NEW WATER

REQUEST FOR PROPOSALS AND STATEMENTS OF QUALIFICATIONS FOR A WISCONSIN POLLUTANT DISCHARGE ELIMINATION SYSTEM (WPDES) PERMIT RENEWAL PROJECT

1) PROJECT OVERVIEW

NEW Water, the brand of the Green Bay Metropolitan Sewerage District (GBMSD), is seeking a qualified Consultant with extensive experience with the WPDES permit renewal process to provide strategic, technical, and advisory support. NEW Water's current WPDES permit expires on March 31, 2027.

The selected Consultant will collaborate with NEW Water staff, legal counsel, and the Wisconsin Department of Natural Resources (WDNR) to prepare and submit the renewal application. The scope of work will include reviewing the draft permit, collecting and analyzing data to support the renewal, preparing and submitting comments, and facilitating meetings with key stakeholders throughout the renewal process.

2) BACKGROUND

NEW Water is a wholesale provider of wastewater treatment and conveyance services to 15 municipal customers, serving approximately 239,000 residents throughout a 285-square-mile area. We collect and treat an average of 41 million gallons a day from our two facilities. In addition, NEW Water has an Adaptive Management Plan that has been approved and implemented within the current permit.

This project will gather and review existing facility information relevant to WPDES permit renewal. It will include an extensive review of additional information for new parameters that could be included in a future permit.

3) SCOPE OF SERVICES

The Scope of Services to be provided under this proposal will be negotiated upon final selection of the Consultant. The following tasks outline the minimum expected scope of work for completing this project. The Consultant team is encouraged to review the scope requested in this RFP and add any additional tasks as they deem necessary to provide a complete project.

NEW Water has established a budget of $75,000 for the Consultant's scope of work, inclusive of all contingencies, allowances, and estimated hours translated into projected costs.

A. Task 1: Project Management

The Consultant shall manage the project to coordinate work efforts of all disciplines, monitor the project budget and schedule, and keep NEW Water informed of project progress and issues. The following activities shall be performed:

1. The Consultant shall conduct an in-person, virtual, or hybrid kick-off meeting with NEW Water, including a review of the following items:
    A. Project schedule/key milestones
    B. Project objectives
    C. NEW Water expectations
    D. Factors critical to project success and the associated tasks
    E. Roles and responsibilities of NEW Water and the Consultant project team members
    F. Data and information needs
    G. Tracking methods for action items and decisions made
    H. Meeting agenda and a summary of meeting discussions/decisions following the meeting.

2. For the duration of the project, the Consultant's Project Manager will have monthly calls with NEW Water's Project Manager to update NEW Water on project progress and identify any issues for resolution.
3. NEW Water is requesting that the Consultant provide a proposed project schedule as part of the Proposal. The project schedule should include milestones, meetings, and submittal dates for approval. The project schedule should consider the Consultant's availability and reasonable turnaround times for NEW Water staff.
4. The Consultant shall prepare and submit invoices and progress reports on a monthly basis. The monthly invoices shall be itemized by task and shall indicate individuals' hours for each task performed during the billing period. Supporting documentation for expenses incurred shall be included with the invoice. The progress reports will be as mutually agreed upon by NEW Water and the Consultant. The Consultant shall implement proven QA/QC measures throughout the project. Consultant shall describe their QA/QC plan in the Proposal. Verification may be documented through standard project correspondence.
5. All project deliverables shall be submitted as an electronic copy in native format and Portable Document Format (PDF).
    A. Meeting Agendas
    B. Project Action Items List and Decisions Made Spreadsheet
    C. Meeting Minutes
    D. Invoices/Progress reports
6. Consultant shall hold conference calls with NEW Water staff to review and coordinate as needed

B. Task 2: Plant Data Review and Permit Application
1. Prepare a draft permit application, including facility descriptions, schematics, and site maps.
2. Consultant shall prepare and submit a written Request for Information (RFI) to list the drawings, data, and information that the Consultant will expect and/or require NEW Water to provide.
3. Review Whole Effluent Toxicity (WET) testing results and support coordination with WDNR regarding potential WET limits.
4. Review submitted Dissipative Cooling and Mixing Zone Studies and Wisconsin Department of Natural Resources approval letters to determine if support compliance is needed.
5. Review mercury data, pollutant minimization plan, and impacts from the R2E2 project; determine if a variance is needed and prepare supporting documents if required.
6. Coordinate with NEW Water teams on permit application updates related to ongoing or planned upgrades (e.g., Pump Station and Headworks Projects).
7. Incorporate materials from the Adaptive Management Program into the permit e-application.
8. Facilitate workshops and calls with NEW Water and WDNR staff to review and finalize the application.
9. Prepare and submit the final permit application through WDNR's online system.

Task 2 Deliverables:
- Draft and final permit application.
- Workshop and meeting materials, including minutes.

C. Task 3: Draft and Final Permit Review
1. Review draft Water Quality-Based Effluent Limit memorandum, fact sheet, and preliminary draft permit; prepare written comments. Coordinate review comments with Municipal Environmental Group (MEG).
2. Facilitate workshops with NEW Water and WDNR to review draft materials and comments.
3. Review official public draft permit; prepare and coordinate NEW Water's comments, including legal review.
4. Review and comment on WDNR's public hearing presentation; attend public hearing.
5. Review final approved permit and support coordination with WDNR, EPA, and legal counsel throughout the process.

6. A conference call shall be held with NEW Water prior to submittal of the final draft WPDES permit application to the WDNR.

Task 3 Deliverables:

- Written comments on preliminary and public draft permits.
- Workshop and meeting materials, including minutes.

D. Task 4: Additional Permit Support
   1. Develop a response plan for potential permit compliance concerns.
   2. Review emerging regulatory issues (e.g., PFAS, nitrogen, disinfection season changes).
   3. Assess the Adaptive Management Plan, watershed progress, and water quality monitoring results.
   4. Provide other permit compliance support as directed by NEW Water (budget of $10,000, not to exceed the overall project budget of $75,000). Budget amount is intended to support WDNR coordination, meeting participation and unanticipated technical assistance needs that may arise during the renewal process.

Task 4 Deliverables:

- Documentation and recommendations as requested by NEW Water.

4) PROPOSAL FORMAT

The Consultant's Proposal shall be submitted in conformance with the following format:

A. Firm Qualifications (3 pages, maximum)
   1. Overall qualifications of the firm as it relates to this project.
   2. A list of three similar projects completed by the proposed project team. For each project, identify the client, the client reference contact information, the project manager, and the lead employee responsible for the work.

B. Project Approach (6 pages, maximum)
   1. Project understanding.
   2. Scope of services proposed by your firm for execution of the project.
   3. Description of the project approach (project plan).
   4. Description of the QA/QC plan.

C. Project Schedule (1 page, 11x17 maximum page size)
   1. Show milestones for all necessary elements of the work, including meetings, draft review document submittals, and final document submittals. Table format or equivalent digital format is acceptable.

D. Project Team/Personnel (3 pages, maximum)
   1. Provide an organizational chart depicting the project team.
   2. Identify key personnel, including project directors/managers and disciplines of lead personnel.
   3. Indicate office work location(s) of the project manager and lead.

E. Level of Effort/Cost (1 page, 11x17 maximum page size)
   1. List of all major tasks.
   2. Estimated Level of Effort and hourly billing rate for each proposed project participant by task.
   3. Estimated labor hours per task.
   4. Itemization of expenses by task.
   5. Subtotal cost of each task and each participant within each task.
   6. Total cost of each project participant for all tasks and grand total of all costs.
   7. Provide a Rate Schedule.
   8. Level of Effort/Cost proposal shall reflect the tasks outlined in the RFP.

F. Appendix/resumes:
   1. Provide resumes of key personnel to be assigned to the project.
   2. Resumes for the lead Consultant and project manager (2 pages, maximum).
   3. Resumes for the remainder of the team (1 page, maximum).

5) PROPOSAL SUBMISSION AND SCHEDULE

A. An electronic copy in Portable Document Format (PDF) of the proposal shall be furnished. The proposals will serve as the basis for selecting a Consultant and subsequently, for negotiating and executing a formal contract. It is acceptable to submit proposals via email, provided the Consultant verifies receipt of the document.

B. Proposals shall be addressed to:

Kate Verbeten, Environmental Compliance Specialist
NEW Water
2231 N. Quincy Street
Green Bay, WI 54302
kverbeten@newwater.us
(920) 438-1045

C. Questions concerning this RFP must be submitted electronically via e-mail to Kate Verbeten at kverbeten@newwater.us. Questions will be accepted until 4:00 p.m. local time on November 21, 2025.

D. Proposals must be received at the email address above by no later than 2:00 p.m. local time on December 19, 2025.

E. The RFP schedule is as follows:

Deadline to submit questions:	November 21, 2025
Answers due:	December 5, 2025
Proposals due:	December 19, 2025
Notice to proceed:	January 7, 2026
Current permit expiration:	March 31, 2027

6) SELECTION PROCESS

Proposals will be evaluated based on monetary and non-monetary criteria, including:

A. Firm Qualifications – 35%
B. Project Approach – 15%
C. Project Schedule – 10%
D. Project Team/Personnel – 20%
E. Level of Effort/Cost – 20%

7) CONTRACT

A. Terms of the formal contract will be negotiated between NEW Water and the selected Consultant. NEW Water anticipates that the scope of work and level of effort described in proposals will be refined through NEW Water/Consultant discussions such that a mutually acceptable project scope, level of effort, and cost can be developed.

B. NEW Water anticipates that a “Labor and Expenses” with a cost ceiling contract format will be utilized.

C. Award and execution of the contract is anticipated in January 2026.

8) ATTACHMENTS

A. NEW Water WPDES Permit WI-0065251-02-1
B. Memorandum of Understanding Between Green Bay Metropolitan Sewerage District and the Wisconsin Department of Natural Resources (2018)
C. Settlement Agreement
D. Dissipative Cooling Study (February 2022) and DNR Approval (April 2023)
E. Mixing Zone Study (January 2023) and DNR Approval (April 2025)
F. Mercury PMP (August 2020)
G. Adaptive Management Plan Executive Summary (October 2020)

ATTACHMENT A

NEW WATER WPDES PERMIT WI-0065251-02-1

WISCONSIN
DEPT. OF NATURAL RESOURCES

WPDES PERMIT

STATE OF WISCONSIN
DEPARTMENT OF NATURAL RESOURCES

PERMIT TO DISCHARGE UNDER THE WISCONSIN POLLUTANT DISCHARGE ELIMINATION SYSTEM

Green Bay Metropolitan Sewerage District

is permitted, under the authority of Chapter 283, Wisconsin Statutes, to discharge from two facilities located in Brown County at
2231 North Quincy Street, Green Bay, Wisconsin (Green Bay Facility [GBF]), and
315 Leonard Street, De Pere, Wisconsin (De Pere Facility [DPF])
to

the Fox River (Water Body Identification Code Number 117900) in the East River Watershed (LF01) of the Lower Fox River Drainage Basin of the Lake Michigan Basin

GBF Outfall 001 – Lat: 44° 32' 18" N / Lon: 88° 00' 13" W

DPF Outfall 051 – Lat: 44° 29' 13" N / Lon: 88° 02' 11" W

in accordance with the effluent limitations, monitoring requirements and other conditions set forth in this permit.

The permittee shall not discharge after the date of expiration. If the permittee wishes to continue to discharge after this expiration date an application shall be filed for reissuance of this permit, according to Chapter NR 200, Wis. Adm. Code, at least 180 days prior to the expiration date given below.

State of Wisconsin Department of Natural Resources
For the Secretary

By Heidi Schmitt

Heidi Schmitt Marquez
Wastewater Field Supervisor

April 28, 2022
Date Permit Signed/Issued for Modification

PERMIT TERM: EFFECTIVE DATE – April 01, 2022 **EXPIRATION DATE - March 31, 2027**
EFFECTIVE DATE OF MODIFICATION: May 01, 2022

TABLE OF CONTENTS

1 Influent Requirements

1.1 Sampling Point(s)

Sampling Point Designation	
Sampling Point Number	**Sampling Point Location, WasteType/Sample Contents and Treatment Description (as applicable)**
701	GBF Influent - Representative influent loading to the facility shall be calculated by combining the monitoring results from the separate influent streams to the facility. Results of chemical analyses shall be determined on a flow-weighted basis.
751	DPF Influent - Representative samples shall be taken at the raw sewage pump station prior to the addition of any sidestreams.

1.2 Monitoring Requirements

The permittee shall comply with the following monitoring requirements.

1.2.1 Sampling Point 701 - GBF Influent

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		MGD	Daily	Continuous	
$CBOD_5$		mg/L	Daily	Calculated	
BOD_5, Total		mg/L	Daily	Calculated	
Suspended Solids, Total		mg/L	Daily	Calculated	
Cadmium, Total Recoverable		µg/L	Monthly	Calculated	See Sections 1.2.1.1 and 1.2.1.2.
Chromium, Total Recoverable		µg/L	Monthly	Calculated	See Sections 1.2.1.1 and 1.2.1.2.
Copper, Total Recoverable		µg/L	Monthly	Calculated	See Sections 1.2.1.1 and 1.2.1.2.
Lead, Total Recoverable		µg/L	Monthly	Calculated	See Sections 1.2.1.1 and 1.2.1.2.
Nickel, Total Recoverable		µg/L	Monthly	Calculated	See Sections 1.2.1.1 and 1.2.1.2.
Zinc, Total Recoverable		µg/L	Monthly	Calculated	See Sections 1.2.1.1 and 1.2.1.2.
Mercury, Total Recoverable		ng/L	Monthly	Calculated	See subsection 1.2.1.3 for Mercury Monitoring Requirements.

1.2.1.1 Total Metals Analyses

Measurements of total metals and total recoverable metals shall be considered as equivalent.

1.2.1.2 Sample Analysis

Samples shall be analyzed using a method which provides adequate sensitivity so that results can be quantified at a level of quantitation below the calculated/potential effluent limit, unless not possible using the most sensitive approved method.

1.2.1.3 Mercury Monitoring

The permittee shall collect and analyze all mercury samples according to the data quality requirements of ss. NR 106.145(9) and (10), Wisconsin Administrative Code. The limit of quantitation (LOQ) used for the effluent and field blank shall be less than 1.3 ng/L, unless the samples are quantified at levels above 1.3 ng/L. The permittee shall collect at least one mercury field blank for each set of mercury samples (a set of samples may include combinations of intake, influent, effluent or other samples all collected on the same day). The permittee shall report results of samples and field blanks to the Department on Discharge Monitoring Reports.

1.2.2 Sampling Point 751 - DPF Influent

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		MGD	Daily	Continuous	
$CBOD_5$		mg/L	5/Week	24-Hr Flow Prop Comp	
BOD_5, Total		mg/L	5/Week	24-Hr Flow Prop Comp	
Suspended Solids, Total		mg/L	5/Week	24-Hr Flow Prop Comp	
Cadmium, Total Recoverable		µg/L	Monthly	24-Hr Flow Prop Comp	See Sections 1.2.2.1 and 1.2.2.2.
Chromium, Total Recoverable		µg/L	Monthly	24-Hr Flow Prop Comp	See Sections 1.2.2.1 and 1.2.2.2.
Copper, Total Recoverable		µg/L	Monthly	24-Hr Flow Prop Comp	See Sections 1.2.2.1 and 1.2.2.2.
Lead, Total Recoverable		µg/L	Monthly	24-Hr Flow Prop Comp	See Sections 1.2.2.1 and 1.2.2.2.
Nickel, Total Recoverable		µg/L	Monthly	24-Hr Flow Prop Comp	See Sections 1.2.2.1 and 1.2.2.2.
Zinc, Total Recoverable		µg/L	Monthly	24-Hr Flow Prop Comp	See Sections 1.2.2.1 and 1.2.2.2.
Mercury, Total Recoverable		ng/L	Monthly	24-Hr Flow Prop Comp	See subsection 1.2.2.3 for Mercury Monitoring Requirements.

1.2.2.1 Total Metals Analyses

Measurements of total metals and total recoverable metals shall be considered as equivalent.

1.2.2.2 Sample Analysis

Samples shall be analyzed using a method which provides adequate sensitivity so that results can be quantified at a level of quantitation below the calculated/potential effluent limit, unless not possible using the most sensitive approved method.

1.2.2.3 Mercury Monitoring

The permittee shall collect and analyze all mercury samples according to the data quality requirements of ss. NR 106.145(9) and (10), Wisconsin Administrative Code. The limit of quantitation (LOQ) used for the effluent and field blank shall be less than 1.3 ng/L, unless the samples are quantified at levels above 1.3 ng/L. The permittee shall collect at least one mercury field blank for each set of mercury samples (a set of samples may include combinations of intake, influent, effluent or other samples all collected on the same day). The permittee shall report results of samples and field blanks to the Department on Discharge Monitoring Reports.

2 In-Plant Requirements

2.1 Sampling Point(s)

Sampling Point Designation	
Sampling Point Number	**Sampling Point Location, WasteType/Sample Contents and Treatment Description (as applicable)**
101	GBF Field Blank - Sample point for reporting results of Mercury field blanks collected using standard sample handling procedures.
151	DPF Field Blank - Sample point for reporting results of Mercury field blanks collected using standard sample handling procedures.
021	Effluent to Green Bay Packaging for Reuse - Sample point to track flow of fully treated effluent to Green Bay Packaging. Flow from the chlorine contact basin at the Green Bay Facility enters reuse pump station and is transferred via force main to the valve vault located on the Green Bay Packaging property.

2.2 Monitoring Requirements and Limitations

The permittee shall comply with the following monitoring requirements and limitations.

2.2.1 Sampling Point 101 - GBF Field Blank and 151- DPF Field Blank

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Mercury, Total Recoverable		ng/L	Monthly	Blank	See subsection 2.2.1.1 for Mercury Monitoring requirements.

2.2.1.1 Mercury Monitoring

The permittee shall collect and analyze all mercury samples according to the data quality requirements of ss. NR 106.145(9) and (10), Wisconsin Administrative Code. The limit of quantitation (LOQ) used for the effluent and field blank shall be less than 1.3 ng/L, unless the samples are quantified at levels above 1.3 ng/L. The permittee shall collect at least one mercury field blank for each set of mercury samples (a set of samples may include combinations of intake, influent, effluent or other samples all collected on the same day). The permittee shall report results of samples and field blanks to the Department on Discharge Monitoring Reports.

2.2.2 Sampling Point 021 - Effluent to GBP

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		MGD	Daily	Continuous	

3 Surface Water Requirements

3.1 Sampling Point(s)

Sampling Point Designation	
Sampling Point Number	**Sampling Point Location, Waste Type/Sample Contents and Treatment Description (as applicable)**
001	GBF Effluent - Representative samples shall be collected downstream of the Parshall flumes for the North and South Complexes. Results of chemical analyses shall be reported on a flow-weighted average between the North Plant and the South Plant. Escherichia coli (E. coli) samples shall be collected 20 feet upstream of the Parshall flume. Grab samples for mercury and continuous measurements for pH shall be collected after dechlorination.
601	River Monitoring for GBF WLA - Lower Fox River data as reported by the Lower Fox River Dischargers Association used in the determination of the daily $CBOD_5$ wasteload allocation.
007	GBF WLA Compliance Reporting - Sample point for determining compliance with $CBOD_5$ wasteload allocation for the discharge from sample point/outfall 001. These requirements are applicable from May through October, each year.
051	DPF Effluent - Representative composite samples and continuous measurements shall be taken from the final effluent channel, and grab samples shall be taken from the disinfection basin discharge.
076	Calculated Combined Effluent - Sample point for Total Suspended Solids and Total Phosphorus calculated as a combined discharge from the GBF and DPF. Loadings are calculated as the sum of the mass discharged at sample points 001 and 051.
602	In-stream Sampling Point 602: Representative surface water samples shall be collected from the Fox River. Sample point 602 is located near the GBF outfall and the mouth of the Fox River at SWIMS Station ID 10046799 (Lat: 44° 32' 8.98" N, Long: 88° 0' 24.12" W).
603	In-stream Sampling Point 603: Representative water samples shall be collected from Ashwaubenon Creek. Sample point 603 is located at Ashwaubenon Creek at Grant Street at SWIMS Station ID 10016502 (Lat: 44° 26' 41.81" N, Lon: 88° 5' 55.77" W). Sample point 603 correlates with sample site A2 described in the approved AM Plan No. WQT-2020-0016 (October 2020).
604	In-stream Sampling Point 604: Representative water samples shall be collected from Dutchman Creek. Sample point 604 is located at Dutchman Creek at Hansen Road at SWIMS Station ID 10054013 (Lat: 44° 28' 58.49" N, Lon: 88° 5' 13.17" W). Sample point 604 correlates with sample site D1a described in the approved AM Plan No. WQT-2020-0016 (October 2020).

3.2 Monitoring Requirements and Effluent Limitations

The permittee shall comply with the following monitoring requirements and limitations.

3.2.1 Sampling Point (Outfall) 001 - GBF Effluent

Monitoring Requirements and Effluent Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		MGD	Daily	Continuous	
$CBOD_5$	Weekly Avg	40 mg/L	Daily	24-Hr Flow Prop Comp	See Section 3.2.3 for reporting Waste Load Allocation mass limits, which apply from May through October.

Monitoring Requirements and Effluent Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
$CBOD_5$	Monthly Avg	25 mg/L	Daily	24-Hr Flow Prop Comp	See Section 3.2.3 for reporting Waste Load Allocation mass limits, which apply from May through October.
Suspended Solids, Total	Weekly Avg	27 mg/L	Daily	24-Hr Flow Prop Comp	This is an Adaptive Management interim limit that applies on the permit effective date.
Suspended Solids, Total	Monthly Avg	18 mg/L	Daily	24-Hr Flow Prop Comp	This is an Adaptive Management interim limit that applies on the permit effective date.
Suspended Solids, Total		lbs/day	Daily	Calculated	Monitoring Only - See Section 3.2.5.1 for calculating combined effluent results for the GBF and DPF.
pH (Minimum)	Daily Min	6.0 su	Daily	Continuous	
pH (Maximum)	Daily Max	9.0 su	Daily	Continuous	
Chlorine, Total Residual	Daily Max	38 µg/L	Daily	Grab	Monitoring and limits apply May 1 through September 30 annually.
Chlorine, Total Residual	Weekly Avg	38 µg/L	Daily	Grab	Monitoring and limits apply May 1 through September 30 annually.
Chlorine, Total Residual	Monthly Avg	38 µg/L	Daily	Grab	Monitoring and limits apply May 1 through September 30 annually.
E. coli	Geometric Mean - Monthly	126 #/100 ml	Weekly	Grab	Monitoring and limits apply May 1 through September 30 annually.
E. coli	% Exceedance	10 Percent	Monthly	Calculated	Monitoring and limits apply May 1 through September 30 annually. See Section 3.2.1.4 for formula to calculate E. coli Percent Limit. Enter the result in the DMR on the last day of the month.
Nitrogen, Ammonia (NH_3-N) Total	Weekly Avg	59 mg/L	Daily	24-Hr Flow Prop Comp	Limit in effect January 1 through April 30 annually.
Nitrogen, Ammonia (NH_3-N) Total	Weekly Avg	13 mg/L	Daily	24-Hr Flow Prop Comp	Limit in effect May 1 through September 30 annually.
Nitrogen, Ammonia (NH_3-N) Total	Weekly Avg	38 mg/L	Daily	24-Hr Flow Prop Comp	Limit in effect the month of October annually.

Monitoring Requirements and Effluent Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Nitrogen, Ammonia (NH_3-N) Total	Weekly Avg	104 mg/L	Daily	24-Hr Flow Prop Comp	Limit in effect November 1 through December 31 annually.
Nitrogen, Ammonia (NH_3-N) Total	Monthly Avg	15 mg/L	Daily	24-Hr Flow Prop Comp	Limit in effect January 1 through April 30 annually.
Nitrogen, Ammonia (NH_3-N) Total	Monthly Avg	4.7 mg/L	Daily	24-Hr Flow Prop Comp	Limit in effect May 1 through September 30 annually.
Nitrogen, Ammonia (NH_3-N) Total	Monthly Avg	14 mg/L	Daily	24-Hr Flow Prop Comp	Limit in effect the month of October annually.
Nitrogen, Ammonia (NH_3-N) Total	Monthly Avg	26 mg/L	Daily	24-Hr Flow Prop Comp	Limit in effect November 1 through December 31 annually.
Phosphorus, Total	Monthly Avg	1.0 mg/L	Daily	24-Hr Flow Prop Comp	
Phosphorus, Total	6-Month Avg	0.6 mg/L	Daily	24-Hr Flow Prop Comp	This is an Adaptive Management interim limit effective beginning May 1, 2022. See Section 3.2.1.7 for averaging periods and compliance determination. Future interim limit of 0.5 mg/L may be effective upon reissuance per Schedule 5.1.
Phosphorus, Total		lbs/day	Daily	Calculated	Monitoring Only - See Section 3.2.5.1 for calculating combined effluent results for the GBF and DPF.
Cadmium, Total Recoverable		µg/L	Monthly	24-Hr Flow Prop Comp	Monitoring Only - See Sections 3.2.1.2 and 3.2.1.3.
Chromium, Total Recoverable		µg/L	Monthly	24-Hr Flow Prop Comp	Monitoring Only - See Sections 3.2.1.2 and 3.2.1.3.
Copper, Total Recoverable		µg/L	Monthly	24-Hr Flow Prop Comp	Monitoring Only - See Sections 3.2.1.2 and 3.2.1.3.
Lead, Total Recoverable		µg/L	Monthly	24-Hr Flow Prop Comp	Monitoring Only - See Sections 3.2.1.2 and 3.2.1.3.
Nickel, Total Recoverable		µg/L	Monthly	24-Hr Flow Prop Comp	Monitoring Only - See Sections 3.2.1.2 and 3.2.1.3.

Monitoring Requirements and Effluent Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Zinc, Total Recoverable		µg/L	Monthly	24-Hr Flow Prop Comp	Monitoring Only - See Sections 3.2.1.2 and 3.2.1.3.
Mercury, Total Recoverable	Daily Max	5.5 ng/L	Monthly	Grab	This is an Alternative Mercury Effluent Limit. See Sections 3.2.1.10 for mercury monitoring requirements, 3.2.1.11 for mercury variance information and 5.3 for the Mercury Schedule.
Acute WET		TU_a	See Listed Qtr(s)	24-Hr Flow Prop Comp	See Section 3.2.1.15 for Whole Effluent Toxicity (WET) testing dates and WET requirements.
Chronic WET	Monthly Avg	11 TUc	See Listed Qtr(s)	24-Hr Flow Prop Comp	See Section 3.2.1.15 for Whole Effluent Toxicity (WET) testing dates and WET requirements.
Temperature Maximum	Weekly Avg	67 deg F	3/Week	Continuous	Monitor year-round beginning on the permit effective date. Limit in effect for the month of October annually beginning October 1, 2025. See the Temperature and Dissipative Cooling Sections below and section 5.2 for the temperature schedule.
Temperature Maximum	Weekly Avg	58 deg F	3/Week	Continuous	Monitor year-round beginning on the permit effective date. Limit in effect for the month of December annually beginning December 1, 2025. See the Temperature and Dissipative Cooling Sections below and section 5.2 for the temperature schedule.
Nitrogen, Total Kjeldahl		mg/L	Quarterly	24-Hr Flow Prop Comp	Monitoring Only.
Nitrogen, Nitrite + Nitrate Total		mg/L	Quarterly	24-Hr Flow Prop Comp	Monitoring Only.

Monitoring Requirements and Effluent Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Nitrogen, Total		mg/L	Quarterly	Calculated	Monitoring Only. Total Nitrogen shall be calculated as the sum of reported values for Total Kjeldahl Nitrogen and Total Nitrite + Nitrate Nitrogen.

3.2.1.1 Annual Average Design Flow

The annual average design flow of the Green Bay Facility is 49.2 MGD.

3.2.1.2 Total Metals Analyses

Measurements of total metals and total recoverable metals shall be considered as equivalent.

3.2.1.3 Sample Analysis

Samples shall be analyzed using a method which provides adequate sensitivity so that results can be quantified at a level of quantitation below the calculated/potential effluent limit, unless not possible using the most sensitive approved method.

3.2.1.4 *E. coli* Percent Limit

No more than 10 percent of *E. coli* bacteria samples collected in any calendar month may exceed 410 #/100 ml. Bacteria samples may be collected more frequently than required. All samples shall be reported on the monthly discharge monitoring reports (DMRs). The following calculation should be used to calculate percent exceedances.

$$\frac{\#\ of\ Samples\ greater\ than\ 410\ \#/100}{Total\ \#\ of\ samples} \times 100 = \%\ Exceedance$$

3.2.1.5 Lower Fox River Basin Total Maximum Daily Load for Total Phosphorus and Total Suspended Solids

Green Bay Metropolitan Sewerage District Combined (GBMSD) operates two separate regional wastewater treatment facilities—the Green Bay Facility (GBF) and the De Pere Facility (DPF)— that both discharge to the Lower Fox River Main Stem Sub-Basin of the Lower Fox River Basin Total Maximum Daily Load (TMDL). Due to the merger of the two facilities (GBF and DPF) under the same permit and the fact that both outfalls discharge to the Lower Fox River, GBMSD's current WPDES permit (Permit No. WI-0065251-01-1) contains the combined TMDL wasteload allocation (WLA) for phosphorus and TSS for both GBF and DPF. Additionally, GBMSD has entered into a contractual agreement with Green Bay Packaging (GBP) under which GBP has agreed to transfer to GBMSD GBP's Lower Fox River TMDL total phosphorus (WLA) under GBP's WPDES permit (Permit No. WI-0000973-09-0). GBP's permitted discharge is to the same reach of the Lower Fox River TMDL as GBMSD's two treatment facilities. TMDL compliance shall be determined based on the combined allocations for the three facilities. This WLA allocation transfer does not include GBP's TSS WLA and therefore does not change GBMSD's TSS WLA.

The combined total phosphorus WLA for GBMSD after the WLA transfer from GBP is 22,921 lbs/year, consisting of 17,349 lbs/year allocated to GBF, 4,943 lbs/year allocated to DPF and 629 lbs/year allocated to GBP.

3.2.1.6 Total Phosphorus and TSS Limitation(s) and Adaptive Management Requirements

Green Bay Metropolitan Sewerage District Combined (GBMSD), branded as NEW Water, has requested and the Department has approved a plan to implement a watershed adaptive management approach under s. NR 217.18, Wis. Adm. Code and s. 283.13(7) Wis. Stats., as a means for GBMSD to achieve compliance with the phosphorus water quality standard in s. NR 102.06, Wis. Adm. Code, and the Lower Fox River Basin TMDL for TSS. The total phosphorus and TSS limitations and conditions in this permit reflect the approved adaptive management plan WQT-2020-0016 (October 2020). Failure to implement the terms and conditions of this section is a violation of this permit. The permittee shall design and implement the actions identified in Section 3.2 of AM Plan No. WQT-2020-0016 (October 2020) in accordance with the goals and measures identified in the approved plan. The scope of the watershed adaptive management approach for GBMSD to achieve compliance with phosphorus water quality standards and the TMDL for TSS accounts for GBMSD's combined discharges from GBF and DPF.

If total phosphorus loadings within the Dutchman and Ashwaubenon Creeks action area, as identified in AM Plan No. WQT-2020-0016 (October 2020), are not reduced by at least 4,727 pounds per year by December 31, 2026 the watershed adaptive management option may not be available to the permittee upon permit reissuance. If TSS loadings within the Dutchman and Ashwaubenon Creeks action areas, as identified in AM Plan No. WQT-2020-0016 (October 2020), are not reduced by at least 985,935 pounds per year by December 31, 2026 the watershed adaptive management option may not be available to the permittee upon permit reissuance.

Pursuant to s. NR 217.18(3)(e)2, Wis. Adm. Code, the total phosphorus adaptive management interim limitation is 0.6 mg/L, expressed as a six-month average. Additionally, a 1.0 mg/L phosphorus limitation expressed as a monthly average is required. These phosphorus effluent limitations apply to the GBF and DPF discharges independently (each facility must meet these phosphorus limits). The adaptive management TSS interim limits are 27 mg/L as a weekly average and 18 mg/L as a monthly average for GBF and 12 mg/L as a weekly average and 8 mg/L as a monthly average for DPF.

The final TMDL water quality based effluent limitations for GBMSD for total phosphorus on a combined basis (GBF + DPF + GBP) are 70 lbs/day as a six-month average and 209 lbs/day as a monthly average. The final TMDL water quality based effluent limitations for GBMSD for TSS on a combined basis (GBF + DPF) are 4,305 lbs/day as a weekly average and 2,404 lbs/day as a monthly average. These final limitations may be recalculated based on changes in the in-stream data or approved revisions to the Lower Fox River TMDL wasteload allocations at the time of permit reissuance. These limits will become effective at the end of four permit terms (December 31, 2041) unless the adaptive management project is terminated per s. NR 217.18(3)(g), Wis. Adm. Code, in which case the limits may be imposed at an earlier date, or the applicable phosphorus water quality standard in s. NR 102.06, Wis. Adm. Code and Lower Fox River Basin TMDL for TSS have been achieved within the permittee's receiving water.

3.2.1.7 Total Phosphorus and TSS Interim Limits, Averaging Periods and Compliance Determination

The adaptive management total phosphorus interim limit of 0.6 mg/L as a 6-month average goes into effect May 1, 2022 beginning with the averaging period from May 1, 2022 through October 31, 2022. The averaging periods are May through October and November through April. Compliance with the 6-month average limit is evaluated at the end of each 6-month period on April 30th and October 31st annually. Interim limits for TSS are effective immediately upon permit reissuance.

3.2.1.8 Adaptive Management Reopener Clause

Per s. NR 217.18(3)(g), Wis. Adm. Code, the Department may terminate the adaptive management option for a permittee through permit modification or at permit reissuance and require compliance with a phosphorus effluent limitation calculated under s. NR 217.13, Wis. Adm. Code, or a TSS mass limitation from a federally approved TMDL based on any of the following reasons:

1. Failure to implement the adaptive management actions in accordance with the approved adaptive management plan and compliance schedule established in the permit.
2. New information becomes available that changes the Department's determinations made under s. NR 217.18(2), Wis. Adm. Code, or pursuant to s. 283.13(7), Wis. Stats.
3. Circumstances beyond the permittee's control have made compliance with the applicable phosphorus criterion in s. NR 102.06, Wis. Adm. Code, or TSS load allocation based on the federally approved TMDL pursuant to the plan's goals and measures infeasible.
4. A determination by the Department that sufficient reductions have not been achieved to timely reduce the amount of total phosphorus or TSS to meet the criteria in s. NR 102.06, Wis. Adm. Code or the federally approved TMDL.

3.2.1.9 Adaptive Management Requirements - Optimization

The permittee shall continue to optimize performance to control phosphorus discharges in accordance with s. NR 217.18(3)(c), Wis. Adm. Code.

3.2.1.10 Mercury Monitoring

The permittee shall collect and analyze all mercury samples according to the data quality requirements of ss. NR 106.145(9) and (10), Wisconsin Administrative Code. The limit of quantitation (LOQ) used for the effluent and field blank shall be less than 1.3 ng/L, unless the samples are quantified at levels above 1.3 ng/L. The permittee shall collect at least one mercury field blank for each set of mercury samples (a set of samples may include combinations of intake, influent, effluent or other samples all collected on the same day). The permittee shall report results of samples and field blanks to the Department on Discharge Monitoring Reports.

3.2.1.11 Mercury Variance – Implement Pollutant Minimization Plan

This permit contains a variance to the water quality-based effluent limit (WQBEL) for mercury granted in accordance with s. 283.15, Stats. As conditions of this variance the permittee shall (a) maintain effluent quality at or below the interim effluent limitation specified in the table above, (b) follow the "Green Bay Metropolitan Sewerage District Mercury Pollutant Minimization Program" dated August 14, 2020 and (c) perform the actions listed in the schedule. (See the Schedules section herein.):

3.2.1.12 Effluent Temperature Monitoring

For monitoring temperature continuously, collect measurements in accordance with s. NR 218.04(13), Wis. Adm. Code. This means that discrete measurements shall be recorded at intervals of not more than 15 minutes during the 24-hour period. Report the maximum temperature measured during the day on the DMR.

3.2.1.13 Effluent Temperature Limitations

Limits for Temperature, Maximum: The effluent limitations for "Temperature, Maximum" become effective on **October 1, 2025** as specified in the Schedules section. Monitoring is required 3X/week upon permit reissuance. Daily maximum temperatures shall be reported so that applicable daily maximum limits can be compared to the reported daily maximum temperatures and applicable weekly average limits can be compared to the weekly averages of the reported daily maximum temperatures.

3.2.1.14 Dissipative Cooling Demonstration – POTW Weekly Average Limits

If weekly average effluent temperature limitations are needed, the permittee may submit all additional necessary information with a request that the Department account for dissipative cooling of the effluent pursuant to s. NR 106.59, Wis. Adm. Code. If the Department determines that weekly average effluent limitations for temperature are not necessary based on dissipative cooling the Department shall modify the permit to remove the weekly average effluent limitations pursuant to s. NR 106.59(4)(e). Monitoring frequency shall be 3X/Week and the remainder of the permit schedule for weekly average temperature limits shall be discontinued at that time. If after reviewing the data the Department determines that weekly average effluent limitations for temperature are still necessary because the thermal load from the effluent is not adequately dissipated, the requirement to meet the effluent limitations according to the permit schedule will not be removed and the monitoring frequency specified in the permit shall continue to apply. A re-evaluation of the limits may then be requested pursuant to NR 106 – 'Subchapters V & VI Effluent Limitations for Temperature' or NR 102.26 – Site Specific Ambient Temperature.

3.2.1.15 Whole Effluent Toxicity (WET) Testing

Primary Control Water: The primary control water shall be a standard laboratory water having approximately the same hardness as the Fox River, as specified in section 4.4.7 of the "State of Wisconsin Aquatic Life Toxicity Testing Methods Manual" (s. NR 219.04, Wis. Adm. Code).

Instream Waste Concentration (IWC): 9%

Acute Mixing Zone Concentration: N/A

Dilution series: At least five effluent concentrations and dual controls must be included in each test.

- **Acute:** 100, 50, 25, 12.5, 6.25% and any additional selected by the permittee.
- **Chronic:** 100, 30, 10, 3, 1% and any additional selected by the permittee.

WET Testing Frequency:

Acute tests shall be conducted once each year in rotating quarters in order to collect seasonal information about the discharge. Tests are required during the following quarters.

Acute:

- 3rd Quarter (July 1 – September 30) 2022
- 4th Quarter (October 1 – December 31) 2023
- 3rd Quarter (July 1 – September 30) 2024
- 1st Quarter (January 1 – March 31) 2025
- 2nd Quarter (April 1 – June 30) 2026

Acute WET testing shall continue after the permit expiration date (until the permit is reissued) in accordance with the WET requirements specified for the last full calendar year of this permit. For example, the next test would be required in 2nd Quarter (April 1 – June 30) 2027.

Chronic tests shall be conducted once each year in rotating quarters in order to collect seasonal information about the discharge. Tests are required during the following quarters.

Chronic:

- 3rd Quarter (July 1 – September 30) 2022
- 4th Quarter (October 1 – December 31) 2023

- 3rd Quarter (July 1 – September 30) 2024
- 1st Quarter (January 1 – March 31) 2025
- 2nd Quarter (April 1 – June 30) 2026

Chronic WET testing shall continue after the permit expiration date (until the permit is reissued) in accordance with the WET requirements specified for the last full calendar year of this permit. For example, the next test would be required in 2nd Quarter (April 1 – June 30) 2027.

Testing: WET testing shall be performed during normal operating conditions. Permittees are not allowed to turn off or otherwise modify treatment systems, production processes, or change other operating or treatment conditions during WET tests.

Reporting: The permittee shall report test results on the Discharge Monitoring Report form, and also complete the "Whole Effluent Toxicity Test Report Form" (Section 6, "*State of Wisconsin Aquatic Life Toxicity Testing Methods Manual, 2nd Edition*"), for each test. The original, complete, signed version of the Whole Effluent Toxicity Test Report Form shall be sent to the Biomonitoring Coordinator, Bureau of Water Quality, 101 S. Webster St., P.O. Box 7921, Madison, WI 53707-7921, within 45 days of test completion. The Discharge Monitoring Report (DMR) form shall be submitted electronically by the required deadline.

Determination of Positive Results: An acute toxicity test shall be considered positive if the Toxic Unit - Acute (TU_a) is greater than 1.0 for either species. The TU_a shall be calculated as follows: $TU_a = 100 \div LC_{50}$. A chronic toxicity test shall be considered positive if the Toxic Unit - Chronic (TU_c) is greater than 11 for either species. The TU_c shall be calculated as follows: $TU_c = 100 \div IC_{25}$.

Additional Testing Requirements: Within 90 days of a test which showed positive results, the permittee shall submit the results of at least 2 retests to the Biomonitoring Coordinator on "Whole Effluent Toxicity Test Report Forms". The 90 day reporting period shall begin the day after the test which showed a positive result. The retests shall be completed using the same species and test methods specified for the original test (see the Standard Requirements section herein).

3.2.2 Sampling Point 601 - River Monitoring for GBF WLA

Monitoring Requirements and Effluent Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
WLA Previous Day River Flow		cfs	Daily	Gauge Station	Monitoring Only - May 1 through October 31.
WLA Previous Day River Temp		deg F	Daily	Measure	Monitoring Only - May 1 through October 31.
~~WLA Previous 4 Day Avg River Flow~~		~~cfs~~	~~Daily~~	~~Calculated~~	~~Monitoring Only - May 1 through October 31.~~

3.2.2.1 Reporting Requirements

See Section 3.2.3.1 for Definitions, Monitoring Requirements and Reporting Requirements applicable to River Monitoring performed for Sampling Point 601.

3.2.3 Sampling Point (Outfall) 007 - GBF WLA Compliance Reporting

Monitoring Requirements and Effluent Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
WLA $CBOD_5$ Value		lbs/day	Daily	See Table	May 1 through October 31. Based on River Monitoring at Sample Point 601, use the "WLA Previous Day River Temp" and "WLA Previous 4-day Avg River Flow" to look up the "WLA $CBOD_5$ Value" from Tables 1 - 4 at Section 3.2.3.1.5.
WLA Adjusted Value		lbs/day	Daily	Calculated	May 1 through October 31. Multiply the "WLA $CBOD_5$ Value" times 1.34 and report the applicable limit in this DMR column.
WLA $CBOD_5$ Discharged	Daily Max - Variable	lbs/day	Daily	Calculated	May 1 through October 31. Enter the daily mass of CBOD5 discharged from Outfall 001. Compare to "WLA Adjusted Value" to determine compliance.
WLA 7 Day Sum of WLA Values		lbs/day	Daily	Calculated	May 1 through October 31. Enter the sum of the "WLA $CBOD_5$ Value" (allocation) for each 7-consecutive-day period (present day value plus 6 previous day's values) and report applicable limit in this DMR column.
WLA 7 Day Sum of $CBOD_5$ Discharged	Daily Max - Variable	lbs/day	Daily	Calculated	May 1 through October 31. Enter the daily mass of CBOD5 discharged from
					Outfall 001. Compare to "WLA Adjusted Value" to determine compliance.

3.2.3.1 Waste Load Allocation Requirements

Each year during the months of May through October, the discharge of $CBOD_5$ from sample point/outfall 001 is limited to the following wasteload allocated water quality related effluent limitations in addition to the effluent limitations contained in section 3.2.1.

3.2.3.1.1 Definitions

- *$CBOD_5$ Allocation*: Green Bay Metropolitan Sewerage District's GBF allocation of $CBOD_5$ (pounds per day $CBOD_5$), as listed in Tables 1 through 4 of Section 3.2.3.1.5, represent water quality related effluent limitations. The flow and temperature conditions used to determine the $CBOD_5$ allocation for a given day are defined below.
- *Flow*: A representative measurement of flow is the previous four days average flow value derived daily from continuous river flow monitoring data for the Fox River as reported by the Lower Fox River Dischargers Association.
- *Temperature*: A representative measurement of temperature is the daily average temperature value of the previous day derived from continuous river temperature monitoring data for the Fox River as reported by the Lower Fox River Dischargers Association.

3.2.3.1.2 Determination of Effluent Limitation

For purposes of determining compliance with the wasteload allocated water quality related $CBOD_5$ effluent limitations, the following conditions shall be met:

- The sum of the actual daily discharges of $CBOD_5$ for any 7-consecutive-day period shall not exceed the sum of the daily $CBOD_5$ allocation values from Tables 1 through 4 for the same 7-consecutive-day period.
- For any one-day period, the actual discharge of $CBOD_5$ shall not exceed 1.34 times the $CBOD_5$ allocation value from Tables 1 through 4 for that day.

3.2.3.1.3 Monitoring Requirements

The same 24-hour period shall be used for the collection of composite and continuous samples for river flow and temperature and all effluent characteristics listed in Table 3.2.1, including effluent flow and $CBOD_5$.

3.2.3.1.4 Reporting Requirements

During the months of May through October inclusive the permittee shall report the following information:

- The daily average river flow value in cfs ("WLA Previous Day River Flow");
- The daily average river temperature value in °F ("WLA Previous Day River Temp");
- The average of the previous 4 days river flow values in cfs ("WLA Previous 4 Day Avg River Flow");
- The daily $CBOD_5$ allocation value in lbs $CBOD_5$ per day from Tables 1 through 4 ("WLA $CBOD_5$ Value");
- The daily adjusted $CBOD_5$ allocation value – 1.34 x daily WLA $CBOD_5$ Value ("WLA Adjusted Value");
- The actual discharge value of $CBOD_5$ in lbs $CBOD_5$ per day ("WLA $CBOD_5$ Discharged");
- The sum of the daily $CBOD_5$ allocation values in lbs $CBOD_5$ for each 7-consecutive-day period (present day allocation plus the 6 previous day's allocation) ("WLA 7 Day Sum of WLA Values"); and
- The sum of the actual daily discharge values of $CBOD_5$ in lbs $CBOD_5$ for each 7-consecutive-day period (present day discharge plus the 6 previous days discharge) ("WLA 7 Day Sum of $CBOD_5$ Discharged").

3.2.3.1.5 Tables 1 through 4 (Wasteload Allocation, May through October)

TABLE 1 - WASTELOAD ALLOCATED VALUES IN LBS PER DAY OF $CBOD_5$
(River mile 7.3 to 0.0)

MAY

Temperature (previous day average in °F)	Flow reported by the Lower Fox River Dischargers Association (previous four-day average in cfs)														
	750 OR LESS	751 TO 1000	1001 TO 1250	1251 TO 1500	1501 TO 1750	1751 TO 2000	2001 TO 2250	2251 TO 2500	2501 TO 2750	2751 TO 3000	3001 TO 3500	3501 TO 4000	4001 TO 5000	5001 TO 8000	8001 OR MORE
≥86	7439	7439	7439	7439	7439	7439	7439	7439	9882	12967	18576	27844	35420	35420	35420
82 TO 85	7439	7439	7439	7439	7439	7439	7439	8441	10925	13901	19274	28104	35420	35420	35420
78 TO 81	7439	7439	7439	7439	7439	7439	8290	10323	12795	15701	20859	29201	35420	35420	35420
74 TO 77	7439	7439	7439	7439	7439	8479	10304	12514	15106	18071	23212	31330	35420	35420	35420
70 TO 73	7439	7439	7439	7439	8670	10528	12719	15241	18083	21243	26566	34724	35420	35420	35420
66 TO 69	7439	7439	7439	8524	10658	13073	15764	18726	21953	25439	31142	35420	35420	35420	35420
62 TO 65	7439	7439	7700	10354	13236	16342	19663	23198	26941	30885	35420	35420	35420	35420	35420
58 TO 61	7439	7439	9276	12868	16630	20557	24642	28885	33274	35420	35420	35420	35420	35420	35420
54 TO 57	7439	7439	11630	16290	21064	25946	30927	35420	35420	35420	35420	35420	35420	35420	35420
50 TO 53	7439	9186	14988	20849	26767	32731	35420	35420	35420	35420	35420	35420	35420	35420	35420
46 TO 49	7439	12380	19573	26769	33960	35420	35420	35420	35420	35420	35420	35420	35420	35420	35420
42 TO 45	10762	16894	25613	34274	35420	35420	35420	35420	35420	35420	35420	35420	35420	35420	35420
≤41	15632	22958	33333	35420	35420	35420	35420	35420	35420	35420	35420	35420	35420	35420	35420

TABLE 2 - WASTELOAD ALLOCATED EFFLUENT VALUES IN POUNDS PER DAY OF $CBOD_5$
(River mile 7.3 to 0.0)

JUNE

Temperature (previous day average in °F)	Flow reported by the Lower Fox River Dischargers Association (previous four-day average in cfs)														
	750 OR LESS	751 TO 1000	1001 TO 1250	1251 TO 1500	1501 TO 1750	1751 TO 2000	2001 TO 2250	2251 TO 2500	2501 TO 2750	2751 TO 3000	3001 TO 3500	3501 TO 4000	4001 TO 5000	5001 TO 8000	8001 OR MORE
≥86	13818	12792	11646	10866	10434	10335	10557	11085	11901	12967	18576	27844	35420	35420	35420
82 TO 85	13068	12203	11285	10726	10512	10627	11057	11788	12804	13901	19274	28104	35420	35420	35420
78 TO 81	12057	11465	10929	10748	10901	11375	12158	13234	14585	15701	20859	29201	35420	35420	35420
74 TO 77	11281	10979	10851	11066	11613	12472	13630	15073	16785	18071	23212	31330	35420	35420	35420
70 TO 73	10738	10743	11047	11686	12646	13913	15472	17307	19403	21243	26566	34724	35420	35420	35420
66 TO 69	7439	7439	7439	8524	10658	13073	15764	18726	21953	25439	31142	35420	35420	35420	35420
62 TO 65	7439	7439	7700	10354	13236	16342	19663	23198	26941	30885	35420	35420	35420	35420	35420
58 TO 61	7439	7439	9276	12868	16630	20557	24642	28885	33274	35420	35420	35420	35420	35420	35420
54 TO 57	7439	7439	11630	16290	21064	25946	30927	35420	35420	35420	35420	35420	35420	35420	35420
50 TO 53	7439	9186	14988	20849	26767	32731	35420	35420	35420	35420	35420	35420	35420	35420	35420
46 TO 49	7439	12380	19573	26769	33960	35420	35420	35420	35420	35420	35420	35420	35420	35420	35420
42 TO 45	10762	16894	25613	34274	35420	35420	35420	35420	35420	35420	35420	35420	35420	35420	35420
≤41	15632	22958	33333	35420	35420	35420	35420	35420	35420	35420	35420	35420	35420	35420	35420

TABLE 3 - WASTELOAD ALLOCATED EFFLUENT VALUES IN POUNDS PER DAY OF $CBOD_5$
(River mile 7.3 to 0.0)

JULY - AUGUST

Temperature (previous day average in °F)	Flow reported by the Lower Fox River Dischargers Association (previous four-day average in cfs))														
	750 OR LESS	751 TO 1000	1001 TO 1250	1251 TO 1500	1501 TO 1750	1751 TO 2000	2001 TO 2250	2251 TO 2500	2501 TO 2750	2751 TO 3000	3001 TO 3500	3501 TO 4000	4001 TO 5000	5001 TO 8000	8001 OR MORE
≥86	13818	12792	11646	10866	10434	10335	10557	11085	11901	12995	15116	18769	25774	35420	35420
82 TO 85	13068	12203	11285	10726	10512	10627	11057	11788	12804	14090	16493	20502	28007	35420	35420
78 TO 81	12057	11465	10929	10748	10901	11375	12158	13234	14585	16201	19083	23703	32066	35420	35420
74 TO 77	11281	10979	10851	11066	11613	12472	13630	15073	16785	18752	22149	27429	35420	35420	35420
70 TO 73	10738	10743	11047	11686	12646	13913	15472	17307	19403	21748	25693	31679	35420	35420	35420
66 TO 69	10432	10759	11517	12604	14005	15703	17684	19934	22439	25184	29715	35420	35420	35420	35420
62 TO 65	10361	11028	12264	13821	15684	17837	20267	22958	25894	29061	34215	35420	35420	35420	35420
≤61	10524	11547	13285	15337	17686	20318	23219	26373	29764	33380	35420	35420	35420	35420	35420

TABLE 4 - WASTELOAD ALLOCATED EFFLUENT VALUES IN POUNDS PER DAY OF $CBOD_5$
(River mile 7.3 to 0.0)

SEPTEMBER - OCTOBER

Temperature (previous day average in °F)	Flow reported by the Lower Fox River Dischargers Association (previous four-day average in cfs)														
	0 TO 750	751 TO 1000	1001 TO 1250	1251 TO 1500	1501 TO 1750	1751 TO 2000	2001 TO 2250	2251 TO 2500	2501 TO 2750	2751 TO 3000	3001 TO 3500	3501 TO 4000	4001 TO 5000	5001 TO 8000	8001 OR MORE
≥86	7439	7439	7439	7439	8811	11224	13833	16613	19550	22620	27439	34151	35420	35420	35420
82 TO 85	7439	7439	7439	7561	9417	11486	13750	16186	18776	21502	25800	31819	35420	35420	35420
78 TO 81	7439	7439	7439	8667	10149	11844	13731	15793	18007	20356	24085	29342	35420	35420	35420
74 TO 77	7439	7547	8392	9486	10811	12347	14078	15979	18031	20219	23705	28635	35420	35420	35420
70 TO 73	7734	8208	9111	10267	11651	13245	15033	16991	19101	21342	24910	29946	35420	35420	35420
66 TO 69	7981	8649	9830	11259	12920	14790	16851	19083	21462	23977	27951	33524	35420	35420	35420
62 TO 65	8104	9118	10792	12717	14868	17229	19781	22500	25370	28373	33076	35420	35420	35420	35420
58 TO 61	8359	9870	12255	14887	17748	20816	24073	27500	31076	34781	35420	35420	35420	35420	35420
54 TO 57	8991	11151	14462	18019	21804	25797	29979	34326	35420	35420	35420	35420	35420	35420	35420
50 TO 53	10255	13215	17668	22368	27295	32427	35420	35420	35420	35420	35420	35420	35420	35420	35420
46 TO 49	12399	16309	22123	28179	34465	35420	35420	35420	35420	35420	35420	35420	35420	35420	35420
42 TO 45	15672	20686	28076	35420	35420	35420	35420	35420	35420	35420	35420	35420	35420	35420	35420
≤41	20328	26597	35420	35420	35420	35420	35420	35420	35420	35420	35420	35420	35420	35420	35420

3.2.4 Sampling Point (Outfall) 051 - DPF Effluent

Monitoring Requirements and Effluent Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		MGD	Daily	Continuous	
$CBOD_5$	Weekly Avg	18 mg/L	5/Week	24-Hr Flow Prop Comp	
$CBOD_5$	Monthly Avg	9.0 mg/L	5/Week	24-Hr Flow Prop Comp	
Suspended Solids, Total	Weekly Avg	12 mg/L	Daily	24-Hr Flow Prop Comp	This is an Adaptive Management interim limit that applies on the permit effective date.
Suspended Solids, Total	Monthly Avg	8.0 mg/L	Daily	24-Hr Flow Prop Comp	This is an Adaptive Management interim limit that applies on the permit effective date.
Suspended Solids, Total		lbs/day	Daily	Calculated	Monitoring Only - See subsection 3.2.5.1 for calculating combined effluent results for the GBF and DPF.
pH (Minimum)	Daily Min	6.0 su	Daily	Continuous	
pH (Maximum)	Daily Max	9.0 su	Daily	Continuous	
E. coli	Geometric Mean - Monthly	126 #/100 ml	Weekly	Grab	Monitoring and limits apply May 1 through September 30 annually.
E. coli	% Exceedance	10 Percent	Monthly	Calculated	Monitoring and limits apply May 1 through September 30 annually. See section 3.2.4.4 for formula to calculate E. coli Percent Limit. Enter the result in the DMR on the last day of the month.
~~Phosphorus, Total~~	~~Monthly Avg~~	~~1.0 mg/L~~	~~Daily~~	~~24-Hr Flow Prop Comp~~	
Phosphorus, Total	6-Month Avg	0.6 mg/L	Daily	24-Hr Flow Prop Comp	This is an Adaptive Management interim limit effective starting May 1, 2022. See Section 3.2.4.6 for averaging periods and compliance determination. Future interim limit of 0.5 mg/L may be effective upon reissuance per Schedule 5.1.

Monitoring Requirements and Effluent Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Phosphorus, Total		lbs/day	Daily	Calculated	Monitoring Only - See Section 3.2.5.1 for calculating combined effluent results for the GBF and DPF.
Nitrogen, Ammonia (NH_3-N) Total	Daily Max	26 mg/L	5/Week	24-Hr Flow Prop Comp	Limit in effect January 1 through April 30 and November 1 through December 31 annually.
Nitrogen, Ammonia (NH_3-N) Total	Weekly Avg	26 mg/L	5/Week	24-Hr Flow Prop Comp	Limit in effect January 1 through April 30 and November 1 through December 31 annually.
Nitrogen, Ammonia (NH_3-N) Total	Monthly Avg	26 mg/L	5/Week	24-Hr Flow Prop Comp	Limit in effect January 1 through March 31 and November 1 through December 31 annually.
Nitrogen, Ammonia (NH_3-N) Total	Monthly Avg	24 mg/L	5/Week	24-Hr Flow Prop Comp	Limit in effect April 1 through April 30 annually.
Nitrogen, Ammonia (NH3-N) Total		mg/L	5/Week	24-Hr Flow Prop Comp	Monitoring Only – May 1 through October 31 annually.
Cadmium, Total Recoverable		µg/L	Monthly	24-Hr Flow Prop Comp	Monitoring Only - See Sections 3.2.4.2 and 3.2.4.3.
Chromium, Total Recoverable		µg/L	Monthly	24-Hr Flow Prop Comp	Monitoring Only - See Sections 3.2.4.2 and 3.2.4.3.
Copper, Total Recoverable		µg/L	Monthly	24-Hr Flow Prop Comp	Monitoring Only - See Sections 3.2.4.2 and 3.2.4.3.
Lead, Total Recoverable		µg/L	Monthly	24-Hr Flow Prop Comp	Monitoring Only - See Sections 3.2.4.2 and 3.2.4.3.
Nickel, Total Recoverable		µg/L	Monthly	24-Hr Flow Prop Comp	Monitoring Only - See Sections 3.2.4.2 and 3.2.4.3.
Zinc, Total Recoverable		µg/L	Monthly	24-Hr Flow Prop Comp	Monitoring Only - See Sections 3.2.4.2 and 3.2.4.3.
Mercury, Total Recoverable		ng/L	Monthly	Grab	Monitoring Only - See Section 3.2.4.9 for mercury monitoring requirements.
Acute WET		TU_a	See Listed Qtr(s)	24-Hr Flow Prop Comp	See Section 3.2.4.10 for Whole Effluent Toxicity (WET) testing dates and WET requirements.

Monitoring Requirements and Effluent Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Chronic WET		TUc	See Listed Qtr(s)	24-Hr Flow Prop Comp	See Section 3.2.4.10 for Whole Effluent Toxicity (WET) testing dates and WET requirements.
Nitrogen, Total Kjeldahl		mg/L	Quarterly	24-Hr Flow Prop Comp	Monitoring Only.
Nitrogen, Nitrite + Nitrate Total		mg/L	Quarterly	24-Hr Flow Prop Comp	Monitoring Only.
Nitrogen, Total		mg/L	Quarterly	Calculated	Monitoring Only. Total Nitrogen shall be calculated as the sum of reported values for Total Kjeldahl Nitrogen and Total Nitrite + Nitrate Nitrogen.

3.2.4.1 Annual Average Design Flow

The annual average design flow of the De Pere Facility is 10 MGD.

3.2.4.2 Total Metals Analyses

Measurements of total metals and total recoverable metals shall be considered as equivalent.

3.2.4.3 Sample Analysis

Samples shall be analyzed using a method which provides adequate sensitivity so that results can be quantified at a level of quantitation below the calculated/potential effluent limit, unless not possible using the most sensitive approved method.

3.2.4.4 *E. coli* Percent Limit

No more than 10 percent of *E. coli* bacteria samples collected in any calendar month may exceed 410 #/100 ml. Bacteria samples may be collected more frequently than required. All samples shall be reported on the monthly discharge monitoring reports (DMRs). The following calculation should be used to calculate percent exceedances.

$$\frac{\#\ of\ Samples\ greater\ than\ 410\ \#/100}{Total\ \#\ of\ samples} \times 100 = \%\ Exceedance$$

3.2.4.5 Adaptive Management for Total Phosphorus and Total Suspended Solids

The De Pere Wastewater Treatment Facility ("DPF") is owned and operated by Green Bay Metropolitan Sewerage District Combined ("GBMSD"). GBMSD also owns and operates the Green Bay Wastewater Treatment Facility ("GBF"). The GBF and DPF are both permitted under same WPDES permit held by GBMSD. GBMSD has requested and the Department has approved a plan to implement a watershed adaptive management approach as a means for GBMSD to achieve compliance with the total phosphorus water quality standard in s. NR 102.06, Wis. Adm. Code, and the Lower Fox River Basin Total Maximum Daily Load for TSS. Compliance is determined on a combined basis (GBF plus DPF). The scope of the watershed adaptive management approach for GBMSD to achieve total phosphorus and total suspended solids compliance accounts for GBMSD's combined discharges from the GBF (Outfall 001) and the DPF (Outfall 051).

The requirements in Sections 3.2.1.5 and 3.2.1.6 of this permit for GBF's Outfall 001 and GBMSD's approved adaptive management plan WQT-2020-0016 (October 2020) all apply to DPF's Outfall 051.

Pursuant to s. NR 217.18(3)(e)2, Wis. Adm. Code, the total phosphorus adaptive management interim limitation for DPF is 0.6 mg/L, expressed as a six-month average. Additionally, a 1.0 mg/L phosphorus limitation expressed as a monthly average is required. The adaptive management TSS interim limits are 12 mg/L as a weekly average and 8 mg/L as a monthly average for DPF.

3.2.4.6 Total Phosphorus and TSS Interim Limits, Averaging Periods and Compliance Determination

The adaptive management total phosphorus interim limit of 0.6 mg/L as a 6-month average goes into effect beginning the period from May 1, 2022 through October 31, 2022. The averaging periods are May through October and November through April. Compliance with the 6-month average limit is evaluated at the end of each 6-month period on April 30th and October 31st annually. Interim limits for TSS are effective immediately upon permit reissuance.

3.2.4.7 Adaptive Management Reopener Clause

Per s. NR 217.18(3)(g), Wis. Adm. Code, the Department may terminate the adaptive management option for a permittee through permit modification or at permit reissuance and require compliance with a phosphorus effluent limitation calculated under s. NR 217.13, Wis. Adm. Code, or a TSS mass limitation from a federally approved TMDL based on any of the following reasons:

1. Failure to implement the adaptive management actions in accordance with the approved adaptive management plan and compliance schedule established in the permit.
2. New information becomes available that changes the Department's determinations made under s. NR 217.18(2), Wis. Adm. Code, or pursuant to s. 283.13(7), Wis. Stats.
3. Circumstances beyond the permittee's control have made compliance with the applicable phosphorus criterion in s. NR 102.06, Wis. Adm. Code, or TSS load allocation based on the federally approved TMDL pursuant to the plan's goals and measures infeasible.
4. A determination by the Department that sufficient reductions have not been achieved to timely reduce the amount of total phosphorus or TSS to meet the criteria in s. NR 102.06, Wis. Adm. Code or the federally approved TMDL.

3.2.4.8 Adaptive Management Requirements - Optimization

The permittee shall continue to optimize performance to control phosphorus discharges in accordance with s. NR 217.18(3)(c), Wis. Adm. Code.

3.2.4.9 Mercury Monitoring

The permittee shall collect and analyze all mercury samples according to the data quality requirements of ss. NR 106.145(9) and (10), Wisconsin Administrative Code. The limit of quantitation (LOQ) used for the effluent and field blank shall be less than 1.3 ng/L, unless the samples are quantified at levels above 1.3 ng/L. The permittee shall collect at least one mercury field blank for each set of mercury samples (a set of samples may include combinations of intake, influent, effluent or other samples all collected on the same day). The permittee shall report results of samples and field blanks to the Department on Discharge Monitoring Reports.

3.2.4.10 Whole Effluent Toxicity (WET) Testing

Primary Control Water: The primary control water shall be a standard laboratory water having approximately the same hardness as the Fox River, as specified in section 4.4.7 of the "State of

Wisconsin Aquatic Life Toxicity Testing Methods Manual" (s. NR 219.04, Wis. Adm. Code).

Instream Waste Concentration (IWC): 9%

Acute Mixing Zone Concentration: N/A

Dilution series: At least five effluent concentrations and dual controls must be included in each test.

- **Acute:** 100, 50, 25, 12.5, 6.25% and any additional selected by the permittee.
- **Chronic:** 100, 30, 10, 3, 1% and any additional selected by the permittee.

WET Testing Frequency:

Acute tests shall be conducted once each year in rotating quarters in order to collect seasonal information about the discharge. Tests are required during the following quarters.

Acute:

- 3rd Quarter (July 1 – September 30) 2022
- 4th Quarter (October 1 – December 31) 2023
- 3rd Quarter (July 1 – September 30) 2024
- 1st Quarter (January 1 – March 31) 2025
- 2nd Quarter (April 1 – June 30) 2026

Acute WET testing shall continue after the permit expiration date (until the permit is reissued) in accordance with the WET requirements specified for the last full calendar year of this permit. For example, the next test would be required in 2nd Quarter (April 1 – June 30) 2027.

Chronic tests shall be conducted once each year, in rotating quarters in order to collect seasonal information about the discharge. Tests are required during the following quarters.

Chronic:

- 3rd Quarter (July 1 – September 30) 2022
- 4th Quarter (October 1 – December 31) 2023
- 3rd Quarter (July 1 – September 30) 2024
- 1st Quarter (January 1 – March 31) 2025
- 2nd Quarter (April 1 – June 30) 2026

Chronic WET testing shall continue after the permit expiration date (until the permit is reissued) in accordance with the WET requirements specified for the last full calendar year of this permit. For example, the next test would be required in 2nd Quarter (April 1 – June 30) 2027.

Testing: WET testing shall be performed during normal operating conditions. Permittees are not allowed to turn off or otherwise modify treatment systems, production processes, or change other operating or treatment conditions during WET tests.

Reporting: The permittee shall report test results on the Discharge Monitoring Report form, and also complete the "Whole Effluent Toxicity Test Report Form" (Section 6, "*State of Wisconsin Aquatic Life Toxicity Testing Methods Manual, 2nd Edition*"), for each test. The original, complete, signed version of the Whole Effluent Toxicity Test Report Form shall be sent to the Biomonitoring Coordinator, Bureau of Water Quality, 101 S. Webster St., P.O. Box 7921, Madison, WI 53707-7921, within 45 days of test completion. The Discharge Monitoring Report (DMR) form shall be submitted electronically by the required deadline.

Determination of Positive Results: An acute toxicity test shall be considered positive if the Toxic Unit - Acute (TU_a) is greater than 1.0 for either species. The TU_a shall be calculated as follows: $TU_a = 100 \div LC_{50}$. A chronic toxicity test shall be considered positive if the Toxic Unit - Chronic (TU_c) is greater than 11 for either species. The TU_c shall be calculated as follows: $TU_c = 100 \div IC_{25}$.

Additional Testing Requirements: Within 90 days of a test which showed positive results, the permittee shall submit the results of at least 2 retests to the Biomonitoring Coordinator on "Whole Effluent Toxicity Test Report Forms". The 90 day reporting period shall begin the day after the test which showed a positive result. The retests shall be completed using the same species and test methods specified for the original test (see the Standard Requirements section herein).

3.2.5 Sampling Point (Outfall) 076 - Calculated Combined Effluent

Monitoring Requirements and Effluent Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Suspended Solids, Total		lbs/day	Daily	Calculated	Monitoring Only.
Phosphorus, Total		lbs/day	Daily	Calculated	Monitoring Only.

3.2.5.1 Calculation of Combined Effluent Results

Results reported under this sample point, for the combined daily mass of total suspended solids and total phosphorus discharged from the GBF and the DPF, shall be calculated as the sum of those respective parameters reported at sample points 001 and 051.

3.2.6 Sampling Point 602 - Fox River; 603 - Ashwaubenon Creek; 604 - Dutchman Creek

Monitoring Requirements and Effluent Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow River		cfs	2/Month	Measure	Provide an estimate of river flow for each day that in-stream phosphorus and total suspended solids monitoring is performed May 1 through October 31 annually.
Flow River		cfs	Per Occurrence	Measure	Voluntary river flow estimates for each day that in-stream phosphorus and total suspended solids monitoring is performed November 1 through April 30 annually.
Phosphorus, Total		mg/L	2/Month	Grab	Collect samples 2/Month May 1 through October 31 annually. See Sections 3.2.6.1 through 3.2.6.3 for sampling and reporting requirements.

Monitoring Requirements and Effluent Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Phosphorus, Total		mg/L	Per Occurrence	Grab	Voluntary monitoring November 1 through April 30 annually. See Sections 3.2.6.1 through 3.2.6.3 for sampling and reporting requirements.
Phosphorus, Total		lbs/month	Monthly	Calculated	Calculate and report total monthly phosphorus loads for the months of May through October annually. See Section 3.2.6.4 for calculation of total monthly loads.
Phosphorus, Total		lbs/month	Per Occurrence	Calculated	Calculated total monthly phosphorus loads may also be reported for the months of November through April, as data is available. See Section 3.2.6.4 for calculation of total monthly loads.
Suspended Solids, Total		mg/L	2/Month	Grab	Collect samples 2/Month May 1 through October 31 annually. See Sections 3.2.6.1 through 3.2.6.3 for sampling and reporting requirements.
Suspended Solids, Total		mg/L	Per Occurrence	Grab	Voluntary monitoring November 1 through April 30 annually. See Sections 3.2.6.1 through 3.2.6.3 for sampling and reporting requirements.
Suspended Solids, Total		lbs/month	Monthly	Calculated	Calculate and report total monthly total suspended solids loads for the months of May through October annually. See Section 3.2.6.4 for calculation of total monthly loads.

Monitoring Requirements and Effluent Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Suspended Solids, Total		lbs/month	Per Occurrence	Calculated	Calculated total monthly total suspended solids loads may also be reported for the months of November through April, as data is available. See Section 3.2.6.4 for calculation of total monthly loads.

3.2.6.1 Surface Water Sampling for Total Phosphorus and Total Suspended Solids

Surface water sampling shall be performed in accordance with Adaptive Management Plan No. WQT-2020-0016 (October 2020). When sampling surface waters for total phosphorus and total suspended solids, sample collection and handling protocols as specified in Section 2.3 of AM Plan No. WQT-2020-0016 (October 2020) shall be followed along with the following Standard Requirements in this permit: "Monitoring Results", "Sampling and Testing Procedures", "Recording of Results" and "Reporting of Monitoring Results".
When testing for total phosphorus and total suspended solids in surface water samples, use the test methods specified in Table 2-9 of AM Plan No. WQT-2020-0016 (October 2020). The methods and protocols listed in Table 2-9 were current at the time this adaptive management plan was approved. See ss. NR 218 and NR 219, Wis. Adm. Code, for up-to-date analytical methods, which may be used in lieu of Table 2-9 analytical methods. Analytical methods used shall enable the laboratory to quantitate total phosphorus at levels below the water quality criterion of 0.075 mg/L. If the required level of quantitation cannot be met by any of the methods available in ch. NR 219, Wis. Adm. Code, then the method with the lowest limit of detection shall be selected.

When surface water samples are collected by Water Action Volunteers, the "The Volunteer Monitor's Guide to Quality Assurance Project Plans" shall be implemented. (Available at www.epa.gov; search for "The Volunteer Monitor's Guide to Quality Assurance Project Plans").

3.2.6.2 Voluntary Surface Water Sampling for Total Phosphorus and Total Suspended Solids

Total phosphorus and total suspended solids monitoring may voluntarily be performed from November 1 through April 30 annually. When voluntary in-stream monitoring is completed monitoring results shall be reported on the monthly eDMR. Report river flow measurements for each day phosphorus and total suspended solids monitoring is performed.

3.2.6.3 Reporting Surface Water Sampling Results for Total Phosphorus, Total Suspended Solids and Flow

The permittee shall report total phosphorus and total suspended solids monitoring results and river flow measurements for surface water samples collected at Sampling Points 602, 603 and 604 on monthly eDMRs. The monitoring results shall be submitted by the date specified on the eDMR.

In addition, all total phosphorus and total suspended solids test results for surface water samples collected at Sampling Points 602, 603, 604 and all other surface water sampling points identified in Adaptive Management Plan No. WQT-2020-0016 (October 2020) shall be reported to the Department using the Department's Laboratory Data Entry System (LDES). Test results for the year shall be submitted by March 31st of the following year. (Available at dnr.wi.gov; search "Laboratory Data Entry System"). Report river flow measurements for each day phosphorus and total suspended solids monitoring is performed.

3.2.6.4 Total Monthly Total Phosphorus (TP) and Total Suspended Solids (TSS) Loads

Use the following methods to calculate the total monthly phosphorus and total suspended solids loading in the receiving stream expressed as a mass in lbs/month:

1) Convert mg/L to lbs/day using the following equation:

   Daily TP/TSS loading (lbs/day) = TP/TSS concentration (mg/L) × [Daily Flow (cfs) ÷ 1.55] × 8.34

2) On a monthly basis, average the reported daily TP and TSS loadings, then multiply the averages by the number of days during the month and report the product as "Phosphorus, Total" or "Suspended Solids, Total" (in lbs/month) for the last day of the month on the eDMR.

   Phosphorus, Total (lbs/month) = Average of daily TP loading (lbs/day) × Number of days/month
   Suspended Solids, Total (lbs/month) = Average of daily TSS loading (lbs/day) × Number of days/month

4 Land Application Requirements

4.1 Sampling Point(s)

The discharge(s) shall be limited to land application of the waste type(s) designated for the listed sampling point(s) on Department approved land spreading sites or by hauling to another facility.

Sampling Point Designation	
Sampling Point Number	**Sampling Point Location, Waste Type/Sample Contents and Treatment Description (as applicable)**
002	Combined Incinerated Cake - Incinerated cake from sludges from the GBF and DPF. Incineration of sludge is regulated under the jurisdiction of US EPA Region 5 and subject to the requirements of 40 CFR part 503. While the State of Wisconsin has not been delegated authority for sludge incineration, Form 3400-165 may be sent to the permittee each year and may be completed and returned to DNR, to satisfy federal reporting requirements. US EPA may also impose other 40 CFR part 503 requirements. For state reporting requirements submit form 3400-52 for other methods of disposal.
003	Combined Dewatered Cake - Dewatered cake from sludges from the GBF and DPF. Monitoring requirements and limitations are applicable during any year in which sludge is disposed in a landfill.
052	DPF Dewatered Cake - Monitoring requirements and limitations are applicable during any year in which sludge is disposed in a landfill.
004	Struvite Harvesting Process: Tons of product produced must be reported on an annual basis.

4.2 Monitoring Requirements and Limitations

The permittee shall comply with the following monitoring requirements and limitations.

4.2.1 Sampling Point (Outfall) 003 - Combined Dewatered Cake

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Solids, Total		Percent	Monthly	Composite	
Arsenic Dry Wt		mg/kg	Monthly	Composite	
Cadmium Dry Wt		mg/kg	Monthly	Composite	
Copper Dry Wt		mg/kg	Monthly	Composite	
Lead Dry Wt		mg/kg	Monthly	Composite	
Mercury Dry Wt		mg/kg	Monthly	Composite	
Molybdenum Dry Wt		mg/kg	Monthly	Composite	
Nickel Dry Wt		mg/kg	Monthly	Composite	
Selenium Dry Wt		mg/kg	Monthly	Composite	
Zinc Dry Wt		mg/kg	Monthly	Composite	
PCB Total Dry Wt		mg/kg	Once	Composite	See Section 4.2.1.1.
Municipal Sludge Priority Pollutant Scan			Once	Composite	As specified in ch. NR 215.03 (1-4), Wis. Adm. Code. See Section 4.2.1.2.

4.2.1.1 Sludge Analysis for PCBs

The permittee shall analyze the sludge for Total PCBs one time during the first year sludge is landfilled. The results shall be reported as "PCB Total Dry Wt". Either congener-specific analysis or Aroclor analysis shall be used to determine the PCB concentration. The permittee may determine whether Aroclor or congener specific analysis is

performed. Analyses shall be performed in accordance with Table EM in s. NR 219.04, Wis. Adm. Code, and the conditions specified in Standard Requirements of this permit. PCB results shall be submitted by January 31, following the specified year of analysis.

4.2.1.2 Priority Pollutant Scan

The permittee shall analyze the sludge for the priority pollutants as specified in s. NR 215.03 (1-4), Wis. Adm. Code one time during the first year sludge is landfilled. Results shall be reported on a dry weight basis. Results shall be submitted by January 31, following the year of analysis.

4.2.2 Sampling Point (Outfall) 052 - DPF Dewatered Cake

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Solids, Total		Percent	Per Occurrence	Composite	See subsection 4.2.2.1 for applicable monitoring frequency.
Arsenic Dry Wt		mg/kg	Per Occurrence	Composite	
Cadmium Dry Wt		mg/kg	Per Occurrence	Composite	
Copper Dry Wt		mg/kg	Per Occurrence	Composite	
Lead Dry Wt		mg/kg	Per Occurrence	Composite	
Mercury Dry Wt		mg/kg	Per Occurrence	Composite	
Molybdenum Dry Wt		mg/kg	Per Occurrence	Composite	
Nickel Dry Wt		mg/kg	Per Occurrence	Composite	
Selenium Dry Wt		mg/kg	Per Occurrence	Composite	
Zinc Dry Wt		mg/kg	Per Occurrence	Composite	

4.2.2.1 Monitoring Frequency

When dewatered cake from this sampling point is landfilled, parameters required to be monitored on a "Per Occurrence" basis are required to be monitored at least once during any period of landfilling, with a minimum frequency during any continuous landfilling period of once per two months.

4.2.3 Sampling Point (Outfall) 004 - Struvite Harvesting

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Weight		tons/yr	Annual	Total Annual	

5 Schedules

5.1 Watershed Adaptive Management Option Annual Report Submittals

The permittee shall submit annual reports on the implementation of AM Plan No. WQT-2020-0016 (October 2020) as specified in Section 3.2.1.6 and the following schedule.

Required Action	Due Date
Annual Adaptive Management Report: Submit an annual adaptive management report. The annual adaptive management report shall: o Identify those actions from Section 3.2 of the approved adaptive management plan that were completed during the previous calendar year and those actions that are in progress; o Evaluate collected monitoring data; o Document progress in achieving the goals and measures identified in the approved adaptive management plan; o Describe the outreach and education efforts that occurred during the past calendar year; o Identify any corrections or adjustments to the adaptive management plan that are needed to achieve compliance with the phosphorus water quality standards specified in s. NR 102.06, Wis. Adm. Code, and the Lower Fox River Basin Total Maximum Daily Load ("TMDL") for Total Suspended Solids ("TSS"); o Describe any updates needed to Green Bay Metropolitan Sewerage District's approved phosphorus optimization plan; o Submit all water chemistry results from all sample points outlined in AM Plan No. WQT-2020-0016 (October 2020) to the Department using the Department's Laboratory Data Entry System (LDES); and o Submit all biomonitoring results from all locations outlined in AM Plan WQT-2020-0016 (October 2020) to the Department using the Department's Laboratory Data Entry System (LDES).	03/31/2023
Annual Adaptive Management Report #2: Submit an Adaptive Management report with the required information described in this section (see above).	03/31/2024
Annual Adaptive Management Report #3: Submit an Adaptive Management report with the required information described in this section (see above).	03/31/2025
Annual Adaptive Management Report #4: Submit an Adaptive Management report with the required information described in this section (see above).	03/31/2026
Renewal of Adaptive Management Plan for Permit Reissuance: If the permittee intends to seek renewal of AM Plan No. WQT-2020-0016 (October 2020) per s. NR 217.18, Wis. Adm. Code, for phosphorus or per s. 281.13(7), Wis. Stats., for TSS for the reissued permit term, proposed AM goals and actions based on an updated AM plan shall be submitted to the Department for review and approval. The permittee may propose to adjust load reductions for phosphorus or TSS required by AM Plan No. WQT-2020-0016 (October 2020) either up or down at the beginning of each WPDES permit term to reflect changes in loads associated with point and non-point sources. This schedule may be modified to incorporate any changes in AM goals and actions, removed if the AM program is terminated per the "Adaptive Management Reopener Clause" permit section, or removed if the adaptive management plan has achieved water quality standards as determined by the Department within the AM action area.	10/01/2026

Final Adaptive Management Report for 1st Permit Term: Submit the final Adaptive Management (AM) report documenting progress made during the first permit term under AM in meeting the watershed phosphorus reduction target of 4,727 lbs/yr and the TSS reduction target of 985,935 lbs/yr, as well as the anticipated future reductions in phosphorus and TSS sources and effluent concentrations, which shall be measured in accordance with the AM Plan protocols. The report shall summarize AM activities that have been implemented during the current permit term and state which, if any, actions from the approved AM Plan No. WQT-2020-0016 (October 2020) were not pursued and why. The report shall include an analysis of trends on both a monthly and six-month average basis for phosphorus, and on both a weekly and monthly average basis for TSS, of phosphorus and TSS concentrations and mass effluent discharged. Additionally, there shall be an analysis of any improvements to the quality of surface waters in the Adaptive Management Action Area focusing on phosphorus, TSS and flow results collected during the permit term. The surface water analysis shall evaluate how phosphorus and TSS concentrations, flow, and the in-stream loadings have changed over the permit term in comparison to the implemented AM actions.	11/30/2026
Comply with Adaptive Management Interim Limit: For the second permit term under Adaptive Management the permittee shall comply with an Adaptive Management total phosphorus interim limit no higher than 0.5 mg/L as a 6-month average, in addition to the 1.0 mg/L monthly avg already effective.	03/31/2027
Annual Adaptive Management Report #6: Submit an Adaptive Management report with the required information described in this section (see above).	03/31/2027
Annual Adaptive Management Report #7: Submit an Adaptive Management report with the required information described in this section (see above).	03/31/2028
Annual Adaptive Management Report #8: Submit an Adaptive Management report with the required information described in this section (see above).	03/31/2029
Annual Adaptive Management Report #9: Submit an Adaptive Management report with the required information described in this section (see above).	03/31/2030
Annual Adaptive Management Report #10: Submit an Adaptive Management report with the required information described in this section (see above).	03/31/2031
Renewal of Adaptive Management Plan for Permit Reissuance: If the permittee intends to seek renewal of AM Plan No. WQT-2020-0016 (October 2020) per s. NR 217.18, Wis. Adm. Code, for phosphorus or per s. 281.13(7), Wis. Stats., for TSS for the reissued permit term, proposed AM goals and actions based on an updated AM plan shall be submitted to the Department for review and approval. The permittee may propose to adjust load reductions for phosphorus or TSS required by AM Plan No. WQT-2020-0016 (October 2020) either up or down at the beginning of each WPDES permit term to reflect changes in loads associated with point and non-point sources. This schedule may be modified to incorporate any changes in AM goals and actions, removed if the AM program is terminated per the "Adaptive Management Reopener Clause" permit section, or removed if the adaptive management plan has achieved water quality standards as determined by the Department within the AM action area.	10/01/2031
Final Adaptive Management Report for 2nd Permit Term: Submit the final Adaptive Management (AM) report documenting progress made during the second permit term under AM in meeting the watershed phosphorus reduction target of 13,238 lbs/yr and the TSS reduction target of 2,760,618 lbs/yr, as well as the anticipated future reductions in phosphorus and TSS sources and effluent concentrations, which shall be measured in accordance with the AM Plan protocols. The report shall summarize AM activities that have been implemented during the current permit term and state which, if any, actions from the approved AM Plan No. WQT-2020-0016 (October 2020) were	11/30/2031

not pursued and why. The report shall include an analysis of trends on both a monthly and six-month average basis for phosphorus, and on both a weekly and monthly average basis for TSS, of phosphorus and TSS concentrations and mass effluent discharged. Additionally, there shall be an analysis of any improvements to the quality of surface waters in the Adaptive Management Action Area focusing on phosphorus, TSS and flow results collected during the permit term. The surface water analysis shall evaluate how phosphorus and TSS concentrations, flow, and the in-stream loadings have changed over the permit term in comparison to the implemented AM actions.	
Annual Adaptive Management Report #12: Submit an Adaptive Management report with the required information described in this section (see above).	03/31/2032
Annual Adaptive Management Report #13: Submit an Adaptive Management report with the required information described in this section (see above).	03/31/2033
Annual Adaptive Management Report #14: Submit an Adaptive Management report with the required information described in this section (see above).	03/31/2034
Annual Adaptive Management Report #15: Submit an Adaptive Management report with the required information described in this section (see above).	03/31/2035
Annual Adaptive Management Report #16: Submit an Adaptive Management report with the required information described in this section (see above).	03/31/2036
Renewal of Adaptive Management Plan for Permit Reissuance: If the permittee intends to seek renewal of AM Plan No. WQT-2020-0016 (October 2020) per s. NR 217.18, Wis. Adm. Code, for phosphorus or per s. 281.13(7), Wis. Stats., for TSS for the reissued permit term, proposed AM goals and actions based on an updated AM plan shall be submitted to the Department for review and approval. The permittee may propose to adjust load reductions for phosphorus or TSS required by AM Plan No. WQT-2020-0016 (October 2020) either up or down at the beginning of each WPDES permit term to reflect changes in loads associated with point and non-point sources. This schedule may be modified to incorporate any changes in AM goals and actions, removed if the AM program is terminated per the "Adaptive Management Reopener Clause" permit section, or removed if the adaptive management plan has achieved water quality standards as determined by the Department within the AM action area.	10/01/2036
Final Adaptive Management Report for 3rd Permit Term: Submit the final Adaptive Management (AM) report documenting progress made during the third permit term under AM in meeting the watershed phosphorus reduction target of 17,965 lbs/yr and the TSS reduction target of 3,746,553 lbs/yr, as well as the anticipated future reductions in phosphorus and TSS sources and effluent concentrations, which shall be measured in accordance with the AM Plan protocols. The report shall summarize AM activities that have been implemented during the current permit term and state which, if any, actions from the approved AM Plan No. WQT-2020-0016 (October 2020) were not pursued and why. The report shall include an analysis of trends on both a monthly and six-month average basis for phosphorus, and on both a weekly and monthly average basis for TSS, of phosphorus and TSS concentrations and mass effluent discharged. Additionally, there shall be an analysis of any improvements to the quality of surface waters in the Adaptive Management Action Area focusing on phosphorus, TSS and flow results collected during the permit term. The surface water analysis shall evaluate how phosphorus and TSS concentrations, flow, and the in-stream loadings have changed over the permit term in comparison to the implemented AM actions.	11/30/2036
Annual Adaptive Management Report #18: Submit an Adaptive Management report with the required information described in this section (see above).	03/31/2037
Annual Adaptive Management Report #19: Submit an Adaptive Management report with the	03/31/2038

required information described in this section (see above).	
Annual Adaptive Management Report #20: Submit an Adaptive Management report with the required information described in this section (see above).	03/31/2039
Annual Adaptive Management Report #21: Submit an Adaptive Management report with the required information described in this section (see above).	03/31/2040
Annual Adaptive Management Report #22: Submit an Adaptive Management report with the required information described in this section (see above).	03/31/2041
Final Adaptive Management Report: Submit the final Adaptive Management (AM) report documenting progress made throughout the AM project in meeting the watershed phosphorus reduction target of 18,911 lbs/yr and the TSS reduction target of 3,943,740 lbs/yr, and in-stream water quality standards specified in s. NR 102.06, Wis. Adm. Code, for phosphorus and TSS reductions from the Lower Fox River Basin TMDL. The report shall summarize AM activities that have been implemented during the current permit term and state which, if any, actions from the approved AM Plan No. WQT-2020-0016 (October 2020) were not pursued and why. The report shall include an analysis of trends on both a monthly and six-month average basis for phosphorus, and on both a weekly and monthly average basis for TSS, of phosphorus and TSS concentrations and mass effluent discharged. Additionally, there shall be an analysis of any improvements to the quality of surface waters in the Adaptive Management Action Area focusing on phosphorus, TSS and flow results collected during the permit term. The surface water analysis shall evaluate how phosphorus and TSS concentrations, flow, and the in-stream loadings have changed over the permit term in comparison to the implemented AM actions.	11/30/2041
Achieve Water Quality Standards and Adaptive Management Plan Success: The permittee's receiving water identified as the in-stream sampling point 602 SWIMS Station ID 10046799 (Lat: 44° 32' 8.98" N, Long: 88° 0' 24.12" W) shall comply with phosphorus water quality standards specified in s. NR 102.06, Wis. Adm. Code, and the approved total maximum daily load for total suspended solids as defined in the EPA approved Lower Fox River Basin TMDL. Compliance with the TMDL means meeting the loading capacity for the receiving water specified in the EPA approved Lower Fox River Basin TMDL. The permittee shall continue to comply with applicable phosphorus effluent limits required under s. 217.18(3)(e)3, Wis. Adm. Code, expressed as a 6-month average and 1.0 mg/L as a monthly average, and TSS effluent limits in effect. Continued monitoring of surface waters identified within AM Plan WQT-2020-0016 (October 2020) at a minimum of monthly May through October for phosphorus and TSS is required.	03/31/2042

5.2 Temperature Limits Compliance & Dissipative Cooling Evaluation (GBF Outfall 001)

This schedule requires the permittee to achieve compliance by the specified date

Required Action	Due Date
Preliminary Compliance Report: Submit a preliminary compliance report indicating alternatives to achieve the final temperature limits. Informational Note: Refer to the Surface Water subsection titled 'Dissipative Cooling Demonstration - POTW Weekly Average Limits' regarding requests for Department consideration of dissipative cooling per s. NR 106.59, Wis. Adm. Code, as well as re-evaluation of the limits pursuant to NR 106 Subchapters V & VI or NR 102.26, Wis. Adm. Code.	04/01/2023
Action Plan: Submit an action plan for complying with all applicable effluent temperature limits.	04/01/2024
Construction Plans: Submit construction plans (if construction is required for complying with	10/01/2024

effluent temperature limits) and include plans and specifications with the submittal.	
Initiate Actions: Initiate actions identified in the plan.	04/01/2025
Complete Actions: Complete actions necessary to achieve compliance with effluent temperature limits.	10/01/2025

5.3 Mercury Pollutant Minimization Program (GBF Outfall 001)

As a condition of the variance to the water quality based effluent limitation(s) for mercury granted in accordance with s. NR 106.145(6), Wis. Adm. Code, the permittee shall perform the following actions.

Required Action	Due Date
Annual Mercury Progress Reports: Submit an annual mercury progress report. The annual mercury progress report shall: Indicate which mercury pollutant minimization activities or activities outlined in the approved Pollutant Minimization Plan have been implemented; Include an analysis of trends in monthly and annual total effluent mercury concentrations based on mercury sampling; and Include an analysis of how influent and effluent mercury varies with time and with significant loading of mercury such as loads from industries into the collection system. The first annual mercury progress report is to be submitted by the Due Date.	03/31/2023
Annual Mercury Progress Report #2: Submit a mercury progress report as defined above.	03/31/2024
Annual Mercury Progress Report #3: Submit a mercury progress report as defined above.	03/31/2025
Annual Mercury Progress Report #4: Submit a mercury progress report as defined above.	03/31/2026
Final Mercury Report: Submit a final report documenting the success in reducing mercury concentrations in the effluent, as well as the anticipated future reduction in mercury sources and mercury effluent concentrations. The report shall summarize mercury pollutant minimization activities that have been implemented during the current permit term and state which, if any, pollutant minimization activities from the approved pollutant minimization plan were not pursued and why. The report shall include an analysis of trends in monthly and annual total effluent mercury concentrations based on mercury sampling during the current permit term. The report shall also include an analysis of how influent and effluent mercury varies with time and with significant loading of mercury such as loads from industries into the collection system.	10/01/2026
If the permittee intends to reapply for a mercury variance per s. NR 106.145, Wis. Adm. Code, for the reissued permit, a detailed pollutant minimization plan outlining the pollutant minimization activities proposed for the upcoming permit term shall be submitted along with the final report.	
Annual Mercury Reports After Permit Expiration: In the event that this permit is not reissued on time, the permittee shall continue to submit annual mercury reports each year covering pollutant minimization activities implemented and mercury concentration trends.	

5.4 Sludge Management Plan

A management plan is required for the sludge management system.

Required Action	Due Date
Sludge Management Plan Submittal: Submit a sludge management plan for Department approval to optimize the sludge management system performance and demonstrate compliance with ch. NR 204, Wis. Adm. Code, by the Due Date. This management plan shall address: 1) specify information on treatment processes, 2) sludge characteristics, 3) outfall descriptions, 4) sludge transport, 5) availability of storage, 6) disposal options, 7) monitoring procedures, 8) record keeping and reporting, 9) contingency plans, and 10) any other pertinent information. Once approved, all sludge management activities must be completed in accordance with the plan. Any changes to the plan must be approved by the Department prior to implementing the changes.	04/01/2023

5.5 Mixing Zone Study Submittal GBF (Outfall 001)

The permittee shall submit a mixing zone study by the specified date.

Required Action	Due Date
Submit Mixing Zone Study: Submit a mixing zone study that demonstrates that a 10:1 (receiving water to effluent) dilution ratio is appropriate for calculating effluent limitations for the Green Bay Facility (Outfall 001).	04/01/2025

6 Standard Requirements

NR 205, Wisconsin Administrative Code: The conditions in ss. NR 205.07(1) and NR 205.07(2), Wis. Adm. Code, are included by reference in this permit. The permittee shall comply with all of these requirements. Some of these requirements are outlined in the Standard Requirements section of this permit. Requirements not specifically outlined in the Standard Requirement section of this permit can be found in ss. NR 205.07(1) and NR 205.07(2).

6.1 Reporting and Monitoring Requirements

6.1.1 Monitoring Results

Monitoring results obtained during the previous month shall be summarized and reported on a Department Wastewater Discharge Monitoring Report. The report may require reporting of any or all of the information specified below under 'Recording of Results'. This report is to be returned to the Department no later than the date indicated on the form. A copy of the Wastewater Discharge Monitoring Report Form or an electronic file of the report shall be retained by the permittee.

Monitoring results shall be reported on an electronic discharge monitoring report (eDMR). The eDMR shall be certified electronically by a responsible executive or municipal officer, manager, partner or proprietor as specified in s. 283.37(3), Wis. Stats., or a duly authorized representative of the officer, manager, partner or proprietor that has been delegated signature authority pursuant to s. NR 205.07(1)(g)2, Wis. Adm. Code. The 'eReport Certify' page certifies that the electronic report form is true, accurate and complete.

If the permittee monitors any pollutant more frequently than required by this permit, the results of such monitoring shall be included on the Wastewater Discharge Monitoring Report.

The permittee shall comply with all limits for each parameter regardless of monitoring frequency. For example, monthly, weekly, and/or daily limits shall be met even with monthly monitoring. The permittee may monitor more frequently than required for any parameter.

6.1.2 Sampling and Testing Procedures

Sampling and laboratory testing procedures shall be performed in accordance with Chapters NR 218 and NR 219, Wis. Adm. Code and shall be performed by a laboratory certified or registered in accordance with the requirements of ch. NR 149, Wis. Adm. Code. Groundwater sample collection and analysis shall be performed in accordance with ch. NR 140, Wis. Adm. Code. The analytical methodologies used shall enable the laboratory to quantitate all substances for which monitoring is required at levels below the effluent limitation. If the required level cannot be met by any of the methods available in NR 219, Wis. Adm. Code, then the method with the lowest limit of detection shall be selected. Additional test procedures may be specified in this permit.

6.1.3 Pretreatment Sampling Requirements

Sampling for pretreatment parameters (cadmium, chromium, copper, lead, nickel, zinc, and mercury) shall be done during a day each month when industrial discharges are occurring at normal to maximum levels. The sampling of the influent and effluent for these parameters shall be coordinated. All 24 hour composite samples shall be flow proportional.

6.1.4 Recording of Results

The permittee shall maintain records which provide the following information for each effluent measurement or sample taken:

- the date, exact place, method and time of sampling or measurements;
- the individual who performed the sampling or measurements;

- the date the analysis was performed;
- the individual who performed the analysis;
- the analytical techniques or methods used; and
- the results of the analysis.

6.1.5 Reporting of Monitoring Results

The permittee shall use the following conventions when reporting effluent monitoring results:

- Pollutant concentrations less than the limit of detection shall be reported as < (less than) the value of the limit of detection. For example, if a substance is not detected at a detection limit of 0.1 mg/L, report the pollutant concentration as < 0.1 mg/L.

- Pollutant concentrations equal to or greater than the limit of detection, but less than the limit of quantitation, shall be reported and the limit of quantitation shall be specified.

- For purposes of calculating NR 101 fees, the 2 mg/l lower reporting limits for BOD_5 and Total Suspended Solids shall be considered to be limits of quantitation

- For the purposes of reporting a calculated result, average or a mass discharge value, the permittee may substitute a "0" (zero) for any pollutant concentration that is less than the limit of detection. However, if the effluent limitation is less than the limit of detection, the department may substitute a value other than zero for results less than the limit of detection, after considering the number of monitoring results that are greater than the limit of detection and if warranted when applying appropriate statistical techniques.

- If no discharge occurs through an outfall, flow related parameters (e.g. flow rate, hydraulic application rate, volume, etc.) should be reported as "0" (zero) at the required sample frequency specified for the outfall. For example: if the sample frequency is daily, "0" would be reported for any day during the month that no discharge occurred.

6.1.6 Compliance Maintenance Annual Reports

Compliance Maintenance Annual Reports (CMAR) shall be completed using information obtained over each calendar year regarding the wastewater conveyance and treatment system. The CMAR shall be submitted and certified by the permittee in accordance with ch. NR 208, Wis. Adm. Code, by June 30, each year on an electronic report form provided by the Department.

In the case of a publicly owned treatment works, a resolution shall be passed by the governing body and submitted as part of the CMAR, verifying its review of the report and providing responses as required. Private owners of wastewater treatment works are not required to pass a resolution; but they must provide an Owner Statement and responses as required, as part of the CMAR submittal.

The CMAR shall be certified electronically by a responsible executive or municipal officer, manager, partner or proprietor as specified in s. 283.37(3), Wis. Stats., or a duly authorized representative of the officer, manager, partner or proprietor that has been delegated signature authority pursuant to s. NR 205.07(1)(g)2, Wis. Adm. Code. The certification verifies that the electronic report is true, accurate and complete.

6.1.7 Records Retention

The permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings or electronic data records for continuous monitoring instrumentation, copies of all reports required by the permit, and records of all data used to complete the application for the permit for a period of at least 3 years from the date of the sample, measurement, report or application. All pertinent sludge information,

including permit application information and other documents specified in this permit or s. NR 204.06(9), Wis. Adm. Code shall be retained for a minimum of 5 years.

6.1.8 Other Information

Where the permittee becomes aware that it failed to submit any relevant facts in a permit application or submitted incorrect information in a permit application or in any report to the Department, it shall promptly submit such facts or correct information to the Department.

6.1.9 Reporting Requirements – Alterations or Additions

The permittee shall give notice to the Department as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is only required when:

- The alteration or addition to the permitted facility may meet one of the criteria for determining whether a facility is a new source.
- The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification requirement applies to pollutants which are not subject to effluent limitations in the existing permit.
- The alteration or addition results in a significant change in the permittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use of disposal sites not reported during the permit application process nor reported pursuant to an approved land application plan. Additional sites may not be used for the land application of sludge until department approval is received.

6.2 System Operating Requirements

6.2.1 Noncompliance Reporting

Sanitary sewer overflows and sewage treatment facility overflows shall be reported according to the 'Sanitary Sewer Overflows and Sewage Treatment Facility Overflows' section of this permit.

The permittee shall report the following types of noncompliance by a telephone call to the Department's regional office within 24 hours after becoming aware of the noncompliance:

- any noncompliance which may endanger health or the environment;
- any violation of an effluent limitation resulting from a bypass;
- any violation of an effluent limitation resulting from an upset; and
- any violation of a maximum discharge limitation for any of the pollutants listed by the Department in the permit, either for effluent or sludge.

A written report describing the noncompliance shall also be submitted to the Department's regional office within 5 days after the permittee becomes aware of the noncompliance. On a case-by-case basis, the Department may waive the requirement for submittal of a written report within 5 days and instruct the permittee to submit the written report with the next regularly scheduled monitoring report. In either case, the written report shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times; the steps taken or planned to reduce, eliminate and prevent reoccurrence of the noncompliance; and if the noncompliance has not been corrected, the length of time it is expected to continue.

A scheduled bypass approved by the Department under the 'Scheduled Bypass' section of this permit shall not be subject to the reporting required under this section.

NOTE: Section 292.11(2)(a), Wisconsin Statutes, requires any person who possesses or controls a hazardous substance or who causes the discharge of a hazardous substance to notify the Department of Natural Resources

immediately of any discharge not authorized by the permit. **The discharge of a hazardous substance that is not authorized by this permit or that violates this permit may be a hazardous substance spill. To report a hazardous substance spill, call DNR's 24-hour HOTLINE at 1-800-943-0003.**

6.2.2 Flow Meters

Flow meters shall be calibrated annually, as per s. NR 218.06, Wis. Adm. Code.

6.2.3 Raw Grit and Screenings

All raw grit and screenings shall be disposed of at a properly licensed solid waste facility or picked up by a licensed waste hauler. If the facility or hauler are located in Wisconsin, then they shall be licensed under chs. NR 500-555, Wis. Adm. Code.

