VPDES PERMIT FACT SHEET

This document gives pertinent information concerning the reissuance of the VPDES permit listed below. This permit is being processed as a major, industrial permit. The effluent limitations contained in this permit will maintain the Water Quality Standards of 9 VAC 25-260-00 et seq. The industrial discharge results from the operation of an integrated pulp and paper mill, which uses unbleached pulp, bleached pulp, and pulp from waste paper to produce medium and linerboard. This permit action consists of updating special conditions and monitoring requirements, and revising the facility name due to an ownership change.

1. Facility Name and Location: SIC Codes: 2611, 2621, 2631, 2869
   Rock-Tenn West Point Mill
   1901 Main Street
   West Point, Virginia, 23181
   King William County

   Mailing Address: P.O. Box 100
   West Point, VA 23181

2. Permit No. VA0003115
   Existing Permit Expiration Date: July 27, 2010

3. Owner: Rock-Tenn C.P. LLC
   Owner Contact: Name: Mr. Chris Broome
   Title: General Manager
   Telephone: 804-843-5650
   Address: P.O. Box 100
   West Point, VA 23181

4. Application Complete Date: March 24, 2010 Regional Office: PRO
   Permit Drafted By: Brad Ricks Date: 8/22/2011
   Reviewed By: Jaime Bauer Date: 9/2/2011
   Reviewed By: Curt Linderman Date: 1/17/2013
   Reviewed By: Kyle Winter Date: 1/22/2013
   Public Comment Period Dates: March 27, 2013 to: April 26, 2013

5. Stream Information

Outfalls 001, 002, 003, 004, 007 and 008

Receiving Stream Name:	Pamunkey River
River Mile:	001: 8-PMK001.58
	002: 8-PMK001.46
	003: 8-PMK001.41
	004: 8-PMK001.34
	007: 8-PMK000.98
	008: 8-PMK000.99
Basin:	York River
Subbasin:	N/A
Section:	1
Class:	II
Special Standards:	a
7-Day, 10-Year Low Flow:	Tidal
1-Day, 10-Year Low Flow:	Tidal
30-Day, 5-Year Low Flow:	Tidal
Harmonic Mean Flow:	Tidal
Tidal:	Y
On 303(d) list:	Y

6. Operator License Requirements: Class I

7. Reliability Class: Not applicable as this facility is not subject to the Virginia Sewage Collection and Treatment Regulations which specify reliability class requirements.

8. Permit Characterization:
   (X) Private (X) Industrial (X) Reissuance
   (X) Existing Discharge (X) Storm Water Management Plan

9. Discharge Description: See **Attachment 1** for a schematic and water flow line drawing of the process wastewater treatment system. All domestic sewage generated at the facility is sent to the HRSD-Town of West Point POTW for treatment.

Process Outfall #	Discharge Source	Treatment	Max 30 Day Avg. Flow
001	Wastewater treatment plant outfall through diffuser. Influent originates from the boiler kiln, chemical recovery area, wood pulping and washing activities, pulp bleaching processes, paper forming and drying, secondary fiber recycling, foul condensate collection, coal pile runoff, landfill leachate, and vat water from the neighboring West Point Veneer facility.	-Clarification -neutralization -temperature reduction -activated sludge (UNOX) -secondary clarification	20.20 MGD (Application)
101	This outfall is the combination of all bleach plant outfalls which include an acidic outfall and a basic outfall. The permit requires that bleach plant effluents consisting of more than one waste stream algebraically combine the test results of each waste stream on a flow-proportional basis.	None	3.3 MGD (DMR data)

One influent stream originates from West Point Veneer, a neighboring facility that discharges process wastewaters from the direct steaming of logs. The permittee identified an expected influent from this process of approximately 0.012 MGD based on previous average flows. Therefore; 40 CFR 429 Subpart B, *Veneer Subcategory of the Timber Products Processing Point Source Category* also applies to the permittee's discharge and this effluent guideline would provide a BOD_5 allotment to the permittee's discharge; however, the veneer influent was not considered when calculating effluent limitations. Excluding this influent from permit limitation development maintains a BOD_5 effluent limitation which is either unchanged or somewhat more stringent than if West Point Veneer influent were included in BOD_5 allotment calculation associated with Rock-Tenn's primary activity in the *Pulp, Paper, or Paperboard Category* under 40 CFR 430 Subparts B, C, and J.

Storm Water Outfall #	Drainage Area	Discharge Source	Treatment	Max Reported Flow (MGD)	Flow (MG)
002	0.13 acres; Chip storage	Stormwater	None	0.003	Rainfall Dependent
003	0.09 acres; Chip storage	Stormwater	None	0.004	
004	17.23 acres; Chip storage	Stormwater	None	1.04	
007	1.16 acres; Wood yard	Stormwater	None	0.050	
008	108.55 acres; Wood yard	Stormwater	None	4.27	

See **Attachment 1** for a facility diagram and stormwater drainage map identifying the source and discharge location of all stormwater outfalls.

Additional stormwater notes:

Outfall 008 contains significant runoff from the town of West Point's separate stormwater collection system.

Outfalls 002, 003, 004, and 007 were identified in the 2005 permit as substantially identical outfalls. Part I.D.1.d of the 2013 permit specifies conditions for this allowance during the 2013-2018 permit term. If multiple outfalls are recognized as substantially identical, it is recommended that sampling rotate to each outfall during the term of the permit to confirm effluent similarity.

Outfalls labeled 014, 015, and 016 in the permittee's SWPPP and permit application are drainage area discharges that discharge via sheet flow and are not point source discharges, and therefore not considered in this permit.

10. Sewage Sludge Use or Disposal: Municipal sewage sludge is not managed by this facility. Industrial process sludge generated by the wastewater treatment facility is burned on site in a facility boiler. When necessary, sludge may be disposed at the facility-owned captive landfill, Solid Waste Permit SWP 543 or through independent solid waste management facilities.

11. Discharge Location Description:
Name of Topo: West Point, Virginia (124D) See **Attachment 1**.

12. Material Storage: Facility stores numerous types of liquid and solid chemicals that have the potential for exposure to state waters. However, the storage, maintenance and housekeeping practices that the permittee follows are guided by a stormwater pollution prevention plan, an operations and maintenance manual, and a Best Management Practice (BMP), as required by the VPDES permit.

Management of petroleum product storage is regulated through the DEQ Tanks program. According to DEQ records, the facility currently holds capacity for approximately 1,903,250 gallons of petroleum products in Aboveground Storage Tanks (ASTs). AST compliance and associated groundwater monitoring is managed through the DEQ Tanks program regulations.

Stormwater monitoring for petroleum products is not considered necessary because petroleum storage areas are designed to self-contain leaks and spills without discharge.

13. Ambient Water Quality Information:

Station 8-PMK006.36 was used to collect data for stream conditions. This station is located about

5 miles upstream of the facility at the southern end of Lee Marsh and provides the most representative stream data of available monitoring sites due to its proximity. The data's entire period of record was used.

Due to saltwater influence at this sampling location, the hardness data is considered unreliable; therefore, hardness data from station 8-PMK034.17, located approximately 33 miles upstream of the facility at White House, VA, was used. The average hardness measured from this monitoring station is 55.7 mg/l. Because this monitoring location is a considerable distance from the facility, a slightly more conservative assumed receiving stream hardness value of 50 mg/l was chosen for the water quality standards evaluation in accordance with best professional judgment, also in agreement with the hardness used in the two previous permit reissuance evaluations. Ambient water quality monitoring data is provided in **Attachment 2.**

At the point of all facility discharges, the river is in a transition zone. See **Attachment 3** for the Flow Frequency Determination provided by Jennifer V. Palmore, Senior Environmental Planner of the DEQ PRO Planning Department.

14. Antidegradation Review & Comments:

Tier: 1 __X__ 2_____ 3_____
The State Water Control Board's Water Quality Standards includes an antidegradation policy (9 VAC 25-260-30). All state surface waters are provided one of three levels of antidegradation protection. For Tier 1 or existing use protection, existing uses of the water body and the water quality to protect these uses must be maintained. Tier 2 water bodies have water quality that is better than the water quality standards. Significant lowering of the water quality of Tier 2 waters is not allowed without an evaluation of the economic and social impacts. Tier 3 water bodies are exceptional waters and are so designated by regulatory amendment. The antidegradation policy prohibits new or expanded discharges into exceptional waters.

The antidegradation review begins with a Tier determination. The Pamunkey River is considered to be a Tier 1 water body. This determination is based on the Pamunkey River being on the 303(d) list of impaired waters with an impaired benthic community in this stretch of the Pamunkey River.

15. Site Inspection: June 20, 2011 Performed by: Brad Ricks and Laura Bauer
A site inspection memo is included as **Attachment 4.**

16 Effluent Screening and Limitation Development:

Process Water Evaluation

Outfall 001

Limitation evaluation begins with a wasteload allocation (WLA) analysis using MSTRANTI version 2a (a DEQ excel spreadsheet). Acute and chronic waste load allocations are calculated from criteria for surface water given in the Virginia Water Quality Standards (9VAC 25-260-140). Statistically derived permit limits are then obtained by inputting these acute and chronic waste load allocations along with reported data and required quantification limits into the DEQ statistical program (STATS.exe). Results of STATS.exe analyses are summarized in Table 2 below with detailed printouts presented in **Attachment 6**.

A comparison of the highest detected values at Outfall 001 to WLAs and Water Quality Standards (WQS) is provided in Table 1 below. See **Attachment 5** for effluent data submitted in the Discharge Monitoring Reports (DMRs) and a list of detected constituents identified in the permit reissuance application. **Attachment 6** also includes the MSTRANTI printout with WLAs for all parameters. Parameters detected below the defined quantitation limit were considered absent for the purpose of

this evaluation. A phosphorus limitation was established as a result of this analysis as discussed below.

The waste load allocations are calculated based upon a dilution multiplier reflecting 60 total parts, comprising 59 parts stream to 1 part effluent. This was the basis of the previous permit reissuance. Flow conditions in this area are not expected to have changed sufficiently to alter the conclusions of the mixing study upon which this dilution ratio is based. The mixing study is dated October 1991 and is provided as **Attachment 7.** Although Outfall 001 is discharged through a diffuser, the specific characteristics of this diffuser were not considered in this study.

Table 1: Process Water WLA and WQS Effluent Evaluation

Parameter	Units	Highest Detected Value[1]	Wasteload Allocation		
			Acute	Chronic	Human Health[3]
pH	S.U.	*6.3 - 8*	Water Quality Std. = 6-9		
Enterococcus	MPN/ 100m	3500	Water Quality Std. = 35		
Ammonia (as N)	mg/L	25	436	65.5	--
Beta Particle & Photon Activity[2]	pCi/L	37.6	--	--	240
Dissolved Arsenic	µg/L	74	4100	2200	--
Dissolved Chromium III	µg/L	3.1	21000	2700	--
Dissolved Copper	µg/L	3.7	460	320	--
Total Zinc	µg/L	10.4	4200	4200	1,600,000
Heptachlor	µg/L	0.015	3.2	0.22	0.047
Nonylphenol	µg/L	3.1	420	100	--

[1] Highest detected value during the September 2005 – February 2011 including the 2010 permit reissuance application. Includes lowest detected value for pH. Does not include total mass loading which cannot be compared to WLA or WQS. Data presented in *italics* represents data collected from DMRs. All other data obtained from permit application.
[2] Beta Particle and Photon Activity analytical results were provided in pCi/L compared to a Public Water Supply standard in units of mrem/yr which cannot be directly converted or compared. However, data can be compared to the drinking water standard which is 50 pCi/L.
[3] Does not include public water supply standards which are not applicable to this outfall.

Attachment 5 presents a significant number of additional constituent detections identified in the permit application, which do not have an associated WLA and/or WQS. ELGs and industry-specific guidance discussed below address the monitoring and/or limitation of those constituents which have the greatest potential to cause or contribute to degradation of water quality when discharged from a facility such as this. With the exception of Enterococci as discussed below, cause does not exist through law, regulation, guidance, or best professional judgment to monitor or limit any other parameters identified in Attachment 5 which are not otherwise addressed through the requirements of this reissued permit.

Table 2: STATS.exe Effluent Limitation Analyses

Parameter (Units)	Limit Needed?
Ammonia (µg/L)	No
Arsenic, dissolved (µg/L)	No
Chromium III, dissolved (µg/L)	No
Copper, dissolved (µg/L)	No
Zinc, Total (µg/L)	No
Heptachlor (µg/L)	No
Nonylphenol (µg/L)	No

Enterococci: Following an *E. coli* concentration reported with the initial permit application above the Water Quality Standard for discharges to non-saline water, Rock-Tenn personnel collected additional samples for analysis of Enterococci for comparison to the saline water standard. The results indicated that Enterococci is present in facility effluent above the water quality standard; however, with no known sanitary inputs to the RockTenn wastewater system, additional study is needed to determine the source, potential human health impacts, and if necessary, the means of reducing or eliminating Enterococci in facility effluent. The requirement for this study is established as Special Condition I.B.14 in the 2013 permit. See Section 19 below for further information.

Temperature: The permit application identifies a max 30-day effluent temperature of 35.9^{O}C which should be assessed against the Virginia Water Quality Standards requirement that effluent not cause a change of 3°C to ambient stream conditions when discharged to the 10% ambient temperature of 5.7^{O}C identified in **Attachment 2**. Assuming the 60:1 acute and chronic dilution ratio and 30-day maximum flow of 20.2 MGD, the resulting rise in ambient temperature is 0.5 ^{O}C as demonstrated by the following equations:

Resulting Temperature: $((1 * 35.9\ ^{O}C) + (59*5.7\ ^{O}C)) / 60 = 6.2$

Change in Temperature: $6.2 – 5.7 = 0.5^{O}C$

Effluent Limitations Guidelines: Limitation evaluation continues with a review of applicable Effluent Limitations Guidelines (ELGs), which are technology-based effluent guidelines established by EPA. Specifically, this facility is subject to ELGs for the pulp, paper, or paperboard industry, under Subparts B (Bleached Papergrade Kraft), C (Unbleached Kraft) and J (Secondary Fiber Non-Deink) of 40 CFR 430. Applicable sections of 40 CFR 430 are provided in **Attachment 8**. All subparts identified herein are existing sources and are therefore not subject to new source performance standards (NSPS). No parts of this facility are enrolled in the Voluntary Advanced Technology Incentives Program.

Although this effluent is also subject to 40 CFR 429 Subpart B due to acceptance of wastewater from an offsite veneer facility, as discussed in Section 9 above, the limited effluent volume from this operation was not considered in this evaluation.

Production data from 2005 to 2010 is summarized in **Attachment 9**, including technical data analysis and a discussion of effluent limitation guideline (ELG) based limitation development. Production analysis provided by the permittee with the permit application is also provided in **Attachment 9**, titled *Form 2C III.C – West Point Mill Production Analysis for NPDES Renewal*. The permit application identified 2,715 Tons per Day (TPD) as the maximum daily production rate observed during the previous permit term, from 2005 to 2010, based on an annual average of daily production and reflecting 2008 as the maximum production year.

The daily production rates presented in **Attachment 9** are based on final paperboard production and are divided into the specified subparts in accordance with 40 CFR 430. Applicable subparts specified in 40 CFR 230 include subparts B, C, and J with subpart J including both corrugating and non-corrugating medium.

Table 3: Outfall 001, Tier 1 Final limits
Effective Dates: From the permit effective date until the total average daily bleached kraft production rate exceeds 697 machine dried tons/day for 3 consecutive months.

Effluent Characteristics	Basis for Limits	Discharge Limitations						Monitoring Requirements	
		Monthly Average		Weekly Ave	Min	Daily Maximum		Frequency	Sample Type
		mg/L	lbs/day			mg/L	lbs/day		
Flow (MGD)	NA	NL		NA	NA	NL		Continuous	Totalizing, Indicating & Recording
pH	2	NA		NA	6.0 SU	9.0 SU		1 per Day	Grab
BOD_5	1,2	NA	19,000	NA	NA	NA	38,000	1 per Day	24 hour composite
Total Suspended Solids	2	NA	36,000	NA	NA	NA	71,000	1 per Month	24 hour composite
Adsorbable Organic Halides (AOX)	2	NA	903	NA	NA	NA	1,380	1 per Day	24 hour composite
Dioxin (2,3,7,8-TCDD)	4	NA		NA	NA	NL	NA	1 per Quarter	24 hour composite
Chronic 7-day static renewal *Americamysis bahia* – TUc	3	NA		NA	NA	NL		1 per year	24 hour composite
Chronic 7-day static renewal *Cyprinodon variegatus* - TUc	3	NA		NA	NA	NL		1 per year	24 hour composite

NA = Not Applicable

1. York River 303(e) Plan adopted 6/77, amended 8/79; **see Attachment 10**
2. Effluent Limitation Guidelines (40 CFR 430)
3. Guidance Memo No. 00-2012, Toxics Management Program Implementation Guidance
4. Best Professional Judgment

pH – While it is noted that the ELGs state that the Subpart B pH limitation shall be within the range of 5.0 to 9.0 at all times, the limitation is set as 6.0 – 9.0 in accordance with subparts C and J. Because Outfall 001 effluent contains combined effluent of Subparts B, C, and J, the most stringent limitation must be used.

BOD_5 - BOD_5 was limited in the prior permit reissuances by the York River 303(e) Plan provided in 9VAC25-720-120 of the Water Quality Management Planning Regulation. The 303(e) Plan established a daily maximum load of 10,445 lbs per day $cBOD_5$ and 15,000 lbs per day Ultimate Biochemical Oxygen Demand (UBOD). The daily maximum load of 10,445 lbs/day $cBOD_5$ was used as the monthly average limitation for BOD_5 in the 2005 permit reissuance. The 2005 fact sheet states, "Since the limitation was placed on BOD_5, which is more restrictive a standard than $cBOD_5$, and the facility has shown it can meet this standard, the limitation will remain in place on BOD_5 to prevent antibacksliding concerns." It could not be clearly ascertained how the previous BOD_5 maximum daily limit of 20,518 lbs was derived. This resulted in a thorough review of the York River Basin Water Quality Management Plan prepared for the State Water control Board by Roy F. Weston in 1976 on which the 303(e) plan and regulation were established.

Table B.2. of 9VAC25-720-120 states that the wasteload allocation given to then Chesapeake Corporation, now Rock-Tenn C.P. LLC, is "based on BPCTCA effluent guidelines". The source of Table B.2 is identified as "Roy F. Weston, Inc.", a reference to the York River Basin Water Quality Management Plan (WQMP) prepared for the State Water Control Board by Roy F. Weston,

Planning Bulletin 229-A. The referenced WQMP states in regards to the Chesapeake Corporation discharge and its associated wasteload allocation:

> "The dissolved oxygen concentration in the Pamunkey River near the Chesapeake Corporation is below State standards. Natural organic discharges from highly productive marshes settle, decay, and manifest themselves as benthic BOD loading in this segment of the River. This is postulated to be the cause of these low dissolved oxygen levels. To illustrate this, even if the requirement for Chesapeake Corporation during the seven-day, once-in-10-year low flow conditions was zero discharge, the DO would not increase to the acceptable 5.0 mg/L; the model revealed that zero discharge would increase the minimum DO to only 4.79 mg/L. Therefore, the Chesapeake Corporation's maximum daily load was set at EPA and State effluent guideline levels."

It appears that the wasteload allocations determined by production-based effluent guidelines in 1976 have been carried forward through previous permit reissuances without consideration of current or future production which does not appear to be the intent of this regulation which was established in accordance with variable facility production rather than a set standard. Therefore, in accordance with the source of wasteload allocations determined in the WQMP, and with concurrence from DEQ PRO senior Planning Department staff, BOD_5 limitations were established for this 2013 permit reissuance in accordance with effluent guidelines based on current production levels in the same manner the limitations were established in 1976. Because effluent guidelines are a technology-based limitation, anti-backsliding is not a concern. Daily monitoring frequency established in accordance with 40 CFR 430.

Total Suspended Solids (Tier 1): The Chesapeake Bay TMDL was approved by EPA on 12/29/2010. This facility received an individual wasteload allocation of 13,030,500 lbs of TSS per year. Based on an average 331 operating days per year, this equates to 39,367 lbs per day which is slightly more than the monthly average allocation calculated from the ELGs of 36,516 lbs per day. The less stringent Chesapeake Bay TMDL-based allocation is managed separately through the Chesapeake Bay Watershed Implementation Plan (WIP); therefore, the more stringent ELG-based limitations remain applicable to this permit as an enforceable limit.

AOX - The standard for Adsorbable Organic Halides (AOX) is calculated based on the bleach plant production rate (**Appendix 9**, Table 8: Outfall 101 ELG Based Effluent LImitations). The effluent guidelines and GM10-2003 indicate that the standard is to be measured at the end of pipe discharge which is Outfall 001. Please see additional discussion in the Outfall 101 section below. Daily monitoring frequency is established in accordance with 40 CFR 430.02.

Although effluent limitations were derived in accordance with guidance memorandum GM06-2016 regarding significant figures, the limitation for AOX is specified by the federal effluent guidelines with three significant figures. The limitation therefore maintains three significant figures.

Dioxin (2,3,7,8-TCDD) – All data for the 2005-2010 permitting cycle at outfall 001 is beneath the quantitation limit which was specified in agreement with 40 CFR 430.01(i) as 10 picograms/liter; therefore, dioxin was presumed absent for the purposes of this evaluation. The 1994, 1999, and 2005 permits contained a dioxin limitation of 73 pg/L with a rationale identified in the Fact Sheet as the Water Quality Standard. Because dioxin is limited at internal Outfall 101 with a more stringent limitation of 10 pg/L, the Water Quality Standard should be met at Outfall 001. Outfall 101 is the only source at the facility with reasonable potential to produce dioxin. To be certain of that the current Water Quality Standard of 3.1 pg/L (MSTRANTI, **Appendix 6**) will be protected at Outfall 001, the following calculation assumes a discharge from Outfall 101 at the limit of 10 pg/L and 30-day maximum flow rate of 3.3 MGD, discharged through Outfall 001 with a 30-day maximum flow rate of 20.20 MGD:

10 pg/L * 3.3 MGD / 20.20 MGD = 1.65 pg/L at Outfall 001.

The 2013 permit maintains dioxin monitoring without limitation at Outfall 001 as continued verification that it is not discharged by any other facility processes.

Toxics Management Parameters / Whole Effluent Toxicity (WET) testing: GM00-2012 states that if no WET limit is needed based on previous testing, "annual monitoring with both organisms should be considered". This annual monitoring is carried forward from the 2005 permit reissuance without a limitation. See Fact Sheet Item 24 and **Attachment 13** for additional discussion.

Total Phosphorus and Total Nitrogen (2005) – Monitoring was established in the previous permit in accordance with Guidance Memorandum 05-2009 VPDES Nutrient Limitations in the Chesapeake Bay Watershed with a total phosphorus limitation also in place as a result of a special standard NEW-17 designation. This requirement has since been superseded by The Chesapeake Bay TMDL, approved by the EPA on 12/29/2010, the General VPDES Watershed Permit Regulation for Total Nitrogen and Total Phosphorus Discharges and Nutrient Trading in the Chesapeake Watershed in Virginia (nutrient GP), and the Watershed Implementation Plan (WIP). The nutrient GP and WIP are both managed to ensure compliance with the TMDL; therefore total phosphorus and total nitrogen monitoring or limitations are not required on this basis.

Permit Condition I.B.14 of the 2005 permit reissuance states the following: "Upon the permittee obtaining coverage under a watershed general permit issued for the control of Total Nitrogen and Total Phosphorus loadings to the Chesapeake Bay or its tidal tributaries, the Total Nitrogen and Total Phosphorus annual load limitations and any associated monitoring requirements and schedule of compliance contained herein shall be waived in lieu of those in the general permit. Upon the effective date the permittee's watershed general permit Total Phosphorus limitation, the monthly average and weekly maximum Total Phosphorus limitations contained herein are also waived. Upon the effective date of the permittee's watershed general permit Total Phosphorus limitation, the monthly average Total Phosphorus limitations contained herein are also waived." DEQ provided notice that such monitoring and limitations were waived by email dated August 2, 2007, which included a reissued DMR with all associated nutrient requirements removed.

Pentachlorophenol and Trichlorophenol – The permittee has certified that that these compounds are not being used as biocides in accordance with 40CFR430.24(d); therefore, no limitations are required. Certification provided as **Attachment 11.**

Final Tier 2 limitations are presented in Table 10, below. The mechanism to trigger the second tier limitations will be three consecutive months of average bleach plant production above 697 tons per day as discussed in **Attachment 9**. The permittee shall notify the Department 14 days prior to when this production level is expected to be met in order to provide sufficient notice for approval and issuance of revised Discharge Monitoring Reports (DMRs). The subpart distribution and associated limitations required by the ELGs are identified in **Attachment 9**, Table 4: ELG Based Effluent Limitations at Projected Production Rates.

Table 4: Outfall 001, Tier 2 Final limits
Effective Dates: After the total average daily production rate of bleached kraft exceeds 697 machine dried tons/day for 3 consecutive months and lasting until the permit's expiration date.

Effluent Characteristics	Basis for Limits	Discharge Limitations						Monitoring Requirements	
		Monthly Ave		Weekly Avg	Min	Maximum		Frequency	Sample Type
		mg/l	lbs/day			mg/l	lbs/day		
Flow (MGD)	NA	NL		NA	NA	NL		Continuous	Totalizing, Indicating & Recording
pH	2	NA		NA	6.0 SU	9.0 SU		1/Day	Grab
BOD_5	1, 2	NA	22,000	NA	NA	NA	43,000	1/Day	24 hour composite
Total Suspended Solids	2, 5	NA	39,000	NA	NA	NA	78,000	1/Month	24 hour composite
Adsorbable Organic Halides (AOX)	2	NA	1,110	NA	NA	NA	1,690	1/Day	24 hour composite
Dioxin (2,3,7,8-TCDD)	4	NA		NA	NA	NL	NA	1 per 3 months	24 hour composite
Chronic 7-day static renewal *Americamysis bahia* – TUc	3	NA		NA	NA	NL		1/year	24 hour composite
Chronic 7-day static renewal *Cyprinodon variegatus* - TUc	3	NA		NA	NA	NL		1/year	24 hour composite

NA = Not Applicable

1. 303(e) Plan (York River 303(e) Plan adopted 6/77, amended 8/79, **See Attachment 10**)
2. Effluent Limitation Guidelines (40 CFR 430)
3. Guidance Memo No. 00-2012, Toxics Management Program Implementation Guidance
4. Best Professional Judgment
5. Chesapeake Bay TMDL

Total Suspended Solids (Tier 2): The Chesapeake Bay TMDL was approved by EPA on 12/29/2010. This facility received an individual wasteload allocation of 13,030,500 lbs of TSS per year. Based on an average 331 operating days per year, this equates to 39,367 lbs per day which is slightly less than the monthly average allocation calculated from the ELGs of 40,316 lbs per day, represented as 4.0×10^4 in accordance with significant figure requirements. The more stringent Chesapeake Bay TMDL-based allocation must therefore be established as the effluent limitation in order to maintain permit consistency with the TMDL allocation.

Outfall 101

40 CFR 430.24.a(1) establishes effluent limitations applicable to each fiber line that does not use an exclusively TCF bleaching process. In accordance with this regulation, the permittee has certified in the application that an elemental chlorine-free (ECF) bleaching process is used. The effluent guidelines and GM10-2003 indicate that the AOX standard is to be measured at the end of pipe discharge which is Outfall 001.

The production rate analysis and effluent limitation development discussion for Outfall 101 is provided in **Attachment 9**.

Table 5: Outfall 101 Tier 1 and 2 Final Limits[1]

EFFLUENT CHARACTERISTICS	BASIS FOR LIMITS	DISCHARGE LIMITATIONS		MONITORING REQUIREMENTS	
		MONTHLY AVERAGE	DAILY MAXIMUM	FREQUENCY	SAMPLE TYPE
Flow (MGD)	NA	NL	NL	Continuous	Totalizing, Indicating & Recording
Dioxin (2,3,7,8-TCDD)	40 CFR 430.24	NA	<10 pg/L	Monthly	Composite
tetrachlorodibenzo-p-furan (TCDF)	40 CFR 430.24	NA	31.9 pg/L	Monthly	Composite
Chloroform – Tier 1 Chloroform – Tier 2	40 CFR 430.24	2,730 g/day 3,340 g/day	4,560 g/day 5,580 g/day	Weekly	Composite
Trichlorosyringol	40 CFR 430.24	NA	<2.5 µg/L	Monthly	Composite
3,4,5-trichlorocatechol	40 CFR 430.24	NA	<5.0 µg/L	Monthly	Composite
3.4.6-trichlorocatechol	40 CFR 430.24	NA	<5.0 µg/L	Monthly	Composite
3,4,5-trichloroguaiacol	40 CFR 430.24	NA	<2.5 µg/L	Monthly	Composite
3,4,6-trichloroguaiacol	40 CFR 430.24	NA	<2.5 µg/L	Monthly	Composite
4,5,6-trichloroguaiacol	40 CFR 430.24	NA	<2.5 µg/L	Monthly	Composite
2,4,5-trichlorophenol	40 CFR 430.24	NA	<2.5 µg/L	Monthly	Composite
2,4,6-trichlorphenol	40 CFR 430.24	NA	<2.5 µg/L	Monthly	Composite
Tetrachlorocatechol	40 CFR 430.24	NA	<5.0 µg/L	Monthly	Composite
Tetrachloroguaiacol	40 CFR 430.24	NA	<5.0 µg/L	Monthly	Composite
2,3,4,6-tretrachlorophenol	40 CFR 430.24	NA	<2.5 µg/L	Monthly	Composite
Pentochlorophenol	40 CFR 430.24	NA	<5.0 µg/L	Monthly	Composite

NA = Not Applicable

[1] Effective Dates:
Tier 1: From the permit effective date until the total average daily unbleached kraft production rate exceeds 697 machine dried tons/day for 3 consecutive months.
Tier 2: After the total average daily production rate of bleached kraft exceeds 697 machine dried tons/day for 3 consecutive months and lasting until the permit's expiration date.
All effluent limitations are unchanged from Tier 1 to Tier 2 with exception of chloroform.

TCDF and chloroform – Although effluent limitations were derived in accordance with guidance memorandum GM06-2016 regarding significant figures, the limitations for tetrachlorodibenzo-p-furan (TCDF) and chloroform are specified by the federal effluent guidelines with three significant figures. The limitations therefore maintain three significant figures.

Stormwater Evaluation

Guidance Memo 96-001 recommends that chemical-specific water quality-based limits not be placed on storm water outfalls at this time because the methodology for developing limits and the proper method of sampling is still a concern and under review/reevaluation by EPA. Exceptions would be where a VPDES permit for a storm water discharge has been issued that includes effluent limitations (backsliding must be considered before these limitations can be modified) and where there are reliable data, obtained using sound, scientifically defensible procedures, which provide the justification and defense for an effluent limitation. Therefore, in lieu of limitations, pollutants are assessed against screening criteria developed solely to identify those pollutants that should be given special emphasis during development and assessment of the Storm Water Pollution Prevention Plan (SWPPP).

Each screening criterion is established as the most stringent of either (1) two times the applicable pollutant's acute criterion or (2) the pollutants waste load allocation, on the basis of the discharge going to a large receiving stream and utilizing conservative assumptions (i.e., Tier 2) or, where applicable, (3) the pollutant's benchmark monitoring concentration as contained in DEQ's VPDES Industrial Storm Water General Permit (ISWGP) (9VAC25-151-10 et seq.). The permit application did not identify any known or suspected pollutants which are subject to items (1) or (2); therefore,

pollutant screening was established solely as a comparison to benchmark monitoring concentrations identified in the ISWGP. ISWGP sectors B and C are specifically applicable to stormwater discharges at this facility. All stormwater outfall effluent data submitted by the permittee that contained pollutants above the established screening criteria triggered the need for monitoring of that specific pollutant in Part I.A of the permit for that outfall. The screening criteria are then utilized in the permit as a comparative value. A comparison of effluent data to each pollutant's benchmark monitoring concentration is presented in Table 6 below, with monitoring established for the pollutants noted in Tables 7 and 8. Stormwater effluent data collected during the permit cycle from 2005 into 2011 is included in **Attachment 5**.

Annual monitoring is required for pollutants identified above their respective benchmark monitoring concentration contained in the VAR05 ISWGP. WET testing is not required for these pollutants. Any storm water effluent data exceeding the pollutant's VAR05 ISWGP benchmark monitoring concentration triggers the need for review and evaluation of the Best Management Practices (BMPs) associated with any outfalls for which concentrations were exceeded. These requirements are specified in Parts I.C.2 through I.C.6 and Parts I.D.2 through I.D.3 of the reissued permit. All parameters with data reported below quantification limits are considered absent from the discharge for the purposes of this evaluation.

The SWPPP required by Parts I.D.2 and 3 of the permit is designed to reduce pollutants in storm water runoff. The goal of the SWPPP is to reduce pollutants to the maximum extent practicable. An annual report is to be prepared and maintained with the SWPPP to include a comprehensive review of compliance with SWPPP requirements and other potential changes or pollutant sources which may require BMP changes.

Table 6: Stormwater Effluent Benchmark Evaluation

Parameter	Units	Highest Detected Value[1]		Benchmark Value[2]
		Outfalls 002, 003, 004, and 007[3]	*Outfall 008*	
BOD_5	mg/L	**562.5**	**62.16**	30
Chemical Oxygen Demand (COD)	mg/L	**1118**	**1318**	120
TSS	mg/L	**1050**	**1550**	100
pH	S.U.	6.42-8.11	6.8-**9.27**	6-9[4]
Total Nitrogen	mg/L	**7.54**	**9.0**	2.2
Total Phosphorus	mg/L	*1.16*	*0.24*	2

[1] Highest reported value from November 10, 2005 – February 11, 2011 including the 2010 permit reissuance application. Values obtained from the permit application are identified in *italics.*
[2] 5-day Biochemical Oxygen Demand (BOD_5) is the only benchmark specific to the Paper and Allied Products Manufacturing sector. Benchmarks are provided from other industrial sectors in order to compare all detected constituents to established benchmark water quality concentrations.
[3] Outfalls 002, 003, and 007 were considered substantially identical to Outfall 004 during the previous permit term.
[4] This range is also identified as an effluent limitation in the Virginia Water Quality Standards (9VAC25-260-10 et. seq.).

Sulfate – Maximum observed monitoring results of 58.6 mg/L at Outfalls 002, 003, 004, and 007; and 575 mg/L at Outfall 008 were observed in DMR data submitted during the previous permit term; however, sulfate is not associated with a VAR05 ISWGP benchmark limit and the Virginia Water Quality Standards (9VAC25-60-10 et seq.) only specify a public water supply standard of 250 mg/L. The Virginia Department of Health confirmed in a letter dated March 17, 2011 that there are no public water supply intakes within 15 miles downstream of the facility. By email dated 6/23/2011, the facility environmental manager also confirmed that there are also no public water supply intakes within 15 miles upstream of the facility.

Sulfate monitoring was required at all stormwater outfalls in the 2005 permit because data was not provided in the associated Form 2F permit application. All monitoring results at all outfalls except Outfall 008 were significantly below the public water supply water quality standard. Two detections were observed above the public water supply water quality standard at Outfall 008; however, the average detection at Outfall 008 was 229 mg/L, which also falls below the standard. Because there is no public water supply intake within 5 miles downstream of the facility, there is no applicable water quality standard, effluent guideline, or benchmark value which may provide suitable cause to require further monitoring or limitation of sulfate in facility stormwater.

Total Phosphorus – Results were obtained from the permit application. A water quality standard exists for elemental phosphorus; however, the standard is for chronic toxicity only. Since no acute standard exists for applicability to a stormwater discharge, a comparison to the water quality standard was not performed. Because monitoring results are below the benchmark value and there is no cause to believe that phosphorus is a concern in stormwater associated with this industrial activity, there is no need to require monitoring for this parameter in the facility permit.

Industrial Sector C - The SIC codes listed for the facility on the Form 2C include 2869, Industrial Organic Chemical Production, which is regulated as Industrial Sector C - Chemical and Allied Products Manufacturing Facilities under the storm water general permit regulation; however, there are no Sector C benchmark parameters tied to SIC code 2869. Therefore, only the pulp and paper production conditions for the storm water pollution prevention plan were included in the permit in addition to all other detected constituents which represent potential cause for concern due to observed concentrations above the benchmark value associated with all industrial sectors including the Chemical and Allied Products Manufacturing sector.

Table 7: Outfall 002, 003, 004, and 007, Monitoring requirements

EFFLUENT CHARACTERISTICS	BASIS FOR LIMITS	DISCHARGE LIMITATIONS			MONITORING REQUIREMENTS	
		MONTHLY AVERAGE	MINIMUM	MAXIMUM	FREQUENCY	SAMPLE TYPE
Flow (Million Gallons)	NA	NL	NA	NL	1/year	Estimate
pH (Standard Units)	BPJ	NA	NA	NL	1/year	Grab
BOD_5 (mg/L)	BPJ	NA	NA	NL	1/year	Grab
Total Suspended Solids (mg/L)	BPJ	NA	NA	NL	1/year	Grab
Chemical Oxygen Demand (mg/L)	BPJ	NA	NA	NL	1/year	Grab
Total Nitrogen (mg/L)	BPJ	NA	NA	NL	1/year	Grab

Table 8: Outfall 008, Monitoring requirements

EFFLUENT CHARACTERISTICS	BASIS FOR LIMITS	DISCHARGE LIMITATIONS			MONITORING REQUIREMENTS	
		MONTHLY AVERAGE	MINIMUM	MAXIMUM	FREQUENCY	SAMPLE TYPE
Flow (Million Gallons)	NA	NL	NA	NL	1/3 months	Estimate
pH (Standard Units)	BPJ	NA	6.0	9.0	1/3 months	Grab
BOD_5 (mg/L)	BPJ	NA	NA	NL	1/year	Grab
Total Suspended Solids (mg/L)	BPJ	NA	NA	NL	1/year	Grab
Chemical Oxygen Demand (mg/L)	BPJ	NA	NA	NL	1/year	Grab
Total Nitrogen (mg/L)	BPJ	NA	NA	NL	1/year	Grab

pH - Quarterly monitoring for pH was included for Outfall 008 in the 2005 permit reissuance due to a reported value of 9.43 S.U. The facility again reported pH above 9.0 S.U. on the 5/11/2007

and 2/10/2011 DMRs; therefore, quarterly monitoring will be maintained with a limitation established in accordance with the Virginia Water Quality Standards.

BOD_5 - Benchmark parameter to be monitored in accordance with Sector B of the VAR05 ISWGP, applicable to facilities with the SIC code 2631

TSS - Reported values suggest the need for monitoring with comparison to VAR05 ISWGP benchmark value.

COD - Reported values suggest the need for monitoring with comparison to VAR05 ISWGP benchmark value.

Total Nitrogen - Reported values suggest the need for monitoring with comparison to VAR05 ISWGP benchmark value.

17. Antibacksliding Statement: A dioxin limitation was removed from Outfall 001 for the 2013 reissued permit; however, as discussed in Section 16 above, the more stringent dioxin limitation at Outfall 101 will sufficiently control dioxin to concentrations that will not exceed the 2005 Outfall 001 limitation. All other limitations are at least as stringent as in the 2005 permit.

18. Compliance Schedules: This permit does not include a compliance schedule.

19. Special Conditions:

I.B.1 **Notification Levels**
Rationale: Required by VPDES permit regulation 9VAC25-31-200.A for all manufacturing commercial, mining, and silvicultural dischargers.

I.B.2 **Operation and Maintenance Manual Requirement**
Rationale: Required by Code of Virginia §62.1-44.16; VPDES Permit Regulation, 9VAC25-31-190.E and 40 CFR 122.41(e). These require proper operation and maintenance of the permitted facility. Compliance with an approved O&M manual ensures this.

I.B.3 **Licensed Operator Requirement**
Rationale: Required by VPDES Permit Regulation, 9 VAC 25-31-200 C and The Code of Virginia §54.1-2300 et seq, Rules and Regulations for Waterworks and Wastewater Works Operators (18VAC160-20-10 et seq.) requires licensure of operators.

I.B.4 **Materials Handling/Storage**
Rationale: 9 VAC 25-31-50 A prohibits the discharge of any wastes into State waters unless authorized by permit. Code of Virginia § 62.1-44.16 and 62.1-44.17 authorizes the Board to regulate the discharge of industrial waste or other waste.

I.B.5 **Water Quality Criteria Reopener**
Rationale: VPDES Permit Regulation, 9 VAC 25-31-220 D requires effluent limitations to be established which will contribute to the attainment or maintenance of the water quality standards.

I.B.6 **Monitoring and/or Limitation Reopener**
Rationale: 9 VAC 25-40-70 A authorizes DEQ to include technology-based annual concentration limits in the permits of facilities that have installed nutrient control equipment, whether by new construction, expansion or upgrade. 9 VAC 25-31-390 A authorizes DEQ to modify VPDES permits to promulgate amended water quality standards.

Section 303(d) of the Clean Water Act requires that Total Maximum Daily Loads (TMDLs) be developed for streams listed as impaired. This special condition is to allow the permit to be reopened if necessary to bring it into compliance with any applicable TMDL approved for the receiving stream. The re-opener recognizes that, according to Section 402(o)(1) of the Clean Water Act, limits and/or conditions may be either more or less stringent than those contained in this permit. Specifically, they can be relaxed if they are the result of a TMDL, basin plan, or other wasteload allocation prepared under section 303 of the Act.

I.B.7 **Compliance Reporting**
Rationale: Authorized by VPDES Permit Regulation, 9VAC25-310-190.J.4 and 220.I. This condition is necessary when pollutants are monitored by the permittee and a maximum level of quantification and/or a specific analytical method is required in order to assess compliance with a permit limit or to compare effluent quality with a numeric criterion. These quantification levels are established based on ELGs or by GM10-2003 where not specified by the ELGs. The condition also established protocols for calculation of reported values.

I.B.8 **Whole Effluent Toxicity Testing**
Rationale: VPDES Permit Regulation, 9VAC25-31-210 and 220.I, requires monitoring in the permit to provide for and assure compliance with all applicable requirements of the State Water Control Law and the Clean Water Act. **See Attachment 11** for the WET data review memorandum.

I.B.9 **Concept Engineering Report**
Rationale: §62.1-44.16 of the Code of Virginia requires industrial facilities to obtain DEQ approval for proposed discharges of industrial wastewater. A CER means a document setting forth preliminary concepts or basic information for the design of industrial wastewater treatment facilities and the supporting calculations for sizing the treatment operations.

I.B.10 **Facility Closure Plan**
Rationale: §62.1-44.16 of the State Water Control Law. This condition establishes the requirement to submit a closure plan for the wastewater treatment facility if the treatment facility is being replaced or is expected to close.

I.B.11 **Bleach Plant Sampling Methodology**
Rationale: Defines methodology for collecting representative effluent samples in conformance with applicable regulations. DEQ guidance titled, “Reduced Monitoring Incentive and Other Issues Related to the 1998 Cluster Rule for Pulp and Paper Mills” recommends this permit condition and specifies the language used. This guidance is reproduced in GM10-2003 under the Pulp and Paper Mills Standard Permit; however, the special condition language is referenced but not included.

I.B.12 **Biocides Prohibition**
Rationale: 40 CFR 430 Subpart B requires certification by facilities not using certain pentachlorophenol or trichlorophenol as biocides in order to prevent additional effluent limitations. Because this facility provided the required certification, associated effluent limits were not included in the permit. This prohibition maintains appropriate effluent limits.

I.B.13 **Oil Storage Ground Water Monitoring Reopener**
Rationale: Facilities with greater than 1,000,000 gallons of regulated aboveground petroleum storage are required to monitor ground water under the Facility and Aboveground Storage Tank Regulations (9VAC25-91). Where potential exists for ground water pollution and that regulation does not require monitoring, the VPDES permit may under Code of Virginia §62.1-44.21.

I.B.14 **Enterococcus Assessment**

Rationale: Because there are no known sources of fecal bacteria contributing to facility effluent and because enterococci bacteria may originate from other sources which do not carry the potential to harm human health or waters of the Commonwealth, it is necessary to determine if it is appropriate to apply the Enterococcus water quality standard to the facility effluent. If the study confirms that water quality standard protection is necessary, this condition and special condition I.B.6 allow the permit to be modified or revoked and reissued to incorporate appropriate effluent limitations or controls. This is in agreement with the definition of water quality standards (9VAC25-260-5) and the stated purposes of the State Water Control Law (§62.1-44.2).

I.C **Best Management Practices (BMPs) for Spent Pulping Liquor, Soap and Turpentine Management, Spill Prevention, and Control**

Rationale:

VPDES Permit Regulation, 9VAC25-31-220 K, requires use of best management practices where applicable to control or abate the discharge of pollutants when numeric effluent limits are infeasible or the practices are necessary to achieve effluent limit or to carry out the purpose and intent of the Clean Water Act and State Water Control Law. In addition, federal categorical effluent guidelines at 40 CFR 430.03 prescribe certain best management practices applicable to this facility. Part I.C.7 was revised from the boilerplate to remove milestones already completed by the permittee in accordance with guidance received from central office staff at the time of the 2005 permit reissuance. These changes were carried forward for this reissuance.

I.D.1 **Storm Water Management Conditions**
I.D.2 **General Storm Water Pollution Prevention Plan Requirements;**
I.D.3 **Sector Specific SWPPP Requirements; and**
I.D.4 **Benchmark Monitoring**

Rationale: VPDES Permit Regulation, 9 VAC 25-31-10 defines discharges of storm water from industrial activity. 9 VAC 25-31-120 requires a permit for these discharges. The General Storm Water Special Conditions, Storm Water Pollution Prevention Plan requirements and Benchmark Monitoring requirements of the permit are derived from the VPDES general permit for discharges of storm water associated with industrial activity (VAR05), 9 VAC 25-151-10 et seq. VPDES Permit Regulation, 9 VAC 25-31-220.K, requires use of best management practices where applicable to control or abate the discharge of pollutants when numerical effluent limits are infeasible or the practices are necessary to achieve effluent limits or to carry out the purpose and intent of the Clean Water Act and State Water Control Law. General storm water requirements, SWPPP requirements, and monitoring requirements have been included in accordance with the GM10-2003 Permit Manual, Section IN-4 and in accordance with the VAR05 Industrial Storm Water General Permit (9VAC25-151-10 et seq.).

Part II: **Conditions Applicable to All Permits**

Rationale: VPDES Permit Regulation, 9 VAC 25-31-190 requires all VPDES permits to contain or specifically cite the conditions listed.

20. NPDES Permit Rating Work Sheet: Total Score 190 (see **Attachment 12**)

21. Changes to Permit:

Permit Cover Sheet Changes:	
Item	**Change and Rationale**
Initial paragraph	Updated language to reflect current agency guidance that incorporates the permit application as part of the permit.
Owner, Facility Name, City, and Facility Location	Owner and facility names revised due to change of ownership; facility location revised due to updated address information received from permittee; reference to West Point as the city in which the facility operates removed because West Point is considered a town rather than a city.
Signature Line	Change from Director to Deputy Director, Piedmont Regional Office per the October 2008 DEQ Agency Policy Statement 2-09, "Delegations of Authority".
Special Standards	Removed special standard NEW-2 due to its removal from the Water Quality Standards (WQS) regulation (9VAC25-260-10 et. seq.).

Part I.A Changes, Outfall 001:

Parameter Changed	Monitoring Requirement Changed		Effluent Limits Changed		Rationale
	From	To	From	To	
TSS (Part I.A.1)	No Change		35,700 lbs/d average; 69,600 lbs/d maximum	36,000 lbs/d average; 71,000 lbs/d maximum	Loading limitations are based on effluent guideline information and production levels. The tiered limit was increased (tier 1) in accordance with historic, current, and projected production rates as discussed in Section 16 above. Tier 2 was decreased to conform to the Chesapeake Bay TMDL as discussed in Section 16 above and Section 24 below. Effluent limitations presented in accordance with agency guidance memorandum GM06-2016 regarding significant figures.
TSS (Part I.A.2)	No Change		43,400 lbs/d average; 83,900 lbs/d maximum	39,000 lbs/d average; 78,000 lbs/d maximum	
BOD_5 (Part I.A.1)	No Change		10,445 lbs/day average; 20,518 lbs/day maximum	19,000 lbs/day average; 38,000 lbs/day maximum	Loading limitations are based on effluent guideline information and production levels. The tiered limit was increased in accordance with historic, current, and projected production rates as discussed in Section 16 above. Effluent limitations presented in accordance with agency guidance memorandum GM06-2016 regarding significant figures.
BOD_5 (Part I.A.2)	No Change		10,445 lbs/day average; 20,518 lbs/day maximum	22,000 lbs/day average; 43,000 lbs/day maximum	
AOX (Part I.A.1)	No Change		990 lbs/day average; 1510 lbs/day maximum	903 lbs/day average; 1380 lbs/day maximum	Loading limitations are based on effluent guideline information and production levels. The tiered limit was decreased (tier 1) and increased (tier 2) in accordance with historic, current, and projected production rates as discussed in Section 16 above. Effluent limitations presented in accordance with agency guidance memorandum GM06-2016 regarding significant figures.
AOX (Part I.A.2)	No Change		990 lbs/day average; 1510 lbs/day maximum	1110 lbs/day average; 1690 lbs/day maximum	

Parameter Changed	Monitoring Requirement Changed		Effluent Limits Changed		Rationale
	From	To	From	To	
Total Nitrogen (Weekly, Monthly, Year-to-Date, Calendar Year) TKN Nitrate plus Nitrite Total Phosphorus (Weekly, Monthly, Year-to-Date, Calendar Year) Ortho-phosphate					Nutrient parameters superseded by the General VPDES Watershed Permit Regulation for Total Nitrogen and Total Phosphorus Discharges and Nutrient Trading in the Chesapeake Watershed in Virginia (nutrient GP). These monitoring requirements were terminated in July 2007 under a permit authorized change initiated by DEQ and a revised DMR was issued. Additional discussion in Section 16.
Furan (TCDF)	1/ 3 Months	NM	NL	NM	The 2005 fact sheet states that furan monitoring is required based on current agency guidance for kraft pulp paper mills. There appears to be no current guidance requiring furan monitoring at Outfall 001. Monitoring with limitation is required at Outfall 101 in accordance with ELGs. Permit Condition C.7.b may require furan monitoring as part of the facility's BMP Plan; however this self-implemented procedure does not require DMR reporting.
Color	1/Day	NM	NL	NM	The 2005 fact sheet states that color monitoring is required based on current agency guidance for kraft pulp paper mills. There appears to be no current guidance requiring color monitoring at Outfall 001.
Chemical Oxygen Demand	1/ Month	NM	NL	NM	The 2005 fact sheet states that COD monitoring is required based on 40 CFR 430. Although COD is mentioned in the ELGs, its limitation is identified as "reserved" with no existing requirement for either monitoring or limitation.
Dioxin	No Change		73 pg/L; 1.36×10^{-5} lb/d	NL; NA	See dioxin discussion, Section 16.
Acute 48 hr static *Mysidopsis bahia* – TUa	1/Year	NM	NL	NM	Acute toxicity testing removed following demonstrated non-toxicity. See WET evaluation provided in **Attachment 13**.
Acute 48 hr static *Cyprinodon variegatus* – TUa	1/Year	NM	NL	NM	Acute toxicity testing removed following demonstrated non-toxicity. See WET evaluation provided in **Attachment 13**.
Part I.A. Changes, Outfall 101					
Chloroform (Part I.A.3)	No Change		2,990 g/day average; 4,990 g/day maximum	2,730 g/day average; 4,560 g/day maximum	Loading limitations are based on effluent guideline information and production levels. The tiered limit was decreased in accordance with historic, current, and projected production rates as discussed in Section 16 above.

Parameter Changed	Monitoring Requirement Changed		Effluent Limits Changed		Rationale
	From	To	From	To	
Chloroform (Part I.A.4)	No Change		2,990 g/day average; 4,990 g/day maximum	3,340 g/day average; 5,580 g/day maximum	Loading limitations are based on effluent guideline information and production levels. The tiered limit was increased in accordance with historic, current, and projected production rates as discussed in Section 16 above.
Part I.A Changes, Outfalls 002, 003, 004, 007, 008:					
Sulfate	1/year	NM	NL	NM	Sulfate monitoring removed; discussion provided in the Stormwater Evaluation portion of Section 16.
NM = Not Monitored		NL = No Limitation			

Other Changes to 2005 Part I.A:

- 2005 Part I.A.1, I.A.2, I.A.4, and I.A.5 Intro paragraphs edited to remove wastewater or stormwater source descriptions. This information is provided in the fact sheet and language revised to reflect, in part, current GM10-2003 boilerplate.

- 2005 Part I.A.1 and I.A.2 effluent characteristic species name *Mysidopsis bahia* changed to its more common identification, *Americamysis bahia*.

- 2005 Part I.A.1.b, I.A.1.c, I.A.2.b, and I.A.2.c removed due to removal of nutrient monitoring including total nitrogen.

- 2005 Part I.A.1.a and I.A.2.a renumbered as Part I.A.1 footnote 1 and I.A.2 footnote 1, respectively.

- 2013 Parts I.A.1.a, I.A.2.a, I.A.3.a, I.A.4.a, and I.A.5.a separated out of introductory paragraph and rephrased for clarity.

- 2013 Part I.A.1 and I.A.2 items b-d added to reflect current GM10-2003 boilerplate and to make needed clarifications.

- 2013 Part I.A.1.e and I.A.2.e added to specify new Enterococci and, if applicable, TRC limitations added in accordance with Water Quality Standards.

- 2013 Part I.A.1.f and I.A.2.f added to maintain consistency with TMDLs so that average monthly flow does not exceed the design capacity upon which wasteload allocations are based.

- 2005 Part I.A.3.d footnote moved to Part I.A.3.b and text revised to specify which parameters are applicable.

- 2013 Part I.A.4 added to provide tiered production limits at Outfall 101. As a result, the 2005 Parts I.A.4, I.A.5, and I.A.6 are now presented as I.A.5, I.A.6, and I.A.7, respectively.

- 2005 Part I.A.4 discussion of substantially identical outfalls removed to match current GM10-2003 boilerplate. This allowance is included in section I.D.1.d of the reissued permit.

- 2005 Part I.A.4.a and I.A.5.a language revised to reflect current GM10-2003 boilerplate and correct location of monitoring requirements. Renumbered as footnotes 1 and 2 to 2013 Parts I.A.5.b and 6.b. .

- 2005 Part I.A.4.b and 5.b language replaced to reflect current GM10-2003 boilerplate; renumbered as footnotes 1 and 2 to 2013 Parts I.A.5.b and 6.b.

- 2013 Part I.A.1 and I.A.2 definitions of TIRE, 24 HC, and 1/Quarter added for clarity.

- 2013 Part I.A.6 definition of 1/Quarter added for clarity.

- 2005 Part I.A.6 removed and replaced with Parts I.A.5.b and I.A.6.b to reflect current GM10-2003 boilerplate

Part I Special Condition Changes:
All previously untitled Part I.B special conditions were given a title as specified in GM10-2003. Other changes noted below.

From	To	Rationale
I.B.1	I.B.1	Notification Levels: No Change
I.B.2	I.B.2	Operation and Maintenance Manual Requirement: Reflects statewide changes in boilerplate language provided email from DEQ Central Office dated 4/3/2012.
I.B.3	I.B.3	Licensed Operator Requirement: Text revised to reflect updated name of regulatory Board.
I.B.4	I.B.4	Materials Handling/Storage: Text revised to reflect GM10-2003 boilerplate.
--	I.B.5	Water Quality Criteria Reopener added in accordance with GM10-2003 when a water criteria parameter with no limit is monitored on a Part I.A. page.
I.B.5	I.B.6	Chesapeake Bay Nutrient Reopener renamed, renumbered and addressed by Part I.B.6.c. Parts I.B.6.a and b are new boilerplate from GM07-2008, Amendment 2.
I.B.6	I.B.7	Compliance Reporting renumbered and text revised in accordance with current VPDES Permit Manual guidance (GM10-2003). QL for BOD5 was adjusted from 5.0 mg/L to 2 mg/L for consistency with recently adopted VPDES General Permit regulations. QLs for AOX, 2,3,7,8-TCDD and 2,3,7,8 TCDF as specified by Federal Effluent Guidelines, part 430.01. Chloroform QL as specified in Water Quality Criteria Monitoring requirements provided in GM10-2003 and other QLs are as specified in GM10-2003 compliance reporting special condition.
I.C	I.B.8	Whole Effluent Toxicity Testing renumbered and language revised. The species name *Mysidopsis bahia* was changed to its more common identification, *Americamysis bahia*. Acute testing requirements have been removed with approval from DEQ toxics coordinator, Deborah DeBiasi, due to consistent results showing no toxicity in the acute test.
I.B.7	--	TMDL reopener removed. Reopener capability found in the Monitoring and/or Limitation Reopener in I.B.6.
--	I.B.9	Concept Engineering Report special condition added to all industrial permits in accordance with PRO staff decision on June 29, 2010.
I.B.15	I.B.10	Facility Closure Plan renumbered and language revised in accordance with GM10-2003 boilerplate. Additional language included to require implementation of approved plan and notice of plan completion.
I.B.8	I.B.11	Bleach Plant Sampling Methodology renumbered and title revised for clarity.
I.B.9	I.B.12	Biocides Prohibition renumbered and title revised for clarity.
I.B.10	--	Nutrient Reporting Calculations removed with the removal of associated nutrient monitoring requirements.
I.B.11	--	Basis of Design Report for nutrient removal technologies condition removed with the removal of associated nutrient monitoring requirements.
I.B.12	--	Nutrient removal optimization report condition removed with the removal of associated nutrient monitoring requirements.
I.B.13	--	Production Tier Notification condition removed as Parts I.A.1 and I.A.2 now specify DEQ review/approval following submittal of this information to the DEQ Piedmont Regional Office.
I.B.14	--	Watershed General Permit waivers are no longer applicable as the permittee received watershed general permit coverage in July 2007.
--	I.B.13	Oil Storage Ground Water Monitoring Reopener added in accordance with GM10-2003 boilerplate because the facility stores greater than 1,000,000 gallons of petroleum in above ground storage tanks.
--	I.B.14	Enterococcus Assessment added because there are no known sources of fecal bacteria contributing to facility effluent and because the presence of enterococci bacteria may originate from other sources which do not carry the potential to harm human health or waters of the Commonwealth; however, it is necessary to determine if it is appropriate to apply the Enterococcus water quality standard to the facility effluent.
I.D	I.C	BMPs for Spent Pulping Liquor, Soap, and Turpentine Management, Spill Prevention and Control: renumbered with internal section references also renumbered to match current permit.
I.E, I.F, I.G	I.D	Changes to storm water language and requirements are in accordance with the VPDES Permit Manual as revised in 2010 (IN-4) and maintain consistency with current VPDES regulations.
--	II.A.4	Monitoring requirement added in accordance with 1VAC30-45 and 1VAC30-46. This requirement became applicable to all permits on January 1, 2012.

22. Variances/Alternate Limits or Conditions: None

23. Public Notice Information required by 9 VAC 25-31-280 B:

All pertinent information is on file and may be inspected or copied by contacting Bradford Ricks at:

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DEQ accepts comments and requests for public hearing by e-mail, fax or postal mail. All comments and requests must be in writing and be received by DEQ during the comment period. Submittals must include the names, mailing addresses and telephone numbers of the commenter/requester and of all persons represented by the commenter/requester. A request for public hearing must also include: 1) The reason why a public hearing is requested. 2) A brief, informal statement regarding the nature and extent of the interest of the requester or of those represented by the requester, including how and to what extent such interest would be directly and adversely affected by the permit. 3) Specific references, where possible, to terms and conditions of the permit with suggested revisions. A public hearing may be held, including another comment period, if public response is significant, based on individual requests for a public hearing, and there are substantial, disputed issues relevant to the permit. The public may review the draft permit and application at the DEQ Piedmont Regional Office by appointment or may request copies of the documents from the contact person listed above.

24. 303(d) Listed Segments:

This facility discharges directly to the Pamunkey River. The water is impaired or threatened for one or more designated uses by a pollutant(s) and the receiving stream has been addressed in two TMDLs (303d list) with the following impairments identified:

- The Aquatic Life Use is impaired due to an insufficient benthic community and EPA's overlist for nutrients;
- The Recreation Use is impaired due to Enterococci exceedances; and
- The Fish Consumption Use is impaired due to PCBs and mercury in fish tissue; in addition, arsenic is considered a non-impairing observed effect.

Neither PCBs nor mercury were detected in the water quality criteria monitoring included with the permit application and are therefore not considered to be attributable to this facility's effluent. Although arsenic was detected in the effluent sample, arsenic is considered non-impairing and the observed concentration is significantly below the acute and chronic wasteload allocation and does not require a permit limitation as presented in Section 16, Table 1 of this Fact Sheet.

The recreation use and Enterococci impairment is protected through Special Condition I.B.14 which establishes a study to determine the pathogenic potential of enterococci in facility effluent which is not believed to originate from fecal sources. Should results of the study indicate the need for a limitation, the permit may be modified or revoked and reissued to incorporate appropriate effluent limitations. Should results of the study indicate that enterococci in the effluent is not a risk to human health in terms of primary contact recreation, the Department may consider a change to the applicable water quality standard, if appropriate.

This facility discharges directly to the Pamunkey River in the Chesapeake Bay watershed in segment CB-PMKOH. The receiving stream has been addressed in the Chesapeake Bay TMDL, approved by EPA on December 29, 2010. The TMDL addresses dissolved oxygen (DO), chlorophyll a, and submerged aquatic vegetation (SAV) impairments in the main stem Chesapeake Bay and its tidal tributaries by establishing non-point source load allocations (LAs) and point-source waste load allocations (WLAs) for Total Nitrogen (TN), Total Phosphorus (TP)

and Total Suspended Solids (TSS) to meet applicable Virginia Water Quality Standards contained in 9VAC25-260-185. This facility is considered a Significant Chesapeake Bay wastewater discharge, and has been assigned a TN WLA of 259,177 pounds per year, a TP WLA of 56,038 pounds per year, and a TSS WLA of 13,030,500 pounds per year.

Implementation of the Chesapeake Bay TDML is currently accomplished in accordance with the Commonwealth of Virginia's Phase I Watershed Implementation Plan (WIP), approved by EPA on December 29, 2010. The approved WIP recognizes that the TMDL nutrient WLAs for Significant Chesapeake Bay wastewater dischargers are set in two regulations: 1) the Water Quality Management Planning Regulation (9VAC25-720); and 2) the "General VPDES Watershed Permit Regulation for Total Nitrogen and Total Phosphorus Discharges and Nutrient Trading in the Chesapeake Bay Watershed of Virginia" (9VAC25-820). The WIP further outlines that since TSS discharges from wastewater facilities represent an insignificant portion of the Bay's total sediment load, they may be considered in the aggregate. The WIP establishes that wastewater discharges with technology-based TSS limits are considered consistent with the TMDL.

40 CFR 122.44(d)(1)(vii)(B) requires permits to be written with effluent limits necessary to meet water quality standards and to be consistent with the assumptions and requirements of applicable WLAs. DEQ has provided coverage under the VPDES Nutrient General Permit (GP) for this facility under permit VAN030049. The requirements of the Nutrient GP currently in effect for this facility are consistent with the Chesapeake Bay TMDL. This individual permit includes federal effluent limitation guidelines (ELG) based Tier 1 TSS limit of 36,000 lbs per day which is more stringent than the TSS WLA referenced above which equates to approximately 3.9×10^4 lbs per day, both based on an average 331 operating days per year. The Tier 2 TSS limit is established at 39,000 lbs per day for direct conformance to the Chesapeake Bay TMDL and WIP. In addition, the individual permit includes a BOD_5 limit at 19,000 lbs per day which is consistent with Water Quality Management Plan (9VAC25-720-120) requirements for the RockTenn effluent discharge limits to be based on federal Effluent Guidelines to satisfactorily address instream DO goals. Compliance with the General VPDES Watershed Permit Regulation for Total Nitrogen and Total Phosphorus Discharges and Nutrient Trading in the Chesapeake Watershed (Nutrient GP) will result in the demonstration of compliance with the wasteload allocations for total nitrogen and total phosphorus in the Chesapeake Bay TMDL; therefore, no associated permit limitations are necessary. Based on this and the limits identified above, this facility can neither cause nor contribute to an observed violation of the standards and is consistent with the TMDL.

25. Additional Comments:
<u>Previous Board Actions:</u>

The permit was originally issued on June 30, 1974, and was subsequently reissued on January 15, 1985. During 1986 and 1987, an administrative Consent Decree allowed the facility to conduct a controlled bypass of the WWTP. This controlled bypass was an attempt to bring the plant into compliance since a plant expansion caused the WWTP to be hydraulically overloaded. A Consent Decree was approved by the SWCB on September 29, 1987, giving the permittee interim effluent limitations until November 7, 1988, also levying a $25,000 fine. Due to litigation, primarily by the Environmental Defense Fund, a revised Consent Decree was approved by the SWCB on March 28, 1988, and signed by a judge on May 20, 1988. This consent decree increased the penalty to $50,000 and required that the permittee to develop a toxics monitoring program. This consent decree set a final date of July 15, 1989 for compliance with all limitations.

The 1985 permit expired on January 15, 1990, and was reissued on May 31, 1994. The permit was reissued on June 9, 1999, and went through a minor modification on December 6, 2000. This permit expired on June 9, 2004 and was reissued on July 28, 2005 with a permit authorized change on January 1, 2007 to eliminate parameters then managed through the General VPDES Watershed Permit Regulation for Total Nitrogen and Total Phosphorus Discharges and Nutrient Trading in the Chesapeake Watershed. The expiration date of this permit was July 27, 2010.

The DEQ Piedmont Regional Office considered this permit administratively continued due to a timely and complete permit application.

On February 7, 2011, the DEQ Piedmont Regional Office issued Notice of Violation No. W2011-02-P-0002 to Smurfit-Stone Container Corporation – West Point following five unpermitted discharges, bypasses, and/or overflows that occurred between August 1, 2010 and January 16, 2011.

Staff Comments:

a. Application Dates: The application was originally received on January 29, 2010 with a revised, complete application received on February 16, 2010 following receipt of Department comments on the initial application.

b. Monitoring Reductions for Reissuances: In a letter dated October 3, 2012, the permittee requested reduced monitoring frequencies as allowable by EPA and DEQ guidance. GM10-2003 states, "Only permittees having exemplary operations that consistently meet permit requirements should be considered for reduced monitoring" and "To qualify for consideration of reduced monitoring requirements, the facility should not have been issued any Warning Letters, Notices of Violation…during the past three years." Because a Notice of Violation was issued on 2/8/2011, this facility is not eligible for reduced monitoring.

