GEORGIA
DEPARTMENT OF NATURAL RESOURCES

ENVIRONMENTAL PROTECTION DIVISION

Summary Page

Name of Facility Graphic Packaging International, LLC – Augusta Mill
(Formerly International Paper – Augusta Mill)

NPDES Permit No. GA0002801

This permit is a reissuance of a NPDES permit for Graphic Packaging International, LLC – Augusta Mill. The facility discharges an average of 44.6 MGD of pulp and paperboard process water, foul condensate, landfill leachate, sanitary wastewater, and wastewater received from Resolute Forest Products for treatment. This facility discharges to the Savannah River in the Savannah River Basin. The permit expired on July 31, 2006 and was administratively extended due to the 2006 EPA TMDL for dissolved oxygen and subsequent Savannah River Basin Restoration (5R) Plan.

The permit was placed on public notice from March 1, 2019 to April 13, 2019.

Please Note The Following Changes to the Proposed NPDES Permit From The Existing Permit

Part I.A.1 (Outfall 001 & 001a) – Effluent Limitations and Monitoring Requirements

- ☐ Modified Total Suspended Solids daily average and daily maximum of 90,131 lbs/day and 147,954 lbs/day, respectively, to 63,604 lbs/day and 118,356 lbs/day based on production based TBELs in the federal regulations.
- ☐ Added seasonal monitoring (March – October) for $CBOD_5$ in order to calculate the permittee's UOD loading.
- ☐ Added 65 month compliance schedule to provide adequate time to make necessary upgrades to meet new UOD daily average of 27,353 lbs/day and daily maximum of 65,647 lbs/day that are being introduced per EPD's 5R Savannah Harbor Restoration Plan.
- ☐ Revised the effluent limit for BOD_5. The BOD_5 daily average limit of 30,000 lbs/day and daily maximum limit of 57,590 lbs/day for the months of March to October has been retained from previous permit in accordance with 40 CFR 122.44(l), which requires a reissued permit to be as stringent as the previous permit. For the months of November to February, BOD_5 will have a technology based daily average limit of 36,379 lbs/day and daily maximum limit of 69,839 lbs/day per 40 CFR 430.22. A 65 compliance schedule was added to provide adequate time to meet the new UOD effluent limit. Upon completion of the 65 month compliance schedule, the effluent limit for BOD_5 during the critical months of March – October will be removed (UOD < BOD – See Fact Sheet Section 4.4).
- ☐ Based on the presence of sanitary wastewater, a Fecal Coliform daily average of 200 colonies per 100 mL and daily maximum of 400 colonies per 100 mL during the months of May to October and the daily average of 1,000 colonies per 100 mL and daily maximum of 4,000 colonies per 100 mL were added. A 48 month compliance schedule was added to allow time for the industry to conduct an extensive study and to design and construct any needed equipment if necessary.

Summary Page

- ☐ Reduced monitoring frequency from daily to 3/week for BOD_5, TSS, COD, and AOX as per EPA's Interim Guidance for Performance-Based Reductions of NPDES Permit Monitoring Frequencies.
- ☐ Removed BOD_{120} monitoring because the BOD_u/BOD_5 ratio needed to calculate UOD has been determined.
- ☐ Added dissolved oxygen monitoring to complement EPD's 5R Savannah River Basin Restoration (5R) Plan.
- ☐ Added chronic whole effluent toxicity testing during the permit term and an additional at the time of next renewal in accordance with EPD's *Whole Effluent Toxicity (WET) Strategy*.
- ☐ Reduced AOX daily average of 2,425 lbs/day and daily maximum of 3,702 lbs/day to 2,223 lbs/day and 3,393 lbs/day, respectively, based on production based TBELs in the federal regulations.
- ☐ Added ammonia monitoring to calculate the overall UOD loading of the facility.
- ☐ Added, total kjeldahl, organic nitrogen, and nitrate/nitrite weekly monitoring per "*Georgia's Plan for the Adoption of Water Quality Standards for Nutrients*".
- ☐ Added total phosphorus and orthophosphate monitoring per "*Georgia's Plan for the Adoption of Water Quality Standards for Nutrients*".
- ☐ Added temperature limits of 90°F daily average and daily maximum based on the data presented in the application.
- ☐ Added delta temperature limits of +5 °F daily average and daily maximum based on the data presented in the application.
- ☐ Added a mixing zone to the permit at the edge of which the permittee must achieve compliance with the temperature limits above.
- ☐ Removed total recoverable mercury monitoring based on the reasonable potential analysis.
- ☐ Revised the 2,3,7,8-TCDD daily average of 0.00016 ug/L to 0.00000065 µg/L per 391-3-6-.03(5)(vi).

Part I.A.3 & Part I.A.4 (Outfall 003 & 004) – Effluent Limitations and Monitoring Requirements.

- ☐ Removed chloroform monitoring per 40 CFR 430.02(f).

Standard Conditions & Boilerplate Modifications

The permit boilerplate includes modified language or added language consistent with other NPDES permits.

GEORGIA
DEPARTMENT OF NATURAL RESOURCES
ENVIRONMENTAL PROTECTION DIVISION

Summary Page

Final Permit Determinations and Public Comments

☐ Final issued permit did not change from the draft permit placed on public notice.

☒ Final permit includes changes from the draft permit placed on public notice. See attached permit addendum and/or permit fact sheet addendum.

☒ Public comments were received during public notice period.

☐ Public hearing was held.

GEORGIA
DEPARTMENT OF NATURAL RESOURCES

ENVIRONMENTAL PROTECTION DIVISION

Revisions to Draft Permit

Name of Facility Graphic Packaging International, LLC – Augusta Mill

NPDES Permit No. GA0002801

Were there any revisions between the draft proposed NPDES permit placed on public notice and the final proposed NPDES permit? If yes, specify: ☒ Yes ☐ No

Part I.A.1 Corrected a typographical error in the "Effluent Limitations and Monitoring Requirements" Table. The seasons indicated for 5-Day Biochemical Oxygen Demand should be March-October and November-February, not March-October and November-April.

Updated table formatting for "Effluent Limitations and Monitoring Requirements" table.

Corrected a typographical error in the "Effluent Limitations and Monitoring Requirements" Table. Temperature reporting and limitations were incorrectly included in both the daily average and daily maximum columns. This has been corrected to include temperature reporting and limitations only in the column for daily maximum.

Added the language "If ambient temperature exceeds 90°F, the daily maximum numeric effluent limitation of 90°F at edge of mixing zone does not apply. The daily maximum numeric effluent limitation of Δ+5°F is still applicable." in the temperature footnote to clarify how permit compliance will be evaluated under these conditions.

Part I.A.2 Corrected a typographical error in footnote 2 from "Exceptions include: 1) A composite sample may consist of a grab sample taken every 4 hours for 24 hours" to "Exceptions include: 1) A composite sample may consist of a grab sample taken every 4 hours for 12 hours instead of every 4 hours for 24 hours". This was an unintentional omission when transcribing the condition from the previous permit into the draft permit.

GEORGIA
DEPARTMENT OF NATURAL RESOURCES

ENVIRONMENTAL PROTECTION DIVISION

Revisions to Draft Permit

Part I.A.3 Corrected a typographical error in footnote 2 from "Exceptions include: 1) A composite sample may consist of a grab sample taken every 4 hours for 24 hours" to "Exceptions include: 1) A composite sample may consist of a grab sample taken every 4 hours for 12 hours instead of every 4 hours for 24 hours". This was an unintentional omission when transcribing the condition from the previous permit into the draft permit.

The permittee has been made aware of these changes.

GEORGIA
DEPARTMENT OF NATURAL RESOURCES
ENVIRONMENTAL PROTECTION DIVISION

Richard E. Dunn, Director

EPD Director's Office
2 Martin Luther King, Jr. Drive
Suite 1456, East Tower
Atlanta, Georgia 30334
404-656-4713

APR 17 2019

Mr. Scott Grimes, Vice President of Manufacturing
Graphic Packaging International, LLC
Augusta Mill
4278 Mike Padget Highway
Augusta, Georgia 30906

RE: Permit Issuance
Graphic Packaging International, LLC
Augusta Mill
NPDES Permit GA0002801
Richmond County, Savannah River Basin

Dear Mr. Grimes:

Pursuant to the Georgia Water Quality Control Act, as amended, the Federal Clean Water Act, as amended, and the Rules and Regulations promulgated thereunder, we have issued the attached permit for the above-referenced facility.

Your facility has been assigned to the following EPD office for reporting and compliance. Signed copies of all required reports shall be submitted to the following address:

Environmental Protection Division
Watershed Protection Branch
Watershed Compliance Program
2 Martin Luther King Jr. Drive, Suite 1152
Atlanta, Georgia 30334

Please be advised that on and after the effective date indicated in the permit, the permittee must comply with all terms, conditions, and limitations of the permit. If you have questions concerning this correspondence, please contact Whitney Fenwick at 404.656.2795 or *whitney.fenwick@dnr.ga.gov*.

Sincerely,

Richard E. Dunn
Director

RED:wf
Enclosure(s)
cc: EPD Watershed Compliance Program, Ms. Karen Sauler (e-mail)

GEORGIA
DEPARTMENT OF NATURAL RESOURCES
ENVIRONMENTAL PROTECTION DIVISION

Richard E. Dunn, Director

Watershed Protection Branch
2 Martin Luther King, Jr. Drive
Suite 1152, East Tower
Atlanta, Georgia 30334
404-463-1511

APR 17 2019

Persons who commented on
Draft NPDES Permit No. GA0002801

RE: EPD Response to Comments
Graphic Packaging International, LLC
Augusta Mill
NPDES Permit No. GA0002801

To Whom it May Concern:

Thank you for your comments regarding the permit issuance for the Graphic Packaging International, LLC – Augusta Mill. Attached is a summary of comments from the public and our responses to the issue raised. In addition, we have attached the Permit Addendum and Permit Fact Sheet Addendum documenting the changes made to the attached permit. We appreciate your interest in this matter.

After consideration of your comments, EPD has determined that the permit is protective of water quality standards and we have issued the permit.

If you have any questions, please contact Whitney Fenwick of my staff at 404-656-2795.

Sincerely,

Audra Dickson, Manager
Wastewater Regulatory Program
Watershed Protection Branch

AHD/wf

Attachment

Public Comments and EPD Responses on Draft NPDES Permit
Graphic Packaging International LLC – Permit No. GA0002801

COMMENT RECEIVED	EPD RESPONSE
After reading through section A.3 footnote 2, I realized that the wording on our current permit is different than our draft permit. Our draft permit mentions an exception as "a composite sample may consist of a grab sample taken every 4 hours for 24 hours," however this is not an exception and is how the Permit Guidance document stats composite sampling should be. Our current permit cites an exception as "a composite sample may consist of a grab sample taken every 4 hours for 12 hours instead of every 4 hours for 24 hours." I would like to make a comment on the draft permit to change the language on composite sampling to match the current permit (as seen below). Bleach plant sampling will be conducte in accordance with EPA's established generic sampling plan described in Appendix B – Sample Collection Methods of the EPA guidance document entitled Permit Guidance Document, Pulp, Paper and Paperboard Manufacturing Point Source Category, EPA-821-B-00-003, which is incorporated into this permit as Attachment No. 1, except where exceptions are approved by the Environmental Protection Division. Exceptions include: 1) A composite sample may consist of a grab sample taken every 4 hours for 12 hours instead of every 4 hours of 24 hours; and 2) Chloroform samples are to be collected as grabs (3 pairs of samples per 12 hours) instead of as grabs (6 pairs per 24 hours), 40 milliliters each from acid and alkaline stream (one set is back-up), which will be composited at the laboratory.	This was a typographical error when the condition was transcribed from the previous permit into the draft permit and has been corrected in the footnotes of sections A.2 and A.3.

Permit No. GA0002801
Issuance Date: APR 17 2019

GEORGIA
DEPARTMENT OF NATURAL RESOURCES

ENVIRONMENTAL PROTECTION DIVISION

National Pollutant Discharge Elimination System Permit

In accordance with the provisions of the Georgia Water Quality Control Act (Georgia Laws 1964, p. 416, as amended), hereinafter called the State Act; the Federal Water Pollution Control Act, as amended (33 U.S. C. 1251 et seq.), hereinafter called the Federal Act; and the Rules and Regulations promulgated pursuant to each of these Acts,

Graphic Packaging International, LLC
Augusta Mill
4278 Mike Padget Highway
Augusta, Georgia 30906

is issued a permit to discharge from a facility located at

4278 Mike Padget Highway
Augusta, Georgia 30906
Richmond County

to receiving waters

Savannah River (Outfalls 001 & 001a) in the Savannah River Basin.

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

This permit is issued in reliance upon the permit application signed on September 22, 2017, any other applications upon which this permit is based, supporting data entered therein or attached thereto, and any subsequent submittal of supporting data.

This permit shall become effective on May 1, 2019.

This permit and the authorization to discharge shall expire at midnight April 30, 2024.

STATE OF GEORGIA
CONSTITUTION
1776

Richard E. Dunn, Director
Environmental Protection Division

PART I

A.1. Effluent Limitations and Monitoring Requirements

a. Upon the effective date of the permit and continuing for 6 months, the permittee is authorized to discharge from external outfall number 001 and 001a (33.328333,-81.91138)[1] – Graphic Packaging International LLC – Augusta Mill pulp and paperboard process wastewater, foul condensate, landfill #2 leachate, sanitary wastewater, and wastewater received from Resolute Forest Products for treatment.

Such discharges shall be limited and monitored by the permittee as specified below:

Effluent Characteristics (Units)	Discharge Limitations				Monitoring Requirements[2]		
	Mass Based (lbs/day)		Concentration Based (mg/L)		Measurement Frequency	Sample Type	Sample Location
	Daily Avg.	Daily Max.	Daily Avg.	Daily Max.			
Flow (MGD)[3]	Report	Report	--	--	Daily	Continuous	Effluent[3]
5-Day Biochemical Oxygen Demand (March – October)	30,000	57,590	--	--	3/Week	Composite	Effluent[4]
5-Day Biochemical Oxygen Demand (November – February)	36,379	69,839	--	--	3/Week	Composite	Effluent[4]
5-Day Carbonaceous Biochemical Oxygen Demand [5] (March – October)	--	--	Report	Report	3/Week	Composite	Effluent[4]
Ultimate Oxygen Demand [5] (March – October)	Report[6]	Report[6]	--	--	3/Week	Calculated[5]	Effluent[4]
Total Suspended Solids	63,604	118,356	--	--	3/Week	Composite	Effluent[4]
Fecal Coliform[7] (#/100 mL)	--	--	Report[6]	Report[6]	1/Week	Grab	Effluent[4]
Adsorbable Organic Halides (AOX)[8]	2,223	3,393	--	--	1/Week	Composite	Effluent[4]
Dissolved Oxygen	--	--	See Footnote[9]	See Footnote[9]	1/Week	Grab	Effluent[4]
Color (Platinum-Cobalt Units)	--	--	Report	Report	Quarterly	Composite	Effluent[4]

Effluent Characteristics (Units)	Discharge Limitations				Monitoring Requirements[2]		
	Mass Based (lbs/day)		Concentration Based (mg/L)		Measurement Frequency	Sample Type	Sample Location
	Daily Avg.	Daily Max.	Daily Avg.	Daily Max.			
Dioxin (2,3,7,8-TCDD)[10]	--	--	0.65 (pg/L)	--	1/Year	Composite	Effluent[4]
Chronic Whole Effluent Toxicity[10]	--	--	Report	Report	1/Permit Term	Composite	Effluent[4]
Ammonia, as N[5,12] (March – October)	--	--	Report	Report	3/Week	Composite	Effluent[4]
Ammonia, as N[12] (November – February)	--	--	Report	Report	1/Week	Composite	Effluent[4]
Total Kjeldahl Nitrogen[12]	--	--	Report	Report	1/Week	Composite	Effluent[4]
Organic Nitrogen,[12]	--	--	Report	Report	1/Week	Composite	Effluent[4]
Nitrate/Nitrite[12]	--	--	Report	Report	1/Week	Composite	Effluent[4]
Total Phosphorus[13]	--	--	Report	Report	1/Month	Composite	Effluent[4]
Orthophosphate, as P[13]	--	--	Report	Report	1/Month	Composite	Effluent[4]
Temperature (°F) (Ambient)	--	Report[6]	--	--	1/Month	Grab[14]	See Footnote[15]
Temperature (°F) (Edge of Mixing Zone)	--	Report[6]	--	--	1/Month	Grab[14]	See Footnote[15]
Delta Temperature (°F)	--	Report[6]	--	--	1/Month	Calculated[14]	See Footnote[15]

The pH shall not be less than 6.0 standard units nor greater than 9.0 standard units and shall be monitored daily by grab sample.

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

2 All the parameters must be monitored, at a minimum, at the measurement frequency stated above if there is any discharge. If there is no discharge, state such in the discharge monitoring report in accordance with the reporting requirements in Part 1.D of this permit.

3 Flow shall be reported as the total sum from both Outfalls 001 and 001a.

[4] Samples shall be collected at the effluent of the final treatment prior to discharge through outfall 001 or 001a.

[5] The ultimate oxygen demand (UOD) shall be calculated using the following equation: UOD (lbs/day) = Effluent Flow x 8.34 x (($CBOD_5$ x 3.62) + (NH_3-N x 4.57)); whereas $CBOD_5$ and NH_3-N are in mg/L and Effluent Flow is in MGD. Furthermore, $CBOD_5$ and NH_3-N samples shall be taken from the same effluent sample on the same day. BOD_5 sampling can be used in lieu of $CBOD_5$.

[6] See Schedule of Compliance, Part III.B, of this permit

[7] Fecal coliform bacteria will be reported as the geometric mean. EPD is currently waiting for final approval from EPA to change the surface water quality indicator bacteria from fecal coliform to E.coli. Upon approval from EPA, the seasonal variation for indicator bacteria is subject to change.

[8] The permittee shall adhere to the approved EPA test method for AOX, 1650. The minimum detection level for AOX is 20 µg/L.

[9] The permittee shall monitor for dissolved oxygen and report the results as a daily minimum accordance with the reporting requirements in Part 1.D of this permit.

[10] The permittee shall adhere to the analytical protocol described in Appendix C of the U.S. EPA/Paper Industry Cooperative Dioxin Screening Study (EPA 440/1-88-025, March 1988) when analyzing wastewater effluent samples for 2,3,7,8-TCDD and the special requirements under Part III.C.2 of this permit.

[11] WET testing shall be conducted once during the permit term and the results submitted to the EPD in accordance with Part I.D of this permit. An additional WET test shall be conducted and submitted as part of the next application for NPDES permit reissuance. The testing must comply with the most current U.S. Environmental Protection Agency (EPA) chronic aquatic toxicity testing manuals. The referenced document is entitled Short-Term Methods of Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms, 4th Edition, U.S. EPA, 821-R-02-013, October 2002. Definitive tests must be run on the samples concurrently using both an invertebrate species (i.e. Ceriodaphnia dubia) and a vertebrate species (i.e. Fathead Minnow, pimephales promelas) and shall include a dilution equal to the facility's instream waste concentration (IWC) of 1.8%.

[12] Ammonia Nitrogen, Total Kjeldahl Nitrogen, Organic Nitrogen, and Nitrate/Nitrates shall be analyzed or calculated from the same effluent sample.

[13] Total Phosphorus and Orthophosphate shall be analyzed or calculated from the same effluent sample.

[14] Upstream and downstream temperature measurements shall be taken on the same day. Delta temperature shall be calculated using the following equation:

$T\Delta = Td - Tu$

Where;
TΔ = water temperature increase attributed to discharge (Delta Temperature)
Td = downstream water temperature (205 feet downstream of discharge location: 33.3284, -81.9115)
Tu = upstream water temperature (upstream of discharge location: 33.3284, -81.9115 at location which is representative and outside of the influence of discharge)

The computation of T_Δ would be done for paired downstream and upstream temperature measurements. Compliance with the permit requirement of a maximum 5 °F water temperature increase attributed to the discharge is said to be achieved if the computed T_Δ is less than or equal to 5 °F. Measurements shall be taken at a depth of approximately one (1) meter.

If ambient temperature exceeds 90°F, the daily maximum numeric effluent limitation of 90°F at edge of mixing zone does not apply. The daily maximum numeric effluent limitation of Δ+5°F is still applicable.

[15] See Special Conditions Part III.C.4 of this permit.

b. Effective 6 months from the effective date of the permit and continuing until 48 months from the effective date of this permit, the permittee is authorized to discharge from external outfall number 001 and 001a (33.328333,-81.91138)[1] – Graphic Processing Pulp and Paperboard process wastewater, foul condensate, landfill #2 leachate, sanitary wastewater, and wastewater received from Resolute Forest Products for treatment.

Such discharges shall be limited and monitored by the permittee as specified below:

Effluent Characteristics (Units)	Discharge Limitations				Monitoring Requirements[2]		
	Mass Based (lbs/day)		Concentration Based (mg/L)		Measurement Frequency	Sample Type	Sample Location
	Daily Avg.	Daily Max.	Daily Avg.	Daily Max.			
Flow (MGD)[3]	Report	Report	--	--	Daily	Continuous	Effluent[3]
5-Day Biochemical Oxygen Demand (March – October)	30,000	57,590	--	--	3/Week	Composite	Effluent[4]
5-Day Biochemical Oxygen Demand (November – February)	36,379	69,839	--	--	3/Week	Composite	Effluent[4]
5-Day Carbonaceous Biochemical Oxygen Demand [5] (March – October)	--	--	Report	Report	3/Week	Composite	Effluent[4]
Ultimate Oxygen Demand [5] (March – October)	Report[6]	Report[6]	--	--	3/Week	Calculated[5]	Effluent[4]
Total Suspended Solids	63,604	118,356	--	--	3/Week	Composite	Effluent[4]
Fecal Coliform[7] (#/100 mL)	--	--	Report[6]	Report[6]	1/Week	Grab	Effluent[4]
Adsorbable Organic Halides (AOX)[8]	2,223	3,393	--	--	1/Week	Composite	Effluent[4]
Dissolved Oxygen	--	--	See Footnote[9]	See Footnote[9]	1/Week	Grab	Effluent[4]
Color (Platinum-Cobalt Units)	--	--	Report	Report	Quarterly	Composite	Effluent[4]
Dioxin (2,3,7,8-TCDD)[10]	--	--	0.65 (pg/L)	--	1/Year	Composite	Effluent[4]
Chronic Whole Effluent Toxicity[10]	--	--	Report	Report	1/Permit Term	Composite	Effluent[4]

Effluent Characteristics (Units)	Discharge Limitations				Monitoring Requirements[2]		
	Mass Based (lbs/day)		Concentration Based (mg/L)		Measurement Frequency	Sample Type	Sample Location
	Daily Avg.	Daily Max.	Daily Avg.	Daily Max.			
Ammonia, as N[5,12] (March – October)	--	--	Report	Report	3/Week	Composite	Effluent[4]
Ammonia, as N[12] (November – February)	--	--	Report	Report	1/Week	Composite	Effluent[4]
Total Kjeldahl Nitrogen[12]	--	--	Report	Report	1/Week	Composite	Effluent[4]
Organic Nitrogen,[12]	--	--	Report	Report	1/Week	Composite	Effluent[4]
Nitrate/Nitrite[12]	--	--	Report	Report	1/Week	Composite	Effluent[4]
Total Phosphorus[13]	--	--	Report	Report	1/Month	Composite	Effluent[4]
Orthophosphate, as P[13]	--	--	Report	Report	1/Month	Composite	Effluent[4]
Temperature (°F) (Ambient)	--	Report	--	--	1/Month	Grab[14]	See Footnote[15]
Temperature (°F) (Edge of Mixing Zone)	--	90	--	--	1/Month	Grab[14]	See Footnote[15]
Delta Temperature (°F)	--	+5	--	--	1/Month	Calculated[14]	See Footnote[15]

The pH shall not be less than 6.0 standard units nor greater than 9.0 standard units and shall be monitored daily by grab sample.

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

2 All the parameters must be monitored, at a minimum, at the measurement frequency stated above if there is any discharge. If there is no discharge, state such in the discharge monitoring report in accordance with the reporting requirements in Part 1.D of this permit.

3 Flow shall be reported as the total sum from both Outfalls 001 and 001a.

4 Samples shall be collected at the effluent of the final treatment prior to discharge through outfall 001 or 001a.

[5] The ultimate oxygen demand (UOD) shall be calculated using the following equation: UOD (lbs/day) = Effluent Flow x 8.34 x (($CBOD_5$ x 3.62) + (NH_3-N x 4.57)); whereas $CBOD_5$ and NH_3-N are in mg/L and Effluent Flow is in MGD. Furthermore, $CBOD_5$ and NH_3-N samples shall be taken from the same effluent sample on the same day. BOD_5 sampling can be used in lieu of $CBOD_5$.

[6] See Schedule of Compliance, Part III.B, of this permit

[7] Fecal coliform bacteria will be reported as the geometric mean. EPD is currently waiting for final approval from EPA to change the surface water quality indicator bacteria from fecal coliform to E.coli. Upon approval from EPA, the seasonal variation for indicator bacteria is subject to change.

[8] The permittee shall adhere to the approved EPA test method for AOX, 1650. The minimum detection level for AOX is 20 µg/L.

[9] The permittee shall monitor for dissolved oxygen and report the results as a daily minimum accordance with the reporting requirements in Part 1.D of this permit.

[10] The permittee shall adhere to the analytical protocol described in Appendix C of the U.S. EPA/Paper Industry Cooperative Dioxin Screening Study (EPA 440/1-88-025, March 1988) when analyzing wastewater effluent samples for 2,3,7,8-TCDD and the special requirements under Part III.C.2 of this permit.

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[12] Ammonia Nitrogen, Total Kjeldahl Nitrogen, Organic Nitrogen, and Nitrate/Nitrates shall be analyzed or calculated from the same effluent sample.

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Where;
$T\Delta$ = water temperature increase attributed to discharge (Delta Temperature)
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The computation of T_Δ would be done for paired downstream and upstream temperature measurements. Compliance with the permit requirement of a maximum 5 °F water temperature increase attributed to the discharge is said to be achieved if the computed T_Δ is less than or equal to 5 °F. Measurements shall be taken at a depth of approximately one (1) meter.

If ambient temperature exceeds 90°F, the daily maximum numeric effluent limitation of 90°F at edge of mixing zone does not apply. The daily maximum numeric effluent limitation of Δ+5°F is still applicable.

[15] See Special Conditions Part III.C.4 of this permit.

c. Effective 48 months from the effective date of the permit and continuing until 65 months from the effective date of this permit, the permittee is authorized to discharge from external outfall number 001 and 001a (33.328333,-81.91138)[1] – Graphic Processing Pulp and Paperboard process wastewater, foul condensate, landfill #2 leachate, sanitary wastewater, and wastewater received from Resolute Forest Products for treatment.

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5-Day Biochemical Oxygen Demand (November – February)	36,379	69,839	--	--	3/Week	Composite	Effluent[4]
5-Day Carbonaceous Biochemical Oxygen Demand [5] (March – October)	--	--	Report	Report	3/Week	Composite	Effluent[4]
Ultimate Oxygen Demand [5] (March – October)	Report[6]	Report[6]	--	--	3/Week	Calculated[5]	Effluent[4]
Total Suspended Solids	63,604	118,356	--	--	3/Week	Composite	Effluent[4]
Fecal Coliform[7] (#/100 mL) (May – October)	--	--	200	400	1/Week	Grab	Effluent[4]
Fecal Coliform (#/100 mL) (November – April)	--	--	1,000	4,000	1/Week	Grab	Effluent[4]
Adsorbable Organic Halides (AOX)[8]	2,223	3,393	--	--	1/Week	Composite	Effluent[4]
Dissolved Oxygen	--	--	See Footnote[9]	See Footnote[9]	1/Week	Grab	Effluent[4]
Color (Platinum-Cobalt Units)	--	--	Report	Report	Quarterly	Composite	Effluent[4]

Effluent Characteristics (Units)	Discharge Limitations				Monitoring Requirements[2]		
	Mass Based (lbs/day)		Concentration Based (mg/L)		Measurement Frequency	Sample Type	Sample Location
	Daily Avg.	Daily Max.	Daily Avg.	Daily Max.			
Dioxin (2,3,7,8-TCDD)[10]	--	--	0.65 (pg/L)	--	1/Year	Composite	Effluent[4]
Chronic Whole Effluent Toxicity[10]	--	--	Report	Report	1/Permit Term	Composite	Effluent[4]
Ammonia, as N[5,12] (March – October)	--	--	Report	Report	3/Week	Composite	Effluent[4]
Ammonia, as N[12] (November – February)	--	--	Report	Report	1/Week	Composite	Effluent[4]
Total Kjeldahl Nitrogen[12]	--	--	Report	Report	1/Week	Composite	Effluent[4]
Organic Nitrogen,[12]	--	--	Report	Report	1/Week	Composite	Effluent[4]
Nitrate/Nitrite[12]	--	--	Report	Report	1/Week	Composite	Effluent[4]
Total Phosphorus[13]	--	--	Report	Report	1/Month	Composite	Effluent[4]
Orthophosphate, as P[13]	--	--	Report	Report	1/Month	Composite	Effluent[4]
Temperature (°F) (Ambient)	--	Report	--	--	1/Month	Grab[14]	See Footnote[15]
Temperature (°F) (Edge of Mixing Zone)	--	90	--	--	1/Month	Grab[14]	See Footnote[15]
Delta Temperature (°F)	--	+5	--	--	1/Month	Calculated[14]	See Footnote[15]

The pH shall not be less than 6.0 standard units nor greater than 9.0 standard units and shall be monitored daily by grab sample.

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

2 All the parameters must be monitored, at a minimum, at the measurement frequency stated above if there is any discharge. If there is no discharge, state such in the discharge monitoring report in accordance with the reporting requirements in Part 1.D of this permit.

3 Flow shall be reported as the total sum from both Outfalls 001 and 001a.

[4] Samples shall be collected at the effluent of the final treatment prior to discharge through outfall 001 or 001a.

[5] The ultimate oxygen demand (UOD) shall be calculated using the following equation: UOD (lbs/day) = Effluent Flow x 8.34 x (($CBOD_5$ x 3.62) + (NH_3-N x 4.57)); whereas $CBOD_5$ and NH_3-N are in mg/L and Effluent Flow is in MGD. Furthermore, $CBOD_5$ and NH_3-N samples shall be taken from the same effluent sample on the same day. BOD_5 sampling can be used in lieu of $CBOD_5$.

[6] See Schedule of Compliance, Part III.B, of this permit

[7] Fecal coliform bacteria will be reported as the geometric mean. EPD is currently waiting for final approval from EPA to change the surface water quality indicator bacteria from fecal coliform to E.coli. Upon approval from EPA, the seasonal variation for indicator bacteria is subject to change..

[8] The permittee shall adhere to the approved EPA test method for AOX, 1650. The minimum detection level for AOX is 20 µg/L.

[9] The permittee shall monitor for dissolved oxygen and report the results as a daily minimum accordance with the reporting requirements in Part 1.D of this permit.

[10] The permittee shall adhere to the analytical protocol described in Appendix C of the U.S. EPA/Paper Industry Cooperative Dioxin Screening Study (EPA 440/1-88-025, March 1988) when analyzing wastewater effluent samples for 2,3,7,8-TCDD and the special requirements under Part III.C.2 of this permit.

[11] WET testing shall be conducted once during the permit term and the results submitted to the EPD in accordance with Part I.D of this permit. An additional WET test shall be conducted and submitted as part of the next application for NPDES permit reissuance. The testing must comply with the most current U.S. Environmental Protection Agency (EPA) chronic aquatic toxicity testing manuals. The referenced document is entitled Short-Term Methods of Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms, 4th Edition, U.S. EPA, 821-R-02-013, October 2002. Definitive tests must be run on the samples concurrently using both an invertebrate species (i.e. Ceriodaphnia dubia) and a vertebrate species (i.e. Fathead Minnow, pimephales promelas) and shall include a dilution equal to the facility's instream waste concentration (IWC) of 1.8%.

[12] Ammonia Nitrogen, Total Kjeldahl Nitrogen, Organic Nitrogen, and Nitrate/Nitrates shall be analyzed or calculated from the same effluent sample.

[13] Total Phosphorus and Orthophosphate shall be analyzed or calculated from the same effluent sample.

[14] Upstream and downstream temperature measurements shall be taken on the same day. Delta temperature shall be calculated using the following equation:

$T\Delta = Td - Tu$

Where;
TΔ = water temperature increase attributed to discharge (Delta Temperature)
Td = downstream water temperature (205 feet downstream of discharge location: 33.3284, -81.9115)
Tu = upstream water temperature (upstream of discharge location: 33.3284, -81.9115 at location which is representative and outside of the influence of discharge)

The computation of T_Δ would be done for paired downstream and upstream temperature measurements. Compliance with the permit requirement of a maximum 5 °F water temperature increase attributed to the discharge is said to be achieved if the computed T_Δ is less than or equal to 5 °F. Measurements shall be taken at a depth of approximately one (1) meter.

If ambient temperature exceeds 90°F, the daily maximum numeric effluent limitation of 90°F at edge of mixing zone does not apply. The daily maximum numeric effluent limitation of Δ+5°F is still applicable.

[15] See Special Conditions Part III.C.4 of this permit.

d. Effective 65 months from the effective date of the permit the permittee is authorized to discharge from external outfall number 001 and 001a (33.328333,-81.91138)[1] – Graphic Processing Pulp and Paperboard process wastewater, foul condensate, landfill #2 leachate, sanitary wastewater, and wastewater received from Resolute Forest Products for treatment.

Such discharges shall be limited and monitored by the permittee as specified below:

Effluent Characteristics (Units)	Discharge Limitations				Monitoring Requirements[2]		
	Mass Based (lbs/day)		Concentration Based (mg/L)		Measurement Frequency	Sample Type	Sample Location
	Daily Avg.	Daily Max.	Daily Avg.	Daily Max.			
Flow (MGD)[3]	Report	Report	--	--	Daily	Continuous	Effluent[3]
5-Day Biochemical Oxygen Demand (November-February)	36,379	69,839	--	--	3/Week	Composite	Effluent[4]
5-Day Carbonaceous Biochemical Oxygen Demand [5] (March – October)	--	--	Report	Report	3/Week	Composite	Effluent[4]
Ultimate Oxygen Demand (March – October)[5]	27,353	65,647	--	--	3/Week	Calculated[5]	Effluent[4]
Total Suspended Solids	63,604	118,356	--	--	3/Week	Composite	Effluent[4]
Fecal Coliform[6] (#/100 mL) (May – October)	--	--	200	400	1/Week	Grab	Effluent[4]
Fecal Coliform (#/100 mL) (November – April)	--	--	1,000	4,000	1/Week	Grab	Effluent[4]
Adsorbable Organic Halides (AOX)[7]	2,223	3,393	--	--		Composite	Effluent[4]
Dissolved Oxygen[8]	--	--	Report	Report	1/Week	Grab	Effluent[4]
Color (Platinum-Cobalt Units)	--	--	Report	Report	Quarterly	Composite	Effluent[4]
Dioxin (2,3,7,8-TCDD)[9]	--	--	0.65 (pg/L)	--	1/Year	Composite	Effluent[4]
Chronic Whole Effluent Toxicity[10]	--	--	Report	Report	1/Permit Term	Composite	Effluent[4]

Effluent Characteristics (Units)	Discharge Limitations				Monitoring Requirements[2]		
	Mass Based (lbs/day)		Concentration Based (mg/L)		Measurement Frequency	Sample Type	Sample Location
	Daily Avg.	Daily Max.	Daily Avg.	Daily Max.			
Ammonia, as N[5,11] (March – October)	--	--	Report	Report	3/Week	Composite	Effluent[4]
Ammonia, as N[11] (November – February)	--	--	Report	Report	1/Week	Composite	Effluent[4]
Total Kjeldahl Nitrogen[11]	--	--	Report	Report	1/Week	Composite	Effluent[4]
Organic Nitrogen[11]	--	--	Report	Report	1/Week	Composite	Effluent[4]
Nitrate/Nitrite[11]	--	--	Report	Report	1/Week	Composite	Effluent[4]
Total Phosphorus[12]	--	--	Report	Report	1/Month	Composite	Effluent[4]
Orthophosphate, as P[12]	--	--	Report	Report	1/Month	Composite	Effluent[4]
Temperature (°F) (Ambient)	Report	Report	--	--	1/Month	Grab[13]	See Footnote[14]
Temperature (°F) (Edge of Mixing Zone)	--	90	--	--	1/Month	Grab[13]	See Footnote[14]
Delta Temperature (°F)	--	+5	--	--	1/Month	Calculation[13]	See Footnote[14]

The pH shall not be less than 6.0 standard units nor greater than 9.0 standard units and shall be monitored monthly by grab sample.

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

2 All the parameters must be monitored, at a minimum, at the measurement frequency stated above if there is any discharge. If there is no discharge, state such in the discharge monitoring report in accordance with the reporting requirements in Part 1.D of this permit.

3 Flow shall be reported as the total sum from both Outfalls 001 and 001a.

4 Samples shall be collected at the effluent of the final treatment prior to discharge through outfalls 001 or 001a.

5 The ultimate oxygen demand (UOD) shall be calculated using the following equation: UOD (lbs/day) = Effluent Flow x 8.34 x (($CBOD_5$ x 3.62) + (NH_3-N x 4.57)); whereas $CBOD_5$ and NH_3-N are in mg/L and Effluent Flow is in MGD. Furthermore, $CBOD_5$ and NH_3-N samples shall be taken from the same effluent sample on the same day. BOD_5 sampling can be used in lieu of $CBOD_5$.

6 Fecal coliform bacteria will be reported as the geometric mean. EPD is currently waiting for final approval from EPA to change the surface water quality indicator bacteria from fecal coliform to E.coli. Upon approval from EPA, the seasonal variation for indicator bacteria is subject to change.

7 The permittee shall adhere to the approved EPA test method for AOX, 1650. The minimum detection level for AOX is 20 µg/L.

8 The permittee shall monitor for dissolved oxygen and report the results as a daily minimum in accordance with the reporting requirements in Part 1.D of this permit.

9 The permittee shall adhere to the analytical protocol described in Appendix C of the U.S. EPA/Paper Industry Cooperative Dioxin Screening Study (EPA 440/1-88-025, March 1988) when analyzing wastewater effluent samples for 2,3,7,8-TCDD and the special requirements under Part III.C.2 of this permit.

10 WET testing shall be conducted once during the permit term and the results submitted to the EPD in accordance with Part I.D of this permit. An additional WET test shall be conducted and submitted as part of the next application for NPDES permit reissuance. The testing must comply with the most current U.S. Environmental Protection Agency (EPA) chronic aquatic toxicity testing manuals. The referenced document is entitled Short-Term Methods of Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms, 4th Edition, U.S. EPA, 821-R-02-013, October 2002. Definitive tests must be run on the samples concurrently using both an invertebrate species (i.e. Ceriodaphnia dubia) and a vertebrate species (i.e. Fathead Minnow, pimephales promelas) and shall include a dilution equal to the facility's instream waste concentration (IWC) of 1.8%.

11 Ammonia Nitrogen, Total Kjeldahl Nitrogen, Organic Nitrogen, and Nitrate/Nitrates shall be analyzed or calculated from the same effluent sample.

12 Total Phosphorus and Orthophosphate shall be analyzed or calculated from the same effluent sample.

13 Upstream and downstream temperature measurements shall be taken on the same day. Delta temperature shall be calculated using the following equation:

$T\Delta = Td - Tu$

Where;
$T\Delta$ = water temperature increase attributed to discharge (Delta Temperature)
Td = downstream water temperature (205 feet downstream of discharge location: 33.3284, -81.9115)
Tu = upstream water temperature (upstream of discharge location: 33.3284, -81.9115 at location which is representative and outside of the influence of discharge)

The computation of T_Δ would be done for paired downstream and upstream temperature measurements. Compliance with the permit requirement of a maximum 5 °F water temperature increase attributed to the discharge is said to be achieved if the computed T_Δ is less than or equal to 5 °F. Measurements shall be taken at a depth of approximately one (1) meter.

If ambient temperature exceeds 90°F, the daily maximum numeric effluent limitation of 90°F at edge of mixing zone does not apply. The daily maximum numeric effluent limitation of Δ+5°F is still applicable.

[14] See Special Conditions Part III.C.4 of this permit.

A.2. Effluent Limitations and Monitoring Requirements

a. During the period specified on the first page of this permit, the permittee is authorized to discharge from internal outfall number 002b – Bleach Plant #2 effluent

Such discharges shall be limited and monitored by the permittee as specified below:

Effluent Characteristics (Units)	Discharge Limitations				Monitoring Requirements[1]		
	Mass Based (lbs/day)		Concentration Based (µg/L)		Measurement Frequency	Sample Type[2]	Sample Location[3]
	Daily Avg.	Daily Max.	Daily Avg.	Daily Max.			
Flow (MGD)	Report	Report	--	--	Daily	Composite	Effluent
Trichlorosyringol	--	--	--	<2.5	1/Month	Composite	Effluent
3,4,5-Trichlorocatechol	--	--	--	<5.0	1/Month	Composite	Effluent
3,4,6-Trichlorocatechol	--	--	--	<5.0	1/Month	Composite	Effluent
3,4,5-Trichloroguaiacol	--	--	--	<2.5	1/Month	Composite	Effluent
3,4,6-Trichloroguaiacol	--	--	--	<2.5	1/Month	Composite	Effluent
4,5,6-Trichloroguaiacol	--	--	--	<2.5	1/Month	Composite	Effluent
2,4,5-Trichlorophenol	--	--	--	<2.5	1/Month	Composite	Effluent
2,4,6-Trichlorophenol	--	--	--	<2.5	1/Month	Composite	Effluent
Tetrachlorocatechol	--	--	--	<5.0	1/Month	Composite	Effluent
Tetrachloroguaiacol	--	--	--	<5.0	1/Month	Composite	Effluent
2,3,4,6-Tetrachlorophenol	--	--	--	<2.5	1/Month	Composite	Effluent
Pentachlorophenol	--	--	--	<5.0	1/Month	Composite	Effluent
2,3,7,8-TCDD	--	--	--	<0.000010	1/Year	Composite	Effluent
2,3,7,8-TCDF	--	--	--	<0.0000319	1/Year	Composite	Effluent

[1] All the parameters must be monitored, at a minimum, at the measurement frequency stated above if there is any discharge. If there is no discharge, state such in the discharge monitoring report in accordance with the reporting requirements in Part 1.D of this permit.

[2] Bleach plant sampling will be conducted in accordance with EPA's established generic sampling plan described in Appendix B – Sample Collection Methods of the EPA guidance document entitled Permit Guidance Document, Pulp, Paper, and Paperboard Manufacturing Point Source Category, EPA-821-B-00-003, which is incorporated into this permit as Attachment No. 1, except where exceptions are approved by the Environmental Protection Division. Exceptions include: 1) A composite sample may consist of a grab sample taken every 4 hours for 12 hours instead of every 4 hours for 24 hours; and 2) Chloroform samples are to be collected as grabs (3 pairs of samples per 12 hours) instead of as grabs (6 pairs of samples per 24 hours), 40 milliliters each from acid and alkaline stream (one set is back-up), which will be composited at the laboratory.

[3] Bleach plant effluent is defined as "the total discharge of process wastewaters from the bleach plant from each physical bleach line operated at the mill, comprising separate acid and alkaline filtrates or the combination therof" (40 CFR 430.01). Monitoring locations are to be situated after the sewers have collected all of the acid or alkaline bleaching stage discharges and before they are mixed with other mill wastewaters. An exception is chloroform sampling, in which case the acid and alkaline monitoring locations are separate and should be at the point as close as possible to where bleach plant wastewater is discharged from process equipment.

A.3. Effluent Limitations and Monitoring Requirements

a. During the period specified on the first page of this permit, the permittee is authorized to discharge from internal outfall number 002c – Bleach Plant #3 effluent

Such discharges shall be limited and monitored by the permittee as specified below:

Effluent Characteristics (Units)	Discharge Limitations				Monitoring Requirements[1]		
	Mass Based (lbs/day)		Concentration Based (µg/L)		Measurement Frequency	Sample Type[2]	Sample Location[3]
	Daily Avg.	Daily Max.	Daily Avg.	Daily Max.			
Flow (MGD)	Report	Report	--	--	Daily	Composite	Effluent
Trichlorosyringol	--	--	--	<2.5	1/Month	Composite	Effluent
3,4,5-Trichlorocatechol	--	--	--	<5.0	1/Month	Composite	Effluent
3,4,6-Trichlorocatechol	--	--	--	<5.0	1/Month	Composite	Effluent
3,4,5-Trichloroguaiacol	--	--	--	<2.5	1/Month	Composite	Effluent
3,4,6-Trichloroguaiacol	--	--	--	<2.5	1/Month	Composite	Effluent
4,5,6-Trichloroguaiacol	--	--	--	<2.5	1/Month	Composite	Effluent
2,4,5-Trichlorophenol	--	--	--	<2.5	1/Month	Composite	Effluent
2,4,6-Trichlorophenol	--	--	--	<2.5	1/Month	Composite	Effluent
Tetrachlorocatechol	--	--	--	<5.0	1/Month	Composite	Effluent
Tetrachloroguaiacol	--	--	--	<5.0	1/Month	Composite	Effluent
2,3,4,6-Tetrachlorophenol	--	--	--	<2.5	1/Month	Composite	Effluent
Pentachlorophenol	--	--	--	<5.0	1/Month	Composite	Effluent
2,3,7,8-TCDD	--	--	--	<0.000010	1/Year	Composite	Effluent
2,3,7,8-TCDF	--	--	--	<0.0000319	1/Year	Composite	Effluent

[1] All the parameters must be monitored, at a minimum, at the measurement frequency stated above if there is any discharge. If there is no discharge, state such in the discharge monitoring report in accordance with the reporting requirements in Part 1.D of this permit.

[2] Bleach plant sampling will be conducted in accordance with EPA's established generic sampling plan described in Appendix B – Sample Collection Methods of the EPA guidance document entitled Permit Guidance Document, Pulp, Paper, and Paperboard Manufacturing Point Source Category, EPA-821-B-00-003, which is incorporated into this permit as Attachment No. 1, except where exceptions are approved by the Environmental Protection Division. Exceptions include: 1) A composite sample may consist of a grab sample taken every 4 hours for 12 hours instead of every 4 hours for 24 hours; and 2) Chloroform samples are to be collected as grabs (3 pairs of samples per 12 hours) instead of as grabs (6 pairs of samples per 24 hours), 40 milliliters each from acid and alkaline stream (one set is back-up), which will be composited at the laboratory.

[3] Bleach plant effluent is defined as "the total discharge of process wastewaters from the bleach plant from each physical bleach line operated at the mill, comprising separate acid and alkaline filtrates or the combination thereof" (40 CFR 430.01). Monitoring locations are to be situated after the sewers have collected all of the acid or alkaline bleaching stage discharges and before they are mixed with other mill wastewaters. An exception is chloroform sampling, in which case the acid and alkaline monitoring locations are separate and should be at the point as close as possible to where bleach plant wastewater is discharged from process equipment.

B. Monitoring

1. Representative Sampling

Samples and measurements taken as required herein shall be representative of the volume and nature of the monitored discharge. The permittee shall maintain a written sampling plan and schedule onsite.

2. Sampling Period

a. Unless otherwise specified in this permit, quarterly samples shall be taken during the periods January-March, April-June, July-September, and October-December.

b. Unless otherwise specified in this permit, semiannual samples shall be taken during the periods January-June and July-December.

c. Unless otherwise specified in this permit, annual samples shall be taken during the period of January-December.

3. Monitoring Procedures

Analytical methods, sample containers, sample preservation techniques, and sample holding times must be consistent with the techniques and methods listed in 40 CFR Part 136. The analytical method used shall be sufficiently sensitive. EPA-approved methods must be applicable to the concentration ranges of the NPDES permit samples.

4. Detection Limits

All parameters will be analyzed using the appropriate detection limits. If the results for a given sample are such that a parameter is not detected at or above the specified detection limit, a value of "NOT DETECTED" will be reported for that sample and the detection limit will also be reported.

5. Recording of Results

For each measurement or sample taken pursuant to the requirements of this permit, the permittee shall record the following information:

a. The exact place, date, and time of sampling or measurements, and the person(s) performing the sampling or the measurements;

b. The dates and times the analyses were performed, and the person(s) performing the analyses;

c. The analytical techniques or methods used;

d. The results of all required analyses.