6.2.4 Sludge Management

All sludge management activities shall be conducted in compliance with ch. NR 204 "Domestic Sewage Sludge Management", Wis. Adm. Code.

6.2.5 Prohibited Wastes

Under no circumstances may the introduction of wastes prohibited by s. NR 211.10, Wis. Adm. Code, be allowed into the waste treatment system. Prohibited wastes include those:

- which create a fire or explosion hazard in the treatment work;
- which will cause corrosive structural damage to the treatment work;
- solid or viscous substances in amounts which cause obstructions to the flow in sewers or interference with the proper operation of the treatment work;
- wastewaters at a flow rate or pollutant loading which are excessive over relatively short time periods so as to cause a loss of treatment efficiency; and
- changes in discharge volume or composition from contributing industries which overload the treatment works or cause a loss of treatment efficiency.

6.2.6 Bypass

This condition applies only to bypassing at a sewage treatment facility that is not a scheduled bypass, approved blending as a specific condition of this permit, a sewage treatment facility overflow or a controlled diversion as provided in the sections titled 'Scheduled Bypass', 'Blending' (if approved), 'SSO's and Sewage Treatment Facility Overflows' and 'Controlled Diversions' of this permit. Any other bypass at the sewage treatment facility is prohibited and the Department may take enforcement action against a permittee for such occurrences under s. 283.89, Wis. Stats. The Department may approve a bypass if the permittee demonstrates all the following conditions apply:

- The bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;
- There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities or adequate back-up equipment, retention of untreated wastes, reduction of inflow and infiltration, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventative maintenance. When evaluating feasibility of alternatives, the department may consider factors such as technical achievability, costs and affordability of implementation and risks to public health, the environment and, where the permittee is a municipality, the welfare of the community served; and
- The bypass was reported in accordance with the Noncompliance Reporting section of this permit.

6.2.7 Scheduled Bypass

Whenever the permittee anticipates the need to bypass for purposes of efficient operations and maintenance and the permittee may not meet the conditions for controlled diversions in the 'Controlled Diversions' section of this permit, the permittee shall obtain prior written approval from the Department for the scheduled bypass. A permittee's written request for Department approval of a scheduled bypass shall demonstrate that the conditions for bypassing specified in the above section titled 'Bypass' are met and include the proposed date and reason for the bypass, estimated volume and duration of the bypass, alternatives to bypassing and measures to mitigate environmental harm caused by the bypass. The department may require the permittee to provide public notification for a scheduled bypass if it is determined there is significant public interest in the proposed action and may recommend mitigation measures to minimize the impact of such bypass.

6.2.8 Controlled Diversions

Controlled diversions are allowed only when necessary for essential maintenance to assure efficient operation. Sewage treatment facilities that have multiple treatment units to treat variable or seasonal loading conditions may shut down redundant treatment units when necessary for efficient operation. The following requirements shall be met during controlled diversions:

- Effluent from the sewage treatment facility shall meet the effluent limitations established in the permit. Wastewater that is diverted around a treatment unit or treatment process during a controlled diversion shall be recombined with wastewater that is not diverted prior to the effluent sampling location and prior to effluent discharge;
- A controlled diversion does not include blending as defined in s. NR 210.03(2e), Wis. Adm. Code, and as may only be approved under s. NR 210.12. A controlled diversion may not occur during periods of excessive flow or other abnormal wastewater characteristics;
- A controlled diversion may not result in a wastewater treatment facility overflow; and
- All instances of controlled diversions shall be documented in sewage treatment facility records and such records shall be available to the department on request.

6.2.9 Proper Operation and Maintenance

The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control which are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training as required in ch. NR 114, Wis. Adm. Code, and adequate laboratory and process controls, including appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems only when necessary to achieve compliance with the conditions of the permit.

6.2.10 Operator Certification

The wastewater treatment facility shall be under the direct supervision of a state certified operator. In accordance with s. NR 114.53, Wis. Adm. Code, every WPDES permitted treatment plant shall have a designated operator-in-charge holding a current and valid certificate. The designated operator-in-charge shall be certified at the level and in all subclasses of the treatment plant, except laboratory. Treatment plant owners shall notify the department of any changes in the operator-in-charge within 30 days. Note that s. NR 114.52(22), Wis. Adm. Code, lists types of facilities that are excluded from operator certification requirements (i.e. private sewage systems, pretreatment facilities discharging to public sewers, industrial wastewater treatment that consists solely of land disposal, agricultural digesters and concentrated aquatic production facilities with no biological treatment).

6.3 Sewage Collection Systems

6.3.1 Sanitary Sewage Overflows and Sewage Treatment Facility Overflows

6.3.1.1 Overflows Prohibited

Any overflow or discharge of wastewater from the sewage collection system or at the sewage treatment facility, other than from permitted outfalls, is prohibited. The permittee shall provide information on whether any of the following conditions existed when an overflow occurred:

- The sanitary sewer overflow or sewage treatment facility overflow was unavoidable to prevent loss of life, personal injury or severe property damage;
- There were no feasible alternatives to the sanitary sewer overflow or sewage treatment facility overflow such as the use of auxiliary treatment facilities or adequate back-up equipment, retention of untreated wastes, reduction of inflow and infiltration, or preventative maintenance activities;
- The sanitary sewer overflow or the sewage treatment facility overflow was caused by unusual or severe weather related conditions such as large or successive precipitation events, snowmelt, saturated soil conditions, or severe weather occurring in the area served by the sewage collection system or sewage treatment facility; and
- The sanitary sewer overflow or the sewage treatment facility overflow was unintentional, temporary, and caused by an accident or other factors beyond the reasonable control of the permittee.

6.3.1.2 Permittee Response to Overflows

Whenever a sanitary sewer overflow or sewage treatment facility overflow occurs, the permittee shall take all feasible steps to control or limit the volume of untreated or partially treated wastewater discharged, and terminate the discharge as soon as practicable. Remedial actions, including those in NR 210.21 (3), Wis. Adm. Code, shall be implemented consistent with an emergency response plan developed under the CMOM program.

6.3.1.3 Permittee Reporting

Permittees shall report all sanitary sewer overflows and sewage treatment overflows as follows:

- The permittee shall notify the department by telephone, fax or email as soon as practicable, but no later than 24 hours from the time the permittee becomes aware of the overflow;
- The permittee shall, no later than five days from the time the permittee becomes aware of the overflow, provide to the department the information identified in this paragraph using department form number 3400-184. If an overflow lasts for more than five days, an initial report shall be submitted within 5 days as required in this paragraph and an updated report submitted following cessation of the overflow. At a minimum, the following information shall be included in the report:

  ◦The date and location of the overflow;
  ◦The surface water to which the discharge occurred, if any;
  ◦The duration of the overflow and an estimate of the volume of the overflow;
  ◦A description of the sewer system or treatment facility component from which the discharge occurred such as manhole, lift station, constructed overflow pipe, or crack or other opening in a pipe;
  ◦The estimated date and time when the overflow began and stopped or will be stopped;
  ◦The cause or suspected cause of the overflow including, if appropriate, precipitation, runoff conditions, areas of flooding, soil moisture and other relevant information;
  ◦Steps taken or planned to reduce, eliminate and prevent reoccurrence of the overflow and a schedule of major milestones for those steps;
  ◦A description of the actual or potential for human exposure and contact with the wastewater from the overflow;

◦Steps taken or planned to mitigate the impacts of the overflow and a schedule of major milestones for those steps;
◦To the extent known at the time of reporting, the number and location of building backups caused by excessive flow or other hydraulic constraints in the sewage collection system that occurred concurrently with the sanitary sewer overflow and that were within the same area of the sewage collection system as the sanitary sewer overflow; and
◦The reason the overflow occurred or explanation of other contributing circumstances that resulted in the overflow event. This includes any information available including whether the overflow was unavoidable to prevent loss of life, personal injury, or severe property damage and whether there were feasible alternatives to the overflow.

NOTE: A copy of form 3400-184 for reporting sanitary sewer overflows and sewage treatment facility overflows may be obtained from the department or accessed on the department's web site at http://dnr.wi.gov/topic/wastewater/SSOreport.html. As indicated on the form, additional information may be submitted to supplement the information required by the form.

- The permittee shall identify each specific location and each day on which a sanitary sewer overflow or sewage treatment facility overflow occurs as a discrete sanitary sewer overflow or sewage treatment facility overflow occurrence. An occurrence may be more than one day if the circumstances causing the sanitary sewer overflow or sewage treatment facility overflow results in a discharge duration of greater than 24 hours. If there is a stop and restart of the overflow at the same location within 24 hours and the overflow is caused by the same circumstance, it may be reported as one occurrence. Sanitary sewer overflow occurrences at a specific location that are separated by more than 24 hours shall be reported as separate occurrences; and
- A permittee that is required to submit wastewater discharge monitoring reports under NR 205.07 (1) (r) shall also report all sanitary sewer overflows and sewage treatment facility overflows on that report.

6.3.1.4 Public Notification

The permittee shall notify the public of any sanitary sewer and sewage treatment facility overflows consistent with its emergency response plan required under the CMOM (Capacity, Management, Operation and Maintenance) section of this permit and s. NR 210.23 (4) (f), Wis. Adm. Code. Such public notification shall occur promptly following any overflow event using the most effective and efficient communications available in the community. At minimum, a daily newspaper of general circulation in the county(s) and municipality whose waters may be affected by the overflow shall be notified by written or electronic communication.

6.3.2 Capacity, Management, Operation and Maintenance (CMOM) Program

- The permittee shall have written documentation of the Capacity, Management, Operation and Maintenance (CMOM) program components in accordance with s. NR 210.23(4), Wis. Adm. Code. Such documentation shall be available for Department review upon request. The Department may request that the permittee provide this documentation or prepare a summary of the permittee's CMOM program at the time of application for reissuance of the WPDES permit.
- The permittee shall implement a CMOM program in accordance with s. NR 210.23, Wis. Adm. Code.
- The permittee shall at least annually conduct a self-audit of activities conducted under the permittee's CMOM program to ensure CMOM components are being implemented as necessary to meet the general standards of s. NR 210.23(3), Wis. Adm. Code.

6.3.3 Sewer Cleaning Debris and Materials

All debris and material removed from cleaning sanitary sewers shall be managed to prevent nuisances, run-off, ground infiltration or prohibited discharges.

- Debris and solid waste shall be dewatered, dried and then disposed of at a licensed solid waste facility.
- Liquid waste from the cleaning and dewatering operations shall be collected and disposed of at a permitted wastewater treatment facility.
- Combination waste including liquid waste along with debris and solid waste may be disposed of at a licensed solid waste facility or wastewater treatment facility willing to accept the waste.

6.4 Surface Water Requirements

6.4.1 Permittee-Determined Limit of Quantitation Incorporated into this Permit

For pollutants with water quality-based effluent limits below the Limit of Quantitation (LOQ) in this permit, the LOQ calculated by the permittee and reported on the Discharge Monitoring Reports (DMRs) is incorporated by reference into this permit. The LOQ shall be reported on the DMRs, shall be the lowest quantifiable level practicable, and shall be no greater than the minimum level (ML) specified in or approved under 40 CFR Part 136 for the pollutant at the time this permit was issued, unless this permit specifies a higher LOQ.

6.4.2 Appropriate Formulas for Effluent Calculations

The permittee shall use the following formulas for calculating effluent results to determine compliance with average concentration limits and mass limits and total load limits:

Weekly/Monthly/Six-Month/Annual Average Concentration = the sum of all daily results for that week/month/six-month/year, divided by the number of results during that time period. [Note: When a six-month average effluent limit is specified for Total Phosphorus the applicable periods are May through October and November through April.]

Weekly Average Mass Discharge (lbs/day): Daily mass = daily concentration (mg/L) x daily flow (MGD) x 8.34, then average the daily mass values for the week.

Monthly Average Mass Discharge (lbs/day): Daily mass = daily concentration (mg/L) x daily flow (MGD) x 8.34, then average the daily mass values for the month.

Six-Month Average Mass Discharge (lbs/day): Daily mass = daily concentration (mg/L) x daily flow (MGD) x 8.34, then average the daily mass values for the six-month period. [Note: When a six-month average effluent limit is specified for Total Phosphorus the applicable periods are May through October and November through April.]

Annual Average Mass Discharge (lbs/day): Daily mass = daily concentration (mg/L) x daily flow (MGD) x 8.34, then average the daily mass values for the entire year.

Total Monthly Discharge: = monthly average concentration (mg/L) x total flow for the month (MG/month) x 8.34.

Total Annual Discharge: = sum of total monthly discharges for the calendar year.

12-Month Rolling Sum of Total Monthly Discharge: = the sum of the most recent 12 consecutive months of Total Monthly Discharges.

6.4.3 Effluent Temperature Requirements

Weekly Average Temperature – The permittee shall use the following formula for calculating effluent results to determine compliance with the weekly average temperature limit (as applicable): Weekly Average Temperature = the sum of all daily maximum results for that week divided by the number of daily maximum results during that time period.

Cold Shock Standard – Water temperatures of the discharge shall be controlled in a manner as to protect fish and aquatic life uses from the deleterious effects of cold shock. 'Cold Shock' means exposure of aquatic organisms to a rapid decrease in temperature and a sustained exposure to low temperature that induces abnormal behavior or physiological performance and may lead to death.

Rate of Temperature Change Standard – Temperature of a water of the state or discharge to a water of the state may not be artificially raised or lowered at such a rate that it causes detrimental health or reproductive effects to fish or aquatic life of the water of the state.

6.4.4 Visible Foam or Floating Solids

There shall be no discharge of floating solids or visible foam in other than trace amounts.

6.4.5 Surface Water Uses and Criteria

In accordance with NR 102.04, Wis. Adm. Code, surface water uses and criteria are established to govern water management decisions. Practices attributable to municipal, industrial, commercial, domestic, agricultural, land development or other activities shall be controlled so that all surface waters including the mixing zone meet the following conditions at all times and under all flow and water level conditions:

a) Substances that will cause objectionable deposits on the shore or in the bed of a body of water, shall not be present in such amounts as to interfere with public rights in waters of the state.

b) Floating or submerged debris, oil, scum or other material shall not be present in such amounts as to interfere with public rights in waters of the state.

c) Materials producing color, odor, taste or unsightliness shall not be present in such amounts as to interfere with public rights in waters of the state.

d) Substances in concentrations or in combinations which are toxic or harmful to humans shall not be present in amounts found to be of public health significance, nor shall substances be present in amounts which are acutely harmful to animal, plant or aquatic life.

6.4.6 Percent Removal

During any 30 consecutive days, the average effluent concentrations of $CBOD_5$ and of total suspended solids shall not exceed 15% of the average influent concentrations, respectively. This requirement does not apply to removal of total suspended solids if the permittee operates a lagoon system and has received a variance for suspended solids granted under NR 210.07(2), Wis. Adm. Code.

6.4.7 *E. coli*

The monthly limit for *E. coli* shall be expressed as a geometric mean. In calculating the geometric mean, a value of 1 is used for any result of 0.

6.4.8 Seasonal Disinfection

Disinfection shall be provided from May 1 through September 30 of each year. Monitoring requirements and the limitations for *E. coli* apply only during the period in which disinfection is required. Whenever chlorine is used for disinfection or other uses, the limitations and monitoring requirements for residual chlorine shall apply. A dechlorination process shall be in operation whenever chlorine is used.

6.4.9 Total Residual Chlorine Requirements (When De-Chlorinating Effluent)

Test methods for total residual chlorine, approved in ch. NR 219 - Table B, Wis. Adm. Code, normally achieve a limit of detection of about 20 to 50 micrograms per liter and a limit of quantitation of about 100 micrograms per liter. Reporting of test results and compliance with effluent limitations for chlorine residual and total residual halogens shall be as follows:

- Sample results which show no detectable levels are in compliance with the limit. These test results shall be reported on Wastewater Discharge Monitoring Report Forms as "< 100 µg/L". (Note: 0.1 mg/L converts to 100 µg/L)

- Samples showing detectable traces of chlorine are in compliance if measured at less than 100 µg/L, unless there is a consistent pattern of detectable values in this range. These values shall also be reported on Wastewater Discharge Monitoring Report Forms as "<100 µg/L." The facility operating staff shall record actual readings on logs maintained at the plant, shall take action to determine the reliability of detected results (such as re-sampling and/or calculating dosages), and shall adjust the chemical feed system if necessary to reduce the chances of detects.

- Samples showing detectable levels greater than 100 µg/L shall be considered as exceedances, and shall be reported as measured.

- To calculate average or mass discharge values, a "0" (zero) may be substituted for any test result less than 100 µg/L. Calculated values shall then be compared directly to the average or mass limitations to determine compliance.

6.4.10 Whole Effluent Toxicity (WET) Monitoring Requirements

In order to determine the potential impact of the discharge on aquatic organisms, static-renewal toxicity tests shall be performed on the effluent in accordance with the procedures specified in the *"State of Wisconsin Aquatic Life Toxicity Testing Methods Manual, 2nd Edition" (PUB-WT-797*, November 2004) as required by NR 219.04, Table A, Wis. Adm. Code). All of the WET tests required in this permit, including any required retests, shall be conducted on the *Ceriodaphnia dubia* and fathead minnow species. Receiving water samples shall not be collected from any point in contact with the permittee's mixing zone and every attempt shall be made to avoid contact with any other discharge's mixing zone.

6.4.11 Whole Effluent Toxicity (WET) Identification and Reduction

Within 60 days of a retest which showed positive results, the permittee shall submit a written report to the Biomonitoring Coordinator, Bureau of Water Quality, 101 S. Webster St., PO Box 7921, Madison, WI 53707-7921, which details the following:

- A description of actions the permittee has taken or will take to remove toxicity and to prevent the recurrence of toxicity;

- A description of toxicity reduction evaluation (TRE) investigations that have been or will be done to identify potential sources of toxicity, including some or all of the following actions:

  (a) Evaluate the performance of the treatment system to identify deficiencies contributing to effluent toxicity (e.g., operational problems, chemical additives, incomplete treatment)
  (b) Identify the compound(s) causing toxicity
  (c) Trace the compound(s) causing toxicity to their sources (e.g., industrial, commercial, domestic)
  (d) Evaluate, select, and implement methods or technologies to control effluent toxicity (e.g., in-plant or pretreatment controls, source reduction or removal)

- Where corrective actions including a TRE have not been completed, an expeditious schedule under which corrective actions will be implemented;

- If no actions have been taken, the reason for not taking action.

The permittee may also request approval from the Department to postpone additional retests in order to investigate the source(s) of toxicity. Postponed retests must be completed after toxicity is believed to have been removed.

6.4.12 Reopener Clause

Pursuant to s. 283.15(11), Wis. Stat. and 40 CFR 131.20, the Department may modify or revoke and reissue this permit if, through the triennial standard review process, the Department determines that the terms and conditions of this permit need to be updated to reflect the highest attainable condition of the receiving water.

6.5 Pretreatment Program Requirements

The permittee is required to operate an industrial pretreatment program as described in the program initially approved by the Department of Natural Resources including any subsequent program modifications approved by the Department, and including commitments to program implementation activities provided in the permittee's annual pretreatment program report, and that complies with the requirements set forth in 40 CFR Part 403 and ch. NR 211, Wis. Adm. Code. To ensure that the program is operated in accordance with these requirements, the following general conditions and requirements are hereby established:

6.5.1 Inventories

The permittee shall implement methods to maintain a current inventory of the general character and volume of wastewater that industrial users discharge to the treatment works and shall provide an updated industrial user listing annually and report any changes in the listing to the Department by March 31 of each year as part of the annual pretreatment program report required herein.

6.5.2 Regulation of Industrial Users

6.5.2.1 Limitations for Industrial Users:

The permittee shall develop, maintain, enforce and revise as necessary local limits to implement the general and specific prohibitions of the state and federal General Pretreatment Regulations.

6.5.2.2 Control Documents for Industrial Users (IUs)

The permittee shall control the discharge from each significant industrial user through individual discharge permits as required by s. NR 211.235, Wis. Adm. Code and in accordance with the approved pretreatment program procedures and the permittee's sewer use ordinance. The discharge permits shall be modified in a timely manner during the stated term of the discharge permits according to the sewer use ordinance as conditions warrant. The discharge permits shall include at a minimum the elements found in s. NR 211.235(1), Wis. Adm. Code and references to the approved pretreatment program procedures and the sewer use ordinance.

6.5.2.3 Review of Industrial User Reports, Inspections and Compliance Monitoring

The permittee shall require the submission of, receive, and review self-monitoring reports and other notices from industrial users in accordance with the approved pretreatment program procedures. The permittee shall randomly sample and analyze industrial user discharges and conduct surveillance activities to determine independent of information supplied by the industrial users, whether the industrial users are in compliance with pretreatment standards and requirements. The inspections and monitoring shall also be conducted to maintain accurate knowledge of local industrial processes, including changes in the discharge, pretreatment equipment operation, spill prevention control plans, slug control plans, and implementation of solvent management plans.

The permittee shall inspect and sample the discharge from each significant industrial user as specified in the permittee's approved pretreatment program or as specified in NR 211.235(3). The permittee shall evaluate whether industrial users identified as significant need a slug control plan according to the requirements of NR 211.235(4). If a slug control plan is needed, the plan shall contain at a minimum the elements specified in s. NR 211.235(4)(b), Wis. Adm. Code.

6.5.2.4 Enforcement and Industrial User Compliance Evaluation & Violation Reports

The permittee shall enforce the industrial pretreatment requirements including the industrial user discharge limitations of the permittee's sewer use ordinance. The permittee shall investigate instances of noncompliance by collecting and analyzing samples and collecting other information with sufficient care to produce evidence admissible in enforcement proceedings or in judicial actions. Investigation and response to instances of noncompliance shall be in accordance with the permittee's sewer use ordinance and approved Enforcement Response Plan.

The permittee shall make a semiannual report on forms provided or approved by the Department. The semiannual report shall include an analysis of industrial user significant noncompliance (i.e. the Industrial User Compliance Evaluation, also known as the SNC Analysis) as outlined in s.NR 211.23(1)(j), Wis. Adm. Code, and a summary of the permittee's response to all industrial noncompliance (i.e. the Industrial User Violation Report). The Industrial User Compliance Evaluation Report shall include monitoring results received from industrial users pursuant to s. NR 211.15(1)-(5), Wis. Adm. Code. The Industrial User Violation Report shall include copies of all notices of noncompliance, notices of violation and other enforcement correspondence sent by the permittee to industrial users, together with the industrial user's response. The Industrial User Compliance Evaluation and Violation Reports for the period January through June shall be provided to the Department by September 30 of each year and for the period July through December shall be provided to the Department by March 31 of the succeeding year, unless alternate submittal dates are approved.

6.5.2.5 Publication of Violations

The permittee shall publish a list of industrial users that have significantly violated the municipal sewer use ordinance during the calendar year, in the largest daily newspaper in the area by March 31 of the following year pursuant to s. NR 211.23(1)(j), Wis. Adm. Code. A copy of the newspaper publication shall be provided as part of the annual pretreatment report specified herein.

6.5.2.6 Multijurisdictional Agreements

The permittee shall establish agreements with all contributing jurisdictions as necessary to ensure compliance with pretreatment standards and requirements by all industrial users discharging to the permittee's wastewater treatment system. Any such agreement shall identify who will be responsible for maintaining the industrial user inventory, issuance of industrial user control mechanisms, inspections and sampling, pretreatment program implementation, and enforcement.

6.5.3 Annual Pretreatment Program Report

The permittee shall evaluate the pretreatment program, and submit the Pretreatment Program Report to the Department on forms provided or approved by the Department by March 31 annually, unless an alternate submittal date is approved. The report shall include a brief summary of the work performed during the preceding calendar year, including the numbers of discharge permits issued and in effect, pollution prevention activities, number of inspections and monitoring surveys conducted, budget and personnel assigned to the program, a general discussion of program progress in meeting the objectives of the permittee's pretreatment program together with summary comments and recommendations.

6.5.4 Pretreatment Program Modifications

- Future Modifications: The permittee shall within one year of any revisions to federal or state General Pretreatment Regulations submit an application to the Department in duplicate to modify and update its approved pretreatment program to incorporate such regulatory changes as applicable to the permittee. Additionally, the Department or the permittee may request an application for program modification at any time where necessary to improve program effectiveness based on program experience to date.

- Modifications Subject to Department Approval: The permittee shall submit all proposed pretreatment program modifications to the Department for determination of significance and opportunity for comment in accordance with the requirements and conditions of s. NR 211.27, Wis. Adm. Code. Any substantial proposed program modification shall be subject to Department public noticing and formal approval prior to implementation. A substantial program modification includes, but is not limited to, changes in enabling legal authority to administer and enforce pretreatment conditions and requirements; significant changes in program administrative or operational procedures; significant reductions in monitoring frequencies; significant reductions in program resources including personnel commitments, equipment, and funding levels; changes (including any relaxation) in the local limitations for substances enforced and applied to users of the sewerage treatment works; changes in treatment works sludge disposal or management practices which impact the pretreatment program; or program modifications which increase pollutant loadings to the treatment works. The Department shall use the procedures outlined in s. NR 211.30, Wis. Adm. Code for review and approval/denial of proposed pretreatment program modifications. The permittee shall comply with local public participation requirements when implementing the pretreatment program.

6.5.5 Program Resources

The permittee shall have sufficient resources and qualified personnel to carry out the pretreatment program responsibilities as listed in ss. NR 211.22 and NR 211.23, Wis. Adm. Code.

6.6 Land Application Requirements

6.6.1 Sludge Management Program Standards And Requirements Based Upon Federally Promulgated Regulations

In the event that new federal sludge standards or regulations are promulgated, the permittee shall comply with the new sludge requirements by the dates established in the regulations, if required by federal law, even if the permit has not yet been modified to incorporate the new federal regulations.

6.6.2 General Sludge Management Information

The General Sludge Management Form 3400-48 shall be completed and submitted prior to any significant sludge management changes.

6.6.3 Sludge Samples

All sludge samples shall be collected at a point and in a manner which will yield sample results which are representative of the sludge being tested, and collected at the time which is appropriate for the specific test.

6.6.4 Land Application Characteristic Report

Each report shall consist of a Characteristic Form 3400-49 and Lab Report. The Characteristic Report Form 3400-49 shall be submitted electronically by January 31 following each year of analysis.

Following submittal of the electronic Characteristic Report Form 3400-49, this form shall be certified electronically via the 'eReport Certify' page by a responsible executive or municipal officer, manager, partner or proprietor as specified in s. 283.37(3), Wis. Stats., or a duly authorized representative of the officer, manager, partner or proprietor that has been delegated signature authority pursuant to s. NR 205.07(1)(g)2, Wis. Adm. Code. The 'eReport Certify' page certifies that the electronic report is true, accurate and complete. The Lab Report must be sent directly to the facility's DNR sludge representative or basin engineer unless approval for not submitting the lab reports has been given.

The permittee shall use the following convention when reporting sludge monitoring results: Pollutant concentrations less than the limit of detection shall be reported as < (less than) the value of the limit of detection. For example, if a substance is not detected at a detection limit of 1.0 mg/kg, report the pollutant concentration as < 1.0 mg/kg .

All results shall be reported on a dry weight basis.

6.6.5 Calculation of Water Extractable Phosphorus

When sludge analysis for Water Extractable Phosphorus is required by this permit, the permittee shall use the following formula to calculate and report Water Extractable Phosphorus:
Water Extractable Phosphorus (% of Total P) =
[Water Extractable Phosphorus (mg/kg, dry wt) ÷ Total Phosphorus (mg/kg, dry wt)] x 100

6.6.6 Monitoring and Calculating PCB Concentrations in Sludge

When sludge analysis for "PCB, Total Dry Wt" is required by this permit, the PCB concentration in the sludge shall be determined using either congener-specific analysis or Aroclor analysis. The permittee may decide which of these analyses is performed. Analyses shall be performed in accordance with the following provisions and Table EM in s. NR 219.04, Wis. Adm. Code:

- If congener-specific analysis is employed: All PCB congeners shall be delineated. Non-detects shall be treated as zero. The values that are between the limit of detection (LOD) and the limit of quantitation shall be used when calculating the total value of all congeners. All results shall be added together and the total PCB concentration by dry weight reported.

- If Aroclor analysis is employed, reporting protocols, consistent with s. NR 106.07(6)(e), should be as follows: If all Aroclors are less than the LOD, then the Total PCB Dry Wt result should be reported as less than the highest LOD. If a single Aroclor is detected, then that is what should be reported for the Total PCB result. If multiple Aroclors are detected, they should be summed and reported as Total PCBs. If the LOD cannot be achieved after using the appropriate clean up techniques, a reporting limit that is achievable for the Aroclors or each congener for the sample shall be determined. This reporting limit shall be reported and qualified indicating the presence of an interference.

6.6.7 Annual Land Application Report

Land Application Report Form 3400-55 shall be submitted electronically by January 31, each year whether or not non-exceptional quality sludge is land applied. Non-exceptional quality sludge is defined in s. NR 204.07(4), Wis. Adm. Code. Following submittal of the electronic Annual Land Application Report Form 3400-55, this form shall be certified electronically via the 'eReport Certify' page by a responsible executive or municipal officer, manager, partner or proprietor as specified in s. 283.37(3), Wis. Stats., or a duly authorized representative of the officer, manager, partner or proprietor that has been delegated signature authority pursuant to s. NR 205.07(1)(g)2, Wis. Adm. Code. The 'eReport Certify' page certifies that the electronic report form is true, accurate and complete.

6.6.8 Other Methods of Disposal or Distribution Report

The permittee shall submit electronically the Other Methods of Disposal or Distribution Report Form 3400-52 by January 31, each year whether or not sludge is hauled, landfilled, incinerated, or exceptional quality sludge is distributed or land applied. Following submittal of the electronic Report Form 3400-52, this form shall be certified electronically via the 'eReport Certify' page by a responsible executive or municipal officer, manager, partner or proprietor as specified in s. 283.37(3), Wis. Stats., or a duly authorized representative of the officer, manager, partner or proprietor that has been delegated signature authority pursuant to s. NR 205.07(1)(g)2, Wis. Adm. Code. The 'eReport Certify' page certifies that the electronic report form is true, accurate and complete.

6.6.9 Approval to Land Apply

Bulk non-exceptional quality sludge as defined in s. NR 204.07(4), Wis. Adm. Code, may not be applied to land without a written approval letter or Form 3400-122 from the Department unless the Permittee has obtained permission from the Department to self approve sites in accordance with s. NR 204.06 (6), Wis. Adm. Code. Analysis of sludge characteristics is required prior to land application. Application on frozen or snow covered ground is restricted to the extent specified in s. NR 204.07(3) (l), Wis. Adm. Code.

6.6.10 Soil Analysis Requirements

Each site requested for approval for land application must have the soil tested prior to use. Each approved site used for land application must subsequently be soil tested such that there is at least one valid soil test in the four years prior to land application. All soil sampling and submittal of information to the testing laboratory shall be done in accordance with UW Extension Bulletin A-2100. The testing shall be done by the UW Soils Lab in Madison or Marshfield, WI or at a lab approved by UW. The test results including the crop recommendations shall be submitted to the DNR contact listed for this permit, as they are available. Application rates shall be determined based on the crop nitrogen recommendations and with consideration for other sources of nitrogen applied to the site.

6.6.11 Land Application Site Evaluation

For non-exceptional quality sludge, as defined in s. NR 204.07(4), Wis. Adm. Code, a Land Application Site Request Form 3400-053 shall be submitted to the Department for the proposed land application site. The Department will evaluate the proposed site for acceptability and will either approve or deny use of the proposed site. The permittee may obtain permission to approve their own sites in accordance with s. NR 204.06(6), Wis. Adm. Code.

6.6.12 Landfilling of Sludge

General: Sewage sludge may not be disposed of in a municipal solid waste landfill unless the landfill meets the requirements of chs. NR 500 to 536, Wis. Adm. Code, and is an approved facility as defined in s. 289.01(3), Wis. Stats. Any facility accepting sewage sludge shall be approved by the Department in writing to accept sewage sludge. Disposal of sewage sludge in a municipal solid waste landfill shall be in accordance with ss. NR 506.13 and 506.14. Sewage sludge may not be disposed of in a surface disposal unit as defined in s. NR 204.03(62).

Approval: The permittee shall obtain approval from the Department prior to the disposal of sludge at a Wisconsin licensed landfill.

6.6.13 Sludge Landfilling Reports

The permittee shall report the volume of sludge disposed of at any landfill facility on Form 3400-52. The permittee shall include the name and address of the landfill, the Department license number or other state's designation or license number for all landfills used during the report period and a letter of acceptability from the landfill owner. In addition, any permittee utilizing landfills as a disposal method shall submit to the Department any test results used to

indicate acceptability of the sludge at a landfill. Form 3400-52 shall be submitted annually by January 31, each year whether or not sludge is landfilled.

6.6.14 Sludge Incineration Reports

The permittee shall report the volume of sludge combusted at an on-site incinerator on Form 3400-52. Submittal of Form 3400-52 is required annually by January 31, each year whether or not sludge is incinerated.

7 Summary of Reports Due

FOR INFORMATIONAL PURPOSES ONLY

Description	Date	Page
Watershed Adaptive Management Option Annual Report Submittals - Annual Adaptive Management Report	March 31, 2023	29
Watershed Adaptive Management Option Annual Report Submittals - Annual Adaptive Management Report #2	March 31, 2024	29
Watershed Adaptive Management Option Annual Report Submittals - Annual Adaptive Management Report #3	March 31, 2025	29
Watershed Adaptive Management Option Annual Report Submittals - Annual Adaptive Management Report #4	March 31, 2026	29
Watershed Adaptive Management Option Annual Report Submittals - Renewal of Adaptive Management Plan for Permit Reissuance	October 1, 2026	29
Watershed Adaptive Management Option Annual Report Submittals -Final Adaptive Management Report for 1st Permit Term	November 30, 2026	30
Watershed Adaptive Management Option Annual Report Submittals - Comply with Adaptive Management Interim Limit	March 31, 2027	30
Watershed Adaptive Management Option Annual Report Submittals - Annual Adaptive Management Report #6	March 31, 2027	30
Watershed Adaptive Management Option Annual Report Submittals - Annual Adaptive Management Report #7	March 31, 2028	30
Watershed Adaptive Management Option Annual Report Submittals - Annual Adaptive Management Report #8	March 31, 2029	30
Watershed Adaptive Management Option Annual Report Submittals - Annual Adaptive Management Report #9	March 31, 2030	30
Watershed Adaptive Management Option Annual Report Submittals - Annual Adaptive Management Report #10	March 31, 2031	30
Watershed Adaptive Management Option Annual Report Submittals - Renewal of Adaptive Management Plan for Permit Reissuance	October 1, 2031	30
Watershed Adaptive Management Option Annual Report Submittals -Final Adaptive Management Report for 2nd Permit Term	November 30, 2031	31
Watershed Adaptive Management Option Annual Report Submittals - Annual Adaptive Management Report #12	March 31, 2032	31
Watershed Adaptive Management Option Annual Report Submittals - Annual Adaptive Management Report #13	March 31, 2033	31
Watershed Adaptive Management Option Annual Report Submittals - Annual Adaptive Management Report #14	March 31, 2034	31
Watershed Adaptive Management Option Annual Report Submittals - Annual Adaptive Management Report #15	March 31, 2035	31

Watershed Adaptive Management Option Annual Report Submittals - Annual Adaptive Management Report #16	March 31, 2036	31
Watershed Adaptive Management Option Annual Report Submittals - Renewal of Adaptive Management Plan for Permit Reissuance	October 1, 2036	31
Watershed Adaptive Management Option Annual Report Submittals -Final Adaptive Management Report for 3rd Permit Term	November 30, 2036	31
Watershed Adaptive Management Option Annual Report Submittals - Annual Adaptive Management Report #18	March 31, 2037	31
Watershed Adaptive Management Option Annual Report Submittals - Annual Adaptive Management Report #19	March 31, 2038	32
Watershed Adaptive Management Option Annual Report Submittals - Annual Adaptive Management Report #20	March 31, 2039	32
Watershed Adaptive Management Option Annual Report Submittals - Annual Adaptive Management Report #21	March 31, 2040	32
Watershed Adaptive Management Option Annual Report Submittals - Annual Adaptive Management Report #22	March 31, 2041	32
Watershed Adaptive Management Option Annual Report Submittals -Final Adaptive Management Report	November 30, 2041	32
Watershed Adaptive Management Option Annual Report Submittals - Achieve Water Quality Standards and Adaptive Management Plan Success	March 31, 2042	32
Temperature Limits Compliance & Dissipative Cooling Evaluation (GBF Outfall 001) -Preliminary Compliance Report	April 1, 2023	32
Temperature Limits Compliance & Dissipative Cooling Evaluation (GBF Outfall 001) -Action Plan	April 1, 2024	32
Temperature Limits Compliance & Dissipative Cooling Evaluation (GBF Outfall 001) -Construction Plans	October 1, 2024	33
Temperature Limits Compliance & Dissipative Cooling Evaluation (GBF Outfall 001) -Initiate Actions	April 1, 2025	33
Temperature Limits Compliance & Dissipative Cooling Evaluation (GBF Outfall 001) -Complete Actions	October 1, 2025	33
Mercury Pollutant Minimization Program (GBF Outfall 001) -Annual Mercury Progress Reports	March 31, 2023	33
Mercury Pollutant Minimization Program (GBF Outfall 001) -Annual Mercury Progress Report #2	March 31, 2024	33
Mercury Pollutant Minimization Program (GBF Outfall 001) -Annual Mercury Progress Report #3	March 31, 2025	33
Mercury Pollutant Minimization Program (GBF Outfall 001) -Annual Mercury Progress Report #4	March 31, 2026	33
Mercury Pollutant Minimization Program (GBF Outfall 001) -Final Mercury Report	October 1, 2026	33

Mercury Pollutant Minimization Program (GBF Outfall 001) -Annual Mercury Reports After Permit Expiration	See Permit	33
Sludge Management Plan -Sludge Management Plan Submittal	April 1, 2023	34
Mixing Zone Study Submittal GBF (Outfall 001) -Submit Mixing Zone Study	April 1, 2025	34
Compliance Maintenance Annual Reports (CMAR)	by June 30, each year	36
Industrial User Compliance Evaluation and Violation Reports	Semiannual	46
Pretreatment Program Report	Annually	46
General Sludge Management Form 3400-48	prior to any significant sludge management changes	47
Characteristic Form 3400-49 and Lab Report	by January 31 following each year of analysis	48
Land Application Report Form 3400-55	by January 31, each year whether or not non-exceptional quality sludge is land applied	48
Other Methods of Disposal or Distribution Report Form 3400-52	by January 31, each year whether or not sludge is hauled, landfilled, incinerated, or exceptional quality sludge is distributed or land applied	49
Wastewater Discharge Monitoring Report	no later than the date indicated on the form	35

Report forms shall be submitted electronically in accordance with the reporting requirements herein. Any facility plans or plans and specifications for municipal, industrial, industrial pretreatment and non industrial wastewater systems shall be submitted to the Bureau of Water Quality, P.O. Box 7921, Madison, WI 53707-7921. All other submittals required by this permit shall be submitted to:
Northeast Region, 2984 Shawano Avenue, Green Bay, WI 54313-6727

ATTACHMENT B

MEMORANDUM OF UNDERSTANDING BETWEEN GREEN BAY METROPOLITAN SEWERAGE DISTRICT AND THE WISCONSIN DEPARTMENT OF NATURAL RESOURCES (2018)

MEMORANDUM OF UNDERSTANDING BETWEEN GREEN BAY METROPOLITAN SEWERAGE DISTRICT AND THE WISCONSIN DEPARTMENT OF NATURAL RESOURCES

CONFIRMATION OF UNDERSTANDING REGARDING ADAPTIVE MANAGEMENT PROGRAM

This Memorandum of Understanding ("MOU") is effective this 15 day of January, 2018 between the Green Bay Metropolitan Sewerage District ("GBMSD") and the Wisconsin Department of Natural Resources ("WDNR") collectively referred to as the "Parties".

1. **Purpose.** The purpose of this MOU is to clarify the Parties' understanding about the process for implementing an adaptive management project in the Lower Fox River drainage basin pursuant to Wis. Adm. Code § NR 217.18 and Wis. Stat. § 283.13(7) to aid GBMSD in developing a final adaptive management plan for review and approval by the WDNR. The overall goal of the adaptive management plan is to provide a reduction of phosphorus and TSS in the Lower Fox drainage basin that is sufficient to attain compliance with applicable water quality standards and criteria at GBMSD's Quincy Street treatment plant outfall ("GBMSD Outfall"). The Lower Fox drainage basin ("Lower Fox") is defined by the USGS 8 digit hydrologic unit code ("HUC") sub-basin 04030204 measured from the Lake Winnebago Outlet to the mouth of the Fox River at Green Bay.

2. **Settlement Agreement.** The parties have executed a settlement agreement in August, 2015, a copy of which is incorporated by reference herein as Exhibit " A"

(the "Settlement Agreement"). The Settlement Agreement contains certain provisions regarding adaptive management, including that GBMSD shall be allowed four permit terms beginning with GBMSD's next reissued Permit to comply with final water quality based effluent limits for phosphorus and Total Suspended Solids ("TSS"), provided the requirements in paragraphs 2 and 3 of the Settlement Agreement are met.

3. **Adaptive Management Plan.**

   a. GBMSD may submit an adaptive management plan to WDNR, or may choose to comply with requirements for phosphorous and TSS through alternative compliance options. If adaptive management is chosen as GBMSD's compliance option, the plan will be submitted to WDNR no later than December 31, 2018, in accordance with the compliance schedule contained in GBMSD's current WPDES permit.

   b. The current total maximum daily loads ("TMDL") for the Lower Fox are contained in the "Total Maximum Daily Load and Watershed Management Plan for Total Phosphorus and Total Suspended Solids in the Lower Fox River Basin and Lower Green Bay, 2012" (the "TMDL Report"). The TMDL Report outlines EPA approved waste load allocations needed to meet water quality criteria for phosphorous and TSS.

   c. GBMSD's current WPDES permit is set to expire June 30, 2019. If GBMSD selects the adaptive management option for reduction of phosphorous and/or TSS, and if the plan is approved by WDNR, the adaptive management plan shall commence upon the incorporation of the plan in the

next WPDES permit reissuance.

4. **Identifying Watersheds for the Adaptive Management Option.**

   a. GBMSD may select an adaptive management action area ("Action Area") that is located within the Lower Fox upstream from GBMSD's Outfall for implementation of an adaptive management plan, subject to the following criteria:

      i. The Action Area for adaptive management should be of sufficient size to achieve the minimum phosphorus offset and support attainment of the phosphorus water quality criteria in Wis. Admin. Code § NR 102.06, at the GBMSD Outfall.

      ii. The minimum phosphorus offset shall be calculated as the difference between GBMSD's annual mass discharge and the TMDL waste load allocation for GBMSD in the TMDL Report.

      iii. The annual mass discharge shall be determined at the time GBMSD's first WPDES permit which includes an adaptive management plan is issued and may be reviewed and adjusted at each subsequent permit reissuance. The annual mass discharge of phosphorus shall be calculated based on the highest annual load that is likely to occur within the permit term.

      iv. If a partner is added to the adaptive management plan by GBMSD, such as another point source or an MS4, the minimum offset requirements of that partner would be additive to GBMSD's minimum offset for determining the size of the Action Areas. So, for example, if

GBMSD needs 5,000 pounds of phosphorous reduction and another point source added as a partner needs 1,000 pounds of phosphorous reduction , the total minimum offset requirements for phosphorous reductions in the Action Area from agricultural and unregulated urban non-point sources would be 6,000 pounds..

v. Because the best management practices used in adaptive management generally address both phosphorus and TSS, it is anticipated that the minimum phosphorus offset should be sufficient to also address needed TSS reductions.

5. **Interim Progress: Determining Reasonable Progress.**

a. For purposes of determining whether reasonable progress is being made when adaptive management is the selected compliance option during the four permit terms, the following concepts shall apply:

i. GBMSD must document reasonable progress in annual reports and at the end of each permit term to qualify to continue adaptive management as a selected option for the next permit term.

ii. Reasonable progress need not be linear throughout the four permit terms available for compliance for a selected adaptive management plan. In particular, it is possible that more reductions of phosphorous and TSS will occur in the later permit terms than in the earlier permit terms.

b. Factors which the Parties will use to establish reasonable progress may include the following:

i. Monitoring results demonstrating reductions in phosphorus concentration over baseline water quality within the Action Area.

ii. Modeled reductions of phosphorous and TSS from best management practices ("BMPs") implemented within the Action Area. For the purposes of demonstrating interim progress, reductions from BMPs can be modeled for phosphorus and TSS in the Action Area and compared to the reductions for phosphorus and TSS listed in the TMDL for the applicable corresponding subbasin. Reductions can be expressed in units of pounds/year for phosphorus and tons/year for TSS. Modeled reductions will be determined using the best available modeling tools approved by WDNR, and in accordance with applicable WDNR rules.

iii. Contacts with landowners to discuss BMPs and implementation of BMPs based on metrics proposed in the Adaptive Management Plan and approved by WDNR.

iv. Biological monitoring demonstrating improvements to biological metrics within or downstream of the Action Area, as approved by WDNR.

c. Assuming GBMSD meets the reasonable progress requirements and the requirements of paragraph 3 of the Settlement Agreement, GBMSD will be entitled to four consecutive permit terms, unless a law change allows additional permit terms, to comply with the final water quality related effluent limitations contained in its permit.

6. **Interim Phosphorous Concentration Limits for Selected Adaptive Management Plan.**

    a. In the event GBMSD selects adaptive management as its compliance option, GBMSD will be subject to interim effluent limits for phosphorous discharges at its facility.

    b. The interim limits applicable to GBMSD for phosphorous during implementation of the adaptive management plan shall be determined in accordance with section NR 217.18(3)(e), Wis. Adm. Code, where applicable, and shall be:

        i. 0.6 mg per liter expressed as a six month average for the first adaptive management permit term.

        ii. 0.5 mg per liter expressed as a six month average for each of the FOLLOWING three consecutive five year terms of GBMSD's WPDES permit.

        iii. The permits will also include a narrative standard requiring GBMSD to optimize the treatment system to control phosphorus and continue to operate under optimized conditions.

7. **Determining and Maintaining Compliance with Applicable Water Quality Standards and Criteria**

    a. Effluent limits for GBMSD shall be reevaluated if compliance with the applicable water quality standards and criteria has been attained at GBMSD's Outfall. Compliance can be demonstrated in two ways:

        i. Through water quality monitoring at GBMSD's Outfall. Monitoring should be conducted in accordance with current EPA approved water condition assessment guidance (see

http://dnr.wi.gov/topic/surfacewater/assessments.html).

ii. Through an analysis, approved by WDNR and using a minimum of five years of current or most recent data, of the effluent data and watershed loads. The analysis can compare the concentration of phosphorus and TSS in the Lower Fox River at GBMSD's Outfall, subtracting out the influence of Lake Winnebago and subtracting out the influence of Green Bay ("seiche events"), with the TMDL allowable load for the mouth of the Fox River.

b. If compliance with applicable water quality standards and criteria at GBMSD's Outfall is demonstrated, no further reductions are required to satisfy the TMDL waste load allocations so long as the BMPs installed under the adaptive management option are maintained at a level to maintain compliance with applicable water quality standards. BMPs with WDNR, Natural Resource Conservation Service (NRCS), or Department of Agriculture Trade and Consumer Protection (DATCP) technical standards shall be maintained according to the requirements in the corresponding technical standards.

8. **Potential for Conversion to Water Quality Trading Credits**

a. If GBMSD chooses to terminate the adaptive management option or if compliance with the applicable water quality standards and criteria is not attained at GBMSD's Outfall through the adaptive management option, GBMSD shall be entitled to utilize the phosphorous and TSS reductions achieved through use of the adaptive management option in a water quality trading option, so long as those reductions meet the requirements of the trading program established under Wis. Stat. § 283.84, are approved by WDNR, and

are incorporated in a modified or reissued permit.. *See* paragraph 4 of the Settlement Agreement.

b. Pollutant reductions obtained by the BMPs installed under the adaptive management option may be converted into water quality trading credits following the applicable water quality trading statutes and rules, recognizing that WDNR may require documentation or agreements prior to installation of the BMPs. *See e.g.*, Wis. Stat. §§ 283.84(1)(b) and (1m)(a).

c. If a BMP practice implemented under the adaptive management option later becomes mandated by local state or federal law, the phosphorous and TSS reductions associated with that BMP will continue to be counted toward meeting the adaptive management option and can still qualify for conversion to water quality trading credits, so long as the BMP is properly maintained. BMPs with WDNR, NRCS, or DATCP technical standards shall be maintained according to the requirements contained in the corresponding technical standards.

d. Pollutant reductions associated with BMPs installed using Targeted Runoff Management (TRM) Grant funds or other sources of state funding may not be converted into water quality trading credits.

e. Pollutant reductions may be converted to water quality trading credits using the appropriate trade ratios. Pollutant reductions cannot be double counted and used by more than one entity. Water quality trading credits may be comprised of both interim and long term credits.

9. **Express Reservation of Rights of the Parties**.

a. Each Party expressly reserves the right to challenge the adequacy of performance and/or decisions of the other Party under the terms of this MOU.

b. In particular, GBMSD expressly reserves the right to challenge any decisions of the WDNR covered by the MOU and the entry into this MOU shall not be construed to be a waiver of any legal rights that GBMSD may possess to challenge WDNR decisions including, but not limited to the following:

   i. WDNR decisions on whether GBMSD has achieved reasonable progress in implementing the adaptive management plan in the Action Area.

   ii. The need for the water quality based effluent limit based upon future water quality monitoring results for phosphorous and TSS in the Lower Fox.

   iii. The amount of phosphorous or TSS reductions associated with BMPs.

   iv. Whether water quality standards for phosphorous and/or TSS have been met at GBMSD's Outfall.

10. **Modification of this MOU.**

a. This MOU applies in the event an adaptive management plan is selected by GBMSD for an Action Area and is implemented. This MOU may be modified by mutual agreement of the Parties.

b. This MOU is subject to all applicable state and federal laws and regulations and shall be construed in accordance with those laws.

GREEN BAY METROPOLITAN SEWERAGE DISTRICT

By: Thomas Wdgmund Date: 1/15/2018

Thomas Sigmund, Executive Director

WISCONSIN DEPARTMENT OF NATURAL RESOURCES

By: Ed Eberle Date: 1-11-18

for Daniel L. Meyer, WDNR Secretary

ATTACHMENT C

SETTLEMENT AGREEMENT

SETTLEMENT AGREEMENT

THIS SETTLEMENT AGREEMENT ("Agreement") is made as of the 20 day of August, 2015, between the **WISCONSIN DEPARTMENT OF NATURAL RESOURCES** ("WDNR"), and **GREEN BAY METROPOLITAN SEWERAGE DISTRICT** ("GBMSD").

BACKGROUND OF THIS AGREEMENT

A. On April 15, 2014, the WDNR issued Wisconsin Pollution Discharge Elimination System (WPDES) Permit No. WI-0065251-01-0 ("Permit"), to GBMSD with an effective date of July 1, 2014.

B. The Permit includes final water quality based effluent limitations for phosphorus and for total suspended solids ("TSS") that were calculated based upon the "Total Maximum Daily Load and Watershed Management Plan for Total Phosphorous and Total Suspended Solids in the Lower Fox River Basin and Lower Green Bay" ("Lower Fox River TMDL"). The Permit also includes compliance schedules for both the final phosphorus limit and the final TSS limit.

C. After the Permit was issued to GBMSD, the Wisconsin legislature enacted 2013 Wisconsin Act 378, which created Wis. Stat. § 283.13(7). Section 283.13(7) provides the WDNR with authority to authorize a WPDES permittee to use an adaptive management option to comply with the water quality standard for phosphorous or an approved total maximum daily load for TSS, and, if WDNR does so, WDNR may specify a date that provides 4 permit terms for the permittee to comply with its phosphorus or TSS water quality based effluent limitations.

D. On June 11, 2014, GBMSD filed a Petition for Review of the Permit with the WDNR pursuant to Wis. Stat. § 283.63, in which it challenged the TSS and mercury limits

in the Permit and requested a contested case hearing. The WDNR granted in part and denied in part GBMSD's request for a contested case hearing.

E. On September 11, 2014, GBMSD filed a Petition for Judicial Review with the Brown County Circuit Court, in a proceeding entitled *Green Bay Metropolitan Sewerage District v. Wisconsin Department of Natural Resources*, Case No. 14-CV-1313 ("Case No. 14-CV- 1313"), in which GBMSD seeks judicial review of the WDNR's partial denial of GBMSD's request for a contested case hearing.

F. WDNR and GBMSD have reached an agreement regarding the issues raised in GBMSD's Petition for Review pursuant to Wis. Stat. § 283.63, and its Petition for Judicial Review in Case No. 14-CV-1313.

NOW, THEREFORE, it is stipulated and agreed:

1. No later than thirty (30) days following the execution of this agreement, the WDNR shall public notice a proposed modification of the Permit, with terms as set forth in **Attachment A;**

2. If GBMSD chooses to submit a plan for adaptive management as a compliance option for the final water quality based effluent limitation for phosphorus and TSS, the plan will be submitted to WDNR on or before December 31, 2018, in accordance with the compliance schedule in GBMSD's current Permit.

3. If GBMSD's adaptive management plan meets the requirements of sections NR 217.17(1) & (3) and 217.18(1) & (2), Wis. Adm. Code, and WNDR approves the adaptive management plan, GBMSD shall be allowed four permit terms beginning with GBMSD's next reissued Permit to comply with the final water quality based effluent limitations provided that the following requirements are met:

a. GBMSD monitors at locations and times specified in the approved plan and GBMSD's WPDES Permit;

b. GBMSD implements the actions identified in the approved plan in accordance with the goals and measures identified in the plan and the compliance schedule included in GBMSD's Permit and any subsequent reissued Permits;

c. GBMSD optimizes the operation of its current treatment system to control phosphorus and TSS discharges;

d. GBMSD submits annual reports that identify implementation of actions in the plan that were completed the previous year, that demonstrate progress toward meeting water quality standards, and that comply with any other reporting procedures and deadlines for monitoring, assessment, and data gathering requirements in the approved plan;

e. GBMSD complies with the adaptive management interim limits in its Permit and any subsequent reissued Permits. Interim limits for phosphorus shall be determined at each Permit reissuance pursuant to section NR 217.18(3)(e), Wis. Adm. Code. WDNR shall propose interim limits for TSS at each Permit reissuance as follows:

First AM Permit Term TSS Interim Limits		
Green Bay	27 mg/L weekly	18 mg/L monthly
De Pere	12 mg/L weekly	8 mg/L monthly
Second AM Permit Term TSS Interim Limits		
Green Bay	22.5 mg/L weekly	15 mg/L monthly
De Pere	10.5 mg/L weekly	7 mg/L monthly
Third AM Permit Term TSS Interim Limits		
Green Bay	22.5 mg/L weekly	15 mg/L monthly
De Pere	10.5 mg/L weekly	7 mg/L monthly

Fourth AM Permit Term
Compliance with Final WQBEL Limits by the end of the permit term.

4. If GBMSD chooses to terminate the adaptive management option prior to achieving compliance, GBMSD may use the reductions GBMSD has achieved toward a water quality trading program, so long as those reductions meet the requirements of the trading program established under Wis. Stat. § 283.84, are approved by WDNR, and are incorporated into a modified or reissued Permit.

5. If the Permit is modified according to the terms of **Attachment A**, anytime on or before January 1, 2016, GBMSD shall withdraw its Petition for Review pursuant to Wis. Stats. § 283.63, and its request for a contested case hearing.

6. If the Permit is modified according to the terms of **Attachment A**, anytime on or before January 1, 2016, a copy of this Agreement shall be filed in Case No. 14-CV-1313, and, upon filing, GBMSD shall stipulate to dismissal of its Petition for Judicial Review.

7. If the Permit is modified according to the terms of **Attachment A**, anytime on or before January 1, 2016, the WDNR and GBMSD agree to waive any right to seek review of the Permit modification pursuant to either Wis. Stat. §§ 283.63 or 227.42.

8. If the Permit is not modified under the terms of **Attachment A** anytime on or before January 1, 2016, GBMSD may continue to pursue its Petition for Review under Wis. Stat. § 283.63, its request for a contested case hearing, and its Petition for Judicial Review in Case No. 14-CV-1313.

9. The WDNR and GBMSD will cooperate in an effort to work with Urban MS4s within the Lower Fox River watershed to develop a process which would allow permittees,

including GBMSD, within the watershed to enter into agreements to reallocate the Lower Fox River TMDL waste load allocations for TSS.

10. The persons signing this Agreement affirm that they have been authorized to enter into this Agreement by and on behalf of their respective parties and that they have full and complete authority to bind their respective parties to this Agreement.

IN WITNESS WHEREOF, the parties have executed this Agreement in their respective capacities below.

Dated this 20th day of August, 2015.

WISCONSIN DEPARTMENT OF JUSTICE

By: _____
Name: Thomas J. Dawson
Title: Assistant Attorney General

Dated this 19th day of August, 2015.

WISCONSIN DEPARTMENT OF NATURAL RESOURCES

By: _____
Name: Michael Bruhn
Title: Assistant Deputy Secretary

Dated this 12 day of August, 2015.

GREEN BAY METROPOLITAN SEWERAGE DISTRICT

By: _____
Thomas Sigmund
Executive Director

Attachment A

Proposed Modification of Green Bay Metropolitan Sewerage District
WPDES Permit No. WI-0065251-01-0

3 Surface Water Requirements

3.2.5 Sampling Point 076 - Calculated Combined Effluent for TMDL Reporting

Monitoring Requirements and Effluent Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Suspended Solids, Total		lbs/day	Daily	Calculated	Monitor only. The final effluent limits are 4,305 lbs/day as a weekly average and 2,404 lbs/day as a monthly average; see Sections 3.2.5.1, 3.2.5.2, 3.2.5.3, 3.2.5.6 and 3.2.5.7. The compliance schedule for achieving final compliance is found in Section 5.2.
Phosphorus, Total		lbs/day	Daily	Calculated	Monitor only. The final effluent limits are 203 lbs/day as a monthly average and 68 lbs/day as a 6-month average; see Sections 3.2.5.1, 3.2.5.4, 3.2.5.5, 3.2.5.6 and 3.2.5.7. The compliance schedule for achieving final compliance is found in Section 5.1.

3.2.5.1 Calculation of Combined Effluent Results

Results reported under this sample point, for the combined daily mass of total suspended solids and total phosphorus discharged from the GBF and the DPF, shall be calculated as the sum of those respective parameters reported at sample points 001 and 051.

3.2.5.2 Total Suspended Solids Water Quality Based Effluent Limitations

Interim Total Suspended Solids Limitation: The interim effluent limitations for total suspended solids, which are effective on the effective date of this permit, are 45 mg/L as a weekly average and 30 mg/L as a

monthly average for the GBF, and 20 mg/L as a weekly average and 10 mg/L as a monthly average for the DPF.

The final TMDL-based water quality based effluent limits (WQBELs) for total suspended solids are 4,305 lbs/day as a weekly average and 2,404 lbs/day as a monthly average on a combined basis for the GBF and the DPF, unless:

(A) As part of the application for the next reissuance, or prior to filing the application, the permittee submits either:

1) A watershed adaptive management plan and a completed Watershed Adaptive Management Request Form 3200-139; or

2) An application for water quality trading; or

4) An application for a variance; or

4) New information or additional data that supports a recalculation of the numeric limitation;

and,

(B) The Department modifies, revokes and reissues, or reissues the permit to incorporate a revised limitation before the expiration of the compliance schedule*.

* The Department will prioritize reissuances and revocations, modifications, and reissuances of permits to allow permittees the opportunity to implement trading in a timely and effective manner.

If Adaptive Management or Water Quality Trading is approved as part of the permit application for the next reissuance or as part of an application for a modification or revocation and reissuance, the plan and specification submittal, construction, and final effective dates for compliance with the total suspended solids WQBELs may change in the reissued or modified permit. In addition, the numeric value of the water quality based effluent limits may change based on new information or additional data.

If a variance is approved for the next reissuance, interim limits and conditions will be imposed in the reissued permit in accordance with s. 283.15, Stats., and applicable regulations. A permittee may apply for a variance to the total suspended solids WQBELs at the next reissuance even if the permittee did not apply for a total suspended solids variance as part of this permit reissuance.

Note: If a water quality based effluent limit has taken effect in a permit, any increase in the limit is subject to s. NR 102.05(1) and ch. NR 207, Wis. Adm. Code.

3.2.5.3 Alternative Approaches to Total Suspended Solids WQBEL Compliance

Rather than upgrading its wastewater treatment facilities to comply with WQBELs for total suspended solids, the permittee may use Water Quality Trading or the Watershed Adaptive Management Option to achieve compliance, provided that the permit is modified, revoked and reissued, or reissued to incorporate any such alternative approach.

The permittee may also implement an upgrade to its wastewater treatment facilities in combination with Water Quality Trading or the Watershed Adaptive Management Option to achieve compliance, provided that the permit is modified, revoked and reissued, or reissued to incorporate any such alternative approach.

If the Final Compliance Alternatives Plan concludes that a variance will be pursued, the Plan shall provide information regarding the basis for the variance.

3.2.5.4 Phosphorus Water Quality Based Effluent Limitations

Interim Phosphorus Limitation: The interim effluent limitation for phosphorus for the GBF and the DPF is 1.0 mg/L, and is effective on the effective date of this permit.

The final WQBELs for phosphorus are 203 lb/day as a monthly average and 68 lb/day as a 6-month average* on a combined basis for the GBF and the DPF, unless:

(A) As part of the application for the next reissuance, or prior to filing the application, the permittee submits either:

1) A watershed adaptive management plan and a completed Watershed Adaptive Management Request Form 3200-139; or

2) An application for water quality trading; or

3) An application for a variance; or

4) New information or additional data that supports a recalculation of the numeric limitation;

and,

(B) The Department modifies, revokes and reissues, or reissues the permit to incorporate a revised limitation before the expiration of the compliance schedule**.

* The applicable averaging periods for 6-month average Total Phosphorus effluent limits are May through October and November through April.

** The Department will prioritize reissuances and revocations, modifications, and reissuances of permits to allow permittees the opportunity to implement adaptive management or nutrient trading in a timely and effective manner.

If Adaptive Management or Water Quality Trading is approved as part of the permit application for the next reissuance or as part of an application for a modification or revocation and reissuance, the plan and specifications submittal, construction, and final effective dates for compliance with the total phosphorus WQBELs may change in the reissued or modified permit. In addition, the numeric value of the water quality based effluent limit may change based on new information or additional data. If a variance is approved for the next reissuance, interim limits and conditions will be imposed in the reissued permit in accordance with s. 283.15, Stats., and applicable regulations. A permittee may apply for a variance to the phosphorus WQBEL at the next reissuance even if the permittee did not apply for a phosphorus variance as part of this permit reissuance.

Note: If a water quality based effluent limit has taken effect in a permit, any increase in the limit is subject to s. NR 102.05(1) and ch. NR 207, Wis. Adm. Code.

3.2.5.5 Alternative Approaches to Phosphorus WQBEL Compliance

Rather than upgrading its wastewater treatment facilities to comply with WQBELs for total phosphorus, the permittee may use Water Quality Trading or the Watershed Adaptive Management Option, to achieve compliance under ch. NR 217, Wis. Adm. Code, provided that the permit is modified, revoked and reissued, or reissued to incorporate any such alternative approach.

The permittee may also implement an upgrade to its wastewater treatment facilities in combination with Water Quality Trading or the Watershed Adaptive Management Option to achieve compliance, provided that the permit is modified, revoked and reissued, or reissued to incorporate any such alternative approach.

If the Final Compliance Alternatives Plan concludes that a variance will be pursued, the Plan shall provide information regarding the basis for the variance.

3.2.5.6 Submittal of Permit Application for Next Reissuance and Adaptive Management or Pollutant Trading Plan or Variance Application

The permittee shall submit the permit application for the next reissuance at least 6 months prior to expiration of this permit.

If the permittee intends to pursue adaptive management to achieve compliance with the phosphorus and/or total suspended solids WQBELs, the permittee shall submit with the application for the next reissuance: a completed Watershed Adaptive Management Request Form 3200-139, the completed Adaptive Management Plan and final plans for any system upgrades necessary to meet interim limits for phosphorus pursuant to s. NR 217.18, Wis. Adm. Code and/or interim limits for total suspended solids pursuant to a compliance schedule authorized under s. 283.13(7), Wis. Stat.

If the permittee intends to pursue pollutant trading to achieve compliance with the phosphorus and/or total suspended solids WQBELs, the permittee shall submit an application for water quality trading with the application for the next reissuance. If system upgrades will be used in combination with pollutant trading to achieve compliance with the final WQBELs, the reissued permit will specify a schedule for the necessary upgrades.

If the permittee intends to seek a variance, the permittee shall submit an application for a variance with the application for the next reissuance.

3.2.5.7 Total Maximum Daily Load (TMDL) Limitations

The Lower Fox River TMDL Waste Load Allocation (WLA) for Total Phosphorus and Total Suspended Solids was approved by the U.S. Environmental Protection Agency on May 18, 2012. The approved TMDL WLA limits for Total Phosphorus, on a combined basis for the GBF and the DPF, are 203 lbs/day as a monthly average, and 68 lbs/day as a 6-month average. The approved TMDL WLA limits for Total Suspended Solids, on a combined basis for the GBF and the DPF, are 4,305 lbs/day as a weekly average and 2,404 lbs/day as a monthly average. Refer to the compliance schedules for compliance dates.

5 Schedules

5.1 TMDL Derived Water Quality Based Effluent Limits for Total Phosphorus

The permittee shall comply with the WQBELs for Phosphorus as specified. No later than 30 days following each compliance date, the permittee shall notify the Department in writing of its compliance or noncompliance. If a submittal is required, a timely submittal fulfills the notification requirement.

Required Action	Due Date
Initial Operational Evaluation Report: The permittee shall prepare and submit to the Department for approval an operational evaluation report. The report shall include an evaluation of collected effluent data, possible source reduction measures, operational improvements or other minor facility modifications that will optimize reductions in phosphorus discharges from the GBF and the DPF under existing operating conditions. The report shall provide a plan and schedule for implementation of the identified measures, improvements, and modifications as soon as possible, but not later than June 30, 2017. The permittee shall implement the measures, improvements, and modifications in accordance with the plan and schedule specified in the operational evaluation report.	06/30/2015
Compliance Alternatives, Source Reduction, Improvements and Modifications Status: The permittee shall submit a 'Compliance Alternatives, Source Reduction, Operational Improvements and Minor Facility Modification' status report to the Department. The report shall provide an update on the permittee's: (1) progress implementing source reduction measures, operational improvements, and minor facility modifications to optimize reductions in phosphorus discharges; (2) progress evaluating the adaptive management option to include a summary of in-stream monitoring data, conservation inventory report, and other related activities; and (3) status evaluating other feasible alternatives for meeting phosphorus WQBELs including water quality trading.	06/30/2016
Status Report # 2: Submit progress report regarding the progress of: (1) implementing source reduction measures, operational improvements, and minor facility modifications to optimize reductions in phosphorus discharges; (2) evaluating the adaptive management option to include a summary of in-stream monitoring data, conservation inventory report, and other related activities; and (3) evaluating other feasible alternatives for meeting phosphorus WQBELs including water quality trading.	06/30/2017
Status Report # 3 / Amend Operational Evaluation Report: Submit progress report addressing any operational conditions that have significantly changed since the Operational Evaluation Report was submitted, amending that report as applicable, and providing a plan and schedule for the implementation of any newly identified facility optimization measures, improvements, and modifications. Such facility optimization measures, improvements, and modifications are to be implemented as soon as possible, but not later than June 30, 2018.	12/31/2017
Preliminary Compliance Alternatives Plan: The permittee shall submit a preliminary compliance alternatives plan to the Department. If the plan concludes upgrading of the GBF and/or the DPF is necessary to achieve compliance with the final phosphorus WQBELs, the submittal shall include a preliminary engineering design report. If the plan concludes Adaptive Management will be used, the submittal shall include a completed Watershed Adaptive Management Request Form 3200-139 without the Adaptive Management Plan. If water quality trading will be undertaken, the plan must state that trading will be pursued.	03/31/2018
Status Report # 4: Submit progress report regarding the progress of implementing source reduction	06/30/2018

measures, operational improvements, and minor facility modifications to optimize reductions in phosphorus discharges.	
Final Compliance Alternatives Plan: The permittee shall submit a final compliance alternatives plan to the Department. If the plan concludes upgrading of the GBF and/or the DPF is necessary to meet the final phosphorus WQBELs, the submittal shall include a final engineering design report addressing the treatment plant upgrades, and a facility plan if required pursuant to ch. NR 110, Wis. Adm. Code. If the plan concludes Adaptive Management will be implemented, the submittal shall include a completed Watershed Adaptive Management Request Form 3200-139 and an engineering report addressing any treatment system upgrades necessary to meet interim limits pursuant to s. NR 217.18, Wis. Adm. Code. If the plan concludes water quality trading will be used, the submittal shall identify potential trading partners. Note: See 'Alternative Approaches to Phosphorus WQBEL Compliance' in the Surface Water section of this permit.	12/31/2018
Progress Report on Plans & Specifications: Submit progress report regarding the progress of preparing final plans and specifications. Note: See 'Alternative Approaches to Phosphorus WQBEL Compliance' in the Surface Water section of this permit.	06/30/2019
Final Plans and Specifications: Unless the permit has been modified, revoked and reissued, or reissued to include Adaptive Management or Water Quality Trading measures, or to include a revised schedule based on factors in s. NR 217.17, Wis. Adm. Code, the permittee shall submit final construction plans to the Department for approval pursuant to s. 281.41, Stats., specifying treatment plant upgrades that must be constructed to achieve compliance with the final phosphorus WQBELs, and a schedule for completing construction of the upgrades by the complete construction date specified below. (Note: Permit modification, revocation and reissuance, and reissuance are subject to s. 283.53(2), Stats.) Note: See 'Alternative Approaches to Phosphorus WQBEL Compliance' in the Surface Water section of this permit.	06/30/2020
Treatment Plant Upgrade to Meet WQBELs: The permittee shall initiate construction of the upgrades. The permittee shall obtain approval of the final construction plans and schedule from the Department pursuant to s. 281.41. Stats. Upon approval of the final construction plans and schedule by the Department pursuant to s. 281.41, Stats., the permittee shall construct the treatment plant upgrades in accordance with the approved plans and specifications. Note: See 'Alternative Approaches to Phosphorus WQBEL Compliance' in the Surface Water section of this permit.	09/30/2020
Construction Upgrade Progress Report #1: The permittee shall submit a progress report on construction upgrades. Note: See 'Alternative Approaches to Phosphorus WQBEL Compliance' in the Surface Water section of this permit.	09/30/2021
Construction Upgrade Progress Report #2: The permittee shall submit a progress report on construction upgrades. Note: See 'Alternative Approaches to Phosphorus WQBEL Compliance' in the Surface Water section	09/30/2022

of this permit.	
Complete Construction: The permittee shall complete construction of wastewater treatment system upgrades. Note: See 'Alternative Approaches to Phosphorus WQBEL Compliance' in the Surface Water section of this permit.	06/30/2023
Achieve Compliance: The permittee shall achieve compliance with the final phosphorus WQBELs. Note: See 'Alternative Approaches to Phosphorus WQBEL Compliance' in the Surface Water section of this permit.	06/30/2023

5.2 TMDL Derived WQBELs for Total Suspended Solids

The permittee shall comply with the Total Maximum Daily Load (TMDL) derived Water Quality Based Effluent Limits (WQBELs) for Total Suspended Solids (TSS) as specified.

Required Action	Due Date
Initial Operational Evaluation Report: The permittee shall prepare and submit to the Department for approval an operational evaluation report. The report shall include an evaluation of collected effluent data, possible source reduction measures, operational improvements or other minor facility modifications that will optimize reductions in TSS discharges from the GBF and the DPF under existing operating conditions. The report shall provide a plan and schedule for implementation of the identified measures, improvements, and modifications as soon as possible, but not later than June 30, 2017. The permittee shall implement the measures, improvements, and modifications in accordance with the plan and schedule specified in the operational evaluation report.	06/30/2015
Compliance Alternatives, Source Reduction, Improvements and Modifications Status: The permittee shall submit a 'Compliance Alternatives, Source Reduction, Operational Improvements and Minor Facility Modification' status report to the Department. The report shall provide an update on the permittee's: (1) progress implementing source reduction measures, operational improvements, and minor facility modifications to optimize reductions in TSS discharges; (2) progress evaluating the adaptive management option to include a summary of in-stream monitoring data, conservation inventory report, and other related activities; and (3) status evaluating other feasible alternatives for meeting TSS WQBELs including water quality trading.	06/30/2016
Status Report # 2: Submit progress report regarding the progress of: (1) implementing source reduction measures, operational improvements, and minor facility modifications to optimize reductions in TSS discharges; and (2) evaluating other feasible alternatives for meeting TSS WQBELs including water quality trading and the adaptive management option.	06/30/2017
Status Report # 3 / Amend Operational Evaluation Report: Submit progress report addressing any operational conditions that have significantly changed since the Operational Evaluation Report was submitted, amending that report as applicable, and providing a plan and schedule for the implementation of any newly identified facility optimization measures, improvements, and modifications. Such facility optimization measures, improvements, and modifications are to be implemented as soon as possible, but not later than June 30, 2018.	12/31/2017
Preliminary Compliance Alternatives Plan: The permittee shall submit a preliminary compliance alternatives plan to the Department.	03/31/2018

If the plan concludes upgrading of the GBF and/or the DPF is necessary to achieve compliance with the final TSS WQBELs, the submittal shall include a preliminary engineering design report. If the plan concludes Adaptive Management will be used, the submittal shall include a completed Watershed Adaptive Management Request Form 3200-139 without the Adaptive Management Plan. If water quality trading will be undertaken, the plan must state that trading will be pursued.	
Status Report # 4: Submit progress report regarding the progress of implementing source reduction measures, operational improvements, and minor facility modifications to optimize reductions in TSS discharges.	06/30/2018
Final Compliance Alternatives Plan: The permittee shall submit a final compliance alternatives plan to the Department. If the plan concludes upgrading of the GBF and/or the DPF is necessary to meet final TSS WQBELs, the submittal shall include a final engineering design report addressing the treatment plant upgrades, and a facility plan if required pursuant to ch. NR 110. If the plan concludes Adaptive Management will be implemented, the submittal shall include a completed Watershed Adaptive Management Request Form 3200-139, and an engineering report addressing any treatment system upgrades necessary to meet TSS interim limits. If the plan concludes water quality trading will be used, the submittal shall identify potential trading partners. Note: See 'Alternative Approaches to Total Suspended Solids WQBEL Compliance' in the Surface Water section of this permit.	12/31/2018
Progress Report on Plans & Specifications: Submit progress report regarding the progress of preparing final plans and specifications. Note: See 'Alternative Approaches to Total Suspended Solids WQBEL Compliance' in the Surface Water section of this permit.	06/30/2019
Final Plans and Specifications: Unless the permit has been modified, revoked and reissued, or reissued to include Adaptive Management or Water Quality Trading measures, the permittee shall submit final construction plans to the Department for approval pursuant to s. 281.41, Stats., specifying treatment plant upgrades that must be constructed to achieve compliance with the final TSS WQBELs, and a schedule for completing construction of the upgrades by the complete construction date specified below. (Note: Permit modification, revocation and reissuance, and reissuance is subject to s. 283.53(2) Stats.) Note: See 'Alternative Approaches to Total Suspended Solids WQBEL Compliance' in the Surface Water section of this permit.	06/30/2020
Treatment Plant Upgrade to Meet WQBELs: The permittee shall initiate construction of the upgrades. The permittee shall obtain approval of the final construction plans and schedule from the Department pursuant to s. 281.41. Stats. Upon approval of the final construction plans and schedule by the Department pursuant to s. 281.41, Stats., the permittee shall construct the treatment plant upgrades in accordance with the approved plans and specifications. Note: See 'Alternative Approaches to Total Suspended Solids WQBEL Compliance' in the Surface Water section of this permit.	09/30/2020
Construction Upgrade Progress Report #1: The permittee shall submit a progress report on construction upgrades. Note: See 'Alternative Approaches to Total Suspended Solids WQBEL Compliance' in the Surface	09/30/2021

Water section of this permit.	
Construction Upgrade Progress Report #2: The permittee shall submit a progress report on construction upgrades. Note: See 'Alternative Approaches to Total Suspended Solids WQBEL Compliance' in the Surface Water section of this permit.	09/30/2022
Complete Construction: The permittee shall complete construction of wastewater treatment system upgrades. Note: See 'Alternative Approaches to Total Suspended Solids WQBEL Compliance' in the Surface Water section of this permit.	06/30/2023
Achieve Compliance: The permittee shall achieve compliance with the final TSS WQBELs. Note: See 'Alternative Approaches to Total Suspended Solids WQBEL Compliance' in the Surface Water section of this permit.	06/30/2023

ATTACHMENT D

DISSIPATIVE COOLING STUDY (FEBRUARY 2022) AND DNR APPROVAL (APRIL 2023)

State of Wisconsin
DEPARTMENT OF NATURAL RESOURCES
2984 Shawano Avenue
Green Bay, WI 54313-6727

Tony Evers, Governor
Adam N. Payne, Secretary
Telephone (920) 662-5100
Toll Free 1-888-936-7463
TTY Access via relay - 711

April 28, 2023

Thomas Sigmund
Executive Director
NEW Water
2231 N. Quincy St.
Green Bay, WI 54302-1248
//sent electronically//

Subject: Green Bay Metropolitan Sewerage District (NEW Water)
WPDES Permit: WI-0065251-02-1
Dissipative Cooling (DC) Study Response

Dear Mr. Sigmund:

Thank you for submitting the Dissipative Cooling Study. The first draft study plan was received on October 15th, 2021. There were subsequent meetings and discussions between NEW Water and the department to agree upon the plan for the study. The Dissipative Cooling (DC) Study was submitted on February 9, 2022. Further meetings were held between NEW Water and the department to discuss the Study and gather more information on June 8, 2022, and July 25, 2022.

The Dissipative Cooling (DC) Study was reviewed for completeness. Please review the attached checklist for additional comments. Temperature limits are included in the current permit for the months of October and December. The limits were calculated considering the Green Bay Facility as a great lakes shore discharge rather than the flow of the river due to seiche effects. The difference between the maximum weekly average effluent temperatures and the calculated weekly average limits was 2 degrees. Without the influence of seiche effects, the effluent limits would be calculated using the Fox River flows. The annual low flow for the Fox River is 660 cubic feet per second (cfs), this would result in limits of 120 degrees. Monthly low flows at the mouth of the Fox River provided by United States Geological Survey (USGS) are also available; 1055 cfs in October and 2231 cfs in December so the river flow would have even greater influence on mixing. The department concurs that temperature is dissipated near the Green Bay outfall.

This study has satisfied the requirements for a Dissipative Cooling Study and is hereby approved. The Wisconsin Pollutant Discharge Elimination System (WPDES) permit for NEW Water will be modified to remove the temperature compliance schedule. The Mixing Zone Study is still currently under review.

If you have any questions, please contact me (Laura Gerold) at (920) 366-6728 or email at laura.gerold@wisconsin.gov.

Thank you again,

Laura A. Gerold

Laura Gerold, PE
Wastewater Engineer

cc: Kate Verbeten – Environmental Compliance Specialist
Jason Breeggemann – WDNR
Diane Figiel – WDNR
Emma Lorenzen – WDNR
Heidi Schmitt Marquez – WDNR
Phillip Spranger - WDNR
Permit File

Save... Print... Clear Data

State of Wisconsin
Department of Natural Resources
PO Box 7921, Madison WI 53707-7921
dnr.wi.gov

Dissipative Cooling Evaluation Checklist

Form 3400-199 (R 10/13)

Notice: This checklist is meant to be a tool to help Water Quality-Based Effluent Limitation (WQBEL) calculators analyze dissipative cooling (DC) requests made by publicly operated treatment works (POTWs) under ss. NR 106.59(4) or (6), Wis. Adm. Code. Personal information collected will be used for administrative purposes and may be provided to requesters to the extent required by Wisconsin's Open Records Law (ss. 19.31-19.39, Wis. Stats.).

Facility Information

Permittee Name	This DC evaluation is (check one):
Green Bay Metropolitan Sewerage Distict Combined	(•) Original DC Proposal or ( ) Updated DC Proposal
This operation is (check one):	WPDES Permit No.
( ) New or relocated outfall, or (•) Existing outfall	WI-0065251

Submitted Information

Physical Characteristics:

Type of Receiving Water	(•) Non-unidirectional water ( ) Unidirectional water	Comments Discharge is to the Fox River at the mouth of Green Bay, there are signficant seiche effects at this location
Waterbody Type	( ) Cold water fishery (•) Warm water sport fishery ( ) Warm water forage fishery ( ) Limited aquatic life ( ) Wetland ( ) Other _____	Comments s. NR 106.06(1)(b)2 - Green Bay south of 44 32' 30" north latitude is warm water
Substrate	( ) Rocky ( ) Gravel ( ) Sand (•) Silt ( ) Unknown ( ) Other _____	Comments Botton sediments are primarily fine sediments and silt
Emergent Features	( ) Rocks ( ) RipRap (•) Structure ( ) None ( ) Other _____	Comments Outfall transitions from a circular pipe to a rectangular outfall w/ two short and wide effluent exits
Ambient Temperature Data	(•) Available ( ) Not available	Comments s. NR 102.25(5) Green Bay Southern

Operation Characteristics:

Multiple Discharges	(•) There are multiple discharges that may contribute thermal loads ( ) There are NOT multiple discharges	Comments Pulliam Plant decommissioned in 2020 reducing thermal load.
Availability of Effluent Temperature Data	(•) Available ( ) Month(s) only (explain) _____ (•) 12 months of representative data (as defined in NR 106.59(4 or 6) (3) ( ) Not Available	Comments Maximum daily effluent temperatures reported on DMRs
Temperature Profile of Thermal Plume	( ) Data available (•) Zone of free passage identified (•) Zones of free passage present ( ) Zones of free passage absent ( ) No data available	Comments 1984 Dye study conducted under several different flow conditions showed zone of free passage.
Mixing Zone Characteristics	(•) Visual/photographic information ( ) Dye study ( ) No data available	Comments Day of DC study (10/27/21), surface swirling/roiling with sufficient velocity for mixing

Biological Characteristics:

Discharge Impacts on Migration of Organisms	◯ Impeded ◉ Not impeded ◯ Unknown	Comments
Difference Between Communities in and Outside of Discharge	◯ Observed ◉ Not observed ◯ Unknown	Comments
Threatened or Endangered Organisms	◯ Present; information source? ◯ Not present; information source? ◉ Unknown	Comments

Department Determination:
Water Quality Biologist

The water quality biologist concludes the following about the DC study:	◉ Heated effluent from the discharge is not having an impact on the fish and aquatic life in the receiving water ◯ Heated effluent from the discharge may have a marginal impact but does not pose an overall concern to the fish and aquatic life community in the receiving water ◯ Heated effluent from the discharge may cause an impact on the fish and aquatic life in the receiving water and poses a concern to the aquatic life community in the receiving water ◯ Heated effluent from the discharge is causing an impact on the fish and aquatic life in the receiving water ◯ Unsure ◯ Water quality biologist not consulted	Comments *(include name of DNR staff participants)* Jason Breeggemann - fisheries biologist see attached email
Was the regional fisheries biologist consulted by the water quality biologist when making this recommendation?	◉ Yes ◯ No	Comments *(include name of DNR staff participants)* Jason Breeggemann

Additional Support:

Does regional staff or basin engineer support physical evidence of DC?	◉ Yes ◯ No ◯ Not Obtained *If contacted, please attach written response from basin engineer.*	Comments *(include name of DNR staff participants)* Laura Gerold
Did preparer or other DNR staff visit the site or is such person(s) familiar with the site so as to verify and substantiate the information in the submittal?	◉ Yes ◯ No	Comments *(include name of DNR staff participants)* Biologist and preparer familiar with site

Additional written documentation provided?

◉ Yes (if yes, written document should be attached)

◯ No

DC Conclusion

Based on the available information, dissipative cooling for this operation is (check one):

- (•) Approved
- ( ) Not enough evidence
- ( ) Not approved

Additional Justification (if needed)

Temperature limits are included in the permit for the months of October and December. The limits were calculated considering this a great lakes shore discharge rather than the flow of the river due to seiche effects. The difference between the maximum weekly average effluent temperatures and the calculated weekly average limits was 2 degrees. Without the influence of seiche effects, the effluent limits would be calculated using the Fox River flows. The annual low flow for the Fox River is 660 cfs, this would result in limits of 120 degrees. Monthly low flows at the mouth of the Fox River provided by USGS are also available; 1055 cfs in October and 2231 cfs in December so the river flow would have even greater influence on mixing.

Preparer Name	Job Title
Diane Figiel	WQBEL Coordinator

Signature of Preparer: Diane Figiel Date Signed: 3/22/23

A copy of this completed form should be saved in SWAMP, and a notification of the final determination should be sent to the Thermal Implementation Coordinator.

Figiel, Diane - DNR

From: Breeggemann, Jason J - DNR
Sent: Monday, August 1, 2022 9:21 AM
To: Verbeten, Kate; Houghton, Erin
Cc: Boyarski, David E - DNR; Schmitt Marquez, Heidi S - DNR; Gerold, Laura A - DNR; Figiel, Diane - DNR; Lorenzen, Emma K - DNR
Subject: RE: NEW Water_Follow-up to Dissipative Cooling Study Discussion

Good morning Kate and Erin,

First off, thanks to everyone who provided valuable information to help me better understand river flows on the Fox River, details of the permitting process and limit calculations, etc. The information below was most critical in helping me understand the impacts of the effluent as well as how to better interpret the results of the dissipative cooling study:

1.) WDNR staff providing October and December calculated low flows on the Fox River in relation to effluent discharge rates from the NEW Water GBF. Effluent discharge rates from the plant are a small fraction of the calculated October low flows, and even less of the calculated December low flows.
2.) NEW Water showing that there was no changes in water temperature near the outflow compared to the rest of the river during June, July, and August transects at their DC1 site even when effluent temperatures were close to 2 degrees Celsius different than river water temperatures during some sampling events.
3.) The temperature differences between effluent and river water are similar between October and December, meaning cooling patterns should be similar between the months.
4.) The most important factor was the discussion between NEW Water and WDNR staff where NEW water explained in detail how their study on October 27, 2021 was conducted during conditions in which you would expect to see the most severe impact from the wastewater plant. This includes light winds and low river flow rates with near stagnant water at times on the Fox River. According to the USGS gauge, mean daily river discharge on October 27 was the fifth lowest day for October in 2021. Furthermore, flows between 8:00 AM and 1:00 PM were some of the lowest flows of that day. Also, the difference in temperature between the river water and effluent were high since it was conducted at the end of the month. While effluent flow rates were low on the day of the study, the thermal plume was no where close to exceeding the NR 102.05(3)(c) mixing zone constraints of being less than 25% of the cross-sectional area of the waterbody and not extending beyond 50% of the water body width.

Because of the reasons above, I believe there is sufficient data to demonstrate that the NEW Water GBF plant is not having thermal impacts on fish and no further studies are requested from the fisheries biologist at this time.

Please let me know if you have any questions.

Thanks,
Jason

We are committed to service excellence.
Visit our survey at http://dnr.wi.gov/customersurvey to evaluate how I did.

Jason Breeggemann
Phone: (920) 662-5480
Mobile Phone: (920) 420-4619
Jason.Breeggemann@wisconsin.gov

Green Bay Facility Dissipative Cooling Study

Dissipative Cooling Study Report

February 9, 2022

Prepared for:

NEW Water
The brand of the Green Bay Metropolitan Sewerage District

Prepared by:

Jacobs

Contents

Appendices

Figures

1. Background Information

The Green Bay Metropolitan Sewerage District, branded as NEW Water, owns and operates two regional wastewater treatment facilities: the Green Bay Facility (GBF) and the De Pere Facility (DPF). A combined Wisconsin Pollutant Discharge Elimination System (WPDES) permit (WI-0065251-02-0) is issued by the Wisconsin Department of Natural Resources (WDNR) for both facilities. NEW Water submitted a permit renewal application on December 20, 2018, and draft limits proposed by WDNR recommend effluent temperature limits for the GBF. Historically, temperature limits have not been required, in part because of the thermal load to the Fox River from the J.P. Pulliam Generation Station power plant (Pulliam Plant) directly across the river from the GBF outfall. The power plant has recently been decommissioned and no longer has a permitted outfall or discharge.

A Water Quality-Based Effluent Limitations (WQBEL) memorandum (WDNR 2019) and subsequent addendum that included temperature (WDNR, August 7, 2020) recommended weekly average temperature limits for October and December at the GBF outfall to meet sublethal temperature criteria (60 degrees Fahrenheit [°F] in October and 46°F in December). Acute temperature limits at the GBF are not needed, and no temperature limits were recommended for the DPF outfall. In response to the WQBEL memorandum and coordination with WDNR, NEW Water completed a dissipative cooling study to determine if the recommended thermal limits can be removed from the permit.

This report summarizes the results of the dissipative cooling study and supports the submittal of a Dissipative Cooling Request (Form 3400-198) included in Appendix A.

The GBF outfall is located on the east shore of the Fox River, approximately 500 feet south of the bay of Green Bay (Figure 1-1). The Fox River is joined by the East River about 6,970 feet upstream of the GBF outfall. Between the East River confluence and the GBF outfall, there are several industrial discharges to the Fox River. The nearest industrial outfall on the Fox River is about 2,250 feet upstream of the GBF outfall. Some of these discharges may have thermal loads that reach the GBF outfall.

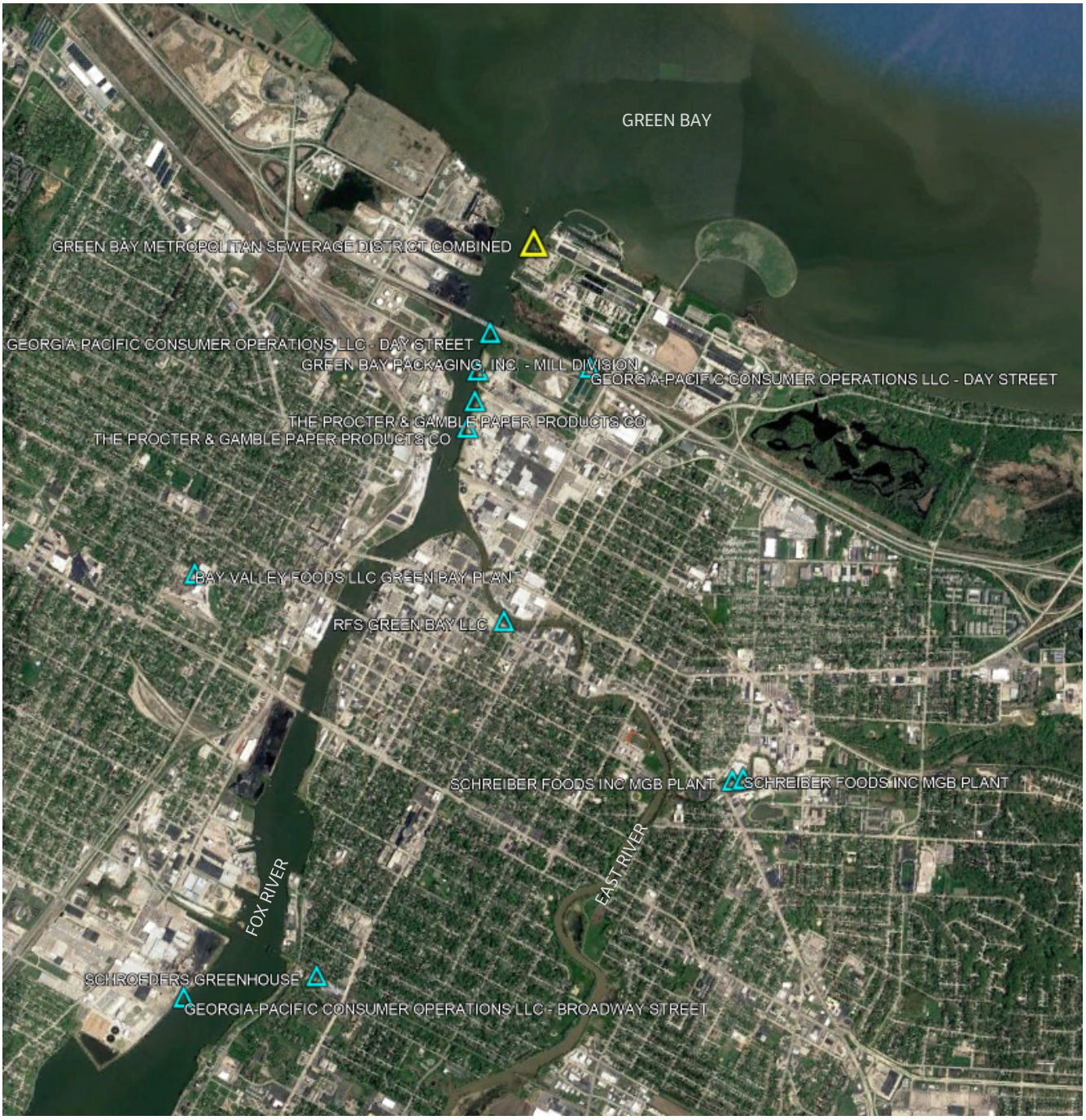


Figure 1-1. Aerial View of the GBF Outfall (yellow) and Other Industrial Dischargers (blue) Near the Dissipative Cooling Study Area

2. Dissipative Cooling Study

2.1 Dissipative Cooling Study Plan

A field study was conducted to evaluate the thermal impact from the GBF effluent on the Fox River and the southern, nearshore waters of the bay of Green Bay. Prior to conducting the study, NEW Water hosted a meeting with WDNR on October 19, 2021, to gain endorsement of the study plan (Appendix B) and its procedures for data collection. Following the meeting, WDNR clarified that if the ambient river temperature is below the sublethal criterion for October (60°F), the goal of the sampling plan should be to collect measurements of sufficient area to demonstrate achieving the criterion (i.e., less than 60°F). If ambient river temperature is above the sublethal criterion (60°F), the goal of the study should be to collect measurements to evaluate the extent of GBF thermal loading against the background temperature. With these comments, WDNR endorsed the proposed sampling plan and agreed that an October field event would be sufficient to demonstrate dissipative cooling, especially if results establish a small mixing zone near the GBF outfall.

2.2 Data Collection Fieldwork

NEW Water staff executed the proposed study on October 27, 2021. Equipment consisted of a 17-foot aluminum jon boat with two staff, one operating a small motor and oar to hold position at the sampling station while the second conducted the temperature sampling. An ArcGIS Collector mobile app allowed the field team to observe their location relative to the sampling locations identified in the study plan. A calibrated temperature and conductivity probe (EXO Sonde) was used to record temperature and conductivity profiles and monitor conditions in real time. Data collection started with sampling near the east bank at NEW Water's GBF outfall followed by sampling north, south, and west in a serpentine pattern at pre-determined distances. Figure 2-1 shows the overall sampling extent; extending to the western shore at 850 feet was not needed.

Profile (vertical) measurements at each sample location were recorded at the near surface (subsurface), 2 meters below the surface (about 6.6 feet) and just above the river bottom. Sampling continued laterally until temperature results were observed below the sublethal criterion for October (60ºF). At least one or more sites were measured beyond the location the sublethal criterion was observed to verify that the conditions were maintained. Thermal loading from the GBF outfall was apparent in the Fox River, where river water temperatures were above ambient conditions. The final sampling area encompassed approximately 100 feet upstream, 150 feet downstream, and 100 feet west from the GBF outfall. Samples were not taken beyond this area (or in the bay of Green Bay), except for a vertical profile sample taken about 550 feet directly west of the outfall for additional background information. The data were reviewed for quality and accuracy and are provided in Appendix C.

Fox River data was retrieved from the U.S. Geological Survey (USGS) gauge website at gauging station USGS 040851385 (Fox River at Oil Tank Depot at Green Bay, Wisconsin) approximately 0.8 mile upstream of the GBF outfall. Data included subsurface temperature, conductivity, flow, and velocity during the time the study was conducted. The data were used to verify that field conditions during sampling were typical for October.

Figure 2-1. Approximate Sampling Perimeter (orange)

3. Results

3.1 Outfall Physical Description

The current GBF outfall was constructed in 1976 and is located on the east shore of the Fox River, approximately 500 feet upstream of where the Fox River meets the bay of Green Bay. The outfall pipe is a 9-foot-diameter (108-inch) circular pipe that runs about 1,520 feet from the GBF to the shorewall, discharging into the Fox River at about mid-depth. Upstream of the shorewall, the outfall transitions from a circular pipe to a rectangular outfall that splits the flow in two and reduces to two short and wide effluent exits. Splitting the flow and using rectangular exit structures (3.5 feet tall by 9.8 feet wide and 3.5 feet tall by 10.9 feet wide) encourages effluent mixing and heat dissipation. The 26.6 million gallons per day (mgd) GBF flow observed on the day of the sampling event had an average velocity of 0.60 foot per second and 0.54 foot per second in the smaller and larger rectangular outfalls, respectively. The average velocity of the GBF flow through the outfall on the day of sampling was 0.57 foot per second.

Upstream of the outfall is a manhole where effluent samples are taken. Appendix D contains a plan view and profile drawing showing the outfall configuration and manhole. Figure 3-1 is a photo of the concrete shorewall outfall location taken from the Fox River.

Figure 3-1. View of the GBF Outfall (Concrete Shorewall)

Over the past 2 years, the GBF daily average effluent flow during October was 30.5 mgd. On the day of field testing, the effluent flow was 26.6 mgd. The flow conditions on the day of fieldwork were within the historical October flows, and consequently, the field day was representative of October conditions.

On the morning of October 27, 2021, NEW Water conducted the dissipative cooling study. Sampling began around 8:00 a.m. and ended just before 1:00 p.m. The weather was mostly overcast, around 48°F, with light wind less than 6 knots out of the east-southeast, building by noon to 8 knots out of the southeast. The Green Bay, Wisconsin, climate information for the day of sampling and all of October 2021 is reported in Appendix C.

Fox River flow and velocity is typically recorded every 5 minutes at the Fox River USGS gauge (USGS 040851385). During the sampling period, the majority of the recorded river flows and velocities were positive (see Appendix C for Fox River flow and velocity data). The flow ranged from -3,900 cubic feet per second (ft^3/s) to 7,290 ft^3/s, and the velocity ranged from -0.27 to 0.51 foot per second, with the majority of water flowing north into lower Green Bay. The condition during sampling was considered a "river dominated system" with little back flow or seiche effects from Green Bay.

The Fox River appeared brown in color during sampling with about 1 meter of visibility. There was no visible effluent plume at the surface indicated by a lack of bubbles or water color differentiation; however, swirling/roiling of water was evident at the river surface near the outfall indicating effluent water mixing with the Fox River. Figure 3-2 includes a picture of the swirling/roiling water pattern.

Figure 3-2. Visible Swirling/Roiling in the Fox River Above the GBF Outfall (Outfall is Concrete Structure at Right)

3.2 Thermal Loading

According to data collected from the Fox River USGS gauge (USGS 040851385), in the last 2 years the daily river temperature for October ranged from approximately 43°F to 68°F. The average Fox River temperature for October is about 56°F, which is consistent with the ambient river temperature (ranging between 52°F and 53°F) recorded on the day of the study.

There does not appear to be thermal loading from upstream industrial dischargers that would influence the GBF thermal plume, because the river was well below the criterion upstream of the GBF outfall. As mentioned previously, the Pulliam Plant, located on the west shore of the mouth of the Fox River, was decommissioned in 2020, greatly reducing the thermal load entering the lower Fox River around the NEW Water GBF outfall. In 2021, Green Bay Packaging (GBP) worked with NEW Water during a mill expansion to convey effluent from GBP to the GBF for treatment, and then constructed a return pipeline of GBF effluent to GBP for use in their new processing at the plant. As a result of this new expansion and effluent reuse, GBP no longer has a primary effluent discharge to the Fox River immediately upstream of the GBF outfall.

3.3 Effluent Temperature Data

From 2020 through 2021, the average daily GBF effluent temperature for the month of October was 72.0°F. The daily effluent temperature during this time ranged from 64.2°F to 78.7°F. On the day of field testing, the daily effluent temperature was 72.5°F, which is typical for October.

3.4 Site-Specific Conditions

The lower Fox River is part of the Total Maximum Daily Load and Watershed Management Plan for Total Phosphorus and Total Suspended Solids in the Lower Fox River Basin and Lower Green Bay (The Cadmus Group, Inc. 2021). Excess phosphorus and excess suspended solids have been identified as main causes of degraded water quality such as nuisance algal growth, oxygen depletion, reduced submerged aquatic vegetation, water clarity problems, and degraded habitat.

As discussed in Section 3.1, the physical configuration of the outfall splits the flow into two smaller openings (3.5 feet tall by 9.8 feet wide and 3.5 feet tall and 10.9 feet wide). The day of the study, the average GBF effluent velocity was 0.57 foot per second, and with evidence of surface swirling/roiling, it was sufficient velocity for mixing. Other physical characteristics of the effluent outfall and receiving stream were previously discussed in this section as well Sections 1 and 2.

