



Department of
Environmental
Conservation

State Pollutant Discharge Elimination System (SPDES) DISCHARGE PERMIT

SIC Code:	4952	NAICS Code:	221320	SPDES Number:	NY0020958
Discharge Class (CL):	05	DEC Number:	7-5030-00002/00001		
Toxic Class (TX):	T	Effective Date (EDP):	EDP		
Major-Sub Drainage Basin:	07 - 05	Expiration Date (ExDP):	ExDP		
Water Index Number:	O-66-12-P296	Item No.:	898 - 228	Modification Dates (EDPM):	
Compact Area:	IJC				

This SPDES permit is issued in compliance with Title 8 of Article 17 of the Environmental Conservation Law of New York State and in compliance with the Clean Water Act, as amended, (33 U.S.C. '1251 et.seq.)

PERMITTEE NAME AND ADDRESS					
Name:	Village of Cayuga Heights	Attention:	Linda Woodard, Mayor		
Street:	836 Hanshaw Road				
City:	Ithaca	State:	NY	Zip Code:	14850
Email:	lwoodard@cayugaheights.gov	Phone:	(607) 257-1238		

is authorized to discharge from the facility described below:

FACILITY NAME, ADDRESS, AND PRIMARY OUTFALL									
Name:	Village of Cayuga Heights Wastewater Treatment Plant								
Address / Location:	951 East Shore Drive / Cayuga Heights (V)					County:	Tompkins		
City:	Ithaca				State:	NY	Zip Code:	14850	
Facility Location:	Latitude:	42 °	28 '	09 " N	& Longitude:	76 °	30 '	08 " W	
Primary Outfall No.:	001	Latitude:	42 °	28 '	12 " N	& Longitude:	76 °	30 '	36 " W
Outfall Description:	Treated Sanitary	Receiving Water:	Cayuga Lake			Class:	A	Standard:	A

in accordance with: effluent limitations; monitoring and reporting requirements; other provisions and conditions set forth in this permit; and 6 NYCRR Part 750-1 and 750-2.

This permit and the authorization to discharge shall expire on midnight of the expiration date shown above and the permittee shall not discharge after the expiration date unless this permit has been renewed or extended pursuant to law. To be authorized to discharge beyond the expiration date, the permittee shall apply for permit renewal not less than 180 days prior to the expiration date shown above.

DISTRIBUTION:

BWP Permit Coordinator (permit.coordinator@dec.ny.gov)

BWP Permit Writer

RWE

RPA

EPA Region II (Region2_NPDES@epa.gov)

NYSEFC (sara.tully@efc.ny.gov)

County DOH

Permit Administrator:	
Address:	625 Broadway Albany, NY 12233-1750
Signature	Date

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DEFINITIONS

TERM	DEFINITION
7-Day Geo Mean	The highest allowable geometric mean of daily discharges over a calendar week.
7-Day Average	The average of all daily discharges for each 7-days in the monitoring period. The sample measurement is the highest of the 7-day averages calculated for the monitoring period.
12-Month Rolling Average (12 MRA)	The current monthly value of a parameter, plus the sum of the monthly values over the previous 11 months for that parameter, divided by the number of months for which samples were collected in the 12-month period.
30-Day Geometric Mean	The highest allowable geometric mean of daily discharges over a calendar month, calculated as the antilog of: the sum of the log of each of the daily discharges measured during a calendar month divided by the number of daily discharges measured during that month.
Action Level	Action level means a monitoring requirement characterized by a numerical value that, when exceeded, triggers additional permittee actions and DEC review to determine if numerical effluent limitations should be imposed.
Compliance Level / Minimum Level	A compliance level is an effluent limitation. A compliance level is given when the water quality evaluation specifies a Water Quality Based Effluent Limit (WQBEL) below the Minimum Level. The compliance level shall be set at the Minimum Level (ML) for the most sensitive analytical method as given in 40 CFR Part 136, or otherwise accepted by the DEC.
Daily Discharge	The discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for the purposes of sampling. For pollutants expressed in units of mass, the 'daily discharge' is calculated as the total mass of the pollutant discharged over the day. For pollutants with limitations expressed in other units of measurement, the 'daily discharge' is calculated as the average measurement of the pollutant over the day.
Daily Maximum	The highest allowable Daily Discharge.
Daily Minimum	The lowest allowable Daily Discharge.
Effective Date of Permit (EDP or EDPM)	The date this permit is in effect.
Effluent Limitations	Effluent limitation means any restriction on quantities, quality, rates and concentrations of chemical, physical, biological, and other constituents of effluents that are discharged into waters of the state.
Expiration Date of Permit (ExDP)	The date this permit is no longer in effect.
Instantaneous Maximum	The maximum level that may not be exceeded at any instant in time.
Instantaneous Minimum	The minimum level that must be maintained at all instants in time.
Monthly Average	The highest allowable average of daily discharges over a calendar month, calculated as the sum of each of the daily discharges measured during a calendar month divided by the number of daily discharges measured during that month.
Outfall	The terminus of a sewer system, or the point of emergence of any waterborne sewage, industrial waste or other wastes or the effluent therefrom, into the waters of the State.
Range	The minimum and maximum instantaneous measurements for the reporting period must remain between the two values shown.
Receiving Water	The classified waters of the state to which the listed outfall discharges.
Sample Frequency / Sample Type / Units	See NYSDEC's "DMR Manual for Completing the Discharge Monitoring Report for the SPDES" for information on sample frequency, type and units.