6. Additional Monitoring by Permittee

If the permittee monitors any pollutant at the location(s) designated herein more frequently than required by this permit, using approved analytical methods as specified above, the results of such monitoring shall be included in the calculation and reporting of the values required in the Discharge Monitoring Report. Such increased monitoring frequency shall also be indicated. EPD may require, by written notification, more frequent monitoring or the monitoring of other pollutants not required in this permit.

7. Records Retention

The permittee shall retain records of all monitoring information, including all records of analyses performed, calibration and maintenance of instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a minimum of three (3) years from the date of the sample, measurement, report or application, or longer if requested by EPD.

8. Penalties

The Federal Clean Water Act and the Georgia Water Quality Control Act provide that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit, makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or noncompliance shall, upon conviction, be punished by a fine or by imprisonment, or by both. The Federal Clean Water Act and the Georgia Water Quality Control Act also provide procedures for imposing civil penalties which may be levied for violations of the Act, any permit condition or limitation established pursuant to the Act, or negligently or intentionally failing or refusing to comply with any final or emergency order of the Director of EPD

C. Definitions

1. The "daily average" mass means the total discharge by mass during a calendar month divided by the number of days in the month that the production or commercial facility was operating. Where less than daily sampling is required by this permit, the daily average discharge shall be determined by the summation of all the measured daily discharges by weight divided by the number of days sampled during the calendar month when the measurements are made.

2. The "daily maximum" mass means the total discharge by mass during any calendar day.

3. The "daily average" concentration means the arithmetic average of all the daily determinations of concentrations made during a calendar month. Daily determinations of concentration made using a composite sample shall be the concentration of the composite sample.

4. The "daily maximum" concentration means the daily determination of concentration for any calendar day.

5. A "calendar day" is defined as any consecutive 24-hour period.

6. "Bypass" means the intentional diversion of waste streams from any portion of a treatment facility.

7. "Severe property damage" means substantial physical damage to property, damage to treatment facilities that causes them to become inoperable, or substantial and permanent loss of natural resources that can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

8. "EPD" as used herein means the Environmental Protection Division of the Department of Natural Resources.

9. "State Act" as used herein means the Georgia Water Quality Control Act (Official Code of Georgia Annotated; Title 12, Chapter 5, Article 2).

10. "Rules" as used herein means the Georgia Rules and Regulations for Water Quality Control.

D. Reporting Requirements

1. The permittee must electronically report the DMR, OMR and additional monitoring data using the web based electronic NetDMR reporting system, unless a waiver is granted by EPD.

   a. The permittee must comply with the Federal National Pollutant Discharge Elimination System Electronic Reporting regulations in 40 CFR §127. The permittee must electronically report the DMR, OMR, and additional monitoring data using the web based electronic NetDMR reporting system online at: https://netdmr.epa.gov/netdmr/public/home.htm

   b. Monitoring results obtained during the calendar month shall be summarized for each month and reported on the DMR. The results of each sampling event shall be reported on the OMR and submitted as an attachment to the DMR.

   c. The permittee shall submit the DMR, OMR and additional monitoring data no later than 11:59 p.m. on the 15th day of the month following the sampling period.

   d. All other reports required herein, unless otherwise stated, shall be submitted to the EPD Office listed on the permit issuance letter signed by the Director of EPD.

2. No later than December 21, 2020, the permittee must electronically report the following compliance monitoring data and reports using the online web based electronic system approved by EPD, unless a waiver is granted by EPD:

   a. Sewer Overflow/Bypass Event Reports;
   b. Noncompliance Notification;
   c. Other noncompliance; and
   d. Bypass

3. **Other Reports**

   All other reports required in this permit not listed above in Part I.D.2 or unless otherwise stated, shall be submitted to the EPD Office listed on the permit issuance letter signed by the Director of EPD.

4. **Other Noncompliance**

   All instances of noncompliance not reported under Part I.B. and Part II. A. shall be reported to EPD at the time the monitoring report is submitted.

5. Signatory Requirements

All reports, certifications, data or information submitted in compliance with this permit or requested by EPD must be signed and certified as follows:

a. Any State or NPDES Permit Application form submitted to the EPD shall be signed as follows in accordance with the Federal Regulations, 40 C.F.R. 122.22:

1. For a corporation, by a responsible corporate officer. A responsible corporate officer means:

i a president, secretary, treasurer, or vice president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision making functions for the corporation, or

ii. the manager of one or more manufacturing, production, or operating facilities employing more than 250 persons or having gross annual sales or expenditures exceeding $25 million (in second-quarter 1980 dollars), if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.

2. For a partnership or sole proprietorship, by a general partner or the proprietor, respectively; or

3. For a municipality, State, Federal, or other public facility, by either a principal executive officer or ranking elected official.

b. All other reports or requests for information required by the permit issuing authority shall be signed by a person designated in (a) above or a duly authorized representative of such person, if:

1. The representative so authorized is responsible for the overall operation of the facility from which the discharge originates, e.g., a plant manager, superintendent or person of equivalent responsibility;

2. The authorization is made in writing by the person designated under (a) above; and

3. The written authorization is submitted to the Director.

c. Any changes in written authorization submitted to the permitting authority under (b) above which occur after the issuance of a permit shall be reported to the permitting authority by submitting a copy of a new written authorization which meets the requirements of (b) and (b.1) and (b.2) above.

d. Any person signing any document under (a) or (b) above shall make the following certification:

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

PART II

A. Management Requirements

1. Notification of Changes

a. The permittee shall provide EPD at least 90 days advance notice of any planned physical alterations or additions to the permitted facility that meet the following criteria:

1. The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR 122.29(b);

2. The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are subject neither to effluent limitations in the permit, nor to notification requirements under 40 CFR 122.42(a)(1); or

3. 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 or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan.

b. The permittee shall give at least 90 days advance notice to EPD of any planned changes to the permitted facility or activity which may result in noncompliance with permit requirements.

c. Following the notice in paragraph a. or b. of this condition the permit may be modified. The permittee shall not make any changes, or conduct any activities, requiring notification in paragraph a. or b. of this condition without approval from EPD.

d. The permittee shall provide at least 30 days advance notice to EPD of:

1. any planned expansion or increase in production capacity; or

2. any planned installation of new equipment or modification of existing processes that could increase the quantity of pollutants discharged or result in the discharge of pollutants that were not being discharged prior to the planned change

if such change was not identified in the permit application(s) upon which this permit is based and for which notice was not submitted under paragraphs a. or b. of this condition.

e. All existing manufacturing, commercial, mining, and silvicultural dischargers shall notify EPD as soon as it is known or there is reason to believe that any activity has occurred or will occur which would result in the discharge, on a routine or frequent basis, of any toxic pollutant not limited in the permit, if that discharge will exceed (i) 100 µg/L, (ii) five times the maximum concentration reported for that pollutant in the permit application, or (iii) 200 µg/L for acrolein and acrylonitrile, 500 µg/L for 2,4 dinitrophenol and for 2-methyl-4-6-dinitrophenol, or 1 mg/L antimony.

f. All existing manufacturing, commercial, mining, and silvicultural dischargers shall notify EPD as soon as it is known or there is reason to believe that any activity has occurred or will occur which would result in any discharge on a nonroutine or infrequent basis, of any toxic pollutant not limited in the permit, if that discharge will exceed (i) 500 µg/L, (ii) ten times the maximum concentration reported for that pollutant in the permit application, or (iii) 1 mg/L antimony.

g. Upon the effective date of this permit, the permittee shall submit to EPD an annual certification in June of each year certifying whether or not there has been any change in processes or wastewater characteristics as described in the submitted NPDES permit application that required notification in paragraph a., b., or d. of this condition. The permittee shall also certify annually in June whether the facility has received offsite wastes or wastewater and detail any such occurrences.

2. Noncompliance Notification

If, for any reason, the permittee does not comply with, or will be unable to comply with any effluent limitation specified in this permit, the permittee shall provide EPD with an oral report within 24 hours from the time the permittee becomes aware of the circumstances followed by a written report within five (5) days of becoming aware of such condition. The written submission shall contain the following information:

a. A description of the discharge and cause of noncompliance; and

b. The period of noncompliance, including exact dates and times; or, if not corrected, the anticipated time the noncompliance is expected to continue, and steps being taken to reduce, eliminate, and prevent recurrence of the noncomplying discharge.

3. Facility Operation

The permittee shall at all times maintain in good working order and operate as efficiently as possible all treatment or control facilities or systems installed or used by the permittee to achieve compliance with the terms and conditions of this permit. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training, 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.

4. Adverse Impact

The permittee shall take all reasonable steps to minimize or prevent any discharge in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment, including such accelerated or additional monitoring as necessary to determine the nature and impact of the noncomplying discharge.

5. Bypassing

a. If the permittee knows in advance of the need for a bypass, it shall submit prior notice to EPD at least 10 days (if possible) before the date of the bypass. The permittee shall submit notice of any unanticipated bypass with an oral report within 24 hours from the time the permittee becomes aware of the circumstances followed by a written report within five (5) days of becoming aware of such condition. The written submission shall contain the following information:

1. A description of the discharge and cause of noncompliance; and

2. The period of noncompliance, including exact dates and times; or, if not corrected, the anticipated time the noncompliance is expected to continue, and steps being taken to reduce, eliminate and prevent recurrence of the noncomplying discharge.

b. Any diversion or bypass of facilities covered by this permit is prohibited, except (i) where unavoidable to prevent loss of life, personal injury, or severe property damage; (ii) there were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime (this condition is not satisfied if the permittee could have installed adequate back-up equipment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance); and (iii) the permittee submitted a notice as required above. The permittee shall operate the treatment works, including the treatment plant and total sewer system, to minimize discharge of the pollutants listed in Part I of this permit from combined sewer overflows or bypasses. Upon written notification by EPD, the permittee may be required to submit a plan and schedule for reducing bypasses, overflows, and infiltration in the system.

6. Sludge Disposal Requirements

Sludge shall be disposed of in accordance with the regulations and guidelines established by EPD, the Federal Clean Water Act, and the Resource Conservation and Recovery Act (RCRA). Prior to disposal of sludge by any method other than co-disposal in a permitted sanitary landfill, the permittee shall submit a sludge management plan to the Watershed Protection Branch of EPD for written approval. For land application of nonhazardous sludge, the permittee shall comply with the applicable criteria outlined in the most current version of EPD's "Guidelines for Land Application of Sewage Sludge (Biosolids) at Agronomic Rates" and with the State Rules, Chapter 391-3-6-.17. EPD may require more stringent control of this activity. Prior to land applying nonhazardous sludge, the permittee shall submit a sludge management plan to EPD for review and approval. Upon approval, the plan for land application will become a part of the NPDES permit upon modification of the permit.

7. Sludge Monitoring Requirements

The permittee shall develop and implement procedures to ensure adequate year-round sludge disposal. The permittee shall monitor the volume and concentration of solids removed from the plant. Records shall be maintained which document the quantity of solids removed from the plant. The ultimate disposal of solids shall be reported (in the unit of lbs) as specified in Part I.D of this permit.

8. Power Failures

Upon the reduction, loss, or failure of the primary source of power to said water pollution control facilities, the permittee shall use an alternative source of power if available to reduce or otherwise control production and/or all discharges in order to maintain compliance with the effluent limitations and prohibitions of this permit.

If such alternative power source is not in existence, and no date for its implementation appears in Part I, the permittee shall halt, reduce or otherwise control production and/or all discharges from wastewater control facilities upon the reduction, loss, or failure of the primary source of power to said wastewater control facilities.

9. Operator Certification Requirements

The permittee shall ensure that, when required, a certified operator is in charge of the facility in accordance with Georgia State Board of Examiners for Certification of Water and Wastewater Treatment Plant operators And Laboratory Analysts Rule 43-51-6.(b)

10. Laboratory Analyst Certification Requirements

The permittee shall ensure that, when required, the person in responsible charge of the laboratory performing the analyses for determining permit compliance is certified in accordance with the Georgia Certification of Water and Wastewater Treatment Plant operators and Laboratory Analysts Act, as amended, and the Rules promulgated thereunder.

B. Responsibilities

1. Right of Entry

The permittee shall allow the Director of EPD, the Regional Administrator of EPA, and/or their authorized representatives, agents, or employees, upon the presentation of credentials:

a. To enter upon the permittee's premises where a discharge source is located or in which any records are required to be kept under the terms and conditions of this permit; and

b. At reasonable times, to have access to and copy any records required to be kept under the terms and conditions of this permit; to inspect any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and to sample any substance or parameters in any location.

2. Transfer of Ownership or Control

A permit may be transferred to another person by a permittee if:

a. The permittee notifies the Director of EPD in writing of the proposed transfer at least thirty (30) days in advance of the proposed transfer;

b. A written agreement containing a specific date for transfer of permit responsibility and coverage between the current and new permittee (including acknowledgement that the existing permittee is liable for violations up to that date, and that the new permittee is liable for violations from that date on) is submitted to the Director at least thirty (30) days in advance of the proposed transfer; and

c. The Director, within thirty (30) days, does not notify the current permittee and the new permittee of EPD's intent to modify, revoke and reissue, or terminate the permit and to require that a new application be filed rather than agreeing to the transfer of the permit.

3. Availability of Reports

Except for data deemed to be confidential under O.C.G.A. § 12-5-26 or by the Regional Administrator of the EPA under the Code of Federal Regulations, Title 40, Part 2, all reports prepared in accordance with the terms of this permit shall be available for public inspection at an office of EPD. Effluent data, permit applications, permittee's names and addresses, and permits shall not be considered confidential.

4. Permit Modification

After written notice and opportunity for a hearing, this permit may be modified, suspended, revoked or reissued in whole or in part during its term for cause including, but not limited to, the following:

a. Violation of any conditions of this permit;

b. Obtaining this permit by misrepresentation or failure to disclose fully all relevant facts;

c. A change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge; or

d. To comply with any applicable effluent limitation issued pursuant to the order of the United States District Court for the District of Columbia issued on June 8, 1976, in Natural Resources Defense Council, Inc. et.al. v. Russell E. Train, 8 ERC 2120(D.D.C. 1976), if the effluent limitation so issued:

1. is different in conditions or more stringent than any effluent limitation in the permit; or

2. controls any pollutant not limited in the permit.

5. Toxic Pollutants

The permittee shall comply with effluent standards or prohibitions established pursuant to Section 307(a) of the Federal Clean Water Act for toxic pollutants, which are present in the discharge within the time provided in the regulations that establish these standards or prohibitions, even if the permit has not yet been modified to incorporate the requirement.

6. Civil and Criminal Liability

Nothing in this permit shall be construed to relieve the permittee from civil or criminal penalties for noncompliance.

7. State Laws

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable State law or regulation under authority preserved by Section 510 of the Federal Clean Water Act.

8. Water Quality Standards

Nothing in this permit shall be construed to preclude the modification of any condition of this permit when it is determined that the effluent limitations specified herein fail to achieve the applicable State water quality standards.

9. Property Rights

The issuance of this permit does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of Federal, State or local laws or regulations.

10. Expiration of Permit

The permittee shall not discharge after the expiration date. In order to receive authorization to discharge beyond the expiration date, the permittee shall submit such information, forms, and fees as are required by EPD at least 180 days prior to the expiration date.

11. Contested Hearings

Any person who is aggrieved or adversely affected by an action of the Director of EPD shall petition the Director for a hearing within thirty (30) days of notice of such action.

12. Severability

The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.

13. Best Management Practices

The permittee will implement best management practices to control the discharge of hazardous and/or toxic materials from ancillary manufacturing activities. Such activities include, but are not limited to, materials storage, in-plant transfer, process and material handling, loading and unloading operations, plant site runoff, and sludge and waste disposal.

14. Need to Halt or Reduce Activity Not a Defense

It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

15. Duty to Provide Information

a. The permittee shall furnish to the EPD Director, within a reasonable time, any information which the Director may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The permittee shall also furnish upon request copies of records required to be kept by this permit.

b. When 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 any report to the Director, it shall promptly submit such facts and information.

16. Duty to Comply

a. The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Georgia Water Quality Control Act (O.C.G.A. § 12-5-20 et. seq.) and is grounds for enforcement action; for permit termination; revocation and reissuance, or modification; or for denial of a permit renewal application. Any instances of noncompliance must be reported to EPD as specified in Part I. D and Part II.A. of this permit.

b. Penalties for violations of permit conditions. The Federal Clean Water Act and the Georgia Water Quality Control Act (O.C.G.A. § 12-5-20 et. seq.) provide that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required under this permit, makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or noncompliance shall, upon conviction be punished by a fine or by imprisonment, or by both. The Georgia Water Quality Control Act (Act) also provides procedures for imposing civil penalties which may be levied for violations of the Act, any permit condition or limitation established pursuant to the Act, or negligently or intentionally failing or refusing to comply with any final or emergency order of the Director.

17. Upset Provisions

Provisions of 40 CFR 122.41(n)(1)-(4), regarding "Upset" shall be applicable to any civil, criminal, or administrative proceeding brought to enforce this permit.

PART III

A. Previous Permits

1. All previous State wastewater permits issued to this facility, whether for construction or operation, are hereby revoked by the issuance of this permit. This action is taken to assure compliance with the Georgia Water Quality Control Act, as amended, and the Federal Clean Water Act, as amended. Receipt of the permit constitutes notice of such action. The conditions, requirements, terms and provisions of this permit authorizing discharge under the National Pollutant Discharge Elimination System govern discharges from this facility.

B. Schedule of Compliance

1. The permittee shall achieve compliance with the effluent limitations specified for discharges in accordance with the following schedule:

   a. The effluent limitations and monitoring specified in Part I A.1.a, Part I.A.1.b, Part I.A.1.c, and Part I.A.1.d are effective on the effective date of this permit, except as specified below.

   b. The permittee shall achieve compliance with the temperature effluent limits specified in Part I A.1.b. of this permit in accordance with the following schedule:

      (i) Beginning on the effective date of this permit and continuing for 6 months, the permittee shall monitor temperature in accordance with Part I A.1.a. of this permit.

      (ii) Within 6 months of the effective date of this permit, the permittee shall achieve compliance with the temperature effluent limits specified in Part I A.1.b of this permit.

   c. The permittee shall achieve compliance with the fecal coliform effluent limits specified in Part I A.1.c. of this permit in accordance with the following schedule:

      (i) Beginning on the effective date of this permit and continuing for 48 months, the permittee shall monitor fecal coliform in accordance with Part I A.1.a and Part I.A.1.b of this permit.

      (ii) Within 48 months of the effective date of this permit, the permittee shall achieve compliance with the fecal coliform effluent limits specified in Part I A.1.c of this permit.

   d. The permittee shall achieve compliance with the UOD effluent limits specified in Part I A.1.b. of this permit in accordance with the following schedule:

      (i) Beginning on the effective date of this permit and continuing for 65 months, the permittee shall continue to discharge under the limitations placed in

previous permit for UOD in accordance with Part I A.1.a, PartI.A.1.b, and Part I.A.1.c of this permit.

(ii) Within 65 months of the effective date of this permit, the permittee shall achieve compliance with the UOD effluent limits specified in Part I A.1.d of this permit.

e. The permittee shall submit a written progress report to EPD on June 30th and December 31st every year describing the status of achieving compliance with Part I. A.1.b of this permit. The permittee shall submit the report to the EPD assigned Compliance Office.

2. No later than 14 calendar days following a date identified in the above schedule of compliance, the permittee shall submit either a report of progress or, in the case of specific actions being required by identified dates, a written notice of compliance or noncompliance, any remedial actions taken, and the probability of meeting the next scheduled requirement

C. Special Conditions

1. Savannah 5R Alternative Restoration Plan Annual Reporting

a. The permittee shall submit an annual report which provides all available discharge data over the previous twelve (12) calendar months for the following parameters: discharge date, flow (MGD), 5-day biochemical oxygen demand (mg/L) and/or 5-day carbonaceous biochemical oxygen demand (mg/L), and ammonia, as N (mg/L). Additionally, the permittee shall calculate the arithmetic average, standard deviation, and coefficient of variation (CV) for ultimate oxygen demand (UOD) loading based on the daily discharge data. The annual report shall be submitted using the Savannah 5R Alternative Restoration Plan Annual Report Form published on Georgia EPD's website and provided in an electronic format on a compact disc (CD) or universal serial bus (USB). The report is due no later than the 15th of November to the Georgia EPD Watershed Planning and Monitoring Program at the address below:

Environmental Protection Division
Watershed Planning and Monitoring Program
2 Martin Luther King Jr. Drive SE
Suite 1152 East
Atlanta, Georgia 30334

2. Fish Tissue Monitoring

a. The permittee shall monitor for all seventeen cogeners of dioxin (2,3,7,8-TCDD) and furan (2,3,7,8-TCDF) in ambient fish tissue in the facility's receiving stream. The dioxin monitoring program shall be conducted in accordance with the Study Plan To Conduct Dioxin Monitoring In Fish Tissue From The Vicinity Of Five Georgia Bleached Kraft Mills, March 31, 1989. The sampling/testing program commenced in 1999 and shall continue through this permit with the program repeating every three years.

b. The Director may request that the permittee revise the Study Plan applicable to the sampling/testing program in order to address the issue of dioxin (2,3,7,8-TCDD) and furan (2,3,7,8-TCDF) congeners in different sizes of fish fillet, as proposed by the Fish Tissue Advisory Committee for developing consumption recommendations.

3. In lieu of monitoring for chloroform, the permittee must recertify on the monthly DMR that the chlorine containing compounds used for bleaching are unchanged and the processes and operating conditions have been maintained on the fiber line and have not exceeded the maximum values recorded for the conditions listed in §430.02(f)(2)(ii) or §430.02(f)(3)(ii).

4. Thermal Mixing Zone

A thermal mixing zone has been approved for the facility. The mixing zone is defined as the segment of the river extending 205 feet downstream from the point of discharge (33.3284, -81.9115) and extending 27 feet from the west bank of the river. The downstream sampling location for compliance with the maximum temperature and delta temperature limits outlined in Part I.A.1.b, Part I.A.1.c, and Part I.A.1.d of this permit is defined as 13.5 feet from the west bank of the river.

D. Best Management Practices (BMP) Plan

1. Specialized Definitions

a. "Action Level" means a daily pollutant loading that when exceeded triggers investigative or corrective action. Mills determine action levels by a statistical analysis of six months of daily measurements collected at the mill. For example, the lower action level may be the 75th percentile of the running seven-day averages (that value exceeded by 25 percent of the running seven-day averages) and the upper action level may be the 90th percentile of the running seven-day averages (that value exceeded by 10 percent of the running seven-day averages).

b. "Equipment Items in Spent Pulping Liquor, Soap, and Turpentine Service" means any process vessel, storage tank, pumping system, evaporator, heat exchanger, recovery furnace or boiler, pipeline, valve, fitting, or the device that contains, processes, transports, or comes into contact with pulping liquor, soap, or turpentine. Sometimes referred to as "equipment items."

c. "Immediate Process Area" means the location at the mill where pulping, screening, knotting, pulp washing, pulping liquor concentration, pulping liquor processing, and chemical recovery facilities are located, generally the battery limits of the aforementioned processes. "Immediate process area" includes spent pulping liquor storage and spill control tanks located at the mill, whether or not they are located in the immediate process area.

d. "Intentional Diversion" means the planned removal of spent pulping liquor, soap, or turpentine from equipment items in spent pulping liquor, soap, or turpentine service by the mill for any purpose including, but not limited to, maintenance, grade changes, or process shutdowns.

e. "Mill" means the owner or operator of a direct or indirect discharging pulp, paper, or paperboard manufacturing facility subject to this section.

f. "Senior Technical Manager" means the person designated by the mill manager to review the BMP Plan. The senior technical manager shall be the chief engineer at the mill, the manager of pulping and chemical recovery operations, or other such responsible person designated by the mill manager who has knowledge of and responsibility for pulping and chemical recovery operations.

g. "Soap" means the product of reaction between the alkali in kraft pulping liquor and fatty acid portions of the wood, which precipitate out when water is evaporated from the spent pulping liquor.

h. "Spent Pulping Liquor" means for kraft and soda mills the black liquor that is used, generated, stored, or processed at any point in the pulping and chemical recovery processes. For sulfite mills "spent pulping liquor" means any intermediate, final, or used chemical recovery processes (e.g. ammonium-, calcium-, magnesium-, or sodium-based sulfite liquors).

i. "Turpentine" means a mixture of terpenes, principally pinene, obtained by the steam distillation of pine gum recovered from the condensation of digester relief gases from the cooking of softwoods by the kraft pulping process. Sometimes referred to as sulfate turpentine.

2. Requirement to Implement Best Management Practices

The permittee must implement the Best Management Practices (BMPs) specified below. BMPs must be developed according to best engineering practices and must be implemented in a manner that takes into account the specific circumstances of the mill.

a. The permittee must return spilled or diverted spent pulping liquors, soap, and turpentine to the process to the maximum extent practicable as determined by the mill, recover such materials outside the process, or discharge spilled or diverted material at a rate that does not disrupt the receiving wastewater treatment system.

b. The permittee must establish a program to identify and repair leaking equipment items. This program must include.

(i) Regular visual inspections (e.g. once per day) of process areas with equipment items in spent pulping liquor, soap, and turpentine service;

(ii) Immediate repairs of leaking equipment items, when possible. Leaking equipment items that cannot be repaired during normal operations must be identified, temporary means for mitigating the leaks must be provided, and the leaking equipment items repaired during the next maintenance outage;

(iii) Identification of conditions under which production will be curtailed or halted to repair leaking equipment items or to prevent pulping liquor, soap, and turpentine leaks and spills; and

(iv) A means for tracking repairs over time to identify those equipment items where upgrade or replacement may be warranted based on frequency and severity of leaks, spills, or failures.

c. The permittee must operate continuous, automatic monitoring systems that the mill determines are necessary to detect and control leaks, spills, and intentional diversions of spent pulping liquor, soap, and turpentine. These monitoring systems should be integrated with the mill process control system and may include, e.g., high level monitors and alarms on storage tanks; process area conductivity (or pH) monitors and alarms; and process area sewer, process wastewater, and wastewater treatment plant conductivity (or pH) monitors and alarms.

d. The permittee must establish a program of initial and refresher training of operators, maintenance personnel, and other technical and supervisory personnel who have responsibility for operating, maintaining, or supervising the operation and maintenance of equipment items in spent pulping liquor, soap, and turpentine service. The refresher training must be conducted at least annually and the training program must be documented.

e. The permittee must prepare a brief report that evaluates each spill of spent pulping liquor, soap, and turpentine that is not contained at the immediate process area and any intentional diversion of spent pulping liquor, soap, or turpentine that is not contained at the immediate process area. The report must describe the equipment items involved, the circumstances leading to the incident, the effectiveness of the corrective actions taken to contain and recover the spill or intentional diversion, and plans to develop changes to equipment and operating and maintenance practices as necessary to prevent recurrence. Discussion of the reports must be included as part of the annual refresher training.

f. The permittee must establish a program to review any planned modifications to the pulping and chemical recovery facilities and any construction activities in the pulping and chemical recovery areas before these activities commence. The purpose of such review is to prevent leaks and spills of spent pulping liquor, soap, and turpentine during the planned modifications, and to ensure that construction

and supervisory personnel are aware of possible liquor diversions and of the requirement to prevent leaks and spills of spent pulping liquors, soap, and turpentine during construction.

g. The permittee must install and maintain secondary containment (i.e., containment constructed of materials impervious to pulping liquors) for spent pulping liquor bulk storage tanks equivalent to the volume of the largest tank plus sufficient freeboard for precipitation. An annual tank integrity testing program, if coupled with other containment or diversion structures, may be substituted for secondary containment for spent pulping liquor bulk storage tanks.

h. The permittee must install and maintain secondary containment for turpentine bulk storage tanks.

i. The permittee must install and maintain curbing, diking or means of isolating soap and turpentine processing and loading areas from the wastewater treatment facilities.

j. The permittee must conduct wastewater monitoring to detect leaks and spills, to track the effectiveness of the BMPs, and to detect trends in spent pulping liquor losses. Such monitoring must be performed in accordance with Part III.D.8.

3. Requirement to Develop A BMP Plan

a. The permittee must prepare and implement a BMP Plan. The BMP Plan must be based on a detailed engineering review as described in Part III.D.3.b and Part III.D.3.c. The BMP Plan must specify the procedures and the practices required for each mill to meet the requirements of Part III.D.2, the construction the mill determines is necessary to meet those requirements including a schedule for such construction, and the monitoring program (including the statistically derived action levels) that will be used to meet the requirements of Part III.D.8. The BMP Plan also must specify the period of time that the mill determines the action levels established under Part III.D.7 may be exceeded without triggering the responses specified in paragraph Part III.D.8.

b. The permittee must conduct a detailed engineering review of the pulping and chemical recovery operations, including but not limited to, process equipment, storage tanks, pipelines and pumping systems, loading and unloading facilities, and other appurtenant pulping and chemical recovery equipment items in spent pulping liquor, soap, and turpentine service for the purpose of determining the magnitude

and routing of potential leaks, spills, and intentional diversions of spent pulping liquors, soap, and turpentine during the following periods of operation:

(i) Process start-ups and shut downs;
(ii) Maintenance;
(iii) Production grade changes;
(iv) Storm or other weather events;
(v) Power failures; and
(vi) Normal operations

c. As part of the engineering review, the permittee must determine whether the existing spent pulping liquor containment facilities are of adequate capacity for collection and storage of anticipated intentional liquor diversions with sufficient contingency for collection and containment of spills. The engineering review must also consider:

(i) The need for continuous, automatic monitoring systems to detect and control leaks and spills of spent pulping liquor, soap, and turpentine;

(ii) The need for process wastewater diversion facilities to protect end-of-pipe wastewater treatment facilities from adverse effects of spills and diversions of spent pulping liquors, soap, and turpentine;

(iii) The potential for contamination of storm water from the immediate process areas; and
(iv) The extent to which segregation and/or collection and treatment of contaminated stormwater from the immediate process areas is appropriate.

4. Amendment of BMP Plan

a. The permittee must amend its BMP Plan whenever there is a change in mill design, construction, operation, or maintenance that materially affects the potential for leaks or spills of spent pulping liquor, turpentine, or soap from the immediate process areas.

b. The permittee must complete a review and evaluation of the BMP Plan five years after the first BMP Plan is prepared and, except as provided in Part III.D.4.a, once every five years thereafter. As a result of this review and evaluation, the permittee must amend the BMP Plan within three months of the review if the mill determines that any new or modified management practices and engineered controls are necessary to reduce significantly the likelihood of spent pulping liquor, soap, and turpentine leaks, spills, or intentional diversions from the immediate process areas, including a schedule for implementation of such practices and controls.

5. Review and Certification of BMP Plan

a. The BMP Plan, and any amendments, must be reviewed by the senior technical manager at the mill and approved and signed by the mill manager. Any person signing the BMP Plan or its amendments must certify to the Georgia

Environmental Protection Division (EPD) under penalty of law that the BMP Plan (or its amendments) has been prepared in accordance with good engineering practices and in accordance with this regulation. The permittee is not required to obtain approval from Georgia EPD of the BMP Plan or any amendments.

6. Recordkeeping Requirements

a. The permittee must maintain on its premises a complete copy of the current BMP Plan and the records specified in Part III.D.6.b and must make such BMP Plan and records available to the Georgia EPD or their designee for review upon request.

b. The permittee must maintain the following records for three years from the date they are created:

(i) Records tracking the repairs performed in accordance with the repair program described in Part III.D.2.b;

(ii) Records of initial and refresher training conducted in accordance with Part III.D.2.d;

(iii) Reports prepared in accordance with Part III.D.2.e; and

(iv) Records of monitoring required by Part III.D.2.j and Part III.D.8.

7. Establishment of Wastewater Treatment System Influent Action Levels

a. The permittee must conduct a monitoring program, described in Part III.D.7.b, for the purpose of defining the wastewater treatment system influent characteristics (or action levels), described in Part III.D.7.c, that will trigger requirements to initiate investigations on BMP effectiveness and to take corrective action.

b. The permittee must employ the following procedures in order to develop the required action levels:

(i) The permittee must collect 24-hour composite samples and analyze the samples for a measure of organic content (e.g., chemical oxygen demand (COD) or Total Organic Carbon (TOC)). Alternatively, the permittee may use a measure related to spent pulping liquor losses measured continuously and averaged over 24 hours (e.g. specific conductivity or color).

(ii) For direct dischargers, monitoring must be conducted at the point influent enters the wastewater treatment system. For indirect dischargers monitoring must be conducted at the point of discharge to the POTW. For the purposes of this requirement, the permittee may select alternate monitoring point(s) in order to isolate possible sources of spent pulping liquor, soap, or turpentine from other possible sources of organic wastewaters that are

tributary to the wastewater treatment facilities (e.g., bleach plants, paper machines and secondary fiber operations).

c. The permittee must have completed an initial six-month monitoring program using the procedures specified in Part III.D.7.b and must have established initial action levels based on the results of that program. A wastewater treatment influent action level is a statistically determined pollutant loading determined by a statistical analysis of six months of daily measurements. The action levels must consist of a lower action level, which if exceeded will trigger the investigation requirements described in Part III.D.8, and an upper action level, which if exceeded will trigger the corrective action requirements described in Part III.D.8.

d. The permittee must have completed a second six-month monitoring program using the procedures specified in Part III.D.7.b of this section and must have established revised action levels based on the results of that program. The initial action levels shall remain in effect until replaced by revised action levels.

e. Action levels developed under this paragraph must be revised using six months of monitoring data after any change in mill design, construction, operation, or maintenance that materially affects the potential for leaks or spills of spent pulping liquor, soap, or turpentine from the immediate process areas.

8. Monitoring, Corrective Action, and Reporting Requirements

a. The permittee must conduct daily monitoring of the influent to the wastewater treatment system in accordance with the procedures described in Part III.D.7.b for the purpose of detecting leaks and spills, tracking the effectiveness of the BMPs, and detecting trends in spent pulping liquor losses.

b. Whenever monitoring results exceed the lower action level for the period of time specified in the BMP Plan, the permittee must conduct an investigation to determine the cause of such exceedance. Whenever the monitoring results exceed the upper action level for the period of time specified in the BMP Plan, the permittee must complete corrective action to bring the wastewater treatment system influent mass loading below the lower action level as soon as practicable.

c. Although exceedances of the action levels will not constitute violations of the NPDES permit, failure to take the actions required by Part III.D.8.b as soon as practicable will be a violation.

d. The permittee must report to the Georgia EPD the results of the daily monitoring conducted pursuant to Part III.D.8.a. Such reports must include a summary of the monitoring results, the number and dates of exceedances of the applicable action levels, and brief descriptions of any corrective actions taken to respond to such exceedances. Such reports shall be submitted annually during the month of June.

E. Biomonitoring and Toxicity Reduction Requirements

1. The permittee shall comply with effluent standards or prohibitions established by section 307(a) of the Federal Act and with chapter 391-3-6-.03(5)(e) of the State Rules and may not discharge toxic pollutants in concentrations or combinations that are harmful to humans, animals, or aquatic life.

   If toxicity is suspected in the effluent, EPD may require the permittee to perform any of the following actions:

   a. Acute biomonitoring tests;

   b. Chronic biomonitoring tests;

   c. Stream studies;

   d. Priority pollutant analyses;

   e. Toxicity reduction evaluations (TRE); or

   f. Any other appropriate study.

2. EPD will specify the requirements and methodologies for performing any of these tests or studies. Unless other concentrations are specified by EPD, the critical concentration used to determine toxicity in biomonitoring tests will be the effluent instream wastewater concentration (IWC) based on the representative plant flow of the facility and the critical low flow of the receiving stream (7Q10). The endpoints that will be reported are the effluent concentration that is lethal to 50% of the test organisms (LC50) if the test is for acute toxicity and the no observed effect concentration (NOEC) of effluent if the test is for chronic toxicity.

   The permittee must eliminate effluent toxicity and supply EPD with data and evidence to confirm toxicity elimination.

GEORGIA
DEPARTMENT OF NATURAL RESOURCES

ENVIRONMENTAL PROTECTION DIVISION

The Georgia Environmental Protection Division proposes to issue an NPDES permit to the applicant identified below. The draft permit places conditions on the discharge of pollutants from the wastewater treatment plant to waters of the State.

Technical Contact: Whitney Fenwick (*whitney.fenwick@dnr.ga.gov*)
404-656-2795

Draft permit:

- ☐ first issuance
- ☐ reissuance with no or minor modifications from previous permit
- ☒ reissuance with substantial modifications from previous permit
- ☐ modification of existing permit
- ☒ requires EPA review
- ☒ designated as a Major facility

1.0 FACILITY INFORMATION

1.1 NPDES Permit No.: GA0002801

1.2 Name and Address of Owner/Applicant

Mr. Scott Grimes, V.P. of Manufacturing
Graphic Packaging International, LLC
4278 Mike Padget Highway
Augusta, Georgia 30906
(Richmond County)

1.3 Name and Address of Facility

Graphic Packaging International, LLC – Augusta Mill
4278 Mike Padget Highway
Augusta, Georgia 30906
(Richmond County)

1.4 Location and Description of the discharge (as reported by applicant)

Outfall ID	Latitude	Longitude	Receiving Waterbody
001 & 001a	33° 19' 42" N (33.3283)	81° 54' 41" W (-81.9113)	Savannah River

1.5 Production Capacity

Graphic Packaging International, LLC's final effluent consists of treated process wastewater from both Graphic Packaging International, LLC and Resolute Forest Products. See below for production capacities of both facilities.

Graphic Packaging International, LLC
4,000,000 lbs/day – Average Off-The-Machine Production
1,070,270 lbs/day – Air Dried Unbleached Pulp (Bleach Plant #1)
2,497,449 lbs/day – Air Dried Unbleached Pulp (Bleach Plant #2)

Resolute Forest Products (formerly Augusta Newsprint)
1,448,000 lbs/day – Newsprint; Unbleached TMP Air Dried Tons

1.6 SIC Code & Description

Graphic Packaging International, LLC
2631 – Bleached Paper Board
2621 – Paper Manufacturers

Resolute Forest Products
2621 – Paper Manufacturers

1.7 Description of Industrial Processes

Graphic Packaging International, LLC is an integrated kraft pulp and paper complex that produces bleached paper board via the kraft pulping process. The mill produces approximately 282,000 lbs/day of bleached pulp. Operating areas include a woodyard, fiberlines and pulping, bleach plants, caustizing and recovery, recovery boilers, power boilers, and paper machines.

Graphic Packaging International, LLC's pulp manufacturing begins at the wood yard where pine and hardwood logs are debarked, chipped, and separated according to type. Hardwood and Softwood chips are screened and sent into the digester system where the pulp is cooked with steam and white liquor until the pulp becomes a slurry. The pulp slurry is sent to brown stock washing. After the pulp is washed it is sent through the knotter, screen, and decker systems prior to high density pulp storage and bleaching.

The washed pump is then transferred from storage to either Bleach Plant #2 or Bleach Plant #3. Bleach Plant #3 is primarily used from hardwood pulp and Bleach Plant #2 is primarily used for softwood or hardwood pulp. Both bleaching lines operate using an elemental chlorine-free (ECF) processes.

Bleached pulp is then used to make various paper paperboard products which include (but not limited to) coated bleached board used for greeting cards, pharmaceutical and food service packaging, and cigarette packaging. The paper is produced in rolls and then packaged for sale. Bleached pulp is sent through a series of refiners, screens, and cleaners prior to being introduced at the head box of the paper machine. The paper machine form the pulp into sheets, capturing all removed water in a pit below. This sheet is then sent through a press where additional water is removed and the sheet is dried using steam. The dried sheet passes through

a size press before additional additives and coatings are applied. The sheet is then further dried before it is calendared and wound onto a reel. The reels are then cut specific to the specified size.

Graphic Packaging International, LLC also accepts wastewater from Resolute Forest Products for treatment. Resolute Forest Products is an integrated pulp and paper mill that produces newsprint on a single paper machine using the thermo-mechanical pulp produced on-site.

1.8 Description of the Wastewater Treatment Facility

Wastewater collection and treatment operations at the Augusta Mill include a collection system of trenches, sewers, and hard piping, and a wastewater treatment plant. The wastewater treatment plant consists of primary clarification and secondary aerobic biological treatment. Process wastewater from both Graphic Packaging International, LLC and Resolute Forest Products enters into a mix pit to remove large solids. Emergency bypass for Resolute Forest Products may be rerouted into a sludge pond before it is merged into the mix pit. Wastewater is then treated via primary clarification. Sludge is removed and it is either used in three power boilers to produce steam for power generation through their steam turbine generators or trucked to the permitted on-site landfill. The remaining wastewater is sent though an inlet channel where it is treated through two fiber traps to further remove solids before it enters a series of aeration basins: #1A, 17.6 acres, #1B, 14 acres, and #2, 69 acres. The foul condensates from Graphic Packaging International, LLC are sent to Aeration Basin #3 per 40 CFR 63- Subpart S. The effluent from both Aeration Basin #2 and #3 are commingled and sent into the final basin, Stabilization Basin #5 (315 acres). Wastewater from Aeration Basin #2 and #3, Basin #4 (for emergency only), and leachate from the on-site landfill enters the final treatment in the 315 acre Stabilization Basin #5 before it is discharged into the Savannah River via Outfall 001 or 001a. Ash from the Sedimentation Ash Basin is either trucked to the landfill or burned to produce power via one of three steam powered turbines.

See process flow diagram in Appendix A.

Outfall	Operation Description	Treatment Description
001 001a (External Outfalls)	Graphic Packaging International, LLC Pulp and Paperboard process wastewater, foul condensate, landfill #2 leachate, sanitary wastewater, and wastewater received from Resolute Forest Products for treatment.	Screening, mixing, clarification, fiber trap, neutralization, aerated basins, sedimentation, stabilization, constructed wetlands, sludge basin, ash basin, screw press, and landfill
002b (Internal Outfall)	No. 2 Bleach Plant Wastewater Discharge	Not Applicable
002c (Internal Outfall)	No. 3 Bleach Plant Wastewater Discharge	Not Applicable

1.9 Type of Wastewater Discharge

☒	process wastewater	☐	stormwater
☒	domestic wastewater	☒	combined (describe)
☐	other (description)		

The discharged wastewater consists of commingled sanitary wastewater and process wastewater from Graphic Packaging International, LLC and Resolute Forest Products,

1.10 Characterization of Effluent Discharge as Reported by Applicant

(Form 2C, Section V, Part A only. Please refer to the application for additional analysis)

1.10.a Outfall No. 001 and 001a[1] – Final Discharge: Graphic Packaging International, LLC Pulp and Paperboard process wastewater, foul condensate, landfill #2 leachate, sanitary wastewater, and wastewater received from Resolute Forest Products for treatment.

1 Outfall 001a is an alternative discharge point that will be used only when conditions such as maintenance and high river flow prevent adequate discharge from Outfall 001. The discharge to Outfall 001a consists of the same effluent discharge and the total discharge will be the sum of both 001 and 001a, hence the effluent characteristics will be the same.

Effluent Characteristics (as Reported by Applicant)	Maximum Daily Value	Average Daily Value
Flow (MGD)	74.7	44.6
Biochemical Oxygen Demand$_{5\text{-day}}$ (mg/L)	294	59
Total Suspended Solids (mg/L)	429	59
Temperature, Winter (°F)	88.8	59.9
Temperature, Summer (°F)	90.8	77.0
Ammonia (mg/L)	17.9	2.4
Total Phosphorus (mg/L)	0.95	N/A

2.0 APPLICABLE REGULATIONS

2.1 State Regulations

Chapter 391-3-6 of the Georgia Rules and Regulations for Water Quality Control

2.2 Federal Regulations

Source	Activity	Applicable Regulation
Industrial	Non-Process Water Discharges	40 CFR 122 40 CFR 125
	Process Water Discharges	40 CFR 122 40 CFR 125 40 CFR 430

2.3 Industrial Effluent Limit Guideline(s)

Graphic Packaging International, LLC Process Wastewater
Code of Federal Regulations, 40 CFR Part 430 – Pulp, Paper, and Paperboard Point Source Category, Subpart B – Bleached Papergrade Kraft and Soda Subcategory

Resolute Forest Products Process Wastewater
Code of Federal Regulations, 40 CFR Part 430 – Pulp, Paper, and Paperboard Point Source Category, Subpart G – Mechanical Pulp Subcategory

See Appendix B of the Fact Sheet

3.0 WATER QUALITY STANDARDS & RECEIVING WATERBODY INFORMATION

Section 301(b)(1)(C) of the Clean Water Act (CWA) requires the development of limitations in permits necessary to meet water quality standards. Federal Regulations 40 CFR 122.4(d) require that conditions in NPDES permits ensure compliance with the water quality standards which are composed of use classifications, numeric and or narrative water quality criteria and an anti-degradation policy. The use classification system designates the beneficial uses that each waterbody is expected to achieve, such as drinking water, fishing, or recreation. The numeric and narrative water quality criteria are deemed necessary to support the beneficial use classification for each water body. The antidegradation policy represents an approach to maintain and to protect various levels of water quality and uses.

3.1 Receiving Waterbody Classification and Information

[391-3-6-.03(6)]

Fishing: Propagation of Fish, Shellfish, Game and Other Aquatic Life; secondary contact recreation in and on the water; or for any other use requiring water of a lower quality

(i) Dissolved Oxygen: A daily average of 6.0 mg/L and no less than 5.0 mg/L at all times for water designated as trout streams by the Wildlife Resources Division. A daily average of 5.0 mg/L and no less than 4.0 mg/L at all times for waters supporting warm water species of fish.

(ii) pH: Within the range of 6.0 - 8.5.

(iii) Bacteria:

1. For the months of May through October, when water contact recreation activities are expected to occur, fecal coliform not to exceed a geometric mean of 200 per 100 mL based on at least four samples collected from a given sampling site over a 30-day period at intervals not less than 24 hours. Should water quality and sanitary studies show fecal coliform levels from non-human sources exceed 200/100 mL (geometric mean) occasionally, then the allowable geometric mean fecal coliform shall not exceed 300 per 100 mL in lakes and reservoirs and 500 per 100 mL in free flowing freshwater streams. For the months of November through April, fecal coliform not to exceed a geometric mean of 1,000 per 100 mL based on at least four samples collected from a given sampling site over a 30-day period at intervals not less than 24 hours and not to exceed a maximum of 4,000 per 100 mL for any sample. The State does not encourage swimming in these surface waters since a number of factors which are beyond the control of any State regulatory agency contribute to elevated levels of bacteria.

2. For waters designated as shellfish growing areas by the Georgia DNR Coastal Resources Division, the requirements will be consistent with those established by the State and Federal agencies responsible for the National Shellfish Sanitation Program. The requirements are found in National Shellfish Sanitation Program Guide for the Control of Molluscan Shellfish, 2007 Revision (or most recent version), Interstate Shellfish Sanitation Conference, U.S. Food and Drug Administration.

(iv) Temperature: Not to exceed 90°F. At no time is the temperature of the receiving waters to be increased more than 5°F above intake temperature except that in estuarine waters the increase will not be more than 1.5°F. In streams designated as primary trout or smallmouth bass waters by the Wildlife Resources Division, there shall be no elevation of natural stream temperatures. In streams designated as secondary trout waters, there shall be no elevation exceeding 2°F natural stream temperatures

Drinking Water Supplies: Those waters approved as a source for public drinking water systems permitted or to be permitted by the Environmental Protection Division. Waters classified for drinking water supplies will also support the fishing use and any other use requiring water of a lower quality.

(i) Bacteria: For the months of May through October, when water contact recreation activities are expected to occur, fecal coliform not to exceed a geometric mean of 200 per 100 mL based on at least four samples collected from a given sampling site over a 30-day period at intervals not less than 24 hours. Should water quality and sanitary studies show fecal coliform levels from non-human sources exceed 200/100 mL (geometric mean) occasionally, then the allowable geometric mean fecal coliform shall not exceed 300 per 100 mL in lakes and reservoirs and 500 per 100 mL in free flowing freshwater streams. For the months of November through April, fecal coliform not to exceed a geometric mean of 1,000 per 100 mL based on at least four samples collected from a given sampling site over a 30-day period at intervals not less than 24 hours and not to exceed a maximum of 4,000 per 100 mL for any sample. The State does not encourage swimming in surface waters since a number of factors which are beyond the control of any State regulatory agency contribute to elevated levels of fecal coliform.

(ii) Dissolved oxygen: A daily average of 6.0 mg/L and no less than 5.0 mg/L at all times for waters designated as trout streams by the Wildlife Resources Division. A daily average of 5.0 mg/L and no less than 4.0 mg/L at all times for water supporting warm water species of fish.