According to the Draft 2022 Impaired Waters and Restoration Waters Lists (WDNR 2022), a primary pollutant for the lower Fox River is polychlorinated biphenyl (PCB)-contaminated sediments. In recent years, the Fox River sediments have been dredged for PCB contamination. Ongoing monitoring of sediment, water quality, and biological response to the PCB cleanup is being conducted by WDNR. The U.S. Army Corps of Engineers also routinely performs navigational dredging along the Fox River to maintain water depths for barges and large ships. Rock may have been previously placed in the river at the GBF outfall; however, the Fox River has a significant sediment load that settles in the river and bay. Consequently, the bottom sediments are primarily fine sediments and silt.

Biological information was not collected for this study; however, it is well known that the Fox River, despite its water quality impairments, is a world-class fishery (e.g., walleye). It is common to observe fishing at the outfall during non-ice-over times from the shoreline and boats.

3.5 Results of the Dissipative Cooling Study

The temperature data collected by NEW Water staff show the GBF effluent rising from the effluent structure and the warmer temperatures dissipating within a short distance from the outfall.

The sublethal criterion of 60°F was met close to the outfall: within 100 feet downstream of the outfall, less than 50 feet upstream of the outfall, and less than 75 feet west of the outfall into the Fox River channel (Figure 3-3). The thermal plume meets the NR 102.05(3)(c) mixing-zone size constraints of being less than 25 percent of the cross-sectional area of the water body and not extending beyond 50 percent of the water body width. At each sampling location, temperature was measured in three locations along a vertical profile:

- Subsurface – Temperatures taken just below the surface had the most variability, ranging from 53.2°F to 68.7°F, with most of the temperatures recorded below the sublethal temperature. The warmest temperatures were measured closest to the GBF outfall, and the heat from the warmer effluent water dissipated into the atmosphere and surrounding water within a short distance from the outfall. The observed temperature plume had a defined presence in the near-surface temperature recordings.
- Mid-Depth – The highest temperature recorded, 70.3°F, was measured mid-depth near the outfall. However, the warm temperature quickly dissipated to surrounding water, and most of the temperatures recorded at mid-depth were near or below the background temperature. The temperature plume from the outfall was less defined at mid-depth.
- Near-Bottom – All of the temperature measurements were below the sublethal criterion. The temperature near the bottom of the river was also consistent upstream, downstream, and laterally from the outfall, with some minor temperature increases near the outfall. There was no observable temperature plume from the outfall at near-bottom.

Conductance data were also collected and showed similar trends as the temperature data. Conductance was not further analyzed because the temperature data convincingly demonstrates dissipative cooling within a short distance of the outfall. The temperature data are consistent with what would be expected with warmer, less dense effluent staying in the upper water column, quickly mixing and dissipating within a short distance with cooler, denser river water.

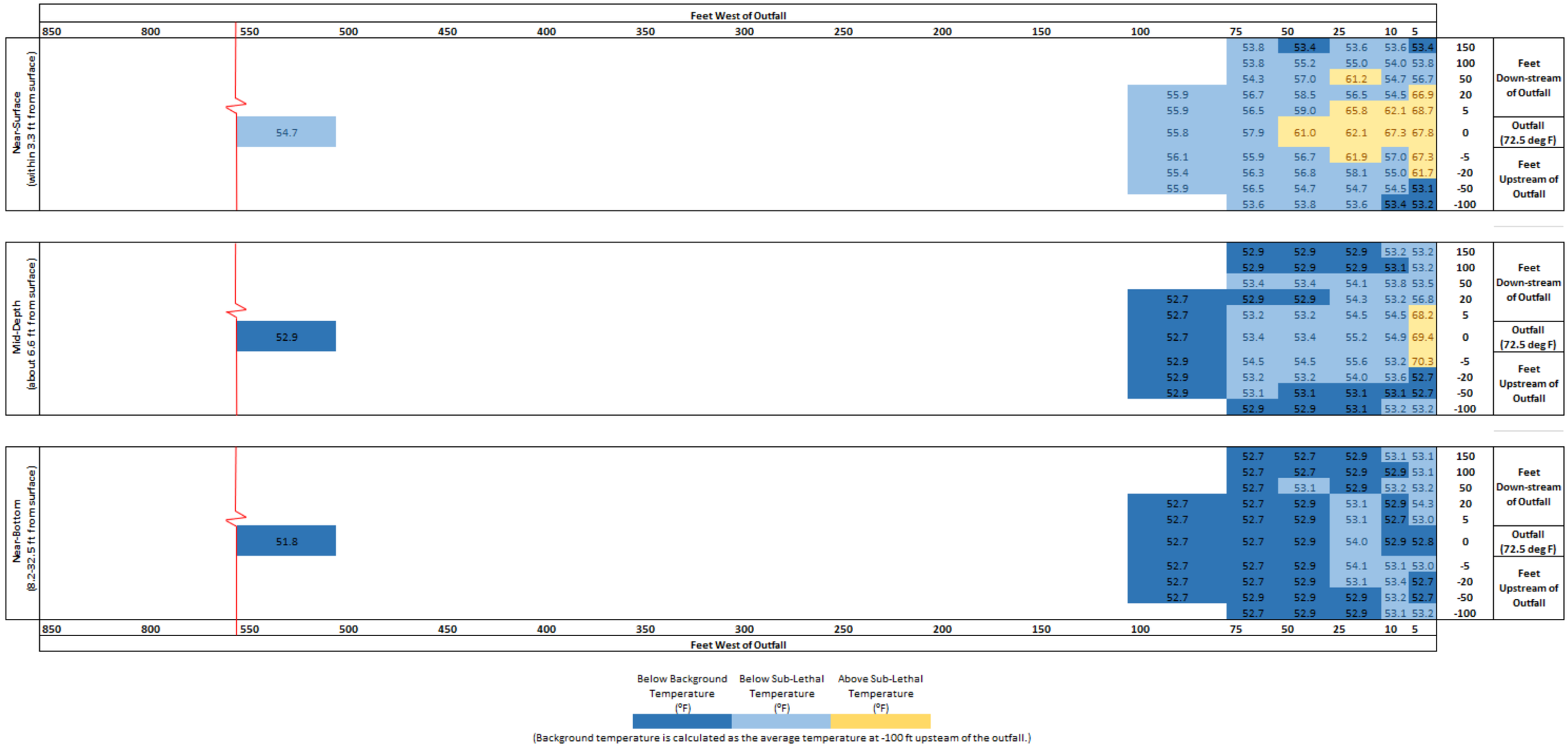


Figure 3-3. Temperature (°F) at Sample Locations

4. Conclusions

The dissipative cooling study was completed on the morning of October 27, 2021, during conditions that were typical and representative of October conditions at the GBF and within the Fox River. The study was executed according to the sampling plan agreed upon by WDNR and demonstrated that the thermal loading dissipated a short distance from the outfall. Additional river water temperature readings were collected beyond where the sublethal criterion (60°F) was met to delineate the extent of the thermal plume. The study did not directly observe thermal impact from upstream sources because the background temperatures, measured at 100 feet upstream of the outfall, were below the sublethal criteria.

Evidence of dissipative cooling for non-unidirectional waters near the GBF outfall includes:

1) An exit velocity of 0.57 foot per second that supports rapid mixing with the Fox River. Rapid mixing is visibly evident with swirling/roiling water on the river surface.

2) GBF effluent rises to the surface and disperses heat to the surrounding water and atmosphere. This is evident by the small thermal plume measured only at the near-surface sampling locations.

3) The measured temperature fell below the October sublethal criterion of 60°F within 100 feet downstream of the outfall, within 50 feet upstream of the outfall, and within 75 feet west of the outfall. The ambient temperature of the Fox River does not increase greatly beyond the small mixing zone.

4) Temperature results from across the sampling area at all three sampling depths show that the heat from the effluent water dispersed rapidly and did not persist in the water column at significant distances. The thermal mixing zone of the GBF outfall is small in both depth and width across the river, meeting NR 102.05(3)(c) mixing-zone size constraints. With the sublethal criterion observed at the shoreline at the bottom, and only extending a maximum of 75 feet near the surface, there is no fish barrier present at this location where the river is about 850 feet wide.

The completed dissipative cooling request form is included in Appendix A. This successful demonstration of dissipative cooling should be sufficient documentation that thermal limits are not needed for the GBF outfall.

5. References

The Cadmus Group, Inc. 2021. *Total Maximum Daily Load and Watershed Management Plan for Total Phosphorus and Total Suspended Solids in the Lower Fox River Basin and Lower Green Bay.* Prepared for WI DNR, Oneida Tribe of Indians of Wisconsin, and USEPA. March.

Wisconsin Department of Natural Resources. (WDNR). 2019. *Water Quality-Based Effluent Limitations for the Green Bay Metropolitan Sewerage District Combined WPDES Permit No. WI-0065251-02.*

Wisconsin Department of Natural Resources. (WDNR). 2020. *Addendum to the Water Quality-Based Effluent Limitations for the Green Bay Metropolitan Sewerage District Combined WPDES Permit No. WI-0065251-02.* August 7.

Wisconsin Department of Natural Resources. (WDNR). 2022. DRAFT 2022 Impaired Waters and Restoration Waters Lists. https://dnr.wisconsin.gov/topic/SurfaceWater/ConditionLists.html.

Appendix A
Dissipative Cooling Request Form

State of Wisconsin
Department of Natural Resources
PO Box 7921, Madison WI 53707-7921
dnr.wi.gov

Dissipative Cooling Request

Notice: Pursuant to ss. NR 106.59(4) and (6), Wis. Adm. Code, this application must be completed for dissipative cooling (DC) evaluation of a publicly operated treatment works (POTW) discharge as related to weekly average temperature limits. Personal information collected will be used for administrative purposes and may be provided to requesters to the extent required by Wisconsin's Open Records Law (ss. 19.31-19.39, Wis. Stats.).

Facility Information

Facility Name	Contact Name
Green Bay Metropolitan Sewerage District	Tom Sigmund
Telephone Number	**Email**
(920) 432-4893	tsigmund@newwater.us
This operation is (check one): ◯ New or relocated outfall, or ◉ Existing outfall	**WPDES Permit No.**
	WI-0065251-01-1

Consultant Information (if consultant performed DC analysis)

Company Name	Preparer Name		
Green Bay Metropolitan Sewerage District	Kate Verbeten		
Telephone Number	**Email**		
(920) 438-1045	kverbeten@newwater.us		
Mailing Address	**City**	**State**	**ZIP Code**
2231 N. Quincy St.	Green Bay	WI	54302

DC Submittal Information

This is a summary. Also see ch. NR 106.59, Wis. Adm. Code, and applicable Thermal Guidance. For each item, check the appropriate box. If information is attached, a column is provided for the applicant to write the page numbers where this information can be found.

Items REQUIRED to Include in the Submittal	Included?	Page Number (if applicable)
1. **Physical Description:** A written description of the physical characteristics of the receiving water or outfall. [s. NR 106.59(4)(a)(1) or 106.59(6)(a)(1), Wis. Adm. Code] *Note: It is recommended that a schematic drawing of location and outfall also be submitted.*	◉ Yes	Section 3-1
2. **Thermal Loading:** A written description of the presence or absence of other thermal loads or discharges of heated water to the receiving water in the vicinity of this outfall (upstream and downstream). [s. NR 106.59(4)(a)(2) or 106.59(6)(a)(2), Wis. Adm. Code]	◉ Yes	Section 3-2
3. **Temperature Data:** The minimum and maximum known effluent temperature for each calendar week for each previously permitted outfall over the past two years. [s. NR 106.59(4)(a)(3) or 106.59(6)(a)(3), Wis. Adm. Code] Must provide if available.	◉ Yes ◯ Some data available, but not to full extent (explain) ◯ Not available	Section 3-3 & Appendix C
4. **Site-Specific Conditions:** For more information on this section see s. NR 106.59(4)(b) or 106.59(6)(b), Wis. Adm. Code. Must provide if available. ***Examples:*** *Biological quality- Species composition, richness, diversity, density, distribution, age, presence/absence of threatened and endangered species, etc.* *Physical characteristics- Bottom substrate of surface water, physical configuration of outfall, discharge velocity, mixing zone, etc.*	◉ Yes ☐ Biological quality ☒ Physical characteristics ☒ Min and max temperatures of the receiving water upstream of outfalls ◯ Not available	Section 3-4
Additional Items that May Be Included in the Submittal	**Included?**	**Page Number (if applicable)**
1. **Data Collection:** If temperature and/or plume data are not available, these data may need to be collected through a dye or temperature profile study. See Thermal Guidance document for additional information.	◉ Yes ☐ Dye study ☒ Temperature profile ☒ Other ◯ No	Appendix C
2. **Visual/photographic information:** It is recommended that photographic or other visual documentation of the outfall and receiving water accompany any DC submittal.	◉ Yes ◯ No	Section 3-1
3. **Other supporting information.**	◉ Yes ◯ No	Appendix C

Data Collection (if applicable)
Describe any studies performed to justify dissipative cooling.

Type of study Field sampling of outfall and receiving water, including temperature profiles.	☐ Dye study ☒ Temperature profile ☐ Other
Time of Year: Month when study was performed October 2021	☐ Jan ☐ Apr ☐ Jul ☒ Oct ☐ Feb ☐ May ☐ Aug ☐ Nov ☐ Ma ☐ Jun ☐ Sep ☐ Dec
Outfall flow conditions *at time of study* Outfall conditions were typical for the month of October.	☐ High ☒ Average ☐ Low
Waterbody flow conditions *at time of study* Fox River conditions were typical for the month of October.	◉ Yes ○ No

Written description of study results. Written description can also be attached.
Please see attached report. October sublethal water quality criteria were met within a short distance from the outfall: within 50 feet upstream of the outfall, 100 feet downstream of the outfall, and 75 feet laterally from the outfall.

Justification for DC: Check ALL that apply. Justification and rationale used to reach this justification should be included in the written description (included on next page or attached to this document), as required in ss. NR 106.59(4) or (6), Wis. Adm. Code.

Physical Evidence of DC:

- ☒ Non-unidirectional waters
  - ☒ Exit velocity such that rapid mixing of effluent occurs
  - ☒ Loss of heat to the atmosphere
  - ☒ Heat disperses rapidly and does not persist in water column at significant distances
  - ☒ Ambient temperature of waterbody does not increase greatly (less than or equal to 3°F) at a point more than a few hundred feet from the outfall
- ☐ Unidirectional waters
  - ☐ Exit velocity such that rapid mixing of effluent occurs
  - ☐ Rough bottom substrates present resulting in turbulent flow
  - ☐ Loss of heat to the atmosphere
  - ☐ Thermal mixing zone does not extend more than 25% of the cross-sectional area or more than 50% of the width of the receiving stream
  - ☐ Zone(s) of free passage exist for fish and aquatic life
  - ☐ Ambient temperature of waterbody does not increase greatly (less than or equal to 5°F) at a point more than 5 to 10 stream widths downstream of outfall

Biological Evidence of DC:

- ☐ Discharge does not impede migration of organisms
- ☐ No observed difference between communities in and outside of discharge
- ☐ No presence of threatened or endangered organisms

Other Information:

- ☒ Multiple thermal effluent discharges do not exist
- ☒ Other

Written Description as required in s. NR 106.59(4) or (6), Wis. Adm. Code: All required written descriptions as well as justification for dissipative cooling should be included. See table on page 1, administrative code, and/or applicable Thermal Guidance for more information. Written description and justification may also be attached.

Please see attached report. River temperatures were below the October sublethal water quality criteria within 50 feet upstream of the outfall, 100 feet downstream of the outfall, and 75 feet laterally from the outfall.

Additional information can be found in the Rule Order on the Thermal Standards, the Guidance for Implementation of Wisconsin's Thermal Water Quality Standards, and the frequently asked questions page. These resources are available at: http://dnr.wi.gov/org/water/wm/wqs/thermalrulesrevisions.htm.

The Preparer and the Owner Certify the Following:

- I am familiar with the specifications submitted for this application, and I believe all applicable items in this checklist have been addressed.
- I have completed this document to the best of my knowledge and have not excluded pertinent information.
- I certify that the information in this document is true to the best of my knowledge.

Signature of Preparer	Date Signed
Kate E Kurkoski	February 9, 2022

Appendix B
Dissipative Cooling Study Sampling Plan

Jacobs

Memorandum

Subject	NEW Water Dissipative Cooling Study Plan - DRAFT
Attention	Kate Verbeten, NEW Water Sarah Bartlett, NEW Water Erin Houghton, NEW Water
From	Jacobs
Date	October 13, 2021

The purpose of this memorandum is to summarize a work plan for the NEW Water dissipative cooling (DC) study for the Green Bay Facility (GBF). The GBF received effluent temperature limits for the months of October and December in its Wisconsin Pollutant Discharge Elimination System (WPDES) DRAFT permit (WI-0065251-02-0). A field study is planned over one day in late October or early November during typical weather and flow conditions.

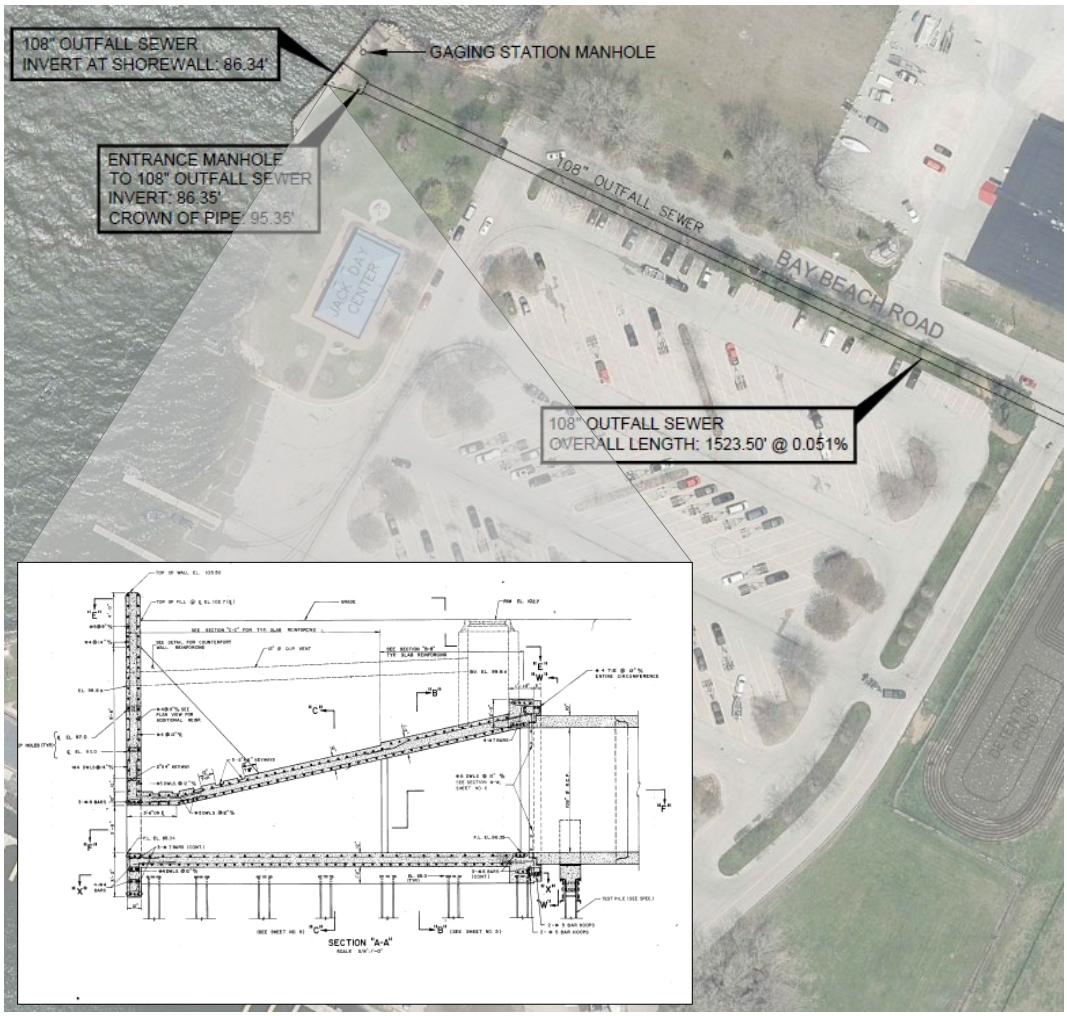
Background Information

The overall goal of this DC study is to evaluate the thermal impact from the GBF on the Fox River and the southern, nearshore waters of the bay of Green Bay. A Dissipative Cooling Request (Form 3400-198) as outlined in the Wisconsin Department of Natural Resources (WDNR) publication Guidance for Implementation of Wisconsin's Thermal Water Quality Standards (August 2013) will be used to guide the associated field work and reporting to the WDNR.

The GBF outfall is located on the east shore of the Fox River, approximately 500 feet south of where the Fox River meets the bay of Green Bay. The outfall was constructed in 1971. A plan view and profile drawing showing the outfall configuration is shown in Exhibit A.

The Fox River is joined by the East River about 6,970 feet upstream of the GBF outfall (Exhibit B), and there are effluent discharges by industries between the De Pere Dam and the GBF outfall. The nearest industrial outfall on the Fox River is about 2,250 feet upstream of the GBF outfall, however thermal loads from these sources could be present at the GBF outfall. Consequently, the data collection will include sample locations between the GBF outfall and the downstream-most industrial outfall to establish a background thermal condition upstream of the GBF outfall. Data will be collected across the Fox River, downstream of the GBF outfall and throughout the facility's thermal plume, and upstream of the outfall to determine where the facility's thermal plume is dissipated to background conditions. The data will then be compared to the background readings. Temperature and conductivity measurements will be used to assess the facility's thermal plume.

Exhibit A: GBF Outfall Plan and Profile Views



Field Study

1. Flow, temperature, and conductivity of the Fox River are measured from USGS Station 040851385 at the Oil Tank Depot in Green Bay, Wisconsin. This station is approximately 4,200 feet upstream of the GBF outfall, both of which are labeled on Exhibit B. The USGS data and weather conditions will be reviewed prior to sampling to determine if conditions are typical for the time of year.

2. Exhibits C and D summarize the proposed sampling transects from the outfall into the river and bay. A background transect will be located at about 900 ft upstream of the GBF outfall. Transects will be at approximately the following distances from the outfall (outfall = "0"); -900 feet, -500 feet, -300 feet, -100 feet, -50 feet, -5 feet, 0 feet, +5 feet, +50 feet, +100 feet, +300 feet, +500 feet, and +900 feet. Samples will be collected at various sample stations from five feet to 800 feet from the east shore of the Fox River. A matrix describing sample station locations is shown in Exhibit E. Sampling stations will be adjusted in the field to document changes in conductivity or flow characteristics, to locate where the thermal plume dissipates to background conditions.

3. Along each transect and sample location, the field team will collect temperature and conductivity measurements. Due to the water depth, a boat will be used as the platform for data collection. Data collection will be completed from the front of the boat so that the boat motor propeller does not impact water turbulence. Temperature and conductivity measurements will be taken just below the surface, mid-depth, and approximately one meter from the bottom.

4. Record the GBF effluent temperature (at the GBF WPDES monitoring location) at the beginning and end of the field event.

5. Photograph the effluent outfall area and river. Aerial drone photos will also be collected if possible, and if mixing characteristics can be observed.

Following the data collection event, the data will be graphed and interpreted to evaluate the thermal mixing area and the extent of the thermal plume when compared to background river conditions. The data will be plotted with an initial data review while in the field to determine if additional data collection made be needed and the same day, such as if higher density sampling locations are needed. Bottom substrate and biological data will not be collected.

Exhibit B: GBF Outfall Location

Exhibit C: Proposed Transect Locations

Exhibit D: Proposed Transect Locations Near GBF Outfall

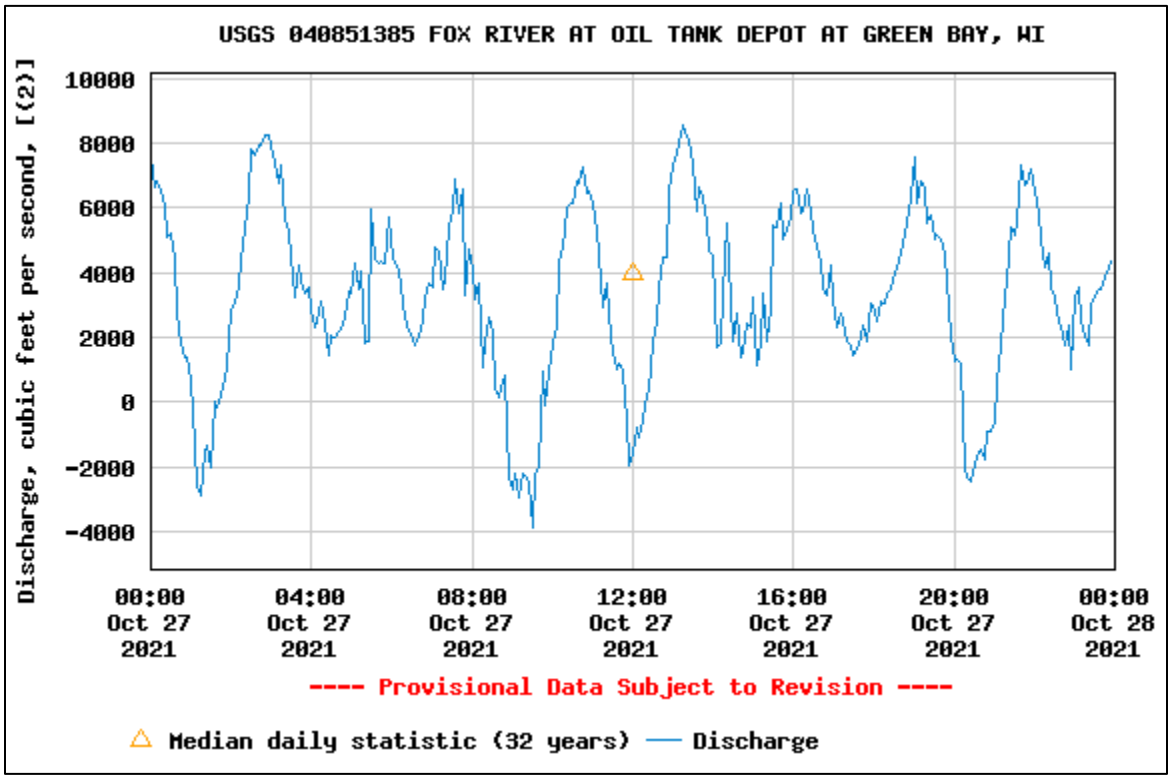
Exhibit E: Proposed Sampling Locations

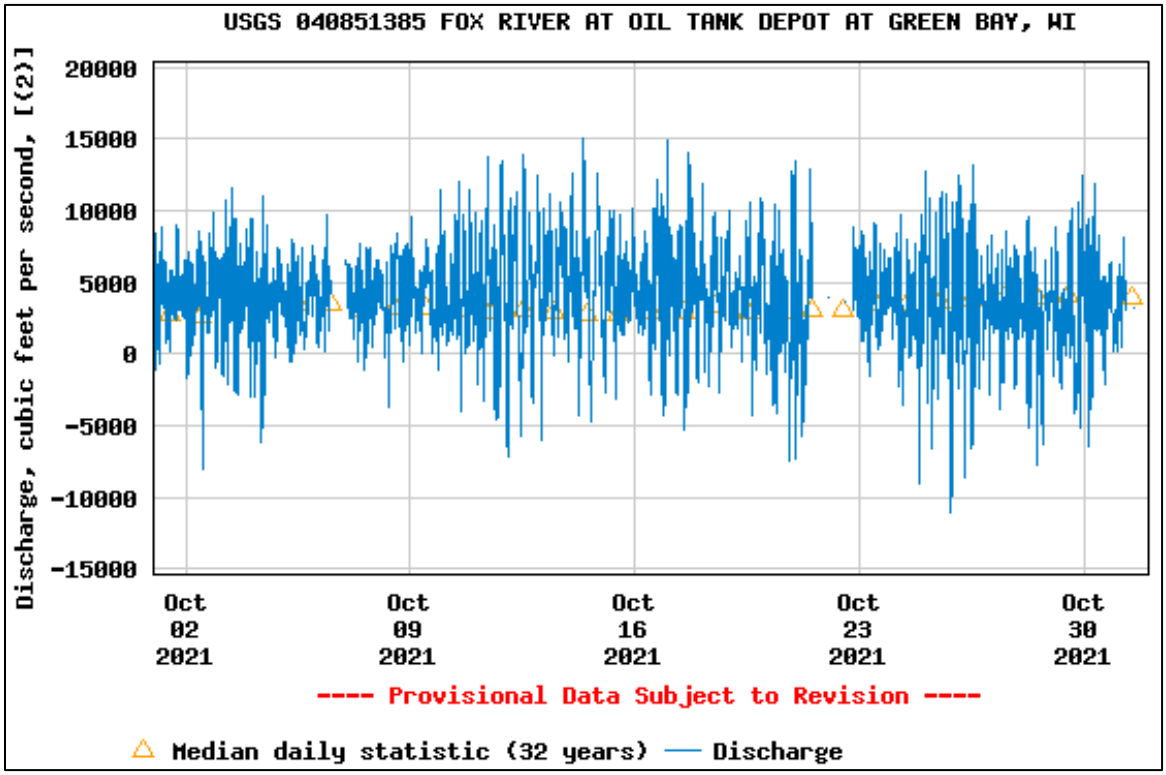
Transect from Outfall (ft)	Feet from East Shore of Fox River															
	5	10	25	50	75	100	150	200*	250*	300*	350*	400*	500*	600*	700*	800*
+ 900 (background)		X		X		X				X			X			X
+ 500 (if needed)		X		X		X				X			X			
+ 300	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
+ 100	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
+ 50	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
+ 5	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
0 (GBF Outfall)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
- 5	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
- 50	X	X		X		X		X		X		X	X		X	
- 100 (if needed)		X		X		X		X		X		X	X		X	
- 300 (if needed)						X				X			X			
- 500 (if needed)						X				X			X			
- 900 (background)		X		X		X				X			X			X

* Initial observations indicate that the outfall plume does not extend beyond 200 feet from the eastern shore. Data will not be collected beyond where the thermal plume has been confirmed to have dissipated the day of sampling.

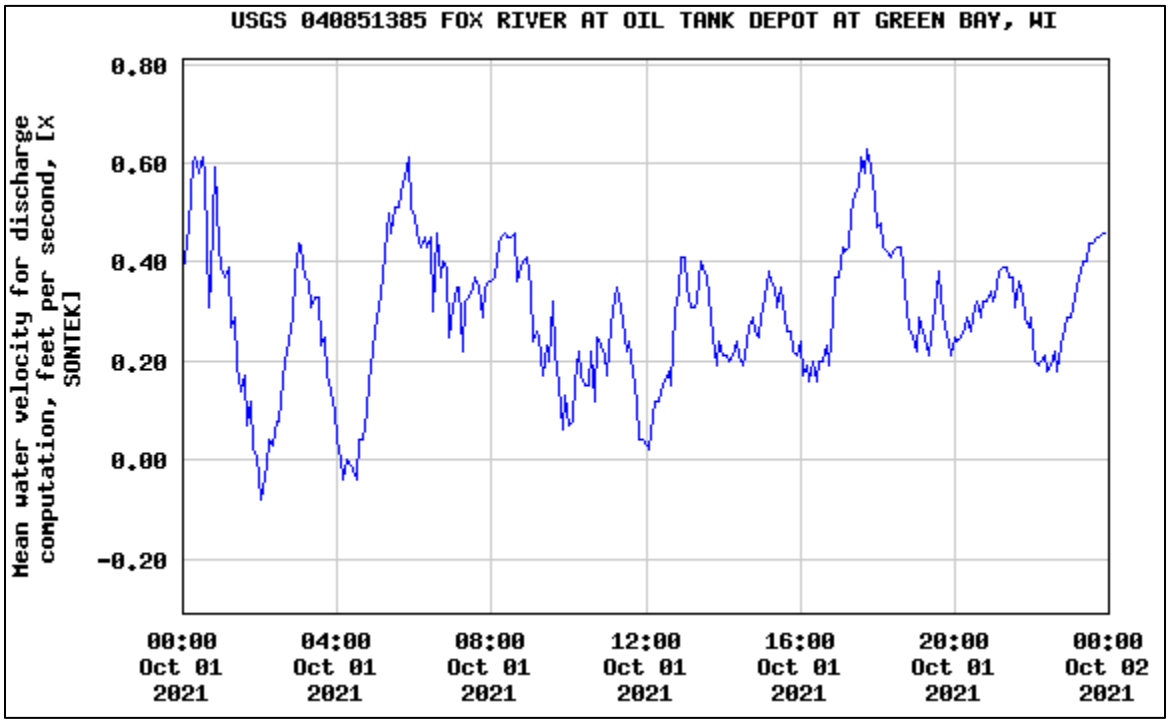
Appendix C
Results Data

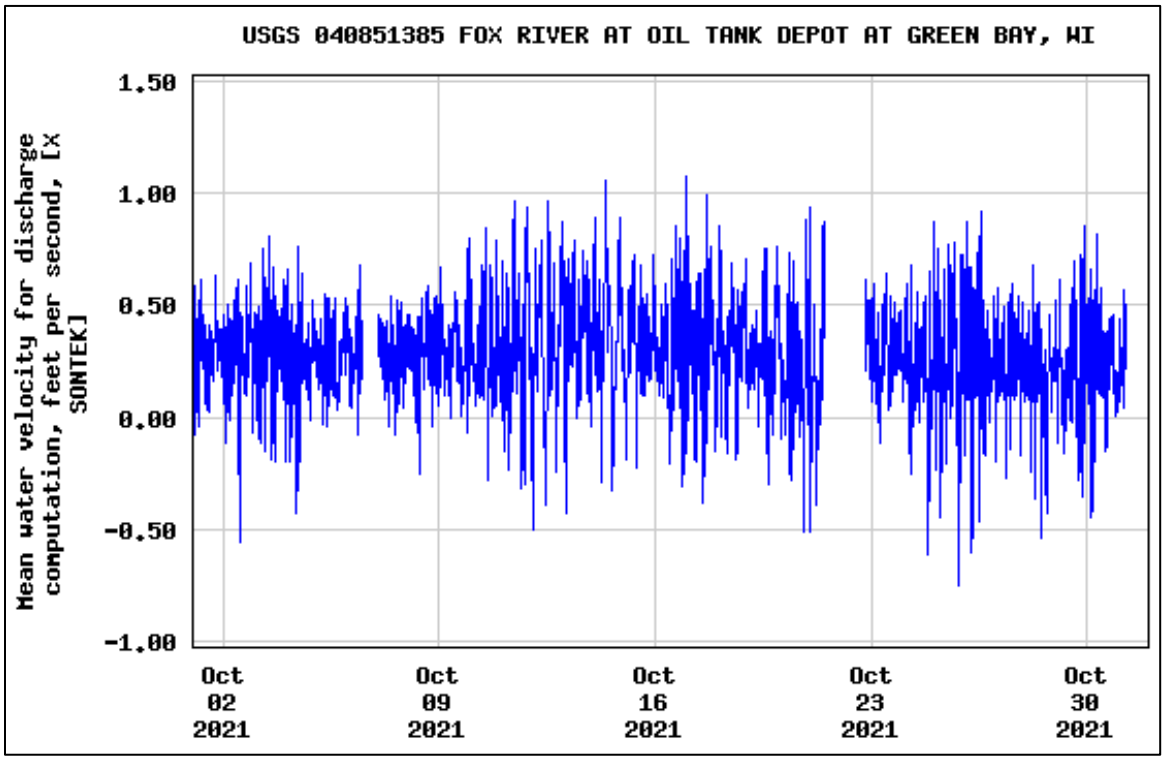
Fox River Flow on Day of Sampling and for October 2021



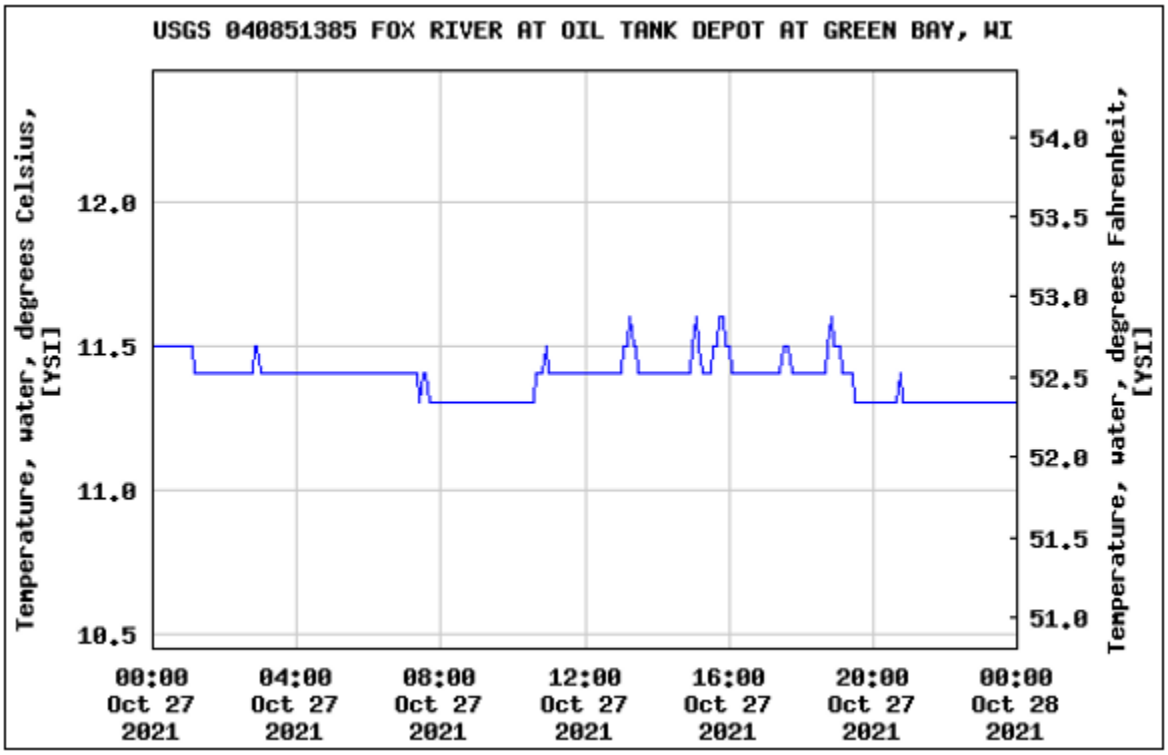


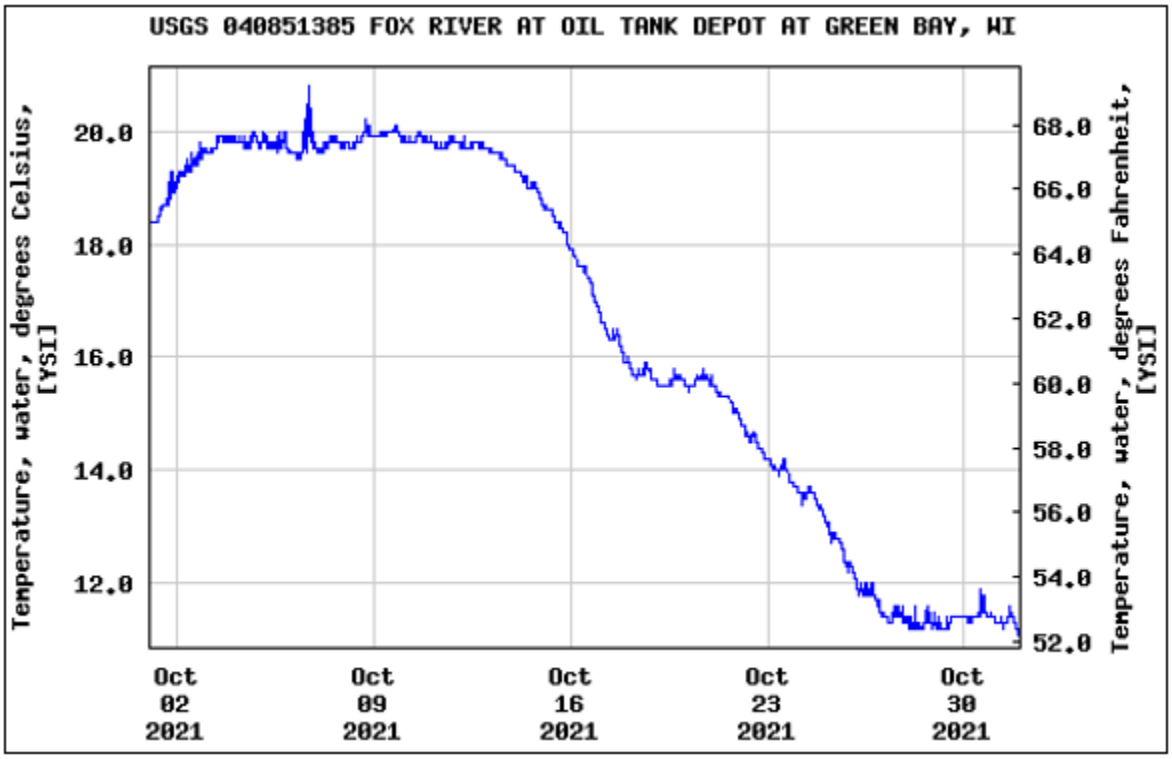
Fox River Velocity on Day of Sampling and for October 2021





Fox River Temperature Data from Day of Sampling and for October 2021





October 2021 Climate Information for Green Bay, Wisconsin

Climatological Data for Green Bay Area, WI (ThreadEx) - October 2021

Click column heading to sort ascending, click again to sort descending.

Date	Temperature				HDD	CDD	Precipitation	New Snow	Snow Depth
	Maximum	Minimum	Average	Departure					
2021-10-01	84	50	67.0	12.1	0	2	0.00	0.0	0
2021-10-02	80	62	71.0	16.5	0	6	0.02	0.0	0
2021-10-03	67	61	64.0	10.0	1	0	0.20	0.0	0
2021-10-04	67	60	63.5	9.9	1	0	0.02	0.0	0
2021-10-05	71	54	62.5	9.3	2	0	0.00	0.0	0
2021-10-06	74	52	63.0	10.2	2	0	0.00	0.0	0
2021-10-07	68	52	60.0	7.6	5	0	0.42	0.0	0
2021-10-08	75	59	67.0	15.0	0	2	0.02	0.0	0
2021-10-09	72	60	66.0	14.5	0	1	0.00	0.0	0
2021-10-10	76	63	69.5	18.4	0	5	T	0.0	0
2021-10-11	68	63	65.5	14.8	0	1	0.02	0.0	0
2021-10-12	68	61	64.5	14.2	0	0	0.10	0.0	0
2021-10-13	67	54	60.5	10.6	4	0	T	0.0	0
2021-10-14	68	45	56.5	7.0	8	0	0.00	0.0	0
2021-10-15	61	39	50.0	0.9	15	0	T	0.0	0
2021-10-16	61	41	51.0	2.3	14	0	0.00	0.0	0
2021-10-17	67	40	53.5	5.2	11	0	0.00	0.0	0
2021-10-18	70	35	52.5	4.6	12	0	0.00	0.0	0
2021-10-19	74	41	57.5	10.0	7	0	0.00	0.0	0
2021-10-20	63	47	55.0	7.9	10	0	0.24	0.0	0
2021-10-21	56	35	45.5	-1.2	19	0	0.02	0.0	0
2021-10-22	47	33	40.0	-6.3	25	0	0.00	0.0	0
2021-10-23	54	32	43.0	-2.9	22	0	0.00	0.0	0
2021-10-24	51	28	39.5	-6.0	25	0	T	0.0	0
2021-10-25	50	36	43.0	-2.1	22	0	T	0.0	0
2021-10-26	52	32	42.0	-2.7	23	0	0.00	0.0	0
2021-10-27	56	33	44.5	0.2	20	0	0.00	0.0	0
2021-10-28	56	50	53.0	9.1	12	0	0.03	0.0	0
2021-10-29	56	49	52.5	9.0	12	0	0.06	0.0	0
2021-10-30	60	38	49.0	5.9	16	0	0.00	0.0	0
2021-10-31	51	35	43.0	0.3	22	0	0.00	0.0	0
Sum	1990	1440	-	-	310	17	1.15	0.0	-
Average	64.2	46.5	55.3	6.6	-	-	-	-	0.0
Normal	58.0	39.5	48.7	-	507	4	2.67	0.3	-

Observations for each day cover the 24 hours ending at the time given below (Local Standard Time). Observation times may have changed during this period.
Max Temperature : midnight
Min Temperature : midnight
Precipitation : midnight
Snowfall : unknown, midnight
Snow Depth : unknown, 6am

Daily and Weekly GBF Effluent Temperature

Daily Average Temp	
Date	**Temp (°F)**
10/1/2021	77.5
10/2/2021	78.1
10/3/2021	77.5
10/4/2021	75.7
10/5/2021	75.5
10/6/2021	75.9
10/7/2021	76.4
10/8/2021	77.1
10/9/2021	77.6
10/10/2021	77.6
10/11/2021	76.5
10/12/2021	76.5
10/13/2021	76.0
10/14/2021	75.8
10/15/2021	75.7
10/16/2021	74.9
10/17/2021	74.2
10/18/2021	73.9
10/19/2021	74.4
10/20/2021	74.3
10/21/2021	74.1
10/22/2021	73.1
10/23/2021	73.5
10/24/2021	73.5
10/25/2021	71.9
10/26/2021	71.6
10/27/2021	72.5
10/28/2021	73.2
10/29/2021	73.0
10/30/2021	72.2
10/31/2021	71.3
Average	74.9
Min	71.3
Max	78.1

Weekly Average Temp	
Week of October	**Temp (°F)**
1	76.5
2	76.1
3	73.9
4	72.6
Average	74.8
Min	72.6
Max	76.5

2020 Weekly Minimum and Maximum GBF Effluent Temperature

Week of	Min Temp (°F)	Max Temp (°F)
12/29/2019	53.42	57.67
1/5/2020	55.30	56.79
1/12/2020	54.62	55.47
1/19/2020	54.83	56.23
1/26/2020	54.36	56.62
2/2/2020	55.03	56.15
2/9/2020	53.95	55.53
2/16/2020	54.59	55.71
2/23/2020	54.68	56.73
3/1/2020	55.71	56.70
3/8/2020	52.13	56.79
3/15/2020	52.81	55.91
3/22/2020	53.36	55.88
3/29/2020	53.66	56.44
4/5/2020	55.91	58.20
4/12/2020	55.03	57.82
4/19/2020	55.41	57.96
4/26/2020	57.38	59.02
5/3/2020	59.66	61.45
5/10/2020	58.90	64.15
5/17/2020	57.41	63.21
5/24/2020	63.09	66.14
5/31/2020	63.03	68.16
6/7/2020	65.82	70.95
6/14/2020	66.87	71.60
6/21/2020	69.50	72.00
6/28/2020	72.40	75.50

Week of	Min Temp (°F)	Max Temp (°F)
7/5/2020	72.30	76.70
7/12/2020	73.10	75.40
7/19/2020	74.20	76.20
7/26/2020	75.20	77.40
8/2/2020	73.30	76.60
8/9/2020	76.00	77.40
8/16/2020	76.10	78.00
8/23/2020	75.00	78.00
8/30/2020	73.60	74.90
9/6/2020	70.90	73.80
9/13/2020	71.40	75.40
9/20/2020	72.60	75.30
9/27/2020	71.10	74.30
10/4/2020	69.30	73.20
10/11/2020	69.70	72.50
10/18/2020	66.20	69.30
10/25/2020	64.20	67.40
11/1/2020	63.80	68.60
11/8/2020	65.50	69.20
11/15/2020	64.00	65.40
11/22/2020	63.00	64.30
11/29/2020	61.40	63.30
12/6/2020	60.90	64.10
12/13/2020	59.70	61.60
12/20/2020	58.00	61.70
12/27/2020	56.90	60.95

2021 Weekly Minimum and Maximum GBF Effluent Temperature

Week of	Min Temp (°F)	Max Temp (°F)
1/3/2021	58.46	61.99
1/10/2021	59.51	61.78
1/17/2021	58.90	61.20
1/24/2021	58.44	61.08
1/31/2021	58.50	61.35
2/7/2021	57.27	60.08
2/14/2021	56.25	58.31
2/21/2021	56.81	61.41
2/28/2021	59.04	61.49
3/7/2021	60.18	62.30
3/14/2021	60.45	60.72
3/21/2021	59.44	60.86
3/28/2021	58.25	61.84
4/4/2021	62.06	65.24
4/11/2021	62.11	64.20
4/18/2021	63.13	64.95
4/25/2021	63.96	66.06
5/2/2021	65.42	67.69
5/9/2021	66.01	68.40
5/16/2021	68.99	71.83
5/23/2021	68.51	72.55
5/30/2021	68.65	73.70
6/6/2021	72.99	76.96
6/13/2021	75.06	77.16
6/20/2021	74.62	76.09
6/27/2021	70.16	74.76

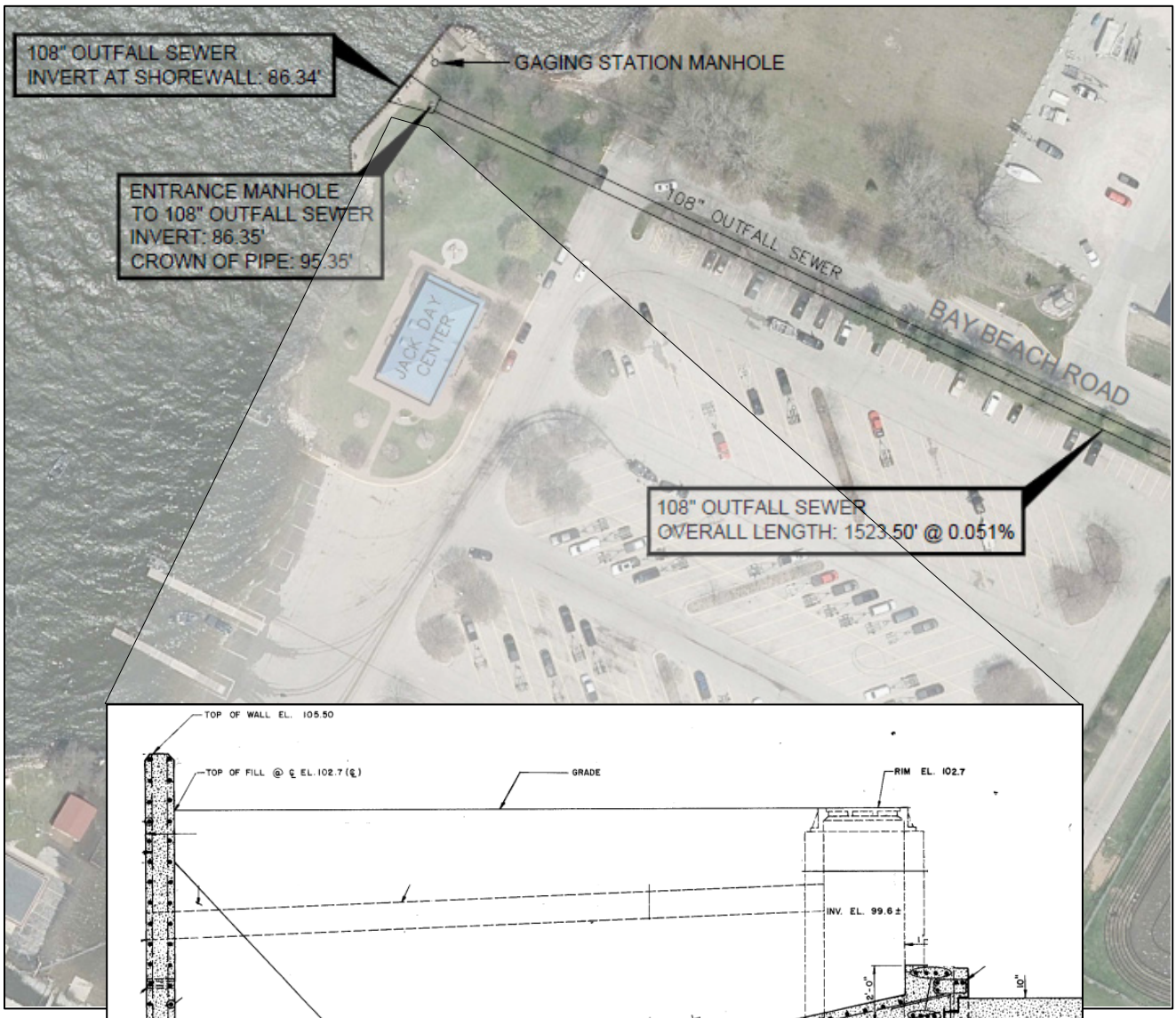
Week of	Min Temp (°F)	Max Temp (°F)
7/4/2021	72.20	75.21
7/11/2021	73.26	76.48
7/18/2021	73.76	78.18
7/25/2021	76.99	78.20
8/1/2021	76.11	79.38
8/8/2021	71.51	75.56
8/15/2021	74.80	79.43
8/22/2021	77.69	79.65
8/29/2021	77.06	77.94
9/5/2021	75.12	78.21
9/12/2021	77.98	78.81
9/19/2021	76.04	78.71
9/26/2021	76.52	78.05
10/3/2021	75.53	77.60
10/10/2021	74.87	77.58
10/17/2021	73.11	74.41
10/24/2021	71.62	73.53
10/31/2021	68.93	71.31
11/7/2021	69.54	70.51
11/14/2021	67.22	70.02
11/21/2021	66.31	68.89
11/28/2021	66.19	67.93
12/5/2021	64.47	66.43
12/12/2021	63.94	66.81
12/19/2021	63.05	64.88
12/26/2021	61.65	64.78

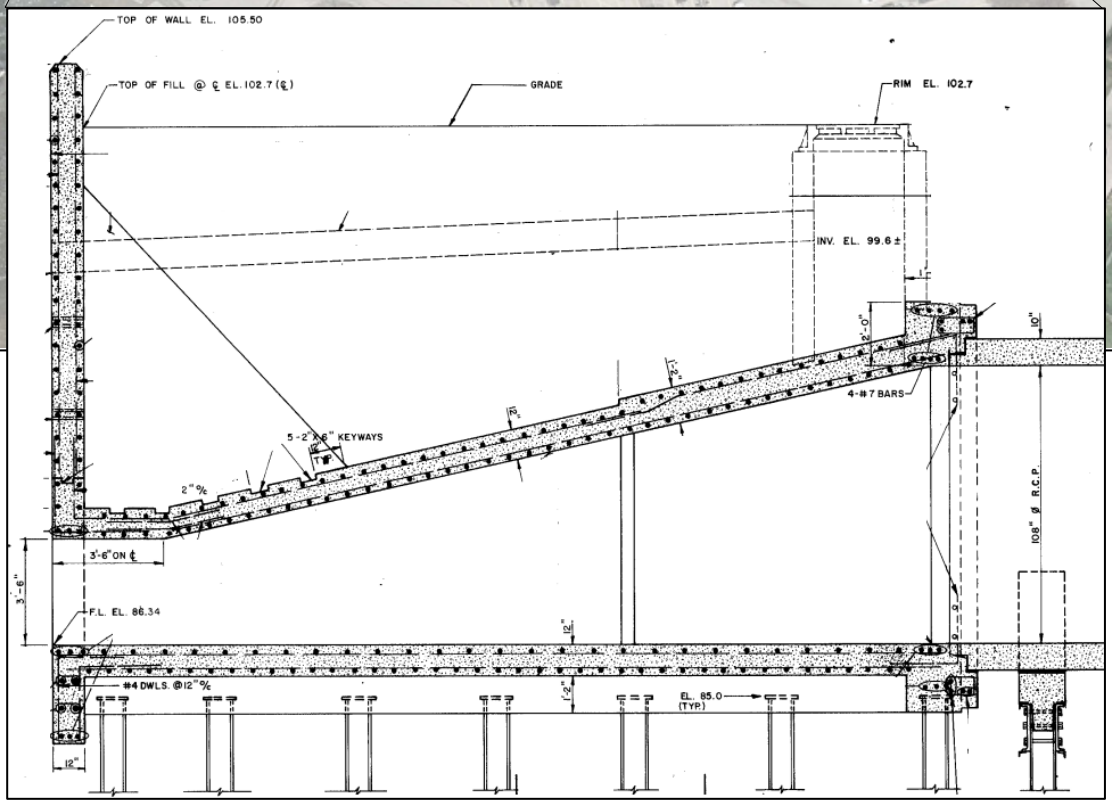
Raw Data from Field Study

Dissipative Cooling Study GBF: Effluent Temp: 72.47oF (22.48oC) USGS Gage Oil Depot Surface Temp: 52.7oF (11.5oC)
10/27/2021 Permit threshold condition: 60oF (15.56oC) Surface Temp + 2oF: 54.7oF (12.61oC)
River dominated current: 0.25ft/sec
Surface Sp Conductivity: 374uS/cm

		5 ft				10 ft				25 ft				50 ft				75 ft				100 ft				550 ft			
	Distance long shore (ft)	Time	Depth (m)	Temp (oC)	Sp Cond (uS/cm)	Time	Depth (m)	Temp (oC)	Sp Cond (uS/cm)	Time	Depth (m)	Temp (oC)	Sp Cond (uS/cm)	Time	Depth (m)	Temp (oC)	Sp Cond (uS/cm)	Time	Depth (m)	Temp (oC)	Sp Cond (uS/cm)	Time	Depth (m)	Temp (oC)	Sp Cond (uS/cm)	Time	Depth (m)	Temp (oC)	Sp Cond (uS/cm)
	-100	10:25 AM	0.5m	11.8	425	10:21 AM	0.5m	11.9	444	10:16 AM	0.5m	12	426	10:12 AM	0.5m	12.1	471	12:16 PM	0.5m	12	441								
			2.0m	11.8	426		2.0m	11.8	425		2.0m	11.7	427		2.0m	11.6	400		2.0m	11.6	400								
			3.0m	11.8	416		3.9m	11.7	419		5.5m	11.6	398		5.8m	11.6	397		7.0m	11.5	389								
	-50	8:09 AM	0.5m	11.7	419	8:51 AM	0.5m	12.5	519	9:03 AM	0.5m	12.6	564	10:04 AM	0.5m	12.6	550	12:11 PM	0.5m	13.6	698	12:21 PM	0.5m	13.3	660				
			2.0m	11.5	388		2.0m	11.7	410		2.0m	11.7	412		2.0m	11.7	420		2.0m	11.7	410		2.0m	11.6	403				
			3.9m	11.5	383.8		5.4m	11.8	422		5.8m	11.6	392		6.3m	11.6	394		6.8m	11.6	387		7.3m	11.5	384				
	-20	8:04 AM	0.5m	16.5	900	8:47 AM	0.5m	12.8	557	9:08 AM	0.5m	14.5	831	10:01 AM	0.5m	13.8	746	12:05 PM	0.5m	13.5	708	12:26 PM	0.5m	13	603				
			2.0m	11.5	384		2.0m	12	462		2.0m	12.2	494		2.0m	11.7	416		2.0m	11.8	458		2.0m	11.6	392				
			4.5m	11.5	382		5.0m	11.9	439		5.9m	11.7	402		6.0m	11.6	392		6.5m	11.5	386		7.3m	11.5	382				
	-5	8:00 AM	0.5m	19.6	1522	8:43 AM	0.5m	13.9	860	9:14 AM	0.5m	16.6	909	9:56 AM	0.5m	13.7	735	12:00 PM	0.5m	13.3	645	12:29 PM	0.5m	13.4	702				
			2.0m	21.3	1838		2.0m	11.8	419		2.0m	13.1	622		2.0m	11.7	415		2.0m	12.5	498		2.0m	11.6	396				
			3.9m	11.67	398		5.0m	11.7	409		5.6m	12.3	503		5.9m	11.6	395		6.6m	11.5	385		7.2m	11.5	383				
GBF Outfall	0	7:56 AM	0.5m	19.9	1610	8:38 AM	0.5m	19.6	1315	9:18 AM	0.5m	16.7	1298	9:54 AM	0.5m	16.1	1064	11:42 AM	0.5m	14.4	820	12:33 PM	0.5m	13.2	737	12:46 PM	0.5m	12.6	500
			2.0m	20.8	1652		2.0m	12.7	546		2.0m	12.9	635		2.0m	11.7	409		2.0m	11.9	540		2.0m	11.5	389		2.0m	11.6	388
			3.9m	11.58	390		5.0m	11.6	390		5.5m	12.2	483		5.8m	11.6	401		7.0m	11.5	381		6.9m	11.5	383		9.9m	11	405
	5	8:13 AM	0.5m	20.4	1626	8:35 AM	0.5m	16.7	1240	9:21 AM	0.5m	18.8	1414	9:42 AM	0.5m	15	788	11:39 AM	0.5m	13.6	677	12:36 PM	0.5m	13.3	762				
			2.0m	20.1	1650		2.0m	12.5	529		2.0m	12.5	601		2.0m	11.7	416		2.0m	11.8	524		2.0m	11.5	390				
			3.5m	11.67	426		4.5m	11.5	386		5.6m	11.7	400		5.9m	11.6	400		7.1m	11.5	381		6.7m	11.5	383				
	20	8:18 AM	0.5m	19.4	1500	8:30 AM	0.5m	12.5	452	9:25 AM	0.5m	13.6	764	9:39 AM	0.5m	14.7	914	11:34 AM	0.5m	13.7	660	12:41 PM	0.5m	13.3	641				
			2.0m	13.8	1216		2.0m	11.8	427		2.0m	12.4	519		2.0m	12	475		2.0m	11.6	399.2		2.0m	11.5	393				
			3.3m	12.4	471		4.3m	11.6	396		4.8m	11.7	400		5.9m	11.6	402		6.8m	11.5	381		7.2m	11.5	384				
	50	8:21 AM	0.5m	13.7	704	8:26	0.5m	12.6	524	9:29 AM	0.5m	16.2	1057	9:36 AM	0.5m	13.9	752	11:28 AM	0.5m	12.4	507								
			2.0m	11.97	459		2.0m	12.1	476		2.0m	12.3	484		2.0m	12.2	511		2.0m	11.9	428								
			2.5m	11.8	430		3.5m	11.8	424		4.4m	11.6	404		5.6m	11.7	407		6.8m	11.5	380								
	100	10:51 AM	0.5m	12.1	445	10:48	0.5m	12.2	472	10:37 AM	0.5m	12.8	570	10:44 AM	0.5m	12.9	595	11:21 AM	0.5m	12.1	453								
			2.0m	11.8	434		2.0m	11.7	403		2.0m	11.6	397		2.0m	11.6	394		2.0m	11.6	470								
			3.8m	11.7	413		4.6m	11.6	400.1		5.0m	11.6	396		5.7m	11.5	387		6.6m	11.5	381								
	150	11:09 AM	0.5m	11.9	428	11.06	0.5m	12	455	10:57 AM	0.5m	12	446	11:01 AM	0.5m	11.9	440	11:17 AM	0.5m	12.1	487								
			2.0m	11.8	427		2.0m	11.8	422		2.0m	11.6	394		2.0m	11.6	420		2.0m	11.6	398								
			4.4m	11.7	407		4.6m	11.7	406		5.5m	11.6	395		7.1m	11.5	383		7.6m	11.5	381								

Appendix D
GBF Outfall Plan and Profile View


108" OUTFALL SEWER
INVERT AT SHOREWALL: 86.34'
GAGING STATION MANHOLE
ENTRANCE MANHOLE
TO 108" OUTFALL SEWER
INVERT: 86.35'
CROWN OF PIPE: 95.35'
108" OUTFALL SEWER
BAY BEACH ROAD
JACK DAY CENTER
108" OUTFALL SEWER
OVERALL LENGTH: 1523.50' @ 0.051%


TOP OF WALL EL. 105.50
TOP OF FILL @ ℄ EL. 102.7 (℄)
GRADE
RIM EL. 102.7
INV. EL. 99.6±
4-#7 BARS
5-2"x6" KEYWAYS
2"%
3'-6" ON ℄
3'-6"
F.L. EL. 86.34
#4 DWLS. @12"%
EL. 85.0 (TYP.)
12"
108" ø R.C.P.

ATTACHMENT E

MIXING ZONE STUDY (JANUARY 2023) AND DNR APPROVAL (APRIL 2025)

CORRESPONDENCE / MEMORANDUM **State of Wisconsin**

DATE: April 14, 2025

TO: WQBEL File

FROM: Emma Lorenzen – WY/3

SUBJECT: Mixing Determination for Green Bay Facility (WI-0065251)

As part of their permit requirements the Green Bay Metropolitan Sewerage District (GMSD) was required to submit a mixing zone study demonstrating that the 10:1 dilution ratio is appropriate for calculating effluent limits for the Green Bay Facility (GBF) by April 1, 2025. This was done on January 19, 2023.

Summary

As part of the permit review process the US Environmental Protection Agency (EPA) questioned the departments use of the 10:1 dilution ratio for calculating effluent limits. The limits are based on a mixing zone from 1984 for which most of the documentation has been lost. A document that refers to the outcome of the study from 1985 was provided to the EPA. After reviewing the document, the EPA had remaining concerns that the mixing zone of the effluent did meet the standard from s. NR 102.05(3)(f), Wis. Adm. Code: "Mixing zones not adversely impacting spawning or nursery areas, migratory routes, nor mouths of tributary streams." As a result, the permit requirement to submit the mixing zone study was added to determine if the mixing zone adequately met the requirements in s. NR 102.05(3), Wis. Adm. Code, particularly focusing on (f).

As part of the same permit reissuance, the GBF triggered weekly average limits for temperature in the months of October and December and was given a compliance schedule to meet these limits. As part of the compliance schedule the facility was recommended to complete a dissipative cooling (DC) study. The permittee chose to use the data collected as part of the DC study for their mixing zone study. As part the DC study, the facility collected temperature and conductivity upstream, downstream, and into the river from their outfall at three depths. Both the temperature and conductivity data demonstrate that the effluent rapidly mixes with the Lower Fox River while rising to the surface of the river.

Temperature from the DC study at the three depths on October 27, 2021.

Distance	Temperature (F) Top 0.5m						
(ft)	5	10	25	50	75	100	550
-100	53.24	53.42	53.6	53.78	53.6		
-50	53.06	54.5	54.68	54.68	56.48	55.94	
-20	61.7	55.04	58.1	56.84	56.3	55.4	
-5	67.28	57.02	61.88	56.66	55.94	56.12	
0	67.82	67.28	62.06	60.98	57.92	55.76	54.68
5	68.72	62.06	65.84	59	56.48	55.94	
20	66.92	54.5	56.48	58.46	56.66	55.94	
50	56.66	54.68	61.16	57.02	54.32		
100	53.78	53.96	55.04	55.22	53.78		
150	53.42	53.6	53.6	53.42	53.78		

Distance	Temperature (F) Middle 2 m						
(ft)	5	10	25	50	75	100	550
-100	53.24	53.24	53.06	52.88	52.88		
-50	52.7	53.06	53.06	53.06	53.06	52.88	
-20	52.7	53.6	53.96	53.06	53.24	52.88	
-5	70.34	53.24	55.58	53.06	54.5	52.88	
0	69.44	54.86	55.22	53.06	53.42	52.7	52.88
5	68.18	54.5	54.5	53.06	53.24	52.7	
20	56.84	53.24	54.32	53.6	52.88	52.7	
50	53.546	53.78	54.14	53.96	53.42		
100	53.24	53.06	52.88	52.88	52.88		
150	53.24	53.24	52.88	52.88	52.88		

Distance	Temperature (F) Bottom						
(ft)	5	10	25	50	75	100	550
-100	53.2	53.1	52.9	52.9	52.7		
-50	52.7	53.2	52.9	52.9	52.9	52.7	
-20	52.7	53.4	53.1	52.9	52.7	52.7	
-5	53.0	53.1	54.1	52.9	52.7	52.7	
0	52.8	52.9	54.0	52.9	52.7	52.7	51.8
5	53.1	52.7	53.1	52.9	52.7	52.7	
20	54.3	52.9	53.1	52.9	52.7	52.7	
50	53.2	53.2	52.9	53.1	52.7		
100	53.1	52.9	52.9	52.7	52.7		
150	53.1	53.1	52.9	52.7	52.7		

The DC study was approved separately by the department on March 22, 2023.

The DC data was supplemented with reference to several academic papers on fish population on the Lower Fox River showing that the effluent was not preventing fish from traveling up the river to spawn.

Determination

A discussion of the requirements from s. NR 102.05(3), Wis. Adm. Code and how they are met is below:

a. *"Limiting mixing zones to as small an area as practicable, and conforming to the time exposure responses of aquatic life."* - Temperature criterion was met within 75 ft across the river width and 100 ft downstream which is a small area.
b. *"Providing passageways for fish and other mobile aquatic organisms."* - This is met since the effluent rapidly mixes and floats to the surface. Temperature criteria is met within 75 ft from the outfall westward and within 100 ft downstream. While there is some back flow, temperature exceedance does not go beyond 50 ft upstream in the upper 0.5 m of the river. At two meters, temperature criteria is met within 10 ft westward and within 20 ft downstream. This leaves the majority of the river free for passage of aquatic organisms.
c. *"Where possible, mixing zones being no larger than 25% of the cross–sectional area or volume of flow of a flowing water body and not extending more than 50% of the width."* – This is met. The river is approximately 875 ft wide at the point of discharge. At a conservative 75 ft of exceedance westward, this would be 9% of the river width. Since the plume floats briefly before dissipating, the cross sectional area would be less than the 9% width.
d. *"Final acute criteria and secondary values specified in or developed pursuant to s. NR 105.05 for the fish and aquatic life subcategory for which the receiving water is classified not being exceeded at any point in the mixing zone."* - Looking at the last WQBEL, there was no parameter subject to s. NR 105.05, Wis. Adm. Code that would have been exceeded the final acute criteria or secondary values in the mixing zone.
e. *"Mixing zones not exceeding 10% of an inland lake's total surface area."* - Not applicable since it does not discharge to an inland lake.
f. *"Mixing zones not adversely impacting spawning or nursery areas, migratory routes, nor mouths of tributary streams."* - As discussed above, the effluent does not block any migratory routes or adversely impact spawning. Over 90% of the width of the river is free for fish passage since the effluent mixes rapidly and floats to the surface.
g. *"Mixing zones not overlapping, but where they do, taking measures to prevent adverse synergistic effects."* - This is met as there are no other dischargers in the area for the mixing zone to overlap with.
h. *"Restricting the pH to values greater than 4.0 s.u. and to values less than 11.0 s.u. at any point in the mixing zone for the protection of indigenous fish and fish food organisms."* – At all points within the study the pH met this requirement. Additionally, the effluent has pH limits where the pH must be within 6-9 s.u.

Department wastewater staff worked with biologists from the fisheries program who concurred with the approval of the DC study.

After review of the mixing zone study submitted by GBSD, the department concurs with the conclusion that the effluent from the GBF rapidly mixes and the mixing zone does not adversely impact spawning or nursery areas, migratory routes, or the mouths of tributary streams and continued use of the 10:1 dilution ratio is appropriate.

Emma Lorenzen
Wastewater Engineer

Green Bay Facility Mixing Zone Study

Mixing Zone Study Report

January 4, 2023

Prepared by:

NEW Water
The brand of the Green Bay Metropolitan Sewerage District

Contents

1. Background Information

The Green Bay Metropolitan Sewerage District, branded as NEW Water, owns and operates two regional wastewater treatment facilities: the Green Bay Facility (GBF) and the De Pere Facility (DPF). A combined Wisconsin Pollutant Discharge Elimination System (WPDES) permit (WI-0065251-02-1) is issued by the Wisconsin Department of Natural Resources (WDNR) for both facilities. NEW Water was issued a renewed permit on April 1, 2022 after the submission of a permit renewal application on December 20, 2018. The renewed permit lists in Section 5.5 Mixing Zone Study Submittal GBF (Outfall 001) that demonstrates a 10:1 dilution ratio.

The purpose of this report is to summarize the results of the mixing zone study done in conjunction with NEW Water's dissipative cooling study.

The GBF outfall is located on the east shore of the Fox River, approximately 500 feet south of the bay of Green Bay (Figure 1-1). The Fox River is joined by the East River about 6,970 feet upstream of the GBF outfall. Between the East River confluence and the GBF outfall, there are several industrial discharges to the Fox River. The nearest industrial outfall on the Fox River is about 2,250 feet upstream of the GBF outfall.

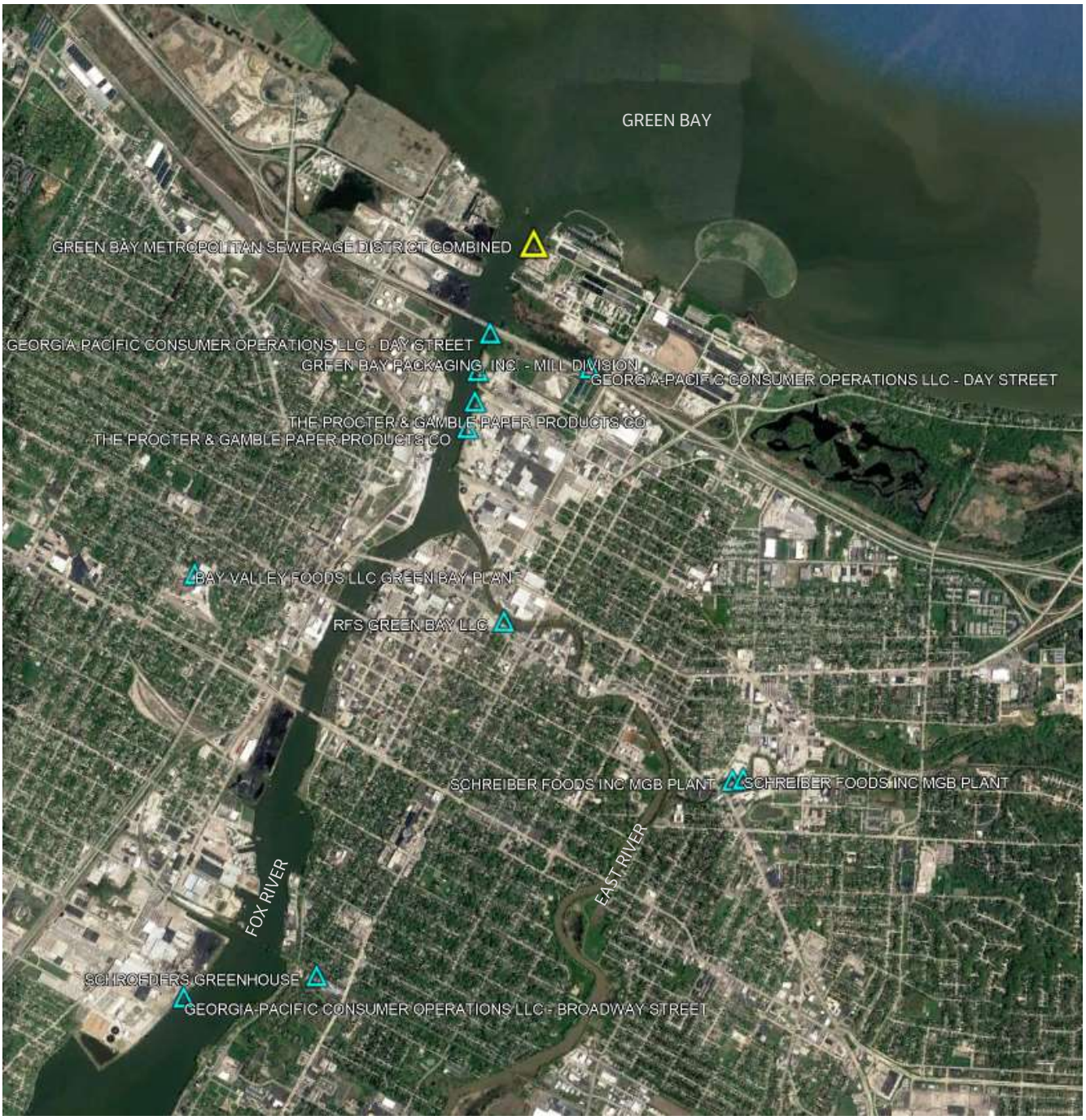


Figure 1-1. Aerial View of the GBF Outfall (yellow) and Other Industrial Dischargers (blue) Near the Mixing Zone Study Area

2. Mixing Zone Study

2.1 Mixing Zone Study Plan

NEW Water utilized specific conductivity data collected in conjunction with the February 9, 2022 submitted Dissipative Cooling Study, to demonstrate the dilution ratio in the GBF mixing zone (Appendix C). The field study evaluated the dissipative cooling and subsequently the mixing zone from the GBF effluent on the Fox River and the southern, nearshore waters of the bay of Green Bay. Prior to conducting the study, NEW Water hosted a meeting with the WDNR on October 19, 2021 to gain endorsement of the study plan and its procedures for data collection, specifically for evaluating the thermal impact from the GBF effluent. The WDNR endorsed the proposed sampling plan, and approved the submitted Dissipative Cooling Study via email on August 4, 2022.

2.2 Data Collection Field Work

NEW Water staff executed the proposed study on October 27, 2021. Equipment consisted of a 17-foot aluminum jon boat with a two-crew setup, one operating a small motor and oar to hold position at the sampling station while the second conducted the temperature and specific conductivity sampling. A map was developed for use in an ArcGIS Collector app that allowed the field team to observe their location relative to the sampling matrix from their phones during data collection. A calibrated temperature and conductivity probe (EXO Sonde) was utilized to record temperature and conductivity profiles and monitor conditions in real-time. Data collection started with sampling near the east bank at NEW Water's GBF outfall followed by sampling north, south and west in a serpentine pattern at pre-determined distances. Figure 2-1 shows the overall sampling extent, however extending to the western shore at 850 feet was not needed.

Profile (vertical) measurements at each sample location were recorded at the near surface (subsurface), two meters below the surface (mid-depth) and just above the river bottom (bottom). Sampling continued laterally until the sublethal temperature criterion for October (60ºF) was met and then continued for at least one or more sites to verify that the conditions were maintained. Thermal loading from the GBF outfall was apparent in the Fox River, where river water temperatures were above ambient conditions within approximately 100 feet upstream, 150 feet downstream, and 100 feet west from the GBF outfall. Samples were not taken beyond this area (or in the bay of Green Bay) except for a vertical profile sample taken about 550 feet directly west of the outfall for additional river background information.

Fox River data was collected from the United States Geological Survey (USGS) gage website at gaging station USGS 040851385 (Fox River at Oil Tank Depot at Green Bay, WI) approximately 0.8 miles upstream of the GBF outfall. Data included subsurface temperature, conductivity, flow, and velocity during the time the study was conducted. These data were used to verify that field conditions during sampling were typical for the month of October.

Figure 2-1. Approximate Sampling Perimeter (orange)

3. Results

3.1 Outfall Physical Description

The current GBF outfall was constructed in 1976 and is located on the east shore of the Fox River, approximately 500 feet upstream of where the Fox River meets the bay of Green Bay. The outfall pipe is a 9-foot-diameter (108-inch) circular pipe that runs about 1,520 feet from the GBF to the shorewall, discharging into the Fox River at about mid-depth. Upstream of the shorewall, the outfall transitions from a circular pipe to a rectangular outfall that splits the flow in two and reduces to two short and wide effluent exits. Splitting the flow and using rectangular exit structures (3.5 feet tall by 9.8 feet wide, and 3.5 feet tall by 10.9 feet wide) spreads out the flow to encourage effluent mixing and heat dissipation. The 26.6 million gallons per day (MGD) GBF flow observed on the day of the sampling event had an average velocity of 0.60 feet per second and 0.54 feet per second in the smaller and larger rectangular outfalls, respectively. The average velocity of the GBF flow through the outfall on the day of sampling was 0.57 ft/s.

Upstream of the outfall is a manhole where effluent samples are taken. Figure 3-1 is a photo of the concrete shorewall outfall location taken from the Fox River.

Figure 3-1. View of the GBF Outfall (Concrete Shorewall).

Over the past two years, GBF daily average effluent flow during October was 30.5 MGD. On the day of field testing, the effluent flow was 26.6 MGD. The flow conditions on the day of fieldwork were within the historical October flows, and consequently, the field day was representative of October conditions.

On the morning of October 27, 2021, NEW Water conducted the joint dissipative cooling and mixing zone study. Sampling began around 8:00 a.m. and ended just before 1:00 p.m. The weather was mostly overcast, around 48ºF,

light wind less than six knots out of the east-southeast, building by noon to eight knots out of the southeast. The Green Bay, WI climate information for the day of sampling and all of October 2021 is reported in Appendix B.

Fox River flow and velocity is typically recorded every five minutes at the Fox River USGS gage (USGS 040851385). During the sampling period, the majority of the recorded river flows and velocities were positive (see Appendix A for Fox River flow and velocity data). The flow ranged from -3,900cu ft/s to 7,290 cu ft/s and the velocity ranged from -0.27 ft/s to 0.51 ft/s, with the majority of water flowing north into lower Green Bay. These conditions, during sampling, were considered a “river dominated system” with little back flow or seiche effects from Green Bay.

The Fox River appeared brown in color during sampling with about 1.0 meters of visibility. There was no visible effluent plume at the surface noted by bubbles or water color differentiation, however, swirling/roiling of water was evident at the river surface near the outfall indicating rapid and efficient effluent water mixing with the Fox River. Figure 3-2 includes a picture of the swirling/roiling water pattern.

Figure 3-2. Visible Swirling/Roiling in the Fox River above the GBF Outfall (Shorewall is Concrete Structure at Right).

3.2 Effluent Temperature Data

From 2020 through 2021, the average daily GBF effluent temperature for the month of October was 72.0°F. The daily effluent temperature during this time ranged from 64.2 to 78.7°F. On the day of field testing, the daily effluent temperature was 72.5°F, which is typical for October.

3.3 Specific Conductivity Data

Using data from NEW Water's Aquatic Monitoring Program, specifically the site identified as Sampling Point 602 which is located near the GBF outfall and the mouth of the Fox River at SWIMS Station ID 10046799, the background specific conductance can be assessed. At this location, weekly specific conductance is measured from approximately May through October. In 2021, specific conductance ranged from 364 to 487 µS/cm at the sub-surface depth, with an average of 398 µS/cm for the season.

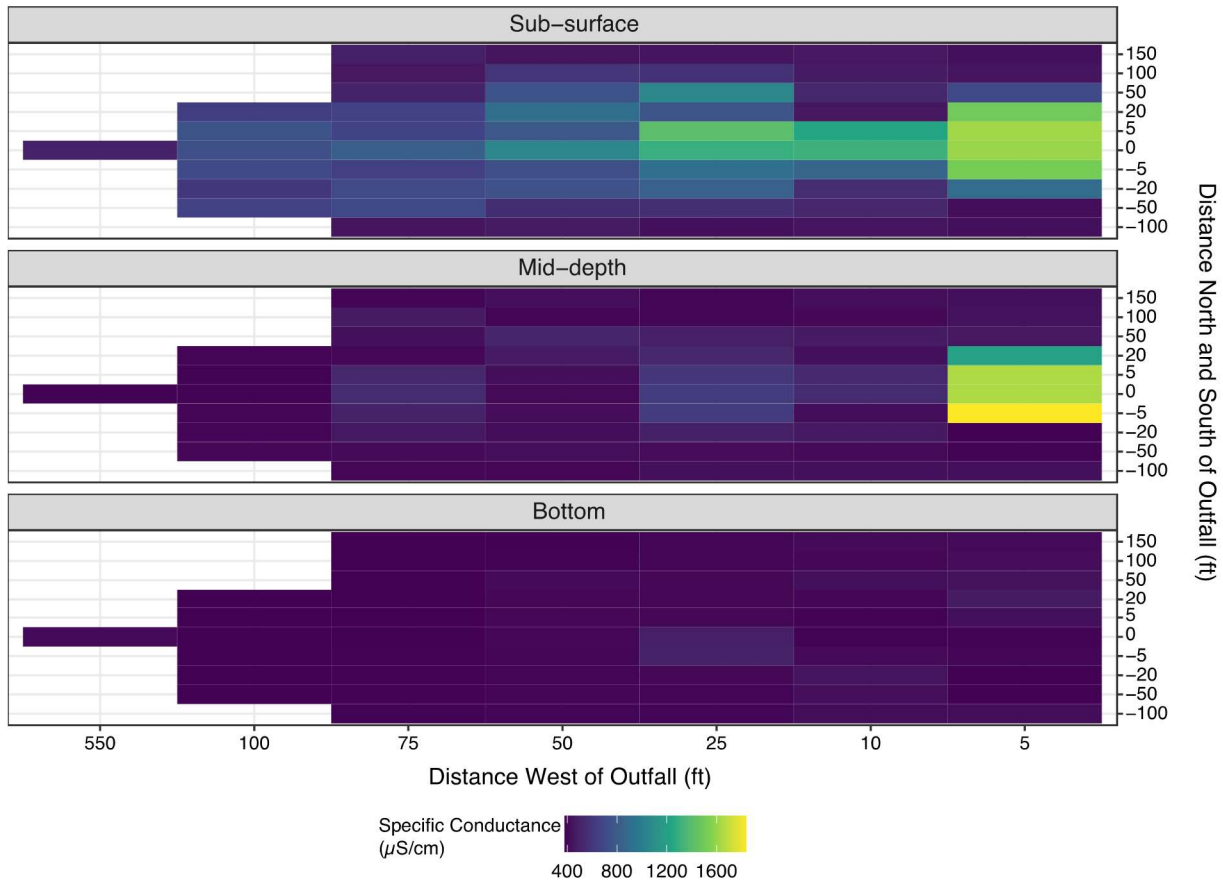


Figure 3-3. Specific Conductance (µS/cm) at Dissipative Cooling Sample Locations

3.4 Site-Specific Conditions

The lower Fox River is part of the Total Maximum Daily Load and Watershed Management Plan for Total Phosphorus and Total Suspended Solids in the Lower Fox River Basin and Lower Green Bay (The Cadmus Group, Inc. 2021). Excess phosphorus and excess suspended solids have been identified as main causes of degraded water quality such as nuisance algal growth, oxygen depletion, reduced submerged aquatic vegetation, water quality problems, and degraded habitat.

As discussed in Section 3.1, the physical configuration of the outfall splits the flow into two smaller openings (3.5 feet tall by 9.8 feet wide and 3.5 feet tall by 10.9 feet wide) and increases the effluent water velocity. The day of the study, the average GBF effluent velocity was 0.57 ft/s, and with evidence of surface swirling/roiling, it was sufficient velocity for mixing. Other physical characteristics of the effluent outfall and receiving stream were previously discussed in this section as well Sections 1 and 2.

According to the Draft 2022 Impaired Waters and Restoration Waters Lists (WDNR 2022), a primary pollutant for the Lower Fox River is polychlorinated biphenyl (PCB) contaminated sediments. In recent years, the Fox River has been dredged for PCB contamination. Ongoing monitoring of sediment, water quality, and biological response to the PCB cleanup is being conducted by WDNR. The U.S. Army Corps of Engineers also routinely performs navigational dredging along the Fox River to maintain water depths for barges and large ships. Rock was believed to be placed in the river at the GBF outfall, however, the Fox River has a significant sediment load that settles annually in the river and bay. Consequently, the bottom sediments are primarily fine sediments and silt.

Biological information was not collected for this study, however, NEW Water requested information from the University of Wisconsin – Green Bay of any recent publications which their organization, or others, has conducted on the Lower Fox River. Below are three recent papers. These research projects were conducted in part or entirely prior to the closure of the Pulliam Power Plant in 2018, whose significant effluent volume discharged opposite NEW Water's Green Bay facility effluent, near the mouth of the Fox River. These publications demonstrate the observed spawning populations of Lake Whitefish and sturgeon in the Lower Fox River in different seasons. As outlined within the abstract *Recolonization of Lake Whitefish river spawning ecotypes and estimates of riverine larval production in Green Bay, Lake Michigan* Science Direct (Ransom, AL., 2021), the whitefish spawning is specifically addressed noting the highest abundance of adults in tributaries, including the lower Fox River, was observed in the month of November. This suggests thermal plumes at the mouth of the Fox River would not have impeded fish passage. The Lower Fox River is also widely known for its abundance of walleye during the spring spawning event starting close after ice off, with thousands of fishermen traveling to the area each year. These patterns support the ability of these fish species to access upstream waters of the Lower Fox River during sensitive months. Improvements to habitat along the Lower Fox River have been documented as a need and project design plans have been completed. Continued research informs species specific spawning preferences and needs. Access to the Lower Fox River does not seem to be preventing fish species from attempting to utilize these significant tributaries for spawning. Suitable spawning substrate at various depths and locations seems to be a more significant factor in spawning success in the Lower Fox River.

-Recolonization of lake whitefish river spawning ecotypes and estimates of riverine larval production in Green Bay, Lake Michigan - ScienceDirect
-Can otolith microchemistry identify the natal origin of larval lake whitefish Coregonus clupeaformis in the waters of Green Bay? - ScienceDirect
-Reproductive status of a remnant Lake sturgeon (Acipenser fulvescens) population: Spawning and larval drift in the lower Fox River, Wisconsin - Tucker - 2021 - River Research and Applications - Wiley Online Library

While NEW Water does not have our own fisheries program, our team has turned to these findings as well as our long-term water quality data as indicators of improving water quality in the Lower Fox River. We acknowledge that the spawning habitat still needs to be prioritized. NEW Water is actively working with the WDNR and the City of Green Bay and Village of Ashwaubenon to seek funding for added habitat improvements at the mouths of Ashwaubenon Creek and Dutchman Creek where they meet the Fox River. These projects will add habitat for fish, birds, and other invertebrates and animals along the creek mouths.

3.5 Results of the Mixing Zone Study

The specific conductivity data collected by NEW Water show the GBF effluent rising from the effluent structure and mixing within a short distance from the outfall (Figure 3-3).

The temperature sublethal criterion of 60°F at mid-depth was met close to the outfall: within 100 feet downstream of the outfall, less than 50 feet upstream of the outfall, and less than 75 feet west of the outfall into the Fox River channel (Figure 3-1). The thermal plume meets the NR102.05(3)(c) mixing zone size constraints of being less than 25 percent of the cross-sectional area of the water body and not extending beyond 50 percent of the water body width.

- Subsurface – Conductivity measurements taken just below the surface had the most variability ranging from 419 to 1610 µS/cm, with the maximum value recorded immediately above the outfall. As was noted with the thermal data, the effluent was concentrated around the outfall and mixed quickly with the surrounding water within a short distance.
- Mid-Depth – The highest specific conductance recorded, 1838 µS/cm, was measured mid-depth near the outfall. However, as was noted with the thermal data, the effluent quickly mixes to surrounding water, and most of the specific conductance measurements recorded at mid-depth were near the background conductance around 450 µS/cm.
- Near-Bottom – All of the specific conductance measurements were at or below approximately 500 µS/cm. The specific conductance near the bottom of the river was also consistent upstream, downstream, and laterally from the outfall, and were consistent with background conductance levels.
- Across all sample points in the mixing zone, pH minimum value was 7.41 with a maximum value of 8.3.

Overall, the specific conductance data showed similar trends as the temperature data. Conductance was not further analyzed because the temperature and conductivity data convincingly demonstrates the effluent mixing zone within a short distance, 9% of river width, of the outfall. These data trends are consistent with what would be expected with warmer less dense effluent staying in the upper water column, quickly mixing and dissipating within a short distance with cooler more dense river water.

4. Conclusions

The mixing zone study was completed on the morning of October 27, 2021 during conditions that were typical and representative of October conditions at the GBF and within the Fox River. The study was executed according to the dissipative cooling sampling plan agreed upon by WDNR and demonstrated the effluent mixing occurred within 75 ft from the outfall or 9% of the river width. Additional river water temperature and conductivity readings samples were collected beyond where the temperature sublethal criterion (60°F) was met to confidently delineate the extent of the mixing zone. The study did not directly observe thermal impact from upstream sources because the background temperatures, measured at 100 ft upstream of the outfall, were below the sublethal criteria.

Evidence of a mixing zone for non-unidirectional waters near the GBF outfall include:

1) An exit velocity of 0.57 f/s that supports rapid mixing with the Fox River. Rapid mixing was visibly evident with swirling/roiling water on the river surface.

2) GBF effluent rises to the surface and disperses to the surrounding water. This is evident by the small thermal plume measured only at the near-surface sampling locations.

3) Temperature results from across the sampling area at all three sampling depths show that the heat from the effluent water dispersed rapidly and did not persist in the water column at significant distances. The thermal mixing zone of the GBF outfall is small in both depth and width across the river. With the sublethal criterion observed at the shoreline at the bottom, and only extending a maximum of 75 feet near the surface, there is no fish barrier present at this location where the river is about 850 feet wide.

This successful study shows no overlapping mixing zones, no pH restrictions, a small as practicable mixing zone within 75ft of the facility outfall minimizing barriers to fish passage and should be sufficient documentation that the mixing zone does not adversely impact spawning or nursery areas, migratory routes, nor mouths of tributary streams meeting requirements set forth in NR102.05(3)(a, b, c, f, g, h).

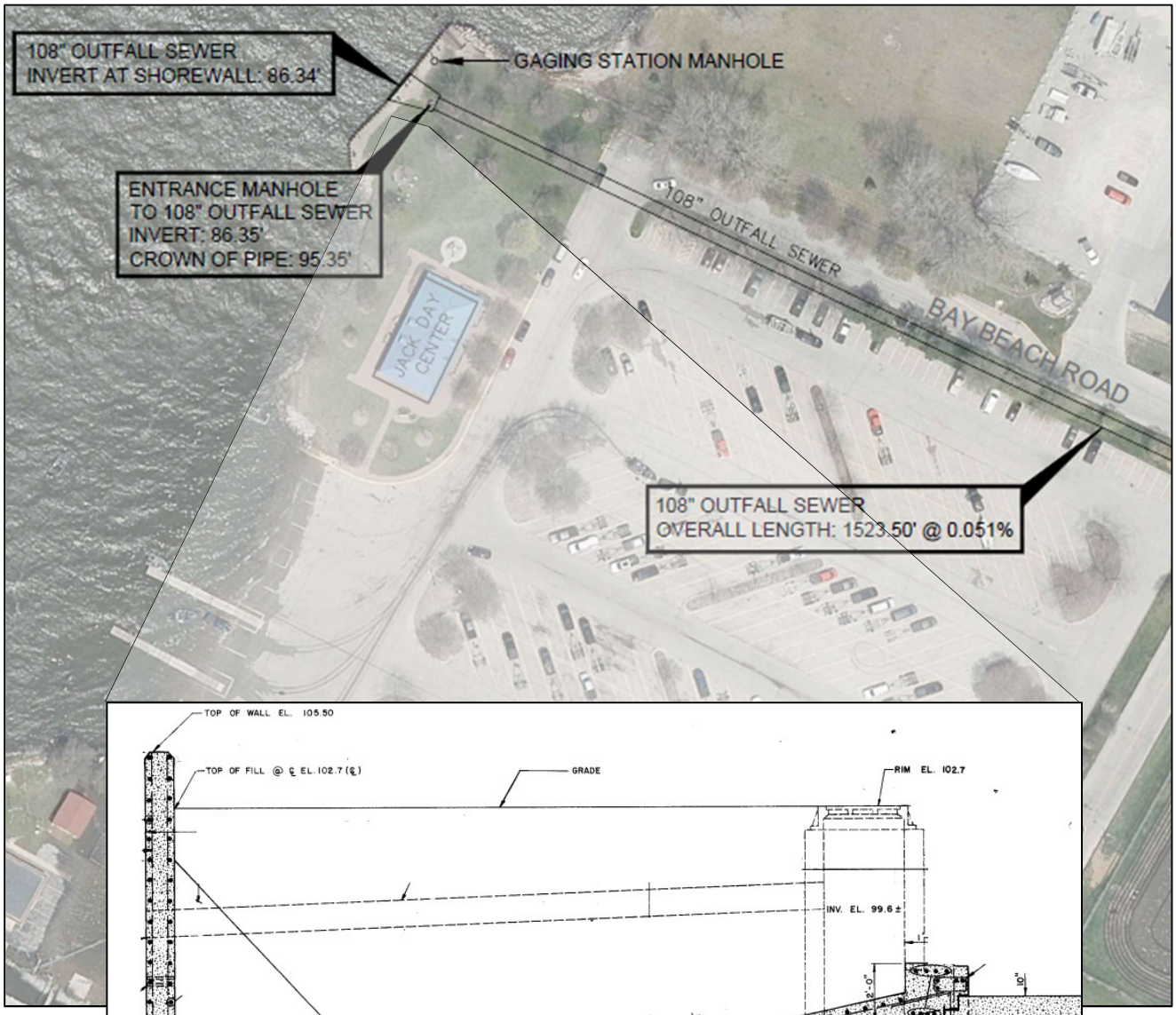
5. References

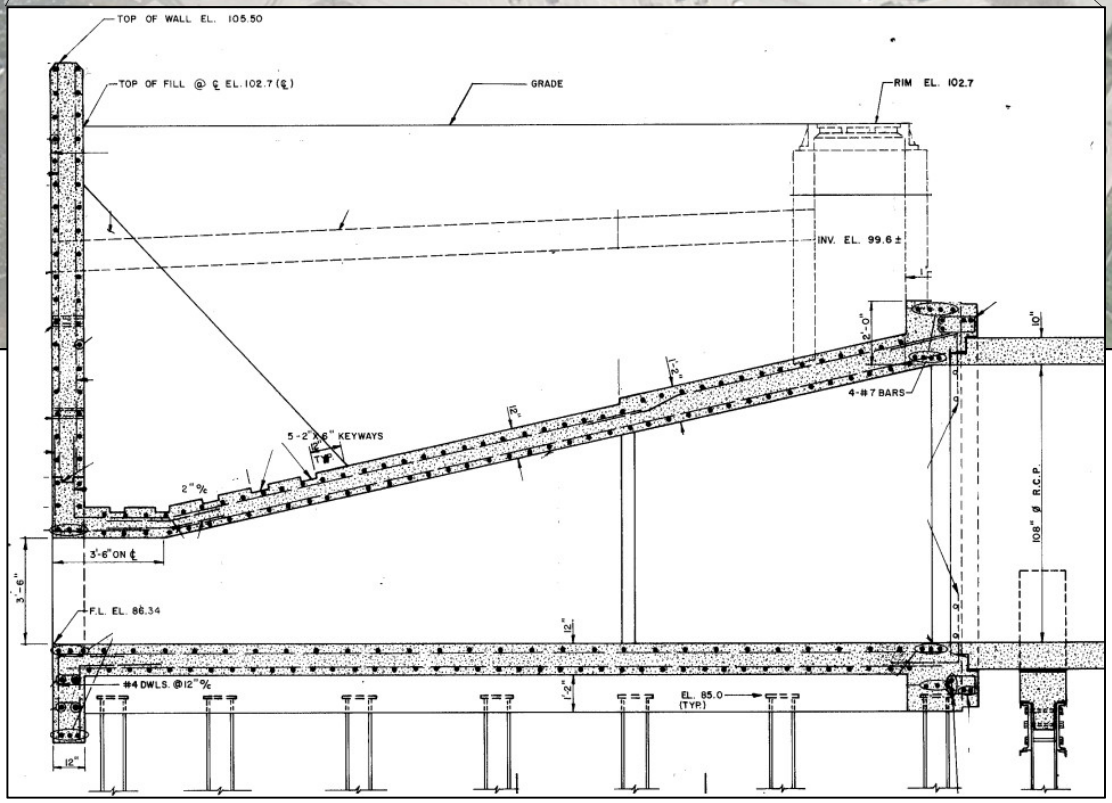
Wisconsin Department of Natural Resources. (WDNR). 2019. *Water Quality-Based Effluent Limitations for the Green Bay Metropolitan Sewerage District Combined WPDES Permit No. WI-0065251-02.*

Wisconsin Department of Natural Resources. (WDNR). 2020. *Addendum to the Water Quality-Based Effluent Limitations for the Green Bay Metropolitan Sewerage District Combined WPDES Permit No. WI-0065251-02.*

Wisconsin Department of Natural Resources. (WDNR). 1997. Chapter NR102 *Water Quality Standards for Wisconsin Surface Waters*

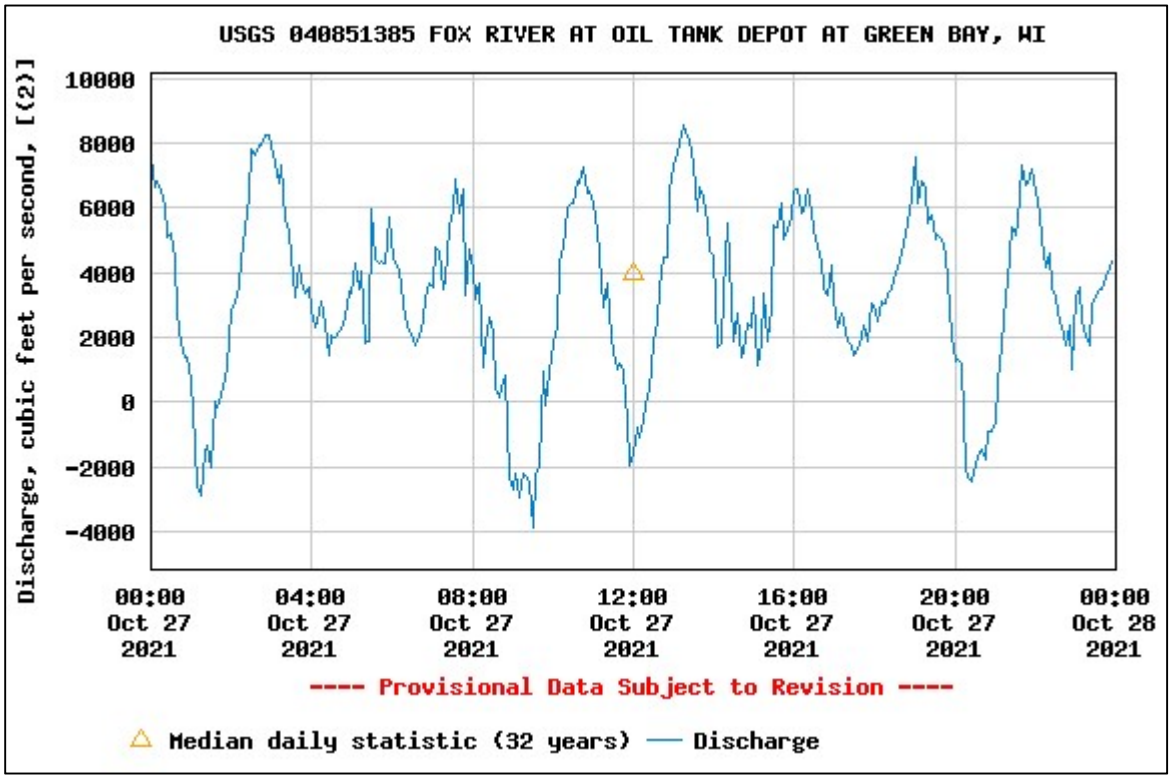
Appendix A
GBF Outfall Plan and Profile View

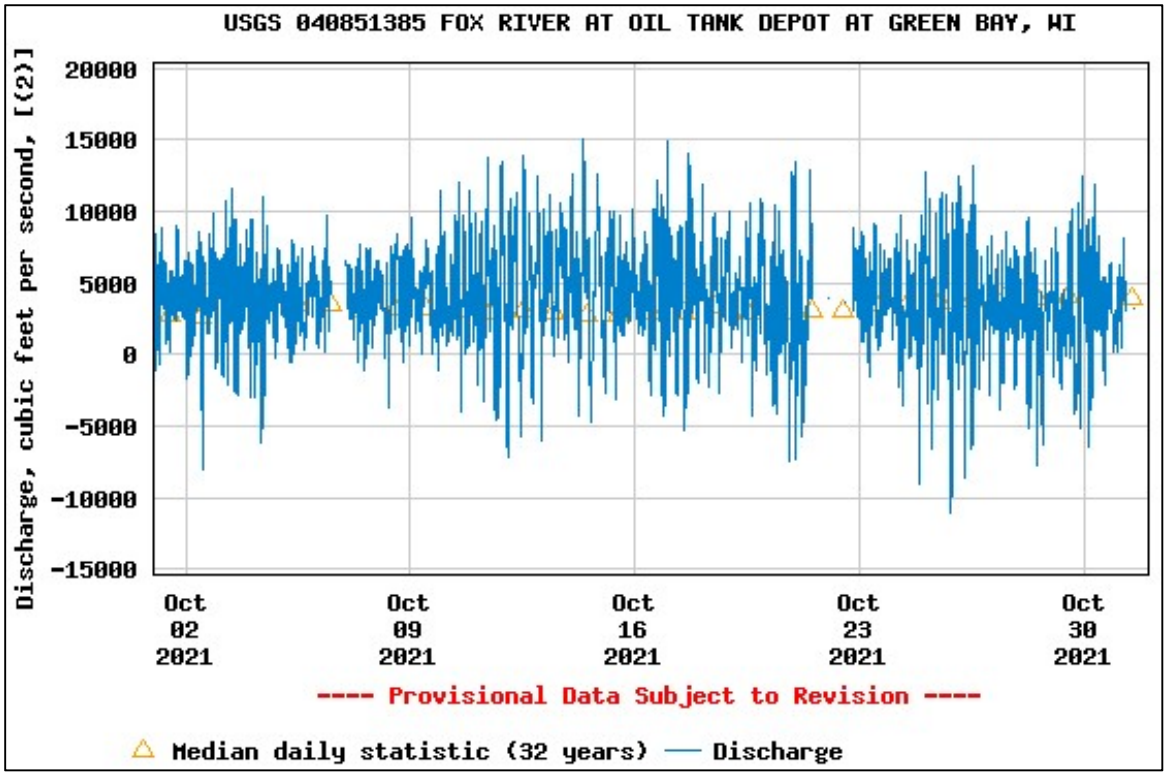

108" OUTFALL SEWER
INVERT AT SHOREWALL: 86.34'
GAGING STATION MANHOLE
ENTRANCE MANHOLE
TO 108" OUTFALL SEWER
INVERT: 86.35'
CROWN OF PIPE: 95.35'
108" OUTFALL SEWER
BAY BEACH ROAD
JACK BAY CENTER
108" OUTFALL SEWER
OVERALL LENGTH: 1523.50' @ 0.051%


TOP OF WALL EL. 105.50
TOP OF FILL @ ℄ EL. 102.7 (℄)
GRADE
RIM EL. 102.7
INV. EL. 99.6 ±
4-#7 BARS
5-2'-6" KEYWAYS
2" %
3'-6" ON ℄
3'-6"
F.L. EL. 86.34
#4 DWLS. @12" %
EL. 85.0 (TYP.)
108" ø R.C.P.