PERMIT LIMITS, LEVELS AND MONITORING

OUTFALL	LIMITATIONS APPLY	RECEIVING WATER	EFFECTIVE	EXPIRING
001	All year unless otherwise noted	Cayuga Lake	EDP	ExDP

PARAMETER	EFFLUENT LIMITATION					MONITORING REQUIREMENTS				FN
	Type	Limit	Units	Limit	Units	Sample Frequency	Sample Type	Location		
								Inf.	Eff.	
Flow	Monthly Average	2.0	MGD			Continuous	Recorder		X	
pH	Daily Minimum	6.0	SU			2/day	Grab		X	
	Daily Maximum	9.0	SU							
Temperature	Daily Maximum	Monitor	°C			2/day	Grab		X	
BOD ₅	Monthly Average	30	mg/L	500	lb/d	1/week	24-hr. Comp.	X	X	1
	7-Day Average	45	mg/L	750	lb/d	1/week	24-hr. Comp.		X	
Total Suspended Solids (TSS)	Monthly Average	30	mg/L	500	lb/d	1/week	24-hr. Comp.	X	X	1
	7-Day Average	45	mg/L	750	lb/d	1/week	24-hr. Comp.		X	
Settleable Solids	Daily Maximum	0.1	mL/L			2/day	Grab		X	
Ammonia (as N)	Monthly Average	Monitor	mg/L			1/month	24-hr. Comp.		X	
Total Phosphorus (as P)	Monthly Average	0.35	mg/L	5.84	lb/d	1/week	24-hr. Comp.		X	
Total Mercury	Daily Maximum	25	ng/L			1/month	Grab		X	2
Biennial Pollutant Scan						1/Two Years	-		X	3

EFFLUENT DISINFECTION		Limit	Units	Limit	Units	Sample Frequency	Sample Type	Inf.	Eff.	FN
Required All Year										
Coliform, Fecal	30-Day Geometric Mean	200	No./100 mL			1/week	Grab		X	
	7-Day Geometric Mean	400	No./100 mL			1/week	Grab		X	
Chlorine, Total Residual	Daily Maximum	2.0	mg/L			2/day	Grab		X	

WHOLE EFFLUENT TOXICITY (WET) TESTING		Limit	Units	Action Level	Units	Sample Frequency	Sample Type	Inf.	Eff.	FN
WET - Acute Invertebrate	See footnote	7.2	TUa			1/quarter	See footnote		X	4
WET - Acute Vertebrate	See footnote	7.2	TUa			1/quarter	See footnote		X	4
WET - Chronic Invertebrate	See footnote	100	TUc			1/quarter	See footnote		X	4
WET - Chronic Vertebrate	See footnote	100	TUc			1/quarter	See footnote		X	4

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PERMIT LIMITS, LEVELS AND MONITORING

OUTFALL	LIMITATIONS APPLY			RECEIVING WATER			EFFECTIVE	EXPIRING		
001	Year-Round for Two Years			Cayuga Lake			EDP	EDP + 2 years		
PARAMETER	EFFLUENT LIMITATION					MONITORING REQUIREMENTS				FN
	Type	Limit	Units	Limit	Units	Sample Frequency	Sample Type	Location		
								Inf.	Eff.	
Soluble Reactive Phosphorus	Monthly Average	Monitor	mg/L	Monitor	lb/d	1/week	Grab		X	
	Daily Maximum	Monitor	mg/L	Monitor	lb/d	1/week	Grab		X	