(iii) pH: Within the range of 6.0 - 8.5

(iv) No material or substance in such concentration that, after treatment by the public water treatment system, exceeds the maximum contaminant level established for that substance by the Environmental Protection Division pursuant to the Georgia Rules for Safe Drinking Water

(v) Temperature: Not to exceed 90°F. At no time is the temperature of the receiving waters to be increased more than 5°F above intake temperature except that in estuarine waters the increase will not be more than 1.5°F. In streams designated as primary trout or smallmouth bass waters by the Wildlife Resources Division, there shall be no elevation of natural stream temperatures. In streams designated as secondary trout waters, there shall be no elevation exceeding 2°F of natural stream temperatures.

3.2 Ambient Information

Outfall ID	30Q3 (cfs)	7Q10 (cfs)	1Q10 (cfs)	Hardness (mg/L as $CaCO_3$)	Annual Average Flow (cfs)	Upstream Total Suspended Solids (mg/L)
001 and 001a	4450	3720	3720	14	8800	Data unavailable[1]

[1] For the Reasonable Potential Analysis calculations, EPD used 10 mg/l as a conservative value.

3.3 Georgia 305(b)/303(d) List Documents

The Savannah River (Reach # R030601060902) is listed as supporting the designated use.

While this Savannah River Reach is listed as supporting its designated use, it is within the scope of the Category 5R Restoration Plan for the Savannah Harbor which is discussed in the next section.

Savannah River	US Hwy. 78/278 to Johnsons Landing	Savannah	78 miles	1	TMDLs completed Pb (2000) and FC (2000) from Butler Creek to McBean Creek.
R030601060902	Richmond/ Burke/ Screven County	Fishing/ Drinking Water			
1,8,10					

3.4 Category 5R Alternative Restoration Plan

In 2006 EPA established a TMDL for the Savannah Harbor segment spanning from SR 25 (Old US Hwy 17) to Elba Island Cut. On May 13, 2016, EPA approved the *Subcategory 5R Documentation for Point Source Dissolved Oxygen Impaired Water in the Savannah River Basin in Georgia and South Carolina* (5R Plan). This document supersedes the 2006 TMDL. Development of the documentation behind the 5R Plan was a result of extensive collaboration between the Georgia Environmental Protection Division (GA EPD), the South Carolina Department of Health and Environmental Control (SC DHEC), the Environmental Protection Agency (EPA), a Technical Modeling Advisory Group, and the Savannah River/Harbor Dischargers Group.

The portions of the Savannah River Basin included in the 5R Plan are the middle and lower watersheds encompassing the area from Thurmond Dam to the Atlantic Ocean. The hydrodynamic and water quality models used to analyze the oxygen-demanding pollutant loadings extend upstream on the Savannah River to River Mile 61.0 near Clyo, Georgia, at United States Geologic Survey (USGS) station 02198500. The downstream end of the models extends approximately 25 miles offshore from Oyster Island to cover the navigational channel of the Savannah Harbor. The models cover the Savannah River, the Front River, the Middle River, the Little Back River, the Back River, the South Channel, and the offshore portions in the Atlantic Ocean.

The process of developing this 5R Plan for the Savannah Harbor included developing three computer modeling tools: (1) the Savannah River Model, (2) the Savannah Harbor Model, and (3) the Savannah River and Harbor DO Calculator. Georgia EPD developed the Savannah River Model for the Savannah River Model for the Savannah River from the Augusta Canal diversion dam to the USGS gaging station (021988760) above Hardeeville Southern Carolina. The Savannah River Model used for the 5R Plan is the hydrodynamic and water quality model developed using GA RIV-1 for the 2006 TMDL. The Savannah River Model includes all major point sources to the River and simulates the effects municipal and industrial dischargers have on both water quality and flow and was calibrated to available data. The output of the Savannah River Model is later used as the input for the Savannah Harbor Model. The Savannah Harbor Model used for the 5R Plan was built upon the Enhanced USACE Model that was finalized on January 30, 2006 and the 2006 Harbor TMDL Model developed by EPA Region 4 (Tetra Tech 2004, Tetra Tech 2006, EPA 2010). Combined, the Savannah River and Harbor models were used to develop the Savannah River and Harbor DO Calculator.

The Savannah River and Harbor DO Calculator was developed as an efficient method to calculate the effect various combinations of wastewater effluent dischargers have on the DO levels in the Savannah River and Harbor. In order to run the calculator, the 5R Plan identified 24 permitted facilities that discharge oxygen-demanding substances. Of these 24 facilities, eleven are considered to discharge to the harbor and thirteen are considered to discharge to the river. Using the calculator, wasteload allocations were developed for the 24 dischargers to establish limits for Ultimate Oxygen Demand (UOD) during the critical months of March – October.

Using the calculator, the 5R plan establishes the following equation for calculating UOD:

$$UOD = CBODu + NBODu$$

$$CBODu = CBOD5 * f_{ratio}; NBODu = NH3\text{–}N * 4.57\ (conversion\ factor)$$

Whereas UOD, $CBOD_5$ and NH_3 are in lbs/day. The f_{ratio} specific to this facility is 3.62.

Information pertaining to the technical basis for determining the load reductions for each wastewater discharger is discussed in Appendix B [of the 5R Plan]. The Memorandum of Understanding between the dischargers to the Savannah River and Harbor is included in Appendix C [of the 5R Plan], which reflects the consensus of the dischargers to the following allocations. The Appendix C [of the 5R Plan] waste load allocations will be used for the issuance of permits by Georgia and South Carolina for the included dischargers but it is not otherwise a final legal agreement by either state of the waste load allocation utilized proportionally by Georgia and South Carolina and agreement to this document does not waive any rights, ownership, or claims by either state to a different share of the waste load allocation. Appendix D contains the final Savannah River and Harbor DO Calculator Version 4.0 run.

Graphic Packaging International, LLC – Augusta Mill (formerly International Paper – Augusta Mill) is identified in the 5R Plan as one of the 24 point-source permitted facilities discharging oxygen demand substances to the Savannah River/Harbor. In accordance with the load reductions outlined in the 5R Plan, the permit has included effluent limitations for Ultimate Oxygen Demand (UOD). A daily average of 27,353 lbs/day and daily maximum of 41,029 lbs/day for UOD during the critical months of March – October has been included in the permit. The permit also includes monitoring requirements for BOD_5 and NH_3 in order to calculate UOD loading.

The new UOD Wasteload allocation and applicable effluent limits for Graphic Packaging International, LLC – Augusta Mill represents a 77.63% UOD load reduction from the previously permitted baseline. In order to achieve such reductions, EPA endorses the full range of administrative and regulatory tools available to the States to provide flexibility in implementing the 5R process. EPA recognizes that the Clean Water Act does not limit compliance schedules to the five-year permit term where a longer period is justified under Section 502(17) of the Act and 40 CFR 122.2 and 122.47. With respect to the implementation of the Savannah Harbor 5R plan, EPA and the States recognize that the required process alterations and improvements will vary, and in some cases, the States may need to allow long-term compliance schedules consistent with the regulatory requirements noted above.

International Paper has evaluated the time required to implement changes at the facility to comply with the new UOD limitations and has requested a 65 month compliance schedule. An implementation plan outlining the timeline for achieving compliance has been included in Appendix C.

3.5 Total Maximum Daily Load (TMDL)

The State of Georgia identified the Savannah River between Butler and McBean Creek near Augusta, Georgia to be impaired for fecal coliform. A TMDL for fecal coliform was developed and approved on March 7, 2000. The TMDL does not establish any criteria for point source discharges of fecal coliform.

3.6 Wasteload Allocation Date (if applicable)

See Appendix D of the Fact Sheet

4.0 EFFLUENT LIMITS AND PERMIT CONDITIONS

4.1 Reasonable Potential Analysis (RP)

Title 40 of the Federal Code of Regulations, 40 CFR 122.44(d) requires delegated States to develop procedures for determining whether a discharge causes, has the reasonable potential to cause, or contributes to an instream excursion above a narrative or numeric criteria within a State water. If such reasonable potential is determined to exist, the NPDES permit must contain pollutant effluent limits and/or effluent limits for whole effluent toxicity. Georgia's Reasonable Potential Procedures are based on Georgia's Rules and Regulations for Water Quality Control (Rules), Chapter 391-3-6-.06(4)(d)5. The chemical specific and biomonitoring data and other pertinent information in EPD's files will be considered in accordance with the review procedures specified in the Rules in the evaluation of a permit application and in the evaluation of the reasonable potential for an effluent to cause an exceedance in the numeric or narrative criteria.

A Reasonable Potential Analysis was performed on the data submitted with the application and the results of those analyses are stated below in the following sections.

EPD evaluated the data provided in the application and supporting documents. If a pollutant is listed below, EPD determined it was a pollutant of concern and there may be a reasonable potential to cause or contribute to an instream violation of the GA Water Quality Standards. If a pollutant is not listed below, EPD determined that the pollutant is not a pollutant of concern or has determined, based on the data provided in the application, there is no reasonable potential to cause or contribute to an instream violation of the GA Water Quality Standards. An example would be if the applicant reported "not detect," "below detection limit," or a value that was below the detection limit for a pollutant.

4.2 Whole Effluent Toxicity

Chronic WET test measures the effect of wastewater on indicator organisms' growth, reproduction and survival. Effluent toxicity is predicted when the No Observable Effect Concentrations for a test organism is less than the facility's Instream Wastewater Concentration.

Two chronic WET tests performed and submitted with the NPDES permit renewal application. Testing was conducted April 18, 2017 for Ceriodaphnia dubia and April 18, 2017 for Pimephales promelas.

Date of Test	Test Species	Survival NOEC	Growth/Reproduction NOEC	Concentration Tested
April 2017	Fathead minnow	100%	100%	6.25%,12.5%,25%, 50%,and 100%
	C.dubia	100%	100%	

Results of the aquatic biomonitoring tests indicated no statistically significant effect on survival and growth for P. promelas at up to 100% effluent concentration. For C. dubia the NOEC was >100% for mortality and >100% for reproduction for all test. The NOEC for all parameters was above the IWC of 1.8%, hence no toxic effects were detected.

4.3 Applicable Water Quality and Technology Based Effluent Limitations

Water Quality Based Effluent Limits (WQBELs)

When drafting a National Pollutant Discharge Elimination System (NPDES) permit, a permit writer must consider the impact of the proposed discharge on the quality of the receiving water. Water quality goals for a waterbody are defined by state water quality standards. By analyzing the effect of a discharge on the receiving water, a permit writer could find that technology-based effluent limitations (TBELs) alone will not achieve the applicable water quality standards. In such cases, the Clean Water Act (CWA) and its implementing regulations require development of water quality-based effluent limitations (WQBELs). WQBELs help meet the CWA objective of restoring and maintaining the chemical, physical, and biological integrity of the nation's waters and the goal of water quality that provides for the protection and propagation of fish, shellfish, and wildlife and recreation in and on the water (*fishable/swimmable*).

WQBELs are designed to protect water quality by ensuring that water quality standards are met in the receiving water and downstream uses are protected. On the basis of the requirements of Title 40 of the *Code of Federal Regulations* (CFR) 125.3(a), additional or more stringent effluent limitations and conditions, such as WQBELs, are imposed when TBELs are not sufficient to protect water quality.

The term *pollutant* is defined in CWA section 502(6) and § 122.2. Pollutants are grouped into three categories under the NPDES program: conventional, toxic, and nonconventional. Conventional pollutants are those defined in CWA section 304(a)(4) and § 401.16 (BOD_5, TSS, fecal coliform, pH, and oil and grease). Toxic (priority) pollutants are those defined in CWA section 307(a)(1) and include 126 metals and manmade organic compounds. Nonconventional

pollutants are those that do not fall under either of the above categories (conventional or toxic pollutants) and include parameters such as chlorine, ammonia, nitrogen, phosphorus, chemical oxygen demand (COD), and whole effluent toxicity (WET).

Applicable Technology Based Effluent Limits (TBELs)

Technology-based effluent limitations aim to prevent pollution by requiring a minimum level of effluent quality that is attainable using demonstrated technologies for reducing discharges of pollutants or pollution into the waters of the United States. TBELs are developed independently of the potential impact of a discharge on the receiving water, which is addressed through water quality standards and water quality-based effluent limitations. The NPDES regulations at Title 40 of the Code of Federal Regulations 125.3(a) require NPDES permit writers to develop technology-based treatment requirements, consistent with CWA section 301(b), that represent the minimum level of control that must be imposed in a permit. The regulation also indicates that permit writers must include in permits additional or more stringent effluent limitations and conditions, including those necessary to protect water quality.

For pollutants not specifically regulated by Federal Effluent Limit Guidelines, the permit writer must identify any needed technology-based effluent limitations and utilize best professional judgment to establish technology-based limits or determine other appropriate means to control its discharge if there is a reasonable potential to cause or contribute to a violation of the water quality standards.

4.4 Conventional Pollutants

Pollutants of Concern	Outfall ID	Basis
pH	001 001a	WQBEL The instream waste concentration is 1.8%. When the instream waste concentration is below 50%, it has no reasonable potential to cause or contribute to violation of the instream Georgia Water Quality Standard; therefore a limit of 6.0 s.u. to 9.0 s.u has been added.
		TBEL Based on 40 CFR 430.22 and 430.72, Best Practicable Control Technology Currently Available (BPT), the pH value shall remain within the range of 5.0 s.u to 9.0 s.u at all times.
	002b	WQBEL Georgia does not have Water Quality Standards for internal outfalls.
	002c	TBEL There is no applicable federal technology based effluent limit.

5-Day Biochemical Oxygen Demand	001 001a	WQBEL The Savannah Harbor is listed as not supporting its designated use due to dissolved oxygen impairment. Per the Wasteload Allocation, BOD shall be monitored during the months of March to October and a daily average of 44,478 lbs/day for the months November to February. The daily maximum is calculated by multiplying the daily average concentration limit by a multiplier of 1.92 and determined to be 85,398 lbs/day. This multiplier is consistent with that used in 40 CFR 430 Subpart B Regulations for BOD_5. This multiplier is consistent with that used in 40 CFR 430 Subpart B Regulations for BOD_5. A 65 month compliance schedule has been added in order to provide adequate time to accommodate any needed upgrades to be compliant with new effluent limits provided with EPD's Savannah Harbor Restoration (5R) Plant. The approved compliance schedule is provided in Part III.B.1 of the permit. After the completion of this schedule, BOD_5 effluent limits will be replaced with Ultimate Oxygen Demand (UOD) effluent limits for the months of March - October. Since the UOD effluent limit is more stringent than the BOD_5 effluent limit, the BOD_5 limit may be removed. Please see calculations below: $BOD5 = CBOD_5 + NBOD_5$ Therefore; $BOD_5 \geq CBOD_5$ $UOD = (CBOD_5 \times 8.11) + (NH_3\text{-}N \times 4.57)$ If $CBOD_5 = 44,478$ lbs/day and $NH_3\text{-}N = 0$ lbs/day $UOD \geq 25,669 \times 8.11)$ $UOD \geq 360,716$ lbs/day which is greater than the 5R limitation of 27,353 lbs/day Upon completion of the compliance schedule, the effluent limit for BOD_5 during the critical months of March – October will be replaced with an effluent limit for Ultimate Oxygen Demand as shown above. *Until the 65 month compliance schedule has been completed; (1) The BOD_5 daily average limit of 30,000 lbs/day and daily maximum limit of 57,590 lbs/day for the months of March to October has been retained from previous permit in accordance with 40 CFR 122.44(l), which requires a reissued permit to be as stringent as the previous permit and; (2) For the months of November to February, BOD_5 will have a technology based daily average limit of 36,379 lbs/day and daily maximum limit of 69,839 lbs/day per 40 CFR 430.22.

		TBEL Outfall 001 consists of waste streams from multiple processes; additionally Graphic Packaging International, LLC receives wastewater from Resolute Forest Products for treatment. Graphic Packaging International, LLC and Resolute Forest Products are covered under separate federal effluent guidelines; hence the alternative mass limit formula was used to calculate an appropriate effluent limit that accounts for both waste streams. Graphic Packaging International, LLC is subject to 40 CFR 430.22, which provides a production based daily average of 28,400 lbs/day and daily maximum of 54,600 lbs/day. Resolute Forest Products is subject to 40 CFR 430.72, which provides a production based daily average of 7,979 lbs/day and daily maximum of 15,239 lbs/day. Due to these wastestreams being commingled before treatment, EPD developed TBELs using the Alternative Mass Limit Formula cited in 40 CFR 403.6(e)(ii). The formula considers the effects of dilute wastestreams to provide an appropriate effluent limit.
5-Day Biochemical Oxygen Demand	001 001a	Graphic Packaging International, LLC discharges a daily average of 33 MGD into their treatment system. The wastestream received from Resolute Forest Products has reported daily average of 6.2 MGD. Using the alternative mass limit formula, an alternative categorical daily average of 36,379 lbs/day and daily maximum of 69,839 lbs/day were calculated. *Until the 65 month compliance schedule has been completed; (1) The BOD_5 daily average limit of 30,000 lbs/day and daily maximum limit of 57,590 lbs/day during the months of March to October has been retained from previous permit in accordance with 40 CFR 122.44(l), which requires a reissued permit to be as stringent as the previous permit and; (2) For the months of November to February, BOD_5 will have a technology based daily average limit of 36,379 lbs/day and daily maximum limit of 69,839 lbs/day per 40 CFR 430.22. Upon completion of the compliance schedule, the effluent limit for BOD_5 during the critical months of March – October will be replaced with an effluent limit for Ultimate Oxygen Demand. See above for further discussion.
	002b	WQBEL Georgia does not have Water Quality Standards for internal outfalls.
	002c	TBEL There is no applicable federal technology based effluent limit.

Ultimate Oxygen Demand	001 001a	WQBEL Graphic Packaging International, LLC was listed as one the 24 point source dischargers in EPD's Savannah Harbor Restoration (5R) Plan. In accordance with the requirements of the 5R Plan, for the months of March – October, Ultimate Oxygen Demand the daily average of 27,353 lbs/day. The daily maximum of 65,647 lbs/day was calculated by multiplying the daily average by 2.4. This multiplier is based on the distributional statistics specific to Graphic Packaging International, LLC Augusta Mill that was used in the modeling effluent to allocate UOD amongst dischargers. For the months of November – February, no effluent limit or reporting requirements were added. Graphic Packaging International, LLC has been given a 65 month compliance schedule to accommodate any changes needed to meet the new UOD limit provided by the Savannah River Restoration Plan (5R). The approved compliance schedule is provided in Part III.B.1 of the permit and implementation plan is included in Appendix C. The ultimate oxygen demand (UOD) is calculated using the following equation: UOD (lbs/day) = Effluent Flow x 8.34 x (($CBOD_5$ x 3.62) + (NH_3-N x 4.57)); whereas BOD_5 and NH_3 are in mg/L and Effluent Flow is in MGD.
		TBEL There is no applicable federal technology based effluent limit.
	002b	WQBEL Georgia does not have Water Quality Standards for internal outfalls.
	002c	TBEL There is no applicable federal technology based effluent limit.
5-Day Carbonaceous Biochemical Oxygen Demand ($CBOD_5$)	001 001a	WQBEL Monitoring for $CBOD_5$ has been included during the critical months of March – October so as to calculate UOD loading. The permittee may use BOD_5 sampling in lieu of $CBOD_5$ for expediency as the use of BOD_5 results for UOD calculations only provides an opportunity for the overestimation of the UOD loading and never an underestimation.
		TBEL There is no applicable federal technology based effluent limit.
	002b	WQBEL Georgia does not have Water Quality Standards for internal outfalls.
	002c	TBEL There is no applicable federal technology based effluent limit.

		WQBEL GA has a narrative Water Quality Standard for total suspended solids. A narrative permit condition stating, "there shall be no floating solids or visible foam other than in trace amounts" has been added.
Total Suspended Solids	001 001a	TBEL Outfall 001 consists of waste streams from multiple processes; additionally Graphic Packaging International, LLC receives wastewater from Resolute Forest Products for treatment. Graphic Packaging International, LLC and Resolute Forest Products are covered under separate federal effluent guidelines; hence the alternative mass limit formula was used to calculate an appropriate effluent limit that accounts for both waste streams. Graphic Packaging International, LLC is subject to 40 CFR 430.22, which provides a production based daily average of 51,600 lbs/day and daily maximum of 96,000 lbs/day. Resolute Forest Products is subject to 40 CFR 430.72, which provides a production based daily average of 12,004 lbs/day and daily maximum of 22,356 lbs/day. Due to these wastestreams being commingled before treatment, EPD developed TBELs using the Alternative Mass Limit Formula cited in 40 CFR 403.6(e)(ii). The formula considers the effects of dilute wastestreams to provide an appropriate effluent limit. Graphic Packaging International, LLC discharges a daily average 33 MGD into their treatment system. The wastestream received form Resolute Forest Products has reported daily average of 6.2 MGD. Using the alternative mass limit formula, an alternative categorical daily average of 63,604 lbs/day and daily maximum of 118,356 lbs/day were calculated.
	002b	WQBEL Georgia does not have Water Quality Standards for internal outfalls.
	002c	TBEL There is no applicable federal technology based effluent limit.
Fecal Coliform	001 001a	WQBEL Based on the data submitted with the permit application, the sanitary wastestream is comingled with the process wastewater, which indicates there are fecal coliform from human sources present, therefore a fecal coliform effluent limit has been included in this permit. A 48 month compliance schedule has been included to meet water quality limits of 200 #/100 mL daily average and 400 #/100 mL daily maximum during the months of May – October and 1,000 #/100mL daily average and 4,000 #/100mL daily maximum during the months of November – April.
		TBEL There is no applicable federal technology based effluent limit.

Fecal Coliform	002b 002c	WQBEL Georgia does not have Water Quality Standards for internal outfalls. TBEL There is no applicable federal technology based effluent limit.
Temperature	001 001a	WQBEL Georgia has numeric Water Quality Criteria of 90°F for maximum temperature and a +5°F temperature differential (391-3-6-.03(6)(a)(v)). EPD has granted a mixing zone for temperature that is defined in Section 5.2 of this fact sheet in accordance with 391-3-6-.03(10). See Appendix E for Graphic Packaging International, LLC – Augusta Mill temperature study and EPD's Analysis and Approval. A six (6) month compliance schedule has been provided to allow the permittee additional time to implement a new sampling plan and protocol for the new mixing zone temperature limit. TBEL There is no applicable federal technology based effluent limit.
	002b 002c	WQBEL Georgia does not have Water Quality Standards for internal outfalls. TBEL There is no applicable federal technology based effluent limit.

4.5 Nonconventional Pollutants

Pollutants of Concern	Outfall ID	Basis
Total Phosphorus	001 001a	WQBEL Per the Strategy for "*Addressing Phosphorus in NPDES Permitting*" (the Strategy is available to review on EPD's website) all routine permit reissuances must include phosphorus monitoring. TBEL There is no applicable federal technology based effluent limit.
	002b 002c	WQBEL Georgia's Strategy for "*Addressing Phosphorus in NPDES Permitting*" does not apply to internal outfalls. TBEL There is no applicable federal technology effluent limit.
Orthophosphate, as P	001 001a	WQBEL Per the Strategy for "*Addressing Phosphorus in NPDES Permitting*" (the Strategy is available to review on EPD's website) all routine permit reissuances that have discharges upstream from reservoirs, lakes, impoundments, and/or estuaries must include orthophosphate monitoring. Discharge at this facility is upstream from the Savannah Harbor; hence monitoring requirements have been added. TBEL There is no applicable federal technology based effluent limit.

Orthophosphate, as P	002b 002c	WQBEL Georgia's Strategy for "*Addressing Phosphorus in NPDES Permitting*" does not apply to internal outfalls. TBEL There is no applicable federal technology based effluent limit.
Ammonia, as N	001 001a	WQBEL Based on the data submitted, EPD conducted a reasonable potential analysis to determine if the discharge has ammonia toxicity. The reasonable potential analysis shows a predicted instream ammonia concentration of 16% of the instream toxicity criteria. Per the Ammonia Reasonable Potential Analysis Procedure for NPDES Permits, if more than 10 data points are available to calculate an instream concentration and if the calculated instream concentration is less than 100% of the applicable site-specific in-stream ammonia criteria, then ammonia will be considered not to be present at levels of concern or and therefore will not require a numeric effluent limit or monitoring in the permit. However, ammonia monitoring is required to quantify loading to the Savannah Harbor and it is required to calculate the overall UOD loading at the facility. TBEL There is no applicable federal technology based effluent limit.
	002b 002c	WQBEL "*Georgia's Plan for the Adoption of Water Quality Standards for Nutrients*" does not apply to internal outfalls. TBEL There is no applicable federal technology based effluent limit.
Total Kjeldahl Nitrogen	001 001a	WQBEL Per "*Georgia's Plan for the Adoption of Water Quality Standards for Nutrients*" as amended, EPD is working to develop water quality models throughout the State of Georgia. EPD is requiring all point source discharges with the presence of ammonia to monitor for Total Kjeldahl Nitrogen to develop these models. TBEL There is no applicable federal technology based effluent limit.
	002b 002c	WQBEL "*Georgia's Plan for the Adoption of Water Quality Standards for Nutrients*" does not apply to internal outfalls TBEL There is no applicable federal technology based effluent limit.

Organic Nitrogen	001 001a	WQBEL Per "*Georgia's Plan for the Adoption of Water Quality Standards for Nutrients*" as amended, EPD is working to develop water quality models throughout the State of Georgia. EPD is requiring all point source discharges with the presence of ammonia to monitor for organic nitrogen to develop these models.
		TBEL There is no applicable federal technology based effluent limit.
	002b 002c	WQBEL "*Georgia's Plan for the Adoption of Water Quality Standards for Nutrients*" does not apply to internal outfalls.
		TBEL There is no applicable federal technology based effluent limit.
Nitrate/Nitrite	001 001a	WQBEL Per "*Georgia's Plan for the Adoption of Water Quality Standards for Nutrients*", as amended, EPD is working to develop water quality models throughout the State of Georgia. EPD is requiring all point source discharges with the presence of ammonia to monitor for nitrate/nitrite to develop these models.
		TBEL There is no applicable federal technology based effluent limit.
	002b 002c	WQBEL "*Georgia's Plan for the Adoption of Water Quality Standards for Nutrients*" does not apply to internal outfalls.
		TBEL There is no applicable federal technology based effluent limit.
Dissolved Oxygen	001 001a	WQBEL The Savannah Harbor is listed as not supporting its designated use due to dissolved oxygen impairment and has been placed into subcategory 5R. Dissolved oxygen monitoring has been included in the permit to complement the UOD limits established in the Savannah River Basin 5R Restoration Plan.
		TBEL There is no applicable federal technology based effluent limit.
	002b 002c	WQBEL The 5R Savannah Harbor River Model does not apply to internal outfalls.
		TBEL There is no applicable federal technology based effluent limit.

Color	001 001a	WQBEL GA has a narrative Water Quality Standard for color stating, "All water shall be free from material related to municipal, industrial or other discharges which produce turbidity, color, odor, or other objectionable conditions which interfere with legitimate water uses. Monitoring for color has been included in this permit cycle.
		TBEL There is no applicable federal technology based effluent limit.
	002b 002c	WQBEL Georgia does not have Water Quality Standards for internal outfalls.
		TBEL There is no applicable federal technology effluent limit.

4.6 Toxics & Manmade Organic Compounds (126 priority pollutants and metals)

Pollutants of Concern	Outfall ID	Basis
Arsenic, Total	001 001a	WQBEL The reasonable potential analysis showed there is no reasonable potential to cause or contribute to an instream violation of the GA Water Quality Standard for arsenic.
		TBEL There is no applicable federal technology based effluent limit.
	002b 002c	WQBEL Georgia's Water Quality Standards do not apply to internal outfalls.
		TBEL There is no applicable federal technology based effluent limit.
Copper, Total	001 001a	WQBEL The reasonable potential analysis showed there is no reasonable potential to cause or contribute to an instream violation of the GA Water Quality Standard for copper.
		TBEL There is no applicable federal technology based effluent limit.
	002b 002c	WQBEL Georgia's Water Quality Standards do not apply to internal outfalls.
		TBEL There is no applicable federal technology based effluent limit.

Lead, Total	001 001a	WQBEL The reasonable potential analysis showed there is no reasonable potential to cause or contribute to an instream violation of the GA Water Quality Standard for lead.
		TBEL There is no applicable federal technology based effluent limit.
	002b	WQBEL Georgia's Water Quality Standards do not apply to internal outfalls.
	002c	TBEL There is no applicable federal technology based effluent limit.
Mercury, Total	001 001a	WQBEL The reasonable potential analysis showed there is no reasonable potential to cause or contribute to an instream violation of the GA Water Quality Standard for mercury.
		TBEL There is no applicable federal technology based effluent limit.
	002b	WQBEL Georgia's Water Quality Standards do not apply to internal outfalls.
	002c	TBEL There is no applicable federal technology based effluent limit.
Zinc, Total	001 001a	WQBEL The reasonable potential analysis showed there is no reasonable potential to cause or contribute to an instream violation of the GA Water Quality Standard for zinc.
		TBEL Per 40 CFR 430.72(e), all discharges from mills using zinc hydrosulfide as a bleaching agent during the manufacturing process shall have an effluent limit for zinc added. Graphic Packaging International, LLC has certified Resolute Forest Products does not utilize zinc hydrosulfide during their manufacturing process, hence it does not apply. The waste stream for Graphic Packaging International, LLC does not have any applicable technology based effluent limits. See Appendix F for certification letter.
	002b	WQBEL Georgia's Water Quality Standards do not apply to internal outfalls.
	002c	TBEL There is no applicable federal technology based effluent limit

2,3,7,8-TCDD	001 001a	WQBEL Per 391-3-6-.03(5)(vi), instream concentrations of 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD) must not exceed 0.0000000051 µg/L under long-term average stream flow conditions. EPD has added a daily average limit of 0.00000065 µg/L for 2,3,7,8-TCDD. The effluent limit was calculated using a dilution factor of 128.5. The dilution factor is based upon the permittee's design, permitted or average flow, and the critical stream flow as defined in the Rules under 391-3-6-.06(2)(f).
		TBEL There is no applicable federal technology based effluent limit.
	002b 002c	WQBEL Georgia does not have Water Quality Standards for internal outfalls.
		TBEL Per 40 CFR 430.24, best available technology economically achievable (BAT), the daily maximum for 2,3,7,8–TCDD shall be applied at the end of the bleaching process line and remain below the minimum detection level of 0.000010 µg/L.
2,3,7,8-TCDF	001 001a	WQBEL Georgia does not have Water Quality Standards for 2,3,7,8-TCDF.
		TBEL There is no applicable federal technology based effluent limit.
	002b 002c	WQBEL Georgia does not have Water Quality Standards for internal outfalls.
		TBEL Per 40 CFR 430.24, best available technology economically achievable (BAT), the daily maximum for 2,3,7,8–TCDF shall be applied at the end of the bleaching process line and have a daily maximum of 0.0000319 µg/L.
Chloroform	001 001a	WQBEL Based on the data submitted, chloroform was not found to be present, hence there is no reasonable potential to cause or contribute to the GA Water Quality Standard for chloroform.
		TBEL There is no applicable federal technology based effluent limit.

		WQBEL Georgia does not have Water Quality Standards for internal outfalls. TBEL The permittee has requested exemption from the minimum monitoring requirements for chloroform. In February 25, 2004, EPD authorized the exemption request (See Appendix G). In accordance with the reporting requirements in 40 CFR 430.02(f)(4), the permittee has certified that the fiber line will not use either elemental chlorine or hypochlorite as a bleaching agent and has established the following process and operating conditions: a. The pH of the first chlorine dioxide bleaching stage shall not exceed 5.0 for a daily logarithmic average. b. The chlorine content of the chlorine dioxide solution used on the bleach lines is manufactured by the R-8 process. The inherent R8 process has been demonstrated through industry testing to produce 0.1 g/1 Cl_2 in a 10.0g/1 ClO_2 solution. c. The kappa factor of the first chlorine dioxide bleaching stages shall not exceed 0.729 for a daily average. d. The total bleach line chlorine dioxide application rate shall not be greater than 137.8 lb ClO_2/Ton for a daily average. The permittee has met all requirements to maintain exemption for chloroform monitoring; hence monitoring of chloroform will not be required in this permit.
	002b	
Chloroform		
		WQBEL Georgia does not have Water Quality Standards for internal outfalls. TBEL The permittee has requested exemption from the minimum monitoring requirements for chloroform. In February 25, 2004, EPD authorized the exemption request (See Appendix G). In accordance with the reporting requirements in 40 CFR 430.02(f)(4), the permittee has certified that the fiber line will not use either elemental chlorine or hypochlorite as a bleaching agent and has established the following process and operating conditions: a. The pH of the first chlorine dioxide bleaching stage shall not exceed 5.0 for a daily logarithmic average. b. The chlorine content of the chlorine dioxide solution used on the bleach lines is manufactured by the R-8 process. The inherent R8 process has been demonstrated through industry testing to produce 0.1 g/1 Cl_2 in a 10.0g/1 ClO_2 solution. c. The kappa factor of the first chlorine dioxide bleaching stages shall not exceed 0.578 for a daily average. d. The total bleach line chlorine dioxide application rate shall not be greater than 130 lb ClO_2/Ton for a daily average. The permittee has met all requirements to maintain exemption for chloroform monitoring; hence monitoring of chloroform will not be required in this permit.
	002c	

Adsorbable Organic Halides (AOX)	001 001a	WQBEL Georgia does not have Water Quality Standards for Adsorbable Organic Halides (AOX). TBEL Based on 40 CFR Part 430.24(a)(1) Best Available Technology Economically Achievable (BAT), production based effluent limits are required for AOX based on unbleached pulp production values at the entrance of the bleach plant. Accordingly, a daily average mass limit of 2,223 lbs/day and a daily maximum mass limit of 3,393 lbs/day have been included in the permit.
	002b 002c	WQBEL Georgia does not have Water Quality Standards for internal outfalls. TBEL There is no applicable federal technology based effluent limit.
Trichlorosyringol	001 001a	WQBEL Georgia does not have Water Quality Standards for Trichlorosyringol. TBEL There is no applicable federal technology based effluent limit.
	002b 002c	WQBEL Georgia does not have Water Quality Standards for internal outfalls. TBEL Per 40 CFR 430.24, best available technology economically achievable (BAT), the daily maximum for Trichlorosyringol shall be applied at the end of the bleaching process line and remain below the minimum detection level of 2.5 µg/L.
3,4,5-Trichloro-catechol	001 001a	WQBEL Georgia does not have Water Quality Standards for 3,4,5-trichlorocatechol. TBEL There is no applicable federal technology based effluent limit.
	002b 002c	WQBEL Georgia does not have Water Quality Standards for internal outfalls. TBEL Per 40 CFR 430.24, best available technology economically achievable (BAT), the daily maximum for 3,4,5-trichlorocatechol shall be applied at the end of the bleaching process line remain below the minimum detection level of 5.0 µg/L.

3,4,6-Trichloro-catechol	001 001a	WQBEL Georgia does not have Water Quality Standards for 3,4,6-trichlorocatechol. TBEL There is no applicable federal technology based effluent limit.
	002b 002c	WQBEL Georgia does not have Water Quality Standards for internal outfalls. TBEL Per 40 CFR 430.24, best available technology economically achievable (BAT), the daily maximum for 3,4,6-Trichlorocatechol shall be applied at the end of the bleaching process line remain below the minimum detection level of 5.0 µg/L.
3,4,5-Trichloro-guaiacol	001 001a	WQBEL Georgia does not have Water Quality Standards for 3,4,5-Trichloroguaiacol. TBEL There is no applicable federal technology based effluent limit.
	002b 002c	WQBEL Georgia does not have Water Quality Standards for internal outfalls. TBEL Per 40 CFR 430.24, best available technology economically achievable (BAT), the daily maximum for 3,4,5-Trichloroguaiacol shall be applied at the end of the bleaching process line remain below the minimum detection level of 2.5 µg/L.
3,4,6-Trichloro-guaiacol	001 001a	WQBEL Georgia does not have Water Quality Standards for 3,4,5-Trichloroguaiacol. TBEL There is no applicable federal technology based effluent limit.
	002b 002c	WQBEL Georgia does not have Water Quality Standards for internal outfalls. TBEL Per 40 CFR 430.24, best available technology economically achievable (BAT), the daily maximum for 3,4,6-Trichloroguaiacol shall be applied at the end of the bleaching process line remain below the minimum detection level of 2.5 µg/L.

4,5,6-Trichloro-guaiacol	001 001a	WQBEL Georgia does not have Water Quality Standards for 4,5,6-Trichloroguaiacol. TBEL There is no applicable federal technology based effluent limit.
	002b 002c	WQBEL Georgia does not have Water Quality Standards for internal outfalls. TBEL Per 40 CFR 430.24, best available technology economically achievable (BAT), the daily maximum for 4,5,6-Trichloroguaiacol shall be applied at the end of the bleaching process line remain below the minimum detection level of 2.5 µg/L.
Trichlorophenol	001 001a	WQBEL Georgia does not have Water Quality Standards for 2,4,5-Trichlorophenol.
	002b 002c	TBEL Per 40 CFR 430.74(a), the waste stream from Resolute Forest Products shall have effluent limitations for trichlorophenol and pentachlorophenol where chlorophenolic-containing biocides are used. Graphic Packaging International, LLC has certified Resolute Forest Products does not use chlorophenolic-containing biocides during their manufacturing processes. Per 40 CFR 430.24(d), the waste stream from Graphic Packaging International, LLC shall have effluent limits for trichlorophenol and pentachlorophenol where chlorophenolic-containing biocides are used. Graphic Packaging International, LLC has certified chlorophenolic-containing biocides are not used in their manufacturing processes. See Appendix F for certified letter.
2,4,5-Trichlorophenol	001 001a	WQBEL Georgia does not have Water Quality Standards for 2,4,5-Trichlorophenol. TBEL There is no applicable federal technology based effluent limit.
	002b 002c	WQBEL Georgia does not have Water Quality Standards for internal outfalls. TBEL Per 40 CFR 430.24, best available technology economically achievable (BAT), the daily maximum for 2,4,5-Trichlorophenol shall be applied at the end of the bleaching process line remain below the minimum detection level of 2.5 µg/L.
2,4,6-Trichlorophenol	001 001a	WQBEL Georgia does not have Water Quality Standards for 2,4,6-Trichlorophenol. TBEL There is no applicable federal technology based effluent limit.

2,4,6-Trichlorophenol	002b 002c	WQBEL Georgia does not have Water Quality Standards internal outfalls. TBEL Per 40 CFR 430.24, best available technology economically achievable (BAT), the daily maximum for 2,4,6-Trichlorophenol shall be applied at the end of the bleaching process line remain below the minimum detection level of 2.5 µg/L.
Tetrachloro-catechol	001 001a	WQBEL Georgia does not have Water Quality Standards for Tetrachlorocatechol. TBEL There is no applicable federal technology based effluent limit.
	002b 002c	WQBEL Georgia does not have Water Quality Standards for internal outfalls. TBEL Per 40 CFR 430.24, best available technology economically achievable (BAT), the daily maximum for Tetrachlorocatechol shall be applied at the end of the bleaching process line remain below the minimum detection level of 5.0 µg/L.
Tetrachloro-guaiacol	001 001a	WQBEL Georgia does not have Water Quality Standards for Tetrachloroguaiacol. TBEL There is no applicable federal technology based effluent limit.
	002b 002c	WQBEL Georgia does not have Water Quality Standards for internal outfalls. TBEL Per 40 CFR 430.24, best available technology economically achievable (BAT), the daily maximum for Tetrachloroguaiacol shall be applied at the end of the bleaching process line remain below the minimum detection level of 5.0 µg/L.
2,3,4,6-Tetrachloro-phenol	001 001a	WQBEL Georgia does not have Water Quality Standards for 2,3,4,6-Tetrachlorophenol. TBEL There is no applicable federal technology based effluent limit.
	002b 002c	WQBEL Georgia does not have Water Quality Standards for internal outfalls. TBEL Per 40 CFR 430.24, best available technology economically achievable (BAT), the daily maximum for 2,3,4,6-Tetrachlorophenol shall be applied at the end of the bleaching process line remain below the minimum detection level of 2.5 µg/L.

		WQBEL Georgia does not have Water Quality Standards for Pentachlorophenol.
Pentachlorophenol	001 001a	TBEL Per 40 CFR 430.74(a), the waste stream from Resolute Forest Products shall have effluent limitations for trichlorophenol and pentachlorophenol where chlorophenolic-containing biocides are used. Graphic Packaging International, LLC has certified Resolute Forest Products does not use chlorophenolic-containing biocides during their manufacturing processes. Per 40 CFR 430.24(d), the waste stream from Graphic Packaging International, LLC shall have effluent limits for trichlorophenol and pentachlorophenol where chlorophenolic-containing biocides are used. Graphic Packaging International, LLC has certified chlorophenolic-containing biocides are not used in their manufacturing processes. See Appendix F for certified letter.
		WQBEL Georgia does not have Water Quality Standards for internal outfalls.
	002b 002c	TBEL Per 40 CFR 430.24, best available technology economically achievable (BAT), the daily maximum for Pentachlorophenol shall be applied at the end of the bleaching process line remain below the minimum detection level of 5.0 µg/L.

4.6 Calculations for Water Quality Based Effluent Limits

4.6.a Instream Waste Concentration (IWC)

Outfall 001 and 001a

$$IWC = \frac{\text{Effluent Flow (gal/day)}}{\text{Effluent Flow (gal/day)} + 7Q10\text{ (gal/day)}}$$

$$IWC = \frac{44{,}600{,}000\text{ (gal/day)}}{44{,}600{,}000\text{ (gal/day)} + 2{,}404{,}131{,}840\text{ (gal/day)}}$$

IWC = 1.8%

4.6.b Biochemical Oxygen Demand (5-day)

Effluent Limits are based on the dissolved oxygen sag (DOSAG) modeling results in the Wasteload Allocation dated November 20, 2017.

Outfall 001 and 001a

November - February
Daily Average = 44,478

Daily Maximum = Daily Average * 1.92
Daily Maximum = 44,478 lbs/day * 1.92
Daily Maximum = 85,398 lbs/day

This is not the most stringent limit. The technology based effluent limits developed per 40 CFR 430 Subpart B and Subpart G were the most stringent. See Section 4.7 below for calculations.

4.6.c Metals

See the reasonable potential analysis spreadsheet in Appendix H.

4.6.d Ammonia Toxicity Analysis

CCC= Chronic Criterion based on Villosa iris (rainbow mussel)

$$CCC=0.8876 \times \left(\frac{0.0278}{1+10^{(7.688-pH)}} + \frac{1.994}{1+10^{(pH-7.688)}} \right) * (2.126 \times 10^{0.028 \times (20-MAX(T,7))})$$

$$NH_3=\frac{(CCC \times \left(Q_{stream}(cfs)+\text{Effluent Flowrate (cfs)}\right) - \left(Q_{stream}(cfs)+\text{Stream Background } NH_3 \left(\frac{mg}{L}\right)\right)}{\text{Effluent Flowrate (cfs)}}$$

See the reasonable potential analysis spreadsheet in Appendix H.

4.7 Technology Based Effluent Limitation Calculations

There are several ways to calculate TBELs when developing case-by-case limitations. EPD can use an approach consistent with the statistical approach EPA has used to develop effluent guidelines or they can utilize several other mathematically and statistically accepted approaches depending on characteristics of the data. In general, EPD utilizes EPA's "NPDES Permit Writer Manual," September 2010, Section 5.2.3, "Case-by-Case TBELs for Industrial Dischargers" and EPA's "Technical Support Document for Water Quality Based Toxic Control," March 1991, Section 5.2, "Basis Principles of Effluent Variability," as guidance to develop limits.

If applicable, when there is no federal technology based effluent limit EPD evaluates the effluent data, operating records and discharge monitoring reports to calculate the long term average for the parameter. The long term average is then used to derive the effluent limits.

EPD recognizes there are several ways to calculate technology based limits and, when applicable, may deviate from the general practice.

See Appendix I for Technology Based Effluent Limit Calculation Spreadsheet.

4.7.a Biochemical Oxygen Demand$_{5\text{-day}}$

The TSS and effluent limits for BOD_5 for outfalls 001/001a are based on the Best Practical Control Technology (BPT) ELGs under 40 CFR 430 Subpart B (bleached kraft facilities where paperboard, coarse paper, and tissue paper are produced) for Graphic Packaging International, LLC's wastestream and Subpart G (mechanical pulp facilities where the integrated production of pulp and coarse paper, molded pulp products, and newsprint at groundwood mills occurs). The limits are more stringent than the WQBELs. See calculations below for development of the applicable production based limits and subsequent alternative mass limits.

Outfall 001 and 001a

Graphic Processing:

Daily Average production load limit:

$$\frac{7.1\text{ lb}}{1000\text{ lb}} = 0.0071 \text{ x } 4{,}000{,}000\ \frac{\text{lbs}}{\text{day}} = 28{,}400\ \frac{\text{lbs}}{\text{day}}$$

Daily Maximum production load limit:

$$\frac{13.65\text{ lb}}{1000\text{ lb}} = 0.01365 \text{ x } 4{,}000{,}000\ \frac{\text{lbs}}{\text{day}} = 54{,}600\ \frac{\text{lbs}}{\text{day}}$$

Resolute Forest Products:

Daily Average production load limit:

$$\frac{5.55\text{ lb}}{1000\text{ lb}} = 0.0055 \text{ x } 4{,}000{,}000\ \frac{\text{lbs}}{\text{day}} = 7{,}979\ \frac{\text{lbs}}{\text{day}}$$

Daily Maximum production load limit:

$$\frac{10.6\text{ lb}}{1000\text{ lb}} = 0.0106 \text{ x } 4{,}000{,}000\ \frac{\text{lbs}}{\text{day}} = 15{,}239\ \frac{\text{lbs}}{\text{day}}$$

Alternate Mass Limit Formula

Outfall 001 and 001a consists of waste streams from multiple processes. Graphic Packaging International, LLC receives wastewater from Resolute Forest Products for treatment. Since Graphic Packaging International, LLC and Resolute Forest Products

are covered under separate federal effluent guidelines; the alternate mass limit formula was used to calculate an appropriate effluent limit that accounts for both waste streams.

Daily Average Combined Load Limit

$$BOD_{5-ALT} = (BOD_{5-Graphic} + BOD_{5-Resolute}) \times (\frac{Flow_{Total}}{Flow_{Graphic}+Flow_{Resolute}})$$

$$BOD_{5-ALT} = \left(28{,}400\,\frac{lbs}{day} + 7{,}979\,\frac{lbs}{day}\right) \times (\frac{39{,}200{,}000\ mgd}{33{,}000{,}000\ mgd+6{,}200{,}000\ mgd})$$

$$BOD_{5-ALT} = 36{,}379\ \frac{lbs}{day}$$

Daily Maximum Combined Load Limit

$$BOD_{5-ALT} = \left(54{,}600\,\frac{lbs}{day} + 15{,}239\,\frac{lbs}{day}\right) \times (\frac{39{,}200{,}000\ mgd}{33{,}000{,}000\ mgd+6{,}200{,}000\ mgd})$$

$$BOD_{5-ALT} = 69{,}839\ \frac{lbs}{day}$$

4.7.b Total Suspended Solids

Outfall 001 and 001a

Graphic Packaging International, LLC:

Daily Average production load limit:

$$\frac{12.9\ lb}{1000\ lb} = 0.0129 \times 4{,}000{,}000\,\frac{lbs}{day} = 51{,}600\ \frac{lbs}{day}$$

Daily Maximum production load limit:

$$\frac{24\ lb}{1000\ lb} = 0.0240 \times 4{,}000{,}000\ \frac{lbs}{day} = 96{,}000\ \frac{lbs}{day}$$

Resolute Forest Products:

Daily Average production load limit:

$$\frac{8.35\ lb}{1000\ lb} = 0.00835 \times 4{,}000{,}000\ \frac{lbs}{day} = 12{,}004\ \frac{lbs}{day}$$

Daily Maximum production load limit:

$$\frac{15.55\ lb}{1000\ lb} = 0.01555 \times 4{,}000{,}000\ \frac{lbs}{day} = 22{,}356\ \frac{lbs}{day}$$

Alternate Mass Limit Formula

Outfall 001 and 001a consists of waste streams from multiple processes. Graphic Packaging International, LLC receives wastewater from Resolute Forest Products for treatment. Since Graphic Packaging International, LLC and Resolute Forest Products are covered under separate federal effluent guidelines; the alternate mass limit formula was used to calculate an appropriate effluent limit that accounts for both waste streams.