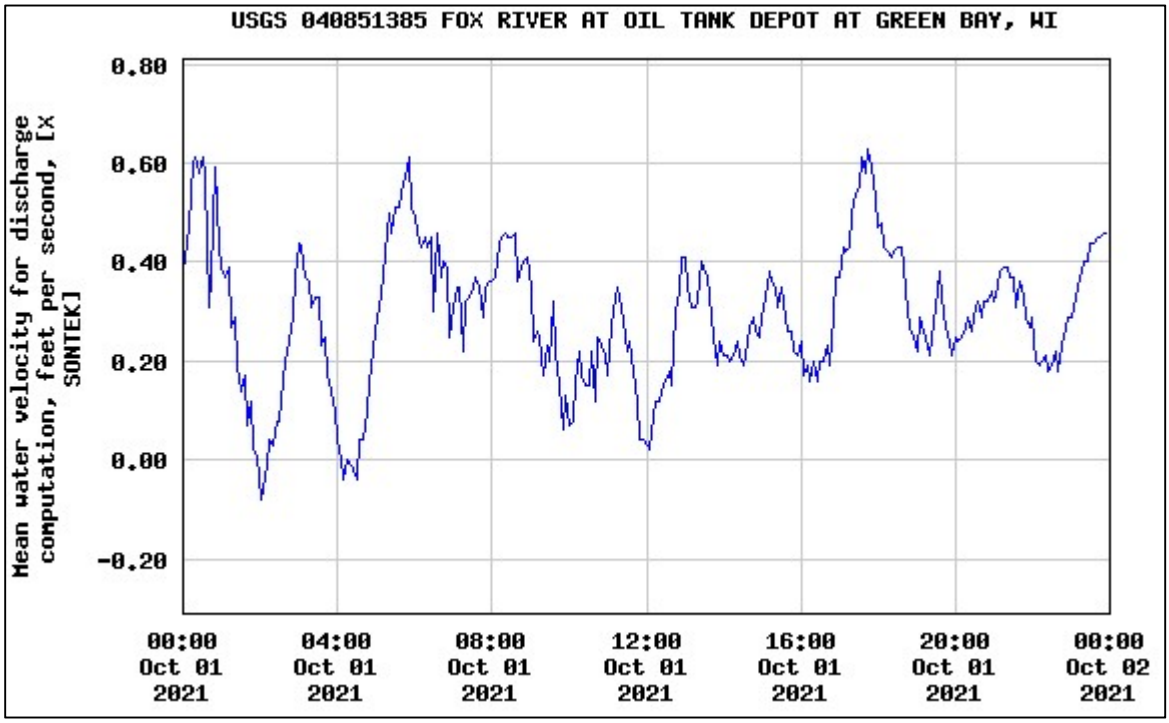
Appendix B
Results Data

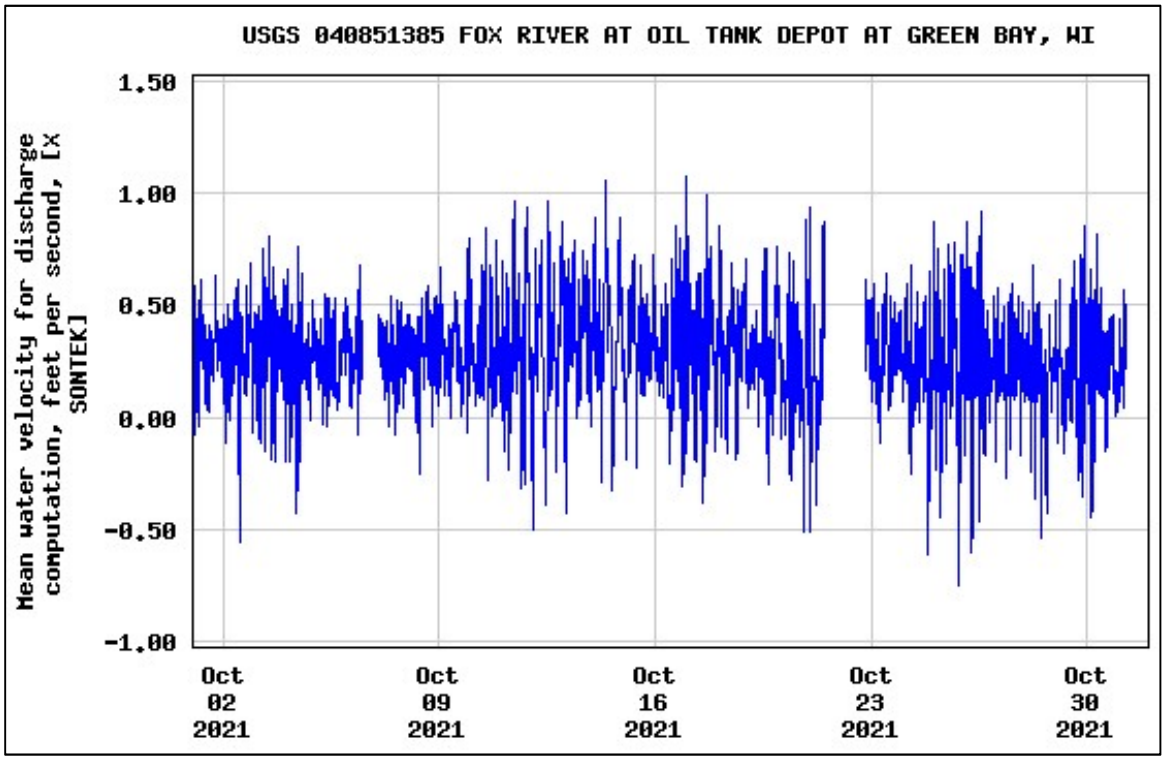
Fox River Flow on Day of Sampling and for October 2021



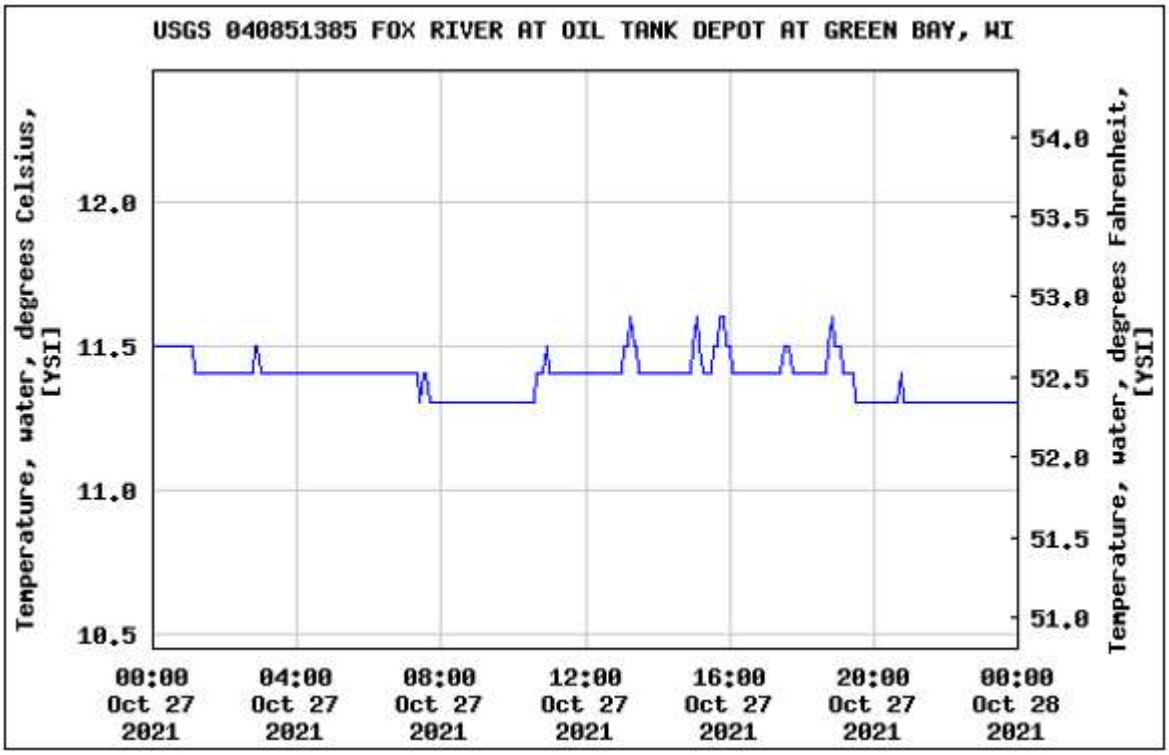


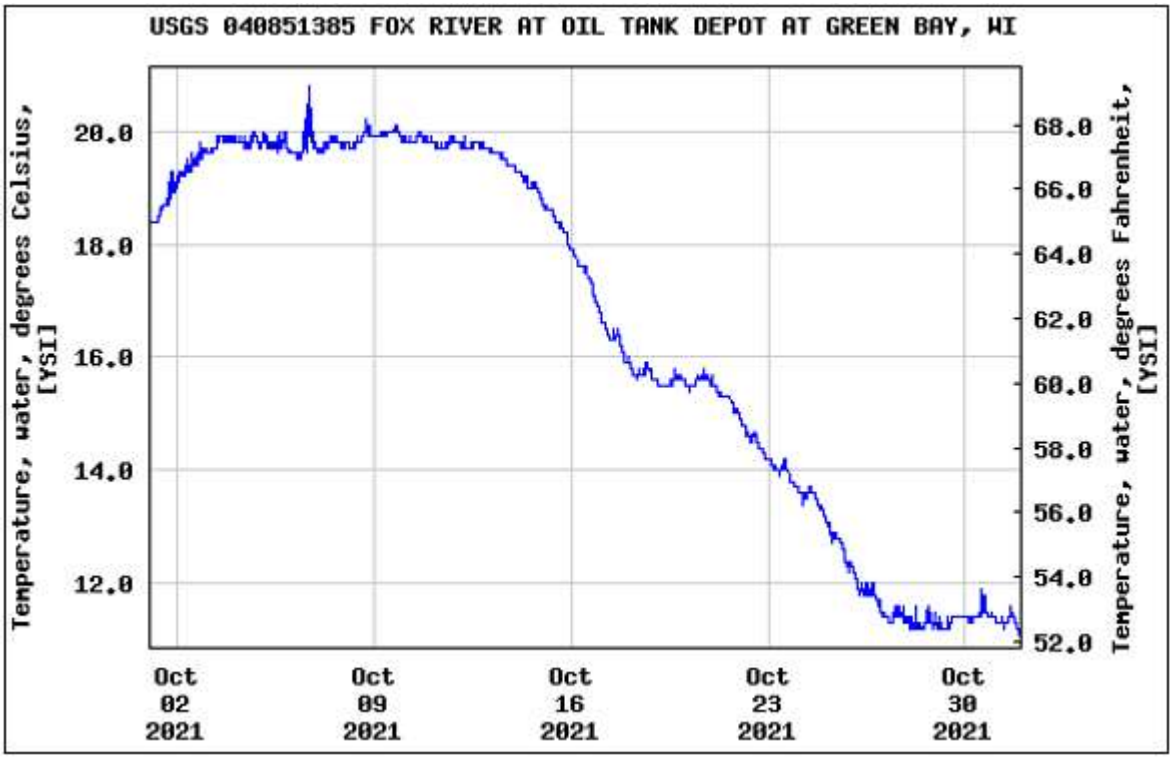
Fox River Velocity on Day of Sampling and for October 2021





Fox River Temperature Data from Day of Sampling and for October 2021





October 2021 Climate Information for Green Bay, Wisconsin

Climatological Data for Green Bay Area, WI (ThreadEx) - October 2021

Click column heading to sort ascending, click again to sort descending.

Date	Temperature				HDD	CDD	Precipitation	New Snow	Snow Depth
	Maximum	Minimum	Average	Departure					
2021-10-01	84	50	67.0	12.1	0	2	0.00	0.0	0
2021-10-02	80	62	71.0	16.5	0	6	0.02	0.0	0
2021-10-03	67	61	64.0	10.0	1	0	0.20	0.0	0
2021-10-04	67	60	63.5	9.9	1	0	0.02	0.0	0
2021-10-05	71	54	62.5	9.3	2	0	0.00	0.0	0
2021-10-06	74	52	63.0	10.2	2	0	0.00	0.0	0
2021-10-07	68	52	60.0	7.6	5	0	0.42	0.0	0
2021-10-08	75	59	67.0	15.0	0	2	0.02	0.0	0
2021-10-09	72	60	66.0	14.5	0	1	0.00	0.0	0
2021-10-10	76	63	69.5	18.4	0	5	T	0.0	0
2021-10-11	68	63	65.5	14.8	0	1	0.02	0.0	0
2021-10-12	68	61	64.5	14.2	0	0	0.10	0.0	0
2021-10-13	67	54	60.5	10.6	4	0	T	0.0	0
2021-10-14	68	45	56.5	7.0	8	0	0.00	0.0	0
2021-10-15	61	39	50.0	0.9	15	0	T	0.0	0
2021-10-16	61	41	51.0	2.3	14	0	0.00	0.0	0
2021-10-17	67	40	53.5	5.2	11	0	0.00	0.0	0
2021-10-18	70	35	52.5	4.6	12	0	0.00	0.0	0
2021-10-19	74	41	57.5	10.0	7	0	0.00	0.0	0
2021-10-20	63	47	55.0	7.9	10	0	0.24	0.0	0
2021-10-21	56	35	45.5	-1.2	19	0	0.02	0.0	0
2021-10-22	47	33	40.0	-6.3	25	0	0.00	0.0	0
2021-10-23	54	32	43.0	-2.9	22	0	0.00	0.0	0
2021-10-24	51	28	39.5	-6.0	25	0	T	0.0	0
2021-10-25	50	36	43.0	-2.1	22	0	T	0.0	0
2021-10-26	52	32	42.0	-2.7	23	0	0.00	0.0	0
2021-10-27	56	33	44.5	0.2	20	0	0.00	0.0	0
2021-10-28	56	50	53.0	9.1	12	0	0.03	0.0	0
2021-10-29	56	49	52.5	9.0	12	0	0.06	0.0	0
2021-10-30	60	38	49.0	5.9	16	0	0.00	0.0	0
2021-10-31	51	35	43.0	0.3	22	0	0.00	0.0	0
Sum	1990	1440	-	-	310	17	1.15	0.0	-
Average	64.2	46.5	55.3	6.6	-	-	-	-	0.0
Normal	58.0	39.5	48.7	-	507	4	2.67	0.3	-

Observations for each day cover the 24 hours ending at the time given below (Local Standard Time). Observation times may have changed during this period.
Max Temperature : midnight
Min Temperature : midnight
Precipitation : midnight
Snowfall : unknown, midnight
Snow Depth : unknown, 6am

Daily and Weekly GBF Effluent Temperature

Daily Average Temp	
Date	Temp (ºF)
10/1/2021	77.5
10/2/2021	78.1
10/3/2021	77.5
10/4/2021	75.7
10/5/2021	75.5
10/6/2021	75.9
10/7/2021	76.4
10/8/2021	77.1
10/9/2021	77.6
10/10/2021	77.6
10/11/2021	76.5
10/12/2021	76.5
10/13/2021	76.0
10/14/2021	75.8
10/15/2021	75.7
10/16/2021	74.9
10/17/2021	74.2
10/18/2021	73.9
10/19/2021	74.4
10/20/2021	74.3
10/21/2021	74.1
10/22/2021	73.1
10/23/2021	73.5
10/24/2021	73.5
10/25/2021	71.9
10/26/2021	71.6
10/27/2021	72.5
10/28/2021	73.2
10/29/2021	73.0
10/30/2021	72.2
10/31/2021	71.3
Average	74.9
Min	71.3
Max	78.1

Weekly Average Temp	
Week of October	Temp (ºF)
1	76.5
2	76.1
3	73.9
4	72.6
Average	74.8
Min	72.6
Max	76.5

2020 Weekly Minimum and Maximum GBF Effluent Temperature

Week of	Min Temp (ºF)	Max Temp (ºF)
12/29/2019	53.42	57.67
1/5/2020	55.30	56.79
1/12/2020	54.62	55.47
1/19/2020	54.83	56.23
1/26/2020	54.36	56.62
2/2/2020	55.03	56.15
2/9/2020	53.95	55.53
2/16/2020	54.59	55.71
2/23/2020	54.68	56.73
3/1/2020	55.71	56.70
3/8/2020	52.13	56.79
3/15/2020	52.81	55.91
3/22/2020	53.36	55.88
3/29/2020	53.66	56.44
4/5/2020	55.91	58.20
4/12/2020	55.03	57.82
4/19/2020	55.41	57.96
4/26/2020	57.38	59.02
5/3/2020	59.66	61.45
5/10/2020	58.90	64.15
5/17/2020	57.41	63.21
5/24/2020	63.09	66.14
5/31/2020	63.03	68.16
6/7/2020	65.82	70.95
6/14/2020	66.87	71.60
6/21/2020	69.50	72.00
6/28/2020	72.40	75.50

Week of	Min Temp (ºF)	Max Temp (ºF)
7/5/2020	72.30	76.70
7/12/2020	73.10	75.40
7/19/2020	74.20	76.20
7/26/2020	75.20	77.40
8/2/2020	73.30	76.60
8/9/2020	76.00	77.40
8/16/2020	76.10	78.00
8/23/2020	75.00	78.00
8/30/2020	73.60	74.90
9/6/2020	70.90	73.80
9/13/2020	71.40	75.40
9/20/2020	72.60	75.30
9/27/2020	71.10	74.30
10/4/2020	69.30	73.20
10/11/2020	69.70	72.50
10/18/2020	66.20	69.30
10/25/2020	64.20	67.40
11/1/2020	63.80	68.60
11/8/2020	65.50	69.20
11/15/2020	64.00	65.40
11/22/2020	63.00	64.30
11/29/2020	61.40	63.30
12/6/2020	60.90	64.10
12/13/2020	59.70	61.60
12/20/2020	58.00	61.70
12/27/2020	56.90	60.95

2021 Weekly Minimum and Maximum GBF Effluent Temperature

Week of	Min Temp (ºF)	Max Temp (ºF)
1/3/2021	58.46	61.99
1/10/2021	59.51	61.78
1/17/2021	58.90	61.20
1/24/2021	58.44	61.08
1/31/2021	58.50	61.35
2/7/2021	57.27	60.08
2/14/2021	56.25	58.31
2/21/2021	56.81	61.41
2/28/2021	59.04	61.49
3/7/2021	60.18	62.30
3/14/2021	60.45	60.72
3/21/2021	59.44	60.86
3/28/2021	58.25	61.84
4/4/2021	62.06	65.24
4/11/2021	62.11	64.20
4/18/2021	63.13	64.95
4/25/2021	63.96	66.06
5/2/2021	65.42	67.69
5/9/2021	66.01	68.40
5/16/2021	68.99	71.83
5/23/2021	68.51	72.55
5/30/2021	68.65	73.70
6/6/2021	72.99	76.96
6/13/2021	75.06	77.16
6/20/2021	74.62	76.09
6/27/2021	70.16	74.76

Week of	Min Temp (ºF)	Max Temp (ºF)
7/4/2021	72.20	75.21
7/11/2021	73.26	76.48
7/18/2021	73.76	78.18
7/25/2021	76.99	78.20
8/1/2021	76.11	79.38
8/8/2021	71.51	75.56
8/15/2021	74.80	79.43
8/22/2021	77.69	79.65
8/29/2021	77.06	77.94
9/5/2021	75.12	78.21
9/12/2021	77.98	78.81
9/19/2021	76.04	78.71
9/26/2021	76.52	78.05
10/3/2021	75.53	77.60
10/10/2021	74.87	77.58
10/17/2021	73.11	74.41
10/24/2021	71.62	73.53
10/31/2021	68.93	71.31
11/7/2021	69.54	70.51
11/14/2021	67.22	70.02
11/21/2021	66.31	68.89
11/28/2021	66.19	67.93
12/5/2021	64.47	66.43
12/12/2021	63.94	66.81
12/19/2021	63.05	64.88
12/26/2021	61.65	64.78

Raw Data from Field Study

Dissipative Cooling Study GBF: Effluent Temp: 72.47oF (22.48oC) USGS Gage Oil Depot Surface Temp: 52.7oF (11.5oC)
10/27/2021 Permit threshold condition: 60oF (15.56oC) Surface Temp + 2oF: 54.7oF (12.61oC)
River dominated current: 0.25ft/sec
Surface Sp Conductivity: 374uS/cm

		5 ft				10 ft				25 ft				50 ft				75 ft				100 ft				550 ft			
	Distance long shore (ft)	Time	Depth (m)	Temp (oC)	Sp Cond (uS/cm)	Time	Depth (m)	Temp (oC)	Sp Cond (uS/cm)	Time	Depth (m)	Temp (oC)	Sp Cond (uS/cm)	Time	Depth (m)	Temp (oC)	Sp Cond (uS/cm)	Time	Depth (m)	Temp (oC)	Sp Cond (uS/cm)	Time	Depth (m)	Temp (oC)	Sp Cond (uS/cm)	Time	Depth (m)	Temp (oC)	Sp Cond (uS/cm)
		10:25 AM	0.5m	11.8	425	10:21 AM	0.5m	11.9	444	10:16 AM	0.5m	12	426	10:12 AM	0.5m	12.1	471	12:16 PM	0.5m	12	441								
	-100		2.0m	11.8	426		2.0m	11.8	425		2.0m	11.7	427		2.0m	11.6	400		2.0m	11.6	400								
			3.0m	11.8	416		3.9m	11.7	419		5.5m	11.6	398		5.8m	11.6	397		7.0m	11.5	389								
		8:09 AM	0.5m	11.7	419	8:51 AM	0.5m	12.5	519	9:03 AM	0.5m	12.6	564	10:04 AM	0.5m	12.6	550	12:11 PM	0.5m	13.6	698	12:21 PM	0.5m	13.3	660				
	-50		2.0m	11.5	388		2.0m	11.7	410		2.0m	11.7	412		2.0m	11.7	420		2.0m	11.7	410		2.0m	11.6	403				
			3.9m	11.5	383.8		5.4m	11.8	422		5.8m	11.6	392		6.3m	11.6	394		6.8m	11.6	387		7.3m	11.5	384				
		8:04 AM	0.5m	16.5	900	8:47 AM	0.5m	12.8	557	9:08 AM	0.5m	14.5	831	10:01 AM	0.5m	13.8	746	12:05 PM	0.5m	13.5	708	12:26 PM	0.5m	13	603				
	-20		2.0m	11.5	384		2.0m	12	462		2.0m	12.2	494		2.0m	11.7	416		2.0m	11.8	458		2.0m	11.6	392				
			4.5m	11.5	382		5.0m	11.9	439		5.9m	11.7	402		6.0m	11.6	392		6.5m	11.5	386		7.3m	11.5	382				
		8:00 AM	0.5m	19.6	1522	8:43 AM	0.5m	13.9	860	9:14 AM	0.5m	16.6	909	9:56 AM	0.5m	13.7	735	12:00 PM	0.5m	13.3	645	12:29 PM	0.5m	13.4	702				
	-5		2.0m	21.3	1838		2.0m	11.8	419		2.0m	13.1	622		2.0m	11.7	415		2.0m	12.5	498		2.0m	11.6	396				
			3.9m	11.67	398		5.0m	11.7	409		5.6m	12.3	503		5.9m	11.6	395		6.6m	11.5	385		7.2m	11.5	383				
GBF Outfall		7:56 AM	0.5m	19.9	1610	8:38 AM	0.5m	19.6	1315	9:18 AM	0.5m	16.7	1298	9:54 AM	0.5m	16.1	1064	11:42 AM	0.5m	14.4	820	12:33 PM	0.5m	13.2	737	12:46 PM	0.5m	12.6	500
	0		2.0m	20.8	1652		2.0m	12.7	546		2.0m	12.9	635		2.0m	11.7	409		2.0m	11.9	540		2.0m	11.5	389		2.0m	11.6	388
			3.9m	11.58	390		5.0m	11.6	390		5.5m	12.2	483		5.8m	11.6	401		7.0m	11.5	381		6.9m	11.5	383		9.9m	11	405
		8:13 AM	0.5m	20.4	1626	8:35 AM	0.5m	16.7	1240	9:21 AM	0.5m	18.8	1414	9:42 AM	0.5m	15	788	11:39 AM	0.5m	13.6	677	12:36 PM	0.5m	13.3	762				
	5		2.0m	20.1	1650		2.0m	12.5	529		2.0m	12.5	601		2.0m	11.7	416		2.0m	11.8	524		2.0m	11.5	390				
			3.5m	11.67	426		4.5m	11.5	386		5.6m	11.7	400		5.9m	11.6	400		7.1m	11.5	381		6.7m	11.5	383				
		8:18 AM	0.5m	19.4	1500	8:30 AM	0.5m	12.5	452	9:25 AM	0.5m	13.6	764	9:39 AM	0.5m	14.7	914	11:34 AM	0.5m	13.7	660	12:41 PM	0.5m	13.3	641				
	20		2.0m	13.8	1216		2.0m	11.8	427		2.0m	12.4	519		2.0m	12	475		2.0m	11.6	399.2		2.0m	11.5	393				
			3.3m	12.4	471		4.3m	11.6	396		4.8m	11.7	400		5.9m	11.6	402		6.8m	11.5	381		7.2m	11.5	384				
		8:21 AM	0.5m	13.7	704	8:26	0.5m	12.6	524	9:29 AM	0.5m	16.2	1057	9:36 AM	0.5m	13.9	752	11:28 AM	0.5m	12.4	507								
	50		2.0m	11.97	459		2.0m	12.1	476		2.0m	12.3	484		2.0m	12.2	511		2.0m	11.9	428								
			2.5m	11.8	430		3.5m	11.8	424		4.4m	11.6	404		5.6m	11.7	407		6.8m	11.5	380								
		10:51 AM	0.5m	12.1	445	10:48	0.5m	12.2	472	10:37 AM	0.5m	12.8	570	10:44 AM	0.5m	12.9	595	11:21 AM	0.5m	12.1	453								
	100		2.0m	11.8	434		2.0m	11.7	403		2.0m	11.6	397		2.0m	11.6	394		2.0m	11.6	470								
			3.8m	11.7	413		4.6m	11.6	400.1		5.0m	11.6	396		5.7m	11.5	387		6.6m	11.5	381								
		11:09 AM	0.5m	11.9	428	11.06	0.5m	12	455	10:57 AM	0.5m	12	446	11:01 AM	0.5m	11.9	440	11:17 AM	0.5m	12.1	487								
	150		2.0m	11.8	427		2.0m	11.8	422		2.0m	11.6	394		2.0m	11.6	420		2.0m	11.6	398								
			4.4m	11.7	407		4.6m	11.7	406		5.5m	11.6	395		7.1m	11.5	383		7.6m	11.5	381								

Appendix C
GBMSD Dissipative Cooling Study

Green Bay Facility Dissipative Cooling Study

Dissipative Cooling Study Report

February 9, 2022

Prepared for:

NEW Water
The brand of the Green Bay Metropolitan Sewerage District

Prepared by:

Jacobs

Contents

Appendices

Figures

1. Background Information

The Green Bay Metropolitan Sewerage District, branded as NEW Water, owns and operates two regional wastewater treatment facilities: the Green Bay Facility (GBF) and the De Pere Facility (DPF). A combined Wisconsin Pollutant Discharge Elimination System (WPDES) permit (WI-0065251-02-0) is issued by the Wisconsin Department of Natural Resources (WDNR) for both facilities. NEW Water submitted a permit renewal application on December 20, 2018, and draft limits proposed by WDNR recommend effluent temperature limits for the GBF. Historically, temperature limits have not been required, in part because of the thermal load to the Fox River from the J.P. Pulliam Generation Station power plant (Pulliam Plant) directly across the river from the GBF outfall. The power plant has recently been decommissioned and no longer has a permitted outfall or discharge.

A Water Quality-Based Effluent Limitations (WQBEL) memorandum (WDNR 2019) and subsequent addendum that included temperature (WDNR, August 7, 2020) recommended weekly average temperature limits for October and December at the GBF outfall to meet sublethal temperature criteria (60 degrees Fahrenheit [°F] in October and 46°F in December). Acute temperature limits at the GBF are not needed, and no temperature limits were recommended for the DPF outfall. In response to the WQBEL memorandum and coordination with WDNR, NEW Water completed a dissipative cooling study to determine if the recommended thermal limits can be removed from the permit.

This report summarizes the results of the dissipative cooling study and supports the submittal of a Dissipative Cooling Request (Form 3400-198) included in Appendix A.

The GBF outfall is located on the east shore of the Fox River, approximately 500 feet south of the bay of Green Bay (Figure 1-1). The Fox River is joined by the East River about 6,970 feet upstream of the GBF outfall. Between the East River confluence and the GBF outfall, there are several industrial discharges to the Fox River. The nearest industrial outfall on the Fox River is about 2,250 feet upstream of the GBF outfall. Some of these discharges may have thermal loads that reach the GBF outfall.

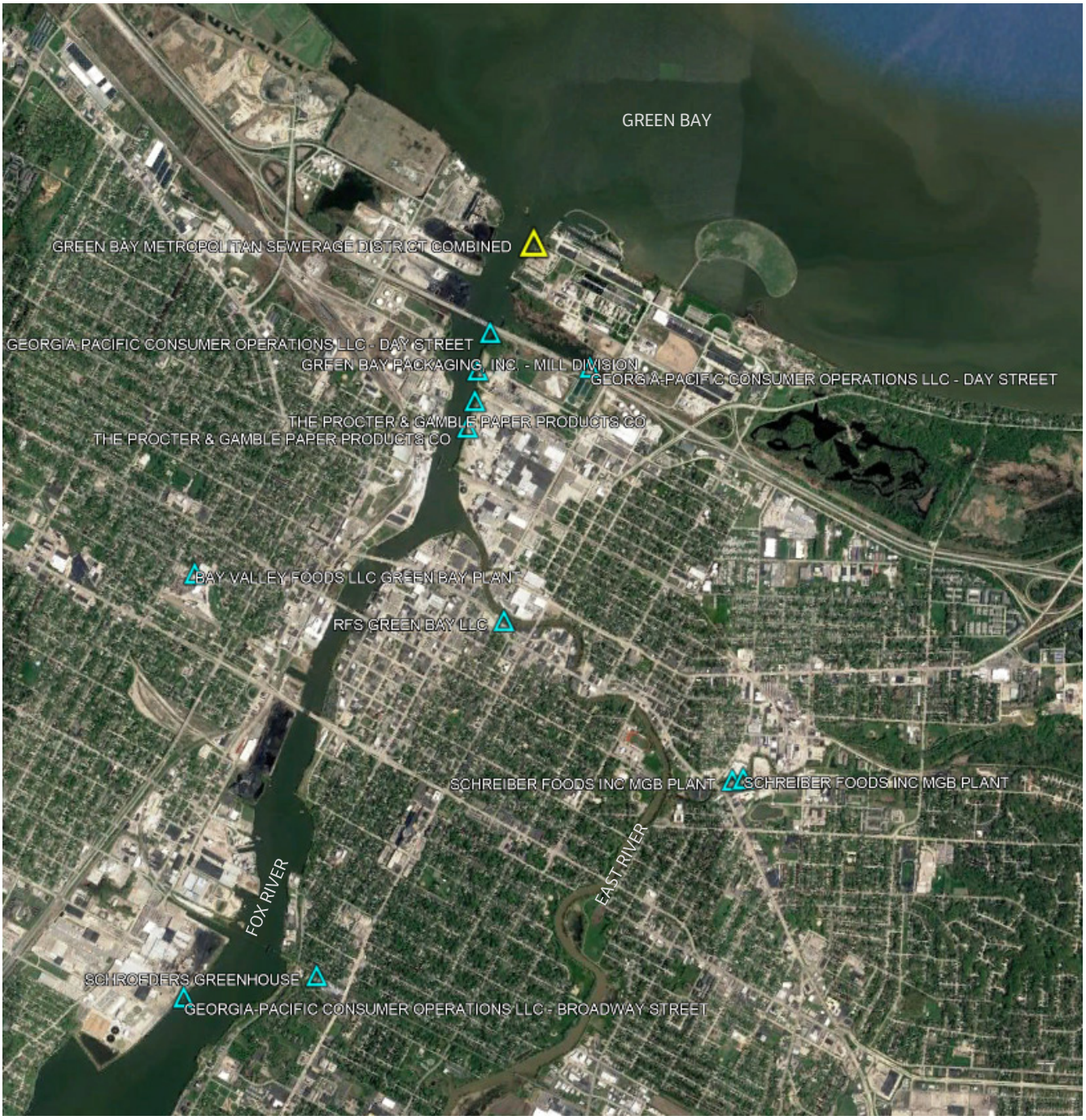


Figure 1-1. Aerial View of the GBF Outfall (yellow) and Other Industrial Dischargers (blue) Near the Dissipative Cooling Study Area

2. Dissipative Cooling Study

2.1 Dissipative Cooling Study Plan

A field study was conducted to evaluate the thermal impact from the GBF effluent on the Fox River and the southern, nearshore waters of the bay of Green Bay. Prior to conducting the study, NEW Water hosted a meeting with WDNR on October 19, 2021, to gain endorsement of the study plan (Appendix B) and its procedures for data collection. Following the meeting, WDNR clarified that if the ambient river temperature is below the sublethal criterion for October (60°F), the goal of the sampling plan should be to collect measurements of sufficient area to demonstrate achieving the criterion (i.e., less than 60°F). If ambient river temperature is above the sublethal criterion (60°F), the goal of the study should be to collect measurements to evaluate the extent of GBF thermal loading against the background temperature. With these comments, WDNR endorsed the proposed sampling plan and agreed that an October field event would be sufficient to demonstrate dissipative cooling, especially if results establish a small mixing zone near the GBF outfall.

2.2 Data Collection Fieldwork

NEW Water staff executed the proposed study on October 27, 2021. Equipment consisted of a 17-foot aluminum jon boat with two staff, one operating a small motor and oar to hold position at the sampling station while the second conducted the temperature sampling. An ArcGIS Collector mobile app allowed the field team to observe their location relative to the sampling locations identified in the study plan. A calibrated temperature and conductivity probe (EXO Sonde) was used to record temperature and conductivity profiles and monitor conditions in real time. Data collection started with sampling near the east bank at NEW Water's GBF outfall followed by sampling north, south, and west in a serpentine pattern at pre-determined distances. Figure 2-1 shows the overall sampling extent; extending to the western shore at 850 feet was not needed.

Profile (vertical) measurements at each sample location were recorded at the near surface (subsurface), 2 meters below the surface (about 6.6 feet) and just above the river bottom. Sampling continued laterally until temperature results were observed below the sublethal criterion for October (60ºF). At least one or more sites were measured beyond the location the sublethal criterion was observed to verify that the conditions were maintained. Thermal loading from the GBF outfall was apparent in the Fox River, where river water temperatures were above ambient conditions. The final sampling area encompassed approximately 100 feet upstream, 150 feet downstream, and 100 feet west from the GBF outfall. Samples were not taken beyond this area (or in the bay of Green Bay), except for a vertical profile sample taken about 550 feet directly west of the outfall for additional background information. The data were reviewed for quality and accuracy and are provided in Appendix C.

Fox River data was retrieved from the U.S. Geological Survey (USGS) gauge website at gauging station USGS 040851385 (Fox River at Oil Tank Depot at Green Bay, Wisconsin) approximately 0.8 mile upstream of the GBF outfall. Data included subsurface temperature, conductivity, flow, and velocity during the time the study was conducted. The data were used to verify that field conditions during sampling were typical for October.

Figure 2-1. Approximate Sampling Perimeter (orange)

3. Results

3.1 Outfall Physical Description

The current GBF outfall was constructed in 1976 and is located on the east shore of the Fox River, approximately 500 feet upstream of where the Fox River meets the bay of Green Bay. The outfall pipe is a 9-foot-diameter (108-inch) circular pipe that runs about 1,520 feet from the GBF to the shorewall, discharging into the Fox River at about mid-depth. Upstream of the shorewall, the outfall transitions from a circular pipe to a rectangular outfall that splits the flow in two and reduces to two short and wide effluent exits. Splitting the flow and using rectangular exit structures (3.5 feet tall by 9.8 feet wide and 3.5 feet tall by 10.9 feet wide) encourages effluent mixing and heat dissipation. The 26.6 million gallons per day (mgd) GBF flow observed on the day of the sampling event had an average velocity of 0.60 foot per second and 0.54 foot per second in the smaller and larger rectangular outfalls, respectively. The average velocity of the GBF flow through the outfall on the day of sampling was 0.57 foot per second.

Upstream of the outfall is a manhole where effluent samples are taken. Appendix D contains a plan view and profile drawing showing the outfall configuration and manhole. Figure 3-1 is a photo of the concrete shorewall outfall location taken from the Fox River.

Figure 3-1. View of the GBF Outfall (Concrete Shorewall)

Over the past 2 years, the GBF daily average effluent flow during October was 30.5 mgd. On the day of field testing, the effluent flow was 26.6 mgd. The flow conditions on the day of fieldwork were within the historical October flows, and consequently, the field day was representative of October conditions.

On the morning of October 27, 2021, NEW Water conducted the dissipative cooling study. Sampling began around 8:00 a.m. and ended just before 1:00 p.m. The weather was mostly overcast, around 48°F, with light wind less than 6 knots out of the east-southeast, building by noon to 8 knots out of the southeast. The Green Bay, Wisconsin, climate information for the day of sampling and all of October 2021 is reported in Appendix C.

Fox River flow and velocity is typically recorded every 5 minutes at the Fox River USGS gauge (USGS 040851385). During the sampling period, the majority of the recorded river flows and velocities were positive (see Appendix C for Fox River flow and velocity data). The flow ranged from -3,900 cubic feet per second (ft^3/s) to 7,290 ft^3/s, and the velocity ranged from -0.27 to 0.51 foot per second, with the majority of water flowing north into lower Green Bay. The condition during sampling was considered a "river dominated system" with little back flow or seiche effects from Green Bay.

The Fox River appeared brown in color during sampling with about 1 meter of visibility. There was no visible effluent plume at the surface indicated by a lack of bubbles or water color differentiation; however, swirling/roiling of water was evident at the river surface near the outfall indicating effluent water mixing with the Fox River. Figure 3-2 includes a picture of the swirling/roiling water pattern.

Figure 3-2. Visible Swirling/Roiling in the Fox River Above the GBF Outfall (Outfall is Concrete Structure at Right)

3.2 Thermal Loading

According to data collected from the Fox River USGS gauge (USGS 040851385), in the last 2 years the daily river temperature for October ranged from approximately 43°F to 68°F. The average Fox River temperature for October is about 56°F, which is consistent with the ambient river temperature (ranging between 52°F and 53°F) recorded on the day of the study.

There does not appear to be thermal loading from upstream industrial dischargers that would influence the GBF thermal plume, because the river was well below the criterion upstream of the GBF outfall. As mentioned previously, the Pulliam Plant, located on the west shore of the mouth of the Fox River, was decommissioned in 2020, greatly reducing the thermal load entering the lower Fox River around the NEW Water GBF outfall. In 2021, Green Bay Packaging (GBP) worked with NEW Water during a mill expansion to convey effluent from GBP to the GBF for treatment, and then constructed a return pipeline of GBF effluent to GBP for use in their new processing at the plant. As a result of this new expansion and effluent reuse, GBP no longer has a primary effluent discharge to the Fox River immediately upstream of the GBF outfall.

3.3 Effluent Temperature Data

From 2020 through 2021, the average daily GBF effluent temperature for the month of October was 72.0°F. The daily effluent temperature during this time ranged from 64.2°F to 78.7°F. On the day of field testing, the daily effluent temperature was 72.5°F, which is typical for October.

3.4 Site-Specific Conditions

The lower Fox River is part of the Total Maximum Daily Load and Watershed Management Plan for Total Phosphorus and Total Suspended Solids in the Lower Fox River Basin and Lower Green Bay (The Cadmus Group, Inc. 2021). Excess phosphorus and excess suspended solids have been identified as main causes of degraded water quality such as nuisance algal growth, oxygen depletion, reduced submerged aquatic vegetation, water clarity problems, and degraded habitat.

As discussed in Section 3.1, the physical configuration of the outfall splits the flow into two smaller openings (3.5 feet tall by 9.8 feet wide and 3.5 feet tall and 10.9 feet wide). The day of the study, the average GBF effluent velocity was 0.57 foot per second, and with evidence of surface swirling/roiling, it was sufficient velocity for mixing. Other physical characteristics of the effluent outfall and receiving stream were previously discussed in this section as well Sections 1 and 2.

According to the Draft 2022 Impaired Waters and Restoration Waters Lists (WDNR 2022), a primary pollutant for the lower Fox River is polychlorinated biphenyl (PCB)-contaminated sediments. In recent years, the Fox River sediments have been dredged for PCB contamination. Ongoing monitoring of sediment, water quality, and biological response to the PCB cleanup is being conducted by WDNR. The U.S. Army Corps of Engineers also routinely performs navigational dredging along the Fox River to maintain water depths for barges and large ships. Rock may have been previously placed in the river at the GBF outfall; however, the Fox River has a significant sediment load that settles in the river and bay. Consequently, the bottom sediments are primarily fine sediments and silt.

Biological information was not collected for this study; however, it is well known that the Fox River, despite its water quality impairments, is a world-class fishery (e.g., walleye). It is common to observe fishing at the outfall during non-ice-over times from the shoreline and boats.

3.5 Results of the Dissipative Cooling Study

The temperature data collected by NEW Water staff show the GBF effluent rising from the effluent structure and the warmer temperatures dissipating within a short distance from the outfall.

The sublethal criterion of 60°F was met close to the outfall: within 100 feet downstream of the outfall, less than 50 feet upstream of the outfall, and less than 75 feet west of the outfall into the Fox River channel (Figure 3-3). The thermal plume meets the NR 102.05(3)(c) mixing-zone size constraints of being less than 25 percent of the cross-sectional area of the water body and not extending beyond 50 percent of the water body width. At each sampling location, temperature was measured in three locations along a vertical profile:

- Subsurface – Temperatures taken just below the surface had the most variability, ranging from 53.2°F to 68.7°F, with most of the temperatures recorded below the sublethal temperature. The warmest temperatures were measured closest to the GBF outfall, and the heat from the warmer effluent water dissipated into the atmosphere and surrounding water within a short distance from the outfall. The observed temperature plume had a defined presence in the near-surface temperature recordings.
- Mid-Depth – The highest temperature recorded, 70.3°F, was measured mid-depth near the outfall. However, the warm temperature quickly dissipated to surrounding water, and most of the temperatures recorded at mid-depth were near or below the background temperature. The temperature plume from the outfall was less defined at mid-depth.
- Near-Bottom – All of the temperature measurements were below the sublethal criterion. The temperature near the bottom of the river was also consistent upstream, downstream, and laterally from the outfall, with some minor temperature increases near the outfall. There was no observable temperature plume from the outfall at near-bottom.

Conductance data were also collected and showed similar trends as the temperature data. Conductance was not further analyzed because the temperature data convincingly demonstrates dissipative cooling within a short distance of the outfall. The temperature data are consistent with what would be expected with warmer, less dense effluent staying in the upper water column, quickly mixing and dissipating within a short distance with cooler, denser river water.

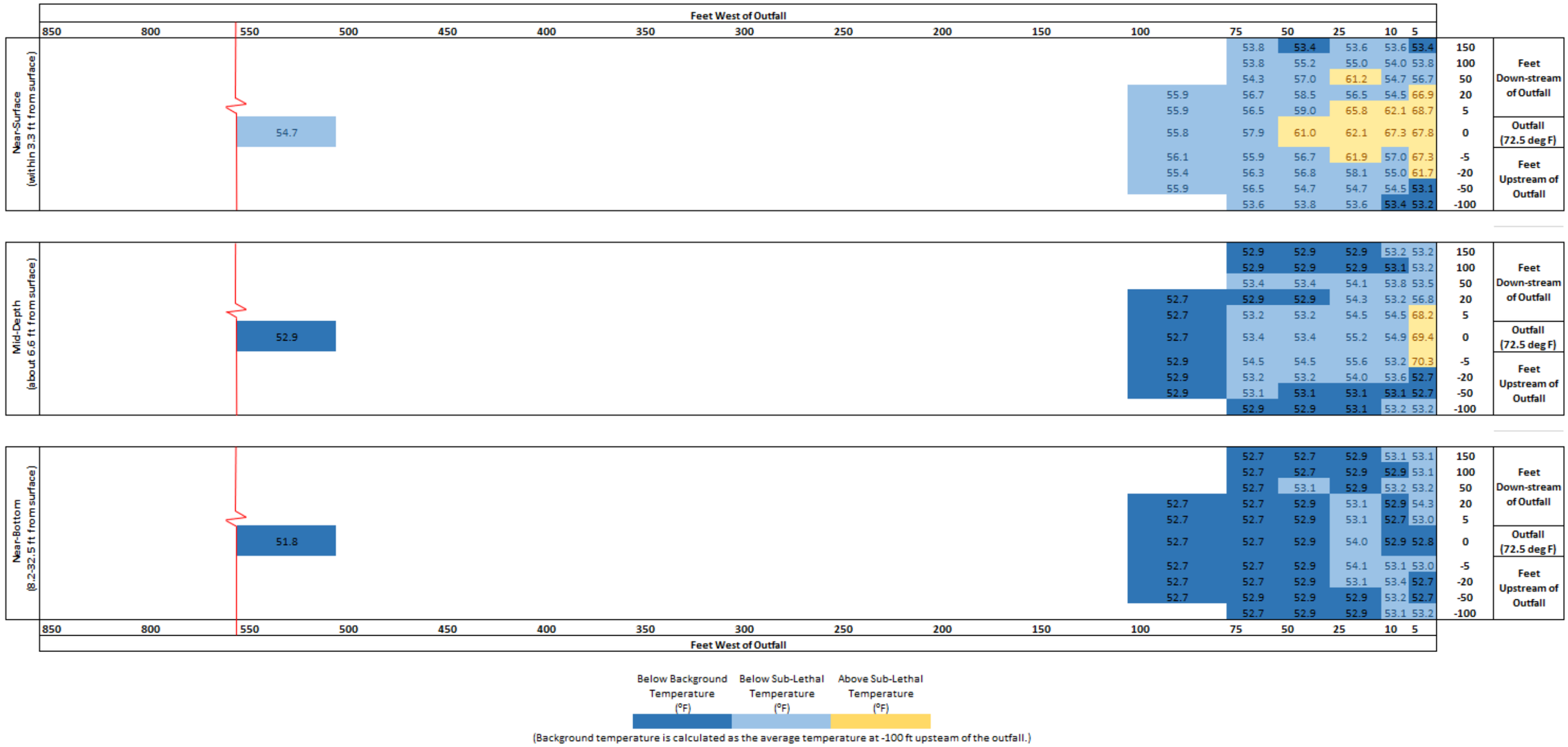


Figure 3-3. Temperature (°F) at Sample Locations

4. Conclusions

The dissipative cooling study was completed on the morning of October 27, 2021, during conditions that were typical and representative of October conditions at the GBF and within the Fox River. The study was executed according to the sampling plan agreed upon by WDNR and demonstrated that the thermal loading dissipated a short distance from the outfall. Additional river water temperature readings were collected beyond where the sublethal criterion (60°F) was met to delineate the extent of the thermal plume. The study did not directly observe thermal impact from upstream sources because the background temperatures, measured at 100 feet upstream of the outfall, were below the sublethal criteria.

Evidence of dissipative cooling for non-unidirectional waters near the GBF outfall includes:

1) An exit velocity of 0.57 foot per second that supports rapid mixing with the Fox River. Rapid mixing is visibly evident with swirling/roiling water on the river surface.

2) GBF effluent rises to the surface and disperses heat to the surrounding water and atmosphere. This is evident by the small thermal plume measured only at the near-surface sampling locations.

3) The measured temperature fell below the October sublethal criterion of 60°F within 100 feet downstream of the outfall, within 50 feet upstream of the outfall, and within 75 feet west of the outfall. The ambient temperature of the Fox River does not increase greatly beyond the small mixing zone.

4) Temperature results from across the sampling area at all three sampling depths show that the heat from the effluent water dispersed rapidly and did not persist in the water column at significant distances. The thermal mixing zone of the GBF outfall is small in both depth and width across the river, meeting NR 102.05(3)(c) mixing-zone size constraints. With the sublethal criterion observed at the shoreline at the bottom, and only extending a maximum of 75 feet near the surface, there is no fish barrier present at this location where the river is about 850 feet wide.

The completed dissipative cooling request form is included in Appendix A. This successful demonstration of dissipative cooling should be sufficient documentation that thermal limits are not needed for the GBF outfall.

5. References

The Cadmus Group, Inc. 2021. *Total Maximum Daily Load and Watershed Management Plan for Total Phosphorus and Total Suspended Solids in the Lower Fox River Basin and Lower Green Bay.* Prepared for WI DNR, Oneida Tribe of Indians of Wisconsin, and USEPA. March.

Wisconsin Department of Natural Resources. (WDNR). 2019. *Water Quality-Based Effluent Limitations for the Green Bay Metropolitan Sewerage District Combined WPDES Permit No. WI-0065251-02.*

Wisconsin Department of Natural Resources. (WDNR). 2020. *Addendum to the Water Quality-Based Effluent Limitations for the Green Bay Metropolitan Sewerage District Combined WPDES Permit No. WI-0065251-02.* August 7.

Wisconsin Department of Natural Resources. (WDNR). 2022. DRAFT 2022 Impaired Waters and Restoration Waters Lists. https://dnr.wisconsin.gov/topic/SurfaceWater/ConditionLists.html.

Appendix A
Dissipative Cooling Request Form

State of Wisconsin
Department of Natural Resources
PO Box 7921, Madison WI 53707-7921
dnr.wi.gov

Dissipative Cooling Request

Notice: Pursuant to ss. NR 106.59(4) and (6), Wis. Adm. Code, this application must be completed for dissipative cooling (DC) evaluation of a publicly operated treatment works (POTW) discharge as related to weekly average temperature limits. Personal information collected will be used for administrative purposes and may be provided to requesters to the extent required by Wisconsin's Open Records Law (ss. 19.31-19.39, Wis. Stats.).

Facility Information

Facility Name	Contact Name
Green Bay Metropolitan Sewerage District	Tom Sigmund
Telephone Number	**Email**
(920) 432-4893	tsigmund@newwater.us
This operation is (check one): ◯ New or relocated outfall, or ◉ Existing outfall	**WPDES Permit No.** WI-0065251-01-1

Consultant Information (if consultant performed DC analysis)

Company Name	Preparer Name		
Green Bay Metropolitan Sewerage District	Kate Verbeten		
Telephone Number	**Email**		
(920) 438-1045	kverbeten@newwater.us		
Mailing Address	**City**	**State**	**ZIP Code**
2231 N. Quincy St.	Green Bay	WI	54302

DC Submittal Information

This is a summary. Also see ch. NR 106.59, Wis. Adm. Code, and applicable Thermal Guidance. For each item, check the appropriate box. If information is attached, a column is provided for the applicant to write the page numbers where this information can be found.

Items REQUIRED to Include in the Submittal	Included?	Page Number (if applicable)
1. **Physical Description:** A written description of the physical characteristics of the receiving water or outfall. [s. NR 106.59(4)(a)(1) or 106.59(6)(a)(1), Wis. Adm. Code] *Note: It is recommended that a schematic drawing of location and outfall also be submitted.*	◉ Yes	
2. **Thermal Loading:** A written description of the presence or absence of other thermal loads or discharges of heated water to the receiving water in the vicinity of this outfall (upstream and downstream). [s. NR 106.59(4)(a)(2) or 106.59(6)(a)(2), Wis. Adm. Code]	◉ Yes	
3. **Temperature Data:** The minimum and maximum known effluent temperature for each calendar week for each previously permitted outfall over the past two years. [s. NR 106.59(4)(a)(3) or 106.59(6)(a)(3), Wis. Adm. Code] Must provide if available.	◉ Yes ◯ Some data available, but not to full extent (explain) ◯ Not available	
4. **Site-Specific Conditions:** For more information on this section see s. NR 106.59(4)(b) or 106.59(6)(b), Wis. Adm. Code. Must provide if available. ***Examples:*** *Biological quality- Species composition, richness, diversity, density, distribution, age, presence/absence of threatened and endangered species, etc.* *Physical characteristics- Bottom substrate of surface water, physical configuration of outfall, discharge velocity, mixing zone, etc.*	◉ Yes ☐ Biological quality ☒ Physical characteristics ☒ Min and max temperatures of the receiving water upstream of outfalls ◯ Not available	
Additional Items that <u>May Be</u> Included in the Submittal	**Included?**	**Page Number (if applicable)**
1. **Data Collection:** If temperature and/or plume data are not available, these data may need to be collected through a dye or temperature profile study. See Thermal Guidance document for additional information.	◉ Yes ☐ Dye study ☒ Temperature profile ☒ Other ◯ No	
2. **Visual/photographic information:** It is recommended that photographic or other visual documentation of the outfall and receiving water accompany any DC submittal.	◉ Yes ◯ No	
3. **Other supporting information.**	◉ Yes ◯ No	

Data Collection (if applicable)
Describe any studies performed to justify dissipative cooling.

Type of study Field sampling of outfall and receiving water, including temperature profiles.	☐ Dye study ☒ Temperature profile ☐ Other
Time of Year: Month when study was performed October 2021	☐ Jan ☐ Apr ☐ Jul ☒ Oct ☐ Feb ☐ May ☐ Aug ☐ Nov ☐ Ma ☐ Jun ☐ Sep ☐ Dec
Outfall flow conditions *at time of study* Outfall conditions were typical for the month of October.	☐ High ☒ Average ☐ Low
Waterbody flow conditions *at time of study* Fox River conditions were typical for the month of October.	◉ Yes ○ No

Written description of study results. Written description can also be attached.
Please see attached report. October sublethal water quality criteria were met within a short distance from the outfall: within 50 feet upstream of the outfall, 100 feet downstream of the outfall, and 75 feet laterally from the outfall.

Justification for DC: Check ALL that apply. Justification and rationale used to reach this justification should be included in the written description (included on next page or attached to this document), as required in ss. NR 106.59(4) or (6), Wis. Adm. Code.

Physical Evidence of DC:

- ☒ Non-unidirectional waters
  - ☒ Exit velocity such that rapid mixing of effluent occurs
  - ☒ Loss of heat to the atmosphere
  - ☒ Heat disperses rapidly and does not persist in water column at significant distances
  - ☒ Ambient temperature of waterbody does not increase greatly (less than or equal to 3°F) at a point more than a few hundred feet from the outfall
- ☐ Unidirectional waters
  - ☐ Exit velocity such that rapid mixing of effluent occurs
  - ☐ Rough bottom substrates present resulting in turbulent flow
  - ☐ Loss of heat to the atmosphere
  - ☐ Thermal mixing zone does not extend more than 25% of the cross-sectional area or more than 50% of the width of the receiving stream
  - ☐ Zone(s) of free passage exist for fish and aquatic life
  - ☐ Ambient temperature of waterbody does not increase greatly (less than or equal to 5°F) at a point more than 5 to 10 stream widths downstream of outfall

Biological Evidence of DC:

- ☐ Discharge does not impede migration of organisms
- ☐ No observed difference between communities in and outside of discharge
- ☐ No presence of threatened or endangered organisms

Other Information:

- ☒ Multiple thermal effluent discharges do not exist
- ☒ Other

Written Description as required in s. NR 106.59(4) or (6), Wis. Adm. Code: All required written descriptions as well as justification for dissipative cooling should be included. See table on page 1, administrative code, and/or applicable Thermal Guidance for more information. Written description and justification may also be attached.

Please see attached report. River temperatures were below the October sublethal water quality criteria within 50 feet upstream of the outfall, 100 feet downstream of the outfall, and 75 feet laterally from the outfall.

Additional information can be found in the Rule Order on the Thermal Standards, the Guidance for Implementation of Wisconsin's Thermal Water Quality Standards, and the frequently asked questions page. These resources are available at: http://dnr.wi.gov/org/water/wm/wqs/thermalrulesrevisions.htm.

The Preparer and the Owner Certify the Following:

- I am familiar with the specifications submitted for this application, and I believe all applicable items in this checklist have been addressed.
- I have completed this document to the best of my knowledge and have not excluded pertinent information.
- I certify that the information in this document is true to the best of my knowledge.

Signature of Preparer	Date Signed
Kate E Kurkoski	February 9, 2022

Appendix B
Dissipative Cooling Study Sampling Plan

Jacobs

Memorandum

Subject	NEW Water Dissipative Cooling Study Plan - DRAFT
Attention	Kate Verbeten, NEW Water Sarah Bartlett, NEW Water Erin Houghton, NEW Water
From	Jacobs
Date	October 13, 2021

The purpose of this memorandum is to summarize a work plan for the NEW Water dissipative cooling (DC) study for the Green Bay Facility (GBF). The GBF received effluent temperature limits for the months of October and December in its Wisconsin Pollutant Discharge Elimination System (WPDES) DRAFT permit (WI-0065251-02-0). A field study is planned over one day in late October or early November during typical weather and flow conditions.

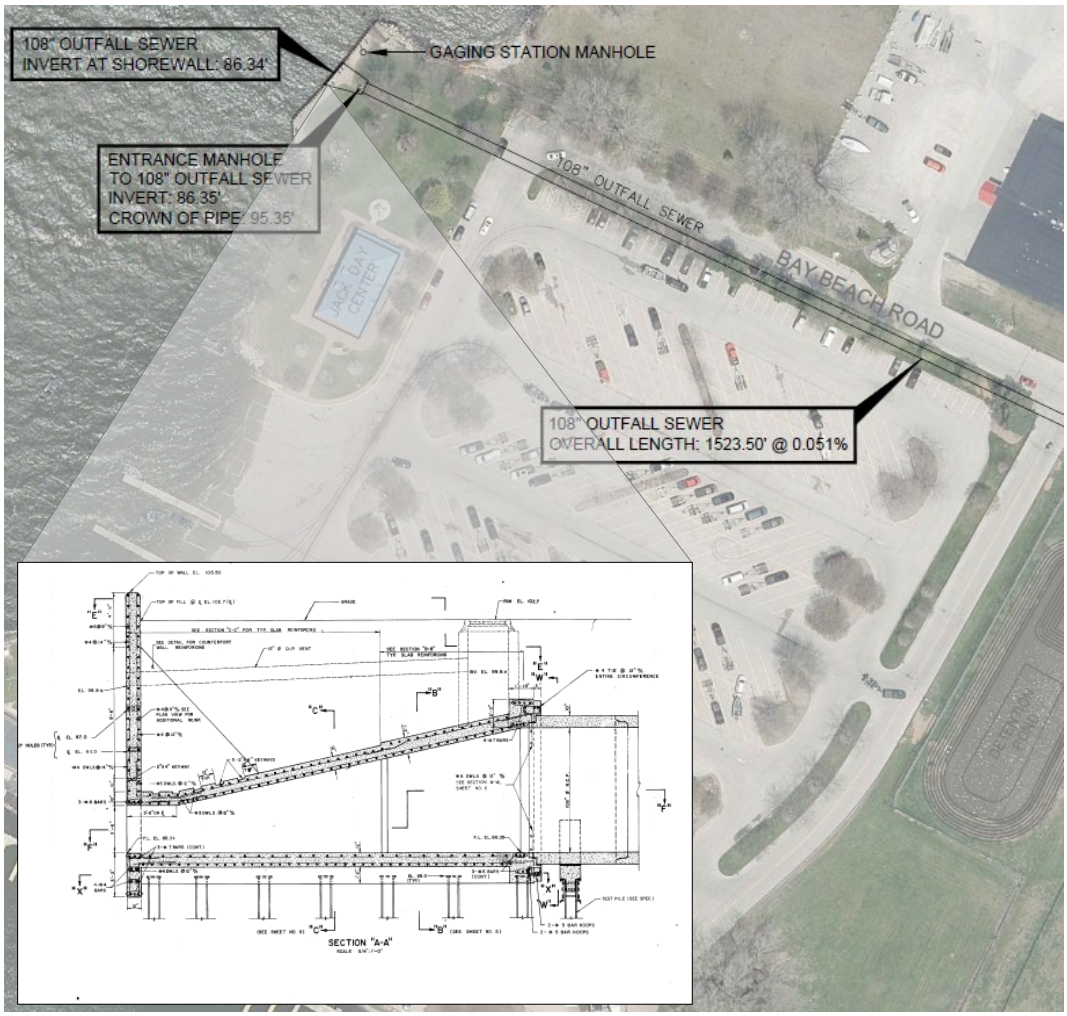
Background Information

The overall goal of this DC study is to evaluate the thermal impact from the GBF on the Fox River and the southern, nearshore waters of the bay of Green Bay. A Dissipative Cooling Request (Form 3400-198) as outlined in the Wisconsin Department of Natural Resources (WDNR) publication Guidance for Implementation of Wisconsin's Thermal Water Quality Standards (August 2013) will be used to guide the associated field work and reporting to the WDNR.

The GBF outfall is located on the east shore of the Fox River, approximately 500 feet south of where the Fox River meets the bay of Green Bay. The outfall was constructed in 1971. A plan view and profile drawing showing the outfall configuration is shown in Exhibit A.

The Fox River is joined by the East River about 6,970 feet upstream of the GBF outfall (Exhibit B), and there are effluent discharges by industries between the De Pere Dam and the GBF outfall. The nearest industrial outfall on the Fox River is about 2,250 feet upstream of the GBF outfall, however thermal loads from these sources could be present at the GBF outfall. Consequently, the data collection will include sample locations between the GBF outfall and the downstream-most industrial outfall to establish a background thermal condition upstream of the GBF outfall. Data will be collected across the Fox River, downstream of the GBF outfall and throughout the facility's thermal plume, and upstream of the outfall to determine where the facility's thermal plume is dissipated to background conditions. The data will then be compared to the background readings. Temperature and conductivity measurements will be used to assess the facility's thermal plume.

Exhibit A: GBF Outfall Plan and Profile Views



Field Study

1. Flow, temperature, and conductivity of the Fox River are measured from USGS Station 040851385 at the Oil Tank Depot in Green Bay, Wisconsin. This station is approximately 4,200 feet upstream of the GBF outfall, both of which are labeled on Exhibit B. The USGS data and weather conditions will be reviewed prior to sampling to determine if conditions are typical for the time of year.

2. Exhibits C and D summarize the proposed sampling transects from the outfall into the river and bay. A background transect will be located at about 900 ft upstream of the GBF outfall. Transects will be at approximately the following distances from the outfall (outfall = "0"); -900 feet, -500 feet, -300 feet, -100 feet, -50 feet, -5 feet, 0 feet, +5 feet, +50 feet, +100 feet, +300 feet, +500 feet, and +900 feet. Samples will be collected at various sample stations from five feet to 800 feet from the east shore of the Fox River. A matrix describing sample station locations is shown in Exhibit E. Sampling stations will be adjusted in the field to document changes in conductivity or flow characteristics, to locate where the thermal plume dissipates to background conditions.

3. Along each transect and sample location, the field team will collect temperature and conductivity measurements. Due to the water depth, a boat will be used as the platform for data collection. Data collection will be completed from the front of the boat so that the boat motor propeller does not impact water turbulence. Temperature and conductivity measurements will be taken just below the surface, mid-depth, and approximately one meter from the bottom.

4. Record the GBF effluent temperature (at the GBF WPDES monitoring location) at the beginning and end of the field event.

5. Photograph the effluent outfall area and river. Aerial drone photos will also be collected if possible, and if mixing characteristics can be observed.

Following the data collection event, the data will be graphed and interpreted to evaluate the thermal mixing area and the extent of the thermal plume when compared to background river conditions. The data will be plotted with an initial data review while in the field to determine if additional data collection made be needed and the same day, such as if higher density sampling locations are needed. Bottom substrate and biological data will not be collected.

Exhibit B: GBF Outfall Location

Exhibit C: Proposed Transect Locations

Exhibit D: Proposed Transect Locations Near GBF Outfall

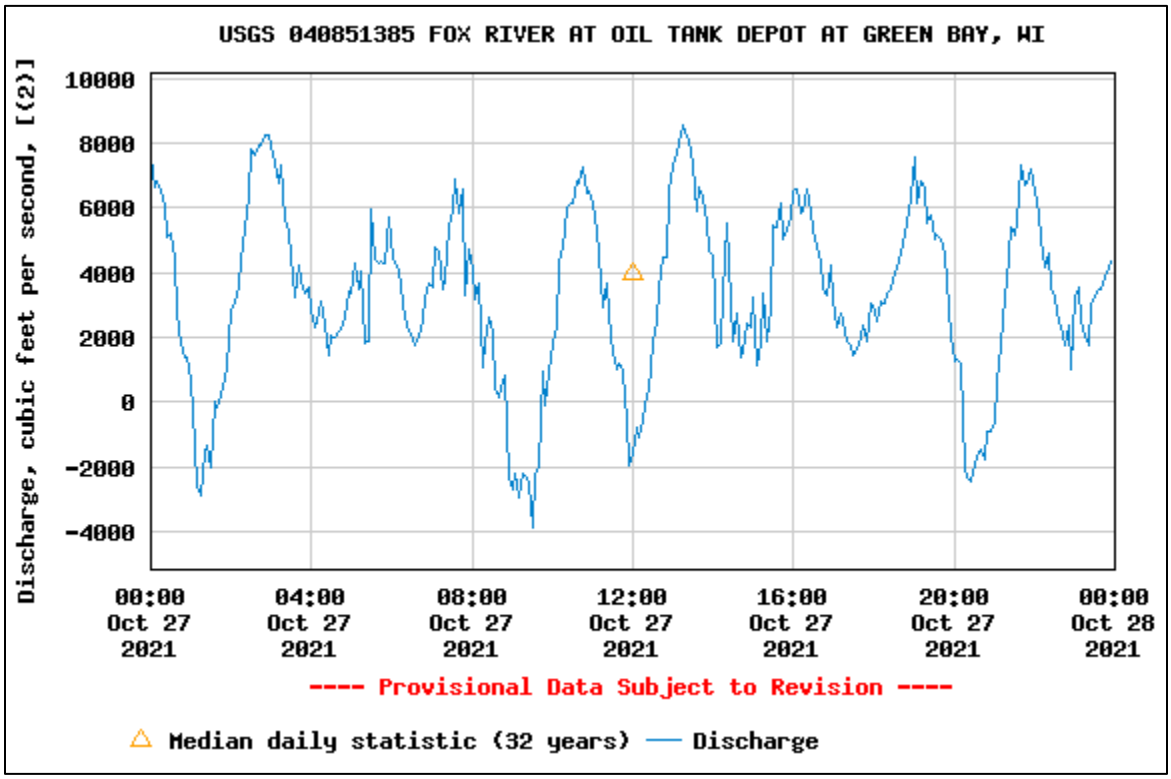
Exhibit E: Proposed Sampling Locations

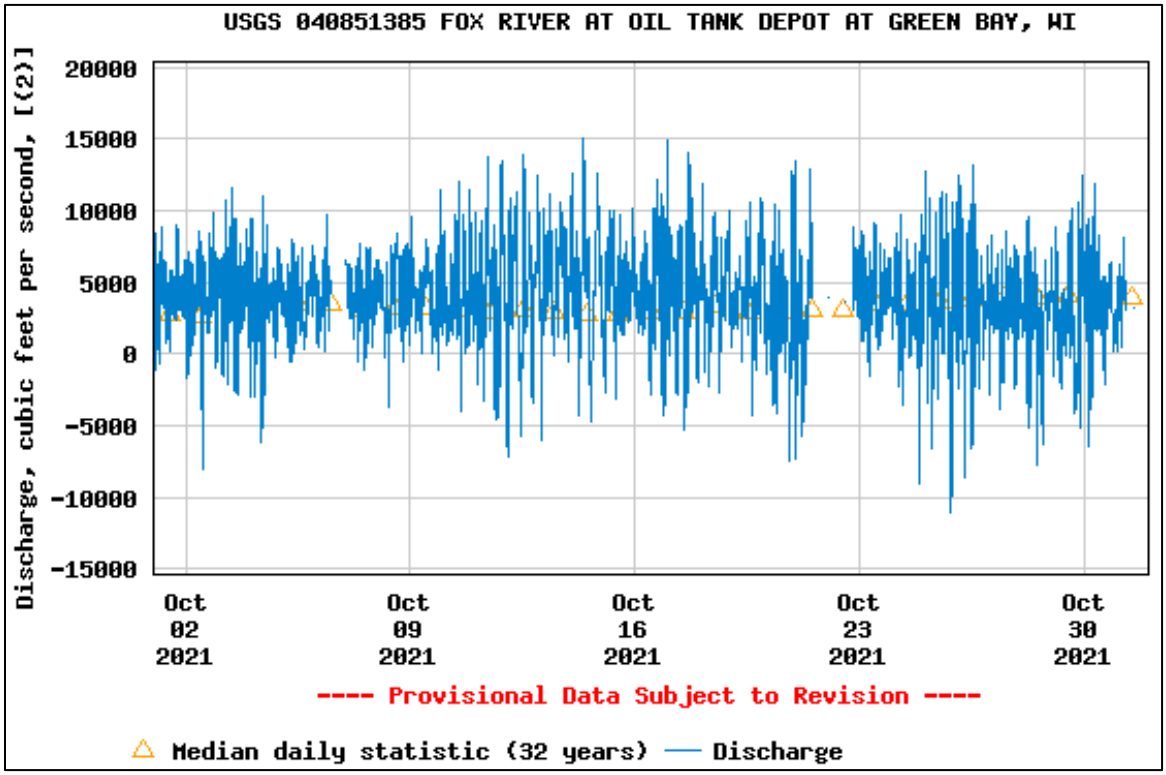
Transect from Outfall (ft)	Feet from East Shore of Fox River															
	5	10	25	50	75	100	150	200*	250*	300*	350*	400*	500*	600*	700*	800*
+ 900 (background)		X		X		X				X			X			X
+ 500 (if needed)		X		X		X				X			X			
+ 300	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
+ 100	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
+ 50	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
+ 5	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
0 (GBF Outfall)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
- 5	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
- 50	X	X		X		X		X		X		X	X		X	
- 100 (if needed)		X		X		X		X		X		X	X		X	
- 300 (if needed)						X				X			X			
- 500 (if needed)						X				X			X			
- 900 (background)		X		X		X				X			X			X

* Initial observations indicate that the outfall plume does not extend beyond 200 feet from the eastern shore. Data will not be collected beyond where the thermal plume has been confirmed to have dissipated the day of sampling.

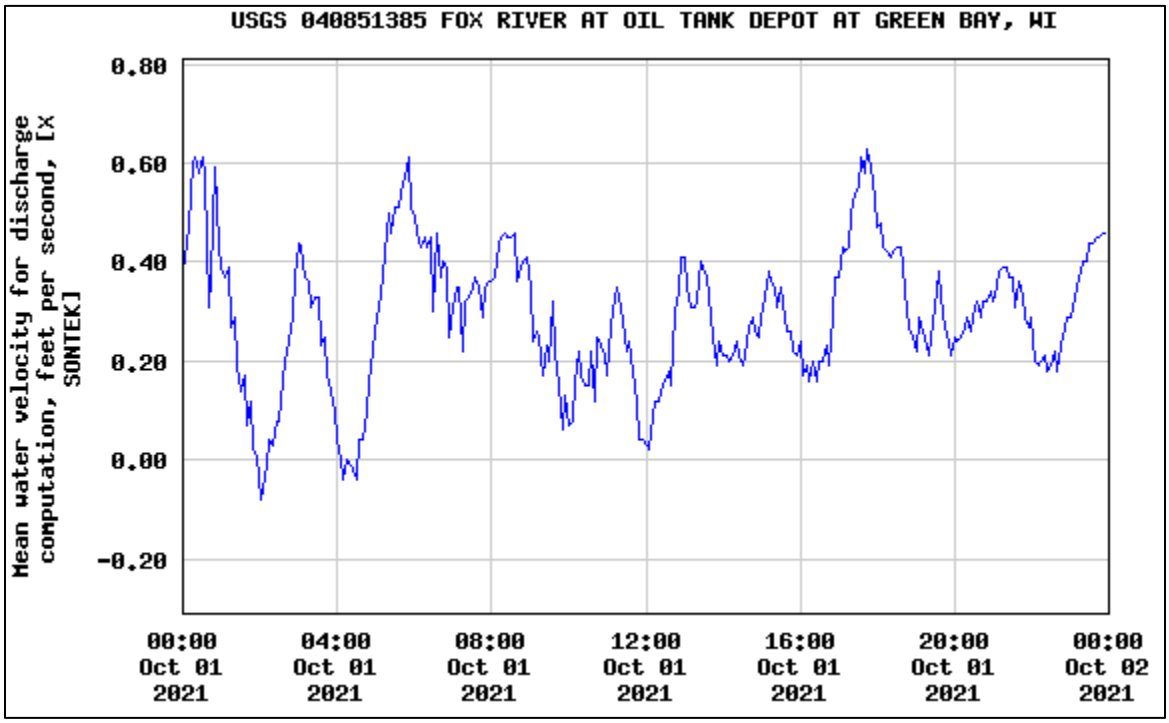
Appendix C
Results Data

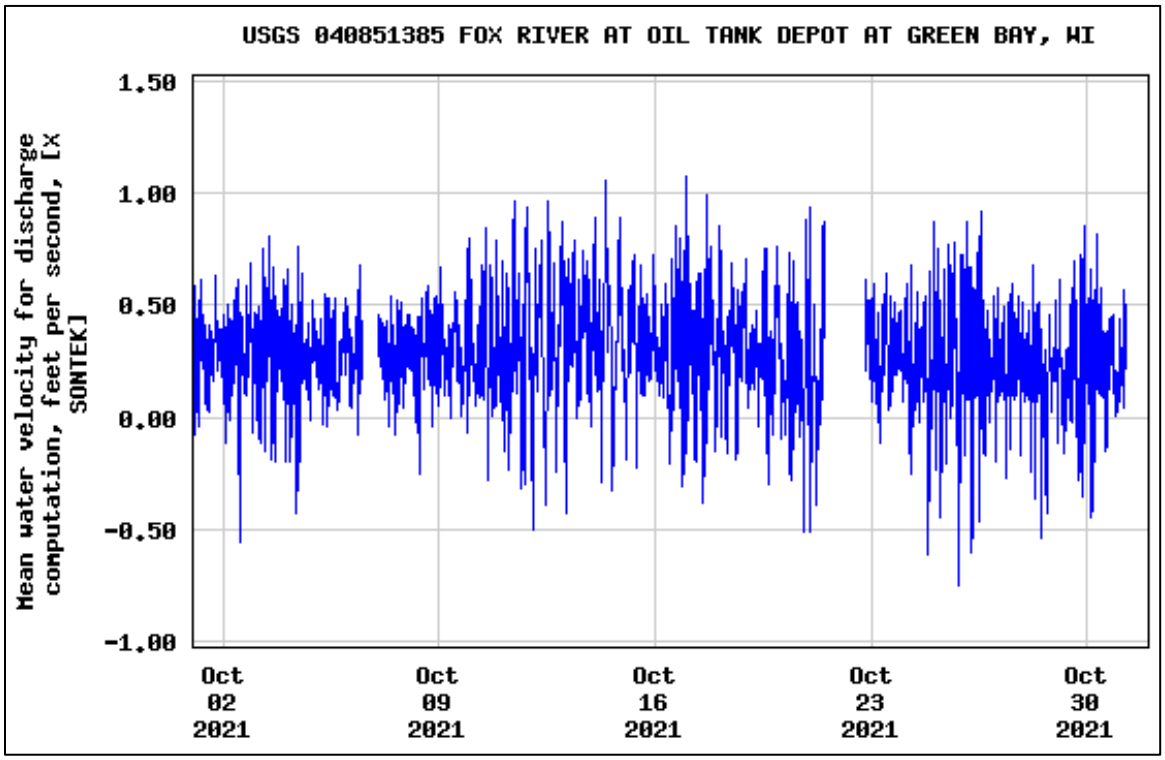
Fox River Flow on Day of Sampling and for October 2021



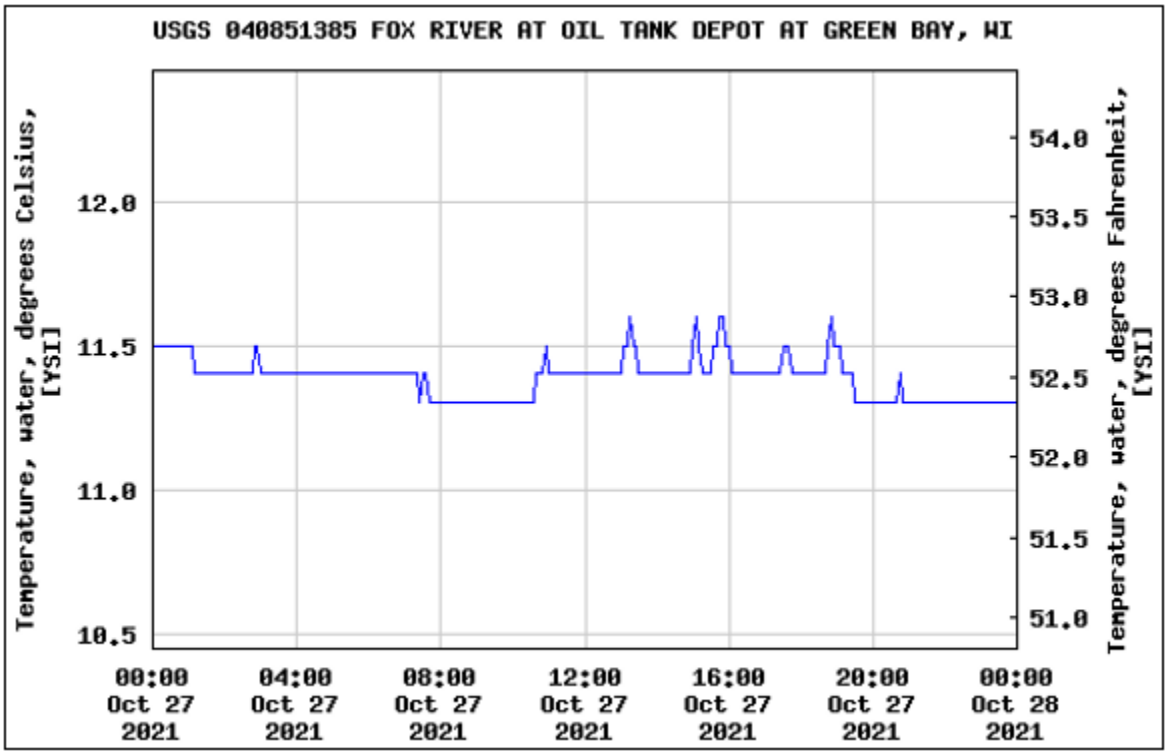


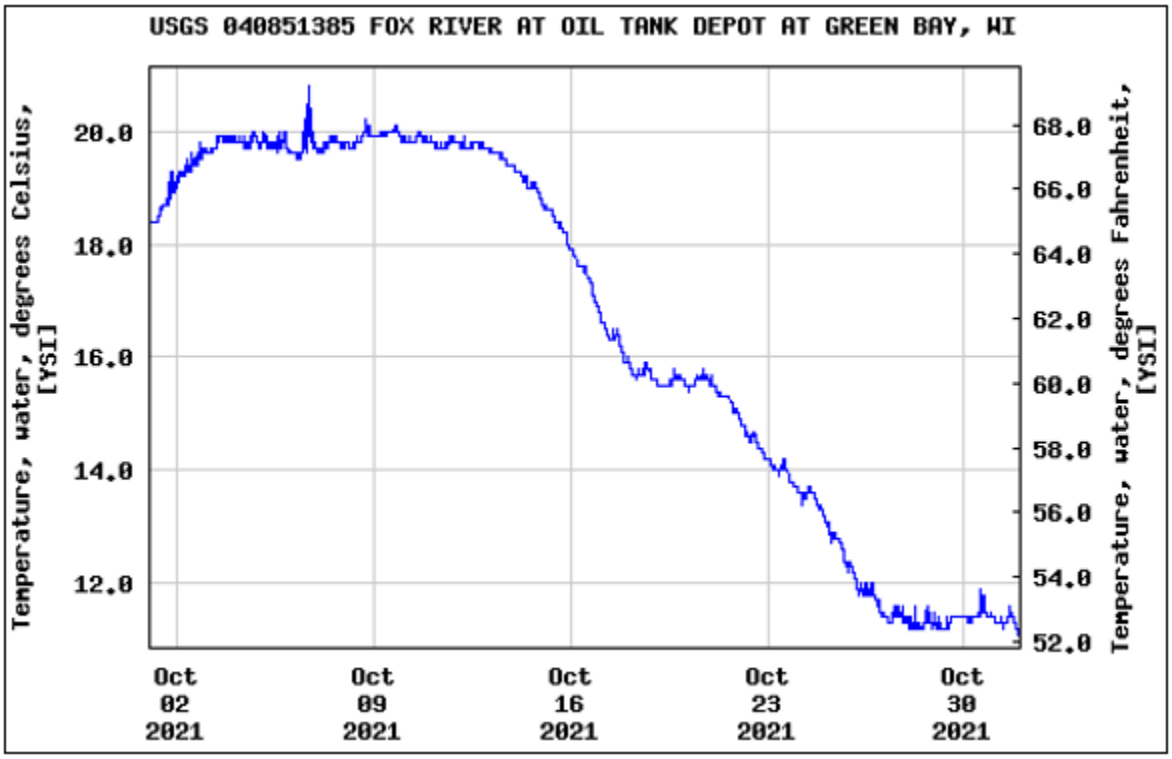
Fox River Velocity on Day of Sampling and for October 2021





Fox River Temperature Data from Day of Sampling and for October 2021





October 2021 Climate Information for Green Bay, Wisconsin

Climatological Data for Green Bay Area, WI (ThreadEx) - October 2021

Click column heading to sort ascending, click again to sort descending.

Date	Temperature				HDD	CDD	Precipitation	New Snow	Snow Depth
	Maximum	Minimum	Average	Departure					
2021-10-01	84	50	67.0	12.1	0	2	0.00	0.0	0
2021-10-02	80	62	71.0	16.5	0	6	0.02	0.0	0
2021-10-03	67	61	64.0	10.0	1	0	0.20	0.0	0
2021-10-04	67	60	63.5	9.9	1	0	0.02	0.0	0
2021-10-05	71	54	62.5	9.3	2	0	0.00	0.0	0
2021-10-06	74	52	63.0	10.2	2	0	0.00	0.0	0
2021-10-07	68	52	60.0	7.6	5	0	0.42	0.0	0
2021-10-08	75	59	67.0	15.0	0	2	0.02	0.0	0
2021-10-09	72	60	66.0	14.5	0	1	0.00	0.0	0
2021-10-10	76	63	69.5	18.4	0	5	T	0.0	0
2021-10-11	68	63	65.5	14.8	0	1	0.02	0.0	0
2021-10-12	68	61	64.5	14.2	0	0	0.10	0.0	0
2021-10-13	67	54	60.5	10.6	4	0	T	0.0	0
2021-10-14	68	45	56.5	7.0	8	0	0.00	0.0	0
2021-10-15	61	39	50.0	0.9	15	0	T	0.0	0
2021-10-16	61	41	51.0	2.3	14	0	0.00	0.0	0
2021-10-17	67	40	53.5	5.2	11	0	0.00	0.0	0
2021-10-18	70	35	52.5	4.6	12	0	0.00	0.0	0
2021-10-19	74	41	57.5	10.0	7	0	0.00	0.0	0
2021-10-20	63	47	55.0	7.9	10	0	0.24	0.0	0
2021-10-21	56	35	45.5	-1.2	19	0	0.02	0.0	0
2021-10-22	47	33	40.0	-6.3	25	0	0.00	0.0	0
2021-10-23	54	32	43.0	-2.9	22	0	0.00	0.0	0
2021-10-24	51	28	39.5	-6.0	25	0	T	0.0	0
2021-10-25	50	36	43.0	-2.1	22	0	T	0.0	0
2021-10-26	52	32	42.0	-2.7	23	0	0.00	0.0	0
2021-10-27	56	33	44.5	0.2	20	0	0.00	0.0	0
2021-10-28	56	50	53.0	9.1	12	0	0.03	0.0	0
2021-10-29	56	49	52.5	9.0	12	0	0.06	0.0	0
2021-10-30	60	38	49.0	5.9	16	0	0.00	0.0	0
2021-10-31	51	35	43.0	0.3	22	0	0.00	0.0	0
Sum	1990	1440	-	-	310	17	1.15	0.0	-
Average	64.2	46.5	55.3	6.6	-	-	-	-	0.0
Normal	58.0	39.5	48.7	-	507	4	2.67	0.3	-

Observations for each day cover the 24 hours ending at the time given below (Local Standard Time). Observation times may have changed during this period.
Max Temperature : midnight
Min Temperature : midnight
Precipitation : midnight
Snowfall : unknown, midnight
Snow Depth : unknown, 6am

Daily and Weekly GBF Effluent Temperature

Daily Average Temp	
Date	**Temp (°F)**
10/1/2021	77.5
10/2/2021	78.1
10/3/2021	77.5
10/4/2021	75.7
10/5/2021	75.5
10/6/2021	75.9
10/7/2021	76.4
10/8/2021	77.1
10/9/2021	77.6
10/10/2021	77.6
10/11/2021	76.5
10/12/2021	76.5
10/13/2021	76.0
10/14/2021	75.8
10/15/2021	75.7
10/16/2021	74.9
10/17/2021	74.2
10/18/2021	73.9
10/19/2021	74.4
10/20/2021	74.3
10/21/2021	74.1
10/22/2021	73.1
10/23/2021	73.5
10/24/2021	73.5
10/25/2021	71.9
10/26/2021	71.6
10/27/2021	72.5
10/28/2021	73.2
10/29/2021	73.0
10/30/2021	72.2
10/31/2021	71.3
Average	74.9
Min	71.3
Max	78.1

Weekly Average Temp	
Week of October	**Temp (°F)**
1	76.5
2	76.1
3	73.9
4	72.6
Average	74.8
Min	72.6
Max	76.5

2020 Weekly Minimum and Maximum GBF Effluent Temperature

Week of	Min Temp (°F)	Max Temp (°F)
12/29/2019	53.42	57.67
1/5/2020	55.30	56.79
1/12/2020	54.62	55.47
1/19/2020	54.83	56.23
1/26/2020	54.36	56.62
2/2/2020	55.03	56.15
2/9/2020	53.95	55.53
2/16/2020	54.59	55.71
2/23/2020	54.68	56.73
3/1/2020	55.71	56.70
3/8/2020	52.13	56.79
3/15/2020	52.81	55.91
3/22/2020	53.36	55.88
3/29/2020	53.66	56.44
4/5/2020	55.91	58.20
4/12/2020	55.03	57.82
4/19/2020	55.41	57.96
4/26/2020	57.38	59.02
5/3/2020	59.66	61.45
5/10/2020	58.90	64.15
5/17/2020	57.41	63.21
5/24/2020	63.09	66.14
5/31/2020	63.03	68.16
6/7/2020	65.82	70.95
6/14/2020	66.87	71.60
6/21/2020	69.50	72.00
6/28/2020	72.40	75.50

Week of	Min Temp (°F)	Max Temp (°F)
7/5/2020	72.30	76.70
7/12/2020	73.10	75.40
7/19/2020	74.20	76.20
7/26/2020	75.20	77.40
8/2/2020	73.30	76.60
8/9/2020	76.00	77.40
8/16/2020	76.10	78.00
8/23/2020	75.00	78.00
8/30/2020	73.60	74.90
9/6/2020	70.90	73.80
9/13/2020	71.40	75.40
9/20/2020	72.60	75.30
9/27/2020	71.10	74.30
10/4/2020	69.30	73.20
10/11/2020	69.70	72.50
10/18/2020	66.20	69.30
10/25/2020	64.20	67.40
11/1/2020	63.80	68.60
11/8/2020	65.50	69.20
11/15/2020	64.00	65.40
11/22/2020	63.00	64.30
11/29/2020	61.40	63.30
12/6/2020	60.90	64.10
12/13/2020	59.70	61.60
12/20/2020	58.00	61.70
12/27/2020	56.90	60.95

2021 Weekly Minimum and Maximum GBF Effluent Temperature

Week of	Min Temp (°F)	Max Temp (°F)
1/3/2021	58.46	61.99
1/10/2021	59.51	61.78
1/17/2021	58.90	61.20
1/24/2021	58.44	61.08
1/31/2021	58.50	61.35
2/7/2021	57.27	60.08
2/14/2021	56.25	58.31
2/21/2021	56.81	61.41
2/28/2021	59.04	61.49
3/7/2021	60.18	62.30
3/14/2021	60.45	60.72
3/21/2021	59.44	60.86
3/28/2021	58.25	61.84
4/4/2021	62.06	65.24
4/11/2021	62.11	64.20
4/18/2021	63.13	64.95
4/25/2021	63.96	66.06
5/2/2021	65.42	67.69
5/9/2021	66.01	68.40
5/16/2021	68.99	71.83
5/23/2021	68.51	72.55
5/30/2021	68.65	73.70
6/6/2021	72.99	76.96
6/13/2021	75.06	77.16
6/20/2021	74.62	76.09
6/27/2021	70.16	74.76

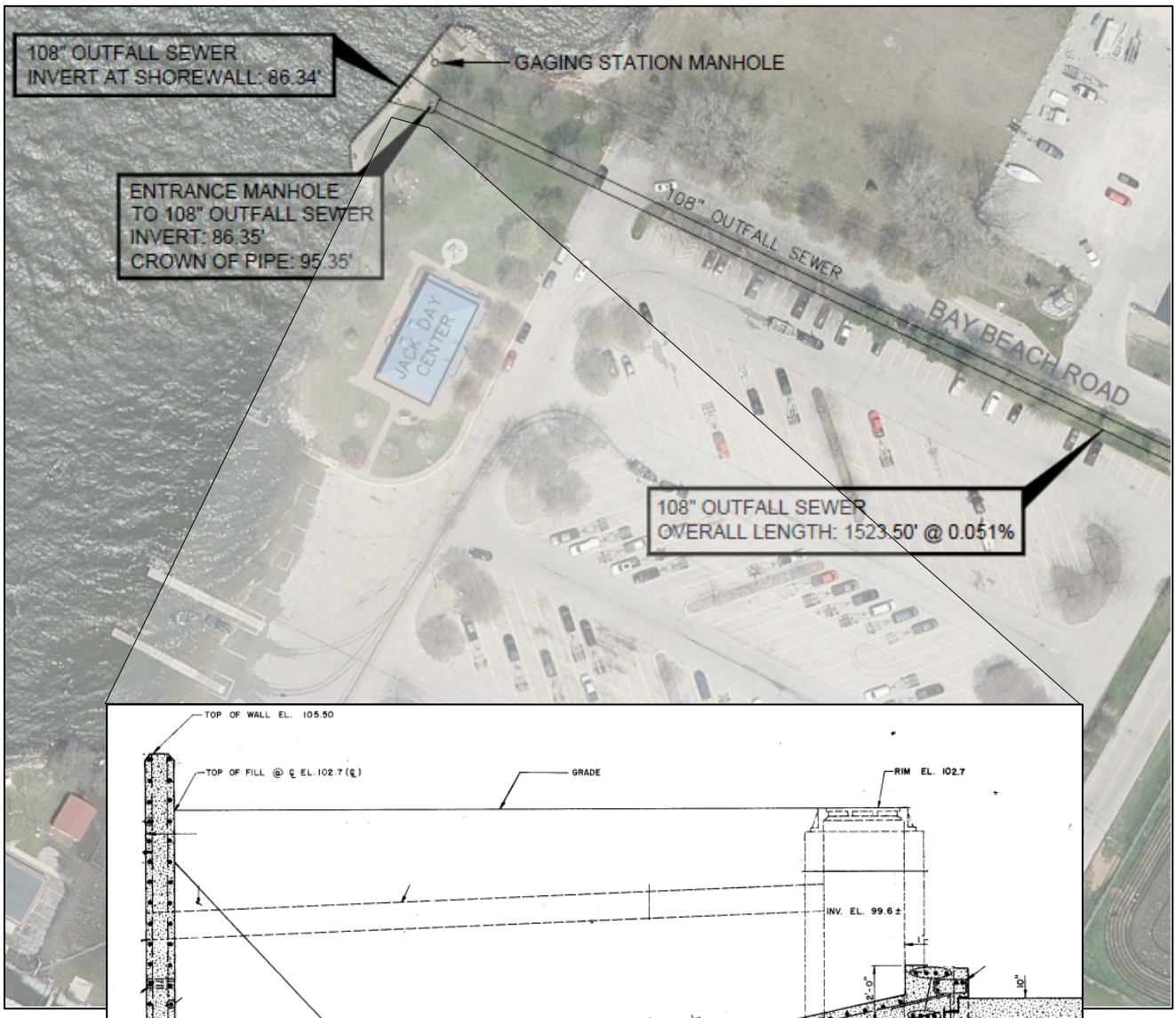
Week of	Min Temp (°F)	Max Temp (°F)
7/4/2021	72.20	75.21
7/11/2021	73.26	76.48
7/18/2021	73.76	78.18
7/25/2021	76.99	78.20
8/1/2021	76.11	79.38
8/8/2021	71.51	75.56
8/15/2021	74.80	79.43
8/22/2021	77.69	79.65
8/29/2021	77.06	77.94
9/5/2021	75.12	78.21
9/12/2021	77.98	78.81
9/19/2021	76.04	78.71
9/26/2021	76.52	78.05
10/3/2021	75.53	77.60
10/10/2021	74.87	77.58
10/17/2021	73.11	74.41
10/24/2021	71.62	73.53
10/31/2021	68.93	71.31
11/7/2021	69.54	70.51
11/14/2021	67.22	70.02
11/21/2021	66.31	68.89
11/28/2021	66.19	67.93
12/5/2021	64.47	66.43
12/12/2021	63.94	66.81
12/19/2021	63.05	64.88
12/26/2021	61.65	64.78

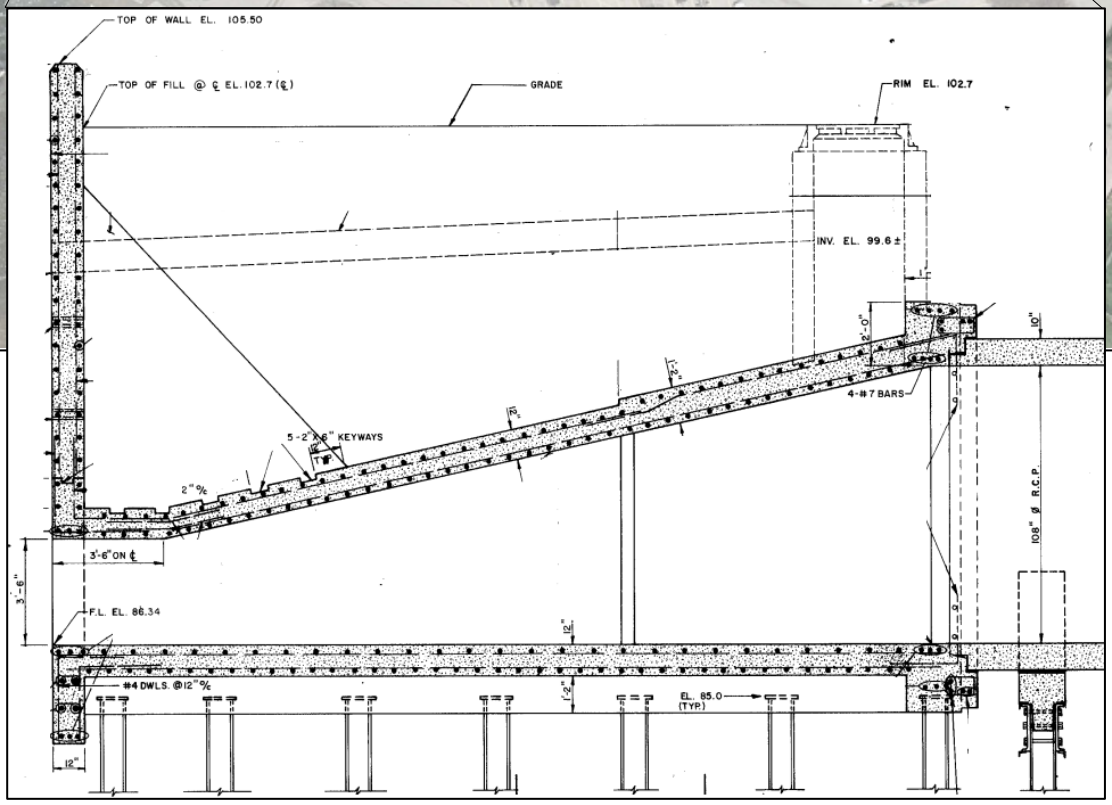
Raw Data from Field Study

Dissipative Cooling Study GBF: Effluent Temp: 72.47oF (22.48oC) USGS Gage Oil Depot Surface Temp: 52.7oF (11.5oC)
10/27/2021 Permit threshold condition: 60oF (15.56oC) Surface Temp + 2oF: 54.7oF (12.61oC)
River dominated current: 0.25ft/sec
Surface Sp Conductivity: 374uS/cm

		5 ft				10 ft				25 ft				50 ft				75 ft				100 ft				550 ft			
	Distance long shore (ft)	Time	Depth (m)	Temp (oC)	Sp Cond (uS/cm)	Time	Depth (m)	Temp (oC)	Sp Cond (uS/cm)	Time	Depth (m)	Temp (oC)	Sp Cond (uS/cm)	Time	Depth (m)	Temp (oC)	Sp Cond (uS/cm)	Time	Depth (m)	Temp (oC)	Sp Cond (uS/cm)	Time	Depth (m)	Temp (oC)	Sp Cond (uS/cm)	Time	Depth (m)	Temp (oC)	Sp Cond (uS/cm)
	-100	10:25 AM	0.5m	11.8	425	10:21 AM	0.5m	11.9	444	10:16 AM	0.5m	12	426	10:12 AM	0.5m	12.1	471	12:16 PM	0.5m	12	441								
			2.0m	11.8	426		2.0m	11.8	425		2.0m	11.7	427		2.0m	11.6	400		2.0m	11.6	400								
			3.0m	11.8	416		3.9m	11.7	419		5.5m	11.6	398		5.8m	11.6	397		7.0m	11.5	389								
	-50	8:09 AM	0.5m	11.7	419	8:51 AM	0.5m	12.5	519	9:03 AM	0.5m	12.6	564	10:04 AM	0.5m	12.6	550	12:11 PM	0.5m	13.6	698	12:21 PM	0.5m	13.3	660				
			2.0m	11.5	388		2.0m	11.7	410		2.0m	11.7	412		2.0m	11.7	420		2.0m	11.7	410		2.0m	11.6	403				
			3.9m	11.5	383.8		5.4m	11.8	422		5.8m	11.6	392		6.3m	11.6	394		6.8m	11.6	387		7.3m	11.5	384				
	-20	8:04 AM	0.5m	16.5	900	8:47 AM	0.5m	12.8	557	9:08 AM	0.5m	14.5	831	10:01 AM	0.5m	13.8	746	12:05 PM	0.5m	13.5	708	12:26 PM	0.5m	13	603				
			2.0m	11.5	384		2.0m	12	462		2.0m	12.2	494		2.0m	11.7	416		2.0m	11.8	458		2.0m	11.6	392				
			4.5m	11.5	382		5.0m	11.9	439		5.9m	11.7	402		6.0m	11.6	392		6.5m	11.5	386		7.3m	11.5	382				
	-5	8:00 AM	0.5m	19.6	1522	8:43 AM	0.5m	13.9	860	9:14 AM	0.5m	16.6	909	9:56 AM	0.5m	13.7	735	12:00 PM	0.5m	13.3	645	12:29 PM	0.5m	13.4	702				
			2.0m	21.3	1838		2.0m	11.8	419		2.0m	13.1	622		2.0m	11.7	415		2.0m	12.5	498		2.0m	11.6	396				
			3.9m	11.67	398		5.0m	11.7	409		5.6m	12.3	503		5.9m	11.6	395		6.6m	11.5	385		7.2m	11.5	383				
GBF Outfall	0	7:56 AM	0.5m	19.9	1610	8:38 AM	0.5m	19.6	1315	9:18 AM	0.5m	16.7	1298	9:54 AM	0.5m	16.1	1064	11:42 AM	0.5m	14.4	820	12:33 PM	0.5m	13.2	737	12:46 PM	0.5m	12.6	500
			2.0m	20.8	1652		2.0m	12.7	546		2.0m	12.9	635		2.0m	11.7	409		2.0m	11.9	540		2.0m	11.5	389		2.0m	11.6	388
			3.9m	11.58	390		5.0m	11.6	390		5.5m	12.2	483		5.8m	11.6	401		7.0m	11.5	381		6.9m	11.5	383		9.9m	11	405
	5	8:13 AM	0.5m	20.4	1626	8:35 AM	0.5m	16.7	1240	9:21 AM	0.5m	18.8	1414	9:42 AM	0.5m	15	788	11:39 AM	0.5m	13.6	677	12:36 PM	0.5m	13.3	762				
			2.0m	20.1	1650		2.0m	12.5	529		2.0m	12.5	601		2.0m	11.7	416		2.0m	11.8	524		2.0m	11.5	390				
			3.5m	11.67	426		4.5m	11.5	386		5.6m	11.7	400		5.9m	11.6	400		7.1m	11.5	381		6.7m	11.5	383				
	20	8:18 AM	0.5m	19.4	1500	8:30 AM	0.5m	12.5	452	9:25 AM	0.5m	13.6	764	9:39 AM	0.5m	14.7	914	11:34 AM	0.5m	13.7	660	12:41 PM	0.5m	13.3	641				
			2.0m	13.8	1216		2.0m	11.8	427		2.0m	12.4	519		2.0m	12	475		2.0m	11.6	399.2		2.0m	11.5	393				
			3.3m	12.4	471		4.3m	11.6	396		4.8m	11.7	400		5.9m	11.6	402		6.8m	11.5	381		7.2m	11.5	384				
	50	8:21 AM	0.5m	13.7	704	8:26	0.5m	12.6	524	9:29 AM	0.5m	16.2	1057	9:36 AM	0.5m	13.9	752	11:28 AM	0.5m	12.4	507								
			2.0m	11.97	459		2.0m	12.1	476		2.0m	12.3	484		2.0m	12.2	511		2.0m	11.9	428								
			2.5m	11.8	430		3.5m	11.8	424		4.4m	11.6	404		5.6m	11.7	407		6.8m	11.5	380								
	100	10:51 AM	0.5m	12.1	445	10:48	0.5m	12.2	472	10:37 AM	0.5m	12.8	570	10:44 AM	0.5m	12.9	595	11:21 AM	0.5m	12.1	453								
			2.0m	11.8	434		2.0m	11.7	403		2.0m	11.6	397		2.0m	11.6	394		2.0m	11.6	470								
			3.8m	11.7	413		4.6m	11.6	400.1		5.0m	11.6	396		5.7m	11.5	387		6.6m	11.5	381								
	150	11:09 AM	0.5m	11.9	428	11.06	0.5m	12	455	10:57 AM	0.5m	12	446	11:01 AM	0.5m	11.9	440	11:17 AM	0.5m	12.1	487								
			2.0m	11.8	427		2.0m	11.8	422		2.0m	11.6	394		2.0m	11.6	420		2.0m	11.6	398								
			4.4m	11.7	407		4.6m	11.7	406		5.5m	11.6	395		7.1m	11.5	383		7.6m	11.5	381								

Appendix D
GBF Outfall Plan and Profile View


108" OUTFALL SEWER
INVERT AT SHOREWALL: 86.34'
GAGING STATION MANHOLE
ENTRANCE MANHOLE
TO 108" OUTFALL SEWER
INVERT: 86.35'
CROWN OF PIPE: 95.35'
108" OUTFALL SEWER
BAY BEACH ROAD
JACK DAY CENTER
108" OUTFALL SEWER
OVERALL LENGTH: 1523.50' @ 0.051%


TOP OF WALL EL. 105.50
TOP OF FILL @ ℄ EL. 102.7 (℄)
GRADE
RIM EL. 102.7
INV. EL. 99.6±
4-#7 BARS
5-2"x6" KEYWAYS
2"%
3'-6" ON ℄
3'-6"
F.L. EL. 86.34
#4 DWLS. @12"%
EL. 85.0 (TYP.)
12"
108" ø R.C.P.