OUTFALL		LIMITATIONS APPLY		RECEIVING WATER			EFFECTIVE	EXPIRING		
001		All year unless otherwise noted		Cayuga Lake			EDP	ExDP		
EMERGING CONTAMINANTS		Limit	Units	Action Level	Units	Sample Frequency	Sample Type	Inf.	Eff.	FN
Perfluorobutanoic Acid (PFBA) CAS No. 375-22-4 DMR Code: 51522	Daily Maximum	Monitor	ng/L			1/quarter	Grab		X	5
Perfluoropentanoic Acid (PFPeA) CAS No. 2706-90-3 DMR Code: 51623	Daily Maximum	Monitor	ng/L			1/quarter	Grab		X	5
Perfluorohexanoic Acid (PFHxA) CAS No.307-24-4 DMR Code: 51624	Daily Maximum	Monitor	ng/L			1/quarter	Grab		X	5
Perfluoroheptanoic Acid (PFHpA) CAS No. 375-85-9 DMR Code: 51625	Daily Maximum	Monitor	ng/L			1/quarter	Grab		X	5
Perfluorooctanoic Acid (PFOA) CAS No. 335-67-1 DMR Code: 51521	Daily Maximum			10	ng/L	1/quarter	Grab		X	5
Perfluoro-nonanoic Acid (PFNA) CAS No. 375-95-1 DMR Code: 51626	Daily Maximum	Monitor	ng/L			1/quarter	Grab		X	5
Perfluoro-decanoic Acid (PFDA) CAS No. 335-76-2 DMR Code: 51627	Daily Maximum	Monitor	ng/L			1/quarter	Grab		X	5
Perfluoroundecanoic Acid (PFUnA) CAS No. 2058-94-8 DMR Code: 51628	Daily Maximum	Monitor	ng/L			1/quarter	Grab		X	5
Perfluorododecanoic Acid (PFDoA) CAS No. 307-55-1 DMR Code: 51629	Daily Maximum	Monitor	ng/L			1/quarter	Grab		X	5
Perfluorotridecanoic Acid (PFTriA) CAS No. 72629-94-8 DMR Code: 51630	Daily Maximum	Monitor	ng/L			1/quarter	Grab		X	5
Perfluorotetradecanoic Acid (PFTeA) CAS No. 376-06-7 DMR Code: 51631	Daily Maximum	Monitor	ng/L			1/quarter	Grab		X	5

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PERMIT LIMITS, LEVELS AND MONITORING

OUTFALL	LIMITATIONS APPLY	RECEIVING WATER	EFFECTIVE	EXPIRING
001	All year unless otherwise noted	Cayuga Lake	EDP	ExDP

EMERGING CONTAMINANTS		Limit	Units	Action Level	Units	Sample Frequency	Sample Type	Inf.	Eff.	FN
Perfluorobutanesulfonic Acid (PFBS) CAS No. 375-73-5 DMR Code: 52602	Daily Maximum	Monitor	ng/L			1/quarter	Grab		X	5
Perfluoropentanesulfonic Acid (PFPeS) CAS No. 2706-91-4 DMR Code: 52610	Daily Maximum	Monitor	ng/L			1/quarter	Grab		X	5
Perfluorohexanesulfonic Acid (PFHxS) CAS No. 355-46-4 DMR Code: 52605	Daily Maximum	Monitor	ng/L			1/quarter	Grab		X	5
Perfluoroheptanesulfonic Acid (PFHpS) CAS No. 375-92-8 DMR Code: 52604	Daily Maximum	Monitor	ng/L			1/quarter	Grab		X	5
Perfluorooctanesulfonic Acid (PFOS) CAS No. 1763-23-1 DMR Code: 52606	Daily Maximum			10	ng/L	1/quarter	Grab		X	5
Perfluorononanesulfonic Acid (PFNS) CAS No. 68259-12-1 DMR Code: 52611	Daily Maximum	Monitor	ng/L			1/quarter	Grab		X	5
Perfluorodecanesulfonic Acid (PFDS) CAS No. 335-77-3 DMR Code: 52603	Daily Maximum	Monitor	ng/L			1/quarter	Grab		X	5
Perfluorododecanesulfonic Acid (PFDoS) CAS No. 79780-39-5 DMR Code: 52632	Daily Maximum	Monitor	ng/L			1/quarter	Grab		X	5
Perfluorooctanesulfonamide (FOSA) CAS No. 754-91-6 DMR Code: 51525	Daily Maximum	Monitor	ng/L			1/quarter	Grab		X	5
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA) CAS No. 2355-31-9 DMR Code: 51644	Daily Maximum	Monitor	ng/L			1/quarter	Grab		X	5
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA) CAS No. 2991-50-6 DMR Code: 51643	Daily Maximum	Monitor	ng/L			1/quarter	Grab		X	5
1H,1H,2H,2H-Fluorotelomer Sulfonic Acid (4:2 FTS) CAS No. 757124-72-4 DMR Code: 52607	Daily Maximum	Monitor	ng/L			1/quarter	Grab		X	5
1H,1H,2H,2H- Fluorotelomer Sulfonic Acid (6:2 FTS) CAS No. 27619-97-2 DMR Code: 52608	Daily Maximum	Monitor	ng/L			1/quarter	Grab		X	5

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PERMIT LIMITS, LEVELS AND MONITORING

OUTFALL	LIMITATIONS APPLY	RECEIVING WATER	EFFECTIVE	EXPIRING
001	All year unless otherwise noted	Cayuga Lake	EDP	ExDP