   The Federal Effluent Limitation Guidelines provide additional opportunity for reduced monitoring in accordance with the Voluntary Advanced Technology Incentives Program (VATIP); however, records indicate that the permittee has not enrolled in this program. GM10-2003 provides the following additional guidance:

   The monitoring frequency for mills that do not enroll in VATIP is set by the federal rule. For those that enroll, there is an interim period before attainment of the more stringent BAT effluent limitations where no monitoring frequency is established. Upon attainment of the more stringent BAT limitations, one year of monitoring at a frequency set by the rule is required, after which the permitting authority is again at liberty to choose a monitoring frequency (assuming the mill has certified that they have advanced elemental chlorine free technology) for parameters other than AOX. The agency should be consistent in determining the monitoring frequency for the two above specified periods.

c. The whole effluent toxicity testing and management program in the 2005 permit is continued in this reissuance as suggested by guidance memo GM 00-2012. The current testing schedule has been maintained as annual. **See Attachment 13** for this analysis. This data will be reported on the DMR for inclusion in the CEDS database. From 1983 to 2005, the facility was required to perform this testing with freshwater species; however, further investigation during the 2005 reissuance into the salinity of the receiving stream indicated that saltwater species are more appropriate for toxicity testing.

d. The whole effluent toxicity special permit condition, Part I.B.8, allows the use of time proportioned sampling in place of flow proportioned sampling at outfall 001. As noted in **Attachment 13**, a letter from DEQ personnel dated 8/27/1999 authorized the permittee to use time proportioned sampling and this authorization continued through the most recent permit cycle. The facility believes that flow proportioned sampling would be difficult to conduct since the flow of 001 is not measured directly; rather, the influent wastewater streams comprising 001 have their flows measured and added to arrive at the flow for 001. Time proportioned sampling provides representative data because the facility's flow presents minimal fluctuation over time. Time proportioned sampling remains appropriate for use on 001. It should be noted that this determination does not apply to internal outfall 101 where flow proportioned sampling is specified in the permit for the bleach plant effluent.

e. The facility has a large (several acres) lagoon used to recover black liquor, a spent wood pulping cooking liquor used as fuel in the recovery furnaces and which contains spent

chemicals from the pulping process. This lagoon does not discharge to surface water and DEQ's Voluntary Remediation Program currently oversees all groundwater monitoring and remediation issues related to the black liquor lagoon.

f. General VPDES Permit for Discharges of Stormwater Associated with Industrial Activity (VAR05 ISWGP) applicability: All stormwater discharges are managed through this permit; therefore, the general permit is not applicable.

EPA Comments: By email dated 3/15/2013, Mark Smith of EPA Region III stated, "EPA exercised its discretion in the review of this State-submitted draft permit and has chosen to perform a limited review on the TMDL requirements. As a result of this limited review, we have no comments related to the TMDL requirements."

VDH Comments: Response to application review dated 3/17/2011 states, "There are no public water supply intakes within 15 miles downstream of the discharge / activity. We do not object to the permit."

Other Agency Comments: None

Public Comment: During the public comment period of March 27, 2013 through April 26, 2013, the public notice was published on March 27 and April 3 in the Tidewater Review. Town Manager Edwards, Jr., Mayor Hudson, and the Middle Peninsula Planning District Commission were also directly provided with a copy of the public notice by mail in accordance with Code of Virginia §62.1-44.15:01.A.2 , 9VAC25-31-290.G.2 and GM11-005. One citizen provided comments by email on April 4, 2013 and April 23, 2013. These comments and DEQ responses are summarized in the Response to Comments Memorandum provided in **Attachment 15**.

Owner Comments: Owner comments were received by letter dated February 4, 2013. Owner comments are summarized in the DEQ response letter provided in **Attachment 14**.

Have all applicable permit fees been paid? Permit fees are up to date, last paid on September 20, 2011.

Is this project/discharge considered to be controversial? No

E-DMR Status: The facility enrolled in the eDMR program on 4/4/2007.

Virginia Environmental Excellence Program (VEEP): This facility is not enrolled in the Virginia Environmental Excellence Program (VEEP).

Planning Conformance Statement: By memo signed 1/31/2013, PRO water planning staff stated, "The discharge is in conformance with the existing planning documents for the area."

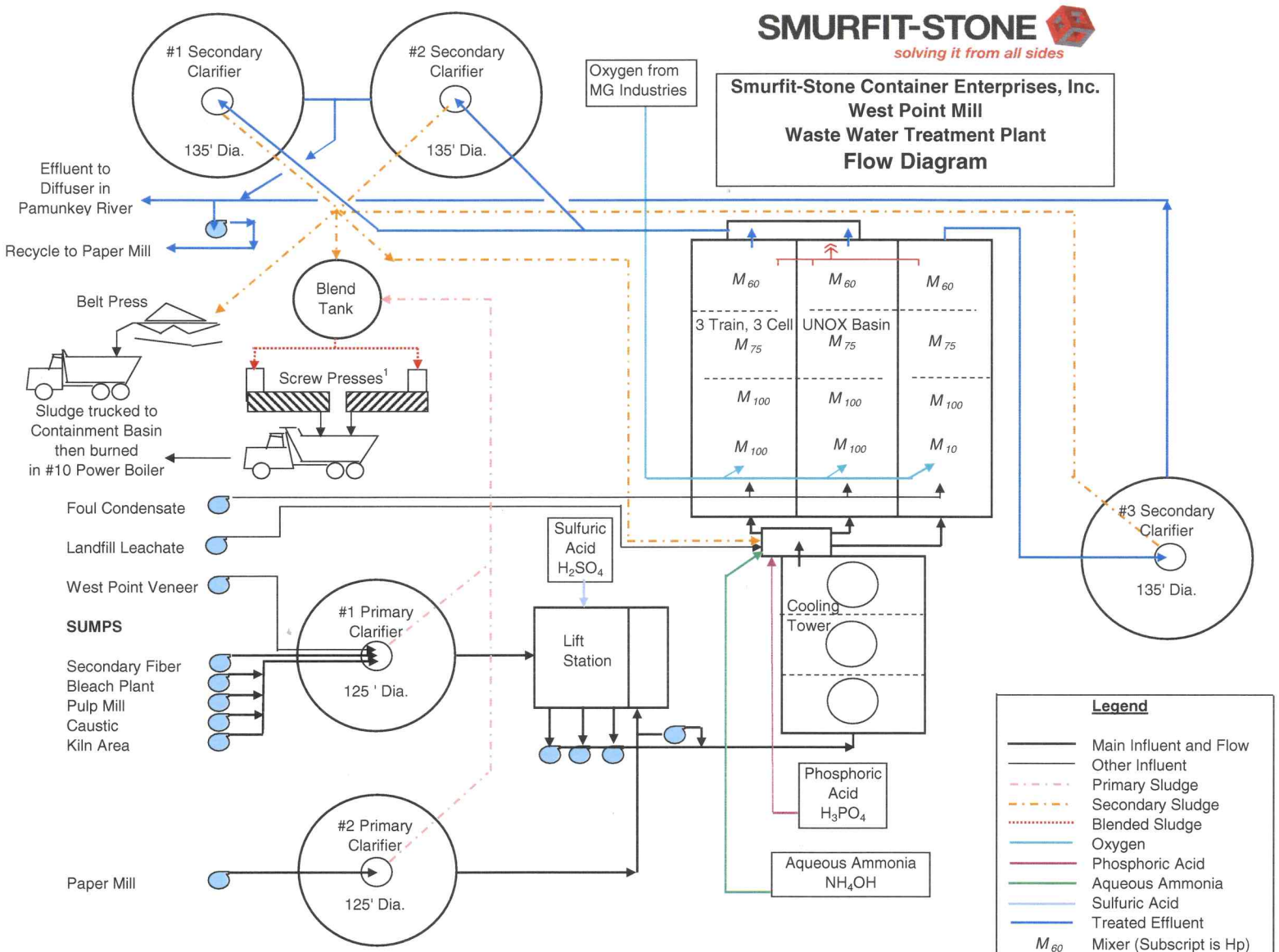
26. The following is a list of attachments and their contents:

Attachment 1: Maps: Site Diagram, Stormwater drainage map, and Topographic Map
Attachment 2: Ambient Water Quality Monitoring Data
Attachment 3: Flow Frequency Determination and 303(d) Fact Sheets
Attachment 4: Site Inspection Memo
Attachment 5: Effluent Monitoring Data
Attachment 6: MSTRANTI Results; MSTRANTI Data Source Report; STATS.exe Results
Attachment 7: *Analysis of Mixing and Dilution of Process Water Discharged into the Pamunkey River, October 1991.*
Attachment 8: Applicable Federal Effluent Limitation Guidelines from 40CFR 430
Attachment 9: Production Data and Analysis
Attachment 10: Excerpt of York River 303(e) Plan
Attachment 11: Biocides certification
Attachment 12: NPDES Permit Rating Worksheet
Attachment 13: WET Data Evaluation Memo
Attachment 14: Response to Owner Review
Attachment 15: Response to Public Comment

Attachment 1

Figures:
Wastewater Process Flow Diagram
Site Diagrams / Stormwater Drainage Maps
Topographic Map

Attachment 5



Note: [1]Coil Filters are also available as back-up to Screw Presses but are not shown.
Note: Filtrate from the screw presses is returned to the centerwell of the primary clarifier(s)
Revised 3/7/2007 (changed logo, moved leachate to UNOX inflow box from primary clarifier.)
Revised 1/12/2010 (Changed logo, added recycle water system)

OUTFALL	LIKELY POLLUTANT
Outfall 2	TSS
Outfall 3	TSS
Outfall 4	TSS, BOD, oil & grease
Outfall 7	TSS, BOD, oil & grease
Outfall 8	TSS, BOD, oil & grease, pH

SIGNIFICANT SPILLS AND LEAKS

500 SEE APPENDIX C FOR SPECIFIC INFORMATION OF EACH EVENT

SPILL GATE

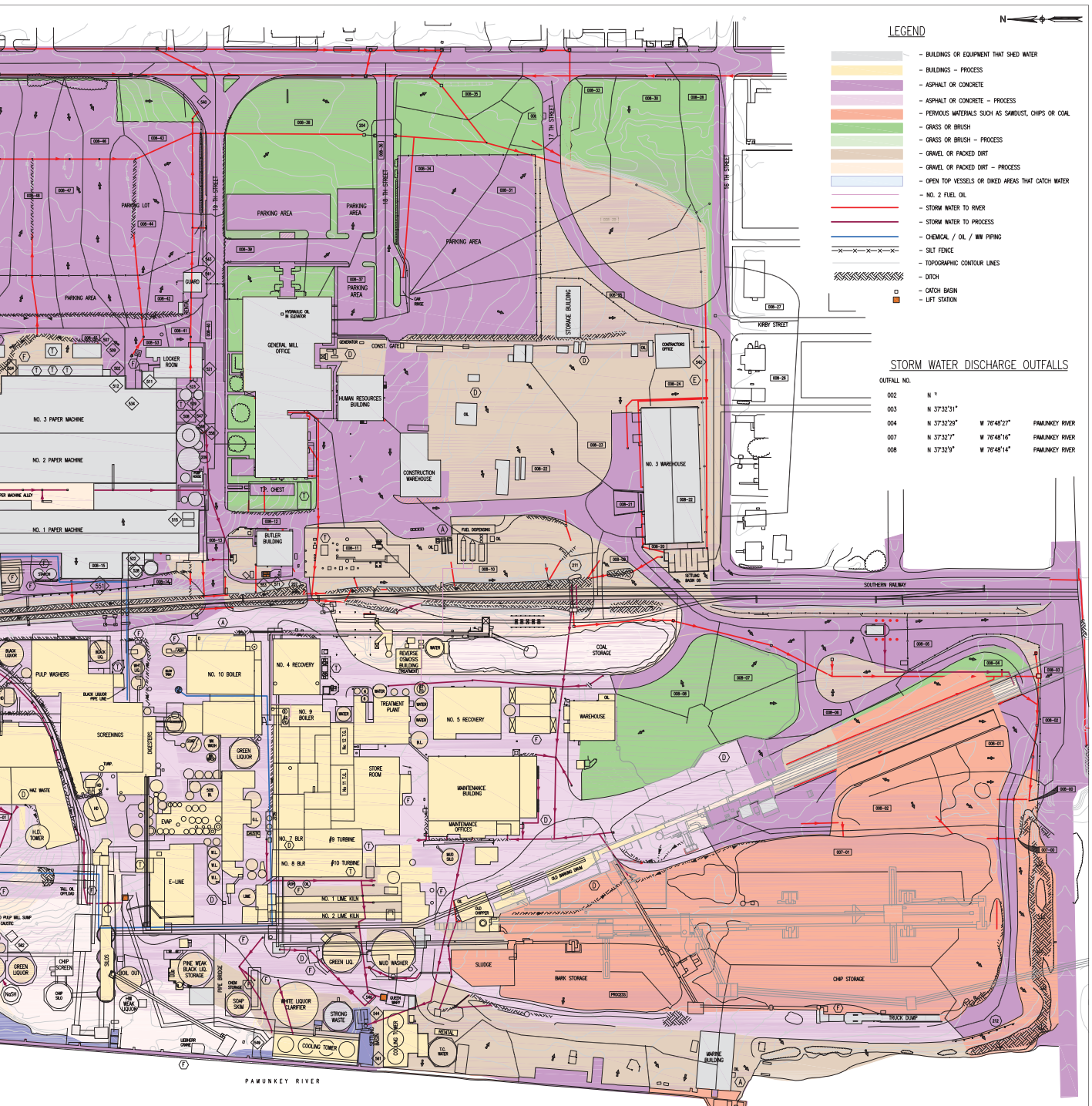
208 VEHICLE MAINT. AREA CURBING
209 UNLOADING AREA CURBING
210 U-DRAINS, CURBS
211 RE-ROUTE FLOW AROUND R/R
212 JERSEY BARRIER, FABRIC FILTER
213 SPILL GATE
214 SPILL GATE

LEGEND

A FUEL TRANSFER POINTS
B VEHICLE/EQUIPMENT WASHING AND MAINTENANCE AREAS
B1 VEHICLE/EQUIPMENT WASHING AND MAINTENANCE AREAS (SELF CONTAINED)
D WASTE MANAGEMENT AREAS
E OUTSIDE RAW MATERIALS, BY-PRODUCT AND FINISHED PRODUCT STORAGE
F LOADING/UNLOADING AREAS
T TRANSFORMERS

BLEACH PLANT TANKS

1 – CHLORINE DIOXIDE
2 – WATER
3 – SULFURIC ACID
4 – BROWN STOCK
6 – CAUSTIC
7 – CHLORATE
8 – DEFOAMER



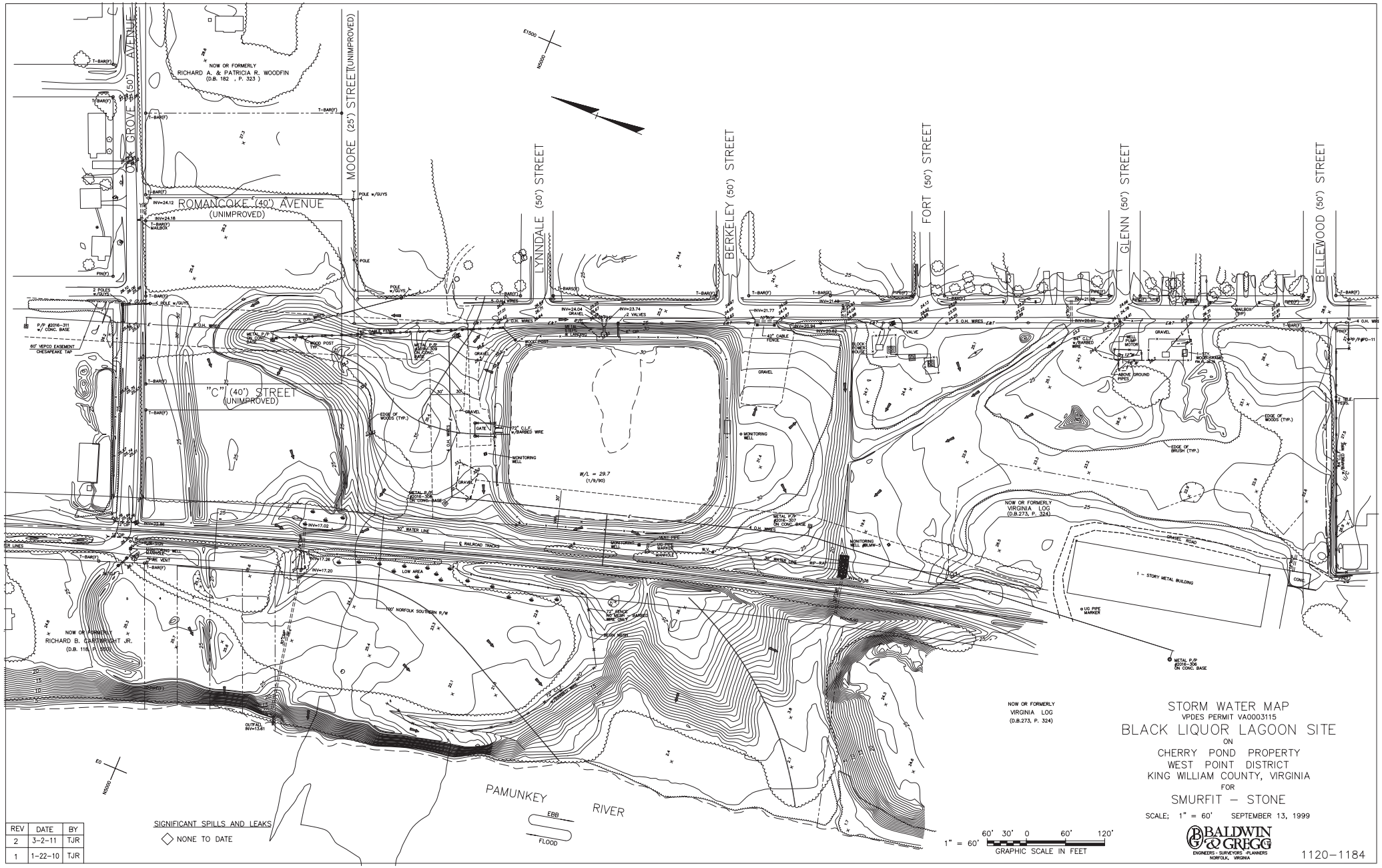
REVISIONS

NO.	DATE	BY	DESCRIPTION	NO.	DATE	BY	DESCRIPTION	NO.	DATE	BY	DESCRIPTION
				4	12/26/09	TJR	REVISED AREA AROUND COAL PILE				
3	2-3-11	CH	UPDATED	3	08/31/07	TJR	UPDATED FOR PERMIT 007 TO 008				
2	1-20-10	TJR	UPDATED FOR PERMIT 006 TO 007	2	09/20/06	TJR	UPDATED FOR PERMIT 005 TO 006				

Smurfit-Stone

TITLE: STORM WATER POLLUTION PREVENTION PLAN MAP

DATE: 9-10-01 | AREA: 1120-MISCELLANEOUS
DESIGNED BY: SWP TEAM | CHECKED BY: TJR
DRAWN BY: DPE | SCALE: 1" = 60'-0"
ACAD DWG. NO.: 1120-1101 | NO. 8



REV	DATE	BY
2	3-2-11	TJR
1	1-22-10	TJR

STORM WATER MAP
VPDES PERMIT VA0003115

BLACK LIQUOR LAGOON SITE

ON
CHERRY POND PROPERTY
WEST POINT DISTRICT
KING WILLIAM COUNTY, VIRGINIA
FOR
SMURFIT – STONE

SCALE; 1" = 60' SEPTEMBER 13, 1999

BALDWIN & GREGG
ENGINEERS - SURVEYORS - PLANNERS
NORFOLK, VIRGINIA

1120–1184

Attachment 2: Smurfit-Stone Container Enterprises, Inc.- West Point Mill
VPDES Permit VA0003115

3-D TopoQuads Copyright © 1999 DeLorme Yarmouth, ME 04096 Source Data: USGS 700 ft Scale: 1 : 24,000 Detail: 13-0 Datum: WGS84

- See List of Outfalls for further identification
- Waterways: Pamunkey River (west of West Point) Mattaponi River (east of West Point) York River (south of West Point)
- Property separating three portions is owned by Smurfit-Stone but leased to others with their own permits.
- This map is a portion of the West Point 7 1/2 minute quadrangle map, using Delorme 3-D TopoQuads Software

Attachment 2
Ambient Water Quality Monitoring Data

Station ID	Collection Date	Depth Desc	Depth	Temp Celcius	Field Ph (S.U.)	DO Probe (mg/L)	DO Winkler (mg/L)	Fdt DO Optical	Salinity (mg/L)	Secchi Depth (ft.)
8-PMK006.36	7/16/1984	S	1	28.3		5.1				
8-PMK006.36	7/16/1984	M	3	28		4.7				
8-PMK006.36	7/16/1984	B	4	27.9		4.6				
8-PMK006.36	7/16/1984	S	7	27.9		4.6				
8-PMK006.36	8/9/1984	S	1	28.73		7.4				1.7
8-PMK006.36	8/9/1984	S	19	26		0.25				1.7
8-PMK006.36	8/14/1984	S	1	29.6	6.5	5.71				0.6
8-PMK006.36	8/14/1984	S	7	29.61	6.5	5.34				0.6
8-PMK006.36	9/4/1984	S	1	26.42	6.7	5.4	5.62		4.04	0.5
8-PMK006.36	9/4/1984	M	3	26.55		5			4.42	
8-PMK006.36	9/4/1984	B	5	26.42		4.8	5.54		7.82	
8-PMK006.36	9/14/1984	S	3	25.14		5.38				
8-PMK006.36	9/14/1984	M	5	25.14		5.33				
8-PMK006.36	9/14/1984	B	6	25.14		5.32				
8-PMK006.36	9/14/1984	S	1	25.21	7	5.52				0.5
8-PMK006.36	9/24/1984	S	1	23.4	7.1	7.18	7.23		12.52	0.5
8-PMK006.36	9/24/1984	M	3	23.25		6.91			12.5	
8-PMK006.36	9/24/1984	B	5	22.9	7.1	6.8	6.63		12.54	
8-PMK006.36	9/24/1984	S	1	23.54	6.65	5.46	5.79		7.93	0.5
8-PMK006.36	9/24/1984	M	3	23.44		5.44			7.89	
8-PMK006.36	9/24/1984	B	5	23.48	6.65	5.2	5.46		7.85	
8-PMK006.36	10/12/1984	S	1	20.01	6.7	6.7				0.2
8-PMK006.36	10/12/1984	M	3	20.13		6.6				
8-PMK006.36	10/12/1984	M	5	20.08		6.6				
8-PMK006.36	10/12/1984	B	6	20.09		6.5				
8-PMK006.36	10/30/1984	S	3	21.32		5.5			3.8	
8-PMK006.36	10/30/1984	B	4	21.32		5.5	6.02		3.96	
8-PMK006.36	10/30/1984	S	1	21.36	7	5.6	6.12		3.8	0.4
8-PMK006.36	11/15/1984	S	1	12.4		8.5	8.42		4.7	
8-PMK006.36	11/15/1984	M	3	12.5		8.4			5.9	
8-PMK006.36	11/15/1984	B	5	12.5	7.25	8.1	8.21		6.1	
8-PMK006.36	12/13/1984	S	1	6.4	7.3	10.45	10.31		0.38	0.3
8-PMK006.36	12/13/1984	M	3	6.44		10.43			0.43	
8-PMK006.36	12/13/1984	B	5	6.36	7.7	10.32	10.26		0.47	
8-PMK006.36	2/11/1985	S	1	1.19	6.7	12.2	12.2		6.34	0.5
8-PMK006.36	2/11/1985	M	3	0.86		12.2			7.32	
8-PMK006.36	2/11/1985	B	5	0.82	6.6	12.2	12.4		7.77	
8-PMK006.36	2/11/1985	S	1	1.28	7.1	12.4	12.2		0.7	0.3
8-PMK006.36	2/11/1985	M	3	1.13		12.3			0.79	
8-PMK006.36	2/11/1985	B	5	1.16	6.3	12.2	13.5		0.98	
8-PMK006.36	3/12/1985	S	1	10.02	7.04	10.7	10.1		7.75	0.4
8-PMK006.36	3/12/1985	M	3	10.15		10.6			7.78	
8-PMK006.36	3/12/1985	B	5	9.91	7.3	10.3	10.2		7.89	
8-PMK006.36	3/12/1985	S	1	10.36	7.01	9.5	9.4		1.92	0.1
8-PMK006.36	3/12/1985	M	3	10.3		9.5			1.9	
8-PMK006.36	3/12/1985	M	5	10.42		9.5			2	
8-PMK006.36	3/12/1985	M	7	10.3		9.5			1.9	
8-PMK006.36	3/12/1985	B	8	10.48	7.08	9.5	9.4		2.04	
8-PMK006.36	3/26/1985	S	1	8.9	6.7	11.9	11.8		1.18	0.2
8-PMK006.36	3/26/1985	M	3	8.82		10.4			2	
8-PMK006.36	3/26/1985	B	5	8.81	6.7	12.2	10		2.17	
8-PMK006.36	4/11/1985	S	1	12.7	7.5	8.6	8.4		1.4	0.3

Station ID	Collection Date	Depth Desc	Depth	Temp Celcius	Field Ph (S.U.)	DO Probe (mg/L)	DO Winkler (mg/L)	Fdt DO Optical	Salinity (mg/L)	Secchi Depth (ft.)
8-PMK006.36	4/11/1985	M	3	12.7		8.5			1.6	
8-PMK006.36	4/11/1985	B	5	12.7	7	8.5			1.8	0.3
8-PMK006.36	4/25/1985	S	1	20.01	6.73	7.5	6.5		3.7	0.3
8-PMK006.36	4/25/1985	M	3	19.76		7.5			4	
8-PMK006.36	4/25/1985	M	5	19.72		7.2			4.5	
8-PMK006.36	4/25/1985	B	7	19.69	6.7	7.2	6.5		5	
8-PMK006.36	5/9/1985	S	0.3	20.7	6.5		6.2			
8-PMK006.36	5/9/1985	M	1	20.7	6.5	6.2	6		3.78	0.3
8-PMK006.36	5/9/1985	M	3	20.66		6.1			4.12	
8-PMK006.36	5/9/1985	B	5	20.68	6.6	6.1	5.8		4.31	
8-PMK006.36	6/6/1985	S	1	24.8	8.6	4.9	4.8		10.14	0.6
8-PMK006.36	6/6/1985	M	3	24.8		4.8			10.4	
8-PMK006.36	6/6/1985	B	5	24.8	8.6	4.8	4.2		10.6	
8-PMK006.36	6/6/1985	S	1	24.4		5.5	4.8		3.6	0.5
8-PMK006.36	6/6/1985	M	3	24.4		5.4			3.7	
8-PMK006.36	6/6/1985	B	5	24.5		5.2	5		10.1	
8-PMK006.36	6/20/1985	S	1	25.2	7.8	6.2	5.3		2.3	0.5
8-PMK006.36	6/20/1985	M	3	25.1		5.7			2.6	
8-PMK006.36	6/20/1985	B	5	25.1	8	5.7	5.1		3.2	
8-PMK006.36	7/3/1985	S	1	24.5	7.9	4.8	5.3		5.4	0.6
8-PMK006.36	7/3/1985	M	3	24.6		4.7			5.6	
8-PMK006.36	7/3/1985	B	5	24.7	7	4.9	5.3		5.6	
8-PMK006.36	7/18/1985	S	1	27.51	7.24	4.9	4.3		11.9	0.4
8-PMK006.36	7/18/1985	M	3	27.22		4.9			12	
8-PMK006.36	7/18/1985	M	5	27.12		4.9			12.3	
8-PMK006.36	7/18/1985	B	7	27.09	7.07	4.6	5.4		12.3	
8-PMK006.36	8/6/1985	S	1	26.8	7.21	5.2	4		6.3	0.6
8-PMK006.36	8/6/1985	M	3	26.6		5.1			6.6	
8-PMK006.36	8/6/1985	B	5	26.6	7.29	5.1	5.1		6.8	
8-PMK006.36	8/21/1985	S	1	27.2	6.86	3.9	3.42		10.56	0.6
8-PMK006.36	8/21/1985	M	3	27.16		3.9			11.34	
8-PMK006.36	8/21/1985	B	5	27.2	6.71	4	3.77		12.48	
8-PMK006.36	8/21/1985	S	1	27.07	6.15	4.4	4.34		3.85	0.3
8-PMK006.36	8/21/1985	M	3	27.04		4.3			3.89	
8-PMK006.36	8/21/1985	B	5	27.11	6.06	4.3	4.28		3.92	
8-PMK006.36	9/5/1985	S	1	27.25	6.43	3.3	2.92		0.42	0.3
8-PMK006.36	9/5/1985	M	3	27.24		3.3			0.43	
8-PMK006.36	9/5/1985	B	5	27.18	6.79	3.2	2.81		0.47	
8-PMK006.36	9/18/1985	S	1	23.2	7	4.9	4.95		6.3	0.6
8-PMK006.36	9/18/1985	M	3	23.28		4.8			6.87	
8-PMK006.36	9/18/1985	B	4	23.25	6.99	4.8	4.78		6.91	
8-PMK006.36	10/3/1985	S	1	21.78	7.17	5.9	5.8		9.5	0.8
8-PMK006.36	10/3/1985	M	3	21.85		5.9			10	
8-PMK006.36	10/3/1985	B	5	21.84	7.36	6	5.7		10.56	
8-PMK006.36	10/3/1985	S	1	21.9	6.83	6.2	5.8		2.8	0.5
8-PMK006.36	10/3/1985	M	3	21.65		6.1			2.87	
8-PMK006.36	10/3/1985	B	5	21.82	7.09	6.1	5.8		3	
8-PMK006.36	10/17/1985	S	1	21.72	6.73	5.5	6.9		10.6	0.8
8-PMK006.36	10/17/1985	M	3	21.86		5.3			11.18	
8-PMK006.36	10/17/1985	B	5	21.78	6.64	5.4	6.9		10.9	
8-PMK006.36	10/17/1985	S	1	21.82	6.41	5.5	5.5		4.18	0.5
8-PMK006.36	10/17/1985	M	3	21.88		5.3			4.74	

Station ID	Collection Date	Depth Desc	Depth	Temp Celcius	Field Ph (S.U.)	DO Probe (mg/L)	DO Winkler (mg/L)	Fdt DO Optical	Salinity (mg/L)	Secchi Depth (ft.)
8-PMK006.36	10/17/1985	B	5	21.84	6.36	5.3	5.3		4.76	
8-PMK006.36	11/19/1985	S	1	15.45	5.94	6.3	5.75		0.3	0.2
8-PMK006.36	11/19/1985	M	3	15.53		6.4			0.32	
8-PMK006.36	11/19/1985	M	5	15.45		6.5			0.33	
8-PMK006.36	11/19/1985	B	7	15.4	6.11	6.6	5.88		0.3	
8-PMK006.36	12/5/1985	S	1	9.7	7.28	9			0.22	0.5
8-PMK006.36	12/5/1985	M	3	9.54		9			0.22	
8-PMK006.36	12/5/1985	B	5	9.68	7.31	9.1			0	
8-PMK006.36	1/16/1986	S	1	1.82	7.2	11.8	11.56		1.36	
8-PMK006.36	1/16/1986	B	3	1.86	7.53	11.9	11.51		1.38	
8-PMK006.36	2/13/1986	S	1	2.79	8	12.7	12.36		0.69	0.4
8-PMK006.36	2/13/1986	M	3	2.75		12.8			0.55	
8-PMK006.36	2/13/1986	B	5	2.78		12.9			0.55	
8-PMK006.36	3/13/1986	S	1	7.6	7.3	11.3	10.83		0.47	0.2
8-PMK006.36	3/13/1986	B	3	7.52	7.4	11.4	10.83		0.46	
8-PMK006.36	3/27/1986	S	1	12.51	6.62	9.1	9.33		0.72	0.2
8-PMK006.36	3/27/1986	M	3	12.41		9.1			0.72	
8-PMK006.36	3/27/1986	B	4	12.3	6.71	9.2	8.01		0.73	
8-PMK006.36	4/14/1986	S	1	14.78	6.76	7.9	7.57		4.86	0.3
8-PMK006.36	4/14/1986	M	3	14.48		8.1			3.8	
8-PMK006.36	4/14/1986	B	4	14.5	7.2	8.3	8.12		3.57	
8-PMK006.36	4/29/1986	S	1	16.56	6.89	7.5	6.45		5.1	0.2
8-PMK006.36	4/29/1986	M	3	16.57		7.5			5.3	
8-PMK006.36	4/29/1986	B	4	16.55	7.09	7.6	6.81		5.28	
8-PMK006.36	5/12/1986	S	1	19.14	6.93	6.5	6.56		6.74	0.3
8-PMK006.36	5/12/1986	M	3	19.2		6.6			7	
8-PMK006.36	5/12/1986	B	5	19.24	6.92	6.8	6.55		7.04	
8-PMK006.36	5/28/1986	S	1	22.47	6.83	5.2	4.9		3.43	0.2
8-PMK006.36	5/28/1986	M	3	22.49		5.3			3.46	
8-PMK006.36	5/28/1986	B	5	22.5	6.86	5.7	4.92		3.55	
8-PMK006.36	6/10/1986	M	1	26	6.74	5.1	4.8		2.44	0.3
8-PMK006.36	6/10/1986	M	3	25.9		5.1			2.38	
8-PMK006.36	6/10/1986	B	5	25.72	6.79	5	4.71		2.71	
8-PMK006.36	6/25/1986	S	1	26.08	7.01	4.7	4.84		7.5	0.3
8-PMK006.36	6/25/1986	M	3	26.04		4.7			7.71	
8-PMK006.36	6/25/1986	B	5	26.07	7.04	4.6	4.74		7.88	
8-PMK006.36	7/9/1986	S	1	28.43	7.04	6	5.88		6.11	0.5
8-PMK006.36	7/9/1986	M	3	28.21		5.6			6.25	
8-PMK006.36	7/9/1986	B	4	28.21	7.22	5.6	5.32		6.41	
8-PMK006.36	7/23/1986	S	1	29.27		3.9			9.72	
8-PMK006.36	7/23/1986	M	3	29.14		3.8			9.77	
8-PMK006.36	7/23/1986	B	4	29.19		3.9	3.6		9.9	
8-PMK006.36	8/7/1986	S	1	28.66	7.07	6.1	5.5		6.72	0.5
8-PMK006.36	8/7/1986	M	3	28.66		6			7.06	
8-PMK006.36	8/7/1986	B	4	28.66	6.79	6.1	4.98		7.18	
8-PMK006.36	8/27/1986	S	1	26.39	7.35	5.5	5.3		5.56	0.5
8-PMK006.36	8/27/1986	M	3	26.22		5.4			6.01	
8-PMK006.36	8/27/1986	B	4	25.34	7.36	5.4	6.54		6.49	
8-PMK006.36	9/8/1986	S	1	24.24	7.84	4.5	4.83		6.88	0.3
8-PMK006.36	9/8/1986	M	3	24.27		4.4			6.9	
8-PMK006.36	9/8/1986	B	4	24.31	7.68	4.4	4.8		6.93	
8-PMK006.36	9/24/1986	S	1	23.89	6.73	5.6	5.36		7.56	0.4

Station ID	Collection Date	Depth Desc	Depth	Temp Celcius	Field Ph (S.U.)	DO Probe (mg/L)	DO Winkler (mg/L)	Fdt DO Optical	Salinity (mg/L)	Secchi Depth (ft.)
8-PMK006.36	9/24/1986	M	3	23.88		5.5			7.8	
8-PMK006.36	9/24/1986	B	5	23.9	6.75	5.5	5.29		8.07	
8-PMK006.36	10/8/1986	S	1	23.61	6.44	5.4	5.2		8.78	0.4
8-PMK006.36	10/8/1986	M	3	23.56		5.2			9.09	
8-PMK006.36	10/8/1986	B	4	23.58	6.46	5.2	5.1		9.03	
8-PMK006.36	10/29/1986	S	1	17.24	7.15	7.3	7.19		12.72	0.6
8-PMK006.36	10/29/1986	M	3	17.18		7.3			12.73	
8-PMK006.36	10/29/1986	B	4	17.1	7.17	7.1	6.3		12.71	
8-PMK006.36	12/23/1986	S	1		7.48		9.6			0.3
8-PMK006.36	1/7/1987	S	1	4.4	6.71	10.8	9.88			0.2
8-PMK006.36	1/7/1987	B	3	4.4	7.64	10.8	9.7			
8-PMK006.36	3/5/1987	S	0.3	7	7.21		10.8			
8-PMK006.36	3/5/1987	M	1	7	7.21	10.8	8.71		0	0.3
8-PMK006.36	3/5/1987	M	3	6.9		10.8			0	
8-PMK006.36	3/5/1987	B	5	6.8	7.99	10.8	9.27		0	
8-PMK006.36	3/23/1987	S	1	8.9	7.29		8.66		3.9	0.4
8-PMK006.36	3/23/1987	M	3	8.8					4.9	
8-PMK006.36	3/23/1987	B	5	8.9	7.38		8.23		6	
8-PMK006.36	4/2/1987	S	0.3	12.8			8.6			
8-PMK006.36	4/2/1987	M	0.61	12.8			8.6			
8-PMK006.36	4/2/1987	M	1	12.8		8.6	8.68		0	0.2
8-PMK006.36	4/2/1987	M	3	13		8.6			0	
8-PMK006.36	4/2/1987	B	4	12		8.5	8.28		0	
8-PMK006.36	4/22/1987	S	1	15		7.5	6.95		0	0.3
8-PMK006.36	4/22/1987	M	3	15		7.3			0	
8-PMK006.36	4/22/1987	B	5	15		7.1	6.71		0.5	
8-PMK006.36	5/7/1987	M	1	16.7	6.55	6.6	6.44		1.36	0.5
8-PMK006.36	5/7/1987	M	3	16.61		6.1			2.41	
8-PMK006.36	5/7/1987	M	5	16.57		5.6			3.06	
8-PMK006.36	5/7/1987	B	6	16.58	6.59	5.6	5.6		3.16	
8-PMK006.36	5/19/1987	S	1	21.87	7.57	5.9	5.85		0.68	0.3
8-PMK006.36	5/19/1987	M	3	21.82		5.9			0.62	
8-PMK006.36	5/19/1987	B	5	21.84	7.52	5.8	5.73		0.64	
8-PMK006.36	6/4/1987	S	0.61	25.9	6.79		6.3			
8-PMK006.36	6/4/1987	M	1	26.06	6.79	6.4	5.69		0.6	0.3
8-PMK006.36	6/4/1987	M	3	25.96		6.3			0.65	
8-PMK006.36	6/4/1987	B	5	26	6.75	6.3	4.37		0.58	
8-PMK006.36	6/17/1987	S	1	26.9	6.69	4.5	4.42		0.47	0.2
8-PMK006.36	6/17/1987	M	3	26.88		4.5			0.5	
8-PMK006.36	6/17/1987	B	5	26.83	6.74	4.4	3.26		0.55	
8-PMK006.36	7/2/1987	S	0.3	12.8			8.6			
8-PMK006.36	7/7/1987	S	0.61	27.8	6.8		3.6			
8-PMK006.36	7/7/1987	M	1	27.88	6.8	3.9	4.07		5.66	0.4
8-PMK006.36	7/7/1987	M	3	27.81		3.6			6.68	
8-PMK006.36	7/7/1987	B	5	28.99	6.89	3.6	3.63		7.41	
8-PMK006.36	7/15/1987	S	1	28.93		2.7	2.7		5.03	0.4
8-PMK006.36	7/15/1987	M	3	28.9		2.5			5.35	
8-PMK006.36	7/15/1987	B	4	28.98		2.6	2.9		5.47	
8-PMK006.36	8/26/1987	S	1	26.72	6.98	4.4	4.82		7.64	0.6
8-PMK006.36	8/26/1987	M	3	26.78		4.2			8.25	
8-PMK006.36	8/26/1987	B	5	26.91	7.06	4.3			8.26	
8-PMK006.36	9/28/1987	S	1	23.65	6.36	6	6.54		3.44	0.4

Station ID	Collection Date	Depth Desc	Depth	Temp Celcius	Field Ph (S.U.)	DO Probe (mg/L)	DO Winkler (mg/L)	Fdt DO Optical	Salinity (mg/L)	Secchi Depth (ft.)
8-PMK006.36	9/28/1987	M	3	23.62		5.7			3.84	
8-PMK006.36	9/28/1987	B	5	23.62		5.7			4	
8-PMK006.36	10/29/1987	S	1	14.1		7.3	8.03		7.9	0.5
8-PMK006.36	10/29/1987	M	3	14.05		7.2			8.14	
8-PMK006.36	10/29/1987	M	5	14.02		7.4			8.21	
8-PMK006.36	10/29/1987	M	7	14.14		7.4			8.23	
8-PMK006.36	10/29/1987	B	8	14.09	7.63	7.5	7.92		8.26	
8-PMK006.36	11/17/1987	S	0.61	11.6	6.8		8.5			
8-PMK006.36	11/17/1987	M	1	11.84	6.8	8.5	8.75		10.99	0.4
8-PMK006.36	11/17/1987	M	3	11.64		8.5			11.17	
8-PMK006.36	11/17/1987	B	5	11.66	7.04	8.5	8.47		11.1	
8-PMK006.36	7/5/1988	S	1	25.25	6.99	5.38			5.8	0.1
8-PMK006.36	7/5/1988	M	3	25.28		4.98			6.1	
8-PMK006.36	7/5/1988	B	5	25.14	7.01	4.58			6	
8-PMK006.36	7/20/1988	S	1	29.08	7.09	5.44			6.3	0.4
8-PMK006.36	7/20/1988	M	3	29.07		5.27			6.5	
8-PMK006.36	7/20/1988	B	5	29.07	7.08	5.27			6.6	
8-PMK006.36	8/3/1988	S	1	29.46	6.95	4.01			6.2	0.4
8-PMK006.36	8/3/1988	M	3	29.41		3.98			6.5	
8-PMK006.36	8/3/1988	B	5	29.41	7.14	3.97			6.7	
8-PMK006.36	9/19/1988	S	1	23.55	7.13	5.77			10.7	0.4
8-PMK006.36	9/19/1988	M	3	23.55		5.53			11.2	
8-PMK006.36	9/19/1988	B	5	23.55	7.15	5.36			11.9	
8-PMK006.36	9/29/1988	S	1	22.5		5.02			11	0.3
8-PMK006.36	9/29/1988	M	3	22.49		4.89			11.1	
8-PMK006.36	9/29/1988	M	5	22.48		5			11.1	
8-PMK006.36	9/29/1988	B	6	22.44		5			11.2	
8-PMK006.36	10/13/1988	S	1	16.88	7.14	6.86			8.1	0.5
8-PMK006.36	10/13/1988	M	3	16.91		6.8			8.1	
8-PMK006.36	10/13/1988	B	5	16.9	7.23	6.77			8.2	
8-PMK006.36	11/3/1988	S	1	12.94	7.22	7.45			10	0.6
8-PMK006.36	11/3/1988	M	3	12.78		7.25			11.1	
8-PMK006.36	11/3/1988	B	4	12.77	7.35	7.26			11.5	
8-PMK006.36	11/16/1988	S	1	12.87	7.19	7.97			8.5	0.6
8-PMK006.36	11/16/1988	M	3	12.84		8.27			9.1	
8-PMK006.36	11/16/1988	B	5	12.85	7.3	8.47			9.2	
8-PMK006.36	12/15/1988	S	1	5.71		10.4			7.1	0.3
8-PMK006.36	12/15/1988	M	3	5.71		10.71			7.5	
8-PMK006.36	12/15/1988	B	5	5.73		10.88			7.6	
8-PMK006.36	1/23/1989	S	1	6.03	7.38	10.9			9	0.4
8-PMK006.36	1/23/1989	M	3	5.83		10.78			9	
8-PMK006.36	1/23/1989	M	5	5.8		10.73			9.1	
8-PMK006.36	1/23/1989	B	6	5.8	7.2	10.74			9.2	
8-PMK006.36	3/27/1989	S	1	10.85	7.82	9.88			0	0.3
8-PMK006.36	3/27/1989	M	3	10.85		10			0	
8-PMK006.36	3/27/1989	B	5	10.86	8.2	10.43			0	
8-PMK006.36	4/17/1989	S	1	13.65	7.42	8.3	8.33		0	0.2
8-PMK006.36	4/17/1989	M	3	13.67		8.15			0	
8-PMK006.36	4/17/1989	M	5	13.63		7.94			1.1	
8-PMK006.36	4/17/1989	B	6	13.62	7.57	8	7.74		1.3	
8-PMK006.36	8/7/1989	S	1	28.78		3.84			0	0.3
8-PMK006.36	8/7/1989	M	3	28.76		3.84			0	

Station ID	Collection Date	Depth Desc	Depth	Temp Celcius	Field Ph (S.U.)	DO Probe (mg/L)	DO Winkler (mg/L)	Fdt DO Optical	Salinity (mg/L)	Secchi Depth (ft.)
8-PMK006.36	8/7/1989	B	4	28.73		3.88			0	
8-PMK006.36	2/14/1990	S	1	10.28	7.18	10.02			0	
8-PMK006.36	2/14/1990	M	3	10.26		10.18			0	
8-PMK006.36	2/14/1990	B	4	10.27	7.14	10.73			0	
8-PMK006.36	3/14/1990	S	1	12.12	7.35	9.6			0	0.1
8-PMK006.36	3/14/1990	M	3	12.11		9.7			0	
8-PMK006.36	3/14/1990	B	4	12.1	7.31	9.99			0	
8-PMK006.36	3/29/1990	S	1	13.06	7.25	8.97			0	
8-PMK006.36	3/29/1990	M	3	13.02		8.97			0	
8-PMK006.36	3/29/1990	B	5	13		8.97			0	
8-PMK006.36	4/17/1990	S	1	14.23	7.12	8.34			0	0.2
8-PMK006.36	4/17/1990	M	3	14.19		8.32			0	
8-PMK006.36	4/17/1990	B	5	14.19		8.36			0	
8-PMK006.36	4/26/1990	S	1	17.47	6.84	7.88			0	0.3
8-PMK006.36	4/26/1990	M	3	17.46		7.88			0	
8-PMK006.36	4/26/1990	B	5	17.46	6.93	7.85			0	
8-PMK006.36	5/10/1990	S	0.3	21			7.7			
8-PMK006.36	5/10/1990	M	1	21.06		7.76			0	0.3
8-PMK006.36	5/10/1990	M	3	21.04		7.75			0	
8-PMK006.36	5/10/1990	B	5	21.02		7.85			0	
8-PMK006.36	6/4/1990	S	1	20.75	6.16	5.75			0	0.2
8-PMK006.36	6/4/1990	M	3	20.68		5.73			0	
8-PMK006.36	6/4/1990	B	5	20.64	6.94	5.69			0	
8-PMK006.36	6/13/1990	S	1	23.22	6.93	5.12			2.6	0.5
8-PMK006.36	6/13/1990	M	3	23.17		5.13			2.8	
8-PMK006.36	6/13/1990	M	5	23.11	7.14	5.2			2.9	
8-PMK006.36	6/27/1990	S	1	26.57	6.64	4.01			3.3	0.4
8-PMK006.36	6/27/1990	M	3	26.57		4.02			3.3	
8-PMK006.36	6/27/1990	M	5	26.49		4.02			3.2	
8-PMK006.36	6/27/1990	B	7	26.48	6.68	4.02			3.2	
8-PMK006.36	7/11/1990	S	1	28.43	6.64	4.8			2.1	0.3
8-PMK006.36	7/11/1990	M	3	28.42		4.74			2.4	
8-PMK006.36	7/11/1990	B	5	28.47	6.89	4.71			2.5	
8-PMK006.36	7/25/1990	S	1	28.82	6.85	4			2	0.3
8-PMK006.36	7/25/1990	M	3	28.79		3.87			2.2	
8-PMK006.36	7/25/1990	B	5	28.73	7.14	3.89			2.2	
8-PMK006.36	8/8/1990	S	1	27.21	6.88	4.64			4	0.4
8-PMK006.36	8/8/1990	M	3	27.2		4.64			4.1	
8-PMK006.36	8/8/1990	B	5	27.16	6.96	4.63			4.2	
8-PMK006.36	8/22/1990	S	1	26.43	6.88	3.54			6.5	0.4
8-PMK006.36	8/22/1990	M	3	26.43		3.52			6.8	
8-PMK006.36	8/22/1990	B	4	26.42	6.79	3.54			6.99	
8-PMK006.36	9/10/1990	S	1	26.32	6.85	4.15			6.5	0.4
8-PMK006.36	9/10/1990	M	3	26.3		4.07			6.5	
8-PMK006.36	9/10/1990	B	5	26.28	6.84	4.3			6.5	
8-PMK006.36	9/25/1990	S	1	21.66	7.12	6.03	6.42		4.1	0.6
8-PMK006.36	9/25/1990	M	3	21.6		5.87			4.3	
8-PMK006.36	9/25/1990	B	5	21.59	7.34	5.96	6.64		4.5	
8-PMK006.36	10/10/1990	S	1	22.42	7.06	5.42			7.9	0.5
8-PMK006.36	10/10/1990	M	3	22.44		5.27			8.5	
8-PMK006.36	10/10/1990	B	5	22.44	7.16	5.41			8.7	
8-PMK006.36	10/24/1990	S	1	20.21	7.07	6.18			5.6	0.3

Station ID	Collection Date	Depth Desc	Depth	Temp Celcius	Field Ph (S.U.)	DO Probe (mg/L)	DO Winkler (mg/L)	Fdt DO Optical	Salinity (mg/L)	Secchi Depth (ft.)
8-PMK006.36	10/24/1990	M	3	20.2		6.19			5.6	
8-PMK006.36	10/24/1990	M	5	20.19		6.19			5.7	
8-PMK006.36	10/24/1990	B	6	20.16	7.03	6.36			5.8	
8-PMK006.36	12/6/1990	S	1	10.1	7.39	9.28			1.9	0.2
8-PMK006.36	12/6/1990	M	3	10.09		9.33			2	
8-PMK006.36	12/6/1990	B	5	10.06	7.75	9.55			2	
8-PMK006.36	1/3/1991	S	1	8.21	7.31	11.25			0	0.2
8-PMK006.36	1/3/1991	M	3	8.17		11.4			0	
8-PMK006.36	1/3/1991	B	5	8.42	7.44	11.6			0	
8-PMK006.36	2/19/1991	S	1	5.99	7.54	10.82			0.4	0.2
8-PMK006.36	2/19/1991	M	3	5.99		10.88			0.5	
8-PMK006.36	2/19/1991	B	4	6.04	7.74	11.03			0.6	
8-PMK006.36	3/5/1991	S	1	10.32	7.49	10.01			0.8	0.2
8-PMK006.36	3/5/1991	M	3	10		10.1			0.9	
8-PMK006.36	3/5/1991	B	5	9.96	7.72	10.24			1	
8-PMK006.36	3/25/1991	S	1	11.19	7.27	8.94	9.76		4	0.4
8-PMK006.36	3/25/1991	M	3	11.15		8.64			5.2	
8-PMK006.36	3/25/1991	M	5	11.15		8.6			6.8	
8-PMK006.36	3/25/1991	B	6	11.13	7.3	8.69	8.58		6.9	
8-PMK006.36	4/2/1991	S	1	13.22	7.61	9.31			0	0.2
8-PMK006.36	4/2/1991	M	3	13.21		9.36			0	
8-PMK006.36	4/2/1991	B	4	13.9	7.72	9.76			0	
8-PMK006.36	4/17/1991	S	1	16.78	7.18	7.59			0	0.2
8-PMK006.36	4/17/1991	M	3	16.77		7.6			0	
8-PMK006.36	4/17/1991	B	5	16.7	7.5	7.82			0	
8-PMK006.36	5/1/1991	S	1	19.25	6.96	6.86			0.2	0.2
8-PMK006.36	5/1/1991	M	3	19.17		6.86			0.3	
8-PMK006.36	5/1/1991	B	5	19.14	7.11	6.91			0.4	
8-PMK006.36	5/15/1991	S	1	23.3	6.92	5.47			1.6	0.3
8-PMK006.36	5/15/1991	M	3	23.04		5.43			1.6	
8-PMK006.36	5/15/1991	M	5	23.04		5.31			2	
8-PMK006.36	5/15/1991	B	6	23.03	7.02	5.42			2	
8-PMK006.36	6/12/1991	S	0.3	25.5			7.2			
8-PMK006.36	6/12/1991	M	1	25.98		7.2			3.5	0.5
8-PMK006.36	6/12/1991	M	3	25.49		7.09			3.6	
8-PMK006.36	6/12/1991	B	4	25.49		7.02			3.7	
8-PMK006.36	6/26/1991	S	1	25.38		6.21			4.6	0.5
8-PMK006.36	6/26/1991	M	3	25.38		6.11			4.8	
8-PMK006.36	6/26/1991	B	5	25.36	7.11	6.16			4.9	
8-PMK006.36	7/15/1991	S	1	28.5	6.9	4.98			4.9	
8-PMK006.36	7/15/1991	B	3	28.47	6.93	4.93			5	
8-PMK006.36	7/31/1991	S	1	27.23	6.89	3.51			6.7	0.4
8-PMK006.36	7/31/1991	M	3	27.21		3.49			6.7	
8-PMK006.36	7/31/1991	M	5	27.2		3.49			6.7	
8-PMK006.36	7/31/1991	B	6	27.18	6.96	3.51			6.7	
8-PMK006.36	8/12/1991	S	1	27.77		5.28			3.1	0.4
8-PMK006.36	8/12/1991	M	3	27.75		5.18			3.3	
8-PMK006.36	8/12/1991	B	4	27.72		5.21			3.5	
8-PMK006.36	8/26/1991	S	1	27.26	6.98	4.65			9.2	0.5
8-PMK006.36	8/26/1991	M	3	27.25		4.65			9.5	
8-PMK006.36	8/26/1991	M	5	27.25		4.66			9.5	
8-PMK006.36	8/26/1991	B	6	27.24	7.01	4.7			9.5	

Station ID	Collection Date	Depth Desc	Depth	Temp Celcius	Field Ph (S.U.)	DO Probe (mg/L)	DO Winkler (mg/L)	Fdt DO Optical	Salinity (mg/L)	Secchi Depth (ft.)
8-PMK006.36	9/11/1991	S	1	26.1	6.99	4.9			7.1	0.5
8-PMK006.36	9/11/1991	M	3	26.08		4.82			7.3	
8-PMK006.36	9/11/1991	B	4	26.04	7.1	4.87			7.4	
8-PMK006.36	10/3/1991	S	1	22.35	6.66	6.06			6.9	0.3
8-PMK006.36	10/3/1991	M	3	22.34		6.03			7	
8-PMK006.36	10/3/1991	M	5	22.33		5.98			7	
8-PMK006.36	10/3/1991	B	7	22.33	6.71	6			7	
8-PMK006.36	10/9/1991	S	1	20.39	7.13	6.41	7.14		6.5	0.4
8-PMK006.36	10/9/1991	B	3	20.37	7.22	6.34	6.48		6.8	
8-PMK006.36	11/12/1991	S	1	10.16	7.11	8.77	8.47		9.1	0.7
8-PMK006.36	11/12/1991	M	3	10.07		8.7			9.3	
8-PMK006.36	11/12/1991	B	4	10.07	7.13	8.93	8.49		9.4	
8-PMK006.36	12/12/1991	S	1	10.29	7.34	8.77	9.51		5.6	0.4
8-PMK006.36	12/12/1991	M	3	10.3		8.75			5.8	
8-PMK006.36	12/12/1991	M	5	10.29		8.79			5.9	
8-PMK006.36	12/12/1991	B	6	10.28	7.41	8.79	10.7		5.9	
8-PMK006.36	1/8/1992	S	1	7		11.99	10.95		1.7	1.4
8-PMK006.36	1/8/1992	M	3	7		12.05			1.8	
8-PMK006.36	1/8/1992	B	4	7	7.8	12.38	12.07		1.8	
8-PMK006.36	2/5/1992	S	1	5.02	7.51	11.67	11.35		4.7	0.3
8-PMK006.36	2/5/1992	M	3	5.02		11.74			5.6	
8-PMK006.36	2/5/1992	B	5	5	7.55	12.33	11.2		6.8	
8-PMK006.36	3/9/1992	S	1	11.58	7.92	9.32	7.96		0	0.2
8-PMK006.36	3/9/1992	M	3	11.57		9.47			0	
8-PMK006.36	3/9/1992	B	5	11.57	8.27	9.64	8.48		0	
8-PMK006.36	3/30/1992	S	1	9.75	7.46	10.51	9.29		3.4	0.2
8-PMK006.36	3/30/1992	M	3	9.7		10.59			4	
8-PMK006.36	3/30/1992	M	5	9.71		10.57			4.9	
8-PMK006.36	3/30/1992	B	6	9.7		11.45	9.3		4.9	
8-PMK006.36	4/6/1992	S	1	10.09	7.71	9.18			0	
8-PMK006.36	4/6/1992	M	3	10		9.18			0.1	
8-PMK006.36	4/6/1992	B	5	9.99		9.41			0.2	
8-PMK006.36	4/20/1992	S	1	16.12	7.25	7.55	7.6		2.8	0.4
8-PMK006.36	4/20/1992	M	3	16.12		7.54			2.9	
8-PMK006.36	4/20/1992	M	5	16.11		7.64			3	
8-PMK006.36	4/20/1992	B	6	16.09	7.6	8.04	7.37		3	
8-PMK006.36	5/5/1992	S	0.3	18.3	7.54	7.3				
8-PMK006.36	5/5/1992	S	1	18.31	7.3	7.36	7.12		1.5	0.3
8-PMK006.36	5/5/1992	M	3	18.32		7.22			1.7	
8-PMK006.36	5/5/1992	B	5	18.3	7.54	7.34	7.35		2	
8-PMK006.36	5/21/1992	S	1	19.76	7.23	6.33			1.8	0.2
8-PMK006.36	5/21/1992	M	3	19.74		6.33			1.8	
8-PMK006.36	5/21/1992	B	5	19.71	7.62	6.52			1.8	
8-PMK006.36	8/31/1992	S	1	26.13	6.29	5.1	4.34		2.7	0.6
8-PMK006.36	8/31/1992	M	3	26.08		5			2.9	
8-PMK006.36	8/31/1992	B	4	26.04	6.54	5.04	4.48		2.9	
8-PMK006.36	9/14/1992	S	1	25.1	7.36	5.23	4.37		2.1	0.4
8-PMK006.36	9/14/1992	M	3	25.07		5.18			2.3	
8-PMK006.36	9/14/1992	B	5	25.03	7.65	5.23	4.34		2.4	
8-PMK006.36	10/1/1992	S	1	20.26	7.19	6	6.13		5.5	0.2
8-PMK006.36	10/1/1992	M	3	20.22		6.04			5.5	
8-PMK006.36	10/1/1992	B	5	20.22	7.41	6.07	6.08		5.5	

Station ID	Collection Date	Depth Desc	Depth	Temp Celcius	Field Ph (S.U.)	DO Probe (mg/L)	DO Winkler (mg/L)	Fdt DO Optical	Salinity (mg/L)	Secchi Depth (ft.)
8-PMK006.36	10/14/1992	S	1	18.64	7.31	7.05	7.25		3.5	0.4
8-PMK006.36	10/14/1992	M	3	18.64		6.95			3.7	
8-PMK006.36	10/14/1992	B	5	18.64	7.47	6.91	7.43		4	
8-PMK006.36	10/28/1992	S	1	15.41	7.33	7.71	8.04		4.7	0.4
8-PMK006.36	10/28/1992	M	3	15.4		7.65			4.8	
8-PMK006.36	10/28/1992	B	5	14.38	7.61	7.51	7.76		5.4	
8-PMK006.36	11/16/1992	S	1	12.21	7.08	8.26			4.2	0.3
8-PMK006.36	11/16/1992	M	3	12.19		8.3			4.2	
8-PMK006.36	11/16/1992	B	5	12.11	7.38	8.65			4.3	
8-PMK006.36	12/17/1992	S	1	6.34	7.27	10.79			0	0.2
8-PMK006.36	12/17/1992	M	3	6.34		10.89			0	
8-PMK006.36	12/17/1992	B	5	6.4	7.55	11.19			0	
8-PMK006.36	1/13/1993	S	1	6.89		10.7	11.56		0	0.3
8-PMK006.36	1/13/1993	M	3	6.88		10.7			0	
8-PMK006.36	1/13/1993	M	5	6.88		10.75			0	
8-PMK006.36	1/13/1993	B	6	6.88		11.22	10.97		0	
8-PMK006.36	2/10/1993	S	1	4.99	7.74	11.43			1.9	0.4
8-PMK006.36	2/10/1993	M	3	4.98		11.48			2	
8-PMK006.36	2/10/1993	B	5	4.96	7.95	11.72			2	
8-PMK006.36	3/11/1993	S	1	7.89	7.99	9.92			0	0.1
8-PMK006.36	3/11/1993	M	3	7.88		9.97			0	
8-PMK006.36	3/11/1993	B	5	7.87	8.55	9			0	
8-PMK006.36	3/25/1993	S	1	8.59	7.46	11			0	0.4
8-PMK006.36	3/25/1993	M	3	8.59		11.01			0	
8-PMK006.36	3/25/1993	M	5	8.58		11.01			0	
8-PMK006.36	3/25/1993	B	6	8.58	7.7	11.05			0	
8-PMK006.36	4/14/1993	S	1	14.14	7.73	8.61			0	0.4
8-PMK006.36	4/14/1993	M	3	13.72		8.62			0	
8-PMK006.36	4/14/1993	B	5	13.71	7.92	8.62	8.23		0	
8-PMK006.36	4/29/1993	S	1	15.83		7.81	7.85		1.4	
8-PMK006.36	4/29/1993	M	3	15.87		7.63			2.5	
8-PMK006.36	4/29/1993	B	4	15.82	7.02	7.58	7.43		2.8	
8-PMK006.36	5/10/1993	S	0.3	21.2	7.61		6.7			
8-PMK006.36	5/10/1993	M	1	21.16	7.61	6.71	6.54		0	0.3
8-PMK006.36	5/10/1993	M	3	21.15		6.71			0	
8-PMK006.36	5/10/1993	B	5	21.13	7.98	6.76	6.54		0	
8-PMK006.36	5/25/1993	S	1	21.7	7.65	7.07	6.85		0	0.4
8-PMK006.36	5/25/1993	M	3	21.64		7.07			0	
8-PMK006.36	5/25/1993	B	5	21.63	8.01	7.09	7.07		0	
8-PMK006.36	6/8/1993	S	1	23.3	7.44	6.24			0	0.3
8-PMK006.36	6/8/1993	M	3	23.3		6.24			0	
8-PMK006.36	6/8/1993	M	5	23.27	7.73	6.26			0	
8-PMK006.36	6/23/1993	S	1	27.18	7.17	4.5			1.1	0.4
8-PMK006.36	6/23/1993	M	3	27.11		4.31			1.3	
8-PMK006.36	6/23/1993	B	5	27.05	7.44	4.22			1.6	
8-PMK006.36	7/8/1993	S	1	29.31	7.35	5.25			2.8	0.4
8-PMK006.36	7/8/1993	M	3	29.28		5.24			2.9	
8-PMK006.36	7/8/1993	B	5	29.28	7.61	5.28			2.9	
8-PMK006.36	7/22/1993	S	1	29.41	7.27	5.24	5.29		5.7	0.5
8-PMK006.36	7/22/1993	M	3	29.38		5.08			5.8	
8-PMK006.36	7/22/1993	B	4	29.31	7.56	5.16	5.54		6	
8-PMK006.36	8/5/1993	S	1	28.49	7.28	5.35	6.43		6.5	0.6

Station ID	Collection Date	Depth Desc	Depth	Temp Celcius	Field Ph (S.U.)	DO Probe (mg/L)	DO Winkler (mg/L)	Fdt DO Optical	Salinity (mg/L)	Secchi Depth (ft.)
8-PMK006.36	8/5/1993	M	3	28.46		5.21			6.8	
8-PMK006.36	8/5/1993	M	5	28.43		5.2			7	
8-PMK006.36	8/5/1993	B	6	28.4	7.47	5.34	5.57		7	
8-PMK006.36	8/19/1993	S	1	27.69	7.05	4.1	4.21		7	0.6
8-PMK006.36	8/19/1993	M	3	27.62		3.87			7.4	
8-PMK006.36	8/19/1993	M	5	27.59		3.7			7.8	
8-PMK006.36	8/19/1993	B	6	27.56	7.37	3.79	3.65		7.9	
8-PMK006.36	9/7/1993	S	1	27.87	7.29	5.59			9.6	0.7
8-PMK006.36	9/7/1993	M	3	27.85		5.19			10.2	
8-PMK006.36	9/7/1993	M	5	27.85		5.1			10.3	
8-PMK006.36	9/7/1993	B	6	27.84		5.15			10.3	
8-PMK006.36	9/22/1993	S	1	23.92	7.3	4.74			9.4	0.6
8-PMK006.36	9/22/1993	M	3	23.27		4.64			9.5	
8-PMK006.36	9/22/1993	B	5	23.85	7.38	4.62			9.7	
8-PMK006.36	10/6/1993	S	1	20.24	7.48	7.86			9	0.3
8-PMK006.36	10/6/1993	M	3	20.22		7.67			9.2	
8-PMK006.36	10/6/1993	M	5	20.15		7.58			9.6	
8-PMK006.36	10/6/1993	B	6	20.15	7.66	7.64			9.7	
8-PMK006.36	12/6/1993	S	1	9.96	8.01	8.04	8.2		0	0.2
8-PMK006.36	12/6/1993	M	3	9.94		8.05			0	
8-PMK006.36	12/6/1993	M	5	9.93		8.06			0	
8-PMK006.36	12/6/1993	B	6	9.93	8.38	8.3	7.87		0	
8-PMK006.36	1/13/1994	S	1	3.38		12.27			1.6	0.2
8-PMK006.36	1/13/1994	M	3	3.38		12.33			1.6	
8-PMK006.36	1/13/1994	B	5	3.38		12.55			1.7	
8-PMK006.36	2/15/1994	S	1	2.49	7.32	12.81	11.51		0.1	0.4
8-PMK006.36	2/15/1994	M	3	2.44		12.8			0.1	
8-PMK006.36	2/15/1994	M	5	2.38		12.79			0.1	
8-PMK006.36	2/15/1994	B	6	2.38	7.73	12.9	11.55		0.1	
8-PMK006.36	3/30/1994	S	1	12.66	7.22	9.4	9.47		0	0.4
8-PMK006.36	3/30/1994	M	3	12.52		9.45			0	
8-PMK006.36	3/30/1994	B	5	12.48		9.61	9.44		0	
8-PMK006.36	4/26/1994	S	1	18.64	7	6.83	6.23		0.2	0.3
8-PMK006.36	4/26/1994	M	3	18.65		6.84			0.2	
8-PMK006.36	4/26/1994	M	5	18.64		6.87			0.2	
8-PMK006.36	4/26/1994	B	6	18.61	7.22	6.92	6.72		0.2	
8-PMK006.36	5/24/1994	S	1	19.92	8.64		6.85		4.6	0.3
8-PMK006.36	5/24/1994	M	3	19.7		6.66			4.8	
8-PMK006.36	5/24/1994	M	5	19.68		6.7			4.9	
8-PMK006.36	5/24/1994	B	6	19.58	6.98	6.69	6.76		4.9	
8-PMK006.36	6/23/1994	S	1	28.94	6.82	3.9	4.27		3.8	0.5
8-PMK006.36	6/23/1994	M	3	28.83		6.35			4.1	
8-PMK006.36	6/23/1994	B	4	28.75	6.8	3.48	4.02		4.4	
8-PMK006.36	7/21/1994	S	1	29.3	6.84	3.77			6.6	0.6
8-PMK006.36	7/21/1994	M	3	29.27		3.97			6.8	
8-PMK006.36	7/21/1994	M	5	29.27		4.07			6.8	
8-PMK006.36	7/21/1994	B	6	29.27	6.89	4.16			6.8	
8-PMK006.36	8/23/1994	S	1	26.8	7.2	5.79			0.5	0.4
8-PMK006.36	8/23/1994	M	3	26.78		5.71			0.5	
8-PMK006.36	8/23/1994	M	5	26.7		5.73			0.5	
8-PMK006.36	8/23/1994	B	6	26.75	7.75	5.73			0.5	
8-PMK006.36	9/27/1994	S	5	23.11	7.01	5.31			6.6	

