administrative Code (TAC) 305.44. Provide a new page signed by an authorized officer of City of Liberty Hill.

4. Section 13 – USGS Map, on page 11 of the administrative report: The applicant's property boundary is not labeled. The wastewater treatment facility (WWTP) is labeled; however, we cannot assume that the WWTP boundary and the applicant's property boundary are the same. Each boundary should be labeled. Please verify if the boundaries are the same.

If they are not the same, provide a new original USGS 7.5 minute topographic map **(an 8 ½ by 11, reproduced portion/area of the most current original USGS map may be provided as long as all the required information can be shown)** showing and labeling the: applicant's property boundary, treatment plant boundaries within the applicants boundary, point of discharge (indicate it with a dot, X, or arrow), the highlighted discharge route (using a light-colored highlighter) for three stream miles downstream from the point of discharge, and an area of not less than one mile in all directions from the facility.

Also, the point of discharge is a distance away from the treatment facility. Please verify if the effluent travels through an underground pipe before reaching the point of discharge.

5. The following is a portion of the Notice of Receipt of Application and Intent to Obtain a Water Quality Permit which contains information relevant to your application. Please read it carefully and indicate if it contains any errors or omissions. The complete notice will be sent to you once the application is declared administratively complete.

   APPLICATION. City of Liberty Hill, 926 Loop 332, Liberty Hill, Texas 78642, has applied to the Texas Commission on Environmental Quality (TCEQ) to renew Texas Pollutant Discharge Elimination System (TPDES) Permit No. WQ0014477001 (EPA I.D. No. TX0126195) to authorize the discharge of treated wastewater at a volume not to exceed an annual average flow of 4,000,000 gallons per day. The domestic wastewater treatment facility is located [plant site location], in Williamson County, Texas [zip code]. The discharge route is from the plant site [via pipe] to South Fork San Gabriel River. TCEQ received this application on September 5, 2018. The permit application is available for viewing and copying at Liberty Hill Public Library, 355 Loop 332, Liberty Hill, Texas. This link to an electronic map of the site or facility's general location is provided as a public courtesy and not part of the application or notice. For the exact location, refer to the application.
   http://www.tceq.texas.gov/assets/public/hb610/index.html?lat=30.631944&lng=-97.861666&zoom=13&type=r

   Further information may also be obtained from City of Liberty Hill at the address stated above or by calling Mr. Wayne Bonnet at 512-778-5449.

6. A preliminary technical review was performed by the technical staff and it has been determined that additional information is needed before the application can be declared technically complete. Please provide a complete response to each item identified in Attachment I of this letter. If you should have any questions, please contact Julian D. Centeno, Jr., Municipal Permits Team at (512) 239-4608.

Please submit the complete response, addressed to my attention by October 20, 2018. If the requested information is not received by the given deadline, pursuant to 30 TAC Chapter 281, the application may be removed from our list of pending applications. If you should have any questions, please do not hesitate to call me at (512) 239-5137.

Sincerely,

Adriene C. McClarron
Applications Review and Processing Team (MC 148)
Water Quality Division
Texas Commission of Environmental Quality

Enclosure

cc: Mr. Aaron Laughlin, P.E., Project Manager, Steger Bizzell, 1978 South Austin Avenue Georgetown, Texas 78626, w/enclosure

Attachment 1
City of Liberty Hill
Permit No. WQ0014477001

Technical Report Data Completeness Review - Domestic Wastewater Permit Application Received September 5, 2018

Please address the following item(s):

1. Section 2 on page 2 of the administrative report 1.0: The applicant marked "Renewal without changes" as the type of application. The type of application should be "Minor amendment with renewal" or "Renewal with changes," because a new Interim II phase for 2.0 million gallons per day (MGD) is being requested.

2. Section 2.A on pages 1 and 2 of the technical report 1.0: To complete the response to this item, we need for you to please provide a detailed description of the proposed Interim II phase of 2.0 MGD and the Final phase of 4.0 MGD. In addition, please provide the process design calculations for the proposed 2.0 MGD Interim II phase. Finally, please provide a description of the design features (auxiliary power, alarm systems, standby and duplicate units, etc.) and functional arrangements (flexibility of piping and of valves to control flow through the plant, reliability of power, etc.) to prevent bypassing or overflows of untreated wastewater that might result from: (A) excessive inflow or infiltration, (B) power failure, (C) equipment malfunction, (D) plant unit maintenance and repair for the propose 2.0 MGD Interim II phase.

3. Section 2.B on page 2 of the technical report 1.0 (referring to Attachment 2): Please verify that for the Proposed Final phase, (i) there will be a new 0.8 MGD MBR facility similar to and in addition to the existing 0.8 MGD MBR facility constructed for the Interim I phase; (ii) there will be a new 1.2 MGD MBR facility in addition to and similar to the 1.2 MGD MBR facility added for the Interim II phase.

4. Section 2.C on page 2 of the technical report 1.0 (referring to Attachment 3): To complete the response to this item, we need for you to please provide the process flow diagram for the proposed 1.2 MGD MBR facility.

5. Section 4 on page 3 of the technical report 1.0: The applicant makes a reference to Attachment A. However, Attachment A in the application is the USGS map. To complete the application, we need for you to please revise the reference.

6. Section 4 on page 3 of the technical report 1.0: To complete the response to this item, we need for you to please show how the proposed Interim II design flow of 2.0 MGD was derived. Please provide the population projections and development schedule used to derive the requested flow and the source and basis upon which the population figures were derived. Please include the unit wastewater generation rate and the basis for using this rate.

7. Section 6.B on page 4 of the technical report 1.0: To complete the response to this item, we need for you to please provide a buffer zone map showing the proposed 2.0 MGD facility.

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.

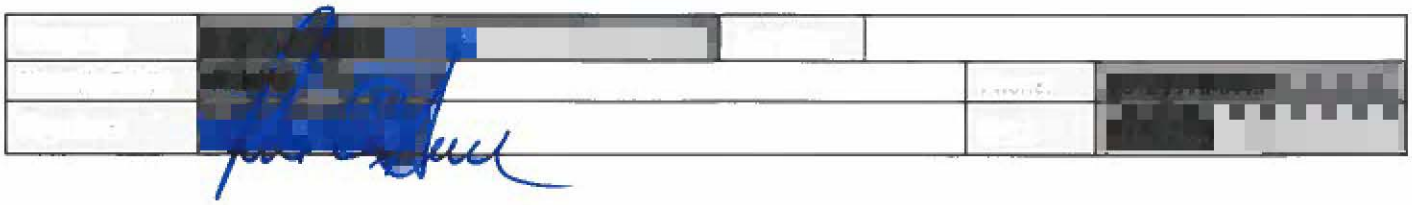
B. Buffer zone compliance method. Indicate how the buffer zone requirements will be met. Check all that apply.

8. Section 7 on page 10 of the technical report 1.0: To complete the application, we need for you to please provide the laboratory report for the analyses of pH and dissolved oxygen for verification purposes.

9. Section 12.B on page 17 of the technical report 1.0: To complete the response to this item, we need for you to please provide the status of the Agreed Order Docket No. 2017-0141-MWD-E.

10. Domestic Worksheet 4.0: To complete the response to this item, we need for you to please provide the laboratory report for Total Trihalomethanes for verification purposes.

If you should have any questions regarding the above-requested item(s), please contact Julian D. Centeno, Jr. of the Municipal Permits Team at (512) 239-4608.



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: City of Liberty Hill

   Permit No. WQ00 14747-001 EPA ID No. TX 0126195

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

   The plant is located approximately 5,000 feet north of the South Fork San Gabriel River and 2,000 feet east of US Highway 183 in Williamson County, Texas 78641

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

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: 18554

Check/Money Order Amount: $2015.00

Name Printed on Check: Steger Bizzell

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: An interim phase of 2.0 MGD average flow/6.5 MGD peak 2-hour flow is being added to the permit.

For existing permits:

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:

The existing 1.2 MGD WWTP consists of a 0.4 MGD sequencing batch reactor (SBR) plant, and a 0.8 MGD membrane bio-reactor (MBR) plant. The 0.4 MGD SBR plant includes a mechanical bar screen, an SBR plant consisting of two SBR basins and one digester basin, an alum feed system for phosphorus removal, a post-equalization tank, cloth media filtration, UV disinfection, and step-aeration prior to discharge. The 0.8 MGD MBR plant includes a package headworks unit with screening, grit, and grease removal, an anaerobic tank, an anoxic tank, a pre-aeration tank, two MBR tanks. The MBR plant uses the same alum feed system, UV disinfection, and step-aeration treatment units as the SBR plant. The plant also has a sludge storage tank and a belt press sludge processing unit. For the Interim 2.0 MGD phase, the 0.4 MGD SBR plant will be de-commissioned, with the ultimate use of the SBR plant equipment yet to be determined. A 1.2 MGD MBR plant identical to the phase 1 0.8 MGD MBR plant will be built to reach the phase II capacity of 2.0 MGD total, consisting of a total of 2 anaerobic tanks, two anoxic tanks, two pre-aeration tanks, and five MBR tanks. For the Final 4.0 MGD phase plant, an additional identical 2.0 MGD plant as the phase II plant will be built to bring the total plant capacity up to 4.0 MGD.