EMERGING CONTAMINANTS		Limit	Units	Action Level	Units	Sample Frequency	Sample Type	Inf.	Eff.	FN
1H,1H,2H,2H- Fluorotelomer Sulfonic Acid (8:2 FTS) CAS No. 39108-34-4 DMR Code: 52609	Daily Maximum	Monitor	ng/L			1/quarter	Grab		X	5
N-ethyl Perfluoro-octanesulfon-amide (NEtFOSA) CAS No. 4151-50-2 DMR Code: 52642	Daily Maximum	Monitor	ng/L			1/quarter	Grab		X	5
N-Methyl Perfluorooctane Sulfonamide (NMeFOSA) CAS No. 31506-32-8 DMR Code: 52641	Daily Maximum	Monitor	ng/L			1/quarter	Grab		X	5
N-Methyl Perfluorooctanesulfonamido Ethanol (NMeFOSE) CAS No. 24448-09-7 DMR Code: 51642	Daily Maximum	Monitor	ng/L			1/quarter	Grab		X	5
N-Ethyl Perfluorooctanesulfonamido Ethanol (NEtFOSE) CAS No. 1691-99-2 DMR Code: 51641	Daily Maximum	Monitor	ng/L			1/quarter	Grab		X	5
9-Chlorohexadecafluoro-3-Oxanone-1-Sulfonic Acid (9Cl-PF3ONS) CAS No. 756426-58-1 DMR Code: PF003	Daily Maximum	Monitor	ng/L			1/quarter	Grab		X	5
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA or GenX) CAS No. 13252-13-6 DMR Code: 52612	Daily Maximum	Monitor	ng/L			1/quarter	Grab		X	5
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUds) CAS No. 763051-92-9 DMR Code: PF004	Daily Maximum	Monitor	ng/L			1/quarter	Grab		X	5
4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA) CAS No. 919005-14-4 DMR Code: 52636	Daily Maximum	Monitor	ng/L			1/quarter	Grab		X	5
3-Perfluoropropyl Propanoic Acid (3:3FTCA) CAS No. 356-02-5 DMR Code: PF001	Daily Maximum	Monitor	ng/L			1/quarter	Grab		X	5
2H,2H,3H,3H-Perfluorooctanoic Acid (5:3FTCA) CAS No. 914637-49-3 DMR Code: PF007	Daily Maximum	Monitor	ng/L			1/quarter	Grab		X	5
3-Perfluoroheptyl Propanoic Acid (7:3FTCA) CAS No. 812-70-4 DMR Code: PF005	Daily Maximum	Monitor	ng/L			1/quarter	Grab		X	5

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PERMIT LIMITS, LEVELS AND MONITORING

OUTFALL	LIMITATIONS APPLY	RECEIVING WATER	EFFECTIVE	EXPIRING
001	All year unless otherwise noted	Cayuga Lake	EDP	ExDP

EMERGING CONTAMINANTS		Limit	Units	Action Level	Units	Sample Frequency	Sample Type	Inf.	Eff.	FN
Nonafluoro-3,6-dioxaheptanoic Acid (NFDHA) CAS No. 151772-58-6 DMR Code: 52626	Daily Maximum	Monitor	ng/L			1/quarter	Grab		X	5
Perfluoro-4-Methoxybutanoic Acid (PFMBA) CAS No. 863090-89-5 DMR Code: PF006	Daily Maximum	Monitor	ng/L			1/quarter	Grab		X	5
Perfluoro-3-Methoxypropanoic Acid (PFMPA) CAS No. 377-73-1 DMR Code: PF002	Daily Maximum	Monitor	ng/L			1/quarter	Grab		X	5
Perfluoro(2-Ethoxyethane)Sulfonic Acid (PFEESA) CAS No. 113507-82-7 DMR Code: 52629	Daily Maximum	Monitor	ng/L			1/quarter	Grab		X	5

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PERMIT LIMITS, LEVELS AND MONITORING

FOOTNOTES:

1. Effluent shall not exceed 15% of influent concentration values for BOD₅ & TSS.
2. This is a Compliance Level for total mercury. The calculated WQBEL is 0.7 ng/L.
3. **Biennial Pollutant Scan:** The permittee shall perform effluent sampling every two (2) years for all applicable pollutants identified in the NY-2A Application, Tables A - D. Sampling data shall be collected according to the guidance in the NY-2A application and maintained by the permittee. Monitoring results shall not be submitted on the DMR. Data shall be submitted with the next submission of the NY-2A form.

4. **Whole Effluent Toxicity (WET) Testing:**

Testing Requirements – Chronic WET testing is required, but report both the acute and chronic results. Testing shall be performed in accordance with 40 CFR Part 136 and TOGS 1.3.2 unless prior written approval has been obtained from the DEC. The test species shall be Ceriodaphnia dubia (water flea - invertebrate) and Pimephales promelas (fathead minnow - vertebrate). Receiving water collected upstream from the discharge should be used for dilution. All tests conducted should be static-renewal (two 24-hr composite samples with one renewal for Acute tests and three 24-hr composite samples with two renewals for Chronic tests). The appropriate dilution series should be used to generate a definitive test endpoint, otherwise an immediate rerun of the test may be required. WET testing shall be coordinated with the monitoring of chemical and physical parameters limited by this permit so that the resulting analyses are also representative of the sample used for WET testing. The ratio of critical receiving water flow to discharge flow (i.e. dilution ratio) is 24:1 for acute, and 100:1 for chronic.