Station ID	Collection Date	Depth Desc	Depth	Temp Celcius	Field Ph (S.U.)	DO Probe (mg/L)	DO Winkler (mg/L)	Fdt DO Optical	Salinity (mg/L)	Secchi Depth (ft.)
8-PMK006.36	9/27/1994	S	1	23.13	6.98	5.27			6.3	0.4
8-PMK006.36	9/27/1994	B	3	23.13		5.29			6.4	
8-PMK006.36	10/20/1994	S	7	16.84	7.12	6.61			6.6	
8-PMK006.36	10/20/1994	S	1	16.87	7.06	6.64			6.1	0.5
8-PMK006.36	10/20/1994	M	3	16.85		6.62			6.2	
8-PMK006.36	10/20/1994	B	5	16.84		6.61			6.5	
8-PMK006.36	11/29/1994	S	6	11.55	7.04	8.13			8.2	
8-PMK006.36	11/29/1994	S	1	11.66	7	8.13			7.1	0.4
8-PMK006.36	11/29/1994	M	3	11.56		8.09			8	
8-PMK006.36	11/29/1994	B	5	11.55		8.09			8.2	
8-PMK006.36	12/13/1994	S	6	9.82	7.23	8.33			10	
8-PMK006.36	12/13/1994	S	1	9.75	7.19	8.43			8.4	0.3
8-PMK006.36	12/13/1994	B	5	9.84		8.27			9.9	
8-PMK006.36	1/12/1995	S	7	5.52	7.08	13.6			8.5	
8-PMK006.36	1/12/1995	S	1	5.72	7.09	13.72			7	0.5
8-PMK006.36	1/12/1995	M	3	5.51		13.56			8.3	
8-PMK006.36	1/12/1995	B	5	5.51		13.55			8.4	
8-PMK006.36	2/13/1995	S	6	2.98	7.27	12.04			7.7	
8-PMK006.36	2/13/1995	S	1	3.19	7.16	11.35			7.4	0.6
8-PMK006.36	2/13/1995	M	3	3.01		11.49			7.6	
8-PMK006.36	2/13/1995	B	5	3		11.64			7.7	
8-PMK006.36	3/7/1995	S	5	7.65	7.44	10.86			1.4	
8-PMK006.36	3/7/1995	S	1	7.7	7.44	10.82			1	0.2
8-PMK006.36	3/7/1995	B	3	7.63		10.83			1.3	
8-PMK006.36	4/20/1995	S	5	16.3	6.86	6.92			3.8	
8-PMK006.36	4/20/1995	B	6		6.86					
8-PMK006.36	4/20/1995	S	1	16.35	6.84	6.86			3.7	0.2
8-PMK006.36	4/20/1995	B	3	16.3		6.86			3.7	
8-PMK006.36	5/9/1995	S	6	17.4	6.97	6.24			7.7	
8-PMK006.36	5/9/1995	S	1	17.63	6.92	6.59			4.7	0.5
8-PMK006.36	5/9/1995	M	3	17.43		6.31			6.9	
8-PMK006.36	5/9/1995	B	5	17.38		6.05			7.6	
8-PMK006.36	6/22/1995	S	4	26.37	6.9	5.07			8.1	
8-PMK006.36	6/22/1995	S	1	26.41	6.87	5.1			7.9	0.5
8-PMK006.36	6/22/1995	B	3	26.38		4.97			8.1	
8-PMK006.36	7/6/1995	S	5	26.88	7.61	5.42			0.1	
8-PMK006.36	7/6/1995	S	1	26.99	7.27	5.31			0.1	0.3
8-PMK006.36	7/6/1995	B	3	26.89		5.23			0.1	
8-PMK006.36	8/15/1995	S	5	28.5	7.05	5.09			7.7	
8-PMK006.36	8/15/1995	S	1	28.51	6.9	4.88			7.6	0.3
8-PMK006.36	8/15/1995	B	3	28.51		4.9			7.6	
8-PMK006.36	9/5/1995	S	7	25.99	7.24	5.1			13.4	
8-PMK006.36	9/5/1995	S	1	26	7.19	4.97			13.4	0.4
8-PMK006.36	9/5/1995	M	3	25.98		4.97			13.5	
8-PMK006.36	9/5/1995	B	5	25.98		5.01			13.5	
8-PMK006.36	10/10/1995	S	6	22.11	7.12	6.44			9.7	
8-PMK006.36	10/10/1995	S	1	22.26	7.18	7.06			9.3	0.4
8-PMK006.36	10/10/1995	M	3	22.12		6.48			9.6	
8-PMK006.36	10/10/1995	B	5	22.12		6.47			9.6	
8-PMK006.36	11/16/1995	S	6	11.12	7.25	8.43			6.6	
8-PMK006.36	11/16/1995	S	1	10.71	7.27	8.69			3.2	0.4
8-PMK006.36	11/16/1995	M	3	11.01		8.47			5.1	

Station ID	Collection Date	Depth Desc	Depth	Temp Celcius	Field Ph (S.U.)	DO Probe (mg/L)	DO Winkler (mg/L)	Fdt DO Optical	Salinity (mg/L)	Secchi Depth (ft.)
8-PMK006.36	11/16/1995	B	5	11.07		8.37			6.2	
8-PMK006.36	12/4/1995	S	1							0.4
8-PMK006.36	1/16/1996	S	6	1.3	7.68	12.45			8.9	
8-PMK006.36	1/16/1996	S	1	1.22	7.56	12.1			7.2	0.6
8-PMK006.36	1/16/1996	M	3	1.24		12.11			7.8	
8-PMK006.36	1/16/1996	B	5	1.3		12.24			8.8	
8-PMK006.36	2/26/1996	S	7	6.3	7.83	11.22			0	
8-PMK006.36	2/26/1996	S	1	6.3	7.67	11.1			0	0.3
8-PMK006.36	2/26/1996	M	3	6.3		11.11			0	
8-PMK006.36	2/26/1996	B	5	6.3		11.15			0	
8-PMK006.36	3/4/1996	S	6	7.04	8.62	11.4			0.1	
8-PMK006.36	3/4/1996	S	1	7.04	8.27	11.16			0.1	0.3
8-PMK006.36	3/4/1996	M	3	7.04		11.2			0.1	
8-PMK006.36	3/4/1996	B	5	7.03		11.32			0.1	
8-PMK006.36	4/15/1996	S	6	13.42	8.05	8.05			1.5	
8-PMK006.36	4/15/1996	S	1	13.42	6.93	8.07			1.5	0.2
8-PMK006.36	4/15/1996	M	3	13.42		8.09			1.5	
8-PMK006.36	4/15/1996	B	5	13.42		8.05			1.5	
8-PMK006.36	5/21/1996	S	6	22.22	7.26	5.9			0.3	
8-PMK006.36	5/21/1996	S	1	22.29	7.1	5.86			0.3	0.3
8-PMK006.36	5/21/1996	M	3	22.23		5.86			0.3	
8-PMK006.36	5/21/1996	B	5	22.22		5.86			0.3	
8-PMK006.36	6/4/1996	S	5	20.73	6.99	5.35			1.6	
8-PMK006.36	6/4/1996	S	1	20.77	6.9	5.35			1.6	0.2
8-PMK006.36	6/4/1996	B	3	20.73		5.35			1.6	
8-PMK006.36	7/9/1996	S	7	27.22	7.5	4.28			7	
8-PMK006.36	7/9/1996	S	1	27.54	7.27	4.55			6.6	0.5
8-PMK006.36	7/9/1996	M	3	27.26		4.24			6.8	
8-PMK006.36	7/9/1996	B	5	27.22		4.26			6.9	
8-PMK006.36	8/6/1996	S	6	27.06	7.61	3.93			2.6	
8-PMK006.36	8/6/1996	S	1	27.06	7.33	3.87			2.4	0.4
8-PMK006.36	8/6/1996	M	3	27.05		3.85			2.4	
8-PMK006.36	8/6/1996	B	5	27.06		3.85			2.6	
8-PMK006.36	9/10/1996	S	6	26.62	6.9	5.16			0.7	
8-PMK006.36	9/10/1996	S	1	26.66	6.78	5.11			0.7	0.5
8-PMK006.36	9/10/1996	M	3	26.62		5.07			0.7	
8-PMK006.36	9/10/1996	B	5	26.62		5.07			0.8	
8-PMK006.36	10/15/1996	S	5	17.29	7.2	6.98			0.1	
8-PMK006.36	10/15/1996	S	1	17.32	7.1	6.94			0.1	0.4
8-PMK006.36	10/15/1996	B	3	17.3		6.94			0.1	
8-PMK006.36	12/3/1996	S	6	7.95	7.42	10.77			0.1	
8-PMK006.36	12/3/1996	S	1	7.95	7.3	10.69			0.1	0.2
8-PMK006.36	12/3/1996	M	3	7.95		10.7			0.1	
8-PMK006.36	12/3/1996	B	5	7.95		10.73			0.1	
8-PMK006.36	2/4/1997	S	6	5.25	7.08	11.16			3.7	
8-PMK006.36	2/4/1997	S	1	5.17	7.04	11.19			3.1	0.4
8-PMK006.36	2/4/1997	M	3	5.22		11.04			3.4	
8-PMK006.36	2/4/1997	B	5	5.25		11.07			3.6	
8-PMK006.36	3/4/1997	S	6	10.03	7.34	9.96			1.8	
8-PMK006.36	3/4/1997	S	1	10.62	7.21	9.84			1.2	0.4
8-PMK006.36	3/4/1997	M	3	10.62		9.81			1.6	
8-PMK006.36	3/4/1997	B	5	10.64		9.8			1.8	

Station ID	Collection Date	Depth Desc	Depth	Temp Celcius	Field Ph (S.U.)	DO Probe (mg/L)	DO Winkler (mg/L)	Fdt DO Optical	Salinity (mg/L)	Secchi Depth (ft.)
8-PMK006.36	4/8/1997	S	5	15.43	7.7	9.25			0.4	
8-PMK006.36	4/8/1997	S	1	15.49	7.4	8.95			0.4	0.3
8-PMK006.36	4/8/1997	B	3	15.45		8.96			0.4	
8-PMK006.36	5/12/1997	S	6	17.42	7.27	8.24			0.6	
8-PMK006.36	5/12/1997	S	1	17.45	7.22	8.11			0.6	0.2
8-PMK006.36	5/12/1997	M	3	17.42		8.1			0.6	
8-PMK006.36	5/12/1997	B	5	17.42		8.14			0.6	
8-PMK006.36	6/10/1997	S	5	19.51	7.06	7.13			2.4	
8-PMK006.36	6/10/1997	S	1	19.54	7	7.1			2.3	0.4
8-PMK006.36	6/10/1997	B	3	19.53		7.1			2.4	
8-PMK006.36	7/8/1997	S	5	27.57	6.95	5.63			4.2	
8-PMK006.36	7/8/1997	S	1	27.59	6.91	5.74			4	0.6
8-PMK006.36	7/8/1997	B	3	27.57		5.64			4.1	
8-PMK006.36	8/11/1997	S	5	26.9	7.2	5.36			7	
8-PMK006.36	8/11/1997	S	1	26.97	7.14	5.34			6.4	0.5
8-PMK006.36	8/11/1997	B	3	26.9		5.17			6.98	
8-PMK006.36	9/9/1997	S	5	24.79	7.23	5.84			12	
8-PMK006.36	9/9/1997	S	1	24.74	7.18	5.95			11.2	0.6
8-PMK006.36	9/9/1997	B	3	24.78		5.82			11.8	
8-PMK006.36	10/7/1997	S	5	21.52	7.25	6.54			9.4	
8-PMK006.36	10/7/1997	S	1	21.56	7.22	6.61			9.3	0.3
8-PMK006.36	10/7/1997	B	3	21.53		6.54			9.3	
8-PMK006.36	11/4/1997	S	5	14.69	7.47	7.99			7.9	
8-PMK006.36	11/4/1997	S	1	14.77	7.41	8.28			7.3	0.5
8-PMK006.36	11/4/1997	B	3	14.68		8.03			7.6	
8-PMK006.36	12/3/1997	S	5	8.31	8.05	9.48			1.3	
8-PMK006.36	12/3/1997	S	1	8.33	7.6	9.36			1.1	0.3
8-PMK006.36	12/3/1997	B	3	8.31		9.38			1.2	
8-PMK006.36	1/6/1998	S	5	5.74	7.6	10.82			2.7	
8-PMK006.36	1/6/1998	S	1	5.75	7.46	10.73			2.7	0.2
8-PMK006.36	1/6/1998	B	3	5.74		10.77			2.7	
8-PMK006.36	2/3/1998	S	4	5.42	8.16	9.9			0.1	
8-PMK006.36	2/3/1998	S	1	5.42	7.87	9.83			0.1	0.3
8-PMK006.36	2/3/1998	B	3	5.42		9.86			0.1	
8-PMK006.36	3/23/1998	S	7	8.08	7.85	10.61			0.1	
8-PMK006.36	3/23/1998	S	1	8.12	7.59	10.14			0.1	0.4
8-PMK006.36	3/23/1998	M	3	8.08		10.21			0.1	
8-PMK006.36	3/23/1998	B	5	8.08		10.3			0.1	
8-PMK006.36	4/7/1998	S	5	14.73	7.7	8.14			0.2	
8-PMK006.36	4/7/1998	S	1	14.75	7.44	8.03			0.1	0.3
8-PMK006.36	4/7/1998	B	3	14.74		8.06			0.2	
8-PMK006.36	5/11/1998	S	7	19.1	7.43	6.95			0.1	
8-PMK006.36	5/11/1998	S	1	19.1	7.19	6.92			0.1	0.6
8-PMK006.36	5/11/1998	M	3	19.1		6.93			0.1	
8-PMK006.36	5/11/1998	B	5	19.1		6.93			0.1	
8-PMK006.36	6/9/1998	S	4	23.4	7.28	6.28			0.6	
8-PMK006.36	6/9/1998	S	1	23.97	7.16	6.52			0.5	0.4
8-PMK006.36	6/9/1998	B	3	23.42		6.16			0.6	
8-PMK006.36	7/7/1998	S	6	28.04	6.94	4.99			4.5	
8-PMK006.36	7/7/1998	S	1	28.1	6.94	5.09			4.1	0.7
8-PMK006.36	7/7/1998	M	3	28.05		4.89			4.4	
8-PMK006.36	7/7/1998	B	5	28.04		4.91			4.4	

Station ID	Collection Date	Depth Desc	Depth	Temp Celcius	Field Ph (S.U.)	DO Probe (mg/L)	DO Winkler (mg/L)	Fdt DO Optical	Salinity (mg/L)	Secchi Depth (ft.)
8-PMK006.36	8/4/1998	S	5	27.34	7.04	5.97			8.8	
8-PMK006.36	8/4/1998	S	1	27.5	7.11	6.27			8.5	0.7
8-PMK006.36	8/4/1998	B	3	27.35		5.78			8.7	
8-PMK006.36	9/8/1998	S	12	27.21	7.12	3.7			8.8	
8-PMK006.36	9/8/1998	S	1	27.2	7.09	3.86			8.7	0.6
8-PMK006.36	9/8/1998	M	3	27.21		3.7			8.8	
8-PMK006.36	9/8/1998	M	5	27.21		3.7			8.8	
8-PMK006.36	9/8/1998	M	7	27.22		3.69			8.8	
8-PMK006.36	9/8/1998	M	9	27.22		3.68			8.8	
8-PMK006.36	9/8/1998	B	11	27.21		3.69			8.8	
8-PMK006.36	10/13/1998	S	6	20.02	7.21	6.19			10.9	
8-PMK006.36	10/13/1998	S	1	20.05	7.21	6.15			10.9	0.4
8-PMK006.36	10/13/1998	M	3	20.03		6.15			10.9	
8-PMK006.36	10/13/1998	B	5	20.01		6.15			10.9	
8-PMK006.36	11/9/1998	S	5	12.34	7.3	8.1			9.2	
8-PMK006.36	11/9/1998	S	1	12.34	7.29	8.13			9.1	0.4
8-PMK006.36	11/9/1998	B	3	12.34		8.11			9.2	
8-PMK006.36	12/8/1998	S	5	13.76	7.51	8.96			8.9	
8-PMK006.36	12/8/1998	S	1	13.79	7.4	8.61			8.8	0.4
8-PMK006.36	12/8/1998	B	3	13.72		8.61			9	
8-PMK006.36	1/5/1999	B	6	4.7	7.65	10.96			3	
8-PMK006.36	1/5/1999	S	1	4.7	7.43	10.77			3	0.4
8-PMK006.36	1/5/1999	M	3	4.69		10.77			3	
8-PMK006.36	1/5/1999	M	5	4.7		10.83			3	
8-PMK006.36	2/9/1999	B	6	8.31	6.92	8.92			7.5	
8-PMK006.36	2/9/1999	S	1	8.08	6.89	8.8			6	0.5
8-PMK006.36	2/9/1999	M	3	8.3		8.77			7.2	
8-PMK006.36	2/9/1999	M	5	8.31		8.86			7.4	
8-PMK006.36	4/6/1999	B	4	13.83	7.52	8.61			2.4	
8-PMK006.36	4/6/1999	S	1	13.83	7.4	8.55			2.3	0.2
8-PMK006.36	4/6/1999	M	3	13.83		8.55			2.4	
8-PMK006.36	5/5/1999	B	5	15.62	7.25	8.19			4.8	
8-PMK006.36	5/5/1999	S	1	15.68	7.16	8.17			4.7	0.3
8-PMK006.36	5/5/1999	M	3	15.62		8.17			4.8	
8-PMK006.36	6/8/1999	B	4	25.59	7.06	5.6			9.4	
8-PMK006.36	6/8/1999	S	1	25.67	7.11	5.92			9	0.6
8-PMK006.36	6/8/1999	M	3	25.59		5.59			9.3	
8-PMK006.36	7/6/1999	B	5	28.74	7.16	5.27			10.3	
8-PMK006.36	7/6/1999	S	1	28.65	7.13	5.72			9.7	0.4
8-PMK006.36	7/6/1999	M	3	28.7		5.2			10.1	
8-PMK006.36	8/3/1999	B	4	29.81	7.15	4.93			10.7	
8-PMK006.36	8/3/1999	S	1	29.82	7.14	4.97			10.7	0.5
8-PMK006.36	8/3/1999	M	3	29.81		4.88			10.7	
8-PMK006.36	9/8/1999	S	1	24.5	7.23	6.17			10	0.8
8-PMK006.36	9/8/1999	M	3	24.5		5.83			10.4	
8-PMK006.36	9/8/1999	B	5	24.45	7.17	5.53			10.6	
8-PMK006.36	10/5/1999	B	5	21.5	7.08	5.69			4.2	
8-PMK006.36	10/5/1999	S	1	21.44	7.37	6.8			3.8	0.3
8-PMK006.36	10/5/1999	M	3	21.52		5.64			4.2	
8-PMK006.36	11/2/1999	B	6	16.26	7.11	6.9			8.5	
8-PMK006.36	11/2/1999	S	1	16.39	7.08	6.61			7.8	0.4
8-PMK006.36	11/2/1999	M	3	16.26		6.58			8.2	

Station ID	Collection Date	Depth Desc	Depth	Temp Celcius	Field Ph (S.U.)	DO Probe (mg/L)	DO Winkler (mg/L)	Fdt DO Optical	Salinity (mg/L)	Secchi Depth (ft.)
8-PMK006.36	11/2/1999	M	5	16.26		6.69			8.4	
8-PMK006.36	12/8/1999	B	4	10.39	7.22	8.61			7.6	
8-PMK006.36	12/8/1999	S	1	10.33	7.22	8.67			6.4	0.4
8-PMK006.36	12/8/1999	M	3	10.39		8.55			7.5	
8-PMK006.36	1/19/2000	B	6	3.91	7.36	11.93			10.3	
8-PMK006.36	1/19/2000	S	1	3.99	7.39	11.48			10.1	0.2
8-PMK006.36	1/19/2000	M	3	3.92		11.53			10.2	
8-PMK006.36	1/19/2000	M	5	3.92		11.67			10.3	
8-PMK006.36	2/8/2000	B	6	2.43	7.43	12.83			0.5	
8-PMK006.36	2/8/2000	S	1	2.45	7.21	12.32			0.5	0.1
8-PMK006.36	2/8/2000	M	3	2.44		12.38			0.5	
8-PMK006.36	2/8/2000	M	5	2.44		12.49			0.5	
8-PMK006.36	3/7/2000	B	6	10.75	7.76	9.09			3.1	
8-PMK006.36	3/7/2000	S	1	10.89	7.76	9.22			2.3	0.2
8-PMK006.36	3/7/2000	M	3	10.79		9.13			2.7	
8-PMK006.36	3/7/2000	M	5	10.76		9.08			3	
8-PMK006.36	4/13/2000	B	4	15.28	7.28	7.96			5.6	
8-PMK006.36	4/13/2000	S	1	15.19	7.22	8.04			4.9	0.2
8-PMK006.36	4/13/2000	M	3	15.25		7.87			5.6	
8-PMK006.36	5/9/2000	B	5	21.25	7.13	6.07			1.3	
8-PMK006.36	5/9/2000	S	1	21.4	7.03	6.08			1.2	0.2
8-PMK006.36	5/9/2000	M	3	21.27		6.05			1.2	
8-PMK006.36	6/6/2000	B	5	20.53	6.9	5.09			4.6	
8-PMK006.36	6/6/2000	S	1	20.76	6.88	5.11			4.5	0.2
8-PMK006.36	6/6/2000	M	3	20.7		5.11			4.2	
8-PMK006.36	7/5/2000	B	5	27.46	7.2	4.39			2.3	
8-PMK006.36	7/5/2000	S	1	27.47	7.04	4.28			2.2	0.3
8-PMK006.36	7/5/2000	M	3	27.46		4.27			2.3	
8-PMK006.36	8/8/2000	B	5	27.82	7.15	3.88			4.4	
8-PMK006.36	8/8/2000	S	1	27.88	7.11	4.23			3.7	0.4
8-PMK006.36	8/8/2000	M	3	27.79		3.92			4.1	
8-PMK006.36	9/14/2000	B	5	25.49	6.93	4.69			3.4	
8-PMK006.36	9/14/2000	S	1	25.52	6.94	4.83			3	0.5
8-PMK006.36	9/14/2000	M	3	25.49		4.7			3.3	
8-PMK006.36	10/10/2000	B	6	19	7.32	5.98			10.4	
8-PMK006.36	10/10/2000	S	1	18.49	7.34	6.51			6.9	0.4
8-PMK006.36	10/10/2000	M	3	18.97		5.85			9.8	
8-PMK006.36	10/10/2000	M	5	19		5.71			10	
8-PMK006.36	11/7/2000	S	1	14.13	7.16	7.39			11.7	0.8
8-PMK006.36	11/7/2000	M	3	14.11		7.39			11.8	
8-PMK006.36	11/7/2000	M	5	14.08		7.45			11.9	
8-PMK006.36	11/7/2000	B	6	14.08	7.15	7.61			11.9	
8-PMK006.36	12/5/2000	S	1	6.64	7.29	10.01			10.5	0.5
8-PMK006.36	12/5/2000	M	3	6.71		9.97			11	
8-PMK006.36	12/5/2000	B	4	6.73	7.28	10.06			11.1	
8-PMK006.36	1/10/2001	S	1	1.53	7.21	12.3			6.8	0.4
8-PMK006.36	1/10/2001	M	3	1.59		12.23			7.7	
8-PMK006.36	1/10/2001	B	5	1.59	7.19	12.32			7.7	
8-PMK006.36	2/6/2001	S	1	5.11	7.18	11.08			8.7	0.4
8-PMK006.36	2/6/2001	M	3	5.08		11.06			8.8	
8-PMK006.36	2/6/2001	M	5	5.07		11.11			8.9	
8-PMK006.36	2/6/2001	B	6	5.06	7.17	11.17			8.9	

Station ID	Collection Date	Depth Desc	Depth	Temp Celcius	Field Ph (S.U.)	DO Probe (mg/L)	DO Winkler (mg/L)	Fdt DO Optical	Salinity (mg/L)	Secchi Depth (ft.)
8-PMK006.36	3/13/2001	S	1	8.61	7.16	10.03			1.8	0.2
8-PMK006.36	3/13/2001	M	3	8.46		10.06			2.1	
8-PMK006.36	3/13/2001	B	5	8.43	7.21	10.1			2.3	
8-PMK006.36	4/10/2001	S	1	12.08	6.92	9.3			0.1	0.2
8-PMK006.36	4/10/2001	M	3	11.64		9.44			0.1	
8-PMK006.36	4/10/2001	M	5	11.73		9.58			0.1	
8-PMK006.36	4/10/2001	B	6	11.7	7.1	9.66			0.1	
8-PMK006.36	5/8/2001	S	1	19.97	6.84	5.78			3.1	0.3
8-PMK006.36	5/8/2001	M	3	19.98		5.74			3.2	
8-PMK006.36	5/8/2001	M	5	19.99		5.66			3.5	
8-PMK006.36	5/8/2001	B	7	20	6.93	5.66			3.6	
8-PMK006.36	6/5/2001	S	1	22.33	6.98	5.89			0.7	0.3
8-PMK006.36	6/5/2001	M	3	22.31		5.85			0.7	
8-PMK006.36	6/5/2001	M	5	22.31		5.93			0.7	
8-PMK006.36	6/5/2001	B	6	22.31	7.06	5.98			0.7	
8-PMK006.36	7/10/2001	S	1	27.04	7.28	6.78			5.2	0.4
8-PMK006.36	7/10/2001	M	3	20.82		7.25			5.4	
8-PMK006.36	7/10/2001	B	5	27.16	7.33	6.86			5.2	
8-PMK006.36	8/7/2001	S	1	27.42	7.08	5.47			5.7	0.5
8-PMK006.36	8/7/2001	M	3	27.37		5.39			5.9	
8-PMK006.36	8/7/2001	B	5	27.36	7.08	5.33			6	
8-PMK006.36	9/4/2001	S	1	27.02	6.99	4.23			6.4	0.6
8-PMK006.36	9/4/2001	M	3	27.04		4.15			6.8	
8-PMK006.36	9/4/2001	M	5	27.06		4.05			7.2	
8-PMK006.36	9/4/2001	B	6	27.06	6.99	4.11			7.2	
8-PMK006.36	10/2/2001	S	1	19.36	7.23	6.35			12.2	0.6
8-PMK006.36	10/2/2001	M	3	19.3		6.31			12.4	
8-PMK006.36	10/2/2001	M	5	19.27		6.24			12.9	
8-PMK006.36	10/2/2001	B	6	19.27	7.21	6.28			12.9	
8-PMK006.36	11/5/2001	S	1	15.62	7.29	7.57			10.2	0.5
8-PMK006.36	11/5/2001	M	3	15.65		7.36			10.6	
8-PMK006.36	11/5/2001	M	5	15.24		7.35			11.2	
8-PMK006.36	11/5/2001	B	6	11.47	7.31	8.72			12.4	
8-PMK006.36	12/4/2001	S	1	14.12	6.93	7.56			10.7	0.5
8-PMK006.36	12/4/2001	M	3	14.07		7.55			10.8	
8-PMK006.36	12/4/2001	B	5	14.06	6.9	7.54			11.1	
8-PMK006.36	1/14/2002	S	1	4.61	6.6	10.75			7.4	0.4
8-PMK006.36	1/14/2002	M	3	4.6		10.72			7.9	
8-PMK006.36	1/14/2002	B	4	4.62	6.62	10.81			8.1	
8-PMK006.36	2/12/2002	S	1	7.6	6.88	10.24			7.8	0.5
8-PMK006.36	2/12/2002	M	3	7.6		10.2			8.1	
8-PMK006.36	2/12/2002	M	5	7.6		10.24			8.2	
8-PMK006.36	2/12/2002	B	7	7.6	6.81	10.41			8.3	
8-PMK006.36	3/12/2002	S	1	10.23	7.3				8.3	0.5
8-PMK006.36	3/12/2002	M	3	10.23					8.7	
8-PMK006.36	3/12/2002	M	5	10.24					8.8	
8-PMK006.36	3/12/2002	B	6	10.23	7.43				8.8	
8-PMK006.36	4/9/2002	S	1	14.4	7.66	8.35			8.4	0.4
8-PMK006.36	4/9/2002	M	3	14.33		8.14			9.2	
8-PMK006.36	4/9/2002	M	5	14.3		8.22			9.5	
8-PMK006.36	4/9/2002	B	6	14.3	7.74	8.74			9.5	
8-PMK006.36	5/15/2002	S	1	21.22	7.66	7.16			2.3	0.3

Station ID	Collection Date	Depth Desc	Depth	Temp Celcius	Field Ph (S.U.)	DO Probe (mg/L)	DO Winkler (mg/L)	Fdt DO Optical	Salinity (mg/L)	Secchi Depth (ft.)
8-PMK006.36	5/15/2002	M	3	21.17	7.7	7.12			2.3	
8-PMK006.36	5/15/2002	M	5	21.17	7.73	7.13			2.4	
8-PMK006.36	5/15/2002	B	6	21.16	7.78	7.14			2.4	
8-PMK006.36	6/11/2002	S	1	25.36	7.09	4.73			7.7	0.5
8-PMK006.36	6/11/2002	M	3	25.34	7.09	4.66			7.7	
8-PMK006.36	6/11/2002	B	4	25.34	7.09	4.73			8.2	
8-PMK006.36	7/9/2002	S	1	28.7	7.09	4.3			10.4	0.5
8-PMK006.36	7/9/2002	M	3	28.69	7.1	4.23			10.4	
8-PMK006.36	7/9/2002	B	5	28.9	7.07	3.71			11.5	
8-PMK006.36	8/6/2002	S	1	29.69	7.21	5.22			13.8	0.4
8-PMK006.36	8/6/2002	M	3	29.7	7.21	5.22			14	
8-PMK006.36	8/6/2002	M	5	29.72	7.21	5.21			14.2	
8-PMK006.36	8/6/2002	B	6	29.72	7.21	5.35			14.2	
8-PMK006.36	9/16/2002	S	1	24.7	7.25	4.55			15.8	0.5
8-PMK006.36	9/16/2002	M	3	24.69	7.28	4.65			15.8	
8-PMK006.36	9/16/2002	B	5	24.67	7.31	4.72			15.8	
8-PMK006.36	10/8/2002	S	1	23.88	6.71	5.27			14.7	0.6
8-PMK006.36	10/8/2002	M	3	23.92	6.68	5.11			14.9	
8-PMK006.36	10/8/2002	M	5	23.95	6.66	5.17			15.2	
8-PMK006.36	10/8/2002	B	6	23.96	6.65	5.29			15.5	
8-PMK006.36	11/5/2002	S	1	12.7		7.86			12.1	0.4
8-PMK006.36	11/5/2002	M	3	12.69		7.93			12.1	
8-PMK006.36	11/5/2002	M	5	12.69		8.05			12.1	
8-PMK006.36	11/5/2002	B	6	12.69		8.41			12.1	
8-PMK006.36	1/13/2003	S	1	4.53		10.87			6.6	0.6
8-PMK006.36	1/13/2003	M	3	5.06		10.7			8.4	
8-PMK006.36	1/13/2003	M	5	5.27		10.72			9.5	
8-PMK006.36	1/13/2003	B	6	5.27		10.74			9.7	
8-PMK006.36	2/3/2003	S	1	1.65	6.76	11.97			2.7	0.3
8-PMK006.36	2/3/2003	M	3	1.56	6.77	11.96			3.3	
8-PMK006.36	2/3/2003	B	5	1.52	6.78	11.97			3.7	
8-PMK006.36	3/4/2003	S	1	4.77	6.91	11.13			0	0.3
8-PMK006.36	3/4/2003	M	3	4.77	6.98	11.23			0	
8-PMK006.36	3/4/2003	B	5	4.74	7.07	11.5			0	
8-PMK006.36	4/2/2003	S	1	12.56	7.56	8.73			0.1	0.3
8-PMK006.36	4/2/2003	M	3	12.52	7.6	8.8			0.1	
8-PMK006.36	4/2/2003	B	5	12.49	7.69	8.93			0.1	
8-PMK006.36	5/14/2003	S	1	20.51	7.03	6.04			2.06	0.3
8-PMK006.36	5/14/2003	M	3	20.42	7.03	5.91			2.44	
8-PMK006.36	5/14/2003	B	5	20.28	7.05	6.04			2.58	
8-PMK006.36	6/10/2003	S	1	21.88	6.77	5.33			0.45	0.3
8-PMK006.36	6/10/2003	M	3	21.75	6.78	5.45			0.53	
8-PMK006.36	6/10/2003	B	5	21.7	6.81	5.49			0.61	
8-PMK006.36	7/1/2003	S	1	27.18	6.76				0.07	0.5
8-PMK006.36	7/1/2003	M	3	27.15	6.75				0.07	
8-PMK006.36	7/1/2003	M	5	27.15	6.79				0.07	
8-PMK006.36	7/1/2003	B	6	27.14	6.87				0.07	
8-PMK006.36	8/12/2003	S	1	27.38	6.85	4.42			0.08	0.5
8-PMK006.36	8/12/2003	M	3	27.37	6.83	4.47			0.09	
8-PMK006.36	8/12/2003	B	4	27.37	6.85	4.45			0.09	
8-PMK006.36	9/16/2003	S	1	24.14	6.96	5.18			0.84	0.4
8-PMK006.36	9/16/2003	M	3	24.14	6.98	5.21			0.85	

Station ID	Collection Date	Depth Desc	Depth	Temp Celcius	Field Ph (S.U.)	DO Probe (mg/L)	DO Winkler (mg/L)	Fdt DO Optical	Salinity (mg/L)	Secchi Depth (ft.)
8-PMK006.36	9/16/2003	B	5	24.13	7	5.28			0.86	
8-PMK006.36	10/7/2003	S	1	19.6	6.73	4.73			1.47	0.4
8-PMK006.36	10/7/2003	M	3	19.59	6.73	4.8			1.47	
8-PMK006.36	10/7/2003	M	5	19.59	6.74	4.92			1.47	
8-PMK006.36	10/7/2003	B	6	19.59	6.75	4.95			1.5	
8-PMK006.36	11/4/2003	S	1	16.74	7.05	6.89			2.2	0.3
8-PMK006.36	11/4/2003	M	3	16.81	7.04	6.9			3.19	
8-PMK006.36	11/4/2003	B	4	16.81	7.03	7.03			3.41	
8-PMK006.36	12/9/2003	S	1	6.62	7.23	10.91			0.23	0.3
8-PMK006.36	12/9/2003	M	3	6.71	7.16	10.96			0.68	
8-PMK006.36	12/9/2003	B	4	6.72	7.16	11.08			0.71	
8-PMK006.36	1/13/2004	S	1	4.61	7.27	12.01			0.04	0.4
8-PMK006.36	1/13/2004	M	3	4.6	7.28	12.06			0.04	
8-PMK006.36	1/13/2004	B	5	4.6	7.33	12.24			0.04	
8-PMK006.36	2/4/2004	S	1	1.59	7.22	12.64			6.44	0.7
8-PMK006.36	2/4/2004	M	3	1.59	7.21	12.67			6.59	
8-PMK006.36	2/4/2004	M	5	1.59	7.21	12.81			6.72	
8-PMK006.36	2/4/2004	B	6	1.59	7.21	12.86			6.76	
8-PMK006.36	3/9/2004	S	1	10.7	7.68	10.45			0.51	0.3
8-PMK006.36	3/9/2004	M	3	10.66	7.73	10.41			0.56	
8-PMK006.36	3/9/2004	B	5	10.6	7.74	10.49			0.66	
8-PMK006.36	4/7/2004	S	1	10.89	7.43	10.12			0.1	0.3
8-PMK006.36	4/7/2004	M	3	10.84	7.45	10.09			0.13	
8-PMK006.36	4/7/2004	B	5	10.83	7.44	10.05			0.15	
8-PMK006.36	5/4/2004	S	1	19	7.19	7.66			1.02	0.3
8-PMK006.36	5/4/2004	M	3	18.99	7.21	7.65			1.05	
8-PMK006.36	5/4/2004	M	5	18.99	7.22	7.67			1.07	
8-PMK006.36	5/4/2004	B	6	18.98	7.23	7.66			1.12	
8-PMK006.36	6/1/2004	S	1	25.25	7.08	5.73			5.9	0.7
8-PMK006.36	6/1/2004	M	3	24.86	6.96	4.23			7.44	
8-PMK006.36	6/1/2004	B	5	24.67	6.95	3.81			8.06	
8-PMK006.36	7/6/2004	S	1	27.89	6.86	4.03			2.3	0.2
8-PMK006.36	7/6/2004	M	3	27.84	6.88	3.92			2.4	
8-PMK006.36	7/6/2004	B	5	27.83	6.9	4.14			2.43	
8-PMK006.36	8/9/2004	S	1	26.44	7.12	4.85			0.18	0.5
8-PMK006.36	8/9/2004	M	3	26.46	7.16	4.78			0.31	
8-PMK006.36	8/9/2004	B	5	26.56	7.17	4.72			0.69	
8-PMK006.36	9/7/2004	S	1	25.05	6.7	4.05			0.23	0.2
8-PMK006.36	9/7/2004	M	3	25	6.81	3.91			0.26	
8-PMK006.36	9/7/2004	B	5	25.03	6.76	3.91			0.45	
8-PMK006.36	10/13/2004	S	1	19.95	7.05	5.97			4.09	0.5
8-PMK006.36	10/13/2004	M	3	19.97	7.06	5.9			4.19	
8-PMK006.36	10/13/2004	M	5	20	7.07	5.81			4.35	
8-PMK006.36	10/13/2004	B	6	20.01	7.1	5.87			4.38	
8-PMK006.36	11/2/2004	S	1	16.95	7.1	7.26			0.96	0.4
8-PMK006.36	11/2/2004	M	3	16.91	7.12	7.19			1.02	
8-PMK006.36	11/2/2004	M	5	16.91	7.14	7.17			1.03	
8-PMK006.36	11/2/2004	B	6	16.91	7.2	7.23			1.04	
8-PMK006.36	12/7/2004	S	1	10.82	7.18	8.76			5.59	0.5
8-PMK006.36	12/7/2004	M	3	10.83	7.19	8.72			6.05	
8-PMK006.36	12/7/2004	M	5	10.82	7.19	8.66			6.08	
8-PMK006.36	12/7/2004	B	6	10.83	7.2	8.63			6.08	

Station ID	Collection Date	Depth Desc	Depth	Temp Celcius	Field Ph (S.U.)	DO Probe (mg/L)	DO Winkler (mg/L)	Fdt DO Optical	Salinity (mg/L)	Secchi Depth (ft.)
8-PMK006.36	1/11/2005	S	1	7.31	7.28	10.67			0.83	0.3
8-PMK006.36	1/11/2005	M	3	7.29	7.29	10.71			1.17	
8-PMK006.36	1/11/2005	M	5	7.31	7.24	10.82			1.35	
8-PMK006.36	1/11/2005	B	6	7.31	7.26	10.72			1.34	
8-PMK006.36	2/8/2005	S	1	3.54	7.1	12.47			3.21	0.3
8-PMK006.36	2/8/2005	M	3	3.54	7.1	12.59			3.35	
8-PMK006.36	2/8/2005	B	5	3.56	7.11	12.94			3.36	
8-PMK006.36	3/15/2005	S	1	7.17	7.57	11.89			0.05	0.3
8-PMK006.36	3/15/2005	M	3	7.16	7.61	12.04			0.05	
8-PMK006.36	3/15/2005	B	5	7.14	7.64	12.28			0.05	
8-PMK006.36	4/5/2005	S	1	12.43	7.31	9.78			0.13	0.3
8-PMK006.36	4/5/2005	M	3	12.41	7.32	9.75			0.15	
8-PMK006.36	4/5/2005	B	5	12.39	7.36	9.76			0.15	
8-PMK006.36	5/10/2005	S	1	16.95	7.08	8.01			1.49	0.3
8-PMK006.36	5/10/2005	M	3	16.87	7.06	7.86			1.78	
8-PMK006.36	5/10/2005	M	5	16.86	7.05	7.97			2	
8-PMK006.36	5/10/2005	B	6	16.85	7.06	8.08			2.05	
8-PMK006.36	6/7/2005	S	1	23.17	6.93	5.61			0.68	0.4
8-PMK006.36	6/7/2005	M	3	23.21	6.97	5.56			0.68	
8-PMK006.36	6/7/2005	M	5	23.19	7	5.54			0.78	
8-PMK006.36	6/7/2005	B	6	23.2	7.05	5.64			0.85	
8-PMK006.36	7/5/2005	S	1	28.01	7.05	5.51			6.39	0.5
8-PMK006.36	7/5/2005	M	3	28.09	7.06	5.56			6.68	
8-PMK006.36	7/5/2005	M	5	28.1	7.06	5.97			6.99	
8-PMK006.36	7/5/2005	B	6	28.11	7.08	5.64			7.17	
8-PMK006.36	8/17/2005	S	1	30.52	6.97	3.88			9.72	0.2
8-PMK006.36	8/17/2005	M	3	30.52	6.97	3.92			9.73	
8-PMK006.36	8/17/2005	M	5	30.52	6.98	3.92			9.74	
8-PMK006.36	8/17/2005	B	7	30.52	7.01	4.05			9.75	
8-PMK006.36	9/8/2005	S	1	26.29	7.1	5.32			6.39	0.5
8-PMK006.36	9/8/2005	M	3	26.14	7.07	4.98			6.78	
8-PMK006.36	9/8/2005	M	5	26.15	7.07	5.1			6.88	
8-PMK006.36	9/8/2005	B	6	26.14	7.08	5.11			6.9	
8-PMK006.36	10/6/2005	S	1	23.7	7.12	5.66			8.64	0.6
8-PMK006.36	10/6/2005	M	3	23.64	7.1	5.41			8.92	
8-PMK006.36	10/6/2005	B	4	23.64	7.1	5.3			9.1	
8-PMK006.36	11/7/2005	S	1	15.25	7.2	8.29			3.85	0.4
8-PMK006.36	11/7/2005	M	3	15.11	7.22	8.43			4.26	
8-PMK006.36	11/7/2005	B	5	15.1	7.23	8.53			4.39	
8-PMK006.36	12/8/2005	S	1	7.87	7.44	9.68			1.91	0.1
8-PMK006.36	12/8/2005	M	3	7.86	7.46	9.71			1.91	
8-PMK006.36	12/8/2005	M	5	7.87	7.47	9.76			1.93	
8-PMK006.36	12/8/2005	B	6	7.86	7.48	9.8			1.93	
8-PMK006.36	1/5/2006	S	1	6.01	7.25	10.63			1.61	0.3
8-PMK006.36	1/5/2006	M	3	6.01	7.26	10.81			1.71	
8-PMK006.36	1/5/2006	B	5	6.02	7.27	11.36			1.92	
8-PMK006.36	3/6/2006	S	1	6.9	7.1	10.7			2.06	0.2
8-PMK006.36	3/6/2006	M	3	6.9	7.1	10.6			2.28	
8-PMK006.36	3/6/2006	B	5	6.9	7.1	10.6			2.41	
8-PMK006.36	4/6/2006	S	1	13.8	7	8.7			6.9	0.4
8-PMK006.36	4/6/2006	M	3	13.9	7	8.4			8.3	
8-PMK006.36	4/6/2006	B	4	13.9	7	8.4			8.4	

Station ID	Collection Date	Depth Desc	Depth	Temp Celcius	Field Ph (S.U.)	DO Probe (mg/L)	DO Winkler (mg/L)	Fdt DO Optical	Salinity (mg/L)	Secchi Depth (ft.)
8-PMK006.36	5/2/2006	S	1	17.6	6.9	6.5			5.4	0.2
8-PMK006.36	5/2/2006	M	3	17.6	6.8	6.5			5.4	
8-PMK006.36	5/2/2006	B	4	17.6	6.9	6.5			5.4	
8-PMK006.36	6/13/2006	S	1	23.5	6.9	5.5			4.7	0.4
8-PMK006.36	6/13/2006	M	3	23.2	6.9	5.2			5	
8-PMK006.36	6/13/2006	M	5	23.2	6.9	5.1			5.4	
8-PMK006.36	6/13/2006	B	6	23.2	6.9	5			5.6	
8-PMK006.36	7/10/2006	S	1	27.1	6.9	4.7			2.6	0.6
8-PMK006.36	7/10/2006	M	3	27.1	6.9	4			3.6	
8-PMK006.36	7/10/2006	B	5	27.1	6.9	4			4.1	
8-PMK006.36	8/7/2006	S	1	30.3	7.1	5			10.9	0.6
8-PMK006.36	8/7/2006	M	3	30.2	7.1	5			11	
8-PMK006.36	8/7/2006	B	5	30.2	7	4.7			11	
8-PMK006.36	9/18/2006	S	1	23.3	7	4.7			5.7	0.5
8-PMK006.36	9/18/2006	M	3	23.4	6.9	4.6			7	
8-PMK006.36	9/18/2006	B	5	23.4	6.9	5.1			7	
8-PMK006.36	10/10/2006	S	1	19	7.1	5.7			0.5	0.3
8-PMK006.36	10/10/2006	M	3	19	7.1	5.7			0.5	
8-PMK006.36	10/10/2006	M	5	19	7.1	5.7			0.5	
8-PMK006.36	10/10/2006	B	6	19	7.2	5.8			0.5	
8-PMK006.36	11/6/2006	S	1	12.6	7.1	7.5			2.5	0.2
8-PMK006.36	11/6/2006	M	3	12.5	7	7.5			3	
8-PMK006.36	11/6/2006	B	5	12.5	7	7.6			3.2	
8-PMK006.36	12/5/2006	S	1	10.2	7	8.6			0.1	0.2
8-PMK006.36	12/5/2006	M	3	10.2	7	8.7			0.1	
8-PMK006.36	12/5/2006	M	5	10.2	7	8.7			0.1	
8-PMK006.36	12/5/2006	B	7	10.2	7.1	9			0.1	
8-PMK006.36	2/12/2007	S	1	3.2	7.5	11.2			7.2	0.7
8-PMK006.36	2/12/2007	M	3	3.4	7.5	11.1			9	
8-PMK006.36	2/12/2007	M	5	3.4	7.5	11.2			9.1	
8-PMK006.36	2/12/2007	B	6	3.4	7.5	11.3			9.2	
8-PMK006.36	3/12/2007	S	1	7.9	7.5	11.1			3	0.3
8-PMK006.36	3/12/2007	M	3	8.1	7.7	11.5			3.7	
8-PMK006.36	3/12/2007	B	5	8.1	7.8	11.6			5.3	
8-PMK006.36	4/23/2007	S	1	14.6	7.3	9			0.1	0.2
8-PMK006.36	4/23/2007	M	2	14.5	7.3	9			0.1	
8-PMK006.36	4/23/2007	M	3	14.5	7.4	9			0.1	
8-PMK006.36	4/23/2007	B	4	14.5	7.5	9.1			0.1	
8-PMK006.36	5/14/2007	S	1	20.5	6.9	5.9			3.3	0.2
8-PMK006.36	5/14/2007	M	2	20.5	6.9	5.9			3.4	
8-PMK006.36	5/14/2007	M	3	20.5	7	5.9			3.4	
8-PMK006.36	5/14/2007	M	4	20.5	7	5.9			3.4	
8-PMK006.36	5/14/2007	M	5	20.5	7	5.9			3.4	
8-PMK006.36	5/14/2007	B	6	20.5	7	6			3.4	
8-PMK006.36	6/11/2007	S	1	25.7	7	4.7			7.6	0.5
8-PMK006.36	6/11/2007	M	2	25.7	7	4.6			7.7	
8-PMK006.36	6/11/2007	M	3	25.7	7	4.6			7.7	
8-PMK006.36	6/11/2007	M	4	25.7	7	4.4			7.8	
8-PMK006.36	6/11/2007	B	5	25.7	7	4.4			7.9	
8-PMK006.36	7/9/2007	S	1	28	7	4.7		4.9	8.5	0.6
8-PMK006.36	7/9/2007	M	2	28.1	7	4.7		4.9	8.7	
8-PMK006.36	7/9/2007	M	3	28.1	7	4.7		5	8.9	

Station ID	Collection Date	Depth Desc	Depth	Temp Celcius	Field Ph (S.U.)	DO Probe (mg/L)	DO Winkler (mg/L)	Fdt DO Optical	Salinity (mg/L)	Secchi Depth (ft.)
8-PMK006.36	7/9/2007	M	4	28.1	7	4.5		4.8	8.9	
8-PMK006.36	7/9/2007	B	5	28.1	7	4.6		4.8	9	
8-PMK006.36	8/6/2007	S	1	29.2	7	3.7		4.1	10.8	0.7
8-PMK006.36	8/6/2007	M	2	29.2	7	3.6		4	10.9	
8-PMK006.36	8/6/2007	M	3	29.2	7	3.6		3.9	11.2	
8-PMK006.36	8/6/2007	M	4	29.3	7	3.6		3.9	11.3	
8-PMK006.36	8/6/2007	M	5	29.3	7	3.6		3.9	11.4	
8-PMK006.36	8/6/2007	B	6	29.3	7	3.6		4	11.4	
8-PMK006.36	9/11/2007	S	1	27.6	7.1	4.8		5.3	9.9	0.6
8-PMK006.36	9/11/2007	M	2	27.6	7.1	4.7		5.2	9.9	
8-PMK006.36	9/11/2007	M	3	27.6	7	4.7		5.1	10	
8-PMK006.36	9/11/2007	B	4	27.6	7	4.2		4.6	10.7	
8-PMK006.36	10/9/2007	S	1	24.8	7.1	5.1			11.9	0.5
8-PMK006.36	10/9/2007	M	2	24.8	7.1	4.8			12.2	
8-PMK006.36	10/9/2007	M	3	24.8	7.1	4.8			12.4	
8-PMK006.36	10/9/2007	M	4	24.8	7.1	4.8			12.4	
8-PMK006.36	10/9/2007	M	5	24.8	7.1	4.9			12.4	
8-PMK006.36	10/9/2007	B	6	24.8	7.1	5.2			12.4	
8-PMK006.36	11/5/2007	S	1	16.1	7.3	6.5			11.8	0.5
8-PMK006.36	11/5/2007	M	2	16	7.3	6.5			11.9	
8-PMK006.36	11/5/2007	M	3	16	7.3	6.5			11.9	
8-PMK006.36	11/5/2007	M	4	16	7.3	6.5			12	
8-PMK006.36	11/5/2007	M	5	16	7.3	6.6			12	
8-PMK006.36	11/5/2007	B	6	16	7.3	6.6			11.9	
8-PMK006.36	12/5/2007	S	1	9.1	7.4	8.4			11.9	0.5
8-PMK006.36	12/5/2007	M	2	9	7.4	8.4			12.2	
8-PMK006.36	12/5/2007	M	3	9	7.4	8.4			12.2	
8-PMK006.36	12/5/2007	M	4	9	7.4	8.4			12.3	
8-PMK006.36	12/5/2007	M	5	9	7.4	8.5			12.3	
8-PMK006.36	12/5/2007	B	6	9	7.4	8.6			12.3	
8-PMK006.36	1/29/2008	S	1	4.3	7.4	11.6			10.4	0.4
8-PMK006.36	1/29/2008	M	2	4.4	7.4	11.6			11.6	
8-PMK006.36	1/29/2008	M	3	4.4	7.5	11.6			12	
8-PMK006.36	1/29/2008	M	4	4.4	7.5	11.7			12.1	
8-PMK006.36	1/29/2008	B	5	4.4	7.5	11.8			12.2	
8-PMK006.36	2/26/2008	S	1	7.5	7.3			10.4	4	0.3
8-PMK006.36	2/26/2008	M	2	7.5	7.3			10.4	4	
8-PMK006.36	2/26/2008	M	3	7.5	7.3			10.3	4.1	
8-PMK006.36	2/26/2008	M	4	7.5	7.2			10.3	4.2	
8-PMK006.36	2/26/2008	B	5	7.5	7.2			10.3	4.3	
8-PMK006.36	3/25/2008	S	1	11.9	7.2	9			2.8	0.1
8-PMK006.36	3/25/2008	M	2	11.9	7.2	9			2.8	
8-PMK006.36	3/25/2008	M	3	11.8	7.2	9			2.8	
8-PMK006.36	3/25/2008	M	4	11.8	7.3	9			2.8	
8-PMK006.36	3/25/2008	M	5	11.8	7.3	9.1			2.8	
8-PMK006.36	3/25/2008	B	6	11.8	7.3	9.2			2.9	
8-PMK006.36	4/23/2008	S	1	17.5	7.2	7.5			0.4	0.3
8-PMK006.36	4/23/2008	M	2	17.5	7.2	7.5			0.4	
8-PMK006.36	4/23/2008	M	3	17.5	7.2	7.5			0.4	
8-PMK006.36	4/23/2008	M	4	17.5	7.2	7.5			0.4	
8-PMK006.36	4/23/2008	M	5	17.5	7.2	7.5			0.4	
8-PMK006.36	4/23/2008	B	6	17.5	7.3	7.5			0.4	

Station ID	Collection Date	Depth Desc	Depth	Temp Celcius	Field Ph (S.U.)	DO Probe (mg/L)	DO Winkler (mg/L)	Fdt DO Optical	Salinity (mg/L)	Secchi Depth (ft.)
8-PMK006.36	5/29/2008	S	1	21	6.9	5.6			2	0.3
8-PMK006.36	5/29/2008	M	2	21	6.9	5.5			2.3	
8-PMK006.36	5/29/2008	M	3	21	6.9	5.4			2.5	
8-PMK006.36	5/29/2008	B	4	21	6.9	5.3			2.6	
8-PMK006.36	6/24/2008	S	1	26.9	6.8				3.4	0.3
8-PMK006.36	6/24/2008	M	2	26.9	6.8				3.4	
8-PMK006.36	6/24/2008	M	3	26.9	6.9				3.4	
8-PMK006.36	6/24/2008	M	4	26.8	6.9				3.4	
8-PMK006.36	6/24/2008	B	5	26.8	6.9				3.4	
8-PMK006.36	7/22/2008	S	1	29.2	6.9	4.8			6.2	0.4
8-PMK006.36	7/22/2008	M	2	29.1	7	4.8			6.2	
8-PMK006.36	7/22/2008	M	3	29.2	7	4.8			6.3	
8-PMK006.36	7/22/2008	B	4	29.2	7	4.9			6.3	
8-PMK006.36	9/2/2008	S	1	26.2	6.9	3.8			7	0.5
8-PMK006.36	9/2/2008	M	2	26.2	6.9	3.7			8	
8-PMK006.36	9/2/2008	M	3	26.2	6.9	3.7			8.1	
8-PMK006.36	9/2/2008	B	4	26.2	6.9	3.7			8.2	
8-PMK006.36	9/29/2008	S	1	21.9	7	5			6.2	0.5
8-PMK006.36	9/29/2008	M	2	21.9	7	4.9			6.3	
8-PMK006.36	9/29/2008	M	3	21.9	7	4.8			6.5	
8-PMK006.36	9/29/2008	M	4	21.9	7	4.8			6.7	
8-PMK006.36	9/29/2008	B	5	21.9	7	4.9			6.7	
8-PMK006.36	11/20/2008	S	1	10.6	7.3	8.8			11.1	0.4
8-PMK006.36	11/20/2008	M	2	10.5	7.3	8.9			11.7	
8-PMK006.36	11/20/2008	M	3	10.5	7.3	9.5			11.6	
8-PMK006.36	11/20/2008	B	4	10.5	7.3	11			11.6	
8-PMK006.36	12/18/2008	S	1	8.3	7.2	10.7			2.4	0.2
8-PMK006.36	12/18/2008	M	2	8.3	7.2	10.7			2.4	
8-PMK006.36	12/18/2008	M	3	8.3	7.2	10.7			2.5	
8-PMK006.36	12/18/2008	M	4	8.3	7.2	10.7			2.6	
8-PMK006.36	12/18/2008	B	5	8.3	7.3	10.9			2.6	
8-PMK006.36	1/27/2009	S	1	3	6.9	13			2.8	0.3
8-PMK006.36	1/27/2009	M	2	3	6.9	13.3			3.1	
8-PMK006.36	1/27/2009	M	3	3	6.9	13.5			3.4	
8-PMK006.36	1/27/2009	B	4	3	7.1	14			3.7	
8-PMK006.36	3/5/2009	S	1	4.5	6.9	11.8			8.1	0.4
8-PMK006.36	3/5/2009	M	2	4.5	6.9	12.2			8.4	
8-PMK006.36	3/5/2009	M	3	4.5	6.9	12.1			8.6	
8-PMK006.36	3/5/2009	B	4	4.5	6.9	13			8.7	
8-PMK006.36	3/25/2009	S	1	10.2	6.9	9.4			3.1	0.4
8-PMK006.36	3/25/2009	M	2	10.2	6.9	9.4			3.1	
8-PMK006.36	3/25/2009	M	3	10.2	6.9	9.3			3.3	
8-PMK006.36	3/25/2009	M	4	10.2	6.8	9.1			4.2	
8-PMK006.36	3/25/2009	B	5	10.2	6.9	9.2			4.2	
8-PMK006.36	4/28/2009	S	1	19.3	6.9	6.2			1	0.2
8-PMK006.36	4/28/2009	M	2	19.2	6.9	6.2			1	
8-PMK006.36	4/28/2009	M	3	19.2	6.8	6.2			1.1	
8-PMK006.36	4/28/2009	B	4	19.2	6.9	6.2			1.1	
8-PMK006.36	5/27/2009	S	1	23.3	6.8	5			3.8	0.3
8-PMK006.36	5/27/2009	M	2	23.2	6.8	5			3.8	
8-PMK006.36	5/27/2009	M	3	23.3	6.8	4.9			4	
8-PMK006.36	5/27/2009	B	4	23.3	6.8	5			4.1	

Station ID	Collection Date	Depth Desc	Depth	Temp Celcius	Field Ph (S.U.)	DO Probe (mg/L)	DO Winkler (mg/L)	Fdt DO Optical	Salinity (mg/L)	Secchi Depth (ft.)
8-PMK006.36	6/24/2009	S	1	26.1	6.6	3.8			1.8	0.3
8-PMK006.36	6/24/2009	M	2	26.1	6.6	3.8			1.8	
8-PMK006.36	6/24/2009	M	3	26	6.6	3.7			1.9	
8-PMK006.36	6/24/2009	B	4	26	6.6	3.7			1.9	
8-PMK006.36	7/28/2009	S	1	27.7	6.8	3.5			7.1	0.4
8-PMK006.36	7/28/2009	M	2	27.8	6.8	3.5			7.3	
8-PMK006.36	7/28/2009	M	3	27.8	6.8	3.5			7.4	
8-PMK006.36	7/28/2009	B	4	27.8	6.8	3.6			7.4	
8-PMK006.36	9/22/2009	S	1	23.6	7.1	4.8			9.1	0.4
8-PMK006.36	9/22/2009	M	2	23.6	7.1	4.7			9.1	
8-PMK006.36	9/22/2009	M	3	23.6	7.1	4.6			9.1	
8-PMK006.36	9/22/2009	B	4	23.6	7.2	4.6			9.2	
8-PMK006.36	10/29/2009	S	1	16.3	7.3	6.4			12.7	0.5
8-PMK006.36	10/29/2009	M	2	16.3	7.3	6.4			12.7	
8-PMK006.36	10/29/2009	M	3	16.3	7.3	6.4			12.7	
8-PMK006.36	10/29/2009	M	4	16.3	7.3	6.4			12.7	
8-PMK006.36	10/29/2009	B	5	16.3	7.3	6.4			12.6	
8-PMK006.36	11/17/2009	S	1	13	7.1	8			1.1	0.3
8-PMK006.36	11/17/2009	M	2	12.9	7.1	7.9			1.1	
8-PMK006.36	11/17/2009	M	3	12.9	7.2	7.8			1.1	
8-PMK006.36	11/17/2009	M	4	12.9	7.2	8.1			1.1	
8-PMK006.36	11/17/2009	B	5	12.9	7.2	8.2			1.1	
8-PMK006.36	12/17/2009	S	1	6.1	6.7	10.7			0.03	0.2
8-PMK006.36	12/17/2009	M	2	6.1	6.7	10.6			0.03	
8-PMK006.36	12/17/2009	M	3	6.1	6.7	10.6			0.03	
8-PMK006.36	12/17/2009	M	4	6.1	6.7	10.6			0.03	
8-PMK006.36	12/17/2009	B	5	6.1	6.8	12.1			0.03	
8-PMK006.36	1/20/2010	S	1	3.3	7	12			1.5	0.3
8-PMK006.36	1/20/2010	M	2	3.3	7.1	12			1.5	
8-PMK006.36	1/20/2010	M	3	3.3	7.1	12			1.5	
8-PMK006.36	1/20/2010	M	4	3.3	7.2	11.9			1.7	
8-PMK006.36	1/20/2010	B	5	3.3	7.2	11.9			1.9	
8-PMK006.36	2/17/2010	S	1	2.2	7	13.8			0	0.3
8-PMK006.36	2/17/2010	M	2	2.2	7	13.8			0	
8-PMK006.36	2/17/2010	M	3	2.1	7	14.1			0	
8-PMK006.36	2/17/2010	B	4	2.1	7.1	14.1			0	
8-PMK006.36	3/17/2010	S	1	10.6	7.4	11.1			0	0.5
8-PMK006.36	3/17/2010	M	2	10.5	7.4	11.2			0	
8-PMK006.36	3/17/2010	M	3	10.5	7.5	11.1			0	
8-PMK006.36	3/17/2010	M	4	10.5	7.5	11.1			0	
8-PMK006.36	3/17/2010	B	5	10.5	7.5	11			0	
8-PMK006.36	4/29/2010	S	1	17.9	7	7.3			0.6	0.4
8-PMK006.36	4/29/2010	M	2	17.8	7	7.3			0.6	
8-PMK006.36	4/29/2010	M	3	17.8	7	7.3			0.6	
8-PMK006.36	4/29/2010	B	4	17.8	7	7.3			0.6	
8-PMK006.36	6/15/2010	S	1	28	7.1	6.3			5.5	0.6
8-PMK006.36	6/15/2010	M	2	27.8	7	5.6			5.5	
8-PMK006.36	6/15/2010	M	3	27.8	7	5.5			5.6	
8-PMK006.36	6/15/2010	B	4	27.8	7	5.5			5.8	
8-PMK006.36	7/20/2010	S	1	29.4	7.1	4.2			11.5	0.4
8-PMK006.36	7/20/2010	M	2	29.4	7.1	4.1			11.8	
8-PMK006.36	7/20/2010	M	3	29.3	7.1	4			11.9	

Station ID	Collection Date	Depth Desc	Depth	Temp Celcius	Field Ph (S.U.)	DO Probe (mg/L)	DO Winkler (mg/L)	Fdt DO Optical	Salinity (mg/L)	Secchi Depth (ft.)
8-PMK006.36	7/20/2010	B	4	29.3	7.1	3.8			12	
8-PMK006.36	9/21/2010	S	1	24.3	7.3	5.4			14.9	0.4
8-PMK006.36	9/21/2010	M	2	24.3	7.3	5.4			14.9	
8-PMK006.36	9/21/2010	M	3	24.3	7.3	5.4			14.9	
8-PMK006.36	9/21/2010	M	4	24.3	7.3	5.3			14.9	
8-PMK006.36	9/21/2010	B	5	24.3	7.3	5.3			14.9	
8-PMK006.36	10/19/2010	S	1	18.1	7.3	6.7			10.7	0.6
8-PMK006.36	10/19/2010	M	2	18.1	7.3	6.7			10.7	
8-PMK006.36	10/19/2010	M	3	18.1	7.3	6.7			10.7	
8-PMK006.36	10/19/2010	M	4	18.1	7.3	6.8			10.7	
8-PMK006.36	10/19/2010	B	5	18.1	7.3	6.9			10.7	
8-PMK006.36	11/16/2010	S	1	12.1	7.3			8.9	10.5	0.5
8-PMK006.36	11/16/2010	M	2	12.1	7.4			8.8	11.7	
8-PMK006.36	11/16/2010	M	3	12.1	7.4			8.8	11.7	
8-PMK006.36	11/16/2010	M	4	12.1	7.4			8.7	11.8	
8-PMK006.36	11/16/2010	B	5	12.1	7.4			8.7	11.8	
8-PMK006.36	1/19/2011	S	1	2.2	7.6			12.6	12.1	0.5
8-PMK006.36	1/19/2011	M	2	2.2	7.6			12.6	12.2	
8-PMK006.36	1/19/2011	M	3	2.2	7.6			12.5	12.3	
8-PMK006.36	1/19/2011	M	4	2.2	7.6			12.4	12.3	
8-PMK006.36	1/19/2011	B	5	2.2	7.6			12.3	12.3	
8-PMK006.36	2/16/2011	S	1	5.2	7.4			12.2	7.4	0.3
8-PMK006.36	2/16/2011	M	2	5.2	7.4			12.2	7.5	
8-PMK006.36	2/16/2011	M	3	5.2	7.5			12.2	7.5	
8-PMK006.36	2/16/2011	B	4	5.2	7.5			12.3	7.6	
90th Percentile				**27.8**	**7.6**					
10th Percentile				**5.7**	**6.8**					
Average									**4.9**	
Average Hardness = 55.7										

					HARDNESS, TOTAL (MG/L AS CACO3)
Sta Id	**Collection Date Time**	**Depth Desc**	**Depth**	**Container Id Desc**	**Value**
8-PMK034.17	01/12/1994 15:25	S	1	R	29
8-PMK034.17	02/15/1994 14:55	S	1	R	21
8-PMK034.17	03/30/1994 15:05	S	1	R	18
8-PMK034.17	04/26/1994 14:55	S	1	R	25
8-PMK034.17	05/24/1994 14:45	S	1	R	29
8-PMK034.17	06/23/1994 14:15	S	1	R	30
8-PMK034.17	09/26/1994 15:25	S	1	R	30
8-PMK034.17	10/20/1994 14:55	S	1	R	30
8-PMK034.17	11/29/1994 15:35	S	1	R	27
8-PMK034.17	12/13/1994 15:20	S	1	R	26
8-PMK034.17	02/13/1995 15:20	S	1	R	28
8-PMK034.17	03/05/1995 13:10	S	1	R	24
8-PMK034.17	03/07/1995 17:00	S	1	R	26
8-PMK034.17	05/09/1995 15:50	S	1	R	25
8-PMK034.17	06/22/1995 13:15	S	1	R	25
8-PMK034.17	07/06/1995 13:30	S	1	R	21
8-PMK034.17	08/15/1995 13:05	S	1	R	27
8-PMK034.17	09/05/1995 13:15	S	1	R	65
8-PMK034.17	10/10/1995 13:00	S	1	R	100
8-PMK034.17	11/08/1995 12:50	S	1	R	29
8-PMK034.17	12/04/1995 12:45	S	1	R	25
8-PMK034.17	01/16/1996 14:30	S	1	R	24
8-PMK034.17	02/12/1996 13:30	S	1	R	20
8-PMK034.17	04/15/1996 14:25	S	1	R	46
8-PMK034.17	05/21/1996 13:30	S	1	R	24
8-PMK034.17	06/04/1996 13:20	S	1	R	34
8-PMK034.17	07/09/1996 12:00	S	1	R	22
8-PMK034.17	09/10/1996 11:25	S	1	R	21
8-PMK034.17	11/05/1996 12:05	S	1	R	29
8-PMK034.17	12/03/1996 11:45	S	1	R	24
8-PMK034.17	01/07/1997 12:00	S	1	R	25
8-PMK034.17	02/04/1997 12:20	S	1	R	23.6
8-PMK034.17	03/04/1997 13:15	S	1	R	25.4
8-PMK034.17	04/08/1997 12:35	S	1	R	27.2
8-PMK034.17	05/06/1997 12:15	S	1	R	28.3
8-PMK034.17	06/10/1997 11:50	S	1	R	30.1
8-PMK034.17	08/11/1997 11:35	S	1	R	28.4
8-PMK034.17	09/09/1997 11:45	S	1	R	64.4
8-PMK034.17	10/07/1997 13:00	S	1	R	90.7
8-PMK034.17	11/04/1997 09:55	S	1	R	154
8-PMK034.17	12/02/1997 11:30	S	1	R	29.5
8-PMK034.17	01/06/1998 10:30	S	1	R	28.7
8-PMK034.17	02/03/1998 10:30	S	1	R	12.4
8-PMK034.17	03/03/1998 10:45	S	1	R	28.2
8-PMK034.17	04/07/1998 10:30	S	1	R	17
8-PMK034.17	05/11/1998 10:20	S	1	R	12.1
8-PMK034.17	06/09/1998 10:35	S	1	R	22.4
8-PMK034.17	07/07/1998 10:45	S	1	R	24.6
8-PMK034.17	08/04/1998 10:40	S	1	R	22.9
8-PMK034.17	09/08/1998 11:20	S	1	R	50.6

					HARDNESS, TOTAL (MG/L AS CACO3)
Sta Id	**Collection Date Time**	**Depth Desc**	**Depth**	**Container Id Desc**	**Value**
8-PMK034.17	10/06/1998 10:30	S	1	R	105
8-PMK034.17	11/09/1998 11:05	S	1	R	145
8-PMK034.17	12/08/1998 10:25	S	1	R	137
8-PMK034.17	02/09/1999 10:40	S	1	R	34
8-PMK034.17	03/11/1999 11:00	S	1	R	48
8-PMK034.17	04/06/1999 10:45	S	1	R	42
8-PMK034.17	05/03/1999 10:30	S	1	R	34
8-PMK034.17	06/08/1999 11:15	S	1	R	40.4
8-PMK034.17	07/06/1999 11:00	S	1	R	80.1
8-PMK034.17	08/03/1999 11:15	S	1	R	132
8-PMK034.17	09/07/1999 11:00	S	1	S1	272
8-PMK034.17	10/05/1999 10:45	S	1	R	21
8-PMK034.17	11/02/1999 10:25	S	1	S1	66
8-PMK034.17	12/08/1999 10:45	S	1	R	43.9
8-PMK034.17	01/12/2000 10:55	S	1	R	31
8-PMK034.17	02/08/2000 11:00	S	1	R	34
8-PMK034.17	03/07/2000 10:45	S	1	S1	42
8-PMK034.17	04/13/2000 10:45	S	1	R	25
8-PMK034.17	05/09/2000 11:32	S	1	R	18
8-PMK034.17	06/06/2000 11:10	S	1	R	27
8-PMK034.17	07/05/2000 10:45	S	1	S1	56.7
8-PMK034.17	08/08/2000 11:05	S	1	R	34.3
8-PMK034.17	09/14/2000 12:10	S	1	R	37.4
8-PMK034.17	10/10/2000 11:50	S	1	R	36.6
8-PMK034.17	11/07/2000 11:00	S	1	R	57.9
8-PMK034.17	12/05/2000 10:45	S	1	R	48.4
8-PMK034.17	01/09/2001 11:40	S	1	S1	69.3
8-PMK034.17	02/06/2001 09:50	S	1	R	23.4
8-PMK034.17	03/13/2001 10:30	S	1	R	17.1
8-PMK034.17	04/10/2001 09:30	S	1	R	37.2
8-PMK034.17	05/08/2001 11:30	S	1	R	22.1
8-PMK034.17	06/05/2001 10:45	S	1	R	17
8-PMK034.17	07/10/2001 11:00	S	1	R	17.9
8-PMK034.17	08/07/2001 17:00	S	1	R	39
8-PMK034.17	09/04/2001 10:50	S	1	R	31.7
8-PMK034.17	10/02/2001 11:15	S	1	R	61.6
8-PMK034.17	11/05/2001 15:30	S	1	R	223
8-PMK034.17	12/04/2001 14:30	S	1	R	233
8-PMK034.17	01/14/2002 15:30	S	1	R	113
8-PMK034.17	02/12/2002 11:30	S	1	R	32.5
8-PMK034.17	03/12/2002 10:55	S	1	R	57.3
8-PMK034.17	04/09/2002 11:15	S	1	R	40.2
8-PMK034.17	05/14/2002 13:45	S	1	R	37.4
8-PMK034.17	06/11/2002 16:00	S	1	R	79.3
8-PMK034.17	07/09/2002 11:00	S	1	R	141
8-PMK034.17	08/06/2002 11:20	S	1	S1	755
8-PMK034.17	09/16/2002 12:00	S	1	R	472
8-PMK034.17	10/08/2002 14:15	S	1	R	642
8-PMK034.17	11/05/2002 11:15	S	1	R	156
8-PMK034.17	12/03/2002 11:00	S	1	R	44.5

					HARDNESS, TOTAL (MG/L AS CACO3)
Sta Id	**Collection Date Time**	**Depth Desc**	**Depth**	**Container Id Desc**	**Value**
8-PMK034.17	01/07/2003 11:45	S	1	R	26.6
8-PMK034.17	02/11/2003 11:15	S	1	R	40.7
8-PMK034.17	03/04/2003 11:00	S	1	R	25.5
8-PMK034.17	04/01/2003 12:00	S	1	R	34.5
8-PMK034.17	05/13/2003 11:00	S	1	R	35.5
8-PMK034.17	06/10/2003 11:10	S	1	R	34.6
8-PMK034.17	07/08/2003 10:30	S	1	R	22.3
8-PMK034.17	08/12/2003 11:30	S	1	R	26.5
8-PMK034.17	09/09/2003 10:45	S	1	R	32.2
8-PMK034.17	10/07/2003 11:25	S	1	R	28.6
8-PMK034.17	11/04/2003 10:30	S	1	S1	31.4
8-PMK034.17	12/08/2003 11:15	S	1	R	33
8-PMK034.17	01/12/2004 11:45	S	1	R	34
8-PMK034.17	02/05/2004 11:40	S	1	R	24.8
8-PMK034.17	03/09/2004 11:20	S	1	R	25.6
8-PMK034.17	04/22/2004 10:50	S	1	R	29.8
8-PMK034.17	05/04/2004 11:30	S	1	R	26.5
8-PMK034.17	06/01/2004 11:30	S	1	R	32
8-PMK034.17	07/06/2004 11:30	S	1	R	28.9
8-PMK034.17	08/09/2004 11:15	S	1	R	28
8-PMK034.17	09/07/2004 11:00	S	1	R	23.4
8-PMK034.17	10/06/2004 10:40	S	1	S1	44
8-PMK034.17	11/02/2004 11:15	S	1	R	39.6
8-PMK034.17	12/07/2004 11:45	S	1	R	30
8-PMK034.17	01/11/2005 10:40	S	1	R	32
8-PMK034.17	02/08/2005 10:50	S	1	R	30
8-PMK034.17	03/17/2005 10:50	S	1	R	26
8-PMK034.17	04/05/2005 10:45	S	1	R	21.1
8-PMK034.17	06/07/2005 11:00	S	1	R	32
8-PMK034.17	07/05/2005 11:10	S	1	R	36
8-PMK034.17	08/17/2005 11:10	S	1	R	44
8-PMK034.17	09/08/2005 11:00	S	1	R	50
8-PMK034.17	10/06/2005 11:30	S	1	R	98
8-PMK034.17	11/07/2005 11:20	S	1	R	32
8-PMK034.17	12/08/2005 10:20	S	1	R	30
8-PMK034.17	01/05/2006 11:30	S	1	R	24
8-PMK034.17	02/07/2006 10:50	S	1	S1	60
8-PMK034.17	03/06/2006 11:30	S	1	R	31
8-PMK034.17	04/06/2006 10:45	S	1	R	54
8-PMK034.17	05/02/2006 11:00	S	1	R	32
8-PMK034.17	06/13/2006 10:30	S	1	R	39
8-PMK034.17	07/10/2006 11:15	S	1	R	24
8-PMK034.17	08/07/2006 10:15	S	1	R	34
8-PMK034.17	09/18/2006 11:00	S	1	R	26
8-PMK034.17	10/10/2006 11:00	S	1	R	19
8-PMK034.17	11/06/2006 11:00	S	1	R	30
8-PMK034.17	12/04/2006 10:30	S	1	R	28
8-PMK034.17	01/08/2007 11:00	S	1	R	16
Average					**55.7**

Attachment 3
Flow Frequency Determination Memorandum

MEMORANDUM

DEPARTMENT OF ENVIRONMENTAL QUALITY
Piedmont Regional Office
4949-A Cox Road Glen Allen, Virginia 23060

SUBJECT: Flow Frequency Determination / 303(d) Status
Smurfit Stone Container Corporation-West Point Mill – VA0003115

TO: Brad Ricks

FROM: Jennifer Palmore, P.G.