Temperature from the DC study at the three depths on October 27, 2021.

Distance	Temperature (F) Top 0.5m						
(ft)	5	10	25	50	75	100	550
-100	53.24	53.42	53.6	53.78	53.6		
-50	53.06	54.5	54.68	54.68	56.48	55.94	
-20	61.7	55.04	58.1	56.84	56.3	55.4	
-5	67.28	57.02	61.88	56.66	55.94	56.12	
0	67.82	67.28	62.06	60.98	57.92	55.76	54.68
5	68.72	62.06	65.84	59	56.48	55.94	
20	66.92	54.5	56.48	58.46	56.66	55.94	
50	56.66	54.68	61.16	57.02	54.32		
100	53.78	53.96	55.04	55.22	53.78		
150	53.42	53.6	53.6	53.42	53.78		

Distance	Temperature (F) Middle 2 m						
(ft)	5	10	25	50	75	100	550
-100	53.24	53.24	53.06	52.88	52.88		
-50	52.7	53.06	53.06	53.06	53.06	52.88	
-20	52.7	53.6	53.96	53.06	53.24	52.88	
-5	70.34	53.24	55.58	53.06	54.5	52.88	
0	69.44	54.86	55.22	53.06	53.42	52.7	52.88
5	68.18	54.5	54.5	53.06	53.24	52.7	
20	56.84	53.24	54.32	53.6	52.88	52.7	
50	53.546	53.78	54.14	53.96	53.42		
100	53.24	53.06	52.88	52.88	52.88		
150	53.24	53.24	52.88	52.88	52.88		

Distance	Temperature (F) Bottom						
(ft)	5	10	25	50	75	100	550
-100	53.2	53.1	52.9	52.9	52.7		
-50	52.7	53.2	52.9	52.9	52.9	52.7	
-20	52.7	53.4	53.1	52.9	52.7	52.7	
-5	53.0	53.1	54.1	52.9	52.7	52.7	
0	52.8	52.9	54.0	52.9	52.7	52.7	51.8
5	53.1	52.7	53.1	52.9	52.7	52.7	
20	54.3	52.9	53.1	52.9	52.7	52.7	
50	53.2	53.2	52.9	53.1	52.7		
100	53.1	52.9	52.9	52.7	52.7		
150	53.1	53.1	52.9	52.7	52.7		

The DC study was approved separately by the department on March 22, 2023.

The DC data was supplemented with reference to several academic papers on fish population on the Lower Fox River showing that the effluent was not preventing fish from traveling up the river to spawn.

Determination

A discussion of the requirements from s. NR 102.05(3), Wis. Adm. Code and how they are met is below:

a. *"Limiting mixing zones to as small an area as practicable, and conforming to the time exposure responses of aquatic life."* - Temperature criterion was met within 75 ft across the river width and 100 ft downstream which is a small area.
b. *"Providing passageways for fish and other mobile aquatic organisms."* - This is met since the effluent rapidly mixes and floats to the surface. Temperature criteria is met within 75 ft from the outfall westward and within 100 ft downstream. While there is some back flow, temperature exceedance does not go beyond 50 ft upstream in the upper 0.5 m of the river. At two meters, temperature criteria is met within 10 ft westward and within 20 ft downstream. This leaves the majority of the river free for passage of aquatic organisms.
c. *"Where possible, mixing zones being no larger than 25% of the cross–sectional area or volume of flow of a flowing water body and not extending more than 50% of the width."* – This is met. The river is approximately 875 ft wide at the point of discharge. At a conservative 75 ft of exceedance westward, this would be 9% of the river width. Since the plume floats briefly before dissipating, the cross sectional area would be less than the 9% width.
d. *"Final acute criteria and secondary values specified in or developed pursuant to s. NR 105.05 for the fish and aquatic life subcategory for which the receiving water is classified not being exceeded at any point in the mixing zone."* - Looking at the last WQBEL, there was no parameter subject to s. NR 105.05, Wis. Adm. Code that would have been exceeded the final acute criteria or secondary values in the mixing zone.
e. *"Mixing zones not exceeding 10% of an inland lake's total surface area."* - Not applicable since it does not discharge to an inland lake.
f. *"Mixing zones not adversely impacting spawning or nursery areas, migratory routes, nor mouths of tributary streams."* - As discussed above, the effluent does not block any migratory routes or adversely impact spawning. Over 90% of the width of the river is free for fish passage since the effluent mixes rapidly and floats to the surface.
g. *"Mixing zones not overlapping, but where they do, taking measures to prevent adverse synergistic effects."* - This is met as there are no other dischargers in the area for the mixing zone to overlap with.
h. *"Restricting the pH to values greater than 4.0 s.u. and to values less than 11.0 s.u. at any point in the mixing zone for the protection of indigenous fish and fish food organisms."* – At all points within the study the pH met this requirement. Additionally, the effluent has pH limits where the pH must be within 6-9 s.u.

Department wastewater staff worked with biologists from the fisheries program who concurred with the approval of the DC study.

After review of the mixing zone study submitted by GBSD, the department concurs with the conclusion that the effluent from the GBF rapidly mixes and the mixing zone does not adversely impact spawning or nursery areas, migratory routes, or the mouths of tributary streams and continued use of the 10:1 dilution ratio is appropriate.

Emma Lorenzen
Wastewater Engineer

ATTACHMENT F

MERCURY PMP (AUGUST 2020)

Mercury Pollutant Minimization Program
Green Bay Metropolitan Sewerage District
WPDES Permit Number 0065251-02

Background

The Green Bay Metropolitan Sewerage District (GBMSD) developed its original mercury pollutant minimization program (PMP) in 2006 to reduce the mercury discharged from its Green Bay Facility to a level closer to or below the proposed water quality based effluent limit of 1.3 nanograms per liter (ng/L). GBMSD was granted a variance for the 2014-2019 Wisconsin Pollutant Discharge Elimination System (WPDES) permit term. In that time, actions were taken to improve mercury source reduction and optimize treatment processes. GBMSD has applied for a variance from the 1.3 ng/L mercury limit for the next term of its WPDES permit as well. In this mercury PMP, GBMSD outlines planned actions that are intended to further reduce mercury. The PMP is a requirement of the variance.

Annual compliance reports have been submitted to the Wisconsin Department of Natural Resources (WDNR) to show progress in the minimization program.

Summary of Pollutant Reduction Work Done to Date

Since implementing its original mercury PMP in 2006, GBMSD has focused its efforts on promoting use of mercury best management practices (BMPs) to four primary sectors. The sectors are dental, medical (including veterinary facilities), academic, and industrial.

Initially, GBMSD partnered with the Wisconsin Department of Natural Resources (WDNR) to offer grants to dental facilities in its service area to fund installation of mercury amalgam separators, with excellent participation by area dentists. In 2012, GBMSD updated its sewer use ordinance to include a requirement for all dental facilities that discharge to the sanitary sewer in the service area to install and maintain an amalgam separator, implement best management practices, and report compliance annually.

GBMSD has kept its database of dental facilities in the service area up to date. Annual questionnaires have been sent to all known dental facilities to document compliance with the requirement.

In 2018, GBMSD's pretreatment coordinator updated the dental outreach program to ensure compliance with the Dental Effluent Guidelines under 40 CFR Part 441. 74% of known dental facilities responded to an initial questionnaire, and all responses (45 in total) reported compliance with the amalgam separator requirement. A follow-up and enforcement program is in development.

GBMSD has also sent periodic questionnaires to academic and medical (including veterinary) facilities in its service area to gauge their management of in-house mercury.

Permitted industrial dischargers are inspected on an annual basis. The inspection checklist includes questions about mercury devices in use at each facility, as well as best management practices for mercury handling, spill prevention, and spill response. Questions also focus on whether the facility has evaluated its process chemicals for more environmentally-friendly options or purchased purer chemicals that don't contain contaminants such as mercury.

In addition to the direct outreach with the four targeted sectors, GBMSD has developed a strong partnership with Brown County Port & Resource Recovery. Brown County's Hazardous Materials Recovery (HMR) operates a household hazardous waste collection site for residents of Brown County. Residents and some small businesses are able to drop off mercury and other hazardous materials at the facility for safe, proper management. GBMSD sponsors Brown County's HMR Facility with a financial contribution each year to make this resource available to residents for no or reduced fees.

GBMSD has conducted outreach in multiple forms, including tours of its facilities as well as presentations to school groups, professional organizations, hobby clubs, and other populations. Outreach always emphasizes prevention of pollution to the sanitary sewer and the environment.

GBMSD has been actively working to optimize conveyance and treatment systems to enhance removal of conventional pollutants. Recent efforts include aeration system modifications to improve biological phosphorus removal, installation of sludge blanket detectors, aeration basin profile sampling, microbial DNA testing, and phosphorus speciation testing. These efforts to improve conventional pollutant performance are expected to improve mercury removal within the system.

GBMSD has worked to improve mercury management efforts at its facilities. Mercury containing devices were identified and labeled. Non-essential mercury containing devices were removed from service and disposed of in accordance with regulations. Non-mercury containing device substitutes were installed when available. New project contract documents include requirements for contractors and suppliers to use non-mercury containing equipment in many applications, to identify mercury containing devices being proposed for a project, and to identify non-mercury alternatives.

Significant Process Changes through R2E2

A significant change that's impacted mercury for GBMSD is that in 2018, a new solids handling facility was brought online at the Green Bay Facility. The Resource Recovery and Electrical Energy (R2E2) project replaced the existing multiple hearth incinerators and dry ash handling system with a new fluid bed incinerator and wet ash handling system. The project also added two anaerobic digesters and two electrical generators that produce electricity using digester gas in addition to natural gas.

Before the R2E2 project, GBMSD's biosolids were processed in two multiple hearth incinerators that were in operation since the 1970s. GBMSD operates under a Title V air operating permit, which regulates emissions of numerous air pollutants, including mercury, from the incineration process. In 2016, new emissions standards took effect for sewage sludge incinerators. The new emission limits for mercury were substantially more stringent than they had been previously. The existing multiple hearth incinerators had reached their operating capacity and there were concerns that they would not reliably meet the new emission limits for existing multiple hearth incinerators. GBMSD selected and installed a new fluid bed incineration system designed to meet the new source performance standards in 40 CFR 60, Subpart LLLL. Air pollution control for the fluid bed incinerator includes a wet scrubber and a wet electrostatic precipitator, as well as a granulated activated carbon unit that has a dedicated purpose to remove mercury from air emissions. To meet the more stringent limits for mercury and other pollutants in air emissions, the pollution control that was installed with the new system is superior to that of the old system, which controlled emissions with only a wet scrubber. As a result, the new air pollution control system removes considerably more mercury from incinerator air emissions than the previous system did.

In addition to removing more mercury from incinerator air emissions, the R2E2 project introduced a different ash handling process. Previously, dry ash from the incinerators was collected in dumpsters and sent to landfill for disposal in a straightforward process. A small portion of ash leaving the incinerators as fly ash was captured in the wet scrubber and recycled to the head of the plant. In the new system, incinerator ash remains suspended in liquid from the scrubber in a slurry. The ash slurry is transferred to one of two large ash cells. During normal operation, the ash settles in the cells and the water overflows a weir and is pumped to the aeration basins. Approximately once every six months, one ash cell is drained of water, leaving the ash on the floor of the cell. The dewatered ash is loaded onto trucks and transported for disposal in a landfill.

Water that's drained from the ash cells is circulated to the head of the treatment plant and it goes through the treatment process. This is a significant change from ash handling prior to R2E2. A discussion of how in-plant mercury has changed since the previous permit was issued is included in Appendix 1.

Mercury Concentrations in Influent, Effluent, and Biosolids

GBMSD analyzes mercury concentrations in influent, effluent, and biosolids each month. Concentrations of mercury at GBMSD's Green Bay Facility have been, and continue to be, highly variable. Overall, mercury levels have shown reductions over time since the mercury PMP was initially implemented in 2006. As noted earlier, mercury shows variability since the R2E2 project came fully online in 2018. Trends for mercury in influent, effluent, and biosolids at the Green Bay Facility are shown in Figures 1, 2, and 3.

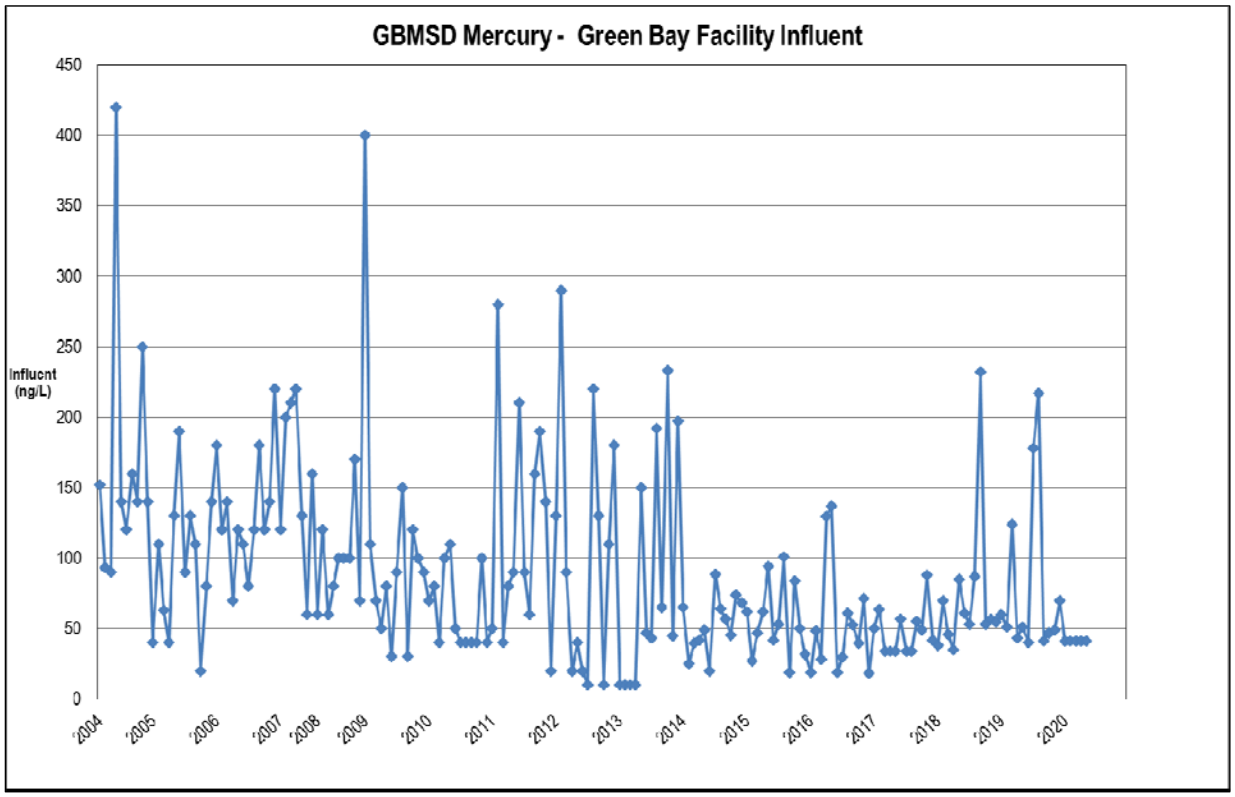


Figure 1: Mercury trends in influent – Green Bay Facility

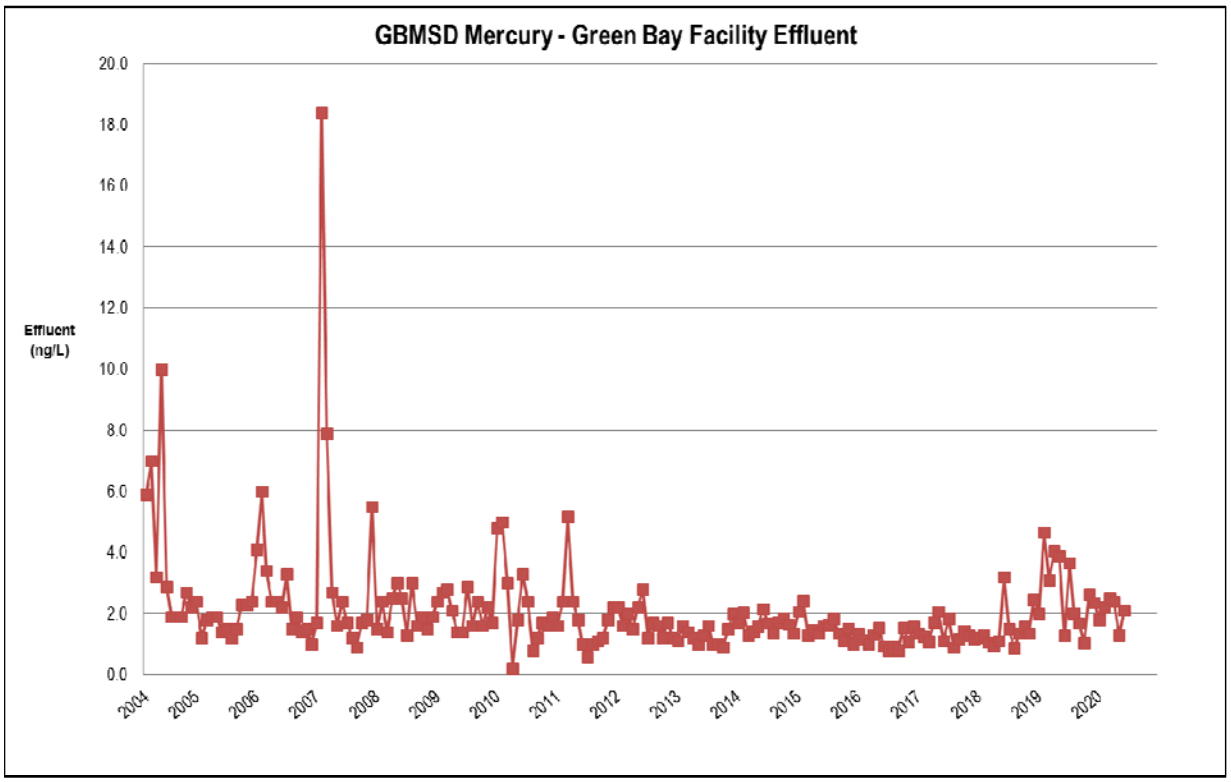


Figure 2: Mercury trends in effluent – Green Bay Facility

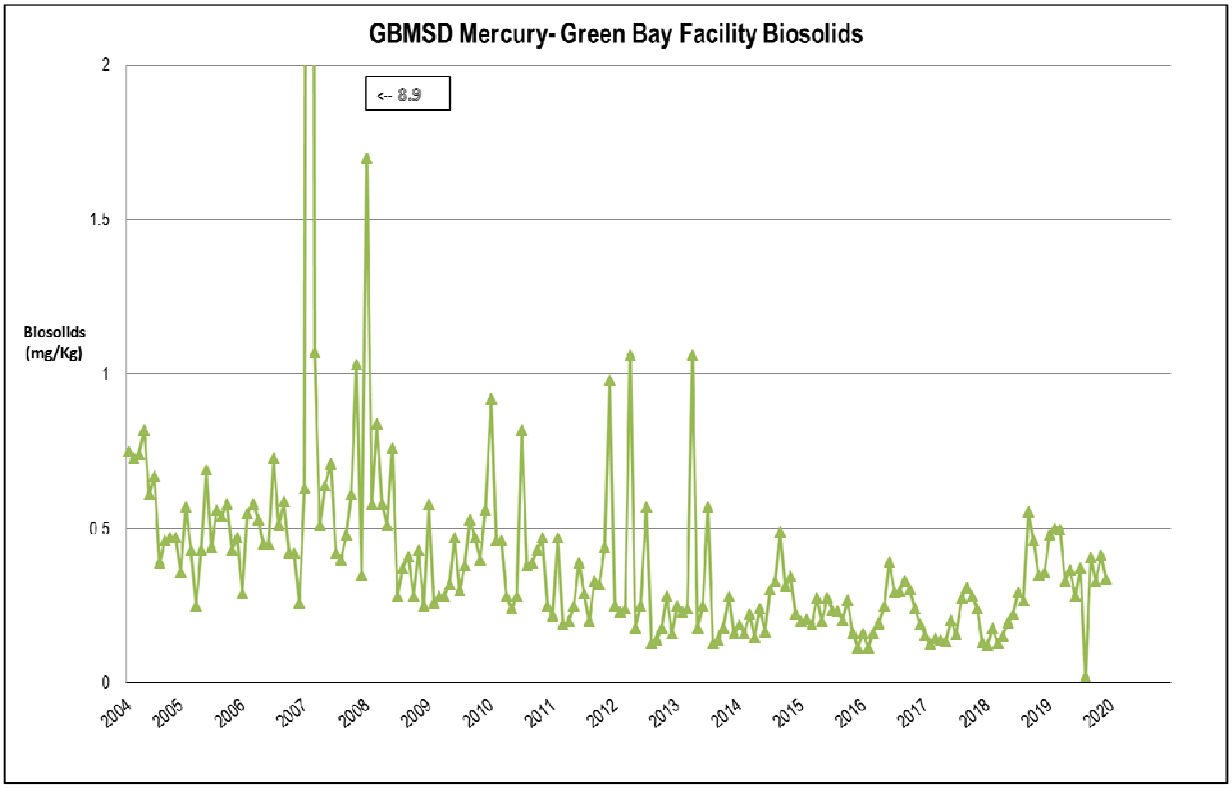


Figure 3: Mercury trends in biosolids – Green Bay Facility

Planned Actions for the Permit 0065251-02 Permit Term

Over the next permit term, GBMSD will continue the source reduction efforts that are already underway. GBMSD is committed to making improvements to existing efforts as well as taking new approaches to continue reducing mercury entering the plant and optimizing treatment to reduce the mercury in effluent and biosolids. Planned actions for the Permit 0065251-02 permit term are summarized in Table 1.

Table 1 Planned Mercury Minimization Actions for the Permit 0065251-02 Permit Term

Continued/Improved Actions		**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**
Sponsor Brown County Port & Resource Recovery Hazardous Materials Recovery (HMR) Facility with an annual financial contribution.	Brown County's HMR Facility accepts elemental mercury, mercury-containing devices, and mercury spill debris from residents and some businesses in GBMSD's service area. The facility is open to residents Tuesdays 9:00 AM – 3:00 PM, Thursdays 12:00 PM – 6:00 PM, and Saturdays 8:00 AM – 2:00 PM. The facility is open to businesses by appointment. Between 2016 and 2018, Brown County HMR collected 613 pounds of mercury impacted material for proper disposal or recycling. GBMSD's continued sponsorship of Brown County's HMR will ensure that residents have a convenient way to safely and properly manage mercury.	X	X	X	X	X
Continue working with dental facilities to ensure proper installation and use of amalgam separators.	1) Draft a follow-up report to all dental facilities to document compliance with mercury amalgam separator requirements. 2) Follow up with dental facilities that don't respond via phone or email. If no response is received after these attempts, a site visit/inspection will be conducted. 3) Develop an inspection protocol, with a list of inspection questions, to use during site visits to dental facilities. 4) Develop and administer training for staff who would be conducting site visits and inspections of dental facilities.	X	 X X	X		

Continued/Improved Actions		Year 1	Year 2	Year 3	Year 4	Year 5
Evaluate medical sector (including veterinary facilities) for mercury BMPs.	Update list of medical sector facilities in service area. Send questionnaire to all medical sector facilities (including veterinary) about mercury BMPs. Document responses. Follow up via phone call or email with facilities that did not respond to questionnaire.			X 	 X	 X
Evaluate academic sector for mercury BMPs.	Update list of academic sector facilities in service area. Send questionnaire to all academic sector facilities about mercury BMPs. Document responses. Follow up via phone call or email with facilities that did not respond to questionnaire.			X 	 X	 X
Include mercury-related discussion during industrial inspections	Permitted industrial dischargers are inspected annually. GBMSD will continue to include questions and discussion about mercury during these inspections. Related questions are: • Does the Industry have a Spill / Solvent Management Plan? • Does the Industry Contract with a Third Party Vendor for Spill Response / Clean-up? • In the Last Year, has the Industry Implemented a Water-Focused Pollution Prevention Strategy, such as Substituting for Environmentally-Friendly Chemicals or Purchasing Purer Chemicals that don't Contain Contaminants? • Does the Industry have any Mercury-Containing Equipment or Chemicals?	X	X	X	X	X
Continue identifying in-house mercury reduction opportunities and implementing	Review and update mercury device inventory. A mercury spill response team has been established. Mercury spill refresher training will be conducted for the		X X		 X	

Continued/Improved Actions		Year 1	Year 2	Year 3	Year 4	Year 5
solutions	team to ensure that any accidental release would be cleaned up completely and properly, without any mercury entering the treatment system.					
Source Reduction						
Expand sectors for targeted mercury outreach	Identify auto repair and salvage businesses and HVAC contractors in GBMSD's service area. Send education and outreach materials to each facility to inform about potential mercury sources they may encounter and resources for proper management.		X	 X		
Partner with Brown County Department of Health	GBMSD will meet with Brown County Department of Health to develop a shared strategy for reaching more of the population to communicate where household mercury might be found, what the hazards are, and how to properly manage it.	X				
Treatment Plant and Conveyance						
Optimize treatment plant operations	1) Upgrade clarifiers for improved solids management at the Green Bay Facility. 2) Complete Liquids Facility Plan to evaluate capacity and condition of both treatment plants. 3) Evaluate ash cell optimization	X X X	X X X	X X	X	X
Monitor mercury trends in service area	Meter stations are tested monthly for mercury and test results are reviewed.	X	X	X	X	X
Assess mercury content in treatment chemicals	1) GBMSD uses numerous chemicals in its treatment processes. Certificates of analysis will be requested from suppliers of treatment chemicals to determine whether any contain mercury. Chemicals evaluated will include ferric chloride, sodium hypochlorite, sodium bisulfite, and sulfuric acid in batteries for electric carts. 2) If any treatment chemicals are found to contain mercury,		X			

Continued/Improved Actions		Year 1	Year 2	Year 3	Year 4	Year 5
	mercury-free alternatives will be researched.			X		
Include mercury reduction in strategic plan	GBMSD has recently updated its three-year strategic plan, which includes objectives focused on pollutant source reduction, with an emphasis on mercury. Further mercury reduction will be considered when the strategic plan is written again.			X		

Conclusions

GBMSD has observed a significant decrease in mercury air emissions but a slight increase in liquid effluent concentrations due to the R2E2 improvements. As GBMSD continues to refine the operation of R2E2; conduct outreach, education, and source reduction efforts within its service area; and take the additional steps described in this report, GBMSD believes that mercury concentrations in its influent, effluent, and biosolids will continue to be reduced.

APPENDIX 1

Technical memo:
Green Bay Facility—Analysis of Bulk Mercury Movement During Post-R2E2 Operation

Jacobs

Memorandum

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Subject	Green Bay Facility—Analysis of Bulk Mercury Movement During Post-R2E2 Operation	**Project Name**	WDNR 2018 Application Project
Attention	NEW Water		
From	Jacobs Engineering Group Inc. (Jacobs)		
Date	August 12, 2020		

Executive Summary

The Resource Recovery and Electrical Energy (R2E2) Project replaced the 50-year-old solids processing facility at the Green Bay Facility (GBF) with state-of-the-art fluid bed incinerator (FBI) incineration, designed to meet the sewage sludge incinerator New Source Performance Standard. The R2E2 Project began initial operations in May 2018, with full incineration starting in September 2018. Since September 2018, all biosolids were processed by the FBI, except for 5 months when processing was reduced for maintenance and modifications.

Implementation of the R2E2 Project has resulted in an apparent increase in mercury (Hg) concentrations in the plant effluent. NEW Water is negotiating a new wastewater discharge permit with the Wisconsin Department of Natural Resources (DNR) for the GBF. As part of the negotiations, NEW Water received a draft Water Quality-Based Effluent Limitations (WQBEL) memorandum (WDNR 2019) as part of its Wisconsin Pollutant Discharge Elimination System (WPDES) permit renewal process. Further analysis by NEW Water indicates that using the data set since R2E2 began operations in May 2018, with full operation in September 2018, the P99 would be 5.5 nanograms per liter (ng/L) through June 2020.

The purpose of this technical memorandum is to review in-plant Hg concentration data collected by NEW Water from May 2018 to April 2020 at various locations in the GBF and the De Pere Facility (DPF) liquid treatment systems, as well as GBF monthly Hg data, and to quantify the impact that R2E2 has on Hg movement within GBF and the effluent. Pre- and post-R2E2 data for plant influent and effluent Hg concentrations and pre-and post-R2E2 stack emission Hg data were also reviewed. The analysis includes review of data trends and mass rates developed using Hg concentration data and flow rates in the liquid system and mass rates in the solids system.

The evaluation process is summarized as follows:

- Hg concentration data was provided by NEW Water at 19 locations in the liquid treatment system at GBF and 2 locations at DPF. Biosolids Hg concentrations were provided for GBF.
  - For GBF, the plant influent, effluent, scrubber effluent (ash decant overflow), primary sludge, waste-activated sludge (WAS), digester feed, and ash Hg concentrations were sampled monthly, except for August 2019.
  - Liquid data was provided from May 2018 through May 2020.

  - Biosolids data was provided from 2014 through May 2020. For post-R2E2, data from May 2018 through May 2020 was used. For pre-R2E2, data from 2016 through April 2018 was used.

- Hg concentrations were plotted for several locations and combinations of locations to compare trends.
- Monthly average Hg concentrations were developed where there were more than one sample per month at a particular location.
- Mass rates were calculated using monthly average Hg concentrations and flow rates for selected locations using data for months when FBI processing exceeded 40 percent of FBI design.
- Average, minimum, maximum, and standard deviation mass rates are developed for plant influent, effluent, degritted primary sludge, WAS, digester feed, FBI feed, decanted scrubber effluent, ash to disposal, Hg removed by carbon, and stack emissions.
  - All data show some variability. This is due to the variability in the reported Hg concentrations and flow rates at each location, as well as the use of single or multiple monthly samples to represent monthly average concentrations and flow rates.

Implementation of the R2E2 Project has resulted in increased liquid effluent loading, but air emissions have seen a greater decrease. The net impact of the R2E2 Project has resulted in reduced overall Hg emissions to the environment. Results from this analysis are summarized as follows:

- Plant effluent Hg concentrations post-R2E2 have increased by about 85 percent. Although plant influent Hg concentrations appear to have increased post-R2E2, review of sewer system operations identified maintenance and customer-specific causes of the spikes, which when corrected suggest that plant influent Hg concentrations have not increased.
- Mass movement of Hg within the GBF and unit process removal efficiencies are consistent with mercury movement and removal efficiencies reported by other wastewater treatment facilities. The configuration of the R2E2 FBI air pollution control system has resulted in recycling scrubber effluent containing Hg to the South Plant aeration system instead of the plant return.
- The increase in plant Hg effluent concentrations post-R2E2 can be attributed to the contribution of the FBI scrubber effluent, following ash decanting, to the South Plant aeration system. Also, the scrubber/wet electrostatic precipitator combination results in higher Hg concentrations in the scrubber effluent compared to pre-R2E2.
- Mass balances for the plant system and the FBI system indicate reasonable agreement, with about a 30.5 percent difference in Hg removed by carbon scrubber, which is the parameter used to close the balance.
- Comparison of stack emissions pre- and post-R2E2 indicate that the FBI stack emissions are 10 to 20 times less than the multiple-hearth incinerator (pre-R2E2) stack emission.

1. Background

NEW Water is negotiating a new wastewater discharge permit with the Wisconsin Department of Natural Resources (DNR) for the Green Bay Facility (GBF). As part of the negotiations, NEW Water received a draft Water Quality-Based Effluent Limitations (WQBEL) memorandum (WDNR 2019) as part of its Wisconsin Pollutant Discharge Elimination System (WPDES) permit renewal process. For the GBF, the WQBEL memorandum stated that the proposed water quality-based limit for mercury is 1.3 nanograms per liter (ng/L); however, if NEW Water's mercury variance application is approved, an alternative limit equal to the 1-day P99 of 4.4 ng/L will be applied as a daily maximum, monitored as a monthly grab sample, using a historical effluent data set from the last 5 years. Further analysis indicates that based on including data since R2E2 began operations in May 2018, with full operation in September 2018, the P99 would be closer to 5.5 ng/L through June 2020.

2. Plant Process Description

NEW Water owns and operates two regional wastewater treatment facilities: the GBF and the De Pere Facility (DPF), which was acquired in 2007. These plants serve 15 municipal customers with a combined population of approximately 232,000, which is spread over 285 square miles. The facilities provide liquid treatment for current average flows of approximately 32 million gallons per day (mgd) (GBF) and 9 mgd (DPF). Solids produced at each facility are treated in a common solids processing facility that is located at the GBF. The solids processes have undergone significant modifications through the R2E2 Project. The R2E2 Project was completed in early 2019, with initial startup commencing around May 2018. The descriptions in the following subsections represent the conditions following completion of the R2E2 Project. The process flow of liquids and solids are shown in Figure 1 and described in the following subsections.

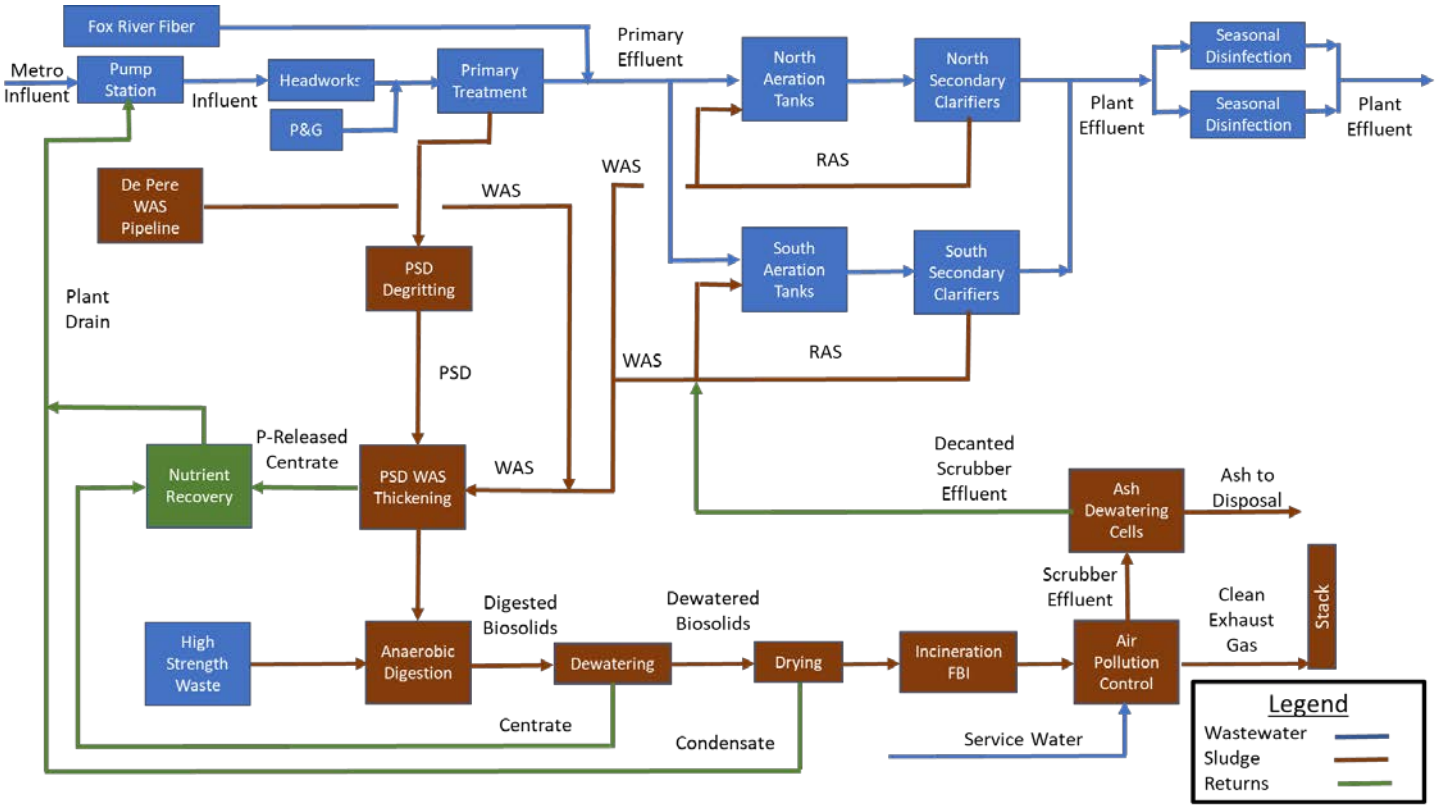


Figure 1. GBF Process Schematic – Post-R2E2

2.1 Green Bay Facility Liquids

The liquids treatment process at the GBF is rated for a design flow of 49.2 mgd and is composed of preliminary treatment, primary treatment, secondary treatment, and disinfection. The GBF consists of the North Plant (constructed in the mid-1970s) and the South Plant (constructed in the early 1990s). The South Plant was constructed to provide for biological treatment of projected flows and loadings in excess of the North Plant's capacity.

Preliminary and primary treatment consists of two influent mechanical trash racks, separate pumping of municipal and paper mill wastewater using six centrifugal pumps with adjustable-speed drives and one constant-speed pump, four step screens with 0.25-inch openings, four square primary clarifiers with corner sweeps, and degritting of primary sludge (PS) using four grit separators and two snails. Grit and screenings are hauled to a landfill. Degritted primary sludge (PSD) is pumped to thickening for further

treatment. The GBF receives septage and other hauled wastes at its septage receiving facility. These hauled wastes are screened and then pumped to the primary influent channels or directly to headworks.

The secondary treatment process consists of a conventional activated sludge process designed for enhanced biological phosphorus removal, nitrification to meet seasonal ammonia limits, and biological oxygen demand removal. The North Plant consists of four aeration basins (two in the north bank and two in the south bank), eight square final clarifiers with corner sweeps (four in the north bank and four in the south bank), and two chlorine contact basins (one in the north bank and one in the south bank). The South Plant has two aeration basins and two circular final clarifiers. South Plant secondary effluent is pumped to the North Plant secondary effluent channel prior to disinfection. Aeration basins in both plants have mechanically mixed selector zones designed for filament control and enhanced biological phosphorus removal. Air is delivered through fine bubble membrane diffusers from centrifugal blowers. Return activated sludge (RAS) from the final clarifiers is returned to the unaerated zones to promote biological phosphorus removal. Waste-activated sludge (WAS) from the North and South Plants is pumped to gravity belt thickeners.

The secondary effluent is chlorinated from May through September with sodium hypochlorite and dechlorinated with sodium bisulfite. Final effluent is discharged into the Fox River near its mouth to the bay of Green Bay.

2.2 Green Bay Facility Solids

PSD produced at the GBF and WAS from both the GBF and DPF is treated through a combined solids processing facility at the GBF. The solids processes, which were constructed in the 1970s, underwent improvements through the R2E2 Project. R2E2 solids modifications consist of modifications to sludge thickening and the addition of anaerobic digestion, dewatering centrifuges, fluidized bed incineration, nutrient recovery, and energy recovery through co-digestion and biogas energy generation.

PSD from the GBF and WAS from both facilities are thickened independently by separate thickening processes, including gravity thickeners, gravity belt thickeners, or a thickening centrifuge. The thickening process used for each solid's waste stream is determined by the operating staff based on waste characteristics. Thickened WAS (TWAS) and the thickened PWAS (TPWAS) is combined with thickened degritted primary sludge (TPSD) and sent to anaerobic digestion, which consists of two silo-shaped anaerobic digesters. Anaerobically digested sludge is dewatered to about 21 percent cake using 3 dewatering centrifuges, dried to about 38 percent dry solids in a multiple-disc dryer, and incinerated using a fluidized bed incinerator. The incinerator exhaust is treated with a multiple-stage air pollution control train. Ash removed in the scrubber is dewatered in ash dewatering cells and hauled to a landfill. The GBF also has the ability to haul anaerobically digested dewatered sludge cake or dried cake to a landfill. Hauling of sludge cake only occurs when the incinerator is out of service for an extended period.

The solids process includes provisions to recover energy and nutrients from the waste streams. Biogas produced in the anaerobic digestion process is collected and treated using iron sponges and activated carbon for hydrogen sulfide (H_2S) and siloxanes prior to being used in biogas engines for energy production. The facility includes provisions to receive high-strength waste directly to digestion to increase biogas production.

2.3 R2E2 Fluid Bed Incinerator Process Descriptions

Figure 2 shows schematically the R2E2 fluid bed incinerator (FBI) process. Dewatered digested sludge is fed to a disc (scalping) dryer to increase the dry solids content from about 21 to 38 percent, using heat in thermal oil. The pre-dried biosolids are pumped into the fluidized sand bed of the FBI reactor where water is evaporated, and the organics are oxidized to carbon dioxide and water. Organics also contain sulfur and chlorides, and these are converted to sulfur dioxide and hydrogen chloride. Inorganics, which include heavy metals, are emitted with the exhaust gases as fly ash. During the combustion process, most of the

heavy metals are oxidized and remain in the ash. The exception is mercury, which is volatile and is gasified above 675 degrees Fahrenheit. Mercury is emitted in two forms, elemental and oxidized (e.g., mercuric oxide, mercuric chloride). Oxidized mercury is water soluble and can be removed by wet scrubbing. Elemental mercury is difficult to remove and must be oxidized before it can be removed (Morency 1999).

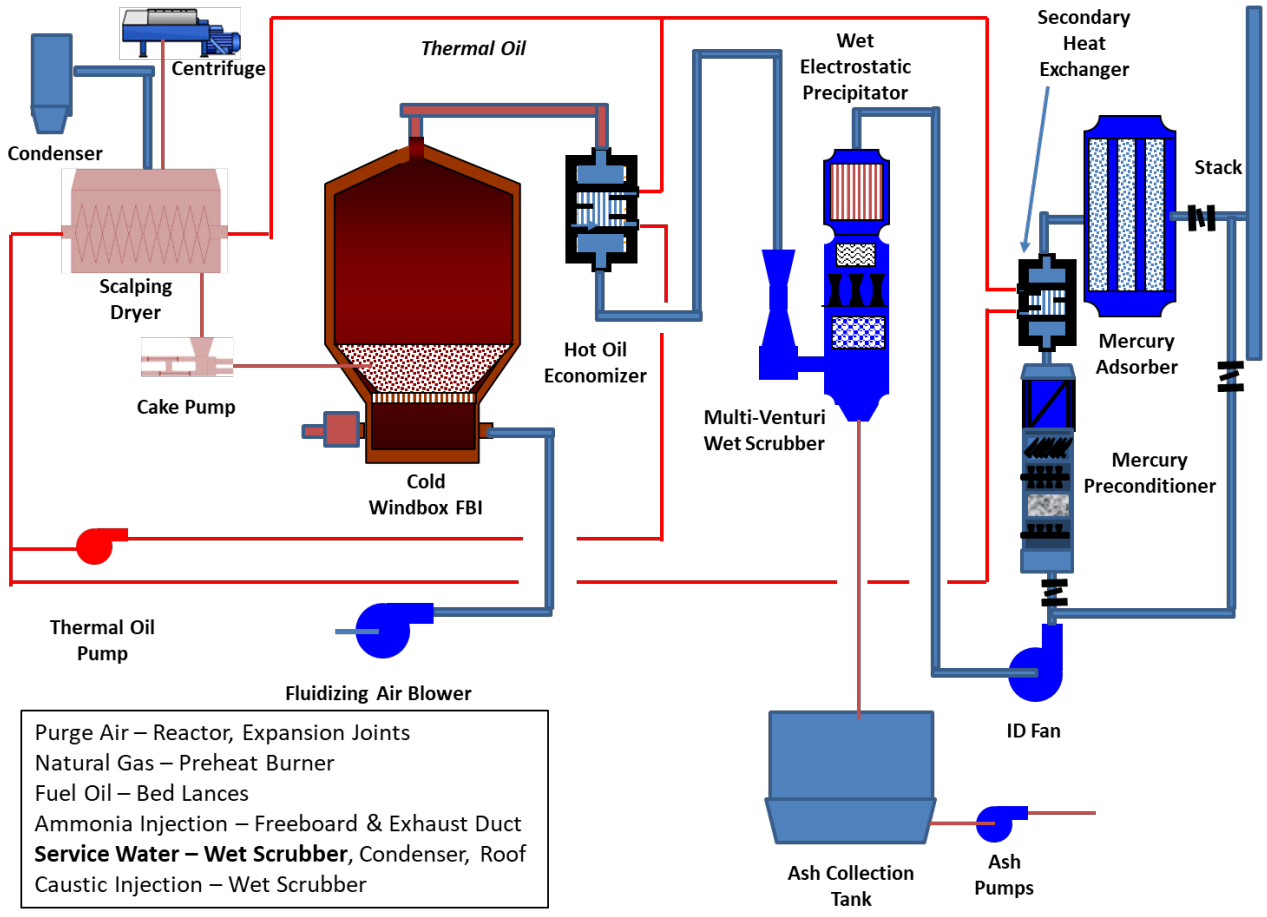


Figure 2. FBI Process Train

The exhaust gases containing fly ash and mercury pass through the hot oil economizer, where the gases are cooled and in turn heat thermal oil, which is used for heating the disc dryer. Excess heat is used for other process requirements at the GBF.

The exhaust gases then pass through a wet scrubbing system, which consists of a quench section, a tray cooling section, a caustic addition section, a multiple venturi section, and mist eliminators. Service water is added to each of the scrubber sections to contact the gases and accomplish various process functions. In the quench section, the exhaust gases are cooled, and larger particulate in the flue gases are removed. In the tray section, the gases are further cooled, and acid gases are absorbed in the tray water. Some of the oxidized mercury is also absorbed in the tray section. The gases then pass through the caustic tray section, which is used to remove additional acid gases. Next, gases pass through the multiple venturi section, where fine particulate is removed. The mist eliminators remove water droplets.

The exhaust gases then enter a wet electrostatic precipitator (WESP) where heavy metals including nickel, cadmium, and zinc are removed. In the WESP, high-voltage electrical pulses are applied to the exhaust gases to charge the heavy metal particles, which are attracted to grounded collector plates and periodically washed through the WESP drain. It should be noted that elemental mercury passes through both the scrubber and the WESP, and the remaining oxidized mercury exiting the scrubber passes through the WESP.

The exhaust gases, which have had acid gases and inorganics removed in the scrubber and WESP, pass through an induced draft fan, the mercury removal stage, and discharge to the atmosphere through a stack. The mercury removal stage consists of a gas conditioner and a cylindrical granular activated carbon (GAC)-filled adsorber vessel containing sulfur-impregnated granular activated carbon. The gas conditioner consists of a gas preheater to raise the temperature and lower the dew point and a coalescer to remove water droplets. The conditioned gas passes through the GAC, which contains three carbon columns in series. Mercury, both elemental and oxidized, is removed to concentrations lower than the 40 *Code of Federal Regulations* (CFR) Part 60 Subpart LLLL rule (U.S. Environmental Protection Agency 2011). Periodically, the spent carbon is replaced by fresh carbon. The condition of the carbon is monitored through periodic testing to establish the mercury adsorption capacity of the carbon.

Stack emission tests are performed annually to confirm compliance with the rule and reaffirm or establish process operating limits that demonstrate compliance between stack tests.

2.4 R2E2 Ash Management Process Description

Figure 3 shows schematically the R2E2 ash management system. All service water entering the wet scrubber and the WESP drains to the ash slurry tank. As described, the ash slurry contains fly ash removed in the scrubber, including heavy metals dissolved sulfur and chloride compounds and some oxidized Hg. The contents of the ash slurry tank are continuously pumped to one of two ash dewatering cells, which are located adjacent to the South Plant aeration tanks and secondary clarifiers. The ash dewatering cells are rectangular concrete tanks each with a sloped ramp at one end for equipment access and a wet well at the other end. A concrete weir separates the wet well from the ash dewatering cell. Decanting valves, which are normally closed, are provided at the bottom of each cell.

The wet wells are connected to the South Plant Drain Wetwell. The well is equipped with three pumps that can pump to the inlet to the aeration tank and can be used for dewatering the secondary tanks to the plant drain. The piping to the plant drain is small and cannot be used to pump decanted scrubber effluent to the plant drain.

Ash slurry is discharged to the sloped end of the operating cell. The ash particulate settles to the bottom of the cell, and the scrubber effluent travels to the other end and flows over the weir to the wet well. From there, the decanted scrubber effluent flows to the drain wetwell and is pumped to the mixed liquor return header that feeds the South Plant aeration tanks.

Typically, one cell is in operation, while the spare cell is used for draining ash prior to removal to landfill. When a cell is full of ash, it is taken out of service, and the spare cell is placed into service. The decant valves are opened to drain the water into the wet well. Once drained, the cell is left to air dry, before the ash is removed by front-end loader, loaded into trucks, and hauled to a landfill.

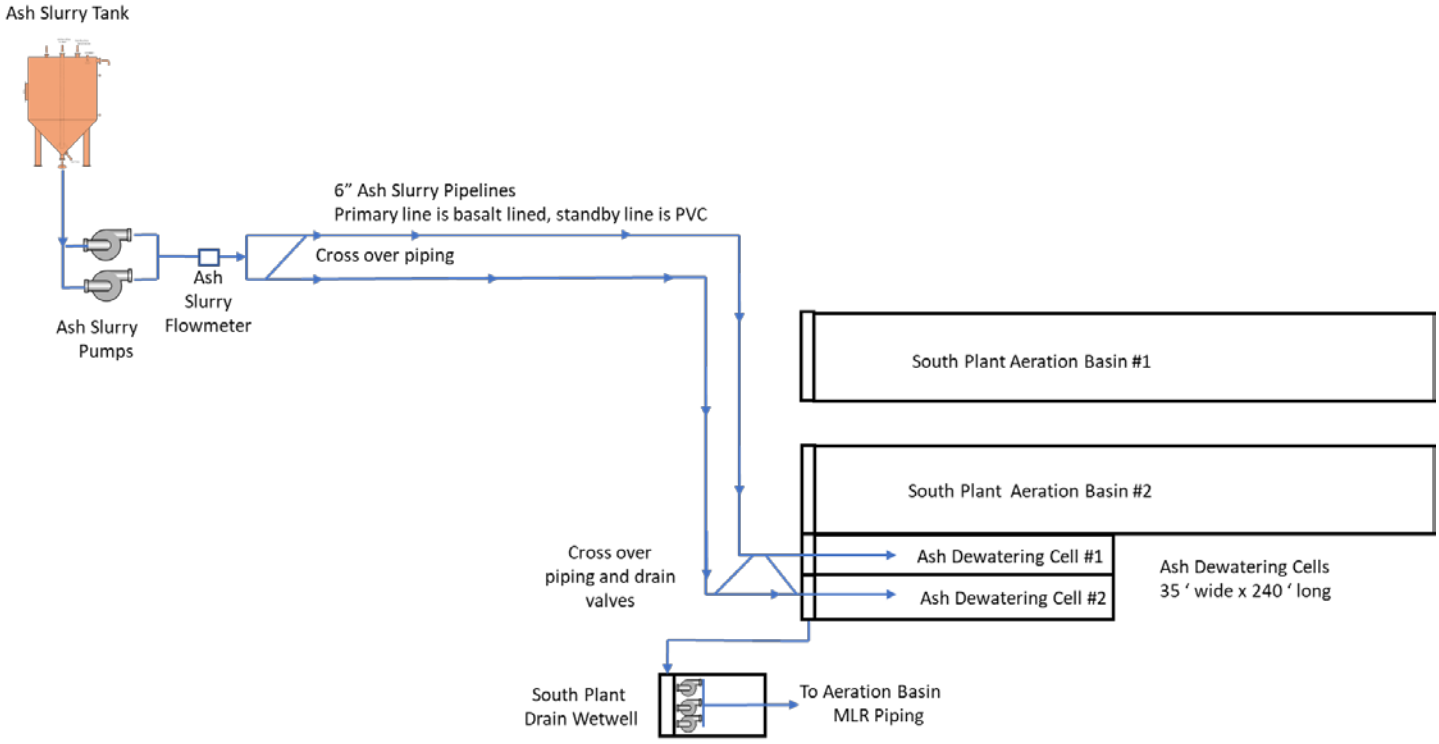


Figure 3. FBI Ash Dewatering System

The scrubber effluent that is separated from the ash in the dewatering cells contains some Hg and some fine ash particles that do not settle. The water is mixed with the mixed liquor returned to the inlet of the aeration tanks and primary effluent. In the biological process, biomass is formed, which will absorb some of the Hg from the decanted scrubber effluent. The biomass (mixed liquor) is then settled in the secondary clarifiers, together with the fine ash particles. Any mercury not absorbed in the biomass with exit the clarifiers with the plant effluent.

2.5 Review of Ash Management Prior to R2E2

Prior to implementation of the R2E2 Project, dewatered sludge was incinerated by multiple-hearth incinerators. The multiple-hearth incinerators consist of a refractory-lined cylinder with multiple levels of refractory floors called hearths. Each hearth was configured with penetrations alternately at the wall or at the center. A hollow refractory-lined shaft, with hollow refractory-lined alloy metal arms with teeth on the bottom, rotated slowly and conveyed the bed of sludge across each hearth, with the contents dropping to the hearth below. Dewatered sludge was fed to the top hearth, where water was evaporated by the hot gases that passed from the lower hearths to the upper hearths and exited in an exhaust gas duct. There are usually two or three drying hearths in a multiple-hearth incinerator. Once the sludge had evaporated sufficient water, it began to combust until only ash remained. There are usually two or three combustion hearths. The ash is cooled in the remaining hearths and discharged from the bottom. Most of the ash is discharged from the bottom of the incinerator. A small amount of ash left the incinerator with the exhaust gases as fly ash. The incinerators were equipped with wet scrubbers, which removed most of the fly ash. As with the FBI, Hg in the sludge exited with the flue gases. Some of the oxidized Hg was absorbed in the scrubber.

Figure 4 shows a schematic of the GBF prior to the R2E2 Project. The scrubber effluent returned to head of the plant via the plant drain. Bottom ash from the incinerator was collected dry and conveyed to roll-off containers for transport to landfill.

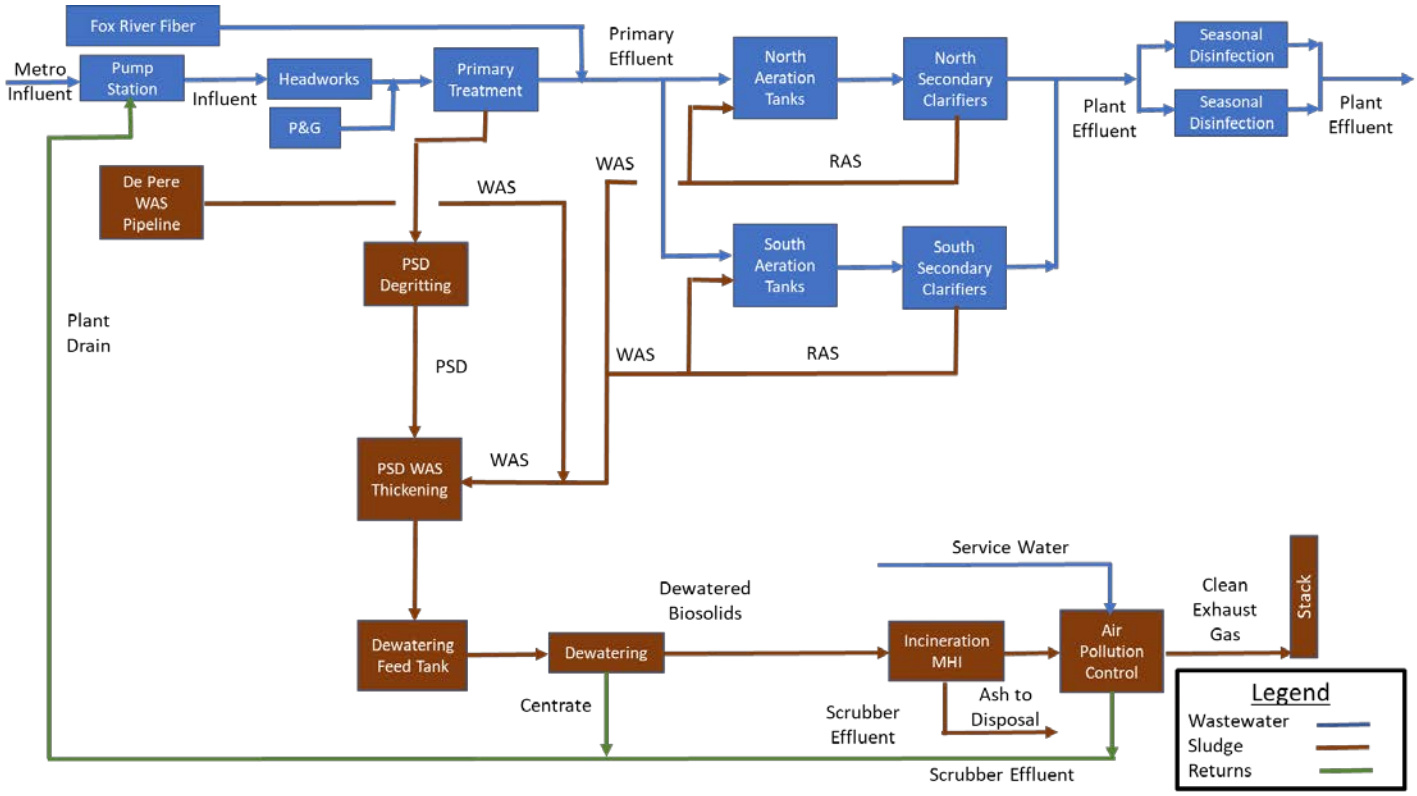


Figure 4. GBF Flow Schematic - Prior to R2E2

3. Methodology for Mercury Mass Movement

The methodology used for analyzing the mass movement of Hg in the liquid treatment system at GBF relies on high-level evaluation of existing Hg concentration data, followed by a high-level mass balance to qualitatively illustrate mass movements at the GBF.

3.1 Data Reviewed

NEW Water sampled and analyzed the Hg concentrations at 19 locations in the liquid system at the GBF between May 2018 and April 2020 and 2 locations at DPF. Table 1 summarizes the sample locations. Hg concentrations were reported as either micrograms per liter (µg/L) or ng/L. Appendix A contains sampling data.

Table 1. Hg Sampling Locations

Sample Name	Sample Location Description
CS-B10/B11	GBF Final Clarifier Effluent - North Side
CS-B12/B13	GBF Final Clarifier Effluent - South Side
CS-B14	GBF Final Effluent - North Side
CS-B15	GBF Final Effluent - South Side
CS-N2	GBF South Plant Influent (primary effluent)
CS-N5	GBF South Plant Final Clarifier Effluent
CS-P2	GBF Combined Influent Flow (Metro & Mill Waste, Plant Return)

Table 1. Hg Sampling Locations

Sample Name	Sample Location Description
DFS	Digested Feed Sludge
DIGESTER1	Digester #1 Contents
DIGESTER2	Digester #2 Contents
DP-EFF	DPF Effluent
DP-INF	DPF Influent
FBI ASH	Fluid Bed Incinerator Ash
FBI ASH DECANT	Ash Cell Overflow (decanted scrubber effluent)
GB-Primary Sludge	GBF Primary Sludge
GB-WAS	GBF Waste-Activated Sludge
ISW	Incinerator Scrubber Water
MS-PG	Proctor and Gamble Influent to GBF
PLT-B1A	GBF Plant Influent (Metro Waste, Plant Return)
PLT-Y1	GBF Plant Return
SIU-072-01	Fox River Fiber Influent to GBF/DPF

Historical plant influent and plant effluent Hg concentrations from 2004 through April 2020.

Dewatered cake Hg concentrations were also reviewed. Concentrations were reported as milligrams per kilogram (mg/kg). Hg concentrations in the FBI stack were reported in the Stack Testing Report – October 2018 (Suez 2018).

For mass calculations, the following information was reviewed:

- Plant effluent monthly flow rates
- PS flow rates
- WAS flow rates
- Incinerator scrubber water flow rates
- Plant return flow rates
- Proctor & Gamble influent flow rates
- Digester feed sludge flow rates
- Dewatered sludge incinerator feed rates
- Scrubber effluent flow rates

4. Results

This section presents the results of the data analysis and mass rates development within the GBF. Appendix B contains additional results.

4.1 Concentration Results and Trends

Figures 5 and 6 show Hg concentration trends for the GBF plant during the period reviewed. Figure 5 is based on the grab samples, and Figure 6 is based on monthly average concentrations. There is no difference in these trends. The graphs show Hg peaks during the summer of 2019.

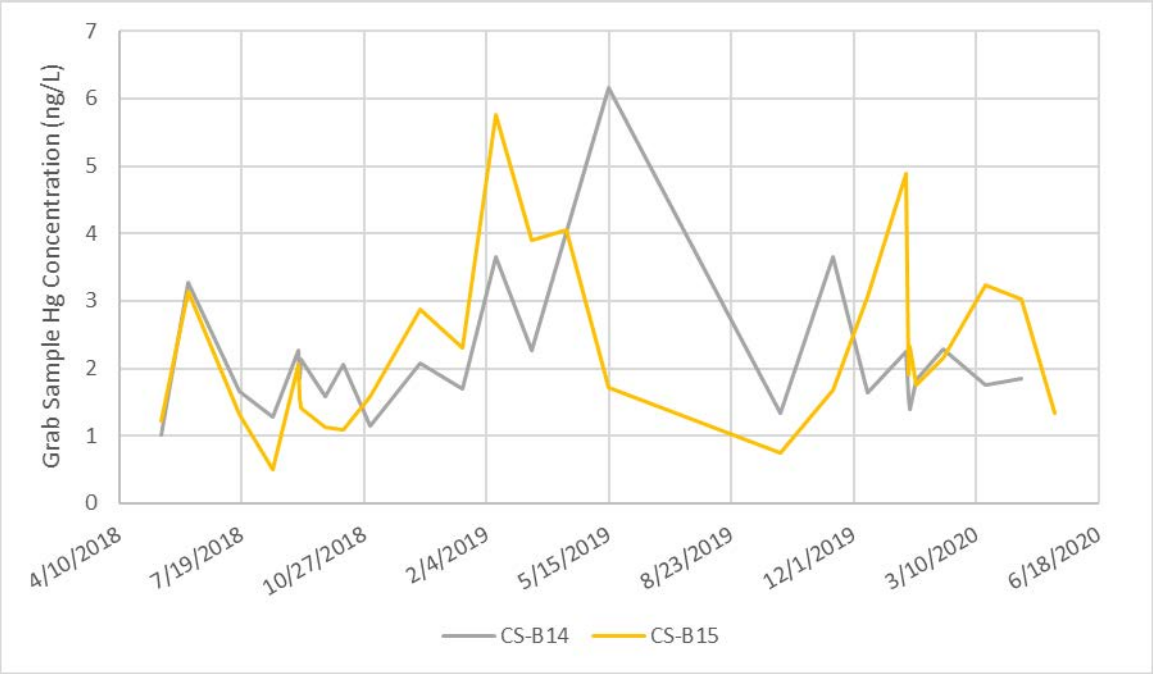


Figure 5. Plant Effluent Hg Concentrations – Grab Samples

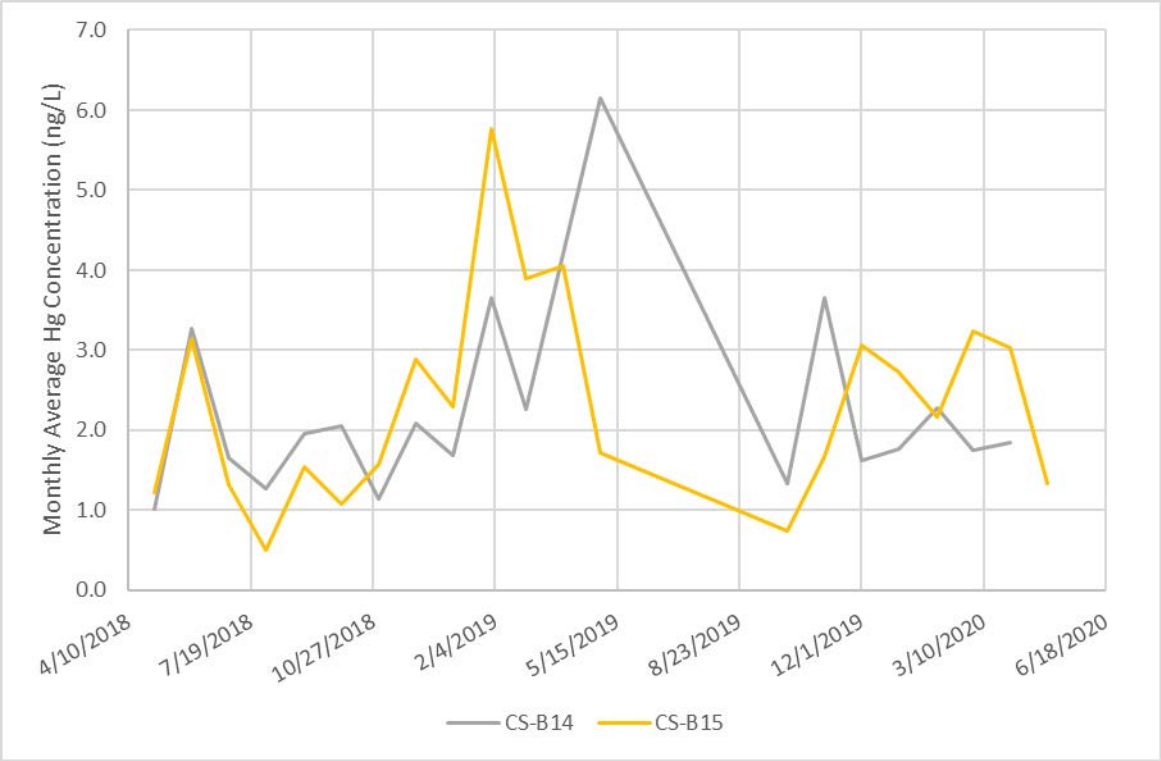


Figure 6. Plant Effluent Hg Concentration - Monthly Average

Figures 7 and 8 compare the plant effluent Hg concentrations with the combined plant influent Hg concentrations. Figure 7 is based on the grab samples, and Figure 8 is based on monthly average concentrations. There is no difference in these trends. There are some peaks in the influent concentrations during 2018 and 2019.

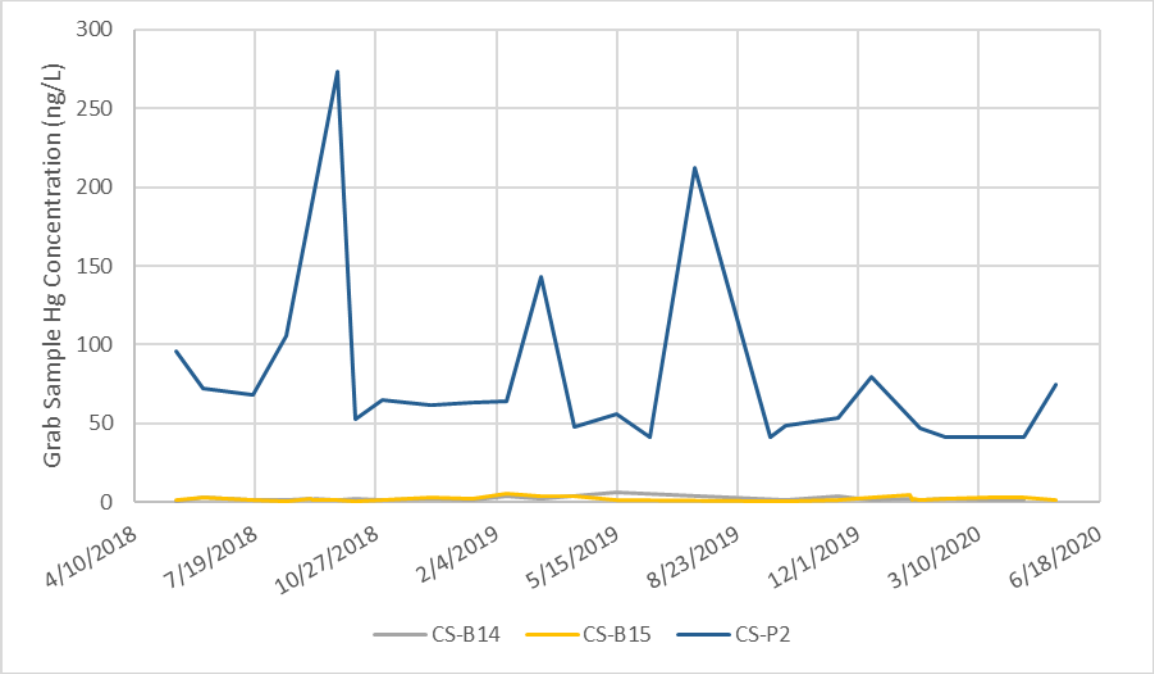


Figure 7. Influent and Effluent Hg Concentrations - Grab Samples

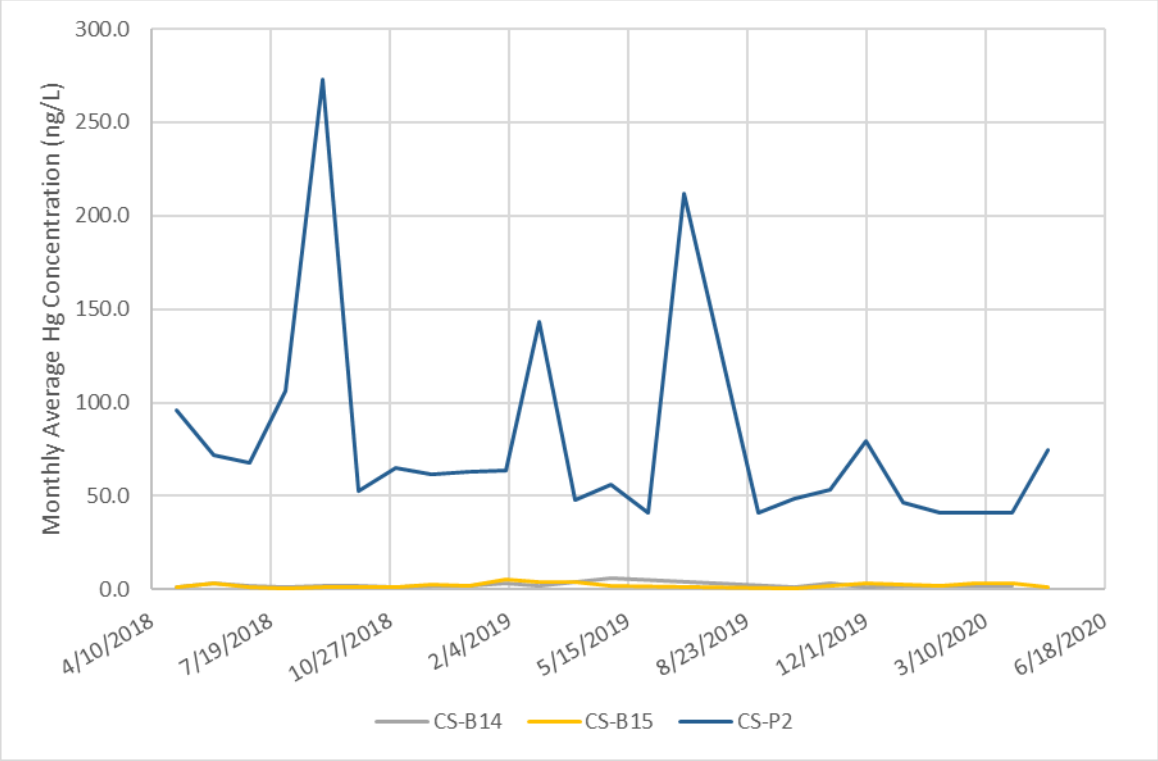


Figure 8. Influent and Effluent Concentrations - Monthly Average

Figures 9 shows Influent and effluent Hg concentrations with influent concentrations on a secondary Y-axis to allow comparison in trends of both influent and effluent concentrations. Generally, a spike in Hg concentration in the influent results in a spike in the effluent.

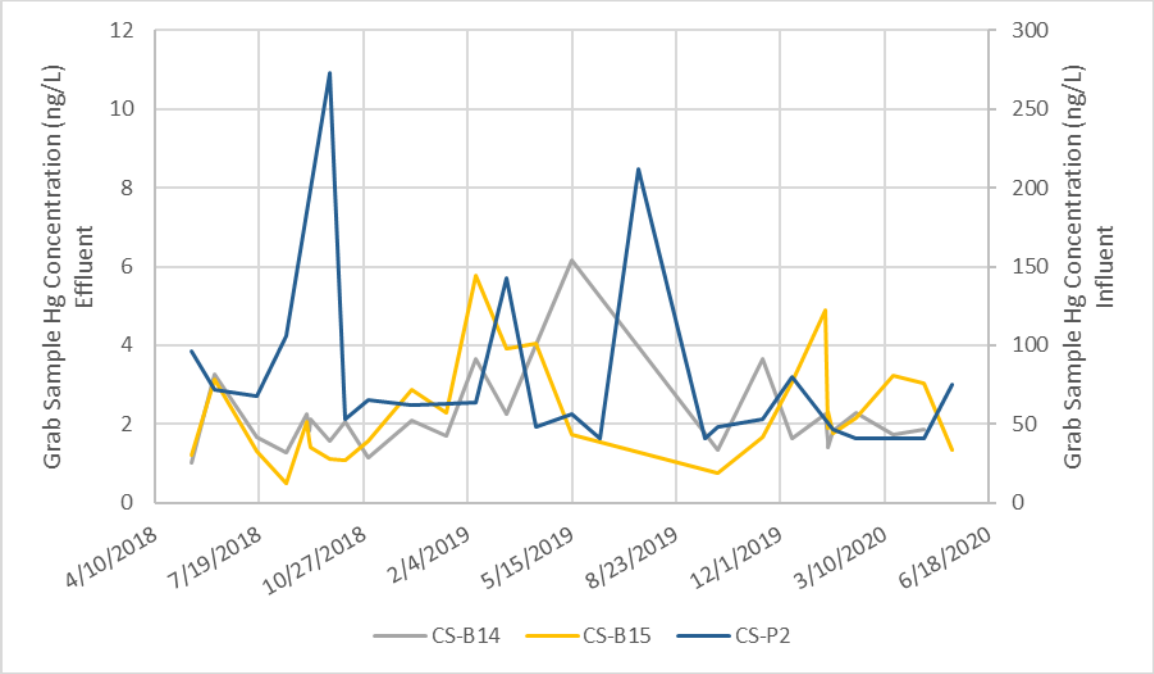


Figure 9. Comparison of Influent and Effluent Hg Trend

Figure 10 shows effluent and decanted scrubber effluent (FBI ASH DECANT) Hg concentrations. The decanted scrubber effluent Hg concentrations are plotted on a secondary Y-axis to provide easy comparison. Changes in effluent Hg concentrations generally follow changes in the decanted scrubber effluent concentrations.

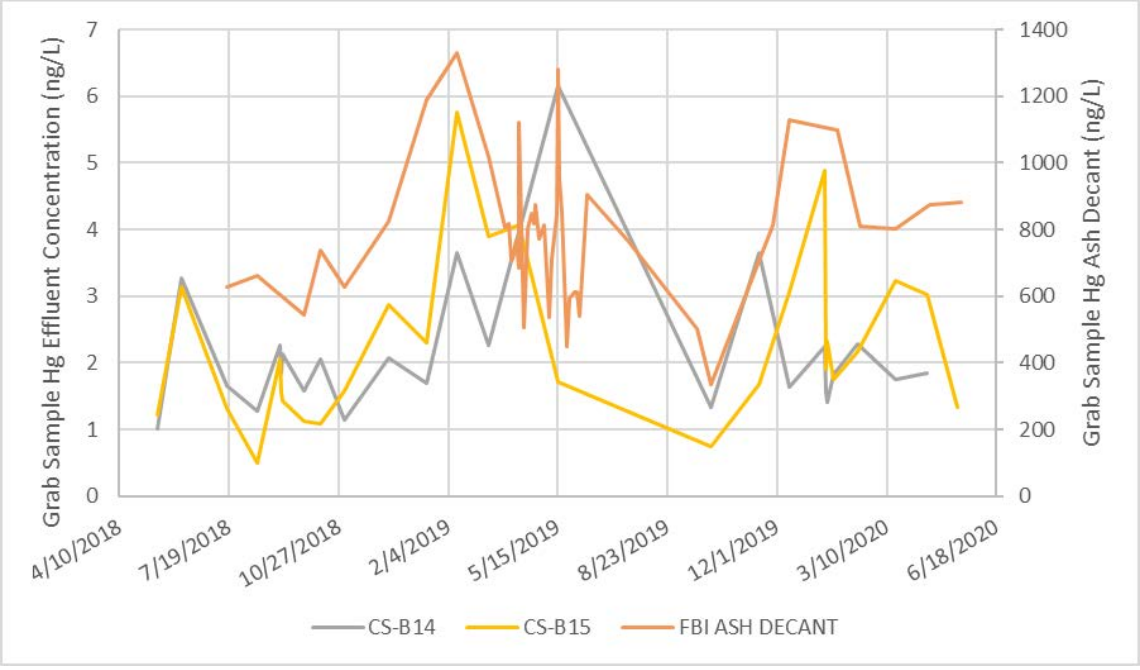


Figure 10. Comparison of Ash Decant and Effluent Hg Concentrations

Figure 11 shows the plant effluent, primary effluent, PS, and decanted scrubber effluent (FBI ASH DECANT) Hg concentrations. The effluent, PS, and decanted scrubber effluent are plotted on a secondary Y-axis for easier comparison with plant effluent Hg concentrations. Primary effluent data is limited to 3 months in 2019, but it does show a spike in plant effluent Hg concentrations. The spike in primary effluent Hg concentration corresponds to a spike in PS concentration. Due to limited primary effluent data, it is not possible to compare PS concentrations, however PS spikes correspond to spikes in plant effluent Hg concentrations.

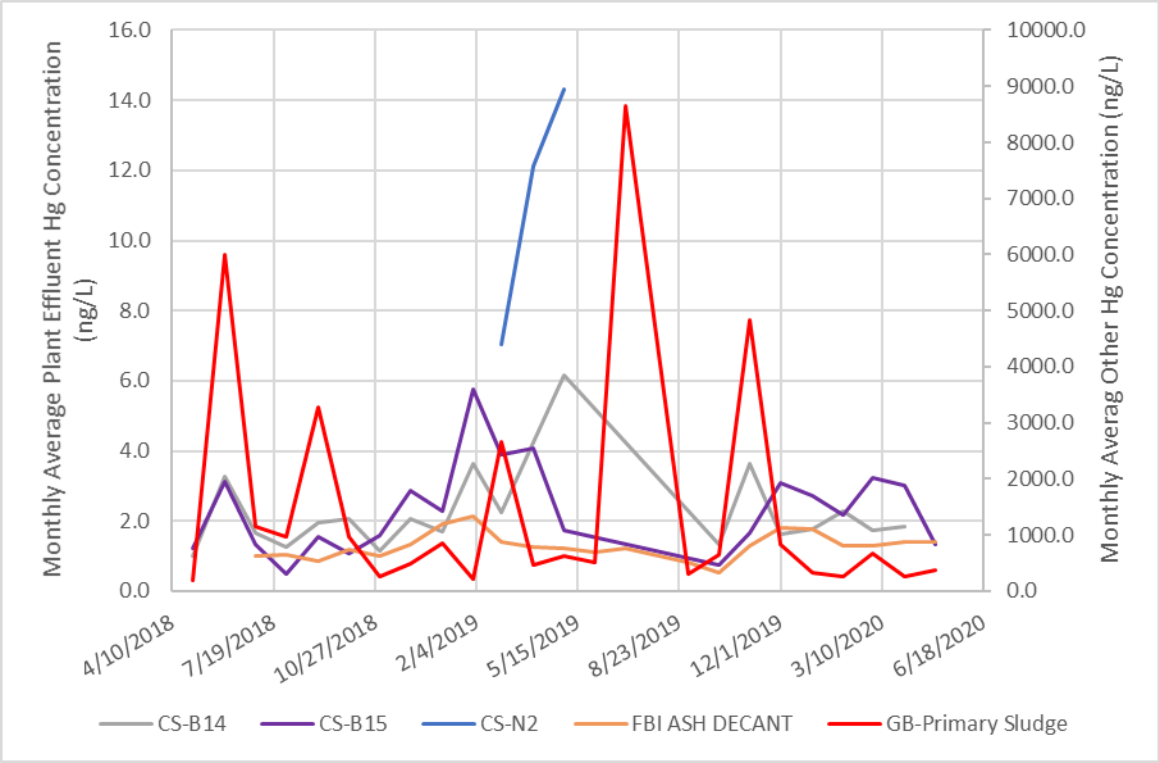


Figure 11. Plant Effluent, Primary Effluent, Primary Sludge, Ash Decant Overflow

Figure 12 shows the plant influent and plant return Hg concentrations. The plant return Hg concentrations are part of the plant influent sample. Some of the changes in plant return are consistent with the changes in plant influent concentrations. Other than the plant return spikes, it does not appear that the influent Hg concentrations have increased during the period reviewed. However, there are spikes that do not appear to be related to spikes in plant returns.

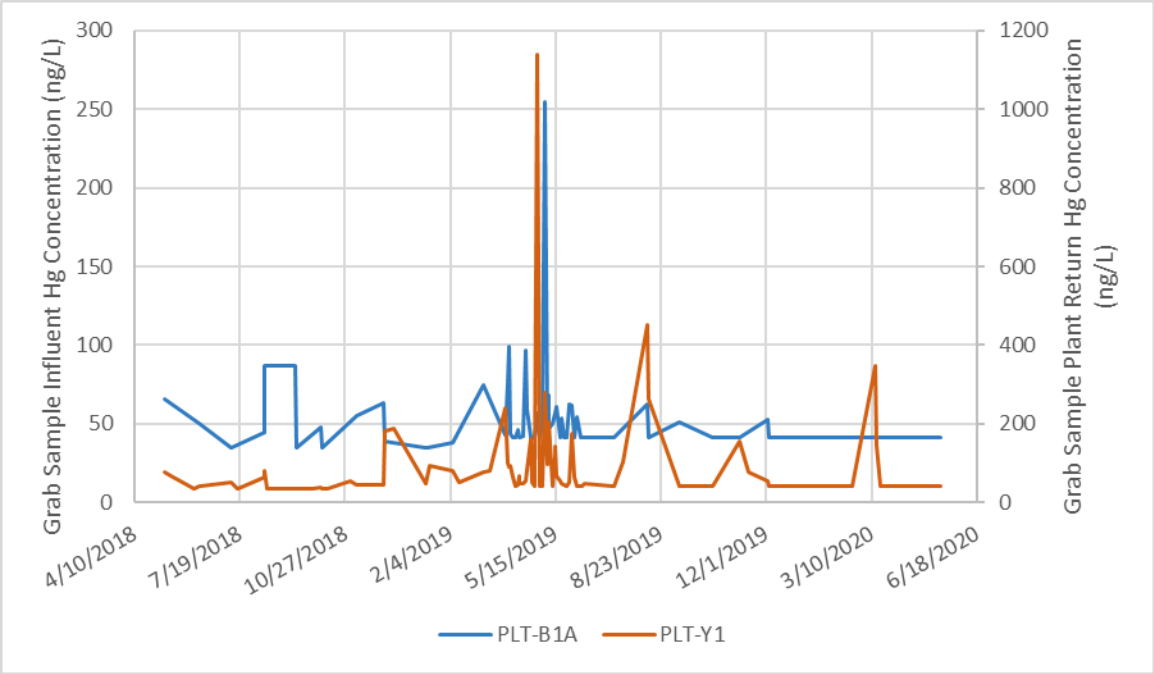


Figure 12. Plant Influent and Plant Return Hg Concentrations

4.2 Mass Rate Results and Trends

Table 2 provides monthly Hg mass loading rates for plant influent, plant effluent, FBI feed solids, settled ash, stack emissions, and decanted scrubber effluent in grams per month (g/month). Averages, minimum, maximum, and standard deviations were calculated for the months where the FBI processed solids for more than 300 hours, which represents operating at about 40 percent throughput capacity based on the design operating schedule of 24 hours, 5 days per week (Figure 14).

Table 2. Mercury Mass Loading Rates

Date	Combined Influent	North Effluent	South Effluent	Combined Effluent	Incinerator Feed	Settled Ash	Stack Emissions	Decanted Scrubber Effluent
	g/month	g/month	g/month	g/month	g/month	g/month	g/month	g/month
May - 18	376.1	1.6	1.8	3.3	24.8	21.8	0.15	-
Jun - 18	241.2	5.0	4.6	9.7	47.7	26.9	0.25	-
Jul – 18	198.4	2.6	2.0	4.5	82.8	39.1	0.33	43.3
Aug - 18	311.9	2.0	0.7	2.7	73.6	39.5	0.32	45.6
Sep - 18	1134.0	3.0	2.3	5.3	441.1	120.4	0.93	37.7
Oct - 18	209.8	3.2	1.6	4.8	486.9	153.5	1.24	50.9
Nov – 18	230.1	1.8	2.4	4.1	138.0	67.7	0.46	43.3
Dec – 18	196.2	3.2	4.3	7.5	324.6	156.0	1.05	57.0
Jan – 19	232.8	2.6	3.4	6.0	377.1	130.7	0.92	82.2
Feb – 19	194.3	5.6	8.5	14.1	336.2	114.8	0.78	91.9
Mar - 19	747.0	3.5	5.8	9.2	337.8	120.3	0.79	60.9

Table 2. Mercury Mass Loading Rates

Date	Combined Influent	North Effluent	South Effluent	Combined Effluent	Incinerator Feed	Settled Ash	Stack Emissions	Decanted Scrubber Effluent
	g/month	g/month	g/month	g/month	g/month	g/month	g/month	g/month
Apr – 19	204.2	2.4	2.6	5.0	239.9	133.9	0.85	54.1
May – 19	261.3	6.1	5.6	11.7	325.0	165.4	1.03	52.8
Jun – 19	174.5	2.7	2.2	4.9	226.5	144.9	0.94	47.4
Jul – 19	918.3	2.1	0.9	2.9	269.7	124.8	0.84	53.1
Aug – 19		4.0	3.3	7.4	79.1	71.0	0.46	-
Sep – 19	205.9	4.2	2.5	6.8	369.3	162.7	1.06	34.8
Oct – 19	248.3	2.3	2.7	5.0	204.7	113.4	0.73	23.2
Nov – 19	205.3	4.2	5.2	9.4	101.6	38.7	0.29	56.3
Dec – 19	384.5	3.6	4.4	7.9	138.2	66.9	0.48	78.1
Jan – 20	206.7	6.5	9.1	15.6	97.2	58.5	0.42	76.0
Feb - 20	136.9	6.4	10.2	16.6	161.7	91.9	0.67	55.8
Mar – 20	170.5	-	11.3	-	304.4	139.1	0.98	55.4
Apr – 20	175.3	15.7	4.6	20.3	296.6	150.8	1.04	60.3
May - 20	345.3	-	-	-	284.2	145.3	1.00	60.9
Average	347.2	5.7	5.9	11.3	311.6	135.5	0.93	54.9
Minimum	136.9	3.6	1.9	5.7	161.7	91.9	0.67	23.2
Maximum	1134.0	15.7	11.3	20.3	486.9	165.4	1.24	91.9
St. Dev.	302.8	3.5	3.2	4.8	84.0	20.4	0.15	16.3

Figure 13 shows the plant flow schematic with averages, maximum, minimum, and standard deviations of the Hg mass loading data presented in Table 2, together with Hg removed by the carbon scrubber. Hg removed by the carbon scrubber was calculated as the difference between Hg inputs and outputs. It should be noted that there is considerable variation in the mass rates developed through sampling. This is due to the variability of the sample analyses and using one or multiple samples to represent the monthly average Hg concentration.

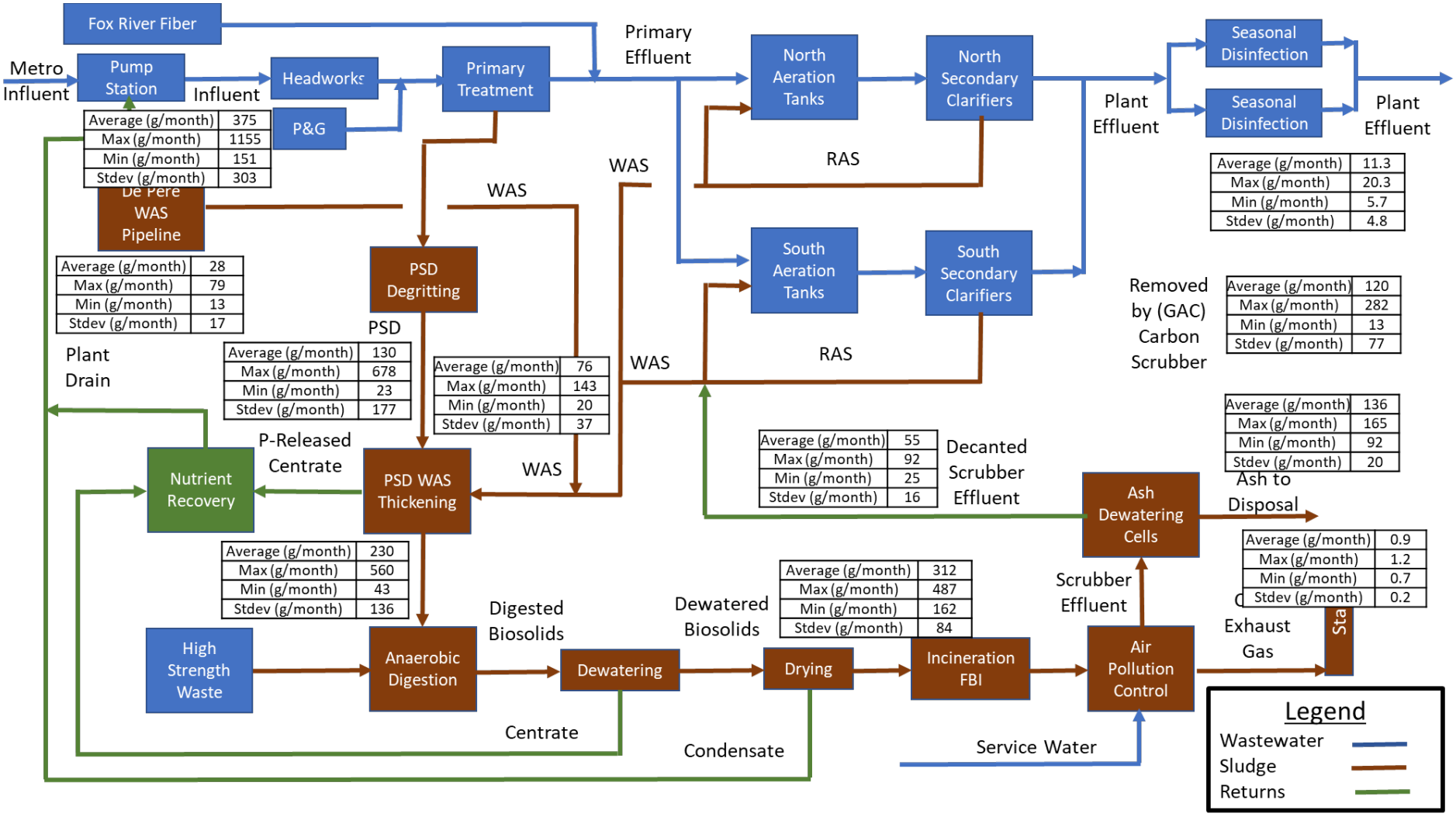


Figure 13. Plant Flow Schematic with Hg Mass Loading

Table 3 shows the Hg mass balance for the plant and for the FBI. The mass balance for the plant includes Hg in the plant influent and Hg leaving the plant: plant effluent, FBI stack emissions, settled ash, and adsorbed by the carbon scrubber. The FBI mass balance includes Hg in the incinerator feed and Hg leaving the FBI: stack emission, settled ash, decanted scrubber effluent, and removed by the carbon scrubber. In both cases, Hg in the carbon scrubber is estimated as the difference between the measured inputs and outputs. Table 3 shows that Hg calculated in the carbon scrubber is about 30.5 percent higher for the FBI balance than for the plant balance.

Table 3. Plant Mass Balance and FBI Mass Balance

	Plant Mass Balance	FBI Mass Balance
Combined Plant Influent	347.2	
Combined Plant Effluent	11.3	
Incinerator Feed		311.6
Stack Emissions	0.93	0.93
Settled Ash	135.5	135.5
Decanted Scrubber Effluent		54.9
Carbon Adsorber (by difference)	173.0	120.3

5. Discussion

5.1 Overview of R2E2 FBI Operation and Hg Trends

The FBI, installed as part of the R2E2 Project, began initial operations in May 2018, with full operations in September 2018. During May through August, the existing multiple-hearth incinerators operated when the FBI was out of service. Since September 2018, the FBI has operated and processed all GBF solids. Figure 14 shows the FBI's monthly processing time and the total hours for each month through May 2020. There was a period in November 2018 and from November 2019 through January 2020 when the FBI operated intermittently while maintenance and modifications were performed.