Daily Average Combined Load Limit

$$TSS_{ALT} = (TSS_{Graphic} + TSS_{Resolute}) \times \left(\frac{Flow_{Total}}{Flow_{Graphic}+Flow_{Resolute}}\right)$$

$$TSS_{ALT} = \left(51{,}600\,\frac{lbs}{day} + 12{,}004\,\frac{lbs}{day}\right) \times \left(\frac{39{,}200{,}000\ mgd}{33{,}000{,}000\ mgd+6{,}200{,}000\ mgd}\right)$$

$$TSS_{ALT} = 63{,}204\ \frac{lbs}{day}$$

Daily Maximum Combined Load Limit

$$TSS_{ALT} = \left(96{,}000\,\frac{lbs}{day} + 22{,}356\,\frac{lbs}{day}\right) \times \left(\frac{39{,}200{,}000\ mgd}{33{,}000{,}000\ mgd+6{,}200{,}000\ mgd}\right.$$

$$TSS_{ALT} = 118{,}356\ \frac{lbs}{day}$$

4.7.c Adsorbable Organic Halides (AOX)

Graphic Packaging International, LLC provided the production rates found in Appendix J. Per 40 CFR 430.01(n)(2), the production for AOX and chloroform effluent limits is defined as the annual unbleached pulp production entering the first stage of the bleach plant divided by the number of operating days during that year. As Appendix J indicates, an anticipated 162,000 tons of unbleached pulp enter bleach plant #2 over the duration of 333 days and 378,023 tons of unbleached pulp enters bleach plant #3 over the duration of 333 days, providing a production value of 1,622 tons of oven-dried unbleached pulp per day. Adding to air dried tons assuming a 10% moisture results in an air-dried unbleached pulp quantity of 1,784 tons per day.

Daily Average production load limit:

$$\frac{0.623\ lb}{1000\ lb} = 0.000623 \times 1{,}784\,\frac{tons}{day} * 2{,}000\,\frac{lbs}{ton} = 2{,}223\,\frac{lbs}{day}$$

Daily Maximum production load limit:

$$\frac{0.951\ lb}{1000\ lb} = 0.000951 \times 1{,}784\,\frac{tons}{day} \times 2{,}000\,\frac{lbs}{ton} = 3{,}393\,\frac{lbs}{day}$$

4.8 Comparison & Summary of Water Quality vs. Technology Based Effluent Limits

After preparing and evaluating applicable technology-based effluent limitations and water quality-based effluent limitations, the most stringent limits are applied in the permit. The tables shown below summarize the most stringent effluent limitations after any applicable compliance schedule has been completed. Pollutants of concern with an effluent limit of monitor and report are not included in the below table.

External Outfall 001 and 001a

Parameter	WQBELs	TBELs	Explanation
5-Day Biochemical Oxygen Demand (lbs/day) [March – October]	30,000/57,590 (1)	36,379/69,839	WLA
5-Day Biochemical Oxygen Demand (lbs/day) [November – February]	44,478/85,398	36,379/69,839	ELG
Total Suspended Solids (lbs/day)	--	63,604/118,356	ELG
pH (s.u.)	6.0 – 9.0	5.0 – 9.0	WLA
Ultimate Oxygen Demand(lbs/day) [March – October]	27,353/65,647	--	WLA
Fecal Coliform (# colonies/100 mL) [May – October]	200/400	--	WQS
Fecal Coliform (# colonies/100 mL) [November - April]	1,000/4,000	--	WQS
Adsorbable Organic Halides(lbs/day)	--	2,223/3,393	ELG
2,3,7,8-TCDD (pg/L)	0.65	--	WQS

1 After the completion of the 65 month compliance schedule for UOD, the effluent limit for BOD_5 during the critical months of March – October will be replaced with monitor and reporting in place of the new effluent limit for UOD.

Internal Outfall 002b

Parameter	WQBELs	TBELs	Explanation
2,3,7,8-TCDD (µg/L)	--	0.000010/0.000010	ELG
2,3,7,8-TCDF (µg/L)	--	0.0000319/0.0000319	ELG
Trichlorosyringol (µg/L)	--	<2.5	ELG
3,4,5-Trichlorocatechol (µg/L)	--	<5.0	ELG
3,4,6-Trichlorocatechol (µg/L)	--	<5.0	ELG
3,4,5-Trichloroguaiacol (µg/L)	--	<2.5	ELG
3,4,6-Trichloroguaiacol (µg/L)	--	<2.5	ELG
4,5,6-Trichloroguaiacol (µg/L)	--	<2.5	ELG
2,4,5-Trichlorophenol (µg/L)	--	<2.5	ELG
2,4,6-Trichlorophenol (µg/L)	--	<2.5	ELG
Tetrachlorocatechol (µg/L)	--	<5.0	ELG
Tetrachloroguaiacol (µg/L)	--	<5.0	ELG
2,3,4,6-Tetrachlorophenol (µg/L)	--	<2.5	ELG
Pentachlorophenol (µg/L)	--	<5.0	ELG

Internal Outfall 002c

Parameter	WQBELs	TBELs	Explanation
2,3,7,8-TCDD (µg/L)	--	0.000010/0.000010	ELG
2,3,7,8-TCDF (µg/L)	--	0.0000319/0.0000319	ELG
Trichlorosyringol (µg/L)	--	<2.5	ELG
3,4,5-Trichlorocatechol (µg/L)	--	<5.0	ELG
3,4,6-Trichlorocatechol (µg/L)	--	<5.0	ELG
3,4,5-Trichloroguaiacol (µg/L)	--	<2.5	ELG
3,4,6-Trichloroguaiacol (µg/L)	--	<2.5	ELG
4,5,6-Trichloroguaiacol (µg/L)	--	<2.5	ELG
2,4,5-Trichlorophenol (µg/L)	--	<2.5	ELG
2,4,6-Trichlorophenol (µg/L)	--	<2.5	ELG
Tetrachlorocatechol (µg/L)	--	<5.0	ELG
Tetrachloroguaiacol (µg/L)	--	<5.0	ELG
2,3,4,6-Tetrachlorophenol (µg/L)	--	<2.5	ELG
Pentachlorophenol (µg/L)	--	<5.0	ELG

5.0 OTHER PERMIT REQUIREMENTS AND CONSIDERATIONS

5.1 Anti-Backsliding

The limits in this permit are in compliance with 40 C.F.R. 122.44(l). 40 C.F.R. 122.44(l)(2)(i)(B(1) states, permit limits may be less stringent if "Information is available which was not available at the time of permit issuance (other than revised regulations, guidance, or test methods) and which would have justified the application of a less stringent effluent limitation at the time of permit issuance."

Outfalls 002b & 002c

a. Graphic Packaging International requested to provide certification in lieu of weekly monitoring for chloroform and EPD concurred with the proposal. In accordance with 40 CFR 430.02(f), Graphic Packaging International has met all requirements to be exempt from monitoring requirements for Chloroform. Based on this newly acquired information, EPD has removed chloroform effluent limits.

5.2 Schedule of Compliance

a. This permit includes a 6 month compliance schedule to comply with the new mixing zone effluent limitations for temperature. The permittee has requested additional time to implement a new sampling plan and protocol, which may require the purchasing of additional equipment. EPD has determined that six (6) month is a reasonable compliance schedule that allows Graphic Packaging International, LLC to develop a sampling plan and protocol that is necessary to demonstrate compliance with the new mixing zone effluent limitations for temperature.

b. The permit includes a 48 month compliance schedule to meet the fecal coliform limitations. EPD has determined that this is a reasonable compliance schedule that allows for the Pulp and Paper Industry to conduct an extensive study evaluating interferences and the suitability of using fecal coliform as an indicator bacterium. The schedule also allows time following the conclusion of the study to either design treatment to achieve compliance with the fecal coliform limit or modify the permit to include a different indicator bacterium.

c. This permit includes a 65 month compliance schedule to comply with the new Ultimate Oxygen Demand effluent limitations. Per the 5R Plan, Graphic Packaging has agreed to a 77.63% reduction in UOD pollutant loading. In order to meet the new UOD effluent limitations, Graphic Packaging International, LLC – Augusta Mill has requested a compliance schedule to allow adequate time to make all needed changes necessary to comply with the new UOD limitations. The permittee has provided included an outline that identifies all necessary upgrades and the approximate time for completion (See Appendix C). In accordance with 40 CFR 122.47(a)(1) & 391-3-6-.06(10), the provided timeline was determined to be both reasonable and identifies the requirements needed to meet the UOD effluent limit "as soon as possible"; therefore, EPD has made the determination to add a 65 month compliance schedule to meet the new UOD effluent limit.

5.3 Thermal Mixing Zone

As part of the NPDES reissuance application for Graphic Packaging International, LLC – Augusta Mill, Graphic Packaging conducted a thermal modeling study for their facilities discharge using CORMIX software. The study, "Augusta Mill Temperature Evaluation" was submitted to EPD on for June 27, 2018 for review and approval. EPD reviewed the modeling report and established an approved mixing zone. The mixing zone is defined in Part III.C.4 of the permit.

5.4 Special Conditions

a. Savannah 5R Alternative Restoration Plan Annual Reporting

i. The permittee shall submit an annual report which provides all available discharge data over the previous twelve (12) calendar months for the following parameters: discharge date, flow (MGD), 5-day biochemical oxygen demand (mg/L) and/or 5-day carbonaceous biochemical oxygen demand (mg/L), and ammonia, as N (mg/L). Additionally, the permittee shall calculate the arithmetic average, standard deviation, and coefficient of variation (CV) for ultimate oxygen demand (UOD) loading based on the daily discharge data. The annual report shall be submitted using the Savannah 5R Alternative Restoration Plan Annual Report Form published on Georgia EPD's website and provided in an electronic format on a compact disc (CD), universal serial bus (USB), or via email. The report is due no later than the 15th of November to the Georgia EPD Watershed Planning and Monitoring Program at the address below:

Environmental Protection Division
Watershed Planning and Monitoring Program
2 Martin Luther King Jr. Drive SE
Suite 1152 East
Atlanta, Georgia 30334

5.5 Best Management Practices (BMP)

40 CFR 430 includes required Best Management Practices (BMPs) that are applicable to Bleached Papergrade Kraft and Soda facilities. As a Bleached Papergrade Kraft facility, Graphic Packaging International, LLC – Augusta Mill is subject to these requirements. To provide further clarity, the BMP requirements have been included in the permit during this permit reissuance cycle.

5.6 Certification of Non-Use of Chlorophenolic containing Biocides

In accordance with 40 CFR 430, the permittee has submitted as part of the application a certified statement indicating that chlorophenolic containing biocides will not be used at the facility. As a result, pentachlorophenol and trichlorophenol limitations have not been applied at the final effluent. See Appendix F for certified statement.

5.7 Certification of Non-Use of Zinc Hydrosulfide as Bleaching Agent

In accordance with 40 CFR 430, the permittee has submitted as part of the application a certified statement indicating that zinc hydrosulfide will not be used at the facility as a bleaching agent. As a result, effluent limitations for total zinc have not been applied at the final effluent. See Appendix F for certified statement.

5.8 Long Term BOD_{120}

BOD_{120} monitoring has been removed in this permit because the BOD_u/BOD_5 ratio needed to calculate UOD has been established and included in the applicable water quality models.

5.9 Outfall Sample Location

The permittee has added Outfall 001a as an alternative route for discharge. Outfall 001a is located adjacent to Outfall 001 at a higher elevation and will only be used when Primary Outfall 001 is under maintenance or when high river levels prevent adequate discharge. For purposes of sampling, all pollutant samples shall be taken at the final treatment discharge prior to discharge through either Outfall 001 or 001a. Flow shall be reported as the total sum of both Outfall 001 and 001a. Loads reported on the monthly DMR will be calculated from the combined load of both outfalls and the concentration value leaving the final treatment.

6.0 REPORTING

The facility has been assigned to the following EPD office for reporting, compliance and enforcement.

Georgia Environmental Protection Division
Watershed Compliance Program
2 Martin Luther King Jr. Drive
Suite 1152 East
Atlanta, Georgia 30334

6.1 E-Reporting

The permittee is required to electronically submit documents in accordance with 40 CFR Part 127.

7.0 REQUESTED VARIANCES OR ALTERNATIVES TO REQUIRED STANDARDS

Not applicable

8.0 PERMIT EXPIRATION

The permit will expire five years from the effective date.

9.0 PROCEDURES FOR THE FORMULATION OF FINAL DETERMINATIONS

9.1 Comment Period

The Georgia Environmental Protection Division (EPD) proposes to issue a permit to this applicant subject to the effluent limitations and special conditions outlined above. These determinations are tentative.

Georgia Environmental Protection Division
Wastewater Regulatory Program
2 Martin Luther King Jr. Drive
Suite 1152 East
Atlanta, Georgia 30334

The permit application, draft permit, and other information are available for review at 2 Martin Luther King Jr. Drive, Suite 1152 East, Atlanta, Georgia 30334, between the hours of 8:00 a.m. and 4:30 p.m., Monday through Friday. For additional information, you can contact 404-463-1511.

9.2 Public Comments

Persons wishing to comment upon or object to the proposed determinations are invited to submit same in writing to the EPD address above, or via e-mail at *EPDcomments@dnr.ga.gov* within 30 days of the initiation of the public comment period. All comments received prior to that date will be considered in the formulation of final determinations regarding the application. The permit number should be placed on the top of the first page of comments to ensure that your comments will be forwarded to the appropriate staff.

9.3 Public Hearing

Any applicant, affected state or interstate agency, the Regional Administrator of the U.S. Environmental Protection Agency (EPA) or any other interested agency, person or group of persons may request a public hearing with respect to an NPDES permit application if such request is filed within thirty (30) days following the date of the public notice for such application. Such request must indicate the interest of the party filing the request, the reasons why a hearing is requested, and those specific portions of the application or other NPDES form or information to be considered at the public hearing.

The Director shall hold a hearing if he determines that there is sufficient public interest in holding such a hearing. If a public hearing is held, notice of same shall be provided at least thirty (30) days in advance of the hearing date.

In the event that a public hearing is held, both oral and written comments will be accepted; however, for the accuracy of the record, written comments are encouraged. The Director or a designee reserves the right to fix reasonable limits on the time allowed for oral statements and such other procedural requirements, as deemed appropriate.

Following a public hearing, the Director, unless it is decided to deny the permit, may make such modifications in the terms and conditions of the proposed permit as may be appropriate and shall issue the permit.

If no public hearing is held, and, after review of the written comments received, the Director determines that a permit should be issued and that the determinations as set forth in the proposed permit are substantially unchanged, the permit will be issued and will become final in the absence of a request for a contested hearing. Notice of issuance or denial will be made available to all interested persons and those persons that submitted written comments to the Director on the proposed permit.

If no public hearing is held, but the Director determines, after a review of the written comments received, that a permit should be issued but that substantial changes in the proposed permit are warranted, public notice of the revised determinations will be given and written comments accepted in the same manner as the initial notice of application was given and written comments accepted pursuant to EPD Rules, Water Quality Control, subparagraph 391-3-6-.06(7)(b). The Director shall provide an opportunity for public hearing on the revised determinations. Such opportunity for public hearing and the issuance or denial of a permit thereafter shall be in accordance with the procedures as are set forth above.

9.4 Final Determination

At the time that any final permit decision is made, the Director shall issue a response to comments. The issued permit and responses to comments can be found at the following address:

http://epd.georgia.gov/watershed-protection-branch-permit-and-public-comments-clearinghouse-0

9.5 Contested Hearings

Any person who is aggrieved or adversely affected by the issuance or denial of a permit by the Director of EPD may petition the Director for a hearing if such petition is filed in the office of the Director within thirty (30) days from the date of notice of such permit issuance or denial. Such hearing shall be held in accordance with the EPD Rules, Water Quality Control, subparagraph 391-3-6-.01.

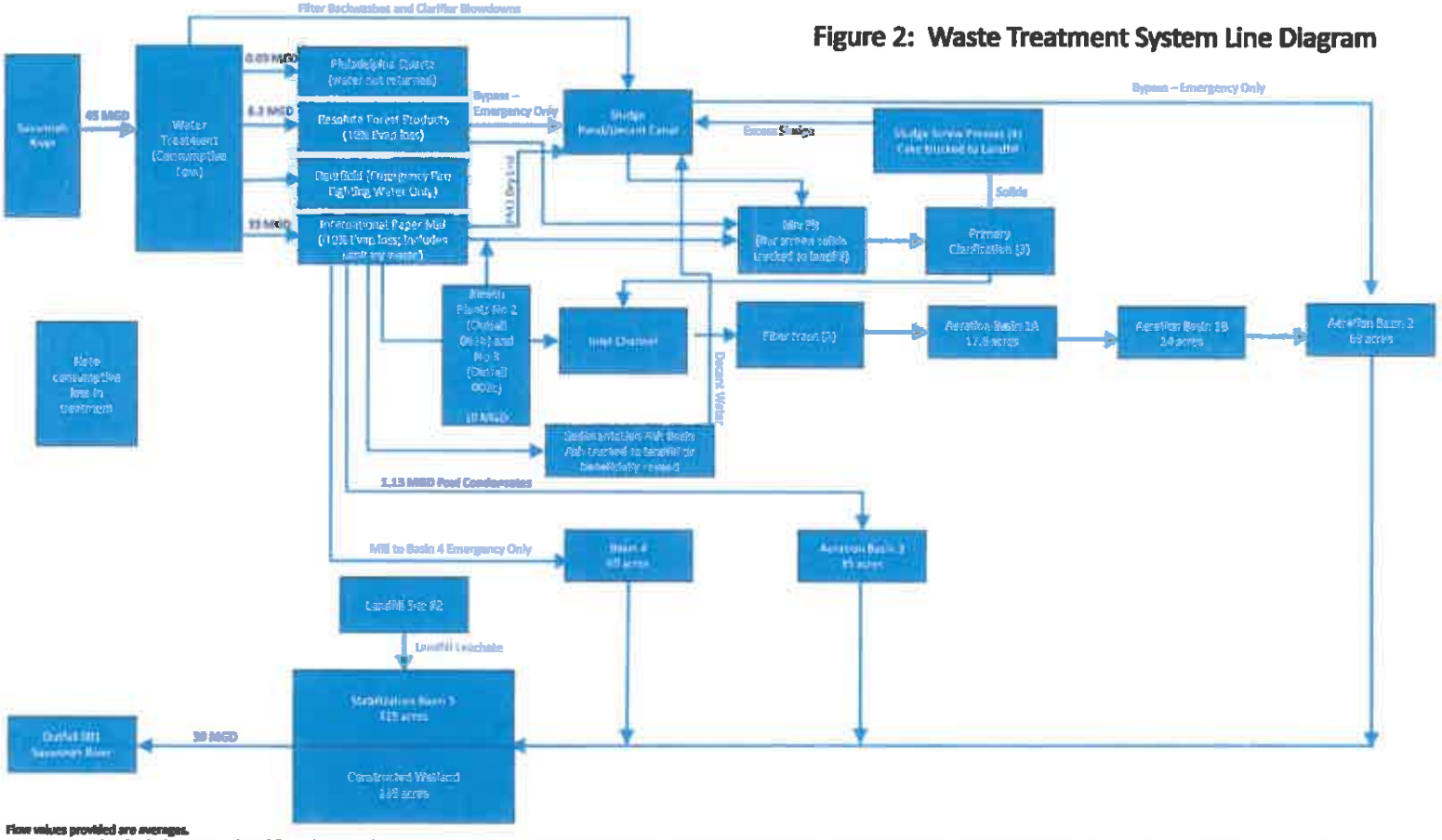
Petitions for a contested hearing must include the following:

1. The name and address of the petitioner;
2. The grounds under which petitioner alleges to be aggrieved or adversely affected by the issuance or denial of a permit;
3. The reason or reasons why petitioner takes issue with the action of the Director;
4. All other matters asserted by petitioner which are relevant to the action in question.

Appendix A

Process Flow Diagram

Figure 2: Waste Treatment System Line Diagram



Flow values provided are averages.

Note: IP is requesting Bleach Plant No. 1 with Outfall 002a be removed in NPDES renewal. Bleach plant 1 is no longer in service. Outfall 002b and Outfall 002c are internal outfalls for monitoring requirements, there is no discharge directly to Georgia waters

Appendix B

Federal Regulations

40 CFR 430 – Subpart B and G

Subpart B—Bleached Papergrade Kraft and Soda Subcategory

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§430.20 Applicability; description of the bleached papergrade kraft and soda subcategory.

The provisions of this subpart apply to discharges resulting from: The production of market pulp at bleached kraft mills; the integrated production of paperboard, coarse paper, and tissue paper at bleached kraft mills; the integrated production of pulp and fine papers at bleached kraft mills; and the integrated production of pulp and paper at soda mills.

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§430.21 Specialized definitions.

(a) The general definitions, abbreviations, and methods of analysis set forth in 40 CFR part 401 and §430.01 of this part apply to this subpart.

(b) *Baseline BAT limitations or NSPS* means the BAT limitations specified in §430.24(a) (1) or (2), as applicable, and the NSPS specified in §430.25(b) (1) or (2), as applicable, that apply to any direct discharger that is not "enrolled" in the "Voluntary Advanced Technology Incentives Program."

(c) *Enroll* means to notify the permitting authority that a mill intends to participate in the "Voluntary Advanced Technology Incentives Program." A mill can enroll by indicating its intention to participate in the program either as part of its application for a National Pollutant Discharge Elimination System (NPDES) permit, or through separate correspondence to the permitting authority as long as the mill signs the correspondence in accordance with 40 CFR 122.22.

(d) *Existing effluent quality* means the level at which the pollutants identified in §430.24(a)(1) are present in the effluent of a mill "enrolled" in the "Voluntary Advanced Technology Incentives Program."

(e) *Kappa number* is a measure of the lignin content in unbleached pulp, determined after pulping and prior to bleaching.

(f) *Voluntary Advanced Technology Incentives Program* is the program established under §430.24(b) (for existing direct dischargers) and §430.25(c) (for new direct dischargers) whereby participating mills agree to accept enforceable effluent limitations and conditions in their NPDES permits that are more stringent than the "baseline BAT limitations or NSPS" that would otherwise apply, in exchange for regulatory- and enforcement-related rewards and incentives.

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§430.22 Effluent limitations representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available (BPT).

(a) Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart must achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available (BPT):

SUBPART B

[BPT effluent limitations for bleached kraft facilities where market pulp is produced]

Pollutant or pollutant parameter	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	15.45	8.05	4.52
TSS	30.4	16.4	9.01
pH	(1)	(1)	(1)

[1]Within the range of 5.0 to 9.0 at all times.

SUBPART B

[BPT effluent limitations for bleached kraft facilities where paperboard, coarse paper, and tissue paper are produced]

Pollutant or pollutant parameter	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	13.65	7.1	3.99
TSS	24.0	12.9	7.09
pH	(1)	(1)	(1)

[1]Within the range of 5.0 to 9.0 at all times.

SUBPART B

[BPT effluent limitations for bleached kraft facilities where pulp and fine papers are produced]

Pollutant or pollutant parameter	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	10.6	5.5	3.09
TSS	22.15	11.9	6.54
pH	(1)	(1)	(1)

[1]Within the range of 5.0 to 9.0 at all times.

SUBPART B

[BPT effluent limitations for soda facilities where pulp and paper are produced]

Pollutant or pollutant parameter	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	13.7	7.1	3.99
TSS	24.5	13.2	7.25
pH	(1)	(1)	(1)

[1]Within the range of 5.0 to 9.0 at all times.

(b) The following limitations establish the quantity or quality of pollutants or pollutant properties, controlled by this section, resulting from the use of wet barking operations, which may be discharged by a point source subject to the provisions of this subpart. These limitations are in addition to the limitations set forth in paragraph (a) of this section and shall be calculated using the proportion of the mill's total production due to use of logs which are subject to such operations:

SUBPART B

[BPT effluent limitations for bleached kraft facilities where market pulp is produced]

Pollutant or pollutant parameter	Kg/kkg (or pounds per 1,000 lb) of product

	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	2.3	1.2	0.70
TSS	5.3	2.85	1.55
pH	(1)	(1)	(1)

[1]Within the range of 5.0 to 9.0 at all times.

Subpart B

[BPT effluent limitations for bleached kraft facilities where paperboard, coarse paper, and tissue paper are produced]

Pollutant or pollutant parameter	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	2.25	1.2	0.65
TSS	5.75	3.1	1.70
pH	(1)	(1)	(1)

[1]Within the range of 5.0 to 9.0 at all times.

Subpart B

[BPT effluent limitations for bleached kraft facilities where pulp and fine papers are produced]

Pollutant or pollutant parameter	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	1.95	1.0	0.55
TSS	5.3	2.85	1.55
pH	(1)	(1)	(1)

[1]Within the range of 5.0 to 9.0 at all times.

Subpart B

[BPT effluent limitations for soda facilities where pulp and papers are produced]

Pollutant or pollutant parameter	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	2.05	1.1	0.60
TSS	5.25	2.8	1.55
pH	(1)	(1)	(1)

[1]Within the range of 5.0 to 9.0 at all times.

(c) The following limitations establish the quantity or quality of pollutants or pollutant parameters, controlled by this section, resulting from the use of log washing or chip washing operations, which may be discharged by a point source subject to the provisions of this subpart. These limitations are in addition to the limitations set forth in paragraph (a) of this section and shall be calculated using the proportion of the mill's total production due to use of logs and/or chips which are subject to such operations:

Subpart B

[BPT effluent limitations for bleached kraft facilities where market pulp is produced]

Pollutant or pollutant parameter	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	0.2	0.1	0.1
TSS	0.6	0.3	0.15
pH	(1)	(1)	(1)

[1]Within the range of 5.0 to 9.0 at all times.

Subpart B

[BPT effluent limitations for bleached kraft facilities where paperboard, coarse paper, and tissue paper are produced]

Pollutant or pollutant parameter	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	0.25	0.15	0.05
TSS	0.65	0.35	0.20
pH	(1)	(1)	(1)

[1]Within the range of 5.0 to 9.0 at all times.

Subpart B

[BPT effluent limitations for bleached kraft facilities where pulp and fine papers are produced]

Pollutant or pollutant parameter	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	0.2	0.1	0.05
TSS	0.55	0.3	0.15
pH	(1)	(1)	(1)

[1]Within the range of 5.0 to 9.0 at all times.

Subpart B

[BPT effluent limitations for soda facilities where pulp and papers are produced]

Pollutant or pollutant parameter	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	0.15	0.1	0.05
TSS	0.5	0.25	0.15
pH	(1)	(1)	(1)

[1]Within the range of 5.0 to 9.0 at all times.

(d) The following limitations establish the quantity or quality of pollutants or pollutant properties, controlled by this section, resulting from the use of log flumes or log ponds, which may be discharged by a point source subject to the provisions of this subpart. These limitations are in addition to the limitations set forth in paragraph (a) of this section and shall be calculated using the proportion of the mill's total production due to use of logs which are subject to such operations:

Subpart B

[BPT effluent limitations for bleached kraft facilities where market pulp is produced]

Pollutant or pollutant parameter	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	0.4	0.2	0.15
TSS	1.15	0.6	0.35
pH	(1)	(1)	(1)

[1]Within the range of 5.0 to 9.0 at all times.

Subpart B

[BPT effluent limitations for bleached kraft facilities where paperboard, coarse paper, and tissue paper are produced]

Pollutant or pollutant parameter	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	0.45	0.25	0.10
TSS	1.25	0.7	0.35
pH	(1)	(1)	(1)

[1]Within the range of 5.0 to 9.0 at all times.

Subpart B

[BPT effluent limitations for bleached kraft facilities where pulp and fine papers are produced]

Pollutant or pollutant parameter	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual
	Maximum for	Average of daily values for 30	

	any 1 day	consecutive days	average)
BOD5	0.35	0.2	0.10
TSS	1.15	0.6	0.30
pH	(1)	(1)	(1)

[1]Within the range of 5.0 to 9.0 at all times.

Subpart B

[BPT effluent limitations for soda facilities where pulp and papers are produced]

Pollutant or pollutant parameter	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	0.3	0.2	0.10
TSS	1.1	0.55	0.35
pH	(1)	(1)	(1)

[1]Within the range of 5.0 to 9.0 at all times.

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§430.23 Effluent limitations representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology (BCT).

Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart must achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology (BCT). The limitations shall be the same as those specified in §430.22 of this subpart for the best practicable control technology currently available (BPT).

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§430.24 Effluent limitations representing the degree of effluent reduction attainable by the application of best available technology economically achievable (BAT).

Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart must achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best available technology economically achievable (BAT).

(a) Except as provided in paragraph (b) of this section—

(1) The following effluent limitations apply with respect to each fiber line that does not use an exclusively TCF bleaching process, as disclosed by the discharger in its NPDES permit application under 40 CFR 122.21(g)(3) and certified under 40 CFR 122.22:

Subpart B

Pollutant or pollutant property	BAT effluent limitations	
	Maximum for any 1 day	Monthly average
TCDD	<ML[a]	(b)
TCDF	31.9[c]	(b)
Chloroform	6.92[d]	4.14(d)
Trichlorosyringol	<ML[a]	(b)

3,4,5-trichlorocatechol	<ML[a]	([b])
3,4,6-trichlorocatechol	<ML[a]	([b])
3,4,5-trichloroguaiacol	<ML[a]	([b])
3,4,6-trichloroguaiacol	<ML[a]	([b])
4,5,6-trichloroguaiacol	<ML[a]	([b])
2,4,5-trichlorophenol	<ML[a]	([b])
2,4,6-trichlorophenol	<ML[a]	([b])
Tetrachlorocatechol	<ML[a]	([b])
Tetrachloroguaiacol	<ML[a]	([b])
2,3,4,6-tetrachlorophenol	<ML[a]	([b])
Pentachlorophenol	<ML[a]	([b])

	Continuous dischargers		Non-continuous dischargers
	Maximum for any 1 day (kg/kkg)	Monthly average (kg/kkg)	Annual average (kg/kkg)
AOX	0.951	0.623	0.512
COD	([e])	([e])	([e])

[a]"<ML" means less than the minimum level specified in §430.01(i) for the particular pollutant.

[b]This regulation does not specify this type of limitation for this pollutant; however, permitting authorities may do so as appropriate.

[c]Picograms per liter.

[d]Grams per 1,000 kilograms (g/kkg).

[e][Reserved]

(2) The following effluent limitations apply with respect to each fiber line that uses exclusively TCF bleaching processes, as disclosed by the discharger in its NPDES permit application under 40 CFR 122.21(g)(3) and certified under 40 CFR 122.22:

SUBPART B

Pollutant or pollutant property	BAT effluent limitations (TCF)			
	Continuous dischargers		Non-continuous dischargers	
	Maximum for any 1 day	Monthly average	Maximum for any 1 day	Annual average
	kg/kkg (or pounds per 1,000 lb) of product			
AOX	<ML[a]	([b])	<ML[a]	([b])
COD	([c])	([c])	([c])	([c])

[a]"<ML" means less than the minimum level specified in §430.01(i) for the particular pollutant.

[b]This regulation does not specify this type of limitation for this pollutant; however, permitting authorities may do so as appropriate.

[c][Reserved]

(b) The following limitations apply with respect to each fiber line enrolled in the Voluntary Advanced Technology Incentives Program:

(1) Stage 1 Limitations: Numeric limitations that are equivalent to the discharger's existing effluent quality or the discharger's current effluent limitations established under CWA section 301(b)(2), whichever are more stringent, for the

pollutants identified in paragraph (a)(1) of this section (with the exception of COD). For AOX, the permitting authority must determine existing effluent quality for each fiber line enrolled in the Voluntary Advanced Technology Incentives Program at the end of the pipe based on loadings attributable to that fiber line. For the remaining pollutants, with the exception of COD, the permitting authority must determine existing effluent quality for each fiber line enrolled in the Voluntary Advanced Technology Incentives Program at the point where the wastewater containing those pollutants leaves the bleach plant. These limitations must be recalculated each time the NPDES permit of a discharger enrolled in the Voluntary Advanced Technology Incentives Program is reissued, up to:

(i) April 15, 2004 for all pollutants in paragraph (a)(1) of this section except AOX; and

(ii) The date specified in paragraph (b)(4)(ii) of this section for achieving the applicable AOX limitation specified in paragraph (b)(4)(i).

(2) Best Professional Judgment Milestones: Narrative or numeric limitations and/or special permit conditions, as appropriate, established by the permitting authority on the basis of his or her best professional judgment that reflect reasonable interim milestones toward achievement of the effluent limitations specified in paragraphs (b)(3) and (b)(4) of this section, as applicable, after consideration of the Milestones Plan submitted by the discharger in accordance with paragraph (c) of this section.

(3) Six-year Milestones: By April 15, 2004 all dischargers enrolled in the Voluntary Advanced Technology Incentives Program must achieve the following:

(i) The effluent limitations specified in paragraph (a)(1) of this section, except that, with respect to AOX, dischargers subject to Tier I effluent limitations specified in paragraph (b)(4)(i) of this section must achieve the AOX limitation specified in that paragraph; or

(ii) For dischargers that use exclusively TCF bleaching processes as of April 15, 2004, the effluent limitations specified in paragraph (a)(2) of this section.

(4)(i) Stage 2 Limitations:

Ultimate Voluntary Advanced Technology Incentives Program BAT Limitations

Tier	Kappa number (annual average)	Filtrate recycling	Total pulping area condensate, evaporator condensate, and bleach plant wastewater flow (annual average)	AOX (kg/kkg)			
				Non-TCF[a]		TCF	
				Maximum for any 1 day	Annual average	Maximum for any 1 day	Annual average
Tier I	20 (softwood furnish) 13 (Hardwood furnish)	([b])	N/A	0.58	0.26	<ML[c]	([d])
Tier II	NA	([b])	10 cubic meters/kkg	0.23	0.10	<ML[c]	([d])
Tier III	N/A	([b])	5 cubic meters/kkg	0.11	0.05	<ML[c]	([d])

[a]Non-TCF: Pertains to any fiber line that does not use exclusively TCF bleaching processes.

[b]Complete recycling to the chemical recovery system of all filtrates generated prior to bleaching. Under Tier I, this includes all filtrates up to the point where kappa number is measured.

[c]"<ML" means less than the minimum level specified in §430.01(i) for the particular pollutant.

[d]This regulation does not specify this type of limitation for this pollutant; however, permitting authorities may do so as appropriate.

N/A means "not applicable."

(ii) Deadlines.

(A) A discharger enrolled in Tier I of the Voluntary Advanced Technology Incentives Program must achieve the Tier I limitations in paragraph (b)(4)(i) of this section by April 15, 2004.

(B) A discharger enrolled in Tier II of the Voluntary Advanced Technology Incentives Program must achieve the Tier II limitations in paragraph (b)(4)(i) of this section by April 15, 2009.

(C) A discharger enrolled in Tier III of the Voluntary Advanced Technology Incentives Program must achieve the Tier III limitations in paragraph (b)(4)(i) of this section by April 15, 2014.

(c) All dischargers enrolled or intending to enroll in the Voluntary Advanced Technology Incentives Program must submit to the NPDES permitting authority a Milestones Plan covering all fiber lines enrolled or intended to be enrolled in that program at their mill by October 5, 1999 or the date the discharger applies for an NPDES permit containing limitations and conditions based on paragraph (b) of this section, whichever is later. Mills may claim all or part of the Milestones Plan as confidential business information (CBI) in accordance with 40 CFR part 2 and 40 CFR 122.7. If a mill claims all or part of the plan as CBI, the mill must prepare and submit to the NPDES permitting authority a summary of the plan for public release. The Milestones Plan must include the following information:

(1) A description of each anticipated new technology component or process modification that the discharger intends to implement in order to achieve the limitations in paragraphs (b)(3) and (b)(4) of this section;

(2) A master schedule showing the sequence of implementing the new technology components or process modifications and identifying critical path relationships within the sequence;

(3) A schedule for each individual new technology component or process modification that includes:

(i) The anticipated initiation and completion dates of construction, installation and operational "shakedown" period associated with the technology components or process modifications and, when applicable, the anticipated dates of initiation and completion of associated research, process development, and mill trials;

(ii) The anticipated dates that the discharger expects the technologies and process modifications selected to achieve the limitations specified in paragraphs (b)(3) and (b)(4) of this section to be operational on a full-scale basis; and

(iii) The anticipated magnitude of reductions in effluent quantity and the anticipated improvements in effluent quality associated with each technology and process modification implemented as measured at the bleach plant (for bleach plant, pulping area and evaporator condensates flow and BAT parameters other than Adsorbable Organic Halides (AOX)) and at the end of the pipe (for AOX), and the dates the discharger expects those reductions and improvements to be achieved;

(4) Contingency plans in the event that any technology or process specified in the Milestones Plan need to be adjusted or alternative approaches developed to ensure that the limitations specified in paragraphs (b)(3)and (b)(4) of this section are met; and

(5) A signature by the responsible corporate officer as defined in 40 CFR 122.22.

(d) The following additional effluent limitations apply to all dischargers subject to this section in accordance with the previous subcategorization scheme unless the discharger certifies to the permitting authority that it is not using these compounds as biocides. Also, for non-continuous dischargers, concentration limitations (mg/l) shall apply. Concentration limitations will only apply to non-continuous dischargers:

Subpart B

[Supplemental BAT effluent limitations for bleached kraft facilities where market pulp is produced]

Pollutant or pollutant property	Maximum for any 1 day	
	kg/kkg (or pounds per 1,000 lb) of product	Milligrams/liter
Pentachlorophenol	0.0019	(0.011)(41.6)/y
Trichlorophenol	0.012	(0.068)(41.6)/y
y = wastewater discharged in kgal per ton product.		

Subpart B

[Supplemental BAT effluent limitations for bleached kraft facilities where paperboard, coarse paper, and tissue paper are produced]

Pollutant or pollutant property	Maximun for any 1 day	
	kg/kkg (or pounds per 1,000 lb) of product	Milligrams/liter
Pentachlorophenol	0.0016	(0.11)(35.4)/y
Trichlorophenol	0.010	(0.068)(35.4)/y
y = wastewater discharged in kgal per ton of product.		

SUBPART B

[Supplemental BAT effluent limitations for bleached kraft facilities where pulp and fine papers are produced and soda facilities where pulp and paper are produced]

Pollutant or pollutant property	Maximum for any 1 day	
	kg/kkg (or pounds per 1,000 lb) of product	Milligrams/liter
Pentachlorophenol	0.0014	(0.011) (30.9)/y
Trichlorophenol	0.0088	(0.068) (30.9)/y
y = wastewater discharged in kgal per ton of product.		

(e) Pursuant to 40 CFR 122.44(l) and 122.45(h), a discharger must demonstrate compliance with the effluent limitations in paragraph (a)(1) or (b)(3) of this section, as applicable, by monitoring for all pollutants (except for AOX and COD) at the point where the wastewater containing those pollutants leaves the bleach plant. The permitting authority may impose effluent limitations and/or monitoring requirements on internal wastestreams for any other pollutants covered in this section as appropriate under 40 CFR 122.44(l) and 122.45(h). In addition, a discharger subject to a limitation on total pulping area condensate, evaporator condensate, and bleach plant wastewater flow under paragraph (b)(4)(i) of this section, for Tier II and Tier III, must demonstrate compliance with that limitation by establishing and maintaining flow measurement equipment to monitor these flows at the point or points where they leave the pulping area, evaporator area, and bleach plant.

[63 FR 18635, Apr. 15, 1998; 63 FR 42239, Aug. 7, 1998, as amended at 64 FR 36586, July 7, 1999]

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§430.25 New source performance standards (NSPS).

New sources subject to this subpart must achieve the following new source performance standards (NSPS), as applicable.

(a) The following standards apply to each new source that commenced discharge after June 15, 1988 and before June 15, 1998, provided that the new source was constructed to meet these standards:

SUBPART B

[1982 New Source Performance Standards for bleached kraft facilities where market pulp is produced]

Pollutant or pollutant property	Continuous dischargers		Non-continuous dischargers
	Maximum for any 1 day	Average of daily values for 30 consecutive days	Annual average
	kg/kkg (or pounds per 1,000 lb) of product		
BOD5	10.3	5.5	2.88
TSS	18.2	9.5	5.00
pH	(1)	(1)	(1)

[1]Within the range of 5.0 to 9.0 at all times.

Subpart B

[1982 New Source Performance Standards for bleached kraft facilities where paperboard, coarse paper, and tissue paper are produced]

Pollutant or pollutant property	Continuous dischargers		Non-continuous dischargers
	Maximum for any 1 day	Average of daily values for 30 consecutive days	Annual average
	kg/kkg (or pounds per 1,000 lb) of product		
BOD5	8.5	4.6	2.41
TSS	14.6	7.6	4.00
pH	([1])	([1])	([1])

[1]Within the range of 5.0 to 9.0 at all times.

Subpart B

[1982 New Source Performance Standards for bleached kraft facilities where pulp and fine papers are produced and soda facilities where pulp and paper are produced]

Pollutant or pollutant property	Continuous dischargers		Non-continuous dischargers
	Maximum for any 1 day	Average of daily values for 30 consecutive days	Annual average
	kg/kkg (or pounds per 1,000 lb) of product		
BOD5	5.7	3.1	1.62
TSS	9.1	4.8	2.53
pH	([1])	([1])	([1])

[1]Within the range of 5.0 to 9.0 at all times.

(b) Except as provided in paragraph (c) of this section—

(1) The following standards apply with respect to each new source fiber line that does not use an exclusively TCF bleaching process, as disclosed by the discharger in its NPDES permit application under 40 CFR 122.21(g)(3) and certified under 40 CFR 122.22, and that commences discharge after June 15, 1998:

Subpart B

Pollutant or pollutant property	NSPS	
	Maximum for any 1 day	Monthly average
TCDD	<ML[a]	([b])
TCDF	31.9[c]	([b])
Chloroform	6.92[d]	4.14[d]
Trichlorosyringol	<ML[a]	([b])
3,4,5-trichlorocatechol	<ML[a]	([b])
3,4,6-trichlorocatechol	<ML[a]	([b])
3,4,5-trichloroguaiacol	<ML[a]	([b])

3,4,6-trichloroguaiacol	<ML[a]	([b])
4,5,6-trichloroguaiacol	<ML[a]	([b])
2,4,5-trichlorophenol	<ML[a]	([b])
2,4,6-trichlorophenol	<ML[a]	([b])
Tetrachlorocatechol	<ML[a]	([b])
Tetrachloroguaiacol	<ML[a]	([b])
2,3,4,6-tetrachlorophenol	<ML[a]	([b])
Pentachlorophenol	<ML[a]	([b])

	Continuous dischargers		Non-continuous dischargers
	Maximum for any 1 day (kg/kkg)	Monthly average (kg/kkg)	Annual average (kg/kkg)
AOX	0.476	0.272	0.208
BOD5	4.52	2.41	1.73
TSS	8.47	3.86	2.72
pH	([1])	([1])	([1])
COD	([e])	([e])	([e])

[a]"<ML" means less than the minimum level specified in §430.01(i) for the particular pollutant.

[b]This regulation does not specify this type of limitation for this pollutant; however, permitting authorities may do so as appropriate.

[c]Picograms per liter.

[d]Grams per 1,000 kilograms(g/kkg).

[e][Reserved]

[1]Within the range of 5.0 to 9.0 at all times.

(2) The following standards apply with respect to each new source fiber line that uses exclusively TCF bleaching processes, as disclosed by the discharger in its NPDES permit application under 40 CFR 122.21(g)(3) and certified under 40 CFR 122.22, and that commences discharge after June 15, 1998:

Subpart B

	NSPS (TCF)			
	Continuous dischargers		Non-continuous dischargers	
Pollutant or pollutant property	Maximum for any 1 day	Monthly average	Maximum for any 1 day	Annual average
AOX	<ML[a]	([b])	<ML[a]	([b])
BOD5	4.52[d]	2.41	N/A	1.73
TSS	8.47[d]	3.86	N/A	2.72
pH	([1])	([1])	([1])	([1])
COD	([c])	([c])	([c])	([c])

[a]"<ML" means less than the minimum level specified in §430.01(l) for the particular pollutant.

[b]This regulation does not specify this type of limitation for this pollutant; however, permitting authorities may do so as appropriate.

[c][Reserved]

[d]Kilograms per 1,000 kilograms (kg/kkg).

[1]Within the range of 5.0 to 9.0 at all times.

(c) With respect to each new source fiber line that is enrolled in the Voluntary Advanced Technology Incentives Program, dischargers subject to this section must achieve:

(1) The standards specified in paragraph (b)(1) of this section (except for AOX) or paragraph (b)(2) of this section, as applicable; and

(2) Standards for filtrates, flow, and AOX:

Ultimate Voluntary Advanced Technology Incentives Program NSPS

Tier	Filtrate recycling	Total pulping area condensate, evaporator condensate, and bleach plant wastewater flow (annual average)	AOX (kg/kkg)			
			Non-TCF[a]		TCF	
			Maximum for any 1 day	Annual average	Maximum for any 1 day	Annual average
Tier II	([b])	10 cubic meters/kkg	0.23	0.10	<ML[c]	([d])
Tier III	([b])	5 cubic meters/kkg	0.11	0.05	<ML[c]	([d])

[a]Non-TCF: Pertains to any fiber line that does not use exclusively TCF bleaching processes.

[b]Complete recycling to the chemical recovery system of all filtrates generated prior to bleaching.

[c]"<ML" means less than the minimum level specified in §430.01(i) for the particular pollutant.

[d]This regulation does not specify this type of limitation for this pollutant; however, permitting authorities may do so as appropriate.

(d) These additional standards apply to all new sources, regardless of when they commenced discharge, in accordance with the previous subcategorization scheme unless the discharger certifies to the permitting authority that it is not using these compounds as biocides. Also, for non-continuous dischargers, concentration limitations (mg/l) shall apply. Concentration limitations will only apply to non-continuous dischargers:

Subpart B

[Supplemental NSPS for bleached kraft facilities where market pulp is produced]

Pollutant or pollutant property	Maximum for any 1 day	
	kg/kkg (or pounds per 1,000 lb) of product	Milligrams/liter
Pentachlorophenol	0.0019	(0.013)(36.6)/y
Trichlorophenol	0.012	(0.077)(36.6)/y
y = wastewater discharged in kgal per ton of product.		

Subpart B

[Supplemental NSPS for bleached kraft facilities where paperboard, coarse paper, and tissue paper are produced]

Pollutant or pollutant property	Maximum for any 1 day	
	kg/kkg (or pounds per 1,000 lb) of	Milligrams/liter

	product	
Pentachlorophenol	0.0016	(0.012)(31.7)/y
Trichlorophenol	0.010	(0.076)(31.7)/y
y = wastewater discharged in kgal per ton of product.		

SUBPART B

[Supplemental NSPS for bleached kraft facilities where pulp and fine papers are produced and soda facilities where pulp and paper are produced]

Pollutant or pollutant property	Maximum for any 1 day	
	kg/kkg (or pounds per 1,000 lb) of product	Milligrams/liter
Pentachlorophenol	0.0014	(0.014)(25.1)/y
Trichlorophenol	0.0088	(0.084)(25.1)/y
y = wastewater discharged in kgal per ton of product.		

(e) Pursuant to 40 CFR 122.44(i) and 122.45(h), a discharger must demonstrate compliance with the limitations in paragraph (b)(1) or (c)(1) of this section, as applicable, by monitoring for all pollutants (except for AOX, COD, BOD5, TSS, and pH) at the point where the wastewater containing those pollutants leaves the bleach plant. The permitting authority may impose effluent limitations and/or monitoring requirements on internal wastestreams for any other pollutants covered in this section as appropriate under 40 CFR 122.44(i) and 122.45(h). In addition, a discharger subject to a limitation on total pulping area condensate, evaporator condensate, and bleach plant wastewater flow under paragraph (c)(2) of this section must demonstrate compliance with that limitation by establishing and maintaining flow measurement equipment monitoring these flows at the point or points where they leave the pulping area, evaporator area, and the bleach plant.

[63 FR 18635, Apr. 15, 1998; 63 FR 42239, Aug. 7, 1998]

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§430.26 Pretreatment standards for existing sources (PSES).

Except as provided in 40 CFR 403.7 and 403.13, any existing source subject to this subpart that introduces pollutants into a publicly owned treatment works must comply with 40 CFR part 403 and must achieve the following pretreatment standards for existing sources (PSES).