DATE: March 4, 2011

COPIES: File

The Smurfit Stone Container Corporation's West Point Mill discharges to the Pamunkey River near West Point, VA. Flow frequencies have been requested at this site for use in developing effluent limitations for the VPDES permit.

The outfalls are located at the following rivermiles:

001: 8-PMK001.58
002: 8-PMK001.46
003: 8-PMK001.41
004: 8-PMK001.34
007: 8-PMK000.98
008: 8-PMK000.99
014: 8-PMK001.77
015: 8-PMK001.82
016: 8-PMK001.95

The Pamunkey River is tidally influenced at the discharge points. Flow frequencies cannot be determined for tidally affected streams, therefore the previously determined dilution ratios should be used. The discharge is located within the transition zone of the Pamunkey River; therefore the more stringent of each of the freshwater and saltwater criteria should be applied.

During the 2010 305(b)/303(d) Water Quality Assessment, the Pamunkey River was considered a Category 5A water ("A Water Quality Standard is not attained. The water is impaired or threatened for one or more designated uses by a pollutant(s) and requires a TMDL (303d list).") The applicable fact sheets are attached. The Aquatic Life Use is impaired due to an insufficient benthic community and EPA's overlist for nutrients. The Recreation Use is impaired due to Enterococci exceedances. The Fish Consumption Use is impaired due to PCBs and mercury in fish tissue; in addition, arsenic is considered a non-impairing observed effect. The Wildlife Use is fully supporting, The Shellfish Use is not applicable because the area is under an administrative condemnation from the VDH-DSS.

The receiving stream has been addressed in two TMDLs. The bacterial TMDL for the Upper York, Lower Pamunkey and Lower Mattaponi River was approved by the EPA on 7/28/2010 and by the SWCB on 12/13/2010; the facility was mentioned in the TMDL, however the facility was not considered a source of bacteria and therefore was not assigned a wasteload allocation. The Chesapeake Bay TMDL was approved by the EPA on 12/29/2010; Smurfit-Stone received individual wasteload allocations of 259,177 lbs of total nitrogen/year, 56,038 lbs of total phosphorus/year, and 13,030,500 lbs of total suspended sediment/year.

Due to the impaired benthic community in the oligohaline Pamunkey River, the river should be considered a Tier 1 waterbody.

Water quality monitoring data is attached. Field data from station 8-PMK006.36 was chosen to characterize the Pamunkey at the discharge point; the station is located on the Pamunkey River at the southern end of Lee Marsh approximately 5 miles upstream of the facility. However, due to the saltwater influence, hardness data is not appropriate at this location. Station 8-PMK0034.17 is used to characterize the expected hardness of the freshwater Pamunkey; the station is located at the railroad trestle at White House, VA and is approximately 33 miles upstream of the facility.

If you have any questions concerning this analysis, please let me know.

[illegible]

RIVER BASIN: [illegible]

HYDROLOGIC UNIT: [illegible]

STREAM NAME: Pamunkey River

TMDL ID: F13R-13-HG

2010 IMPAIRED AREA ID: [illegible]

ASSESSMENT CATEGORY: [illegible]

TMDL DUE DATE: [illegible]

IMPAIRED SIZE: [illegible]

Watershed: [illegible]

INITIAL LISTING: [illegible]

UPSTREAM LIMIT: [illegible]

DOWNSTREAM LIMIT: [illegible]

[illegible]

CLEAN WATER ACT GOAL AND USE SUPPORT:

[illegible]

IMPAIRMENT: [illegible]

[illegible]

[illegible]

[illegible]

IMPAIRMENT SOURCE: [illegible]

[illegible]

RECOMMENDATION: [illegible]

[illegible]

RIVER BASIN: [illegible]

HYDROLOGIC UNIT: [illegible]

STREAM NAME: Pamunkey River

TMDL ID: F13R-13-PCB

2010 IMPAIRED AREA ID: [illegible]

ASSESSMENT CATEGORY: [illegible]

TMDL DUE DATE: [illegible]

IMPAIRED SIZE: [illegible]

Watershed: [illegible]

INITIAL LISTING: [illegible]

UPSTREAM LIMIT: [illegible]

DOWNSTREAM LIMIT: [illegible]

[illegible]

CLEAN WATER ACT GOAL AND USE SUPPORT:

[illegible]

IMPAIRMENT: [illegible]

[illegible]

IMPAIRMENT SOURCE: [illegible]

[illegible]

RECOMMENDATION: [illegible]

[illegible]

RIVER BASIN: [illegible]

HYDROLOGIC UNIT: [illegible]

STREAM NAME: Pamunkey River

TMDL ID: F14E-05-EBEN

2010 IMPAIRED AREA ID: [illegible]

ASSESSMENT CATEGORY: [illegible]

TMDL DUE DATE: [illegible]

IMPAIRED SIZE: [illegible]

Watershed: [illegible]

INITIAL LISTING: [illegible]

UPSTREAM LIMIT: [illegible]

DOWNSTREAM LIMIT: [illegible]

[illegible]

CLEAN WATER ACT GOAL AND USE SUPPORT:

[illegible]

IMPAIRMENT: [illegible]

[illegible]

IMPAIRMENT SOURCE: [illegible]

[illegible]

RECOMMENDATION: [illegible]

[illegible]

RIVER BASIN: [illegible] **HYDROLOGIC UNIT:** [illegible]

STREAM NAME: Pamunkey River

TMDL ID: PMKOH-DO-BAY **2010 IMPAIRED AREA ID:** [illegible]

ASSESSMENT CATEGORY: [illegible] **TMDL DUE DATE:** [illegible]

IMPAIRED SIZE: [illegible] **Watershed:** [illegible]

INITIAL LISTING: [illegible]

UPSTREAM LIMIT: [illegible]

DOWNSTREAM LIMIT: [illegible]

[illegible]

CLEAN WATER ACT GOAL AND USE SUPPORT:

[illegible]

IMPAIRMENT: [illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

IMPAIRMENT SOURCE: [illegible]

[illegible]

RECOMMENDATION: [illegible]

[illegible]

[illegible]

RIVER BASIN: [illegible]

HYDROLOGIC UNIT: [illegible]

STREAM NAME: Pamunkey River

TMDL ID: F14E-03-BAC

2010 IMPAIRED AREA ID: [illegible]

ASSESSMENT CATEGORY: [illegible]

TMDL DUE DATE: [illegible]

IMPAIRED SIZE: [illegible]

Watershed: [illegible]

INITIAL LISTING: [illegible]

UPSTREAM LIMIT: [illegible]

DOWNSTREAM LIMIT: [illegible]

[illegible]

CLEAN WATER ACT GOAL AND USE SUPPORT:

[illegible]

IMPAIRMENT: [illegible]

[illegible]

IMPAIRMENT SOURCE: [illegible]

[illegible]

RECOMMENDATION: [illegible]

Attachment 4
Site Inspection Memorandum

DEPARTMENT OF ENVIRONMENTAL QUALITY
Piedmont Regional Office

4949-A Cox Road, Glen Allen, VA 23060-6296 **804/527-5020**

MEMORANDUM

To: File

From: Brad Ricks, Waste Permit Writer
Piedmont Regional Office

Subject: Site Inspection: Rock-Tenn West Point Mill
VA0003115

Date: June 20, 2011

On June 20, 2011, I conducted a site inspection of the Rock-Tenn West Point Mill, VA0003115, in preparation for permit reissuance. I met with the facility's environmental manager, Carol Hamner, and environmental engineer, Tom Roberts. I was accompanied by DEQ water permits staff member Laura Bauer for training purposes. Periods of light to heavy rain and moderate to heavy wind were experienced for the duration of the inspection.

Stormwater management facilities appeared to be adequately managed although facility staff were encouraged to continually improve BMPs, specifically surrounding wood chip piles which have the potential to contribute significant BOD to its stormwater runoff.

Recent BMP improvements observed included the color-coding of all process-water / wastewater drains, outlets, and valves (red) and all stormwater drains, outlets, and valves (yellow) in order to clearly identify to all operational staff whether waters associated with any particular activity will flow to wastewater treatment or to stormwater. This improvement should prevent inadvertent discharges of wastewater to stormwater management.

Inspection of the facility coal pile indicated that all associated stormwater is properly routed to wastewater treatment facilities; therefore eliminating the requirement for stormwater monitoring associated with coal pile runoff.

The wastewater treatment facility maintains numerous materials for process chemical addition or operational equipment maintenance either in sealed containers under cover or in sealed open-air tanks with secondary containment equipped with drainage to wastewater treatment influent.

Wastewater treatment and stormwater management facilities appeared to be overall functional and properly operated based on this brief site visit.

Attachment 5
Effluent Monitoring Data

Smurfit Stone Container Corporation - West Point

Outfall	Parameter	Quant Avg	Quant Max	Conc Avg	Conc Min	Conc Max	Received
001	FLOW (MGD)	18.53	20.25				9/12/05
		18.25	19.66				10/12/05
		17.87	20.78				11/10/05
		18.04	19.97				12/9/05
		18.51	20.72				1/10/06
		18.51	19.96				2/10/06
		17.61	19.02				3/10/06
		15.54	18.91				4/11/06
		17	18.59				5/11/06
		17.57	18.97				6/12/06
		17.84	19.27				7/12/06
		17.62	19.27				8/11/06
		17.75	20.22				9/11/06
		17.19	20.59				10/10/06
		17.91	19.89				11/9/06
		17.53	19.04				12/11/06
		17.08	18.8				1/10/07
		17.94	18.8				2/12/07
		18.19	19.02				3/12/07
		15.78	19.27				4/12/07
		18.66	20.51				5/11/07
		18.75	20.06				6/11/07
		19.31	21.11				7/11/07
		18.49	19.95				8/10/07
		19.18	21.68				9/10/07
		19.4	21.59				10/11/07
		19.84	21.42				11/9/07
		19.48	20.95				12/14/07
		18.41	19.63				1/11/08
		18.23	19.95				2/11/08
		19.07	20.8				3/11/08
		18.63	20.1				4/11/08
		17.4	19.27				5/13/08
		18.54	20.58				6/11/08
		18.72	20.28				7/11/08
		18.96	20.2				8/8/08
		19.32	21.22				9/11/08
		19.89	22.26				10/14/08
		19.47	20.8				11/12/08
		18.81	21.68				12/11/08
		19.01	20.48				1/12/09
		19.3	20.74				2/11/09
		19.38	20.78				3/11/09
		19.22	21.36				4/9/08
		17.43	20.32				5/11/09
		18.3	20.03				6/11/09
		18.99	20.35				7/13/09
		18.61	20.51				8/13/09
		19.33	21.33				9/11/09

FLOW (MGD)	19.47	21.43			10/13/09
	19.42	20.92			11/11/09
	18.71	20.85			12/11/09
	19.02	20.58			1/8/10
	18.52	21.28			2/10/10
	17.82	18.97			3/10/10
	18.12	19.22			4/9/10
	16.94	18.54			5/6/10
	17.26	18.16			6/10/10
	17.75	19.11			7/8/10
	17.89	18.95			8/10/10
	18.3	19.08			9/13/10
	18.11	21.03			10/8/10
	18.12	19.65			11/10/10
	18.3	19.41			12/10/10
	18.15	19.17			1/10/11
	17.91	19.06			2/10/11
Average	18.33636	20.09621			
Max	19.89	22.26			
PH (S.U.)			6.4	7.1	9/12/05
			6.6	6.8	10/12/05
			6.5	7.3	11/10/05
			6.4	7	12/9/05
			6.5	7.6	1/10/06
			6.5	6.9	2/10/06
			6.4	6.9	3/10/06
			6.5	7.8	4/11/06
			6.4	6.9	5/11/06
			6.5	7	6/12/06
			6.5	7.2	7/12/06
			6.5	7.1	8/11/06
			6.4	7.2	9/11/06
			6.5	7.4	10/10/06
			6.4	7.2	11/9/06
			6.6	7.1	12/11/06
			6.5	6.9	1/10/07
			6.5	7.1	2/12/07
			6.6	7.1	3/12/07
			6.7	7.6	4/12/07
			6.6	7	5/11/07
			6.7	7.3	6/11/07
			6.4	6.9	7/11/07
			6.6	6.8	8/10/07
			6.5	6.8	9/10/07
			6.6	7.1	10/11/07
			6.5	7	11/9/07
			6.5	6.8	12/14/07
			6.4	7.2	1/11/08
			6.5	6.9	2/11/08
			6.5	7	3/11/08
			6.4	7	4/11/08
			6.5	7.4	5/13/08

PH (S.U.)				6.5	7.1	6/11/08
				6.6	7.2	7/11/08
				6.3	7.1	8/8/08
				6.5	7.1	9/11/08
				6.7	7.1	10/14/08
				6.6	7.1	11/12/08
				6.6	7.8	12/11/08
				6.6	7	1/12/09
				6.6	7	2/11/09
				6.5	6.9	3/11/09
				6.4	7.1	4/9/08
				6.6	7.5	5/11/09
				6.5	7	6/11/09
				6.4	6.7	7/13/09
				6.5	6.8	8/13/09
				6.5	7.1	9/11/09
				6.5	6.9	10/13/09
				6.4	7.4	11/11/09
				6.5	8	12/11/09
				6.4	6.9	1/8/10
				6.5	7.1	2/10/10
				6.5	7	3/10/10
				6.4	6.9	4/9/10
				6.5	7.4	5/6/10
				6.4	6.9	6/10/10
				6.6	7.1	7/8/10
				6.4	6.9	8/10/10
				6.4	6.9	9/13/10
				6.5	6.9	10/8/10
				6.4	6.9	11/10/10
				6.6	7.1	12/10/10
				6.4	7	1/10/11
				6.4	7	2/10/11
				Minimum	6.3	
				Maximum	8	
			Percentile	90th	7.4	
				10th	6.9	
BOD5 (lbs/day)	4574	7648				9/12/05
	4382	8215				10/12/05
	6072	18892				11/10/05
	5845	12061				12/9/05
	4179	12418				1/10/06
	3831	9625				2/10/06
	5002	6685				3/10/06
	6163	16486				4/11/06
	6286	9935				5/11/06
	5280	8827				6/12/06
	4556	6367				7/12/06
	5451	15757				8/11/06
	5610	8852				9/11/06
	5150	6699				10/10/06
	5592	8151				11/9/06

BOD5 (lbs/day)	5403	8311	12/11/06
	5784	10297	1/10/07
	8351	21029	2/12/07
	8199	11813	3/12/07
	6728	21524	4/12/07
	11321	21261	5/11/07
	7252	12470	6/11/07
	4501	9133	7/11/07
	2897	3891	8/10/07
	3135	4882	9/10/07
	2656	57.54	10/11/07
	2617	4430	11/9/07
	3109	4418	12/14/07
	3744	7631	1/11/08
	2663	4492	2/11/08
	4858	13346	3/11/08
	3547	6328	4/11/08
	4190	8495	5/13/08
	4103	8769	6/11/08
	3429	4659	7/11/08
	3462	7891	8/8/08
	2521	3466	9/11/08
	2757	9384	10/14/08
	3332	5858	11/12/08
	4747	41122	12/11/08
	2529	9287	1/12/09
	2251	3576	2/11/09
	2583	3440	3/11/09
	2904	4523	4/9/08
	2878	6394	5/11/09
	2391	3561	6/11/09
	2944	4729	7/13/09
	2811	4245	8/13/09
	2292	3585	9/11/09
	2310	3506	10/13/09
	3005	11869	11/11/09
	3734	16281	12/11/09
	2544	3463	1/8/10
	2982	5789	2/10/10
	2835	3801	3/10/10
	2577	7092	4/9/10
	2684	5566	5/6/10
	2697	5467	6/10/10
	2955	4462	7/8/10
	2989	7005	8/10/10
	2924	9027	9/13/10
	3010	3814	10/8/10
	2712	3774	11/10/10
	4262	6305	12/10/10
	3216	4727	1/10/11
	4065	6193	2/10/11
Max	11321	41122	

Average	6298.633	8531.16	
90th Percentile	6117.5	16019	
TSS (lbs/day)	4574	6748	9/12/05
	4423	11436	10/12/05
	6893	29705	11/10/05
	5442	12679	12/9/05
	4922	13017	1/10/06
	6174	29856	2/10/06
	5661	8593	3/10/06
	7465	23617	4/11/06
	7215	16809	5/11/06
	7414	18390	6/12/06
	5985	10285	7/12/06
	7152	17849	8/11/06
	7315	13828	9/11/06
	6183	15059	10/10/06
	6812	12072	11/9/06
	5618	9746	12/11/06
	6044	13366	1/10/07
	6708	13059	2/12/07
	7101	13978	3/12/07
	9946	53933	4/12/07
	9578	26223	5/11/07
	10891	30707	6/11/07
	6544	28560	7/11/07
	2921	4849	8/10/07
	3241	5802	9/10/07
	3078	7118	10/11/07
	3778	8359	11/9/07
	4871	7770	12/14/07
	6249	20648	1/11/08
	5028	8486	2/11/08
	7086	17031	3/11/08
	5160	10784	4/11/08
	6439	14450	5/13/08
	4744	7406	6/11/08
	4699	6278	7/11/08
	5204	9824	8/8/08
	4254	6586	9/11/08
	5299	17121	10/14/08
	7993	25835	11/12/08
	6198	26019	12/11/08
	3904	9699	1/12/09
	3812	5565	2/11/09
	4498	6069	3/11/09
	4882	8239	4/9/08
	5425	31926	5/11/09
	3103	7770	6/11/09
	4374	10809	7/13/09
	5277	10376	8/13/09
	3906	6335	9/11/09
	3850	6255	10/13/09

TSS (lbs/day)	4377	19585	11/11/09
	8979	54232	12/11/09
	5455	8405	1/8/10
	6697	15802	2/10/10
	5645	7259	3/10/10
	4718	9310	4/9/10
	5252	13143	5/6/10
	3200	6502	6/10/10
	3021	5648	7/8/10
	3577	5546	8/10/10
	3197	7370	9/13/10
	4581	6010	10/8/10
	3117	4150	11/10/10
	6473	8965	12/10/10
	5958	7929	1/10/11
	5318	5491	2/10/11
Average	5528.758	13973.8	
Max	10891	54232	
90th Percentile	7364.5	27391.5	
COD (lbs/day)	55627	68001	9/12/05
	59814	76799	10/12/05
	77269	149558	11/10/05
	63811	99268	12/9/05
	51312	59370	1/10/06
	52223	56786	2/10/06
	51307	58591	3/10/06
	54870	69227	4/11/06
	62183	78002	5/11/06
	65503	77328	6/12/06
	56152	59363	7/12/06
	55353	72338	8/11/06
	57554	63722	9/11/06
	63864	83113	10/10/06
	50154	60759	11/9/06
	50667	55116	12/11/06
	41388	57743	1/10/07
	75369	130165	2/12/07
	65091	69634	3/12/07
	92704	148948	4/12/07
	64549	87224	5/11/07
	71142	77649	6/11/07
	58081	83217	7/11/07
	50817	54924	8/10/07
	52088	61837	9/10/07
	45021	51391	10/11/07
	51277	54548	11/9/07
	44305	48425	12/14/07
	52245	71882	1/11/08
	48857	62729	2/11/08
	51905	59383	3/11/08
	54545	63637	4/11/08
	53665	63665	5/13/08

COD (lbs/day)	45367	56822			6/11/08
	48009	62614			7/11/08
	50434	66385			8/8/08
	38397	41510			9/11/08
	45674	50042			10/14/08
	50929	58412			11/12/08
	47819	63757			12/11/08
	43196	53309			1/12/09
	40497	45151			2/11/09
	41923	51373			3/11/09
	60683	73019			4/9/08
	44231	51285			5/11/09
	42803	53125			6/11/09
	44376	65994			7/13/09
	45878	61317			8/13/09
	43720	52068			9/11/09
	49291	52936			10/13/09
	51150	55099			11/11/09
	48799	55038			12/11/09
	47568	64127			1/8/10
	58181	97317			2/10/10
	52901	64311			3/10/10
	46914	61823			4/9/10
	41804	53591			5/6/10
	45499	58459			6/10/10
	48883	51341			7/8/10
	51557	64510			8/10/10
	53009	67404			9/13/10
	61204	68531			10/8/10
	44856	52304			11/10/10
	59437	62603			12/10/10
	42213	45564			1/10/11
	51311	59518			2/10/11
Average	52867.05	66287.89			
Max	92704	149558			
90th Percentile	64206.5	83165			
COLOR, PCU			719	1189	9/12/05
			913	1743	10/12/05
			792	1407	11/10/05
			829	1407	12/9/05
			699	1069	1/10/06
			675	847	2/10/06
			655	1016	3/10/06
			766	1103	4/11/06
			862	1808	5/11/06
			909	2253	6/12/06
			757	1652	7/12/06
			689	1835	8/11/06
			688	868	9/11/06
			709	1580	10/10/06
			592	1038	11/9/06

COLOR, PCU	688	1070	12/11/06
	570	2654	1/10/07
	746	1419	2/12/07
	665	1694	3/12/07
	898	1820	4/12/07
	785	1481	5/11/07
	724	1550	6/11/07
	547	1060	7/11/07
	606	950	8/10/07
	683	1146	9/10/07
	648	1196	10/11/07
	581	846	11/9/07
	508	784	12/14/07
	592	1550	1/11/08
	470	780	2/11/08
	585	984	3/11/08
	572	1284	4/11/08
	432	1054	5/13/08
	460	686	6/11/08
	445	605	7/11/08
	652	1136	8/8/08
	514	748	9/11/08
	467	864	10/14/08
	471	624	11/12/08
	472	754	12/11/08
	417	720	1/12/09
	404	785	2/11/09
	361	628	3/11/09
	446	722	4/9/08
	420	704	5/11/09
	438	648	6/11/09
	469	782	7/13/09
	753	1498	8/13/09
	814	1303	9/11/09
	796	1252	10/13/09
	873	1549	11/11/09
	854	1462	12/11/09
	997	1400	1/8/10
	856	1423	2/10/10
	814	1360	3/10/10
	652	1001	4/9/10
	528	1075	5/6/10
	500	810	6/10/10
	453	745	7/8/10
	552	880	8/10/10
	575	740	9/13/10
	697	960	10/8/10
	531	720	11/10/10
	654	920	12/10/10
	514	700	1/10/11
	574	730	2/10/11
Average	636.0152	1137.439	

Maximum		997	2654	
90th Percentile		855	1673	
2,3,7,8-TCDD	<QL		<QL	11/10/05
	<QL		<QL	2/10/06
	<QL		<QL	5/11/06
	<QL		<QL	8/11/06
	<QL		<QL	11/9/06
	<QL		<QL	2/12/07
	<QL		<QL	5/11/07
	<QL		<QL	8/10/07
	<QL		<QL	8/13/07
	<QL		<QL	11/9/07
	<QL		<QL	1/11/08
	<QL		<QL	5/13/08
	<QL		<QL	8/8/08
	<QL		<QL	11/12/08
	<QL		<QL	2/11/09
	<QL		<QL	5/20/09
	<QL		<QL	8/13/09
	<QL		<QL	11/11/09
	<QL		<QL	2/10/10
	<QL		<QL	5/6/10
	<QL		<QL	8/10/10
	<QL		<QL	11/12/10
	<QL		<QL	2/10/11
2,3,7,8-TETRACHLORODIBENZOFURAN (PPQ)				
	<QL		<QL	11/10/05
	<QL		<QL	2/10/06
	<QL		<QL	5/11/06
	<QL		<QL	8/11/06
	<QL		<QL	11/9/06
	<QL		<QL	2/12/07
	<QL		<QL	5/11/07
	<QL		<QL	8/13/07
	<QL		<QL	8/10/07
	<QL		<QL	11/9/07
	<QL		<QL	1/11/08
	<QL		<QL	5/13/08
	<QL		<QL	8/8/08
	<QL		<QL	11/12/08
	<QL		<QL	2/11/09
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	<QL		<QL	8/10/10
	<QL		<QL	11/12/10
	<QL		<QL	2/10/11
TUa - ACUTE 48 HR STAT AMERICAMYSIS BAHIA			<1	1/10/06
			<1	1/10/07

TUa - ACUTE 48 HR STAT AMERICAMYSIS BAHIA			<1.00	1/11/08
			<1.00	10/14/08
			<1	11/12/09
			<1.00	10/8/10
TUa - ACUTE 48 HR STAT CYPRINODON VARIEGATUS			<1	1/10/06
			<1	1/10/07
			<1.00	1/11/08
			<1.00	10/14/08
			<1	11/12/09
			<1.00	10/8/10
TUc - CHRONIC 7-DAY STATRE AMERICAMYSIS BAHIA			8	1/10/06
			4	1/10/07
			1.00	1/11/08
			1.00	10/14/08
			1	11/12/09
			3.33	10/8/10
TUc - CHRONIC 7-DAY STATRE CYPRINODON VARIEGATUS			8	1/10/06
			2	1/10/07
			1.00	1/11/08
			1.00	10/14/08
			1	11/12/09
			1.00	10/8/10
AOX (Adsorbable Organic Halides) (lb/d)	464	703		9/12/05
	448	679		10/12/05
	458	612		11/10/05
	556	815		12/9/05
	445	652		1/10/06
	448	688		2/10/06
	429	560		3/10/06
	383	667		4/11/06
	448	647		5/11/06
	398	565		6/12/06
	401	527		7/12/06
	258	448		8/11/06
	343	573		9/11/06
	376	551		10/10/06
	351	671		11/9/06
	385	627		12/11/06
	246	542		1/10/07
	336	500		2/12/07
	345	476		3/12/07
	129	363		4/12/07
	364	565		5/11/07
	391	537		6/11/07
	484	874		7/11/07
	519	986		8/10/07
	423	574		9/10/07
	354	520		10/11/07
	414	622		11/9/07
	402	644		12/14/07
	375	540		1/11/08
	357	523		2/11/08

	AOX (Adsorbable	360	467		3/11/08
	Organic Halides) (lb/d)	339	521		4/11/08
		290	444		5/13/08
		303	377		6/11/08
		323	459		7/11/08
		349	552		8/8/08
		329	459		9/11/08
		372	510		10/14/08
		352	509		11/12/08
		401	568		12/11/08
		334	495		1/12/09
		329	473		2/11/09
		339	460		3/11/09
		424	603		4/9/08
		344	549		5/11/09
		430	832		6/11/09
		349	555		7/13/09
		403	600		8/13/09
		371	541		9/11/09
		429	725		10/13/09
		481	653		11/11/09
		449	683		12/11/09
		410	617		1/8/10
		402	652		2/10/10
		420	528		3/10/10
		421	620		4/9/10
		312	618		5/6/10
		423	582		6/10/10
		362	543		7/8/10
		458	582		8/10/10
		497	613		9/13/10
		525	705		10/8/10
		434	603		11/10/10
		573	742		12/10/10
		487	680		1/10/11
		478	646		2/10/11
	Average	394.4242	591.1667		
	Max	573	986		
	90th Percentile	482.5	704		
002	FLOW (MGD)	0.0026	0.0026		11/10/05
		0.0002	0.0002		5/11/06
		0.0002	0.0002		5/11/06
		0.0005	0.0005		5/11/07
		0.0009	0.0009		2/11/08
		0.0003	0.0003		2/11/09
		0.0015	0.0015		2/11/10
		0.0002	0.0002		2/11/11
	PH (S.U.)			6.42	11/10/05
				7.59	5/11/06
				7.59	5/11/06
				7.4	5/11/07
				7.78	2/11/08

	PH (S.U.)			7.53	2/11/09
				8.11	2/11/10
				7.99	2/11/11
	BOD5 (mg/L)			10.98	11/10/05
				78.42	5/11/06
				78.42	5/11/06
				55	5/11/07
				40.39	2/11/08
				562.50	2/11/09
				6.56	2/11/10
				41	2/11/11
	TSS (mg/L)			227	11/10/05
				406	5/11/06
				406	5/11/06
				1050	5/11/07
				18	2/11/08
				284	2/11/09
				4	2/11/10
				28	2/11/11
	COD (mg/L)			308	11/10/05
				394	5/11/06
				394	5/11/06
				974	5/11/07
				156	2/11/08
				1118	2/11/09
				39	2/11/10
				118	2/11/11
	SULFATES (AS SO4) (mg/L)			21	11/10/05
				42.21	5/11/06
				42.21	5/11/06
				19.5	5/11/07
				42	2/11/08
				35	2/11/09
				56	2/11/10
				58.6	2/11/11
	NITROGEN, TOTAL (AS N) (mg/L)			1.73	11/10/05
				7.54	5/11/06
				7.54	5/11/06
				3.3	5/11/07
				1.06	2/11/08
				4.77	2/11/09
				0.485	2/11/10
				0.39	2/11/11
003	FLOW (MG)	0.0039	0.0039		11/10/05
		0.0003	0.0003		5/11/06
		0.0003	0.0003		5/11/06
		0.0008	0.0008		5/11/07
		0.0013	0.0013		2/11/08
		0.0004	0.0004		2/11/09
		0.0022	0.0022		2/11/10
		0.0003	0.0003		2/11/11
	PH (S.U.)			6.42	11/10/05

	PH (S.U.)			7.59	5/11/06
				7.59	5/11/06
				7.4	5/11/07
				7.78	2/11/08
				7.53	2/11/09
				8.11	2/11/10
				7.99	2/11/11
	BOD5 (mg/L)			10.98	11/10/05
				78.42	5/11/06
				78.42	5/11/06
				55	5/11/07
				40.39	2/11/08
				562.50	2/11/09
				6.56	2/11/10
				41	2/11/11
	TSS (mg/L)			227	11/10/05
				406	5/11/06
				406	5/11/06
				1050	5/11/07
				18	2/11/08
				284	2/11/09
				4	2/11/10
				28	2/11/11
	COD (mg/L)			308	11/10/05
				394	5/11/06
				394	5/11/06
				974	5/11/07
				156	2/11/08
				1118	2/11/09
				39	2/11/10
				118	2/11/11
	SULFATES (AS SO4) (mg/L)			21	11/10/05
				42.21	5/11/06
				42.21	5/11/06
				19.5	5/11/07
				42	2/11/08
				35	2/11/09
				56	2/11/10
				58.6	2/11/11
	NITROGEN, TOTAL (AS N) (mg/L)			1.73	11/10/05
				7.54	5/11/06
				7.54	5/11/06
				3.3	5/11/07
				1.06	2/11/08
				4.77	2/11/09
				0.485	2/11/10
				0.39	2/11/11
004	FLOW (MG)	1.04	1.04		11/10/05
		0.07	0.07		5/11/06
		0.07	0.07		5/11/06
		0.20	0.20		5/11/07
		0.35	0.35		2/11/08

	FLOW (MG)	0.10	0.10		2/11/09
		0.58	0.58		2/11/10
		0.08	0.08		2/11/11
	PH (S.U.)			6.42	11/10/05
				7.59	5/11/06
				7.59	5/11/06
				7.4	5/11/07
				7.78	2/11/08
				7.53	2/11/09
				8.11	2/11/10
				7.99	2/11/11
	BOD5 (mg/L)			10.98	11/10/05
				78.42	5/11/06
				78.42	5/11/06
				55	5/11/07
				40.39	2/11/08
				562.50	2/11/09
				6.56	2/11/10
				41	2/11/11
	TSS (mg/L)			227	11/10/05
				406	5/11/06
				406	5/11/06
				1050	5/11/07
				18	2/11/08
				284	2/11/09
				4	2/11/10
				28	2/11/11
	COD (mg/L)			308	11/10/05
				394	5/11/06
				394	5/11/06
				974	5/11/07
				156	2/11/08
				1118	2/11/09
				39	2/11/10
				118	2/11/11
	SULFATES (AS SO4) (mg/L)			21	11/10/05
				42.21	5/11/06
				42.21	5/11/06
				19.5	5/11/07
				42	2/11/08
				35	2/11/09
				56	2/11/10
				58.6	2/11/11
	NITROGEN, TOTAL (AS N) (mg/L)			1.73	11/10/05
				7.54	5/11/06
				7.54	5/11/06
				3.3	5/11/07
				1.06	2/11/08
				4.77	2/11/09
				0.485	2/11/10
				0.39	2/11/11
007	FLOW (MG)	0.050	0.050		11/10/05

FLOW (MG)	0.003	0.003		5/11/06
	0.003	0.003		5/11/06
	0.010	0.010		5/11/07
	0.017	0.017		2/11/08
	0.005	0.005		2/11/09
	0.028	0.028		2/11/10
	0.004	0.004		2/11/11
PH (S.U.)			6.42	11/10/05
			7.59	5/11/06
			7.59	5/11/06
			7.4	5/11/07
			7.78	2/11/08
			7.53	2/11/09
			8.11	2/11/10
			7.99	2/11/11
BOD5 (mg/L)			10.98	11/10/05
			78.42	5/11/06
			78.42	5/11/06
			55	5/11/07
			40.39	2/11/08
			562.50	2/11/09
			6.56	2/11/10
			41	2/11/11
TSS (mg/L)			227	11/10/05
			406	5/11/06
			406	5/11/06
			1050	5/11/07
			18	2/11/08
			284	2/11/09
			4	2/11/10
			28	2/11/11
COD (mg/L)			308	11/10/05
			394	5/11/06
			394	5/11/06
			974	5/11/07
			156	2/11/08
			1118	2/11/09
			39	2/11/10
			118	2/11/11
SULFATES (AS SO4) (mg/L)			21	11/10/05
			42.21	5/11/06
			42.21	5/11/06
			19.5	5/11/07
			42	2/11/08
			35	2/11/09
			56	2/11/10
			58.6	2/11/11
NITROGEN, TOTAL (AS N) (mg/L)			1.73	11/10/05
			7.54	5/11/06
			7.54	5/11/06
			3.3	5/11/07
			1.06	2/11/08

	NITROGEN, TOTAL (AS N) (mg/L)			4.77	2/11/09
				0.485	2/11/10
				0.39	2/11/11
008	FLOW (MG)	4.27	4.27		11/10/05
		0.21	0.21		4/10/06
		0.27	0.27		5/11/06
		0.48	0.48		9/11/06
		0.68	0.68		11/9/06
		0.82	0.82		5/11/07
		1.54	1.54		8/13/07
		0.41	0.41		11/9/07
		1.45	1.45		2/11/08
		1.71	1.71		5/13/08
		0.26	0.26		8/8/08
		0.19	0.19		11/12/08
		0.43	0.43		2/11/09
		1.85	1.85		5/11/09
		0.34	0.34		8/13/09
		0.32	0.32		11/11/09
		2.39	2.39		2/10/10
		2.39	2.39		2/11/10
		1.44	1.44		5/6/10
		0.34	0.34		8/10/10
		0.46	0.46		10/12/10
		0.34	0.34		2/10/11
	PH (S.U.)			8.97	11/10/05
				7.5	4/10/06
				7.39	5/11/06
				7.11	9/11/06
				6.9	11/9/06
				9.12	5/11/07
				7.3	8/13/07
				7.49	11/9/07
				8.04	2/11/08
				9.0	5/13/08
				7.36	8/8/08
				7.0	11/12/08
				8.95	2/11/09
				6.89	5/11/09
				6.8	8/13/09
				7.53	11/11/09
				8.61	2/10/10
				8.61	2/11/10
				8.15	5/6/10
				7.2	8/10/10
				7.3	10/12/10
				9.27	2/10/11
	BOD5 (mg/L)			8.43	11/10/05
				11.54	5/11/06
				11.54	5/11/06
				55	5/11/07
				62.16	2/11/08

	BOD5 (mg/L)			25.54	2/11/09
				26.45	2/11/10
				11.49	2/11/11
	TSS (mg/L)			40	11/10/05
				26	5/11/06
				26	5/11/06
				1550	5/11/07
				58	2/11/08
				13	2/11/09
				25	2/11/10
				18	2/11/11
	COD (mg/L)			111	11/10/05
				105	5/11/06
				105	5/11/06
				1318	5/11/07
				278	2/11/08
				175	2/11/09
				108	2/11/10
				46	2/11/11
	SULFATES (AS SO4) (mg/L)			176	11/10/05
				163.47	5/11/06
				163.47	5/11/06
				33.2	5/11/07
			228.5288	575	2/11/08
				509	2/11/09
				90	2/11/10
				118.09	2/11/11
	NITROGEN, TOTAL (AS N) (mg/L)			1.80	11/10/05
				2.45	5/11/06
				2.45	5/11/06
				9	5/11/07
				1.54	2/11/08
				1.29	2/11/09
				3.155	2/11/10
				0.26	2/11/11
101	FLOW (MGD)	2.76	2.93		9/12/05
		2.92	3.21		10/12/05
		2.53	2.91		11/10/05
		2.63	2.89		12/9/05
		2.52	3.19		1/10/06
		2.95	3.1		2/10/06
		2.41	2.89		3/10/06
		2.39	2.66		4/11/06
		2.42	2.56		5/11/06
		2.35	2.43		6/12/06
		2.42	2.95		7/12/06
		2.57	2.77		8/11/06
		2.7	2.95		9/11/06
		2.43	2.89		10/10/06
		2.68	3.07		11/9/06
		2.87	3.03		12/11/06
		2.74	2.89		1/10/07

FLOW (MGD)	2.79	2.95	2/12/07
	2.79	2.88	3/12/07
	2.49	2.9	4/11/07
	2.68	2.88	5/11/07
	2.65	2.75	6/11/07
	2.58	2.87	7/11/07
	2.6	2.75	8/13/07
	2.62	6.94	9/10/07
	2.62	2.94	10/11/07
	2.63	3.15	11/9/07
	2.7	2.95	12/14/07
	2.69	3.05	1/11/08
	2.42	2.83	2/11/08
	2.52	2.72	3/11/08
	2.33	2.38	4/11/08
	2.5	2.63	5/13/08
	2.57	2.92	6/11/08
	2.81	2.97	7/11/08
	2.63	2.72	8/8/08
	3.01	3.33	9/11/08
	2.9	3.14	10/14/08
	2.63	3.14	11/12/08
	3.07	3.13	12/11/08
	2.67	2.76	1/12/09
	2.87	3.15	2/11/09
	2.67	2.76	3/11/09
	2.86	3.22	4/9/09
	2.78	3.11	5/11/09
	3.3	4.49	6/11/09
	2.81	3.11	7/13/09
	2.8	2.95	8/13/09
	2.79	3.11	9/11/09
	3.2	3.4	10/13/09
	3.17	3.29	11/11/09
	2.99	3.25	12/11/09
	2.81	3.07	1/8/10
	3.04	3.38	2/10/10
	2.94	3	3/10/10
	3.08	3.17	4/9/10
	2.79	3.08	5/6/10
	2.89	2.96	6/10/10
	2.73	2.97	7/8/10
	2.86	3.08	8/10/10
	3	3.11	9/13/10
	2.76	2.88	10/8/10
	2.67	2.93	11/10/10
	3	3.14	12/10/10
	2.87	3.03	1/10/11
	2.79	2.89	2/10/11
Average	2.737273	3.053485	
Max	3.3	6.94	

PENTACHLOROPHENOL (µg/L)	<5.0	9/12/05
	<5.0	10/12/05
	<5.0	11/10/05
	<5.0	12/9/05
	<5.0	1/10/06
	<5.0	2/10/06
	<5.0	3/10/06
	<5.0	4/11/06
	<5.0	5/11/06
	<5.0	6/12/06
	<5.0	7/12/06
	<5.0	8/11/06
	<5.0	9/11/06
	<5.0	10/10/06
	<5.0	11/9/06
	<5.0	12/11/06
	<5.0	1/10/07
	<5.0	2/12/07
	<5.0	3/12/07
	<5.0	4/11/07
	<5.0	5/11/07
	<5.0	6/11/07
	<5.0	7/11/07
	<5.0	8/13/07
	<5.0	9/10/07
	<5.0	10/11/07
	<5.0	11/9/07
	<5.0	12/14/07
	<5.0	1/11/08
	<5.0	2/11/08
	<5.0	3/11/08
	<5.0	4/11/08
	<5.0	5/13/08
	<5.0	6/11/08
	<5.0	7/11/08
	<5.0	8/8/08
	<5.0	9/11/08
	<5.0	10/14/08
	<5.0	11/12/08
	<5.0	12/11/08
	<5.0	1/12/09
	<5.0	2/11/09
	<5.0	3/11/09
	<5.0	4/9/09
	<5.0	5/11/09
	<5.0	6/11/09
	<5.0	7/13/09
	<5.0	8/13/09
	<5.0	9/11/09
	<5.0	10/13/09
	<5.0	11/11/09
	< 5.0	12/11/09

PENTACHLOROPHENOL (µg/L)			<5.0	1/8/10
			< 5.0	2/10/10
			<5.0	3/10/10
			<5.0	4/9/10
			<5.0	5/6/10
			<5.0	6/10/10
			<5.0	7/8/10
			<5.0	8/10/10
			<5.0	9/13/10
			<5.0	10/8/10
			<5.0	11/10/10
			<5.0	12/10/10
			<5.0	1/10/11
			<5.0	2/10/11
CHLOROFORM (AS CHCL3) (g/d)	46.7	70.4		9/12/05
	80.3	95.7		10/12/05
	66.0	99.1		11/10/05
	65.2	75.3		12/9/05
	58.0	87.6		1/10/06
	70	86		2/10/06
	48.9	54.9		3/10/06
	42.4	57.9		4/11/06
	47.3	51.5		5/11/06
	57.3	70.6		6/12/06
	65	90		7/12/06
	79.7	115.0		8/11/06
	77.7	94.0		9/11/06
	77.1	114.3		10/10/06
	87.6	118.2		11/9/06
	65.4	83.1		12/11/06
	85	102		1/10/07
	108	139		2/12/07
	141	214		3/12/07
	354	406		4/11/07
	218	379		5/11/07
	98.7	225.7		6/11/07
	41.0	65.1		7/11/07
	49	68		8/13/07
	71	103		9/10/07
	71	103		10/11/07
	86.6	109.8		11/9/07
	99.2	113.2		12/14/07
	79.9	96.1		1/11/08
	87.5	146.4		2/11/08
	82.6	118.1		3/11/08
	68.6	98.2		4/11/08
	95.7	116.1		5/13/08
	63.0	87.2		6/11/08
	116.2	131.4		7/11/08
	117.4	178.4		8/8/08
	120.3	171.7		9/11/08
	93.5	112.7		10/14/08

CHLOROFORM (AS CHCL3) (g/d)	258.6	745.5		11/12/08
	101.9	144.1		12/11/08
	67.5	80.4		1/12/09
	67.8	80.7		2/11/09
	65.9	74.7		3/11/09
	85.8	96.1		4/9/09
	114.5	145.9		5/11/09
	115.8	130.3		6/11/09
	93.2	155.0		7/13/09
	98.4	114.1		8/13/09
	135.0	202.5		9/11/09
	168.9	185.4		10/13/09
	192.0	230.2		11/11/09
	165.5	204.2		12/11/09
	106.0	124.4		1/8/10
	123	161		2/10/10
	149.4	180.1		3/10/10
	96.8	111.2		4/9/10
	83.1	105.3		5/6/10
	74.5	112.6		6/10/10
	121.4	153.5		7/8/10
	106.5	130.7		8/10/10
	120.7	144.2		9/13/10
	117.6	142.0		10/8/10
	89	129		11/10/10
	121	149		12/10/10
	91.6	123.6		1/10/11
	78.4	99.3		2/10/11
2,3,7,8-TCDD (pg/L)			<10	9/12/05
			<10	10/12/05
			<10	11/10/05
			<10	12/9/05
			<10	1/10/06
			<10	2/10/06
			<10	3/10/06
			<10	4/11/06
			<10	5/11/06
			<10	6/12/06
			<10	7/12/06
			<10	8/11/06
			<10	9/11/06
			<10	10/10/06
			<10	11/9/06
			<10	12/11/06
			<10	1/10/07
			<10	2/12/07
			<10	3/12/07
			<10	4/11/07
			<10	5/11/07
			<10	6/11/07
			<10	7/11/07
			<10	8/13/07

2,3,7,8-TCDD (pg/L)	<10	9/10/07
	<10	10/11/07
	<10	11/9/07
	<10	12/14/07
	<10	1/11/08
	<10	2/11/08
	<10	3/11/08
	<10	4/11/08
	<10	5/13/08
	<10	6/11/08
	<10	7/11/08
	<10	8/8/08
	<10	9/11/08
	<10	10/14/08
	<10	11/12/08
	<10	12/11/08
	<10	1/12/09
	<10	2/11/09
	<10	3/11/09
	<10	4/9/09
	<10	5/11/09
	<10	6/11/09
	<10	7/13/09
	<10	8/13/09
	<10	9/11/09
	<10	10/13/09
	<10	11/11/09
	<10	12/11/09
	<10	1/8/10
	<10	2/10/10
	<10	3/10/10
	<10	4/9/10
	<10	5/6/10
	<10	6/10/10
	<10	7/8/10
	<10	8/10/10
	<10	9/13/10
	<10	10/8/10
	<10	11/10/10
	<10	12/10/10
	<10	1/10/11
	<10	2/10/11
2,3,7,8-TETRACHLORODIBENZOFURAN (PPQ)	<10	9/12/05
	<10	10/12/05
	<10	11/10/05
	<10	12/9/05
	<10	1/10/06
	<10	2/10/06
	<10	3/10/06
	<10	4/11/06
	<10	5/11/06
	<10	6/12/06

2,3,7,8-TETRACHLORODIBENZOFURAN (PPQ)	<10	7/12/06
	<10	8/11/06
	<10	9/11/06
	<10	10/10/06
	<10	11/9/06
	<10	12/11/06
	<10	1/10/07
	<10	2/12/07
	<10	3/12/07
	<10	4/11/07
	<10	5/11/07
	<10	6/11/07
	<10	7/11/07
	<10	8/13/07
	<10	9/10/07
	<10	10/11/07
	<10	11/9/07
	<10	12/14/07
	<10	1/11/08
	<10	2/11/08
	<10	3/11/08
	<10	4/11/08
	<10	5/13/08
	<10	6/11/08
	<10	7/11/08
	<10	8/8/08
	<10	9/11/08
	<10	10/14/08
	<10	11/12/08
	<10	12/11/08
	<10	1/12/09
	<10	2/11/09
	<10	3/11/09
	<10	4/9/09
	<10	5/11/09
	<10	6/11/09
	<10	7/13/09
	<10	8/13/09
	<10	9/11/09
	<10	10/13/09
	<10	11/11/09
	<10	12/11/09
	<10	1/8/10
	<10	2/10/10
	<10	3/10/10
	<10	4/9/10
	<10	5/6/10
	<10	6/10/10
	<10	7/8/10
	<10	8/10/10
	<10	9/13/10
	<10	10/8/10

2,3,7,8-TETRACHLORODIBENZOFURAN (PPQ)	<10	11/10/10
	<10	12/10/10
	<10	1/10/11
	<10	2/10/11
2,4,5-TRICHLOROPHENOL (µg/L)	<2.5	9/12/05
	<2.5	10/12/05
	<2.5	11/10/05
	<2.5	12/9/05
	<2.5	1/10/06
	<2.5	2/10/06
	<2.5	3/10/06
	<2.5	4/11/06
	<2.5	5/11/06
	<2.5	6/12/06
	<2.5	7/12/06
	<2.5	8/11/06
	<2.5	9/11/06
	<2.5	10/10/06
	<2.5	11/9/06
	<2.5	12/11/06
	<2.5	1/10/07
	<2.5	2/12/07
	<2.5	3/12/07
	<2.5	4/11/07
	<2.5	5/11/07
	<2.5	6/11/07
	<2.5	7/11/07
	<2.5	8/13/07
	<2.5	9/10/07
	<2.5	10/11/07
	<2.5	11/9/07
	<2.5	12/14/07
	<2.5	1/11/08
	<2.5	2/11/08
	<2.5	3/11/08
	<2.5	4/11/08
	<2.5	5/13/08
	<2.5	6/11/08
	<2.5	7/11/08
	<2.5	8/8/08
	<2.5	9/11/08
	<2.5	10/14/08
	<2.5	11/12/08
	<2.5	12/11/08
	<2.5	1/12/09
	<2.5	2/11/09
	<2.5	3/11/09
	<2.5	4/9/09
	<2.5	5/11/09
	<2.5	6/11/09
	<2.5	7/13/09
	<2.5	8/13/09

2,4,5-TRICHLOROPHENOL (µg/L)	<2.5	9/11/09
	<2.5	10/13/09
	<2.5	11/11/09
	<2.5	12/11/09
	<2.5	1/8/10
	<2.5	2/10/10
	<2.5	3/10/10
	<2.5	4/9/10
	<2.5	5/6/10
	<2.5	6/10/10
	<2.5	7/8/10
	<2.5	8/10/10
	<2.5	9/13/10
	<2.5	10/8/10
	<2.5	11/10/10
	<2.5	12/10/10
	<2.5	1/10/11
	<2.5	2/10/11
2,4,6-TRICHLOROPHENOL (µg/L)	<2.5	9/12/05
	<2.5	10/12/05
	<2.5	11/10/05
	<2.5	12/9/05
	<2.5	1/10/06
	<2.5	2/10/06
	<2.5	3/10/06
	<2.5	4/11/06
	<2.5	5/11/06
	<2.5	6/12/06
	<2.5	7/12/06
	<2.5	8/11/06
	<2.5	9/11/06
	<2.5	10/10/06
	<2.5	11/9/06
	<2.5	12/11/06
	<2.5	1/10/07
	<2.5	2/12/07
	<2.5	3/12/07
	<2.5	4/11/07
	<2.5	5/11/07
	<2.5	6/11/07
	<2.5	7/11/07
	<2.5	8/13/07
	<2.5	9/10/07
	<2.5	10/11/07
	<2.5	11/9/07
	<2.5	12/14/07
	<2.5	1/11/08
	<2.5	2/11/08
	<2.5	3/11/08
	<2.5	4/11/08
	<2.5	5/13/08
	<2.5	6/11/08

2,4,6-TRICHLOROPHENOL (µg/L)	<2.5	7/11/08
	<2.5	8/8/08
	<2.5	9/11/08
	<2.5	10/14/08
	<2.5	11/12/08
	<2.5	12/11/08
	<2.5	1/12/09
	<2.5	2/11/09
	<2.5	3/11/09
	<2.5	4/9/09
	<2.5	5/11/09
	<2.5	6/11/09
	<2.5	7/13/09
	<2.5	8/13/09
	<2.5	9/11/09
	<2.5	10/13/09
	<2.5	11/11/09
	<2.5	12/11/09
	<2.5	1/8/10
	<2.5	2/10/10
	<2.5	3/10/10
	<2.5	4/9/10
	<2.5	5/6/10
	<2.5	6/10/10
	<2.5	7/8/10
	<2.5	8/10/10
	<2.5	9/13/10
	<2.5	10/8/10
	<2.5	11/10/10
	<2.5	12/10/10
	<2.5	1/10/11
	<2.5	2/10/11
TETRACHLOROCATECHOL (µg/L)	<5.0	9/12/05
	<5.0	10/12/05
	<5.0	11/10/05
	<5.0	12/9/05
	<5.0	1/10/06
	<5.0	2/10/06
	<5.0	3/10/06
	<5.0	4/11/06
	<5.0	5/11/06
	<5.0	6/12/06
	<5.0	7/12/06
	<5.0	8/11/06
	<5.0	9/11/06
	<5.0	10/10/06
	<5.0	11/9/06
	<5.0	12/11/06
	<5.0	1/10/07
	<5.0	2/12/07
	<5.0	3/12/07
	<5.0	4/11/07

TETRACHLOROCATECHOL (µg/L)	<5.0	5/11/07
	<2.5	6/11/07
	<5.0	7/11/07
	<5.0	8/13/07
	<5.0	9/10/07
	<5.0	10/11/07
	<5.0	11/9/07
	<5.0	12/14/07
	<5.0	1/11/08
	<5.0	2/11/08
	<5.0	3/11/08
	<5.0	4/11/08
	<5.0	5/13/08
	<5.0	6/11/08
	<5.0	7/11/08
	<5.0	8/8/08
	<5.0	9/11/08
	<5.0	10/14/08
	<5.0	11/12/08
	<5.0	12/11/08
	<5.0	1/12/09
	<5.0	2/11/09
	<5.0	3/11/09
	<5.0	4/9/09
	<5.0	5/11/09
	<5.0	6/11/09
	<5.0	7/13/09
	<5.0	8/13/09
	<5.0	9/11/09
	<5.0	10/13/09
	<5.0	11/11/09
	<5.0	12/11/09
	<5.0	1/8/10
	<5.0	2/10/10
	<5.0	3/10/10
	<5.0	4/9/10
	<5.0	5/6/10
	<5.0	6/10/10
	<5.0	7/8/10
	<5.0	8/10/10
	<5.0	9/13/10
	<5.0	10/8/10
	<5.0	11/10/10
	<5.0	12/10/10
	<5.0	1/10/11
	<5.0	2/10/11
TETRACHLOROGUAIACOL (µg/L)	<5.0	9/12/05
	<5.0	10/12/05
	<5.0	11/10/05
	<5.0	12/9/05
	<5.0	1/10/06
	<5.0	2/10/06

TETRACHLOROGUAIACOL (µg/L)	<5.0	3/10/06
	<5.0	4/11/06
	<5.0	5/11/06
	<5.0	6/12/06
	<5.0	7/12/06
	<5.0	8/11/06
	<5.0	9/11/06
	<5.0	10/10/06
	<5.0	11/9/06
	<5.0	12/11/06
	<5.0	1/10/07
	<5.0	2/12/07
	<5.0	3/12/07
	<5.0	4/11/07
	<5.0	5/11/07
	<5.0	6/11/07
	<5.0	7/11/07
	<5.0	8/13/07
	<5.0	9/10/07
	<5.0	10/11/07
	<5.0	11/9/07
	5.0	12/14/07
	<5.0	1/11/08
	<5.0	2/11/08
	<5.0	3/11/08
	<5.0	4/11/08
	<5.0	5/13/08
	<5.0	6/11/08
	<5.0	7/11/08
	<5.0	8/8/08
	<5.0	9/11/08
	<5.0	10/14/08
	<5.0	11/12/08
	<5.0	12/11/08
	<5.0	1/12/09
	<5.0	2/11/09
	<5.0	3/11/09
	<5.0	4/9/09
	<5.0	5/11/09
	<5.0	6/11/09
	<5.0	7/13/09
	<5.0	8/13/09
	<5.0	9/11/09
	<5.0	10/13/09
	<5.0	11/11/09
	<5.0	12/11/09
	<5.0	1/8/10
	<5.0	2/10/10
	<5.0	3/10/10
	<5.0	4/9/10
	<5.0	5/6/10
	<5.0	6/10/10

TETRACHLOROGUAIACOL (µg/L)	<5.0	7/8/10
	<5.0	8/10/10
	<5.0	9/13/10
	<5.0	10/8/10
	<5.0	11/10/10
	<5.0	12/10/10
	<5.0	1/10/11
	<5.0	2/10/11
TRICHLOROSYRINGOL (µg/L)	<2.5	9/12/05
	<2.5	10/12/05
	<2.5	11/10/05
	<2.5	12/9/05
	<2.5	1/10/06
	<2.5	2/10/06
	<2.5	3/10/06
	<2.5	4/11/06
	<2.5	5/11/06
	<2.5	6/12/06
	<2.5	7/12/06
	<2.5	8/11/06
	<2.5	9/11/06
	<2.5	10/10/06
	<2.5	11/9/06
	<2.5	12/11/06
	<2.5	1/10/07
	<2.5	2/12/07
	<2.5	3/12/07
	<2.5	4/11/07
	<2.5	5/11/07
	<2.5	6/11/07
	<2.5	7/11/07
	<2.5	8/13/07
	<2.5	9/10/07
	<2.5	10/11/07
	<2.5	11/9/07
	2.5	12/14/07
	<2.5	1/11/08
	<2.5	2/11/08
	<2.5	3/11/08
	<2.5	4/11/08
	<2.5	5/13/08
	<2.5	6/11/08
	<2.5	7/11/08
	<2.5	8/8/08
	<2.5	9/11/08
	<2.5	10/14/08
	<2.5	11/12/08
	<2.5	12/11/08
	<2.5	1/12/09
	<2.5	2/11/09
	<2.5	3/11/09
	<2.5	4/9/09

TRICHLOROSYRINGOL (µg/L)	<2.5	5/11/09
	<2.5	6/11/09
	<2.5	7/13/09
	<2.5	8/13/09
	<2.5	9/11/09
	<2.5	10/13/09
	<2.5	11/11/09
	<2.5	12/11/09
	<2.5	1/8/10
	<2.5	2/10/10
	<2.5	3/10/10
	<2.5	4/9/10
	<2.5	5/6/10
	<2.5	6/10/10
	<2.5	7/8/10
	<2.5	8/10/10
	<2.5	9/13/10
	<2.5	10/8/10
	<2.5	11/10/10
	<2.5	12/10/10
	<2.5	1/10/11
	<2.5	2/10/11
4,5,6-TRICHLOROGUAIACOL (µg/L)	<2.5	9/12/05
	<2.5	10/12/05
	<2.5	11/10/05
	<2.5	12/9/05
	<2.5	1/10/06
	<2.5	2/10/06
	<2.5	3/10/06
	<2.5	4/11/06
	<2.5	5/11/06
	<2.5	6/12/06
	<2.5	7/12/06
	<2.5	8/11/06
	<2.5	9/11/06
	<2.5	10/10/06
	<2.5	11/9/06
	<2.5	12/11/06
	<2.5	1/10/07
	<2.5	2/12/07
	<2.5	3/12/07
	<2.5	4/11/07
	<2.5	5/11/07
	<2.5	6/11/07
	<2.5	7/11/07
	<2.5	8/13/07
	<2.5	9/10/07
	<2.5	10/11/07
	<2.5	11/9/07
	2.5	12/14/07
	<2.5	1/11/08
	<2.5	2/11/08

4,5,6-TRICHLOROGUAIACOL (µg/L)	<2.5	3/11/08
	<2.5	4/11/08
	<2.5	5/13/08
	<2.5	6/11/08
	<2.5	7/11/08
	<2.5	8/8/08
	<2.5	9/11/08
	<2.5	10/14/08
	<2.5	11/12/08
	<2.5	12/11/08
	<2.5	1/12/09
	<2.5	2/11/09
	<2.5	3/11/09
	<2.5	4/9/09
	<2.5	5/11/09
	<2.5	6/11/09
	<2.5	7/13/09
	<2.5	8/13/09
	<2.5	9/11/09
	<2.5	10/13/09
	<2.5	11/11/09
	<2.5	12/11/09
	<2.5	1/8/10
	<2.5	2/10/10
	<2.5	3/10/10
	<2.5	4/9/10
	<2.5	5/6/10
	<2.5	6/10/10
	<2.5	7/8/10
	<2.5	8/10/10
	<2.5	9/13/10
	<2.5	10/8/10
	<2.5	11/10/10
	<2.5	12/10/10
	<2.5	1/10/11
	<2.5	2/10/11
3,4,6-TRICHLOROCATECHOL (µg/L)	<5.0	9/12/05
	<5.0	10/12/05
	<5.0	11/10/05
	<5.0	12/9/05
	<5.0	1/10/06
	<5.0	2/10/06
	<5.0	3/10/06
	<5.0	4/11/06
	<5.0	5/11/06
	<5.0	6/12/06
	<5.0	7/12/06
	<5.0	8/11/06
	<5.0	9/11/06
	<5.0	10/10/06
	<5.0	11/9/06
	<5.0	12/11/06