Port or pipe diameter at the discharge point, in inches: 16

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 2		

C. Process flow diagrams

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

Attachment: 3

Section 3. Site Drawing (Instructions Page 52)

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

SECTION 1: MBR HYDRAULIC DESIGN

Part 1: Membrane Specification

1. The hydraulic capacity of an MBR plant is a function of temperature and the number of membrane cartridges. At the minimum design temperature, the estimated membrane flux will be:

1.1.1.1	Minimum Operating Temperature, T_{MIN}	=	15	^{o}C	15 deg. C
1.1.1.2	Suggested Membrane Flux, F_C	=	13.3	gal/ft^2*day	13.3 gfd

2. Once the design flux is determined, the required number of membrane cartridges can be calculated as follows:

1.1.2.1	Design Flow, Q_D	=	800,000	gal/day	2.0 MGD
1.1.2.2	Membrane Area Per Cartridge, A_C	=	1,119	ft^2	1,119 sf
1.1.2.3	Required Number of Membrane Cartridges, $Cart_{REQ}$		$(1/F_C)*(Q_D)*(1/A_C)$		135 sf
			54	cartridges	
1.1.2.4	Selected Number of Membrane Units, #Units		20	OV	50 OV
1.1.2.5	Actual Number of Cartridges, $Cart_{ACT}$		80	cartridges	200 cartridges
1.1.2.6	**Actual Membrane Flux, F_C**		**8.9**	**gal/ft^2*day**	8.9 gfd

SECTION 2: TANK SIZING CALCULATIONS

Part 1: Aeration Tank (MBR)

1. Initially, the volume of an MBR is calculated based on the number and type of membrane units used to provide the design hydraulic capacity (see Section 1, Part 1):

2.1.1.1	Recommended SWD, H_{MBR}	=	14	ft	14 ft
2.1.1.2	Minimum MBR Tank Width, W_{MBR}	=	14	ft	14 ft
2.1.1.3	Distance Between Membrane Unit Centerlines, L_{CL}	=	5.20	ft	5.2 ft
2.1.1.4	Distance from End Membrane Unit to Tank Wall, L_{WALL}	=	2.60	ft	2.6 ft
2.1.1.5	Number of MBR Tanks, #Tanks	=	2	tanks	5 tanks
2.1.1.6	Number of Units Per Basin, #Units	=	10	units	10 units
2.1.1.7	Minimum MBR Tank				

	Length, L_{MBR}	=	$[L_{CL}$* (#Units per basin – 1)] + 2 * L_{WALL}		
		=	28.0	ft	28 ft
2.1.1.8	Minimum MBR Tank Volume, $V_{MBR,TANK}$	=	L_{MBR} * H_{MBR} * W_{MBR} * (7.48 gal/ft^3)		
		=	41,050	gal	41050 gal
2.1.1.9	Total MBR Volume, $V_{MBR,T}$	=	#Tanks * $V_{MBR,TANK}$		
		=	82,100	gal	205250 gal
2.1.1.10	Volume Displaced by Each Cartridge, $V_{DISP,CART}$	=	39.63	gal/cartridge	39.63 gal
2.1.1.11	Total Volume Displaced by Membranes, V_{DISP}	=	$V_{DISP,CART}$ * $Cart_{ACT}$		
		=	3,170	gal	7926 gal
2.1.1.12	Volume Available for Nitrification, $V_{AVAIL,MBR}$	=	$V_{MBR,T}$ - V_{DISP}		
		=	78,930	gal	197324 gal

2. The MBR can be operated at total sludge ages (nitrification and denitrification) from 10 days and up. The nitrates produced in the MBR Basin are sent back to the Anoxic Tank for denitrification. The net nitrogen load based on plant design parameters is:

2.1.2.1	Influent BOD Concentration, C_{BOD0}	=	216	mg/l	216 mg/L
2.1.2.2	Influent BOD Load, N_{BOD0}	=	C_{BOD0} * [8.34 (lb/MGD)/(mg/l)] * (Q_D/10^o)		
		=	1,441.2	lb BOD / day	3603 lb/day
2.1.2.3	Effluent BOD Concentration, C_{BOD1}	=	5	mg/l	5 mg/L
2.1.2.4	Effluent BOD Load, N_{BOD1}	=	C_{BOD1} * [8.34 (lb/MGD)/(mg/l)] * (Q_D/10^o)		
		=	33.4	lb BOD / day	83.5 lb/day
2.1.2.5	Influent Nitrogen (TKN) Concentration, C_{N0}	=	70	mg/l	70 mg/L
2.1.2.6	Influent Nitrogen (TKN) Load, N_{N0}	=	C_{N0} * [8.34 (lb/MGD)/(mg/l)] * (Q_D/10^o gal/MG)		
		=	467.0	lb N / day	1167 lb/day
2.1.2.7	Yield, Y	=	0.75	lb TSS / lb BOD	0.75
2.1.2.8	Nitrogen Concentration in Waste Sludge, C_{NWAS}	=	6.0%	lb N / lb SS	6.0%
2.1.2.9	Waste Sludge Nitrogen Load, N_{NWS}	=	N_{BOD0} * Y * C_{NWAS}		
		=	64.9	lb N / day	162.5 lb/day
2.1.2.10	Effluent TKN Limit,$N_{eff\ TKN}$	=	20.0	lb N / day	50 lb/day

2.1.2.11	Net Nitrification Load, N_{NNET}	=	$N_{N0} - N_{NWS} - N_{eff\ TKN}$		
		=	382.2	lb N / day	955.5 lb/day
2.1.2.12	Total Nitrogen Load, (TN) N_{TN}	=	467.0	lb N / day	1168 lb/day
2.1.2.13	Design Effluent Nitrate Concentration Based on Full Denitrification, $C_{NO3,1}$	=	16.6	mg/l	16.6 mg/L
2.1.2.14	Design Effluent Nitrate Loading Based on Full Denitrification, $N_{NO3,1}$	=	$C_{NO3,1}$ * [8.34 (lb/mgd)/(mg/l)] * (Q_D/10^6 gal/MG)		
		=	110.8	lb N / day	277 lb/day
2.1.2.15	Net Denitrification load, Design NO3-Nitrogen to be denitrified, N_{DNET}	=	$N_{TN} - N_{NO3,1} - N_{effTKN} - N_{NWS}$		
		=	271.4	lb N / day	700 lb/day
2.1.2.16	Calculated Effluent Nitrate Load, $N_{N1,CALC}$	=	$N_{NNET} - N_{DNET}$		
		=	110.8	lb N / day	255 lb/day
2.1.2.17	Calculated Effluent Nitrate Concentration $C_{N1,CALC}$	=	$N_{N1,CALC}$ / [8.34 (lb/MGD)/(mg/l)] * (Q_D/10^6 gal/MG)		
		=	16.6	mg/l	16.6 mg/L
2.1.2.18	**Confirm 2.1.2.17 <= 2.1.2.13**	**=**	**OK**		

3. Because the rate at which TKN is consumed is slow relative to the consumption of BOD, the required aeration process volume is given by:

2.1.3.1	Selected Concentration of Suspended Solids in MBR, SS_{MBR}	=	11,500	mg / l	11500 mg/L
		=	0.10	lb TSS / gal	0.10
2.1.3.2	Maximum Concentration of Suspended Solids in MBR, $SS_{MBR,MAX}$	=	18,000	mg / l	18000 mg/L
		=	0.15	lb TSS / gal	0.15
2.1.3.3	Minimum Aerobic SRT @ Min SRT_{Min}	=	5.627	days	5.627 days
2.1.3.4	Safety Factor, SF	=	30.0%		30%
2.1.3.5	Minimum Volume Required for Nitrification, $V_{N,MIN}$	=	N_{NNET} * (1/r_{NIT}) * (1/SS_{MBR}) * (1 + SF)		
		=	103,223	gal	258058 gal

Part 2: Anoxic Tank (Pre and Post Denitrification tanks)

	Required Denitrification volume for stabilization (20% of MBR volume + Pre-air volume) if Denitrification is not needed	=	46,866	gal	117165 gal