(a)(1) The following pretreatment standards apply with respect to each fiber line operated by an indirect discharger subject to this section, unless the indirect discharger discloses to the pretreatment control authority in a report submitted under 40 CFR 403.12(b) that it uses exclusively TCF bleaching processes at that fiber line. These pretreatment standards must be attained on or before April 16, 2001:

SUBPART B

Pollutant or pollutant property	PSES	
	Maximum for any 1 day	Monthly average
TCDD	<ML[a]	([b])
TCDF	31.9[c]	([b])
Chloroform	6.92[d]	[d]4.14
Trichlorosyringol	<ML[a]	([b])
3,4,5-trichlorocatechol	<ML[a]	([b])
3,4,6-trichlorocatechol	<ML[a]	([b])
3,4,5-trichloroguaiacol	<ML[a]	([b])

3,4,6-trichloroguaiacol	<ML[a]	([b])
4,5,6-trichloroguaiacol	<ML[a]	([b])
2,4,5-trichlorophenol	<ML[a]	([b])
2,4,6-trichlorophenol	<ML[a]	([b])
Tetrachlorocatechol	<ML[a]	([b])
Tetrachloroguaiacol	<ML[a]	([b])
2,3,4,6-tetrachlorophenol	<ML[a]	([b])
Pentachlorophenol	<ML[a]	([b])
AOX	2.64[e]	[e]1.41

[a]"<ML" means less than the minimum level specified in §430.01(i) for the particular pollutant.

[b]This regulation does not specify this type of limitation for this pollutant; however, pretreatment control authorities may do so as appropriate.

[c]Picograms per liter.

[d]Grams per 1,000 kilograms (g/kkg).

[e]Kilograms per 1,000 kilograms (kg/kkg).

(2) The following pretreatment standards apply with respect to each fiber line operated by an indirect discharger subject to this section if the indirect discharger discloses to the pretreatment control authority in a report submitted under 40 CFR 403.12(b), (d), or (e) that it uses exclusively TCF bleaching processes at that fiber line. These pretreatment standards must be attained on or before April 16, 2001:

Subpart B

Pollutant or pollutant parameter	PSES (TCF)	
	Maximum for any 1 day	Monthly average
AOX	<ML[a]	([b])

[a]"<ML" means less than the minimum level specified in §430.01(i) for the particular pollutant.

[b]This regulation does not specify this type of limitation for this pollutant; however, pretreatment control authorities may do so as appropriate.

(b) The following pretreatment standards apply to all indirect dischargers, in accordance with the previous subcategorization scheme. An indirect discharger is not required to meet these pretreatment standards if it certifies to the pretreatment control authority that it is not using these compounds as biocides. In cases when POTWs find it necessary to impose mass effluent limitations, equivalent mass limitations are provided as guidance:

Subpart B

[Supplemental PSES for bleached kraft facilities where market pulp is produced]

Pollutant or pollutant property	Maximum for any 1 day	
	kg/kkg (or pounds per 1,000 lb) of product	Milligrams/liter
Pentachlorophenol	0.0019	(0.011)(41.6)/y
Trichlorophenol	0.014	(0.082)(41.6)/y
y = wastewater discharged in kgal per ton of product.		

SUBPART B

[Supplemental PSES for bleached kraft facilities where paperboard, coarse paper, and tissue paper are produced]

Pollutant or pollutant property	Maximum for any 1 day	
	kg/kkg (or pounds per 1,000 lb) of product	Milligrams/liter
Pentachlorophenol	0.0016	(0.011)(35.4)/y
Trichlorophenol	0.012	(0.082)(35.4)/y
y = wastewater discharged in kgal per ton of product.		

SUBPART B

[Supplemental PSES for bleached kraft facilities where pulp and fine papers are produced and soda facilities where pulp and paper are produced]

Pollutant or pollutant property	Maximum for any 1 day	
	kg/kkg (or pounds per 1,000 lb) of product	Milligrams/liter
Pentachlorophenol	0.0014	(0.011)(30.9)/y
Trichlorophenol	0.011	(0.082)(30.9)/y
y = wastewater discharged in kgal per ton of product		

(c) An indirect discharger must demonstrate compliance with the pretreatment standards in paragraph (a)(1) of this section by monitoring at the point where the wastewater containing those pollutants leaves the bleach plant.

[63 FR 18635, Apr. 15, 1998; 63 FR 42239, Aug. 7, 1998]

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§430.27 Pretreatment standards for new sources (PSNS).

Except as provided in 40 CFR 403.7, any new source subject to this subpart that introduces pollutants into a publicly owned treatment works must comply with 40 CFR part 403 and must achieve the following pretreatment standards for new sources (PSNS).

(a)(1) The following pretreatment standards apply with respect to each fiber line that is a new source, unless the indirect discharger discloses to the pretreatment control authority in a report submitted under 40 CFR 403.12 that it uses exclusively TCF bleaching processes at that fiber line:

SUBPART B

Pollutant or pollutant property	PSNS	
	Maximum for any 1 day	Monthly average
TCDD	<ML[a]	([b])
TCDF	31.9[c]	([b])
Chloroform	6.92[d]	4.14[d]
Trichlorosyringol	<ML[a]	([b])
3,4,5-trichlorocatechol	<ML[a]	([b])
3,4,6-trichlorocatechol	<ML[a]	([b])
3,4,5-trichloroguaiacol	<ML[a]	([b])

3,4,6-trichloroguaiacol	<ML[a]	(b)
4,5,6-trichloroguaiacol	<ML[a]	(b)
2,4,5-trichlorophenol	<ML[a]	(b)
2,4,6-trichlorophenol	<ML[a]	(b)
Tetrachlorocatechol	<ML[a]	(b)
Tetrachloroguaiacol	<ML[a]	(b)
2,3,4,6-tetrachlorophenol	<ML[a]	(b)
Pentachlorophenol	<ML[a]	(b)
AOX	1.16[e]	0.814[e]

[a]"<ML" means less than the minimum level specified in §430.01(i) for the particular pollutant.

[b]This regulation does not specify this type of limitation for this pollutant; however, pretreatment control authorities may do so as appropriate.

[c]Picograms per liter.

[d]Grams per 1,000 kilograms (g/kkg).

[e]Kilograms per 1,000 kilograms (kg/kkg).

(2) The following pretreatment standards apply with respect to each new source fiber line operated by an indirect discharger subject to this section if the indirect discharger discloses to the pretreatment control authority in a report submitted under 40 CFR 403.12(b), (d), or (e) that it uses exclusively TCF bleaching processes at that fiber line:

Subpart B

Pollutant or pollutant parameter	PSNS (TCF)	
	Maximum for any 1 day	Monthly average
AOX	<ML[a]	(b)

[a]"<ML" means less than the minimum level specified in §430.01(i) for the particular pollutant.

[b]This regulation does not specify this type of limitation for this pollutant; however, pretreatment control authorities may do so as appropriate.

(b) The following pretreatment standards apply to all new source indirect dischargers, regardless of when they commenced discharge, in accordance with the previous subcategorization scheme. An indirect discharger is not required to meet these pretreatment standards if it certifies to the pretreatment control authority that it is not using these compounds as biocides. In cases when POTWs find it necessary to impose mass-based effluent limitations, equivalent mass limitations are provided as guidance:

Subpart B

[Supplemental PSNS for bleached kraft facilities where market pulp is produced]

Pollutant or pollutant property	Maximum for any 1 day	
	kg/kkg (or pounds per 1,000 lb) of product	Milligrams/liter
Pentachlorophenol	0.0019	(0.013)(36.6)/y
Trichlorophenol	0.014	(0.093)(36.6)/y
y = wastewater discharged in kgal per ton of product.		

SUBPART B

[Supplemental PSNS for bleached kraft facilities where paperboard, coarse paper, and tissue paper are produced]

Pollutant or pollutant property	Maximum for any 1 day	
	kg/kkg (or pounds per 1,000 lb) of product	Milligrams/liter
Pentachlorophenol	0.0016	(0.012)(31.7)/y
Trichlorophenol	0.012	(0.092)(31.7)/y
y = wastewater discharged in kgal per ton of product.		

SUBPART B

[Supplemental PSNS for bleached kraft facilities where pulp and fine papers are produced and soda facilities where pulp and paper are produced]

Pollutant or pollutant parameter	Maximum for any 1 day	
	kg/kkg (or pounds per 1,000 lb) of product	Milligrams/liter
Pentachlorophenol	0.0014	(0.014)(25.1)/y
Trichlorophenol	0.011	(0.101)(25.1)/y
y = wastewater discharged in kgal per ton of product.		

(c) An indirect discharger must demonstrate compliance with the pretreatment standards in paragraph (a)(1) of this section by monitoring at the point where the wastewater containing those pollutants leaves the bleach plant.

[63 FR 18635, Apr. 15, 1998; 63 FR 42239, Aug. 7, 1998]

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§430.28 Best management practices (BMPs).

The definitions and requirements set forth in 40 CFR 430.03 apply to facilities in this subpart.

Subpart G—Mechanical Pulp Subcategory

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§430.70 Applicability; description of the mechanical pulp subcategory.

The provisions of this subpart are applicable to discharges resulting from: the production of pulp and paper at groundwood chemi-mechanical mills; the production of pulp and paper at groundwood mills through the application of the thermo-mechanical process; the integrated production of pulp and coarse paper, molded pulp products, and newsprint at groundwood mills; and the integrated production of pulp and fine paper at groundwood mills.

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§430.71 Specialized definitions.

For the purpose of this subpart, the general definitions, abbreviations, and methods of analysis set forth in 40 CFR part 401 and §430.01 of this part shall apply to this subpart.

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§430.72 Effluent limitations representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available (BPT).

(a) Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart must achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available (BPT), except that non-continuous dischargers shall not be subject to the maximum day and average of 30 consecutive days limitations but shall be subject to annual average effluent limitations:

SUBPART G

[BPT effluent limitations for mechanical pulp facilities where pulp and paper at groundwood chemi-mechanical mills are produced]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	13.5	7.05	3.96
TSS	19.75	10.65	5.85
pH	(1)	(1)	(1)

[1]Within the range of 5.0 to 9.0 at all times.

SUBPART G

[BPT effluent limitations for mechanical pulp facilities where pulp and paper at groundwood mills are produced through the application of the thermo-mechanical process]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	10.6	5.55	3.12
TSS	15.55	8.35	4.59
pH	(1)	(1)	(1)

[1]Within the range of 5.0 to 9.0 at all times.

SUBPART G

[BPT effluent limitations for mechanical pulp facilities where the integrated production of pulp and coarse paper, molded pulp products, and newsprint at groundwood mills occurs]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	7.45	3.9	2.19
TSS	12.75	6.85	3.76
pH	(1)	(1)	(1)

[1]Within the range of 5.0 to 9.0 at all times.

SUBPART G

[BPT effluent limitations for mechanical pulp facilities where the integrated production of pulp and fine paper at groundwood mills occurs]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	6.85	3.6	2.0
TSS	11.75	6.3	3.5
pH	(1)	(1)	(1)

[1]Within the range of 5.0 to 9.0 at all times.

(b) The following limitations establish the quantity or quality of pollutants or pollutant properties, controlled by this section, resulting from the use of wet barking operations, which may be discharged by a point source subject to the provisions of this subpart. These limitations are in addition to the limitations set forth in paragraph (a) of this section and shall be calculated using the proportion of the mill's total production due to use of logs which are subject to such operations. Non-continuous dischargers shall not be subject to the maximum day and average of 30 consecutive days limitations, but shall be subject to annual average effluent limitations:

SUBPART G

[BPT effluent limitations for mechanical pulp facilities where pulp and paper at groundwood chemi-mechanical mills are produced]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	0.9	0.45	0.25
TSS	2.6	1.45	0.80
pH	(1)	(1)	(1)

[1]Within the range of 5.0 to 9.0 at all times.

SUBPART G

[BPT effluent limitations for mechanical pulp facilities where pulp and paper at groundwood mills are produced through the application of the thermo-mechanical process]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	0.9	0.45	0.3
TSS	2.7	1.45	0.75
pH	([1])	([1])	([1])

[1]Within the range of 5.0 to 9.0 at all times.

SUBPART G

[BPT effluent limitations for mechanical pulp facilities where the integrated production of pulp and coarse paper, molded pulp products, and newsprint at groundwood mills occurs]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	1.15	0.55	0.30
TSS	2.0	1.1	0.60
pH	([1])	([1])	([1])

[1]Within the range of 5.0 to 9.0 at all times.

SUBPART G

[BPT effluent limitations for mechanical pulp facilities where the integrated production of pulp and fine paper at groundwood mills occurs]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	1.1	0.55	0.35
TSS	1.95	1.1	0.60
pH	([1])	([1])	([1])

[1]Within the range of 5.0 to 9.0 at all times.

(c) The following limitations establish the quantity or quality of pollutants or pollutant parameters, controlled by this section, resulting from the use of log washing or chip washing operations, which may be discharged by a point source subject to the provisions of this subpart. These limitations are in addition to the limitations set forth in paragraph (a) of this section and

shall be calculated using the proportion of the mill's total production due to use of logs and/or chips which are subject to such operations. Non-continuous dischargers shall not be subject to the maximum day and average of 30 consecutive days limitations, but shall be subject to the annual average effluent limitations:

Subpart G

[BPT effluent limitations for mechanical pulp facilities where pulp and paper at groundwood chemi-mechanical mills are produced]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	0.05	0.05	0.05
TSS	0.25	0.15	0.10
pH	(1)	(1)	(1)

[1]Within the range of 5.0 to 9.0 at all times.

Subpart G

[BPT effluent limitations for mechanical pulp facilities where pulp and paper at groundwood mills are produced through the application of the thermo-mechanical process]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	0.05	0.05	0.05
TSS	0.30	0.15	0.05
pH	(1)	(1)	(1)

[1]Within the range of 5.0 to 9.0 at all times.

Subpart G

[BPT effluent limitations for mechanical pulp facilities where the integrated production of pulp and coarse paper, molded pulp products, and newsprint at groundwood mills occurs]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	0.15	0.05	0.05
TSS	0.20	0.15	0.10
pH	(1)	(1)	(1)

[1]Within the range of 5.0 to 9.0 at all times.

Subpart G

[BPT effluent limitations for mechanical pulp facilities where the integrated production of pulp and fine paper at groundwood mills occurs]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	0.15	0.05	0.05
TSS	0.2	0.15	0.10
pH	(1)	(1)	(1)

[1]Within the range of 5.0 to 9.0 at all times.

(d) The following limitations establish the quantity or quality of pollutants or pollutant properties, controlled by this section, resulting from the use of log flumes or log ponds, which may be discharged by a point source subject to the provisions of this subpart. These limitations are in addition to the limitations set forth in paragraph (a) of this section and shall be calculated using the proportion of the mill's total production due to use of logs which are subject to such operations. Non-continuous dischargers shall not be subject to the maximum day and average of 30 consecutive days limitations but shall be subject to the annual average effluent limitations:

SUBPART G

[BPT effluent limitations for mechanical pulp facilities where pulp and paper at groundwood chemi-mechanical mills are produced]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	0.15	0.05	0.05
TSS	0.55	0.3	0.15
pH	(1)	(1)	(1)

[1]Within the range of 5.0 to 9.0 at all times.

SUBPART G

[BPT effluent limitations for mechanical pulp facilities where pulp and paper at groundwood mills are produced through the application of the thermo-mechanical process]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	0.15	0.15	0.05
TSS	0.60	0.35	0.15
pH	(1)	(1)	(1)

[1]Within the range of 5.0 to 9.0 at all times.

SUBPART G

[BPT effluent limitations for mechanical pulp facilities where the integrated production of pulp and coarse paper, molded pulp products, and newsprint at groundwood mills occurs]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	0.25	0.1	0.05
TSS	0.45	0.25	0.15
pH	(1)	(1)	(1)

[1]Within the range of 5.0 to 9.0 at all times.

SUBPART G

[BPT effluent limitations for mechanical pulp facilities where the integrated production of pulp and fine paper at groundwood mills occurs]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	0.2	0.05	0.05
TSS	0.4	0.25	0.15
pH	(1)	(1)	(1)

[1]Within the range of 5.0 to 9.0 at all times.

(e) For those mills using zinc hydrosulfite as a bleaching agent in the manufacturing process, the following effluent limitations are to be added to the base limitations set forth in paragraph (a) of this section. Permittees not using zinc hydrosulfite as a bleaching agent must certify to the permit issuing authority that they are not using this bleaching compound. Non-continuous dischargers shall not be subject to the maximum day and average of 30 consecutive days effluent limitations, but shall be subject to annual average effluent limitations:

SUBPART G

[BPT effluent limitations for mechanical pulp facilities where pulp and paper at groundwood chemi-mechanical mills are produced]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
Zinc	0.34	0.17	0.11

SUBPART G

[BPT effluent limitations for mechanical pulp facilities where pulp and paper at groundwood mills are produced through the application of the thermo-mechanical process]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product	

	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
Zinc	0.26	0.13	0.09

Subpart G

[BPT effluent limitations for mechanical pulp facilities where the integrated production of pulp and coarse paper, molded pulp products, and newsprint at groundwood mills occurs]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
Zinc	0.30	0.15	0.10

Subpart G

[BPT effluent limitations for mechanical pulp facilities where the integrated production of pulp and fine paper at groundwood mills occurs]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
Zinc	0.275	0.135	0.090

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§430.73 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology (BCT).

(a)(1) The following applies to: mechanical pulp facilities where the integrated production of pulp and coarse paper, molded pulp products, and newsprint at groundwood mills occurs; and mechanical pulp facilities where the integrated production of pulp and fine paper at groundwood mills occurs:

(2) Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart shall achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology (BCT): The limitations shall be the same as those specified for conventional pollutants (which are defined in 40 CFR 401.16) in §430.72 of this subpart for the best practicable control technology currently available (BPT).

(b) [Reserved]

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§430.74 Effluent limitations representing the degree of effluent reduction attainable by the application of the best available technology economically achievable (BAT).

(a) The following applies to mechanical pulp facilities where pulp and paper at groundwood mills are produced through the application of the thermo-mechanical process; mechanical pulp facilities where the integrated production of pulp and coarse paper, molded pulp products, and newsprint at groundwood mills occurs; and mechanical pulp facilities where the integrated production of pulp and fine paper at groundwood mills occurs: except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart must achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best available technology economically achievable (BAT), except that non-continuous dischargers shall not be subject to the maximum day mass limitations in kg/kkg (lb/1000 lb), but shall be subject to concentration limitations. Concentration limitations are only applicable to non-continuous dischargers. Pentachlorophenol and trichlorophenol limitations are only applicable at facilities where chlorophenolic-containing biocides are used. Permittees not

using chlorophenolic-containing biocides must certify to the permit-issuing authority that they are not using these biocides. Zinc limitations are only applicable at facilities where zinc hydrosulfite is used as a bleaching agent. Permittees not using zinc hydrosulfite as a bleaching agent must certify to the permit issuing authority that they are not using this bleaching compound:

Subpart G

[BAT effluent limitations for mechanical pulp facilities where pulp and paper at groundwood mills are produced through the application of the thermo-mechanical process]

Pollutant or pollutant property	Maximum for any 1 day	
	Kg/kkg (or pounds per 1,000 lb) of product	Milligrams/liter
Pentachlorophenol	0.00097	(0.011)(21.1)/y
Trichlorophenol	0.00088	(0.010)(21.1)/y
Zinc	0.26	(3.0)(21.1)/y
y = wastewater discharged in kgal per ton of product.		

Subpart G

[BAT effluent limitations for mechanical pulp facilities where the integrated production of pulp and coarse paper, molded pulp products, and newsprint at groundwood mills occurs]

Pollutant or pollutant property	Maximum for any 1 day	
	Kg/kkg (or pounds per 1,000 lb) of product	Milligrams/liter
Pentachlorophenol	0.0011	(0.011)(23.8)/y
Trichlorophenol	0.00099	(0.010)(23.8)/y
Zinc	0.30	(3.0)(23.8)/y
y = wastewater discharged in kgal per ton of product.		

Subpart G

[BAT effluent limitations for mechanical pulp facilities where the integrated production of pulp and fine paper at groundwood mills occurs

Pollutant or pollutant property	Maximum for any 1 day	
	Kg/kkg (or pounds per 1,000 lb) of product	Milligrams/liter
Pentachlorophenol	0.0010	(0.011)(21.9)/y
Trichlorophenol	0.00092	(0.010)(21.9)/y
Zinc	0.27	(3.0)(21.9)/y
y = wastewater discharged in kgal per ton of product.		

(b) [Reserved]

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§430.75 New source performance standards (NSPS).

(a) The following applies to mechanical pulp facilities where pulp and paper at groundwood mills are produced through the application of the thermo-mechanical process; mechanical pulp facilities where the integrated production of pulp and coarse paper, molded pulp products, and newsprint at groundwood mills occurs; and mechanical pulp facilities where the integrated production of pulp and fine paper at groundwood mills occurs: any new source subject to this subpart must achieve the

following new source performance standards (NSPS), except that non-continuous dischargers shall not be subject to the maximum day and average of 30 consecutive days effluent limitations for BOD5 and TSS, but shall be subject to annual average effluent limitations. Also, for non-continuous dischargers, concentration limitations (mg/l) shall apply, where provided. Concentration limitations will only apply to non-continuous dischargers. Pentachlorophenol and trichlorophenol limitations are only applicable at facilities where chlorophenolic-containing biocides are used. Permittees not using chlorophenolic-containing biocides must certify to the permit-issuing authority that they are not using these biocides. Zinc limitations are only applicable at facilities where zinc hydrosulfite is used as a bleaching agent. Permittees not using zinc hydrosulfite as a bleaching agent must certify to the permit issuing authority that they are not using this bleaching compound:

Subpart G

[NSPS for mechanical pulp facilities where pulp and paper at groundwood mills are produced through the application of the thermo-mechanical process]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	4.6	2.5	1.3
TSS	8.7	4.6	2.4
pH	([1])	([1])	([1])

	Maximum for any 1 day	
	Kg/kkg (or pounds per 1,000 lb) of product	Milligrams/liter
Pentachlorophenol	0.00097	(0.017)(13.8)/y
Trichlorophenol	0.00088	(0.015)(13.8)/y
Zinc	0.17	(3.0)(13.8)/y
y = wastewater discharged in kgal per ton at all times.		

[1]Within the range of 5.0 to 9.0 at all times.

Subpart G

[NSPS for mechanical pulp facilities where the integrated production of pulp and coarse paper, molded pulp products, and newsprint at groundwood mills occurs]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	4.6	2.5	1.3
TSS	7.3	3.8	2.0
pH	([1])	([1])	([1])

	Maximum for any 1 day	
	Kg/kkg (or pounds per 1,000 lb) of product	Milligrams/liter
Pentachlorophenol	0.0011	(0.016)(16.8)/y
Trichlorophenol	0.00099	(0.014)(16.8)/y
Zinc	0.21	(3.0)(16.8)/y
y = wastewater discharged in kgal per ton at		

all times.		

[1]Within the range of 5.0 to 9.0 at all times.

Subpart G

[NSPS mechanical pulp facilities where the integrated production of pulp and fine paper at groundwood mills occurs]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	3.5	1.9	0.99
TSS	5.8	3.0	1.58
pH	([1])	([1])	([1])

	Maximum for any 1 day	
	Kg/kkg (or pounds per 1,000 lb) of product	Milligrams/liter
Pentachlorophenol	0.0010	(0.016) (15.4)/y
Trichlorophenol	0.00092	(0.014) (15.4)/y
Zinc	0.19	(3.0) (15.4)/y
y = wastewater discharged in kgal per ton at all times.		

[1]Within the range of 5.0 to 9.0 at all times.

(b) [Reserved]

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§430.76 Pretreatment standards for existing sources (PSES).

(a) The following applies to mechanical pulp facilities where pulp and paper at groundwood mills are produced through the application of the thermo-mechanical process; mechanical pulp facilities where the integrated production of pulp and coarse paper, molded pulp products, and newsprint at groundwood mills occurs; and mechanical pulp facilities where the integrated production of pulp and fine paper at groundwood mills occurs: except as provided in 40 CFR 403.7 and 403.13, any existing source subject to this subpart that introduces pollutants into a publicly owned treatment works must comply with 40 CFR part 403 and achieve the following pretreatment standards for existing sources (PSES). Pentachlorophenol and trichlorophenol limitations are only applicable at facilities where chlorophenolic-containing biocides are used. Permittees not using chlorophenolic-containing biocides must certify to the permit-issuing authority that they are not using these biocides. Zinc limitations are only applicable at facilities where zinc hydrosulfite is used as a bleaching agent. Permittees not using zinc hydrosulfite as a bleaching agent must certify to the permit-issuing authority that they are not using this bleaching compound. PSES must be attained on or before July 1, 1984:

Subpart G

[PSES for mechanical pulp facilities where pulp and paper at groundwood mills are produced through the application of the thermo-mechanical process]

Pollutant or pollutant property	Maximum for any 1 day	
	Milligrams/liter (mg/1)	Kg/kkg (or pounds per 1,000 1b) of product[a]
Pentachlorophenol	(0.011) (21.1)/y	0.00097
Trichlorophenol	(0.010) (21.1)/y	0.00088
Zinc	(3.0) (21.1)/y	0.26

y = wastewater discharged in kgal per ton of product.		

[a]The following equivalent mass limitations are provided as guidance in cases when POTWs find it necessary to impose mass effluent limitations.

Subpart G

[PSES for mechanical pulp facilities where the integrated production of pulp and coarse paper, molded pulp products, and newsprint at groundwood mills occurs]

Pollutant or pollutant property	Maximum for any 1 day	
	Milligrams/liter (mg/1)	Kg/kkg (or pounds per 1,000 1b) of product[a]
Pentachlorophenol	(0.011) (23.8)/y	0.0011
Trichlorophenol	(0.010) (23.8)/y	0.00099
Zinc	(3.0) (23.8)/y	0.30
y = wasterwater discharged in kgal per ton of product.		

[a]The following equivalent mass limitations are provided as guidance in cases when POTWs find it necessary to impose mass effluent limitations.

Subpart G

[PSNS for mechanical pulp facilities where the integrated production of pulp and fine paper at groundwood mills occurs]

Pollutant or pollutant property	Maximum for any 1 day	
	Milligrams/liter (mg/l)	Kg/kkg (or pounds per 1,000 lb) of product[a]
Pentachlorophenol	(0.011)(21.9)/y	0.0010
Trichlorophenol	(0.010)(21.9)/y	0.00092
Zinc	(3.0)(21.9)/y	0.27
y = wastewater discharged in kgal per ton of product.		

[a]The following equivalent mass limitations are provided as guidance in cases when POTWs find it necessary to impose mass effluent limitations.

(b) [Reserved]

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§430.77 Pretreatment standards for new sources (PSNS).

(a) The following applies to mechanical pulp facilities where pulp and paper at groundwood mills are produced through the application of the thermo-mechanical process; mechanical pulp facilities where the integrated production of pulp and coarse paper, molded pulp products, and newsprint at groundwood mills occurs; and mechanical pulp facilities where the integrated production of pulp and fine paper at groundwood mills occurs: except as provided in 40 CFR 403.7, any new source subject to this subpart that introduces pollutants into a publicly owned treatment works must comply with 40 CFR part 403 and achieve the following pretreatment standards for new sources (PSNS). Pentachlorophenol and trichlorophenol limitations are only applicable at facilities where chlorophenolic-containing biocides are used. Permittees not using chlorophenolic-containing biocides must certify to the permit-issuing authority that they are not using these biocides. Zinc limitations are only applicable at facilities where zinc hydrosulfite is used as a bleaching agent. Permittees not using zinc hydrosulfite as a bleaching agent must certify to the permit issuing authority that they are not using this bleaching compound:

Subpart G

[PSNS for mechanical pulp facilities where pulp and paper at groundwood mills are produced through the application of the thermo-mechanical process]

Pollutant or pollutant property	Maximum for any 1 day	
	Milligrams/liter (mg/l)	Kg/kkg (or pounds per 1,000 lb) of product[a]
Pentachlorophenol	(0.017)(13.8)/y	0.00097
Trichlorophenol	(0.015)(13.8)/y	0.00088
Zinc	(3.0)(13.8)/y	0.17
y = wastewater discharged in kgal per ton of product.		

[a]The following equivalent mass limitations are provided as guidance in cases when POTWs find it necessary to impose mass effluent limitations.

SUBPART G

[PSNS for mechanical pulp facilities where the integrated production of pulp and coarse paper, molded pulp products, and newsprint at groundwood mills occurs]

Pollutant or pollutant property	Maximum for any 1 day	
	Milligrams/liter (mg/l)	Kg/kkg (or pounds per 1,000 lb) of product[a]
Pentachlorophenol	(0.016)(16.8)/y	0.0011
Trichlorophenol	(0.014)(16.8)/y	0.00099
Zinc	(3.0)(16.8)/y	0.21
y = wastewater discharged in kgal per ton of product.		

[a]The following equivalent mass limitations are provided as guidance in cases when POTWs find it necessary to impose mass effluent limitations.

SUBPART G

[PSNS for mechanical pulp facilities where the integrated production of pulp and fine paper at groundwood mills occurs]

Pollutant or pollutant property	Maximum for any 1 day	
	Milligrams/liter (mg/l)	Kg/kkg (or pounds per 1,000 lb) of product[a]
Pentachlorophenol	(0.016)(15.4)/y	0.0010
Trichlorophenol	(0.014)(15.4)/y	0.00092
Zinc	(3.0)(15.4)/y	0.19
y = wastewater discharged in kgal per ton of product.		

[a]The following equivalent mass limitations are provided as guidance in cases when POTWs find it necessary to impose mass effluent limitations.

Appendix C

Implementation Plan

Table 8-1 Proposed Savannah 5R Compliance Schedule

Milestone	Date
1. Technology Evaluation & Selection	12/31/17
2. Complete Preliminary Engineering of Selected Technology	2/1/18
Select Contractors and Refine Schedule	7/1/18
The dates for the following steps are contingent on receipt of all required permits by June 2018	
3. Equipment Procurement Initiated	7/1/18
4. Construct and Install (Could be multiple phases/iterations)	9/1/18 – 8/1/21
5. System Checkout & Commissioning	8/1/21 – 11/1/21
6. Startup	11/1/21
7. Trial Period through Savannah 5R Season (Must include March)	11/1/21 – 11/1/22
8. If Additional Phases, go to Step 4; Otherwise go to Step 9	N/A at time of application
9. Compliance with Savannah 5R Permit Limits	11/1/22

Appendix D

Wasteload Allocation

National Pollutant Discharge Elimination System
Wasteload Allocation Form

Part I: Background Information

WLA Request Type: Reissuance ☒ Expansion ☐ Relocation ☐ New Discharge ☐

Facility Name:	International Paper	County:	Richmond	WQMU:	0191
NPDES Permit No.:	GA0002801	Expiration Date:	7/31/2008 (Extended)	Outfall Number:	001, 001a
Receiving Water:	Savannah River	River Basin:	Savannah	10-Digit HUC:	0306010606
Discharge Type:	Domestic ☐ Industrial ☒ Both ☐	Proportion (D:I):		Flow Requested (MGD):	44.6

Industrial Contributions Type(s): International Paper operates a bleached paperboard mill. Other wastewater comes from Resolute Forest Products paper mill producing newsprint.

Treatment Process Description: Screening, mixing, primary clarifier, fiber traps, aerated basins, sedimentation and stabilization pond, constructed wetlands, ash sedimentation pond, sludge basin, landfill

Additional Information: (history, special conditions, other facilities): Outfall 001 discharges treated wastewater

Requested by: Christopher Douglas Title: EE Program: WRP

Telephone: 404-463-0932 Date: 10/6/2017

Part II: Receiving Water Information

Receiving Water: Savannah River Designated Use Classification: Fishing

Integrated 305(b)/303(d) List: Yes ☒ No ☐ Support: ☒ Not Support: ☐ Criteria:

Total Maximum Daily Load: Yes ☒ No ☐ Parameter(s) DO WLA Complies with TMDL Yes ☒ No ☐

The WLA and recommended permits comply with the Subcategory 5R Documentation for Point Source Dissolved Oxygen Impaired Water in the Savannah River Basin, Georgia and South Carolina (5R).

Part III: Water Quality Model Review Information

Model Type: Uncalibrated ☐ Calibrated ☒ Verified ☐ Cannot be Modeled ☐ Model Length (mi):

Field Data: None ☐ Fair ☒ Good ☐ Excellent ☐

Model and Field Data Description: The WLA was developed using the Savannah Harbor TMDL calculator version 4, which is based on results from water quality models for the Savannah River and Harbor. The WLAs for facilities included in the 5R plan were developed by the discharger group using the TMDL calculator.

Critical Water Temperature:(°C):	26	Drainage Area (mi²):		Mean annual streamflow at discharge (cfs):	8800
7Q10 Yield (cfs/mi²):		Velocity (range fps):		30Q3 streamflow at discharge (cfs):	4450
Effluent Flow Rate (cfs):		IWC (%):	1.8	7Q10 streamflow at discharge (cfs):	3720
Slope (range - fpm):	K1:	K3:	K2 :	1Q10 streamflow at discharge (cfs):	3720
SOD:	Escape Coef. (ft^{-1}):	f-Ratio BOD_u/BOD_5):	3.62	Background Hardness (as $CaCO_3$)(mg/L):	14

Part IV: Recommended Permit Limitations and Conditions (lbs/day as a daily average except as noted)

Rationale: Same as current ☐ Revised ☒ New ☐

Location: Savannah River

Period	Effluent Flow Rate (MGD)	BOD_5	*UOD	NH_3-N	pH (std. units)	Total Phosphorus Ortho-Phosphorus	TKN Nitrite–Nitrate Organic Nitrogen
March - October	Monitor	Monitor	27,353	Monitor	6.0 – 9.0	Monitor	Monitor
November - February	Monitor	44,478	–	Monitor	6.0 – 9.0	Monitor	Monitor

Additional Comments:

- Priority pollutants permit limits, aquatic toxicity testing requirements, and other parameters required by categorical effluent guidelines are to be determined by WRP.
- *UOD shall be reported as a combined effluent load of outfalls 001 and 001a. The combined load shall not exceed 27,353 lbs/day.
- The Ultimate Oxygen Demand (UOD) has been added to the permit according to requirements of the 5R Plan, and shall be computed with the following equation:

$$UOD\ (lbs/day) = Flow\ (mgd) \times 8.34 \times [BOD_5\ (mg/L) \times 3.62 + NH_3\text{-}N\ (mg/L) \times 4.57]$$

- Effluent monitoring for total phosphorus, ortho-phosphorus, TKN, nitrate-nitrite, and organic nitrogen is recommended in accordance with the Georgia's nutrient management strategy to identify and quantify nutrient loadings to the Savannah River and Harbor. Total phosphorus and ortho-phosphorus should be analyzed from the same effluent sample; TKN, nitrate-nitrite, ammonia, and organic nitrogen should be analyzed from the same effluent sample.

Prepared by: Lucy Sun LS Date: 11/7/2017 | Reviewed by: Josh Welte JW Date: 9 Nov 17

Part V: Program Manager Comment

Elizabeth A Booth.

Elizabeth Booth Date: 11/20/17

Appendix E

Thermal Mixing Zone Study & EPD Analysis

AquAeTer

optimizing
resources | water, air, earth

MEMORANDUM

TO:	**Donna Byrdy, Graphic Packaging – Augusta Mill**
CC:	**Dana Hollon, Graphic Packaging – Augusta Mill**
FROM:	Martin E. Lebo, **AquAeTer, Inc.**
DATE:	**June 27, 2018**
JOB NO.:	**171022**
RE:	**Augusta Mill Temperature Evaluation - GA0002801**

An evaluation of temperature in the Savannah River near the outfall from the Augusta Mill was requested to be performed by **AquAeTer** as a follow-up to the NPDES permit renewal application submitted in September 2017 (GA0002801). This technical memo summarizes an initial analysis of temperature in the Savannah River near the mill outfall based on engineering calculations and mixing zone modeling.

Analysis Summary

1. Flow and temperature data for the Savannah River and Augusta Mill effluent were obtained to evaluate temperature increase near the mill outfall.
2. The applicable temperature criteria for the Savannah River at the mill outfall is not to exceed 90°F and not to be increased more than 5°F above the intake temperature.
3. The maximum reported effluent temperature for 2014-2016 was above 90°F for the month of July. Predicted future maximum effluent temperature after the mill wastewater treatment system is modified to comply with anticipated new NPDES limits was modeled and may be greater than 90°F for June, July, and August conditions.
4. For the critical season for potential mill effluent temperatures greater than 90°F, a river volume of 198-339 cfs (Dispersion of 3.2 to 4.7) was needed for mixing with the maximum effluent discharge volume to achieve a change in river temperature of less than 5°F based on 2014-2016 data, which corresponds to 4-8% of the 10th percentile monthly flows.
5. An application of CORMIX (Version 11.0) was developed to simulate the mixing of mill effluent into the Savannah River. Existing conditions from 2014-2016 and predicted future conditions after the wastewater system is upgraded were simulated.

6. Temperature modeling of the potential future condition indicated temperature greater than 90°F may occur for <2 feet downstream of Outfall 001 and about 21 feet in the cross-channel direction in the jet mixing phase.
7. The increase in temperature in the Savannah River is predicted to be more than 5°F for up to a distance of approximately 250 feet in the effluent plume. The plume is 15-31 feet wide when the standard is met. A mixing zone is needed for temperature as effluent mixes with river water downstream of the mill outfall.

Background

The Augusta Mill discharges treated effluent to the Savannah River from the final basin (Basin 5) of the mill wastewater treatment system (WWTS) primarily through Outfall 001 (see Figure 1). The outfall consists of a 48-inch diameter pipe on the southern bank of the Savannah River, with a bottom elevation of about 90.7 feet NGVD29. For the final basin of the WWTS, the diagram lists an operating elevation in the WWTS of 117 feet. Adjacent to and upstream of Outfall 001 is an alternative discharge location labeled as Outfall 001a in Figure 1. Since Outfall 001 is the primary discharge location for the Augusta Mill, this temperature evaluation is based on information about Outfall 001 provided on the diagram.

Georgia Environmental Protection Division (GAEPD) defines the best use for the Savannah River downstream of the City of Augusta as "Drinking Water Supply" [Chapter 391-3-6-.03(14)]. The temperature criteria listed for Drinking Water Supply are provided in chapter 391-3-6-.03(6)(a)(v).

> Temperature: Not to exceed 90°F. At no time is the temperature of the receiving waters to be increased more than 5°F above intake temperature except that in estuarine waters the increase will not be more than 1.5°F. In streams designated as primary trout or smallmouth bass waters by the Wildlife Resources Division, there shall be no elevation of natural stream temperatures. In streams designated as secondary trout waters, there shall be no elevation exceeding 2°F of natural stream temperatures.

The Fishing designated use includes the same temperature criteria [391-3-6-.03(6)(c)(iv)] as listed above for the Drinking Water Supply use. The applicable criteria for the Savannah River at the mill outfall are not to exceed 90°F and not to be increased more than 5°F above the intake temperature.

Mill and River Data

Data with which to evaluate temperature change in the Savannah River near the mill outfall were provided by mill staff or obtained from Internet sources (see Table 1). The focus for the data obtained was parameters required for mixing zone calculations and modeling. Average daily river flow data for the Savannah River were obtained from the U.S. Geological Survey (USGS) website

for a gaged location approximately five miles upstream of the mill outfall (Gage 02197000). For this analysis, flow data from 1958-2017 were used to reflect seasonal flows in the Savannah River with Thurmond Dam in operation upstream of the City of Augusta. Average daily water temperature data were also available for the USGS gage for 1973-2011. Conductivity data were retrieved from STORET for any stations on the Savannah River near Augusta. A total of 297 conductivity measurements from two stations were available, with one of the locations being the USGS gage and the other immediately upstream of the mill outfall.

Data on mill effluent characteristics were provided by mill staff. The mill daily effluent flow and temperature for 2014-2016 were used for seasonal calculations consistent with data utilized for preparation of the NPDES permit renewal application. Conductivity measurements from the mill effluent used for the analysis included measurements taken as a part of Whole Effluent Toxicity (WET) testing in April 2017 and measurements performed by mill staff in December 2017. Effluent samples were analyzed for Total Dissolved Solids (TDS) for three dates in December 2017.

Table 1. Data sources for Augusta Mill temperature analysis.

Source	Data Retrieved	Time Period
USGS	Daily Average Flow at gage 02197000	1958-2017
USGS	Daily Average Temperature at gage 02197000	1973-2011
STORET	Conductivity at gage 02197000 and station just upstream of mill outfall	1999-2013
Mill Staff	Effluent flow and temperature	2014-2016
Mill Staff	Conductivity for effluent sample sent for WET testing; Conductivity and TDS measurements in December	2017

Daily flow and water quality data retrieved from the USGS website for the Savannah River and provided by mill staff for treated effluent were used to characterize the monthly conditions for the Savannah River and mill effluent (see Table 2). For this analysis, the statistical percentile for the parameter value selected was based on conditions when elevated mill effluent temperature would have the greatest effect. Thus, the 10^{th} percentile river flow (less water for mixing) and 10^{th} percentile river temperature (concurrent low temperatures with low flows) were calculated for each month of the year using the data obtained for this analysis. For mill effluent, the maximum effluent flow and the 90^{th} percentile effluent temperature were calculated for each month of the year based on 2014-2016 data. For the June and July future condition runs, the 90^{th} percentile river temperature was used to evaluate potential for effluent plume temperatures exceeding 90°F.

Conductivity data were used to calculate Total Dissolved Solids (TDS) values for river water using a general equation developed for surface waters (Carlson, 2005). In the equation, the specific

conductance or conductivity in µmhos/cm is multiplied by a conversion factor of 0.65 to yield TDS in mg/L. The median river TDS was calculated for each month for use in the mixing zone modeling.

Seasonal measurements of the temperature of final effluent at the Augusta Mill showed elevated values of greater than 80°F have occurred in the months of April to October. In general, effluent temperatures greater than 85°F have been more common during June to September, as shown in the 90th percentile values. Monitoring data for 2014-2016 indicate an effluent temperature greater than 90°F occurred during the month of July (91°F). In terms of seasonal variation in effluent temperature after current proposed modifications are completed, staff for the National Council on Air and Stream Improvement (NCASI) performed temperature modeling of the modified WWTS using the NCASI aeration heat balance model. Results reported to the mill indicate effluent temperature may be greater than 90°F during June, July, and August.

Table 2. Seasonal Variation in Savannah River and mill effluent parameters.

Month	River Flow (cfs) - Q_R	River Temp (°F) - T_R	River Temp (°F) - T_R	Effluent Flow (cfs) - Q_E	Effluent Temp (°F) - T_E
Percentile	10th	10th	90th	Max	90th (Max)
January	4,399	44.8	52.7	115.6	64.0 (72.0)
February	4,620	45.5	52.7	102.7	66.6 (72.0)
March	4,820	49.3	57.2	94.0	70.8 (73.0)
April	4,370	55.4	64.4	97.0	76.1 (86.0)
May	4,090	61.2	68.0	94.4	82.0 (84.0)
June	4,220	64.6	73.4	92.1	88.0 (89.0)
July	4,230	69.3	75.2	95.2	88.0 (91.0)
August	4,320	70.1	75.2	90.9	86.0 (88.0)
September	4,230	69.0	75.2	88.2	86.0 (88.0)
October	4,110	66.2	72.5	93.5	80.0 (84.0)
November	4,100	58.1	66.2	113.6	74.2 (78.0)
December	4,177	49.3	59.0	91.1	72.0 (76.0)

Dispersion Required

The first consideration for the mixing zone study is the dispersion required to achieve adequate mixing. This equation was derived from the overall mixing but has been simplified to the unitless dispersion value. The dispersion required is calculated using the following equation:

$$(S-1)*T_R+(1)*T_E=(S)*T_{Standard} \quad (1)$$

where: S = dispersion required (__:1, dimensionless);
T_R = background temperature in river (°F or °C);
T_E = effluent temperature (°F or °C); and
$T_{Standard}$ = desired temperature (°F or °C).

Rearranging Equation 1 and solving for S yields the following:

$$S=\frac{T_E-T_R}{T_{Standard}-T_R} \quad (2)$$

A bulk dispersion calculation that assumes complete mix in the outfall area and does not take into account entrainment of additional water can then be used to determine the total flow required in the mixing zone.

$$S=\frac{Q_{RS}+Q_E}{Q_E} \quad (3)$$

where: Q_{RS} = River flow in mixing zone (cfs) to attain standard; and
Q_E = Effluent flow (cfs).

Knowing the dispersion required using Equation 2, we can calculate the volume of river flow mixing with effluent necessary to meet the standard.

Engineering Calculations

Monthly summary data were used to evaluate minimum mixing of river water with effluent in the region near the mill outfall needed to attain the delta temperature criterion of less than 5°F. River flow needed to achieve a less than 5°F change in temperature was calculated for each month using the 90th percentile monthly effluent temperature. In the calculation, flows are in cfs and temperatures are in °F. The results of the calculations are presented in Table 3.

The predicted river flow needed to mix with effluent that would achieve a change in river temperature of less than 5°F varied among months (see Table 3). For the 2014-2016 effluent temperatures, a river volume to mix with effluent varied from 164.8 cfs (S = 2.8) in October to 339.3 cfs (S = 4.7) for June. For the critical season for potential mill effluent temperatures greater than 90°F, a river volume of 198-339 cfs (S = 3.2 to 4.7) was needed to achieve a change in river temperature of less than 5°F based on 2014-2016 data. In terms of mixing, less than a 5:1 mixing of river water with effluent would achieve the less than 5°F criterion for all months where the effluent temperature could exceed 90°F. River volumes to achieve the less than 5°F change in river temperature are compared with the 10th percentile river flow at the Augusta Mill outfall by

month in Figure 2. A small proportion (4-8%) of the 10th percentile river flow is required to mix with effluent to achieve the delta temperature criterion of <5°F in all months.

Table 3. Flow Calculations by Month to meet a Delta 5°F Temperature Change. The QRS values are the river flow needed to meet a temperature change of less than 5°F.

Month	Q_R (cfs) 10th	T_R (°F) 10th	Q_E (cfs) (Max)	T_E (°F) 90th	S (-)	Q_{RS} (cfs)
January	4,399	44.8	115.6	64.0	3.8	327.9
February	4,620	45.5	102.7	66.6	4.2	330.8
March	4,820	49.3	94.0	70.8	4.3	310.6
April	4,370	55.4	97.0	76.1	4.1	304.7
May	4,090	61.2	94.4	82.0	4.2	297.6
June	4,220	64.6	92.1	88.0	4.7	339.3
July	4,230	69.3	95.2	88.0	3.7	261.7
August	4,320	70.1	90.9	86.0	3.2	198.4
September	4,230	69.0	88.2	86.0	3.4	210.9
October	4,110	66.2	93.5	80.0	2.8	164.8
November	4,100	58.1	113.6	74.2	3.2	252.2
December	4,177	49.3	91.1	72.0	4.5	319.1

CORMIX Modeling:

An application of the CORMIX model (Version 11.0) was developed for the Augusta Mill Outfall 001 to evaluate the mixing of mill effluent into the Savannah River. The focus of the modeling was to predict the initial zone of mixing where temperature was increased above a component of the ambient river temperature standard. Both the increase in temperature by more than 5°F and the predicted temperature greater than 90°F were evaluated. The description of Outfall 001 was provided by mill staff and included a 48-inch pipe near the bottom of the river. Due to the relatively shallow cross-sectional average depth of water in the river at the outfall and the 48-inch pipe, CORMIX 3 (surface discharge) was used to model the outfall; CORMIX 1 did not allow a 48-inch subsurface pipe in 8.5 feet of water. To model Outfall 001 with CORMIX 3, a 48-inch pipe (1.17 m^2) at a bottom invert depth of 1.8 m was used. The invert depth selected was the largest value allowed by CORMIX 3 for the range of local water depths simulated for Outfall 001.

Effluent discharge rates and the 90th percentile effluent temperature values by month are listed in Table 3. Five months (January, April, June, July, and October) were modeled to simulate seasonal conditions in the river. Each of the five months was modeled using mill data from 2014-2016. In addition to the five existing condition scenarios, June and July were also modeled with a future WWTS condition with higher effluent temperature, as predicted by NCASI staff and provided to AquAeTer. For the future conditions, river temperature at the 10th percentile and the 90th percentile were simulated to allow evaluation of the spatial extent of the effluent plume that may exceed 90°F

to be evaluated in addition to the increase in river temperature of more than 5°F. Effluent density was computed from temperature and an average TDS concentration (1,220 mg/L) for effluent based on the limited available data (CSGNetwork, 2018).