3,4,6-TRICHLOROCATECHOL (µg/L)	<5.0	1/10/07
	<5.0	2/12/07
	<5.0	3/12/07
	<5.0	4/11/07
	<5.0	5/11/07
	<5.0	6/11/07
	<5.0	7/11/07
	<5.0	8/13/07
	<5.0	9/10/07
	<5.0	10/11/07
	<5.0	11/9/07
	5.0	12/14/07
	<5.0	1/11/08
	<5.0	2/11/08
	<5.0	3/11/08
	<5.0	4/11/08
	<5.0	5/13/08
	<5.0	6/11/08
	<5.0	7/11/08
	<5.0	8/8/08
	<5.0	9/11/08
	<5.0	10/14/08
	<5.0	11/12/08
	<5.0	12/11/08
	<5.0	1/12/09
	<5.0	2/11/09
	<5.0	3/11/09
	<5.0	4/9/09
	<5.0	5/11/09
	<5.0	6/11/09
	<5.0	7/13/09
	<5.0	8/13/09
	<5.0	9/11/09
	<5.0	10/13/09
	<5.0	11/11/09
	<5.0	12/11/09
	<5.0	1/8/10
	<5.0	2/10/10
	<5.0	3/10/10
	<5.0	4/9/10
	<5.0	5/6/10
	<5.0	6/10/10
	<5.0	7/8/10
	<5.0	8/10/10
	<5.0	9/13/10
	<5.0	10/8/10
	<5.0	11/10/10
	<5.0	12/10/10
	<5.0	1/10/11
	<5.0	2/10/11

3,4,5-TRICHLOROCATECHOL (µg/L)	<5.0	9/12/05
	<5.0	10/12/05
	<5.0	11/10/05
	<5.0	12/9/05
	<5.0	1/10/06
	<5.0	2/10/06
	<5.0	3/10/06
	<5.0	4/11/06
	<5.0	5/11/06
	<5.0	6/12/06
	<5.0	7/12/06
	<5.0	8/11/06
	<5.0	9/11/06
	<5.0	10/10/06
	<5.0	11/9/06
	<5.0	12/11/06
	<5.0	1/10/07
	<5.0	2/12/07
	<5.0	3/12/07
	<5.0	4/11/07
	<5.0	5/11/07
	<5.0	6/11/07
	<5.0	7/11/07
	<5.0	8/13/07
	<5.0	9/10/07
	<5.0	10/11/07
	<5.0	11/9/07
	5.0	12/14/07
	<5.0	1/11/08
	<5.0	2/11/08
	<5.0	3/11/08
	<5.0	4/11/08
	<5.0	5/13/08
	<5.0	6/11/08
	<5.0	7/11/08
	<5.0	8/8/08
	<5.0	9/11/08
	<5.0	10/14/08
	<5.0	11/12/08
	<5.0	12/11/08
	<5.0	1/12/09
	<5.0	2/11/09
	<5.0	3/11/09
	<5.0	4/9/09
	<5.0	5/11/09
	<5.0	6/11/09
	<5.0	7/13/09
	<5.0	8/13/09
	<5.0	9/11/09
	<5.0	10/13/09
	<5.0	11/11/09
	<5.0	12/11/09

3,4,5-TRICHLOROCATECHOL (µg/L)	<5.0	1/8/10
	<5.0	2/10/10
	<5.0	3/10/10
	<5.0	4/9/10
	<5.0	5/6/10
	<5.0	6/10/10
	<5.0	7/8/10
	<5.0	8/10/10
	<5.0	9/13/10
	<5.0	10/8/10
	<5.0	11/10/10
	<5.0	12/10/10
	<5.0	1/10/11
	<5.0	2/10/11
3,4,5-TRICHLOROGUAIACOL (µg/L)	<2.5	9/12/05
	<2.5	10/12/05
	<2.5	11/10/05
	<2.5	12/9/05
	<2.5	1/10/06
	<2.5	2/10/06
	<2.5	3/10/06
	<2.5	4/11/06
	<2.5	5/11/06
	<2.5	6/12/06
	<2.5	7/12/06
	<2.5	8/11/06
	<2.5	9/11/06
	<2.5	10/10/06
	<2.5	11/9/06
	<2.5	12/11/06
	<2.5	1/10/07
	<2.5	2/12/07
	<2.5	3/12/07
	<2.5	4/11/07
	<2.5	5/11/07
	<2.5	6/11/07
	<2.5	7/11/07
	<2.5	8/13/07
	<2.5	9/10/07
	<2.5	10/11/07
	<2.5	11/9/07
	2.5	12/14/07
	<2.5	1/11/08
	<2.5	2/11/08
	<2.5	3/11/08
	<2.5	4/11/08
	<2.5	5/13/08
	<2.5	6/11/08
	<2.5	7/11/08
	<2.5	8/8/08
	<2.5	9/11/08
	<2.5	10/14/08

3,4,5-TRICHLOROGUAIACOL (µg/L)	<2.5	11/12/08
	<2.5	12/11/08
	<2.5	1/12/09
	<2.5	2/11/09
	<2.5	3/11/09
	<2.5	4/9/09
	<2.5	5/11/09
	<2.5	6/11/09
	<2.5	7/13/09
	<2.5	8/13/09
	<2.5	9/11/09
	<2.5	10/13/09
	<2.5	11/11/09
	<2.5	12/11/09
	<2.5	1/8/10
	<2.5	2/10/10
	<2.5	3/10/10
	<2.5	4/9/10
	<2.5	5/6/10
	<2.5	6/10/10
	<2.5	7/8/10
	<2.5	8/10/10
	<2.5	9/13/10
	<2.5	10/8/10
	<2.5	11/10/10
	<2.5	12/10/10
	<2.5	1/10/11
	<2.5	2/10/11
2,3,4,6-TETRACHLOROPHENOL (µg/L)	<2.5	9/12/05
	<2.5	10/12/05
	<2.5	11/10/05
	<2.5	12/9/05
	<2.5	1/10/06
	<2.5	2/10/06
	<2.5	3/10/06
	<2.5	4/11/06
	<2.5	5/11/06
	<2.5	6/12/06
	<2.5	7/12/06
	<2.5	8/11/06
	<2.5	9/11/06
	<2.5	10/10/06
	<2.5	11/9/06
	<2.5	12/11/06
	<2.5	1/10/07
	<2.5	2/12/07
	<2.5	3/12/07
	<2.5	4/11/07
	<2.5	5/11/07
	<2.5	6/11/07
	<2.5	7/11/07
	<2.5	8/13/07

2,3,4,6-TETRACHLOROPHENOL (µg/L)	<2.5	9/10/07
	<2.5	10/11/07
	<2.5	11/9/07
	2.5	12/14/07
	<2.5	1/11/08
	<2.5	2/11/08
	<2.5	3/11/08
	<2.5	4/11/08
	<2.5	5/13/08
	<2.5	6/11/08
	<2.5	7/11/08
	<2.5	8/8/08
	<2.5	9/11/08
	<2.5	10/14/08
	<2.5	11/12/08
	<2.5	12/11/08
	<2.5	1/12/09
	<2.5	2/11/09
	<2.5	3/11/09
	<2.5	4/9/09
	<2.5	5/11/09
	<2.5	6/11/09
	<2.5	7/13/09
	<2.5	8/13/09
	<2.5	9/11/09
	<2.5	10/13/09
	<2.5	11/11/09
	<2.5	12/11/09
	<2.5	1/8/10
	<2.5	2/10/10
	<2.5	3/10/10
	<2.5	4/9/10
	<2.5	5/6/10
	<2.5	6/10/10
	<2.5	7/8/10
	<2.5	8/10/10
	<2.5	9/13/10
	<2.5	10/8/10
	<2.5	11/10/10
	<2.5	12/10/10
	<2.5	1/10/11
	<2.5	2/10/11
3,4,6-TRICHLOROGUAIACOL (µg/L)	2.5	9/12/05
	<2.5	10/12/05
	<2.5	11/10/05
	<2.5	12/9/05
	<2.5	1/10/06
	<2.5	2/10/06
	<2.5	3/10/06
	<2.5	4/11/06
	<2.5	5/11/06
	<2.5	6/12/06

3,4,6-TRICHLOROGUAIACOL (µg/L)	<2.5	7/12/06
	<2.5	8/11/06
	<2.5	9/11/06
	<2.5	10/10/06
	<2.5	11/9/06
	<2.5	12/11/06
	<2.5	1/10/07
	<2.5	2/12/07
	<2.5	3/12/07
	<2.5	4/11/07
	<2.5	5/11/07
	<2.5	6/11/07
	<2.5	7/11/07
	<2.5	8/13/07
	<2.5	9/10/07
	<2.5	10/11/07
	<2.5	11/9/07
	2.5	12/14/07
	<2.5	1/11/08
	<2.5	2/11/08
	<2.5	3/11/08
	<2.5	4/11/08
	<2.5	5/13/08
	<2.5	6/11/08
	<2.5	7/11/08
	<2.5	8/8/08
	<2.5	9/11/08
	<2.5	10/14/08
	<2.5	11/12/08
	<2.5	12/11/08
	<2.5	1/12/09
	<2.5	2/11/09
	<2.5	3/11/09
	<2.5	4/9/09
	<2.5	5/11/09
	<2.5	6/11/09
	<2.5	7/13/09
	<2.5	8/13/09
	<2.5	9/11/09
	<2.5	10/13/09
	<2.5	11/11/09
	<2.5	12/11/09
	<2.5	1/8/10
	<2.5	2/10/10
	<2.5	3/10/10
	<2.5	4/9/10
	<2.5	5/6/10
	<2.5	6/10/10
	<2.5	7/8/10
	<2.5	8/10/10
	<2.5	9/13/10
	<2.5	10/8/10

3,4,6-TRICHLOROGUAIACOL (µg/L)	<2.5	11/10/10
	<2.5	12/10/10
	<2.5	1/10/11
	<2.5	2/10/11

Outfall 001 Permit Application Detected Constituents

[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	*997*
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]

[illegible] [illegible] *italics* [illegible]

Attachment 6
MSTRANTI Results; MSTRANTI Data Source Report; STATS.exe Results

SALTWATER AND TRANSITION ZONES
WATER QUALITY CRITERIA / WASTELOAD ALLOCATION ANALYSIS

Facility Name: Rock-Tenn West Point Mill
Receiving Stream: Pamunkey River

Permit No.: VA0003115

Version: OWP Guidance Memo 00-2011 (8/24/00)

Stream Information		
Mean Hardness (as CaCO3) =	50	mg/l
90th % Temperature (Annual) =	27.8	(° C)
90th % Temperature (Winter) =	8.1	(° C)
90th % Maximum pH =	7.6	
10th % Maximum pH =	6.8	
Tier Designation (1 or 2) =	1	
Early Life Stages Present Y/N =	Y	
Tidal Zone =	2	(1 = saltwater, 2 = transition zone)
Mean Salinity =	4.9	(g/kg)

Mixing Information	
Design Flow (MGD)	20.2
Acute WLA multiplier	60
Chronic WLA multiplier	60
Human health WLA multiplier	60

Effluent Information		
Mean Hardness (as CaCO3) =	322	mg/L
90 % Temperature (Annual) =	35.9	(° C)
90 % Temperature (Winter) =	34.2	(° C)
90 % Maximum pH =	7.4	SU
10 % Maximum pH =	6.9	SU
Discharge Flow =	22.26	MGD

Parameter	Background	Water Quality Criteria			Wasteload Allocations			Antidegradation Baseline			Antidegradation Allocations			**Most Limiting Allocations**		
(ug/l unless noted)	Conc.	Acute	Chronic	HH	Acute	Chronic	HH	Acute	Chronic	HH	Acute	Chronic	HH	**Acute**	**Chronic**	**HH**
Acenapthene	0	--	--	9.9E+02	--	--	5.9E+04	--	--	--	--	--	--	**--**	**--**	**5.9E+04**
Acrolein		--	--	9.3E+00	--	--	5.6E+02	--	--	--	--	--	--	**--**	**--**	**5.6E+02**
Acrylonitrile[C]		--	--	2.5E+00	--	--	1.5E+02	--	--	--	--	--	--	**--**	**--**	**1.5E+02**
Aldrin [C]	0	1.3E+00	--	5.0E-04	7.8E+01	--	3.0E-02	--	--	--	--	--	--	**7.8E+01**	**--**	**3.0E-02**
Ammonia-N (mg/l) - Annual	0	#######	1.09E+00	--	4.36E+02	6.55E+01	--	--	--	--	--	--	--	**4.36E+02**	**6.55E+01**	**--**
Ammonia-N (mg/l) - Winter	0	#######	3.99E+00	--	1.03E+03	2.40E+02	--	--	--	--	--	--	--	**1.03E+03**	**2.40E+02**	**--**
Anthracene	0	--	--	4.0E+04	--	--	2.4E+06	--	--	--	--	--	--	**--**	**--**	**2.4E+06**
Antimony	0	--	--	6.4E+02	--	--	3.8E+04	--	--	--	--	--	--	**--**	**--**	**3.8E+04**
Arsenic	0	6.9E+01	3.6E+01	--	4.1E+03	2.2E+03	--	--	--	--	--	--	--	**4.1E+03**	**2.2E+03**	**--**
Benzene [C]	0	--	--	5.1E+02	--	--	3.1E+04	--	--	--	--	--	--	**--**	**--**	**3.1E+04**
Benzidine[C]		--	--	2.0E-03	--	--	1.2E-01	--	--	--	--	--	--	**--**	**--**	**1.2E-01**
Benzo (a) anthracene [C]	0	--	--	1.8E-01	--	--	1.1E+01	--	--	--	--	--	--	**--**	**--**	**1.1E+01**
Benzo (b) fluoranthene [C]	0	--	--	1.8E-01	--	--	1.1E+01	--	--	--	--	--	--	**--**	**--**	**1.1E+01**
Benzo (k) fluoranthene [C]	0	--	--	1.8E-01	--	--	1.1E+01	--	--	--	--	--	--	**--**	**--**	**1.1E+01**
Benzo (a) pyrene [C]	0	--	--	1.8E-01	--	--	1.1E+01	--	--	--	--	--	--	**--**	**--**	**1.1E+01**
Bis2-Chloroethyl Ether[C]	0	--	--	5.3E+00	--	--	3.2E+02	--	--	--	--	--	--	**--**	**--**	**3.2E+02**
Bis2-Chloroisopropyl Ether	0	--	--	6.5E+04	--	--	3.9E+06	--	--	--	--	--	--	**--**	**--**	**3.9E+06**
Bis2-Ethylhexyl Phthalate[C]	0	--	--	2.2E+01	--	--	1.3E+03	--	--	--	--	--	--	**--**	**--**	**1.3E+03**
Bromoform [C]	0	--	--	1.4E+03	--	--	8.4E+04	--	--	--	--	--	--	**--**	**--**	**8.4E+04**
Butylbenzylphthalate	0	--	--	1.9E+03	--	--	1.1E+05	--	--	--	--	--	--	**--**	**--**	**1.1E+05**
Cadmium	0	2.0E+00	7.0E-01	--	1.2E+02	4.2E+01	--	--	--	--	--	--	--	**1.2E+02**	**4.2E+01**	**--**
Carbon Tetrachloride [C]	0	--	--	1.6E+01	--	--	9.6E+02	--	--	--	--	--	--	**--**	**--**	**9.6E+02**
Chlordane [C]	0	9.0E-02	4.0E-03	8.1E-03	5.4E+00	2.4E-01	4.9E-01	--	--	--	--	--	--	**5.4E+00**	**2.4E-01**	**4.9E-01**

Parameter	Background	Water Quality Criteria			Wasteload Allocations			Antidegradation Baseline			Antidegradation Allocations			**Most Limiting Allocations**		
(ug/l unless noted)	Conc.	Acute	Chronic	HH	Acute	Chronic	HH	Acute	Chronic	HH	Acute	Chronic	HH	**Acute**	**Chronic**	**HH**
TRC	0	1.9E+01	1.1E+01	--	1.1E+03	6.6E+02	--	--	--	--	--	--	--	**1.1E+03**	**6.6E+02**	**--**
Chlorine Prod. Oxidant	0	1.3E+01	7.5E+00	--	7.8E+02	4.5E+02	--	--	--	--	--	--	--	**7.8E+02**	**4.5E+02**	**--**
Chlorobenzene		--	--	1.6E+03	--	--	9.6E+04	--	--	--	--	--	--	**--**	**--**	**9.6E+04**
Chlorodibromomethane [C]	0	--	--	1.3E+02	--	--	7.8E+03	--	--	--	--	--	--	**--**	**--**	**7.8E+03**
Chloroform	0	--	--	1.1E+04	--	--	6.6E+05	--	--	--	--	--	--	**--**	**--**	**6.6E+05**
2-Chloronaphthalene	0	--	--	1.6E+03	--	--	9.6E+04	--	--	--	--	--	--	**--**	**--**	**9.6E+04**
2-Chlorophenol	0	--	--	1.5E+02	--	--	9.0E+03	--	--	--	--	--	--	**--**	**--**	**9.0E+03**
Chlorpyrifos	0	1.1E-02	5.6E-03	--	6.6E-01	3.4E-01	--	--	--	--	--	--	--	**6.6E-01**	**3.4E-01**	**--**
Chromium III	0	3.5E+02	4.5E+01	--	2.1E+04	2.7E+03	--	--	--	--	--	--	--	**2.1E+04**	**2.7E+03**	**--**
Chromium VI	0	1.6E+01	1.1E+01	--	9.6E+02	6.6E+02	--	--	--	--	--	--	--	**9.6E+02**	**6.6E+02**	**--**
Chrysene [C]	0	--	--	1.8E-02	--	--	1.1E+00	--	--	--	--	--	--	**--**	**--**	**1.1E+00**
Copper	0	7.6E+00	5.3E+00	--	4.6E+02	3.2E+02	--	--	--	--	--	--	--	**4.6E+02**	**3.2E+02**	**--**
Cyanide, Free	0	1.0E+00	1.0E+00	1.6E+04	6.0E+01	6.0E+01	9.6E+05	--	--	--	--	--	--	**6.0E+01**	**6.0E+01**	**9.6E+05**
DDD [C]	0	--	--	3.1E-03	--	--	1.9E-01	--	--	--	--	--	--	**--**	**--**	**1.9E-01**
DDE [C]	0	--	--	2.2E-03	--	--	1.3E-01	--	--	--	--	--	--	**--**	**--**	**1.3E-01**
DDT [C]	0	1.3E-01	1.0E-03	2.2E-03	7.8E+00	6.0E-02	1.3E-01	--	--	--	--	--	--	**7.8E+00**	**6.0E-02**	**1.3E-01**
Demeton	0	--	1.0E-01	--	--	6.0E+00	--	--	--	--	--	--	--	**--**	**6.0E+00**	**--**
Diazinon	0	1.7E-01	1.7E-01	--	1.0E+01	1.0E+01	--	--	--	--	--	--	--	**1.0E+01**	**1.0E+01**	**--**
Dibenz(a,h)anthracene [C]	0	--	--	1.8E-01	--	--	1.1E+01	--	--	--	--	--	--	**--**	**--**	**1.1E+01**
1,2-Dichlorobenzene	0	--	--	1.3E+03	--	--	7.8E+04	--	--	--	--	--	--	**--**	**--**	**7.8E+04**
1,3-Dichlorobenzene	0	--	--	9.6E+02	--	--	5.8E+04	--	--	--	--	--	--	**--**	**--**	**5.8E+04**
1,4-Dichlorobenzene	0	--	--	1.9E+02	--	--	1.1E+04	--	--	--	--	--	--	**--**	**--**	**1.1E+04**
3,3-Dichlorobenzidine [C]	0	--	--	2.8E-01	--	--	1.7E+01	--	--	--	--	--	--	**--**	**--**	**1.7E+01**
Dichlorobromomethane [C]	0	--	--	1.7E+02	--	--	1.0E+04	--	--	--	--	--	--	**--**	**--**	**1.0E+04**
1,2-Dichloroethane [C]	0	--	--	3.7E+02	--	--	2.2E+04	--	--	--	--	--	--	**--**	**--**	**2.2E+04**
1,1-Dichloroethylene	0	--	--	7.1E+03	--	--	4.3E+05	--	--	--	--	--	--	**--**	**--**	**4.3E+05**
1,2-trans-dichloroethylene	0	--	--	1.0E+04	--	--	6.0E+05	--	--	--	--	--	--	**--**	**--**	**6.0E+05**
2,4-Dichlorophenol	0	--	--	2.9E+02	--	--	1.7E+04	--	--	--	--	--	--	**--**	**--**	**1.7E+04**
1,2-Dichloropropane [C]	0	--	--	1.5E+02	--	--	9.0E+03	--	--	--	--	--	--	**--**	**--**	**9.0E+03**
1,3-Dichloropropene [C]	0	--	--	2.1E+02	--	--	1.3E+04	--	--	--	--	--	--	**--**	**--**	**1.3E+04**
Dieldrin [C]	0	7.1E-01	1.9E-03	5.4E-04	4.3E+01	1.1E-01	3.2E-02	--	--	--	--	--	--	**4.3E+01**	**1.1E-01**	**3.2E-02**
Diethyl Phthalate	0	--	--	4.4E+04	--	--	2.6E+06	--	--	--	--	--	--	**--**	**--**	**2.6E+06**
2,4-Dimethylphenol	0	--	--	8.5E+02	--	--	5.1E+04	--	--	--	--	--	--	**--**	**--**	**5.1E+04**
Dimethyl Phthalate	0	--	--	1.1E+06	--	--	6.6E+07	--	--	--	--	--	--	**--**	**--**	**6.6E+07**
Di-n-Butyl Phthalate	0	--	--	4.5E+03	--	--	2.7E+05	--	--	--	--	--	--	**--**	**--**	**2.7E+05**
2,4 Dinitrophenol	0	--	--	5.3E+03	--	--	3.2E+05	--	--	--	--	--	--	**--**	**--**	**3.2E+05**
2-Methyl-4,6-Dinitrophenol	0	--	--	2.8E+02	--	--	1.7E+04	--	--	--	--	--	--	**--**	**--**	**1.7E+04**
2,4-Dinitrotoluene [C]	0	--	--	3.4E+01	--	--	2.0E+03	--	--	--	--	--	--	**--**	**--**	**2.0E+03**
Dioxin 2,3,7,8-tetrachlorodibenzo-p-dioxin	0	--	--	5.1E-08	--	--	3.1E-06	--	--	--	--	--	--	**--**	**--**	**3.1E-06**
1,2-Diphenylhydrazine [C]	0	--	--	2.0E+00	--	--	1.2E+02	--	--	--	--	--	--	**--**	**--**	**1.2E+02**
Alpha-Endosulfan	0	3.4E-02	8.7E-03	8.9E+01	2.0E+00	5.2E-01	5.3E+03	--	--	--	--	--	--	**2.0E+00**	**5.2E-01**	**5.3E+03**

Parameter	Background	Water Quality Criteria			Wasteload Allocations			Antidegradation Baseline			Antidegradation Allocations			**Most Limiting Allocations**		
(ug/l unless noted)	Conc.	Acute	Chronic	HH	Acute	Chronic	HH	Acute	Chronic	HH	Acute	Chronic	HH	**Acute**	**Chronic**	**HH**
Beta-Endosulfan	0	3.4E-02	8.7E-03	8.9E+01	2.0E+00	5.2E-01	5.3E+03	--	--	--	--	--	--	**2.0E+00**	**5.2E-01**	**5.3E+03**
Alpha + Beta Endosulfan	0	3.4E-02	8.7E-03	--	2.0E+00	5.2E-01	--	--	--	--	--	--	--	**2.0E+00**	**5.2E-01**	**--**
Endosulfan Sulfate	0	--	--	8.9E+01	--	--	5.3E+03	--	--	--	--	--	--	**--**	**--**	**5.3E+03**
Endrin	0	3.7E-02	2.3E-03	6.0E-02	2.2E+00	1.4E-01	3.6E+00	--	--	--	--	--	--	**2.2E+00**	**1.4E-01**	**3.6E+00**
Endrin Aldehyde	0	--	--	3.0E-01	--	--	1.8E+01	--	--	--	--	--	--	**--**	**--**	**1.8E+01**
Ethylbenzene	0	--	--	2.1E+03	--	--	1.3E+05	--	--	--	--	--	--	**--**	**--**	**1.3E+05**
Fluoranthene	0	--	--	1.4E+02	--	--	8.4E+03	--	--	--	--	--	--	**--**	**--**	**8.4E+03**
Fluorene	0	--	--	5.3E+03	--	--	3.2E+05	--	--	--	--	--	--	**--**	**--**	**3.2E+05**
Guthion	0	--	1.0E-02	--	--	6.0E-01	--	--	--	--	--	--	--	**--**	**6.0E-01**	**--**
Heptachlor [C]	0	5.3E-02	3.6E-03	7.9E-04	3.2E+00	2.2E-01	4.7E-02	--	--	--	--	--	--	**3.2E+00**	**2.2E-01**	**4.7E-02**
Heptachlor Epoxide[C]	0	5.3E-02	3.6E-03	3.9E-04	3.2E+00	2.2E-01	2.3E-02	--	--	--	--	--	--	**3.2E+00**	**2.2E-01**	**2.3E-02**
Hexachlorobenzene[C]	0	--	--	2.9E-03	--	--	1.7E-01	--	--	--	--	--	--	**--**	**--**	**1.7E-01**
Hexachlorobutadiene[C]	0	--	--	1.8E+02	--	--	1.1E+04	--	--	--	--	--	--	**--**	**--**	**1.1E+04**
Hexachlorocyclohexane Alpha-BHC[C]	0	--	--	4.9E-02	--	--	2.9E+00	--	--	--	--	--	--	**--**	**--**	**2.9E+00**
Hexachlorocyclohexane Beta-BHC[C]	0	--	--	1.7E-01	--	--	1.0E+01	--	--	--	--	--	--	**--**	**--**	**1.0E+01**
Hexachlorocyclohexane Gamma-BHC[C] (Lindane)	0	1.6E-01	--	1.8E+00	9.6E+00	--	1.1E+02	--	--	--	--	--	--	**9.6E+00**	**--**	**1.1E+02**
Hexachlorocyclopentadiene	0	--	--	1.1E+03	--	--	6.6E+04	--	--	--	--	--	--	**--**	**--**	**6.6E+04**
Hexachloroethane[C]	0	--	--	3.3E+01	--	--	2.0E+03	--	--	--	--	--	--	**--**	**--**	**2.0E+03**
Hydrogen Sulfide	0	--	2.0E+00	--	--	1.2E+02	--	--	--	--	--	--	--	**--**	**1.2E+02**	**--**
Indeno (1,2,3-cd) pyrene C	0	--	--	1.8E-01	--	--	1.1E+01	--	--	--	--	--	--	**--**	**--**	**1.1E+01**
Isophorone[C]	0	--	--	9.6E+03	--	--	5.8E+05	--	--	--	--	--	--	**--**	**--**	**5.8E+05**
Kepone	0	--	0.0E+00	--	--	0.0E+00	--	--	--	--	--	--	--	**--**	**0.0E+00**	**--**
Lead	0	5.5E+01	6.2E+00	--	3.3E+03	3.7E+02	--	--	--	--	--	--	--	**3.3E+03**	**3.7E+02**	**--**
Malathion	0	--	1.0E-01	--	--	6.0E+00	--	--	--	--	--	--	--	**--**	**6.0E+00**	**--**
Mercury	0	1.8E+00	9.4E-01	--	1.1E+02	5.6E+01	--	--	--	--	--	--	--	**1.1E+02**	**5.6E+01**	**--**
Methyl Bromide	0	--	--	1.5E+03	--	--	9.0E+04	--	--	--	--	--	--	**--**	**--**	**9.0E+04**
Methylene Chloride [C]	0	--	--	5.9E+03	--	--	3.5E+05	--	--	--	--	--	--	**--**	**--**	**3.5E+05**
Methoxychlor	0	--	3.0E-02	--	--	1.8E+00	--	--	--	--	--	--	--	**--**	**1.8E+00**	**--**
Mirex	0	--	0.0E+00	--	--	0.0E+00	--	--	--	--	--	--	--	**--**	**0.0E+00**	**--**
Nickel	0	7.4E+01	8.2E+00	4.6E+03	4.4E+03	4.9E+02	2.8E+05	--	--	--	--	--	--	**4.4E+03**	**4.9E+02**	**2.8E+05**
Nitrobenzene	0	--	--	6.9E+02	--	--	4.1E+04	--	--	--	--	--	--	**--**	**--**	**4.1E+04**
N-Nitrosodimethylamine[C]	0	--	--	3.0E+01	--	--	1.8E+03	--	--	--	--	--	--	**--**	**--**	**1.8E+03**
N-Nitrosodiphenylamine[C]	0	--	--	6.0E+01	--	--	3.6E+03	--	--	--	--	--	--	**--**	**--**	**3.6E+03**
N-Nitrosodi-n-propylamine[C]	0	--	--	5.1E+00	--	--	3.1E+02	--	--	--	--	--	--	**--**	**--**	**3.1E+02**
Nonylphenol	0	7.0E+00	1.7E+00	--	4.2E+02	1.0E+02	--	--	--	--	--	--	--	**4.2E+02**	**1.0E+02**	**--**
Parathion	0	6.5E-02	1.3E-02	--	3.9E+00	7.8E-01	--	--	--	--	--	--	--	**3.9E+00**	**7.8E-01**	**--**
PCB Total[C]	0	--	1.4E-01	6.4E-04	--	8.4E+00	3.8E-02	--	--	--	--	--	--	**--**	**8.4E+00**	**3.8E-02**
Pentachlorophenol [C]	0	7.1E+00	5.5E+00	3.0E+01	4.3E+02	3.3E+02	1.8E+03	--	--	--	--	--	--	**4.3E+02**	**3.3E+02**	**1.8E+03**

Parameter	Background	Water Quality Criteria			Wasteload Allocations			Antidegradation Baseline			Antidegradation Allocations			**Most Limiting Allocations**		
(ug/l unless noted)	Conc.	Acute	Chronic	HH	Acute	Chronic	HH	Acute	Chronic	HH	Acute	Chronic	HH	**Acute**	**Chronic**	**HH**
Phenol	0	--	--	8.6E+05	--	--	5.2E+07	--	--	--	--	--	--	**--**	**--**	**5.2E+07**
Phosphorus (Elemental)	0	--	1.0E-01	--	--	6.0E+00	--	--	--	--	--	--	--	**--**	**6.0E+00**	**--**
Pyrene	0	--	--	4.0E+03	--	--	2.4E+05	--	--	--	--	--	--	**--**	**--**	**2.4E+05**
Selenium	0	2.0E+01	5.0E+00	4.2E+03	1.2E+03	3.0E+02	2.5E+05	--	--	--	--	--	--	**1.2E+03**	**3.0E+02**	**2.5E+05**
Silver	0	1.2E+00	--	--	7.3E+01	--	--	--	--	--	--	--	--	**7.3E+01**	**--**	**--**
1,1,2,2-Tetrachloroethane[C]	0	--	--	4.0E+01	--	--	2.4E+03	--	--	--	--	--	--	**--**	**--**	**2.4E+03**
Tetrachloroethylene[C]	0	--	--	3.3E+01	--	--	2.0E+03	--	--	--	--	--	--	**--**	**--**	**2.0E+03**
Thallium	0	--	--	4.7E-01	--	--	2.8E+01	--	--	--	--	--	--	**--**	**--**	**2.8E+01**
Toluene	0	--	--	6.0E+03	--	--	3.6E+05	--	--	--	--	--	--	**--**	**--**	**3.6E+05**
Toxaphene [C]	0	2.1E-01	2.0E-04	2.8E-03	1.3E+01	1.2E-02	1.7E-01	--	--	--	--	--	--	**1.3E+01**	**1.2E-02**	**1.7E-01**
Tributyltin	0	4.2E-01	7.4E-03	--	2.5E+01	4.4E-01	--	--	--	--	--	--	--	**2.5E+01**	**4.4E-01**	**--**
1,2,4-Trichlorobenzene	0	--	--	7.0E+01	--	--	4.2E+03	--	--	--	--	--	--	**--**	**--**	**4.2E+03**
1,1,2-Trichloroethane[C]		--	--	1.6E+02	--	--	9.6E+03	--	--	--	--	--	--	**--**	**--**	**9.6E+03**
Trichloroethylene [C]	0	--	--	3.0E+02	--	--	1.8E+04	--	--	--	--	--	--	**--**	**--**	**1.8E+04**
2,4,6-Trichlorophenol [C]	0	--	--	2.4E+01	--	--	1.4E+03	--	--	--	--	--	--	**--**	**--**	**1.4E+03**
Vinyl Chloride[C]	0	--	--	2.4E+01	--	--	1.4E+03	--	--	--	--	--	--	**--**	**--**	**1.4E+03**
Zinc	0	7.0E+01	7.1E+01	2.6E+04	4.2E+03	4.2E+03	1.6E+06	--	--	--	--	--	--	**4.2E+03**	**4.2E+03**	**1.6E+06**

Notes:

1. All concentrations expressed as micrograms/liter (ug/l), unless noted otherwise
2. Discharge flow is highest monthly average or Form 2C maximum for Industries and design flow for Municipals
3. Metals measured as Dissolved, unless specified otherwise
4. "C" indicates a carcinogenic parameter
5. For transition zone waters, spreadsheet prints the lesser of the freshwater and saltwater water quality criteria.
6. Regular WLA = (WQC x WLA multiplier) - (WLA multiplier - 1)(background conc.)
7. Antideg. Baseline = (0.25(WQC - background conc.) + background conc.) for acute and chronic
   = (0.1(WQC - background conc.) + background conc.) for human health
8. Antideg. WLA = (Antideg. Baseline)(WLA multiplier) - (WLA multiplier - 1)(background conc.)

Metal	Site Specific Target Value (SSTV)
Antimony	3.8E+04
Arsenic III	1.3E+03
Cadmium	2.5E+01
Chromium III	1.6E+03
Chromium VI	3.8E+02
Copper	1.8E+02
Lead	2.2E+02
Mercury	3.4E+01
Nickel	3.0E+02
Selenium	1.8E+02
Silver	2.9E+01
Zinc	1.7E+03

Note: do not use QL's lower than the minimum QL's provided in agency guidance

MSTRANTI DATA SOURCE REPORT – Outfall 001

Stream information	
Mean Hardness	Stream information obtained from DEQ water quality monitoring data at station 8-PMK006.36, five miles upstream of facility. Hardness obtained from station PMK0034.17, 33 miles upstream to prevent saltwater influence. See Fact Sheet section 13 for hardness discussion.
90% Temperature (annual)	
90% Temperature (wet season)	
90% Maximum pH	
10% Maximum pH	
Tier Designation	Tier Determination (Item 14 in Fact Sheet)
Stream Flows	
All Data	Flow Frequency Memo and Item 5 in Fact Sheet
Mixing Information	
All Data	The mix ratio was set as 60:1 based on an October 1991 mixing study conducted by John Hamrick, associate professor of marine science at the College of William and Mary. Design flow value is the maximum 30-day average flow. See effluent data from DMRs.
Effluent Information	
Mean Hardness	Hardness data provided in the 2010 permit application.
90% Temperature (annual)	Maximum 30-day values provided in 2010 permit application Form 2C. This is best available estimate of 90% temperature.
90% Maximum pH	Effluent Data from DMRs.
10% Maximum pH	Effluent Data from DMRs.
Discharge flow	Maximum daily value from DMRs.

Data Location:

Effluent Data – Attachment 5

Flow Frequency Memo – Attachment 3

Chemical = Ammonia Chronic averaging period = 30 WLAa = 436 WLAc = 65.5 Q.L. = 1 # samples/mo. = 1 # samples/wk. = 1 Summary of Statistics: # observations = 1 Expected Value = 25 Variance = 225 C.V. = 0.6 97th percentile daily values = 60.8354 97th percentile 4 day average = 41.5947 97th percentile 30 day average= 30.1513 # < Q.L. = 0 Model used = BPJ Assumptions, type 2 data No Limit is required for this material The data are: 25	Chemical = Arsenic Chronic averaging period = 4 WLAa = 4100 WLAc = 2200 Q.L. = 1 # samples/mo. = 1 # samples/wk. = 1 Summary of Statistics: # observations = 1 Expected Value = 74 Variance = 1971.36 C.V. = 0.6 97th percentile daily values = 180.072 97th percentile 4 day average = 123.120 97th percentile 30 day average= 89.2479 # < Q.L. = 0 Model used = BPJ Assumptions, type 2 data No Limit is required for this material The data are: 74
Chemical = Chromium III Chronic averaging period = 4 WLAa = 21000 WLAc = 2700 Q.L. = 1 # samples/mo. = 1 # samples/wk. = 1 Summary of Statistics: # observations = 1 Expected Value = 3.1 Variance = 3.4596 C.V. = 0.6 97th percentile daily values = 7.54359 97th percentile 4 day average = 5.15774 97th percentile 30 day average= 3.73876 # < Q.L. = 0 Model used = BPJ Assumptions, type 2 data No Limit is required for this material The data are: 3.1	Chemical = Copper Chronic averaging period = 4 WLAa = 460 WLAc = 320 Q.L. = 1 # samples/mo. = 1 # samples/wk. = 1 Summary of Statistics: # observations = 1 Expected Value = 3.7 Variance = 4.9284 C.V. = 0.6 97th percentile daily values = 9.00364 97th percentile 4 day average = 6.15602 97th percentile 30 day average= 4.46239 # < Q.L. = 0 Model used = BPJ Assumptions, type 2 data No Limit is required for this material The data are: 3.7

Chemical = Heptachlor Chronic averaging period = 4 WLAa = 3.2 WLAc = 0.22 Q.L. = 0.01 # samples/mo. = 1 # samples/wk. = 1 Summary of Statistics: # observations = 1 Expected Value = .015 Variance = .000081 C.V. = 0.6 97th percentile daily values = .036501 97th percentile 4 day average = .024956 97th percentile 30 day average= .018090 # < Q.L. = 0 Model used = BPJ Assumptions, type 2 data No Limit is required for this material The data are: 0.015	Chemical = Zinc Chronic averaging period = 4 WLAa = 4200 WLAc = 4200 Q.L. = 1 # samples/mo. = 1 # samples/wk. = 1 Summary of Statistics: # observations = 1 Expected Value = 10.4 Variance = 39.69 C.V. = 0.6 97th percentile daily values = 25.5508 97th percentile 4 day average = 17.4697 97th percentile 30 day average= 12.6635 # < Q.L. = 0 Model used = BPJ Assumptions, type 2 data No Limit is required for this material The data are: 10.4
Chemical = Nonylphenol Chronic averaging period = 4 WLAa = 420 WLAc = 100 Q.L. = 1 # samples/mo. = 1 # samples/wk. = 1 Summary of Statistics: # observations = 1 Expected Value = 3.1 Variance = 3.4596 C.V. = 0.6 97th percentile daily values = 7.54359 97th percentile 4 day average = 5.15774 97th percentile 30 day average= 3.73876 # < Q.L. = 0 Model used = BPJ Assumptions, type 2 data No Limit is required for this material The data are: 3.1	

Attachment 7
Mixing study

The College of William and Mary
Virginia Institute of Marine Science
School of Marine Science
Gloucester Point, Virginia 23062

October 16, 1991

Mr. M. Dale Phillips
State Water Control Board
Box 11143
Richmond, VA 23230

Dear Mr. Phillips: Dale

Thank you for your comments on the draft summary of results in your letter of August 8, 1991. They were most helpful in preparing the the enclosed draft final report 'Analysis of Mixing and Dilution of Process Water Discharged into the Pamunkey River'. The report provides a more detailed description of the work leading to the results presented in the summary. An appendix contains the primary input files for the three situations analyzed. I will porvide these files, as well as a number of additional data files, and the source code on DOS disks. The code runs on 386 PC's under the Lahey Professional Fortran compiler and Ergo operating system. Please contact me if you have any questions or comments that should be responded to in the final report. Thank you for comments and interest.

Sincerely yours,

John Hamrick

John M. Hamrick
Associate Professor of
Marine Science

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Enclosure

804-642-7210 (Off) 804-642-7195 (Fax) jham@ches.cs.vims.edu

Att. 4E p. 2 of 3

Analysis of Mixing and Dilution of Process Water Discharged Into the Pamunkey River

by

John M. Hamrick

A Report To

Chesapeake Corporation
West Point, VA

Division of Physical Oceanography
Virginia Institute of Marine Science
School of Marine Science
The College of William and Mary
Gloucester Point, VA 23062.

October 1991

MEAN FLOW MIXING AND DILUTION

The procedure for analyzing mixing and dilution of the process water discharge under mean river flow conditions is identical to the low flow procedure, except that the initial salinity distribution is the quasi-steady distribution for the mean river discharges rates of 1338 cfs (37.89 cms) in the Pamunkey and 903 cfs (25.57 cms) in the Mattaponi. Maximum concentrations observed during the tidal cycle did not change after 24 tidal cycles (12 days) of simulation. The results for the mean flow runs are summarized in Table 3. The maximum instantaneous concentration inside both the old and new mixing zone was 17.67 mg/l, which corresponds to a minimum instantaneous dilution of 56.6. The maximum instantaneous concentrations outside of the old and new mixing zones were 15.12 and 14.58 mg/l, respectively. The corresponding minimum instantaneous dilutions are 66.1 and 68.6. The two tidal cycle averaged results in the third column again show the reduction in maximum averaged concentration, or increase in minimum dilution, from instantaneous values.

SUMMARY AND CONCLUSIONS

Based on the general agreement of the model simulated dye study with the field results, the model appears to represent the important mixing mechanisms in the York, Pamunkey, and Mattaponi Rivers near West Point and is an appropriate tool to analyze the mixing of process water from the Chesapeake Corporation's plant. In regard to the prediction of minimum dilutions, it is noted that the steady state 7Q10 run represents a prolonged low flow condition, more severe than an actual 7 day, 10 year recurrence, low flow. Taking this conservative river flow condition into consideration, it would seem reasonable in the writer's opinion to use the minimum dilution of 60.2, based on the maximum two tidal cycle averaged concentration inside the new mixing zone, as a measure of continuously achievable mixing rather than a lower intermittent value.

Analysis of Mixing and Dilution of Process Water Discharged Into the Pamunkey River

by

John M. Hamrick

A Report To

Chesapeake Corporation
West Point, VA

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Tidewater Regional
Office

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Division of Physical Oceanography
Virginia Institute of Marine Science
School of Marine Science
The College of William and Mary
Gloucester Point, VA 23062.

October 1991

ABSTRACT

This report describes and documents an analysis of the mixing and dilution of the Chesapeake Corporation's process water discharge into the Pamunkey River at West Point, Virginia. The analysis involves the application of the Virginia Institute of Marine Science's three-dimensional environmental fluid dynamics computer code, EFDC, to model the combined York, Pamunkey and Mattaponi Rivers. Following a large scale tidal calibration, the model's ability to predict the mixing of discharges into the river system is verified by the simulation of a field dye release study. The model is then used to predict mixing and dilution of the Chesapeake Corporation's West Point plant's process water discharge into the Pamunkey River at sustained low and mean flow conditions.

ACKNOWLEDGEMENT

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INTRODUCTION

The ability to predict the mixing and fate of materials discharged into surface water bodies is an essential element of sound environmental management, since regulations governing the discharge of many materials dictate that the concentration of the material in the receiving water not exceed a specified value. In general, the concentration of material is specified in terms of mass of material per unit volume of water, ie mg/l, or mass of material per mass of a unit volume of water, ie parts per million. The concept of dilution is used as a measure of how effectively a discharged material is mixed with the receiving water and how much its concentration is reduced. When regulations are defined in terms of maximum allowable concentrations in the receiving water, it is most appropriate to define dilution as the ratio of the material's concentration in the discharge to its concentration in the receiving water, Fischer et al (1979). If a background concentration of material exists in the water body before the discharge, it may be appropriate to subtract the background concentration from both the discharge and the impacted receiving water concentrations.

Field dye releases, dye releases in reduced scale hydraulic models, analytic models based upon or supported by experimental verification, and computer or numerical models which have been verified by comparison with field and experimental data are the generally accepted approaches for predicting the mixing and dilution of discharged material. Field dye releases at the actual discharge point have traditionally been viewed as the most effective means of determining mixing and dilution in complex natural water bodies. However, such dye releases are capable of determining the mixing and dilution only for the hydrodynamic and hydrologic conditions under which the release was conducted. For example, a dye release into a tidal estuary under spring tide and mean river discharge conditions is not readily extrapolated to neap tide and low river discharge conditions which may result in less effective mixing. Recent advances in computer or numerical modeling of

environmental flows have provided powerful tools for analysis of mixing and dilution, particularly since a wider range of hydrodynamic and hydrologic conditions may be investigated at a cost considerably below that for multiple field dye releases.

The approach taken in this study is to utilize a three-dimensional environmental fluid flow computer model, the Environmental Fluid Dynamics Computer Code, EFDC, in conjunction with a field dye release to predict the mixing and dilution of the Chesapeake Corporation's West Point plant's process water discharge into the Pamunkey River near its confluence with the Mattaponi to form the York River estuary. The numerical model is calibrated using field observations of water surface elevation, velocity and salinity collected during various studies conducted by the Virginia Institute of Marine Science over the period between 1969 and 1990. The ability of the model to simulate mixing in the river-estuary system is then verified by the simulation of a 20 day duration continuous dye release conducted by VIMS in 1969. The model can then be used to predict the mixing and dilution of the process water discharge under various hydrologic and hydrodynamic conditions.

Description of the Environmental Fluid Dynamics Computer Code

The Environmental Fluid Dynamics Computer Code, EFDC, is a three-dimensional environmental fluid flow simulation model developed at the Virginia Institute of Marine Science, the College of William and Mary. The code or model was developed to provide the Institute with both a state of the art engineering tool for environmental impact assessment in the Virginia waters of the Chesapeake Bay system and a sophisticated scientific tool for estuarine and coastal circulation research through numerical experimentation and coordinated field investigation. The three-dimensional model is currently being applied at VIMS to the James River estuary to study environmental impacts of dredge spoil disposal alternatives, and to study the transport paths of oyster larvae. An earlier two-

dimensional depth integrated version of the model was applied to the York River to predict oil spill trajectories during a mock oil spill exercise.

The computer code solves the vertically hydrostatic, free surface, variable density, turbulent-averaged equations of motion and transport equations for turbulent kinetic energy and macro-scale, salinity and temperature in a stretched, (sigma), vertical coordinate system, and horizontal coordinate systems which may be Cartesian or curvilinear-orthogonal. Equations describing the transport of suspended sediment and dynamically neutral conservative and nonconservative tracers are also solved. Since the hydrostatic equations of motions are used, the code is appropriate only for the large class of environmental flows which are essentially horizontal. The code is not appropriate for environmental flows having large vertical accelerations such as high frequency surface gravity waves and near vertical jets and plumes. The code uses a three time level, finite difference scheme with a internal-external mode splitting procedure to separate the internal shear or baroclinic mode from the external free surface gravity wave or barotropic mode. The external mode solution is implicit, and simultaneously computes the two-dimensional surface elevation field by a multicolor SOR procedure avoiding polarization problems associated with ADI schemes in complex geometries where waves may propagate skewed to the grid. The external solution is completed by the calculation of the depth integrated barotropic velocities using the new surface elevation field. The implicit external solution allows large time steps which are constrained only by the stability criteria of the explicit advection scheme used for the nonlinear accelerations. The internal solution, at the same time step as the external, is implicit with respect to vertical diffusion. The internal solution of the momentum equations is in terms of the velocity shear, which results in the simplest and most accurate form of the baroclinic pressure gradients and eliminates the over determined character of alternate internal mode formulations. The vertical diffusion coefficients for momentum, mass and temperature are determined by the second moment closure scheme

of Mellor and Yamada, (Mellor and Yamada, 1982, Blumberg and Mellor, 1987, and Galperin et al, 1988) which involves the use of analytically determined stability functions and the solution of transport equations for the turbulent kinetic energy and the turbulent macro-scale. Time splitting inherent in the three time level scheme is controlled by periodic insertion of a two time level step. The two time level step may also be used for startup and restart, eliminating the need for initial conditions at two time levels.

Other features of the code include various options for advective transport, computation of generalized Lagrangian mean mass transport velocities which may be used to drive long time step water quality models, and direct graphical display of program output. Current advection schemes include the central difference scheme and the Smolarkiewicz's multidimensional positive definite advective transport algorithm, (Smolarkiewicz and Clark, 1986, Smolarkiewicz and Grabowski, 1990), which is used in the scalar transport equations. The Somlarkiewicz scheme has been successful in simulating high salinity gradient frontal systems in the James River, (Hamrick et al, 1991). The standard model output is highly graphical using printer character plots rather than lengthy numerical tabulations. A number of additional subroutines create files for horizontally and vertically sliced contour, color shaded and vector plots, using the NCAR graphics package. Three-dimensional vector and scalar fields may be output in NCSA HDF format, for use with a number of currently available visualization and animation software packages. The code is written in standard Fortran 77, and is designed to economize mass storage by storing only active water cell variables in memory. Particular attention has also been given to minimizing logical operations, and the code is highly vectorizable. The code was originally developed on a DEC VAX computer and has been ported to Sun workstations, Macintosh and 386 PC's, and Cray and Convex supercomputers. For a complete description of the theoretical and computational aspects of the code, the reader is referred to Hamrick (1991).

MODEL CONFIGURATION AND TIDAL CALIBRATION

The configuration of the EFDC code for the York, Pamunkey and Mattaponi system first involves the construction of a horizontal grid of quadralateral and triangular cells which approximately conform to the actual water body boundaries shown in Figure 1. The grid of quadralateral cells forms a horizontal curvilinear coordinate system which is approximately orthogonal. The grid is generated by a computer code which implements the weak constraint elliptic equation method of Ryskin and Leal (1983) as modified by Chikhliwala and Yortsos (1985). Triangular cells are actually half quadralateral cells and are used for improved boundary representation in certain locations. The full horizontal grid contains approximately 1600 water cells in the horizontal. Figure 2 shows the complete grid, while Figure 3 shows details of the grid near the three river confluence at West Point. The eastern model boundary is approximately 3 km east of Tue Marsh Light, while the western boundaries extend to the head of tide in both the Pamunkey and Mattaponi Rivers. Horizontal resolution ranges from approximately 500 meters in the central York to 100 meters in the Pamunkey, Mattaponi and the upper York. In the vicinity of the process water discharge into the Pamunkey, three horizontal cells are used across the width of the river, see Figure 3. In the vertical direction, eight layers of uniform local thickness are used. For typical tidal forcings used, a model time step of approximately 37 seconds produced a stable integration in time. Simulation of a 12.42 hr tidal cycle requires 2.75 hours of processing time on a Sun 4-330 workstation.

To simplify the tidal calibration and operation of the model, a single constituent tide at the 12.4206 hour M2 period will be used. However, the forcing amplitude will be adjusted from the M2 amplitude to one half of the mean tide range reported in the NOAA tide tables. The tidal forcing is applied at the eastern boundary where a radiation water surface elevation boundary condition at the M2 period of 12.4206 hours is specified. This forcing was adjusted until the 72 cm mean tide range resulted at Gloucester Point. River

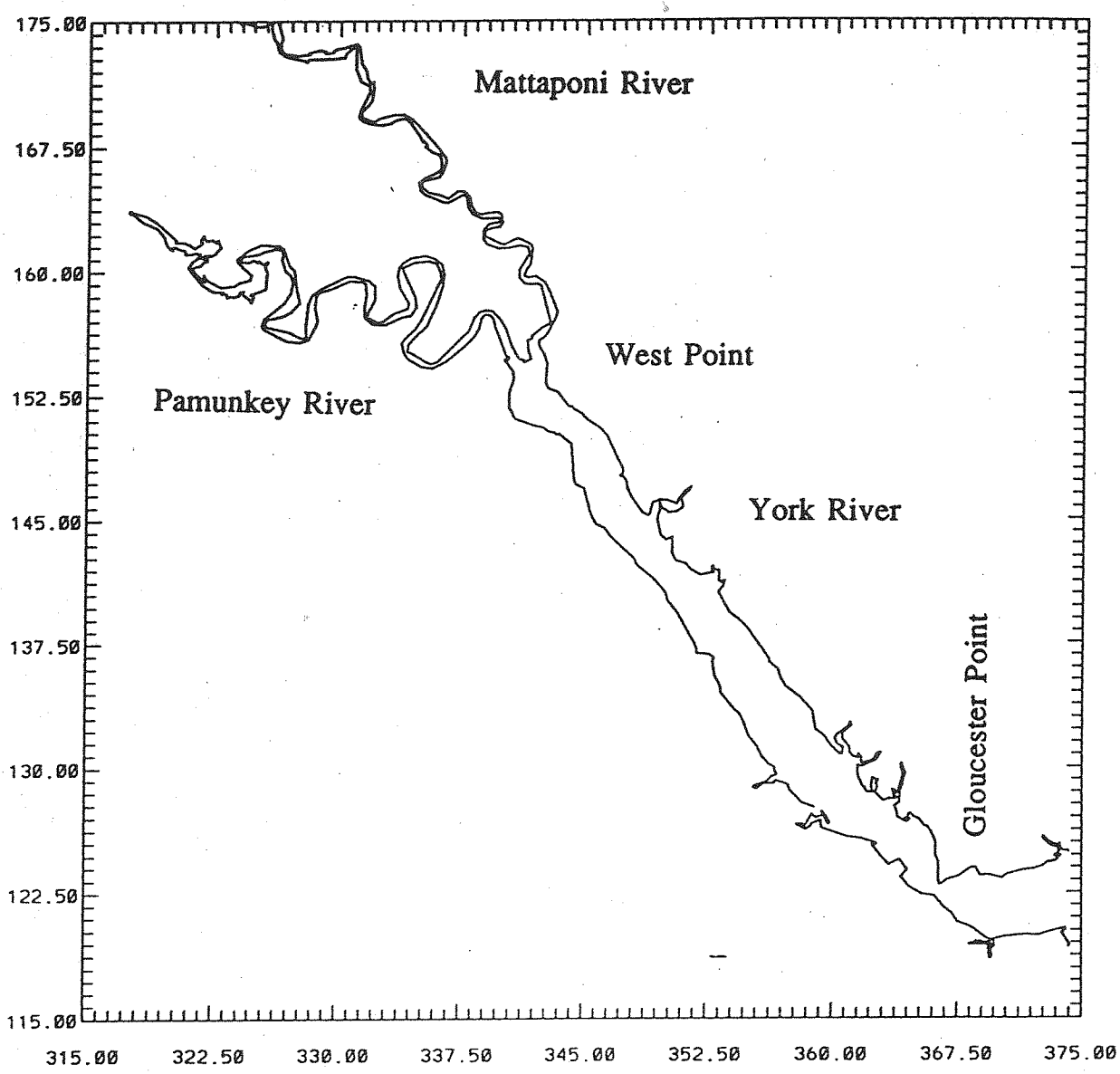


Figure 1. Shoreline of the York, Pamunkey, and Mattaponi Rivers. (Scale distances are in kilometers.)

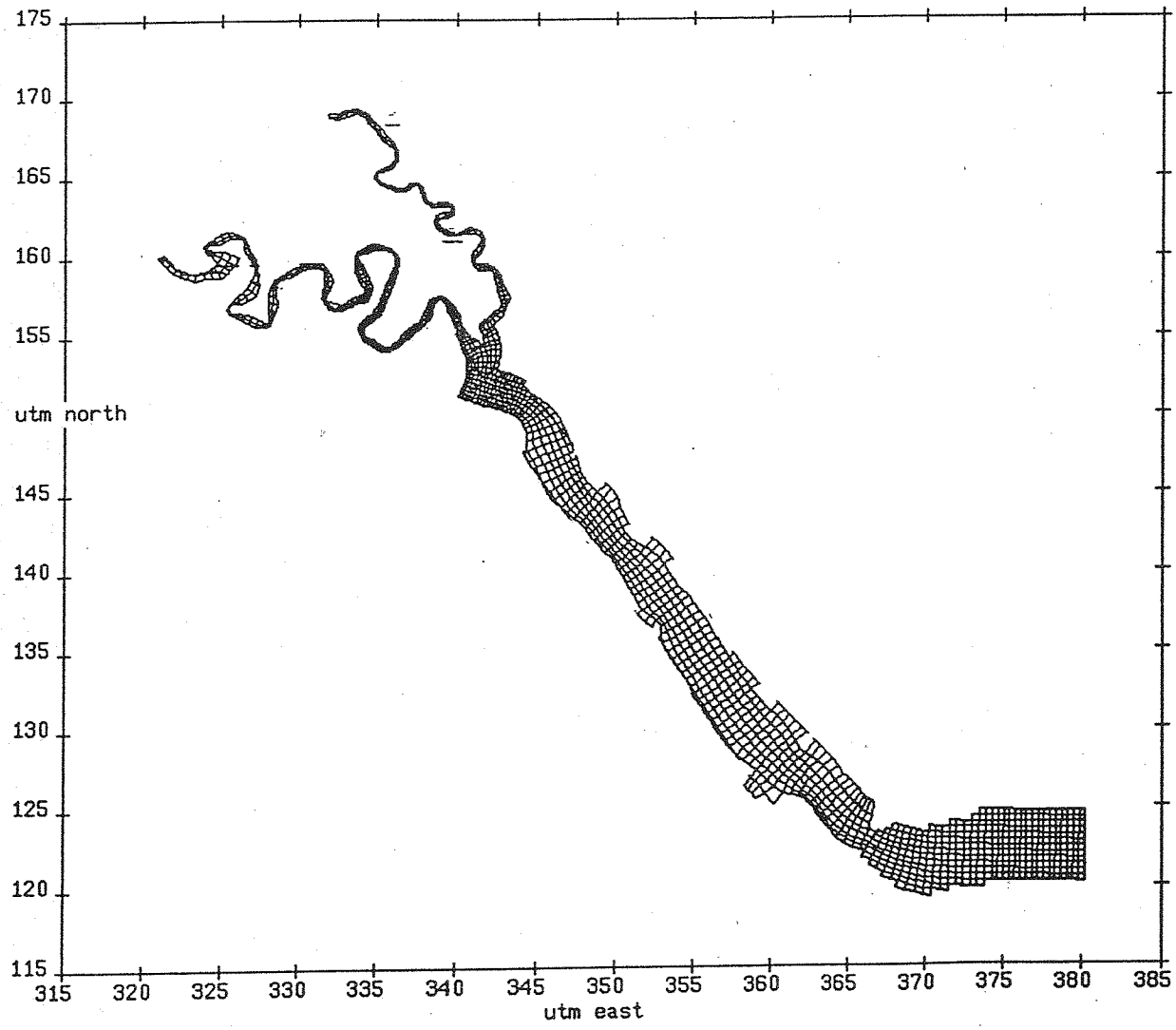


Figure 2. Curvilinear orthogonal computational grid. (Scale distances are in kilometers.)

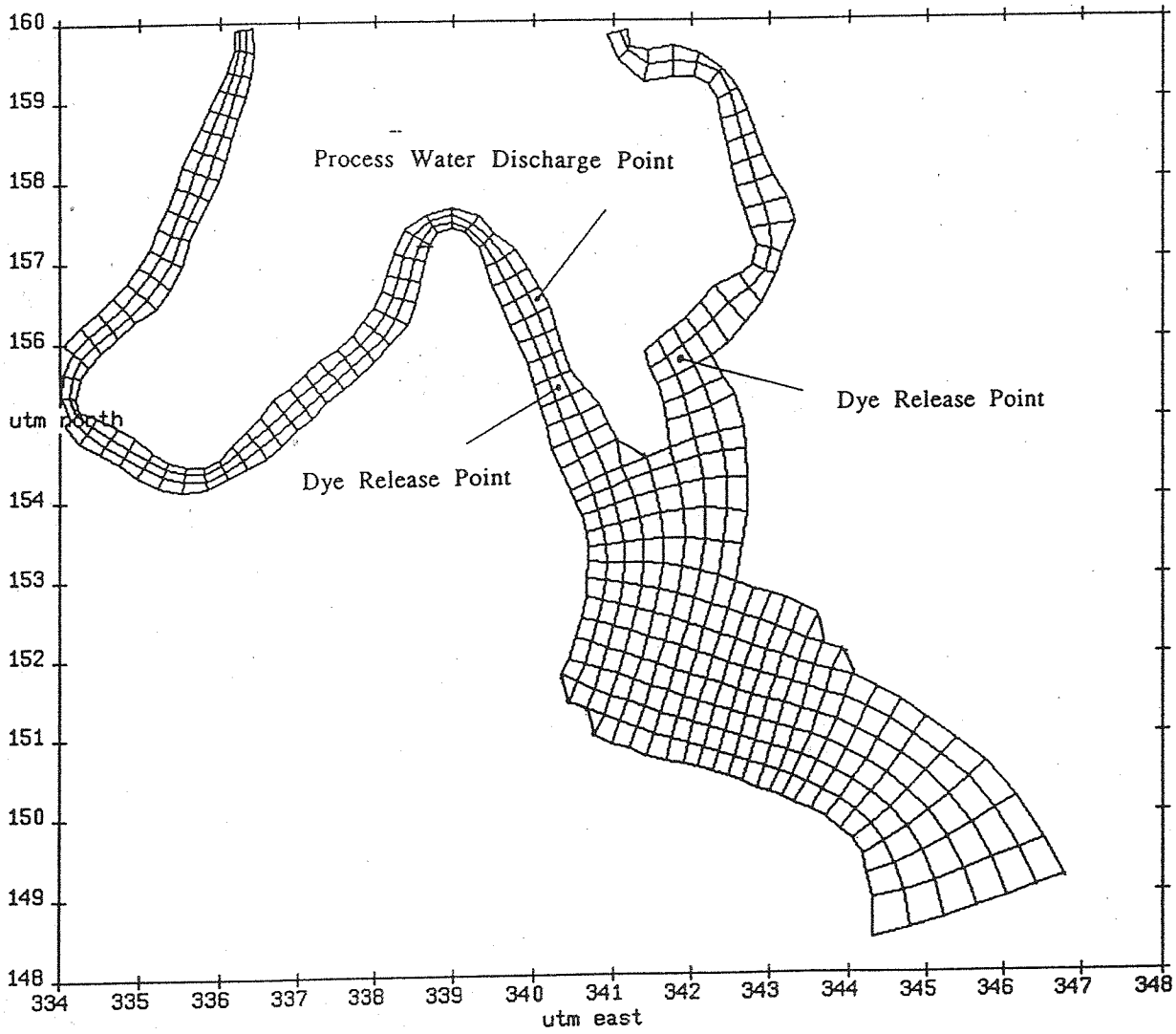


Figure 3. Details of the grid near West Point. (Scale distances are in kilometers)

discharge is introduced in the upstream boundary cells in the Pamunkey and Mattaponi Rivers, which are also closed to tidal propagation. The criteria for the tidal calibration was to achieve agreement in observed and model computed tide ranges along the York River between Gloucester Point and West Point. In order to use both NOAA tide table data and VIMS field tide gauge data, a decision was made to estimate mean tide ranges for gauge locations by multiplying the measured M2 range at the gauge by the ratio of the mean to M2 range at Gloucester Point. The analysis of five one year long records from the tide gauge at the VIMS pier showed this ratio to be approximately 1.09. The tidal calibration then consisted of adjusting the bottom roughness and minimum depth until an acceptable agreement was achieved between the estimated observed tide ranges and model computed tide ranges. Table 1 shows that the mean tide range estimated from the M2 range or taken from the tide tables agrees to within 1 cm of model computed ranges. The estimated mean range for Cheatham Annex and Allmondsville are from the NOAA tide tables.

SIMULATION OF A FIELD DYE RELEASE

To verify the calibrated model's ability to predict mixing and transport near the three river confluence at West Point, a continuous dye release conducted by VIMS (Harrison and Fang, 1971) was simulated. The field study involved the continuous release of dye into the Pamunkey and Mattaponi Rivers, from bridges in West Point, for approximately 19 days between October 12, 1969 to October 30, 1969. Since river flow conditions during the dye study were relatively constant, the initial salinity distribution was the quasi-steady distribution for the average river flows during the release period. Gauged unsteady river flows for the release period were used. The model ran for 40 tidal cycles with dye released during the last 36 cycles. The dye released at both locations was put into only the surface layer since the release rate was insufficient to induce any vertical mixing in excess of the ambient flow. Figure 4 shows the model simulated dye distribution in the surface layer near West

Location	Observer M2 Range (cm)	Estimated Mean Range (cm)	Computed Mean Range (cm)
Gloucester Point	67	72	72
Cheatham Annex	no gauge	76	75
Clay Bank	73	79	80
Allmondsville	no gauge	85	84
Roane Point	82	88	87
West Point	82	88	87

Table 1. Mean Tidal Water Surface Displacement Range

Point at low slack or slack before flood during the last tidal cycle of dye release. Figure 5 shows the corresponding field measured dye distribution. Figures 6 and 7 show model simulated and field measured dye distributions on a larger scale at slack before flood during the last tidal cycle of dye release. Figure 8 shows the dye distribution in the surface layer at high slack or slack before ebb during the last tidal cycle of dye release. The corresponding field measurements are shown in Figure 9. Visual inspection and comparison of the model simulated dye distributions and the field measurements reveal general agreement in concentration magnitude and distribution.

LOW FLOW, 7Q10, MIXING AND DILUTION

To determine the mixing and dilution of material in the Chesapeake Corporation plant's process water discharge at low flow conditions, a conservative approach of using an indefinite length seven day low flow with a recurrence interval of ten years, the 7Q10 flow, was selected. An initial sequence of runs were used to bring the salinity distribution to quasi-steady state at the 7Q10 river flow rates of 73 cfs (2.07 cms) in the Pamunkey and 21 cfs (0.59 cms) in the Mattaponi. Using this initial condition, the 7Q10 mixing and dilution run sequence began by activating the 17 mgd (0.75 cms) process water discharge containing a hypothetical conservative material at a concentration of 1000 mg/l. Since there is significant momentum flux associated with the process water discharge, it was distributed uniformly over the eight layers of the single horizontal cell indicated in Figure 3. Maximum concentrations observed during the tidal cycle did not change after 40 tidal cycles (21 days) of simulation. The maximum instantaneous concentration occurring inside the permit defined mixing zone was 23.11 mg/l, while the maximum instantaneous concentration occurring outside of the mixing zone was also 23.11 mg/l, due to the maximum concentration occurring in a grid cell on the northern boundary of the mixing zone.