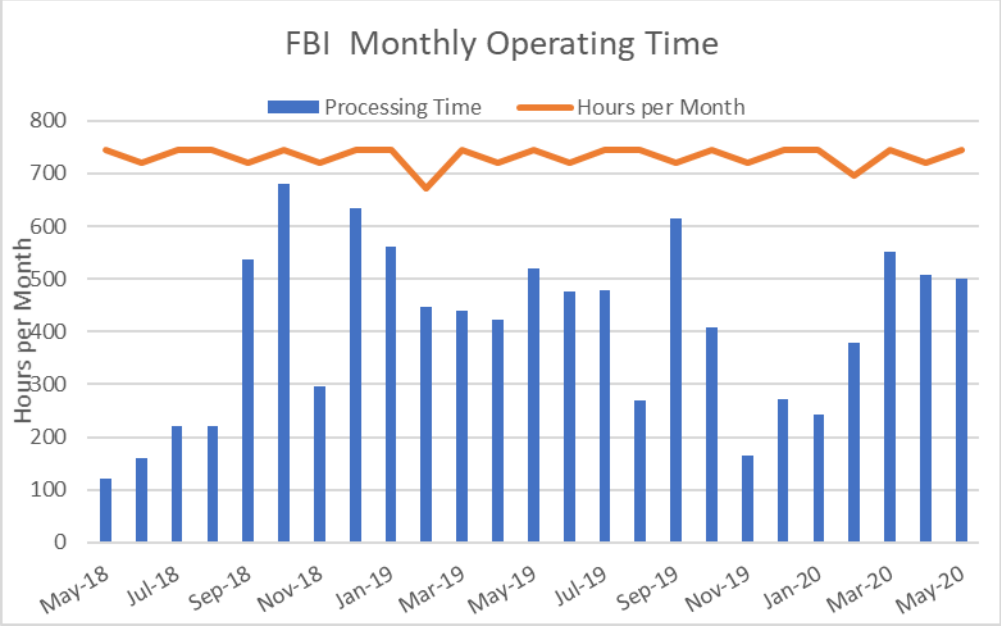


Figure 14. FBI Processing Time - May 2018 to May 2020

Since implementation of the R2E2 Project, the effluent Hg concentrations have appeared to increase. Average Hg influent and effluent concentrations between January 2016 through April 2018 were 50.6 and 1.25 ng/L, respectively, which represents 97.5 percent Hg removal. Between May 2018 and April 2020, average Hg influent and effluent concentrations averaged 75.8 and 2.28 ng/L, respectively, which represents 97 percent Hg removal. Suess, et. al reported that a study of 28 wastewater treatment plants in Switzerland revealed an overall Hg removal efficiency of 85 to 99.7 percent, with an average of 96 ± 4 percent (Suess 2020). Average plant effluent Hg concentrations have increased by about 85 percent.

Figure 15 shows influent and effluent Hg concentrations between 2016 and present. Influent concentrations are shown on a secondary Y-axis to allow comparison of the two concentrations. Trend lines are also included in the graph to illustrate the concentration trend of each stream. The increase in effluent mercury concentrations post-R2E2 is not believed to be associated with increases in influent mercury concentrations. After May 2018, when operational changes at GBF first began, there were four samples with influent mercury concentrations higher than 100 ng/L: September 2018, March 2019, July 2019, and August 2019. These dates do not have a clear connection to the increases in effluent mercury, and a corresponding elevated effluent mercury level is not always present in months with high influent concentrations. NEW Water has reviewed operational logs and pre-treatment records to determine if these increases could be explained from customer operations or collection system maintenance. During these times, there were records of sewer cleaning in the collection system, one customer had discovered that sulfuric acid used to adjust pH contained mercury (which was corrected in December 2019), and one customer had higher mercury levels where its source was never identified. These influent test results could be considered indicative of normal operational items for NEW Water's collection system (Jacobs 2020).

Further review of Figures 10 and 12 suggests that the increase in Hg effluent concentrations since implementation of R2E2 is due to both FBI ash decant addition to the South Plant aeration tanks. While Hg spikes in plant influent concentrations do not appear to coincide with spikes in plant effluent concentrations, the increase in Hg loads to the plant are expected to have some impact in the plant effluent Hg loads.

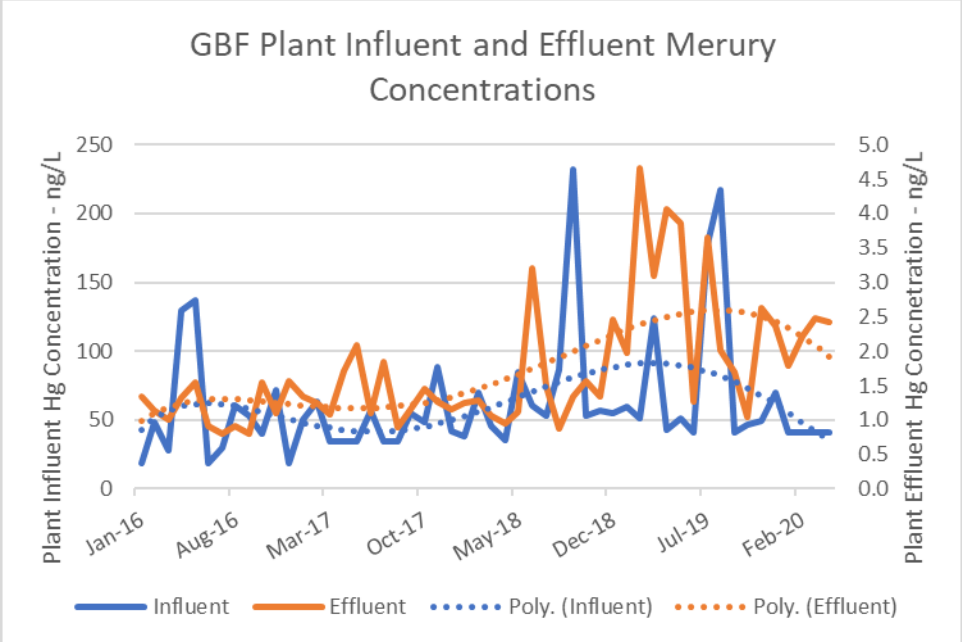


Figure 15. Plant Influent and Effluent Mercury Concentrations - January 2016 to April 2020

5.2 Mass Loadings and Mass Movement in the GBF

The Hg concentration data shows that both Hg influent and effluent concentrations have increased since the implementation of the R2E2 Project, and Hg effluent removal efficiencies have dropped from 97.5 to 97 percent.

To understand the Hg mass loadings and mass movement, the flow of liquids and solids through the plant is discussed. Figure 1 shows the plant flow schematic. Metro waste enters the pumping station, together with the plant returns. This combined stream is pumped to the headworks. Papermill waste from Proctor & Gamble also enters the pumping station but is pumped separately to downstream of the headworks. All three streams contain Hg. According to Balogh (1995), previous studies had reported that more than 90 percent of the Hg in raw municipal wastewater is typically associated with particulate phases, and work in a utility's laboratory indicated that approximately 85 percent of the Hg in the Metropolitan Wastewater Treatment Plant (St. Paul, Minnesota) primary influent is associated with particle sizes greater than 5 micrometers (Balogh 1995).

The combined influent wastewater enters the primary clarifiers where solids settle and are pumped to degritting and thickening. Balogh reported 79 percent Hg removal in the primary treatment system (Balogh 1995) and, following conversion of the solids treatment to FBI system, 58 percent removal in the primary treatment system (Balogh 2008). Following thickening, the primary solids are combined with TWAS and pumped to the digesters. During thickening, effluent is returned to the headworks via the plant drain.

Primary effluent is distributed to the North Plant north and south secondaries and South Plant secondaries. Fox River Fiber influent is mixed with primary effluent. In the secondary treatment process, biomass is formed in the bioreactors and the biomass, together with solids that did not settle in primary treatment, are settled in the secondary clarifiers and effluent is discharged to the Fox River via flow meters. South Plant effluent is combined with the North Plant effluent prior to metering. Settled solids, known as return activated sludge (RAS), are pumped to the inlet of the bioreactors and mixed with the primary effluent and the Fox River Fiber influent. In the case of the South Plant, FBI decanted scrubber effluent from the ash dewatering cells is mixed with the South Plant RAS before entering the bioreactors.

As with the primary treatment, Hg in the primary effluent, Fox River Fiber influent and the FBI decanted scrubber effluent associated with the biomass are settled in the secondary clarifiers. Hg not removed in the bioreactors and clarifiers exits with the plant effluent. As discussed, overall Hg removal efficiency was 97.5 percent prior to R2E2 implementation and 97 percent since.

WAS is pumped to WAS thickening and combined with thickened PS prior to digestion. Effluent from WAS thickening is returned to the headworks via the plant return.

Combined thickened sludge is digested in anaerobic digesters and is pumped to the digested sludge storage tanks. The digestion process has no impact on Hg loading. Digested sludge is dewatered by centrifuges. The digestion process has no impact on Hg loading. Centrate from the centrifuges is returned to the headworks via the plant return. It is expected that centrate will contain Hg. Concentration measurements indicate that there is Hg in the plant return, which includes dewatering centrate, as well as thickened primary and WAS effluent.

Dewatered digested sludge is fed to a dryer and then to the FBI where it is combusted. Hg emitted in the FBI reactor leaves with the flue gases. As described earlier, the Hg is in its speciated forms of elemental and oxidized Hg. Some of the oxidized Hg is absorbed by the scrubbing water and exits the scrubber drain to the ash slurry tank, together with ash removed by the scrubber, where they are pumped to the ash dewatering cells. Ash settles in the dewatering cells, and the scrubbing liquid containing oxidized Hg overflows the weirs of the cells and is pumped to the South Plant RAS header and fed to the inlet of the bioreactors. The ash slurry contains some fine ash, which does not settle and is carried over the weir.

In addition, some ash that is draining in the dewatering cell after it is taken offline may escape through the drain valves and get pumped to the RAS header. Settled ash, which contains some Hg, is removed from the plant for disposal.

Once the flue gases pass through the scrubber and WESP, they pass through the carbon adsorber, through the ID fan, and then discharged from the stack. The GAC is impregnated with sulfur. Elemental Hg passing through the carbon bed is oxidized and adsorbs to the carbon. Oxidized Hg is also adsorbed by the carbon. The carbon adsorber removes >99.99 percent Hg entering the adsorber.

Figure 16 presents graphically the plant and FBI Hg mass balance data contained in Table 3. The balances are presented numerically, as well as a percentage. Figure 16 shows that about 3.5 percent of Hg entering the plant leaves in the effluent, about 42 percent in the settled ash, about 54 percent in the carbon, and <1 percent is emitted by the stack. About 43 percent of the Hg entering the FBI leaves in the settled ash, about 39 percent in the carbon, about 18 percent in the scrubber effluent, and less than 1 percent is emitted by the stack. It should be noted that the two mass balances do not close exactly, signified by the difference in the mass of Hg removed by the carbon in the plant balance and the FBI balance. The difference is about 30.5 percent, which is not surprising, given the variability in the Hg concentration data, and the method assumes that one or two Hg concentration grab samples each month represent the monthly average, as well as some of the flow data is based on a daily average based on one or two daily readings.

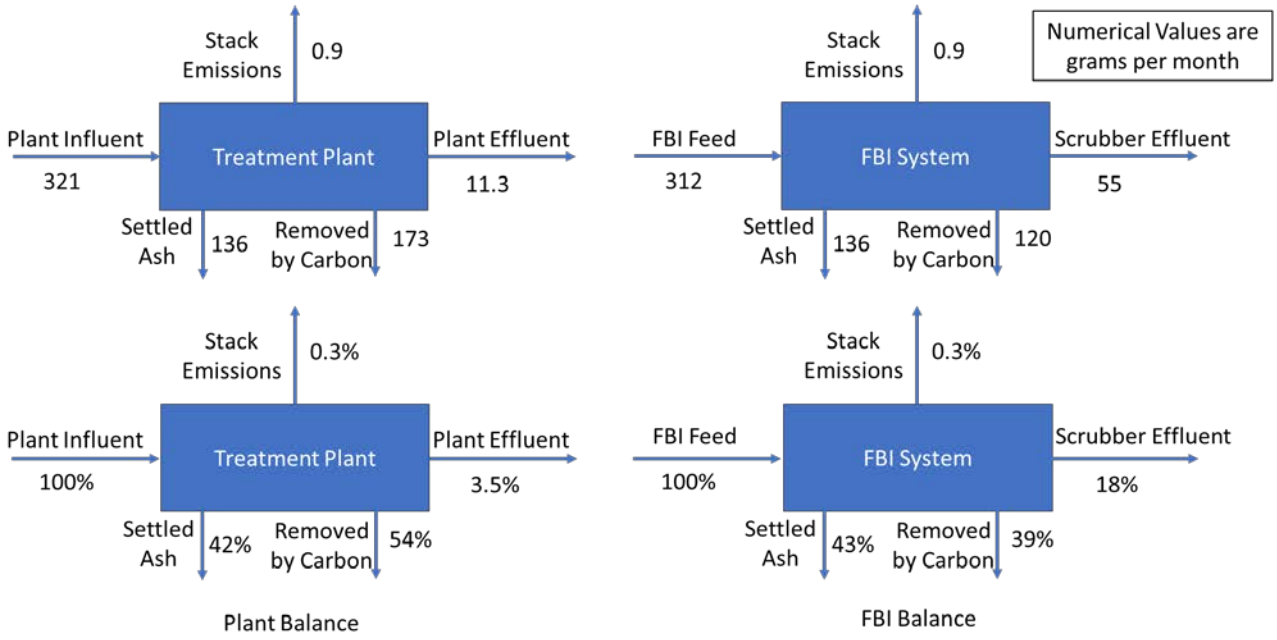


Figure 16. Plant and FBI Hg Balances

5.3 FBI and Multiple-Hearth Incinerator Stack Emissions and Overall Impact to the Environment

Figure 17 shows a reduction in stack emission Hg concentrations with implementation of R2E2 FBI incineration compared to multiple-hearth incineration, prior to R2E2. The graph shows that stack Hg concentrations have decreased by 10 to 20 times the multiple-hearth incinerator stack emissions, pre-R2E2 implementation. This represents a substantial reduction in Hg emitted to the environment of 9 to 18 grams per month pre-R2E2. As discussed earlier, the overall Hg removal efficiency across the liquid stream has decreased from 97.5 to 97 percent, and the influent Hg mass has increased by about

50 percent over pre-R2E2 implementation. The net is a reduction of about 6 to 15 grams per month Hg to the environment.

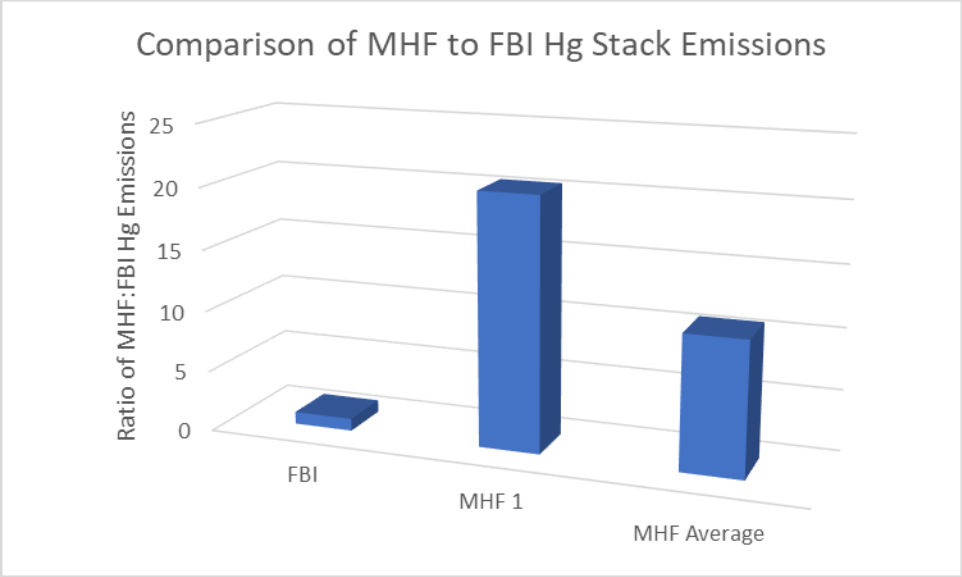


Figure 17. Comparison of Multiple-Hearth Incinerator and FBI Hg Stack Emissions

6. Summary Conclusions

Hg concentration data from May 2018 to April 2020 at various locations in the GBF and DPF liquid treatment system was reviewed. The analysis included review of data trends and mass rates were developed using Hg concentration data and flow rates in the liquid system and mass rates in the solids system.

The evaluation process is summarized as follows:

- Hg concentration data was provided by NEW Water at 19 locations in the liquid treatment system at GBF and 2 locations at DPF. Biosolids Hg concentrations were provided for GBF.
  - For GBF, the plant influent, effluent, scrubber effluent (ash decant overflow), PS, WAS, digester feed, and ash Hg concentrations were sampled monthly, except for August 2019.
  - Liquid data was provided from May 2018 through May 2020.
  - Biosolids data was provided from 2014 through May 2020. For post-R2E2, data from May 2018 through May 2020 was used. For pre-R2E2, data from 2016 through April 2018 was used.
- Hg concentrations were plotted for several locations and combinations of locations to compare trends.
- Monthly average Hg concentrations were developed where there were more than one sample per month at a particular location.
- Mass rates were calculated using monthly average Hg concentrations and flow rates for selected locations using data for months when FBI processing exceeded 40 percent of FBI design.
- Average, minimum, maximum, and standard deviation mass rates are developed for plant influent, effluent, PSD, WAS, digester feed, FBI feed, decanted scrubber effluent, ash to disposal, Hg removed by carbon, and stack emissions.

- All data show some variability. This is due to the variability in the reported Hg concentrations and flow rates at each location, as well as the use of single or multiple monthly samples to represent monthly average concentrations and flow rates.

Implementation of the R2E2 Project has resulted in increased liquid effluent loading, but air emissions have seen a greater decrease. The net impact of the R2E2 Project has resulted in reduced overall Hg emissions to the environment. Results from this analysis are summarized as follows:

- Plant effluent Hg concentrations post-R2E2 have increased by about 85 percent. Although plant influent Hg concentrations appear to have increased post-R2E2, review of sewer system operations identified maintenance and customer-specific causes of the spikes, which when corrected suggest that plant influent Hg concentrations have not increased.
- Mass movement of Hg within the GBF and unit process removal efficiencies are consistent with mercury movement and removal efficiencies reported by other wastewater treatment facilities. The configuration of the R2E2 FBI air pollution control system has resulted in recycling scrubber effluent containing Hg to the South Plant aeration system instead of the plant return.
- The increase in plant Hg effluent concentrations post-R2E2 can be attributed to the contribution of the FBI scrubber effluent, following ash decanting, to the South Plant aeration system. Also, the scrubber/WESP combination results in higher Hg concentrations in the scrubber effluent compared to pre-R2E2.
- Mass balances for the plant system and the FBI system indicate reasonable agreement, with about a 30.5 percent difference in Hg removed by carbon scrubber, which is the parameter used to close the balance.
- Comparison of stack emissions pre- and post-R2E2 indicate that the FBI stack emissions are 10 to 20 times less than the multiple-hearth incinerator (pre-R2E2) stack emission.

7. References

Balogh, S., Laing, L. 1995. *Mercury Pathways in Municipal Wastewater Treatment Plants, Metropolitan Waste Control Commission, St. Paul, MN*.

Balogh, S. J., Nollett, Y. H. 2008. "Mercury Mass Balance at a Wastewater Treatment Plant Employing Sludge Incineration with Offgas Mercury Control." *Science of the Total Environment*. 389 (2008) 125 – 131. Elsevier, Metropolitan Council Environmental Services, St. Paul, MN, 2007.

Environmental Technology & Engineering Corp. 2017a. *Testing to Demonstrate Initial Compliance with EPA Emission Requirements for Sewage Sludge Incineration Units Constructed before October 14, 2010 (40 CFR Part 62 LLL) of Incinerator No. 1 Exhaust (I01, S01, C01, C02), April 17 – 24, 2017*. Prepared for Green Bay Metropolitan Sewerage District, ETE, Elm Grove, WI. April.

Environmental Technology & Engineering Corp. 2017b. *Testing to Demonstrate Initial Compliance with EPA Emission Requirements for Sewage Sludge Incineration Units Constructed before October 14, 2010 (40 CFR Part 62 LLL) of Incinerator No. 2 Exhaust (I02, S02, C02, C06), March 9 – April 25, 2017*. Prepared for Green Bay Metropolitan Sewerage District, ETE, Elm Grove, WI. April.

Morency, J. R., T. Panagiotou, R.F. Lobo.1999. "Control of Mercury Emissions in Utility Power Plants." TR-1113187-V3, presented at EPRI-DOE-EPA Combined Utility Air Pollutant Control Symposium: The MEGA Symposium (Atlanta, GA). 16-20 August.

Jacobs Engineering Group Inc. (Jacobs). 2020. *NEW Water Facility Process Changes Related to Liquid Effluent Mercury Concentrations.* March 31.

State of Wisconsin (WDNR). 2019, Water Quality-Based Effluent Limitations for the Green Bay Metropolitan Sewerage District Combined WPDES Permit No. WI-0065251-02. September 2019.

Suess, E., et al. 2020. "Mercury Loads and Fluxes from Wastewater: A Nation-wide Survey in Switzerland." *Water Research*. 175 (2020) 115708.

Suez. 2018. S*ewage Sludge Incineration Unit MACT Test Report, FLUIDIZED BED INCINERATOR (FBI) PROCESS I08 – STACK S08 At GREEN BAY METROPOLITAN SEWERAGE DISTRICT Treatment Plant, Project ID: KR-10094, October 17 – 18, 2018*. Prepared by Advanced Industrial Resources, Inc., Suez Richmond, VA, October.

Suez. 2019. *Green Bay Fluidized Bed Incinerator Digested Sludge Testing, Suez, Richmond, VA*. January.

U.S. Environmental Protection Agency. 2011. 40 CFR part 60 Standards of Performance for New Stationary Sources and Emission Guidelines for Existing Sources: Sewage Sludge Incineration Units; Final Rule, Federal Register Volume 76, No. 54, March 21, 2011.

Appendix A
Operations and Sampling Data

NEW Water Mercury Sample Data
Received 6/18/2020

Analyte	Project Name	LIMS #	Sample Name	Sample Date	Result	Result (Number)	Units	Qualifier	Status	Appr. Status	App. Date	Received Date	Special Conditions	Analysis Date
Mercury	GBMSD-MPS	190615-47	CS-B10/B11	5/2/2019	0.672	0.672	ng/L		Done	Released	6/27/2019 7:47	5/3/2019 10:59		5/14/2019
Mercury	GBMSD-MPS	190716-44	CS-B10/B11	5/15/2019	0.816	0.816	ng/L		Done	Released	6/4/2019 12:59	5/16/2019 13:26		5/17/2019
Mercury	GBMSD-MPS	190615-48	CS-B10/B11	5/2/2019	1.23	1.23	ng/L		Done	Released	6/27/2019 7:47	5/3/2019 10:59		5/14/2019
Mercury	GBMSD-MPS	190716-45	CS-B12/B13	5/15/2019	0.959	0.959	ng/L		Done	Released	6/4/2019 12:59	5/16/2019 13:26		5/17/2019
Mercury	GBMSD-MPS	180695-30	CS-B14	5/15/2018	1.01	1.01	ng/L		Done	Released	6/1/2018 15:47	5/16/2018 13:10		5/18/2018
Mercury	GBMSD-MPS	180832-32	CS-B14	6/6/2018	3.27	3.27	ng/L		Done	Released	6/25/2018 13:34	6/7/2018 13:08		6/7/2018
Mercury	GBMSD-MPS	181069-39	CS-B14	7/17/2018	1.66	1.66	ng/L		Done	Released	8/27/2018 9:24	7/20/2018 11:52		7/19/2018
Mercury	GBMSD-MPS	181243-32	CS-B14	8/14/2018	1.27	1.27	ng/L		Done	Released	12/11/2018 9:47	8/16/2018 6:27		8/20/2018
Mercury	WET 2018	181368-03	CS-B14	9/3/2018	2.26	2.26	ng/L		Done	Released	12/19/2018 8:26	9/6/2018 15:02		9/14/2018
Mercury	WET 2018	181369-03	CS-B14	9/5/2018	1.84	1.84	ng/L		Done	Released	12/19/2018 8:27	9/5/2018 9:21		9/14/2018
Mercury	WET 2018	181370-03	CS-B14	9/6/2018	2.13	2.13	ng/L		Done	Released	10/16/2018 9:48	9/7/2018 8:48		9/14/2018
Mercury	GBMSD-MPS	181529-32	CS-B14	9/25/2018	1.58	1.58	ng/L		Done	Released	12/11/2018 9:47	9/27/2018 7:46		9/26/2018
Mercury	GBMSD-MPS	181650-39	CS-B14	10/10/2018	2.05	2.05	ng/L		Done	Released	11/30/2018 12:50	10/12/2018 13:24		10/12/2018
Mercury	GBMSD-MPS	181797-32	CS-B14	11/1/2018	1.14	1.14	ng/L		Done	Released	1/8/2019 6:59	11/2/2018 12:34		11/9/2018
Mercury	GBMSD-MPS	182082-32	CS-B14	12/12/2018	2.08	2.08	ng/L		Done	Released	1/14/2019 8:39	12/13/2018 13:25		12/18/2018
Mercury	GBMSD-MPS	190086-39	CS-B14	1/15/2019	1.69	1.69	ng/L		Done	Released	2/19/2019 15:03	1/17/2019 13:46		1/18/2019
Mercury	GBMSD-MPS	190249-32	CS-B14	2/12/2019	3.65	3.65	ng/L		Done	Released	4/16/2019 9:51	2/12/2019 12:42		2/25/2019
Mercury	GBMSD-MPS	190380-24	CS-B14	3/13/2019	2.26	2.26	ng/L		Done	Released	4/18/2019 9:41	3/14/2019 13:43		3/14/2019
Mercury	GBMSD-MPS	190716-24	CS-B14	5/15/2019	6.15	6.15	ng/L		Done	Released	6/4/2019 12:59	5/16/2019 13:26		5/17/2019
Mercury	GBMSD-MPS	191645-24	CS-B14	10/2/2019	1.34	1.34	ng/L		Done	Released	10/23/2019 13:45	10/5/2019 13:26		10/3/2019
Mercury	GBMSD-MPS	191902-24	CS-B14	11/14/2019	3.65	3.65	ng/L		Done	Released	1/16/2020 13:26	11/18/2019 6:50		11/15/2019
Mercury	GBMSD-MPS	192070-24	CS-B14	12/12/2019	1.63	1.63	ng/L		Done	Released	1/6/2020 8:54	12/13/2019 8:35		12/19/2019
Mercury	WET 2020	200048-03	CS-B14	1/13/2020	2.25	2.25	ng/L		Done	Released	2/7/2020 15:21			1/20/2020
Mercury	WET 2020	200050-03	CS-B14	1/15/2020	1.56	1.56	ng/L		Done	Released	2/17/2020 14:48	1/15/2020 9:41		1/20/2020
Mercury	WET 2020	200062-03	CS-B14	1/16/2020	1.4	1.4	ng/L		Done	Released	2/7/2020 15:21			1/20/2020
Mercury	GBMSD-MPS	200095-24	CS-B14	1/21/2020	1.83	1.83	ng/L		Done	Released	3/5/2020 13:07	1/22/2020 13:31		1/23/2020
Mercury	GBMSD-MPS	200224-23	CS-B14	2/12/2020	2.28	2.28	ng/L		Done	Released	3/5/2020 13:09	2/17/2020 10:13		2/14/2020
Mercury	GBMSD-MPS	200423-24	CS-B14	3/18/2020	1.75	1.75	ng/L		Done	Released	4/23/2020 13:23	3/19/2020 12:56		3/20/2020
Mercury	GBMSD-MPS	200541-24	CS-B14	4/16/2020	1.85	1.85	ng/L		Done	Released	5/15/2020 12:48	4/22/2020 9:25		4/25/2020
Mercury	GBMSD-MPS	180695-31	CS-B15	5/15/2018	1.22	1.22	ng/L		Done	Released	6/1/2018 15:47	5/16/2018 13:10		5/18/2018
Mercury	GBMSD-MPS	180832-33	CS-B15	6/6/2018	3.14	3.14	ng/L		Done	Released	6/25/2018 13:34	6/7/2018 13:08		6/7/2018
Mercury	GBMSD-MPS	181069-40	CS-B15	7/17/2018	1.32	1.32	ng/L		Done	Released	8/27/2018 9:24	7/20/2018 11:52		7/19/2018
Mercury	GBMSD-MPS	181243-33	CS-B15	8/14/2018	0.499	0.499	ng/L		Done	Released	12/11/2018 9:47	8/16/2018 6:27		8/20/2018
Mercury	WET 2018	181368-04	CS-B15	9/3/2018	2.05	2.05	ng/L		Done	Released	12/19/2018 8:26	9/6/2018 15:02		9/14/2018
Mercury	WET 2018	181369-04	CS-B15	9/5/2018	1.56	1.56	ng/L		Done	Released	12/19/2018 8:27	9/5/2018 9:21		9/14/2018
Mercury	WET 2018	181370-04	CS-B15	9/6/2018	1.42	1.42	ng/L		Done	Released	10/16/2018 9:48	9/7/2018 8:48		9/14/2018
Mercury	GBMSD-MPS	181529-33	CS-B15	9/25/2018	1.12	1.12	ng/L		Done	Released	12/11/2018 9:47	9/27/2018 7:46		9/26/2018
Mercury	GBMSD-MPS	181650-40	CS-B15	10/10/2018	1.08	1.08	ng/L		Done	Released	11/30/2018 12:50	10/12/2018 13:24		10/12/2018
Mercury	GBMSD-MPS	181797-33	CS-B15	11/1/2018	1.58	1.58	ng/L		Done	Released	1/8/2019 6:59	11/2/2018 12:34		11/9/2018
Mercury	GBMSD-MPS	182082-33	CS-B15	12/12/2018	2.88	2.88	ng/L		Done	Released	1/14/2019 8:39	12/13/2018 13:25		12/18/2018
Mercury	GBMSD-MPS	190086-40	CS-B15	1/15/2019	2.3	2.3	ng/L		Done	Released	2/19/2019 15:03	1/17/2019 13:46		1/18/2019
Mercury	GBMSD-MPS	190249-33	CS-B15	2/12/2019	5.76	5.76	ng/L		Done	Released	4/16/2019 9:51	2/12/2019 12:42		2/25/2019
Mercury	GBMSD-MPS	190380-25	CS-B15	3/13/2019	3.9	3.9	ng/L		Done	Released	4/18/2019 9:41	3/14/2019 13:43		3/14/2019
Mercury	GBMSD-MPS	190505-26	CS-B15	4/10/2019	4.06	4.06	ng/L		Done	Released	5/20/2019 8:00	4/15/2019 11:31		4/15/2019
Mercury	GBMSD-MPS	190716-25	CS-B15	5/15/2019	1.72	1.72	ng/L		Done	Released	6/4/2019 12:59	5/16/2019 13:26		5/17/2019
Mercury	GBMSD-MPS	191645-25	CS-B15	10/2/2019	0.741	0.741	ng/L		Done	Released	10/23/2019 13:45	10/5/2019 13:26		10/3/2019
Mercury	GBMSD-MPS	191902-25	CS-B15	11/14/2019	1.67	1.67	ng/L		Done	Released	1/16/2020 13:26	11/18/2019 6:50		11/15/2019
Mercury	GBMSD-MPS	192070-25	CS-B15	12/12/2019	3.07	3.07	ng/L		Done	Released	1/6/2020 8:54	12/13/2019 8:35		12/19/2019
Mercury	WET 2020	200048-04	CS-B15	1/13/2020	4.89	4.89	ng/L		Done	Released	2/7/2020 15:21			1/20/2020
Mercury	WET 2020	200050-04	CS-B15	1/15/2020	1.91	1.91	ng/L		Done	Released	2/17/2020 14:48	1/15/2020 9:41		1/20/2020
Mercury	WET 2020	200062-04	CS-B15	1/16/2020	2.33	2.33	ng/L		Done	Released	2/7/2020 15:21			1/20/2020
Mercury	GBMSD-MPS	200095-25	CS-B15	1/21/2020	1.76	1.76	ng/L		Done	Released	3/5/2020 13:07	1/22/2020 13:31		1/23/2020
Mercury	GBMSD-MPS	200224-24	CS-B15	2/12/2020	2.16	2.16	ng/L		Done	Released	3/5/2020 13:09	2/17/2020 10:13		2/14/2020
Mercury	GBMSD-MPS	200423-25	CS-B15	3/18/2020	3.24	3.24	ng/L		Done	Released	4/23/2020 13:23	3/19/2020 12:56		3/20/2020
Mercury	GBMSD-MPS	200541-25	CS-B15	4/16/2020	3.03	3.03	ng/L		Done	Released	5/15/2020 12:48	4/22/2020 9:25		4/25/2020
Mercury	GBMSD-MPS	200636-18	CS-B15	5/13/2020	1.33	1.33	ng/L		Done	Released	6/5/2020 9:15	5/15/2020 7:28		5/15/2020
Mercury	Daily Samples	190440-20	CS-N2	3/28/2019	7.02	7.02	ng/L		Done	Released	4/19/2019 9:15	3/29/2019 10:23		4/3/2019
Mercury	Daily Samples	190459-20	CS-N2	4/1/2019	7.1	7.1	ng/L		Done	Released	5/20/2019 8:00	4/1/2019 14:31		4/3/2019
Mercury	Daily Samples	190463-34	CS-N2	4/2/2019	7.34	7.34	ng/L		Done	Released	5/20/2019 8:00	4/5/2019 8:51	N/A	4/3/2019
Mercury	Daily Samples	190479-23	CS-N2	4/4/2019	15.2	15.2	ng/L		Done	Released	5/20/2019 8:00	4/6/2019 7:08		4/15/2019
Mercury	Daily Samples	190498-20	CS-N2	4/8/2019	6.07	6.07	ng/L		Done	Released	5/20/2019 8:00	4/10/2019 7:20		4/15/2019
Mercury	Daily Samples	190503-34	CS-N2	4/9/2019	11.5	11.5	ng/L		Done	Released	10/22/2019 15:01	4/12/2019 13:01		4/15/2019
Mercury	Daily Samples	190507-23	CS-N2	4/11/2019	14.6	14.6	ng/L		Done	Released	5/7/2019 10:59	4/15/2019 11:31		4/15/2019
Mercury	Daily Samples	190528-20	CS-N2	4/15/2019	12.8	12.8	ng/L		Done	Released	5/20/2019 8:00	4/16/2019 7:14		4/24/2019
Mercury	Daily Samples	190532-34	CS-N2	4/16/2019	7.37	7.37	ng/L		Done	Released	5/7/2019 13:34	4/17/2019 14:42		4/24/2019
Mercury	Daily Samples	190540-23	CS-N2	4/18/2019	14.5	14.5	ng/L		Done	Released	5/21/2019 8:45	4/19/2019 12:24		4/24/2019
Mercury	Daily Samples	190562-20	CS-N2	4/22/2019	16.9	16.9	ng/L		Done	Released	5/20/2019 8:00	4/22/2019 13:55		4/24/2019
Mercury	Daily Samples	190566-34	CS-N2	4/23/2019	17.2	17.2	ng/L		Done	Released	5/22/2019 11:52	4/24/2019 13:29		4/24/2019
Mercury	Daily Samples	190585-23	CS-N2	4/25/2019	12.6	12.6	ng/L		Done	Released	5/22/2019 11:52	4/26/2019 10:56		5/14/2019
Mercury	Daily Samples	190602-20	CS-N2	4/29/2019	14.9	14.9	ng/L		Done	Released	5/22/2019 11:52	5/1/2019 9:58		5/14/2019
Mercury	Daily Samples	190609-34	CS-N2	4/30/2019	11.5	11.5	ng/L		Done	Released	5/31/2019 9:44	5/1/2019 13:22		5/14/2019
Mercury	GBMSD-MPS	190615-37	CS-N2	5/2/2019	18.7	18.7	ng/L		Done	Released	6/27/2019 7:47	5/3/2019 10:59		5/14/2019
Mercury	Daily Samples	190661-34	CS-N2	5/7/2019	13.1	13.1	ng/L		Done	Released	10/22/2019 15:03	5/8/2019 13:54		5/14/2019
Mercury	Daily Samples	190677-25	CS-N2	5/9/2019	5.44	5.44	ng/L		Done	Released	6/10/2019 11:13	5/10/2019 10:54		5/17/2019
Mercury	Daily Samples	190702-20	CS-N2	5/13/2019	7.56	7.56	ng/L		Done	Released	6/13/2019 8:33	5/14/2019 6:33		5/17/2019
Mercury	Daily Samples	190707-36	CS-N2	5/14/2019	20.4	20.4	ng/L		Done	Released	10/22/2019 15:04	5/15/2019 12:56		5/17/2019
Mercury	GBMSD-MPS	190716-46	CS-N2	5/15/2019	19.7	19.7	ng/L		Done	Released	6/4/2019 12:59	5/16/2019 13:26		5/17/2019
Mercury	Daily Samples	190719-23	CS-N2	5/16/2019	15.4	15.4	ng/L		Done	Released	6/25/2019 11:55	5/20/2019 7:19		5/17/2019
Mercury	Daily Samples	190440-21	CS-N5	3/28/2019	6.03	6.03	ng/L		Done	Released	4/19/2019 9:15	3/29/2019 10:23		4/3/2019
Mercury	Daily Samples	190459-21	CS-N5	4/1/2019	7	7	ng/L		Done	Released	5/20/2019 8:00	4/1/2019 14:31		4/3/2019
Mercury	Daily Samples	190463-35	CS-N5	4/2/2019	7.32	7.32	ng/L		Done	Released	5/20/2019 8:00	4/5/2019 8:51	N/A	4/3/2019
Mercury	Daily Samples	190479-24	CS-N5	4/4/2019	11.7	11.7	ng/L		Done	Released	5/20/2019 8:00	4/6/2019 7:08		4/15/2019
Mercury	Daily Samples	190498-21	CS-N5	4/8/2019	6.12	6.12	ng/L		Done	Released	5/20/2019 8:00	4/10/2019 7:20		4/15/2019
Mercury	Daily Samples	190503-35	CS-N5	4/9/2019	12.4	12.4	ng/L		Done	Released	10/22/2019 15:01	4/12/2019 13:01		4/15/2019
Mercury	Daily Samples	190540-24	CS-N5	4/18/2019	14.8	14.8	ng/L		Done	Released	5/21/2019 8:45	4/19/2019 12:24		4/24/2019
Mercury	Daily Samples	190562-21	CS-N5	4/22/2019	16.4	16.4	ng/L		Done	Released	5/20/2019 8:00	4/22/2019 13:55		4/24/2019
Mercury	Daily Samples	190566-35	CS-N5	4/23/2019	16.2	16.2	ng/L		Done	Released	5/22/2019 11:52	4/24/2019 13:29		4/24/2019
Mercury	Daily Samples	190585-24	CS-N5	4/25/2019	12.2	12.2	ng/L		Done	Released	5/22/2019 11:52	4/26/2019 10:56		5/14/2019
Mercury	Daily Samples	190602-21	CS-N5	4/29/2019	15	15	ng/L		Done	Released	5/22/2019 11:52	5/1/2019 9:58		5/14/2019
Mercury	Daily Samples	190609-35	CS-N5	4/30/2019	12.3	12.3	ng/L		Done	Released	5/31/2019 9:44	5/1/2019 13:22		5/14/2019
Mercury	GBMSD-MPS	190615-38	CS-N5	5/2/2019	18.2	18.2	ng/L		Done	Released	6/27/2019 7:47	5/3/2019 10:59		5/14/2019
Mercury	Daily Samples	190661-35	CS-N5	5/7/2019	10.3	10.3	ng/L		Done	Released	10/22/2019 15:03	5/8/2019 13:54		5/14/2019
Mercury	Daily Samples	190677-26	CS-N5	5/9/2019	5.43	5.43	ng/L		Done	Released	6/10/2019 11:13	5/10/2019 10:54		5/17/2019
Mercury	Daily Samples	190702-21	CS-N5	5/13/2019	6.94	6.94	ng/L		Done	Released	6/13/2019 8:33	5/14/2019 6:33		5/17/2019

NEW Water Mercury Sample Data
Received 6/18/2020

Analyte	Project Name	LIMS #	Sample Name	Sample Date	Result	Result (Number)	Units	Qualifier	Status	Appr. Status	App. Date	Received Date	Special Conditions	Analysis Date
Mercury	Daily Samples	190707-37	CS-N5	5/14/2019	19.3	19.3	ng/L		Done	Released	10/22/2019 15:04	5/15/2019 12:56		5/17/2019
Mercury	GBMSD-MPS	190716-47	CS-N5	5/15/2019	18.2	18.2	ng/L		Done	Released	6/4/2019 12:59	5/16/2019 13:26		5/17/2019
Mercury	Daily Samples	190719-24	CS-N5	5/16/2019	16	16	ng/L		Done	Released	6/25/2019 11:55	5/20/2019 7:19		5/17/2019
Mercury	GBMSD-MPS	180695-03	CS-P2	5/15/2018	0.096	0.096	ug/L	N4	Done	Released	6/1/2018 15:47	5/16/2018 13:10		6/1/2018
Mercury	GBMSD-MPS	180832-03	CS-P2	6/6/2018	0.072	0.072	ug/L	N4	Done	Released	6/25/2018 13:34	6/7/2018 13:08		6/19/2018
Mercury	GBMSD-MPS	181069-03	CS-P2	7/17/2018	0.068	0.068	ug/L	N4	Done	Released	8/27/2018 9:24	7/20/2018 11:52		7/23/2018
Mercury	GBMSD-MPS	181243-03	CS-P2	8/14/2018	0.106	0.106	ug/L	N4	Done	Released	12/11/2018 9:47	8/16/2018 6:27		8/27/2018
Mercury	GBMSD-MPS	181529-03	CS-P2	9/25/2018	0.273	0.273	ug/L		Done	Released	12/11/2018 9:47	9/27/2018 7:46		10/1/2018
Mercury	GBMSD-MPS	181650-03	CS-P2	10/10/2018	0.053	0.053	ug/L	N4	Done	Released	11/30/2018 12:50	10/12/2018 13:24		11/7/2018
Mercury	GBMSD-MPS	181797-03	CS-P2	11/1/2018	0.065	0.065	ug/L	N4	Done	Released	1/8/2019 6:59	11/2/2018 12:34		11/14/2018
Mercury	GBMSD-MPS	182082-03	CS-P2	12/12/2018	0.062	0.062	ug/L	N4	Done	Released	1/14/2019 8:39	12/13/2018 13:25		12/20/2018
Mercury	GBMSD-MPS	190086-03	CS-P2	1/15/2019	0.063	0.063	ug/L	N4	Done	Released	2/19/2019 15:03	1/17/2019 13:46		1/22/2019
Mercury	GBMSD-MPS	190249-03	CS-P2	2/12/2019	0.064	0.064	ug/L	N4	Done	Released	4/16/2019 9:51	2/12/2019 12:42		2/26/2019
Mercury	GBMSD-MPS	190380-03	CS-P2	3/13/2019	0.143	0.143	ug/L		Done	Released	4/18/2019 9:41	3/14/2019 13:43		3/20/2019
Mercury	GBMSD-MPS	190505-03	CS-P2	4/10/2019	0.0482	0.0482	ug/L	N4	Done	Released	5/20/2019 8:00	4/15/2019 11:31		4/25/2019
Mercury	GBMSD-MPS	190716-03	CS-P2	5/15/2019	0.0563	0.0563	ug/L	N4	Done	Released	6/4/2019 12:59	5/16/2019 13:26		5/31/2019
Mercury	GBMSD-MPS	190889-03	CS-P2	6/11/2019	<0.041	0.041	ug/L		Done	Released	8/1/2019 8:06	6/12/2019 12:52		6/25/2019
Mercury	GBMSD-MPS	191142-03	CS-P2	7/18/2019	0.212	0.212	ug/L		Done	Released	9/27/2019 14:44	7/22/2019 10:00		7/31/2019
Mercury	GBMSD-MPS	191563-03	CS-P2	9/19/2019	<0.041	0.041	ug/L		Done	Released	10/21/2019 8:56	9/20/2019 11:04		9/25/2019
Mercury	GBMSD-MPS	191645-03	CS-P2	10/2/2019	0.0486	0.0486	ug/L	N4	Done	Released	10/23/2019 13:45	10/5/2019 13:26		10/7/2019
Mercury	GBMSD-MPS	191902-03	CS-P2	11/14/2019	0.0532	0.0532	ug/L	N4	Done	Released	1/16/2020 13:26	11/18/2019 6:50		12/2/2019
Mercury	GBMSD-MPS	192070-03	CS-P2	12/12/2019	0.0798	0.0798	ug/L	N4	Done	Released	1/6/2020 8:54	12/13/2019 8:35		12/31/2019
Mercury	GBMSD-MPS	200095-03	CS-P2	1/21/2020	0.0468	0.0468	ug/L	N4	Done	Released	3/5/2020 13:07	1/22/2020 13:31		1/29/2020
Mercury	GBMSD-MPS	200224-03	CS-P2	2/12/2020	<0.041	0.041	ug/L		Done	Released	3/5/2020 13:09	2/17/2020 10:13		2/19/2020
Mercury	GBMSD-MPS	200423-03	CS-P2	3/18/2020	<0.041	0.041	ug/L		Done	Released	4/23/2020 13:23	3/19/2020 12:56		3/24/2020
Mercury	GBMSD-MPS	200541-03	CS-P2	4/16/2020	<0.041	0.041	ug/L		Done	Released	5/15/2020 12:48	4/22/2020 9:25		4/26/2020
Mercury	GBMSD-MPS	200636-03	CS-P2	5/13/2020	0.0747	0.0747	ug/L	N4	Done	Released	6/5/2020 9:15	5/15/2020 7:28		5/28/2020
Mercury	R2E2 DIG2 START	180713-01	DFS	5/16/2018	6.6	6.6	ug/L		Done	Released	6/1/2018 15:47	5/16/2018 6:23		6/1/2018
Mercury	R2E2 DIG2 START	180834-01	DFS	6/6/2018	6.25	6.25	ug/L		Done	Released	6/25/2018 13:34	6/6/2018 7:00		6/19/2018
Mercury	R2E2 DIG2 START	181483-01	DFS	9/18/2018	4.99	4.99	ug/L		Done	Released	10/15/2018 12:34	9/18/2018 6:22		10/1/2018
Mercury	R2E2 DIG2 START	181750-01	DFS	10/25/2018	8.45	8.45	ug/L		Done	Released	12/19/2018 9:13	10/25/2018 7:51		11/7/2018
Mercury	R2E2 DIG2 START	181750-03	DFS	10/25/2018	<0.0875	0.0875	ug/L		Done	Released	12/19/2018 9:13	10/25/2018 7:51	Filt	11/7/2018
Mercury	R2E2 DIG2 START	181892-01	DFS	11/15/2018	7.81	7.81	ug/L		Done	Released	12/26/2018 10:00			12/12/2018
Mercury	R2E2 DIG2 START	182091-01	DFS	12/13/2018	18.9	18.9	ug/L		Done	Released	1/7/2019 10:49	12/13/2018 8:16		12/20/2018
Mercury	R2E2 DIG2 START	190107-01	DFS	1/17/2019	14.1	14.1	ug/L		Done	Released	1/31/2019 14:22			1/29/2019
Mercury	GBMSD-MPS	190249-36	DFS	2/12/2019	6.12	6.12	ug/L		Done	Released	4/16/2019 9:51	2/12/2019 12:42		2/26/2019
Mercury	GBMSD-MPS	190380-28	DFS	3/13/2019	10.7	10.7	ug/L		Done	Released	4/18/2019 9:41	3/14/2019 13:43		3/20/2019
Mercury	GBMSD-MPS	190505-32	DFS	4/10/2019	4.87	4.87	ug/L		Done	Released	5/20/2019 8:00	4/15/2019 11:31		4/25/2019
Mercury	GBMSD-MPS	190615-31	DFS	5/2/2019	6.81	6.81	ug/L		Done	Released	6/27/2019 7:47	5/3/2019 10:59		5/20/2019
Mercury	GBMSD-MPS	190716-31	DFS	5/15/2019	6.68	6.68	ug/L		Done	Released	6/4/2019 12:59	5/16/2019 13:26		5/31/2019
Mercury	GBMSD-MPS	190889-31	DFS	6/11/2019	9.85	9.85	ug/L		Done	Released	8/1/2019 8:06	6/12/2019 12:52		6/25/2019
Mercury	GBMSD-MPS	191142-31	DFS	7/18/2019	4.94	4.94	ug/L		Done	Released	9/27/2019 14:44	7/22/2019 10:00		7/31/2019
Mercury	GBMSD-MPS	191563-31	DFS	9/19/2019	4.99	4.99	ug/L		Done	Released	10/21/2019 8:56	9/20/2019 11:04		9/25/2019
Mercury	GBMSD-MPS	191645-31	DFS	10/2/2019	5.71	5.71	ug/L		Done	Released	10/23/2019 13:45	10/5/2019 13:26		10/7/2019
Mercury	GBMSD-MPS	191902-31	DFS	11/14/2019	3.47	3.47	ug/L		Done	Released	1/16/2020 13:26	11/18/2019 6:50		12/2/2019
Mercury	GBMSD-MPS	192070-31	DFS	12/12/2019	7.62	7.62	ug/L		Done	Released	1/6/2020 8:54	12/13/2019 8:35		12/31/2019
Mercury	GBMSD-MPS	200095-31	DFS	1/21/2020	4.02	4.02	ug/L		Done	Released	3/5/2020 13:07	1/22/2020 13:31		1/29/2020
Mercury	GBMSD-MPS	200224-30	DFS	2/12/2020	2.53	2.53	ug/L		Done	Released	3/5/2020 13:09	2/17/2020 10:13		2/19/2020
Mercury	GBMSD-MPS	200423-31	DFS	3/18/2020	9.62	9.62	ug/L		Done	Released	4/23/2020 13:23	3/19/2020 12:56		3/24/2020
Mercury	GBMSD-MPS	200541-31	DFS	4/16/2020	4.21	4.21	ug/L		Done	Released	5/15/2020 12:48	4/22/2020 9:25		4/17/2020
Mercury	GBMSD-MPS	200636-24	DFS	5/13/2020	7.52	7.52	ug/L		Done	Released	6/5/2020 9:15	5/15/2020 7:28		5/28/2020
Mercury	R2E2 DIG1 START	181891-01	DIGESTER1	11/15/2018	6.28	6.28	ug/L		Done	Released	12/26/2018 10:00			12/12/2018
Mercury	R2E2 DIG1 START	182090-01	DIGESTER1	12/13/2018	5.99	5.99	ug/L		Done	Released	1/7/2019 10:49	12/13/2018 8:14		12/20/2018
Mercury	R2E2 DIG1 START	190106-01	DIGESTER1	1/17/2019	10.7	10.7	ug/L		Done	Released	1/31/2019 14:22			1/29/2019
Mercury	GBMSD-MPS	190249-38	DIGESTER1	2/12/2019	7.78	7.78	ug/L		Done	Released	4/16/2019 9:51	2/12/2019 12:42		2/26/2019
Mercury	GBMSD-MPS	190380-30	DIGESTER1	3/13/2019	8.08	8.08	ug/L		Done	Released	4/18/2019 9:41	3/14/2019 13:43		3/20/2019
Mercury	GBMSD-MPS	190505-33	DIGESTER1	4/10/2019	7.49	7.49	ug/L	M1,R1,E3	Done	Released	5/20/2019 8:00	4/15/2019 11:31		4/25/2019
Mercury	GBMSD-MPS	190615-32	DIGESTER1	5/2/2019	8.55	8.55	ug/L		Done	Released	6/27/2019 7:47	5/3/2019 10:59		5/20/2019
Mercury	GBMSD-MPS	190716-32	DIGESTER1	5/15/2019	6.8	6.8	ug/L		Done	Released	6/4/2019 12:59	5/16/2019 13:26		5/31/2019
Mercury	GBMSD-MPS	190889-32	DIGESTER1	6/11/2019	6.05	6.05	ug/L		Done	Released	8/1/2019 8:06	6/12/2019 12:52		6/25/2019
Mercury	GBMSD-MPS	191142-32	DIGESTER1	7/18/2019	5.53	5.53	ug/L		Done	Released	9/27/2019 14:44	7/22/2019 10:00		7/31/2019
Mercury	GBMSD-MPS	191563-32	DIGESTER1	9/19/2019	12.7	12.7	ug/L		Done	Released	10/21/2019 8:56	9/20/2019 11:04		9/25/2019
Mercury	GBMSD-MPS	191645-32	DIGESTER1	10/2/2019	5.28	5.28	ug/L		Done	Released	10/23/2019 13:45	10/5/2019 13:26		10/7/2019
Mercury	GBMSD-MPS	191902-32	DIGESTER1	11/14/2019	4.18	4.18	ug/L		Done	Released	1/16/2020 13:26	11/18/2019 6:50		12/2/2019
Mercury	GBMSD-MPS	192070-32	DIGESTER1	12/12/2019	6.09	6.09	ug/L		Done	Released	1/6/2020 8:54	12/13/2019 8:35		12/31/2019
Mercury	GBMSD-MPS	200095-64	DIGESTER1	1/21/2020	5.94	5.94	ug/L		Done	Released	3/5/2020 13:07	1/22/2020 13:31		1/29/2020
Mercury	GBMSD-MPS	200224-31	DIGESTER1	2/12/2020	5.06	5.06	ug/L		Done	Released	3/5/2020 13:09	2/17/2020 10:13		2/19/2020
Mercury	GBMSD-MPS	200423-32	DIGESTER1	3/18/2020	7.02	7.02	ug/L		Done	Released	4/23/2020 13:23	3/19/2020 12:56		3/24/2020
Mercury	GBMSD-MPS	200541-32	DIGESTER1	4/16/2020	3.97	3.97	ug/L		Done	Released	5/15/2020 12:48	4/22/2020 9:25		4/17/2020
Mercury	GBMSD-MPS	200636-25	DIGESTER1	5/13/2020	4.48	4.48	ug/L		Done	Released	6/5/2020 9:15	5/15/2020 7:28		5/28/2020
Mercury	R2E2 DIG2 START	180713-02	DIGESTER2	5/16/2018	2.48	2.48	ug/L		Done	Released	6/1/2018 15:47	5/16/2018 6:23		6/1/2018
Mercury	R2E2 DIG2 START	180834-02	DIGESTER2	6/6/2018	3.02	3.02	ug/L		Done	Released	6/25/2018 13:34	6/6/2018 7:00		6/19/2018
Mercury	R2E2 DIG2 START	181066-02	DIGESTER2	7/17/2018	5.94	5.94	ug/L		Done	Released	7/26/2018 11:08			7/23/2018
Mercury	R2E2 DIG2 START	181483-02	DIGESTER2	9/18/2018	11.7	11.7	ug/L		Done	Released	10/15/2018 12:34	9/18/2018 6:22		10/1/2018
Mercury	R2E2 DIG2 START	181750-02	DIGESTER2	10/25/2018	3.3	3.3	ug/L		Done	Released	12/19/2018 9:13	10/25/2018 7:51		11/7/2018
Mercury	R2E2 DIG2 START	181750-04	DIGESTER2	10/25/2018	0.115	0.115	ug/L	N4	Done	Released	12/19/2018 9:13	10/25/2018 7:51	Filt	11/7/2018
Mercury	R2E2 DIG2 START	181892-02	DIGESTER2	11/15/2018	6.1	6.1	ug/L		Done	Released	12/26/2018 10:00			12/12/2018
Mercury	R2E2 DIG2 START	182091-02	DIGESTER2	12/13/2018	7.6	7.6	ug/L		Done	Released	1/7/2019 10:49	12/13/2018 8:16		12/20/2018
Mercury	R2E2 DIG2 START	190107-02	DIGESTER2	1/17/2019	11.4	11.4	ug/L		Done	Released	1/31/2019 14:22			1/29/2019
Mercury	GBMSD-MPS	190249-39	DIGESTER2	2/12/2019	6.38	6.38	ug/L		Done	Released	4/16/2019 9:51	2/12/2019 12:42		2/26/2019
Mercury	GBMSD-MPS	190380-31	DIGESTER2	3/13/2019	16.3	16.3	ug/L		Done	Released	4/18/2019 9:41	3/14/2019 13:43		3/20/2019
Mercury	GBMSD-MPS	190505-34	DIGESTER2	4/10/2019	5.49	5.49	ug/L		Done	Released	5/20/2019 8:00	4/15/2019 11:31		4/25/2019
Mercury	GBMSD-MPS	190615-33	DIGESTER2	5/2/2019	8.29	8.29	ug/L		Done	Released	6/27/2019 7:47	5/3/2019 10:59		5/20/2019
Mercury	GBMSD-MPS	190716-33	DIGESTER2	5/15/2019	6.24	6.24	ug/L		Done	Released	6/4/2019 12:59	5/16/2019 13:26		5/31/2019
Mercury	GBMSD-MPS	190889-33	DIGESTER2	6/11/2019	5.25	5.25	ug/L		Done	Released	8/1/2019 8:06	6/12/2019 12:52		6/25/2019
Mercury	GBMSD-MPS	191142-33	DIGESTER2	7/18/2019	5.44	5.44	ug/L		Done	Released	9/27/2019 14:44	7/22/2019 10:00		7/31/2019
Mercury	GBMSD-MPS	191563-33	DIGESTER2	9/19/2019	7.97	7.97	ug/L		Done	Released	10/21/2019 8:56	9/20/2019 11:04		9/25/2019
Mercury	GBMSD-MPS	191645-33	DIGESTER2	10/2/2019	5.17	5.17	ug/L		Done	Released	10/23/2019 13:45	10/5/2019 13:26		10/7/2019
Mercury	GBMSD-MPS	191902-33	DIGESTER2	11/14/2019	3	3	ug/L		Done	Released	1/16/2020 13:26	11/18/2019 6:50		12/2/2019
Mercury	GBMSD-MPS	192070-33	DIGESTER2	12/12/2019	5.13	5.13	ug/L		Done	Released	1/6/2020 8:54	12/13/2019 8:35		12/31/2019
Mercury	GBMSD-MPS	200095-65	DIGESTER2	1/21/2020	5.4	5.4	ug/L		Done	Released	3/5/2020 13:07	1/22/2020 13:31		1/29/2020
Mercury	GBMSD-MPS	200224-32	DIGESTER2	2/12/2020	4.13	4.13	ug/L		Done	Released	3/5/2020 13:09	2/17/2020 10:13		2/19/2020
Mercury	GBMSD-MPS	200423-33	DIGESTER2	3/18/2020	4.73	4.73	ug/L		Done	Released	4/23/2020 13:23	3/19/2020 12:56		3/24/2020
Mercury	GBMSD-MPS	200541-33	DIGESTER2	4/16/2020	5.41	5.41	ug/L		Done	Released	5/15/2020 12:48	4/22/2020 9:25		4/17/2020

NEW Water Mercury Sample Data
Received 6/18/2020

Analyte	Project Name	LIMS #	Sample Name	Sample Date	Result	Result (Number)	Units	Qualifier	Status	Appr. Status	App. Date	Received Date	Special Conditions	Analysis Date
Mercury	GBMSD-MPS	200636-26	DIGESTER2	5/13/2020	4.04	4.04	ug/L		Done	Released	6/5/2020 9:15	5/15/2020 7:28		5/28/2020
Mercury	GBMSD-MPS	180695-26	DP-EFF	5/15/2018	0.668	0.668	ng/L		Done	Released	6/1/2018 15:47	5/16/2018 13:10		5/18/2018
Mercury	GBMSD-MPS	180832-28	DP-EFF	6/6/2018	1.38	1.38	ng/L		Done	Released	6/25/2018 13:34	6/7/2018 13:08		6/7/2018
Mercury	GBMSD-MPS	181069-26	DP-EFF	7/17/2018	0.454	0.454	ng/L		Done	Released	8/27/2018 9:24	7/20/2018 11:52		7/19/2018
Mercury	GBMSD-MPS	181243-28	DP-EFF	8/14/2018	<0.135	0.135	ng/L		Done	Released	12/11/2018 9:47	8/16/2018 6:27		8/20/2018
Mercury	Daily Samples	181425-24	DP-EFF	9/10/2018	0.326	0.326	ng/L	N4	Done	Released	10/16/2018 9:48	9/12/2018 9:53		9/14/2018
Mercury	Daily Samples	181445-24	DP-EFF	9/13/2018	0.46	0.46	ng/L		Done	Released	10/16/2018 9:48	9/14/2018 12:44		9/14/2018
Mercury	GBMSD-MPS	181488-24	DP-EFF	9/18/2018	0.798	0.798	ng/L		Done	Released	12/11/2018 9:47	9/25/2018 10:21		9/26/2018
Mercury	GBMSD-MPS	181650-52	DP-EFF	10/11/2018	0.753	0.753	ng/L		Done	Released	11/30/2018 12:50	10/12/2018 13:24		10/12/2018
Mercury	GBMSD-MPS	181797-28	DP-EFF	11/1/2018	0.358	0.358	ng/L	N4	Done	Released	1/8/2019 6:59	11/2/2018 12:34		11/9/2018
Mercury	GBMSD-MPS	182082-28	DP-EFF	12/12/2018	1.39	1.39	ng/L		Done	Released	1/14/2019 8:39	12/13/2018 13:25		12/18/2018
Mercury	GBMSD-MPS	190086-26	DP-EFF	1/15/2019	0.618	0.618	ng/L		Done	Released	2/19/2019 15:03	1/17/2019 13:46		1/18/2019
Mercury	GBMSD-MPS	190249-28	DP-EFF	2/12/2019	0.406	0.406	ng/L	N4	Done	Released	4/16/2019 9:51	2/12/2019 12:42		2/25/2019
Mercury	GBMSD-MPS	190380-20	DP-EFF	3/13/2019	0.599	0.599	ng/L		Done	Released	4/18/2019 9:41	3/14/2019 13:43		3/14/2019
Mercury	GBMSD-MPS	190505-21	DP-EFF	4/11/2019	0.586	0.586	ng/L		Done	Released	5/20/2019 8:00	4/15/2019 11:31		4/15/2019
Mercury	GBMSD-MPS	190615-20	DP-EFF	5/2/2019	0.475	0.475	ng/L		Done	Released	6/27/2019 7:47	5/3/2019 10:59		5/14/2019
Mercury	GBMSD-MPS	191645-20	DP-EFF	10/2/2019	0.32	0.32	ng/L	N4	Done	Released	10/23/2019 13:45	10/5/2019 13:26		10/3/2019
Mercury	GBMSD-MPS	191902-20	DP-EFF	11/14/2019	0.298	0.298	ng/L	N4	Done	Released	1/16/2020 13:26	11/18/2019 6:50		11/15/2019
Mercury	GBMSD-MPS	192070-20	DP-EFF	12/12/2019	0.591	0.591	ng/L		Done	Released	1/6/2020 8:54	12/13/2019 8:35		12/19/2019
Mercury	WET 2020	200048-06	DP-EFF	1/13/2020	0.302	0.302	ng/L	N4	Done	Released	2/7/2020 15:21			1/20/2020
Mercury	WET 2020	200050-06	DP-EFF	1/15/2020	0.508	0.508	ng/L		Done	Released	2/17/2020 14:48	1/15/2020 9:41		1/20/2020
Mercury	WET 2020	200062-06	DP-EFF	1/16/2020	0.332	0.332	ng/L	N4	Done	Released	2/7/2020 15:21			1/20/2020
Mercury	GBMSD-MPS	200095-20	DP-EFF	1/21/2020	0.243	0.243	ng/L	N4	Done	Released	3/5/2020 13:07	1/22/2020 13:31		1/23/2020
Mercury	GBMSD-MPS	200224-19	DP-EFF	2/13/2020	0.79	0.79	ng/L		Done	Released	3/5/2020 13:09	2/17/2020 10:13		2/14/2020
Mercury	GBMSD-MPS	200423-20	DP-EFF	3/18/2020	0.345	0.345	ng/L	N4	Done	Released	4/23/2020 13:23	3/19/2020 12:56		3/20/2020
Mercury	GBMSD-MPS	200541-20	DP-EFF	4/16/2020	0.327	0.327	ng/L	N4	Done	Released	5/15/2020 12:48	4/22/2020 9:25		4/25/2020
Mercury	GBMSD-MPS	200636-13	DP-EFF	5/13/2020	0.311	0.311	ng/L	N4	Done	Released	6/5/2020 9:15	5/15/2020 7:28		5/15/2020
Mercury	GBMSD-MPS	180695-23	DP-INF	5/15/2018	<0.035	0.035	ug/L		Done	Released	6/1/2018 15:47	5/16/2018 13:10		6/1/2018
Mercury	GBMSD-MPS	180832-25	DP-INF	6/6/2018	<0.035	0.035	ug/L		Done	Released	6/25/2018 13:34	6/7/2018 13:08		6/19/2018
Mercury	GBMSD-MPS	181069-23	DP-INF	7/17/2018	0.062	0.062	ug/L	N4	Done	Released	8/27/2018 9:24	7/20/2018 11:52		7/23/2018
Mercury	GBMSD-MPS	181243-25	DP-INF	8/14/2018	0.041	0.041	ug/L	N4	Done	Released	12/11/2018 9:47	8/16/2018 6:27		8/27/2018
Mercury	GBMSD-MPS	181488-21	DP-INF	9/18/2018	0.036	0.036	ug/L	N4	Done	Released	12/11/2018 9:47	9/25/2018 10:21		10/1/2018
Mercury	GBMSD-MPS	181650-23	DP-INF	10/10/2018	0.057	0.057	ug/L	N4	Done	Released	11/30/2018 12:50	10/12/2018 13:24		11/7/2018
Mercury	GBMSD-MPS	181797-25	DP-INF	11/1/2018	0.057	0.057	ug/L	N4	Done	Released	1/8/2019 6:59	11/2/2018 12:34		11/14/2018
Mercury	GBMSD-MPS	182082-25	DP-INF	12/12/2018	1.32	1.32	ug/L		Done	Released	1/14/2019 8:39	12/13/2018 13:25		12/20/2018
Mercury	GBMSD-MPS	190086-23	DP-INF	1/15/2019	0.06	0.06	ug/L	N4	Done	Released	2/19/2019 15:03	1/17/2019 13:46		1/22/2019
Mercury	GBMSD-MPS	190249-25	DP-INF	2/12/2019	0.038	0.038	ug/L	N4	Done	Released	4/16/2019 9:51	2/12/2019 12:42		2/26/2019
Mercury	GBMSD-MPS	190380-17	DP-INF	3/13/2019	0.34	0.34	ug/L		Done	Released	4/18/2019 9:41	3/14/2019 13:43		3/20/2019
Mercury	GBMSD-MPS	190505-18	DP-INF	4/10/2019	0.0539	0.0539	ug/L	N4	Done	Released	5/20/2019 8:00	4/15/2019 11:31		4/25/2019
Mercury	GBMSD-MPS	190615-17	DP-INF	5/2/2019	<0.041	0.041	ug/L		Done	Released	6/27/2019 7:47	5/3/2019 10:59		5/20/2019
Mercury	GBMSD-MPS	190889-17	DP-INF	6/11/2019	0.0978	0.0978	ug/L	N4	Done	Released	8/1/2019 8:06	6/12/2019 12:52		6/25/2019
Mercury	GBMSD-MPS	191142-17	DP-INF	7/18/2019	<0.041	0.041	ug/L		Done	Released	9/27/2019 14:44	7/22/2019 10:00		7/31/2019
Mercury	GBMSD-MPS	191563-17	DP-INF	9/19/2019	<0.041	0.041	ug/L		Done	Released	10/21/2019 8:56	9/20/2019 11:04		9/25/2019
Mercury	GBMSD-MPS	191645-17	DP-INF	10/2/2019	0.0419	0.0419	ug/L	N4	Done	Released	10/23/2019 13:45	10/5/2019 13:26		10/7/2019
Mercury	GBMSD-MPS	191902-17	DP-INF	11/14/2019	<0.041	0.041	ug/L		Done	Released	1/16/2020 13:26	11/18/2019 6:50		12/2/2019
Mercury	GBMSD-MPS	192070-17	DP-INF	12/12/2019	<0.041	0.041	ug/L		Done	Released	1/6/2020 8:54	12/13/2019 8:35		12/31/2019
Mercury	GBMSD-MPS	200095-17	DP-INF	1/21/2020	<0.041	0.041	ug/L		Done	Released	3/5/2020 13:07	1/22/2020 13:31		1/29/2020
Mercury	GBMSD-MPS	200224-16	DP-INF	2/12/2020	<0.041	0.041	ug/L		Done	Released	3/5/2020 13:09	2/17/2020 10:13		2/19/2020
Mercury	GBMSD-MPS	200423-17	DP-INF	3/18/2020	<0.041	0.041	ug/L		Done	Released	4/23/2020 13:23	3/19/2020 12:56		3/24/2020
Mercury	GBMSD-MPS	200541-17	DP-INF	4/16/2020	<0.041	0.041	ug/L		Done	Released	5/15/2020 12:48	4/22/2020 9:25		4/26/2020
Mercury	GBMSD-MPS	200636-10	DP-INF	5/13/2020	<0.041	0.041	ug/L		Done	Released	6/5/2020 9:15	5/15/2020 7:28		5/28/2020
Mercury	GBMSD-MPS	180832-43	FBI ASH	6/4/2018	1.15	1.15	ug/L		Done	Released	6/25/2018 13:34	6/7/2018 13:08		6/19/2018
Mercury	GBMSD-MPS	181069-62	FBI ASH	7/17/2018	1.74	1.74	ug/L		Done	Released	8/27/2018 9:24	7/20/2018 11:52		7/26/2018
Mercury	GBMSD-MPS	181069-63	FBI ASH	7/17/2018	0.136	0.136	ug/L		Done	Released	8/27/2018 9:24	7/20/2018 11:52	Filt	7/26/2018
Mercury	GBMSD-MPS	181243-55	FBI ASH	8/14/2018	1.12	1.12	ug/L		Done	Released	12/11/2018 9:47	8/16/2018 6:27		8/27/2018
Mercury	GBMSD-MPS	181529-55	FBI ASH	9/25/2018	3.42	3.42	ug/L		Done	Released	12/11/2018 9:47	9/27/2018 7:46		10/1/2018
Mercury	GBMSD-MPS	181650-47	FBI ASH	10/10/2018	2.1	2.1	ug/L		Done	Released	11/30/2018 12:50	10/12/2018 13:24		11/7/2018
Mercury	GBMSD-MPS	181797-39	FBI ASH	11/1/2018	1.66	1.66	ug/L		Done	Released	1/8/2019 6:59	11/2/2018 12:34		11/14/2018
Mercury	GBMSD-MPS	182082-39	FBI ASH	12/12/2018	2.22	2.22	ug/L		Done	Released	1/14/2019 8:39	12/13/2018 13:25		12/20/2018
Mercury	GBMSD-MPS	190086-61	FBI ASH	1/15/2019	3.12	3.12	ug/L		Done	Released	2/19/2019 15:03	1/17/2019 13:46		1/22/2019
Mercury	GBMSD-MPS	190249-65	FBI ASH	2/12/2019	2.85	2.85	ug/L		Done	Released	4/16/2019 9:51	2/12/2019 12:42		2/26/2019
Mercury	GBMSD-MPS	190380-34	FBI ASH	3/13/2019	2.16	2.16	ug/L		Done	Released	4/18/2019 9:41	3/14/2019 13:43		3/20/2019
Mercury	Daily Samples	190440-22	FBI ASH	3/28/2019	1.88	1.88	ug/L		Done	Released	4/19/2019 9:15	3/29/2019 10:23		4/1/2019
Mercury	Daily Samples	190440-24	FBI ASH	3/28/2019	0.759	0.759	ug/L		Done	Released	4/19/2019 9:15	3/29/2019 10:23	Filt	4/1/2019
Mercury	Daily Samples	190459-22	FBI ASH	3/31/2019	2.4	2.4	ug/L		Done	Released	5/20/2019 8:00	4/1/2019 14:31		4/12/2019
Mercury	Daily Samples	190459-24	FBI ASH	3/31/2019	0.834	0.834	ug/L		Done	Released	5/20/2019 8:00	4/1/2019 14:31	Filt	4/12/2019
Mercury	Daily Samples	190463-36	FBI ASH	4/2/2019	2.1	2.1	ug/L		Done	Released	5/20/2019 8:00	4/5/2019 8:51		4/12/2019
Mercury	Daily Samples	190463-38	FBI ASH	4/2/2019	0.663	0.663	ug/L		Done	Released	5/20/2019 8:00	4/5/2019 8:51	Filt	4/12/2019
Mercury	Daily Samples	190479-25	FBI ASH	4/4/2019	1.96	1.96	ug/L		Done	Released	5/20/2019 8:00	4/6/2019 7:08		4/18/2019
Mercury	Daily Samples	190479-27	FBI ASH	4/4/2019	0.543	0.543	ug/L		Done	Released	5/20/2019 8:00	4/6/2019 7:08	Filt	4/18/2019
Mercury	Daily Samples	190498-22	FBI ASH	4/7/2019	2.59	2.59	ug/L		Done	Released	5/20/2019 8:00	4/10/2019 7:20		4/18/2019
Mercury	Daily Samples	190498-24	FBI ASH	4/7/2019	0.444	0.444	ug/L		Done	Released	5/20/2019 8:00	4/10/2019 7:20	Filt	4/18/2019
Mercury	Daily Samples	190503-36	FBI ASH	4/9/2019	1.5	1.5	ug/L		Done	Released	10/22/2019 15:01	4/12/2019 13:01		4/25/2019
Mercury	Daily Samples	190503-38	FBI ASH	4/9/2019	0.477	0.477	ug/L	Q3	Done	Released	10/22/2019 15:01	4/12/2019 13:01	Filt	4/25/2019
Mercury	GBMSD-MPS	190505-35	FBI ASH	4/10/2019	1.67	1.67	ug/L		Done	Released	5/20/2019 8:00	4/15/2019 11:31		4/25/2019
Mercury	Daily Samples	190528-22	FBI ASH	4/14/2019	1.05	1.05	ug/L		Done	Released	5/20/2019 8:00	4/16/2019 7:14		4/25/2019
Mercury	Daily Samples	190528-24	FBI ASH	4/14/2019	0.126	0.126	ug/L	N4,Q3	Done	Released	5/20/2019 8:00	4/16/2019 7:14	Filt	4/25/2019
Mercury	Daily Samples	190540-25	FBI ASH	4/18/2019	1.33	1.33	ug/L		Done	Released	5/21/2019 8:45	4/19/2019 12:24		5/1/2019
Mercury	Daily Samples	190540-27	FBI ASH	4/18/2019	0.413	0.413	ug/L	Q3	Done	Released	5/21/2019 8:45	4/19/2019 12:24	Filt	5/1/2019
Mercury	Daily Samples	190562-22	FBI ASH	4/21/2019	1.29	1.29	ug/L		Done	Released	5/20/2019 8:00	4/22/2019 13:55		5/1/2019
Mercury	Daily Samples	190562-24	FBI ASH	4/21/2019	0.287	0.287	ug/L	Q3	Done	Released	5/20/2019 8:00	4/22/2019 13:55	Filt	5/1/2019
Mercury	Daily Samples	190566-36	FBI ASH	4/23/2019	0.983	0.983	ug/L		Done	Released	5/22/2019 11:52	4/24/2019 13:29		5/7/2019
Mercury	Daily Samples	190566-38	FBI ASH	4/23/2019	0.0874	0.0874	ug/L	N4,Q3	Done	Released	5/22/2019 11:52	4/24/2019 13:29	Filt	5/7/2019
Mercury	Daily Samples	190585-25	FBI ASH	4/25/2019	2.04	2.04	ug/L		Done	Released	5/22/2019 11:52	4/26/2019 10:56		5/7/2019
Mercury	Daily Samples	190585-27	FBI ASH	4/25/2019	0.705	0.705	ug/L	Q3	Done	Released	5/22/2019 11:52	4/26/2019 10:56	Filt	5/7/2019
Mercury	Daily Samples	190602-22	FBI ASH	4/28/2019	1.29	1.29	ug/L		Done	Released	5/22/2019 11:52	5/1/2019 9:58		5/7/2019
Mercury	Daily Samples	190602-24	FBI ASH	4/28/2019	0.648	0.648	ug/L	Q3	Done	Released	5/22/2019 11:52	5/1/2019 9:58	Filt	5/7/2019
Mercury	GBMSD-MPS	190615-34	FBI ASH	5/2/2019	2.19	2.19	ug/L		Done	Released	6/27/2019 7:47	5/3/2019 10:59		5/20/2019
Mercury	GBMSD-MPS	190615-41	FBI ASH	5/2/2019	0.482	0.482	ug/L		Done	Released	6/27/2019 7:47	5/3/2019 10:59	Filt	5/20/2019
Mercury	Daily Samples	190661-36	FBI ASH	5/7/2019	2.06	2.06	ug/L		Done	Released	10/22/2019 15:03	5/8/2019 13:54		6/6/2019
Mercury	Daily Samples	190661-38	FBI ASH	5/7/2019	0.486	0.486	ug/L		Done	Released	10/22/2019 15:03	5/8/2019 13:54	Filt	6/6/2019
Mercury	Daily Samples	190677-27	FBI ASH	5/9/2019	2.14	2.14	ug/L		Done	Released	6/10/2019 11:13	5/10/2019 10:54		6/6/2019
Mercury	Daily Samples	190677-29	FBI ASH	5/9/2019	0.559	0.559	ug/L		Done	Released	6/10/2019 11:13	5/10/2019 10:54	Filt	6/6/2019
Mercury	Daily Samples	190707-38	FBI ASH	5/14/2019	2	2	ug/L		Done	Released	10/22/2019 15:04	5/15/2019 12:56		6/10/2019

NEW Water Mercury Sample Data
Received 6/18/2020

Analyte	Project Name	LIMS #	Sample Name	Sample Date	Result	Result (Number)	Units	Qualifier	Status	Appr. Status	App. Date	Received Date	Special Conditions	Analysis Date
Mercury	Daily Samples	190707-40	FBI ASH	5/14/2019	0.554	0.554	ug/L		Done	Released	10/22/2019 15:04	5/15/2019 12:56	Filt	6/10/2019
Mercury	GBMSD-MPS	190716-34	FBI ASH	5/15/2019	1.95	1.95	ug/L		Done	Released	6/4/2019 12:59	5/16/2019 13:26		5/31/2019
Mercury	Daily Samples	190719-25	FBI ASH	5/16/2019	1.99	1.99	ug/L		Done	Released	6/25/2019 11:55	5/20/2019 7:19		6/10/2019
Mercury	Daily Samples	190719-27	FBI ASH	5/16/2019	0.717	0.717	ug/L		Done	Released	6/25/2019 11:55	5/20/2019 7:19	Filt	6/10/2019
Mercury	Daily Samples	190746-22	FBI ASH	5/19/2019	2.45	2.45	ug/L		Done	Released	1/22/2020 12:40	5/20/2019 13:06		6/10/2019
Mercury	Daily Samples	190746-24	FBI ASH	5/19/2019	0.63	0.63	ug/L		Done	Released	1/22/2020 12:40	5/20/2019 13:06	Filt	6/10/2019
Mercury	Daily Samples	190769-25	FBI ASH	5/23/2019	1.63	1.63	ug/L		Done	Released	1/22/2020 12:40	5/24/2019 13:01		6/18/2019
Mercury	Daily Samples	190769-27	FBI ASH	5/23/2019	0.473	0.473	ug/L		Done	Released	1/22/2020 12:40	5/24/2019 13:01	Filt	6/18/2019
Mercury	Daily Samples	190786-22	FBI ASH	5/26/2019	1.77	1.77	ug/L		Done	Released	7/1/2019 9:16	5/27/2019 13:03		6/18/2019
Mercury	Daily Samples	190786-24	FBI ASH	5/26/2019	0.374	0.374	ug/L		Done	Released	7/1/2019 9:16	5/27/2019 13:03	Filt	6/18/2019
Mercury	Daily Samples	190820-25	FBI ASH	5/30/2019	1.91	1.91	ug/L		Done	Released	1/22/2020 12:40	5/31/2019 12:05		6/20/2019
Mercury	Daily Samples	190820-27	FBI ASH	5/30/2019	0.38	0.38	ug/L		Done	Released	1/22/2020 12:40	5/31/2019 12:05	Filt	6/20/2019
Mercury	Daily Samples	190836-22	FBI ASH	6/2/2019	1.95	1.95	ug/L		Done	Released	1/22/2020 12:40	6/3/2019 15:05		6/20/2019
Mercury	Daily Samples	190836-24	FBI ASH	6/2/2019	0.313	0.313	ug/L		Done	Released	1/22/2020 12:40	6/3/2019 15:05	Filt	6/20/2019
Mercury	Daily Samples	190841-36	FBI ASH	6/4/2019	1.95	1.95	ug/L	Q3	Done	Released	8/1/2019 8:06	6/6/2019 8:11		6/20/2019
Mercury	Daily Samples	190841-38	FBI ASH	6/4/2019	0.339	0.339	ug/L		Done	Released	8/1/2019 8:06	6/6/2019 8:11	Filt	6/25/2019
Mercury	GBMSD-MPS	190889-34	FBI ASH	6/11/2019	1.85	1.85	ug/L		Done	Released	8/1/2019 8:06	6/12/2019 12:52		6/25/2019
Mercury	GBMSD-MPS	191142-34	FBI ASH	7/18/2019	1.74	1.74	ug/L		Done	Released	9/27/2019 14:44	7/22/2019 10:00		7/31/2019
Mercury	GBMSD-MPS	191563-34	FBI ASH	9/19/2019	1.8	1.8	ug/L		Done	Released	10/21/2019 8:56	9/20/2019 11:04		9/25/2019
Mercury	GBMSD-MPS	191645-34	FBI ASH	10/2/2019	1.69	1.69	ug/L		Done	Released	10/23/2019 13:45	10/5/2019 13:26		10/7/2019
Mercury	GBMSD-MPS	192014-04	FBI ASH	11/27/2019	1.53	1.53	ug/L		Done	Released	12/23/2019 10:45			12/19/2019
Mercury	GBMSD-MPS	192070-34	FBI ASH	12/12/2019	1.67	1.67	ug/L		Done	Released	1/6/2020 8:54	12/13/2019 8:35		12/31/2019
Mercury	GBMSD-MPS	200131-01	FBI ASH	1/25/2020	1.35	1.35	ug/L		Done	Released	3/5/2020 13:07			1/29/2020
Mercury	GBMSD-MPS	200262-01	FBI ASH	2/15/2020	1.14	1.14	ug/L		Done	Released	3/5/2020 13:09			2/19/2020
Mercury	GBMSD-MPS	200423-34	FBI ASH	3/18/2020	1.12	1.12	ug/L		Done	Released	4/23/2020 13:23	3/19/2020 12:56		3/24/2020
Mercury	GBMSD-MPS	200563-01	FBI ASH	4/18/2020	1.69	1.69	ug/L		Done	Released	5/15/2020 9:22	4/20/2020 7:37		4/26/2020
Mercury	GBMSD-MPS	200661-01	FBI ASH	5/17/2020	1.74	1.74	ug/L		Done	Released	6/5/2020 9:15	5/18/2020 14:07		5/28/2020
Mercury	GBMSD-MPS	181069-65	FBI ASH DECANT	7/17/2018	0.627	0.627	ug/L		Done	Released	8/27/2018 9:24	7/20/2018 11:52		7/26/2018
Mercury	GBMSD-MPS	181243-56	FBI ASH DECANT	8/14/2018	0.66	0.66	ug/L		Done	Released	12/11/2018 9:47	8/16/2018 6:27		8/27/2018
Mercury	GBMSD-MPS	181529-56	FBI ASH DECANT	9/25/2018	0.545	0.545	ug/L		Done	Released	12/11/2018 9:47	9/27/2018 7:46		10/1/2018
Mercury	GBMSD-MPS	181650-48	FBI ASH DECANT	10/10/2018	0.736	0.736	ug/L		Done	Released	11/30/2018 12:50	10/12/2018 13:24		11/7/2018
Mercury	GBMSD-MPS	181797-40	FBI ASH DECANT	11/1/2018	0.627	0.627	ug/L		Done	Released	1/8/2019 6:59	11/2/2018 12:34		11/14/2018
Mercury	GBMSD-MPS	182082-40	FBI ASH DECANT	12/12/2018	0.825	0.825	ug/L		Done	Released	1/14/2019 8:39	12/13/2018 13:25		12/20/2018
Mercury	GBMSD-MPS	190086-62	FBI ASH DECANT	1/15/2019	1.19	1.19	ug/L		Done	Released	2/19/2019 15:03	1/17/2019 13:46		1/22/2019
Mercury	GBMSD-MPS	190249-66	FBI ASH DECANT	2/12/2019	1.33	1.33	ug/L		Done	Released	4/16/2019 9:51	2/12/2019 12:42		2/26/2019
Mercury	GBMSD-MPS	190380-35	FBI ASH DECANT	3/13/2019	1.02	1.02	ug/L		Done	Released	4/18/2019 9:41	3/14/2019 13:43		3/20/2019
Mercury	Daily Samples	190440-23	FBI ASH DECANT	3/28/2019	0.998	0.998	ug/L		Done	Released	4/19/2019 9:15	3/29/2019 10:23		4/1/2019
Mercury	Daily Samples	190440-25	FBI ASH DECANT	3/28/2019	0.612	0.612	ug/L		Done	Released	4/19/2019 9:15	3/29/2019 10:23	Filt	4/1/2019
Mercury	Daily Samples	190459-23	FBI ASH DECANT	3/31/2019	1.1	1.1	ug/L		Done	Released	5/20/2019 8:00	4/1/2019 14:31		4/12/2019
Mercury	Daily Samples	190459-25	FBI ASH DECANT	3/31/2019	0.537	0.537	ug/L		Done	Released	5/20/2019 8:00	4/1/2019 14:31	Filt	4/12/2019
Mercury	Daily Samples	190463-37	FBI ASH DECANT	4/2/2019	1	1	ug/L		Done	Released	5/20/2019 8:00	4/5/2019 8:51		4/12/2019
Mercury	Daily Samples	190463-39	FBI ASH DECANT	4/2/2019	0.418	0.418	ug/L		Done	Released	5/20/2019 8:00	4/5/2019 8:51	Filt	4/12/2019
Mercury	Daily Samples	190479-26	FBI ASH DECANT	4/4/2019	1.02	1.02	ug/L		Done	Released	5/20/2019 8:00	4/6/2019 7:08		4/18/2019
Mercury	Daily Samples	190479-28	FBI ASH DECANT	4/4/2019	0.403	0.403	ug/L		Done	Released	5/20/2019 8:00	4/6/2019 7:08	Filt	4/18/2019
Mercury	Daily Samples	190498-23	FBI ASH DECANT	4/7/2019	1.17	1.17	ug/L		Done	Released	5/20/2019 8:00	4/10/2019 7:20		4/18/2019
Mercury	Daily Samples	190498-25	FBI ASH DECANT	4/7/2019	0.369	0.369	ug/L		Done	Released	5/20/2019 8:00	4/10/2019 7:20	Filt	4/18/2019
Mercury	Daily Samples	190503-37	FBI ASH DECANT	4/9/2019	0.915	0.915	ug/L		Done	Released	10/22/2019 15:01	4/12/2019 13:01		4/25/2019
Mercury	Daily Samples	190503-39	FBI ASH DECANT	4/9/2019	0.452	0.452	ug/L	Q3	Done	Released	10/22/2019 15:01	4/12/2019 13:01	Filt	4/25/2019
Mercury	GBMSD-MPS	190505-36	FBI ASH DECANT	4/10/2019	1.12	1.12	ug/L		Done	Released	5/20/2019 8:00	4/15/2019 11:31		4/25/2019
Mercury	Daily Samples	190528-23	FBI ASH DECANT	4/14/2019	0.606	0.606	ug/L		Done	Released	5/20/2019 8:00	4/16/2019 7:14		4/25/2019
Mercury	Daily Samples	190528-25	FBI ASH DECANT	4/14/2019	0.403	0.403	ug/L	Q3	Done	Released	5/20/2019 8:00	4/16/2019 7:14	Filt	4/25/2019
Mercury	Daily Samples	190540-26	FBI ASH DECANT	4/18/2019	1.07	1.07	ug/L		Done	Released	5/21/2019 8:45	4/19/2019 12:24		5/1/2019
Mercury	Daily Samples	190540-28	FBI ASH DECANT	4/18/2019	0.536	0.536	ug/L	Q3	Done	Released	5/21/2019 8:45	4/19/2019 12:24	Filt	5/1/2019
Mercury	Daily Samples	190562-23	FBI ASH DECANT	4/21/2019	1.12	1.12	ug/L		Done	Released	5/20/2019 8:00	4/22/2019 13:55		5/1/2019
Mercury	Daily Samples	190562-25	FBI ASH DECANT	4/21/2019	0.576	0.576	ug/L	Q3	Done	Released	5/20/2019 8:00	4/22/2019 13:55	Filt	5/1/2019
Mercury	Daily Samples	190566-37	FBI ASH DECANT	4/23/2019	1.16	1.16	ug/L		Done	Released	5/22/2019 11:52	4/24/2019 13:29		5/7/2019
Mercury	Daily Samples	190566-39	FBI ASH DECANT	4/23/2019	0.475	0.475	ug/L	Q3	Done	Released	5/22/2019 11:52	4/24/2019 13:29	Filt	5/7/2019
Mercury	Daily Samples	190585-26	FBI ASH DECANT	4/25/2019	1.19	1.19	ug/L		Done	Released	5/22/2019 11:52	4/26/2019 10:56		5/7/2019
Mercury	Daily Samples	190585-28	FBI ASH DECANT	4/25/2019	0.559	0.559	ug/L	Q3	Done	Released	5/22/2019 11:52	4/26/2019 10:56	Filt	5/7/2019
Mercury	Daily Samples	190602-23	FBI ASH DECANT	4/28/2019	1.02	1.02	ug/L		Done	Released	5/22/2019 11:52	5/1/2019 9:58		5/7/2019
Mercury	Daily Samples	190602-25	FBI ASH DECANT	4/28/2019	0.52	0.52	ug/L	Q3	Done	Released	5/22/2019 11:52	5/1/2019 9:58	Filt	5/7/2019
Mercury	GBMSD-MPS	190615-35	FBI ASH DECANT	5/2/2019	1.3	1.3	ug/L		Done	Released	6/27/2019 7:47	5/3/2019 10:59		5/20/2019
Mercury	GBMSD-MPS	190615-42	FBI ASH DECANT	5/2/2019	0.326	0.326	ug/L		Done	Released	6/27/2019 7:47	5/3/2019 10:59	Filt	5/20/2019
Mercury	Daily Samples	190661-37	FBI ASH DECANT	5/7/2019	0.822	0.822	ug/L		Done	Released	10/22/2019 15:03	5/8/2019 13:54		6/6/2019
Mercury	Daily Samples	190661-39	FBI ASH DECANT	5/7/2019	0.251	0.251	ug/L		Done	Released	10/22/2019 15:03	5/8/2019 13:54	Filt	6/6/2019
Mercury	Daily Samples	190677-28	FBI ASH DECANT	5/9/2019	1.1	1.1	ug/L		Done	Released	6/10/2019 11:13	5/10/2019 10:54		6/6/2019
Mercury	Daily Samples	190677-30	FBI ASH DECANT	5/9/2019	0.322	0.322	ug/L		Done	Released	6/10/2019 11:13	5/10/2019 10:54	Filt	6/6/2019
Mercury	Daily Samples	190707-39	FBI ASH DECANT	5/14/2019	1.2	1.2	ug/L		Done	Released	10/22/2019 15:04	5/15/2019 12:56		6/10/2019
Mercury	Daily Samples	190707-41	FBI ASH DECANT	5/14/2019	0.486	0.486	ug/L		Done	Released	10/22/2019 15:04	5/15/2019 12:56	Filt	6/10/2019
Mercury	GBMSD-MPS	190716-35	FBI ASH DECANT	5/15/2019	1.28	1.28	ug/L		Done	Released	6/4/2019 12:59	5/16/2019 13:26		5/31/2019
Mercury	Daily Samples	190719-26	FBI ASH DECANT	5/16/2019	1.37	1.37	ug/L		Done	Released	6/25/2019 11:55	5/20/2019 7:19		6/10/2019
Mercury	Daily Samples	190719-28	FBI ASH DECANT	5/16/2019	0.535	0.535	ug/L		Done	Released	6/25/2019 11:55	5/20/2019 7:19	Filt	6/10/2019
Mercury	Daily Samples	190746-23	FBI ASH DECANT	5/19/2019	1.23	1.23	ug/L		Done	Released	1/22/2020 12:40	5/20/2019 13:06		6/10/2019
Mercury	Daily Samples	190746-25	FBI ASH DECANT	5/19/2019	0.471	0.471	ug/L		Done	Released	1/22/2020 12:40	5/20/2019 13:06	Filt	6/10/2019
Mercury	Daily Samples	190769-26	FBI ASH DECANT	5/23/2019	0.631	0.631	ug/L		Done	Released	1/22/2020 12:40	5/24/2019 13:01		6/18/2019
Mercury	Daily Samples	190769-28	FBI ASH DECANT	5/23/2019	0.268	0.268	ug/L		Done	Released	1/22/2020 12:40	5/24/2019 13:01	Filt	6/18/2019
Mercury	Daily Samples	190786-23	FBI ASH DECANT	5/26/2019	0.903	0.903	ug/L		Done	Released	7/1/2019 9:16	5/27/2019 13:03		6/18/2019
Mercury	Daily Samples	190786-25	FBI ASH DECANT	5/26/2019	0.282	0.282	ug/L		Done	Released	7/1/2019 9:16	5/27/2019 13:03	Filt	6/18/2019
Mercury	Daily Samples	190820-26	FBI ASH DECANT	5/30/2019	0.993	0.993	ug/L		Done	Released	1/22/2020 12:40	5/31/2019 12:05		6/20/2019
Mercury	Daily Samples	190820-28	FBI ASH DECANT	5/30/2019	0.234	0.234	ug/L		Done	Released	1/22/2020 12:40	5/31/2019 12:05	Filt	6/20/2019
Mercury	Daily Samples	190836-23	FBI ASH DECANT	6/2/2019	0.861	0.861	ug/L		Done	Released	1/22/2020 12:40	6/3/2019 15:05		6/20/2019
Mercury	Daily Samples	190836-25	FBI ASH DECANT	6/2/2019	0.365	0.365	ug/L		Done	Released	1/22/2020 12:40	6/3/2019 15:05	Filt	6/20/2019
Mercury	Daily Samples	190841-37	FBI ASH DECANT	6/4/2019	0.832	0.832	ug/L	Q3	Done	Released	8/1/2019 8:06	6/6/2019 8:11		6/20/2019
Mercury	Daily Samples	190841-39	FBI ASH DECANT	6/4/2019	0.245	0.245	ug/L		Done	Released	8/1/2019 8:06	6/6/2019 8:11	Filt	6/25/2019
Mercury	GBMSD-MPS	190889-35	FBI ASH DECANT	6/11/2019	0.906	0.906	ug/L		Done	Released	8/1/2019 8:06	6/12/2019 12:52		6/25/2019
Mercury	GBMSD-MPS	191142-35	FBI ASH DECANT	7/18/2019	0.768	0.768	ug/L		Done	Released	9/27/2019 14:44	7/22/2019 10:00		7/31/2019
Mercury	GBMSD-MPS	191563-35	FBI ASH DECANT	9/19/2019	0.504	0.504	ug/L		Done	Released	10/21/2019 8:56	9/20/2019 11:04		9/25/2019
Mercury	GBMSD-MPS	191645-35	FBI ASH DECANT	10/2/2019	0.336	0.336	ug/L		Done	Released	10/23/2019 13:45	10/5/2019 13:26		10/7/2019
Mercury	GBMSD-MPS	192014-05	FBI ASH DECANT	11/27/2019	0.815	0.815	ug/L		Done	Released	12/23/2019 10:45			12/19/2019
Mercury	GBMSD-MPS	192070-35	FBI ASH DECANT	12/12/2019	1.13	1.13	ug/L		Done	Released	1/6/2020 8:54	12/13/2019 8:35		12/31/2019
Mercury	GBMSD-MPS	200131-02	FBI ASH DECANT	1/25/2020	1.1	1.1	ug/L		Done	Released	3/5/2020 13:07			1/29/2020
Mercury	GBMSD-MPS	200262-02	FBI ASH DECANT	2/15/2020	0.808	0.808	ug/L		Done	Released	3/5/2020 13:09			2/19/2020
Mercury	GBMSD-MPS	200423-35	FBI ASH DECANT	3/18/2020	0.801	0.801	ug/L		Done	Released	4/23/2020 13:23	3/19/2020 12:56		3/24/2020
Mercury	GBMSD-MPS	200563-02	FBI ASH DECANT	4/18/2020	0.873	0.873	ug/L		Done	Released	5/15/2020 9:22	4/20/2020 7:37		4/26/2020