A survey of bathymetry near the mill outfall was conducted on February 15, 2018. The average water level for the transect in the vicinity of the outfall was 95.6 ft NGVD29, and the average depth across the transect was 7.47 feet. In terms of modeling river temperature downstream of the mill outfall, the average depth for the half of the river closest to the outfall was 8.47 feet. Thus, water depth near the outfall was one foot deeper than the overall average depth for the complete cross-section of the river. Estimated river flow at the time bathymetric measurements were made was estimated to be 4,600 cfs.

Information on river bathymetry was also available for the Savannah River at the USGS gaging station upstream of the mill outfall (gage 02197000) for a range of flows. For the gaging location, flow, velocity, width and cross-sectional area were available for 103 dates during 2000 to 2017. Using the available data, an average depth was calculated for each date. The calculated average depth was plotted against measured river flow for dates with flow between 4,000 and 8,200 cfs. A linear trendline was added to give an equation for calculating average depth based on river flow at this upstream gaging location. A linear relationship was selected due to variability in calculated depth for the limited flow range utilized. Using the slope from the equation for the upstream gaging location, average depth near the outfall, and river flow for the day the local bathymetry in the vicinity of the outfall was surveyed, the following equation was defined to calculate average depth near the mill outfall using river flow:

$$\text{Depth (ft)} = 8.05\text{x}10^{-4} * \text{Flow (cfs)} + 3.77$$

The depth near the outfall used for CORMIX scenarios was calculated by adding 1.0 feet to the average depth to reflect a deeper water column in the region in which effluent is discharged. A width was calculated for each modeling scenario to give the same cross-sectional area as was derived from the surveying conducted in February 2018. The adjustment in width maintained the correct flow in the river while allowing a more accurate evaluation of mixing near the mill outfall by using the actual estimated local water depth. A velocity was then calculated for each scenario based on the river flow, depth, and width for each scenario. The average depth for each scenario was used for the local depth near the outfall. Other input parameters followed the recommendations given in the CORMIX manual for Manning's n (0.035), Wind Speed (2 m/s), and a surface heat exchange derived from the table on page 44 of the CORMIX model User Manual for seasonal variation in the ambient river temperature and wind speed (Jirka et al, 1996). A slope of 0.5% on the river bottom near the outfall was used.

Simulation of mixing was done for the months of January, April, June, July, and October for historical effluent temperature conditions for 2014-2016 (see Table 3). Predicted future effluent

temperature after the wastewater treatment system is modified to achieve anticipated decreased limits for oxygen consuming substances was also simulated for the months of June and July. Simulation of future conditions was limited to June and July since modeling of the upgraded wastewater system by NCASI predicted similar or cooler temperatures in effluent for fall to spring months. Key inputs for the CORMIX modeling are provided in Table 4 for the existing condition runs. The effluent temperature for the future condition runs was based on the NCASI modeling using an effluent temperature of 91.9°F for the June runs and 93.9°F for July runs. Since the effluent in the future may be greater than 90°F for the months of June through August, runs were done both with the 10th percentile river temperature (see Table 4 existing conditions runs) to evaluate the region where temperature may be increased by more than 5°F and the 90th percentile river temperature (June = 73.4°F; July = 75.2°F) to evaluate the not to exceed 90°F component of the temperature standard. Model session files are provided in Attachment 1 for existing conditions runs and Attachment 2 for the future condition runs.

Table 4. Effluent and River inputs for existing condition simulations.

Parameter	Units	AU-JAN1E	AU-APR1E	AU-JUN1E	AU-JUL1E	AU-OCT1E
Avg Depth	ft	7.31	7.29	7.17	7.18	7.08
Actual Width	ft	331.4	331.4	331.4	331.4	331.4
Q_R	cfs	4,399	4,370	4,220	4,230	4,110
Model Inputs						
Local Depth	ft	8.31	8.29	8.17	8.18	8.08
Adjusted Width	ft	291.5	291.4	290.8	290.9	290.4
Velocity	ft/s	1.82	1.81	1.78	1.78	1.75
T_R	°F	44.8	55.4	64.6	69.3	66.2
Q_E	cfs	115.6	97.0	92.1	95.2	93.5
T_E	°F	64.0	76.1	88.0	88.0	80.0
ΔT	°F	19.2	20.7	23.4	18.7	13.8
Effluent Density	kg/m³	999.602	998.124	996.250	996.250	997.553
Surface Heat Exchange Coeff	W/m²·°C	16.0	20.0	19.5	24.5	23.0

Notes: (1) Runs are for the 2014-2016 conditions; (2) Units were converted to metric for use in CORMIX.

Parameters:

(Avg Depth) Average depth calculated using the equation derived for depth relationship with river flow;
(Actual Width) The approximate width of river measured from satellite imagery;
(Q_R) 10th percentile river flow at upstream USGS gage for the corresponding month;
(Local Depth) Average depth used for model inputs; adds one foot to cross-sectional average depth;
(Adjusted Width) Calculated width to match the cross-sectional area measured on 2/15/18;
(Velocity) Calculated velocity using cross-sectional area and river flow;
(T_R) 10th percentile river temperature for given month;
(Q_E) Maximum effluent flow for given month;
(T_E) 90th percentile effluent temperature for given month;
(ΔT) Difference between effluent and river temperature;
(Effluent Density) Calculated Density of effluent using a TDS of 1,220 mg/L and effluent temperature.

Results for CORMIX simulations indicate there is a rapid decrease in predicted temperature within 50 feet downstream of the outfall, where effluent initially mixes with river water, followed by a continual decline. In terms of vertical mixing, the effluent plume extends throughout the shallow water column within a short distance from the discharge point. The predicted increase in temperature in the Savannah River downstream of the mill outfall for the simulated conditions is shown for existing conditions runs in Figure 3. For the five runs based on 2014-2016 data, the increase in temperature over the ambient river temperature is less than 5°F within 194 feet (59 m). The predicted downstream distance at which the increase in temperature is less than 5°F in the effluent plume by run is listed in Table 5. For the potential future conditions runs (AU-JUN1F, AU-JUL1F), the higher effluent temperature increased the distance at which the temperature criterion is met. Overall, the increase in temperature of not more than 5°F above the upstream background is achieved within 51 to 223 feet, depending on river and effluent conditions.

The predicted spatial distribution of the effluent plume in which the 5°F criterion is exceeded moves away from the south bank and widens with distance downstream of Outfall 001. An example plot for the June future condition is shown in Figure 4. The spatial area downstream of the outfall in which water temperature in the Savannah River is increased by more than 5°F for all runs is shown in Figure 5. The criterion is met within a distance of 250 feet and at a distance of less than 90 feet from the south bank of the river from which the mill discharges treated effluent.

Table 5. Predicted distance downstream of mill outfall for meeting a 5°F Delta temperature. Run IDs ending in "E" are for existing conditions and in "F" are for the potential future condition.

Run ID	Month	T_R	Q_E (cfs)	T_E (°F)	S (-)	Downstream Distance (ft)
AU-JAN1E	January	44.8	115.6	64.0	3.8	114.4
AU-APR1E	April	55.4	97.0	76.1	4.1	137.8
AU-JUN1E	June	64.6	92.1	88.0	4.7	193.1
AU-JUL1E	July	69.3	95.2	88.0	3.7	103.5
AU-OCT1E	October	66.2	93.5	80.0	2.8	51.1
AU-JUN1F	June	64.6	92.1	91.9	5.5	204.5
AU-JUL1F	July	69.3	95.2	93.9	4.9	222.4

Evaluation of the not to exceed 90°F component of the temperature standard was done for the potential future condition scenarios for June and July. The analysis focused on these two runs

since all existing conditions runs had an effluent temperature (90th percentile) of less than 90°F. For the analysis of the potential spatial area near Outfall 001 where water temperature may exceed 90°F, the 90th percentile river temperature for each month (June and July) were used in the CORMIX run with the predicted future effluent temperature. The CORMIX output for each future condition run contained a single point in the jet plume at a downstream distance of 0.6 feet for the center of the effluent plume and a cross-channel distance of about 21 feet. The second prediction point for both cases was well below 90°F (see Figure 6).

Conclusions:

This initial modeling evaluation of temperature in the Savannah River downstream of the outfall from the Augusta Mill indicates a mixing zone is needed. The predicted temperature in the effluent plume is less than 90°F for potential future conditions after initial mixing. For both existing and future conditions, the predicted temperature is more than 5°F higher than ambient river temperature for a limited distance downstream from the outfall. Within a distance of 250 feet, the change in temperature is less than 5°F above ambient river temperature. The effluent plume, at the downstream distance where the 5°F criterion is met, is mixed throughout the water column and located about 40-60 feet from the south bank (15-31 feet wide).

References

Carlson, G. 2005. Total Dissolved Solids from conductivity. Technical Note 14. In-Situ Inc. May 26, 2005.

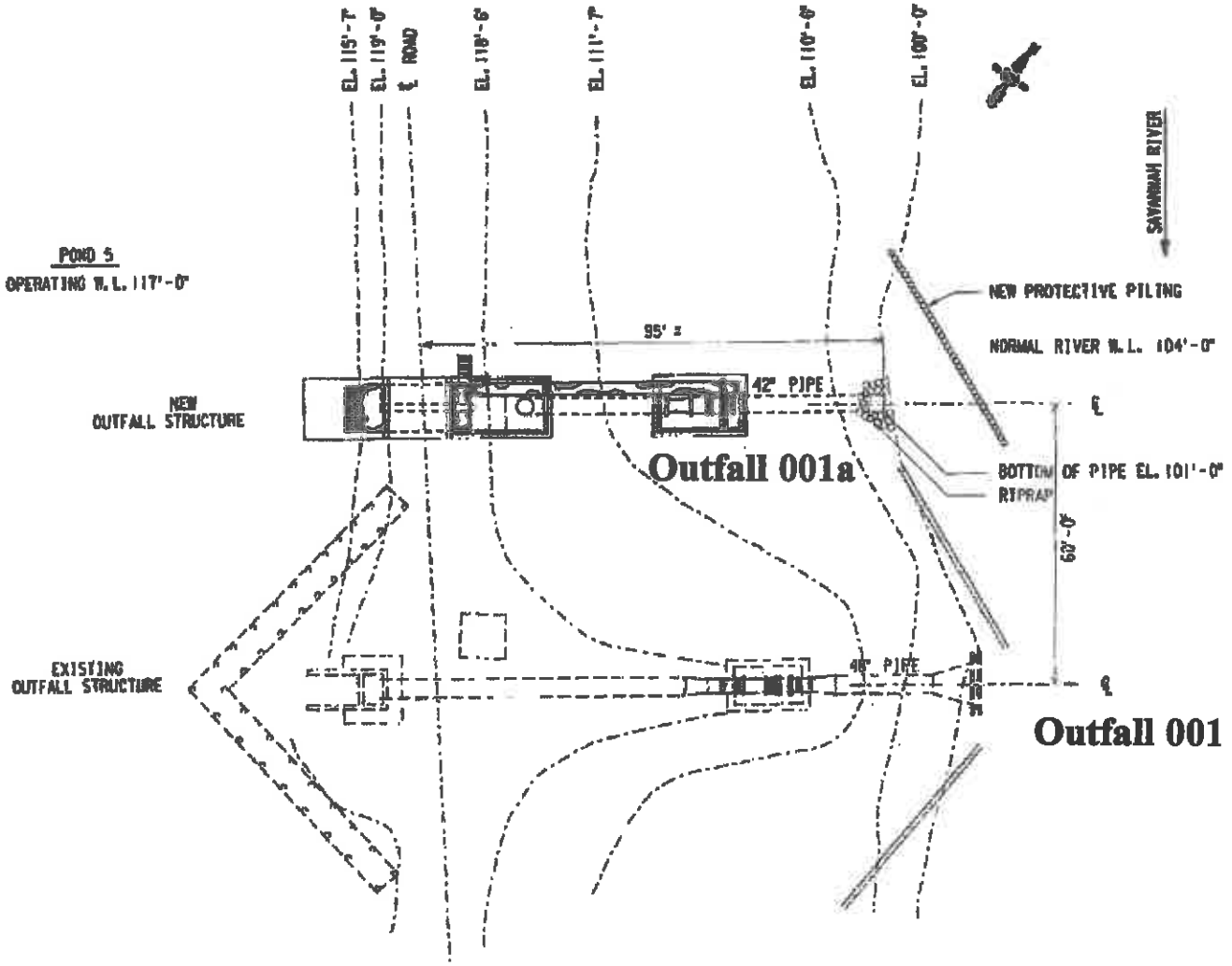
CSGNetwork, 2018. Website: http://www.csgnetwork.com/h2odenscalc.html. Accessed on January 16, 2018.

Jirka, G.H., R. L. Doneker, S. W. Hinton. 1996. User's Manual for CORMIX: A Hydrodynamic Mixing Zone Model and Decision Support System for Pollutant Discharges into Surface Water. Office of science and technology U.S. Environmental Protection Agency, Washington, DC 20460. September 1996.

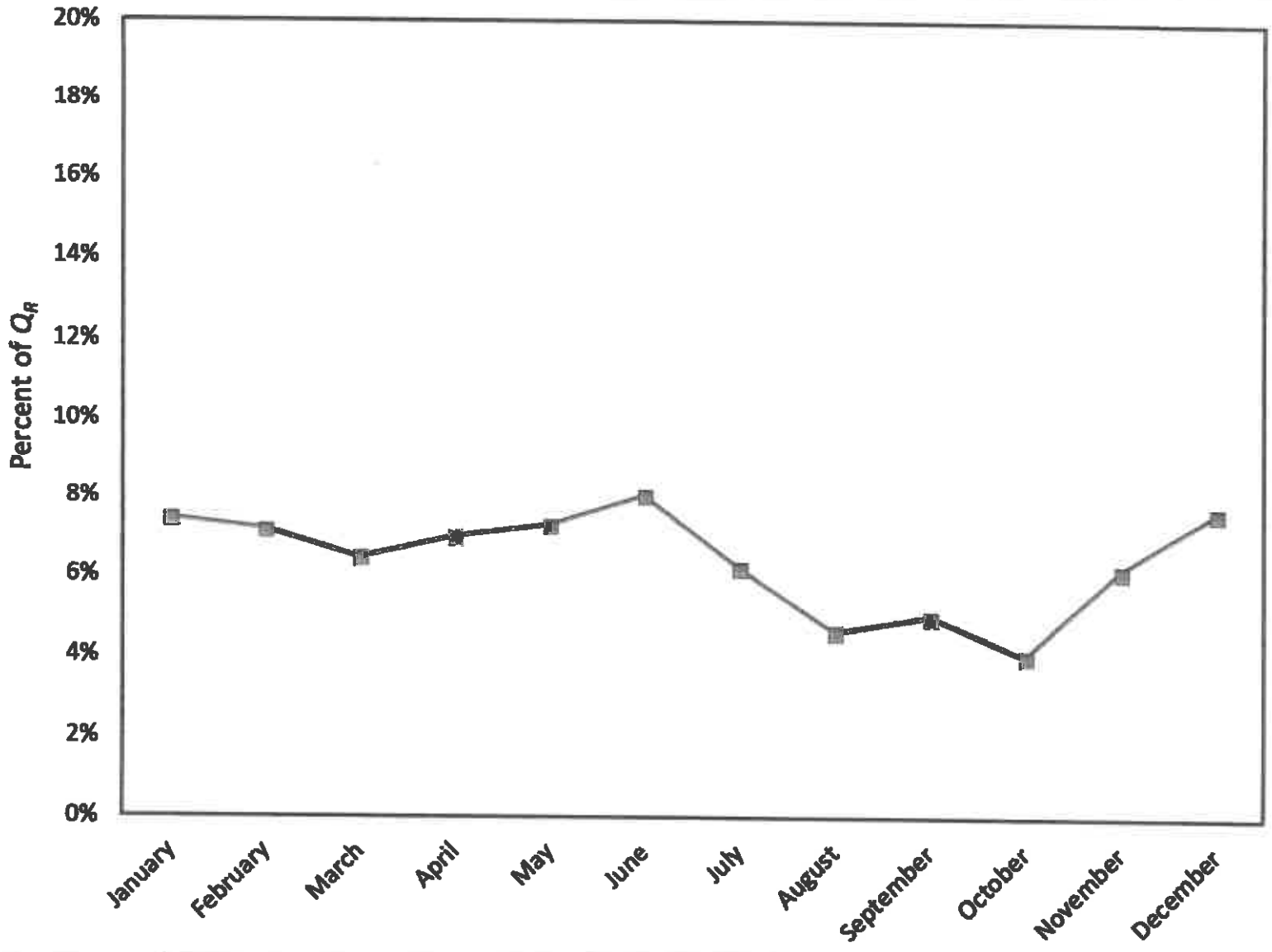
If you should have questions or comments concerning our assessment, please call us at (252) 631-5159 or (252) 571-9465 or contact by e-mail at mlebo@aquaeter.com.

FIGURES

Outfall 001 →



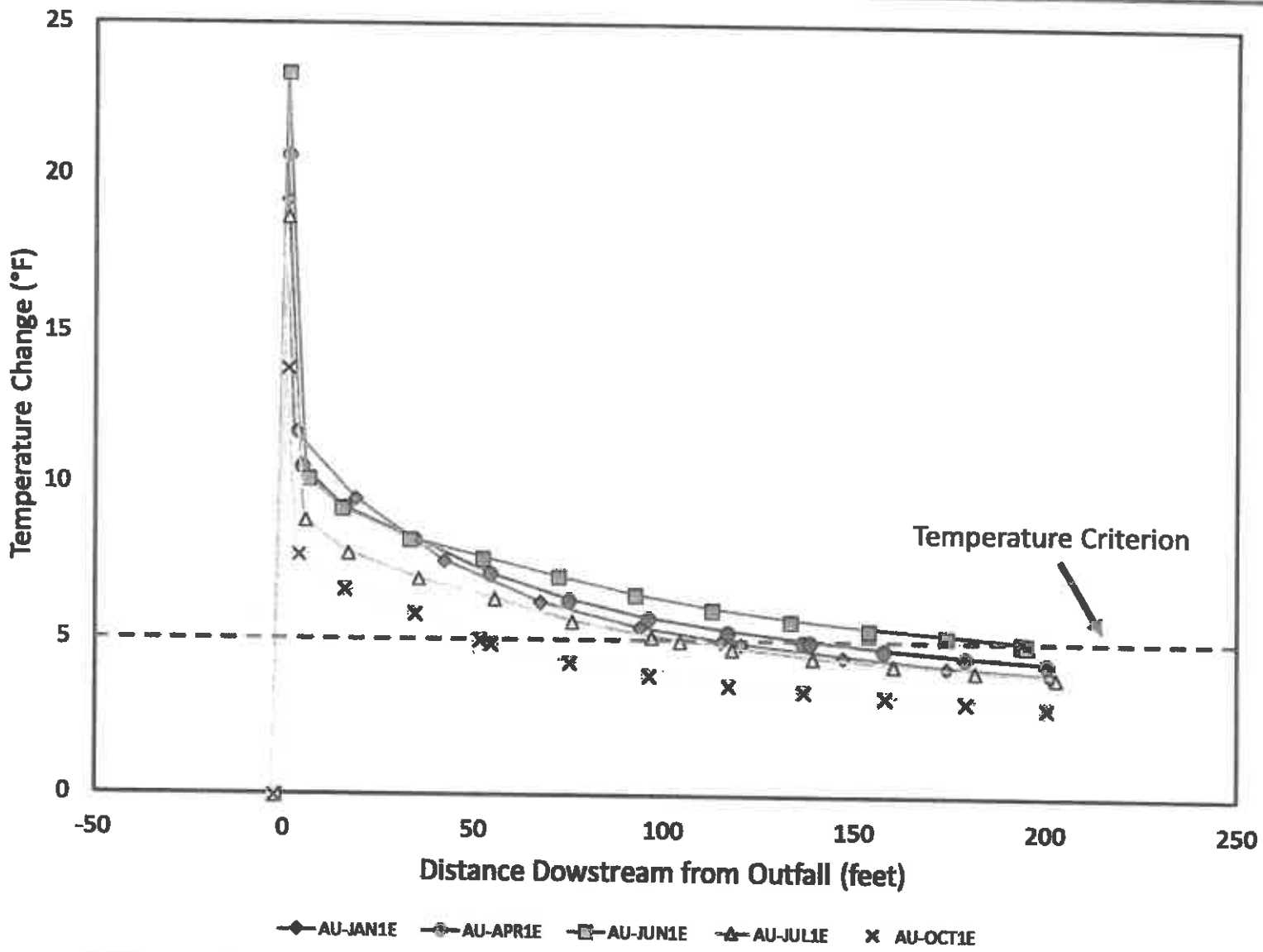
CLIENT: Graphic Packaging – Augusta Mill	**FIGURE 1**
LOCATION: Augusta, GA	**Augusta Mill Outfall 001**
PROJECT/FILE: 171022	**schematic (Existing)**
optimizing resources | water, air, earth	



CLIENT: Graphic Packaging – Augusta Mill
LOCATION: Augusta, GA
PROJECT/FILE: 171022

optimizing resources | water, air, earth

FIGURE 2
Percent of 10th percentile river flow needed for mixing with effluent for ΔT < 5°F



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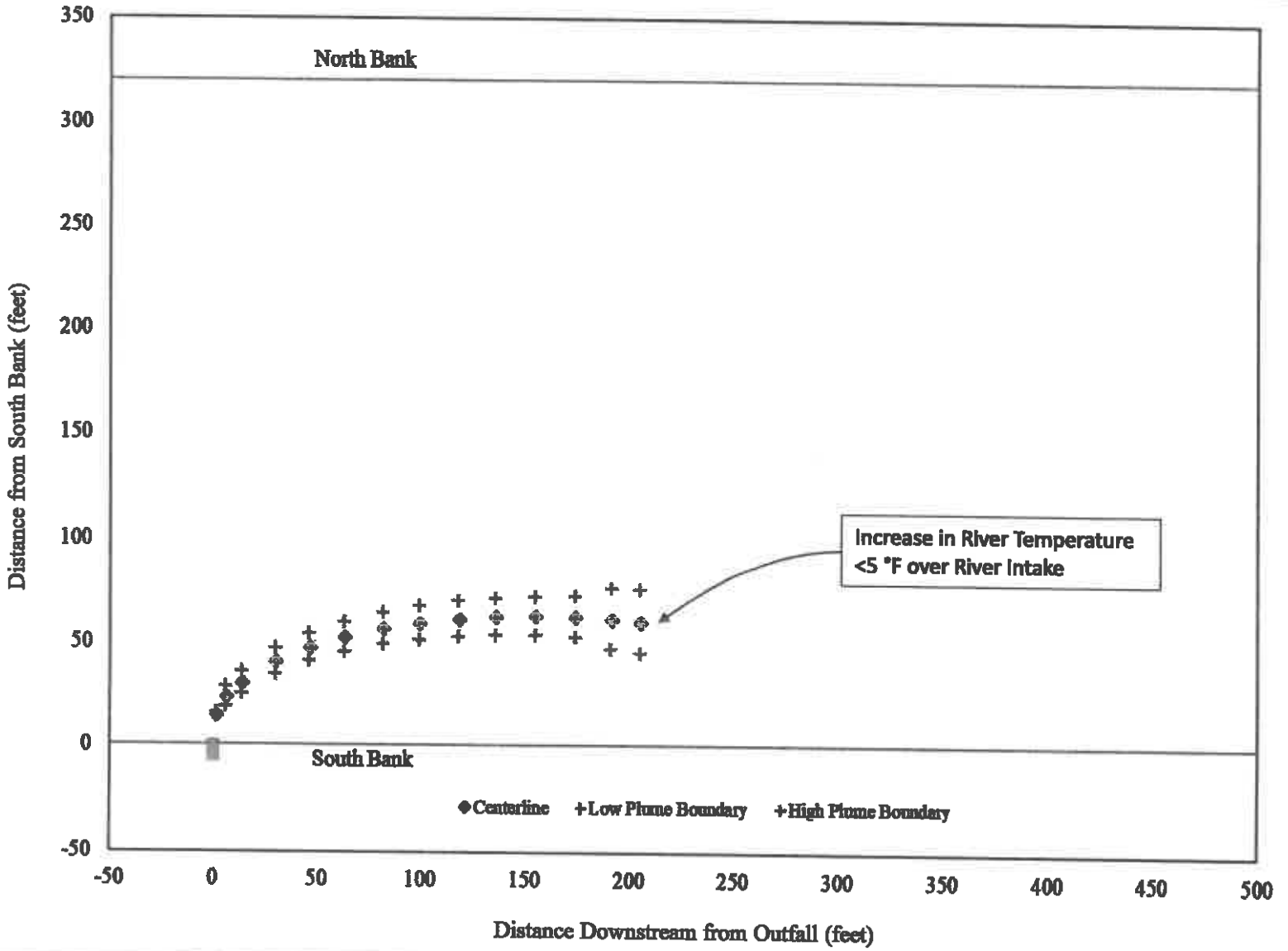
CLIENT: Graphic Packaging – Augusta Mill
LOCATION: Augusta, GA
PROJECT/FILE: 171022

FIGURE 3
Change in temperature with distance downstream from Outfall 001 – Existing Conditions



AquAeTer

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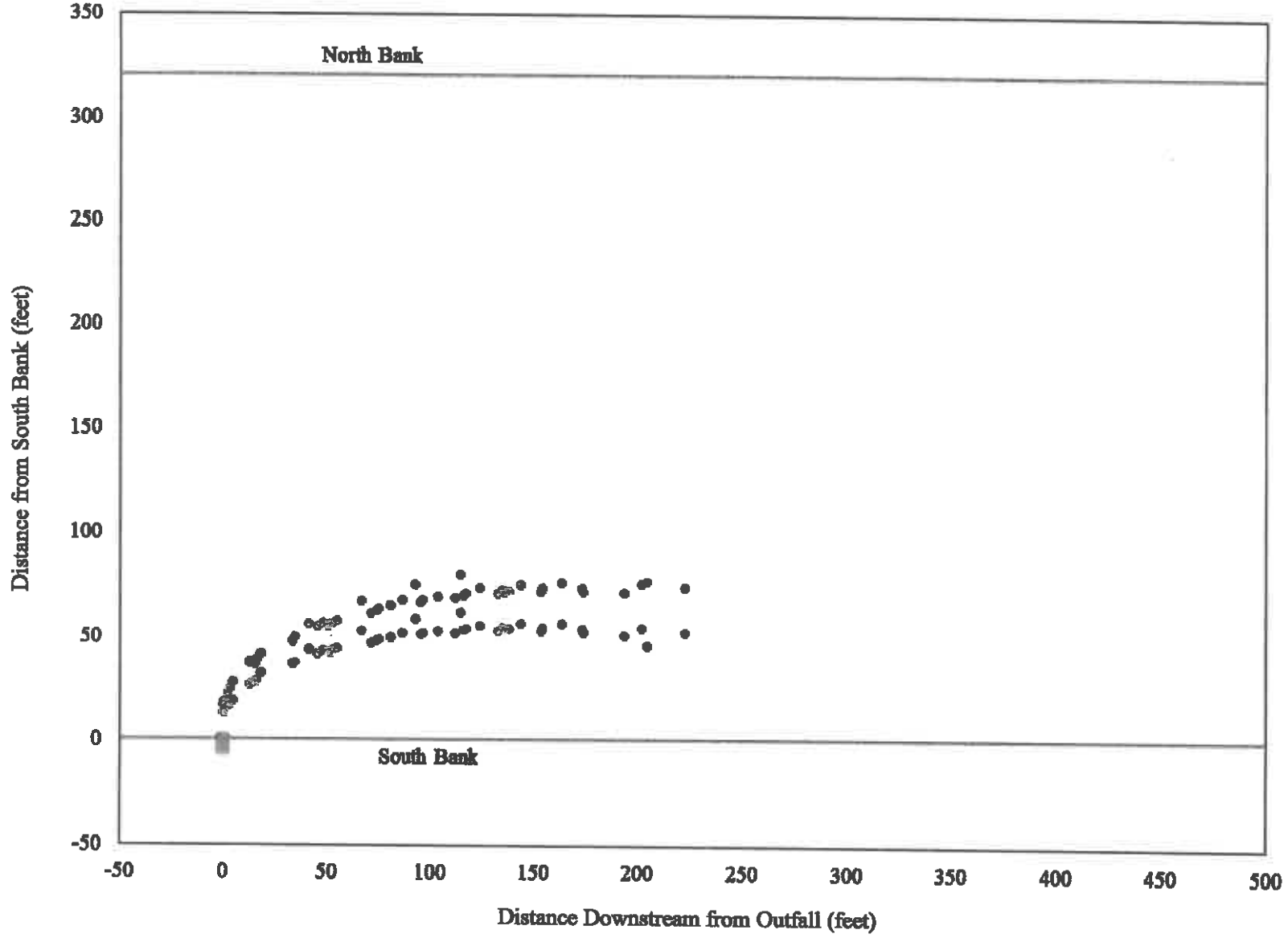
CLIENT: Graphic Packaging – Augusta Mill
LOCATION: Augusta, GA
PROJECT/FILE: 171022

FIGURE 4
Effluent plume to point where Delta T < 5 °F
Run ID: AU-JUN1F



CLIENT: Graphic Packaging – Augusta Mill
LOCATION: Augusta, GA
PROJECT/FILE: 171022

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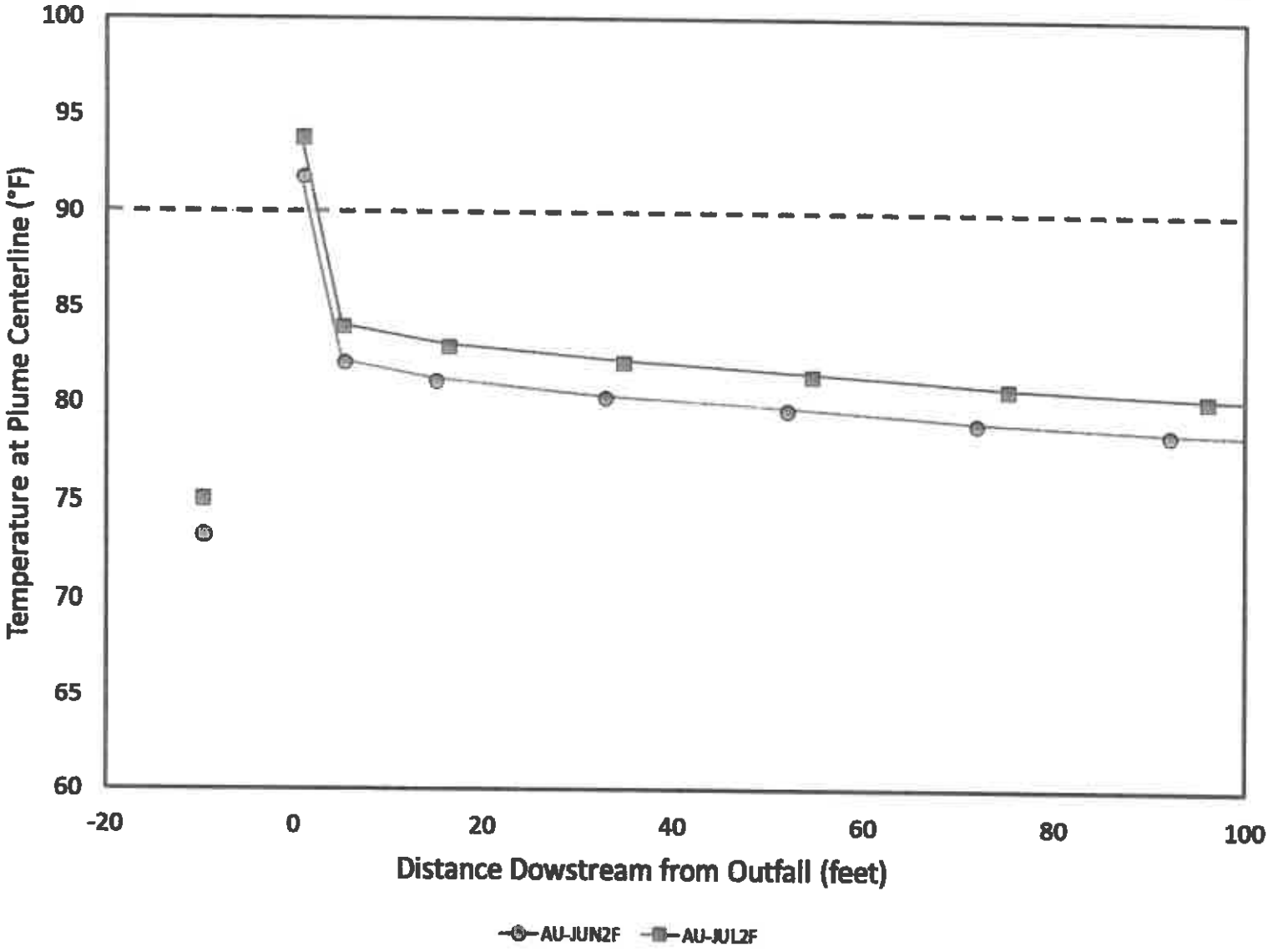
FIGURE 5
Effluent plume edges with Delta T > 5 °F for Existing and Future Condition Runs



CLIENT: Graphic Packaging – Augusta Mill
LOCATION: Augusta, GA
PROJECT/FILE: 171022

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FIGURE 6
Temperature with distance downstream of Outfall 001 for Future Conditions: AU-JUN2F, AU-JUL2F

ATTACHMENT 1

CORMIX SESSION FILES – EXISTING CONDITIONS

Run ID	Description
AU-JAN1E	Existing 2014-2016 – January
AU-APR1E	Existing 2014-2016 – April
AU-JUN1E	Existing 2014-2016 - June
AU-JUL1E	Existing 2014-2016 – July
AU-OCT1E	Existing 2014-2016 – October

Results from June 2018 Model Runs - Existing Conditions (standard attained)

Run ID	X (ft)	Y-left	Y-right	Depth (ft)	S
WQS = not increase by more than 5°F					
AU-JAN1E	114.4	79.6	61.7	8.3	3.8
AU-APR1E	137.8	71.4	53.8	8.3	4.1
AU-JUN1E	193.1	70.9	50.5	8.2	4.7
AU-JUL1E	103.5	68.8	52.5	8.2	3.7
AU-OCT1E	51.1	54.4	42.4	8.1	2.8