Monitoring Period - WET testing shall be performed quarterly (calendar quarters).

Reporting - Toxicity Units shall be calculated and reported on the DMR as follows: $TU_a = (100)/(48\text{-hr LC50})$ [note that Acute data is generated by both Acute and Chronic testing] and $TU_c = (100)/(7\text{-day NOEC})$ or $(100)/(7\text{-day IC25})$ when Chronic testing has been performed or $TU_c = (TU_a) \times (10)$ when only Acute testing has been performed and is used to predict Chronic test results, where the 48-hr LC50, 7-day NOEC and/or IC25 are all expressed in % effluent. This must be done, including the Chronic prediction from the Acute data, for both species unless otherwise directed. For Chronic results, report the most sensitive endpoint (i.e. survival, growth and/or reproduction) corresponding to the lowest 7-day NOEC or IC25 and resulting highest TU_c . For Acute results, report a TU_a of 0.3 if there is no statistically significant mortality in 100% effluent as compared to the control. Report a TU_a of 1.0 if there is statistically significant mortality in 100% effluent as compared to the control, but insufficient mortality to generate a 48-hr LC50. Also, in the absence of a 48-hr LC50, use 1.0 TU_a for the Chronic prediction from the Acute data, and report a TU_c of 10.0.

The complete test report including all bench sheets, statistical analyses, reference toxicity data, daily average flow at the time of sampling and other appropriate supporting documentation, shall be submitted within 60 days following the end of each test period with your WET DMR and to the WET@dec.ny.gov email address. A summary page of the test results for the invertebrate and vertebrate species indicating TU_a , 48-hr LC50 for Acute tests and/or TU_c , NOEC, IC25, and most sensitive endpoints for Chronic tests, should also be included at the beginning of the test report.

5. **Emerging Contaminants:**

Monitoring: PFAS sampling shall use EPA Method 1633/1633A. Note that "DMR code" corresponds to the 5-digit code displayed in the top left of each parameter line on the DMR page within NetDMR.

Action Level: The permittee must collect one (1) confirmatory sample within seven (7) days of receiving the test result(s) when an Action Level is exceeded. If confirmed exceedance, the permittee must notify DEC at emergingcontaminantsdow@dec.ny.gov and initiate minimization program and continuous reporting as outlined in the [Schedule of Additional Submittals](#). Upon initiation of the minimization program, confirmatory sampling is no longer required when an Action Level is exceeded. If the reporting limit (RL) exceeds the Action Level, and the laboratory method shows no detection, the permittee must provide the DEC with documentation from the laboratory supporting the RL, including the basis for any matrix interference or method limitations.

STORMWATER POLLUTION PREVENTION REQUIREMENTS

NO EXPOSURE CERTIFICATION

The permittee submitted a Conditional Exclusion for No Exposure Form on June 9th, 2025, certifying that all industrial activities and materials are completely sheltered from exposure to rain, snow, snowmelt, and stormwater runoff except as allowed under 40 CFR 122.26(g)(2). The permittee must maintain a condition of no exposure for the exclusion to remain applicable. If conditions change resulting in the exposure of materials and activities to stormwater, the permittee must notify the Regional Water Engineer. The permittee must recertify a condition of no exposure every five years by completing the "No Exposure Certification Form" found on the DEC website.

DRAFT

MERCURY MINIMIZATION PROGRAM (MMP) - Type I

1. General – To reduce mercury effluent levels with the goal of achieving the water quality standard of 0.7 ng/L, the permittee must develop, implement, and maintain a written MMP plan, which includes the elements set forth below.
2. Relevant Documents – incorporate by reference documents already prepared, if any, for the wastewater treatment facility.
3. Drawings or Maps – for the facility and collection system identifying key locations and other areas identified in the MMP Plan.
4. Monitoring Plan – All mercury outfall monitoring must be conducted using the methods specified in Table 8 of DOW 1.3.10. Monitoring at influent and other locations tributary to compliance points may be performed using either USEPA Method 1631 or another sufficiently sensitive method, as approved under 40 CFR Part 136. Monitoring of raw materials, equipment, treatment residuals, and other non-wastewater/non-stormwater substances may be performed using other methods as appropriate. Monitoring must be coordinated so that the results can be effectively compared between locations and conducted with the following frequencies:
 - a. Influent/Effluent – sampled in accordance with the SPDES permit limitations table; and
 - b. Key Locations – sampled semi-annually, chosen to identify potential mercury sources. Sampling of discharges from dental facilities that are in compliance with 6 NYCRR 374.4 is not required.
5. Hauled Wastes Procedures – establish procedures for the acceptance of hauled waste to ensure it is not a potential mercury source. The permittee must notify the DEC prior to acceptance of loads which may exceed 500 ng/L¹.
6. Control Strategy –
 - a. Pretreatment/Sewer Use Law (SUL) – develop, include, and enforce pretreatment and SUL conditions which will support efforts to achieve the water quality standard of 0.7 ng/L in the effluent.
 - b. Inventory – develop and maintain an inventory of known and potential mercury sources, including a subset list of dental facilities.