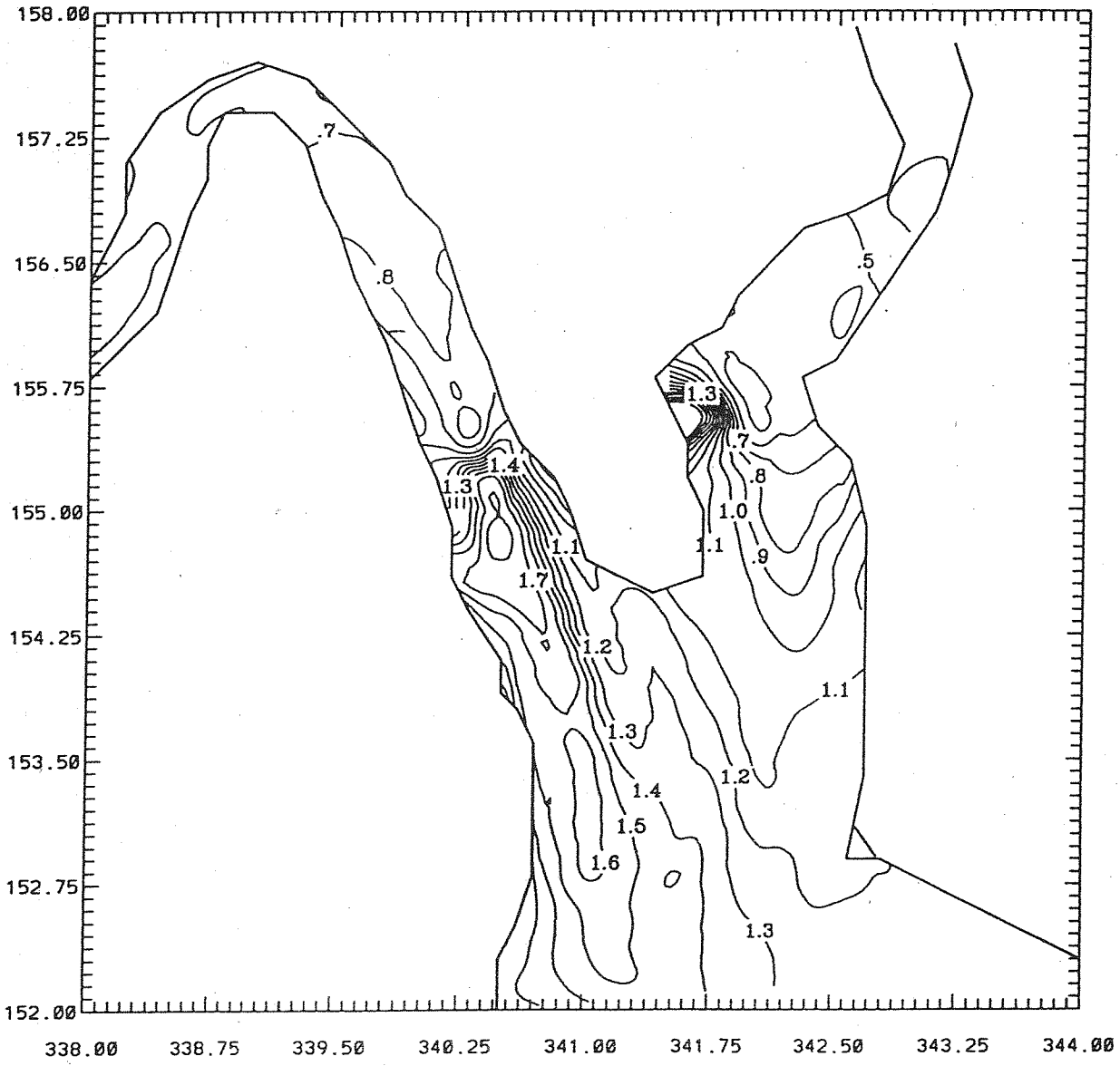


Figure 4. Model simulated surface layer dye concentration in PPB at slack before flood during last tidal cycle of 19 day dye release. (Scale distances are in kilometers)

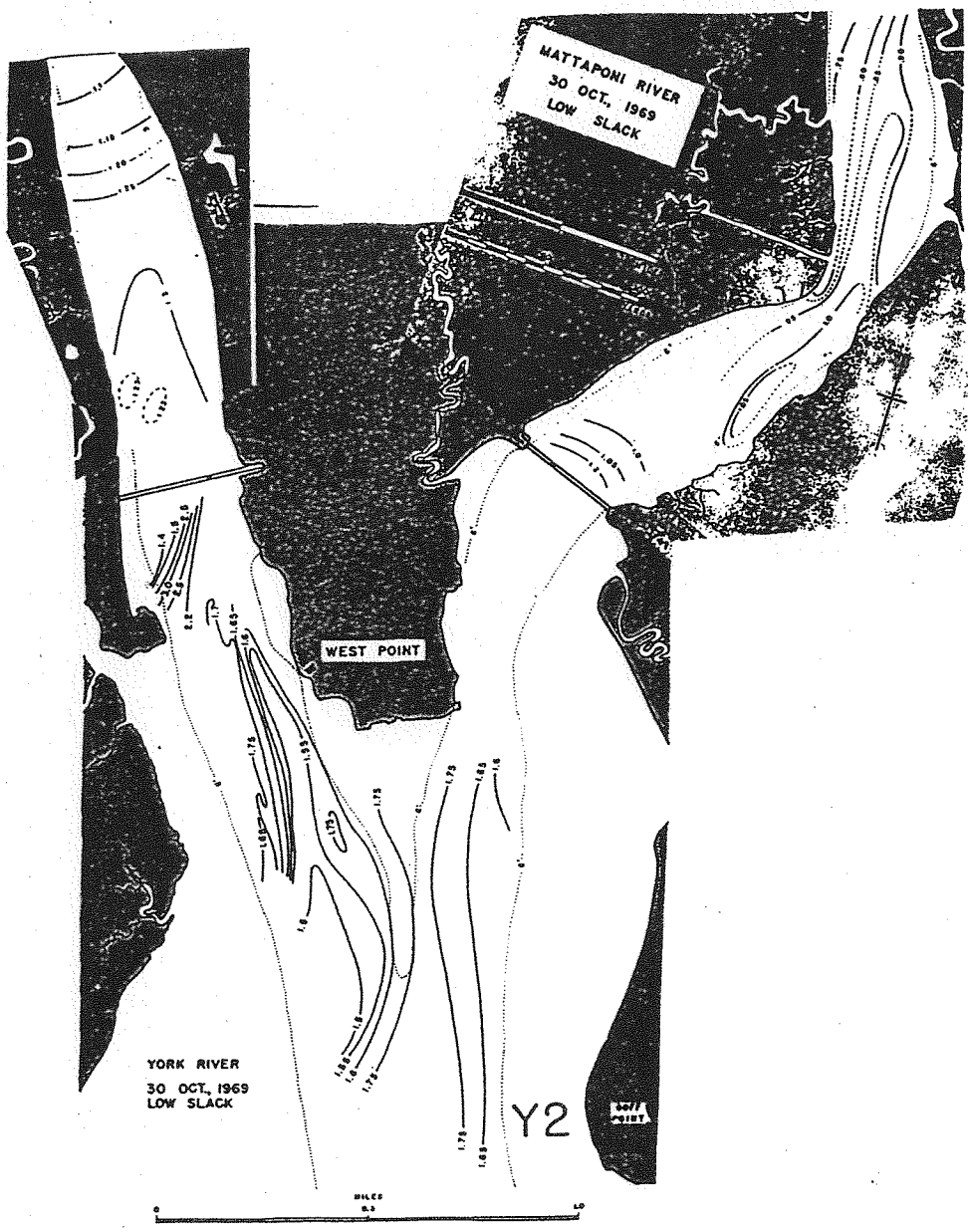


Figure 5. Measured surface layer dye concentration in PPB at slack before flood during last tidal cycle of 19 day dye release. (from Harrison and Fang 1971)

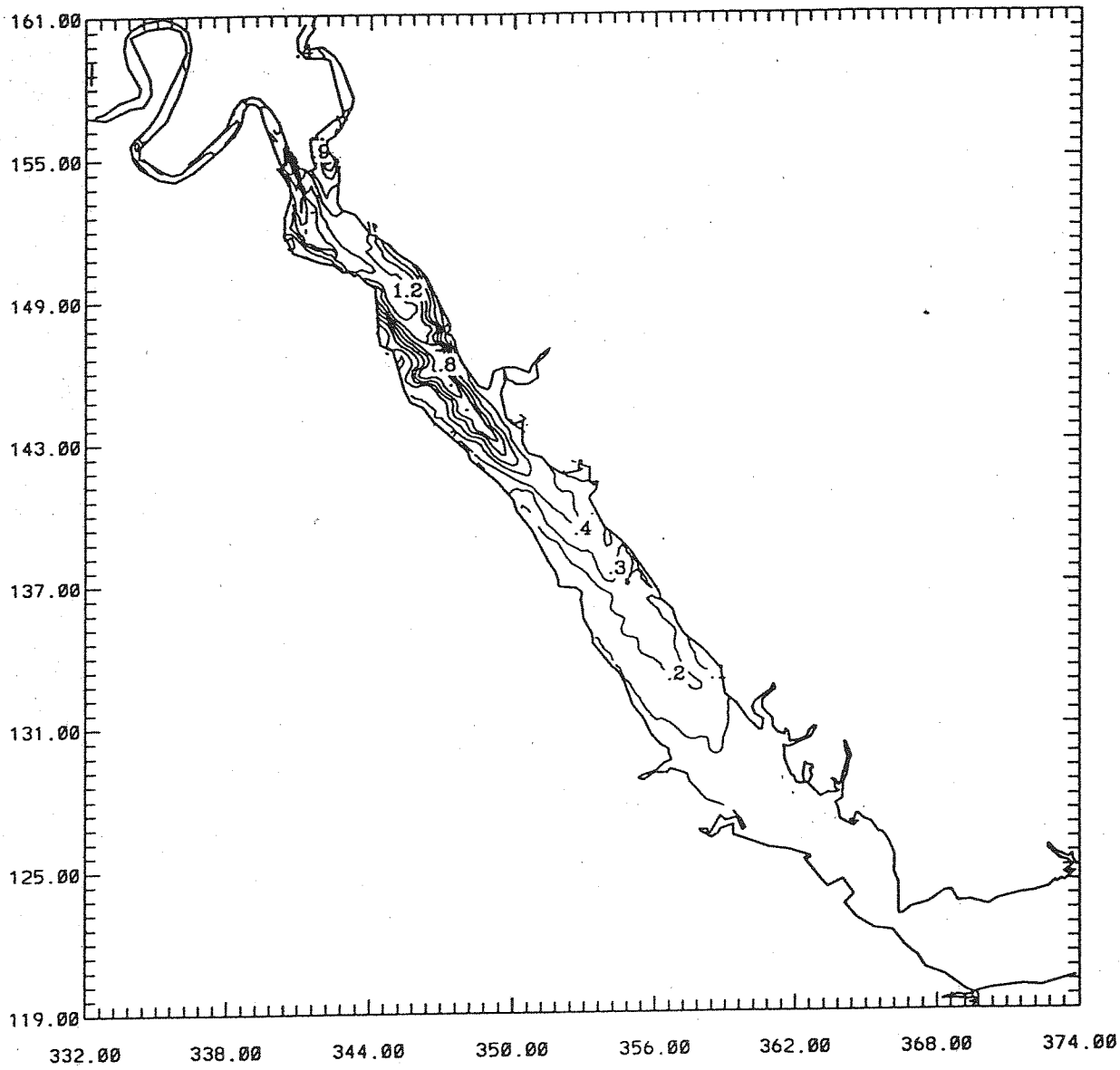


Figure 6. Model simulated surface layer dye concentration in PPB at slack before flood during last tidal cycle of 19 day dye release. (Scale distances are in kilometers)

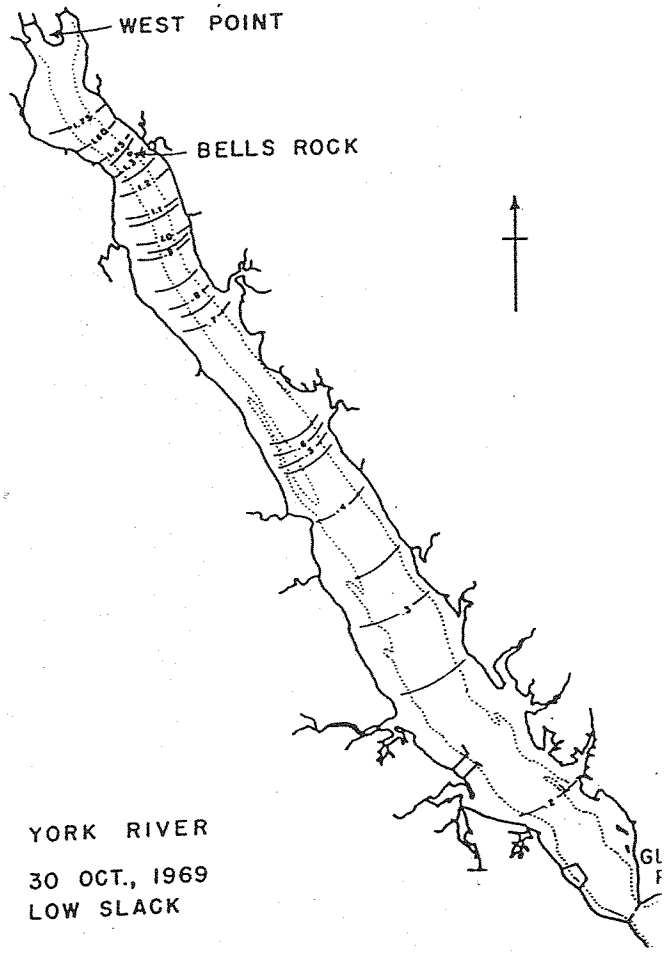


Figure 7. Measured surface layer dye concentration in PPB at slack before flood during last tidal cycle of 19 day dye release. (from Harrison and Fang 1971)

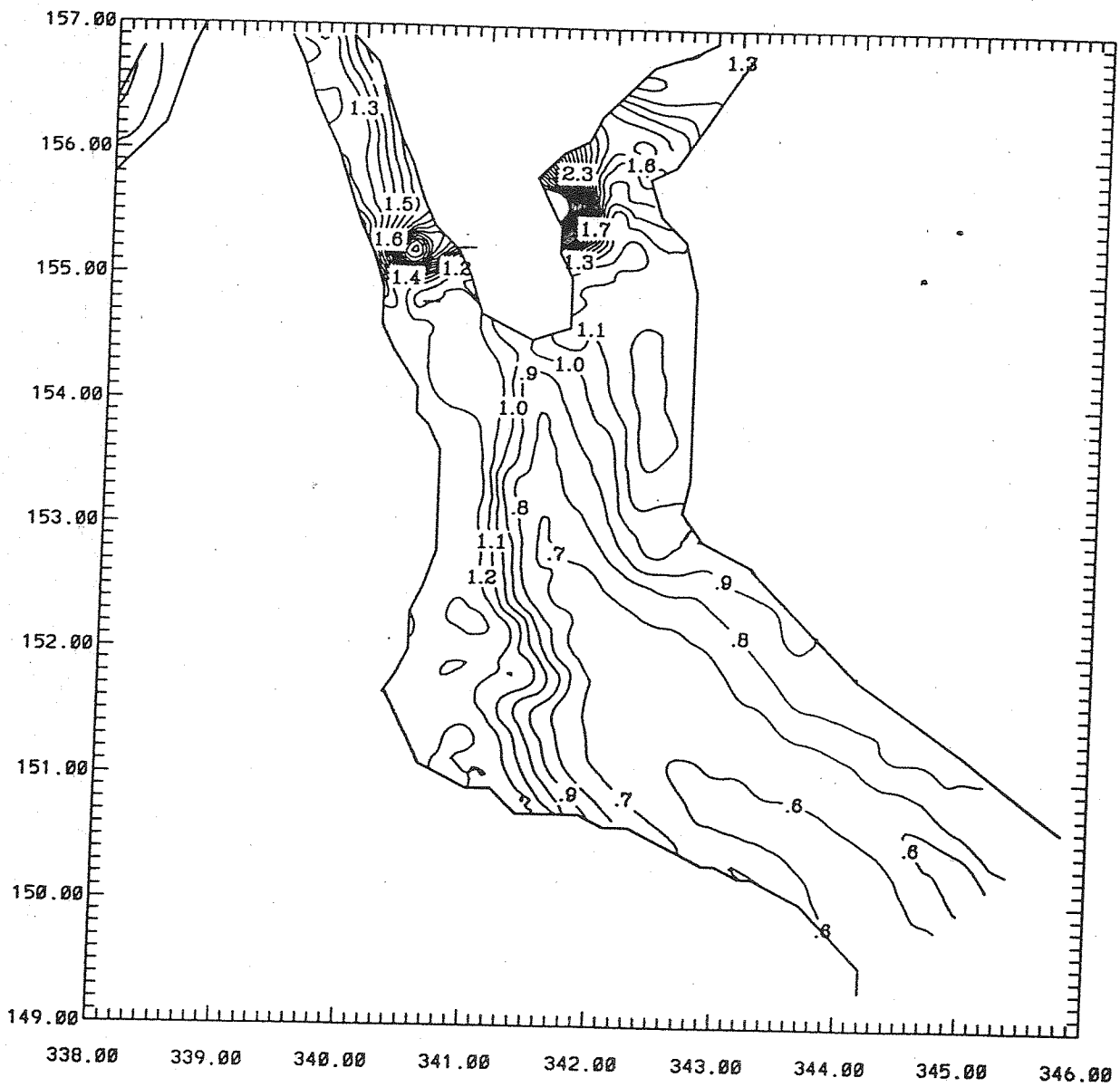


Figure 8. Model simulated surface layer dye concentration in PPB at slack before ebb during last tidal cycle of 19 day dye release. (Scale distances are in kilometers)

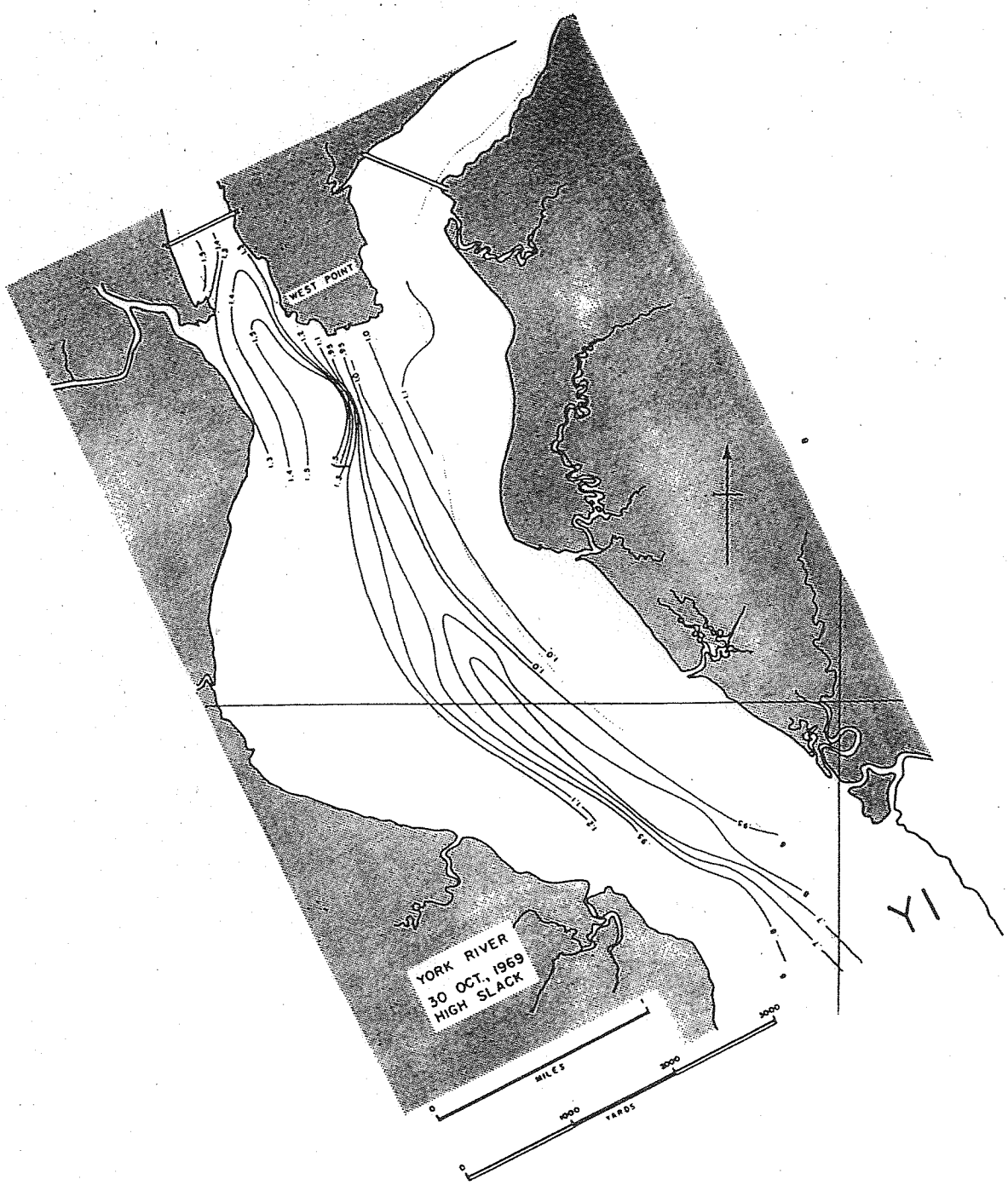
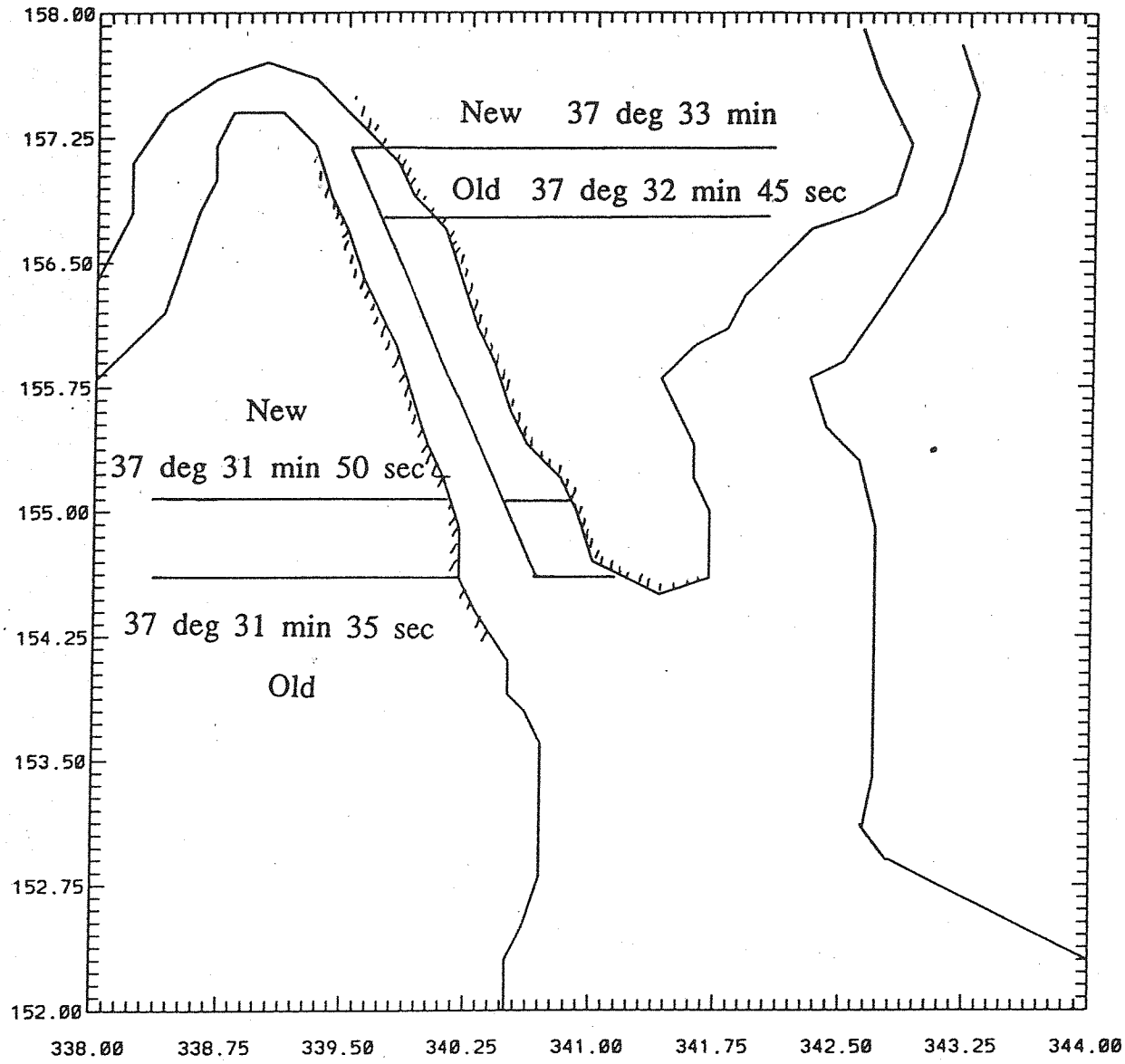


Figure 9. Measured surface layer dye concentration in PPB at slack before ebb during last tidal cycle of 19 day dye release. (from Harrison and Fang 1971).

In analyzing the concentration distribution relative to the permit defined mixing zone, it was noted that the along river extent of the permit defined mixing zone is not symmetric about the discharge point and does not account for the bidirectional nature of the tidal flow. A more realistic mixing zone having the same horizontal area is proposed by moving the northern mixing zone boundary from 37d 32m 45s to 37d 33m and moving the southern boundary from 37d 31m 35s to 37d 31m 50s as shown in Figure 10. This 460 m northward shift results in the discharge being nearer the center of the mixing zone. For this shift, the maximum instantaneous concentrations inside and outside the mixing zone are 23.11 mg/l and 19.83 mg/l, respectively. The concentration distributions corresponding to these conditions are shown in Figures 11 and 12.

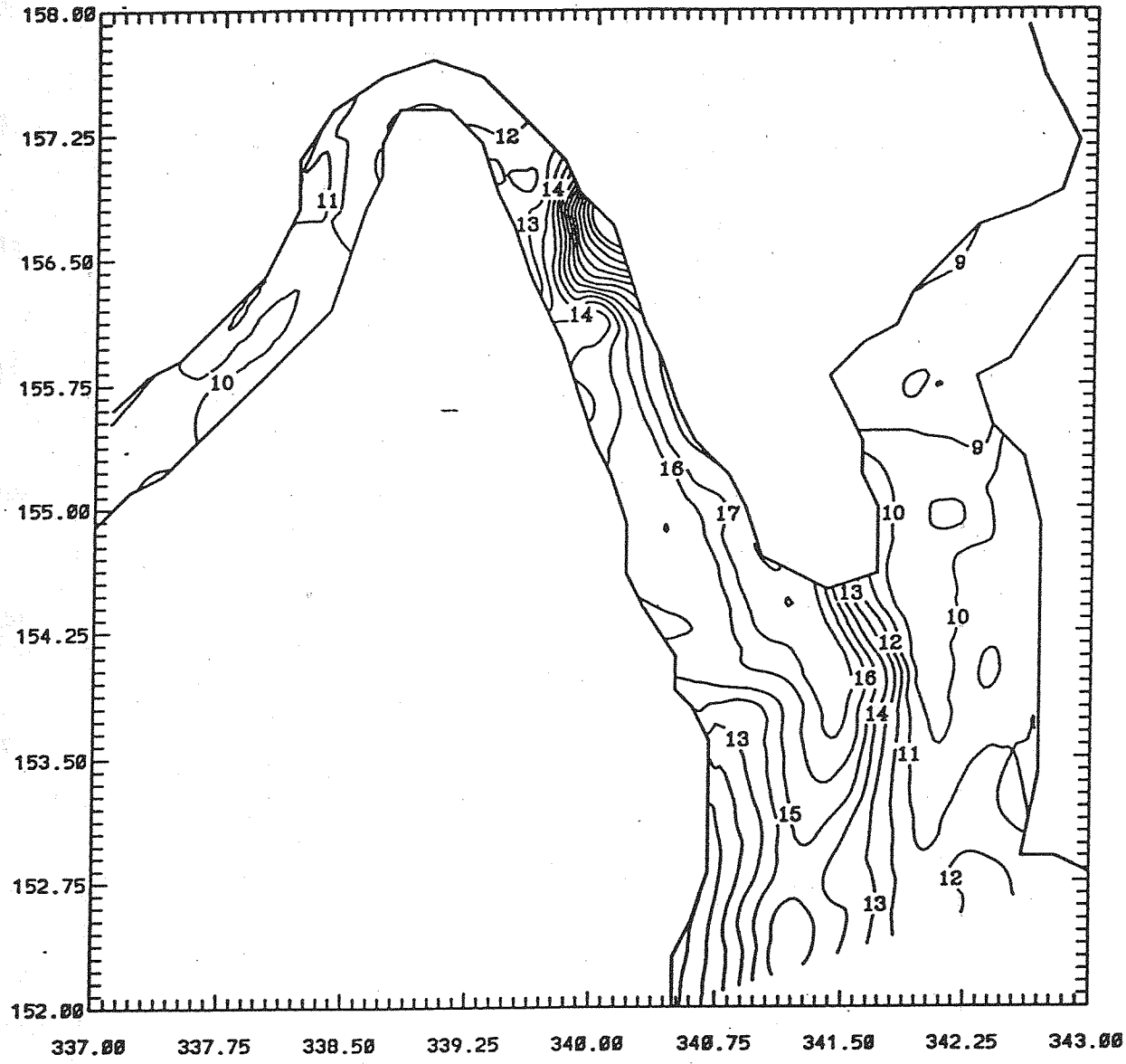
The above concentration distributions can be readily used to determine the dilution, which is appropriately defined as the discharge concentration, (in this case 1000), divided by the local concentration. Given the dilution at a given location and time for a particular volumetric discharge, the concentration at that time and location is equal to the discharge concentration divided by the dilution. The minimum instantaneous dilutions for the above 7Q10 flow concentrations are denoted in ( ) in the second column of Table 2. The minimum instantaneous dilution inside the new mixing zone is 43.3, while outside of the new mixing zone the minimum dilution is 50.4. Table 2 also summarizes the maximum two tidal cycle averaged (24.84 hour) concentrations and corresponding minimum dilution inside and outside of the old and new mixing zones, while Figure 13 shows the bottom layer, two tidal cycle averaged concentration distribution. The minimum dilutions inside and outside of the new mixing zone, corresponding to maximum two tidal cycle averaged concentrations, are 60.2 and 64.3, respectively. The reduction in maximum averaged concentration, or increase in minimum dilution, from instantaneous values indicates the intermittent character of the extreme instantaneous conditions.



Old Northern Mixing Zone Boundary at YUTM=156.744
Old Southern Mixing Zone Boundary at YUTM=154.587

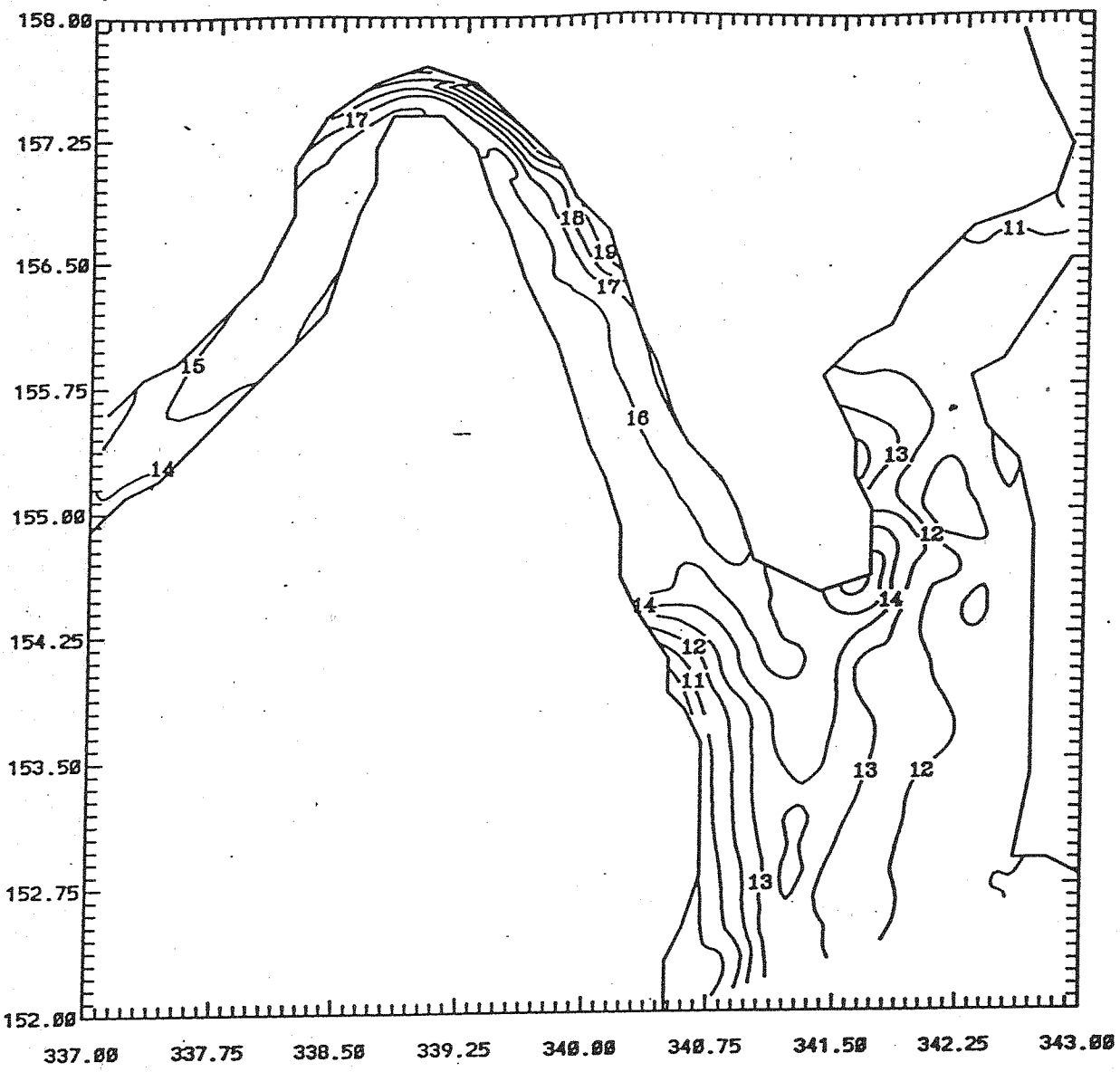
New Northern Mixing Zone Boundary at YUTM=157.206
New Southern Mixing Zone Boundary at YUTM=155.049

Figure 10. Old and proposed new mixing zone boundaries. (Scale distances are in kilometers)



Minimum Dilution = (1000 mg/l)/(Max Concentration) = 43.3

Figure 11. Surface layer concentration distribution in mg/l at time of occurrence of maximum concentration inside of the proposed new mixing zone for 7Q10 fows. (Scale distances are in kilometers)



Minimum Dilution = (1000 mg/l)/(Max Concentration) = 50.4

Figure 12. Bottom layer concentration distribution in mg/l at time of occurrence of maximum concentration outside of the proposed new mixing zone for 7Q10 flows. (Scale distances are in kilometers)

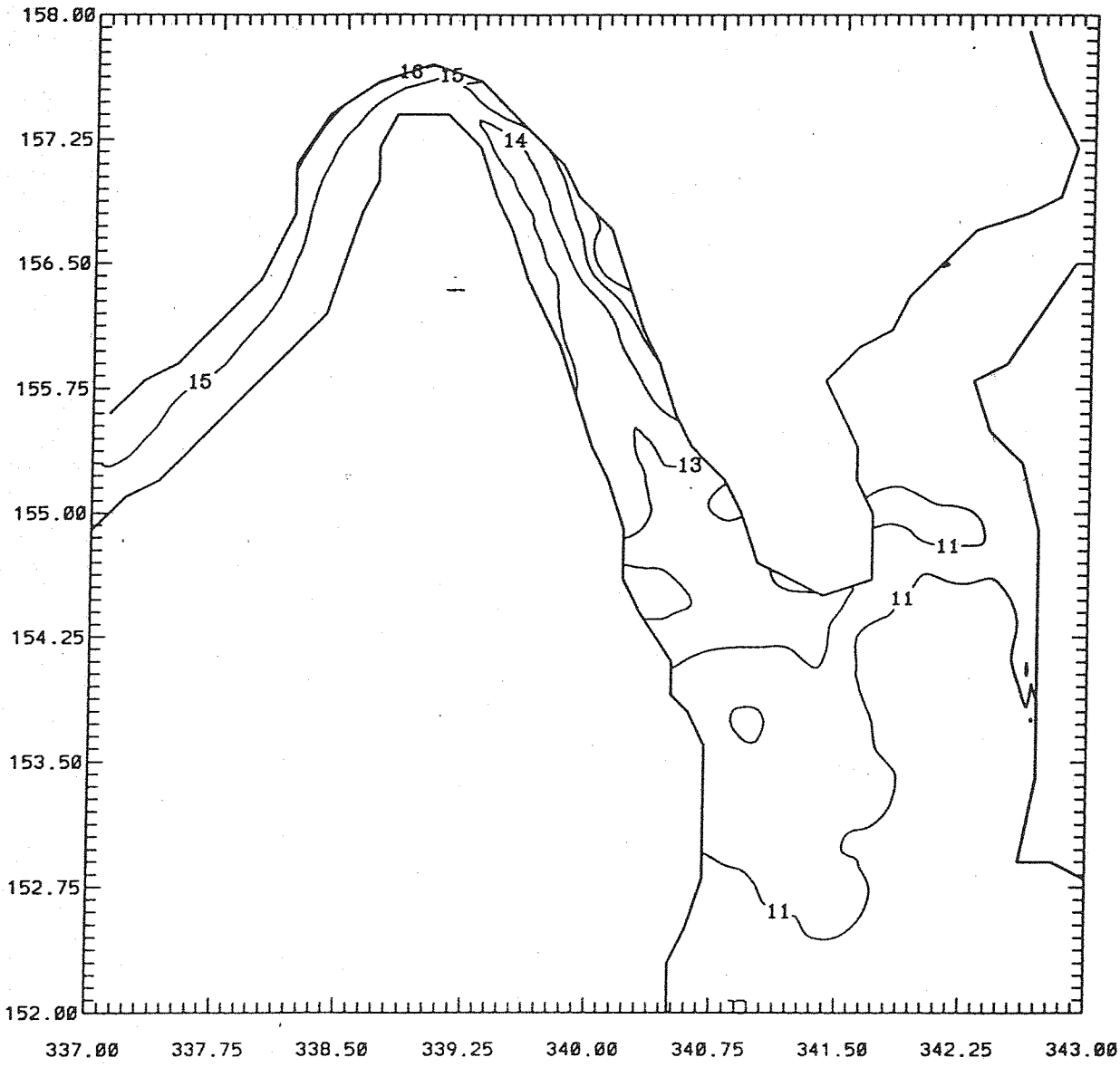


Figure 13. Bottom layer concentration distribution in mg/l averaged over two tidal cycles for 7Q10 flows. (Scale distances are in kilometers)

Location	Maximum Instantaneous Concentration (Min Inst Dilution)	Maximum Two Tidal Cycle Averaged Concentration (Min Avg Dilution)
Inside Old Mixing Zone	23.11 (43.3)	16.61 (60.2)
Outside Old Mixing Zone	23.11 (43.3)	15.55 (64.3)
Inside New Mixing Zone	23.11 (43.3)	16.61 (60.2)
Outside New Mixing Zone	19.83 (50.4)	15.55 (64.3)

Table 2. Summary of 7Q10 Flow Results.

Location	Maximum Instantaneous Concentration (mg/l) (Min Inst Dilution)	Maximum Two Tidal Cycle Averaged Concentration (Min Avg Dilution)
Inside Old Mixing Zone	17.67 (56.6)	13.79 (72.5)
Outside Old Mixing Zone	15.12 (66.1)	12.22 (81.8)
Inside New Mixing Zone	17.67 (56.6)	13.79 (72.5)
Outside New Mixing Zone	14.58 (68.6)	12.22 (81.8)

Table 3. Summary of Mean Flow Results.

MEAN FLOW MIXING AND DILUTION

The procedure for analyzing mixing and dilution of the process water discharge under mean river flow conditions is identical to the low flow procedure, except that the initial salinity distribution is the quasi-steady distribution for the mean river discharges rates of 1338 cfs (37.89 cms) in the Pamunkey and 903 cfs (25.57 cms) in the Mattaponi. Maximum concentrations observed during the tidal cycle did not change after 24 tidal cycles (12 days) of simulation. The results for the mean flow runs are summarized in Table 3. The maximum instantaneous concentration inside both the old and new mixing zone was 17.67 mg/l, which corresponds to a minimum instantaneous dilution of 56.6. The maximum instantaneous concentrations outside of the old and new mixing zones were 15.12 and 14.58 mg/l, respectively. The corresponding minimum instantaneous dilutions are 66.1 and 68.6. The two tidal cycle averaged results in the third column again show the reduction in maximum averaged concentration, or increase in minimum dilution, from instantaneous values.

SUMMARY AND CONCLUSIONS

Based on the general agreement of the model simulated dye study with the field results, the model appears to represent the important mixing mechanisms in the York, Pamunkey, and Mattaponi Rivers near West Point and is an appropriate tool to analyze the mixing of process water from the Chesapeake Corporation's plant. In regard to the prediction of minimum dilutions, it is noted that the steady state 7Q10 run represents a prolonged low flow condition, more severe than an actual 7 day, 10 year recurrence, low flow. Taking this conservative river flow condition into consideration, it would seem reasonable in the writer's opinion to use the minimum dilution of 60.2, based on the maximum two tidal cycle averaged concentration inside the new mixing zone, as a measure of continuously achievable mixing rather than a lower intermittent value.

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Appendix A.1

Dye Release Simulation Input and River Discharge Files

```
MODEL INPUT FILE FOR DYE RELEASE SIMULATION


#C1   TITLE FOR RUN
#C1   (LIMIT TO 80 CHARACTERS LENGTH)
      YORK RIVER, DYE RELEASE, RADBC
#C2   RESTART AND DIAGNOSTIC SWITCHES
#C2   ISRESTI ISRESTO ISRESTR ISLOG ISDIVEX ISNEGH ISMMC
      1       1       0       1     0       1      0
#C3   RELAXATION PARAMETERS AND SWITCHES
#C3   RP    RSQM   ITERM  IRVEC  RPADJ  RSQMADJ  ITRMADJ
      1.8   1.E-8  100    0      1.8    1.E-16   1000
#C4   LONGTERM MASS TRANSPORT INTEGRATION ONLY SWITCHES
#C4   ISLTMT  ISSSMMT ISLTMTS  ISIA  RPIA  RSQMIA   ITRMIA
      0       1       0        0     1.8   1.E-10   100
#C5   MOMENTUM ADVEC AND HORIZ DIFF SWITCHES AND MISC SWITCHES
#C5   ISCDMA  ISAHMF  ISDISP  ISWASP
      0       0       0       0
#C6   DISSOLVED AND SUSPENDED CONSTITUENT TRANSPORT SWITCHES
#C6   SALT=1, TEMP=2, DYEC=3, SEDC=4
#C6   ISTRAN ISCDCA ISADAC ISFCT ISPLIT ISADAH ISADAV ISCI ISCO
      1      0      1      1     0      0      0      1    1
      0      0      0      0     0      0      0      0    0
      1      0      1      1     0      0      0      1    1
      0      0      0      0     0      0      0      0    0
#C7   TIME-RELATED INTEGER PARAMETERS
#C7   NTC NTSPTC NLTC NTTC NTCPP NTSTBC NTCNB NTCVB NTSMMT NFLTMT
      8   1200   0    0    8     8      0     0     2400   1
#C8   TIME-RELATED REAL PARAMETERS
#C8   TCON  TADD        TPM2        CORIOLIS
      3600. 7129.4244   44714.16    0.0001
#C9   SPACE-RELATED AND SMOOTHING  PARAMETERS
#C9   KC  IC   JC   LC    LVC   ISCO NSHMAX  NSBMAX  WSMH    WSMB
      8   126  161  1600  1598  1    0       0       0.0625  0.5
#C10  LAYER THICKNESS IN VERTICAL
#C10  1     2     3     4     5     6     7     8
      0.125 0.125 0.125 0.125 0.125 0.125 0.125 0.125
#C11  GRID, ROUGHNESS AND DEPTH PARAMETERS
#C11  DX    DY   DXYCVT  ISMASK   ZROUGH  HMIN   HADJ  HCVRT
      1.0   1.0  1000.   0        0.0002  1.2    0.0   1.0
#C12  TURBULENT DIFFUSION PARAMETERS
#C12  AHO   AHD     AVO      ABO      AVBCON
      0.0   0.0     1.E-6    1.E-6    1.0
#C13  TURBULENCE CLOSURE PARAMETERS
#C13  VKC   CTURB   CTE1   CTE2   CTE3   QQMIN   QQLMIN   DMLMIN
      0.4   16.0    1.8    1.33   0.53   1.E-8   1.E-16   1.E-8
#C14  TIDAL CONSTITUENT AND HARMONIC ANALYSIS PARAMETERS
#C14  MTIDE  ISLSHA  MLLSHA   NTCLSHA  ISLSTR
      1      1       10        2        0
#C15  TIDAL CONSTITUENT SYMBOLS AND PERIODS
#C15  SYMBOL   PERIOD
      'M2'     44714.16
#C16  HARMONIC ANALYSIS LOCATIONS AND SWITCHES
#C16  ILLSHA   JLLSHA   LSHAP  LSHAB  LSHAU  CLSL
      116      10       1      0      0      'TML'
      93       10       1      0      0      'GP'
      76       7        1      0      0      'CA'
      63       12       1      0      0      'CB'
      50       12       1      0      0      'AV'
      36       12       1      0      0      'RP'
      26       12       1      0      0      'BV'
      5        19       1      0      0      'WP'
      72       24       1      0      0      'WK'
      5        116      1      0      0      'SH'
```

```
#C17  ELEVATION BOUNDARY CONDITION PARAMETERS
#C17  NPBS NPBW NPBE NPBN  NPFOR  NPSER
      0    0    12   0     1      0
#C18  TIDAL HARMONIC ELEVATION BOUNDARY CONDITION FORCINGS
#C18  NPFOR    SYMBOL   AMPLITUDE   PHASE
      1        'M2'     0.228        11178.54
#C19  ELEVATION BOUNDARY CONDITIONS ON SOUTH OPEN BOUNDARY
#C19  IPBS     JPBS   ISPBS    NPFORS  NPSERS
#C20  ELEVATION BOUNDARY CONDITIONS ON WEST  OPEN BOUNDARY
#C20  IPBW     JPBW   ISPBW    NPFORW  NPSERW
#C21  ELEVATION BOUNDARY CONDITIONS ON EAST  OPEN BOUNDARY
#C21  IPBE     JPBE   ISPBE    NPFORE  NPSERE
      125      6      1        1       0
      125      7      1        1       0
      125      8      1        1       0
      125      9      1        1       0
      125     10      1        1       0
      125     11      1        1       0
      125     12      1        1       0
      125     13      1        1       0
      125     14      1        1       0
      125     15      1        1       0
      125     16      1        1       0
      125     17      1        1       0
#C22  ELEVATION BOUNDARY CONDITIONS ON NORTH OPEN BOUNDARY
#C22  IPBN     JPBN   ISPBN    NPFORN  NPSERN
#C23  VELOCITY AND VOLUMETRIC SOURCE BOUNDARY CONDITION PARAMETERS
#C23  NVBS NUBW NUBE NVBN NQVS  NNQSER
      0    0    0    0    4     3
#C24  VOLUMETRIC SOURCE BOUNDARY CONDITIONS
#C24  IQVS     JQVS     QVS       NQSER
      32       160      0.        1
      96       24       0.        2
       4       23       0.        3
       8       23       0.        3
#C25  VOLUMETRIC SOURCE INFLOW CONCENTRATIONS
#C25  SALT    TEMP    DYEC     SEDC
      0.0     0.0     0.0      0.0
      0.0     0.0     0.0      0.0
      0.0     0.0     78125.   0.0
      0.0     0.0     49421.   0.0
#C26  CONCENTRATION BOUNDARY CONDITION PARAMETERS
#C26  NCBS NCBW NCBE NCBN  BSCALE
      0    0    12   0     0.00075
#C27  LOCATION OF CONC BC'S ON SOUTH BOUNDARIES
#C27  ICBS   JCBS  NTSCRS
#C28  BOTTOM CONC ON SOUTH CONC BOUNDARIES
#C28  SALT  TEMP  DYEC  SEDC
#C29  SURFACE CONC ON SOUTH CONC BOUNDARIES
#C29  SALT  TEMP  DYEC  SEDC
#C30  LOCATION OF CONC BC'S ON WEST BOUNDARIES
#C30  ICBW  JCBW  NTSCRW
#C31  BOTTOM CONC ON WEST CONC BOUNDARIES
#C31  SALT  TEMP  DYEC   SEDC
#C32  SURFACE CONC ON WEST CONC BOUNDARIES
#C32  SALT  TEMP  DYEC   SEDC
#C33  LOCATION OF CONC BC'S ON EAST BOUNDARIES
#C33  ICBE   JCBE  NTSCRE
      125     6     36
      125     7     36
      125     8     36
      125     9     36
      125    10     36
      125    11     36
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        125    12     36
        125    13     36
        125    14     36
        125    15     36
        125    16     36
        125    17     36
#C34    BOTTOM CONC ON EAST CONC BOUNDARIES
#C34    SALT  TEMP  DYEC  SEDC
        25.0  0.0   0.0   0.0
        25.0  0.0   0.0   0.0
        25.0  0.0   0.0   0.0
        25.0  0.0   0.0   0.0
        25.0  0.0   0.0   0.0
        25.0  0.0   0.0   0.0
        25.0  0.0   0.0   0.0
        25.0  0.0   0.0   0.0
        25.0  0.0   0.0   0.0
        25.0  0.0   0.0   0.0
        25.0  0.0   0.0   0.0
        25.0  0.0   0.0   0.0
#C35    SURFACE CONC ON EAST CONC BOUNDARIES
#C35    SALT  TEMP  DYEC  SEDC
        25.0  0.0   0.0   0.0
        25.0  0.0   0.0   0.0
        25.0  0.0   0.0   0.0
        25.0  0.0   0.0   0.0
        25.0  0.0   0.0   0.0
        25.0  0.0   0.0   0.0
        25.0  0.0   0.0   0.0
        25.0  0.0   0.0   0.0
        25.0  0.0   0.0   0.0
        25.0  0.0   0.0   0.0
        25.0  0.0   0.0   0.0
        25.0  0.0   0.0   0.0
#C36    LOCATION OF CONC BC'S ON NORTH BOUNDARIES
#C36    ICBN   JCBN  NTSCRN
#C37    BOTTOM CONC ON NORTH CONC BOUNDARIES
#C37    SALT  TEMP  DYEC  SEDC
#C38    SURFACE CONC ON NORTH CONC BOUNDARIES
#C38    SALT  TEMP  DYEC  SEDC
#C39    DRIFTER DATA
#C39    ISPD  NPD  NPDRT  NWPD
        0     1    1      1
#C40    INITIAL DRIFTER POSITIONS
#C40    RI    RJ   RK
        1     1    1
#C41    CONSTANTS FOR LONGITUDE AND LATITUDE OF CELL CENTERS
#C41    CDLON1  CDLON2   CDLON3   CDLAT1  CDLAT2   CDLAT3
        0.0     76.8     -153.6   0.0     38.4     -76.8
#C42    CONTROLS FOR PRINTED OUTPUT
#C42    ISPOP   ISPOU  ISPOV  ISPOS
        0       0      0      0
#C43    CONTROLS FOR HORIZONTAL PLANE SALINITY PLOTTING
#C43    ISSPH   NPSPH   ISRSPH
        1       12      1
#C44    CONTROLS FOR HORIZONTAL PLANE VELOCITY PLOTTING
#C44    ISVPH   NPVPH   ISRVPH
        0       10      0
#C45    CONTROLS FOR VERTICAL PLANE SALINITY PLOTTING
#C45    ISECSPV   NPSPV  ISSPV  ISRSPV
        0         10     0      0
#C46    CONTROLS FOR VERTICAL PLANE SALINITY PLOTTING
#C46    ISECSPV NIJSPV  SEC ID
#C47    CONTROLS FOR VERTICAL PLANE SALINITY PLOTTING
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#C47  ISECSPV ISPV    JSPV
#C48  CONTROLS FOR VERTICAL PLANE VELOCITY PLOTTING
#C48  ISECVPV   NPVPV  ISVPV  ISRSPV
      0         10     0      0
#C49  CONTROLS FOR VERTICAL PLANE VELOCITY PLOTTING
#C49  ISECVPV  NIJVPV  ANGVPV  SEC ID
#C50  CONTROLS FOR VERTICAL PLANE VELOCITY PLOTTING
#C50  ISECVPV IVPV    JVPV
#C51  CONTROLS FOR 3D FIELD OUTPUT
#C51  IS3DO  NP3DO  KPC  HMAX  HMMAX
      0      4      16   0.40  0.32
#C52  CONTROLS FOR 3D FIELD OUTPUT
#C52  IS3DU  IS3DV  IS3DW  IS3DS
      0      0      0      0
```

RIVER DISCHARGE FILE QSER.INP FOR DYE RELEASE SIMULATION

61	3600.	0.	
1.23	1.29	1.	
5844.000	13.16734	19.82179	0.
5868.000	12.14793	16.42377	0.
5892.000	12.14793	13.02575	0.
5916.000	13.79031	11.60991	0.
5940.000	12.14793	10.47723	0.
5964.000	11.63823	10.19407	0.
5988.000	11.12852	9.627729	0.
6012.000	10.61882	9.061392	0.
6036.000	11.12852	8.778223	0.
6060.000	11.63823	8.325154	0.
6084.000	13.16734	7.419014	0.
6108.000	12.14793	6.937628	0.
6132.000	9.599412	6.824361	0.
6156.000	10.27902	6.144756	0.
6180.000	8.070302	5.380201	0.
6204.000	7.617233	4.530696	0.
6228.000	7.617233	3.964359	0.
6252.000	8.070302	4.247528	0.
6276.000	9.599412	4.813865	0.
6300.000	12.14793	5.380201	0.
6324.000	15.65922	6.796044	0.
6348.000	25.76833	9.344561	0.
6372.000	18.77407	10.47723	0.
6396.000	13.79031	9.910897	0.
6420.000	11.63823	8.778223	0.
6444.000	10.10912	7.362381	0.
6468.000	9.599412	6.512876	0.
6492.000	9.089708	5.946538	0.
6516.000	8.580006	5.663370	0.
6540.000	8.070302	5.380201	0.
6564.000	7.617233	5.663370	0.
6588.000	7.164163	5.946538	0.
6612.000	9.599412	6.512876	0.
6636.000	12.14793	6.796044	0.
6660.000	12.65763	7.362381	0.
6684.000	10.61882	7.645549	0.
6708.000	8.580006	6.796044	0.
6732.000	8.580006	6.229707	0.
6756.000	9.089708	5.663370	0.
6780.000	8.580006	5.946538	0.
6804.000	8.070302	6.796044	0.
6828.000	8.070302	7.362381	0.0005
6852.000	7.617233	7.928718	0.001
6876.000	7.617233	7.079213	0.001
6900.000	7.164163	6.512876	0.001
6924.000	6.711093	6.229707	0.001
6948.000	6.711093	6.229707	0.001
6972.000	6.258024	5.663370	0.001
6996.000	6.258024	5.097033	0.001
7020.000	6.258024	4.530696	0.001
7044.000	5.804954	5.380201	0.001
7068.000	6.258024	5.097033	0.001
7092.000	5.804954	4.813865	0.001
7116.000	6.258024	4.389112	0.001
7140.000	5.804954	4.445745	0.001
7164.000	5.804954	4.445745	0.001
7188.000	5.804954	4.247528	0.001
7212.000	5.804954	4.190894	0.001
7236.000	6.258024	4.247528	0.001

7260.000	5.804954	4.190894	0.0005
7284.000	5.804954	4.134260	0.0

Appendix A.2

7Q10 Flow Dilution Input File

```
MODEL INPUT FILE EFDC.INP FOR 7Q10 FLOW DILUTION


#C1   TITLE FOR RUN
#C1   (LIMIT TO 80 CHARACTERS LENGTH)
      YORK RIVER, PROCESS DILUTION AT 7Q10, RADBC
#C2   RESTART AND DIAGNOSTIC SWITCHES
#C2   ISRESTI ISRESTO ISRESTR ISLOG ISDIVEX ISNEGH ISMMC
      1       1       0       1     0       1      0
#C3   RELAXATION PARAMETERS AND SWITCHES
#C3   RP    RSQM   ITERM  IRVEC  RPADJ  RSQMADJ  ITRMADJ
      1.8   1.E-8  100    0      1.8    1.E-16   1000
#C4   LONGTERM MASS TRANSPORT INTEGRATION ONLY SWITCHES
#C4   ISLTMT  ISSSMMT ISLTMTS  ISIA  RPIA  RSQMIA   ITRMIA
      0       1       0        0     1.8   1.E-10   100
#C5   MOMENTUM ADVEC AND HORIZ DIFF SWITCHES AND MISC SWITCHES
#C5   ISCDMA  ISAHMF  ISDISP  ISWASP
      0       0       0       0
#C6   DISSOLVED AND SUSPENDED CONSTITUENT TRANSPORT SWITCHES
#C6   SALT=1, TEMP=2, DYEC=3, SEDC=4
#C6   ISTRAN ISCDCA ISADAC ISFCT ISPLIT ISADAH ISADAV ISCI ISCO
      1      0      1      1     0      0      0      1    1
      0      0      0      0     0      0      0      0    0
      1      0      1      1     0      0      0      1    1
      0      0      0      0     0      0      0      0    0
#C7   TIME-RELATED INTEGER PARAMETERS
#C7   NTC NTSPTC NLTC NTTC NTCPP NTSTBC NTCNB NTCVB NTSMMT NFLTMT
      4   1200   0    0    4     8      0     0     2400   1
#C8   TIME-RELATED REAL PARAMETERS
#C8   TCON  TADD    TPM2       CORIOLIS
      1.    0.0     44714.16   0.0001
#C9   SPACE-RELATED AND SMOOTHING  PARAMETERS
#C9   KC  IC   JC   LC    LVC   ISCO NSHMAX  NSBMAX  WSMH    WSMB
      8   126  161  1600  1598  1    0       0       0.0625  0.5
#C10  LAYER THICKNESS IN VERTICAL
#C10  1     2     3     4     5     6     7     8
      0.125 0.125 0.125 0.125 0.125 0.125 0.125 0.125
#C11  GRID, ROUGHNESS AND DEPTH PARAMETERS
#C11  DX    DY   DXYCVT  ISMASK   ZROUGH  HMIN   HADJ  HCVRT
      1.0   1.0  1000.   0        0.0002  1.2    0.0   1.0
#C12  TURBULENT DIFFUSION PARAMETERS
#C12  AHO   AHD     AVO      ABO      AVBCON
      0.0   0.0     1.E-6    1.E-6    1.0
#C13  TURBULENCE CLOSURE PARAMETERS
#C13  VKC   CTURB   CTE1   CTE2   CTE3   QQMIN   QQLMIN   DMLMIN
      0.4   16.0    1.8    1.33   0.53   1.E-8   1.E-16   1.E-8
#C14  TIDAL CONSTITUENT AND HARMONIC ANALYSIS PARAMETERS
#C14  MTIDE  ISLSHA  MLLSHA   NTCLSHA  ISLSTR
      1      1       10       2        0
#C15  TIDAL CONSTITUENT SYMBOLS AND PERIODS
#C15  SYMBOL   PERIOD
      'M2'     44714.16
#C16  HARMONIC ANALYSIS LOCATIONS AND SWITCHES
#C16  ILLSHA   JLLSHA   LSHAP  LSHAB  LSHAU  CLSL
      116      10       1      0      0      'TML'
      93       10       1      0      0      'GP'
      76       7        1      0      0      'CA'
      63       12       1      0      0      'CB'
      50       12       1      0      0      'AV'
      36       12       1      0      0      'RP'
      26       12       1      0      0      'BV'
      5        19       1      0      0      'WP'
      72       24       1      0      0      'WK'
      5        116      1      0      0      'SH'
```

```
#C17  ELEVATION BOUNDARY CONDITION PARAMETERS
#C17  NPBS NPBW NPBE NPBN  NPFOR  NPSER
      0    0    12   0     1      0
#C18  TIDAL HARMONIC ELEVATION BOUNDARY CONDITION FORCINGS
#C18  NPFOR    SYMBOL   AMPLITUDE   PHASE
      1        'M2'     0.228       11178.54
#C19  ELEVATION BOUNDARY CONDITIONS ON SOUTH OPEN BOUNDARY
#C19  IPBS     JPBS   ISPBS    NPFORS  NPSERS
#C20  ELEVATION BOUNDARY CONDITIONS ON WEST  OPEN BOUNDARY
#C20  IPBW     JPBW   ISPBW    NPFORW  NPSERW
#C21  ELEVATION BOUNDARY CONDITIONS ON EAST  OPEN BOUNDARY
#C21  IPBE     JPBE   ISPBE    NPFORE  NPSERE
      125      6      1        1       0
      125      7      1        1       0
      125      8      1        1       0
      125      9      1        1       0
      125     10      1        1       0
      125     11      1        1       0
      125     12      1        1       0
      125     13      1        1       0
      125     14      1        1       0
      125     15      1        1       0
      125     16      1        1       0
      125     17      1        1       0
#C22  ELEVATION BOUNDARY CONDITIONS ON NORTH OPEN BOUNDARY
#C22  IPBN     JPBN   ISPBN    NPFORN  NPSERN
#C23  VELOCITY AND VOLUMETRIC SOURCE BOUNDARY CONDITION PARAMETERS
#C23  NVBS NUBW NUBE NVBN NQVS  NNQSER
      0    0    0    0    3     0
#C24  VOLUMETRIC SOURCE BOUNDARY CONDITIONS
#C24  IQVS     JQVS     QVS       NQSER
      32       160      2.07      0
      96       24       0.59      0
       5       28       0.75      0
#C25  VOLUMETRIC SOURCE INFLOW CONCENTRATIONS
#C25  SALT   TEMP   DYEC     SEDC
      0.0    0.0    0.0      0.0
      0.0    0.0    0.0      0.0
      0.0    0.0    1000.    0.0
#C26  CONCENTRATION BOUNDARY CONDITION PARAMETERS
#C26  NCBS NCBW NCBE NCBN  BSCALE
      0    0    12   0     0.00075
#C27  LOCATION OF CONC BC'S ON SOUTH BOUNDARIES
#C27  ICBS   JCBS  NTSCRS
#C28  BOTTOM CONC ON SOUTH CONC BOUNDARIES
#C28  SALT  TEMP  DYEC  SEDC
#C29  SURFACE CONC ON SOUTH CONC BOUNDARIES
#C29  SALT  TEMP  DYEC  SEDC
#C30  LOCATION OF CONC BC'S ON WEST BOUNDARIES
#C30  ICBW  JCBW  NTSCRW
#C31  BOTTOM CONC ON WEST CONC BOUNDARIES
#C31  SALT  TEMP  DYEC   SEDC
#C32  SURFACE CONC ON WEST CONC BOUNDARIES
#C32  SALT  TEMP  DYEC   SEDC
#C33  LOCATION OF CONC BC'S ON EAST BOUNDARIES
#C33  ICBE   JCBE  NTSCRE
      125     6     36
      125     7     36
      125     8     36
      125     9     36
      125    10     36
      125    11     36
      125    12     36
      125    13     36
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      125    14     36
      125    15     36
      125    16     36
      125    17     36
#C34  BOTTOM CONC ON EAST CONC BOUNDARIES
#C34  SALT  TEMP  DYEC  SEDC
      25.0  0.0   0.0   0.0
      25.0  0.0   0.0   0.0
      25.0  0.0   0.0   0.0
      25.0  0.0   0.0   0.0
      25.0  0.0   0.0   0.0
      25.0  0.0   0.0   0.0
      25.0  0.0   0.0   0.0
      25.0  0.0   0.0   0.0
      25.0  0.0   0.0   0.0
      25.0  0.0   0.0   0.0
      25.0  0.0   0.0   0.0
      25.0  0.0   0.0   0.0
#C35  SURFACE CONC ON EAST CONC BOUNDARIES
#C35  SALT  TEMP  DYEC  SEDC
      25.0  0.0   0.0   0.0
      25.0  0.0   0.0   0.0
      25.0  0.0   0.0   0.0
      25.0  0.0   0.0   0.0
      25.0  0.0   0.0   0.0
      25.0  0.0   0.0   0.0
      25.0  0.0   0.0   0.0
      25.0  0.0   0.0   0.0
      25.0  0.0   0.0   0.0
      25.0  0.0   0.0   0.0
      25.0  0.0   0.0   0.0
      25.0  0.0   0.0   0.0
#C36  LOCATION OF CONC BC'S ON NORTH BOUNDARIES
#C36  ICBN   JCBN  NTSCRN
#C37  BOTTOM CONC ON NORTH CONC BOUNDARIES
#C37  SALT  TEMP  DYEC  SEDC
#C38  SURFACE CONC ON NORTH CONC BOUNDARIES
#C38  SALT  TEMP  DYEC  SEDC
#C39  DRIFTER DATA
#C39  ISPD  NPD  NPDRT  NWPD
      0     1    1      1
#C40  INITIAL DRIFTER POSITIONS
#C40  RI    RJ   RK
      1     1    1
#C41  CONSTANTS FOR LONGITUDE AND LATITUDE OF CELL CENTERS
#C41  CDLON1  CDLON2   CDLON3   CDLAT1  CDLAT2   CDLAT3
      0.0     76.8     -153.6  0.0     38.4     -76.8
#C42  CONTROLS FOR PRINTED OUTPUT
#C42  ISPOP   ISPOU  ISPOV  ISPOS
      0       0      0      0
#C43  CONTROLS FOR HORIZONTAL PLANE SALINITY PLOTTING
#C43  ISSPH   NPSPH   ISRSPH
      1       12      1
#C44  CONTROLS FOR HORIZONTAL PLANE VELOCITY PLOTTING
#C44  ISVPH   NPVPH   ISRVPH
      0       10      0
#C45  CONTROLS FOR VERTICAL PLANE SALINITY PLOTTING
#C45  ISECSPV   NPSPV  ISSPV  ISRSPV
      0         10     0      0
#C46  CONTROLS FOR VERTICAL PLANE SALINITY PLOTTING
#C46  ISECSPV NIJSPV  SEC ID
#C47  CONTROLS FOR VERTICAL PLANE SALINITY PLOTTING
#C47  ISECSPV ISPV    JSPV
#C48  CONTROLS FOR VERTICAL PLANE VELOCITY PLOTTING
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```
#C48  ISECVPV   NPVPV  ISVPV  ISRSPV
      0         10     0      0
#C49  CONTROLS FOR VERTICAL PLANE VELOCITY PLOTTING
#C49  ISECVPV   NIJVPV  ANGVPV  SEC ID
#C50  CONTROLS FOR VERTICAL PLANE VELOCITY PLOTTING
#C50  ISECVPV IVPV    JVPV
#C51  CONTROLS FOR 3D FIELD OUTPUT
#C51  IS3DO  NP3DO  KPC  HMAX  HMMAX
      0      4      16   0.40  0.32
#C52  CONTROLS FOR 3D FIELD OUTPUT
#C52  IS3DU  IS3DV  IS3DW  IS3DS
      0      0      0      0
```