Pre Anoxic Denitrification calculations

1. The concentration of suspended solids in the Anoxic Tank is a function of the recycle rate and the MLSS concentration in the MBR. The recycle rate is calculated by:

2.2.1.1	Net Nitrogen Concentration, C_{NNET}	=	N_{NNET} * (1 mg/l / 8.34 lb/MGD) * ($10^{o}/Q_D$)		
		=	57.3	mg/l	57.3 mg/L
2.2.1.2	RAS Recycle Rate, RR_{CALC}	=	(C_{NNET} – $C_{NO3,1}$)/ $C_{NO3,1}$		
		=	2.5		2.5
2.2.1.3	Design RAS Recycle Rate, RR_{DESIGN}	=	4	(from MBR to Anoxic)	4

2. The required volume of the Anoxic Tank is determined by the minimum rate at which denitrification occurs, the concentration of heterotrophic organisms, and the nitrate load:

2.2.2.1	Pre-Anoxic MLSS based Recycle Rate, $SS_{PRE-ANOX}$ (=SS_{PA})	=	9,200	mg/L	9200 mg/L
2.2.2.2	Min Pre-Anoxic volume selected $V_{PRE-ANOX}$	=	68,755	gal	171888 gal
2.2.2.3	Pre Anoxic Specific Denitrification rate, $SDNR_{20}$	=	0.03*(F:M_{Anoxic}) + 0.029		
	Food to Microorganism ratio in the Pre-Anoxic basin F:M_{anoxic}	=	(Inf BOD-Eff BOD/(Anoxic volume * Anoxic MLVSS)		
		=	0.34	1 / day	0.34
	$SDNR_{20}$	=	0.039	lb NO_3/lb VSS*day	0.039

Correction for Design Temperature

	Specific Denitrificatin rate, $SDNR_T$	=	$SDNR_{20}$*$\Theta^{(T-20)}$		
	Denitrification-Temperature Activity Coeff., Θ	=	1.026	Unitless	1.026
		=	0.035	lb NO_3/lb VSS*day	0.035
	VSS content	=	0.80		0.8
2.2.2.4	Nitrate removed in Pre-Anoxic tank	=	($SDNR_T$ * $SS_{PRE-ANOX}$ * $V_{PRE-ANOX}$ * VSS content * 8.34 /10^6)		
		=	146	lb/day	365 lb/day

Post - Anoxic Denitrification calculations

2.2.2.5	Post-Anoxic MLSS $SS_{POST-ANOX}$ (=SS_{MBR})	=	0	mg/L	0 mg/L
2.2.2.6	Min Post Anoxic volume selected	=	0	gal	0 gal

	$V_{POST-ANOX}$					
2.2.2.7	$SDNR_{POST-ANOX}$	=	$0.025 * \Theta^{(T-20)}$			
	Post Denitrification Temp. coefficient, Θ	=	1.08	Unitless		1.08
		=	0.035	lb NO_3/lb VSS*day		0.035
2.2.2.8	Nitrate removed in Post-Anoxic tank	=	($SDNR_{POST-ANOXIC}$ * $SS_{POST-ANOX}$ * $V_{POST-ANOX}$ * VSS content * 8.34 /10^6)			
		=	0	lb/day		0 lb/day
2.2.2.9	Total Nirate removed	=	146	lb/day		365 lb/day

Part 3: Pre-Aeration Tank (PA)

1. If the minimum nitrification volume exceeds the MBR volume (see Section 2, Part 1) then a Pre-Aeration Tank is required to meet effluent nitrogen limits:

2.3.1.1	Pre-Aeration Tank Volume, $V_{PA,NIT}$ (Corrected for Anoxic MLSS)	=	(V_{NMIN} – $V_{AVAIL,MBR}$) * SS_{MBR}/SS_{ANOX}		
		=	4,561	gal	11,402 gal
			(Volume of Pre-Aeration Required)		

2. Sufficient aerated basin volume is needed to provide enough biomass to maintain a reasonable food to mass (F:M) ratio for the process (0.1 to 0.2). The volume of the pre-aeration basin can be calculated as follows:

2.3.2.1	F:M Ratio Assumed to Calculate Pre-Air Volume, $F:M_{ASSD}$	=	0.145		0.145
2.3.2.2	Safety Factor (S.F)	=	30%		30%
2.3.2.3	Pre-Aeration Tank Volume, $V_{PA,F:M}$	=	[(N_{BOD0} / $F:M_{ASSD}$) – ($V_{AVAIL,MBR}$ * SS_{MBR})]* (1+S.F)/ SS_{ANOX}		
		=	40,418	gal	101045 gal
			(Pre-aeration volume required)		
2.3.2.4	Selected Volume for Pre-Aeration, V_{PA}	=	101,323	gal	253308 gal

Part 4: Pre-Anaerobic Tank (PAN for Bio-P)

2.4.1.1	Recommended Volume for $V_{PAN,CALC}$	=	33,333	gallons	Based on 1 Hour HRT	83333 gal
2.4.1.2	Recommended Recycle Rate	=	1.0		From Pre-Aeration Basin	1.0
2.4.1.3	Selected Volume, V_{PAN}	=	55,486	gallons		138715 gal
2.4.1.4	Operating MLSS in SS_{PAN}	=	4,600	mg/L	Based on Recycle Rate	4600 mg/L
		=	0.04	lb TSS / gal		0.04 lb/gal

SECTION 3: PLANT F:M, HRT, & SRT

Part 1: F:M Ratio

1. The F:M ratio can be calculated as follows:

3.1.1.1 Plant Food to Mass Ratio, F:M

$= (N_{BOD0} - N_{BOD1}) * [1/(SS_{MBR} * V_{AVAIL,MBR} + SS_{POST-ANOX} * V_{POST-ANOX} + SS_{PA} * V_{PA} + SS_{PRE-ANOX} * V_{PRE-ANOX} + V_{PAN} * SS_{PAN})]$

$=$ 0.06 1/day — 0.06

2. HRT is an estimate of the average time liquid stays in a given volume. For the MBR and Anoxic Tank, the design HRT is:

3.1.2.1 MBR Hydraulic Residence Time, θ_{MBR}

$= V_{AVAIL,MBR} * (1/Q_D) * (24 hr/day)$

$=$ 2.4 hr — 2.4 hr

3.1.2.2 Anoxic Tank Hydraulic Residence Time, θ_{ANOX} (Includes Pre and Post Anoxic if applicable)

$= V_{ANOX} * (1/Q_D) * (24 hr/day)$

$=$ 2.1 hr — 2.1 hr

3.1.2.3 Pre-Aeration Tank Hydraulic Residence Time, θ_{PA}

$= V_{PA} * (1/Q_D) * (24 hr/day)$

$=$ 3.0 hr — 3.0 hr

3.1.2.4 Pre-Anaerobic Tank Hydraulic Residence Time, θ_{PAN}

$= V_{PAN} * (1/Q_D) * (24 hr/day)$

$=$ 1.7 hr — 1.7 hr

3.1.2.5 Total Hydraulic Residence Time, θ_T

$= \theta_{MBR} + \theta_{ANOX} + \theta_{PA} + \theta_{PAN}$

$=$ 9.1 hr — 9.1 hr

3. Similar to HRT in concept, SRT is an estimate of the average time solids spend in a given volume and is calculated as follows:

3.1.3.1 Wasting Rate of Activated Sludge, N_{WAS}

$= Y * (C_{BOD0} - C_{BOD1}) * 8.34 * (Q_D/10^6)$

$=$ 1,056 lb TSS / day — 2640 lb/day

3.1.3.2 Total Mass of Suspended Solids, M_{SS}

$= (V_{AVAIL,MBR} * SS_{MBR}) + (V_{POST-ANOX} * SS_{POST-ANOX}) + (V_{PA} * SS_{PA}) + (V_{PRE-ANOX} * SS_{PRE-ANOX}) + (V_{PAN} * SS_{PAN})$