NEW Water Mercury Sample Data
Received 6/18/2020

Analyte	Project Name	LIMS #	Sample Name	Sample Date	Result	Result (Number)	Units	Qualifier	Status	Appr. Status	App. Date	Received Date	Special Conditions	Analysis Date
Mercury	GBMSD-MPS	200661-02	FBI ASH DECANT	5/17/2020	0.881	0.881	ug/L		Done	Released	6/5/2020 9:15	5/18/2020 14:07		5/28/2020
Mercury	GBMSD-MPS	180695-35	GB-Primary Sludge	5/15/2018	0.182	0.182	ug/L	N4	Done	Released	6/1/2018 15:47	5/16/2018 13:10		6/1/2018
Mercury	GBMSD-MPS	180832-36	GB-Primary Sludge	6/6/2018	6	6	ug/L		Done	Released	6/25/2018 13:34	6/7/2018 13:08		6/19/2018
Mercury	GBMSD-MPS	181069-44	GB-Primary Sludge	7/17/2018	1.16	1.16	ug/L		Done	Released	8/27/2018 9:24	7/20/2018 11:52		7/26/2018
Mercury	GBMSD-MPS	181243-36	GB-Primary Sludge	8/14/2018	0.975	0.975	ug/L		Done	Released	12/11/2018 9:47	8/16/2018 6:27		8/27/2018
Mercury	GBMSD-MPS	181529-36	GB-Primary Sludge	9/25/2018	3.28	3.28	ug/L		Done	Released	12/11/2018 9:47	9/27/2018 7:46		10/1/2018
Mercury	GBMSD-MPS	181650-44	GB-Primary Sludge	10/10/2018	0.98	0.98	ug/L		Done	Released	11/30/2018 12:50	10/12/2018 13:24		11/7/2018
Mercury	GBMSD-MPS	181797-36	GB-Primary Sludge	11/1/2018	0.262	0.262	ug/L	N4	Done	Released	1/8/2019 6:59	11/2/2018 12:34		11/14/2018
Mercury	GBMSD-MPS	182082-36	GB-Primary Sludge	12/12/2018	0.492	0.492	ug/L		Done	Released	1/14/2019 8:39	12/13/2018 13:25		12/20/2018
Mercury	GBMSD-MPS	190086-44	GB-Primary Sludge	1/15/2019	0.846	0.846	ug/L		Done	Released	2/19/2019 15:03	1/17/2019 13:46		1/22/2019
Mercury	GBMSD-MPS	190249-37	GB-Primary Sludge	2/12/2019	0.222	0.222	ug/L	N4	Done	Released	4/16/2019 9:51	2/12/2019 12:42		2/26/2019
Mercury	GBMSD-MPS	190380-29	GB-Primary Sludge	3/13/2019	2.52	2.52	ug/L	M1, E3	Done	Released	4/18/2019 9:41	3/14/2019 13:43		3/20/2019
Mercury	GBMSD-MPS	190380-29A	GB-Primary Sludge	3/13/2019	2.81	2.81	ug/L	M1,R1,E3	Done	Released	4/18/2019 9:41	3/14/2019 13:43		4/1/2019
Mercury	GBMSD-MPS	190505-29	GB-Primary Sludge	4/10/2019	0.461	0.461	ug/L		Done	Released	5/20/2019 8:00	4/15/2019 11:31		4/25/2019
Mercury	GBMSD-MPS	190716-28	GB-Primary Sludge	5/15/2019	0.618	0.618	ug/L		Done	Released	6/4/2019 12:59	5/16/2019 13:26		5/31/2019
Mercury	GBMSD-MPS	190889-28	GB-Primary Sludge	6/11/2019	0.51	0.51	ug/L		Done	Released	8/1/2019 8:06	6/12/2019 12:52		6/25/2019
Mercury	GBMSD-MPS	191142-28	GB-Primary Sludge	7/18/2019	8.66	8.66	ug/L		Done	Released	9/27/2019 14:44	7/22/2019 10:00		7/31/2019
Mercury	GBMSD-MPS	191563-28	GB-Primary Sludge	9/19/2019	0.312	0.312	ug/L	N4	Done	Released	10/21/2019 8:56	9/20/2019 11:04		9/25/2019
Mercury	GBMSD-MPS	191645-28	GB-Primary Sludge	10/2/2019	0.645	0.645	ug/L		Done	Released	10/23/2019 13:45	10/5/2019 13:26		10/7/2019
Mercury	GBMSD-MPS	191902-28	GB-Primary Sludge	11/14/2019	4.83	4.83	ug/L		Done	Released	1/16/2020 13:26	11/18/2019 6:50		12/2/2019
Mercury	GBMSD-MPS	192070-28	GB-Primary Sludge	12/12/2019	0.826	0.826	ug/L		Done	Released	1/6/2020 8:54	12/13/2019 8:35		12/31/2019
Mercury	GBMSD-MPS	200095-28	GB-Primary Sludge	1/21/2020	0.327	0.327	ug/L	N4	Done	Released	3/5/2020 13:07	1/22/2020 13:31		1/29/2020
Mercury	GBMSD-MPS	200224-27	GB-Primary Sludge	2/12/2020	0.258	0.258	ug/L	N4	Done	Released	3/5/2020 13:09	2/17/2020 10:13		2/19/2020
Mercury	GBMSD-MPS	200423-28	GB-Primary Sludge	3/18/2020	0.67	0.67	ug/L		Done	Released	4/23/2020 13:23	3/19/2020 12:56		3/24/2020
Mercury	GBMSD-MPS	200541-28	GB-Primary Sludge	4/16/2020	0.254	0.254	ug/L	N4	Done	Released	5/15/2020 12:48	4/22/2020 9:25		4/17/2020
Mercury	GBMSD-MPS	200636-21	GB-Primary Sludge	5/13/2020	0.379	0.379	ug/L		Done	Released	6/5/2020 9:15	5/15/2020 7:28		5/28/2020
Mercury	GBMSD-MPS	180695-34	GB-WAS	5/15/2018	1.15	1.15	ug/L		Done	Released	6/1/2018 15:47	5/16/2018 13:10		6/1/2018
Mercury	GBMSD-MPS	180832-22	GB-WAS	6/6/2018	0.91	0.91	ug/L		Done	Released	6/25/2018 13:34	6/7/2018 13:08		6/19/2018
Mercury	GBMSD-MPS	181069-43	GB-WAS	7/17/2018	0.838	0.838	ug/L		Done	Released	8/27/2018 9:24	7/20/2018 11:52		7/23/2018
Mercury	GBMSD-MPS	181243-22	GB-WAS	8/14/2018	0.885	0.885	ug/L		Done	Released	12/11/2018 9:47	8/16/2018 6:27		8/27/2018
Mercury	GBMSD-MPS	181529-22	GB-WAS	9/25/2018	1.08	1.08	ug/L		Done	Released	12/11/2018 9:47	9/27/2018 7:46		10/1/2018
Mercury	GBMSD-MPS	181650-43	GB-WAS	10/10/2018	1.55	1.55	ug/L		Done	Released	11/30/2018 12:50	10/12/2018 13:24		11/7/2018
Mercury	GBMSD-MPS	181797-22	GB-WAS	11/1/2018	2.22	2.22	ug/L		Done	Released	1/8/2019 6:59	11/2/2018 12:34		11/14/2018
Mercury	GBMSD-MPS	182082-22	GB-WAS	12/12/2018	0.405	0.405	ug/L		Done	Released	1/14/2019 8:39	12/13/2018 13:25		12/20/2018
Mercury	GBMSD-MPS	190086-43	GB-WAS	1/15/2019	1.46	1.46	ug/L		Done	Released	2/19/2019 15:03	1/17/2019 13:46		1/22/2019
Mercury	GBMSD-MPS	190249-22	GB-WAS	2/12/2019	0.302	0.302	ug/L		Done	Released	4/16/2019 9:51	2/12/2019 12:42		2/26/2019
Mercury	GBMSD-MPS	190380-16	GB-WAS	3/13/2019	1.2	1.2	ug/L		Done	Released	4/18/2019 9:41	3/14/2019 13:43		3/20/2019
Mercury	GBMSD-MPS	190505-47	GB-WAS	4/10/2019	0.939	0.939	ug/L		Done	Released	5/20/2019 8:00	4/15/2019 11:31		4/25/2019
Mercury	GBMSD-MPS	190716-43	GB-WAS	5/15/2019	1.91	1.91	ug/L		Done	Released	6/4/2019 12:59	5/16/2019 13:26		5/31/2019
Mercury	GBMSD-MPS	190889-54	GB-WAS	6/11/2019	1.74	1.74	ug/L		Done	Released	8/1/2019 8:06	6/12/2019 12:52		6/25/2019
Mercury	GBMSD-MPS	191142-52	GB-WAS	7/18/2019	1.79	1.79	ug/L		Done	Released	9/27/2019 14:44	7/22/2019 10:00		7/31/2019
Mercury	GBMSD-MPS	191563-38	GB-WAS	9/19/2019	1.81	1.81	ug/L		Done	Released	10/21/2019 8:56	9/20/2019 11:04		9/25/2019
Mercury	GBMSD-MPS	191645-46	GB-WAS	10/2/2019	2.82	2.82	ug/L		Done	Released	10/23/2019 13:45	10/5/2019 13:26		10/7/2019
Mercury	GBMSD-MPS	191902-38	GB-WAS	11/14/2019	0.686	0.686	ug/L		Done	Released	1/16/2020 13:26	11/18/2019 6:50		12/2/2019
Mercury	GBMSD-MPS	192070-38	GB-WAS	12/12/2019	1.18	1.18	ug/L		Done	Released	1/6/2020 8:54	12/13/2019 8:35		12/31/2019
Mercury	GBMSD-MPS	200095-46	GB-WAS	1/21/2020	1.78	1.78	ug/L		Done	Released	3/5/2020 13:07	1/22/2020 13:31		1/29/2020
Mercury	GBMSD-MPS	200224-37	GB-WAS	2/12/2020	0.586	0.586	ug/L		Done	Released	3/5/2020 13:09	2/17/2020 10:13		2/19/2020
Mercury	GBMSD-MPS	200423-38	GB-WAS	3/18/2020	1.4	1.4	ug/L		Done	Released	4/23/2020 13:23	3/19/2020 12:56		3/24/2020
Mercury	GBMSD-MPS	200541-38	GB-WAS	4/16/2020	0.748	0.748	ug/L		Done	Released	5/15/2020 12:48	4/22/2020 9:25		4/17/2020
Mercury	GBMSD-MPS	200636-38	GB-WAS	5/13/2020	1.47	1.47	ug/L		Done	Released	6/5/2020 9:15	5/15/2020 7:28		5/28/2020
Mercury	GBMSD-MPS	180695-14	ISW	5/15/2018	0.079	0.079	ug/L	N4	Done	Released	6/1/2018 15:47	5/16/2018 13:10	Filt	6/1/2018
Mercury	GBMSD-MPS	180695-15	ISW	5/15/2018	0.08	0.08	ug/L	N4	Done	Released	6/1/2018 15:47	5/16/2018 13:10		6/1/2018
Mercury	GBMSD-MPS	180880-03	ISW	6/9/2018	0.041	0.041	ug/L	N4	Done	Released	6/25/2018 13:34	6/11/2018 8:45		6/19/2018
Mercury	GBMSD-MPS	180880-04	ISW	6/9/2018	0.036	0.036	ug/L	N4	Done	Released	6/25/2018 13:34	6/11/2018 8:45	Filt	6/19/2018
Mercury	GBMSD-MPS	181054-01	ISW	7/12/2018	0.082	0.082	ug/L	N4	Done	Released	8/6/2018 11:44	7/13/2018 7:45	Filt	7/23/2018
Mercury	GBMSD-MPS	181054-02	ISW	7/12/2018	0.1	0.1	ug/L	N4	Done	Released	8/6/2018 11:44	7/13/2018 7:45		7/23/2018
Mercury	GBMSD-MPS	181205-01	ISW	8/7/2018	0.161	0.161	ug/L		Done	Released	9/21/2018 13:17	8/16/2018 6:33	Filt	8/27/2018
Mercury	GBMSD-MPS	181205-02	ISW	8/7/2018	0.178	0.178	ug/L		Done	Released	9/21/2018 13:17	8/16/2018 6:33		8/27/2018
Mercury	GBMSD-MPS	181488-51	ISW	9/18/2018	0.089	0.089	ug/L	N4	Done	Released	12/11/2018 9:47	9/25/2018 10:21	Filt	10/1/2018
Mercury	GBMSD-MPS	181488-52	ISW	9/18/2018	0.112	0.112	ug/L	N4	Done	Released	12/11/2018 9:47	9/25/2018 10:21		10/1/2018
Mercury	GBMSD-MPS	180695-04	MS-PG	5/15/2018	<0.035	0.035	ug/L		Done	Released	6/1/2018 15:47	5/16/2018 13:10		6/1/2018
Mercury	GBMSD-MPS	180832-04	MS-PG	6/6/2018	<0.035	0.035	ug/L		Done	Released	6/25/2018 13:34	6/7/2018 13:08		6/19/2018
Mercury	GBMSD-MPS	181069-04	MS-PG	7/17/2018	<0.035	0.035	ug/L		Done	Released	8/27/2018 9:24	7/20/2018 11:52		7/23/2018
Mercury	GBMSD-MPS	181243-04	MS-PG	8/14/2018	<0.035	0.035	ug/L		Done	Released	12/11/2018 9:47	8/16/2018 6:27		8/27/2018
Mercury	GBMSD-MPS	181529-04	MS-PG	9/25/2018	<0.035	0.035	ug/L		Done	Released	12/11/2018 9:47	9/27/2018 7:46		10/1/2018
Mercury	GBMSD-MPS	181650-04	MS-PG	10/10/2018	0.058	0.058	ug/L	N4	Done	Released	11/30/2018 12:50	10/12/2018 13:24		11/7/2018
Mercury	GBMSD-MPS	181797-04	MS-PG	11/1/2018	<0.035	0.035	ug/L		Done	Released	1/8/2019 6:59	11/2/2018 12:34		11/14/2018
Mercury	GBMSD-MPS	182082-04	MS-PG	12/12/2018	<0.035	0.035	ug/L		Done	Released	1/14/2019 8:39	12/13/2018 13:25		12/20/2018
Mercury	GBMSD-MPS	190086-04	MS-PG	1/15/2019	0.041	0.041	ug/L	N4	Done	Released	2/19/2019 15:03	1/17/2019 13:46		1/22/2019
Mercury	GBMSD-MPS	190249-04	MS-PG	2/12/2019	<0.035	0.035	ug/L		Done	Released	4/16/2019 9:51	2/12/2019 12:42		2/26/2019
Mercury	GBMSD-MPS	190380-04	MS-PG	3/13/2019	<0.035	0.035	ug/L		Done	Released	4/18/2019 9:41	3/14/2019 13:43		3/20/2019
Mercury	GBMSD-MPS	190505-04	MS-PG	4/10/2019	<0.041	0.041	ug/L		Done	Released	5/20/2019 8:00	4/15/2019 11:31		4/25/2019
Mercury	GBMSD-MPS	190615-04	MS-PG	5/2/2019			ug/L		Cancel	Released	6/27/2019 7:47	5/3/2019 10:59		
Mercury	GBMSD-MPS	190716-04	MS-PG	5/15/2019	<0.041	0.041	ug/L		Done	Released	6/4/2019 12:59	5/16/2019 13:26		5/31/2019
Mercury	GBMSD-MPS	190889-04	MS-PG	6/11/2019	<0.041	0.041	ug/L		Done	Released	8/1/2019 8:06	6/12/2019 12:52		6/25/2019
Mercury	GBMSD-MPS	191142-04	MS-PG	7/18/2019	<0.041	0.041	ug/L		Done	Released	9/27/2019 14:44	7/22/2019 10:00		7/31/2019
Mercury	GBMSD-MPS	191563-04	MS-PG	9/19/2019	<0.041	0.041	ug/L		Done	Released	10/21/2019 8:56	9/20/2019 11:04		9/25/2019
Mercury	GBMSD-MPS	191645-04	MS-PG	10/2/2019	<0.041	0.041	ug/L		Done	Released	10/23/2019 13:45	10/5/2019 13:26		10/7/2019
Mercury	GBMSD-MPS	191902-04	MS-PG	11/14/2019	<0.041	0.041	ug/L		Done	Released	1/16/2020 13:26	11/18/2019 6:50		12/2/2019
Mercury	GBMSD-MPS	192070-04	MS-PG	12/12/2019	<0.041	0.041	ug/L		Done	Released	1/6/2020 8:54	12/13/2019 8:35		12/31/2019
Mercury	GBMSD-MPS	200095-04	MS-PG	1/21/2020	<0.041	0.041	ug/L		Done	Released	3/5/2020 13:07	1/22/2020 13:31		1/29/2020
Mercury	GBMSD-MPS	200224-04	MS-PG	2/12/2020	<0.041	0.041	ug/L		Done	Released	3/5/2020 13:09	2/17/2020 10:13		2/19/2020
Mercury	GBMSD-MPS	200423-04	MS-PG	3/18/2020	<0.041	0.041	ug/L		Done	Released	4/23/2020 13:23	3/19/2020 12:56		3/24/2020
Mercury	GBMSD-MPS	200541-04	MS-PG	4/16/2020	<0.041	0.041	ug/L		Done	Released	5/15/2020 12:48	4/22/2020 9:25		4/26/2020
Mercury	GBMSD-MPS	200636-04	MS-PG	5/13/2020	0.044	0.044	ug/L	N4	Done	Released	6/5/2020 9:15	5/15/2020 7:28		5/28/2020
Mercury	Daily Samples	180665-01	PLT-B1A	5/9/2018	0.066	0.066	ug/L	N4	Done	Released	5/23/2018 8:51	5/10/2018 13:46		5/22/2018
Mercury	Daily Samples	180864-01	PLT-B1A	6/11/2018	0.05	0.05	ug/L	N4	Done	Released	6/29/2018 14:18	6/12/2018 10:09		6/19/2018
Mercury	Daily Samples	181034-01	PLT-B1A	7/11/2018	<0.035	0.035	ug/L		Done	Released	7/31/2018 13:29	7/12/2018 14:01		7/23/2018
Mercury	Daily Samples	181235-01	PLT-B1A	8/11/2018	0.045	0.045	ug/L	N4	Done	Released	12/19/2018 8:22	8/13/2018 7:09		8/27/2018
Mercury	Daily Samples	181238-01	PLT-B1A	8/12/2018	0.087	0.087	ug/L	N4	Done	Released	12/19/2018 8:23	8/13/2018 13:16		9/10/2018
Mercury	Daily Samples	181427-01	PLT-B1A	9/10/2018	0.087	0.087	ug/L	N4	Done	Released	10/15/2018 12:34	9/11/2018 12:38		9/18/2018
Mercury	Daily Samples	181439-01	PLT-B1A	9/11/2018	<0.035	0.035	ug/L		Done	Released	10/16/2018 9:48	9/12/2018 14:55		9/18/2018
Mercury	Daily Samples	181611-01	PLT-B1A	10/4/2018	0.048	0.048	ug/L	N4	Done	Released	10/29/2018 8:42	10/6/2018 7:01		10/25/2018
Mercury	Daily Samples	181616-01	PLT-B1A	10/5/2018	<0.035	0.035	ug/L		Done	Released	10/29/2018 8:42	10/6/2018 11:48		10/25/2018

NEW Water Mercury Sample Data
Received 6/18/2020

Analyte	Project Name	LIMS #	Sample Name	Sample Date	Result	Result (Number)	Units	Qualifier	Status	Appr. Status	App. Date	Received Date	Special Conditions	Analysis Date
Mercury	Daily Samples	181839-01	PLT-B1A	11/7/2018	0.055	0.055	ug/L	N4	Done	Released	11/27/2018 14:30	11/8/2018 12:39		11/20/2018
Mercury	Daily Samples	182008-01	PLT-B1A	12/3/2018	0.063	0.063	ug/L	N4	Done	Released	12/26/2018 10:00	12/4/2018 12:54		12/12/2018
Mercury	Daily Samples	182013-01	PLT-B1A	12/4/2018	0.039	0.039	ug/L	N4	Done	Released	12/27/2018 8:46	12/6/2018 7:38		12/12/2018
Mercury	Daily Samples	190070-01	PLT-B1A	1/12/2019	<0.035	0.035	ug/L		Done	Released	2/11/2019 9:15	1/17/2019 13:45		1/22/2019
Mercury	Daily Samples	190074-01	PLT-B1A	1/13/2019	<0.035	0.035	ug/L		Done	Released	2/11/2019 9:15	1/17/2019 13:45		1/29/2019
Mercury	Daily Samples	190223-01	PLT-B1A	2/6/2019	0.038	0.038	ug/L	N4	Done	Released	3/1/2019 14:20	2/9/2019 6:23		2/26/2019
Mercury	Daily Samples	190352-01	PLT-B1A	3/7/2019	0.075	0.075	ug/L	N4	Done	Released	3/21/2019 11:30	3/8/2019 11:18		3/14/2019
Mercury	Daily Samples	190440-01	PLT-B1A	3/28/2019	0.043	0.043	ug/L	N4	Done	Released	4/19/2019 9:15	3/29/2019 10:23		4/1/2019
Mercury	Daily Samples	190459-01	PLT-B1A	3/31/2019	0.0754	0.0754	ug/L	N4	Done	Released	5/20/2019 8:00	4/1/2019 14:31		4/12/2019
Mercury	Daily Samples	190460-01	PLT-B1A	4/1/2019	0.099	0.099	ug/L	N4	Done	Released	4/23/2019 14:05	4/5/2019 8:51		4/18/2019
Mercury	Daily Samples	190463-01	PLT-B1A	4/2/2019	0.0438	0.0438	ug/L	N4	Done	Released	5/20/2019 8:00	4/5/2019 8:51		4/12/2019
Mercury	Daily Samples	190479-01	PLT-B1A	4/4/2019	<0.041	0.041	ug/L		Done	Released	5/20/2019 8:00	4/6/2019 7:08		4/18/2019
Mercury	Daily Samples	190498-01	PLT-B1A	4/7/2019	<0.041	0.041	ug/L		Done	Released	5/20/2019 8:00	4/10/2019 7:20		4/18/2019
Mercury	Daily Samples	190503-01	PLT-B1A	4/9/2019	0.0465	0.0465	ug/L	N4	Done	Released	10/22/2019 15:01	4/12/2019 13:01		4/25/2019
Mercury	Daily Samples	190507-01	PLT-B1A	4/11/2019	<0.041	0.041	ug/L		Done	Released	5/7/2019 10:59	4/15/2019 11:31		4/25/2019
Mercury	Daily Samples	190528-01	PLT-B1A	4/14/2019	0.042	0.042	ug/L	N4	Done	Released	5/20/2019 8:00	4/16/2019 7:14		4/25/2019
Mercury	Daily Samples	190532-01	PLT-B1A	4/16/2019	0.0966	0.0966	ug/L	N4	Done	Released	5/7/2019 13:34	4/17/2019 14:42		5/1/2019
Mercury	Daily Samples	190540-01	PLT-B1A	4/18/2019	0.0592	0.0592	ug/L	N4	Done	Released	5/21/2019 8:45	4/19/2019 12:24		5/1/2019
Mercury	Daily Samples	190562-01	PLT-B1A	4/21/2019	<0.041	0.041	ug/L		Done	Released	5/20/2019 8:00	4/22/2019 13:55		5/1/2019
Mercury	Daily Samples	190566-01	PLT-B1A	4/23/2019	<0.041	0.041	ug/L		Done	Released	5/22/2019 11:52	4/24/2019 13:29		5/1/2019
Mercury	Daily Samples	190585-01	PLT-B1A	4/25/2019	<0.041	0.041	ug/L		Done	Released	5/22/2019 11:52	4/26/2019 10:56		5/7/2019
Mercury	Daily Samples	190602-01	PLT-B1A	4/28/2019	0.0572	0.0572	ug/L	N4	Done	Released	5/22/2019 11:52	5/1/2019 9:58		5/7/2019
Mercury	Daily Samples	190609-01	PLT-B1A	4/30/2019	<0.041	0.041	ug/L		Done	Released	5/31/2019 9:44	5/1/2019 13:22		5/20/2019
Mercury	GBMSD-MPS	190615-01	PLT-B1A	5/2/2019	0.0504	0.0504	ug/L	N4	Done	Released	6/27/2019 7:47	5/3/2019 10:59		5/20/2019
Mercury	Daily Samples	190656-01	PLT-B1A	5/5/2019	0.255	0.255	ug/L		Done	Released	6/6/2019 7:48	5/6/2019 12:50		5/20/2019
Mercury	Daily Samples	190661-01	PLT-B1A	5/7/2019	<0.041	0.041	ug/L		Done	Released	10/22/2019 15:03	5/8/2019 13:54		5/20/2019
Mercury	Daily Samples	190674-01	PLT-B1A	5/8/2019	0.0686	0.0686	ug/L	N4	Done	Released	6/10/2019 11:13	5/9/2019 13:34		6/6/2019
Mercury	Daily Samples	190677-01	PLT-B1A	5/9/2019	0.0475	0.0475	ug/L	N4	Done	Released	6/10/2019 11:13	5/10/2019 10:54		6/6/2019
Mercury	Daily Samples	190702-01	PLT-B1A	5/12/2019	0.0505	0.0505	ug/L	N4	Done	Released	6/13/2019 8:33	5/14/2019 6:33		6/10/2019
Mercury	Daily Samples	190707-01	PLT-B1A	5/14/2019	0.0568	0.0568	ug/L	N4	Done	Released	10/22/2019 15:04	5/15/2019 12:56		6/10/2019
Mercury	Daily Samples	190719-01	PLT-B1A	5/16/2019	0.0612	0.0612	ug/L	N4	Done	Released	6/25/2019 11:55	5/20/2019 7:19		6/10/2019
Mercury	Daily Samples	190746-01	PLT-B1A	5/19/2019	0.0417	0.0417	ug/L	N4	Done	Released	1/22/2020 12:40	5/20/2019 13:06		6/10/2019
Mercury	Daily Samples	190751-01	PLT-B1A	5/21/2019	0.0536	0.0536	ug/L	N4	Done	Released	1/22/2020 12:40	5/22/2019 12:50		6/18/2019
Mercury	Daily Samples	190769-01	PLT-B1A	5/23/2019	<0.041	0.041	ug/L		Done	Released	1/22/2020 12:40	5/24/2019 13:01		6/18/2019
Mercury	Daily Samples	190786-01	PLT-B1A	5/26/2019	<0.041	0.041	ug/L		Done	Released	7/1/2019 9:16	5/27/2019 13:03		6/18/2019
Mercury	Daily Samples	190792-01	PLT-B1A	5/28/2019	0.0622	0.0622	ug/L	N4	Done	Released	1/22/2020 12:40	5/29/2019 12:55		6/20/2019
Mercury	Daily Samples	190820-01	PLT-B1A	5/30/2019	0.0616	0.0616	ug/L	N4	Done	Released	1/22/2020 12:40	5/31/2019 12:05		6/20/2019
Mercury	Daily Samples	190836-01	PLT-B1A	6/2/2019	<0.041	0.041	ug/L		Done	Released	1/22/2020 12:40	6/3/2019 15:05		6/20/2019
Mercury	Daily Samples	190841-01	PLT-B1A	6/4/2019	0.0541	0.0541	ug/L	N4	Done	Released	8/1/2019 8:06	6/6/2019 8:11		6/20/2019
Mercury	Daily Samples	190881-01	PLT-B1A	6/8/2019	<0.041	0.041	ug/L		Done	Released	7/16/2019 14:48	6/10/2019 7:47		6/25/2019
Mercury	Daily Samples	190884-01	PLT-B1A	6/9/2019	<0.041	0.041	ug/L		Done	Released	7/16/2019 14:48	6/10/2019 13:59		6/25/2019
Mercury	Daily Samples	191088-01	PLT-B1A	7/10/2019	<0.041	0.041	ug/L		Done	Released	7/31/2019 14:11	7/12/2019 14:36		7/23/2019
Mercury	Daily Samples	191296-01	PLT-B1A	8/10/2019	0.0625	0.0625	ug/L	N4	Done	Released	8/19/2019 15:36	8/13/2019 10:07		8/14/2019
Mercury	Daily Samples	191299-01	PLT-B1A	8/11/2019	<0.041	0.041	ug/L		Done	Released	8/20/2019 9:39	8/16/2019 7:39		8/14/2019
Mercury	Daily Samples	191494-01	PLT-B1A	9/9/2019	0.051	0.051	ug/L	N4	Done	Released	9/23/2019 8:45	9/10/2019 11:31		9/13/2019
Mercury	Daily Samples	191705-01	PLT-B1A	10/11/2019	<0.041	0.041	ug/L		Done	Released	10/25/2019 14:03	10/12/2019 13:51		10/21/2019
Mercury	Daily Samples	191867-01	PLT-B1A	11/6/2019	<0.041	0.041	ug/L		Done	Released	11/20/2019 13:59	11/7/2019 14:15		11/20/2019
Mercury	Daily Samples	192003-01	PLT-B1A	12/2/2019	0.0525	0.0525	ug/L	N4	Done	Released	12/19/2019 14:14	12/3/2019 11:03		12/19/2019
Mercury	Daily Samples	192006-01	PLT-B1A	12/3/2019	<0.041	0.041	ug/L		Done	Released	12/19/2019 14:14	12/4/2019 15:10		12/19/2019
Mercury	Daily Samples	200057-01	PLT-B1A	1/15/2020	<0.041	0.041	ug/L	M1,R1	Done	Released	2/18/2020 13:40	1/16/2020 14:05		1/24/2020
Mercury	Daily Samples	200270-01	PLT-B1A	2/20/2020	<0.041	0.041	ug/L		Done	Released	3/11/2020 8:11	2/21/2020 13:34		2/25/2020
Mercury	Daily Samples	200275-01	PLT-B1A	2/21/2020	<0.041	0.041	ug/L		Done	Released	3/11/2020 8:11	2/22/2020 12:06		2/25/2020
Mercury	Daily Samples	200404-01	PLT-B1A	3/14/2020	<0.041	0.041	ug/L		Done	Released	4/3/2020 10:16			3/26/2020
Mercury	Daily Samples	200409-01	PLT-B1A	3/15/2020	<0.041	0.041	ug/L		Done	Released	4/23/2020 7:55	3/16/2020 14:52		3/26/2020
Mercury	Daily Samples	200562-01	PLT-B1A	4/22/2020	<0.041	0.041	ug/L		Done	Released	5/7/2020 8:27	4/22/2020 11:55		4/26/2020
Mercury	Daily Samples	200640-01	PLT-B1A	5/14/2020	<0.041	0.041	ug/L		Done	Released	5/29/2020 10:45	5/15/2020 11:56		5/28/2020
Mercury	Daily Samples	180665-02	PLT-Y1	5/9/2018	0.078	0.078	ug/L	N4	Done	Released	5/23/2018 8:51	5/10/2018 13:46		5/22/2018
Mercury	GBMSD-MPS	180695-02	PLT-Y1	5/15/2018	0.067	0.067	ug/L	N4	Done	Released	6/1/2018 15:47	5/16/2018 13:10		6/1/2018
Mercury	GBMSD-MPS	180832-02	PLT-Y1	6/6/2018	<0.035	0.035	ug/L		Done	Released	6/25/2018 13:34	6/7/2018 13:08		6/19/2018
Mercury	Daily Samples	180864-02	PLT-Y1	6/11/2018	0.043	0.043	ug/L	N4	Done	Released	6/29/2018 14:18	6/12/2018 10:09		6/19/2018
Mercury	Daily Samples	181034-02	PLT-Y1	7/11/2018	0.051	0.051	ug/L	N4	Done	Released	7/31/2018 13:29	7/12/2018 14:01		7/23/2018
Mercury	GBMSD-MPS	181069-02	PLT-Y1	7/17/2018	<0.035	0.035	ug/L		Done	Released	8/27/2018 9:24	7/20/2018 11:52		7/23/2018
Mercury	Daily Samples	181235-02	PLT-Y1	8/11/2018	0.066	0.066	ug/L	N4	Done	Released	12/19/2018 8:22	8/13/2018 7:09		8/27/2018
Mercury	Daily Samples	181238-02	PLT-Y1	8/12/2018	0.082	0.082	ug/L	N4	Done	Released	12/19/2018 8:23	8/13/2018 13:16		9/10/2018
Mercury	GBMSD-MPS	181243-02	PLT-Y1	8/14/2018	<0.035	0.035	ug/L		Done	Released	12/11/2018 9:47	8/16/2018 6:27		8/27/2018
Mercury	Daily Samples	181427-02	PLT-Y1	9/10/2018	<0.035	0.035	ug/L		Done	Released	10/15/2018 12:34	9/11/2018 12:38		9/18/2018
Mercury	Daily Samples	181439-02	PLT-Y1	9/11/2018	<0.035	0.035	ug/L		Done	Released	10/16/2018 9:48	9/12/2018 14:55		9/18/2018
Mercury	GBMSD-MPS	181529-02	PLT-Y1	9/25/2018	<0.035	0.035	ug/L		Done	Released	12/11/2018 9:47	9/27/2018 7:46		10/1/2018
Mercury	Daily Samples	181611-02	PLT-Y1	10/4/2018	0.038	0.038	ug/L	N4	Done	Released	10/29/2018 8:42	10/6/2018 7:01		10/25/2018
Mercury	Daily Samples	181616-02	PLT-Y1	10/5/2018	<0.035	0.035	ug/L		Done	Released	10/29/2018 8:42	10/6/2018 11:48		10/25/2018
Mercury	GBMSD-MPS	181650-02	PLT-Y1	10/10/2018	<0.035	0.035	ug/L		Done	Released	11/30/2018 12:50	10/12/2018 13:24		11/7/2018
Mercury	GBMSD-MPS	181797-02	PLT-Y1	11/1/2018	0.055	0.055	ug/L	N4	Done	Released	1/8/2019 6:59	11/2/2018 12:34		11/14/2018
Mercury	Daily Samples	181839-02	PLT-Y1	11/7/2018	0.044	0.044	ug/L	N4	Done	Released	11/27/2018 14:30	11/8/2018 12:39		11/20/2018
Mercury	Daily Samples	182008-02	PLT-Y1	12/3/2018	0.045	0.045	ug/L	N4	Done	Released	12/26/2018 10:00	12/4/2018 12:54		12/12/2018
Mercury	Daily Samples	182013-02	PLT-Y1	12/4/2018	0.183	0.183	ug/L		Done	Released	12/27/2018 8:46	12/6/2018 7:38		12/12/2018
Mercury	GBMSD-MPS	182082-02	PLT-Y1	12/12/2018	0.188	0.188	ug/L		Done	Released	1/14/2019 8:39	12/13/2018 13:25		12/20/2018
Mercury	Daily Samples	190070-02	PLT-Y1	1/12/2019	0.047	0.047	ug/L	N4	Done	Released	2/11/2019 9:15	1/17/2019 13:45		1/22/2019
Mercury	Daily Samples	190074-02	PLT-Y1	1/13/2019	0.066	0.066	ug/L	N4	Done	Released	2/11/2019 9:15	1/17/2019 13:45		1/29/2019
Mercury	GBMSD-MPS	190086-02	PLT-Y1	1/15/2019	0.095	0.095	ug/L	N4	Done	Released	2/19/2019 15:03	1/17/2019 13:46		1/22/2019
Mercury	Daily Samples	190223-02	PLT-Y1	2/6/2019	0.081	0.081	ug/L	N4	Done	Released	3/1/2019 14:20	2/9/2019 6:23		2/26/2019
Mercury	GBMSD-MPS	190249-02	PLT-Y1	2/12/2019	0.051	0.051	ug/L	N4	Done	Released	4/16/2019 9:51	2/12/2019 12:42		2/26/2019
Mercury	Daily Samples	190352-02	PLT-Y1	3/7/2019	0.078	0.078	ug/L	N4	Done	Released	3/21/2019 11:30	3/8/2019 11:18		3/14/2019
Mercury	GBMSD-MPS	190380-02	PLT-Y1	3/13/2019	0.082	0.082	ug/L	N4	Done	Released	4/18/2019 9:41	3/14/2019 13:43		3/20/2019
Mercury	Daily Samples	190440-02	PLT-Y1	3/28/2019	0.239	0.239	ug/L		Done	Released	4/19/2019 9:15	3/29/2019 10:23		4/1/2019
Mercury	Daily Samples	190459-02	PLT-Y1	3/31/2019	0.1	0.1	ug/L	N4	Done	Released	5/20/2019 8:00	4/1/2019 14:31		4/12/2019
Mercury	Daily Samples	190460-02	PLT-Y1	4/1/2019	0.0892	0.0892	ug/L	N4	Done	Released	4/23/2019 14:05	4/5/2019 8:51		4/18/2019
Mercury	Daily Samples	190463-02	PLT-Y1	4/2/2019	0.0939	0.0939	ug/L	N4	Done	Released	5/20/2019 8:00	4/5/2019 8:51		4/12/2019
Mercury	Daily Samples	190479-02	PLT-Y1	4/4/2019	0.0631	0.0631	ug/L	N4	Done	Released	5/20/2019 8:00	4/6/2019 7:08		4/18/2019
Mercury	Daily Samples	190498-02	PLT-Y1	4/7/2019	0.0428	0.0428	ug/L	N4	Done	Released	5/20/2019 8:00	4/10/2019 7:20		4/18/2019
Mercury	Daily Samples	190503-02	PLT-Y1	4/9/2019	0.0453	0.0453	ug/L	N4	Done	Released	10/22/2019 15:01	4/12/2019 13:01		4/25/2019
Mercury	GBMSD-MPS	190505-02	PLT-Y1	4/10/2019	0.0691	0.0691	ug/L	N4	Done	Released	5/20/2019 8:00	4/15/2019 11:31		4/25/2019
Mercury	Daily Samples	190507-02	PLT-Y1	4/11/2019	0.0482	0.0482	ug/L	N4	Done	Released	5/7/2019 10:59	4/15/2019 11:31		4/25/2019
Mercury	Daily Samples	190528-02	PLT-Y1	4/14/2019	0.0491	0.0491	ug/L	N4	Done	Released	5/20/2019 8:00	4/16/2019 7:14		4/25/2019
Mercury	Daily Samples	190532-02	PLT-Y1	4/16/2019	0.0545	0.0545	ug/L	N4	Done	Released	5/7/2019 13:34	4/17/2019 14:42		5/1/2019

NEW Water Mercury Sample Data
Received 6/18/2020

Analyte	Project Name	LIMS #	Sample Name	Sample Date	Result	Result (Number)	Units	Qualifier	Status	Appr. Status	App. Date	Received Date	Special Conditions	Analysis Date
Mercury	Daily Samples	190540-02	PLT-Y1	4/18/2019	0.0857	0.0857	ug/L	N4	Done	Released	5/21/2019 8:45	4/19/2019 12:24		5/1/2019
Mercury	Daily Samples	190562-02	PLT-Y1	4/21/2019	0.162	0.162	ug/L		Done	Released	5/20/2019 8:00	4/22/2019 13:55		5/1/2019
Mercury	Daily Samples	190566-02	PLT-Y1	4/23/2019	0.0518	0.0518	ug/L	N4	Done	Released	5/22/2019 11:52	4/24/2019 13:29		5/1/2019
Mercury	Daily Samples	190585-02	PLT-Y1	4/25/2019	<0.041	0.041	ug/L		Done	Released	5/22/2019 11:52	4/26/2019 10:56		5/7/2019
Mercury	Daily Samples	190602-02	PLT-Y1	4/28/2019	1.14	1.14	ug/L		Done	Released	5/22/2019 11:52	5/1/2019 9:58		5/7/2019
Mercury	Daily Samples	190609-02	PLT-Y1	4/30/2019	<0.041	0.041	ug/L		Done	Released	5/31/2019 9:44	5/1/2019 13:22		5/20/2019
Mercury	GBMSD-MPS	190615-02	PLT-Y1	5/2/2019	<0.041	0.041	ug/L		Done	Released	6/27/2019 7:47	5/3/2019 10:59		5/20/2019
Mercury	Daily Samples	190656-02	PLT-Y1	5/5/2019	0.278	0.278	ug/L		Done	Released	6/6/2019 7:48	5/6/2019 12:50		5/20/2019
Mercury	Daily Samples	190661-02	PLT-Y1	5/7/2019	0.0986	0.0986	ug/L	N4	Done	Released	10/22/2019 15:03	5/8/2019 13:54		6/6/2019
Mercury	Daily Samples	190674-02	PLT-Y1	5/8/2019	0.148	0.148	ug/L		Done	Released	6/10/2019 11:13	5/9/2019 13:34		6/6/2019
Mercury	Daily Samples	190677-02	PLT-Y1	5/9/2019	0.206	0.206	ug/L		Done	Released	6/10/2019 11:13	5/10/2019 10:54		6/6/2019
Mercury	Daily Samples	190702-02	PLT-Y1	5/12/2019	<0.041	0.041	ug/L		Done	Released	6/13/2019 8:33	5/14/2019 6:33		6/10/2019
Mercury	Daily Samples	190707-02	PLT-Y1	5/14/2019	0.12	0.12	ug/L	N4	Done	Released	10/22/2019 15:04	5/15/2019 12:56		6/10/2019
Mercury	GBMSD-MPS	190716-02	PLT-Y1	5/15/2019	0.143	0.143	ug/L		Done	Released	6/4/2019 12:59	5/16/2019 13:26		5/31/2019
Mercury	Daily Samples	190719-02	PLT-Y1	5/16/2019	0.0664	0.0664	ug/L	N4	Done	Released	6/25/2019 11:55	5/20/2019 7:19		6/10/2019
Mercury	Daily Samples	190746-02	PLT-Y1	5/19/2019	0.0553	0.0553	ug/L	N4	Done	Released	1/22/2020 12:40	5/20/2019 13:06		6/10/2019
Mercury	Daily Samples	190751-02	PLT-Y1	5/21/2019	0.0488	0.0488	ug/L	N4	Done	Released	1/22/2020 12:40	5/22/2019 12:50		6/18/2019
Mercury	Daily Samples	190769-02	PLT-Y1	5/23/2019	0.0465	0.0465	ug/L	N4	Done	Released	1/22/2020 12:40	5/24/2019 13:01		6/18/2019
Mercury	Daily Samples	190786-02	PLT-Y1	5/26/2019	<0.041	0.041	ug/L		Done	Released	7/1/2019 9:16	5/27/2019 13:03		6/18/2019
Mercury	Daily Samples	190792-02	PLT-Y1	5/28/2019	0.0504	0.0504	ug/L	N4	Done	Released	1/22/2020 12:40	5/29/2019 12:55		6/20/2019
Mercury	Daily Samples	190820-02	PLT-Y1	5/30/2019	0.176	0.176	ug/L		Done	Released	1/22/2020 12:40	5/31/2019 12:05		6/20/2019
Mercury	Daily Samples	190836-02	PLT-Y1	6/2/2019	0.0662	0.0662	ug/L	N4	Done	Released	1/22/2020 12:40	6/3/2019 15:05		6/20/2019
Mercury	Daily Samples	190841-02	PLT-Y1	6/4/2019	<0.041	0.041	ug/L		Done	Released	8/1/2019 8:06	6/6/2019 8:11		6/20/2019
Mercury	Daily Samples	190881-02	PLT-Y1	6/8/2019	<0.041	0.041	ug/L		Done	Released	7/16/2019 14:48	6/10/2019 7:47		6/25/2019
Mercury	Daily Samples	190884-02	PLT-Y1	6/9/2019	<0.041	0.041	ug/L		Done	Released	7/16/2019 14:48	6/10/2019 13:59		6/25/2019
Mercury	GBMSD-MPS	190889-02	PLT-Y1	6/11/2019	0.0479	0.0479	ug/L	N4	Done	Released	8/1/2019 8:06	6/12/2019 12:52		6/25/2019
Mercury	Daily Samples	191088-02	PLT-Y1	7/10/2019	<0.041	0.041	ug/L		Done	Released	7/31/2019 14:11	7/12/2019 14:36		7/23/2019
Mercury	GBMSD-MPS	191142-02	PLT-Y1	7/18/2019	0.104	0.104	ug/L	N4	Done	Released	9/27/2019 14:44	7/22/2019 10:00		7/31/2019
Mercury	Daily Samples	191296-02	PLT-Y1	8/10/2019	0.452	0.452	ug/L		Done	Released	8/19/2019 15:36	8/13/2019 10:07		8/14/2019
Mercury	Daily Samples	191299-02	PLT-Y1	8/11/2019	0.262	0.262	ug/L	N4	Done	Released	8/20/2019 9:39	8/16/2019 7:39		8/14/2019
Mercury	Daily Samples	191494-02	PLT-Y1	9/9/2019	0.0419	0.0419	ug/L	N4	Done	Released	9/23/2019 8:45	9/10/2019 11:31		9/13/2019
Mercury	Daily Samples	191497-02	PLT-Y1	9/10/2019	<0.041	0.041	ug/L		Done	Released	10/22/2019 14:58	9/11/2019 15:22		9/13/2019
Mercury	GBMSD-MPS	191563-02	PLT-Y1	9/19/2019	<0.041	0.041	ug/L		Done	Released	10/21/2019 8:56	9/20/2019 11:04		9/25/2019
Mercury	GBMSD-MPS	191645-02	PLT-Y1	10/2/2019	<0.041	0.041	ug/L		Done	Released	10/23/2019 13:45	10/5/2019 13:26		10/7/2019
Mercury	Daily Samples	191701-02	PLT-Y1	10/10/2019	<0.041	0.041	ug/L		Done	Released	10/25/2019 14:03	10/12/2019 6:52		10/21/2019
Mercury	Daily Samples	191705-02	PLT-Y1	10/11/2019	<0.041	0.041	ug/L		Done	Released	10/25/2019 14:03	10/12/2019 13:51		10/21/2019
Mercury	Daily Samples	191867-02	PLT-Y1	11/6/2019	0.157	0.157	ug/L		Done	Released	11/20/2019 13:59	11/7/2019 14:15		11/20/2019
Mercury	GBMSD-MPS	191902-02	PLT-Y1	11/14/2019	0.0769	0.0769	ug/L	N4	Done	Released	1/16/2020 13:26	11/18/2019 6:50		12/2/2019
Mercury	Daily Samples	192003-02	PLT-Y1	12/2/2019	0.0553	0.0553	ug/L	N4	Done	Released	12/19/2019 14:14	12/3/2019 11:03		12/19/2019
Mercury	Daily Samples	192006-02	PLT-Y1	12/3/2019			ug/L		Cancel	Released	12/19/2019 14:14	12/4/2019 15:10		
Mercury	Daily Samples	192023-02	PLT-Y1	12/4/2019	<0.041	0.041	ug/L		Done	Released	12/19/2019 14:14	12/5/2019 14:41		12/19/2019
Mercury	GBMSD-MPS	192070-02	PLT-Y1	12/12/2019	<0.041	0.041	ug/L		Done	Released	1/6/2020 8:54	12/13/2019 8:35		12/31/2019
Mercury	Daily Samples	200057-02	PLT-Y1	1/15/2020	<0.041	0.041	ug/L		Done	Released	2/18/2020 13:40	1/16/2020 14:05		1/24/2020
Mercury	GBMSD-MPS	200095-02	PLT-Y1	1/21/2020	<0.041	0.041	ug/L		Done	Released	3/5/2020 13:07	1/22/2020 13:31		1/29/2020
Mercury	GBMSD-MPS	200224-02	PLT-Y1	2/12/2020	<0.041	0.041	ug/L		Done	Released	3/5/2020 13:09	2/17/2020 10:13		2/19/2020
Mercury	Daily Samples	200270-02	PLT-Y1	2/20/2020	<0.041	0.041	ug/L		Done	Released	3/11/2020 8:11	2/21/2020 13:34		2/25/2020
Mercury	Daily Samples	200275-02	PLT-Y1	2/21/2020	<0.041	0.041	ug/L		Done	Released	3/11/2020 8:11	2/22/2020 12:06		2/25/2020
Mercury	Daily Samples	200404-02	PLT-Y1	3/14/2020	0.348	0.348	ug/L		Done	Released	4/3/2020 10:16			3/26/2020
Mercury	Daily Samples	200409-02	PLT-Y1	3/15/2020	0.145	0.145	ug/L		Done	Released	4/23/2020 7:55	3/16/2020 14:52		3/26/2020
Mercury	GBMSD-MPS	200423-02	PLT-Y1	3/18/2020	<0.041	0.041	ug/L		Done	Released	4/23/2020 13:23	3/19/2020 12:56		3/24/2020
Mercury	GBMSD-MPS	200541-02	PLT-Y1	4/16/2020	<0.041	0.041	ug/L		Done	Released	5/15/2020 12:48	4/22/2020 9:25		4/26/2020
Mercury	Daily Samples	200562-02	PLT-Y1	4/22/2020	<0.041	0.041	ug/L		Done	Released	5/7/2020 8:27	4/22/2020 11:55		4/26/2020
Mercury	GBMSD-MPS	200636-02	PLT-Y1	5/13/2020	<0.041	0.041	ug/L		Done	Released	6/5/2020 9:15	5/15/2020 7:28		5/28/2020
Mercury	Daily Samples	200640-02	PLT-Y1	5/14/2020	<0.041	0.041	ug/L		Done	Released	5/29/2020 10:45	5/15/2020 11:56		5/28/2020
Mercury	GBMSD-MPS	180695-25	SIU-072-01	5/15/2018	0.054	0.054	ug/L	N4	Done	Released	6/1/2018 15:47	5/16/2018 13:10		6/1/2018
Mercury	GBMSD-MPS	180832-27	SIU-072-01	6/6/2018	0.037	0.037	ug/L	N4	Done	Released	6/25/2018 13:34	6/7/2018 13:08		6/19/2018
Mercury	Daily Samples	181084-21	SIU-072-01	7/19/2018	0.058	0.058	ug/L	N4	Done	Released	8/7/2018 8:48	7/20/2018 11:57		7/26/2018
Mercury	GBMSD-MPS	181243-27	SIU-072-01	8/14/2018	0.068	0.068	ug/L	N4	Done	Released	12/11/2018 9:47	8/16/2018 6:27		8/27/2018
Mercury	GBMSD-MPS	181488-23	SIU-072-01	9/18/2018	0.072	0.072	ug/L	N4	Done	Released	12/11/2018 9:47	9/25/2018 10:21		10/1/2018
Mercury	GBMSD-MPS	181529-27	SIU-072-01	9/25/2018	0.074	0.074	ug/L	N4	Done	Released	12/11/2018 9:47	9/27/2018 7:46		10/1/2018
Mercury	GBMSD-MPS	181650-25	SIU-072-01	10/10/2018	0.057	0.057	ug/L	N4	Done	Released	11/30/2018 12:50	10/12/2018 13:24		11/7/2018
Mercury	GBMSD-MPS	181797-27	SIU-072-01	11/1/2018	0.06	0.06	ug/L	N4	Done	Released	1/8/2019 6:59	11/2/2018 12:34		11/14/2018
Mercury	GBMSD-MPS	182082-27	SIU-072-01	12/12/2018	0.128	0.128	ug/L		Done	Released	1/14/2019 8:39	12/13/2018 13:25		12/20/2018
Mercury	GBMSD-MPS	190086-25	SIU-072-01	1/15/2019	0.067	0.067	ug/L	N4	Done	Released	2/19/2019 15:03	1/17/2019 13:46		1/22/2019
Mercury	GBMSD-MPS	190249-27	SIU-072-01	2/12/2019	0.045	0.045	ug/L	N4	Done	Released	4/16/2019 9:51	2/12/2019 12:42		2/26/2019
Mercury	GBMSD-MPS	190380-19	SIU-072-01	3/13/2019	0.088	0.088	ug/L	N4	Done	Released	4/18/2019 9:41	3/14/2019 13:43		3/20/2019
Mercury	GBMSD-MPS	190505-20	SIU-072-01	4/10/2019	0.0749	0.0749	ug/L	N4	Done	Released	5/20/2019 8:00	4/15/2019 11:31		4/25/2019
Mercury	GBMSD-MPS	190615-19	SIU-072-01	5/2/2019	0.133	0.133	ug/L	N4	Done	Released	6/27/2019 7:47	5/3/2019 10:59		5/20/2019
Mercury	GBMSD-MPS	190716-19	SIU-072-01	5/15/2019	0.182	0.182	ug/L		Done	Released	6/4/2019 12:59	5/16/2019 13:26		5/31/2019
Mercury	GBMSD-MPS	190889-19	SIU-072-01	6/11/2019	0.0737	0.0737	ug/L	N4	Done	Released	8/1/2019 8:06	6/12/2019 12:52		6/25/2019
Mercury	GBMSD-MPS	191142-19	SIU-072-01	7/18/2019	0.0573	0.0573	ug/L	N4	Done	Released	9/27/2019 14:44	7/22/2019 10:00		7/31/2019
Mercury	GBMSD-MPS	191563-19	SIU-072-01	9/19/2019	<0.041	0.041	ug/L		Done	Released	10/21/2019 8:56	9/20/2019 11:04		9/25/2019
Mercury	GBMSD-MPS	191645-19	SIU-072-01	10/2/2019	0.112	0.112	ug/L	N4	Done	Released	10/23/2019 13:45	10/5/2019 13:26		10/7/2019
Mercury	GBMSD-MPS	191902-19	SIU-072-01	11/14/2019	0.0813	0.0813	ug/L	N4	Done	Released	1/16/2020 13:26	11/18/2019 6:50		12/2/2019
Mercury	GBMSD-MPS	192070-19	SIU-072-01	12/12/2019	0.0988	0.0988	ug/L	N4	Done	Released	1/6/2020 8:54	12/13/2019 8:35		12/31/2019
Mercury	GBMSD-MPS	200095-19	SIU-072-01	1/21/2020	0.0841	0.0841	ug/L	N4	Done	Released	3/5/2020 13:07	1/22/2020 13:31		1/29/2020
Mercury	GBMSD-MPS	200263-01	SIU-072-01	2/17/2020	<0.1025	0.1025	ug/L		Done	Released	3/5/2020 13:09			2/25/2020
Mercury	GBMSD-MPS	200423-19	SIU-072-01	3/18/2020	0.0534	0.0534	ug/L	N4	Done	Released	4/23/2020 13:23	3/19/2020 12:56		3/24/2020
Mercury	IPS Samples	200559-01	SIU-072-01	4/16/2020	<0.1025	0.1025	ug/L		Done	Released	5/7/2020 8:27	4/17/2020 12:12		4/26/2020
Mercury	GBMSD-MPS	200636-12	SIU-072-01	5/13/2020	0.0623	0.0623	ug/L	N4	Done	Released	6/5/2020 9:15	5/15/2020 7:28		5/28/2020

GBF Hg PMP Data
Latest Update Recieved 7/24/20

Year	Month	Influent ng/L	Effluent ng/L	Biosolids mg/Kg
2016	Jan	19	1.3	0.161
	Feb	48.26	1.1	0.114
	Mar	28.15	1.0	0.163
	Apr	129.38	1.3	0.194
	May	136.71	1.5	0.25
	Jun	18.96	0.9	0.393
	Jul	29.89	0.8	0.294
	Aug	60.97	0.9	0.297
	Sep	52.66	0.8	0.331
	Oct	39.76	1.5	0.304
	Nov	71.53	1.1	0.24
	Dec	18.4	1.6	0.19
2017	Jan	49.91	1.4	0.156
	Feb	63.32	1.3	0.127
	Mar	34	1.1	0.146
	Apr	34	1.7	0.138
	May	34	2.1	0.135
	Jun	56.54	1.1	0.203
	Jul	34	1.9	0.157
	Aug	34	0.9	0.275
	Sep	55.29	1.2	0.31
	Oct	48.78	1.5	0.28
	Nov	88.16	1.3	0.24
	Dec	41.64	1.2	0.132
2018	Jan	38	1.2	0.122
	Feb	70	1.3	0.177
	Mar	46	1.1	0.129
	Apr	35	1.0	0.152
	May	85	1.1	0.195
	Jun	61	3.2	0.225
	Jul	53	1.5	0.293
	Aug	87	0.9	0.266
	Sep	232	1.3	0.555
	Oct	53.33	1.6	0.46
	Nov	56.49	1.3	0.35
	Dec	54.68	2.5	0.36
2019	Jan	60	2.0	0.480
	Feb	51	4.7	0.502
	Mar	124	3.1	0.497
	Apr	43	4.1	0.33
	May	51	3.9	0.367
	Jun	<41	1.3	0.282
	Jul	178	3.7	0.374
	Aug	217	2.0	0.020
	Sep	<41	1.7	0.407
	Oct	47	1.0	0.329
	Nov	49	2.6	0.413
	Dec	70	2.4	0.338
2020	Jan	41	1.8	0.273
	Feb	<41	2.2	0.282
	Mar	<41	2.5	0.361
	Apr	<41	2.4	0.332
	May	<41	1.3	0.331

Advanced Industrial Resources, Inc.

Test Results

Green Bay MSD
Green Bay, WI
FBI Stack 08

Notes:

1) tpy-tons per year assumes continuous operation or 8,760 hours per year.

2) Permit FOP No. 405004600-P30 Emission limits

3) 40 CFR 60 LLLL New SSI Emission limits - Table 1

* "Less than' symbol (<) indicates analyte of interest below the analytical detection limit; values reported based upon lab's detection limit

		Units	Run 1	Run 2	Run 3	Averages
Test Date			17-Oct-18	17-Oct-18	17-Oct-18	
Start Time			7:15	11:20	15:00	
End Time			10:22	14:28	18:05	
P_m	Pressure of meter gases	inches Hg	29.74	29.74	29.74	29.74
P_s	Pressure of stack gases	inches Hg	29.66	29.66	29.66	29.66
$V_{m(std)}$	Volume of gas sample	dscf	118.62	119.75	121.58	119.98
$V_{w(std)}$	Volume of water vapor	scf	5.24	5.10	5.38	5.24
B_{ws}	Moisture in stack gas	dimensionless	0.042	0.041	0.042	0.042
$B_{ws,theo}$	Theoretical max. moisture		0.140	0.137	0.140	0.139
$B_{ws,act}$	Actual moisture		0.042	0.041	0.042	0.042
M_d	Mol. Wt. Of gas at DGM	lb./lb.-mole	30.10	30.10	30.11	30.10
M_s	Mol. Wt. Of gas at stack	lb./lb.-mole	29.58	29.60	29.60	29.59
v_s	Velocity of stack gas	ft./sec	50.16	50.44	51.36	50.65
A_n	Area of nozzle	ft^2	0.000252	0.000252	0.000252	0.000252
A_s	Area of stack	ft^2	2.89	2.89	2.89	2.89
Gas Stream Flow Rates						
Q_a	Vol. Flow rate of actual gas	cfm	8,683	8,732	8,891	8,769
Q_{sd}	Vol. Flow rate of dry gas	dscfm	7,420	7,483	7,596	7,500
I	Isokinetic sampling ratio	percent	101.6	101.7	101.8	101.7
Process Data						
$P_{(product\ input}$	Sludge input	dry tons / hr	1.99	1.95	1.90	1.95
Gas Stream Mercury Concentrations						
c_{Hg}	Conc. Of Hg in dry stack gas	mg/dscm	< 0.0001	< 0.0001	< 0.0001	< 0.0001
c'_{Hg}	Hg Conc. Corr. to 7% O_2	mg/dscm @ 7%O_2	< 0.0002	< 0.0002	< 0.0002	**< 0.0002**
$c'_{Hg,\ All}$	Allow. Hg Conc. [3]	mg/dscm @ 7%O_2	0.0010	0.0010	0.0010	**0.0010**
% of All	% of Allowable	%	< 17%	< 17%	< 17%	**< 17%**
c_{Hg}	Conc. Of Hg in dry stack gas	10^{-6} gr/dscf	< 0.07	< 0.06	< 0.06	< 0.06
Mercury Mass Rates						
E_{Hg}	Emission rate of Hg	lb/hour	< 0.000004	< 0.000004	< 0.000004	< 0.000004
		lb/24-hour	< 0.0001	< 0.0001	< 0.0001	< 0.0001
E_{Hg} All	Allowable Hg Em. Rate	lb/24-hour[2]	7.1	7.1	7.1	7.1
% of All	% of Allowable	%	< 0.001%	< 0.001%	< 0.001%	**< 0.001%**
E_{Hg}	Emission rate of Hg	tpy[1]	< 1.8E-05	< 1.8E-05	< 1.8E-05	< 1.8E-05
		lb/ton of dry sludge	< 2.1E-06	< 2.1E-06	< 2.2E-06	< 2.1E-06
Gas Stream Cadmium Concentrations						
c_{Cd}	Conc. Of Cd in dry stack gas	mg/dscm	< 0.00006	< 0.00006	< 0.00006	< 0.00006
c'_{Cd}	Cd Conc. Corr. to 7% O_2	mg/dscm @ 7%O_2	< 0.00007	< 0.00007	< 0.00007	**< 0.00007**
$c'_{Cd,\ All}$	Allow. Cd Conc. [3]	mg/dscm @ 7%O_2	0.0011	0.0011	0.0011	**0.0011**
% of All	% of Allowable	%	< 6%	< 6%	< 6%	**< 6%**

c_{Cd}	Conc. Of Cd in dry stack gas	10^{-6} gr/dscf	< 0.03	< 0.03	< 0.03	< 0.03
Cadmium Mass Rates						
E_{Cd}	Emission rate of Cd	lb/hour	< 1.7E-06	< 1.7E-06	< 1.7E-06	< 1.7E-06
		tpy[1]	< 7.2E-06	< 7.2E-06	< 7.2E-06	< 7.2E-06
		lb/ton of dry sludge	< 8.3E-07	< 8.5E-07	< 8.7E-07	< 8.5E-07
Gas Stream Lead Concentrations						
c_{Pb}	Conc. Of Pb in dry stack gas	mg/dscm	5.15E-04	4.98E-04	2.39E-04	4.18E-04
c'_{Pb}	Pb Conc. Corr. to 7% O_2	mg/dscm @ 7%O_2	0.00059	0.00059	0.00029	**0.00049**
$c'_{Pb, All}$	Allow. Pb Conc. [3]	mg/dscm @ 7%O_2	0.00062	0.00062	0.00062	**0.00062**
% of All	% of Allowable	%	96%	95%	46%	**79%**
c_{Pb}	Conc. Of Pb in dry stack gas	10^{-6} gr/dscf	0.225	0.218	0.105	0.182
Lead Mass Rates						
E_{Pb}	Emission rate of Pb	lb/hour	1.43E-05	1.40E-05	6.81E-06	1.17E-05
		tpy[1]	6.27E-05	6.12E-05	2.98E-05	5.12E-05
		lb/ton of dry sludge	7.18E-06	7.16E-06	3.58E-06	5.97E-06
Gas Stream Beryllium Concentrations						
c_{Be}	Conc. Of Be in dry stack gas	mg/dscm	< 1.5E-05	< 1.5E-05	< 1.5E-05	< 1.5E-05
c'_{Be}	Be Conc. Corrected to 7% O_2	mg/dscm @ 7%O_2	< 0.00002	< 0.00002	< 0.00002	< 0.00002
c_{Be}	Conc. Of Be in dry stack gas	10^{-6} gr/dscf	< 0.007	< 0.006	< 0.006	< 0.006
Beryllium Mass Rates						
E_{Be}	Emission rate of Be	lb/hour	< 4.1E-07	< 4.1E-07	< 4.1E-07	< 4.1E-07
		lb/24-hour	< 0.00001	< 0.00001	< 0.00001	< 0.00001
E_{Be} All	Allowable Be Emission Rate	lb/24-hour[2]	7.1	7.1	7.1	7.1
% of All	% of Allowable	%	< 0.0001%	< 0.0001%	< 0.0001%	**< 0.0001%**
E_{Be}	Emission rate of Be	tpy[1]	< 1.8E-06	< 1.8E-06	< 1.8E-06	< 1.8E-06
		lb/ton of dry sludge	< 2.1E-07	< 2.1E-07	< 2.2E-07	< 2.1E-07
Gas Stream Arsenic Concentrations						
c_{As}	Conc. Of As in dry stack gas	mg/dscm	< 6.0E-05	< 5.9E-05	< 5.8E-05	< 5.9E-05
c'_{As}	As Conc. Corrected to 7% O_2	mg/dscm @ 7%O_2	< 6.9E-05	< 7.0E-05	< 6.9E-05	< 6.9E-05
c_{As}	Conc. Of As in dry stack gas	10^{-6} gr/dscf	< 0.03	< 0.03	< 0.03	< 0.03
Arsenic Mass Rates						
E_{As}	Emission rate of As	lb/hour	< 1.7E-06	< 1.7E-06	< 1.7E-06	< 1.7E-06
		tpy[1]	< 7.2E-06	< 7.2E-06	< 7.2E-06	< 7.2E-06
		lb/ton of dry sludge	< 8.3E-07	< 8.5E-07	< 8.7E-07	< 8.5E-07
Gas Stream Chromium Concentrations						
c_{Cr}	Conc. Of Cr in dry stack gas	mg/dscm	9.08E-04	9.32E-04	7.20E-04	8.53E-04
c'_{Cr}	Cr Conc. Corrected to 7% O_2	mg/dscm @ 7%O_2	1.04E-03	1.10E-03	8.58E-04	1.00E-03
c_{Cr}	Conc. Of Cr in dry stack gas	10^{-6} gr/dscf	0.397	0.407	0.315	0.373
Chromium Mass Rates						
E_{Cr}	Emission rate of Cr	lb/hour	2.52E-05	2.61E-05	2.05E-05	2.40E-05
		tpy[1]	1.11E-04	1.14E-04	8.98E-05	1.05E-04
		lb/ton of dry sludge	1.27E-05	1.34E-05	1.08E-05	1.23E-05
Gas Stream Magnesium Concentrations						
c_{Mg}	Conc. Of Mg in dry stack gas	mg/dscm	1.08E-02	1.30E-02	9.47E-03	1.11E-02
c'_{Mg}	Mg Conc. Corrected to 7% O_2	mg/dscm @ 7%O_2	1.24E-02	1.54E-02	1.13E-02	1.30E-02
c_{Mg}	Conc. Of Mg in dry stack gas	10^{-6} gr/dscf	4.71	5.69	4.14	4.85
MagnesiumMass Rates						
E_{Mg}	Emission rate of Mg	lb/hour	3.00E-04	3.65E-04	2.69E-04	3.11E-04
		tpy[1]	1.31E-03	1.60E-03	1.18E-03	1.36E-03
		lb/ton of dry sludge	1.50E-04	1.87E-04	1.42E-04	1.60E-04
Gas Stream Manganese Concentrations						
c_{Mn}	Conc. Of Mn in dry stack gas	mg/dscm	8.69E-04	1.45E-02	2.11E-03	5.82E-03
c'_{Mn}	Mn Conc. Corrected to 7% O_2	mg/dscm @ 7%O_2	1.00E-03	1.71E-02	2.52E-03	6.88E-03

c_{Mn}	Conc. Of Mn in dry stack gas	10^{-6} gr/dscf	0.38	6.32	0.92	2.54
Manganese Mass Rates						
E_{Mn}	Emission rate of Mn	lb/hour	2.42E-05	4.06E-04	6.02E-05	1.63E-04
		tpy[1]	1.06E-04	1.78E-03	2.64E-04	7.16E-04
		lb/ton of dry sludge	1.21E-05	2.08E-04	3.17E-05	8.39E-05
Gas Stream Nickel Concentrations						
c_{Ni}	Conc. Of Ni in dry stack gas	mg/dscm	7.26E-04	9.44E-04	7.64E-04	8.11E-04
c'_{Ni}	Ni Conc. Corrected to 7% O_2	mg/dscm @ 7%O_2	8.36E-04	1.12E-03	9.10E-04	9.54E-04
c_{Ni}	Conc. Of Ni in dry stack gas	10^{-6} gr/dscf	0.317	0.412	0.334	0.354
Nickel Mass Rates						
E_{Ni}	Emission rate of Ni	lb/hour	2.02E-05	2.65E-05	2.17E-05	2.28E-05
		tpy[1]	8.84E-05	1.16E-04	9.52E-05	9.98E-05
		lb/ton of dry sludge	1.01E-05	1.36E-05	1.14E-05	1.17E-05
Gas Stream Selenium Concentrations						
c_{Se}	Conc. Of Se in dry stack gas	mg/dscm	< 6.0E-05	< 5.9E-05	< 5.8E-05	< 5.9E-05
c'_{Se}	Se Conc. Corrected to 7% O_2	mg/dscm @ 7%O_2	< 6.9E-05	< 7.0E-05	< 6.9E-05	< 6.9E-05
c_{Se}	Conc. Of Se in dry stack gas	10^{-6} gr/dscf	< 2.6E-02	< 2.6E-02	< 2.5E-02	< 2.6E-02
Selenium Mass Rates						
E_{Se}	Emission rate of Se	lb/hour	< 1.7E-06	< 1.7E-06	< 1.7E-06	< 1.7E-06
		tpy[1]	< 7.2E-06	< 7.2E-06	< 7.2E-06	< 7.2E-06
		lb/ton of dry sludge	< 8.3E-07	< 8.5E-07	< 8.7E-07	< 8.5E-07
Gas Stream Zinc Concentrations						
c_{Zn}	Conc. Of Zn in dry stack gas	mg/dscm	2.48E-03	2.82E-03	1.76E-03	2.35E-03
c'_{Zn}	Zn Conc. Corrected to 7% O_2	mg/dscm @ 7%O_2	2.85E-03	3.33E-03	2.10E-03	2.76E-03
c_{Zn}	Conc. Of Zn in dry stack gas	10^{-6} gr/dscf	1.08	1.23	0.77	1.03
Zinc Mass Rates						
E_{Zn}	Emission rate of Zn	lb/hour	6.88E-05	7.90E-05	5.01E-05	6.60E-05
		tpy[1]	3.02E-04	3.46E-04	2.19E-04	2.89E-04
		lb/ton of dry sludge	3.45E-05	4.05E-05	2.64E-05	3.38E-05

Source: Stack Test Oct, 2018

	Grams Hg Per Ton Dry Solids Incinerated
Run 1	0.001035
Run 2	0.001057
Run 3	0.001085
Average	0.001059

Stack Test MHF 1, April 18 - 24,2017 - ETE

Stack Test MHF 2, March 9 - April 25, 2017 - ETE

	Incinerator 1 g/t	Incinerator 2 g/t	Ave of Incinerator 1 and 2 g/t
Run 1	0.04615	0.00301	
Run 2	0.01241	0.01733	
Run 3	0.33582	0.00438	
Average	0.13146	0.00824	0.06985

Stack Test Result Summary - MHF1 4/19/17

Run	Mercury Concentration mg/m^3 dry	Flow Rate m^3/h dry	Sludge Feed Rate dt/hr
1	0.0012	32,933	0.942
2	0.00034	32,746	0.987
3	0.0091	32,576	0.971

Stack Test Result Summary - MHF2 4/25/17

Run	Mercury Concentration mg/m^3 dry	Flow Rate m^3/h dry	Sludge Feed Rate dt/hr
1	0.000082	33,283	0.996
2	0.00047	33,391	0.996
3	0.00012	33,425	1.008

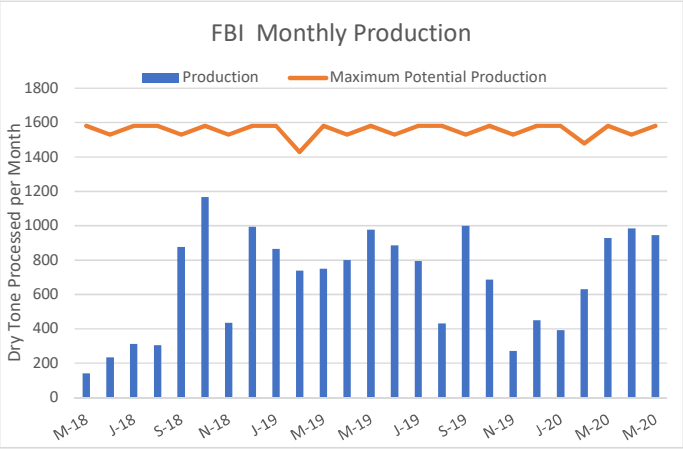
Suez Performance Test Report - Jan, 2019

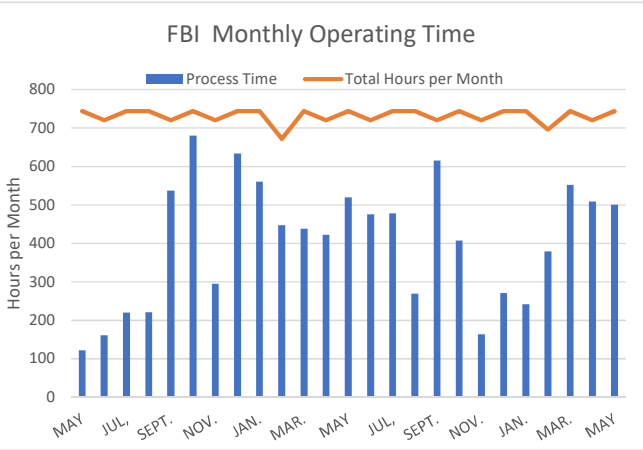
Run No	Total Scrub (gpm)	Ash Pump (gpm)
1	398	422
1	407	430
1	408	441
1	407	438
1	394	425
1	391	417
2	406	422
2	409	420
2	408	444
2	398	437
2	402	414
2	400	451
2	405	433
3	367	377
3	385	384
3	370	410
3	412	405
3	403	428

Miscellaneous Data

Solids Data

Process Time Hours	Water Evaporated Tons	gpm	Total Hours per Month	Hours per 7/5	Days per Mth		Maximum Potential Production	24/5 Potential Production			
	0		744	531	31						
	0		672	480	28						
	0		744	531	31						
	0		720	514	30						
122	271.9875279	8.91049547	744	531	31		1,581	1,129	16.40%	22.96%	12.43%
160.8	371.5224274	9.234463857	720	514	30		1,530	1,093	22.33%	31.27%	21.39%
220.4	649.2649597	11.77397392	744	531	31		1,581	1,129	29.62%	41.47%	27.57%
221.3	705.0321239	12.73327698	744	531	31		1,581	1,129	29.74%	41.64%	27.01%
537.1	2066.154877	15.37518729	720	514	30		1,530	1,093	74.60%	104.44%	80.16%
680.8	2259.64276	13.26578432	744	531	31		1,581	1,129	91.51%	128.11%	103.33%
295.39	838.422763	11.34435913	720	514	30		1,530	1,093	41.03%	57.44%	39.76%
633.44	1721.80513	10.86403629	744	531	31	365	1,581	1,129	85.14%	119.20%	88.00%
560.436	1428.800327	10.18962522	744	531	31		1,581	1,129	75.33%	105.46%	76.67%
447.5533	1362.428735	12.16694916	672	480	28		1,428	1,020	66.60%	93.24%	72.37%
438.75	1367.789735	12.45991	744	531	31		1,581	1,129	58.97%	82.56%	66.35%
422.6833	1247.104129	11.79234803	720	514	30		1,530	1,093	58.71%	82.19%	73.32%
519.6833	1582.296803	12.16919517	744	531	31		1,581	1,129	69.85%	97.79%	86.45%
475.9833	1440.451269	12.09538006	720	514	30		1,530	1,093	66.11%	92.55%	81.01%
478.25	1288.839351	10.77101184	744	531	31		1,581	1,129	64.28%	89.99%	70.40%
269.7333	747.5157762	11.07639508	744	531	31		1,581	1,129	36.25%	50.76%	38.27%
615.7667	1661.890924	10.78695918	720	514	30		1,530	1,093	85.52%	119.73%	91.52%
407.4333	1096.870953	10.75998518	744	531	31		1,581	1,129	54.76%	76.67%	60.73%
163.6167	424.6627879	10.37359672	720	514	30		1,530	1,093	22.72%	31.81%	24.82%
271.2167	729.7936077	10.75465234	744	531	31	365	1,581	1,129	36.45%	51.04%	39.92%
241.75	645.203964	10.66702318	744	531	31		1,581	1,129	32.49%	45.49%	34.75%
378.9333	1016.679477	10.72343544	696	497	29		1,479	1,056	54.44%	76.22%	59.83%
552.25	1424.651028	10.31063625	744	531	31		1,581	1,129	74.23%	103.92%	82.30%
508.8167	1490.42068	11.70739399	720	514	30		1,530	1,093	70.67%	98.94%	90.12%
500.5667	1460.408914	11.66071669	744	531	31		1,581	1,129	67.28%	94.19%	83.80%
261.85	348.6833156	5.322201136	720	514	30		1,530	1,093	36.37%	50.92%	20.13%
			744	531	31						
			744	531	31						
			720	514	30						
			744	531	31						
			720	514	30						
			744	531	31	366					





GBF Plant Effluent Flow Data
Recieved 6/17/2020

Date	LM_B15	LM_B16	Combined Effluent Flow (mgd)	Rolling 30-day Effluent Flow (mgd)
1/1/2016	14.6	15.0	29.7	38.1
1/2/2016	16.0	16.2	32.2	38.0
1/3/2016	16.4	16.6	33.0	38.0
1/4/2016	15.9	16.3	32.2	38.1
1/5/2016	15.9	16.4	32.2	38.2
1/6/2016	15.6	16.0	31.5	38.2
1/7/2016	15.8	16.2	32.1	38.3
1/8/2016	18.3	21.1	39.4	38.6
1/9/2016	22.8	23.7	46.5	39.1
1/10/2016	20.8	21.3	42.1	39.5
1/11/2016	19.5	20.7	40.1	39.9
1/12/2016	18.9	20.1	39.0	39.8
1/13/2016	17.5	19.1	36.6	37.9
1/14/2016	16.7	18.3	35.1	36.8
1/15/2016	16.7	18.2	35.0	36.2
1/16/2016	16.6	17.4	34.0	35.7
1/17/2016	16.0	16.5	32.4	35.3
1/18/2016	16.7	17.3	34.1	35.1
1/19/2016	15.0	16.4	31.4	34.9
1/20/2016	15.1	16.4	31.5	34.7
1/21/2016	15.2	16.3	31.4	34.6
1/22/2016	8.3	23.9	32.3	34.5
1/23/2016	0.0	32.1	32.1	34.4
1/24/2016	0.0	29.1	29.1	34.4
1/25/2016	0.0	32.0	32.0	34.5
1/26/2016	0.0	32.0	32.0	34.5
1/27/2016	0.0	32.9	32.9	34.4
1/28/2016	0.0	31.5	31.5	34.2
1/29/2016	27.6	0.5	28.1	33.8
1/30/2016	26.6	0.0	26.6	33.6
1/31/2016	27.1	0.0	27.1	33.5
2/1/2016	24.3	0.0	24.3	33.3
2/2/2016	28.1	0.0	28.1	33.1
2/3/2016	13.5	16.5	30.0	33.0
2/4/2016	13.4	16.3	29.7	32.9
2/5/2016	13.3	16.0	29.3	32.9
2/6/2016	12.3	15.1	27.3	32.7
2/7/2016	12.7	15.4	28.0	32.3
2/8/2016	13.9	16.5	30.4	31.8
2/9/2016	13.8	16.4	30.2	31.4
2/10/2016	13.5	16.3	29.8	31.0
2/11/2016	13.6	16.8	30.4	30.8
2/12/2016	13.9	16.5	30.4	30.6
2/13/2016	13.1	16.2	29.3	30.4
2/14/2016	12.5	15.8	28.3	30.1
2/15/2016	4.1	26.2	30.4	30.0
2/16/2016	0.0	33.2	33.2	30.0
2/17/2016	0.0	32.3	32.3	30.0
2/18/2016	0.0	30.8	30.8	30.0
2/19/2016	0.0	33.6	33.6	30.0
2/20/2016	18.0	19.6	37.5	30.2
2/21/2016	18.4	20.0	38.4	30.4
2/22/2016	36.3	0.0	36.3	30.6
2/23/2016	34.5	0.0	34.5	30.8
2/24/2016	32.5	0.0	32.5	30.8
2/25/2016	32.7	0.0	32.7	30.8
2/26/2016	15.6	18.6	34.2	30.8
2/27/2016	15.8	18.9	34.7	31.0
2/28/2016	17.5	20.4	37.9	31.3
2/29/2016	18.2	21.2	39.4	31.7
3/1/2016	17.7	20.8	38.4	32.1
3/2/2016	17.0	20.4	37.4	32.5
3/3/2016	16.5	19.8	36.3	32.8
3/4/2016	15.9	19.1	35.0	33.0
3/5/2016	15.0	18.1	33.1	33.1
3/6/2016	15.0	17.9	32.9	33.2
3/7/2016	17.1	19.9	37.0	33.5
3/8/2016	21.5	24.2	45.7	34.1
3/9/2016	22.0	25.4	47.5	34.7
3/10/2016	20.1	23.2	43.2	35.1
3/11/2016	18.7	21.8	40.5	35.5
3/12/2016	17.5	20.3	37.8	35.7
3/13/2016	16.9	19.3	36.2	35.9
3/14/2016	19.1	22.1	41.2	36.3
3/15/2016	19.3	22.2	41.5	36.7
3/16/2016	30.3	33.4	63.7	37.8
3/17/2016	27.8	30.7	58.4	38.7
3/18/2016	21.9	24.9	46.9	39.2
3/19/2016	19.4	22.4	41.8	39.5
3/20/2016	18.4	21.4	39.8	39.7
3/21/2016	17.6	20.6	38.2	39.8
3/22/2016	17.3	21.0	38.2	39.8
3/23/2016	17.8	21.1	38.9	39.8
3/24/2016	18.7	21.8	40.5	40.0
3/25/2016	18.4	21.6	40.0	40.3
3/26/2016	18.7	22.1	40.8	40.6
3/27/2016	21.5	24.8	46.4	41.0
3/28/2016	23.2	26.1	49.2	41.5
3/29/2016	22.3	24.7	47.0	41.8

GBF Plant Effluent Flow Data
Recieved 6/17/2020

Date	LM_B15	LM_B16	Combined Effluent Flow (mgd)	Rolling 30-day Effluent Flow (mgd)
3/30/2016	20.0	23.1	43.1	41.9
3/31/2016	30.8	33.8	64.6	42.8
4/1/2016	28.3	31.4	59.7	43.5
4/2/2016	23.8	26.5	50.3	44.0
4/3/2016	21.1	24.2	45.3	44.3
4/4/2016	20.6	23.3	43.9	44.7
4/5/2016	19.8	22.9	42.6	45.0
4/6/2016	19.5	22.6	42.1	45.2
4/7/2016	18.7	22.1	40.8	45.0
4/8/2016	19.4	22.4	41.8	44.8
4/9/2016	19.1	22.4	41.4	44.8
4/10/2016	18.0	20.9	38.9	44.7
4/11/2016	17.7	20.5	38.1	44.7
4/12/2016	17.6	20.3	37.9	44.8
4/13/2016	18.1	20.6	38.7	44.7
4/14/2016	18.2	20.5	38.6	44.6
4/15/2016	17.2	19.3	36.6	43.7
4/16/2016	16.9	18.6	35.5	42.9
4/17/2016	16.1	16.8	32.9	42.5
4/18/2016	19.0	19.2	38.2	42.3
4/19/2016	15.6	19.0	34.5	42.2
4/20/2016	17.7	19.9	37.6	42.1
4/21/2016	17.5	19.3	36.8	42.1
4/22/2016	17.5	19.3	36.8	42.0
4/23/2016	16.1	17.7	33.8	41.8
4/24/2016	17.1	18.8	35.9	41.7
4/25/2016	17.7	19.6	37.3	41.5
4/26/2016	6.4	32.4	38.7	41.3
4/27/2016	10.4	23.9	34.3	40.8
4/28/2016	16.0	16.8	32.8	40.3
4/29/2016	12.6	18.7	31.3	39.9
4/30/2016			0.0	37.8
5/1/2016			0.0	35.8
5/2/2016			0.0	34.1
5/3/2016			0.0	32.6
5/4/2016			0.0	31.1
5/5/2016	14.8	16.4	31.2	30.8
5/6/2016	12.4	14.6	27.0	30.3
5/7/2016	12.6	14.8	27.4	29.8
5/8/2016	12.6	13.9	26.5	29.3
5/9/2016	13.8	15.0	28.7	28.9
5/10/2016	15.8	17.1	32.9	28.7
5/11/2016	14.5	16.1	30.6	28.4
5/12/2016	15.5	17.0	32.5	28.2
5/13/2016	14.0	16.7	30.7	28.0
5/14/2016	14.5	16.0	30.5	27.7
5/15/2016	13.2	14.9	28.1	27.4
5/16/2016	13.8	14.8	28.5	27.2
5/17/2016	14.1	15.2	29.3	27.1
5/18/2016	13.8	14.7	28.4	26.7
5/19/2016	13.0	14.0	27.1	26.5
5/20/2016	13.3	14.3	27.6	26.2
5/21/2016	12.4	13.5	25.9	25.8
5/22/2016	12.5	13.2	25.7	25.4
5/23/2016	13.1	13.7	26.8	25.2
5/24/2016	13.5	14.3	27.9	24.9
5/25/2016	14.5	15.3	29.8	24.7
5/26/2016	14.3	15.3	29.6	24.4
5/27/2016	17.0	17.1	34.1	24.4
5/28/2016	16.0	16.7	32.7	24.4
5/29/2016	14.1	14.5	28.6	24.3
5/30/2016	12.3	13.2	25.5	25.1
5/31/2016	16.1	15.7	31.7	26.2
6/1/2016	18.2	18.1	36.3	27.4
6/2/2016	16.4	16.1	32.4	28.5
6/3/2016	15.0	15.1	30.1	29.5
6/4/2016	15.8	16.5	32.3	29.5
6/5/2016	14.4	15.2	29.6	29.6
6/6/2016	15.2	16.1	31.2	29.7
6/7/2016	15.3	16.6	31.9	29.9
6/8/2016	13.6	14.4	28.1	29.9
6/9/2016	14.1	14.5	28.6	29.7
6/10/2016	14.0	15.4	29.3	29.7
6/11/2016	16.2	16.2	32.4	29.7
6/12/2016	14.6	14.3	28.9	29.6
6/13/2016	16.0	16.5	32.6	29.7
6/14/2016	3.2	29.3	32.5	29.9
6/15/2016	18.5	16.7	35.2	30.1
6/16/2016	18.4	17.6	36.1	30.3
6/17/2016	16.2	15.0	31.1	30.4
6/18/2016	15.0	13.6	28.5	30.4
6/19/2016	14.1	12.9	27.0	30.4
6/20/2016	15.5	13.4	28.9	30.5
6/21/2016	15.9	14.1	30.0	30.7
6/22/2016	15.6	13.7	29.4	30.7
6/23/2016	15.6	14.2	29.9	30.8
6/24/2016	14.5	13.6	28.1	30.8
6/25/2016	14.5	12.8	27.2	30.7
6/26/2016	15.9	14.0	29.9	30.5

GBF Plant Effluent Flow Data
Recieved 6/17/2020

Date	LM_B15	LM_B16	Combined Effluent Flow (mgd)	Rolling 30-day Effluent Flow (mgd)
6/27/2016	15.8	13.7	29.6	30.4
6/28/2016	13.9	13.0	26.9	30.4
6/29/2016	14.7	13.5	28.1	30.5
6/30/2016	16.2	14.3	30.5	30.4
7/1/2016	16.2	14.6	30.8	30.2
7/2/2016	14.2	13.1	27.2	30.1
7/3/2016	13.5	12.4	25.9	29.9
7/4/2016	12.9	11.8	24.7	29.7
7/5/2016	14.3	12.6	26.9	29.6
7/6/2016	15.1	13.1	28.2	29.5
7/7/2016	16.6	14.5	31.0	29.4
7/8/2016	16.5	14.8	31.3	29.6
7/9/2016	15.3	14.2	29.6	29.6
7/10/2016	13.9	12.4	26.3	29.5
7/11/2016	16.0	14.0	30.0	29.4
7/12/2016	16.0	14.3	30.3	29.5
7/13/2016	15.5	13.9	29.4	29.4
7/14/2016	14.6	13.9	28.6	29.2
7/15/2016	15.1	15.4	30.5	29.1
7/16/2016	13.9	14.1	28.0	28.8
7/17/2016	13.6	13.9	27.5	28.7
7/18/2016	14.0	13.5	27.5	28.6
7/19/2016	14.4	14.0	28.4	28.7
7/20/2016	13.7	13.5	27.2	28.6
7/21/2016	15.6	14.9	30.5	28.6
7/22/2016	13.4	13.9	27.3	28.6
7/23/2016	13.0	13.5	26.5	28.5
7/24/2016	14.5	14.4	28.9	28.5
7/25/2016	14.7	14.2	28.9	28.6
7/26/2016	14.9	14.2	29.1	28.5
7/27/2016	14.2	12.8	27.0	28.4
7/28/2016	17.2	16.0	33.2	28.6
7/29/2016	16.0	15.5	31.5	28.8
7/30/2016	13.3	12.8	26.1	28.6
7/31/2016	12.1	11.8	24.0	28.4
8/1/2016	14.0	14.0	28.0	28.4
8/2/2016	14.5	14.4	28.9	28.5
8/3/2016	14.2	13.8	28.1	28.6
8/4/2016	13.3	12.5	25.8	28.6
8/5/2016	14.1	13.3	27.4	28.6
8/6/2016	12.8	12.3	25.1	28.4
8/7/2016	12.0	11.4	23.3	28.1
8/8/2016	13.1	12.7	25.8	28.0
8/9/2016	13.4	12.7	26.1	28.0
8/10/2016	12.9	12.4	25.3	27.8
8/11/2016	12.9	12.3	25.2	27.6
8/12/2016	14.9	14.2	29.1	27.6
8/13/2016	13.5	13.1	26.6	27.6
8/14/2016	11.8	11.6	23.5	27.3
8/15/2016	12.9	12.8	25.7	27.2
8/16/2016	13.1	13.1	26.2	27.2
8/17/2016	13.1	12.9	26.0	27.2
8/18/2016	13.0	12.7	25.6	27.1
8/19/2016	14.3	14.0	28.3	27.1
8/20/2016	14.6	14.3	29.0	27.0
8/21/2016	12.7	12.8	25.5	27.0
8/22/2016	12.9	13.3	26.2	27.0
8/23/2016	13.2	13.2	26.4	26.9
8/24/2016	17.6	17.7	35.4	27.1
8/25/2016	15.2	15.2	30.4	27.2
8/26/2016	14.0	13.9	27.9	27.2
8/27/2016	14.2	13.9	28.1	27.0
8/28/2016	12.4	12.7	25.1	26.8
8/29/2016	13.5	13.7	27.1	26.8
8/30/2016	13.9	13.9	27.8	27.0
8/31/2016	14.1	13.9	27.9	27.0
9/1/2016	13.6	13.5	27.1	26.9
9/2/2016	13.8	14.2	28.0	26.9
9/3/2016	13.3	13.6	26.9	26.9
9/4/2016	12.0	12.1	24.1	26.8
9/5/2016	12.5	12.7	25.2	26.8
9/6/2016	14.7	14.9	29.6	27.0
9/7/2016	15.8	15.9	31.7	27.2
9/8/2016	14.8	15.0	29.8	27.4
9/9/2016	14.6	14.8	29.4	27.5
9/10/2016	18.7	19.1	37.8	27.9
9/11/2016	14.7	15.6	30.3	28.0
9/12/2016	13.6	14.4	28.0	28.0
9/13/2016	16.4	16.8	33.2	28.3
9/14/2016	14.6	15.0	29.6	28.5
9/15/2016	14.3	14.8	29.1	28.6
9/16/2016	15.8	16.2	32.0	28.8
9/17/2016	15.0	15.3	30.3	28.9
9/18/2016	13.2	13.5	26.7	28.9
9/19/2016	13.6	13.7	27.3	28.8
9/20/2016	13.3	13.6	26.9	28.8
9/21/2016	14.6	14.6	29.2	28.9
9/22/2016	21.2	22.1	43.3	29.5
9/23/2016	19.2	20.0	39.2	29.6

GBF Plant Effluent Flow Data
Recieved 6/17/2020

Date	LM_B15	LM_B16	Combined Effluent Flow (mgd)	Rolling 30-day Effluent Flow (mgd)
9/24/2016	16.7	17.4	34.1	29.8
9/25/2016	15.8	16.3	32.2	29.9
9/26/2016	16.8	17.5	34.3	30.1
9/27/2016	15.8	16.7	32.5	30.4
9/28/2016	14.9	16.0	30.9	30.5
9/29/2016	14.6	15.6	30.3	30.6
9/30/2016	14.6	15.6	30.2	30.6
10/1/2016	14.0	15.1	29.1	30.7
10/2/2016	14.6	15.8	30.4	30.8
10/3/2016	15.1	16.0	31.1	30.9
10/4/2016	15.1	15.8	30.9	31.2
10/5/2016	15.1	15.8	30.9	31.3
10/6/2016	14.7	15.3	29.9	31.4
10/7/2016	14.9	15.2	30.0	31.3
10/8/2016	13.7	14.4	28.1	31.2
10/9/2016	13.0	13.7	26.6	31.2
10/10/2016	13.5	14.2	27.7	30.8
10/11/2016	13.8	14.3	28.1	30.7
10/12/2016	15.9	16.5	32.4	30.9
10/13/2016	15.8	17.0	32.8	30.9
10/14/2016	15.0	16.0	31.1	30.9
10/15/2016	13.6	14.1	27.6	30.9
10/16/2016	0.0	28.8	28.8	30.8
10/17/2016	0.0	27.4	27.4	30.7
10/18/2016	0.0	24.8	24.8	30.6
10/19/2016	0.0	24.6	24.6	30.5
10/20/2016	0.0	25.1	25.1	30.5
10/21/2016	0.0	29.1	29.1	30.5
10/22/2016	0.0	27.2	27.2	29.9
10/23/2016	0.0	25.2	25.2	29.4
10/24/2016	0.0	26.4	26.4	29.2
10/25/2016	0.0	27.4	27.4	29.0
10/26/2016	0.0	32.2	32.2	29.0
10/27/2016	0.0	33.3	33.3	29.0
10/28/2016	14.0	15.9	29.8	29.0
10/29/2016	14.1	13.8	27.9	28.9
10/30/2016	14.4	14.2	28.6	28.8
10/31/2016	14.5	14.4	28.9	28.8
11/1/2016	15.1	14.5	29.6	28.8
11/2/2016	15.0	14.5	29.5	28.7
11/3/2016	14.6	14.2	28.8	28.7
11/4/2016	14.9	14.6	29.5	28.6
11/5/2016	13.6	13.3	26.9	28.5
11/6/2016	13.3	12.9	26.2	28.4
11/7/2016	13.7	13.3	27.0	28.4
11/8/2016	13.9	13.7	27.6	28.4
11/9/2016	13.6	13.6	27.2	28.4
11/10/2016	14.1	14.0	28.1	28.4
11/11/2016	13.9	13.8	27.7	28.2
11/12/2016	12.7	12.9	25.6	28.0
11/13/2016	12.2	12.2	24.4	27.7
11/14/2016	12.6	12.7	25.3	27.7
11/15/2016	12.7	13.0	25.6	27.6
11/16/2016	12.8	12.8	25.7	27.5
11/17/2016	12.7	12.7	25.4	27.5
11/18/2016	14.0	13.8	27.8	27.6
11/19/2016	14.2	14.1	28.3	27.7
11/20/2016	12.7	13.3	26.0	27.6
11/21/2016	13.7	14.5	28.1	27.7
11/22/2016	13.1	14.1	27.2	27.7
11/23/2016	15.1	15.1	30.2	27.9
11/24/2016	15.9	14.5	30.4	28.0
11/25/2016	15.4	13.6	29.0	27.9
11/26/2016	16.1	14.5	30.5	27.8
11/27/2016	15.3	13.9	29.2	27.7
11/28/2016	17.6	16.2	33.8	27.9
11/29/2016	24.1	22.4	46.4	28.5
11/30/2016	21.3	19.7	41.0	28.9
12/1/2016	19.3	17.5	36.8	29.2
12/2/2016	18.1	16.3	34.3	29.3
12/3/2016	17.4	15.6	33.0	29.5
12/4/2016	17.6	16.1	33.7	29.6
12/5/2016	18.5	17.1	35.7	29.9
12/6/2016	18.4	16.8	35.3	30.2
12/7/2016	19.3	17.0	36.2	30.5
12/8/2016	18.9	16.4	35.3	30.8
12/9/2016	18.0	15.6	33.6	31.0
12/10/2016	17.7	15.4	33.1	31.2
12/11/2016	16.5	14.5	31.1	31.3
12/12/2016	17.3	14.9	32.2	31.5
12/13/2016	17.6	15.1	32.7	31.8
12/14/2016	18.0	15.5	33.5	32.0
12/15/2016	17.6	15.2	32.8	32.3
12/16/2016	17.5	15.5	33.0	32.5
12/17/2016	17.3	15.2	32.5	32.8
12/18/2016	16.2	14.0	30.2	32.8
12/19/2016	16.7	14.7	31.4	32.9
12/20/2016	16.4	14.8	31.2	33.1
12/21/2016	15.8	14.4	30.2	33.2

GBF Plant Effluent Flow Data
Recieved 6/17/2020

Date	LM_B15	LM_B16	Combined Effluent Flow (mgd)	Rolling 30-day Effluent Flow (mgd)
12/22/2016	16.2	14.7	30.9	33.3
12/23/2016	16.1	14.7	30.8	33.3
12/24/2016	15.1	14.0	29.0	33.3
12/25/2016	12.7	11.5	24.2	33.1
12/26/2016	23.3	21.5	44.8	33.6
12/27/2016	23.2	20.9	44.1	34.1
12/28/2016	20.2	18.7	38.9	34.3
12/29/2016	19.9	18.1	38.1	34.0
12/30/2016	19.2	17.4	36.6	33.8
12/31/2016	18.0	16.4	34.5	33.8
1/1/2017	15.9	14.4	30.4	33.6
1/2/2017	15.8	14.6	30.4	33.5
1/3/2017	16.8	15.6	32.5	33.5
1/4/2017	18.6	16.3	34.9	33.5
1/5/2017	18.7	16.3	35.0	33.5
1/6/2017	17.6	15.4	33.0	33.4
1/7/2017	16.8	14.5	31.3	33.2
1/8/2017	16.3	14.3	30.6	33.1
1/9/2017	16.5	14.9	31.4	33.1
1/10/2017	18.3	16.7	35.1	33.2
1/11/2017	18.6	16.4	35.0	33.3
1/12/2017	17.1	15.1	32.2	33.3
1/13/2017	16.4	14.2	30.6	33.2
1/14/2017	16.5	14.7	31.2	33.1
1/15/2017	15.5	13.6	29.1	33.0
1/16/2017	15.7	14.1	29.8	32.9
1/17/2017	20.9	19.2	40.0	33.2
1/18/2017	19.3	17.6	36.9	33.4
1/19/2017	18.2	16.7	34.9	33.5
1/20/2017	19.2	18.4	37.6	33.8
1/21/2017	18.9	19.1	38.0	34.0
1/22/2017	18.9	19.1	38.0	34.3
1/23/2017	20.0	19.8	39.8	34.6
1/24/2017	20.0	19.7	39.7	35.1
1/25/2017	21.3	21.0	42.3	35.1
1/26/2017	21.6	21.2	42.8	35.0
1/27/2017	18.6	18.0	36.6	34.9
1/28/2017	18.0	17.4	35.4	34.9
1/29/2017	17.1	16.4	33.5	34.8
1/30/2017	17.1	16.5	33.6	34.7
1/31/2017	16.9	16.5	33.4	34.8
2/1/2017	17.2	16.5	33.8	34.9
2/2/2017	17.5	16.6	34.1	35.0
2/3/2017	17.0	16.2	33.2	34.9
2/4/2017	16.4	16.0	32.4	34.8
2/5/2017	15.7	15.2	30.9	34.8
2/6/2017	15.7	15.5	31.2	34.8
2/7/2017	16.0	16.0	32.0	34.8
2/8/2017	16.5	15.9	32.4	34.9
2/9/2017	16.7	15.8	32.5	34.8
2/10/2017	15.4	15.3	30.7	34.6
2/11/2017	14.7	14.8	29.5	34.5
2/12/2017	14.8	14.6	29.4	34.5
2/13/2017	15.2	14.9	30.0	34.5
2/14/2017	16.7	16.4	33.1	34.6
2/15/2017	16.6	16.1	32.7	34.7
2/16/2017	15.2	15.9	31.2	34.4
2/17/2017	15.2	15.5	30.7	34.2
2/18/2017	15.4	15.6	31.0	34.1
2/19/2017	15.5	15.3	30.8	33.8
2/20/2017	16.9	16.7	33.5	33.7
2/21/2017	18.9	19.1	38.0	33.7
2/22/2017	18.9	18.9	37.8	33.6
2/23/2017	19.4	19.0	38.3	33.6
2/24/2017	19.4	18.7	38.2	33.4
2/25/2017	19.6	18.7	38.3	33.3
2/26/2017	18.3	18.0	36.3	33.3
2/27/2017	18.7	18.6	37.2	33.3
2/28/2017	19.6	19.8	39.4	33.5
3/1/2017	23.9	23.7	47.6	34.0
3/2/2017	22.1	21.7	43.8	34.3
3/3/2017	22.5	21.8	44.4	34.7
3/4/2017	21.0	20.7	41.8	34.9
3/5/2017	19.5	19.8	39.2	35.1
3/6/2017	21.5	22.2	43.7	35.5
3/7/2017	25.0	25.2	50.1	36.2
3/8/2017	24.0	23.5	47.6	36.7
3/9/2017	21.7	21.3	43.0	37.1
3/10/2017	22.0	21.2	43.2	37.4
3/11/2017	20.7	20.2	40.9	37.7
3/12/2017	19.1	18.7	37.7	38.0
3/13/2017	19.6	19.0	38.6	38.3
3/14/2017	19.2	18.8	38.1	38.5
3/15/2017	18.9	18.5	37.4	38.8
3/16/2017	17.9	17.8	35.7	38.9
3/17/2017	18.0	17.9	35.9	39.0
3/18/2017	17.7	17.5	35.2	39.1
3/19/2017	16.2	16.2	32.4	39.2
3/20/2017	18.2	18.4	36.5	39.4

GBF Plant Effluent Flow Data
Recieved 6/17/2020

Date	LM_B15	LM_B16	Combined Effluent Flow (mgd)	Rolling 30-day Effluent Flow (mgd)
3/21/2017	19.5	19.1	38.6	39.6
3/22/2017	19.1	18.7	37.8	39.8
3/23/2017	19.0	18.9	37.8	39.8
3/24/2017	18.0	18.0	36.0	39.7
3/25/2017	21.8	21.7	43.4	39.9
3/26/2017	25.3	25.3	50.6	40.3
3/27/2017	24.8	25.0	49.9	40.7
3/28/2017	22.1	22.4	44.5	40.9
3/29/2017	22.3	22.4	44.8	41.2
3/30/2017	21.8	21.7	43.5	41.3
3/31/2017	23.0	23.5	46.6	41.3
4/1/2017	21.4	21.1	42.5	41.2
4/2/2017	21.8	20.2	42.0	41.2
4/3/2017	22.2	20.5	42.7	41.2
4/4/2017	24.1	22.6	46.7	41.4
4/5/2017	22.8	21.0	43.8	41.4
4/6/2017	22.9	21.2	44.0	41.2
4/7/2017	21.2	19.9	41.2	41.0
4/8/2017	19.9	18.7	38.6	40.9
4/9/2017			0.0	39.4
4/10/2017			0.0	38.1
4/11/2017			0.0	36.8
4/12/2017	19.5	18.5	38.1	36.8
4/13/2017	20.0	18.9	38.9	36.8
4/14/2017	19.5	18.5	38.0	36.9
4/15/2017	21.4	20.3	41.7	37.1
4/16/2017	27.9	26.4	54.3	37.7
4/17/2017	25.4	23.9	49.3	38.1
4/18/2017	0.0	42.6	42.6	38.5
4/19/2017	0.0	36.3	36.3	38.5
4/20/2017	30.4	31.0	61.5	39.2
4/21/2017	29.2	30.2	59.4	39.9
4/22/2017	25.4	26.6	52.0	40.4
4/23/2017	22.6	23.4	46.0	40.8
4/24/2017	21.5	22.7	44.2	40.8
4/25/2017	37.9	0.0	37.9	40.4
4/26/2017	37.1	0.0	37.1	39.9
4/27/2017	24.2	24.2	48.4	40.1
4/28/2017	23.3	23.7	46.9	40.1
4/29/2017	19.4	19.9	39.3	40.0
4/30/2017	19.8	20.0	39.8	39.8
5/1/2017	27.5	28.4	55.9	40.2
5/2/2017	25.0	25.6	50.6	40.5
5/3/2017	21.0	22.3	43.3	40.5
5/4/2017	20.9	22.1	43.1	40.4
5/5/2017	21.8	23.2	45.1	40.4
5/6/2017	20.7	21.9	42.6	40.4
5/7/2017	19.0	19.9	38.9	40.3
5/8/2017	19.7	20.9	40.6	40.4
5/9/2017	20.2	21.2	41.4	41.8
5/10/2017	19.5	20.8	40.3	43.1
5/11/2017	18.8	20.2	39.0	44.4
5/12/2017	19.7	21.0	40.7	44.5
5/13/2017	18.8	19.9	38.7	44.5
5/14/2017	18.8	17.8	36.6	44.4
5/15/2017	19.4	18.4	37.8	44.3
5/16/2017	0.0	41.6	41.6	43.9
5/17/2017	0.0	36.6	36.6	43.5
5/18/2017	20.2	19.6	39.8	43.4
5/19/2017	21.0	17.8	38.8	43.5
5/20/2017	21.3	18.3	39.6	42.7
5/21/2017	21.2	18.4	39.5	42.1
5/22/2017	19.5	16.7	36.2	41.5
5/23/2017	20.1	17.1	37.3	41.2
5/24/2017	23.9	20.8	44.6	41.3
5/25/2017	20.9	18.5	39.4	41.3
5/26/2017	19.7	17.4	37.1	41.3
5/27/2017	17.1	15.2	32.3	40.8
5/28/2017	17.6	15.6	33.3	40.3
5/29/2017	16.9	14.7	31.6	40.1
5/30/2017	16.4	14.2	30.6	39.8
5/31/2017	18.3	16.0	34.2	39.0
6/1/2017	17.1	16.5	33.6	38.5
6/2/2017	16.0	16.0	32.0	38.1
6/3/2017	17.0	16.7	33.7	37.8
6/4/2017	17.0	16.7	33.8	37.4
6/5/2017	17.5	17.1	34.5	37.1
6/6/2017	15.1	15.5	30.7	36.9
6/7/2017	15.1	15.4	30.5	36.5
6/8/2017	15.4	15.8	31.2	36.2
6/9/2017	15.0	15.4	30.4	35.9
6/10/2017	11.6	13.2	24.8	35.4
6/11/2017	11.7	12.8	24.5	34.8
6/12/2017	14.1	14.6	28.7	34.5
6/13/2017	17.7	17.3	35.1	34.5
6/14/2017	16.7	16.7	33.4	34.3
6/15/2017	16.9	16.9	33.8	34.1
6/16/2017	15.7	15.8	31.5	33.9
6/17/2017	15.6	15.7	31.3	33.6