Appendix A.3

Mean Flow Dilution Input File

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MODEL INPUT FILE EFDC.INP FOR MEAN FLOW DILUTION


#C1   TITLE FOR RUN
#C1   (LIMIT TO 80 CHARACTERS LENGTH)
      YORK RIVER, PROCESS DILUTION AT MEAN FLOW, RADBC
#C2   RESTART AND DIAGNOSTIC SWITCHES
#C2   ISRESTI ISRESTO ISRESTR ISLOG ISDIVEX ISNEGH ISMMC
      1       1       0       1     0       1      0
#C3   RELAXATION PARAMETERS AND SWITCHES
#C3   RP    RSQM   ITERM  IRVEC  RPADJ  RSQMADJ  ITRMADJ
      1.8   1.E-8  100    0      1.8    1.E-16   1000
#C4   LONGTERM MASS TRANSPORT INTEGRATION ONLY SWITCHES
#C4   ISLTMT  ISSSMMT ISLTMTS  ISIA  RPIA  RSQMIA   ITRMIA
      0       1       0        0     1.8   1.E-10   100
#C5   MOMENTUM ADVEC AND HORIZ DIFF SWITCHES AND MISC SWITCHES
#C5   ISCDMA  ISAHMF  ISDISP  ISWASP
      0       0       0       0
#C6   DISSOLVED AND SUSPENDED CONSTITUENT TRANSPORT SWITCHES
#C6   SALT=1, TEMP=2, DYEC=3, SEDC=4
#C6   ISTRAN ISCDCA ISADAC ISFCT ISPLIT ISADAH ISADAV ISCI ISCO
      1      0      1      1     0      0      0      1    1
      0      0      0      0     0      0      0      0    0
      1      0      1      1     0      0      0      1    1
      0      0      0      0     0      0      0      0    0
#C7   TIME-RELATED INTEGER PARAMETERS
#C7   NTC NTSPTC NLTC NTTC NTCPP NTSTBC NTCNB NTCVB NTSMMT NFLTMT
      8   1200   0    0    8     8      0     0     2400   1
#C8   TIME-RELATED REAL PARAMETERS
#C8   TCON  TADD    TPM2        CORIOLIS
      1.    0.0     44714.16    0.0001
#C9   SPACE-RELATED AND SMOOTHING  PARAMETERS
#C9   KC  IC   JC   LC    LVC   ISCO NSHMAX  NSBMAX  WSMH    WSMB
      8   126  161  1600  1598  1    0       0       0.0625  0.5
#C10  LAYER THICKNESS IN VERTICAL
#C10  1     2     3     4     5     6     7     8
      0.125 0.125 0.125 0.125 0.125 0.125 0.125 0.125
#C11  GRID, ROUGHNESS AND DEPTH PARAMETERS
#C11  DX    DY   DXYCVT  ISMASK   ZROUGH   HMIN   HADJ  HCVRT
      1.0   1.0  1000.   0        0.0002   1.2    0.0   1.0
#C12  TURBULENT DIFFUSION PARAMETERS
#C12  AHO   AHD     AVO      ABO      AVBCON
      0.0   0.0     1.E-6    1.E-6    1.0
#C13  TURBULENCE CLOSURE PARAMETERS
#C13  VKC   CTURB   CTE1   CTE2   CTE3   QQMIN   QQLMIN   DMLMIN
      0.4   16.0    1.8    1.33   0.53   1.E-8   1.E-16   1.E-8
#C14  TIDAL CONSTITUENT AND HARMONIC ANALYSIS PARAMETERS
#C14  MTIDE  ISLSHA  MLLSHA   NTCLSHA  ISLSTR
      1      1       10       2        0
#C15  TIDAL CONSTITUENT SYMBOLS AND PERIODS
#C15  SYMBOL   PERIOD
      'M2'     44714.16
#C16  HARMONIC ANALYSIS LOCATIONS AND SWITCHES
#C16  ILLSHA   JLLSHA   LSHAP  LSHAB  LSHAU  CLSL
      116      10       1      0      0      'TML'
      93       10       1      0      0      'GP'
      76       7        1      0      0      'CA'
      63       12       1      0      0      'CB'
      50       12       1      0      0      'AV'
      36       12       1      0      0      'RP'
      26       12       1      0      0      'BV'
      5        19       1      0      0      'WP'
      72       24       1      0      0      'WK'
      5        116      1      0      0      'SB'
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#C17  ELEVATION BOUNDARY CONDITION PARAMETERS
#C17  NPBS NPBW NPBE NPBN  NPFOR  NPSER
      0    0    12   0     1     0
#C18  TIDAL HARMONIC ELEVATION BOUNDARY CONDITION FORCINGS
#C18  NPFOR    SYMBOL   AMPLITUDE   PHASE
      1        'M2'     0.228        11178.54
#C19  ELEVATION BOUNDARY CONDITIONS ON SOUTH OPEN BOUNDARY
#C19  IPBS     JPBS   ISPBS    NPFORS  NPSERS
#C20  ELEVATION BOUNDARY CONDITIONS ON WEST  OPEN BOUNDARY
#C20  IPBW     JPBW   ISPBW    NPFORW  NPSERW
#C21  ELEVATION BOUNDARY CONDITIONS ON EAST  OPEN BOUNDARY
#C21  IPBE     JPBE   ISPBE    NPFORE  NPSERE
      125      6      1        1       0
      125      7      1        1       0
      125      8      1        1       0
      125      9      1        1       0
      125     10      1        1       0
      125     11      1        1       0
      125     12      1        1       0
      125     13      1        1       0
      125     14      1        1       0
      125     15      1        1       0
      125     16      1        1       0
      125     17      1        1       0
#C22  ELEVATION BOUNDARY CONDITIONS ON NORTH OPEN BOUNDARY
#C22  IPBN     JPBN   ISPBN    NPFORN  NPSERN
#C23  VELOCITY AND VOLUMETRIC SOURCE BOUNDARY CONDITION PARAMETERS
#C23  NVBS NUBW NUBE NVBN NQVS  NNQSER
      0    0    0    0    3     0
#C24  VOLUMETRIC SOURCE BOUNDARY CONDITIONS
#C24  IQVS    JQVS    QVS       NQSER
      32      160     37.89     0
      96      24      25.57     0
       5      28      0.75      0
#C25  VOLUMETRIC SOURCE INFLOW CONCENTRATIONS
#C25  SALT   TEMP   DYEC     SEDC
      0.0    0.0    0.0      0.0
      0.0    0.0    0.0      0.0
      0.0    0.0    1000.    0.0
#C26  CONCENTRATION BOUNDARY CONDITION PARAMETERS
#C26  NCBS NCBW NCBE NCBN  BSCALE
      0    0    12   0     0.00075
#C27  LOCATION OF CONC BC'S ON SOUTH BOUNDARIES
#C27  ICBS   JCBS  NTSCRS
#C28  BOTTOM CONC ON SOUTH CONC BOUNDARIES
#C28  SALT  TEMP  DYEC  SEDC
#C29  SURFACE CONC ON SOUTH CONC BOUNDARIES
#C29  SALT  TEMP  DYEC  SEDC
#C30  LOCATION OF CONC BC'S ON WEST BOUNDARIES
#C30  ICBW  JCBW  NTSCRW
#C31  BOTTOM CONC ON WEST CONC BOUNDARIES
#C31  SALT  TEMP  DYEC   SEDC
#C32  SURFACE CONC ON WEST CONC BOUNDARIES
#C32  SALT  TEMP  DYEC   SEDC
#C33  LOCATION OF CONC BC'S ON EAST BOUNDARIES
#C33  ICBE   JCBE  NTSCRE
      125     6     36
      125     7     36
      125     8     36
      125     9     36
      125    10     36
      125    11     36
      125    12     36
      125    13     36
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      125    14     36
      125    15     36
      125    16     36
      125    17     36
#C34  BOTTOM CONC ON EAST CONC BOUNDARIES
#C34  SALT  TEMP  DYEC  SEDC
      25.0  0.0   0.0   0.0
      25.0  0.0   0.0   0.0
      25.0  0.0   0.0   0.0
      25.0  0.0   0.0   0.0
      25.0  0.0   0.0   0.0
      25.0  0.0   0.0   0.0
      25.0  0.0   0.0   0.0
      25.0  0.0   0.0   0.0
      25.0  0.0   0.0   0.0
      25.0  0.0   0.0   0.0
      25.0  0.0   0.0   0.0
      25.0  0.0   0.0   0.0
#C35  SURFACE CONC ON EAST CONC BOUNDARIES
#C35  SALT  TEMP  DYEC  SEDC
      25.0  0.0   0.0   0.0
      25.0  0.0   0.0   0.0
      25.0  0.0   0.0   0.0
      25.0  0.0   0.0   0.0
      25.0  0.0   0.0   0.0
      25.0  0.0   0.0   0.0
      25.0  0.0   0.0   0.0
      25.0  0.0   0.0   0.0
      25.0  0.0   0.0   0.0
      25.0  0.0   0.0   0.0
      25.0  0.0   0.0   0.0
      25.0  0.0   0.0   0.0
#C36  LOCATION OF CONC BC'S ON NORTH BOUNDARIES
#C36  ICBN   JCBN  NTSCRN
#C37  BOTTOM CONC ON NORTH CONC BOUNDARIES
#C37  SALT  TEMP  DYEC  SEDC
#C38  SURFACE CONC ON NORTH CONC BOUNDARIES
#C38  SALT  TEMP  DYEC  SEDC
#C39  DRIFTER DATA
#C39  ISPD  NPD  NPDRT  NWPD
      0     1    1      1
#C40  INITIAL DRIFTER POSITIONS
#C40  RI    RJ   RK
      1     1    1
#C41  CONSTANTS FOR LONGITUDE AND LATITUDE OF CELL CENTERS
#C41  CDLON1  CDLON2   CDLON3   CDLAT1  CDLAT2   CDLAT3
      0.0     76.8     -153.6   0.0     38.4     -76.8
#C42  CONTROLS FOR PRINTED OUTPUT
#C42  ISPOP   ISPOU  ISPOV  ISPOS
      0       0      0      0
#C43  CONTROLS FOR HORIZONTAL PLANE SALINITY PLOTTING
#C43  ISSPH   NPSPH   ISRSPH
      1       12      1
#C44  CONTROLS FOR HORIZONTAL PLANE VELOCITY PLOTTING
#C44  ISVPH   NPVPH   ISRVPH
      0       10      0
#C45  CONTROLS FOR VERTICAL PLANE SALINITY PLOTTING
#C45  ISECSPV   NPSPV  ISSPV  ISRSPV
      0         10     0      0
#C46  CONTROLS FOR VERTICAL PLANE SALINITY PLOTTING
#C46  ISECSPV NIJSPV  SEC ID
#C47  CONTROLS FOR VERTICAL PLANE SALINITY PLOTTING
#C47  ISECSPV ISPV    JSPV
#C48  CONTROLS FOR VERTICAL PLANE VELOCITY PLOTTING
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#C48  ISECVPV   NPVPV  ISVPV  ISRSPV
      0         10     0      0
#C49  CONTROLS FOR VERTICAL PLANE VELOCITY PLOTTING
#C49  ISECVPV   NIJVPV  ANGVPV  SEC ID
#C50  CONTROLS FOR VERTICAL PLANE VELOCITY PLOTTING
#C50  ISECVPV IVPV    JVPV
#C51  CONTROLS FOR 3D FIELD OUTPUT
#C51  IS3DO  NP3DO  KPC  HMAX  HMMAX
      0      4      16   0.40  0.32
#C52  CONTROLS FOR 3D FIELD OUTPUT
#C52  IS3DU  IS3DV  IS3DW  IS3DS
      0      0      0      0
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Attachment 8
Federal Effluent Limitation Guidelines

Authority: Sections 301, 304, 306, 307, 308, 402, and 501 of the Clean Water Act, as amended, (33 U.S.C. 1311, 1314, 1316, 1317, 1318, 1342, and 1361), and Section 112 of the Clean Air Act, as amended (42 U.S.C. 7412).

Source: 63 FR 18635, Apr. 15, 1998, unless otherwise noted.

General Provisions

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§ 430.00 Applicability.

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(a) This part applies to any pulp, paper, or paperboard mill that discharges or may discharge process wastewater pollutants to the waters of the United States, or that introduces or may introduce process wastewater pollutants into a publicly owned treatment works.

(b) The following table presents the subcategorization scheme codified in this part, with references to former subpart designations contained in the 1997 edition of 40 CFR parts 425 through 699:

Subcategorization Scheme With References to Former Subparts Contained in the July 1, 1997 Edition of 40 CFR Parts 425 Through 699

Final codified subpart	Final subcategorization scheme	Types of products covered in the subpart
A	Dissolving Kraft	Dissolving pulp at kraft mills (F[a])
B	Bleached Papergrade Kraft and Soda	Market pulp at bleached kraft mills (G[a]); paperboard, coarse paper, and tissue paper at bleached kraft mills (H[a]); pulp and fine papers at bleached kraft mills (I[a]); and pulp and paper at soda mills (P[a]).
C	Unbleached Kraft	Pulp and paper at unbleached kraft mills including linerboard or bag paper and other mixed products (A[a]); pulp and paper using the unbleached kraft-neutral sulfite semi-chemical (cross recovery) process (D[a]); and pulp and paper at combined unbleached kraft and semi-chemical mills, wherein the spent semi-chemical cooking liquor is burned within the unbleached kraft chemical recovery system (V[a]).
D	Dissolving Sulfite	Pulp at dissolving sulfite mills for the following grades: nitration, viscose, cellophane, and acetate (K[a]).
E	Papergrade Sulfite —Calcium-, Magnesium-, or	Pulp and paper at papergrade sulfite mills where blow pit pulp washing techniques are used (J[a]) and pulp and paper at

	Sodium-based pulps —Ammonium-based pulps. —Specialty grade pulps.	papergrade sulfite mills where vacuum or pressure drums are used to wash pulp (U[a]).
F	Semi-Chemical	Pulp and paper at semi-chemical mills using an ammonia base or a sodium base (B[a]).
G	Mechanical Pulp	Pulp and paper at groundwood chemi-mechanical mills (L[a]); pulp and paper at groundwood mills through the application of the thermo-mechanical process (M[a]); pulp and coarse paper, molded pulp products, and newsprint at groundwood mills (N[a]); and pulp and fine paper at groundwood mills (O[a]).
H	Non-Wood Chemical Pulp	Pulp and paper at non-wood chemical pulp mills.
I	Secondary Fiber Deink	Pulp and paper at deink mills including fine papers, tissue papers, or newsprint (Q[a]).
J	Secondary Fiber Non-Deink	Paperboard from wastepaper from noncorrugating medium furnish or from corrugating medium furnish (E[a]); tissue paper from wastepaper without deinking at secondary fiber mills (T[a]); molded products from wastepaper without deinking (W[a]); and builders' paper and roofing felt from wastepaper (40 CFR part 431, subpart A[a]).
K	Fine and Lightweight Papers from Purchased Pulp	Fine Papers at nonintegrated mills using wood fiber furnish or cotton fiber furnish (R[a]); and lightweight papers at nonintegrated mills or lightweight electrical papers at nonintegrated mills (X[a]).
L	Tissue, Filter, Non-woven, and Paperboard from Purchased Pulp	Tissue papers at nonintegrated mills (S[a]); filter and non-woven papers at nonintegrated mills (Y[a]); and paperboard at nonintegrated mills (Z[a]).

[a]This subpart is contained in the 40 CFR parts 425 through 699, edition revised as of July 1, 1997.

§ 430.01 General definitions.

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In addition to the definitions set forth in 40 CFR part 401 and 40 CFR 403.3, the following definitions apply to this part:

(a) *Adsorbable organic halides (AOX).* A bulk parameter that measures the total mass of chlorinated organic matter in water and wastewater.

(b) *Annual average.* The mean concentration, mass loading or production-normalized mass loading of a pollutant over a period of 365 consecutive days (or such other period of time determined by the

permitting authority to be sufficiently long to encompass expected variability of the concentration, mass loading, or production-normalized mass loading at the relevant point of measurement).

(c) *Bleach plant.* All process equipment used for bleaching beginning with the first application of bleaching agents (e.g., chlorine, chlorine dioxide, ozone, sodium or calcium hypochlorite, or peroxide), each subsequent extraction stage, and each subsequent stage where bleaching agents are applied to the pulp. For mills in subpart E of this part producing specialty grades of pulp, the bleach plant includes process equipment used for the hydrolysis or extraction stages prior to the first application of bleaching agents. Process equipment used for oxygen delignification prior to the application of bleaching agents is not part of the bleach plant.

(d) *Bleach plant effluent.* 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.

(e) *Chemical oxygen demand (COD).* A bulk parameter that measures the oxygen-consuming capacity of organic and inorganic matter present in water or wastewater. It is expressed as the amount of oxygen consumed from a chemical oxidant in a specific test.

(f) *Elemental chlorine-free (ECF).* Any process for bleaching pulps in the absence of elemental chlorine and hypochlorite that uses exclusively chlorine dioxide as the only chlorine-containing bleaching agent.

(g) *End of the pipe.* The point at which final mill effluent is discharged to waters of the United States or introduced to a POTW.

(h) *Fiber line.* A series of operations employed to convert wood or other fibrous raw material into pulp. If the final product is bleached pulp, the fiber line encompasses pulping, de-knotting, brownstock washing, pulp screening, centrifugal cleaning, and multiple bleaching and washing stages.

(i) *Minimum level (ML).* The level at which the analytical system gives recognizable signals and an acceptable calibration point. The following minimum levels apply to pollutants in this part:

Pollutant	Method	Minimum level
2,3,7,8-TCDD	1613	10 pg/L[a]
2,3,7,8-TCDF	1613	10 pg/L[a]
Trichlorosyringol	1653	2.5 ug/L[b]
3,4,5-Trichlorocatechol	1653	5.0 ug/L[b]
3,4,6-Trichlorocatechol	1653	5.0 ug/L[b]
3,4,5-Trichloroguaiacol	1653	2.5 ug/L[b]
3,4,6-Trichloroguaiacol	1653	2.5 ug/L[b]
4,5,6-Trichloroguaiacol	1653	2.5 ug/L[b]
2,4,5-Trichlorophenol	1653	2.5 ug/L[b]
2,4,6-Trichlorophenol	1653	2.5 ug/L[b]
Tetrachlorocatechol	1653	5.0 ug/L[b]
Tetrachloroguaiacol	1653	5.0 ug/L[b]
2,3,4,6-Tetrachlorophenol	1653	2.5 ug/L[b]
Pentachlorophenol	1653	5.0 ug/L[b]
AOX	1650	20 ug/L[b]

[a]Picograms per liter.

[b]Micrograms per liter.

(j) *New source.* (1) Notwithstanding the criteria codified at 40 CFR 122.29(b)(1), a source subject to subpart B or E of this part is a "new source" if it meets the definition of "new source" at 40 CFR 122.2

and:

(i) It is constructed at a site at which no other source is located; or

(ii) It totally replaces the process or production equipment that causes the discharge of pollutants at an existing source, including the total replacement of a fiber line that causes the discharge of pollutants at an existing source, except as provided in paragraph (j)(2) of this section; or

(iii) Its processes are substantially independent of an existing source at the same site. In determining whether these processes are substantially independent, the Director shall consider such factors as the extent to which the new facility is integrated with the existing plant; and the extent to which the new facility is engaged in the same general type of activity as the existing source.

(2) The following are examples of changes made by mills subject to subparts B or E of this part that alone do not cause an existing mill to become a "new source":

(i) Upgrades of existing pulping operations;

(ii) Upgrades or replacement of pulp screening and washing operations;

(iii) Installation of extended cooking and/or oxygen delignification systems or other post-digester, pre-bleaching delignification systems;

(iv) Bleach plant modifications including changes in methods or amounts of chemical applications, new chemical applications, installation of new bleaching towers to facilitate replacement of sodium or calcium hypochlorite, and installation of new pulp washing systems; or

(v) Total replacement of process or production equipment that causes the discharge of pollutants at an existing source (including a replacement fiber line), but only if such replacement is performed for the purpose of achieving limitations that have been included in the discharger's NPDES permit pursuant to §430.24(b).

(k) *Non-continuous discharger.* (1) Except as provided in paragraph (k)(2) of this section, a non-continuous discharger is a mill which is prohibited by the NPDES authority from discharging pollutants during specific periods of time for reasons other than treatment plant upset control, such periods being at least 24 hours in duration. A mill shall not be deemed a non-continuous discharger unless its permit, in addition to setting forth the prohibition described above, requires compliance with the effluent limitations established for non-continuous dischargers and also requires compliance with maximum day and average of 30 consecutive days effluent limitations. Such maximum day and average of 30 consecutive days effluent limitations for non-continuous dischargers shall be established by the NPDES authority in the form of concentrations which reflect wastewater treatment levels that are representative of the application of the best practicable control technology currently available, the best conventional pollutant control technology, or new source performance standards in lieu of the maximum day and average of 30 consecutive days effluent limitations for conventional pollutants set forth in each subpart.

(2) A mill is a non-continuous discharger for the purposes of determining applicable effluent limitations under subpart B or E of this part (other than conventional limits for existing sources) if, for reasons other than treatment plant upset control (e.g., protecting receiving water quality), the mill is prohibited by the NPDES authority from discharging pollutants during specific periods of time or if it is required to release its discharge on a variable flow or pollutant loading rate basis.

(l) *POTW.* Publicly owned treatment works as defined at 40 CFR 403.3(o).

(m) *Process wastewater.* For subparts B and E only, process wastewater is any water that, during manufacturing or processing, comes into direct contact with or results from the production or use of any raw material, intermediate product, finished product, byproduct, or waste product. For purposes of subparts B and E of this part, process wastewater includes boiler blowdown; wastewaters from water treatment and other utility operations; blowdowns from high rate (e.g., greater than 98 percent) recycled non-contact cooling water systems to the extent they are mixed and co-treated with other process wastewaters; wastewater, including leachates, from landfills owned by pulp and paper mills subject to subpart B or E of this part if the wastewater is commingled with wastewater from the mill's manufacturing or processing facility; and storm waters from the immediate process areas to the extent they are mixed and co-treated with other process wastewaters. For purposes of this part, contaminated groundwaters from on-site or off-site groundwater remediation projects are not process wastewater.

(n) *Production.* (1) For all limitations and standards specified in this part except those pertaining to AOX and chloroform: Production shall be defined as the annual off-the-machine production (including off-the-machine coating where applicable) divided by the number of operating days during that year. Paper and paperboard production shall be measured at the off-the-machine moisture content, except for subpart C

of this part (as it pertains to pulp and paperboard production at unbleached kraft mills including linerboard or bag paper and other mixed products, and to pulp and paperboard production using the unbleached kraft neutral sulfite semi-chemical (cross recovery) process), and subparts F and J of this part (as they pertain to paperboard production from wastepaper from noncorrugating medium furnish or from corrugating medium furnish) where paper and paperboard production shall be measured in air-dry-tons (10% moisture content). Market pulp shall be measured in air-dry tons (10% moisture). Production shall be determined for each mill based upon past production practices, present trends, or committed growth.

(2) For AOX and chloroform limitations and standards specified in subparts B and E of this part: Production shall be 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. Unbleached pulp production shall be measured in air-dried-metric-tons (10% moisture) of brownstock pulp entering the bleach plant at the stage during which chlorine or chlorine-containing compounds are first applied to the pulp. In the case of bleach plants that use totally chlorine free bleaching processes, unbleached pulp production shall be measured in air-dried-metric tons (10% moisture) of brownstock pulp entering the first stage of the bleach plant from which wastewater is discharged. Production shall be determined for each mill based upon past production practices, present trends, or committed growth.

(o) *TCDD.* 2,3,7,8-tetrachlorodibenzo-p-dioxin.

(p) *TCDF.* 2,3,7,8-tetrachlorodibenzofuran.

(q) *Totally chlorine-free (TCF) bleaching.* Pulp bleaching operations that are performed without the use of chlorine, sodium hypochlorite, calcium hypochlorite, chlorine dioxide, chlorine monoxide, or any other chlorine-containing compound.

(r) *Wet Barking.* Wet barking operations shall be defined to include hydraulic barking operations and wet drum barking operations which are those drum barking operations that use substantial quantities of water in either water sprays in the barking drums or in a partial submersion of the drums in a "tub" of water.

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

§ 430.02 Monitoring requirements.

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This section establishes minimum monitoring frequencies for certain pollutants. Where no monitoring frequency is specified in this section or where the duration of the minimum monitoring frequency has expired under paragraphs (b) through (e) of this section, the permit writer or pretreatment control authority shall determine the appropriate monitoring frequency in accordance with 40 CFR 122.44(i) or 40 CFR part 403, as applicable.

(a) *BAT, NSPS, PSES, and PSNS monitoring frequency for chlorinated organic pollutants.* The following monitoring frequencies apply to discharges subject to subpart B or subpart E of this part:

CAS number	Pollutant	Minimum monitoring frequency	
		Non-TCF[a]	TCF[b]
1198556	Tetrachlorocatechol	Monthly	([c])
2539175	Tetrachloroguaiacol	Monthly	([c])
2539266	Trichlorosyringol	Monthly	([c])
2668248	4,5,6-trichloroguaiacol	Monthly	([c])
32139723	3,4,6-trichlorocatechol	Monthly	([c])
56961207	3,4,5-trichlorocatechol	Monthly	([c])
57057837	3,4,5-trichloroguaiacol	Monthly	([c])
58902	2,3,4,6-tetrachlorophenol	Monthly	([c])
60712449	3,4,6-trichloroguaiacol	Monthly	([c])
87865		Monthly	

	Pentachlorophenol[d]		([c])
88062	2,4,6-trichlorophenol[d]	Monthly	([c])
95954	2,4,5-trichlorophenol[d]	Monthly	([c])
1746016	2,3,7,8-TCDD	Monthly	([c])
51207319	2,3,7,8-TCDF	Monthly	([c])
67663	chloroform[e]	Weekly	([c])
59473040	AOX[f]	Daily	None specified.

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

[b]TCF: Pertains to any fiber line that uses exclusively TCF bleaching processes, as disclosed by the discharger in its permit application under 40 CFR 122.21(g)(3) and certified under 40 CFR 122.22 or, for indirect dischargers, as reported to the pretreatment control authority under 40 CFR 403.12 (b), (d), or (e).

[c]This regulation does not specify a limit for this pollutant for TCF bleaching processes.

[d]Monitoring frequency does not apply to this compound when used as a biocide. The permitting or pretreatment control authority must determine the appropriate monitoring frequency for this compound, when used as a biocide, under 40 CFR 122.44(i) or 40 CFR part 403, as applicable.

[e]This regulation does not specify a limit for this pollutant for subpart E mills.

[f]This regulation does not specify a limit for this pollutant for the ammonium-based or specialty grade sulfite pulp segments of subpart E.

(b) *Duration of required monitoring for BAT, NSPS, PSES, and PSNS.* The monitoring frequencies specified in paragraph (a) of this section apply for the following time periods:

(1) For direct dischargers, a duration of 5 years commencing on the date the applicable limitations or standards from subpart B or subpart E of this part are first included in the discharger's NPDES permit;

(2) For existing indirect dischargers, until April 17, 2006;

(3) For new indirect dischargers, a duration of 5 years commencing on the date the indirect discharger commences operation.

(c) *Reduced monitoring frequencies for bleach plant pollutants under the Voluntary Advanced Technology Incentives Program.* The following monitoring frequencies apply to mills enrolled in the Voluntary Advanced Technology Incentives Program established under subpart B of this part for a duration of 5 years commencing after achievement of the applicable BAT limitations specified in §430.24 (b)(3) or NSPS specified in §430.25(c)(1) for the following pollutants, except as noted in footnote f:

CAS number	Pollutant	Minimum monitoring frequency		
		Non-ECF[a]	Advanced ECF[b,f]	TCF[c]
1198556	Tetrachlorocatechol	Monthly	Monthly	([d])
2539175	Tetrachloroguiacol	Monthly	Monthly	([d])
2539266	Trichlorosyringol	Monthly	Monthly	([d])
2668248	4,5,6-trichloroguaiacol	Monthly	Monthly	([d])
32139723	3,4,6-trichlorocatechol	Monthly	Monthly	([d])
56961207	3,4,5-trichlorocatechol	Monthly	Monthly	([d])
57057837	3,4,5-trichloroguaiacol	Monthly	Monthly	([d])

58902	2,3,4,6-tetrachlorophenol	Monthly	Monthly	([d])
60712449	3,4,6-trichloroguaiacol	Monthly	Monthly	([d])
87865	Pentachlorophenol[e]	Monthly	Monthly	([d])
88062	2,4,6-trichlorophenol[e]	Monthly	Monthly	([d])
95954	2,4,5-trichlorophenol[e]	Monthly	Monthly	([d])
1746016	2,3,7,8-TCDD	Monthly	Monthly	([d])
51207319	2,3,7,8-TCDF	Monthly	Monthly	([d])
67663	Chloroform	Weekly	Monthly	([d])

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

[b]Advanced ECF: Pertains to any fiber line that uses exclusively Advanced ECF bleaching processes, or exclusively ECF and TCF bleaching processes as disclosed by the discharger in its permit application under 40 CFR 122.21(g)(3) and certified under 40 CFR 122.22. Advanced ECF consists of the use of extended delignification or other technologies that achieve at least the Tier I performance levels specified in §430.24(b)(4)(i).

[c]TCF: Pertains to any fiber line that uses exclusively TCF bleaching processes, as disclosed by the discharger in its permit application under 40 CFR 122.21(g)(3) and certified under 40 CFR 122.22.

[d]This regulation does not specify a limit for this pollutant for TCF bleaching processes.

[e]Monitoring frequency does not apply to this compound when used as a biocide. The permitting authority must determine the appropriate monitoring frequency for this compound, when used as a biocide, under 40 CFR 122.44(i).

[f]Monitoring requirements for these pollutants by mills certifying as Advanced ECF in their NPDES permit application or other communication to the permitting authority will be suspended after one year of monitoring. The permitting authority must determine the appropriate monitoring frequency for these pollutants beyond that time under 40 CFR 122.44(i).

(d) *Reduced monitoring frequencies for AOX under the Voluntary Advanced Technology Incentives Program (year one).* The following monitoring frequencies apply to direct dischargers enrolled in the Voluntary Advanced Technology Incentives Program established under subpart B of this part for a duration of one year after achievement of the applicable BAT limitations specified in §430.24(b)(4)(i) or NSPS specified in §430.25(c)(2):

CAS number	Pollutant	Non-ECF, any tier[a]	Advanced ECF, any tier[b]	TCF, any tier[c]
59473040	AOX	Daily	Weekly	None specified.

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

[b]Advanced ECF: Pertains to any fiber line that uses exclusively Advanced ECF bleaching processes or exclusively ECF and TCF bleaching processes, as disclosed by the discharger in its permit application under 40 CFR 122.21(g)(3) and certified under 40 CFR 122.22. Advanced ECF consists of the use of extended delignification or other technologies that achieve at least the Tier I performance levels specified in §430.24(b)(4)(i).

[c]TCF: Pertains to any fiber line that uses exclusively TCF bleaching processes, as disclosed by the discharger in its permit application under 40 CFR 122.21(g)(3) and certified under 40 CFR 122.22.

(e) *Reduced monitoring frequencies for AOX under the Voluntary Advanced Technology Incentives Program (years two through five).* The following monitoring frequencies apply to mills enrolled in the Voluntary Advanced Technology Incentives Program established under subpart B of this part for a duration of four years starting one year after achievement of the applicable BAT limitations specified in §430.24(b)(4)(i) or NSPS specified in §430.25(c)(2):

CAS number	Pollutant	Non-ECF any tier[a]	Advanced ECF—tier I[b]	Advanced ECF—tier II[b]	Advanced ECF—tier III[b]	TCF—any tier[c]
59473040	AOX	Daily	Monthly	Quarterly	Annually	None specified.

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

[b]Advanced ECF: Pertains to any fiber line that uses exclusively Advanced ECF bleaching processes or exclusively ECF and TCF bleaching processes, as disclosed by the discharger in its permit application under 40 CFR 122.21(g)(3) and certified under 40 CFR 122.22. Advanced ECF consists of the use of extended delignification or other technologies that achieve at least the Tier I performance levels specified in §430.24(b)(4)(i).

[c]TCF: Pertains to any fiber line that uses exclusively TCF bleaching processes, as disclosed by the discharger in its permit application under 40 CFR 122.21(g)(3) and certified under 40 CFR 122.22.

(f) *Certification in Lieu of Monitoring for Chloroform* —(1) *Under what circumstances may a discharger be exempt from the minimum monitoring requirements of this section for chloroform?* A discharger subject to limitations or standards for chloroform under subpart B of this part is not subject to the minimum monitoring requirements specified in this section for chloroform at a fiber line to which the limitations or standards apply if the discharger meets the requirements of this section.

(2) *How do I qualify for the exemption?* At the time you request an exemption from the minimum monitoring requirements of this section for chloroform from your permitting authority or pretreatment control authority for a fiber line, you must:

(i) Demonstrate, based on 104 measurements taken over a period of not less than two years of monitoring conducted in accordance with paragraph (a) of this section, that you are complying with the applicable limitations or standards for chloroform;

(ii) Certify that you will maintain a record of the maximum value for each of the following process and operating conditions for the fiber line that was recorded during the collection of each of the samples used to make the demonstration required under paragraph (f)(2)(i) of this section.

(A) The pH of the first chlorine dioxide bleaching stage;

(B) The chlorine (Cl_2) content of chlorine dioxide (ClO_2) used on the bleach line;

(C) The kappa factor of the first chlorine dioxide bleaching stage; and

(D) The total bleach line chlorine dioxide application rate;

(iii) Identify the chlorine-containing compound used for bleaching during the collection of samples used to make the demonstration required under paragraph (f)(2)(i) of this section; and

(iv) Certify that the fiber line does not use either elemental chlorine or hypochlorite as bleaching agents.

(3) *What happens if I change the process and operating conditions on the fiber line so that one or more exceeds the maximum value recorded under paragraph (f)(2)(ii) of this section for that process and operating condition?* If you wish to continue your exemption from the minimum monitoring requirements of this section for chloroform, you must:

(i) Demonstrate, based on monitoring conducted at a frequency similar to that required in paragraph (a) of this section and for a duration determined by the permitting or pretreatment control authority, that you are complying with the applicable limitations or standards for chloroform;

(ii) Certify that you will maintain a record of the maximum value for each of the following process and operating conditions for the fiber line that was recorded during the collection of each of the samples used to make the demonstration required under paragraph (f)(6)(i) of this section:

(A) The pH of the first chlorine dioxide bleaching stage;

(B) The chlorine (Cl_2) content of chlorine dioxide (ClO_2) used on the bleach line;

(C) The kappa factor of the first chlorine dioxide bleaching stage; and

(D) The total bleach line chlorine dioxide application rate;

(iii) Identify the chlorine-containing compound used for bleaching during the collection of each sample used to make the demonstration required under paragraph (f)(3)(i) of this section; and

(iv) Certify that the fiber line does not use either elemental chlorine or hypochlorite as bleaching agents.

(4) *What are my reporting obligations?* You must certify in reports required under §122.41(l)(4) or §403.12(b) of this chapter, as appropriate, that the chlorine-containing compounds used for bleaching are unchanged from those identified under paragraph (f)(2)(iii) of this section and that the following process and operating conditions maintained on the fiber line during the reporting period have not exceeded the maximum value recorded for each such condition during the collection of the samples used to make the demonstration required under paragraphs (f)(2)(i) or (f)(3)(i) of this section:

(i) The pH of the first chlorine dioxide bleaching stage;

(ii) The chlorine (Cl_2) content of chlorine dioxide (ClO_2) used on the bleach line;

(iii) The kappa factor of the first chlorine dioxide bleaching stage; and

(iv) The total bleach line chlorine dioxide application rate.

(5) *What happens if I fail to maintain the records described in paragraphs (f)(2)(ii) and (f)(3)(ii) of this section?* You will be required to comply with the minimum monitoring requirements of this section for chloroform.

(6) *What happens if I exceed the maximum value recorded under paragraphs (f)(2)(ii) or (f)(3)(ii) of this section for any of the process and operating conditions identified in that section?*

(i) If for any reason (e.g., intentionally or due to process upset) you fail to maintain process and operating conditions at values equal to or less than the maximum value recorded under paragraphs (f)(2)(ii) or (f)(3)(ii) of this section for each such condition, you will be in violation of the applicable chloroform limitation or standard unless:

(A) Within 30 days, you notify your permitting or pretreatment control authority in writing of the exceedance; and

(B) You demonstrate compliance with the applicable chloroform limitation or standard by immediately monitoring the bleach plant effluent for chloroform at a frequency similar to that required in paragraph (a) of this section and for a duration determined by the permit or pretreatment control authority.

(ii) In order to continue your exemption from the minimum monitoring requirements of this section for chloroform, you must meet the requirements of paragraph (f)(6)(i) of this section and you must recertify that the fiber line process and operating conditions do not exceed the maximum value recorded under paragraphs (f)(2)(ii) or (f)(3)(ii) of this section for each of the parameters identified in those paragraphs.

(7) *Definitions:*

(i) *Kappa factor* —the ratio of available chlorine (total equivalent chlorine, as percent on oven dry pulp) to the kappa number of the pulp. Kappa number is the lignin content of pulp, as measured by a modified permanganate test corrected to 50 percent consumption of the chemical.

(ii) *Total bleach line chlorine dioxide application rate* —mass of chlorine dioxide applied in all stages of the bleach line per mass of unbleached pulp (*i.e.,* lb/ton or kg/kkg).

(iii) *Chlorine-containing compounds* —compounds containing chlorine used in the bleach plant for bleaching, brightening, whitening, or viscosity control. These compounds include but are not limited to chlorine (Cl_2), sodium hypochlorite (NaOCl), chlorine dioxide (ClO_2) and chlorine monoxide (Cl_2O).

(g) Analyst may use NCASI Method CP–86.07, "Chlorinated Phenolics in Water by *In situ* Acetylation and GC/MS Determination" (January 2002) for determination of certain chlorinated phenols, chlorinated

guaiacols, chlorinated catechols, chlorinated benzaldehydes (*i.e.* , vanillins and syringaldehydes), and trichlorsyringol (analytes specified in the method) in bleach plant filtrate as an alternative to EPA Method 1653. NCASI Method CP–86.07 is available from the Publications Coordinator, NCASI, P.O. Box 13318, Research Triangle Park, NC 27709–3318. Telephone: 919–588–1987.

[63 FR 18635, Apr. 15, 1998, as amended at 67 FR 58997, Sept. 19, 2002; 72 FR 11248, Mar. 12, 2007]

§ 430.03 Best management practices (BMPs) for spent pulping liquor, soap, and turpentine management, spill prevention, and control.

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(a) *Applicability.* This section applies to direct and indirect discharging pulp, paper, and paperboard mills with pulp production in subparts B (Bleached Papergrade Kraft and Soda) and E (Papergrade Sulfite).

(b) *Specialized definitions* —(1) *Action Level:* 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).

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

(3) *Immediate Process Area:* 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.

(4) *Intentional Diversion:* 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.

(5) *Mill:* The owner or operator of a direct or indirect discharging pulp, paper, or paperboard manufacturing facility subject to this section.

(6) *Senior Technical Manager:* 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.

(7) *Soap:* 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.

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

(9) *Turpentine:* 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.

(c) *Requirement to implement Best Management Practices.* Each mill subject to this section must implement the Best Management Practices (BMPs) specified in paragraphs (c)(1) through (10) of this section. The primary objective of the BMPs is to prevent leaks and spills of spent pulping liquors, soap, and turpentine. The secondary objective is to contain, collect, and recover at the immediate process area, or otherwise control, those leaks, spills, and intentional diversions of spent pulping liquor, soap, and turpentine that do occur. BMPs must be developed according to best engineering practices and must be implemented in a manner that takes into account the specific circumstances at each mill. The BMPs are as follows:

(1) The mill 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.

(2) The mill 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.

(3) The mill 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.

(4) The mill 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.

(5) The mill must prepare a brief report that evaluates each spill of spent pulping liquor, soap, or 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.

(6) The mill 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.

(7) The mill 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.

(8) The mill must install and maintain secondary containment for turpentine bulk storage tanks.

(9) The mill must install and maintain curbing, diking or other means of isolating soap and turpentine processing and loading areas from the wastewater treatment facilities.

(10) The mill 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 paragraph (i) of this section.

(d) *Requirement to develop a BMP Plan.* (1) Each mill subject to this section must prepare and implement a BMP Plan. The BMP Plan must be based on a detailed engineering review as described in paragraphs (d)(2) and (3) of this section. The BMP Plan must specify the procedures and the practices required for each mill to meet the requirements of paragraph (c) of this section, 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 paragraph (i) of this section. The BMP Plan also must specify the period of time that the mill determines the action levels established under paragraph (h) of this section may be exceeded without triggering the responses specified in paragraph (i) of this section.

(2) Each mill subject to this section 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.

(3) As part of the engineering review, the mill must determine whether 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 storm water from the immediate process areas is appropriate.

(e) *Amendment of BMP Plan.* (1) Each mill subject to this section 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.

(2) Each mill subject to this section must complete a review and evaluation of the BMP Plan five years after the first BMP Plan is prepared and, except as provided in paragraph (e)(1) of this section, once every five years thereafter. As a result of this review and evaluation, the mill 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.

(f) *Review and certification of BMP Plan.* The BMP Plan, and any amendments thereto, 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 permitting or pretreatment control authority 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 mill is not required to obtain approval from the permitting or pretreatment control authority of the BMP Plan or any amendments thereto.

(g) *Record keeping requirements.* (1) Each mill subject to this section must maintain on its premises a complete copy of the current BMP Plan and the records specified in paragraph (g)(2) of this section and must make such BMP Plan and records available to the permitting or pretreatment control authority and the Regional Administrator or his or her designee for review upon request.

(2) The mill must maintain the following records for 3 years from the date they are created:

(i) Records tracking the repairs performed in accordance with the repair program described in paragraph (c)(2) of this section;

(ii) Records of initial and refresher training conducted in accordance with paragraph (c)(4) of this section;

(iii) Reports prepared in accordance with paragraph (c)(5) of this section; and

(iv) Records of monitoring required by paragraphs (c)(10) and (i) of this section.

(h) *Establishment of wastewater treatment system influent action levels.* (1) Each mill subject to this section must conduct a monitoring program, described in paragraph (h)(2) of this section, for the purpose of defining wastewater treatment system influent characteristics (or action levels), described in paragraph (h)(3) of this section, that will trigger requirements to initiate investigations on BMP effectiveness and to take corrective action.

(2) Each mill subject to this section must employ the following procedures in order to develop the action levels required by paragraph (h) of this section:

(i) *Monitoring parameters.* The mill 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 mill may use a measure related to spent pulping liquor losses measured continuously and averaged over 24 hours (e.g., specific conductivity or color).

(ii) *Monitoring locations.* 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 mill 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).

(3) By the date prescribed in paragraph (j)(1)(iii) of this section, each existing discharger subject to this section must complete an initial six-month monitoring program using the procedures specified in paragraph (h)(2) of this section and must establish 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 paragraph (i) of this section, and an upper action level, which if exceeded will trigger the corrective action requirements described in paragraph (i) of this section.

(4) By the date prescribed in paragraph (j)(1)(vi) of this section, each existing discharger must complete a second six-month monitoring program using the procedures specified in paragraph (h)(2) of this section and must establish revised action levels based on the results of that program. The initial action levels shall remain in effect until replaced by revised action levels.

(5) By the date prescribed in paragraph (j)(2) of this section, each new source subject to this section must complete a six-month monitoring program using the procedures specified in paragraph (h)(2) of this section and must develop a lower action level and an upper action level based on the results of that program.

(6) 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.

(i) *Monitoring, corrective action, and reporting requirements.* (1) Each mill subject to this section must conduct daily monitoring of the influent to the wastewater treatment system in accordance with the procedures described in paragraph (h)(2) of this section for the purpose of detecting leaks and spills, tracking the effectiveness of the BMPs, and detecting trends in spent pulping liquor losses.

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

(3) Although exceedances of the action levels will not constitute violations of an NPDES permit or pretreatment standard, failure to take the actions required by paragraph (i)(2) of this section as soon as practicable will be a permit or pretreatment standard violation.

(4) Each mill subject to this section must report to the NPDES permitting or pretreatment control authority the results of the daily monitoring conducted pursuant to paragraph (i)(1) of this section. 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. Submission of such reports shall be at the frequency established by the NPDES permitting or pretreatment control authority, but in no case less than once per year.

(j) *Compliance deadlines* —(1) *Existing direct and indirect dischargers.* Except as provided in paragraph (j)(2) of this section for new sources, indirect discharging mills subject to this section must meet the deadlines set forth below. Except as provided in paragraph (j)(2) of this section for new sources, NPDES permits must require direct discharging mills subject to this section to meet the deadlines set forth below. If a deadline set forth below has passed at the time the NPDES permit containing the BMP requirement is issued, the NPDES permit must require immediate compliance with such BMP requirement(s).

(i) Prepare BMP Plans and certify to the permitting or pretreatment authority that the BMP Plan has been prepared in accordance with this regulation not later than April 15, 1999;

(ii) Implement all BMPs specified in paragraph (c) of this section that do not require the construction of containment or diversion structures or the installation of monitoring and alarm systems not later than April 15, 1999.

(iii) Establish initial action levels required by paragraph (h)(3) of this section not later than April 15, 1999.

(iv) Commence operation of any new or upgraded continuous, automatic monitoring systems that the mill determines to be necessary under paragraph (c)(3) of this section (other than those associated with construction of containment or diversion structures) not later than April 17, 2000.

(v) Complete construction and commence operation of any spent pulping liquor, collection, containment, diversion, or other facilities, including any associated continuous monitoring systems, necessary to fully implement BMPs specified in paragraph (c) of this section not later than April 16, 2001.

(vi) Establish revised action levels required by paragraph (h)(4) of this section as soon as possible after fully implementing the BMPs specified in paragraph (c) of this section, but not later than January 15, 2002.

(2) *New sources.* Upon commencing discharge, new sources subject to this section must implement all of the BMPs specified in paragraph (c) of this section, prepare the BMP Plan required by paragraph (d) of this section, and certify to the permitting or pretreatment authority that the BMP Plan has been prepared in accordance with this regulation as required by paragraph (f) of this section, except that the action levels required by paragraph (h)(5) of this section must be established not later than 12 months after commencement of discharge, based on six months of monitoring data obtained prior to that date in accordance with the procedures specified in paragraph (h)(2) of this section.

(k) The provisions of paragraphs (c) through (j) of this section do not apply to the bleached papergrade kraft mill, commonly known as the Androscoggin Mill, that is owned by International Paper and located in Jay, Maine. In lieu of imposing the requirements specified in those paragraphs, the permitting authority shall establish conditions for the discharge of COD and color for this mill on the basis of best professional judgment.

[63 FR 18635, Apr. 15, 1998, as amended at 65 FR 46108, July 27, 2000]

Subpart A—Dissolving Kraft Subcategory

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§ 430.10 Applicability; description of the dissolving kraft subcategory.

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The provisions of this subpart apply to discharges resulting from the production of dissolving pulp at kraft mills.

§ 430.11 Specialized definitions.

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Title 40: Protection of Environment

PART 430—THE PULP, PAPER, AND PAPERBOARD POINT SOURCE CATEGORY

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Subpart B—Bleached Papergrade Kraft and Soda Subcategory

§ 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.

§ 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.

§ 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]

	Kg/kkg (or pounds per 1,000 lb) of

Pollutant or pollutant parameter	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]1Within 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.

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[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 average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
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.

§ 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).

§ 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:

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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]

Pullutant 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(i) 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(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 (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]

§ 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

Pollutant or pollutant property	NSPS (TCF)			
	Continuous dischargers		Non-continuous dischargers	
	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(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]

[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 product	Milligrams/liter
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]

§ 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]

	Maximum for any 1 day	

Pollutant or pollutant property	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]

§ 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.		

[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]

§ 430.28 Best management practices (BMPs).

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

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Title 40: Protection of Environment

PART 430—THE PULP, PAPER, AND PAPERBOARD POINT SOURCE CATEGORY

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Subpart C—Unbleached Kraft Subcategory

§ 430.30 Applicability; description of the unbleached kraft subcategory.

The provisions of this subpart are applicable to discharges resulting from: the production of pulp and paper at unbleached kraft mills; the production of pulp and paper at unbleached kraft-neutral sulfite semi-chemical (cross recovery) mills; and the production of pulp and paper at combined unbleached kraft and semi-chemical mills, wherein the spent semi-chemical cooking liquor is burned within the unbleached kraft chemical recovery system.

§ 430.31 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.

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

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 C

[BPT effluent limitations for unbleached kraft facilities]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product	
	Maximum for any 1 day	Average of daily values for 30 consecutive days
BOD5	5.6	2.8
TSS	12.0	6.0
pH	([1])	([1])

[1]Within the range of 6.0 to 9.0 at all times.

Subpart C

[BPT effluent limitations for unbleached kraft facilities producing pulp and paper using the unbleached kraft-neutral sulfite semi-chemical (cross recovery) process]

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

Pollutant or pollutant property	Maximum for any 1 day	Average of daily values for 30 consecutive days
BOD5	8.0	4.0
TSS	12.5	6.25
pH	([1])	([1])

[1]Within the range of 6.0 to 9.0 at all times.

Subpart C

[BPT effluent limitations for unbleached kraft facilities where pulp and paper are produced using a combined unbleached kraft and semi-chemical process, wherein the spent semi-chemical cooking liquor is burned within the unbleached kraft chemical recovery system]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product	
	Maximum for any 1 day	Average of daily values for 30 consecutive days
BOD5	([a])	([a])
TSS	([a])	([a])
pH	([a])	([a])

[a][Reserved]

§ 430.33 Effluent limitations guidelines 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 shall achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology (BCT), 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 C

[BCT effluent limitations for unbleached kraft facilities]

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	5.6	2.8	1.9
TSS	12.0	6.0	3.6
pH	([1])	([1])	([1])

[1]Within the range of 6.0 to 9.0 at all times.

Subpart C

[BCT effluent limitations for unbleached kraft-neutral sulfite semi-chemical (cross recovery) process and/or a combined unbleached kraft and semi-chemical process, wherein the spent semi-chemical

cooking liquor is burned within the unbleached kraft chemical recovery system]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dis-chargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	8.0	4.0	2.9
TSS	12.5	6.25	3.57
pH	([1])	([1])	([1])

[1]Within the range of 6.0 to 9.0 at all times.

§ 430.34 Effluent limitations representing the degree of effluent reduction attainable by the application of the 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 where chlorophenolic-containing biocides are used must achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best available technology economically achievable (BAT). 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. Permittees not using chlorophenolic-containing biocides must certify to the permit-issuing authority that they are not using these biocides:

Subpart C

[BAT effluent limitations for unbleached kraft facilities]

Pollutant or pollutant property	Maximum for any 1 day	
	Kg/kkg (or pounds per 1,000 lb) of product	Milligrams/liter
Pentachlorophenol	0.00058	(0.011)(12.6)/y
Trichlorophenol	0.00053	(0.010)(12.6)/y
y=wastewater discharged in kgal per ton of product.		

Subpart C

[BAT effluent limitations for unbleached kraft facilities where pulp and paper are produced using the unbleached kraft-neutral sulfite semi-chemical (cross recovery) process and/or a combined unbleached kraft and semi-chemical process, wherein the spent semi-chemical cooking liquor is burned within the unbleached kraft chemical recovery system]

Pollutant or pollutant property	Maximum for any 1 day	
	Kg/kkg (or pounds per 1,000 lb) of product	Milligrams/liter
Pentachlorophenol	0.00064	(0.011)(14.0)/y
Trichlorophenol	0.00059	(0.010)(14.0)/y
y=wastewater discharged in kgal per ton of product.		

§ 430.35 New source performance standards (NSPS).

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. Only facilities where chlorophenolic-containing biocides are used shall be subject to pentachlorophenol and trichlorophenol limitations. Permittees not using chlorophenolic-containing biocides must certify to the permit-issuing authority that they are not using these biocides:

Subpart C

[NSPS for unbleached kraft facilities where linerboard is produced]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dis-chargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	3.4	1.8	0.94
TSS	5.8	3.0	1.6
pH	([1])	([1])	([1])

	Maximum for any 1 day	
	Kg/kkg (or pounds per 1,000 lb) of product	Milligrams/liter
Pentachlorophenol	0.00058	(0.015)(9.4)/y
Trichlorophenol	0.00053	(0.013)(9.4)/y
y = wastewater discharged in kgal per ton at all times.		

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

Subpart C

[NSPS for unbleached kraft facilities where bag paper and other mixed products are produced]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dis-chargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	5.0	2.71	1.4
TSS	9.1	4.8	2.5
pH	([1])	([1])	([1])

	Maximum for any 1 day	

	Kg/kkg (or pounds per 1,000 lb) of product	Milligrams/liter
Pentachlorophenol	0.00058	(0.012)(11.4)/y
Trichlorophenol	0.00053	(0.011)(11.4)/y
y = wastewater discharged in kgal per ton at all times.		

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

Subpart C

[NSPS for unbleached kraft facilities where pulp and paper are produced using the unbleached kraft-neutral sulfite semi-chemical (cross recovery) process and/or a combined unbleached kraft and semi-chemical process, wherein the spent semi-chemical cooking liquor is burned within the unbleached kraft chemical recovery system]

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	3.9	2.1	1.1
TSS	7.3	3.8	1.9
pH	([1])	([1])	([1])

	Maximum for any 1 day	
	Kg/kkg (or pounds per 1,000 lb) of product	Milligrams/liter
Pentachlorophenol	0.00064	(0.013)(11.5)/y
Trichlorophenol	0.00059	(0.012)(11.5)/y
y = wastewater discharged in kgal per ton at all times.		

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

§ 430.36 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 achieve the following pretreatment standards for existing sources (PSES) if it uses chlorophenolic-containing biocides. Permittees not using chlorophenolic-containing biocides must certify to the permit-issuing authority that they are not using those biocides. PSES must be attained on or before July 1, 1984:

Subpart C

[PSES for unbleached kraft facilities]

Pollutant or pollutant property	Maximum for any 1 day	
	Milligrams/liter	Kg/kkg (or pounds per 1,000 lb) of product[a]
Pentachlorophenol	(0.011)(12.6)/y	0.00058

Trichlorophenol	(0.010)(12.6)/y	0.00053
y = wastewater discharged in kgal per ton of product.		

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

Subpart C

[PSES for unbleached kraft facilities where pulp and paper are produced using the unbleached kraft-neutral sulfite semi-chemical (cross recovery) process and/or a combined unbleached kraft and semi-chemical process, wherein the spent semi-chemical cooking liquor is burned within the unbleached kraft chemical recovery system]

	Maximum for any 1 day	
Pollutant or pollutant property	**Milligrams/liter**	**Kg/kkg (or pounds per 1,000 lb) of product[a]**
Pentachlorophenol	(0.011)(14.0)/y	0.00064
Trichlorophenol	(0.010)(14.0)/y	0.00059
y = wastewater discharged in kgal per ton of product.		

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

§ 430.37 Pretreatment standards for new sources (PSNS).

(a) 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) if it uses chlorophenolic-containing biocides. Permittees not using chlorophenolic-containing biocides must certify to the permit-issuing authority that they are not using these biocides:

Subpart C

[PSNS for unbleached kraft facilities where linerboard is produced]

	Maximum for any 1 day	
Pollutant or pollutant property	**Milligrams/liter**	**Kg/kkg (or pounds per 1,000 lb) of product[a]**
Pentachlorophenol	(0.015)(9.4)/y	0.00058
Trichlorophenol	(0.013)(9.4)/y	0.00053
y = wastewater discharged in kgal per ton of product.		

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

Subpart C

[PSNS for unbleached kraft facilities where bag paper and other mixed products are produced]

	Maximum for any 1 day	
		Kg/kkg (or pounds per

Pollutant or pollutant property	Milligrams/liter	1,000 lb) of product[a]
Pentachlorophenol	(0.012)(11.4)/y	0.00058
Trichlorophenol	(0.011)(11.4)/y	0.00053
y = wastewater discharged in kgal per ton of product.		

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

Subpart C

[PSNS for unbleached kraft facilities where pulp and paper are produced using the unbleached kraft-neutral sulfite semi-chemical (cross recovery) process and/or a combined unbleached kraft and semi-chemical process, wherein the spent semi-chemical cooking liquor is burned within the unbleached kraft chemical recovery system]

	Maximum for any 1 day	
Pollutant or pollutant property	Milligrams/liter	Kg/kkg (or pounds per 1,000 lb) of product[a]
Pentachlorophenol	(0.013)(11.5)/y	0.00064
Trichlorophenol	(0.012)(11.5)/y	0.00059
y = wastewater discharged in kgal per ton of product.		

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

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Title 40: Protection of Environment

PART 430—THE PULP, PAPER, AND PAPERBOARD POINT SOURCE CATEGORY

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Subpart J—Secondary Fiber Non-Deink Subcategory

§ 430.100 Applicability; description of the secondary fiber non-deink subcategory.

The provisions of this subpart are applicable to discharges resulting from the production of: Paperboard from wastepaper; tissue paper from wastepaper without deinking at secondary fiber mills; molded products from wastepaper without deinking at secondary fiber mills; and builders' paper and roofing felt from wastepaper.

§ 430.101 Specialized definitions.

For the purpose of this subpart:

(a) Except as provided below, 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.

(b) Noncorrugating medium furnish subdivision mills are mills where recycled corrugating medium is not used in the production of paperboard.

(c) Corrugating medium furnish subdivision mills are mills where only recycled corrugating medium is used in the production of paperboard.

§ 430.102 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 J

[BPT effluent limitations for secondary fiber non-deink facilities where paperboard from wastepaper is produced—noncorrugating medium finish subdivision]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product	
	Maximum for any 1 day	Average of daily values for 30 consecutive days
BOD5	3.0	1.5
TSS	5.0	2.5
pH	([1])	([1])

[1]1Within the range of 6.0 to 9.0 at all times.

Subpart J

[BPT effluent limitations for secondary fiber non-deink facilities where paperboard from wastepaper is produced—corrugating medium finish subdivision]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product	
	Maximum for any 1 day	Average of daily values for 30 consecutive days
BOD5	5.7	2.8
TSS	9.2	4.6
pH	([1])	([1])

[1]Within the range of 6.0 to 9.0 at all times.

Subpart J

[BPT effluent limitations for secondary fiber non-deink facilities where builders' paper and roofing felt from wastepaper are produced]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product	
	Maximum for any 1 day	Average of daily values for 30 consecutive days
BOD5	5.0	3.0
TSS	5.0	3.0
pH	([1])	([1])
Setteable Solids	([2])	([2])

[1]Within the range of 6.0 to 9.0 at all times.

[2]Not to exceed 0.2 ml/l.

(b) 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 J

[BPT effluent limitations for secondary fiber non-deink facilities where tissue from wastepaper is produced without deinking]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average days)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	13.7	7.1	4.0
TSS	17.05	9.2	5.1
pH	([1])	([1])	([1])

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

Subpart J

[BPT effluent limitations for secondary fiber non-deink facilities where molded products from wastepaper are produced without deinking]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average days)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	4.4	2.3	1.3
TSS	10.8	5.8	3.2
pH	([1])	([1])	([1])

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

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

(a) 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 §430.102 of this subpart for the best practicable control technology currently available (BPT).

(b) For secondary fiber non-deink facilities where paperboard from wastepaper is produced, 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 determined by dividing the average-of-30-consecutive-days limitations for BOD5 and TSS by 1.77 and 2.18.

(c) For secondary fiber non-deink facilities where builders' paper and roofing felt from wastepaper are produced, 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 determined by dividing the average-of-30-consecutive-days limitations for BOD5 and TSS by 1.90 and 1.90.

§ 430.104 Effluent limitations representing the degree of effluent reduction attainable by the application of the 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 where chlorophenolic-containing biocides are used must achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best available technology economically achievable (BAT). 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. Permittees not using chlorophenolic-containing biocides must certify to the permit-issuing authority that they are not using these biocides:

Subpart J

[BAT effluent limitations for secondary fiber non-deink facilities where paperboard from wastepaper is produced]

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

Pentachlorophenol	0.00087	(0.029)(7.2)/y
Trichlorophenol	0.00030	(0.010)(7.2)/y
y = wastewater discharged in kgal per ton of product.		

Subpart J

[BAT effluent limitations for secondary fiber non-deink facilities where builders' paper and roofing felt from wastepaper are produced]

Pollutant or pollutant property	Maximum for any 1 day	
	Kg/kkg (or pounds per 1,000 lb) of product	Milligrams/liter
Pentachlorophenol	0.0017	(0.029)(14.4)/y
Trichlorophenol	0.00060	(0.010)(14.4)/y
y = wastewater discharged in kgal per ton of product.		

Subpart J

[BAT effluent limitations for secondary fiber non-deink facilities where tissue from wastepaper is produced without deinking]

Pollutant or pollutant property	Maximum for any 1 day	
	Kg/kkg (or pounds per 1,000 lb) of product	Milligrams/liter
Pentachlorophenol	0.0030	(0.029)(25.2)/y
Trichlorophenol	0.0011	(0.010)(25.2)/y
y = wastewater discharged in kgal per ton of product.		

Subpart J

[BAT effluent limitations for secondary fiber non-deink facilities where molded products from wastepaper are produced without deinking]

Pollutant or pollutant property	Maximum for any 1 day	
	Kg/kkg (or pounds per 1,000 lb) of product	Milligrams/liter
Pentachlorophenol	0.0026	(0.029)(21.1)/y
Trichlorophenol	0.00088	(0.010)(21.1)/y
y = wastewater discharged in kgal per ton of product.		

§ 430.105 New source performance standards (NSPS).

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. Only facilities where chlorophenolic-containing biocides are used shall be subject to pentachlorophenol and trichlorophenol limitations. Permittees not using chlorophenolic-containing biocides must certify to the

permit-issuing authority that they are not using these biocides:

Subpart J

[NSPS for secondary fiber non-deink facilities where paperboard from wastepaper is produced—noncorrugating medium furnish subdivision]

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	2.6	1.4	0.73
TSS	3.5	1.8	0.95
pH	([1])	([1])	([1])

	Maximum for any 1 day	
	Kg/kkg (or pounds per 1,000 lb) of product	Milligrams/liter
Pentachlorophenol	0.00087	(0.065)(3.2)/y
Trichlorophenol	0.00030	(0.023)(3.2)/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 J

[NSPS for secondary fiber non-deink facilities where paperboard from wastepaper is produced—corrugating medium finish subdivision]

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	3.9	2.1	1.1
TSS	4.4	2.3	1.2
pH	([1])	([1])	([1])

	Maximum for any 1 day	
	Kg/kkg (or pounds per 1,000 lb) of product	Milligrams/liter
Pentachlorophenol	0.00087	(0.065)(3.2)/y
Trichlorophenol	0.00030	(0.023)(3.2)/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 J

[NSPS for secondary fiber non-deink facilities where builders' paper and roofing felt from wastepaper 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	1.7	0.94	0.49
TSS	2.7	1.40	0.74
pH	([1])	([1])	([1])

	Maximum for any 1 day	
	Kg/kkg (or pounds per 1,000 lb) of product	Milligrams/liter
Pentachlorophenol	0.0017	(0.155)(2.7)/y
Trichlorophenol	0.00060	(0.053)(2.7)/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 J

[NSPS for secondary fiber non-deink facilities where tissue from wastepaper is produced without deinking]

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	10.2	5.3	2.8
pH	([1])	([1])	([1])

	Maximum for any 1 day	
	Kg/kkg (or pounds per 1,000 lb) of product	Milligrams/liter
Pentachlorophenol	0.0030	(0.045)(16.3)/y
Trichlorophenol	0.0011	(0.015)(16.3)/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 J

[NSPS for secondary fiber non-deink facilities where molded products from wastepaper are produced without deinking]

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	2.1	1.1	0.58
TSS	4.4	2.3	1.21
pH	([1])	([1])	([1])

	Maximum for any 1 day	
	Kg/kkg (or pounds per 1,000 lb) of product	Milligrams/liter
Pentachlorophenol	0.0026	(0.107)(5.7)/y
Trichlorophenol	0.00088	(0.037)(5.7)/y
y = wastewater discharged in kgal per ton at all times.		

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

§ 430.106 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 achieve the following pretreatment standards for existing sources (PSES) if it uses chlorophenolic-containing biocides. Permittees not using chlorophenolic-containing biocides must certify to the permit-issuing authority that they are not using these biocides. PSES must be attained on or before July 1, 1984:

Subpart J

[PSES for secondary fiber non-deink facilities where paperboard from wastepaper is produced]

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	(0.032)(7.2)/y	0.00096
Trichlorophenol	(0.010)(7.2)/y	0.00030
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 J

[PSES for secondary fiber non-deink facilities where builders' paper and roofing felt from wastepaper are produced]

	Maximum for any 1 day	
		Kg/kkg (or pounds per

Pollutant or pollutant property	Milligrams/liter (mg/l)	1,000 lb) of product[a]
Pentachlorophenol	(0.032)(14.4)y	0.0019
Trichlorophenol	(0.010)(14.4)y	0.00060
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 J

[PSES for secondary fiber non-deink facilities where tissue from wastepaper is produced without deinking]

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	(0.032)(25.2)y	0.0034
Trichlorophenol	(0.010)(25.2)/y	0.0011
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 J

[PSES for secondary fiber non-deink facilities where molded products from wastepaper are produced without deinking]

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	(0.032)(21.1)y	0.0028
Trichlorophenol	(0.010)(21.1)y	0.00088
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.

§ 430.107 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 achieve the following pretreatment standards for new sources (PSNS) if it uses chlorophenolic-containing biocides. Permittees not using chlorophenolic-containing biocides must certify to the permit-issuing authority that they are not using these biocides:

Subpart J

[PSNS for secondary fiber non-deink facilities where paperboard from wastepaper is produced]

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	(0.072)(3.2)/y	0.00096
Trichlorophenol	(0.023)(3.2)/y	0.00030
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 J

[PSNS for secondary fiber non-deink facilities where builders' paper and roofing felt from wastepaper are produced]

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	(0.171)(2.7)/y	0.0019
Trichlorophenol	(0.053)(2.7)/y	0.00060
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 J

[PSNS for secondary fiber non-deink facilities where tissue from wastepaper is produced without deinking]

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	(0.049)(16.3)/y	0.0034
Trichlorophenol	(0.015)(16.3)/y	0.0011
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 J

[PSNS for secondary fiber non-deink facilities where molded products from wastepaper are produced without deinking]

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	(0.118)(5.7)/y	0.0028
Trichlorophenol	(0.037)(5.7)/y	0.00088
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.

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Attachment 9
Production Data and Analyses

DEQ Production Data Analysis for Effluent Limitation Development

Table 1: 2008 Average Daily Production Distribution

40CFR 430 Subpart	Description	2008 Production (TPD)	Affected Outfall
B	Bleached Papergrade Kraft	495	001
C	Unbleached Kraft	1252	001
J	Secondary Fiber Non-Deink, Corrugating	924	001
J	Secondary Fiber Non-Deink, Non-Corrugating	44	001
Total		**2715**	**001**
Unbleached Pulp to Bleach Plant (2009)		606 UADT / day	101 and 102

UADT = Unbleached Air Dried Tons

Table 2: ELG Based Effluent Limitations at 2008 Average Daily Production Rates - Outfall 001

40CFR reference; Subpart	ELG Limit (lbs/1000 lbs product)				2008 Production (tons/day)	Calculated Limit (lbs/day)			
	Daily Max		**Monthly Average**			**Daily Max**		**Monthly Average**	
	BOD_5	**TSS**	**BOD_5**	**TSS**		**BOD_5**	**TSS**	**BOD_5**	**TSS**
430.22.a; B	13.65	24.0	7.1	12.9	495	13513.5	23760	7029	12771
430.32; C	5.6	12	2.8	6.0	1252	14022.4	30048	7011.2	15024
430.102.a; J[a]	5.7	9.2	2.8	4.6	924	10533.6	17001.6	5174.4	8500.8
430.102.a; J[b]	3.0	5.0	1.5	2.5	44	264	440	132	220
Total					**2715**	**38334**	**71250**	**19347**	**36516**

[1] Categorical limits are based on paperboard production limits in each subpart. Subpart B limitations based on paperboard production with continuous discharge. Subpart C limitations for unbleached kraft facilities with continuous discharge. Subpart J limitations for both secondary fiber non-deink facilities producing both corrugating ([a]) and non-corrugating ([b]) media.