$=$ 22,730 lb TSS — 56825 lb

3.1.3.3 Total Solids Residence Time, θ_C

$= M_{SS} / N_{WAS}$

$=$ 22 days — 22 days

SECTION 4: M&E Nitrification Design Criteria- Cross Check

Part 1: Nitrification check

1 Nitrification SRT check

4.1.1.1	$1/SRT_{Nmin}$	=	$[(\mu_{Nmax} * N) / (K_N + N)] - K_{dN}$		
	Design Temperature	=	15	^oC	15 deg C
	Nitrification Max. Specific growth rate, μ_{Nmax}				
	Range	=	0.20-0.90	g VSS/ g VSS.d	0.2-0.9
	Typical value at 20 ^oC	=	0.75	g VSS/ g VSS.d	0.7
	Temperature Activity Coeff. for $\mu_{Nmax,}$ Θ	=	1.07	Unitless	1.07
	Correction for Design Temperature	=	$0.75 * (\Theta)^{\wedge(T-20)}$		
	μ_{Nmax}	=	0.53	g VSS/ g VSS.d	0.53
	Nitrification Half velocity constant,K_N				
	Range	=	0.50-1.00	mg NH_4-N/L	0.5-1.0
	Typical value at 20 ^oC	=	0.74	mg NH_4-N/L	0.74
	Temperature Activity Coeff. For $K_{N,}$ Θ	=	1.053	Unitless	1.053
	Correction for Design Temperature	=	$0.74 * (\Theta)^{\wedge(T-20)}$		
	K_N	=	0.57	mg NH_4-N/L	0.57 mg/L
	Nitrification Endogenous decay coefficient K_{dN}				0.05-0.15
	Range	=	0.05-0.15	g VSS/ g VSS.d	
	Typical value at 20 ^oC	=	0.08	g VSS/ g VSS.d	0.08
	Temperature Activity Coeff. For $K_{dN,}$ Θ	=	1.04	Unitless	1.04
	Correction for Design Temperature	=	$0.08 * (\Theta)^{\wedge(T-20)}$		
	K_{dN}	=	0.07	g VSS/ g VSS.d	0.07
	Effluent N concentration, N	=	2.0	mg / L	2.0 mg/L
	Minimum SRT needed for Nitrification, SRT_{Nmin}	=	2.9	days	2.9 days
4.1.1.2	Safety Factor, SF Same as peaking factor, PDF/MMF	=	2	Unitless	2
4.1.1.3	M&E recommended SRT	=	Min SRT * SF		
		=	5.7	days	5.7 days
4.1.1.4	Enviroquip calculated Aerobic SRT for nitrification	=	(Aerobic volume* MLSS)/ ((Inf. BOD - Eff. BOD) * Y)		
		=	14.5	days	14.5 days

00167

4.1.1.5 Enviroquip calculated Aerobic SRT for should be higher than M&E recommended SRT = OK

SECTION 5: AERATION REQUIREMENTS

Part 1: Actual Oxygen Requirements

1. Carbonaceous biochemical oxygen demand (CBOD) is a measure of the oxygen consumed during assimilation of waste carbon entering the MBR. The actual CBOD load is:

5.1.1.1	Unit BOD Oxygen Demand, O_{2UBOD}	=	0.5	lb O_2 / lb BOD	0.5 lb/lb BOD
5.1.1.2	Total BOD Oxygen Demand, O_{2TBOD}	=	$O_{2UBOD} * (N_{BOD0} - N_{BOD1})$		
		=	704	lb O_2 / day	1760 lb/day

2. Nitrifying organisms are able to utilize reduced ammonia in place of CBOD as an electron donor in cell synthesis. The oxygen demand exerted during this process is referred to as nitrogenous biochemical oxygen demand (NBOD) and can be calculated by:

5.1.2.1	Unit Nitrogen Oxygen Demand, O_{2UNIT}	=	4.57	lb O_2 / lb N	4.57 lb/lb
5.1.2.2	Total Nitrogen Oxygen Demand, O_{2TNIT}	=	$O_{2UNIT} * N_{NNET}$		
		=	1,747	lb O_2 / day	4368 lb/day

3. Microorganisms will consume other microorganisms in a process called endogenous decay. The oxygen demand exerted by endogenous decay is:

5.1.3.1	Endogenous Oxygen Unit Requirement, c	=	0.07	lb O_2 / lb VSS*day	0.07 lb/lb
5.1.3.2	Volatile Fraction of Suspended Solids, SS/VSS	=	0.80		0.80
5.1.3.3	Mass of Volatile Solids In MBR & PA, $m_{MBR\&PA}$	=	$(V_{AVAIL,MBR} * SS_{MBR} + V_{PA} * SS_{PA}) * SS/VSS$		
		=	12,263	lb VSS	30658 lb
5.1.3.4	Total Endogenous Oxygen Demand, O_{2END}	=	$m_{MBR\&PA} * c$		
		=	907	lb O_2 / day	2268 lb/day

4. During denitrification a certain amount of BOD is consumed. Therefore, we can take a denitrification credit when calculating the oxygen demand. The denitrification credit can be calculated as follows:

5.1.4.1 Unit BOD Consumed

00168

	During Denitrification, BOD_{UNIT}	=	2.86	lb BOD / lb N	2.86
5.1.4.2	Total Denitrification Credit, $O_{2CREDIT}$	=	$DN_N * BOD_{UNIT} * O_{2UBOD}$		
		=	388	lb O_2 / day	970 lb/day

5. The oxygen demand of the process is the sum total of the demands calculated in the previous three steps and represents the actual oxygen requirement (AOR) of the plant. The AOR is:

5.1.5.1	**Total Oxygen Demand, AOR**	=	$O_{2TBOD} + O_{2TNIT} + O_{2END} - O_{2CREDIT}$		
		=	**2,969**	**lb O_2 / day**	7423 lb/day

Part 2: Coarse Bubble Air

1. The membrane units are supplied with integral coarse bubble diffusers (4 mm). The air supplied by the diffuser is used to provide membrane scouring, mixing, and process oxygen. The minimum air required for cleaning is:

5.2.1.1	Cleaning Air Required Per Cartridge, Air_{CART}	=	19.000	SCFM	19 SCFM
5.2.1.2	Total Cleaning Air Required, Air_{CLEAN}	=	$Air_{CART} * Cart_{ACT}$		3800 SCFM
		=	1,520	SCFM	
5.2.1.3	Actual Cleaning air Provided, Air_{CLEAN}	=	1,520	SCFM	3800 SCFM

2. The minimum air required for mixing is:

5.2.2.1	Unit Mixing Air, Air_{UMIX}	=	0.015	SCFM / ft3	0.015
5.2.2.2	Mixing Air For MBR, Air_{MMBR}	=	VAVAIL,MBR * (1 ft3/7.48 gal) * 0.015 SCFM / ft3		
		=	158	SCFM	158 SCFM
			Air_{MMBR} < Cleaning Air Supplied		

3. The amount of usable oxygen provided by the membrane units is a function of several factors, including: site conditions, diffuser depth, residual dissolved oxygen concentration (DO), and thermodynamic/kinetic correction factors, and is given by:

5.2.3.1	Kinetic Correction Factor, α	=	0.5		0.5
5.2.3.2	Thermodynamic Correction Factor, β	=	0.95		0.95
5.2.3.3	Temperature Correction Factor, θ	=	1.024		1.024
5.2.3.4	Ambient Pressure	=	14.16	psi	14.16 psi

	corrected for elevation(Psite)				
5.2.3.5	Std. Atmospheric pressure (P std)	=	14.7	psi	14.7 psi
5.2.3.6	Pressure Correction Factor (Ω)	=	(Psite + 0.007*γ_{wT}*H_s*0.3 -P_{vT})/(P std + 0.007*γ_{w20}*H_s*0.3		
		=	0.96		0.96
	Specifi weight of water at T, γ_{wT}	=	62.25	lb/cu.ft	62.25 lb/cf
	Specific weight of water at 20, γ_{w20}	=	62.32	lb/cu.ft	62.32 lb/cf
	Vapor Pressure of water T, P_{vT}	=	0.46	psi	0.46 psi
	Vapor Pressure of water 20 C, P_{v20}	=	0.34	psi	0.34 psi
5.2.3.7	Surface Oxygen Saturation at Standard Temp and Pressure (STP), C_{20s}	=	9.08	mg/l	9.08 mg/L
5.2.3.8	Oxygen Saturation at Temperature (C_T)	=	8.24	mg/l	8.24 mg/L
5.2.3.9	Temperature correction Factor, (ζ)	=	C_T/C_{20}		
		=	0.91		0.91
	Steady state Dissolved oxygen saturation concentration , C_{20}	=	C_{20s}((P std - P_{v20} + 0.007*γ_{w20} *H_s*0.3)/(P std - P_{v20}))		
		=	10.13	mg/L	10.13 mg/L
5.2.3.10	Residual Oxygen Concentration in MBR, C_R	=	2.0	mg/l	2.0 mg/L
5.2.3.11	Max Design Operating Temp, T	=	25	°C	25 deg. C
5.2.3.12	Diffuser Submergence, H_S	=	(H_{SWD} – 1)		
		=	13	ft	13 ft
5.2.3.13	Oxygen Transfer Efficiency per Foot , $SOTE_{FT}$	=	0.5%	per foot submergence	0.5%/ft
5.2.3.14	Standard Oxygen Transfer Efficiency, SOTE	=	H_S * $SOTE_{FT}$		
		=	6.5%		6.5%
5.2.3.15	Density of Air, ρ_{AIR}	=	0.075	lb/ft^3	0.075 lb/cf
5.2.3.16	Mass Fraction of Oxygen In Air, C_{O2}	=	0.232	lb O_2 / lb Air	0.232
5.2.3.17	Hours of Operation for Cleaning air, *x*	=	19	hrs/day	19 hr/day
5.2.3.18	SOR Provided by MBR	=	Air_{Clean}*C_{O2}*ρAIR*SOTE*x		
	Scouring Air (Membrane blowers are ***ON*** for *x* hrs. and ***OFF*** for 24-*x* hours	=	1959.8	lb O_2 / day	4900 lb/day

during night)