¹ A level of 0.2 mg/L (200,000 ng/L) or more is considered hazardous per 40 CFR 261.11. The 500 ng/L amount is used here to alert the permittee that there is an unusual concentration of mercury and that it will need to be managed appropriately.

MERCURY MINIMIZATION PROGRAM (MMP) – Type I (Continued)

- c. Dental Facilities Requirements – once every five years, conduct and document either:
 - i. Inspections at each dental facility to verify compliance with the wastewater treatment operation, maintenance, and notification elements of 6 NYCRR 374.4; OR,
 - ii. An outreach program², which informs new and existing users of their responsibilities, and collection of the “Amalgam Waste Compliance Report for Dental Dischargers”³ form. Ensure the “Amalgam Waste Compliance Report for Dental Dischargers” is submitted by new users. The permittee should conduct site inspections to support the outreach program.
- d. Other Potential Mercury Sources – once every five years, conduct and document either:
 - i. Inspections at each identified location with potential mercury source(s), other than dental facilities; OR,
 - ii. An outreach program which informs users of their responsibilities as identified locations with potential mercury source(s). The permittee should conduct site inspections to support the outreach program.
- e. Equipment and Materials – evaluate equipment and materials (e.g., thermometers, thermostats) used by the permittee for potential mercury contribution to the discharge. As equipment and materials containing mercury are updated/replaced, the permittee must use mercury-free alternatives, if possible.
- f. Bulk Chemical Evaluation – for chemicals used at a rate which exceeds 1,000 gallons/year or 10,000 pounds/year, the permittee must obtain:
 - i. A manufacturer's certificate of analysis;
 - ii. A chemical analysis performed by a certified laboratory; OR,
 - iii. A notarized affidavit that describes the substance's mercury concentration and the detection limit achieved.

Where practicable, the permittee must only use bulk chemicals in the wastewater treatment process which contain <10 parts per billion (ppb) of mercury.

- g. Systems with CSO and Type II SSO Outfalls – prioritize locations, with potential mercury sources upstream of CSOs and Type II SSOs, for mercury reduction activities and/or controlled-release discharge.
7. Status Report – the permittee must develop an **annual** report, in accordance with the [Schedule of Additional Submittals](#), summarizing:
- a. All MMP monitoring results since the previous report;
 - b. A list of known mercury sources and potential mercury sources;
 - c. All actions undertaken by the permittee, pursuant to the control strategy, since the previous report;
 - d. Actions planned by the permittee, pursuant to the control strategy, for the upcoming reporting period; and,
 - e. Progress toward achieving a dissolved mercury concentration of 0.7 ng/L in the effluent (e.g., summarizing reductions in effluent concentrations as a result of the control strategy implementation or installation/modification of a treatment system).

The first status report is due in accordance with the Schedule of Additional Submittals. The permittee must maintain a file on-site with all MMP documentation.

8. MMP Modification – the permittee must submit a permittee-initiated modification request to DEC whenever:
- a. The permittee meets the criteria for another MMP type;
 - b. Changes at the facility, or within the collection system, increase the potential for mercury discharges; OR,
 - c. Effluent discharges exceed the current permit limitation(s).

The permittee may use information in the status reports, as applicable in accordance with item 7, as a basis for the permittee-initiated modification.

² For example, the outreach program could include education about sources of mercury and what to do if a mercury source is found.

³ The form, “Amalgam Waste Compliance Report for Dental Dischargers,” can be found here:

https://www.dec.ny.gov/docs/water_pdf/dentalform.pdf.

MERCURY MINIMIZATION PROGRAM (MMP) – Type I (Continued)

DEFINITIONS:

Key location – a location within the collection/wastewater system (e.g., including but not limited to a specific manhole/access point, tributary sewer/wastewater connection, or user discharge point) identified by the permittee as a potential mercury source. The permittee may adjust key locations based upon sampling and/or best professional judgement.

Potential mercury source – a source identified by the permittee that may reasonably be expected to have total mercury contained in the discharge. Some potential mercury sources include switches, fluorescent lightbulbs, cleaners, degreasers, thermometers, batteries, hauled wastes, universities, hospitals, laboratories, landfills, Brownfield sites, or raw material storage.