The permittee's production analysis which follows this document identifies 2008 as the maximum production year from 2005 to 2010. This is the baseline production data utilized for limitation development presented in Tables 1 and 2 above. The permittee's production analysis also identifies a recent trend of increased bleached papergrade kraft production which is expected to continue during the reissued permit term. To account for this, the permitee requested effluent limits based on a projected increase of bleached papergrade kraft production, presented in Table 3 below. This proposed scenario includes a 38% increase in the production of bleached kraft compared to the 2008 production numbers above, but a 1% decrease in total production when compared to 2008. Table 4 presents the ELG-based limitations associated with the Projected Production Distribution.

Table 3: Projected Production Distribution

40 CFR 430 Subpart	Description	Projected Production (TPD)	Affected Outfall
B	Bleached Papergrade Kraft	800	001
C	Unbleached Kraft	913	001
J	Secondary Fiber Non-Deink, Corrugating	924	001
J	Secondary Fiber Non-Deink, Non-Corrugating	44	001
Total		**2681**	**001**
Projected Unbleached Pulp to Bleach Plant		889 UADT / day	101 and 102

UADT = Unbleached Air Dried Tons

Table 4: ELG Based Effluent Limitations at Projected Production Rates - Outfall 001

40CFR reference; Subpart	ELG Limit (lbs/1000 lbs product)				Projected Production (tons/day)	Calculated Limit (lbs/day)			
	Daily Max		Monthly Average			Daily Max		Monthly Average	
	BOD_5	**TSS**	**BOD_5**	**TSS**		**BOD_5**	**TSS**	**BOD_5**	**TSS**
430.22.a; B	13.65	24.0	7.1	12.9	800	21840	38400	11360	20640
430.32; C	5.6	12	2.8	6.0	913	10225.6	21912	5112.8	10956
430.102.a; J[a]	5.7	9.2	2.8	4.6	924	10533.6	17001.6	5174.4	8500.8
430.102.a; J[b]	3.0	5.0	1.5	2.5	44	264	440	132	220
Total					**2681**	**42863**	**77754**	**21779**	**40317**

[1] Categorical limits are based on paperboard production limits in each subpart. Subpart B limitations based on paperboard production with continuous discharge excluding the use of wet barking operations, log or chip washing facilities, or log flume/log ponds. Subpart C limitations for unbleached kraft facilities with continuous discharge. Subpart J limitations for both secondary fiber non-deink facilities producing both corrugating ([a]) and non-corrugating ([b]) media.

The significant increase in bleached kraft production from 2008 production data (Tables 1 and 2) to Projected Production Rates (Tables 3 and 4) represents an approximately 11% increase to the associated BOD_5 load and an approximately 9% increase to the TSS load above the limitations based on 2008 production data. The increasing trend in bleached kraft production was confirmed by obtaining 2010 production data which represented a daily average bleached kraft production rate of 594 tons per day compared to a total 2010 facility production average of 2220 tons per day. 2010 production data and associated ELG based limitations are provided in Tables 5 and 6 below.

This trend of increased bleached kraft production compared to decreased total production from 2008 to 2010 appears to be reflected appropriately in the facility's projected production rate. For further comparison, the projected production rate represented in Tables 3 and 4 propose an approximately 20% increase in average BOD load and 19% increase in average TSS load above the loading associated with 2010 production data (Table 6).

Table 5: 2010 Average Daily Production Distribution

40 CFR 430 Subpart	Description	2010 Production (TPD)	Affected Outfall
B	Bleached Papergrade Kraft	594	001
C	Unbleached Kraft	835	001
J	Secondary Fiber Non-Deink, Corrugating	750	001
J	Secondary Fiber Non-Deink, Non-Corrugating	41	001
Total		**2220**	**001**
Unbleached Pulp to Bleach Plant (2009)		660 UADT / day	101 and 102

UADT = Unbleached Air Dried Tons

Table 6: ELG Based Effluent Limitations at 2010 Average Daily Production Rates - Outfall 001

40CFR reference; Subpart	ELG Limit (lbs/1000 lbs product)				2010 Production (tons/day)	Calculated Limit (lbs/day)			
	Daily Max		Monthly Average			Daily Max		Monthly Average	
	BOD_5	**TSS**	**BOD_5**	**TSS**		**BOD_5**	**TSS**	**BOD_5**	**TSS**
430.22.a; B	13.65	24.0	7.1	12.9	594	16216.2	28512	8434.8	15325.2
430.32; C	5.6	12	2.8	6.0	835	9352	20040	4676	10020
430.102.a; J[a]	5.7	9.2	2.8	4.6	750	8550	13800	4200	6900
430.102.a; J[b]	3.0	5.0	1.5	2.5	41	246	410	123	205
Total					**2220**	**34364.2**	**62762**	**17433.8**	**32450.2**

[1] Categorical limits are based on paperboard production limits in each subpart. Subpart B limitations based on paperboard production with continuous discharge. Subpart C limitations for unbleached kraft facilities with continuous discharge. Subpart J limitations for both secondary fiber non-deink facilities producing both corrugating ([a]) and non-corrugating ([b]) media.

Water Guidance Memo No. 10-2003 (GM10-2003) states, "When developing effluent guidelines limits, use the maximum production rate reported on the application or the projected future production rate, whichever is greater. Multiple production tiers could be used to address future

operating projections." While production-based effluent limitations should allow for variation and increase in production, it is not appropriate to select limitations which are either unlikely to be attained or which do not appropriately capture significant changes in production. Significant production changes are best managed through a tiered production rate, established to become effective when a higher production rate is maintained. For additional guidance on establishing production-based limitations and tiers, the 2010 NPDES Permit Writer's Manual states, "Generally, up to a 20 percent fluctuation in production is considered to be within the range of normal variability, while changes in production higher than 20 percent could warrant consideration of tiered limitations."

Because the 2008 production rate represents an approximately 10% increase in average BOD loading and 11% increase in average TSS loading above the most recent 2010 average daily production rates, compared to the facility's projected production rate, which is approximately 20% greater, it appears most appropriate in accordance with GM10-2003 and the NPDES Permit Writer's Manual, to utilize the 2008 production data to calculate baseline effluent limitations.

Table 7: Projected Future Production Rates - Outfall 001

40 CFR 430 Subpart	Description	Projected Future Production (TPD)	Affected Outfall
B	Bleached Papergrade Kraft	950	001
C	Unbleached Kraft	1152	001
J	Secondary Fiber Non-Deink, Corrugating	1021	001
J	Secondary Fiber Non-Deink, Non-Corrugating	54	001
Total		**3177**	**001**
Unbleached Pulp to Bleach Plant		1056 UADT / day	101 and 102

UADT = Unbleached Air Dried Tons

Table 7 is a future production tier proposed by the permitee in Attachment 9. For comparison to historic levels, this is a bleached kraft increase of 37% above the highest recorded annual average daily production for 2010 and a total facility production increase of 15% above the highest historical recorded annual average total daily facility production which occurred in 2008. A review of historical production data from 2005 through 2010 indicated a maximum change in total facility production of only 18% when the maximum production year (2008) is compared to the minimum production year (2010). The proposed future production tier represents a production increase of 30% above the most recent, 2010 facility production. Based on historical production trends and without clear facility changes anticipated to support such a production increase, this scenario appears very unlikely and therefore the permittee's projected future production rate was not used for a production tier limit.

In order to support historical trends and anticipated future growth of up to approximately 20%, a second production tier is best accomplished through application of the facility's proposed "projected production rate" presented in Tables 3 and 4, above. This production tier represents an approximately 20% discharge loading increase above discharges which would be associated with 2010 production rates.

Production-based limitations are most significantly impacted by changes in ELG Category B, bleached kraft production, which has shown and is expected to show the most near-term growth. As a result, the second production tier will become effective when average daily bleached kraft production exceeds 697 machine dried tons (MDT)/day for three consecutive months. 697 MDT/day is a 50% difference between the bleached kraft projected production rate of 800 MDT/day and the most recent production rate of 594 MDT/day identified as the 2010 average daily production rate, representing a 25% bleached kraft production increase.

Three consecutive months are considered sufficient to indicate the maintenance of this production level as historical production data presents gradually moving monthly averages rather than short-term increases or decreases in average monthly bleached kraft production.

Outfall 101

Because internal Outfall 101 effluent limitations are based solely on unbleached pulp production entering the bleach plant, the 2008 production rates upon which Outfall 001 limitations were based is not adequate, in part because unbleached pulp production rates were higher in 2009 and 2010 than they were in 2008.

As presented in the document which follows, prepared by RockTenn, the permitee requested that a single tier of AOX and chloroform limits be calculated based on a projected production rate of unbleached pulp entering the bleach plant of 889 tons/day compared to a maximum observed average daily annual unbleached pulp production rate of 660 tons/day which occurred in 2010. GM 10-2003 states that ELGs are to be developed based on either the maximum production rate reported on the application or the projected future production rate, whichever is greater; however, the EPA NPDES Permit Writer's Manual indicates that production variability higher than 20% could warrant consideration of tiered limits.

The projected rate of 889 tons/day is greater than 20% above the observed production rate, 660 tons/day; therefore, the Outfall 101 effluent limitations are tiered in accordance with a projected production at a 10% increase to the 2010 unbleached pulp production rate, which equals 726 tons per day, followed by a second tier which equals the projected production rate of 889 tons/day, which is the same unbleached kraft production rate associated with the second tier of Outfall 001 effluent limitations. The associated production based limitations and monitoring requirements are presented in Tables 8 and 9 below.

Table 8: Outfall 101 Tier 1 ELG Based Effluent Limitations per 40CFR 430.24.a.1; Subpart B

Constituent	ELG Limit		Production (tons/day)	Calculated Limit	
	Daily Max	Mo Average		Daily Max	Mo Average
Dioxin (2,3,7,8-TCDD)	<ML	NA	--	<10 pg/L	NA
Tetrachlorodibenzo-p-furan (TCDF)	31.9 pg/L	NA	--	31.9 pg/L	NA
Chloroform	6.92 g/kkg	4.14 g/kkg	659 kkg/day 726 tons/day	4560 g/day 10 lb/day	2728 g/day 6.0 lb/day
Trichlorosyringol	<ML	NA	--	<2.5 µg/L	NA
3,4,5-trichlorocatechol	<ML	NA	--	<5.0 µg/L	NA
3,4,6-trichlorocatechol	<ML	NA	--	<5.0 µg/L	NA
3,4,5-trichloroguaiacol	<ML	NA	--	<2.5 µg/L	NA
3,4,6-trichloroguaiacol	<ML	NA	--	<2.5 µg/L	NA
4,5,6-trichloroguaiacol	<ML	NA	--	<2.5 µg/L	NA
2,4,5-trichlorophenol	<ML	NA	--	<2.5 µg/L	NA
2,4,6-trichlorophenol	<ML	NA	--	<2.5 µg/L	NA
Tetrachlorocatechol	<ML	NA	--	<5.0 µg/L	NA
Tetrachloroguaiacol	<ML	NA	--	<5.0 µg/L	NA
2,3,4,6-tetrachlorophenol	<ML	NA	--	<2.5 µg/L	NA
Pentachlorophenol	<ML	NA	--	<5.0 µg/L	NA
AOX[1]	0.951 kg/kkg	0.623 kg/kkg	659 kkg/day 726 tons/day	626 kg/day 1380 lb/day	410 kg/day 903 lb/day

[1] AOX limitations are applied to the end-of-pipe discharge, Outfall 001, per ELGs and GM10-2003.

ML = Less than the minimum level at which the analytical system gives recognizable signals and an acceptable calibration point as specified in 40 CFR 430.01(i) for the particular pollutant. The minimum level is therefore established as the final limitation.

NA = Not Applicable

Table 9: Outfall 101 Tier 2 ELG Based Effluent Limitations per 40CFR 430.24.a.1; Subpart B

Constituent	ELG Limit		Production (tons/day)	Calculated Limit	
	Daily Max	Mo Average		Daily Max	Mo Average
Dioxin (2,3,7,8-TCDD)	<ML	NA	--	<10 pg/L	NA
Tetrachlorodibenzo-p-furan (TCDF)	31.9 pg/L	NA	--	31.9 pg/L	NA
Chloroform	6.92 g/kkg	4.14 g/kkg	806 kkg/day 889 tons/day	5578 g/day 12 lb/day	3337 g/day 7.0 lb/day
Trichlorosyringol	<ML	NA	--	<2.5 µg/L	NA
3,4,5-trichlorocatechol	<ML	NA	--	<5.0 µg/L	NA
3,4,6-trichlorocatechol	<ML	NA	--	<5.0 µg/L	NA
3,4,5-trichloroguaiacol	<ML	NA	--	<2.5 µg/L	NA
3,4,6-trichloroguaiacol	<ML	NA	--	<2.5 µg/L	NA
4,5,6-trichloroguaiacol	<ML	NA	--	<2.5 µg/L	NA
2,4,5-trichlorophenol	<ML	NA	--	<2.5 µg/L	NA
2,4,6-trichlorophenol	<ML	NA	--	<2.5 µg/L	NA
Tetrachlorocatechol	<ML	NA	--	<5.0 µg/L	NA
Tetrachloroguaiacol	<ML	NA	--	<5.0 µg/L	NA
2,3,4,6-tetrachlorophenol	<ML	NA	--	<2.5 µg/L	NA
Pentachlorophenol	<ML	NA	--	<5.0 µg/L	NA
AOX[1]	0.951 kg/kkg	0.623 kg/kkg	806 kkg/day 889 tons/day	766 kg/day 1691 lb/day	502 kg/day 1108 lb/day

[1] AOX limitations are applied to the end-of-pipe discharge, Outfall 001, per ELGs and GM10-2003.

ML = Less than the minimum level at which the analytical system gives recognizable signals and an acceptable calibration point as specified in 40 CFR 430.01(i) for the particular pollutant. The minimum level is therefore established as the final limitation.

NA = Not Applicable

TECHNICAL MEMORANDUM

Form 2C III.C - West Point Mill Production Analysis for NPDES Renewal

PREPARED FOR:	SSCC West Point Mill NPDES Permit Renewal
PREPARED BY:	Niall O'Shaughnessy
COPIES:	Tom Roberts Stan Brewer Eric Schmidt
DATE:	January 27, 2010

Introduction

Smurfit Stone Container Enterprises, Inc owns and operates an integrated pulp and paper mill located in West Point, Virginia. The mill produces unbleached kraft linerboard, white top linerboard and recycled corrugating medium. The mill operates under NPDES Permit No. VA0003115 and is subject to the categorical effluent guidelines under Subparts B (Bleached Papergrade Kraft), C (Unbleached Kraft) and J (Secondary Fiber Non-Deink).

This memo provides an analysis of the production over the past five years and also provides a basis for the inclusion of a tiered permit limit scenario to address a projected production increase at the West Point mill that is currently under evaluation by Smurfit Stone.

It should be noted that the production data for the five year look-back period is not representative of the mill's anticipated production during the term of the new NPDES permit. Specifically, in 2008/2009 SSCC implemented a project to increase production capacity for white top at the mill. However, due to market conditions, the white top production increase has not yet been realized but is anticipated to occur over the next year or so as the economy recovers. The bleach pulp production has already started on an upward trend and this trend is expected to continue. As a result of this situation, SSCC is requesting that the categorical limits provided in the renewed permit reflect the bleach plant capacity of 800 tons/day.

Current Production Assessment

An analysis was conducted of the previous five years of production for each of the three Paper Machines at the West Point Mill in accordance with the requirements for production information required under Item III.C of Form 2C for the NPDES renewal application. The results of this analysis are presented in Table 1. The production provided in Table 1 reflects off-the-machine tons which is consistent with the requirements under 40 CFR 430. Based on this analysis the average daily production for 2008 (2,715 tons/day) represents the maximum rate over the past five years and is based on an average of 331 operating days for the year.

Table 1
Annual Production Analysis
SSCC West Point Mill, West Point, Virginia

	PM1			PM2			PM3				
Year	Production Tons/yr	Operating Days	Production Tons/day	Production Tons/yr	Operating Days	Production Tons/day	Production Tons/yr	Operating Days	Production Tons/day	Total Production Tons/yr	Daily Production Tons/day
2005	160,032	324	494	300,609	338	890	376,146	326	1,155	836,787	2,539
2006	167,477	330	508	301,578	335	899	386,288	339	1,140	855,344	2,547
2007	170,700	334	512	307,186	339	907	400,341	332	1,204	878,227	2,623
2008	182,544	334	547	309,919	332	935	403,645	327	1,233	896,108	2,715
2009	181,424	336	540	312,120	340	919	404,652	329	1,230	898,196	2,690

The distribution of the production tons among the categorical subcategories was assessed based on the proportion of pulp produced under each subcategory. The results are provided in Table 2 below:

Table 2
Existing Production Distribution under 40 CFR 430 Subcategories
Smurfit-Stone West Point Mill, Virginia

Subpart	Description	2008 Production (tons/day)	Affected Outfall
B	Bleached Papergrade Kraft	495	001
C	Unbleached Kraft	1,252	001
J	Secondary Fiber Non-Deink, Corrugating	924	001
J	Secondary Fiber Non-Deink, Non-corrugating	44	001
	Total	**2,715**	**001**
	Unbleached Pulp to Bleach Plant (2009)	606 UADT/day	101 and 102
	Projected Unbleached Pulp to Bleach Plant (based on 800 tons/d of bleached pulp)	889 UADT/day	101 and 102

Table 2 also provides the unbleached pulp production that goes to the first stage of the bleach plant. This production is based on the 2009 bleach plant production of 182,576 ADT/day using 335 average operating days and adjusting the bleached pulp tonnage to reflect a 10 percent shrinkage across the bleach plant. This production is provided for development of AOX and Chloroform limitations. In addition, Table 2 provides the unbleached pulp production associated with the bleach plant capacity of 800 tons/day which the mill expects to utilize in the very near future.

Table 3 provides effluent limit calculations based on the selected existing production numbers from 2008. However, it must be recognized that market conditions in recent years have been lower than would be expected to occur in future years as the economy improves. Over the past several months, the bleached kraft production has started to increase and this trend is anticipated to continue in the future. Table 4 provides the requested effluent limits for inclusion in the renewed permit using the projected 800 tons/day bleached kraft

production. The calculated limits for AOX and Chloroform using the 800 tons/day bleached kraft production (889 UADT/day) are provided in Table 5.

Table 3
2008 NPDES Categorical Permit Limits
SSCC West Point Mill, Virginia

Category	Description	Limit Basis	Categorical Limits (lbs/1,000 lbs) Daily Max BOD_5	Daily Max TSS	Monthly Avg BOD_5	Monthly Avg TSS	2008 Production (Tons/day)	Allowable Limits (ppd) Daily Max BOD_5	Daily Max TSS	Monthly Avg BOD_5	Monthly Avg TSS
Subpart B	Bleached Papergrade Kraft and Soda	BPT	13.65	24	7.1	12.9	495	13,523	23,777	7,034	12,780
Subpart C	Unbleached Kraft	BPT	5.6	12	2.8	6	1,252	14,021	30,045	7,011	15,023
Subpart J	Secondary Fiber Non-Deink Corrugating	BPT	5.7	9.2	2.8	4.6	924	10,533	17,001	5,174	8,500
Subpart J	Secondary Fiber Non-Deink Non-Corrugating	BPT	3	5	1.5	2.5	44	266	443	133	221
Totals							**2,715**	**38,343**	**71,265**	**19,351**	**36,524**

Table 4
NPDES Categorical Permit Limits for Projected Production
SSCC West Point Mill, Virginia

Category	Description	Limit Basis	Categorical Limits (lbs/1,000 lbs) Daily Max BOD_5	Daily Max TSS	Monthly Avg BOD_5	Monthly Avg TSS	Production (Tons/day)	Allowable Limits (ppd) Daily Max BOD_5	Daily Max TSS	Monthly Avg BOD_5	Monthly Avg TSS
Subpart B	Bleached Papergrade Kraft and Soda	BPT	13.65	24	7.1	12.9	800	21,840	38,400	11,360	20,640
Subpart C	Unbleached Kraft	BPT	5.6	12	2.8	6	913	10,226	21,912	5,113	10,956
Subpart J	Secondary Fiber Non-Deink Corrugating	BPT	5.7	9.2	2.8	4.6	924	10,533	17,001	5,174	8,500
Subpart J	Secondary Fiber Non-Deink Non-Corrugating	BPT	3	5	1.5	2.5	44	266	443	133	221
Totals							**2,681**	**42,864**	**77,756**	**21,780**	**40,318**

Table 5
Proposed Permit Limits for AOX & Chloroform at 800 tons/day Bleach Production
Smurfit Stone, West Point Mill, Virginia

Category	Description	Limit Basis	Daily Max Chloroform (g/kkg)	Daily Max AOX (lb/1,000 lbs)	Monthly Avg Chloroform (g/kkg)	Monthly Avg AOX (lb/1,000 lbs)	Unbleached Pulp Production	Daily Max Chloroform (g/day)	Daily Max AOX (lbs/day)	Monthly Avg Chloroform (g/day)	Monthly Avg AOX (lbs/day)
Subpart B	Bleached Papergrade Kraft and Soda	BAT	6.92		4.14		726 kkg/d (=800T/d)	5,024		3,006	
Subpart B	Bleached Papergrade Kraft and Soda	BAT		0.951		0.623	889 tons/d (=806kkg/d)		1,691		1,108

Future Production Assessment

Smurfit-Stone is currently in the process of assessing additional upgrades to increase the mill's production to over a million tons/day. It is projected that this goal will be achieved within the next permit renewal period. The bleach plant production capacity will be increased to approximately 950 tons/day. The anticipated production split by subcategory for the future production scenario is estimated as follows:

Future Scenario – 950 Tons/day Bleach Plant Capacity

Subpart	Description	Production (tons/day)
B	Bleached Papergrade Kraft	950
C	Unbleached Kraft	1152
J	Secondary Fiber Non Deink	1,075

Tables 6 and 7 provide the projected categorical effluent limits for the final scenario of a modified bleach plant to provide 950 tons/day production capacity.

Table 6
NPDES Categorical Permit Limits for Future Production at 950 T/D Bleach Plant
SSCC West Point Mill, Virginia

			Categorical Limits (lbs/1,000 lbs)					Allowable Limits (ppd)			
			Daily Max		Monthly Avg		Production	Daily Max		Monthly Avg	
Category	Description	Limit Basis	BOD_5	TSS	BOD_5	TSS	(Tons/day)	BOD_5	TSS	BOD_5	TSS
Subpart B	Bleached Papergrade Kraft and Soda	BPT	13.65	24	7.1	12.9	950	25,935	45,600	13,490	24,510
Subpart C	Unbleached Kraft	BPT	5.6	12	2.8	6	1,152	12,902	27,648	6,451	13,824
Subpart J	Secondary Fiber Non-Deink Corrugating	BPT	5.7	9.2	2.8	4.6	1,021	11,642	18,791	5,719	9,396
Subpart J	Secondary Fiber Non-Deink Non-Corrugating	BPT	3	5	1.5	2.5	54	323	538	161	269
Totals							**3,177**	**50,802**	**92,577**	**25,821**	**47,998**

Table 7
Proposed Permit Limits for AOX & Chloroform at 950 tons/day Bleached Production
Smurfit Stone, West Point Mill, Virginia

			Daily Max		Monthly Avg			Daily Max		Monthly Avg	
Category	Description	Limit Basis	Chloroform (g/kkg)	AOX (lb/1,000 lbs)	Chloroform (g/kkg)	AOX (lb/1,000 lbs)	Unbleached Pulp Production	Chloroform (g/day)	AOX (lbs/day)	Chloroform (g/day)	AOX (lbs/day)
Subpart B	Bleached Papergrade Kraft and Soda	BAT	6.92		4.14		958 kkg/d	**6,629**		**3,966**	
Subpart B	Bleached Papergrade Kraft and Soda	BAT		0.951		0.623	1,056 tons/d		**2,009**		**1,316**

Note: Production is based on Unbleached pulp entering first stage of bleaching measured in air dry tons (10% moisture)

Ricks, Bradford (DEQ)

From: Hamner, Carole D. [chamner@rocktenn.com]
Sent: Thursday, June 23, 2011 5:06 PM
To: Ricks, Bradford (DEQ)
Cc: Roberts, Tom; O'Shaughnessy, Niall
Subject: West Point Mill Production Numbers and Comments on Draft Fact Sheet

Mr. Ricks,

Attached are revised production numbers for the West Point Mill, as discussed earlier this week. We discovered this week that there was an error in our tracking database, so many of the previous numbers for 2010 and 2011 that we sent to you were not correct. We are very sorry for any inconvenience this may cause you.

I also include some comments on the draft fact sheet you left with us during your visit.

Listed below are the maximum production numbers for the West Point Mill for the year 2010 in terms of machine-dried tons per day:

Bleached paper grade Kraft: 1,110 tons/day

Unbleached Kraft: 1,693 tons/day

Secondary Fiber non-deink: 1,117 tons/day

Corrugating, secondary fiber non-deink: 58 tons/day

Unbleached pulp to bleach plant: 1,220 tons/day

Daily average 2010 production in terms of machine-dried tons per day:

Bleached paper-grade Kraft: 594 tons/day

Unbleached Kraft: 835 tons/day

Secondary Fiber non-deink: 750 tons/day

Corrugating, secondary fiber non-deink: 41 tons/day

Unbleached pulp to bleach plant: 660 tons/day

Bleached Kraft production average monthly for 2010 and 2011 to date:

2010 Month	Bleach Kraft Monthly Average MDT	Yearly Average
Jan-10	446	
Feb-10	508	
Mar-10	622	
Apr-10	466	
May-10	578	
Jun-10	532	
Jul-10	617	
Aug-10	687	
Sep-10	602	
Oct-10	612	

Nov-10	787	
Dec-10	668	
		594
Jan-11	503	
Feb-11	612	
Mar-11	637	
Apr-11	610	
		591

Comments on draft West Point Mill fact sheet:

1-Facility Name: RockTenn West Point Mill

3-The General Manager is now Chris Broome (not Richard Tremblay); phone number 804-843-5650

10-Note that we also may send wastewater treatment plant residuals (sludge) to third-party landfills, not just the RockTenn Mann Landfill.

12-We do not have any underground storage tanks on site.

12-We have a groundwater monitoring program in place regulated by the DEQ tank program.

Stormwater Evaluation, top paragraph of page 13-there are no public supply intakes upstream or downstream of the West Point Mill within 15 miles

We had developed a request for reduced monitoring frequency that was not submitted with our application. I hope to have a revised request sent to you either on Friday or first of next week.

Please let me know if you have questions or comments.

Carole Hamner
Environmental Manager
RockTenn CP, LLC
1901 Main Street, PO Box 100
West Point, VA 23181
Office Phone: 804-843-5270
Cell Phone: 804-921-6433
E-mail: chamner@rocktenn.com

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Attachment 10
Excerpt of York River 303(e) plan & 303(d) listing

TABLE B2 - WASTE LOAD ALLOCATIONS (IN LBS PER DAY)

POINT SOURCE	1977 WASTE LOAD[2]		MAXIMUM[7] DAILY LOAD		RECOMMENDED ALLOCATION			RAW WASTE LOAD AT 1995		REQUIRED & REMOVAL EFFICENCY 1995	
	$CBOD_5$	UBOD[1]	$CBOD_5$	UBOD	$CBOD_5$	UBOD	PERCENT RESERVE	$CBOD_5$	UBOD	$CBOD_5$	UBOD
Gordonsville	145	398	150	412	150	412	0	1950	2730	92	85
Louisa-Mineral	50	108	55	118	55	118	0	850	1150	93	90
Doswell	52	110	862[8]	1407[8]	690[8]	1125[8]	20	1080	1444	85[4]	71
Thornburg	63	150	68	162	68	162	0	1240	1690	94	90
Bowling Green	27	64	29	68	29	68	0	680	926	96	93
Ashland	160	303	235	559	188	447	20	2250	3825	92	88
Hanover (Regional STP)	170	437	280	820	280	820	0	5730	7930	96	90
Chesapeake Corp.	6400	8000	10445[5]	15000[5]	10445[5]	15000[5]	N/A	51700	64630	90	90
West Point	105	380	281[3]	1020	225	814	20	1000	1600	85[4]	66

[1]BOD is Ultimate Biochemical Oxygen Demand. Its concentration is derived by the following: BOD_5 /0.80+ 4.5(TKN)=(UBOD). NOTE: The amount of TKN utilized depends on the location in the basin.

[2]Projected for 1977 based on population projections.

[3]Recommended allocation based on BPCTCA effluent guidelines applied to raw waste loads at 2020.

[4]Minimum removal efficiency.

[5]Allocation based on BPCTCA effluent guidelines; amended by Minute 25, June 3-5, 1979 board meeting.

[7]Assimilative capacity.

[8]Amended by Minute 1, August 17, 1978, board meeting.

Source: Roy F. Weston, Inc.

Attachment 11
Biocides Certification

RockTenn

RECEIVED
JUN 15 2011
PRO

June 8, 2011

Mr. Brad Ricks
VPDES Permit Writer
Piedmont Regional Office
Department of Environmental Quality
4949-A Cox Road
Glen Allen, VA 23060

RE: VPDES Permit No. VA0003115
Renewal Application – Supplemental Information

Dear Mr. Ricks:

Thank you for your request to allow us to submit the following certification as we have in the previous permit renewal to continue without undue limitations or requirements. We overlooked the following statement in submitting the current renewal application, but it is still true.

RockTenn certifies that the West Point Mill is not using pentachlorophenol or trichlorophenol as biocides [40CFR 430.24.d].

The official name of our company is presently RockTenn CP, LLC, however it can be referred to as RockTenn. Under those forms, there is no dash between the two names.

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.

Thank you for your efforts in processing the permit renewal. We look forward to seeing the draft when it is ready. If you have further questions or concerns, please call Tom Roberts at (804) 843-5484 tjrobert@rocktenn.com or Carole Hamner at (804) 843-5270 or chamner@rocktenn.com.

Sincerely,

Chris Broome
General Manager

Cc: Eric Schmidt, Niall O'Shaughnessy, Carole Hamner
File C-03-04-01f
Certified Mail No. 7008 1140 0002 3151 8379

1901 Main Street, P.O. Box 100 • West Point, VA 23181 • Direct: 804-843-5000 • Fax: 804-843-5655

Attachment 12
NPDES Permit Rating Worksheet

NPDES PERMIT RATING WORK SHEET

☐ Regular Addition
☐ DiscretionaryAddition
■ Score change, but no status change
☐ Deletion

NPDES NO. VA0003115

Facility Name: Rock-Tenn C.P. LLC – West Point Mill

City: West Point

Receiving Water: Pamunkey River

Reach Number: NA

Is this facility a steam electric power plant (SIC=4911) with one or more of the following characteristics?
1. Power output 500 MW or greater (not using a cooling pond/lake)
2. A nuclear power plant
3. Cooling water discharge greater than 25% of the receiving stream's 7Q10 flow rate

☐ YES; score is 600 (stop here) ■NO (continue)

Is this permit for a municipal separate storm sewer serving a population greater than 100,000?

☐ YES; score is 700 (stop here)
■ NO (continue)

FACTOR 1: Toxic Pollutant Potential

PCS SIC Code: _____ Primary SIC Code: 2611 Other SIC Codes: 2621, 2631, 2869
Industrial Subcategory Code: 430.B, 430.C, 430.J (Code 000 if no subcategory)
*See Fact Sheet Item 19

Determine the Toxicity potential from Appendix A. Be sure to use the TOTAL toxicity potential column and check one)

Toxicity Group	Code	Points	Toxicity Group	Code	Points	Toxicity Group	Code	Points
☐ No process waste streams	0	0	☐ 3.	3	15	☐ 7.	7	35
☐ 1.	1	5	☐ 4.	4	20	☐ 8.	8	40
☐ 2.	2	10	■ 5.	5	25	☐ 9.	9	45
			☐ 6.	6	30	■ 10.	10	50

Code Number Checked: 10

Total Points Factor 1: 50

FACTOR 2: Flow/Stream Flow Volume (*Complete either Section A or Section B; check only one)*

Section A ■ Wastewater Flow Only Considered

Wastewater Type (See Instructions)		Code	Points
Type I: Flow < 5 MGD	☐	11	0
Flow 5 to 10 MGD	☐	12	10
Flow > 10 to 50 MGD	☐	13	20
Flow > 50 MGD	☐	14	30
Type II: Flow < 1 MGD	☐	21	10
Flow 1 to 5 MGD	☐	22	20
Flow > 5 to 10 MGD	☐	23	30
Flow > 10 MGD	■	24	50
Type III: Flow < 1 MGD	☐	31	0
Flow 1 to 5 MGD	☐	32	10
Flow > 5 to 10 MGD	☐	33	20
Flow > 10 MGD	☐	34	30

Section B ☐ Wastewater and Stream Flow Considered

Wastewater Type (See Instructions)	Percent of instream Wastewater Concentration at Receiving Stream Low Flow		Code	Points
Type I/III:	< 10 %	☐	41	0
	10 % to < 50 %	☐	42	10
	> 50 %	☐	43	20
Type II:	< 10 %	☐	51	0
	10 % to <50 %	☐	52	20
	> 50 %	☐	53	30

Code Checked from Section A or B: 24
Total Points Factor 2: 50

FACTOR 3: Conventional Pollutants

NPDES NO: VA0003115

(only when limited by the permit)

A. Oxygen Demanding Pollutant: (check one) ■ BOD ☐ COD ☐ Other:_____

			Code	*Points*
Permit Limits: (check one)	☐	< 100 lbs/day	1	0
	☐	100 to 1000 lbs/day	2	5
	☐	> 1000 to 3000 lbs/day	3	15
	■	> 3000 lbs/day	4	20

Code Checked: 4

Points Scored: __20___

B. Total Suspended Solids (TSS) Approx. 12 lb/day at Outfall 002 average flow.

			Code	*Points*
Permit Limits: (check one)	☐	< 100 lbs/day	1	0
	☐	100 to 1000 lbs/day	2	5
	☐	> 1000 to 5000 lbs/day	3	15
	■	> 5000 lbs/day	4	20

Code Checked: 4

Points Scored: __20___

C. Nitrogen Pollutant: (check one) ☐ Ammonia ☐ Other: _____

		Nitrogen Equivalent	*Code*	*Points*
Permit Limits: (check one)	☐	< 300 lbs/day	1	0
	☐	300 to 1000 lbs/day	2	5
	☐	> 1000 to 3000 lbs/day	3	15
	☐	> 3000 lbs/day	4	20

Code Checked: Not Limited in Permit

Points Scored: __0___

Total Points Factor 3: __40___

FACTOR 4: Public Health Impact

Is there a public drinking water supply located within 50 miles downstream of the effluent discharge (this includes any body of water to which the receiving water is a tributary)? A public drinking water supply may include infiltration galleries, or other methods of conveyance that ultimately get water from the above referenced supply.

☐ YES (If yes, check toxicity potential number below)

■ NO (If no, go to Factor 5)

Determine the *human health* toxicity potential from Appendix A. Use the same SIC code and subcategory reference as in Factor 1. (Be sure to use the human health toxicity group column ☐ check one below)

Toxicity Group	Code	Points	Toxicity Group	Code	Points	Toxicity Group	Code	Points
☐ No process waste streams	0	0	☐ 3.	3	0	☐ 7.	7	15
☐ 1.	1	0	☐ 4.	4	0	☐ 8.	8	20
☐ 2.	2	0	☐ 5.	5	5	☐ 9.	9	25
			☐ 6.	6	10	☐ 10.	10	30

Code Number Checked: __NA___

Total Points Factor 4: __0___

FACTOR 5: Water Quality Factors

NPDES NO. VA0003115

A. *Is (or will) one or more of the effluent discharge limits based on water quality factors of the receiving stream (rather than technology-based federal effluent guidelines, or technology-based state effluent guidelines), or has a wasteload allocation been assigned to the discharge:*

		Code	Points
■	Yes	1	10
☐	No	2	0

B. *Is the receiving water in compliance with applicable water quality standards for pollutants that are water quality limited in the permit?*

		Code	Points
■	Yes	1	0
☐	No	2	5

C. *Does the effluent discharged from this facility exhibit the reasonable potential to violate water quality standards due to whole effluent toxicity?*

		Code	Points
☐	Yes	1	10
■	No	2	0

Code Number Checked: A 1 B 1 C 2

Points Factor 5: A 10 + B 0 + C 0 = 10 TOTAL

FACTOR 6: Proximity to Near Coastal Waters

A. *Base Score: Enter flow code here (from Factor 2): 24* *Enter the multiplication factor that corresponds to the flow code: 1.00*

Check appropriate facility HPRI Code (from PCS):

	HPRI#	*Code*	*HPRI Score*
☐	1	1	20
☐	2	2	0
■	3	3	30
☐	4	4	0
☐	5	5	20

Flow Code	*Multiplication Factor*
11, 31, or 41	0.00
12, 32, or 42	0.05
13, 33, or 43	0.10
14 or 34	0.15
21 or 51	0.10
22 or 52	0.30
23 or 53	0.60
24	1.00

HPRI code checked: 3

Base Score: (HPRI Score) 30 X (Multiplication Factor) 1.00 = 30 (TOTAL POINTS)

B. *Additional Points ☐ NEP Program*
For a facility that has an HPRI code of 3, does the facility discharge to one of the estuaries enrolled in the National Estuary Protection (NEP) program (see instructions) or the Chesapeake Bay?

		Code	Points
■	Yes	1	10
☐	No	2	0

C. *Additional Points ☐ Great Lakes Area of Concern*
For a facility that has an HPRI code of 5, does the facility discharge any of the pollutants of concern into one of the Great Lakes' 31 areas of concern (see Instructions)

		Code	Points
☐	Yes	1	10
■	No	2	0

Code Number Checked: A 3 B 1 C 2

Points Factor 6: A 30 + B 10 + C 0 = 40 TOTAL

SCORE SUMMARY NPDES NO. VA0003115

Factor	Description	Total Points
1	Toxic Pollutant Potential	50
2	Flows/Streamflow Volume	50
3	Conventional Pollutants	40
4	Public Health Impacts	0
5	Water Quality Factors	10
6	Proximity to Near Coastal Waters	40
	TOTAL (Factors 1 through 6)	190

S1. Is the total score equal to or greater than 80? ■ Yes (Facility is a major) ☐ No

S2. If the answer to the above questions is no, would you like this facility to be discretionary major?

■ No

☐ Yes (Add 500 points to the above score and provide reason below:

Reason:

NEW SCORE: 190

OLD SCORE: 185

Change due to recalculated Factor 6 which did not identify this facility as one discharging to the Chesapeake Bay in the 2005 reissuance (+ 10 points) and a recalculated Factor 5 due to current receiving water compliance with all permit limits (-5 points).

Brad Ricks
Permit Reviewer's Name

(804) 527-5129
Phone Number

6/15/11
Date

Attachment 13
WET data evaluation memo

MEMORANDUM

DEPARTMENT OF ENVIRONMENTAL QUALITY
Piedmont Regional Office

4949-A Cox Road Glen Allen, VA 23060 804/527-5020

SUBJECT: Whole Effluent Toxicity (WET) Test Data Review
TO: Curtis J. Linderman, Water Permit Manager, PRO
FROM: Brad Ricks, PRO
DATE: July 21, 2011; revised November 30, 2011
COPIES: Deborah DeBiasi, CO

Facility Name:	Rock-Tenn C.P. LLC – West Point
Number:	VA0003115
Receiving Stream	Pamunkey River
Facility SIC:	2611, 2621, 2631, 2869
Current Outfall Descriptions:	Outfall 001 – Wastewater Treatment Effluent
Discharge Location Description:	Tidal, Saltwater

FACILITY DESCRIPTION AND PERMIT REQUIREMENTS
The permit for the Rock-Tenn (formerly Smurfit-Stone) West Point Mill is in the process of reissuance. The facility is an integrated pulp and paper mill, producing corrugating medium and linerboard on three paper machines.

There is one permitted process water outfall, Outfall 001, which discharges a maximum 30-day average flow of 20.20 MGD. Contributions to the wastewater treatment facility which discharges to Outfall 001 originate from the boiler kiln, chemical recovery area, wood pulping and washing, pulp bleaching process, coal pile runoff, paper forming and drying, secondary fiber recycling, foul condensate collection, landfill leachate, and vat water from the neighboring West Point Veneer facility.

The permit was reissued on July 28, 2005 and required Whole Effluent Toxicity (WET) testing at Outfall 001 with the following requirements:

- 24-hour time proportioned composite samples
- Annual acute toxicity testing using 48 hour static tests with *Mysidopsis bahia* (now known as *Americamysis bahia)* and *Cyprinodon variegat~~e~~us*.
- Annual chronic toxicity testing using static renewal 7-day survival and growth tests with *Mysidopsis bahia* and *Cyprinodon variegat~~e~~us*.
- Test dilution endpoints included an Acute LC_{50} of 12% equivalent to a TU_a of 8.3 and a chronic NOEC of 2% equivalent to a TU_c of 50.0
- Reports were to be submitted by January 10 of each year beginning with 2006 and ending with 2010.

DATA SUMMARY
Results from the quarterly monitoring for toxicity at Outfall 001 are shown in Table 1 below. All tests were performed in accordance with approved testing techniques and met the specified endpoints.

Table 1: Annual WET Test Results for Outfall 001

Test Period	Test Date	Acute A.b. LC_{50}	Acute C.v. LC_{50}	Acute Survival in 100% Effluent	Chronic A.b. NOEC	Chronic C.v. NOEC	Survival in 100% Effluent	Lab
1st Annual	12/5/05				25% S **12.5% G**		25%	Reed
						100% S **12.5% G**	95%	
	12/7/05	>100%		100%				
			>100%	100%				
2nd Annual	12/12/06				100% S **25% G**		77.5%	Reed
						100% S **50% G**	95%	
	12/13/06	>100%		100%				
			>100%	100%				
3rd Annual	12/11/07				100 % S/G/F		93%	CBI
						100% S/G	100%	
	12/12/07	>100%		100%				
			>100%	100%				
4th Annual	9/9/08				100% S **30% G**		85%	CBI
						100% S/G	98%	
	9/10/08	>100%		100%				
			>100%	100%				
5th Annual	9/29/09				100 % S/G		95%	CBI
						100% S/G	98%	
	9/30/09	>100%		100%				
			>100%	100%				
6th Annual	9/14/09				100% S **30%G**		90%	CBI
						100% S/G	100%	
	9/15/09	>100%		100%				
			>100%	100%				

DMR Summary

Operating Year	DMR Date	*A. bahia*		*C. variegatus*	
		TUa	TUc	TUa	TUc
2005	1/10/2006	<1	8	<1	8
2006	1/10/2007	<1	4	<1	2
2007	1/11/2008	<1	1	<1	1
2008	10/14/2008	<1	1 (3.33)[1]	<1	1
2009	11/12/2009	<1	1	<1	1
2010	10/8/2010	<1	3.33	<1	1

[1]DMR reported A. bahia TUc of 1; however, review of the associated WET analysis indicates an actual value of 3.33.

DISCUSSION AND DATA EVALUATION

The toxicity data was analyzed using the agency established WETLIM10.xls spreadsheet and the

STATS.exe statistical software to determine if there is a need to adjust the acute and chronic endpoints or establish permit limitations for toxicity.

For Outfall 001, acute and chronic dilution ratios of 1:60 are applied based on a mixing study conducted in 1991 and referenced in the Fact Sheet. Note that when "Y" is entered for ''Diffuser/Model Study?'' the plant and receiving stream flow information is not used in the endpoint and limitation evaluation. The plant flow is being included for informational purposes only and is based on previous DMR data. .

Based on results from the WETLIM10 evaluation (attached), the following endpoints will be carried forward from the 2005 Permit to the 2011 reissuance:

- Acute LC_{50} of 12% equivalent to a TU_a of 8.3
- Chronic NOEC of 2% equivalent to a TU_c of 50.0

Based on the results from the WETLIM10 evaluation, the following wasteload allocations were used in the STATS.exe evaluation to determine if a permit limit is needed:

- Acute WLAa = 180
- Chronic WLAc = 60

Using the wasteload allocations calculated in WETLIM10 and the toxicity data reported in toxic units (TU) as shown in the table above, the STAT.exe statistical software program was used to determine if a toxicity limitation may be required for Outfall 001. The results shown below indicate that a limitation is not required. Because these data show greater toxicity, limitation analysis is not required for *Cyprinodon variegates*.

Facility = Rock-Tenn West Point
Chemical = *Americamysis bahia* toxicity
Chronic averaging period = 4
WLAa = 180
WLAc = 60
Q.L. = 1
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 6
Expected Value = 3.44333
Variance = 4.26835
C.V. = 0.6
97th percentile daily values = 8.37906
97th percentile 4 day average = 5.72898
97th percentile 30 day average= 4.15284
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material
The data are: 3.33, 1, 3.33, 1, 4, 8

RECOMMENDATIONS

Continuation of annual chronic toxicity testing is recommended due to evidence of chronic toxicity. Continuation of annual acute toxicity testing does not appear necessary since no toxicity has been shown to either species. The chronic dilution endpoints and species will be unchanged from the 2005 reissuance; however acute testing requirements are removed and permit language is revised. The recommended permit language is provided below:

Whole Effluent Toxicity Testing

a. In accordance with the schedule in Part I.B.7.b below, the permittee shall conduct annual chronic toxicity tests for the duration of the permit. The permittee shall collect 24-hour time proportioned composite samples of final effluent from outfall 001.

(1) The chronic tests to use are:

(a) Chronic Static Renewal 7-Day Survival, Growth, and Fecundity Test with *Americamysis bahia,* and

(b) Chronic Static Renewal 7-Day Survival and Growth Test with *Cyprinodon variegatus.*

These chronic tests shall be conducted in such a manner and at sufficient dilutions (minimum of five dilutions, derived geometrically) to determine the "No Observed Effect Concentration" (NOEC) for survival, growth, or fecundity. Results which cannot be determined (i.e., a "less than" NOEC value) are not acceptable, and a retest will have to be performed within the same compliance period. Express the test NOEC results at TU_c (Chronic Toxic Units), by dividing 100/NOEC for DMR reporting. Report the LC_{50} at 48 hours and the IC_{25} with the NOEC's in the test report.

(2) The permittee may provide additional samples to address data variability. These data shall be reported and may be included in the evaluation of effluent toxicity. Test procedures and reporting shall be in accordance with the WET testing methods cited in 40 CFR 136.3.

(3) The test dilutions should be able to determine compliance with the following endpoints:

(a) Chronic NOEC of 2% equivalent to a TU_c of 50.0.

(4) The test data will be evaluated by for reasonable potential at the conclusion of the test period. The data may be evaluated sooner if requested by the permittee, or if toxicity has been noted. Should evaluation of the data indicate that a limit is needed, a WET limit and compliance schedule will be required and the toxicity tests of 1.a. may be discontinued.

(5) The permit may be modified or revoked and reissued to include pollutant specific limits in lieu of a WET limit should it be demonstrated that toxicity is due to specific parameters. The pollutant specific limits must control the toxicity of the effluent.

b. Reporting Schedule: The permittee shall report the results on the DMR and supply one copy of the toxicity test reports specified in accordance with the following schedule:

Period	Compliance Date	DMR/Report Due Date
1st Annual	By 12/31/2012	1/10/2013
2nd Annual	By 12/31/2013	1/10/2014
3rd Annual	By 12/31/2014	1/10/2015
4th Annual	By 12/31/2015	1/10/2016
5th Annual	By 12/31/2016	1/10/2017

Virginia DEQ
Deborah L. DeBiasi
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Spreadsheet for determination of WET test endpoints or WET limits

Excel 97
Revision Date: 01/10/05
File: WETLIM10.xls
(MIX.EXE required also)

Acute Endpoint/Permit Limit — **Use as LC_{50} in Special Condition, as TUa on DMR**

ACUTE	8.775448104	TUa	LC_{50} =	12	% Use as	8.33	TUa

ACUTE WLAa 18

Note: Inform the permittee that if the mean of the data exceeds this TUa: 2.46566726 a limit may result using WLA.EXE

Chronic Endpoint/Permit Limit — **Use as NOEC in Special Condition, as TUc on DMR**

CHRONIC	87.75448104	TU_c	NOEC =	2	% Use as	50.00	TU_c
BOTH*	180.0000044	TU_c	NOEC =	1	% Use as	100.00	TU_c
AML	87.75448104	TU_c	NOEC =	2	% Use as	50.00	TU_c

ACUTE WLAa,c 180
CHRONIC WLAc 60
* Both means acute expressed as chronic

Note: Inform the permittee that if the mean of the data exceeds this TUc: 36.0622363 a limit may result using WLA.EXE

Enter data in the cells with blue type:

Entry Date:	08/14/12	
Facility Name:	Rock Tenn West Point	
VPDES Number:	VA0003115	
Outfall Number:	1	
Plant Flow:	21.4	MGD
Acute 1Q10:		MGD
Chronic 7Q10:		MGD

% Flow to be used from MIX.EXE

%
%

Difuser /modeling study?

Enter Y/N Y
Acute 60 :1
Chronic 60 :1

Are data available to calculate CV? (Y/N) N (Minimum of 10 data points, same species, needed) Go to Page 2
Are data available to calculate ACR? (Y/N) N (NOEC<LC50, do not use greater/less than data) Go to Page 3

IWC_a	1.666666667	%	Plant flow/plant flow + 1Q10
IWC_c	1.666666667	%	Plant flow/plant flow + 7Q10

NOTE: If the IWCa is >33%, specify the NOAEC = 100% test/endpoint for use

Dilution, acute	60	100/IWCa
Dilution, chronic	60	100/IWCc
WLA_a	18	Instream criterion (0.3 TUa) X's Dilution, acute
WLA_c	60	Instream criterion (1.0 TUc) X's Dilution, chronic
$WLA_{a,c}$	180	ACR X's WLA_a - converts acute WLA to chronic units
ACR -acute/chronic ratio	10	LC50/NOEC (Default is 10 - if data are available, use tables Page 3)
CV-Coefficient of variation	0.6	Default of 0.6 - if data are available, use tables Page 2)
Constants eA	0.4109447	Default = 0.41
eB	0.6010373	Default = 0.60
eC	2.4334175	Default = 2.43
eD	2.4334175	Default = 2.43 (1 samp) No. of samples 1

****The Maximum Daily Limit is calculated from the lowest LTA, X's eC. The LTAa,c and MDL using it are driven by the ACR.**

$LTA_{a,c}$	73.970046	WLAa,c X's eA						
LTA_c	36.062238	WLAc X's eB				Rounded NOEC's		%
MDL** with $LTA_{a,c}$	180.0000044	TU_c	NOEC =	0.555556	(Protects from acute/chronic toxicity)	NOEC =	1	%
MDL** with LTA_c	87.75448104	TU_c	NOEC =	1.139543	(Protects from chronic toxicity)	NOEC =	2	%
AML with lowest LTA	87.75448104	TU_c	NOEC =	1.139543	Lowest LTA X's eD	NOEC =	2	

IF ONLY ACUTE ENDPOINT/LIMIT IS NEEDED, CONVERT MDL FROM TU_c to TU_a

						Rounded LC50's	%
MDL with $LTA_{a,c}$	18.00000044	TU_a	LC50 =	5.555555	%	LC50 = 6	%
MDL with LTA_c	8.775448104	TU_a	LC50 =	11.395429	%	LC50 = 12	

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Page 2 - Follow the directions to develop a site specific CV (coefficient of variation)

IF YOU HAVE AT LEAST 10 DATA POINTS THAT ARE QUANTIFIABLE (NOT "<" OR ">") FOR A SPECIES, ENTER THE DATA IN EITHER COLUMN "G" (VERTEBRATE) OR COLUMN "J" (INVERTEBRATE). THE 'CV' WILL BE PICKED UP FOR THE CALCULATIONS BELOW. THE DEFAULT VALUES FOR eA, eB, AND eC WILL CHANGE IF THE 'CV' IS ANYTHING OTHER THAN 0.6.

	Vertebrate IC_{25} Data or LC_{50} Data	LN of data	Invertebrate IC_{25} Data or LC_{50} Data	LN of data
	**********		**********	
1			1	0
2			2	
3			3	
4			4	
5			5	
6			6	
7			7	
8			8	
9			9	
10			10	
11			11	
12			12	
13			13	
14			14	
15			15	
16			16	
17			17	
18			18	
19			19	
20			20	

Coefficient of Variation for effluent tests

CV = 0.6 (Default 0.6)

δ^2 = 0.3074847

δ = 0.554513029

Using the log variance to develop eA
(P. 100, step 2a of TSD)

Z = 1.881 (97% probability stat from table

A = -0.88929666

eA = 0.410944686

Using the log variance to develop eB
(P. 100, step 2b of TSD)

δ_4^2 = 0.086177696

δ_4 = 0.293560379

B = -0.50909823

eB = 0.601037335

St Dev	NEED DATA	NEED DATA	St Dev	NEED DATA	NEED DATA
Mean	0	0	Mean	0	0
Variance	0	0.000000	Variance	0	0.000000
CV	0		CV	0	

Using the log variance to develop eC
(P. 100, step 4a of TSD)

δ^2 = 0.3074847

δ = 0.554513029

C = 0.889296658

eC = 2.433417525

Using the log variance to develop eD
(P. 100, step 4b of TSD)

n = 1 This number will most likely stay as "1", for 1 sample/month.

δ_n^2 = 0.3074847

δ_n = 0.554513029

D = 0.889296658

eD = 2.433417525

Virginia DEQ
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Page 3 - Follow directions to develop a site specific ACR (Acute to Chronic Ratio)

To determine Acute/Chronic Ratio (ACR), insert usable data below. Usable data is defined as valid paired test results, acute and chronic, tested at the same temperature, same species. The chronic NOEC must be less than the acute LC_{50}, since the ACR divides the LC_{50} by the NOEC. LC_{50}'s >100% should not be used.

Table 1. ACR using Vertebrate data

Set #	LC_{50}	NOEC	Test ACR	Logarithm	Geomean	Antilog	ACR to Use
1	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
2	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
3	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
4	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
5	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
6	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
7	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
8	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
9	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
10	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
				ACR for vertebrate data:			0

Table 1. Result:	Vertebrate ACR	0
Table 2. Result:	Invertebrate ACR	0
	Lowest ACR	Default to 10

Table 2. ACR using Invertebrate data

Set #	LC_{50}	NOEC	Test ACR	Logarithm	Geomean	Antilog	ACR to Use
1	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
2	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
3	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
4	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
5	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
6	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
7	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
8	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
9	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
10	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
				ACR for vertebrate data:			0

Convert LC_{50}'s and NOEC's to Chronic TU's
for use in WLA.EXE

Table 3. **ACR used:** **10**

	Enter LC_{50}	TUc	Enter NOEC	TUc
1		NO DATA		NO DATA
2		NO DATA		NO DATA
3		NO DATA		NO DATA
4		NO DATA		NO DATA
5		NO DATA		NO DATA
6		NO DATA		NO DATA
7		NO DATA		NO DATA
8		NO DATA		NO DATA
9		NO DATA		NO DATA
10		NO DATA		NO DATA
11		NO DATA		NO DATA
12		NO DATA		NO DATA
13		NO DATA		NO DATA
14		NO DATA		NO DATA
15		NO DATA		NO DATA
16		NO DATA		NO DATA
17		NO DATA		NO DATA
18		NO DATA		NO DATA
19		NO DATA		NO DATA
20		NO DATA		NO DATA

If WLA.EXE determines that an acute limit is needed, you need to convert the TUc answer you get to TUa and then an LC50,

enter it here:	NO DATA	$\%LC_{50}$
	NO DATA	TUa

DILUTION SERIES TO RECOMMEND

Table 4.

	Monitoring		Limit	
	% Effluent	TUc	% Effluent	TUc
Dilution series based on data mean	2.8	36.062236		
Dilution series to use for limit			2	50
Dilution factor to recommend:	0.1665228		0.1414214	
Dilution series to recommend:	100.0	1.00	100.0	1.00
	16.7	6.01	14.1	7.07
	2.8	36.06	2.0	50.00
	0.5	216.56	0.3	353.55
	0.08	1300.48	0.0	2500.00
Extra dilutions if needed	0.01	7809.65	0.0	17677.67
	0.00	46898.39	0.0	125000.00

Virginia DEQ
Deborah L. DeBiasi
804-698-4028 dldebiasi@deq.virginia.gov

Cell: I9
Comment:
This is assuming that the data are Type 2 data (none of the data in the data set are censored - "<" or ">").

Cell: K18
Comment: This is assuming that the data are Type 2 data (none of the data in the data set are censored - "<" or ">").

Cell: J22
Comment: Remember to change the "N" to "Y" if you have ratios entered, otherwise, they won't be used in the calculations.

Cell: C40
Comment:
If you have entered data to calculate an ACR on page 3, and this is still defaulted to "10", make sure you have selected "Y" in cell E21

Cell: C41
Comment: If you have entered data to calculate an effluent specific CV on page 2, and this is still defaulted to "0.6", make sure you have selected "Y" in cell E20

Cell: L48
Comment:
See Row 151 for the appropriate dilution series to use for these NOEC's

Cell: G62
Comment:
Vertebrates are:
Pimephales promelas
Oncorhynchus mykiss
Cyprinodon variegatus

Cell: J62
Comment:
Invertebrates are:
Ceriodaphnia dubia
Mysidopsis bahia

Cell: C117
Comment: Vertebrates are:

Pimephales promelas
Cyprinodon variegatus

Cell: M119
Comment: The ACR has been picked up from cell C34 on Page 1. If you have paired data to calculate an ACR, enter it in the tables to the left, and make sure you have a "Y" in cell E21 on Page 1. Otherwise, the default of 10 will be used to convert your acute data.

Cell: M121
Comment: If you are only concerned with acute data, you can enter it in the NOEC column for conversion and the number calculated will be equivalent to the TUa. The calculation is the same: 100/NOEC = TUc or 100/LC50 = TUa.

Cell: C138
Comment: Invertebrates are:

Ceriodaphnia dubia
Mysidopsis bahia

Attachment 14
Response to Owner Review

COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY
PIEDMONT REGIONAL OFFICE
4949A Cox Road, Glen Allen, Virginia 23060
(804) 527-5020 Fax (804) 527-5106
www.deq.virginia.gov

Douglas W. Domenech
Secretary of Natural Resources

David K. Paylor
Director

Michael P. Murphy
Regional Director

February 6, 2013

Mr. Chris Broome
General Manager
RockTenn CP, LLC West Point Mill
1901 Main St
West Point, VA 23181

Re: VPDES Permit VA0003115, Draft Permit Review

Dear Mr. Broome:

Thank you for your comments on the draft VPDES permit for your facility, received on February 4, 2013. I have summarized your comments below in italics, followed by our response.

1. *Part I.A.2.a: Request to use calculated TSS limit of 40,317 lb/day vs. draft permit limitation of 39,000 lb/day.*

   As indicated in the discussion on page 10 of the fact sheet, the permit includes a TSS limitation of 39,000 lb/day in order to conform to the individual wasteload allocation given to the RockTenn CL, LLC West Point Mill in the Chesapeake Bay TMDL as approved by EPA on 12/29/2010. VPDES permits issued by this agency cannot authorize the discharge of pollutants in excess of that which is authorized through any approved TMDL; therefore, the TSS allocation cannot be increased. The actual TMDL for this facility is 39,367 lb/day; however, this is rounded to 2 significant figures in accordance with agency protocol (Guidance Memo GM06-2016).

2. *Part I.A.2.a: Request for the AOX limitation to be based on the same production rate of 800 ADBT/day upon which BOD_5 and TSS limits were calculated; this equals 889 ADUBT/day entering the bleach plant which should therefore be applied to the AOX limit calculation.*

   Unlike the tiered calculations applied to Outfall 001; where the 1st tier is based on the maximum observed production rate and the 2nd tier is based on a projected production rate; the limitations applied to AOX at Outfall 001 and to chloroform at Outfall 101, are based solely on a projected production rate which is 10% higher than that which has been observed. Because RockTenn anticipates production rates in excess of this projected production rate, a 2nd tier is appropriate.

Because the proposed 2nd tier is based on the same bleached kraft production rate used to calculate Outfall 001 limitations, it is necessary for the sake of consistency with the AOX and chloroform limitations applied to separate outfalls, for a single production rate trigger to move both Outfalls 001 and 101 from the 1st to 2nd tier. The average production rate of 697 MDT/day of bleached kraft over 3 consecutive months is the most applicable production rate trigger for this purpose. The permit and fact sheet have been revised accordingly.

3. *Part I.A.3.a: Request that tiered chloroform limits be applied to Outfall 101.*

   Revised; see response to item 2, above.

4. *Part I.A: Request to modify BOD_5, AOX, and chloroform monitoring frequencies per EPA Guidance, "Reduced Monitoring Requirements for Pulp and Paper Mills…"*

   DEQ maintains similar agency guidance, applicable to facilities permitted within the Commonwealth, specified in DEQ Guidance Memo No. 10-2003, section IN-2, part D.5. This guidance provides the same reductions proposed in Table 2 of your request. The one requirement which prevents these reductions from being applied states, "To qualify for consideration of reduced monitoring requirements, the facility should not have been issued any Warning Letters, Notices of Violation, or Notices of Unsatisfactory Laboratory Evaluation, or be under any Consent Orders, Consent Decrees, Executive Compliance Agreements, or related enforcement documents during the past three years." Because a VPDES Notice of Violation was issued to the West Point Mill on 2/8/2011, reduced monitoring cannot currently be provided.

5. *Part I.D.4: Request to remove benchmark parameters COD, TSS, and TN as these are not included in Industrial Sector B (Paperboard Mills). Proposal to incorporate COD, TSS, and TN as targets in the mill's SWPPP.*

   The inclusion of parameters associated with the industrial sectors identified in the General VPDES Permit for Discharges of Storm Water Associated with Industrial Activity (ISWGP) is recommended for individual permits. The issuance of an individual permit also provides for a degree of assessment, evaluation, and site-specific permitting which is not available under a general permit. ISWGP sectors identify the parameters which are expected to be present in facility effluent, potentially at or above benchmark levels; however, this individual permit evaluation also identified parameters in stormwater which, though not identified in Sector B as expected to be of concern at a paperboard mill, nonetheless are present at concentrations of concern. When parameters are not expected to be present in an industrial sector's effluent, but monitoring identifies their presence above benchmark concentrations, an individual permit affords the opportunity to require the pollutants to be managed through the facility's SWPPP. Please note that benchmark parameters are not effluent limitations and do not require DMR reporting.

A revised permit and fact sheet is attached in response to items 2 and 3 above. If you have any questions or further comments, please feel free to call me at (804) 527-5129 or by email at bradford.ricks@deq.virginia.gov.

Sincerely,

Brad Ricks
Water Permit Writer

Enclosure

Attachment 15
Response to Public Comment

MEMORANDUM

DEPARTMENT OF ENVIRONMENTAL QUALITY
Piedmont Regional Office

4949-A Cox Road, Glen Allen, VA 23060-6296 **804/527-5020**

TO: Stan Brewer; File

FROM: Brad Ricks, Water Permit Writer

DATE: April 29, 2013

SUBJECT: Response to Comments Received During Public Comment Period
VPDES Permit No. VA0003115, issued to Rock-Tenn CP, LLC
Rock-Tenn West Point Mill, West Point, VA

Section 9 VAC 25-31-290 of the VPDES permit regulation requires that public notice allowing a comment period of at least 30 days be given when a draft permit has been prepared. Section 9 VAC 25-31-300 allows any interested person to submit written comments on the draft permit and may request a public hearing; all such comments shall be considered in making the final decision to issue the permit. A response to significant comments received during the public comment period must be provided.

On March 27, 2013 and April 3, 2013, the Tidewater Review published the public notice that draft VPDES permit for the Rock-Tenn West Point Mill (VA0003115) was available for public review and comment. The comment period ended at 11:59 pm on April 26, 2013. During the 30 day public comment period, comments were received from one West Point citizen on April 4, 2013, including a request for public hearing, with additional comments received from the same citizen on April 23, 2013.

A summary of the comments received are enumerated below with DEQ Piedmont Regional Office responses provided *in italics*.

1. Request for a public hearing for the following reasons:
    a. The 5-year permit has extended well past the original permit expiration date, during which time the permit should have changed to better protect the environment, community, and people in the estuary; and
    b. The community has the right to hear the details of the new permit and how it will improve the environment after extending the old permit well beyond its expiration date.

Response: Section 62.1-44.15:02 of the Code of Virginia states that a public hearing shall be granted if the Director finds that there is significant public interest in the permit in question as evidenced by receipt of a minimum of 25 individual requests for a public hearing; that substantial, disputed, and relevant issues are raised; and that the action requested is not inconsistent with or in violation of applicable laws or regulations. Because the office received one request for public hearing, this office has determined that a hearing is not appropriate at this time.

Although the permit expired on July 27, 2010, the permit was administratively continued as provided by 9VAC25-31-70 of the VPDES Permit Regulation following receipt of a timely and complete permit application, with expiration being no fault of the permittee. When this provision of the regulation is enacted, permit reissuance is not required at the permit expiration date.

The community does have the right, and the ability to know the details of the proposed permit as provided for by the public notice published in the Tidewater Review allowing for draft permit document review and public comment.

2. Concerns related to proximity to and/or contact with facility effluent:
    a. Citizen lives on the Mattaponi River and spends significant time on Mattaponi, Pamunkey, and York Rivers for recreational purposes;
    b. Wants to be sure the reissued permit requires continual improvement;
    c. Concern that the reissued permit may also extend beyond 5 years;

Response: 9VAC25-31-210, 9VAC25-310-220, and 9VAC25-31-230 provide extensive requirements for all permits to meet state and federal laws and regulations established for the protection of human health and the environment. This permit is prepared to meet these requirements, including effluent limitations and permit conditions designed to protect the receiving waters and the recreational use of them.

Because permits are written to maintain existing water quality standards and effluent limitation guidelines established by state and federal regulation, continual improvement is typically provided when the overriding regulations which the permit is prepared to be in compliance with, become more stringent. Permits are reissued in order to capture changes in regulation and changes in assessments of the receiving water; but are not otherwise reissued for the purpose of becoming more stringent. Changes made in this permit are summarized in section 21 of the Fact Sheet provided to you by email dated April 5, 2013. Certain continual review and, as needed, improvement is required by the Best Management Practices (BMPs) and the Storm Water Pollution Prevention Plan (SWPPP) required by Parts I.C and I.D of the draft 2013 permit.

Although it is our goal to reissue permits by or before the expiration date, administrative continuance of expired permits is provided by regulation when such delay is no fault of the permittee.

3. Concerns regarding water use:
    a. Mill and municipality use of water may lower water tables and encourage saltwater intrusion;
    b. The "old" permit had a section on water reduction through a water reduction plan; citizen would like to see the results of this section on water reuse and effluent volume.

The VPDES permitting program regulates discharges to waters of the commonwealth and has no authority to limit water removal rates. Concerns regarding groundwater withdrawal can be directed to DEQ's Groundwater Withdrawal Permitting Program administered through the DEQ Central Office, (804)698-4000.

The outcomes of any permit requirement may be obtained by reviewing Department compliance files associated with this permitted facility through the Freedom of Information Act (FOIA) process. Piedmont Regional Office files may be reviewed after submitting a FOIA request by email to PROFOIA@deq.virginia.gov or by calling the regional office at (804)527-5020.

4. Additional Interest in Permit content and Permit compliance:
    a. Interested to see changes in the new permit to effect continual improvement;
    b. Unsure if Rock-Tenn is doing a good job of meeting requirements of the 2005 permit;
    c. Wants to see how many requirements of the previous (2005) permit were met;
    d. Interested in the testing required to meet new permit requirements;
    e. Requests a copy of the proposed permit and 2005 permit.

Response: The draft permit and fact sheet were provided by email on April 5, 2013 in response to this request. No specific questions or comments were received regarding the contents of the draft permit documents; therefore, it must be assumed that the requests and concerns identified herein were satisfactorily met.

As indicated above, facility compliance with permit requirements is managed by a separate division of this office and the public is welcome to review all compliance files through the FOIA process identified above.