5.2.3.19	Actual AOR Provided by MBR Blowers	=	SOR * [α * ((β * Ω* ζ* $C_{20} - C_R$)/C_{20}) * θ^{T-20}]		
5.2.3.20	AOR_{AVAIL}	=	999	lb O_2 / day	2498 lb/day

Part 3: Fine Bubble Air

1. In the event of insufficient nitrification volume or relatively high loadings, supplemental aeration may be required. Any air not supplied in the MBR will be supplied in a fine bubble pre-aeration basin. The aeration requirements for this basin can be calculated as follows:

5.3.1.1	Total Oxygen Demand, AOR	=	2,969	lb O_2 / day	7423 lb/day
5.3.1.2	Total AOR Provided by MBR Blowers, AOR_{AVAIL}	=	999	lb O_2 / day	2498 lb/day
5.3.1.3	Air Required in Pre-Aeration Basin, AOR_{PA}	=	AOR – AOR_{AVAIL}		
		=	1,970	lb O_2 / day	4925 lb/day
			(Pre-Aeration required)		
5.3.1.4	Kinetic Correction Factor, α	=	0.65		0.65
5.3.1.5	Thermodynamic Correction Factor, β	=	0.95		0.95
5.3.1.6	Temperature Correction Factor, θ	=	1.02		1.02
5.3.1.7	Ambient Pressure Corrected for Elevation(Psite)	=	14.16	psi	14.16 psi
5.3.1.8	Std. Atmospheric pressure (Pstd)	=	14.70	psi	14.7 psi
5.3.1.9	Pressure Correction Factor (Ω)	=	(Psite + 0.007*γ_{wT}*H_s*0.4 -P_{vT})/(P std + 0.007*γ_{w20}*H_s*0.4		
		=	0.96		0.96
	Specifi weight of water at T, γ_{wT}	=	62.25	lb/cu.ft	62.25 lb/cf
	Specific weight of water at 20, γ_{w20}	=	62.32	lb/cu.ft	62.32 lb/cf
	Vapor Pressure of water T, P_{vT}	=	0.46	psi	0.46 psi
	Vapor Pressure of water 20 C, P_{v20}	=	0.34	psi	0.34 psi
5.3.1.10	Temperature correction Factor, (ζ)	=	C_T/C_{20}		
		=	0.91		0.91
5.3.1.11	Oxygen Saturation at Temperature (C_T)	=	8.24	mg/lit	8.24 mg/L

5.3.1.12	Surface Oxygen Saturation at Standard Temp and Pressure (STP), C_{20s}	=	9.08	mg/l	9.08 mg/L
	Steady state Dissolved oxygen saturation concentration , C_{20}	=	$C_{20s}(P\ std - P_{v20} + 0.007*\gamma_{w20}*H_s*0.4)/(P\ std - P_{v20})$		
		=	10.68	mg/L	10.68 mg/L
5.3.1.13	Residual Oxygen Concentration in Pre-Air, C_R	=	2.0	mg/l	2.0 mg/L
5.3.1.14	Max Design Operating Temp, T	=	25	°C	25 deg. C
5.3.1.15	Oxygen Transfer Efficiency per Foot , $SOTE_{FT}$	=	2%		2%
5.3.1.16	SWD in Pre-Air Basin PA_{SWD}	=	14.5	Ft.	14.5 ft
5.3.1.17	Standard Oxygen Transfer Efficiency, SOTE	=	$PA_{SWD} * SOTE_{FT}$		29%
		=	29%		
5.3.1.18	Air Required in Pre-Aeration Basin, Q_{PA}	=	$AOR_{PA} * 1/[\alpha * ((\beta * \Omega * \zeta * C_{20} - C_R)/C_{20}) * \theta^{T-20}] * (1/\rho_{AIR}) * (1/C_{O2}) * (1/SOTE) * (day/1440\ min)$		
		=	491	SCFM	1228 SCFM
5.3.1.19	Max. Oxygen Uptake Rate (OUR) Recommended	=	100	mg/L/Hr	100 mg/L/hr
5.3.1.20	Actual OUR in Pre-Aeration	=	$AOR_{PA} *454000 / (3.785*24*V_{PA})$		
5.3.1.21	Actual OUR in Pre-Aeration	=	87	mg/L/Hr At Operating Point	87 mg/L/hr
5.3.1.22	**Confirm 5.3.1.21 <= 5.3.1.19**	**=**	**OK**		

SECTION 6: CHEMICAL REQUIREMENTS

Part 1: Sodium Hypochlorite

1. Approximately 2 times per year a maintenance cleaning of the membrane cartridges is required for organic fouling. A 0.1 percent solution of Sodium Hypochlorite is used for this cleaning, and the volume of chemical needed can be calculated by:

6.1.1.1	Actual Number of Cartridges, $Cart_{ACT}$	=	80	cartridges	200 cart.
6.1.1.2	Volume of Dilute Chemical Needed per cartridge, V_{CART}	=	39.63	gal dilute / cart	39.63 gal/cart
6.1.1.3	Total Volume of Dilute Chemical Needed per Cleaning, $V_{T,DIL}$	=	$Cart_{ACT} * V_{CART}$		
		=	3,170	gal dilute solution	7925 gal
6.1.1.4	Concentration of Dilute				

	NaOCl, $C_{D,NaOCl}$	=	0.10%		0.10%
6.1.1.5	Concentration of Stock NaOCl, $C_{S,NaOCl}$	=	12.5%		12.5%
6.1.1.6	Dilution Rate, DR_{NaOCl}	=	$C_{S,NaOCl} / C_{D,NaOCl}$		125
		=	125		
6.1.1.7	Number of NaOCl Cleanings Per Year, CIP_{NaOCl}	=	2	cleanings / year	2/year
6.1.1.8	Total Volume of Stock Chemical Needed per Year, $V_{T,STOCK}$	=	$CIP_{NaOCl} * V_{T,DIL} / DR_{NaOCl}$		128 gal/yr
		=	51	gal stock NaOCl / year	

Part 2: Oxalic Acid

1. In case of inorganic fouling (or scaling), the membrane cartridges may need be cleaned with a 1 percent solution of Oxalic Acid 2 times per year.

6.2.1.1	Actual Number of Cartridges, $Cart_{ACT}$	=	80	cartridges	200 cart.
6.2.1.2	Volume of Dilute Chemical Needed per cartridge, V_{CART}	=	39.63	gal dilute / cart	39.63 gal/cart
6.2.1.3	Total Volume of Dilute Chemical Needed per Cleaning, $V_{T,DIL}$	=	$Cart_{ACT} * V_{CART}$		7925 gal
		=	3,170	gal dilute solution	
6.2.1.4	Concentration of Dilute Acid, $C_{D,Acid}$	=	1.0%		1%
6.2.1.5	Concentration of Stock Acid, $C_{S,Acid}$	=	100%		100%
6.2.1.6	Dilution Rate, DR_{Acid}	=	$C_{S,Acid} / C_{D,Acid}$		
		=	100		100
6.2.1.7	Number of Acid Cleanings Per Year, CIP_{Acid}	=	2	cleanings / year	2/year
6.2.1.8	Total Volume of Stock Chemical Needed per Year, $V_{T,STOCK}$	=	$CIP_{Acid} * V_{T,DIL} / DR_{Acid}$		
		=	63	gal stock acid / year	158 gal/yr

Part 3: Chemical addition for Nitrogen Removal

1 Methanol addition for Nitrate Removal

00173

6.3.1.1	BOD:TKN ratio	=	< 6			<6
6.3.1.2	Methanol addition required	=	YES			YES
6.3.1.3	Net Denitrification load, Design NO3-Nitrogen to be denitrified, N_{DNET}	=	$N_{TN} - N_{NO3,1} - N_{effTKN} - N_{NWS}$			
		=	271.42	lb N / day		679 lb/day
		=	40.68	mg / L		40.68 mg/L
	100 % Solution has 792,000 mg/L of Methanol	=	78	gal/ day	BIOWIN estimate	195 gal/day