Note: (x-axis) distance downstream from outfall; (y-axis) distance from South Bank.

```
CORMIX SESSION REPORT:
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
                      CORMIX MIXING ZONE EXPERT SYSTEM
                          CORMIX Version 11.0GT
                       HYDRO3:Version-11.0.0.0  April,2018
 SITE NAME/LABEL:                Augusta Mill Outrall 001
   DESIGN CASE:                  Augusta 001 JAN Existing Conditions
   FILE NAME:                    C:\Users\JLebo\Documents\CORMIX Model Runs\Augusta
Mill\AU-JAN1E.prd
   Using subsystem CORMIX3:     Buoyant Surface Discharges
   Start of session:             06/07/2018--17:11:37
*******************************************************************************
SUMMARY OF INPUT DATA:
-------------------------------------------------------------------------------
AMBIENT PARAMETERS:
   Cross-section                          = bounded
   Width                         BS       = 88.90 m
   Channel regularity            ICHREG   = 2
   Ambient flowrate              QA       = 123.70 m^3/s
   Average depth                 HA       = 2.53 m
   Depth at discharge            HD       = 2.53 m
   Ambient velocity              UA       = 0.55 m/s
   Darcy-Weisbach friction factor F       = 0.0706
     Calculated from Manning's n          = 0.035
   Wind velocity                 UW       = 2 m/s
   Stratification Type           STRCND   = U
   Surface temperature                    = 7.1 degC
   Bottom temperature                     = 7.1 degC
   Calculated FRESH-WATER DENSITY values:
   Surface density               RHOAS    = 999.8995 kg/m^3
   Bottom density                RHOAB    = 999.8995 kg/m^3
-------------------------------------------------------------------------------
DISCHARGE PARAMETERS:            Surface Discharge
   Discharge located on                   = right bank/shoreline
   Discharge configuration                = flush discharge
   Distance from bank to outlet  DISTB    = 0 m
   Discharge angle               SIGMA    = 90 deg
   Depth near discharge outlet   HD0      = 2.53 m
   Bottom slope at discharge     SLOPE    = 0 deg
   Circular pipe diameter                 = 1.22 m
     Equivalent rectangular discharge:
     Discharge cross-section area A0      = 1.168987 m^2
     Discharge channel width      B0      = 0.649437 m
     Discharge channel depth      H0      = 1.8 m
     Discharge aspect ratio       AR      = 2.771631
   Discharge flowrate            Q0       = 3.27 m^3/s
   Discharge velocity            U0       = 2.80 m/s
   Discharge density             RHO0     = 999.6020 kg/m^3
```

```
  Density difference                DRHO   = 0.2975 kg/m^3
  Buoyant acceleration              GP0    = 0.0029 m/s^2
  Discharge concentration           C0     = 10.700000 deg.C
  Surface heat exchange coeff.      KS     = 0.000004 m/s
  Coefficient of decay              KD     = 0 /s
-------------------------------------------------------------------------
DISCHARGE/ENVIRONMENT LENGTH SCALES:
  LQ  = 1.08 m        Lm  = 5.50 m        Lbb = 0.06 m
  LM  = 53.84 m
-------------------------------------------------------------------------
NON-DIMENSIONAL PARAMETERS:
  Densimetric Froude number         FR0    = 49.80 (based on LQ)
  Channel densimetric Froude no.    FRCH   = 38.60 (based on H0)
  Velocity ratio                    R      = 5.09
-------------------------------------------------------------------------
MIXING ZONE / TOXIC DILUTION ZONE / AREA OF INTEREST PARAMETERS:
  Toxic discharge                          = no
  Water quality standard specified         = yes
  Water quality standard            CSTD   = 2.78 deg.C
  Regulatory mixing zone                   = no
  Region of interest                       = 5000 m downstream
*************************************************************************
HYDRODYNAMIC CLASSIFICATION:
  *-----------------------*
  | FLOW CLASS   = SA2 |
  *-----------------------*

  Limiting Dilution S = (QA/Q0)+ 1.0 = 38.8

*************************************************************************
MIXING ZONE EVALUATION (hydrodynamic and regulatory summary):

-------------------------------------------------------------------------
X-Y-Z Coordinate system:
Origin is located at WATER SURFACE and at centerline of discharge channel:
    0 m from the right bank/shore.
  Number of display steps NSTEP = 20 per module.
-------------------------------------------------------------------------
NEAR-FIELD REGION (NFR) CONDITIONS :
Note: The NFR is the zone of strong initial mixing.  It has no regulatory
  implication.  However, this information may be useful for the discharge
  designer because the mixing in the NFR is usually sensitive to the
  discharge design conditions.
  Pollutant concentration at NFR edge  c = 1.4109 deg.C
  Dilution at edge of NFR              s = 7.6
  NFR Location:                        x = 156.83 m
    (centerline coordinates)           y = 0 m
                                       z = 0 m
```

```
   NFR plume dimensions:  half-width (bh) = 11.41 m
                           thickness (bv) = 2.53 m
 Cumulative travel time:       201.0385 sec.
 ------------------------------------------------------------------------
 Buoyancy assessment:
   The effluent density is less than the surrounding ambient water
   density at the discharge level.
   Therefore, the effluent is POSITIVELY BUOYANT and will tend to rise towards
   the surface.
 ------------------------------------------------------------------------
 FAR-FIELD MIXING SUMMARY:
   Plume is vertically fully mixed WITHIN NEAR-FIELD (or a fraction thereof),
   but RE-STRATIFIES LATER.
   Plume becomes vertically fully mixed again at 460.38 m downstream.
 ------------------------------------------------------------------------
 PLUME BANK CONTACT SUMMARY:
   Plume in bounded section contacts one bank only at 0 m downstream.
 ********************** TOXIC DILUTION ZONE SUMMARY ***********************
 No TDZ was specified for this simulation.
 ********************** REGULATORY MIXING ZONE SUMMARY ********************
 No RMZ has been specified.
 However:
 The ambient water quality standard was encountered at the following
   plume position:
   Water quality standard                 = 2.78  deg.C
   Corresponding dilution               s = 3.8
   Plume location:                      x = 34.87 m
     (centerline coordinates)           y = 21.54 m
                                        z = 0 m
   Plume dimensions:      half-width (bh) = 2.73 m
                           thickness (bv) = 2.53 m
 ********************** FINAL DESIGN ADVICE AND COMMENTS **********************
 REMINDER:  The user must take note that HYDRODYNAMIC MODELING by any known
   technique is NOT AN EXACT SCIENCE.
 Extensive comparison with field and laboratory data has shown that the
   CORMIX predictions on dilutions and concentrations (with associated
   plume geometries) are reliable for the majority of cases and are accurate
   to within about +-50% (standard deviation).
 As a further safeguard, CORMIX will not give predictions whenever it judges
   the design configuration as highly complex and uncertain for prediction.
```

```
CORMIX SESSION REPORT:
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
                      CORMIX MIXING ZONE EXPERT SYSTEM
                          CORMIX Version 11.0GT
                       HYDRO3:Version-11.0.0.0  April,2018
 SITE NAME/LABEL:                 Augusta Mill Outrall 001
   DESIGN CASE:                   Augusta 001 APR Existing Conditions
   FILE NAME:                     C:\Users\JLebo\Documents\CORMIX Model Runs\Augusta
 Mill\AU-APR1E.prd
   Using subsystem CORMIX3:     Buoyant Surface Discharges
   Start of session:             06/07/2018--17:14:28
*******************************************************************************
 SUMMARY OF INPUT DATA:
 -----------------------------------------------------------------------------
 AMBIENT PARAMETERS:
   Cross-section                          = bounded
   Width                          BS      = 88.80 m
   Channel regularity             ICHREG  = 2
   Ambient flowrate               QA      = 123.57 m^3/s
   Average depth                  HA      = 2.53 m
   Depth at discharge             HD      = 2.53 m
   Ambient velocity               UA      = 0.55 m/s
   Darcy-Weisbach friction factor F       = 0.0706
     Calculated from Manning's n          = 0.035
   Wind velocity                  UW      = 2 m/s
   Stratification Type            STRCND  = U
   Surface temperature                    = 13 degC
   Bottom temperature                     = 13 degC
   Calculated FRESH-WATER DENSITY values:
   Surface density                RHOAS   = 999.3789 kg/m^3
   Bottom density                 RHOAB   = 999.3789 kg/m^3
 -----------------------------------------------------------------------------
 DISCHARGE PARAMETERS:            Surface Discharge
   Discharge located on                   = right bank/shoreline
   Discharge configuration                = flush discharge
   Distance from bank to outlet   DISTB   = 0 m
   Discharge angle                SIGMA   = 90 deg
   Depth near discharge outlet    HD0     = 2.53 m
   Bottom slope at discharge      SLOPE   = 0 deg
   Circular pipe diameter                 = 1.22 m
     Equivalent rectangular discharge:
     Discharge cross-section area A0      = 1.168987 m^2
     Discharge channel width      B0      = 0.649437 m
     Discharge channel depth      H0      = 1.8 m
     Discharge aspect ratio       AR      = 2.771631
   Discharge flowrate             Q0      = 2.75 m^3/s
   Discharge velocity             U0      = 2.35 m/s
   Discharge density              RHO0    = 998.1240 kg/m^3
```

```
   Density difference                DRHO    = 1.2549 kg/m^3
   Buoyant acceleration              GP0     = 0.0123 m/s^2
   Discharge concentration           C0      = 11.5 deg.C
   Surface heat exchange coeff.      KS      = 0.000004 m/s
   Coefficient of decay              KD      = 0 /s
-------------------------------------------------------------------------
DISCHARGE/ENVIRONMENT LENGTH SCALES:
  LQ  = 1.08 m          Lm  = 4.62 m          Lbb = 0.20 m
  LM  = 22.04 m
-------------------------------------------------------------------------
NON-DIMENSIONAL PARAMETERS:
  Densimetric Froude number         FR0     = 20.39 (based on LQ)
  Channel densimetric Froude no.    FRCH    = 15.80 (based on H0)
  Velocity ratio                    R       = 4.28
-------------------------------------------------------------------------
MIXING ZONE / TOXIC DILUTION ZONE / AREA OF INTEREST PARAMETERS:
  Toxic discharge                           = no
  Water quality standard specified          = yes
  Water quality standard            CSTD    = 2.78 deg.C
  Regulatory mixing zone                    = no
  Region of interest                        = 5000 m downstream
*************************************************************************
HYDRODYNAMIC CLASSIFICATION:
  *-----------------------*
  | FLOW CLASS    = SA2 |
  *-----------------------*

  Limiting Dilution S = (QA/Q0)+ 1.0 = 45.9

*************************************************************************
MIXING ZONE EVALUATION (hydrodynamic and regulatory summary):

-------------------------------------------------------------------------
X-Y-Z Coordinate system:
Origin is located at WATER SURFACE and at centerline of discharge channel:
    0 m from the right bank/shore.
  Number of display steps NSTEP = 20 per module.
-------------------------------------------------------------------------
NEAR-FIELD REGION (NFR) CONDITIONS :
Note: The NFR is the zone of strong initial mixing.  It has no regulatory
  implication.  However, this information may be useful for the discharge
  designer because the mixing in the NFR is usually sensitive to the
  discharge design conditions.
  Pollutant concentration at NFR edge  c = 1.6514 deg.C
  Dilution at edge of NFR              s = 7.0
  NFR Location:                        x = 122.80 m
    (centerline coordinates)           y = 0 m
                                       z = 0 m
```

```
  NFR plume dimensions:  half-width (bh) = 8.83 m
                          thickness (bv) = 2.53 m
Cumulative travel time:       163.1465 sec.
-------------------------------------------------------------------------
Buoyancy assessment:
  The effluent density is less than the surrounding ambient water
  density at the discharge level.
  Therefore, the effluent is POSITIVELY BUOYANT and will tend to rise towards
  the surface.
-------------------------------------------------------------------------
FAR-FIELD MIXING SUMMARY:
  Plume is vertically fully mixed WITHIN NEAR-FIELD (or a fraction thereof),
  but RE-STRATIFIES LATER.
  Plume becomes vertically fully mixed again at 740.79 m downstream.
-------------------------------------------------------------------------
PLUME BANK CONTACT SUMMARY:
  Plume in bounded section contacts one bank only at 0 m downstream.
************************ TOXIC DILUTION ZONE SUMMARY ************************
No TDZ was specified for this simulation.
*********************** REGULATORY MIXING ZONE SUMMARY ***********************
No RMZ has been specified.
However:
The ambient water quality standard was encountered at the following
  plume position:
  Water quality standard                 = 2.78  deg.C
  Corresponding dilution               s = 4.1
  Plume location:                      x = 42.00 m
    (centerline coordinates)           y = 19.08 m
                                       z = 0 m
  Plume dimensions:      half-width (bh) = 2.68 m
                          thickness (bv) = 2.53 m
********************** FINAL DESIGN ADVICE AND COMMENTS **********************
REMINDER:  The user must take note that HYDRODYNAMIC MODELING by any known
  technique is NOT AN EXACT SCIENCE.
Extensive comparison with field and laboratory data has shown that the
  CORMIX predictions on dilutions and concentrations (with associated
  plume geometries) are reliable for the majority of cases and are accurate
  to within about +-50% (standard deviation).
As a further safeguard, CORMIX will not give predictions whenever it judges
  the design configuration as highly complex and uncertain for prediction.
```

```
CORMIX SESSION REPORT:
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
                      CORMIX MIXING ZONE EXPERT SYSTEM
                          CORMIX Version 11.0GT
                       HYDRO3:Version-11.0.0.0  April,2018
 SITE NAME/LABEL:                Augusta Mill Outrall 001
   DESIGN CASE:                  Augusta 001 JUN Existing Conditions
   FILE NAME:                    C:\Users\JLebo\Documents\CORMIX Model Runs\Augusta
Mill\AU-JUN1E.prd
   Using subsystem CORMIX3:     Buoyant Surface Discharges
   Start of session:             06/07/2018--17:16:06
*******************************************************************************
 SUMMARY OF INPUT DATA:
 -----------------------------------------------------------------------------
 AMBIENT PARAMETERS:
   Cross-section                          = bounded
   Width                          BS      = 88.60 m
   Channel regularity             ICHREG  = 2
   Ambient flowrate               QA      = 119.13 m^3/s
   Average depth                  HA      = 2.49 m
   Depth at discharge             HD      = 2.49 m
   Ambient velocity               UA      = 0.54 m/s
   Darcy-Weisbach friction factor F       = 0.0709
     Calculated from Manning's n          = 0.035
   Wind velocity                  UW      = 2 m/s
   Stratification Type            STRCND  = U
   Surface temperature                    = 18.10 degC
   Bottom temperature                     = 18.10 degC
   Calculated FRESH-WATER DENSITY values:
   Surface density                RHOAS   = 998.5781 kg/m^3
   Bottom density                 RHOAB   = 998.5781 kg/m^3
 -----------------------------------------------------------------------------
 DISCHARGE PARAMETERS:            Surface Discharge
   Discharge located on                   = right bank/shoreline
   Discharge configuration                = flush discharge
   Distance from bank to outlet   DISTB   = 0 m
   Discharge angle                SIGMA   = 90 deg
   Depth near discharge outlet    HD0     = 2.49 m
   Bottom slope at discharge      SLOPE   = 0 deg
   Circular pipe diameter                 = 1.22 m
     Equivalent rectangular discharge:
     Discharge cross-section area A0      = 1.168987 m^2
     Discharge channel width      B0      = 0.649437 m
     Discharge channel depth      H0      = 1.8 m
     Discharge aspect ratio       AR      = 2.771631
   Discharge flowrate             Q0      = 2.61 m^3/s
   Discharge velocity             U0      = 2.23 m/s
   Discharge density              RHO0    = 996.25 kg/m^3
```

```
  Density difference              DRHO    = 2.3281 kg/m^3
  Buoyant acceleration            GP0     = 0.0229 m/s^2
  Discharge concentration         C0      = 13 deg.C
  Surface heat exchange coeff.    KS      = 0.000005 m/s
  Coefficient of decay            KD      = 0 /s
-------------------------------------------------------------------------
DISCHARGE/ENVIRONMENT LENGTH SCALES:
  LQ  = 1.08 m          Lm  = 4.47 m          Lbb = 0.38 m
  LM  = 15.35 m
-------------------------------------------------------------------------
NON-DIMENSIONAL PARAMETERS:
  Densimetric Froude number       FR0     = 14.20 (based on LQ)
  Channel densimetric Froude no.  FRCH    = 11.01 (based on H0)
  Velocity ratio                  R       = 4.13
-------------------------------------------------------------------------
MIXING ZONE / TOXIC DILUTION ZONE / AREA OF INTEREST PARAMETERS:
  Toxic discharge                         = no
  Water quality standard specified        = yes
  Water quality standard          CSTD    = 2.78 deg.C
  Regulatory mixing zone                  = no
  Region of interest                      = 5000 m downstream
*************************************************************************
HYDRODYNAMIC CLASSIFICATION:
  *-----------------------*
  | FLOW CLASS    = SA2 |
  *-----------------------*

  Limiting Dilution S = (QA/Q0)+ 1.0 = 46.6

*************************************************************************
MIXING ZONE EVALUATION (hydrodynamic and regulatory summary):

-------------------------------------------------------------------------
X-Y-Z Coordinate system:
Origin is located at WATER SURFACE and at centerline of discharge channel:
    0 m from the right bank/shore.
  Number of display steps NSTEP = 20 per module.
-------------------------------------------------------------------------
NEAR-FIELD REGION (NFR) CONDITIONS :
Note: The NFR is the zone of strong initial mixing.  It has no regulatory
  implication.  However, this information may be useful for the discharge
  designer because the mixing in the NFR is usually sensitive to the
  discharge design conditions.
  Pollutant concentration at NFR edge  c = 1.9505 deg.C
  Dilution at edge of NFR              s = 6.7
  NFR Location:                        x = 119.01 m
    (centerline coordinates)           y = 0 m
                                       z = 0 m
```

```
   NFR plume dimensions:  half-width (bh) = 8.58 m
                           thickness (bv) = 2.49 m
 Cumulative travel time:       165.4493 sec.
--------------------------------------------------------------------------------
 Buoyancy assessment:
   The effluent density is less than the surrounding ambient water
   density at the discharge level.
   Therefore, the effluent is POSITIVELY BUOYANT and will tend to rise towards
   the surface.
--------------------------------------------------------------------------------
 FAR-FIELD MIXING SUMMARY:
   Plume is vertically fully mixed WITHIN NEAR-FIELD (or a fraction thereof),
   but RE-STRATIFIES LATER.
   Plume becomes vertically fully mixed again at 828.17 m downstream.
--------------------------------------------------------------------------------
 PLUME BANK CONTACT SUMMARY:
   Plume in bounded section contacts nearest bank at 0 m downstream.
   Plume contacts second bank at 608.60 m downstream.
************************ TOXIC DILUTION ZONE SUMMARY ************************
 No TDZ was specified for this simulation.
********************** REGULATORY MIXING ZONE SUMMARY ***********************
 No RMZ has been specified.
 However:
 The ambient water quality standard was encountered at the following
   plume position:
   Water quality standard                 = 2.78  deg.C
   Corresponding dilution               s = 4.7
   Plume location:                      x = 58.87 m
     (centerline coordinates)           y = 18.50 m
                                        z = 0 m
   Plume dimensions:      half-width (bh) = 3.10 m
                           thickness (bv) = 2.49 m
********************** FINAL DESIGN ADVICE AND COMMENTS **********************
 REMINDER:  The user must take note that HYDRODYNAMIC MODELING by any known
   technique is NOT AN EXACT SCIENCE.
 Extensive comparison with field and laboratory data has shown that the
   CORMIX predictions on dilutions and concentrations (with associated
   plume geometries) are reliable for the majority of cases and are accurate
   to within about +-50% (standard deviation).
 As a further safeguard, CORMIX will not give predictions whenever it judges
   the design configuration as highly complex and uncertain for prediction.
```

```
CORMIX SESSION REPORT:
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
                    CORMIX MIXING ZONE EXPERT SYSTEM
                        CORMIX Version 11.0GT
                     HYDRO3:Version-11.0.0.0  April,2018
SITE NAME/LABEL:                Augusta Mill Outrall 001
  DESIGN CASE:                  Augusta 001 JUL Existing Conditions
  FILE NAME:                    C:\Users\JLebo\Documents\CORMIX Model Runs\Augusta
Mill\AU-JUL1E.prd
  Using subsystem CORMIX3:     Buoyant Surface Discharges
  Start of session:             06/07/2018--17:17:59
*******************************************************************************
SUMMARY OF INPUT DATA:
-------------------------------------------------------------------------------
AMBIENT PARAMETERS:
  Cross-section                          = bounded
  Width                         BS       = 88.70 m
  Channel regularity            ICHREG   = 2
  Ambient flowrate              QA       = 119.27 m^3/s
  Average depth                 HA       = 2.49 m
  Depth at discharge            HD       = 2.49 m
  Ambient velocity              UA       = 0.54 m/s
  Darcy-Weisbach friction factor F       = 0.0709
    Calculated from Manning's n          = 0.035
  Wind velocity                 UW       = 2 m/s
  Stratification Type           STRCND   = U
  Surface temperature                    = 20.70 degC
  Bottom temperature                     = 20.70 degC
  Calculated FRESH-WATER DENSITY values:
  Surface density               RHOAS    = 998.0580 kg/m^3
  Bottom density                RHOAB    = 998.0580 kg/m^3
-------------------------------------------------------------------------------
DISCHARGE PARAMETERS:           Surface Discharge
  Discharge located on                   = right bank/shoreline
  Discharge configuration                = flush discharge
  Distance from bank to outlet  DISTB    = 0 m
  Discharge angle               SIGMA    = 90 deg
  Depth near discharge outlet   HD0      = 2.49 m
  Bottom slope at discharge     SLOPE    = 0 deg
  Circular pipe diameter                 = 1.22 m
    Equivalent rectangular discharge:
    Discharge cross-section area A0      = 1.168987 m^2
    Discharge channel width     B0       = 0.649437 m
    Discharge channel depth     H0       = 1.8 m
    Discharge aspect ratio      AR       = 2.771631
  Discharge flowrate            Q0       = 2.7 m^3/s
  Discharge velocity            U0       = 2.31 m/s
  Discharge density             RHO0     = 996.25 kg/m^3
```

```
  Density difference              DRHO   = 1.8080 kg/m^3
  Buoyant acceleration            GP0    = 0.0178 m/s^2
  Discharge concentration         C0     = 10.4 deg.C
  Surface heat exchange coeff.    KS     = 0.000005 m/s
  Coefficient of decay            KD     = 0 /s
-------------------------------------------------------------------------
DISCHARGE/ENVIRONMENT LENGTH SCALES:
  LQ  = 1.08 m        Lm  = 4.62 m        Lbb = 0.30 m
  LM  = 18.02 m
-------------------------------------------------------------------------
NON-DIMENSIONAL PARAMETERS:
  Densimetric Froude number       FR0    = 16.67 (based on LQ)
  Channel densimetric Froude no.  FRCH   = 12.92 (based on H0)
  Velocity ratio                  R      = 4.28
-------------------------------------------------------------------------
MIXING ZONE / TOXIC DILUTION ZONE / AREA OF INTEREST PARAMETERS:
  Toxic discharge                        = no
  Water quality standard specified       = yes
  Water quality standard          CSTD   = 2.78 deg.C
  Regulatory mixing zone                 = no
  Region of interest                     = 5000 m downstream
*************************************************************************
HYDRODYNAMIC CLASSIFICATION:
  *----------------------*
  | FLOW CLASS   = SA2 |
  *----------------------*

  Limiting Dilution S = (QA/Q0)+ 1.0 = 45.2

*************************************************************************
MIXING ZONE EVALUATION (hydrodynamic and regulatory summary):

-------------------------------------------------------------------------
X-Y-Z Coordinate system:
Origin is located at WATER SURFACE and at centerline of discharge channel:
    0 m from the right bank/shore.
  Number of display steps NSTEP = 20 per module.
-------------------------------------------------------------------------
NEAR-FIELD REGION (NFR) CONDITIONS :
Note: The NFR is the zone of strong initial mixing.  It has no regulatory
  implication.  However, this information may be useful for the discharge
  designer because the mixing in the NFR is usually sensitive to the
  discharge design conditions.
  Pollutant concentration at NFR edge  c = 1.5287 deg.C
  Dilution at edge of NFR              s = 6.8
  NFR Location:                        x = 124.46 m
    (centerline coordinates)           y = 0 m
                                       z = 0 m
```

```
  NFR plume dimensions:  half-width (bh) = 8.97 m
                          thickness (bv) = 2.49 m
Cumulative travel time:       170.1149 sec.
--------------------------------------------------------------------------------
Buoyancy assessment:
  The effluent density is less than the surrounding ambient water
  density at the discharge level.
  Therefore, the effluent is POSITIVELY BUOYANT and will tend to rise towards
  the surface.
--------------------------------------------------------------------------------
FAR-FIELD MIXING SUMMARY:
  Plume is vertically fully mixed WITHIN NEAR-FIELD (or a fraction thereof),
  but RE-STRATIFIES LATER.
  Plume becomes vertically fully mixed again at 830.78 m downstream.
--------------------------------------------------------------------------------
PLUME BANK CONTACT SUMMARY:
  Plume in bounded section contacts one bank only at 0 m downstream.
********** TOXIC DILUTION ZONE SUMMARY **********
No TDZ was specified for this simulation.
********** REGULATORY MIXING ZONE SUMMARY **********
No RMZ has been specified.
However:
The ambient water quality standard was encountered at the following
  plume position:
  Water quality standard                = 2.78  deg.C
  Corresponding dilution              s = 3.7
  Plume location:                     x = 31.56 m
    (centerline coordinates)          y = 18.48 m
                                      z = 0 m
  Plume dimensions:      half-width (bh) = 2.48 m
                          thickness (bv) = 2.49 m
********** FINAL DESIGN ADVICE AND COMMENTS **********
REMINDER:  The user must take note that HYDRODYNAMIC MODELING by any known
  technique is NOT AN EXACT SCIENCE.
Extensive comparison with field and laboratory data has shown that the
  CORMIX predictions on dilutions and concentrations (with associated
  plume geometries) are reliable for the majority of cases and are accurate
  to within about +-50% (standard deviation).
As a further safeguard, CORMIX will not give predictions whenever it judges
  the design configuration as highly complex and uncertain for prediction.
```

```
CORMIX SESSION REPORT:
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
                    CORMIX MIXING ZONE EXPERT SYSTEM
                        CORMIX Version 11.0GT
                     HYDRO3:Version-11.0.0.0  April,2018
SITE NAME/LABEL:                Augusta Mill Outrall 001
  DESIGN CASE:                  Augusta 001 OCT Existing Conditions
  FILE NAME:                    C:\Users\JLebo\Documents\CORMIX Model Runs\Augusta
Mill\AU-OCT1E.prd
  Using subsystem CORMIX3:     Buoyant Surface Discharges
  Start of session:             06/07/2018--17:19:36
*********************************************************************************
SUMMARY OF INPUT DATA:
---------------------------------------------------------------------------------
AMBIENT PARAMETERS:
  Cross-section                          = bounded
  Width                          BS      = 88.5 m
  Channel regularity             ICHREG  = 2
  Ambient flowrate               QA      = 115.39 m^3/s
  Average depth                  HA      = 2.46 m
  Depth at discharge             HD      = 2.46 m
  Ambient velocity               UA      = 0.53 m/s
  Darcy-Weisbach friction factor F       = 0.0712
    Calculated from Manning's n          = 0.035
  Wind velocity                  UW      = 2 m/s
  Stratification Type            STRCND  = U
  Surface temperature                    = 19 degC
  Bottom temperature                     = 19 degC
  Calculated FRESH-WATER DENSITY values:
  Surface density                RHOAS   = 998.4063 kg/m^3
  Bottom density                 RHOAB   = 998.4063 kg/m^3
---------------------------------------------------------------------------------
DISCHARGE PARAMETERS:           Surface Discharge
  Discharge located on                   = right bank/shoreline
  Discharge configuration                = flush discharge
  Distance from bank to outlet   DISTB   = 0 m
  Discharge angle                SIGMA   = 90 deg
  Depth near discharge outlet    HD0     = 2.46 m
  Bottom slope at discharge      SLOPE   = 0 deg
  Circular pipe diameter                 = 1.22 m
    Equivalent rectangular discharge:
    Discharge cross-section area A0      = 1.168987 m^2
    Discharge channel width      B0      = 0.649437 m
    Discharge channel depth      H0      = 1.8 m
    Discharge aspect ratio       AR      = 2.771631
  Discharge flowrate             Q0      = 2.65 m^3/s
  Discharge velocity             U0      = 2.27 m/s
  Discharge density              RHO0    = 997.553 kg/m^3
```

```
   Density difference              DRHO    = 0.8533 kg/m^3
   Buoyant acceleration            GP0     = 0.0084 m/s^2
   Discharge concentration         C0      = 7.7 deg.C
   Surface heat exchange coeff.    KS      = 0.000005 m/s
   Coefficient of decay            KD      = 0 /s
 ---------------------------------------------------------------------------
 DISCHARGE/ENVIRONMENT LENGTH SCALES:
   LQ  = 1.08 m          Lm  = 4.62 m          Lbb = 0.15 m
   LM  = 25.75 m
 ---------------------------------------------------------------------------
 NON-DIMENSIONAL PARAMETERS:
   Densimetric Froude number       FR0     = 23.81 (based on LQ)
   Channel densimetric Froude no.  FRCH    = 18.46 (based on H0)
   Velocity ratio                  R       = 4.28
 ---------------------------------------------------------------------------
 MIXING ZONE / TOXIC DILUTION ZONE / AREA OF INTEREST PARAMETERS:
   Toxic discharge                         = no
   Water quality standard specified        = yes
   Water quality standard          CSTD    = 2.78 deg.C
   Regulatory mixing zone                  = no
   Region of interest                      = 5000 m downstream
*****************************************************************************
 HYDRODYNAMIC CLASSIFICATION:
   *-----------------------*
   | FLOW CLASS   = SA2 |
   *-----------------------*

   Limiting Dilution S = (QA/Q0)+ 1.0 = 44.5

*****************************************************************************
MIXING ZONE EVALUATION (hydrodynamic and regulatory summary):

---------------------------------------------------------------------------
X-Y-Z Coordinate system:
Origin is located at WATER SURFACE and at centerline of discharge channel:
    0 m from the right bank/shore.
  Number of display steps NSTEP = 20 per module.
---------------------------------------------------------------------------
NEAR-FIELD REGION (NFR) CONDITIONS :
Note: The NFR is the zone of strong initial mixing.  It has no regulatory
  implication.  However, this information may be useful for the discharge
  designer because the mixing in the NFR is usually sensitive to the
  discharge design conditions.
  Pollutant concentration at NFR edge  c = 1.1265 deg.C
  Dilution at edge of NFR              s = 6.8
  NFR Location:                        x = 122.91 m
    (centerline coordinates)           y = 0 m
                                       z = 0 m
```

```
  NFR plume dimensions:  half-width (bh) = 8.86 m
                          thickness (bv) = 2.46 m
Cumulative travel time:       167.8837 sec.
-------------------------------------------------------------------------
Buoyancy assessment:
  The effluent density is less than the surrounding ambient water
  density at the discharge level.
  Therefore, the effluent is POSITIVELY BUOYANT and will tend to rise towards
  the surface.
-------------------------------------------------------------------------
FAR-FIELD MIXING SUMMARY:
  Plume is vertically fully mixed WITHIN NEAR-FIELD (or a fraction thereof),
  but RE-STRATIFIES LATER.
  Plume becomes vertically fully mixed again at 654.57 m downstream.
-------------------------------------------------------------------------
PLUME BANK CONTACT SUMMARY:
  Plume in bounded section contacts one bank only at 0 m downstream.
************************ TOXIC DILUTION ZONE SUMMARY ************************
No TDZ was specified for this simulation.
*********************** REGULATORY MIXING ZONE SUMMARY ***********************
No RMZ has been specified.
However:
The ambient water quality standard was encountered at the following
  plume position:
  Water quality standard                 = 2.78  deg.C
  Corresponding dilution               s = 2.8
  Plume location:                      x = 15.58 m
    (centerline coordinates)           y = 14.75 m
                                       z = 0 m
  Plume dimensions:      half-width (bh) = 1.83 m
                          thickness (bv) = 2.46 m
********************** FINAL DESIGN ADVICE AND COMMENTS **********************
REMINDER:  The user must take note that HYDRODYNAMIC MODELING by any known
  technique is NOT AN EXACT SCIENCE.
Extensive comparison with field and laboratory data has shown that the
  CORMIX predictions on dilutions and concentrations (with associated
  plume geometries) are reliable for the majority of cases and are accurate
  to within about +-50% (standard deviation).
As a further safeguard, CORMIX will not give predictions whenever it judges
  the design configuration as highly complex and uncertain for prediction.
```

ATTACHMENT 2

CORMIX SESSION FILES – POTENTIAL FUTURE CONDITIONS

Run ID	Description
AU-JUN1F	Future effluent; 10th percentile river; June
AU-JUN2F	Future effluent; 90th percentile river; June
AU-JUL1F	Future effluent; 10th percentile river; July
AU-JUL2F	Future effluent; 90th percentile river; July

Results from June 2018 Model Runs - Future Conditions (standard attained)

Run ID	X (ft)	Y-left	Y-right	Depth (ft)	S
WQS = not increase by more than 5°F					
AU-JUN1F	204.5	76.4	45.7	8.2	5.5
AU-JUL1F	222.4	73.9	51.8	8.2	4.9
WQS = not exceed 90°F					
AU-JUN2F*	1.4	19.5	13.9	5.3	1.1
AU-JUL2F*	2.2	21.4	15.1	6.0	1.3

Note: (x-axis) distance downstream from outfall; (y-axis) distance from South Bank; (*) x, y, z, Bh, and Bv were linearly interpolated from the two output lines before and after the temperature standard was reached in the prediction file.

```
CORMIX SESSION REPORT:
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
                      CORMIX MIXING ZONE EXPERT SYSTEM
                          CORMIX Version 11.0GT
                       HYDRO3:Version-11.0.0.0  April,2018
SITE NAME/LABEL:                Augusta Mill Outrall 001
  DESIGN CASE:                  Augusta 001 JUN Future Conditions
  FILE NAME:                    C:\Users\JLebo\Documents\CORMIX Model Runs\Augusta
Mill\AU-JUN1F.prd
  Using subsystem CORMIX3:     Buoyant Surface Discharges
  Start of session:             06/08/2018--09:34:13
*******************************************************************************
SUMMARY OF INPUT DATA:
-------------------------------------------------------------------------------
AMBIENT PARAMETERS:
  Cross-section                          = bounded
  Width                         BS       = 88.60 m
  Channel regularity            ICHREG   = 2
  Ambient flowrate              QA       = 119.13 m^3/s
  Average depth                 HA       = 2.49 m
  Depth at discharge            HD       = 2.49 m
  Ambient velocity              UA       = 0.54 m/s
  Darcy-Weisbach friction factor F       = 0.0709
    Calculated from Manning's n          = 0.035
  Wind velocity                 UW       = 2 m/s
  Stratification Type           STRCND   = U
  Surface temperature                    = 18.10 degC
  Bottom temperature                     = 18.10 degC
  Calculated FRESH-WATER DENSITY values:
  Surface density               RHOAS    = 998.5781 kg/m^3
  Bottom density                RHOAB    = 998.5781 kg/m^3
-------------------------------------------------------------------------------
DISCHARGE PARAMETERS:           Surface Discharge
  Discharge located on                   = right bank/shoreline
  Discharge configuration                = flush discharge
  Distance from bank to outlet  DISTB    = 0 m
  Discharge angle               SIGMA    = 90 deg
  Depth near discharge outlet   HD0      = 2.49 m
  Bottom slope at discharge     SLOPE    = 0 deg
  Circular pipe diameter                 = 1.22 m
    Equivalent rectangular discharge:
    Discharge cross-section area A0      = 1.168987 m^2
    Discharge channel width      B0      = 0.649437 m
    Discharge channel depth      H0      = 1.8 m
    Discharge aspect ratio       AR      = 2.771631
  Discharge flowrate            Q0       = 2.61 m^3/s
  Discharge velocity            U0       = 2.23 m/s
  Discharge density             RHO0     = 995.5520 kg/m^3
```

```
   Density difference              DRHO    = 3.0261 kg/m^3
   Buoyant acceleration            GP0     = 0.0297 m/s^2
   Discharge concentration         C0      = 15.200000 deg.C
   Surface heat exchange coeff.    KS      = 0.000005 m/s
   Coefficient of decay            KD      = 0 /s
-------------------------------------------------------------------------
DISCHARGE/ENVIRONMENT LENGTH SCALES:
  LQ  = 1.08 m          Lm  = 4.47 m          Lbb = 0.49 m
  LM  = 13.47 m
-------------------------------------------------------------------------
NON-DIMENSIONAL PARAMETERS:
  Densimetric Froude number       FR0     = 12.46 (based on LQ)
  Channel densimetric Froude no.  FRCH    = 9.65 (based on H0)
  Velocity ratio                  R       = 4.13
-------------------------------------------------------------------------
MIXING ZONE / TOXIC DILUTION ZONE / AREA OF INTEREST PARAMETERS:
  Toxic discharge                         = no
  Water quality standard specified        = yes
  Water quality standard          CSTD    = 2.78 deg.C
  Regulatory mixing zone                  = no
  Region of interest                      = 5000 m downstream
*************************************************************************
HYDRODYNAMIC CLASSIFICATION:
  *-----------------------*
  | FLOW CLASS   = SA2 |
  *-----------------------*

  Limiting Dilution S = (QA/Q0)+ 1.0 = 46.6

*************************************************************************
MIXING ZONE EVALUATION (hydrodynamic and regulatory summary):

-------------------------------------------------------------------------
X-Y-Z Coordinate system:
Origin is located at WATER SURFACE and at centerline of discharge channel:
    0 m from the right bank/shore.
  Number of display steps NSTEP = 20 per module.
-------------------------------------------------------------------------
NEAR-FIELD REGION (NFR) CONDITIONS :
Note: The NFR is the zone of strong initial mixing.  It has no regulatory
  implication.  However, this information may be useful for the discharge
  designer because the mixing in the NFR is usually sensitive to the
  discharge design conditions.
  Pollutant concentration at NFR edge  c = 1.6815 deg.C
  Dilution at edge of NFR              s = 9.0
  NFR Location:                        x = 106.74 m
    (centerline coordinates)           y = 0 m
                                       z = 0 m
```

```
  NFR plume dimensions:  half-width (bh) = 15.77 m
                          thickness (bv) = 2.49 m
Cumulative travel time:       166.8036 sec.
-------------------------------------------------------------------------
Buoyancy assessment:
  The effluent density is less than the surrounding ambient water
  density at the discharge level.
  Therefore, the effluent is POSITIVELY BUOYANT and will tend to rise towards
  the surface.
-------------------------------------------------------------------------
FAR-FIELD MIXING SUMMARY:
  Plume is vertically fully mixed WITHIN NEAR-FIELD (or a fraction thereof),
  but RE-STRATIFIES LATER.
  Plume becomes vertically fully mixed again at 917.64 m downstream.
-------------------------------------------------------------------------
PLUME BANK CONTACT SUMMARY:
  Plume in bounded section contacts nearest bank at 0 m downstream.
  Plume contacts second bank at 464.04 m downstream.
************************ TOXIC DILUTION ZONE SUMMARY ************************
No TDZ was specified for this simulation.
********************** REGULATORY MIXING ZONE SUMMARY ***********************
No RMZ has been specified.
However:
The ambient water quality standard was encountered at the following
  plume position:
  Water quality standard                  = 2.78  deg.C
  Corresponding dilution               s = 5.5
  Plume location:                      x = 62.32 m
    (centerline coordinates)           y = 18.61 m
                                       z = 0 m
  Plume dimensions:      half-width (bh) = 4.69 m
                          thickness (bv) = 2.49 m
********************** FINAL DESIGN ADVICE AND COMMENTS **********************
REMINDER:  The user must take note that HYDRODYNAMIC MODELING by any known
  technique is NOT AN EXACT SCIENCE.
Extensive comparison with field and laboratory data has shown that the
  CORMIX predictions on dilutions and concentrations (with associated
  plume geometries) are reliable for the majority of cases and are accurate
  to within about +-50% (standard deviation).
As a further safeguard, CORMIX will not give predictions whenever it judges
  the design configuration as highly complex and uncertain for prediction.
```

AU-JUN2F.ses

```
CORMIX SESSION REPORT:
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
                       CORMIX MIXING ZONE EXPERT SYSTEM
                           CORMIX Version 11.0GT
                       HYDRO3:Version-11.0.0.0  April,2018
SITE NAME/LABEL:                Augusta Mill Outrall 001
  DESIGN CASE:                  Augusta 001 JUN Future Conditions 90 deg
  FILE NAME:                    C:\Users\JLebo\Documents\CORMIX Model Runs\Augusta
Mill\AU-JUN2F.prd
  Using subsystem CORMIX3:     Buoyant Surface Discharges
  Start of session:            06/08/2018--09:25:16
****************************************************************************
SUMMARY OF INPUT DATA:
----------------------------------------------------------------------------
AMBIENT PARAMETERS:
  Cross-section                            = bounded
  Width                           BS       = 88.60 m
  Channel regularity              ICHREG = 2
  Ambient flowrate                QA       = 119.13 m^3/s
  Average depth                   HA       = 2.49 m
  Depth at discharge              HD       = 2.49 m
  Ambient velocity                UA       = 0.54 m/s
  Darcy-Weisbach friction factor  F        = 0.0709
    Calculated from Manning's n            = 0.035
  Wind velocity                   UW       = 2 m/s
  Stratification Type             STRCND = U
  Surface temperature                      = 23 degC
  Bottom temperature                       = 23 degC
  Calculated FRESH-WATER DENSITY values:
  Surface density                 RHOAS  = 997.5393 kg/m^3
  Bottom density                  RHOAB  = 997.5393 kg/m^3
----------------------------------------------------------------------------
DISCHARGE PARAMETERS:             Surface Discharge
  Discharge located on                   = right bank/shoreline
  Discharge configuration                = flush discharge
  Distance from bank to outlet    DISTB  = 0 m
  Discharge angle                 SIGMA  = 90 deg
  Depth near discharge outlet     HD0    = 2.49 m
  Bottom slope at discharge       SLOPE  = 0 deg
  Circular pipe diameter                 = 1.22 m
    Equivalent rectangular discharge:
    Discharge cross-section area  A0     = 1.168987 m^2
    Discharge channel width       B0     = 0.649437 m
    Discharge channel depth       H0     = 1.8 m
    Discharge aspect ratio        AR     = 2.771631
  Discharge flowrate              Q0     = 2.61 m^3/s
  Discharge velocity              U0     = 2.23 m/s
  Discharge density               RHO0   = 995.5520 kg/m^3
```

```
  Density difference                DRHO    = 1.9873 kg/m^3
  Buoyant acceleration              GP0     = 0.0195 m/s^2
  Discharge concentration           C0      = 10.300000 deg.C
  Surface heat exchange coeff.      KS      = 0.000005 m/s
  Coefficient of decay              KD      = 0 /s
-------------------------------------------------------------------------
DISCHARGE/ENVIRONMENT LENGTH SCALES:
  LQ  = 1.08 m        Lm  = 4.47 m        Lbb = 0.32 m
  LM  = 16.61 m
-------------------------------------------------------------------------
NON-DIMENSIONAL PARAMETERS:
  Densimetric Froude number         FR0     = 15.36 (based on LQ)
  Channel densimetric Froude no.    FRCH    = 11.91 (based on H0)
  Velocity ratio                    R       = 4.13
-------------------------------------------------------------------------
MIXING ZONE / TOXIC DILUTION ZONE / AREA OF INTEREST PARAMETERS:
  Toxic discharge                           = no
  Water quality standard specified          = yes
  Water quality standard            CSTD    = 9.300000 deg.C
  Regulatory mixing zone                    = no
  Region of interest                        = 5000 m downstream
*************************************************************************
HYDRODYNAMIC CLASSIFICATION:
  *-----------------------*
  | FLOW CLASS   = SA2 |
  *-----------------------*

  Limiting Dilution S = (QA/Q0)+ 1.0 = 46.6

*************************************************************************
MIXING ZONE EVALUATION (hydrodynamic and regulatory summary):

-------------------------------------------------------------------------
X-Y-Z Coordinate system:
Origin is located at WATER SURFACE and at centerline of discharge channel:
    0 m from the right bank/shore.
  Number of display steps NSTEP = 20 per module.
-------------------------------------------------------------------------
NEAR-FIELD REGION (NFR) CONDITIONS :
Note: The NFR is the zone of strong initial mixing.  It has no regulatory
  implication.  However, this information may be useful for the discharge
  designer because the mixing in the NFR is usually sensitive to the
  discharge design conditions.
  Pollutant concentration at NFR edge  c = 1.5205 deg.C
  Dilution at edge of NFR              s = 6.8
  NFR Location:                        x = 118.58 m
    (centerline coordinates)           y = 0 m
                                       z = 0 m
```

NFR plume dimensions: half-width (bh) = 11.15 m
thickness (bv) = 2.49 m
Cumulative travel time: 163.7222 sec.

Buoyancy assessment:
The effluent density is less than the surrounding ambient water density at the discharge level.
Therefore, the effluent is POSITIVELY BUOYANT and will tend to rise towards the surface.

FAR-FIELD MIXING SUMMARY:
Plume is vertically fully mixed WITHIN NEAR-FIELD (or a fraction thereof), but RE-STRATIFIES LATER.
Plume becomes vertically fully mixed again at 844.67 m downstream.

PLUME BANK CONTACT SUMMARY:
Plume in bounded section contacts one bank only at 0 m downstream.

********** TOXIC DILUTION ZONE SUMMARY **********

No TDZ was specified for this simulation.

********** REGULATORY MIXING ZONE SUMMARY **********

No RMZ has been specified.
However:
The ambient water quality standard was encountered at the following plume position:

Water quality standard	= 9.300000 deg.C	
Corresponding dilution	s = 1.1	CORMIX incorrectly reported values for meeting the temperature criterion in the session report file. See attached prediction file.
Plume location:	x = 70.45 m	
(centerline coordinates)	y = 4.58 m	
	z = 0 m	
Plume dimensions: half-width (bh)	= 2.91 m	
thickness (bv)	= 2.20 m	

********** FINAL DESIGN ADVICE AND COMMENTS **********

REMINDER: The user must take note that HYDRODYNAMIC MODELING by any known technique is NOT AN EXACT SCIENCE.
Extensive comparison with field and laboratory data has shown that the CORMIX predictions on dilutions and concentrations (with associated plume geometries) are reliable for the majority of cases and are accurate to within about +-50% (standard deviation).
As a further safeguard, CORMIX will not give predictions whenever it judges the design configuration as highly complex and uncertain for prediction.

```
 CORMIX3 PREDICTION FILE:
 3333333333333333333333333333333333333333333333333333333333333333333333333333333333333333333333333333
                        CORMIX MIXING ZONE EXPERT SYSTEM
                  Subsystem CORMIX3: Buoyant Surface Discharges
                              CORMIX Version 11.0GT
                          HYDRO3 Version 11.0.0.0 April 2018
 ------------------------------------------------------------------------------

 ------------------------------------------------------------------------------

 CASE DESCRIPTION
  Site name/label:   Augusta Mill Outrall 001
  Design case:       Augusta 001 JUN Future Conditions 90 deg
  FILE NAME:         C:\...ments\CORMIX Model Runs\Augusta Mill\AU-JUN2F.prd
  Time stamp:        06/08/2018--09:25:16

 ENVIRONMENT PARAMETERS (metric units)
  Bounded section
  BS    =     88.60  AS    =    220.61  QA    =    119.13  ICHREG= 2
  HA    =      2.49  HD    =      2.49
  UA    =     0.540  F     =     0.071 USTAR =0.5085E-01
  UW    =     2.000 UWSTAR=0.2198E-02
  Uniform density environment
  STRCND=  U         RHOAM =  997.5393

 DISCHARGE PARAMETERS (metric units)
  BANK  =  RIGHT     DISTB =      0.00  Configuration: flush_discharge
  SIGMA =     90.00  HDO   =      2.49  SLOPE =    0.00 deg.
  Circular discharge pipe:
  D0    =     1.220 A0    =     1.169
  Dimensions of equivalent rectangular discharge:
  B0    =     0.649 H0    =     1.800 A0    =0.1169E+01  AR    =     2.772
  U0    =     2.233 Q0    =     2.610       =0.2610E+01
  RHO0  =  995.5520  DRHO0 =0.1987E+01  GP0   =0.1954E-01
  C0    =0.1030E+02  CUNITS=  deg.C
  IPOLL =  3         KS    =0.5493E-05  KD    =0.0000E+00

 FLUX VARIABLES (metric units)
  Q0    =0.2610E+01  M0    =0.5827E+01  J0    =0.5099E-01
  Associated length scales (meters)
  LQ    =     1.08  LM    =    16.61  Lm    =     4.47  Lb    =     0.32
  LQ2D  =     0.47  LM2D  =    31.26  Lm2D  =     8.03

 NON-DIMENSIONAL PARAMETERS
  FR0   =    15.36  FRCH  =    11.91  R     =     4.13

 FLOW CLASSIFICATION
  3333333333333333333333333333333333333333
```

```
 3  Flow class (CORMIX3)      =    SA2    3
 3  Applicable layer depth HS =     2.49  3
 3  Limiting Dilution S =QA/Q0=    46.64  3
 333333333333333333333333333333333333333333

MIXING ZONE / TOXIC DILUTION / REGION OF INTEREST PARAMETERS
 C0    =0.1030E+02  CUNITS=  deg.C
 NTOX  =  0
 NSTD  =  1         CSTD  =0.9300E+01
 REGMZ =  0
 XINT  =   5000.00  XMAX  =   5000.00

X-Y-Z COORDINATE SYSTEM:
    ORIGIN is located at the WATER SURFACE and at center of discharge
    . channel/outlet:      0.00 m  from the RIGHT bank/shore.
    X-axis points downstream
    Y-axis points to left as seen by an observer looking downstream
    Z-axis points vertically upward (in CORMIX3, all values Z = 0.00)
NSTEP =  20 display intervals per module
-------------------------------------------------------------------------------


NOTE on dilution/concentration values for this HEATED DISCHARGE (IPOLL=3):
   S  = hydrodynamic dilutions, include buoyancy (heat) loss effects
   C  = corresponding temperature values (in "deg.C"!) include heat loss
-------------------------------------------------------------------------------

BEGIN MOD301: DISCHARGE MODULE

 Efflux conditions:
      X        Y        Z        S        C        BV       BH       UC        TT
    0.00     0.00     0.00     1.0 0.103E+02   1.80     0.32     2.233  .00000E+00

END OF MOD301: DISCHARGE MODULE
-------------------------------------------------------------------------------

-------------------------------------------------------------------------------

BEGIN MOD302: ZONE OF FLOW ESTABLISHMENT

  Control volume inflow:
      X        Y        Z        S        C        BV       BH       UC        TT
    0.00     0.00     0.00     1.0 0.103E+02   1.80     0.32     2.233  .00000E+00

 Profile definitions:
   BV = Gaussian 1/e (37%) vertical thickness
   BH = Gaussian 1/e (37%) horizontal half-width, normal to trajectory
   S  = hydrodynamic centerline dilution
```

C = centerline concentration (includes reaction efects, if any)
Uc = Local centerline excess velocity (above ambient)
TT = Cumulative travel time

Control volume outflow: SIGMAE= 73.29

X	Y	Z	S	C	BV	BH	UC	TT
0.18	4.67	0.00	1.0	0.103E+02	1.40	0.74	2.233	.20949E+01

Cumulative travel time = 2.0949 sec (0.00 hrs)

END OF MOD302: ZONE OF FLOW ESTABLISHMENT

BEGIN CORSURF (MOD310): BUOYANT SURFACE JET - NEAR-FIELD REGION

Surface jet in shallow crossflow with shoreline-attachment.

Profile definitions:
BV = Gaussian 1/e (37%) vertical thickness
BH = Gaussian 1/e (37%) horizontal half-width, normal to trajectory
S = hydrodynamic centerline dilution
C = centerline concentration (includes reaction efects, if any)
Uc = Local centerline excess velocity (above ambient)
TT = Cumulative travel time

X	Y	Z	S	C	BV	BH	UC	TT
0.18	4.67	0.00	1.0	0.103E+02	1.40	0.74	2.341	.20949E+01

** WATER QUALITY STANDARD OR CCC HAS BEEN FOUND **
The pollutant concentration in the plume falls below water quality standard or CCC value of 0.930E+01 in the current prediction interval.
This is the spatial extent of concentrations exceeding the water quality standard or CCC value.
Jet/plume becomes VERTICALLY FULLY MIXED over the local ambient water depth.
BV = water depth (vertically mixed)

1.51	6.94	0.00	2.1	0.488E+01	2.53	1.34	0.815	.35426E+01
4.50	9.62	0.00	2.4	0.435E+01	2.49	1.51	0.701	.71607E+01
9.94	12.69	0.00	2.6	0.389E+01	2.49	1.75	0.488	.13171E+02
15.80	14.87	0.00	2.9	0.355E+01	2.49	1.97	0.386	.19868E+02
21.86	16.43	0.00	3.3	0.316E+01	2.49	2.16	0.326	.27024E+02
28.02	17.54	0.00	3.6	0.289E+01	2.49	2.34	0.287	.34517E+02
34.23	18.28	0.00	3.8	0.269E+01	2.49	2.50	0.259	.42271E+02
40.03	18.69	0.00	4.0	0.255E+01	2.49	2.64	0.239	.49663E+02
46.28	18.85	0.00	4.3	0.242E+01	2.49	2.78	0.223	.57795E+02

Maximum lateral extent of recirculation bubble.