DISCHARGE NOTIFICATION REQUIREMENTS

- (a) The permittee shall install and maintain identification signs at all outfalls to surface waters listed in this permit, unless the Permittee has obtained a waiver in accordance with the Discharge Notification Act (DNA). Such signs shall be installed before initiation of any new discharge location.
- (b) Subsequent modifications to or renewal of this permit does not reset or revise the deadline set forth in (a) above, unless a new deadline is set explicitly by such permit modification or renewal.
- (c) The Discharge Notification Requirements described herein do not apply to outfalls from which the discharge is composed exclusively of storm water, or discharges to ground water.
- (d) The sign(s) shall be conspicuous, legible and in as close proximity to the point of discharge as is reasonably possible while ensuring the maximum visibility from the surface water and shore. The signs shall be installed in such a manner to pose minimal hazard to navigation, bathing or other water related activities. If the public has access to the water from the land in the vicinity of the outfall, an identical sign shall be posted to be visible from the direction approaching the surface water.

The signs shall have **minimum** dimensions of eighteen inches by twenty-four inches (18" x 24") and shall have white letters on a green background and contain the following information:

N.Y.S. PERMITTED DISCHARGE POINT

SPDES PERMIT No.: NY _____

OUTFALL No. : _____

For information about this permitted discharge contact:

Permittee Name: _____

Permittee Contact: _____

Permittee Phone: () - ### - #####

OR:

NYSDEC Division of Water Regional Office Address:

NYSDEC Division of Water Regional Phone: () - ### - #####

- (e) Upon request, the permittee shall make available electronic or hard copies of the sampling data to the public. In accordance with the RECORDING, REPORTING AND ADDITIONAL MONITORING REQUIREMENTS page of your permit, each DMR shall be maintained (either electronically or as a hard copy) on record for a period of five years.
- (f) The permittee shall periodically inspect the outfall identification sign(s) in order to ensure they are maintained, are still visible, and contain information that is current and factually correct. Signs that are damaged or incorrect shall be replaced within 3 months of inspection.

MINI INDUSTRIAL PRETREATMENT PROGRAM

The permittee previously performed the actions described in items 1 through 4 below in order to develop a mini pretreatment program:

1. Industrial Survey

The permittee submitted the results of an industrial survey.

2. Develop Procedures

The permittee submitted documentation of procedures for obtaining and ensuring compliance with applicable standards. Such procedures include requirements and schedules for discharge permits, industrial self-monitoring, compliance monitoring of industries by the permittee, on-going POTW monitoring, and an enforcement program. Such procedures are equivalent to procedures described or referenced in the document entitled Introduction to the National Pretreatment Program, USEPA, June, 2011, (https://www3.epa.gov/npdes/pubs/pretreatment_program_intro_2011.pdf).

3. Treatment Plant/Industry Monitoring

The permittee submitted the results of industrial and POTW monitoring and a completed Fast Report On Significant Industries forms (FROSIs) for all significant industrial users (SIUs).

4. Local Sewer Use Law

The permittee submitted a draft local sewer use law equivalent to the DEC Model Sewer Use Law, NYSDEC, 1994. Local limits for substances capable of causing SPDES permit violations, endangering municipal employees or limiting sludge disposal options were included in the local law. Such limits were developed in accordance with document entitled Local Limits Development Guidance, US EPA, July 2004, EPA 833-R-04-002A (<https://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=300062Q1.txt>). After approval by the DEC, dated 2/10/1992, the permittee submitted a copy of the enacted Law accompanied by proof of enactment.

Therefore, the permittee shall continue to implement the procedures developed in accordance with 2. above and approved by the DEC. At a minimum, the following activities shall continue to be undertaken by the permittee:

1. Issue permits including limitations, monitoring requirements, and reporting requirements to its SIUs.
2. Enforce the local limits set forth in the POTW local sewer use law.
3. Carry out inspections and monitoring of SIUs to determine compliance with categorical standards and local limits.
4. Undertake enforcement actions in accordance with DEC approved procedures.