Part 4: Chemical addition for Phosphorus removal

	EBPR available	=	YES			YES
	Phosphorus to be removed, N_{PNET} With EBPR CPWAS @ 4 % P in sludge Without EBPR CPWAS@ 1.5 % P in sludge	=	Influent P- Effluent P-(Influent BOD * Y * C_{PWAS})			
		=	2.4	mg/ L		2.4 mg/L
		=	16	lb/ day		40 lb/day
	2 Alum addition					
6.4.2.1	Al:P Molar ratio, MR	=	2			2
6.4.2.2	Alum Mass Loading	=	$(N_{PNET} * MR * 666.5)/(30.97 * 2)$			
		=	340	lb/ day		850 lb/day
6.4.2.3	Actual dosage with 48 % solution by weight, A_{Dosage}	=	709	lb/day		1773 lb/day
6.4.2.4	Alum Volumetric Loading (Solution has specific gravity of 1.2)	=	$(A_{Dosage})/(8.34*1.2)$			100 gal/day
		=	40	gal/day		
6.4.2.5	Alum Design storage capacity Peaking factor: 2 Retention days: 30	=	2,400	gal		6000 gal
6.4.2.6	Sludge Production Alum Phosphate ($AlPO_4$)	=	62	lb/day		155 lb/day
6.4.2.7	Sludge Production Alum Hydroxide ($Al(OH)_3$)	=	20	lb/day		50 lb/day

SECTION 7: ALKALINITY BALANCE

	Influent Alkalinity	=	300	mg/L		300 mg/L
	Effluent Alkalinity to be maintained	=	75	mg/L		75 mg/L

Part 1: Alkalinity consumed during Nitrogen Removal

1 Nitrification

7.1.1.1	Net Nitrification Load, N_{NNET}	=	382.2	lb N/day	956 lb/day
7.1.1.2	Net Nitrification Load, N_{NNET}	=	N_{NNET}/ (Flow * 8.34)		57.28 mg/L
		=	57.28	mg / L	
7.1.1.3	Alkalinity consumed during nitrification (Per mg of Ammonia nitrified)	=	N_{NNET} * 7.14	mg / L	409 mg/L
		=	409.0	mg / L	

2 Denitrification

7.1.2.1	Net Denitrification load, Design NO3-Nitrogen to be denitrified, N_{DNET}	=	271.4	lb N / day	679 lb/day
7.1.2.2	Net Denitrification load, Design NO3-Nitrogen to be denitrified, N_{DNET}	=	N_{DNET}/ (Flow * 8.34)		40.68 mg/L
		=	40.68	mg / L	
7.1.2.3	Alkalinity recovered during denitrification (Per mg of Nitrate denitrified)	=	N_{NDNET} * 3.57		145.2 mg/L
		=	145.2	mg / L	
7.1.2.4	Alkalinity consumed during Nitrogen Removal	=	Alkalinity consumed (nit) - Alkalinity recovered (denit)		263.8 mg/L
		=	263.8	mg / L	

Part 2: Alkalinity consumed during Phosphorus removal

1 Alkalinity consumed by Ferric Chloride

7.2.1.1	Fe:P, Theoretical Molar ratio required	=	1		1
7.2.1.2	Fe:P, Molar ratio used, MR	=	0		0
7.2.1.3	Fe:P Excess Molar ratio, EMR	=	0.0		0.0
7.2.1.4	Excessive chemical added (M.W of Ferric Chloride = 162.21)	=	(M.W * EMR * N_{PNET})/30.97		0.00
		=	0.00	mg / L	
7.2.1.5	Alkalinity consumed by Ferric chloride (Per mg of Excessive Ferric chloride)	=	0.92	mg / L	0.92
7.2.1.6	Alkalinity consumed	=	Excessive Chemical added * 0.92		0.0
		=	0.0	mg / L	

00175

2 Alkalinity consumed by Alum

7.2.2.1	Al:P, Theoretical Molar ratio required	=	1		1
7.2.2.2	Al:P, Molar ratio used, MR	=	2		2
7.2.2.3	Al:P Excess Molar ratio, EMR	=	1.0		1.0
7.2.2.4	Excessive chemical added (M.W of Ferric Chloride = 666.5)	=	(M.W * EMR * N_{PNET})/30.97 * 2		
		=	25.5	mg / L	25.5 mg/L
7.2.2.5	Alkalinity consumed by Alum (Per mg of Excessive Alum)	=	0.45		0.45
7.2.2.6	Alkalinity consumed	=	Excessive Chemical added * 0.45		
		=	11.48	mg / L	11.48 mg/L

Part 3: Alkalinity Balance

7.3.1.1	Alkalinity remaining	=	Influent Alkalinity - Alkalinity consumed during N removal - Alkalinity consuemd during P removal		
		=	24.8	mg / L	24.8 mg/L
7.3.1.2	Effluent Alkalinity to be maintaned	=	75	mg / L	75 mg/L
7.3.1.3	Alkalinity to be added	=	50.22758079	mg / L	50.2 mg/L

Part 4: Chemical addition to recover alkalinity

7.4.1.1	Caustic addition (NaoH) 50 % concentration				
7.4.1.2	Density of 50 % Caustic solution	=	12.76	lb / gal	12.76 lb/gal
7.4.1.3	Alkalinity provided by 50 % Caustic solution	=	0.625	lb $CaCo_3$ / lb NaoH	0.625 lb/lb
	Alkalinity to be added		50	mg/l	50 mg/L
7.4.1.4	Alkalinity to be added	=	335	lb / day	838 lb/day
7.4.1.5	Caustic needed	=	(Alkalinity to be added)/ 0.625		
		=	536	lb / day	1340 lb/day
		=	42	gal / day	105 gal/day

Plant Design Features – 2.0 MGD Interim Phase

A. Standby Power System

The treatment plant standby power system will consist of a diesel-engine-driven generator with sufficient capacity to operate the plant pumps, blowers, chemical feed system and plant controls for a minimum eight-hour power outage. An automatic transfer is installed for the generator in the event of a power failure.

B. Alarm Features

The plant will be tied into Liberty Hill's existing SCADA system which will generate an alarm to the operator if any of the following alarm conditions occur (Note: this is not an exhaustive list of all plant alarm conditions):

- Power outage
- SCADA communication failure
- Lift Station high level
- Plant basins high alarm level

C. Design Features for Operating Flexibility

1. Headworks: The plant is equipped with both an automatic drum screen package headworks unit and a manual bar screen. Each screening system is capable of meeting the full plant design flow with a 3.25X peaking factor.

2. MBR's
Each MBR will be capable of operation at 50% design flow, and individual MBR units can be isolated for cleaning and repairs

3. Plant Lift station
The on-site plant drain lift station will be able to pump peak design flows with any one pump out of service for repairs.

4. Blowers
Plant will be fitted with blowers sufficient to operate the plant at design air flow with any one blower out of service. Both the 0.8 MGD Phase 1 plant and the 1.2 MGD Phase 2 plant will have a standby blower.

5. Permeate Pumps
Two permeate pumps will be installed. They will be equipped with VFD's and designed for 100% redundancy. The plant is capable of operating at full design flow in gravity mode if a permeate pump is down for maintenance. A shelf spare permeate pump is available on site.

6. Transfer/WAS Pumps
One WAS pump will be installed for each MBR basin. A shelf spare WAS pump is available on site.

7. Mixers for anoxic/anaerobic zone
Two mixers will be installed for proper mixing in each anoxic zone and each anaerobic zone.

D. Overflow Prevention
Plant will be designed with sufficient freeboard on all units to allow sufficient time for operators to repair any line blockage or equipment malfunction.

E. Equalization Storage
The plant is designed with enough equalization storage to handle a 2-hour 5X peak flow event and a 10-hour 3X peak flow event.

Existing Lift Stations

Future MUD 19 Off-Site Lift Station 1085 gpm

Future MUD 19 Off-Site Lift Station 1085 gpm

Existing MUD 19 Off-Site Lift Station 1085 gpm @ 223' TDH 16' Sq. x 6.3' Range (13,450 gallons)

Existing Off-Site Plant Lift Station 1000 gpm @ 68' TDH Future 2000 gpm 12'Ø x 7.6' Range (7,168 gallons)

Future Caufield Lift Station 1085 gpm

Future Rosenbush Lift Station 600 gpm

Future DIPREY Off-Site Lift Station 1085 gpm

Leander Future Off-Site Lift Station 1085 gpm

Flow Splitter Box Concrete Channel (3,603 gallons) Potential From L.S.'s 9,110 gpm

9,110 gpm Max.