52.54	18.75	0.00	4.4	0.232E+01	2.49	2.92	0.210	.66081E+02
58.79	18.39	0.00	4.6	0.222E+01	2.49	3.05	0.199	.74507E+02
65.02	17.80	0.00	4.8	0.214E+01	2.49	3.18	0.190	.83062E+02

```
    71.22    16.98    0.00     5.0 0.205E+01   2.49     3.30    0.183  .91740E+02
    77.40    15.95    0.00     5.2 0.198E+01   2.49     3.43    0.177  .10053E+03
    83.09    14.81    0.00     5.4 0.191E+01   2.49     3.54    0.172  .10880E+03
    89.19    13.39    0.00     5.6 0.184E+01   2.49     3.66    0.167  .11780E+03
    95.24    11.80    0.00     5.8 0.178E+01   2.49     3.78    0.164  .12690E+03
   101.25    10.04    0.00     6.0 0.172E+01   2.49     3.90    0.161  .13610E+03
   107.21     8.13    0.00     6.2 0.166E+01   2.49     4.02    0.158  .14540E+03
   113.11     6.06    0.00     6.4 0.161E+01   2.49     4.14    0.156  .15479E+03
   118.14     4.18    0.00     6.6 0.157E+01   2.49     4.25    0.154  .16223E+03
  End of recirculation bubble at the above position.
   Dilution in recirculation bubble =    8.4
   Corresponding concentration      =    0.123E+01
  Flow continues as WALL JET/PLUME.
   118.58     0.00    0.00     6.8 0.152E+01   2.49     8.50    0.103  .16293E+03
  Jet/plume RESTRATIFIES at the above position.
     BV = Gaussian 1/e (37%) vertical thickness
   118.58     0.00    0.00     6.8 0.152E+01   2.49    11.15    0.021  .16372E+03
 Cumulative travel time =        163.7222 sec  (    0.05 hrs)

END OF CORSURF (MOD310): BUOYANT SURFACE JET - NEAR-FIELD REGION
------------------------------------------------------------------------------

------------------------------------------------------------------------------

** End of NEAR-FIELD REGION (NFR) **
------------------------------------------------------------------------------


 The initial plume WIDTH/THICKNESS VALUE in the next far-field module will be
  CORRECTED by a factor  1.15 to conserve the mass flux in the far-field!

 Some lateral bank/shore interaction occurs at end othe near-field.

 In the next prediction module, the jet/plume centerline will be set
   to follow the bank/shore.
------------------------------------------------------------------------------

BEGIN MOD341: BUOYANT AMBIENT SPREADING

 Plume is ATTACHED to RIGHT bank/shore.
   Plume width is now determined from RIGHT bank/shore.

 Profile definitions:
   BV = top-hat thickness,measured vertically
   BH = top-hat half-width, measured horizontally from bank/shoreline
   S  = hydrodynamic average (bulk) dilution
   C  = average (bulk) concentration (includes reaction effects, if any)
   TT = Cumulative travel time
```

```
 Plume Stage 2 (bank attached):
      X        Y        Z        S        C        BV       BH        TT
   118.58     0.00     0.00      6.8 0.152E+01   2.49    12.87 .16372E+03
   143.95    -0.00     0.00      7.6 0.135E+01   1.87    19.28 .20970E+03
   169.32    -0.00     0.00      8.4 0.123E+01   1.60    24.74 .25567E+03
   194.69    -0.00     0.00      9.1 0.113E+01   1.45    29.64 .30164E+03
   220.06    -0.00     0.00      9.9 0.104E+01   1.37    34.16 .34761E+03
   245.43    -0.00     0.00     10.8 0.950E+00   1.34    38.39 .39359E+03
   270.80    -0.00     0.00     11.9 0.865E+00   1.33    42.40 .43956E+03
   296.17    -0.00     0.00     13.1 0.786E+00   1.34    46.22 .48553E+03
   321.54    -0.00     0.00     14.4 0.713E+00   1.37    49.88 .53150E+03
   346.91    -0.00     0.00     16.0 0.645E+00   1.41    53.42 .57748E+03
   372.28    -0.00     0.00     17.7 0.583E+00   1.47    56.83 .62345E+03
   397.65    -0.00     0.00     19.5 0.527E+00   1.54    60.15 .66942E+03
   423.01    -0.00     0.00     21.6 0.476E+00   1.61    63.38 .71540E+03
   448.38    -0.00     0.00     23.9 0.431E+00   1.70    66.53 .76137E+03
   473.75    -0.00     0.00     26.3 0.391E+00   1.79    69.60 .80734E+03
   499.12    -0.00     0.00     29.0 0.355E+00   1.89    72.61 .85331E+03
   524.49    -0.00     0.00     31.9 0.322E+00   2.00    75.55 .89929E+03
   549.86    -0.00     0.00     35.0 0.294E+00   2.11    78.45 .94526E+03
   575.23    -0.00     0.00     38.3 0.268E+00   2.23    81.29 .99123E+03
   600.60    -0.00     0.00     41.9 0.245E+00   2.36    84.08 .10372E+04
   625.97    -0.00     0.00     45.7 0.225E+00   2.49    86.82 .10832E+04
 Cumulative travel time =        1083.1780 sec  (    0.30 hrs)

END OF MOD341: BUOYANT AMBIENT SPREADING
-------------------------------------------------------------------------------

-------------------------------------------------------------------------------

BEGIN MOD361: PASSIVE AMBIENT MIXING IN UNIFORM AMBIENT

  Vertical diffusivity (initial value)   = 0.253E-01 m^2/s
  Horizontal diffusivity (initial value) = 0.633E-01 m^2/s

 Profile definitions:
   BV = Gaussian s.d.*sqrt(pi/2) (46%) thickness, measured vertically
      = or equal to water depth, if fully mixed
   BH = Gaussian s.d.*sqrt(pi/2) (46%) half-width,
        measured horizontally in Y-direction
   S  = hydrodynamic centerline dilution
   C  = centerline concentration (includes reaction efects, if any)
   TT = Cumulative travel time

 Plume Stage 2 (bank attached):
      X        Y        Z        S        C        BV       BH        TT
   625.97     0.00     0.00     45.7 0.225E+00   2.49    86.82 .10832E+04
```

```
 Plume interacts with BOTTOM.
 The passive diffusion plume becomes VERTICALLY FULLY MIXED within this
   prediction interval.
    844.67    -0.00    0.00    45.9 0.224E+00   2.49    87.28 .14795E+04
   1063.37    -0.00    0.00    46.2 0.222E+00   2.49    87.73 .18758E+04
   1282.07    -0.00    0.00    46.4 0.221E+00   2.49    88.17 .22721E+04
 The passive diffusion plume becomes LATERALLY FULLY MIXED over the channel
   width during the current prediction interval.
   1500.77    -0.00    0.00    46.7 0.220E+00   2.49    88.60 .26685E+04
 Effluent is FULLY MIXED over the entire channel cross-section.
 Except for possible far-field decay or reaction processes, there are
   NO FURTHER CHANGES with downstream direction.
   1719.48    -0.00    0.00    46.6 0.219E+00   2.49    88.60 .30648E+04
   1938.18    -0.00    0.00    46.6 0.219E+00   2.49    88.60 .34611E+04
   2156.88    -0.00    0.00    46.6 0.219E+00   2.49    88.60 .38574E+04
   2375.58    -0.00    0.00    46.6 0.219E+00   2.49    88.60 .42537E+04
   2594.28    -0.00    0.00    46.6 0.219E+00   2.49    88.60 .46501E+04
   2812.98    -0.00    0.00    46.6 0.218E+00   2.49    88.60 .50464E+04
   3031.69    -0.00    0.00    46.6 0.218E+00   2.49    88.60 .54427E+04
   3250.39    -0.00    0.00    46.6 0.218E+00   2.49    88.60 .58390E+04
   3469.09    -0.00    0.00    46.6 0.218E+00   2.49    88.60 .62353E+04
   3687.79    -0.00    0.00    46.6 0.218E+00   2.49    88.60 .66317E+04
   3906.49    -0.00    0.00    46.6 0.218E+00   2.49    88.60 .70280E+04
   4125.19    -0.00    0.00    46.6 0.217E+00   2.49    88.60 .74243E+04
   4343.90    -0.00    0.00    46.6 0.217E+00   2.49    88.60 .78206E+04
   4562.60    -0.00    0.00    46.6 0.217E+00   2.49    88.60 .82169E+04
   4781.30    -0.00    0.00    46.6 0.217E+00   2.49    88.60 .86133E+04
   5000.00    -0.00    0.00    46.6 0.217E+00   2.49    88.60 .90096E+04
 Cumulative travel time =        9009.5811 sec  (    2.50 hrs)

 Simulation limit based on maximum specified distance =   5000.00 m.
   This is the REGION OF INTEREST limitation.

END OF MOD361: PASSIVE AMBIENT MIXING IN UNIFORM AMBIENT
--------------------------------------------------------------------------------

--------------------------------------------------------------------------------

CORMIX3: Buoyant Surface Discharges                    End of Prediction File
3333333333333333333333333333333333333333333333333333333333333333333333333333333
```

```
CORMIX SESSION REPORT:
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
                      CORMIX MIXING ZONE EXPERT SYSTEM
                          CORMIX Version 11.0GT
                       HYDRO3:Version-11.0.0.0  April,2018
 SITE NAME/LABEL:                Augusta Mill Outrall 001
   DESIGN CASE:                  Augusta 001 JUL Future Conditions
   FILE NAME:                    C:\Users\JLebo\Documents\CORMIX Model Runs\Augusta
Mill\AU-JUL1F.prd
   Using subsystem CORMIX3:     Buoyant Surface Discharges
   Start of session:             06/07/2018--17:22:49
*******************************************************************************
 SUMMARY OF INPUT DATA:
 ------------------------------------------------------------------------------
 AMBIENT PARAMETERS:
   Cross-section                          = bounded
   Width                          BS      = 88.70 m
   Channel regularity             ICHREG  = 2
   Ambient flowrate               QA      = 119.27 m^3/s
   Average depth                  HA      = 2.49 m
   Depth at discharge             HD      = 2.49 m
   Ambient velocity               UA      = 0.54 m/s
   Darcy-Weisbach friction factor F       = 0.0709
     Calculated from Manning's n          = 0.035
   Wind velocity                  UW      = 2 m/s
   Stratification Type            STRCND  = U
   Surface temperature                    = 20.70 degC
   Bottom temperature                     = 20.70 degC
   Calculated FRESH-WATER DENSITY values:
   Surface density                RHOAS   = 998.0580 kg/m^3
   Bottom density                 RHOAB   = 998.0580 kg/m^3
 ------------------------------------------------------------------------------
 DISCHARGE PARAMETERS:            Surface Discharge
   Discharge located on                   = right bank/shoreline
   Discharge configuration                = flush discharge
   Distance from bank to outlet   DISTB   = 0 m
   Discharge angle                SIGMA   = 90 deg
   Depth near discharge outlet    HD0     = 2.49 m
   Bottom slope at discharge      SLOPE   = 0 deg
   Circular pipe diameter                 = 1.22 m
     Equivalent rectangular discharge:
     Discharge cross-section area A0      = 1.168987 m^2
     Discharge channel width      B0      = 0.649437 m
     Discharge channel depth      H0      = 1.8 m
     Discharge aspect ratio       AR      = 2.771631
   Discharge flowrate             Q0      = 2.7 m^3/s
   Discharge velocity             U0      = 2.31 m/s
   Discharge density              RHO0    = 995.1800 kg/m^3
```

```
   Density difference                DRHO    = 2.8780 kg/m^3
   Buoyant acceleration              GP0     = 0.0283 m/s^2
   Discharge concentration           C0      = 13.700000 deg.C
   Surface heat exchange coeff.      KS      = 0.000005 m/s
   Coefficient of decay              KD      = 0 /s
-------------------------------------------------------------------------
DISCHARGE/ENVIRONMENT LENGTH SCALES:
  LQ  = 1.08 m         Lm  = 4.62 m          Lbb = 0.48 m
  LM  = 14.28 m
-------------------------------------------------------------------------
NON-DIMENSIONAL PARAMETERS:
  Densimetric Froude number         FR0     = 13.21 (based on LQ)
  Channel densimetric Froude no.    FRCH    = 10.24 (based on H0)
  Velocity ratio                    R       = 4.28
-------------------------------------------------------------------------
MIXING ZONE / TOXIC DILUTION ZONE / AREA OF INTEREST PARAMETERS:
  Toxic discharge                           = no
  Water quality standard specified          = yes
  Water quality standard            CSTD    = 2.78 deg.C
  Regulatory mixing zone                    = no
  Region of interest                        = 5000 m downstream
*************************************************************************
HYDRODYNAMIC CLASSIFICATION:
  *-----------------------*
  | FLOW CLASS   = SA2 |
  *-----------------------*

  Limiting Dilution S = (QA/Q0)+ 1.0 = 45.2

*************************************************************************
MIXING ZONE EVALUATION (hydrodynamic and regulatory summary):

-------------------------------------------------------------------------
X-Y-Z Coordinate system:
Origin is located at WATER SURFACE and at centerline of discharge channel:
    0 m from the right bank/shore.
  Number of display steps NSTEP = 20 per module.
-------------------------------------------------------------------------
NEAR-FIELD REGION (NFR) CONDITIONS :
Note: The NFR is the zone of strong initial mixing.  It has no regulatory
  implication.  However, this information may be useful for the discharge
  designer because the mixing in the NFR is usually sensitive to the
  discharge design conditions.
  Pollutant concentration at NFR edge  c = 1.4273 deg.C
  Dilution at edge of NFR              s = 9.6
  NFR Location:                        x = 113.25 m
    (centerline coordinates)           y = 0 m
                                       z = 0 m
```

```
   NFR plume dimensions:  half-width (bh) = 14.22 m
                           thickness (bv) = 3.09 m
 Cumulative travel time:       170.2161 sec.
--------------------------------------------------------------------------------
 Buoyancy assessment:
   The effluent density is less than the surrounding ambient water
   density at the discharge level.
   Therefore, the effluent is POSITIVELY BUOYANT and will tend to rise towards
   the surface.
--------------------------------------------------------------------------------
 FAR-FIELD MIXING SUMMARY:
   Plume is vertically fully mixed WITHIN NEAR-FIELD (or a fraction thereof),
   but RE-STRATIFIES LATER.
   Plume becomes vertically fully mixed again at 912.90 m downstream.
--------------------------------------------------------------------------------
 PLUME BANK CONTACT SUMMARY:
   Plume in bounded section contacts nearest bank at 0 m downstream.
   Plume contacts second bank at 458.78 m downstream.
************************ TOXIC DILUTION ZONE SUMMARY ************************
No TDZ was specified for this simulation.
********************** REGULATORY MIXING ZONE SUMMARY ***********************
No RMZ has been specified.
However:
The ambient water quality standard was encountered at the following
  plume position:
  Water quality standard                  = 2.78  deg.C
  Corresponding dilution                s = 4.9
  Plume location:                       x = 67.80 m
    (centerline coordinates)            y = 19.16 m
                                        z = 0 m
  Plume dimensions:       half-width (bh) = 3.37 m
                           thickness (bv) = 2.49 m
********************** FINAL DESIGN ADVICE AND COMMENTS **********************
REMINDER:  The user must take note that HYDRODYNAMIC MODELING by any known
  technique is NOT AN EXACT SCIENCE.
Extensive comparison with field and laboratory data has shown that the
  CORMIX predictions on dilutions and concentrations (with associated
  plume geometries) are reliable for the majority of cases and are accurate
  to within about +-50% (standard deviation).
As a further safeguard, CORMIX will not give predictions whenever it judges
  the design configuration as highly complex and uncertain for prediction.
```

```
CORMIX SESSION REPORT:
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
                      CORMIX MIXING ZONE EXPERT SYSTEM
                          CORMIX Version 11.0GT
                       HYDRO3:Version-11.0.0.0  April,2018
 SITE NAME/LABEL:                Augusta Mill Outrall 001
   DESIGN CASE:                  Augusta 001 JUL Future Conditions 90 deg
   FILE NAME:                    C:\Users\JLebo\Documents\CORMIX Model Runs\Augusta
 Mill\AU-JUL2F.prd
   Using subsystem CORMIX3:     Buoyant Surface Discharges
   Start of session:             06/08/2018--09:31:47
*******************************************************************************
 SUMMARY OF INPUT DATA:
 -----------------------------------------------------------------------------
 AMBIENT PARAMETERS:
   Cross-section                          = bounded
   Width                         BS       = 88.70 m
   Channel regularity            ICHREG   = 2
   Ambient flowrate              QA       = 119.27 m^3/s
   Average depth                 HA       = 2.49 m
   Depth at discharge            HD       = 2.49 m
   Ambient velocity              UA       = 0.54 m/s
   Darcy-Weisbach friction factor F       = 0.0709
     Calculated from Manning's n          = 0.035
   Wind velocity                 UW       = 2 m/s
   Stratification Type           STRCND   = U
   Surface temperature                    = 24 degC
   Bottom temperature                     = 24 degC
   Calculated FRESH-WATER DENSITY values:
   Surface density               RHOAS    = 997.2973 kg/m^3
   Bottom density                RHOAB    = 997.2973 kg/m^3
 -----------------------------------------------------------------------------
 DISCHARGE PARAMETERS:           Surface Discharge
   Discharge located on                   = right bank/shoreline
   Discharge configuration                = flush discharge
   Distance from bank to outlet  DISTB    = 0 m
   Discharge angle               SIGMA    = 90 deg
   Depth near discharge outlet   HD0      = 2.49 m
   Bottom slope at discharge     SLOPE    = 0 deg
   Circular pipe diameter                 = 1.22 m
     Equivalent rectangular discharge:
     Discharge cross-section area A0      = 1.168987 m^2
     Discharge channel width      B0      = 0.649437 m
     Discharge channel depth      H0      = 1.8 m
     Discharge aspect ratio       AR      = 2.771631
   Discharge flowrate            Q0       = 2.7 m^3/s
   Discharge velocity            U0       = 2.31 m/s
   Discharge density             RHO0     = 995.1800 kg/m^3
```

```
   Density difference                DRHO    = 2.1173 kg/m^3
   Buoyant acceleration              GP0     = 0.0208 m/s^2
   Discharge concentration           C0      = 10.4 deg.C
   Surface heat exchange coeff.      KS      = 0.000006 m/s
   Coefficient of decay              KD      = 0 /s
-------------------------------------------------------------------------
DISCHARGE/ENVIRONMENT LENGTH SCALES:
   LQ  = 1.08 m          Lm  = 4.62 m          Lbb = 0.36 m
   LM  = 16.64 m
-------------------------------------------------------------------------
NON-DIMENSIONAL PARAMETERS:
   Densimetric Froude number         FR0     = 15.39 (based on LQ)
   Channel densimetric Froude no.    FRCH    = 11.93 (based on H0)
   Velocity ratio                    R       = 4.28
-------------------------------------------------------------------------
MIXING ZONE / TOXIC DILUTION ZONE / AREA OF INTEREST PARAMETERS:
   Toxic discharge                           = no
   Water quality standard specified          = yes
   Water quality standard            CSTD    = 8.300000 deg.C
   Regulatory mixing zone                    = no
   Region of interest                        = 5000 m downstream
*************************************************************************
HYDRODYNAMIC CLASSIFICATION:
   *-----------------------*
   | FLOW CLASS   = SA2 |
   *-----------------------*

   Limiting Dilution S = (QA/Q0)+ 1.0 = 45.2

*************************************************************************
MIXING ZONE EVALUATION (hydrodynamic and regulatory summary):

-------------------------------------------------------------------------
X-Y-Z Coordinate system:
Origin is located at WATER SURFACE and at centerline of discharge channel:
     0 m from the right bank/shore.
   Number of display steps NSTEP = 20 per module.
-------------------------------------------------------------------------
NEAR-FIELD REGION (NFR) CONDITIONS :
Note: The NFR is the zone of strong initial mixing.  It has no regulatory
   implication.  However, this information may be useful for the discharge
   designer because the mixing in the NFR is usually sensitive to the
   discharge design conditions.
   Pollutant concentration at NFR edge  c = 1.4995 deg.C
   Dilution at edge of NFR              s = 6.9
   NFR Location:                        x = 125.21 m
     (centerline coordinates)           y = 0 m
                                        z = 0 m
```

```
  NFR plume dimensions:  half-width (bh) = 11.67 m
                          thickness (bv) = 2.49 m
Cumulative travel time:       172.1961 sec.
-------------------------------------------------------------------------
Buoyancy assessment:
  The effluent density is less than the surrounding ambient water
  density at the discharge level.
  Therefore, the effluent is POSITIVELY BUOYANT and will tend to rise towards
  the surface.
-------------------------------------------------------------------------
FAR-FIELD MIXING SUMMARY:
  Plume is vertically fully mixed WITHIN NEAR-FIELD (or a fraction thereof),
  but RE-STRATIFIES LATER.
  Plume becomes vertically fully mixed again at 836.81 m downstream.
-------------------------------------------------------------------------
PLUME BANK CONTACT SUMMARY:
  Plume in bounded section contacts nearest bank at 0 m downstream.
  Plume contacts second bank at 617.69 m downstream.
********************** TOXIC DILUTION ZONE SUMMARY **********************
No TDZ was specified for this simulation.
********************** REGULATORY MIXING ZONE SUMMARY **********************
No RMZ has been specified.
However:
The ambient water quality standard was encountered at the following
  plume position:
  Water quality standard                  = 8.300000  deg.C
  Corresponding dilution              s = 1.3          CORMIX incorrectly reported
  Plume location:                     x = 19.00 m      values for meeting the
    (centerline coordinates)          y = 4.96 m       temperature criterion in the
                                      z = 0 m          session report file.  See
  Plume dimensions:      half-width (bh) = 1.47 m      attached prediction file.
                          thickness (bv) = 1.88 m
********************** FINAL DESIGN ADVICE AND COMMENTS **********************
REMINDER:  The user must take note that HYDRODYNAMIC MODELING by any known
  technique is NOT AN EXACT SCIENCE.
Extensive comparison with field and laboratory data has shown that the
  CORMIX predictions on dilutions and concentrations (with associated
  plume geometries) are reliable for the majority of cases and are accurate
  to within about +-50% (standard deviation).
As a further safeguard, CORMIX will not give predictions whenever it judges
  the design configuration as highly complex and uncertain for prediction.
```

```
 CORMIX3 PRESICTION FILE:
 3333333333333333333333333333333333333333333333333333333333333333333333333333333333333333333333333
                        CORMIX MIXING ZONE EXPERT SYSTEM
                  Subsystem CORMIX3: Buoyant Surface Discharges
                              CORMIX Version 11.0GT
                          HYDRO3 Version 11.0.0.0 April 2018
 ------------------------------------------------------------------------------

 ------------------------------------------------------------------------------

 CASE DESCRIPTION
  Site name/label:   Augusta Mill Outrall 001
  Design case:       Augusta 001 JUL Future Conditions 90 deg
  FILE NAME:         C:\...ments\CORMIX Model Runs\Augusta Mill\AU-JUL2F.prd
  Time stamp:        06/08/2018--09:31:47

 ENVIRONMENT PARAMETERS (metric units)
  Bounded section
  BS    =     88.70 AS    =    220.86 QA    =    119.27 ICHREG= 2
  HA    =      2.49 HD    =      2.49
  UA    =     0.540 F     =     0.071 USTAR =0.5085E-01
  UW    =     2.000 UWSTAR=0.2198E-02
  Uniform density environment
  STRCND=  U         RHOAM =  997.2973

 DISCHARGE PARAMETERS (metric units)
  BANK  =  RIGHT     DISTB =     0.00  Configuration: flush_discharge
  SIGMA =    90.00   HD0   =     2.49  SLOPE =    0.00 deg.
  Circular discharge pipe:
  D0    =     1.220 A0    =     1.169
  Dimensions of equivalent rectangular discharge:
  B0    =     0.649 H0    =     1.800 A0    =0.1169E+01  AR    =     2.772
  U0    =     2.310 Q0    =     2.700       =0.2700E+01
  RHO0  =  995.1800  DRHO0 =0.2117E+01  GP0   =0.2082E-01
  C0    =0.1040E+02  CUNITS=  deg.C
  IPOLL =  3         KS    =0.5732E-05  KD    =0.0000E+00

 FLUX VARIABLES (metric units)
  Q0    =0.2700E+01  M0    =0.6236E+01  J0    =0.5621E-01
  Associated length scales (meters)
  LQ    =     1.08   LM    =    16.64   Lm    =     4.62  Lb    =     0.36
  LQ2D  =     0.47   LM2D  =    31.35   Lm2D  =     8.59

 NON-DIMENSIONAL PARAMETERS
  FR0   =    15.39  FRCH  =    11.93  R     =     4.28

 FLOW CLASSIFICATION
  333333333333333333333333333333333333333333
```

```
 3  Flow class (CORMIX3)      =    SA2    3
 3  Applicable layer depth HS =     2.49  3
 3  Limiting Dilution S =QA/Q0=    45.17  3
 333333333333333333333333333333333333333333

MIXING ZONE / TOXIC DILUTION / REGION OF INTEREST PARAMETERS
 C0    =0.1040E+02  CUNITS=  deg.C
 NTOX  =  0
 NSTD  =  1         CSTD  =0.8300E+01
 REGMZ =  0
 XINT  =   5000.00  XMAX  =   5000.00

X-Y-Z COORDINATE SYSTEM:
    ORIGIN is located at the WATER SURFACE and at center of discharge
      channel/outlet:      0.00 m  from the RIGHT bank/shore.
    X-axis points downstream
    Y-axis points to left as seen by an observer looking downstream
    Z-axis points vertically upward (in CORMIX3, all values Z = 0.00)
NSTEP =  20 display intervals per module
-------------------------------------------------------------------------------


NOTE on dilution/concentration values for this HEATED DISCHARGE (IPOLL=3):
   S  = hydrodynamic dilutions, include buoyancy (heat) loss effects
   C  = corresponding temperature values (in "deg.C"!) include heat loss
-------------------------------------------------------------------------------

BEGIN MOD301: DISCHARGE MODULE

 Efflux conditions:
      X        Y        Z        S        C        BV       BH       UC        TT
   0.00     0.00     0.00     1.0 0.104E+02   1.80     0.32     2.310   .00000E+00

END OF MOD301: DISCHARGE MODULE
-------------------------------------------------------------------------------

-------------------------------------------------------------------------------

BEGIN MOD302: ZONE OF FLOW ESTABLISHMENT

  Control volume inflow:
      X        Y        Z        S        C        BV       BH       UC        TT
   0.00     0.00     0.00     1.0 0.104E+02   1.80     0.32     2.310   .00000E+00

 Profile definitions:
   BV = Gaussian 1/e (37%) vertical thickness
   BH = Gaussian 1/e (37%) horizontal half-width, normal to trajectory
   S  = hydrodynamic centerline dilution
```

C = centerline concentration (includes reaction efects, if any)
Uc = Local centerline excess velocity (above ambient)
TT = Cumulative travel time

Control volume outflow: SIGMAE= 74.25

X	Y	Z	S	C	BV	BH	UC	TT
0.18	4.67	0.00	1.0	0.104E+02	1.41	0.74	2.310	.20224E+01

Cumulative travel time = 2.0224 sec (0.00 hrs)

END OF MOD302: ZONE OF FLOW ESTABLISHMENT

BEGIN CORSURF (MOD310): BUOYANT SURFACE JET - NEAR-FIELD REGION

Surface jet in shallow crossflow with shoreline-attachment.

Profile definitions:
BV = Gaussian 1/e (37%) vertical thickness
BH = Gaussian 1/e (37%) horizontal half-width, normal to trajectory
S = hydrodynamic centerline dilution
C = centerline concentration (includes reaction efects, if any)
Uc = Local centerline excess velocity (above ambient)
TT = Cumulative travel time

X	Y	Z	S	C	BV	BH	UC	TT
0.18	4.67	0.00	1.0	0.104E+02	1.41	0.74	2.449	.20224E+01

** WATER QUALITY STANDARD OR CCC HAS BEEN FOUND **
The pollutant concentration in the plume falls below water quality standard or CCC value of 0.830E+01 in the current prediction interval.
This is the spatial extent of concentrations exceeding the water quality standard or CCC value.
Jet/plume becomes VERTICALLY FULLY MIXED over the local ambient water depth.
BV = water depth (vertically mixed)

1.50	7.04	0.00	2.1	0.494E+01	2.54	1.34	0.869	.34598E+01
4.91	10.14	0.00	2.4	0.435E+01	2.49	1.55	0.708	.75085E+01
10.55	13.31	0.00	2.7	0.389E+01	2.49	1.81	0.496	.13674E+02
16.61	15.57	0.00	3.0	0.352E+01	2.49	2.04	0.394	.20544E+02
22.87	17.20	0.00	3.3	0.313E+01	2.49	2.24	0.333	.27888E+02
29.24	18.37	0.00	3.6	0.286E+01	2.49	2.43	0.293	.35583E+02
35.66	19.16	0.00	3.9	0.267E+01	2.49	2.60	0.264	.43553E+02
42.58	19.65	0.00	4.2	0.250E+01	2.49	2.77	0.241	.52338E+02
49.05	19.81	0.00	4.4	0.239E+01	2.49	2.92	0.225	.60729E+02

Maximum lateral extent of recirculation bubble.

55.53	19.70	0.00	4.6	0.228E+01	2.49	3.07	0.211	.69280E+02
61.99	19.34	0.00	4.7	0.219E+01	2.49	3.21	0.201	.77975E+02
68.44	18.74	0.00	4.9	0.211E+01	2.49	3.34	0.192	.86806E+02

```
    74.86    17.91    0.00     5.1 0.203E+01   2.49     3.47    0.184  .95764E+02
    81.25    16.86    0.00     5.3 0.195E+01   2.49     3.60    0.178  .10484E+03
    88.05    15.51    0.00     5.5 0.188E+01   2.49     3.73    0.172  .11470E+03
    94.36    14.05    0.00     5.7 0.181E+01   2.49     3.86    0.168  .12401E+03
   100.62    12.41    0.00     5.9 0.175E+01   2.49     3.98    0.164  .13342E+03
   106.83    10.59    0.00     6.1 0.169E+01   2.49     4.11    0.161  .14294E+03
   113.00     8.62    0.00     6.3 0.164E+01   2.49     4.24    0.158  .15255E+03
   119.12     6.50    0.00     6.6 0.159E+01   2.49     4.36    0.156  .16226E+03
   124.75     4.40    0.00     6.7 0.154E+01   2.49     4.48    0.154  .17066E+03
  End of recirculation bubble at the above position.
   Dilution in recirculation bubble =    8.6
   Corresponding concentration      =    0.121E+01
  Flow continues as WALL JET/PLUME.
   125.21     0.00    0.00     6.9 0.150E+01   2.49     8.97    0.103  .17138E+03
  Jet/plume RESTRATIFIES at the above position.
     BV = Gaussian 1/e (37%) vertical thickness
   125.21     0.00    0.00     6.9 0.150E+01   2.49    11.67    0.026  .17220E+03
 Cumulative travel time =         172.1961 sec  (    0.05 hrs)

END OF CORSURF (MOD310): BUOYANT SURFACE JET - NEAR-FIELD REGION
------------------------------------------------------------------------------

------------------------------------------------------------------------------

** End of NEAR-FIELD REGION (NFR) **
------------------------------------------------------------------------------


 The initial plume WIDTH/THICKNESS VALUE in the next far-field module will be
  CORRECTED by a factor  1.17 to conserve the mass flux in the far-field!

 Some lateral bank/shore interaction occurs at end othe near-field.

 In the next prediction module, the jet/plume centerline will be set
   to follow the bank/shore.
------------------------------------------------------------------------------

BEGIN MOD341: BUOYANT AMBIENT SPREADING

 Plume is ATTACHED to RIGHT bank/shore.
   Plume width is now determined from RIGHT bank/shore.

 Profile definitions:
   BV = top-hat thickness,measured vertically
   BH = top-hat half-width, measured horizontally from bank/shoreline
   S  = hydrodynamic average (bulk) dilution
   C  = average (bulk) concentration (includes reaction effects, if any)
   TT = Cumulative travel time
```

```
 Plume Stage 2 (bank attached):
      X        Y        Z        S        C        BV       BH        TT
   125.21     0.00     0.00      6.9 0.150E+01   2.49    13.62 .17220E+03
   149.84    -0.00     0.00      7.8 0.134E+01   1.89    20.07 .21679E+03
   174.46    -0.00     0.00      8.5 0.123E+01   1.62    25.59 .26138E+03
   199.08    -0.00     0.00      9.2 0.113E+01   1.47    30.56 .30597E+03
   223.71    -0.00     0.00      9.9 0.105E+01   1.38    35.15 .35056E+03
   248.33    -0.00     0.00     10.8 0.966E+00   1.33    39.45 .39515E+03
   272.96    -0.00     0.00     11.7 0.887E+00   1.32    43.52 .43974E+03
   297.58    -0.00     0.00     12.8 0.813E+00   1.32    47.40 .48433E+03
   322.20    -0.00     0.00     14.0 0.742E+00   1.34    51.13 .52892E+03
   346.83    -0.00     0.00     15.3 0.677E+00   1.37    54.72 .57351E+03
   371.45    -0.00     0.00     16.8 0.617E+00   1.42    58.19 .61810E+03
   396.08    -0.00     0.00     18.5 0.562E+00   1.47    61.57 .66269E+03
   420.70    -0.00     0.00     20.3 0.511E+00   1.53    64.85 .70728E+03
   445.32    -0.00     0.00     22.3 0.466E+00   1.60    68.05 .75187E+03
   469.95    -0.00     0.00     24.5 0.424E+00   1.68    71.18 .79646E+03
   494.57    -0.00     0.00     26.8 0.387E+00   1.77    74.24 .84105E+03
   519.20    -0.00     0.00     29.3 0.354E+00   1.86    77.24 .88564E+03
   543.82    -0.00     0.00     32.1 0.324E+00   1.96    80.18 .93023E+03
   568.44    -0.00     0.00     35.0 0.297E+00   2.06    83.07 .97483E+03
   593.07    -0.00     0.00     38.1 0.273E+00   2.17    85.91 .10194E+04
   617.69    -0.00     0.00     41.4 0.251E+00   2.28    88.70 .10640E+04
 Cumulative travel time =        1064.0063 sec  (    0.30 hrs)
 Plume is LATERALLY FULLY MIXED at the end of the buoyant spreading regime.

END OF MOD341: BUOYANT AMBIENT SPREADING
-------------------------------------------------------------------------------

-------------------------------------------------------------------------------

BEGIN MOD361: PASSIVE AMBIENT MIXING IN UNIFORM AMBIENT

  Vertical diffusivity (initial value)   = 0.253E-01 m^2/s
  Horizontal diffusivity (initial value) = 0.633E-01 m^2/s

 Profile definitions:
   BV = Gaussian s.d.*sqrt(pi/2) (46%) thickness, measured vertically
      = or equal to water depth, if fully mixed
   BH = Gaussian s.d.*sqrt(pi/2) (46%) half-width,
        measured horizontally in Y-direction
   S  = hydrodynamic centerline dilution
   C  = centerline concentration (includes reaction efects, if any)
   TT = Cumulative travel time

 Plume Stage 2 (bank attached):
      X        Y        Z        S        C        BV       BH        TT
```

```
   617.69     0.00     0.00     41.4 0.251E+00    2.28     88.70 .10640E+04
 Plume interacts with BOTTOM.
 The passive diffusion plume becomes VERTICALLY FULLY MIXED within this
   prediction interval.
   836.81    -0.00     0.00     45.2 0.230E+00    2.49     88.70 .14608E+04
 Effluent is FULLY MIXED over the entire channel cross-section.
 Except for possible far-field decay or reaction processes, there are
   NO FURTHER CHANGES with downstream direction.
  1055.92    -0.00     0.00     45.2 0.229E+00    2.49     88.70 .18576E+04
  1275.04    -0.00     0.00     45.2 0.229E+00    2.49     88.70 .22544E+04
  1494.15    -0.00     0.00     45.2 0.229E+00    2.49     88.70 .26512E+04
  1713.27    -0.00     0.00     45.2 0.229E+00    2.49     88.70 .30479E+04
  1932.38    -0.00     0.00     45.2 0.228E+00    2.49     88.70 .34447E+04
  2151.50    -0.00     0.00     45.2 0.228E+00    2.49     88.70 .38415E+04
  2370.61    -0.00     0.00     45.2 0.228E+00    2.49     88.70 .42383E+04
  2589.73    -0.00     0.00     45.2 0.228E+00    2.49     88.70 .46351E+04
  2808.85    -0.00     0.00     45.2 0.228E+00    2.49     88.70 .50319E+04
  3027.96    -0.00     0.00     45.2 0.227E+00    2.49     88.70 .54287E+04
  3247.08    -0.00     0.00     45.2 0.227E+00    2.49     88.70 .58254E+04
  3466.19    -0.00     0.00     45.2 0.227E+00    2.49     88.70 .62222E+04
  3685.31    -0.00     0.00     45.2 0.227E+00    2.49     88.70 .66190E+04
  3904.42    -0.00     0.00     45.2 0.227E+00    2.49     88.70 .70158E+04
  4123.54    -0.00     0.00     45.2 0.226E+00    2.49     88.70 .74126E+04
  4342.65    -0.00     0.00     45.2 0.226E+00    2.49     88.70 .78094E+04
  4561.77    -0.00     0.00     45.2 0.226E+00    2.49     88.70 .82062E+04
  4780.88    -0.00     0.00     45.2 0.226E+00    2.49     88.70 .86030E+04
  5000.00    -0.00     0.00     45.2 0.226E+00    2.49     88.70 .89997E+04
 Cumulative travel time =        8999.7393 sec  (    2.50 hrs)

 Simulation limit based on maximum specified distance =   5000.00 m.
   This is the REGION OF INTEREST limitation.

END OF MOD361: PASSIVE AMBIENT MIXING IN UNIFORM AMBIENT
-------------------------------------------------------------------------------

-------------------------------------------------------------------------------

CORMIX3: Buoyant Surface Discharges                    End of Prediction File
333333333333333333333333333333333333333333333333333333333333333333333333333333
```

GEORGIA
DEPARTMENT OF NATURAL RESOURCES
ENVIRONMENTAL PROTECTION DIVISION

Richard E. Dunn, Director

Watershed Protection Branch
7 Martin Luther King, Jr. Drive
Suite 450
Atlanta, Georgia 30334
404-463-1511

MEMORANDUM

Date: December 17, 2018

To: Audra Dickson

Through: Elizabeth Booth EB
Josh Welte JW

From: Lucy Sun LS

Subject: **Thermal Mixing Zone Analysis**
Graphic Packaging International – Augusta Mill (GA0002801)
Savannah River, Richmond County, WQMU 0191

Introduction

This memorandum responds to a thermal modeling reviewing request from Christopher Douglas of the Wastewater Regulatory Program (WRP) for the Graphic Packaging International (GPI) – Augusta Mill having National Pollutant Discharge Elimination System (NPDES) permit GA0002801. This memorandum summarizes the issues involving the study report.

Background and Relevant Issues

GPI is an integrated kraft pulp and paper complex that produces various types of bleached paperboard. The wastewater from its Augusta Mill consists of comingled sanitary wastewater and process wastewater from GPI and from the adjacent Resolute Forest Products that produces newsprint. The treated wastewater is conveyed through a 48-inch diameter pipe and discharged into the Savannah River with a design flow rate of 74.7 million gallons per day (MGD). GPI – Augusta Mill conducted a thermal mixing zone study using the EPA-approved near-field model, CORMIX (version 11.0) to model its effluent thermal plumes. This study report, along with the model input data has been submitted to the GA EPD for review.

GPI – Augusta Mill is located along the Savannah River in Richmond County. The receiving stream segment at the outfall is on Georgia's 2016 305(b)/303(d) list as supporting its designated use of Fishing. Instream flow at GPI – Augusta Mill is impacted by minimum release of the water-regulating dam upstream. The estimated 1Q10, 7Q10, 30Q3, and average annual stream flows are 3720, 3720, 4450, and 8800 cubic feet per second (cfs), respectively.

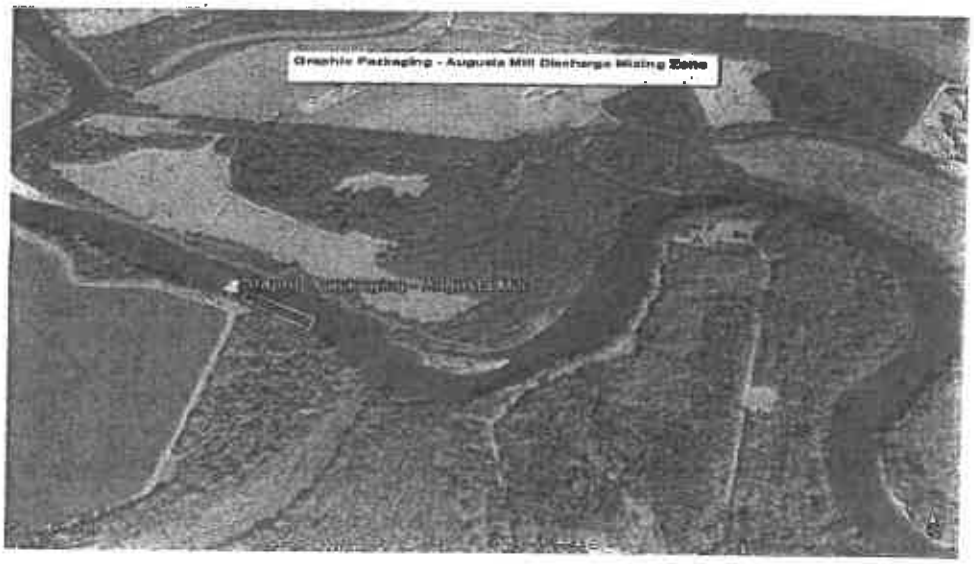
GPI – Augusta Mill's thermal mixing zone study was conducted utilizing monthly parameters, including monthly river flows and temperatures and monthly effluent flows and temperatures. Our review utilized annual 7Q10 streamflow and the facility's design flow. Applicable instream temperature criteria are a maximum of 90°F and a ΔT of no more than 5°F above intake temperature. The main parameters utilized in the analysis are listed in the following table.

Summary of Parameter

Parameter	Value
Maximum Effluent Flow Rate (cfs)	115
Effluent Temperature – Summer (^{0}F)	93.9
Effluent Temperature – Winter (^{0}F)	64.0
Ambient Stream Temperature – Summer (^{0}F)	69.3
Ambient Stream Temperature – Winter (^{0}F)	44.8
7Q10 Streamflow (cfs)	3720
Channel Depth at Discharge (ft)	8.2
Channel Width (ft)	291

Recommended Permit Limits Methodology

Analyses show that all applicable temperature criteria should be met outside of a zone having dimensions of approximately 205 ft downstream and 27 ft across at the downstream extent. The figure below illustrates the general extent of the thermal plume.



Attachment: GPI – Augusta Mill Thermal Mixing Zone Report

Appendix F

Certified Chlorophenolic and Zinc Hydrosulfide Letter

Graphic Packaging INTERNATIONAL

Augusta Mill
4276 Mike Padgett Highway
Augusta, Georgia 30906

September 13, 2018

Attention: Mr. Christopher Douglas
Georgia Environmental Protection Division
Watershed Protection Branch
2 Martin Luther King Jr Drive, Suite 1152E
Atlanta, GA 30334

RE: Certification Chlorophenolic Statement – 40 CFR 430 Subpart G

Dear Mr. Douglas:

Graphic Packaging International (GPI) - Augusta Mill is providing this letter as certification that pentachlorophenol-containing and trichlorophenol-containing compounds are not used as biocides at the Augusta Mill as allowed at 40 CFR 430.24(d). This certification is based on a review of vendor provided SDS information for biocides used at the GPI-Augusta Mill.

In addition, GPI-Augusta Mill has obtained a similar certification from Resolute Forests Products (RFP) – Augusta Mill whose effluent is treated in the GPI-Augusta Mill wastewater treatment system. RFP-Augusta Mill has provided certification that it does not use pentachlorophenol or trichlorophenol compounds as biocides. RFP-Augusta Mill has also provided certification that it does not use zinc hydrosulfite for bleaching in its manufacturing process as allowed at 40 CFR 430.74(a).

If you have any questions or require further information, please contact Donna Byrdy at 706-796-5620 or electronically at donna.byrdy@graphicpkg.com.

Sincerely,

Dean Messner
EHS Manager

Appendix G

Chloroform Exemption EPD Approval Letter

Georgia Department of Natural Resources
Environmental Protection Division, Water Protection Branch
4220 International Parkway, Suite 101, Atlanta, Georgia 30354
Permitting, Compliance and Enforcement Program
404/362-2680
FAX: 404/362-2691

February 25, 2004

RETAIN UNTIL SUPERCEDED BY NPDES PERMIT RENEWAL

Mr. Steve Bowden
Mill Manager
International Paper
4278 Mike Padgett Highway
PO Box 1425
Augusta, GA 30903-1425

Re: Chloroform Testing
Concurrence Letter

Dear Mr. Bowden:

We have received your December 31, 2003, letter regarding certification in lieu of monitoring for chloroform. We concur with your proposal to certify compliance with your chloroform effluent limit. If process and operating changes on the fiber line occur, the new operating values must be shown to represent compliance with the chloroform effluent limitation in NPDES Permit No GA0002801.

If you have any comments or questions, please contact Sean L. Stauffer at 404-362-2614.

Sincerely,

Michael S. Creason

Michael S. Creason, P.E.
Unit Coordinator
Industrial Wastewater Unit

MSC/sls

Appendix H

Reasonable Potential Analysis

Reasonable Potential Analysis for Freshwater

Permit Name: International Paper - Augusta Mill

NPDES Permit No. GA0002801 (Outfall 001 & 001a)

Stream Data:

Receiving stream Hardness:	14	mg/L
Upstream TSS:	10	mg/L
7Q10:	3,720.00	ft^3/s
	2,404,131,840	gal/day
1Q10:	3,720.00	ft^3/s
	2,404,131,840	gal/day

Effluent Data:

Flow	44,600,000	gal/day
TSS	429.00	mg/L

Instream TSS:	17.63	mg/L
Acute Dilution factor:	54.90	
Chronic Dilution factor:	54.90	

Water Quality Criteria:

Mean annual streamflow at discharge:	8,800.00	ft^3/s
	5,687,193,600	gal/day
Dilution factor:	128.516	
IWC	1.821350924	

$$IWC = \frac{Flow\ (^{gal}/_{day})}{Flow\ (^{gal}/_{day}) + 7Q10\ (^{gal}/_{day})}$$

Acute Water Quality Criteria (WQC_{Acute})

Metal	K_{PD}	α	f_D	Maximum effluent C_T (µg/L)	Instream C_D (µg/L)	WQC_{Acute} (µg/L)	Action needed?
Arsenic	4.80.E+05	-0.729	0.49	1.20	0.01	340.00	no
Cadmium	4.00.E+06	-1.131	0.000	0.00	0.00	0.30	no
Chromium III	3.36.E+06	-0.930	0.00	0.00	0.00	113.86	no
Chromium VI	3.36.E+06	-0.930	0.00	0.00	0.00	16.00	no
Copper	1.04.E+06	-0.744	0.32	2.60	0.01	2.11	no
Lead	2.80.E+06	-0.800	0.17	1.03	0.00	7.20	no
Mercury	2.91.E+06	-1.136	0.94	0.0044	0.0001	1.40	no
Nickel	4.80.E+05	-0.572	0.00	0.00	0.00	88.73	no
Zinc	1.25.E+06	-0.704	0.25	27.00	0.13	22.15	no

$$Acute\ Dilution\ Factor = \frac{1Q10\ (^{gal}/_{day}) + Flow\ (^{gal}/_{day})}{Flow\ (^{gal}/_{day})}$$

Chronic Water Quality Criteria ($WQC_{Chronic}$)

Metal	K_{PD}	α	f_D	Average effluent C_T (µg/L)	Instream C_D (µg/L)	$WQC_{Chronic}$ (µg/L)	Action needed?
Arsenic	4.80.E+05	-0.729	0.49	1.20	0.01	150.00	no
Cadmium	4.00.E+06	-1.131	0.000	0.00	0.00	0.06	no
Chromium III	3.36.E+06	-0.930	0.00	0.00	0.00	14.81	no
Chromium VI	3.36.E+06	-0.930	0.00	0.00	0.00	11.00	no
Copper	1.04.E+06	-0.744	0.32	2.60	0.01	1.67	no
Lead	2.80.E+06	-0.800	0.17	1.03	0.00	0.28	no
Mercury	2.91.E+06	-1.136	0.94	0.0044	0.0001	0.012	no
Nickel	4.80.E+05	-0.572	0.00	0.00	0.00	9.86	no
Zinc	1.25.E+06	-0.704	0.25	27.00	0.13	22.33	no
Selenium	NA	NA	NA	0.00	0.00	5.00	no

$$f_D = \frac{1}{1 + K_{PD} \times TSS_{Instream}(mg/L)^{(1+\alpha)} \times 10^{-6}}$$

$$Instream\ C_D = \frac{Effluent\ C_T\ (mg/L) \times f_D}{DF}\ mg/L$$

$$Chronic\ Dilution\ Factor = \frac{7Q10\ (^{gal}/_{day}) + Flow\ (^{gal}/_{day})}{Flow\ (^{gal}/_{day})}$$

Total Recoverable Effluent Limit

Metal	C_S (µg/L)	Chronic C_T (µg/L) 30-Day Avg	Chronic C_T (lbs/day) 30-Day Avg	Acute C_T (µg/L) Daily Max	Acute C_T (lbs/day) Daily Max
Arsenic	0.0	N/A	N/A	N/A	N/A
Cadmium	0.0	N/A	N/A	N/A	N/A
Chromium III	0.0	N/A	N/A	N/A	N/A
Chromium VI	0.0	N/A	N/A	N/A	N/A
Copper	0.0	N/A	N/A	N/A	N/A
Lead	0.0	N/A	N/A	N/A	N/A
Mercury	0.0	N/A	N/A	N/A	N/A
Nickel	0.0	N/A	N/A	N/A	N/A
Zinc	0.0	N/A	N/A	N/A	N/A
Selenium	0.0	N/A	N/A	--	--

(1)

$$Acute\ C_T = \frac{\frac{WQC_{Acute} \times (Q_E + 1Q10) - (1Q10 \times C_S)}{f_D}}{Q_E}$$

$$Chronic\ C_T = \frac{\frac{WQC_{Chronic} \times (Q_E + 7Q10) - (7Q10 \times C_S)}{f_D}}{Q_E}$$

(2)

$$Acute\ C_T = \frac{\frac{WQC_{Acute} \times (Q_E + 1Q10)}{f_D}}{Q_E}$$

$$Chronic\ C_T = \frac{\frac{WQC_{Chronic} \times (Q_E + 7Q10)}{f_D}}{Q_E}$$

NOTES:

(1) Chronic and acute total recoverable metal effluent concentration (C_T) from EPA 823-B-96-007, June 1996, page 33:

(2) Assuming background dissolved metal concentration (C_S) in the stream is 0 µg/L, equations above become:

NOTES:

*Water Quality Criteria (WQC) from State of Georgia Rules and Regulations 391-3-6-.03.

*If the calculated instream concentration is less than 50% of the instream water quality criteria, then the constituent will be considered not to be present at levels of concern in the effluent and it will not be included in the permit.

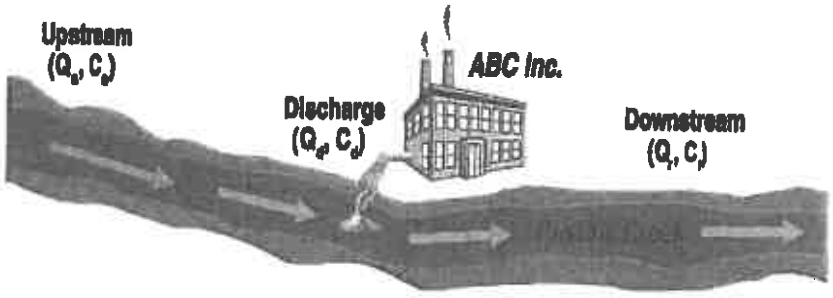
*If the calculated instream concentration is 50% or more of the instream water quality criteria, then a permit limit for that constituent will be placed in the permit.

End of report

Ammonia Reasonable Potential Analysis

General Information	Outfall 001 & 003	
Facility	Graphic Packaging International LL	
Permit #	GA0002801	
Staff	Douglas	
Date	15.Apr.18	
Upstream Conditions		**Basis**
Flow, Q_s	4450.000 cfs	30Q3 as determined by WPMP
Concentration, C_s	0.13 mg/L	background concentration generally ~0.13 mg/L or as specified by WPMP
Effluent Conditions		**Basis**
Flow, Q_d	44.600 MGD	effluent flow rate
Flow, Q_d	69.01 cfs	effluent flow rate
Concentration, C_d	2.40 mg/L	concentration
IWC	1.5 %	instream waste concentration
Predicted Downstream		**Basis**
Flow, Q_r	4519.01 cfs	calculated combined flow
Concentration, C_r	0.16 mg/L	calculated instream concentration
Applicable Criteria	1.00 mg/L	instream toxicity criteria as determined by WPMP
Ratio	16 %	predicted instream concentration as % of criteria
RP	No	is there reasonable potential to exceed criteria?
Action	None	what is appropriate permitting action?

Exhibit 6-14 Example of applying mass-balance equation to conduct reasonable potential analysis for conservative pollutant under conditions of rapid and complete mixing



Mass-Balance Equation: $Q_sC_s + Q_dC_d = Q_rC_r$

Dividing both sides of the mass-balance equation by Q_r gives the following:

$$C_r = \frac{(Q_d)(C_d)+(Q_s)(C_s)}{Q_r}$$

Appendix I

Effluent Limit Calculations

Graphic Packaging International LLC - Augusta Mill
GA0002801

Effluent Limit Calculations

	Graphic Packaging International LLC 40 CFR 430 - Subpart B	Resolute Forest Products 40 CFR 430 - Subpart G
Average Off-The-Machine Production (lbs/day)	4,000,000	1,437,660
Average Unbleached Pulp Production (lbs/day)[1]	Bleach Plant #2 1,070,270 Bleach Plant #3 2,497,449	

[1] Unbleached Pulp Production is defined as the pulp entering the first stage of the bleach plant and is used for calculating AOX and Chloroform limitations

Subpart B Calculations for External Outfall 001/001-a

Graphic Processing Wastestream	Mass Factors (lbs/1000 lbs)		Permit Limits (lbs/day)	
	Daily Max	Daily Avg	Daily Max	Daily Avg
BOD_5	13.65	7.1	54600	28400
Total Suspended Solids	24	12.9	96000	51600
AOX	0.951	0.623	3393	2223

Resolute Forest Products Wastestream	Mass Factors (lbs/1000 lbs)		Permit Limits (lbs/day)	
Best Practicable Technology (BPT) - §430.72	Daily Max	Daily Avg	Daily Max	Daily Avg
BOD_5	10.6	5.55	15239	7979
Total Suspended Solids	15.55	8.35	22356	12004

Adjusted Mass Based Limit Formula	Adjusted Permit Limits (lbs/day)	
	Daily Max	Daily Avg
BOD_5	69839	36379
Total Suspended Solids	118356	63604

Appendix J

Graphic Packaging International, LLC (Augusta Mill) - Production Rates

Graphic Packaging INTERNATIONAL

Augusta Mill
4278 Mike Padgett Hwy
Augusta, GA 30906

January 5, 2018

Mr. Christopher Douglas
Industrial Permitting
Georgia Environmental Protection Division
Georgia Department of Natural Resources
2 Martin Luther King J. Drive, Suite 1152
Atlanta, Georgia 30334

Re: Production Values – Augusta Mill

Dear Mr. Douglas:

The following information is being submitted as an Addendum to the Augusta Mill's National Pollution Discharge Elimination System (NPDES) Permit Renewal Application as requested in your email dated December 20, 2017. Annual unbleached pulp entering the first stage of bleaching the number of days during the year that the bleaching line was in production were requested for 2011-2016, in addition to any anticipated growth in the bleach line. This data is provided in the table below.

	2011	2012	2013	2014	2015	2016	Anticipated
BP2 Pulp Entering Bleach Plant (ODUBT)	173,135	174,667	155,585	143,644	154,786	130,589	162,000
BP2 Running Days	334	333	331	308	314	318	333
BP3 Pulp Entering Bleach Plant (ODUBT)	374,790	347,455	323,208	298,123	308,846	345,302	378,023
BP3 Running Days	339	343	338	324	330	326	333

As requested on a call with EPD on December 12, 2017, final effluent color data from Outfall 001 from 2012 to 2016 is provided in the table on the following page.

Date	Outfall 001 Color, PtCo
2/29/2012	408
6/8/2012	588
8/29/2012	672
12/21/2012	561
3/13/2013	488
5/30/2013	502
8/28/2013	500
11/18/2013	472
3/20/2014	518
5/19/2014	591
8/20/2014	654
11/17/2014	538
2/19/2015	530
5/26/2015	621
8/26/2015	702
11/16/2015	758
2/25/2016	1124
5/18/2016	490
8/24/2016	414
11/16/2016	334

Should you have any questions or require additional information concerning the attached permit application, please contact Elizabeth Kornegay at (706)-771-4426 or by email at elizabeth.kornegay@graphicpkg.com. Please note that our facility's transfer to Graphic Packaging International, LLC is complete and, as such, email addresses for our facility have changed.

Sincerely,

Elizabeth Kornegay
Environmental Process Manager

cc: Donna Byrdy, GPI