GBF Plant Effluent Flow Data
Recieved 6/17/2020

Date	LM_B15	LM_B16	Combined Effluent Flow (mgd)	Rolling 30-day Effluent Flow (mgd)
6/18/2017	16.2	16.0	32.2	33.4
6/19/2017	17.4	16.9	34.3	33.2
6/20/2017	18.0	17.8	35.9	33.1
6/21/2017	17.5	17.7	35.1	33.0
6/22/2017	19.2	18.6	37.8	33.1
6/23/2017	30.1	7.1	37.2	32.8
6/24/2017	34.6	0.0	34.6	32.7
6/25/2017	31.3	0.0	31.3	32.5
6/26/2017	32.2	0.0	32.2	32.5
6/27/2017	32.4	0.0	32.4	32.4
6/28/2017	33.7	0.0	33.7	32.5
6/29/2017	33.1	0.0	33.1	32.6
6/30/2017	31.9	0.0	31.9	32.5
7/1/2017	29.3	0.0	29.3	32.4
7/2/2017	26.8	0.0	26.8	32.2
7/3/2017	28.1	0.0	28.1	32.0
7/4/2017	27.0	0.0	27.0	31.8
7/5/2017	30.2	0.0	30.2	31.6
7/6/2017	30.3	0.0	30.3	31.6
7/7/2017	31.2	0.0	31.2	31.6
7/8/2017	29.0	0.0	29.0	31.6
7/9/2017	27.3	0.0	27.3	31.5
7/10/2017	28.9	0.0	28.9	31.6
7/11/2017	28.9	0.0	28.9	31.8
7/12/2017	37.7	0.0	37.7	32.1
7/13/2017	33.0	0.0	33.0	32.0
7/14/2017	32.5	0.0	32.5	32.0
7/15/2017	30.2	0.0	30.2	31.8
7/16/2017	31.1	0.0	31.1	31.8
7/17/2017	32.7	0.0	32.7	31.9
7/18/2017	31.8	0.0	31.8	31.9
7/19/2017	29.0	0.0	29.0	31.7
7/20/2017	14.0	14.2	28.1	31.4
7/21/2017	14.0	14.5	28.4	31.2
7/22/2017	13.6	14.0	27.6	30.9
7/23/2017	20.6	19.4	40.0	30.9
7/24/2017	17.7	17.2	34.9	31.0
7/25/2017	15.9	15.3	31.2	31.0
7/26/2017	18.4	17.9	36.3	31.1
7/27/2017	17.6	17.2	34.8	31.2
7/28/2017	17.5	16.9	34.3	31.2
7/29/2017	14.4	15.2	29.6	31.1
7/30/2017	15.3	15.2	30.4	31.0
7/31/2017	14.5	14.9	29.5	31.0
8/1/2017	15.0	14.9	29.8	31.1
8/2/2017	15.5	15.1	30.6	31.2
8/3/2017	15.8	15.4	31.2	31.4
8/4/2017	17.7	17.2	34.9	31.5
8/5/2017	14.9	14.9	29.8	31.5
8/6/2017	14.2	14.1	28.2	31.4
8/7/2017	20.3	9.6	30.0	31.4
8/8/2017	30.3	0.0	30.3	31.5
8/9/2017	14.2	14.7	28.9	31.5
8/10/2017	15.7	15.6	31.3	31.6
8/11/2017	15.6	15.7	31.3	31.4
8/12/2017	12.9	14.2	27.1	31.2
8/13/2017	11.1	12.6	23.7	30.9
8/14/2017	12.8	13.9	26.7	30.8
8/15/2017	14.4	15.8	30.2	30.8
8/16/2017	13.8	14.9	28.7	30.6
8/17/2017	15.3	15.6	30.9	30.6
8/18/2017	14.4	14.8	29.2	30.6
8/19/2017	12.3	13.5	25.7	30.5
8/20/2017	11.3	12.7	24.0	30.4
8/21/2017	12.7	13.8	26.5	30.3
8/22/2017	14.1	14.4	28.5	30.0
8/23/2017	13.7	14.3	27.9	29.7
8/24/2017	14.5	14.2	28.7	29.6
8/25/2017	15.4	14.4	29.8	29.4
8/26/2017	13.5	13.3	26.9	29.2
8/27/2017	12.5	12.5	25.0	28.8
8/28/2017	13.6	13.6	27.1	28.8
8/29/2017	12.6	13.0	25.6	28.6
8/30/2017	13.9	13.6	27.5	28.5
8/31/2017	14.7	14.3	29.0	28.5
9/1/2017	13.8	13.7	27.4	28.4
9/2/2017	13.1	13.0	26.1	28.2
9/3/2017	10.8	11.3	22.1	27.8
9/4/2017	12.3	12.1	24.4	27.6
9/5/2017	14.4	13.8	28.2	27.6
9/6/2017	14.0	14.6	28.5	27.6
9/7/2017	14.1	14.5	28.6	27.5
9/8/2017	13.7	14.5	28.2	27.5
9/9/2017	14.0	13.7	27.7	27.4
9/10/2017	12.8	12.5	25.3	27.2
9/11/2017	13.5	13.0	26.5	27.2
9/12/2017	14.3	14.0	28.3	27.3
9/13/2017	12.8	13.1	25.9	27.3
9/14/2017	11.9	12.5	24.4	27.1

GBF Plant Effluent Flow Data
Recieved 6/17/2020

Date	LM_B15	LM_B16	Combined Effluent Flow (mgd)	Rolling 30-day Effluent Flow (mgd)
9/15/2017	10.4	12.3	22.7	26.9
9/16/2017	9.6	11.5	21.2	26.6
9/17/2017	11.1	11.0	22.1	26.3
9/18/2017	11.6	11.8	23.4	26.3
9/19/2017	11.8	12.3	24.1	26.3
9/20/2017	12.9	13.0	26.0	26.2
9/21/2017	12.5	12.8	25.3	26.1
9/22/2017	12.1	12.8	24.9	26.0
9/23/2017	11.0	11.9	22.9	25.8
9/24/2017	10.9	11.5	22.5	25.6
9/25/2017	11.4	12.1	23.6	25.5
9/26/2017	12.8	12.8	25.6	25.5
9/27/2017	13.3	12.7	26.0	25.5
9/28/2017	12.6	12.5	25.2	25.4
9/29/2017	12.4	12.8	25.2	25.4
9/30/2017	10.8	11.2	22.1	25.1
10/1/2017	11.4	11.2	22.6	25.0
10/2/2017	11.7	11.6	23.4	24.9
10/3/2017	11.5	11.8	23.4	24.9
10/4/2017	13.8	13.1	26.9	25.0
10/5/2017	12.9	12.4	25.3	24.9
10/6/2017	12.2	12.0	24.2	24.8
10/7/2017	15.1	14.9	30.0	24.8
10/8/2017	12.3	12.0	24.3	24.7
10/9/2017	13.0	12.6	25.6	24.6
10/10/2017	14.8	14.2	29.0	24.7
10/11/2017	14.4	14.1	28.5	24.8
10/12/2017	14.3	14.0	28.2	24.8
10/13/2017	13.6	13.3	26.9	24.8
10/14/2017	14.7	14.4	29.1	25.0
10/15/2017	19.2	18.7	37.9	25.5
10/16/2017	16.6	16.1	32.7	25.9
10/17/2017	15.5	15.1	30.6	26.2
10/18/2017	14.6	14.2	28.8	26.4
10/19/2017	14.3	13.6	27.9	26.5
10/20/2017	13.6	13.1	26.7	26.5
10/21/2017	12.3	12.0	24.3	26.5
10/22/2017	13.2	12.8	26.0	26.5
10/23/2017	14.7	14.4	29.1	26.7
10/24/2017	15.4	14.7	30.1	27.0
10/25/2017	15.2	14.6	29.8	27.2
10/26/2017	14.2	14.1	28.3	27.3
10/27/2017	14.6	14.2	28.7	27.4
10/28/2017	13.3	13.1	26.4	27.4
10/29/2017	12.3	12.1	24.4	27.4
10/30/2017	14.2	13.6	27.8	27.6
10/31/2017	14.2	13.4	27.6	27.7
11/1/2017	14.5	14.1	28.6	27.9
11/2/2017	15.4	15.2	30.6	28.1
11/3/2017	14.3	13.7	28.1	28.2
11/4/2017	14.0	13.5	27.5	28.3
11/5/2017	12.9	12.6	25.5	28.3
11/6/2017	13.0	12.4	25.4	28.2
11/7/2017	14.0	13.4	27.3	28.3
11/8/2017	14.2	13.6	27.8	28.3
11/9/2017	14.6	13.7	28.3	28.3
11/10/2017	15.3	14.6	29.9	28.3
11/11/2017	12.3	12.2	24.6	28.2
11/12/2017	12.4	12.3	24.7	28.2
11/13/2017	12.1	11.9	24.1	28.0
11/14/2017	13.0	13.0	26.0	27.6
11/15/2017	13.2	13.7	26.9	27.4
11/16/2017	12.2	13.1	25.3	27.2
11/17/2017	13.9	13.9	27.8	27.2
11/18/2017	14.5	14.1	28.6	27.2
11/19/2017	13.9	13.2	27.1	27.2
11/20/2017	13.4	13.0	26.4	27.3
11/21/2017	14.1	13.1	27.2	27.3
11/22/2017	14.2	13.5	27.7	27.3
11/23/2017	13.0	12.5	25.5	27.1
11/24/2017	12.6	12.3	24.9	27.0
11/25/2017	13.3	12.5	25.8	26.9
11/26/2017	12.6	11.8	24.4	26.7
11/27/2017	13.7	13.1	26.8	26.8
11/28/2017	12.9	12.6	25.5	26.8
11/29/2017	13.7	13.0	26.7	26.8
11/30/2017	14.4	13.9	28.3	26.8
12/1/2017	14.9	14.7	29.6	26.8
12/2/2017	14.5	14.0	28.5	26.7
12/3/2017	14.5	14.2	28.7	26.8
12/4/2017	14.1	14.2	28.3	26.8
12/5/2017	14.5	13.5	27.9	26.9
12/6/2017	14.4	13.4	27.8	27.0
12/7/2017	14.4	13.6	28.0	27.0
12/8/2017	14.1	13.5	27.6	27.0
12/9/2017	14.1	13.4	27.5	26.9
12/10/2017	12.8	12.3	25.1	26.8
12/11/2017	13.3	12.9	26.2	26.8
12/12/2017	15.7	15.0	30.7	27.0

GBF Plant Effluent Flow Data
Recieved 6/17/2020

Date	LM_B15	LM_B16	Combined Effluent Flow (mgd)	Rolling 30-day Effluent Flow (mgd)
12/13/2017	16.6	16.2	32.8	27.3
12/14/2017	14.7	14.4	29.1	27.4
12/15/2017	13.4	13.2	26.6	27.4
12/16/2017	13.4	13.2	26.6	27.5
12/17/2017	12.5	12.2	24.7	27.4
12/18/2017	13.6	13.2	26.8	27.3
12/19/2017	13.8	13.1	26.9	27.3
12/20/2017	14.0	13.2	27.2	27.3
12/21/2017	13.7	13.2	26.9	27.3
12/22/2017	13.8	13.3	27.1	27.3
12/23/2017	14.0	13.2	27.3	27.4
12/24/2017	13.3	12.7	26.0	27.4
12/25/2017	11.3	10.3	21.5	27.2
12/26/2017	14.8	13.7	28.5	27.4
12/27/2017	14.9	14.1	28.9	27.5
12/28/2017	14.4	13.8	28.2	27.5
12/29/2017	13.6	12.8	26.4	27.5
12/30/2017	13.3	12.1	25.4	27.4
12/31/2017	12.3	11.4	23.6	27.2
1/1/2018	12.2	11.2	23.4	27.1
1/2/2018	13.1	12.0	25.2	26.9
1/3/2018	13.6	12.5	26.1	26.9
1/4/2018	13.6	12.6	26.2	26.8
1/5/2018	12.7	12.1	24.8	26.7
1/6/2018	13.3	12.6	25.9	26.6
1/7/2018	12.3	11.8	24.1	26.5
1/8/2018	12.6	12.2	24.7	26.4
1/9/2018	12.8	12.6	25.4	26.4
1/10/2018	13.0	13.0	26.1	26.4
1/11/2018	15.0	15.0	30.0	26.4
1/12/2018	14.7	13.8	28.6	26.3
1/13/2018	13.9	13.0	26.9	26.2
1/14/2018	12.8	12.0	24.8	26.1
1/15/2018	12.7	12.1	24.8	26.1
1/16/2018	12.9	12.3	25.3	26.1
1/17/2018	12.8	12.2	25.1	26.0
1/18/2018	13.1	12.5	25.6	26.0
1/19/2018	13.3	12.8	26.1	26.0
1/20/2018	12.7	12.3	25.0	25.9
1/21/2018	11.9	11.5	23.4	25.8
1/22/2018	15.6	15.1	30.7	25.9
1/23/2018	15.5	14.8	30.3	26.0
1/24/2018	14.6	14.0	28.6	26.3
1/25/2018			0.0	25.3
1/26/2018	13.8	13.6	27.4	25.3
1/27/2018	14.1	13.4	27.6	25.2
1/28/2018	13.1	12.3	25.4	25.2
1/29/2018	14.0	13.4	27.3	25.3
1/30/2018	14.3	13.9	28.2	25.4
1/31/2018	13.4	13.1	26.5	25.5
2/1/2018	14.2	13.3	27.5	25.6
2/2/2018	14.2	13.4	27.5	25.6
2/3/2018	13.2	12.9	26.0	25.6
2/4/2018	12.6	12.1	24.7	25.6
2/5/2018	13.5	12.9	26.4	25.7
2/6/2018	14.1	13.4	27.4	25.8
2/7/2018	13.7	13.3	27.0	25.8
2/8/2018	13.6	13.1	26.6	25.9
2/9/2018	13.4	13.1	26.4	25.9
2/10/2018	13.0	12.6	25.6	25.8
2/11/2018	12.2	11.8	24.0	25.6
2/12/2018	13.2	12.6	25.8	25.6
2/13/2018	13.3	13.1	26.4	25.6
2/14/2018	12.9	12.9	25.8	25.7
2/15/2018	14.6	14.5	29.1	25.8
2/16/2018	14.3	13.5	27.9	25.9
2/17/2018	13.9	13.3	27.2	25.9
2/18/2018	12.8	12.4	25.2	25.9
2/19/2018	13.3	12.8	26.1	25.9
2/20/2018	16.0	15.4	31.4	26.2
2/21/2018	15.0	14.1	29.2	26.2
2/22/2018	13.7	13.4	27.1	26.0
2/23/2018	15.1	14.7	29.8	26.1
2/24/2018	14.4	13.8	28.2	27.0
2/25/2018	17.4	16.6	34.0	27.2
2/26/2018	14.7	14.0	28.7	27.3
2/27/2018	14.5	14.0	28.5	27.4
2/28/2018	15.2	14.5	29.7	27.5
3/1/2018	15.9	15.3	31.3	27.6
3/2/2018	14.9	14.5	29.4	27.7
3/3/2018	14.2	13.5	27.6	27.7
3/4/2018	13.8	13.2	27.0	27.7
3/5/2018	14.5	13.8	28.3	27.7
3/6/2018	15.4	14.7	30.1	27.9
3/7/2018	15.8	14.9	30.7	28.1
3/8/2018	15.3	14.5	29.9	28.1
3/9/2018	14.7	14.2	28.8	28.2
3/10/2018	14.3	13.7	28.0	28.2
3/11/2018	13.5	12.9	26.5	28.2

GBF Plant Effluent Flow Data
Recieved 6/17/2020

Date	LM_B15	LM_B16	Combined Effluent Flow (mgd)	Rolling 30-day Effluent Flow (mgd)
3/12/2018	14.9	14.1	29.0	28.4
3/13/2018	15.5	14.8	30.3	28.6
3/14/2018	3.1	26.0	29.1	28.7
3/15/2018	0.0	26.8	26.8	28.7
3/16/2018	0.0	26.4	26.4	28.7
3/17/2018	14.0	12.3	26.3	28.6
3/18/2018	14.3	12.1	26.4	28.6
3/19/2018	15.5	12.8	28.3	28.6
3/20/2018	15.8	13.4	29.2	28.7
3/21/2018	15.0	12.9	27.9	28.8
3/22/2018	15.3	13.0	28.3	28.7
3/23/2018	14.8	12.4	27.1	28.6
3/24/2018	14.7	12.2	26.9	28.6
3/25/2018	13.9	11.6	25.5	28.5
3/26/2018	14.7	12.3	27.0	28.4
3/27/2018	16.2	13.7	29.9	28.3
3/28/2018	16.1	13.4	29.5	28.3
3/29/2018	15.9	13.2	29.1	28.3
3/30/2018	15.5	12.9	28.4	28.3
3/31/2018	16.7	13.9	30.6	28.3
4/1/2018	16.3	13.4	29.7	28.3
4/2/2018	16.3	13.8	30.1	28.4
4/3/2018	17.6	14.8	32.4	28.5
4/4/2018	18.0	15.1	33.1	28.7
4/5/2018	17.6	14.9	32.4	28.8
4/6/2018	18.2	15.1	33.2	28.9
4/7/2018	18.0	15.0	33.0	29.0
4/8/2018	16.2	13.8	30.0	29.0
4/9/2018	16.7	14.4	31.1	29.1
4/10/2018	17.9	15.0	32.9	29.3
4/11/2018	18.2	15.5	33.7	29.5
4/12/2018	20.6	17.6	38.2	29.8
4/13/2018	24.1	20.8	44.9	30.3
4/14/2018	26.8	23.0	49.8	31.0
4/15/2018	24.6	21.1	45.6	31.7
4/16/2018	24.5	21.0	45.5	32.3
4/17/2018	24.5	20.8	45.4	33.0
4/18/2018	23.0	20.1	43.1	33.5
4/19/2018	22.2	20.0	42.2	33.9
4/20/2018	26.9	23.8	50.7	34.6
4/21/2018	31.2	27.5	58.7	35.7
4/22/2018	5.9	54.0	59.9	36.8
4/23/2018	33.8	29.4	63.2	38.0
4/24/2018	32.7	28.1	60.8	39.1
4/25/2018	29.8	25.7	55.5	40.1
4/26/2018	50.5	0.0	50.5	40.8
4/27/2018	46.6	0.0	46.6	41.3
4/28/2018	17.0	26.1	43.1	41.8
4/29/2018	0.0	37.6	37.6	42.1
4/30/2018	0.0	37.7	37.7	42.4
5/1/2018			0.0	41.4
5/2/2018	27.7	24.5	52.2	42.1
5/3/2018	25.2	22.3	47.5	42.6
5/4/2018	42.8	38.6	81.4	44.2
5/5/2018	31.3	27.8	59.1	45.1
5/6/2018	26.6	23.4	50.0	45.7
5/7/2018	24.2	21.5	45.7	46.1
5/8/2018	22.4	19.8	42.3	46.5
5/9/2018	25.8	22.3	48.1	47.1
5/10/2018	25.7	22.4	48.2	47.6
5/11/2018	24.7	21.4	46.1	48.0
5/12/2018	22.4	19.9	42.2	48.1
5/13/2018	18.9	16.7	35.6	47.8
5/14/2018	19.5	17.1	36.6	47.4
5/15/2018	19.8	17.2	37.0	47.1
5/16/2018	17.5	15.1	32.6	46.6
5/17/2018	18.9	15.6	34.5	46.3
5/18/2018	19.4	16.5	35.9	46.0
5/19/2018	19.9	17.0	36.9	45.9
5/20/2018	17.2	14.7	31.9	45.2
5/21/2018	18.5	15.8	34.3	44.4
5/22/2018	19.6	17.0	36.6	43.7
5/23/2018	17.1	14.8	32.0	42.6
5/24/2018	17.5	14.9	32.4	41.7
5/25/2018	17.8	15.0	32.8	40.9
5/26/2018	16.9	14.3	31.2	40.3
5/27/2018	13.8	12.5	26.2	39.6
5/28/2018	12.5	11.6	24.1	39.0
5/29/2018	15.6	13.3	28.9	38.7
5/30/2018	17.0	14.5	31.5	38.5
5/31/2018	16.9	14.3	31.2	39.5
6/1/2018	15.8	13.3	29.2	38.7
6/2/2018	17.4	14.9	32.3	38.2
6/3/2018	17.6	14.9	32.5	36.6
6/4/2018	16.4	13.8	30.2	35.6
6/5/2018	15.4	13.2	28.6	34.9
6/6/2018	14.2	12.4	26.6	34.3
6/7/2018	14.3	12.8	27.1	33.8
6/8/2018	16.2	13.5	29.7	33.2

GBF Plant Effluent Flow Data
Recieved 6/17/2020

Date	LM_B15	LM_B16	Combined Effluent Flow (mgd)	Rolling 30-day Effluent Flow (mgd)
6/9/2018	16.3	13.8	30.1	32.6
6/10/2018	15.2	13.2	28.4	32.0
6/11/2018	14.2	13.0	27.3	31.5
6/12/2018	16.3	16.1	32.4	31.4
6/13/2018	15.0	15.2	30.2	31.2
6/14/2018	13.9	14.4	28.4	30.9
6/15/2018	17.1	16.5	33.6	30.9
6/16/2018	17.5	17.1	34.6	30.9
6/17/2018	15.6	15.5	31.1	30.7
6/18/2018	28.0	27.3	55.3	31.4
6/19/2018	22.2	21.7	44.0	31.8
6/20/2018	20.0	19.9	40.0	31.9
6/21/2018	18.9	18.6	37.5	32.0
6/22/2018	16.9	16.7	33.6	32.0
6/23/2018	15.8	15.8	31.6	32.0
6/24/2018	15.4	15.4	30.8	31.9
6/25/2018	17.0	16.2	33.2	32.0
6/26/2018	16.2	15.5	31.6	32.2
6/27/2018	15.8	15.5	31.4	32.4
6/28/2018	14.3	14.9	29.2	32.4
6/29/2018	12.2	13.5	25.7	32.2
6/30/2018	12.1	12.9	25.0	32.0
7/1/2018	12.8	13.0	25.7	31.9
7/2/2018	13.6	13.7	27.3	31.8
7/3/2018	12.6	13.4	26.1	31.5
7/4/2018	14.4	14.2	28.7	31.5
7/5/2018	13.6	14.4	28.0	31.5
7/6/2018	14.1	14.6	28.7	31.5
7/7/2018	12.9	13.4	26.4	31.5
7/8/2018	12.3	12.9	25.2	31.4
7/9/2018	13.5	13.7	27.2	31.3
7/10/2018	12.9	13.8	26.7	31.2
7/11/2018	13.9	14.1	28.0	31.2
7/12/2018	14.3	14.1	28.4	31.1
7/13/2018	13.7	14.3	28.0	31.0
7/14/2018	12.8	13.8	26.6	31.0
7/15/2018	11.9	12.6	24.5	30.7
7/16/2018	15.4	15.1	30.5	30.5
7/17/2018	14.6	15.2	29.7	30.5
7/18/2018	13.8	14.6	28.4	29.6
7/19/2018	11.9	12.4	24.3	28.9
7/20/2018	15.4	15.6	31.0	28.6
7/21/2018	16.8	16.9	33.7	28.5
7/22/2018	15.4	15.7	31.1	28.4
7/23/2018	15.5	15.7	31.2	28.4
7/24/2018	15.6	16.0	31.6	28.4
7/25/2018	14.9	14.8	29.8	28.3
7/26/2018	15.9	15.8	31.7	28.3
7/27/2018	14.7	15.0	29.7	28.3
7/28/2018	12.0	13.1	25.1	28.1
7/29/2018	11.5	12.6	24.1	28.1
7/30/2018	12.4	13.5	25.8	28.1
7/31/2018	12.3	13.7	25.9	28.1
8/1/2018	14.9	15.1	30.0	28.2
8/2/2018	16.2	16.3	32.5	28.4
8/3/2018	13.2	14.5	27.7	28.4
8/4/2018	12.0	13.2	25.2	28.3
8/5/2018	12.2	13.0	25.2	28.2
8/6/2018	12.9	13.5	26.3	28.2
8/7/2018	13.4	14.3	27.7	28.3
8/8/2018	12.5	13.7	26.1	28.2
8/9/2018	12.2	13.9	26.1	28.2
8/10/2018	12.1	13.7	25.8	28.1
8/11/2018	11.6	12.6	24.1	28.0
8/12/2018	11.5	12.1	23.6	27.8
8/13/2018	13.0	14.3	27.3	27.9
8/14/2018	11.6	12.3	23.9	27.8
8/15/2018	12.3	13.2	25.6	27.7
8/16/2018	12.3	12.9	25.2	27.5
8/17/2018	12.5	13.5	26.0	27.4
8/18/2018	11.8	12.5	24.3	27.5
8/19/2018	10.8	11.4	22.2	27.2
8/20/2018	11.6	12.2	23.9	26.8
8/21/2018	14.0	14.1	28.1	26.7
8/22/2018	11.4	12.1	23.5	26.5
8/23/2018	11.2	12.3	23.5	26.2
8/24/2018	11.7	12.1	23.8	26.0
8/25/2018	11.4	12.4	23.9	25.7
8/26/2018	11.4	12.3	23.6	25.5
8/27/2018	14.7	15.5	30.2	25.7
8/28/2018	27.7	27.3	55.1	26.7
8/29/2018	26.9	26.6	53.5	27.7
8/30/2018	19.2	19.2	38.4	28.1
8/31/2018	17.1	17.3	34.4	28.2
9/1/2018	14.6	15.5	30.1	28.1
9/2/2018	12.7	14.2	26.9	28.1
9/3/2018	13.4	14.4	27.8	28.2
9/4/2018	34.8	34.0	68.8	29.7
9/5/2018	30.8	30.4	61.2	30.8

GBF Plant Effluent Flow Data
Recieved 6/17/2020

Date	LM_B15	LM_B16	Combined Effluent Flow (mgd)	Rolling 30-day Effluent Flow (mgd)
9/6/2018	24.1	23.9	47.9	31.5
9/7/2018	21.0	21.0	42.0	32.0
9/8/2018	19.8	20.0	39.9	32.5
9/9/2018	17.7	18.2	35.9	32.8
9/10/2018	17.1	17.5	34.6	33.2
9/11/2018	16.9	17.5	34.3	33.5
9/12/2018	15.3	16.4	31.7	33.7
9/13/2018	13.1	14.7	27.8	33.8
9/14/2018	13.1	15.1	28.2	33.9
9/15/2018	11.9	13.9	25.8	33.9
9/16/2018	11.6	13.7	25.2	33.9
9/17/2018	14.8	16.5	31.3	34.1
9/18/2018	28.5	29.1	57.6	35.3
9/19/2018	20.3	21.4	41.6	35.9
9/20/2018	20.0	21.4	41.4	36.3
9/21/2018	23.5	24.5	48.0	37.1
9/22/2018	19.8	20.8	40.6	37.7
9/23/2018	17.6	18.9	36.5	38.1
9/24/2018	17.9	19.2	37.1	38.6
9/25/2018	16.2	17.8	33.9	38.9
9/26/2018	16.3	17.5	33.8	39.0
9/27/2018	15.1	16.7	31.8	38.3
9/28/2018	15.8	16.8	32.6	37.6
9/29/2018	15.7	16.6	32.3	37.4
9/30/2018	14.0	15.7	29.7	37.2
10/1/2018	16.3	17.8	34.1	37.3
10/2/2018	19.6	20.6	40.2	37.8
10/3/2018	16.1	18.0	34.0	38.0
10/4/2018	16.4	17.6	34.0	36.8
10/5/2018	15.4	16.9	32.3	35.9
10/6/2018	15.5	17.0	32.5	35.4
10/7/2018	14.4	16.0	30.4	35.0
10/8/2018	23.0	24.7	47.7	35.2
10/9/2018	24.6	26.2	50.8	35.7
10/10/2018	31.9	33.0	64.9	36.7
10/11/2018	30.6	31.0	61.6	37.7
10/12/2018	24.7	25.5	50.2	38.3
10/13/2018	21.4	22.5	43.9	38.8
10/14/2018	19.0	20.4	39.3	39.2
10/15/2018	20.6	21.8	42.4	39.7
10/16/2018	19.4	21.1	40.5	40.2
10/17/2018	18.0	19.4	37.4	40.4
10/18/2018	17.4	19.1	36.5	39.7
10/19/2018	16.9	18.6	35.5	39.5
10/20/2018	15.5	17.4	32.9	39.3
10/21/2018	14.2	16.3	30.5	38.7
10/22/2018	15.2	17.2	32.4	38.4
10/23/2018	16.0	17.0	33.1	38.3
10/24/2018	15.2	16.4	31.7	38.1
10/25/2018	15.5	16.6	32.1	38.0
10/26/2018	15.6	16.7	32.2	38.0
10/27/2018	14.4	15.7	30.1	37.9
10/28/2018	14.5	15.8	30.4	37.9
10/29/2018	13.1	16.2	29.3	37.8
10/30/2018	3.4	28.1	31.5	37.8
10/31/2018	12.7	14.3	27.0	37.6
11/1/2018	16.8	14.2	31.0	37.3
11/2/2018	16.8	14.5	31.3	37.2
11/3/2018	15.7	13.5	29.1	37.0
11/4/2018	16.6	14.5	31.1	37.0
11/5/2018	17.3	15.2	32.5	37.0
11/6/2018	21.7	18.7	40.4	37.3
11/7/2018	20.9	18.1	39.0	37.0
11/8/2018	20.1	17.8	37.8	36.6
11/9/2018	19.8	17.4	37.2	35.7
11/10/2018	20.3	17.6	37.9	34.9
11/11/2018	18.0	15.9	33.9	34.3
11/12/2018	18.2	15.6	33.8	34.0
11/13/2018	18.5	15.7	34.1	33.8
11/14/2018	18.3	15.7	34.0	33.6
11/15/2018	18.0	15.6	33.6	33.3
11/16/2018	17.8	15.2	33.0	33.2
11/17/2018	16.5	14.0	30.5	33.0
11/18/2018	16.1	13.7	29.7	32.8
11/19/2018	17.7	15.1	32.8	32.8
11/20/2018	17.8	15.0	32.8	32.9
11/21/2018	17.8	15.0	32.8	32.9
11/22/2018	15.9	13.5	29.4	32.7
11/23/2018	15.0	13.2	28.2	32.6
11/24/2018	16.5	14.4	31.0	32.6
11/25/2018	16.0	13.6	29.6	32.5
11/26/2018	17.0	14.4	31.4	32.6
11/27/2018	17.4	14.6	32.0	32.6
11/28/2018	17.4	14.7	32.1	32.7
11/29/2018	17.3	14.8	32.0	32.7
11/30/2018	16.7	14.3	31.0	32.8
12/1/2018	16.7	14.2	30.9	32.8
12/2/2018	20.5	17.5	38.0	33.1
12/3/2018	20.9	17.7	38.6	33.4

GBF Plant Effluent Flow Data
Recieved 6/17/2020

Date	LM_B15	LM_B16	Combined Effluent Flow (mgd)	Rolling 30-day Effluent Flow (mgd)
12/4/2018	20.5	17.2	37.7	33.6
12/5/2018	19.8	16.5	36.2	33.7
12/6/2018	20.0	16.6	36.6	33.6
12/7/2018	18.9	15.5	34.4	33.4
12/8/2018	18.2	15.2	33.4	33.3
12/9/2018	17.2	14.6	31.7	33.1
12/10/2018	17.9	15.3	33.1	32.9
12/11/2018	17.7	15.5	33.2	32.9
12/12/2018	17.0	15.1	32.1	32.9
12/13/2018	16.9	15.0	31.9	32.8
12/14/2018	17.0	14.9	31.8	32.7
12/15/2018	16.4	14.4	30.9	32.6
12/16/2018	15.8	13.9	29.7	32.5
12/17/2018	16.4	14.6	31.0	32.5
12/18/2018	16.2	14.7	30.9	32.6
12/19/2018	16.1	14.8	30.8	32.5
12/20/2018	16.3	14.9	31.2	32.5
12/21/2018	17.4	15.5	32.9	32.5
12/22/2018	16.6	15.2	31.8	32.5
12/23/2018	15.1	13.8	28.9	32.6
12/24/2018	14.7	13.2	27.9	32.5
12/25/2018	12.7	11.5	24.2	32.3
12/26/2018	16.1	14.7	30.8	32.3
12/27/2018	17.8	16.5	34.3	32.3
12/28/2018	18.9	17.3	36.1	32.5
12/29/2018	18.2	16.3	34.4	32.6
12/30/2018	16.7	15.1	31.7	32.6
12/31/2018	16.9	15.4	32.3	32.6
1/1/2019	16.4	14.8	31.2	32.4
1/2/2019	17.0	15.4	32.4	32.2
1/3/2019	16.9	15.3	32.2	32.0
1/4/2019	17.0	15.5	32.5	31.9
1/5/2019	16.4	15.0	31.4	31.7
1/6/2019	15.8	14.3	30.1	31.6
1/7/2019	23.8	21.8	45.6	32.0
1/8/2019	25.8	23.4	49.2	32.6
1/9/2019	23.3	20.8	44.0	32.9
1/10/2019	20.9	19.0	40.0	33.1
1/11/2019	20.1	18.4	38.4	33.4
1/12/2019	18.8	17.2	36.0	33.5
1/13/2019	17.5	16.1	33.6	33.6
1/14/2019	18.2	16.5	34.7	33.7
1/15/2019	18.4	16.7	35.1	33.9
1/16/2019	18.0	16.2	34.2	34.0
1/17/2019	17.9	16.4	34.3	34.1
1/18/2019	18.1	16.3	34.4	34.2
1/19/2019	16.4	14.9	31.3	34.2
1/20/2019	15.4	14.4	29.8	34.1
1/21/2019	18.1	16.6	34.7	34.2
1/22/2019	16.9	15.4	32.3	34.3
1/23/2019	16.3	14.7	31.0	34.4
1/24/2019	17.0	15.1	32.1	34.7
1/25/2019	17.2	15.2	32.4	34.7
1/26/2019	15.8	14.3	30.1	34.6
1/27/2019	16.3	14.5	30.7	34.4
1/28/2019	16.8	15.2	32.0	34.3
1/29/2019	15.5	13.8	29.3	34.2
1/30/2019	16.4	14.2	30.6	34.2
1/31/2019	16.5	14.6	31.2	34.2
2/1/2019	17.3	15.5	32.8	34.2
2/2/2019	16.0	14.4	30.4	34.1
2/3/2019	15.2	14.0	29.2	34.0
2/4/2019	17.5	15.8	33.2	34.1
2/5/2019	18.1	16.2	34.3	34.2
2/6/2019	17.3	15.5	32.8	33.8
2/7/2019	16.9	15.3	32.2	33.2
2/8/2019	17.1	14.8	31.9	32.8
2/9/2019	16.8	14.9	31.7	32.6
2/10/2019	16.0	14.4	30.5	32.3
2/11/2019	16.2	14.7	30.9	32.1
2/12/2019	16.9	15.4	32.4	32.1
2/13/2019	16.0	14.5	30.5	31.9
2/14/2019	16.0	14.6	30.6	31.8
2/15/2019	17.1	15.2	32.3	31.7
2/16/2019	15.9	14.2	30.1	31.6
2/17/2019	15.2	13.6	28.8	31.4
2/18/2019	15.9	14.1	30.0	31.4
2/19/2019	16.2	14.6	30.8	31.4
2/20/2019	16.9	15.3	32.2	31.3
2/21/2019	16.5	14.7	31.2	31.3
2/22/2019	16.5	14.7	31.2	31.3
2/23/2019	15.3	13.8	29.1	31.2
2/24/2019	17.9	16.0	34.0	31.2
2/25/2019	17.7	15.7	33.4	31.3
2/26/2019	17.2	15.5	32.8	31.4
2/27/2019	17.7	16.0	33.6	31.5
2/28/2019	17.2	15.6	32.8	31.6
3/1/2019	16.2	14.6	30.7	31.6
3/2/2019	15.7	14.0	29.8	31.5

GBF Plant Effluent Flow Data
Recieved 6/17/2020

Date	LM_B15	LM_B16	Combined Effluent Flow (mgd)	Rolling 30-day Effluent Flow (mgd)
3/3/2019	16.0	14.3	30.4	31.5
3/4/2019	16.5	14.6	31.1	31.5
3/5/2019	17.5	15.5	33.0	31.6
3/6/2019	17.8	15.8	33.6	31.6
3/7/2019	15.9	14.1	30.0	31.5
3/8/2019	15.8	14.2	30.0	31.4
3/9/2019	15.7	14.2	30.0	31.3
3/10/2019	16.0	14.4	30.4	31.3
3/11/2019	16.4	14.7	31.1	31.2
3/12/2019	17.6	16.0	33.6	31.3
3/13/2019	27.4	25.5	52.9	32.1
3/14/2019	48.1	45.0	93.2	34.1
3/15/2019	53.1	49.6	102.8	36.5
3/16/2019	34.7	32.4	67.1	37.7
3/17/2019	26.7	24.8	51.5	38.4
3/18/2019	26.9	24.9	51.9	39.1
3/19/2019	28.1	26.3	54.4	40.0
3/20/2019	30.0	28.0	58.0	40.9
3/21/2019	29.7	28.0	57.6	41.8
3/22/2019	28.3	26.6	54.9	42.5
3/23/2019	26.3	24.9	51.2	43.2
3/24/2019	25.6	23.9	49.6	43.8
3/25/2019	25.5	24.0	49.4	44.5
3/26/2019	22.8	21.6	44.4	44.8
3/27/2019	23.1	22.0	45.2	45.2
3/28/2019	24.1	22.8	46.9	45.7
3/29/2019	23.9	22.4	46.2	46.1
3/30/2019	23.1	21.6	44.7	46.5
3/31/2019	22.6	21.1	43.7	46.9
4/1/2019	20.6	19.5	40.1	47.3
4/2/2019	20.9	19.9	40.8	47.6
4/3/2019	22.2	20.9	43.1	48.0
4/4/2019	20.4	19.2	39.5	48.3
4/5/2019	20.5	19.4	39.9	48.5
4/6/2019	19.7	18.4	38.0	48.7
4/7/2019	0.0	40.7	40.7	49.1
4/8/2019	0.0	45.6	45.6	49.6
4/9/2019	0.0	42.1	42.1	50.0
4/10/2019	0.0	40.4	40.4	50.3
4/11/2019	33.3	6.2	39.6	50.5
4/12/2019	46.4	0.0	46.4	50.3
4/13/2019	25.7	26.0	51.7	48.9
4/14/2019	24.3	25.2	49.5	47.1
4/15/2019	21.4	23.0	44.3	46.4
4/16/2019	21.3	23.1	44.4	46.2
4/17/2019	24.3	25.2	49.5	46.1
4/18/2019	29.9	30.7	60.7	46.3
4/19/2019	24.5	25.6	50.1	46.0
4/20/2019	21.2	22.5	43.6	45.5
4/21/2019	19.3	20.5	39.7	45.0
4/22/2019	22.6	23.2	45.8	44.9
4/23/2019	33.9	34.9	68.8	45.5
4/24/2019	25.0	26.4	51.4	45.6
4/25/2019	22.8	23.8	46.6	45.6
4/26/2019	23.2	24.1	47.3	45.7
4/27/2019	22.1	22.6	44.7	45.6
4/28/2019	19.8	20.8	40.7	45.5
4/29/2019	21.9	22.3	44.2	45.4
4/30/2019	22.2	23.1	45.3	45.5
5/1/2019	26.3	27.5	53.8	45.9
5/2/2019	24.3	25.7	50.0	46.3
5/3/2019	22.2	23.6	45.8	46.3
5/4/2019	19.9	21.4	41.3	46.4
5/5/2019	18.4	19.6	38.0	46.3
5/6/2019	19.9	20.6	40.6	46.4
5/7/2019	19.5	20.4	39.8	46.4
5/8/2019	20.7	21.1	41.8	46.3
5/9/2019	26.1	27.0	53.1	46.6
5/10/2019	23.6	24.7	48.3	46.9
5/11/2019	21.0	22.3	43.3	47.0
5/12/2019	19.5	20.4	39.9	46.8
5/13/2019	19.1	20.3	39.4	46.4
5/14/2019	18.8	19.9	38.7	46.0
5/15/2019	18.0	19.3	37.3	45.8
5/16/2019	19.1	20.1	39.2	45.6
5/17/2019	19.2	19.7	38.9	45.3
5/18/2019	20.0	20.3	40.3	44.6
5/19/2019	23.8	24.6	48.4	44.5
5/20/2019	21.2	22.6	43.8	44.5
5/21/2019	20.5	21.6	42.2	44.6
5/22/2019	21.8	23.1	44.9	44.6
5/23/2019	20.9	22.0	42.9	43.7
5/24/2019	20.0	20.9	40.9	43.4
5/25/2019	20.3	22.0	42.3	43.2
5/26/2019	17.9	19.2	37.1	42.9
5/27/2019	19.7	20.2	40.0	42.7
5/28/2019	37.9	39.3	77.2	44.0
5/29/2019	27.7	29.7	57.4	44.4
5/30/2019	23.2	25.1	48.3	44.5

GBF Plant Effluent Flow Data
Recieved 6/17/2020

Date	LM_B15	LM_B16	Combined Effluent Flow (mgd)	Rolling 30-day Effluent Flow (mgd)
5/31/2019	21.9	23.5	45.4	44.2
6/1/2019	23.2	24.1	47.3	44.1
6/2/2019	20.6	22.1	42.7	44.0
6/3/2019	21.7	23.1	44.7	44.1
6/4/2019	20.5	21.8	42.3	44.3
6/5/2019	20.8	22.2	43.0	44.4
6/6/2019	19.3	20.9	40.1	44.4
6/7/2019	18.3	20.0	38.3	44.3
6/8/2019	17.6	18.7	36.3	43.7
6/9/2019	17.7	18.4	36.0	43.3
6/10/2019	17.7	18.9	36.6	43.1
6/11/2019	17.1	18.6	35.7	42.9
6/12/2019	21.1	22.0	43.1	43.0
6/13/2019	23.3	23.8	47.1	43.3
6/14/2019	23.0	24.0	47.0	43.6
6/15/2019	20.8	22.4	43.2	43.8
6/16/2019	19.4	20.6	40.1	43.8
6/17/2019	18.8	20.4	39.2	43.8
6/18/2019	19.8	21.0	40.8	43.5
6/19/2019	20.8	22.3	43.1	43.5
6/20/2019	19.6	21.0	40.6	43.5
6/21/2019	19.0	20.4	39.4	43.3
6/22/2019	17.5	18.7	36.2	43.0
6/23/2019	17.1	18.1	35.2	42.9
6/24/2019	21.1	22.0	43.1	42.9
6/25/2019	21.4	22.7	44.1	43.1
6/26/2019	19.0	20.3	39.3	43.1
6/27/2019	19.8	21.0	40.8	41.9
6/28/2019	22.6	24.0	46.6	41.5
6/29/2019	19.6	21.1	40.6	41.3
6/30/2019	19.5	20.1	39.7	41.1
7/1/2019	19.2	20.1	39.3	40.8
7/2/2019	19.8	20.9	40.7	40.7
7/3/2019	19.5	20.8	40.3	40.6
7/4/2019	18.0	19.0	37.0	40.4
7/5/2019	17.5	18.7	36.1	40.2
7/6/2019	20.0	20.6	40.6	40.2
7/7/2019	18.4	19.2	37.6	40.2
7/8/2019	18.1	19.2	37.4	40.2
7/9/2019	19.4	20.1	39.4	40.3
7/10/2019	18.2	18.7	36.9	40.3
7/11/2019	18.6	19.3	37.9	40.4
7/12/2019	17.0	18.0	35.1	40.1
7/13/2019	16.6	17.5	34.1	39.7
7/14/2019	14.8	16.3	31.0	39.2
7/15/2019	16.9	17.7	34.6	38.9
7/16/2019	17.9	18.2	36.1	38.8
7/17/2019	17.6	18.0	35.6	38.6
7/18/2019	18.1	18.6	36.7	38.5
7/19/2019	18.1	18.9	37.0	38.3
7/20/2019	28.2	28.5	56.7	38.8
7/21/2019	23.4	24.4	47.9	39.1
7/22/2019	21.7	22.7	44.4	39.4
7/23/2019	21.5	22.1	43.6	39.7
7/24/2019	20.4	21.1	41.5	39.6
7/25/2019	19.8	20.4	40.3	39.5
7/26/2019	18.2	19.2	37.3	39.4
7/27/2019	15.8	17.7	33.6	39.2
7/28/2019	14.9	16.4	31.3	38.7
7/29/2019	17.5	18.0	35.4	38.5
7/30/2019	16.9	17.8	34.7	38.3
7/31/2019	16.3	17.6	33.9	38.2
8/1/2019	14.0	15.5	29.5	37.8
8/2/2019	15.2	17.0	32.2	37.5
8/3/2019	15.6	17.3	32.9	37.4
8/4/2019	15.3	17.2	32.5	37.3
8/5/2019	18.5	19.2	37.7	37.2
8/6/2019	21.2	21.8	43.0	37.3
8/7/2019	23.4	24.1	47.4	37.7
8/8/2019	30.3	30.9	61.2	38.4
8/9/2019	23.1	23.6	46.7	38.7
8/10/2019	19.9	20.3	40.3	38.8
8/11/2019	17.3	18.1	35.4	38.8
8/12/2019	16.8	18.3	35.1	38.9
8/13/2019	18.7	19.7	38.4	39.1
8/14/2019	17.0	18.4	35.4	39.1
8/15/2019	16.0	17.7	33.7	39.0
8/16/2019	16.5	18.1	34.6	39.0
8/17/2019	14.9	17.2	32.1	38.9
8/18/2019	13.5	16.1	29.6	38.6
8/19/2019	14.7	17.1	31.8	37.8
8/20/2019	14.3	16.9	31.3	37.2
8/21/2019	25.1	7.1	32.1	36.8
8/22/2019	14.6	15.4	30.0	36.4
8/23/2019	14.3	16.2	30.5	36.0
8/24/2019	12.9	15.1	28.0	35.6
8/25/2019	11.8	14.3	26.1	35.2
8/26/2019	16.0	17.1	33.1	35.2
8/27/2019	16.7	17.8	34.5	35.3

GBF Plant Effluent Flow Data
Recieved 6/17/2020

Date	LM_B15	LM_B16	Combined Effluent Flow (mgd)	Rolling 30-day Effluent Flow (mgd)
8/28/2019	15.2	16.6	31.8	35.2
8/29/2019	15.1	16.5	31.6	35.1
8/30/2019	13.7	15.6	29.3	34.9
8/31/2019	13.4	15.1	28.4	34.9
9/1/2019	12.0	14.3	26.3	34.7
9/2/2019	10.4	13.1	23.5	34.4
9/3/2019	22.0	23.3	45.3	34.8
9/4/2019	19.6	20.8	40.4	34.9
9/5/2019	17.9	19.1	36.9	34.7
9/6/2019	17.4	18.8	36.1	34.3
9/7/2019	16.3	17.9	34.3	33.4
9/8/2019	15.5	16.7	32.2	32.9
9/9/2019	15.4	16.8	32.2	32.7
9/10/2019	30.6	31.9	62.5	33.6
9/11/2019	38.8	39.3	78.2	35.0
9/12/2019	37.6	38.4	76.1	36.3
9/13/2019	39.6	40.3	80.0	37.8
9/14/2019	28.0	27.0	55.1	38.5
9/15/2019	24.0	25.1	49.1	38.9
9/16/2019	22.2	23.4	45.6	39.4
9/17/2019	21.0	22.6	43.7	39.9
9/18/2019	21.4	22.9	44.2	40.3
9/19/2019	22.5	24.0	46.5	40.8
9/20/2019	22.2	23.4	45.6	41.2
9/21/2019	20.7	21.9	42.5	41.7
9/22/2019	25.9	26.7	52.6	42.4
9/23/2019	26.7	27.5	54.2	43.3
9/24/2019	24.0	25.0	49.1	44.0
9/25/2019	22.3	22.9	45.2	44.4
9/26/2019	22.4	23.0	45.4	44.8
9/27/2019	25.7	26.0	51.8	45.5
9/28/2019	24.2	24.5	48.7	46.0
9/29/2019	23.5	23.9	47.5	46.6
9/30/2019	22.2	23.3	45.5	47.2
10/1/2019	24.6	25.3	49.9	48.0
10/2/2019	41.6	40.9	82.5	50.0
10/3/2019	35.3	35.2	70.6	50.8
10/4/2019	29.5	29.6	59.1	51.4
10/5/2019	26.5	26.9	53.4	52.0
10/6/2019	24.2	24.6	48.8	52.4
10/7/2019	22.9	23.4	46.4	52.8
10/8/2019	22.4	23.0	45.4	53.2
10/9/2019	21.6	22.2	43.8	53.6
10/10/2019	21.3	21.8	43.1	53.0
10/11/2019	25.7	25.8	51.5	52.1
10/12/2019	24.6	24.7	49.3	51.2
10/13/2019	22.5	22.8	45.3	50.0
10/14/2019	21.6	22.0	43.6	49.7
10/15/2019	22.4	22.8	45.2	49.5
10/16/2019	23.3	23.7	47.1	49.6
10/17/2019	21.6	22.1	43.7	49.6
10/18/2019	21.0	21.4	42.5	49.5
10/19/2019	21.5	21.9	43.3	49.4
10/20/2019	19.6	19.7	39.3	49.2
10/21/2019	20.3	20.3	40.7	49.1
10/22/2019	21.6	21.4	43.0	48.8
10/23/2019	20.8	20.7	41.4	48.4
10/24/2019	32.6	6.9	39.5	48.1
10/25/2019	37.9	0.0	37.9	47.8
10/26/2019	18.4	18.6	37.0	47.6
10/27/2019	19.2	19.4	38.7	47.1
10/28/2019	19.6	19.7	39.3	46.8
10/29/2019	19.5	20.2	39.7	46.5
10/30/2019	18.6	20.2	38.8	46.3
10/31/2019	19.6	21.0	40.6	46.0
11/1/2019	18.3	20.0	38.3	44.5
11/2/2019	17.7	19.2	36.9	43.4
11/3/2019	16.0	17.6	33.6	42.6
11/4/2019	17.2	18.9	36.0	42.0
11/5/2019	15.9	17.6	33.5	41.5
11/6/2019	17.0	18.9	35.9	41.1
11/7/2019	18.9	20.7	39.6	40.9
11/8/2019	16.4	18.3	34.7	40.6
11/9/2019	16.0	18.0	34.0	40.3
11/10/2019	16.1	18.0	34.1	39.7
11/11/2019	16.9	18.6	35.5	39.3
11/12/2019	17.0	18.8	35.8	39.0
11/13/2019	16.9	19.1	36.0	38.7
11/14/2019	17.0	18.1	35.1	38.4
11/15/2019	16.1	17.1	33.2	37.9
11/16/2019	16.8	17.9	34.7	37.6
11/17/2019	15.4	17.0	32.3	37.3
11/18/2019	17.1	18.4	35.5	37.0
11/19/2019	17.8	19.1	36.9	36.9
11/20/2019	17.4	18.7	36.1	36.8
11/21/2019	21.6	22.6	44.3	36.8
11/22/2019	23.7	24.3	48.0	37.0
11/23/2019	20.4	21.2	41.6	37.1
11/24/2019	19.2	20.1	39.4	37.2

GBF Plant Effluent Flow Data
Recieved 6/17/2020

Date	LM_B15	LM_B16	Combined Effluent Flow (mgd)	Rolling 30-day Effluent Flow (mgd)
11/25/2019	19.2	20.0	39.2	37.2
11/26/2019	19.0	19.8	38.9	37.2
11/27/2019	33.0	32.8	65.8	38.1
11/28/2019	27.4	27.6	55.0	38.6
11/29/2019	24.8	25.3	50.1	39.0
11/30/2019	25.0	25.4	50.5	39.3
12/1/2019	30.1	30.1	60.2	40.1
12/2/2019	28.7	28.6	57.3	40.8
12/3/2019	26.1	26.5	52.6	41.4
12/4/2019	24.0	24.4	48.5	41.8
12/5/2019	23.6	24.2	47.8	42.3
12/6/2019	23.5	23.8	47.3	42.7
12/7/2019	22.6	23.0	45.6	42.9
12/8/2019	20.7	21.3	42.0	43.1
12/9/2019	22.3	22.7	45.0	43.5
12/10/2019	22.4	22.4	44.8	43.8
12/11/2019	22.0	22.1	44.0	44.1
12/12/2019	21.4	21.8	43.2	44.4
12/13/2019	21.1	21.6	42.7	44.6
12/14/2019	20.7	21.3	42.0	44.8
12/15/2019	19.5	19.9	39.3	45.0
12/16/2019	19.8	20.2	40.0	45.2
12/17/2019	19.6	19.9	39.5	45.4
12/18/2019	18.3	18.5	36.8	45.5
12/19/2019	18.3	18.8	37.0	45.5
12/20/2019	17.7	18.4	36.2	45.5
12/21/2019	17.9	18.3	36.3	45.2
12/22/2019	16.3	16.8	33.1	44.7
12/23/2019	17.8	18.2	36.0	44.5
12/24/2019	18.4	19.1	37.4	44.5
12/25/2019	14.9	15.7	30.6	44.2
12/26/2019	17.7	18.3	36.0	44.1
12/27/2019	19.0	19.2	38.2	43.2
12/28/2019	18.1	18.6	36.7	42.6
12/29/2019	27.9	27.8	55.7	42.7
12/30/2019	36.2	35.2	71.4	43.4
12/31/2019	32.4	31.3	63.7	43.6
1/1/2020	26.4	25.8	52.2	43.4
1/2/2020	25.9	25.4	51.3	43.3
1/3/2020	25.8	25.4	51.2	43.4
1/4/2020	24.4	23.9	48.3	43.5
1/5/2020	23.4	23.0	46.3	43.4
1/6/2020	24.2	23.4	47.7	43.5
1/7/2020	23.8	23.2	47.0	43.7
1/8/2020	21.7	21.4	43.1	43.6
1/9/2020	20.4	20.8	41.2	43.5
1/10/2020	20.4	20.6	41.0	43.4
1/11/2020	19.9	20.3	40.2	43.3
1/12/2020	19.6	20.4	40.0	43.2
1/13/2020	19.3	20.5	39.8	43.1
1/14/2020	19.1	20.3	39.4	43.1
1/15/2020	19.1	20.1	39.3	43.1
1/16/2020	20.1	20.8	40.9	43.1
1/17/2020	18.1	18.9	37.0	43.1
1/18/2020	18.1	18.9	37.0	43.1
1/19/2020	17.7	18.2	35.9	43.1
1/20/2020	18.2	18.8	37.0	43.2
1/21/2020	18.1	18.4	36.5	43.3
1/22/2020	18.5	19.2	37.7	43.3
1/23/2020	18.0	18.8	36.8	43.3
1/24/2020	17.5	18.3	35.8	43.5
1/25/2020	17.4	18.3	35.7	43.5
1/26/2020	16.2	16.7	32.9	43.3
1/27/2020	16.6	17.0	33.6	43.2
1/28/2020	18.6	18.7	37.3	42.6
1/29/2020	18.0	18.1	36.1	41.4
1/30/2020	16.8	16.9	33.7	40.4
1/31/2020	16.4	16.5	32.9	39.8
2/1/2020	16.1	16.3	32.4	39.1
2/2/2020	16.0	16.1	32.1	38.5
2/3/2020	18.2	18.0	36.2	38.1
2/4/2020	18.5	18.1	36.6	37.8
2/5/2020	18.6	18.2	36.8	37.4
2/6/2020	18.5	18.1	36.6	37.1
2/7/2020	17.5	16.9	34.4	36.8
2/8/2020	17.2	16.7	33.9	36.5
2/9/2020	16.7	16.2	32.9	36.2
2/10/2020	17.0	16.4	33.4	36.0
2/11/2020	17.4	16.7	34.1	35.8
2/12/2020	17.2	16.4	33.6	35.6
2/13/2020	17.2	16.0	33.2	35.4
2/14/2020	17.0	15.9	32.9	35.2
2/15/2020	16.4	15.4	31.7	34.9
2/16/2020	15.8	14.7	30.5	34.7
2/17/2020	17.2	16.1	33.2	34.6
2/18/2020	17.3	16.2	33.5	34.5
2/19/2020	17.5	16.2	33.7	34.4
2/20/2020	17.2	15.9	33.1	34.2
2/21/2020	16.9	15.7	32.6	34.1

GBF Plant Effluent Flow Data
Recieved 6/17/2020

Date	LM_B15	LM_B16	Combined Effluent Flow (mgd)	Rolling 30-day Effluent Flow (mgd)
2/22/2020	16.7	15.4	32.1	33.9
2/23/2020	15.9	14.8	30.7	33.7
2/24/2020	17.2	15.7	32.9	33.7
2/25/2020	17.5	16.1	33.6	33.7
2/26/2020	17.3	16.0	33.3	33.7
2/27/2020	17.7	16.2	34.0	33.6
2/28/2020	17.4	16.1	33.5	33.5
2/29/2020	16.5	15.2	31.7	33.4
3/1/2020	15.3	14.5	29.7	33.3
3/2/2020	17.7	16.4	34.1	33.4
3/3/2020	19.8	18.3	38.1	33.6
3/4/2020	19.9	18.3	38.2	33.6
3/5/2020	19.9	18.5	38.4	33.7
3/6/2020	19.8	18.2	38.0	33.7
3/7/2020	19.7	18.5	38.2	33.8
3/8/2020	20.5	19.3	39.9	34.0
3/9/2020	28.8	26.4	55.1	34.7
3/10/2020	33.7	30.9	64.6	35.7
3/11/2020	30.0	27.6	57.7	36.5
3/12/2020	31.9	29.5	61.4	37.4
3/13/2020	33.0	30.2	63.2	38.4
3/14/2020	28.3	26.1	54.4	39.1
3/15/2020	26.3	24.3	50.6	39.7
3/16/2020	25.5	23.5	49.0	40.3
3/17/2020	24.5	22.7	47.2	40.9
3/18/2020	23.8	22.2	46.0	41.3
3/19/2020	28.0	25.7	53.7	42.0
3/20/2020	38.7	36.1	74.8	43.3
3/21/2020	31.4	29.2	60.5	44.2
3/22/2020	27.8	26.0	53.9	44.9
3/23/2020	25.8	24.4	50.2	45.5
3/24/2020	24.3	23.0	47.3	46.1
3/25/2020	24.6	23.3	47.9	46.6
3/26/2020	30.1	28.4	58.6	47.4
3/27/2020	26.9	25.5	52.4	48.1
3/28/2020	29.3	27.7	57.0	48.8
3/29/2020	41.7	39.0	80.8	50.4
3/30/2020	34.3	32.3	66.6	51.6
3/31/2020	31.2	29.4	60.6	52.6
4/1/2020	28.0	26.8	54.8	53.3
4/2/2020	25.8	25.2	51.0	53.7
4/3/2020	23.8	23.3	47.1	54.0
4/4/2020	23.2	22.4	45.6	54.3
4/5/2020	21.6	21.0	42.6	54.4
4/6/2020	21.6	21.1	42.7	54.6
4/7/2020	21.9	21.2	43.1	54.7
4/8/2020	21.1	20.6	41.7	54.2
4/9/2020	21.3	20.5	41.8	53.5
4/10/2020	20.0	19.5	39.6	52.9
4/11/2020	17.7	17.6	35.2	52.0
4/12/2020	18.4	17.7	36.1	51.1
4/13/2020	24.6	23.5	48.1	50.9
4/14/2020	22.5	21.5	44.1	50.7
4/15/2020	22.2	21.4	43.6	50.5
4/16/2020	20.8	20.2	41.0	50.3
4/17/2020	21.8	21.2	43.0	50.2
4/18/2020	19.3	18.5	37.8	49.6
4/19/2020	18.1	17.1	35.2	48.3
4/20/2020	18.1	17.3	35.4	47.5
4/21/2020	17.9	17.3	35.2	46.9
4/22/2020	17.6	17.3	34.9	46.4
4/23/2020	17.4	17.2	34.6	45.9
4/24/2020	16.1	16.0	32.1	45.4
4/25/2020	16.5	16.3	32.8	44.5
4/26/2020	15.6	15.7	31.3	43.8
4/27/2020	17.4	17.0	34.4	43.1
4/28/2020	18.1	17.8	35.9	41.6
4/29/2020	22.9	22.1	45.1	40.9
4/30/2020	22.0	21.8	43.8	40.3
5/1/2020	18.3	17.9	36.2	39.7
5/2/2020	26.3	10.3	36.6	39.2
5/3/2020	36.2	0.0	36.2	38.8
5/4/2020	37.6	0.0	37.6	38.6
5/5/2020	37.0	0.0	37.0	38.4
5/6/2020	34.5	0.0	34.5	38.1
5/7/2020	16.5	18.1	34.6	37.8
5/8/2020	17.4	18.7	36.1	37.7
5/9/2020	16.0	18.0	34.0	37.4
5/10/2020	0.0	32.0	32.0	37.1
5/11/2020	0.0	32.1	32.1	37.0
5/12/2020	0.0	34.0	34.0	37.0
5/13/2020	0.0	33.2	33.2	36.5
5/14/2020	0.0	33.6	33.6	36.1
5/15/2020	14.3	15.7	30.0	35.7
5/16/2020	13.9	14.5	28.5	35.3
5/17/2020	18.0	18.3	36.4	35.0
5/18/2020	45.6	44.6	90.3	36.8
5/19/2020	36.7	36.9	73.5	38.1
5/20/2020	27.8	28.6	56.4	38.8

GBF Plant Effluent Flow Data
Recieved 6/17/2020

Date	LM_B15	LM_B16	Combined Effluent Flow (mgd)	Rolling 30-day Effluent Flow (mgd)
5/21/2020	22.9	24.1	47.0	39.2
5/22/2020	21.3	22.1	43.3	39.4
5/23/2020	19.7	20.4	40.1	39.6
5/24/2020	19.1	19.9	39.0	39.8
5/25/2020	16.4	17.5	33.9	39.9
5/26/2020	17.7	18.8	36.5	40.1
5/27/2020	17.7	18.3	35.9	40.1
5/28/2020	29.4	28.9	58.3	40.9
5/29/2020	31.5	31.1	62.6	41.4
5/30/2020	24.6	24.5	49.1	41.6
5/31/2020	20.7	21.0	41.7	41.8
6/1/2020	21.1	21.4	42.6	42.0
6/2/2020	19.2	20.3	39.6	42.1
6/3/2020	18.6	19.3	37.9	42.1
6/4/2020	18.7	19.5	38.2	42.2
6/5/2020	18.2	18.8	37.0	42.2
6/6/2020	17.6	17.9	35.5	42.3
6/7/2020	17.2	17.5	34.6	42.2
6/8/2020	16.8	17.6	34.4	42.2
6/9/2020	16.6	17.2	33.8	42.3
6/10/2020	20.9	20.9	41.8	42.6
6/11/2020	21.3	21.5	42.8	42.9
6/12/2020	19.1	19.5	38.6	43.1
6/13/2020	17.2	18.0	35.2	43.1
6/14/2020	16.0	16.6	32.5	43.2
6/15/2020	17.3	17.9	35.1	43.5
6/16/2020	16.8	17.5	34.3	43.4

Appendix B
Mass Balance Analysis

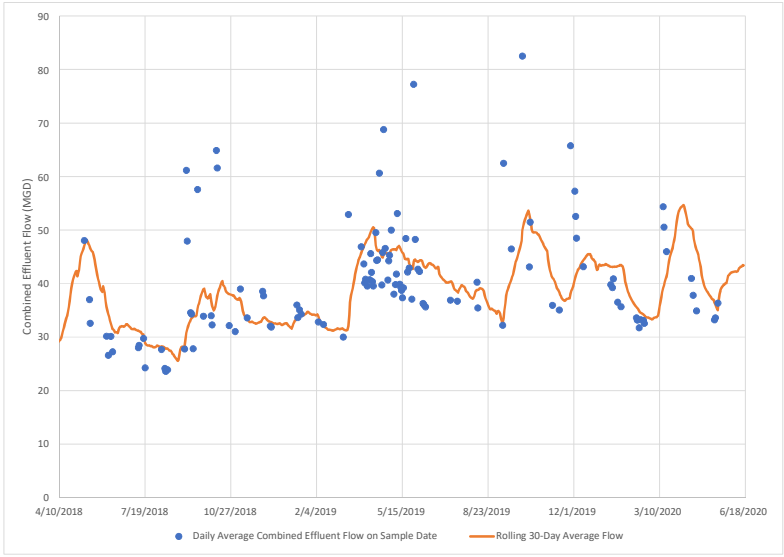
Mass Balance Calculations

Monthly Average Grab Samples

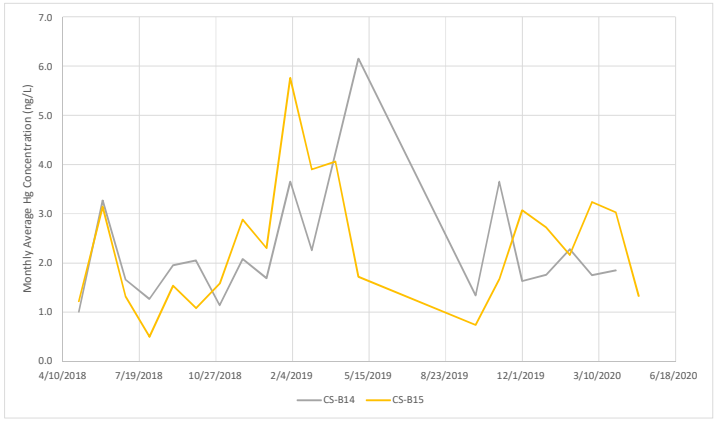
Year	Month	CS-B10/B11 ng/L	CS-B12/B13 ng/L	CS-B14 ng/L	CS-B15 ng/L	CS-N2 ng/L	CS-N5 ng/L	CS-P2 ng/L	DFS ng/L	DIGESTER 1 ng/L	DIGESTER 2 ng/L	DP-EFF ng/L	DP-INF ng/L	FBI ASH ng/L	FBI ASH DECANT ng/L	GB-Primary Sludge ng/L	GB-WAS ng/L	ISW ng/L	MS-PG ng/L	SIU-072-01 ng/L	PLT-Y1 ng/L	PLT-B1A ng/L	Biosolids mg/kg
2018	5			1.0	1.2			96.0	6600.0		2480.0	0.7	35.0			182.0	1150.0	79.5	35.0	54.0	72.5	66.0	0.1950
2018	6			3.3	3.1			72.0	6250.0		3020.0	1.4	35.0	1150.0		6000.0	910.0	38.5	35.0	37.0	39.0	50.0	0.2250
2018	7			1.7	1.3			68.0			5940.0	0.5	62.0	938.0	627.0	1160.0	838.0	91.0	35.0	58.0	43.0	35.0	0.2930
2018	8			1.3	0.5			106.0				0.1	41.0	1120.0	660.0	975.0	885.0	169.5	35.0	68.0	61.0	66.0	0.2660
2018	9			2.0	1.5			273.0	4990.0		11700.0	0.5	36.0	3420.0	545.0	3280.0	1080.0	100.5	35.0	73.0	35.0	61.0	0.5550
2018	10			2.1	1.1			53.0	4268.8		1707.5	0.8	57.0	2100.0	736.0	980.0	1550.0		58.0	57.0	36.0	41.5	0.4600
2018	11			1.1	1.6			65.0	7810.0	6280.0	6100.0	0.4	57.0	1660.0	627.0	262.0	2220.0		35.0	60.0	49.5	55.0	0.3500
2018	12			2.1	2.9			62.0	18900.0	5990.0	7600.0	1.4	1320.0	2220.0	825.0	492.0	405.0		35.0	128.0	138.7	51.0	0.3600
2019	1			1.7	2.3			63.0	14100.0	10700.0	11400.0	0.6	60.0	3120.0	1190.0	846.0	1460.0		41.0	67.0	69.3	35.0	0.4800
2019	2			3.7	5.8			64.0	6120.0	7780.0	6380.0	0.4	38.0	2850.0	1330.0	222.0	302.0		35.0	45.0	66.0	38.0	0.5020
2019	3			2.3	3.9	7.0	6.0	143.0	10700.0	8080.0	16300.0	0.6	340.0	1698.8	881.2	2665.0	1200.0		35.0	88.0	124.8	64.5	0.4970
2019	4				4.1	12.1	11.9	48.2	4870.0	7490.0	5490.0	0.6	53.9	1084.8	782.8	461.0	939.0		41.0	74.9	138.4	52.2	0.3300
2019	5	0.9	1.0	6.2	1.7	14.3	13.5	56.3	6745.0	7675.0	7265.0	0.5	41.0	1334.8	764.2	618.0	1910.0		41.0	157.5	104.0	66.6	0.3670
2019	6							41.0	9850.0	6050.0	5250.0		97.8	1375.3	685.8	510.0	1740.0		41.0	73.7	47.4	44.3	0.2820
2019	7							212.0	4940.0	5530.0	5440.0		41.0	1740.0	768.0	8660.0	1790.0		41.0	57.3	72.5	41.0	0.3740
2019	8																				357.0	51.8	0.2017
2019	9							41.0	4990.0	12700.0	7970.0		41.0	1800.0	504.0	312.0	1810.0		41.0	41.0	41.3	51.0	0.4070
2019	10			1.3	0.7			48.6	5710.0	5280.0	5170.0	0.3	41.9	1690.0	336.0	645.0	2820.0		41.0	112.0	41.0	41.0	0.3290
2019	11			3.7	1.7			53.2	3470.0	4180.0	3000.0	0.3	41.0	1530.0	815.0	4830.0	686.0		41.0	81.3	117.0	41.0	0.4130
2019	12			1.6	3.1			79.8	7620.0	6090.0	5130.0	0.6	41.0	1670.0	1130.0	826.0	1180.0		41.0	98.8	45.8	46.8	0.3380
2020	1			1.8	2.7			46.8	4020.0	5940.0	5400.0	0.3	41.0	1350.0	1100.0	327.0	1780.0		41.0	84.1	41.0	41.0	0.2730
2020	2			2.3	2.2			41.0	2530.0	5060.0	4130.0	0.8	41.0	1140.0	808.0	258.0	586.0		41.0	102.5	41.0	41.0	0.2820
2020	3			1.8	3.2			41.0	9620.0	7020.0	4730.0	0.3	41.0	1120.0	801.0	670.0	1400.0		41.0	53.4	178.0	41.0	0.3610
2020	4			1.9	3.0			41.0	4210.0	3970.0	5410.0	0.3	41.0	1690.0	873.0	254.0	748.0		41.0	102.5	41.0	41.0	0.3320
2020	5				1.3			74.7	7520.0	4480.0	4040.0	0.3	41.0	1740.0	881.0	379.0	1470.0		44.0	62.3	41.0	41.0	0.3310

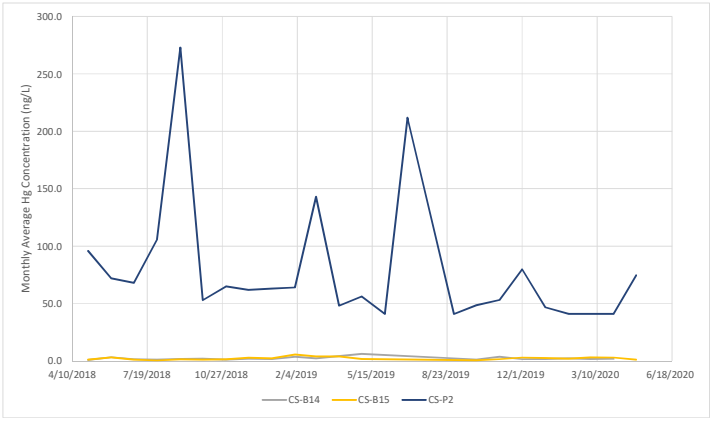
Flow

Year	Month	Monthly Total North Side Effluent MG/Month	Monthly Total South Side Effluent MG/Month	Monthly Total Combined Effluent Flow MG/Month	Solids Production Dry Tons	Ash Production Dry Tons	DFS MG/Month	GB-Primary Sludge MG/Month	GB-WAS MG/Month	ISW MG/Month	MS-PG MG/Month	PLY-Y1 MG/Month	SIU-072-01 MG/Month
2018	5	633.1	551.8	1185.0	140.4	44.4	1.9	23.8	18.8	72.1	118.6	200.2	
2018	6	493.3	467.8	961.1	233.8	54.9	2.8	41.7	14.3	70.9	119.8	142.7	
2018	7	427.6	441.8	869.3	311.4	79.9	0.0	23.0	9.7	36.6	182.4	157.2	
2018	8	427.2	449.6	876.8	305.0	80.5	0.0	31.7	18.7	72.9	130.5	174.4	
2018	9	543.3	573.1	1116.3	876.1	245.7	2.3	30.3	17.0	70.9	143.7	158.4	
2018	10	546.7	614.9	1161.6	1166.8	313.3	3.9	29.3	11.4		128.1	172.2	
2018	11	529.8	455.5	985.3	434.5	138.2	6.7	26.8	17.8		105.9	67.1	
2018	12	537.4	472.3	1009.7	993.8	318.3	7.8	27.6	18.4		98.5	78.1	
2019	1	554.9	502.0	1056.9	865.9	266.8	8.2	30.2	16.0		114.3	74.2	
2019	2	466.7	419.1	885.8	738.2	234.4	8.7	27.7	17.4		143.6	82.3	
2019	3	747.3	691.9	1439.2	749.3	245.5	6.0	29.8	11.7		216.4	69.7	
2019	4	629.5	735.3	1364.8	801.3	273.3	7.0	30.0	16.6		112.0	86.0	
2019	5	672.5	708.0	1380.5	976.2	337.5	8.9	32.3	19.1		148.4	84.4	
2019	6	597.8	634.5	1232.2	885.3	295.7	7.2	29.5	21.8		129.0	94.6	
2019	7	578.3	605.6	1183.9	795.0	254.6	7.4	20.6	17.7		157.6	120.1	
2019	8	524.9	551.5	1076.4	432.2	144.9			19.7			73.7	
2019	9	692.1	723.9	1416.1	1000.2	332.1	10.4	20.0	10.8		150.9	90.4	28.9
2019	10	742.0	688.1	1430.1	685.9	231.4	8.7	28.7	8.8		134.6	97.3	21.8
2019	11	571.1	609.3	1180.4	271.2	79.0	7.8	29.1	21.3		102.5	73.8	9.2
2019	12	679.1	687.8	1366.9	450.9	136.5	8.6	16.8	27.8		148.1	166.4	0.7
2020	1	617.8	627.0	1244.8	392.4	119.4	7.2	25.5	17.7		127.6	90.5	13.7
2020	2	497.7	471.6	969.3	632.1	187.5	0.0	25.4	18.6		108.3	88.3	10.1
2020	3	832.6	775.3	1607.8	929.4	283.9	9.6	30.2	17.0		118.1	117.6	20.1
2020	4	613.5	596.0	1209.5	984.9	307.8	9.6	28.6	18.2		113.5	81.4	22.9
2020	5	637.0	653.2	1290.2	946.3	296.6	8.5	26.1			170.9	128.4	14.4



		Monthly Average Load																		Calculated						
		Final Clarifier Effluent North Side	Final Clarifier Effulent South Side	GBF Final Effluent North Side	GBF Final Effluent South Side	South Plant Influent (primary effluent)	GBF South Plant Final Clarifier Effluent	Combined Influent Flow	Proctor and Gamble Influent	Fox River Fiber Influent	GBF Plant Return	Plant Influent	Scrubber Effluent	FBI Feed	Stack	Settled Ash	Digester Feed	Primary Sludge	WAS				Carbon Adsorber		Incinerator Output (Scrubber Effleunt +Ash +Stack)
		CS-B10/B11	CS-B12/B13	CS-B14	CS-B15	CS-N2	CS-N5	CS-P2	MS-PG	SIU-072-01	PLT-Y1	PLT-B1A	FBI ASH DECANT	Biosolids	Stack	Ash				Combined Effluent Load	Influent - Effluent Load	Net Influent Load	Biosolids - ash - stack	Biosolids - ash - stack - FBI Decant	Incinerator Output (Ash + Stack)	
Year	Month	*g/month*	*g/month*	*g/month*	*g/month*	*g/month*	*g/month*	*g/month*	*g/month*	*g/month*	*g/month*	*g/month*	*g/month*	*g/month*	*g/month*	*g/month*	*g/month*	*g/month*	*g/month*	*g/month*	*g/month*	*g/month*	*g/month*	*g/month*	*g/month*	*g/month*
2018	5			2.4	2.6			431.1	15.7	0.0	55.0	296.4		24.8	0.15	21.8	48.2	16.4	82.1	5.0	426.2	376.1	2.9		21.918	
2018	6			6.1	5.6			262.3	15.9	0.0	21.1	182.1		47.7	0.25	26.9	66.8	948.1	49.3	11.7	250.6	241.2	20.6		27.138	
2018	7			2.7	2.2			224.0	24.2	0.0	25.6	115.3	43.3	82.8	0.33	39.1		101.2	30.9	4.9	219.1	198.4	43.3	0.0	39.474	82.804
2018	8			2.1	0.9			352.2	17.3	0.0	40.3	219.3	45.6	73.6	0.32	39.5		117.1	62.8	2.9	349.3	311.9	33.8	-11.8	39.774	85.385
2018	9			4.0	3.3			1155.0	19.1	0.0	21.0	258.1	37.7	441.1	0.93	120.4	42.6	377.1	69.6	7.4	1147.7	1134.0	319.8	282.1	121.336	158.999
2018	10			4.2	2.5			233.3	28.2	0.0	23.5	182.7	50.9	486.9	1.24	153.5	62.7	108.9	66.8	6.8	226.6	209.8	332.2	281.3	154.769	205.631
2018	11			2.3	2.7			242.7	14.1	0.0	12.6	205.4	43.3	138.0	0.46	67.7	197.8	26.6	149.4	5.0	237.7	230.1	69.8	26.5	68.165	111.495
2018	12			4.2	5.2			237.2	13.1	0.0	41.1	195.2	57.0	324.6	1.05	156.0	559.7	51.4	28.3	9.4	227.9	196.2	167.6	110.5	157.015	214.027
2019	1			3.6	4.4			252.4	17.8	0.0	19.5	140.2	82.2	377.1	0.92	130.7	437.8	96.9	88.5	7.9	244.4	232.8	245.4	163.2	131.643	213.880
2019	2			6.5	9.1			214.9	19.0	0.0	20.6	127.6	91.9	336.2	0.78	114.8	202.8	23.3	20.0	15.6	199.3	194.3	220.6	128.6	115.626	207.537
2019	3			6.4	10.2	18.4	17.1	780.0	28.7	0.0	33.0	351.6	60.9	337.8	0.79	120.3	245.1	300.7	53.0	16.6	763.4	747.0	216.7	155.8	121.104	181.998
2019	4				11.3	33.8	28.5	249.3	17.4	0.0	45.1	270.2	54.1	239.9	0.85	133.9	129.8	52.4	59.0			204.2	105.1	51.0	134.790	188.887
2019	5	2.3	2.6	15.7	4.6	38.4	34.4	294.6	23.1	0.0	33.3	348.3	52.8	325.0	1.03	165.4	228.3	75.6	138.2	20.3	274.3	261.3	158.6	105.8	166.438	219.249
2019	6							191.5	20.0	0.0	17.0	206.8	47.4	226.5	0.94	144.9	269.4	57.1	143.4			174.5	80.7	33.3	145.831	193.226
2019	7							951.3	24.5	0.0	33.0	184.0	53.1	269.7	0.84	124.8	139.4	677.7	119.9			918.3	144.1	91.1	125.595	178.668
2019	8										99.7	211.1		79.1	0.46	71.0							7.7		71.442	
2019	9							220.0	23.4	4.5	14.1	273.7	34.8	369.3	1.06	162.7	196.3	23.6	74.3			205.9	205.5	170.7	163.801	198.630
2019	10			3.8	1.9			263.4	20.9	9.2	15.1	222.2	23.2	204.7	0.73	113.4	188.9	70.1	94.4	5.7	257.7	248.3	90.6	67.4	114.114	137.334
2019	11			7.9	3.9			238.0	15.9	2.8	32.7	183.4	56.3	101.6	0.29	38.7	102.2	531.8	55.5	11.8	226.2	205.3	62.6	6.3	38.977	95.299
2019	12			4.2	8.0			413.4	23.0	0.2	28.9	242.2	78.1	138.2	0.48	66.9	247.5	52.7	124.2	12.2	401.2	384.5	70.9	-7.2	67.372	145.462
2020	1			4.1	6.5			220.8	19.8	4.4	14.1	193.4	76.0	97.2	0.42	58.5	109.9	31.6	119.6	10.6	210.2	206.7	38.3	-37.7	58.902	134.919
2020	2			4.3	3.9			150.6	16.8	3.9	13.7	150.6	55.8	161.7	0.67	91.9		24.8	41.3	8.2	142.5	136.9	69.1	13.3	92.565	148.403
2020	3			5.5	9.5			249.8	18.3	4.1	79.3	249.8	55.4	304.4	0.98	139.1	349.4	76.6	90.0	15.0	234.8	170.5	164.3	108.9	140.104	195.458
2020	4			4.3	6.8			187.9	17.6	8.9	12.7	187.9	60.3	296.6	1.04	150.8	153.3	27.5	51.6	11.1	176.8	175.3	144.8	84.4	151.878	212.207
2020	5				3.3			365.3	28.5	3.4	19.9	200.5	60.9	284.2	1.00	145.3	242.6	37.4				345.3	137.8	76.9	146.326	207.208
All Months	**Average**	2.3	2.6	5.0	5.2	30.2	26.6	349.2	20.1	1.7	30.9	215.9	55.5	230.7	0.7	103.9	201.0	162.8	78.8	9.9	327.1	321.2	126.1	86.4	104.6	168.9
	Min	2.3	2.6	2.1	0.9	18.4	17.1	150.6	13.1	0.0	12.6	115.3	23.2	24.8	0.1	21.8	42.6	16.4	20.0	2.9	142.5	136.9	2.9	-37.7	21.9	82.8
	Max	2.3	2.6	15.7	11.3	38.4	34.4	1155.0	28.7	9.2	99.7	351.6	91.9	486.9	1.2	165.4	559.7	948.1	149.4	20.3	1147.7	1134.0	332.2	282.1	166.4	219.2
	Stdev			3.0	3.0	10.5	8.8	252.2	4.5	2.8	21.1	60.1	15.9	130.3	0.3	47.1	129.0	239.3	38.1	4.7	240.9	251.1	92.1	86.9	47.4	44.7
Months with greater than 300 hours processing time	**Average**	2.3	2.6	5.7	5.9	30.2	26.6	374.8	21.0	2.1	27.6	221.8	54.9	311.6	0.93	135.5	229.9	130.1	75.9	11.3	354.1	347.2	175.2	120.3	136.4	191.3
	Min	2.3	2.6	3.6	1.9	18.4	17.1	150.6	13.1	0.0	12.7	127.6	23.2	161.7	0.67	91.9	42.6	23.3	20.0	5.7	142.5	136.9	69.1	13.3	92.6	137.3
	Max	2.3	2.6	15.7	11.3	38.4	34.4	1155.0	28.7	9.2	79.3	351.6	91.9	486.9	1.24	165.4	559.7	677.7	143.4	20.3	1147.7	1134.0	332.2	282.1	166.4	219.2
	Stdev			3.5	3.2	10.5	8.8	303.1	4.6	3.2	17.0	66.4	16.3	84.0	0.15	20.4	136.0	177.3	37.0	4.8	311.7	302.8	78.0	77.0	20.5	24.6


Monthly Average Hg Concentration (ng/L)
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
4/10/2018
7/19/2018
10/27/2018
2/4/2019
5/15/2019
8/23/2019
12/1/2019
3/10/2020
6/18/2020
CS-B14
CS-B15


Monthly Average Hg Concentration (ng/L)
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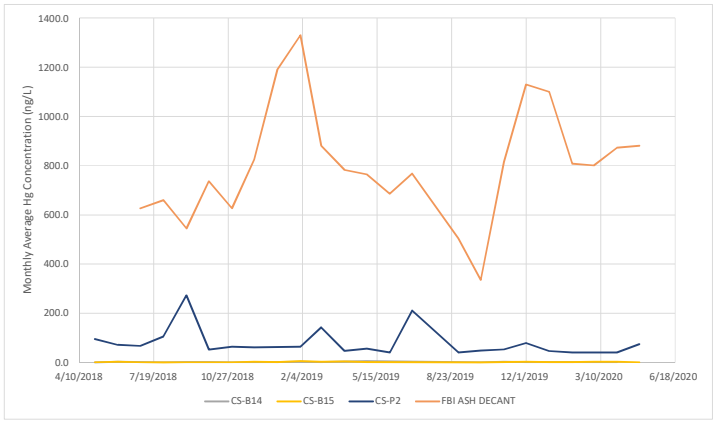
250.0
200.0
150.0
100.0
50.0
0.0
4/10/2018
7/19/2018
10/27/2018
2/4/2019
5/15/2019
8/23/2019
12/1/2019
3/10/2020
6/18/2020
CS-B14
CS-B15
CS-P2


Monthly Average Hg Concentration (ng/L)
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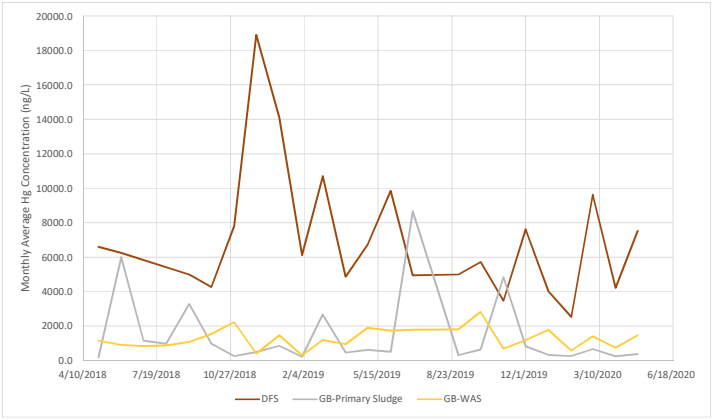
1000.0
800.0
600.0
400.0
200.0
0.0
4/10/2018
7/19/2018
10/27/2018
2/4/2019
5/15/2019
8/23/2019
12/1/2019
3/10/2020
6/18/2020
CS-B14
CS-B15
CS-P2
FBI ASH DECANT


Monthly Average Hg Concentration (ng/L)
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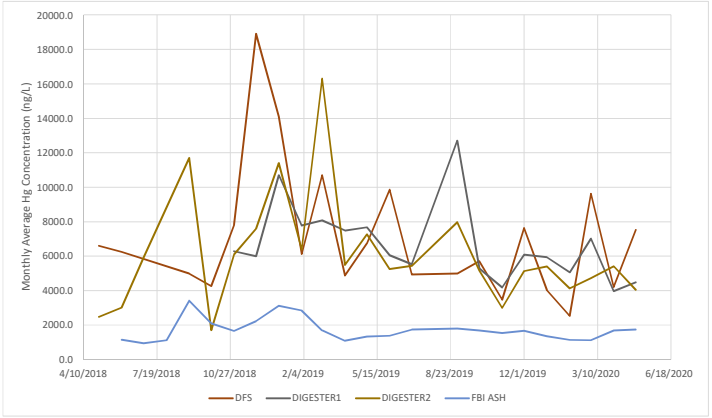
18000.0
16000.0
14000.0
12000.0
10000.0
8000.0
6000.0
4000.0
2000.0
0.0
4/10/2018
7/19/2018
10/27/2018
2/4/2019
5/15/2019
8/23/2019
12/1/2019
3/10/2020
6/18/2020
DFS
GB-Primary Sludge
GB-WAS


Monthly Average Hg Concentration (ng/L)
20000.0
18000.0
16000.0
14000.0
12000.0
10000.0
8000.0
6000.0
4000.0
2000.0
0.0
4/10/2018
7/19/2018
10/27/2018
2/4/2019
5/15/2019
8/23/2019
12/1/2019
3/10/2020
6/18/2020
DFS
DIGESTER1
DIGESTER2
FBI ASH

ATTACHMENT G

ADAPTIVE MANAGEMENT PLAN EXECUTIVE SUMMARY (OCTOBER 2020)

NEW Water
The brand of the Green Bay Metropolitan Sewerage District

NEW Water's Adaptive Management Plan for the Ashwaubenon and Dutchman Creeks Watersheds

October 2020

Prepared for NEW Water by:

JACOBS

Executive Summary

NEW Water, the brand of the Green Bay Metropolitan Sewerage District, is pursuing watershed adaptive management as part of its compliance with phosphorus and total suspended solids (TSS) permit requirements. Selection of this compliance option was completed in the phosphorus Final Compliance Alternatives Plan that was submitted to the Wisconsin Department of Natural Resources (WDNR) in December 2018. The Final Compliance Alternatives Plan also summarizes the outcomes from Operational Evaluation Reports, the optimization of current operations at both facilities, and the proposed enhancement to the De Pere Facility filters, which contribute toward achieving compliance with phosphorus and TSS permit requirements. NEW Water discharges to the Lower Fox River (LFR) in the Lower Fox River Basin (LFRB). The Fox River and Bay of Green Bay are impaired for phosphorus and sediment/TSS and have an approved total maximum daily load (TMDL). Wisconsin Administrative Code NR 217.18 identifies three criteria for determining a permittees' eligibility for Adaptive Management, and NEW Water meets all three criteria.

A Memorandum of Understanding (MOU) was executed between NEW Water and WDNR, in close coordination with the United States Environmental Protection Agency, in January 2018. The MOU provides greater detail of the requirements and scope of an Adaptive Management Plan specific to NEW Water and accounts for NEW Water's combined discharges from its two treatment facilities and location at the downstream end of a large, complex watershed. The MOU states that NEW Water may select an Action Area where the agricultural and unregulated urban annual phosphorus mass reduction identified in the TMDL is at least as large as the calculated difference between NEW Water's annual phosphorus mass discharge and the TMDL waste load allocation expected to occur within the permit term. Through very detailed review of numerous sub-basins in the LFRB, NEW Water selected an Action Area in the Ashwaubenon and Dutchman Creeks sub-basins (Figure ES-1). The Ashwaubenon and Dutchman Creeks sub-basins have a TMDL total phosphorus load reduction of 18,911 pounds per year (lbs/year), with 16,816 lbs/year of reductions from agricultural and unregulated urban nonpoint sectors. Based on NEW Water's treatment facility improvements and projected flows and loads through a four-permit-term Adaptive Management period, this Action Area meets phosphorus mass reduction required by the MOU.

The Oneida Nation reservation boundary overlaps with the Action Area, primarily in the agricultural land use areas. Although the majority of the land in the watershed is currently being used for agriculture, including several confined animal feeding operations, six municipal separate storm sewer systems, and the Austin Straubel International Airport are all located or have operations within the Action Area. Partnerships within the watersheds will be important for implementing a successful Adaptive Management Plan. Some entities have load-reduction requirements from the TMDL and may be interested in joining NEW Water's Adaptive Management Plan for their permit compliance (load partners), and some entities will be interested in collaborating with NEW Water to achieve their goals (project partners). NEW Water does not yet have a load partner but has several project partners (i.e., collaborators) from work originating in the Silver Creek Pilot Project. Developing partnerships with each of these entities will also contribute to progress towards achieving goals in the LFR at NEW Water's point of standards application (i.e., Green Bay Facility outfall). NEW Water has created the NEW Watershed Program (Program) to implement the Adaptive Management Plan.

Water quality, flow, and biological monitoring have been initiated to establish baseline conditions in the Action Area and demonstrate progress toward achieving water quality throughout the Program. Seven locations have been established in the Action Area for water quality and biological monitoring, four of which have United States Geological Survey flow gages installed. The downstream-most flow gage in each sub-basin includes automated sampling equipment to perform event-based sampling, which will be used to complete loading calculations. Additional data collection and review will continue during the Program, where the data will be used to inform decisions on prioritizing implementation of conservation practices and demonstrate the watershed chemical and biological improvements.

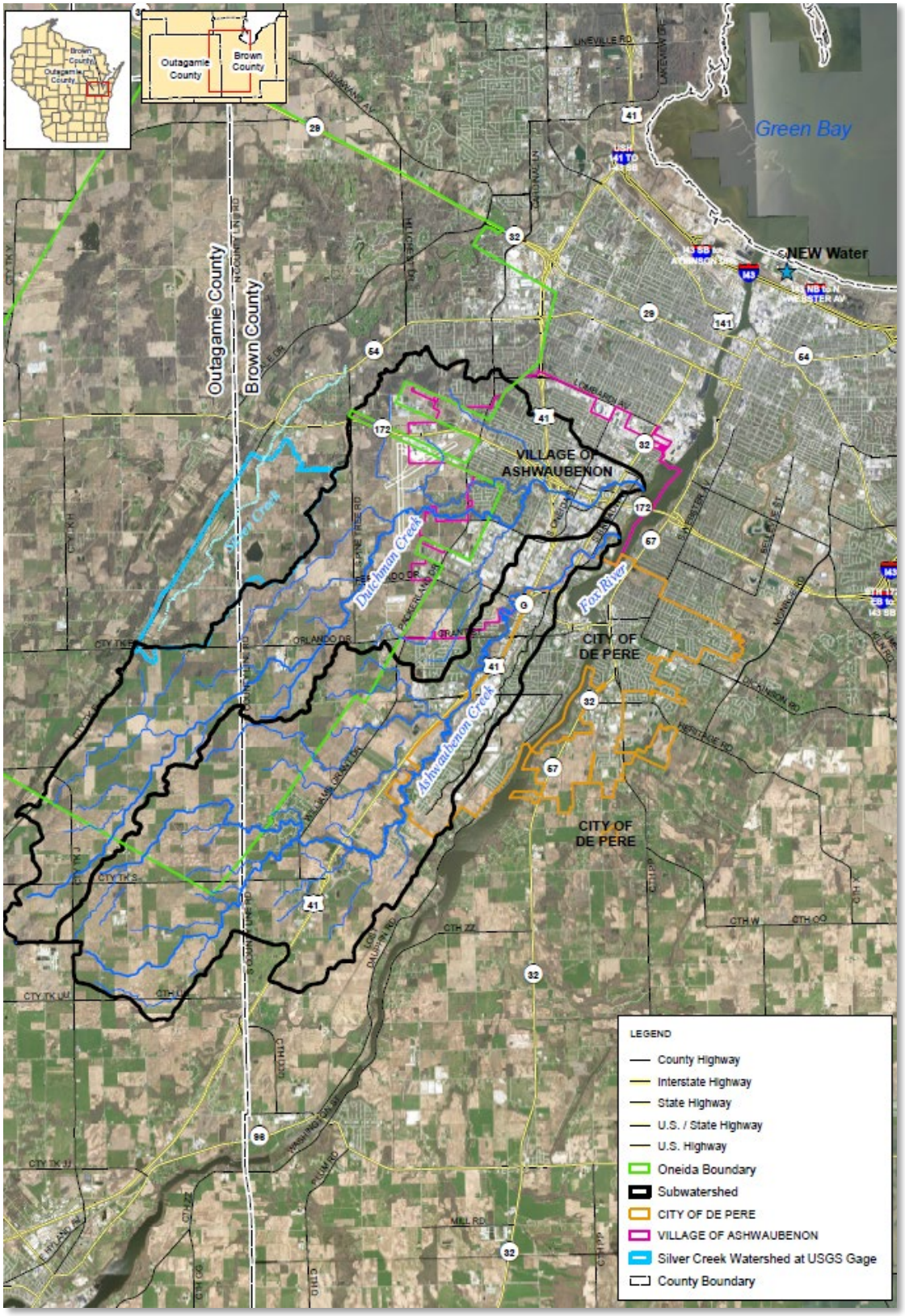


Figure ES-1. Adaptive Management Plan Action Area Ashwaubenon and Dutchman Creeks Sub-Basins

NEW Water will focus its Adaptive Management Plan implementation strategy on working collaboratively within the Action Area with a diverse set of partners, collaborators, and stakeholders. To accomplish this, the Program will use the tools, organization structure, and successes and lessons learned during the Silver Creek Pilot Project (Pilot Project) that was initiated in 2014. The Pilot Project successfully implemented best management practices (BMPs) that resulted in 3,658 lbs/year of phosphorus and 2,281 tons/year of TSS reduced through 2018, modeled using the Spreadsheet Tool for Estimating Pollutant Loads (STEPL) and Soil and Nutrient Application Planner (SnapPlus). This was completed on approximately 2,130 agricultural field acres, which equates to about 1.7 pounds of phosphorus per field acre reduced per year and 1,160 lbs/year of sediment reduced per one lb/year of phosphorus reduced.

Guided by these experiences in the Pilot Project, NEW Water has the tools, strategy, and knowledge necessary to meet phosphorus reduction needs determined by the TMDL in the Action Area. NEW Water has proposed phosphorus and TSS reduction goals that achieve a 25 percent reduction in the first permit term and 95 percent reduction by the conclusion of the third permit term (Table ES-1).

Table ES-1. Phosphorus and TSS Reduction Goals by Permit Term

Permit Term	Phosphorus, lbs/year	TSS, lbs/year	% of Total Action Area TMDL Reduction
1	4,727	985,935	25%
2	13,238	2,760,618	70%
3	17,965	3,746,553	95%
4	18,911	3,943,740	100%

The Program includes goals and measurable actions throughout the four-permit-term Adaptive Management period. The goals and measurable actions include near-term, mid-term, and long-term timeframes to allow the Program to build partnerships, identify conservation opportunities, and implement early-out conservation practices in the near term, and to implement comprehensive conservation opportunities and monitor the watershed response in the mid-term. For the long-term goals, the Program will continue implementation, maintain conservation practices, maintain partnerships, and monitor water quality improvements. However, a long-term goal and vision of the Program is to make lasting behavioral changes that will produce sustainable improvements beyond the Adaptive Management period.

Measurable actions will be reported in annual reports to WDNR and during permit renewals that include Adaptive Management. The measurable actions will include quantitative evaluation and reporting of changes in in-stream water quality and progress towards achieving water quality criterion, completion of field walks, conservation planning, BMP implementation, and modeled reductions of phosphorus and TSS through software such as STEPL, SnapPlus, and Source Loading and Management Model for Windows (WinSLAMM). These modeled reductions will be compared against the reduction goals for each permit term (Table ES-1).

During phosphorus compliance planning, NEW Water developed a financial tool that allows for evaluation of treatment and adaptive management alternative costs. This tool supported NEW Water's commitment to Adaptive Management, and it is also used to support budgeting and evaluating customer rate impacts. NEW Water has prepared its rate structure to accommodate Adaptive Management for meeting phosphorus and TSS permit limits, and with Adaptive Management resulting in the greatest benefit and the lowest cost, NEW Water rates and budget planning are fully supportive of this compliance alternative. The Adaptive Management Program costs are estimated to have a net present value of approximately $38 million. This estimate assumes no grants are used, implementation of the Program is not contingent on an external partners' financial contribution, and the Program costs include conservative

assumptions more than those observed during the Pilot Project. Consequently, NEW Water has prepared its budgets and rate structure to meet the financial obligations of implementing the Program.

References to the Adaptive Management Handbook

The WDNR *Adaptive Management Technical Handbook* identifies nine elements within a written Adaptive Management Plan. For purposes of comparing this Plan to the nine elements, Table ES-2 provides a key for cross reference between the two documents.

To read NEW Water's full adaptive management plan, please visit the WDNR link below. Select the purple pin by Green Bay to download the files you are interested in.

https://dnr.wisconsin.gov/topic/Wastewater/AmWqtMap.html

Table ES-2. Suggested Elements of an Adaptive Management Plan in WDNR Guidance and their Locations within the NEW Water Watershed Adaptive Management Plan

WDNR Guidance Component	Section Within This Plan	Comment
Identify Partners	Section 3.1 Appendix N	There are no load partners at this time. NEW Water has identified several project partners (i.e., collaborators) with their description and roles.
Describe the Watershed and Set Load Reduction Goals	Section 2 Section 3.3, Table 3-6	Conditions of the LFRB and the Action Area are described in detail in Section 2 of the report. TMDL loads and allocations are presented in Tables 2-4, 2-6, and 2-13. Load-reduction goals are presented in Section 3.3.
Conduct a Watershed Inventory	Section 2.2 Section 2.4 Section 2.5 Section 3.2.1	Section 2 identifies current conditions in the Action Area, including existing inventories, land, soil, and topography data. A description of the Plan inventory is provided in Section 3.2.1.
Identify Where Reductions Will Occur	Section 3.2	Reductions will occur throughout the Action Area with specific locations identified through desktop GIS analysis, field surveys, and conservation planning.
Describe Management Measures	Section 3.2 and Table 3-2 Section 1.3, Table 1-3	A demonstration of successful BMP implementation in Silver Creek is provided in Section 1.3 and serves as a justification of NEW Water's experience implementing management measures. Further description of these BMPs as they relate to the Action Area are included in Section 3.2.
Estimate Load Reductions by Permit Term	Section 3.3, Table 3-6	Load-reduction goals are presented in Section 3.3. Justification and modeling of load reductions using experiences in the Pilot Project are described in Section 1.3.
Measuring Success	Section 2.3 Section 3.2.1.5 Appendix H Appendix I Appendix J	A robust monitoring program has been started, which includes water quality, biological, and stream-flow data collection. An overview is presented in Section 2.3, with specific monitoring plans included in Appendixes H, I, and J. Section 3.2.1.5 summarizes modeling approaches for measuring BMP performance.
Financial Security	Section 4 Appendix O	An overview of the financial analysis is provided as Section 4 of this report. Further details are described in Appendix O.
Implementation Schedule with Milestones	Section 3.2 Section 3.3 Appendix K	Detailed descriptions of the key proposed actions (Section 3.2) and the goals and measures of actions (Section 3.3) are also in the program schedule (Appendix K).