Future Connection

0.40 MGD Avg. 1.30 MGD Peak

Future Disconnect

Phase 1 Existing SBR Plant Headworks 0.4 MGD Avg. 1.3 MGD Peak (To be decomissioned in Phase 2)

4.0 MGD Avg. 13.0 MGD Peak

2.0 MGD Avg. 6.5 MGD Peak

Existing Fine Bar Screen Grit Removal Grease Removal 2.0 MGD Avg. 6.5 MGD Peak Capacity

Existing Manual Fine Screen Headworks Bypass 4.0 MGD Avg. 13 MGD Peak Capacity

Future Fine Bar Screen Grit Removal Grease Removal 2.0 MGD Avg. 6.5 MDG Peak Capacity

0.8 MGD Avg. 2.6 MGD Peak

Phase 1 Existing Ovivo MBR 0.8 MGD Avg. 2.6 MGD Peak

Phase 2 Proposed Ovivo MBR 1.2 MGD Avg. 3.9 MGD Peak

Future Phase Future Ovivo MBR 0.8 MGD Avg. 2.6 MGD Peak

Future Phase Future Ovivo MBR 1.2 MGD Avg. 3.9 MGD Peak

3.2 MGD Avg. 10.4 MGD Peak

2.0 MGD Avg. 6.5 MGD Peak

1.3 MGD Avg. 3.9 MGD Peak

Drain

Sludge

Initial Plant Flow Diversion to SBR

Future Drain Recycle to Influent Pipe Header

Liquid Sludge Haul-Off

Sludge Transfer Pump

Existing SBR Sludge Digester/Holding Tank

Future Disconnect

* Existing SBR Plant 0.4 MGD Avg. 1.3 MGD Peak

* Existing SBR Tankage To Be Converted To Aerobic Digester In Future

0.4 MGD Avg. 1.3 MGD Peak

* Existing Post Equalization Basin

Existing Rotating Disk Filter 0.4 MGD Existing

Existing UV Disinfection 2.0 MGD Existing 6.0 MGD Future

2 - 2.0 MGD Modules Installed
Room for 2 - 2.0 MGD Module Addition

Future Chlorination Basin 4.0 MGD Avg. 13.0 MGD Peak

Future De-Chlorination Basin 4.0 MGD Avg. 13.0 MGD Peak

Future Reaeration Basin 4.0 MGD Avg. 13.0 MGD Peak

Existing Step Aeration

Increase Capacity of Existing Step Aeration

Future Effluent Lift Station Expansion 3-2650 gpm pumps - 5300 gpm Firm

Future Effluent Lift Station Expansion 3-2650 gpm pumps 5300 gpm Firm

Future Wet Well Connection

Existing Effluent Lift Station 3-2100 gpm pumps 4200 gpm Firm

Existing Effluent Lift Station
3-1250 gpm pumps - 2500 gpm Firm
Interim II Upgrade:
3-2100 gpm pumps - 4200 gpm Firm

Future Combined Effluent Lift Stations
3-1250 gpm pumps - 3750 gpm
+2-2650 gpm pumps - 5300 gpm
9050 gpm firm capacity

0.40 MGD Avg. 13.0 MGD Peak

Effluent Discharge

Aerated Sludge Storage

Future Aerated Sludge Storage

Mechanical De-Water 1.5 Meter BFP 180 gpm Max. 750 lbs/hr Dry Solids Max.

Future Mechanical De-Water 1.0 Meter BFP 120 gpm Max. 500 lbs.hr Dry Solids Max.

Dewatered Sludge Haul-Off

Dewatered Sludge Haul-Off

Future Drain

Existing Lift Station For Drain/SBR Plant 278 gpm Avg. 903 gpm Peak

Existing Lift Station Converted to Manhole 130 gpm @ 42' TDH 5'Ø x 3' Range (491 gallons)

Legend:

Process Flow
- Existing
- Proposed
- Future

Sludge Flow
- Existing
- Proposed
- Future

Drain Flow
- Existing
- Proposed
- Future

Proposed WWTP Flow Diagram
2.0 MGD Avg. Flow Rate
(1389 gpm)

PRELIMINARY NOT FOR CONSTRUCTION

NO.	REVISION	BY	DATE

DESIGNED BY: DATE

DRAWN BY: DATE

CHECKED BY: DATE

APPROVED BY: DATE

FOR REVIEW.

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STEGER BIZZELL

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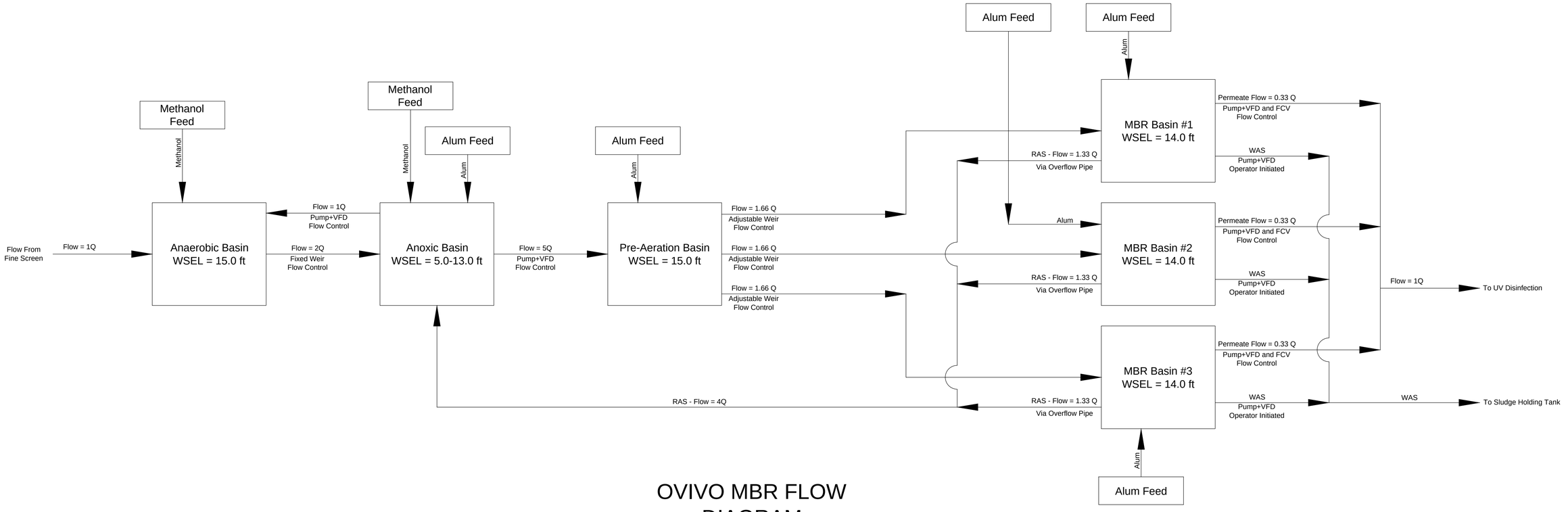
SERVICES >>ENGINEERS >>PLANNERS >>SURVEYORS

TOTAL PLANT PROCESS FLOW DIAGRAM
South Fork Wastewater Treatment Plant - 1.2 MGD Expansion
for
CITY OF LIBERTY HILL
Liberty Hill, Texas

Project No: 22632



OVIVO MBR FLOW DIAGRAM
1.2 MGD

PRELIMINARY NOT FOR CONSTRUCTION

NO.	REVISION	BY	DATE

DESIGNED BY: DATE

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CHECKED BY: DATE

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FOR REVIEW.

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STEGER BIZZELL

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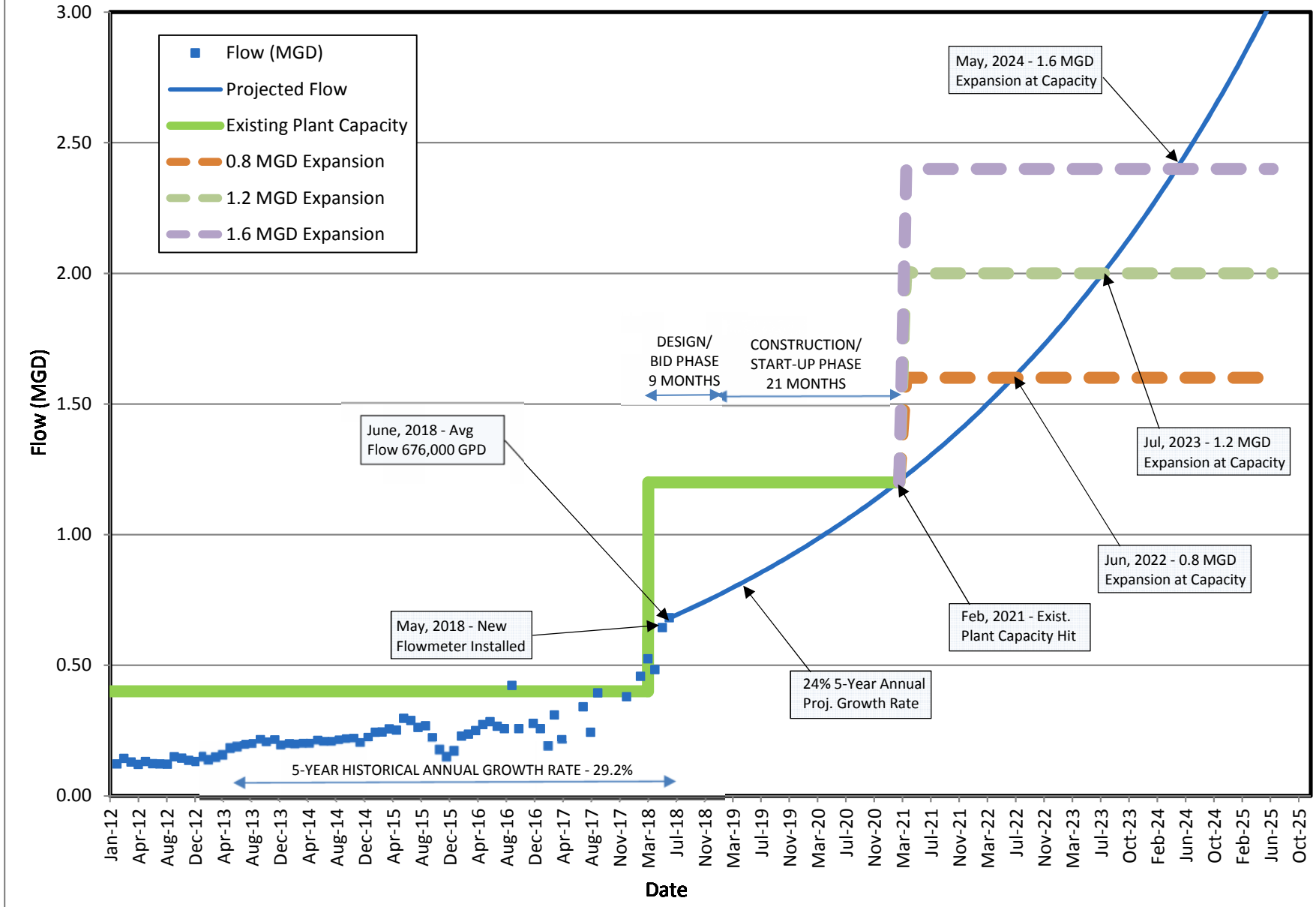
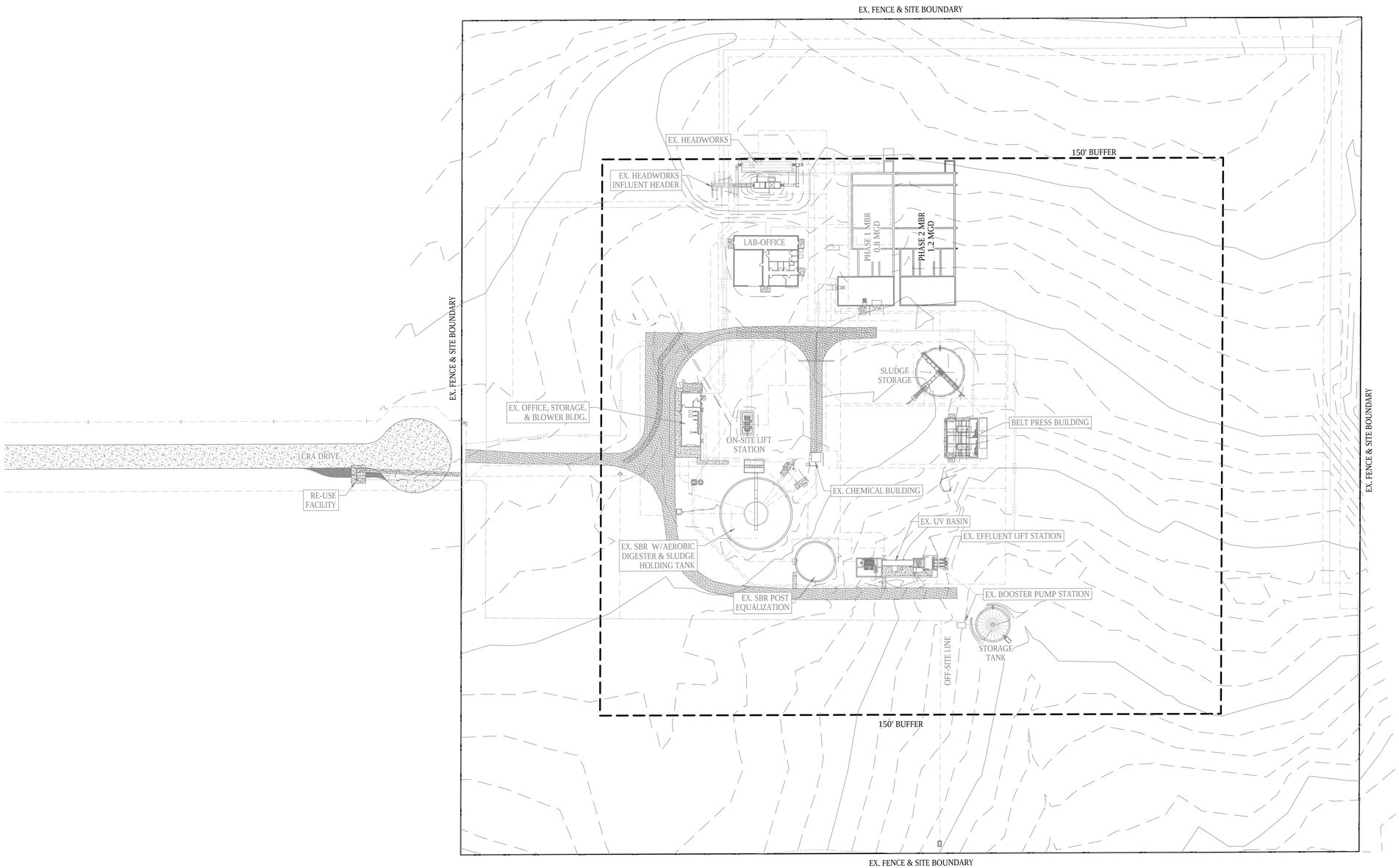
METRO 512.930.9412 TEXAS REGISTERED ENGINEERING FIRM F-181 TBPLS FIRM No.10003700 WEB STEGERBIZZELL.COM
SERVICES >>ENGINEERS >>PLANNERS >>SURVEYORS

OVIVO FLOW DIAGRAM
South Fork Wastewater Treatment Plant - 1.2 MGD Expansion
for
CITY OF LIBERTY HILL
Liberty Hill, Texas

Project No: 22632

Liberty Hill WWTP- Analysis of Expansion Options & Timelines





150' BUFFER ZONE SITE EXHIBIT

SCALE: 1" = 60'

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DATE 2018-10-11 JOB NO. 22632

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B014041-01 continued	Result	Units	Notes	MDL	Adj MDL	SQL	Lab	Analyzed	Method	Batch	
Volatiles											
Trihalomethanes (Total)	**0.00045**	mg/L	(0.00045)	0.00		0.001	*Sub*	10/12/18 12:28 ANA	EPA 624	SUB	*NEL*

Pollutant	AVG Effluent Conc. (µg/l)	MAX Effluent Conc. (µg/l)	Number of Samples	MAL (µg/l)
2,4,5-TP (Silvex)	<0.300	N/A	1	0.3
Tributyltin (see instructions for explanation)	Not Required	Not Required		0.01
1,1,1-Trichloroethane	<1.00	N/A	1	10
1,1,2-Trichloroethane	<1.00	N/A	1	10
Trichloroethylene	<1.00	N/A	1	10
2,4,5-Trichlorophenol	<1.01	N/A	1	50
TTHM (Total Trihalomethanes)	0.45	N/A	1	10
Vinyl Chloride	<1.00	N/A	1	10
Zinc	43.7	N/A	1	5

(*1) Determined by subtracting hexavalent Cr from total Cr.

(*2) Cyanide, amenable to chlorination or weak-acid dissociable.

(*3) The sum of seven PCB congeners 1242, 1254, 1221, 1232, 1248, 1260, and 1016.