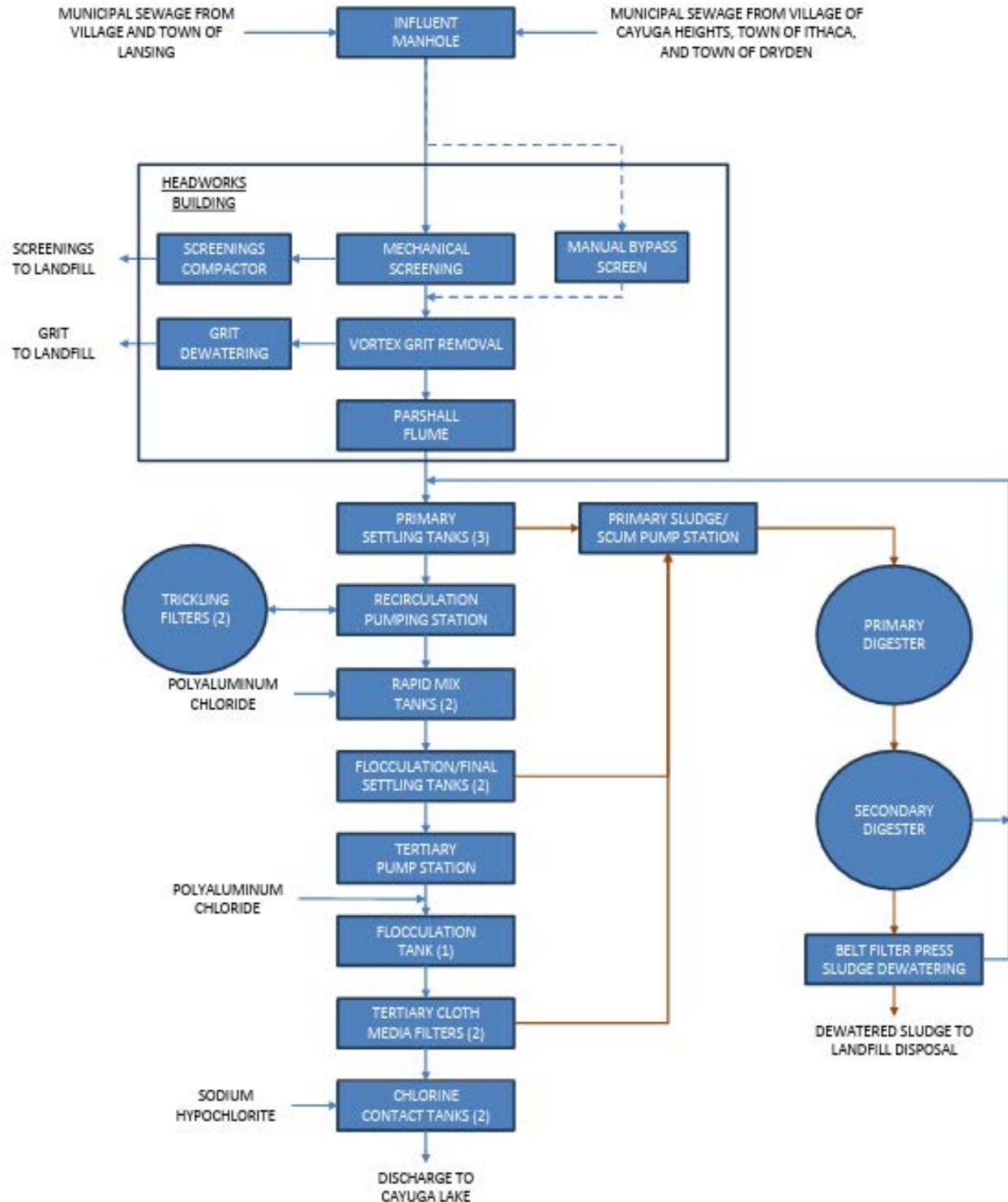
In accordance with the [Schedule of Additional Submittals](#), the permittee shall submit yearly FROSIs for each SIU to the DEC. Every third year, on the same date, the permittee shall submit Industrial Chemical Survey forms completed by all SIUs to the DEC. At the same time the permittee shall notify the DEC of any proposed significant changes to its implementing procedures or local sewer use law.

MONITORING LOCATIONS

The permittee shall take samples and measurements, to comply with the monitoring requirements specified in this permit, at the location(s) specified below:

Influent: at influent manhole

Effluent: post chlorine contact tank



GENERAL REQUIREMENTS

- A. The regulations in 6 NYCRR Part 750 are hereby incorporated by reference and the conditions are enforceable requirements under this permit. The permittee shall comply with all requirements set forth in this permit and with all the applicable requirements of 6 NYCRR Part 750 incorporated into this permit by reference, including but not limited to the regulations in paragraphs B through I as follows:
- B. General Conditions
- | | |
|--|---|
| 1. Duty to comply | 6 NYCRR 750-2.1(e) & 2.4 |
| 2. Duty to reapply | 6 NYCRR 750-1.16(a) |
| 3. Need to halt or reduce activity not a defense | 6 NYCRR 750-2.1(g) |
| 4. Duty to mitigate | 6 NYCRR 750-2.7(f) |
| 5. Permit actions | 6 NYCRR 750-1.1(c), 1.18, 1.20 & 2.1(h) |
| 6. Property rights | 6 NYCRR 750-2.2(b) |
| 7. Duty to provide information | 6 NYCRR 750-2.1(i) |
| 8. Inspection and entry | 6 NYCRR 750-2.1(a) & 2.3 |
- C. Operation and Maintenance
- | | |
|-----------------------------------|--------------------------------------|
| 1. Proper Operation & Maintenance | 6 NYCRR 750-2.8 |
| 2. Bypass | 6 NYCRR 750-1.2(a)(17), 2.8(b) & 2.7 |
| 3. Upset | 6 NYCRR 750-1.2(a)(94) & 2.8(c) |
- D. Monitoring and Records
- | | |
|---------------------------|--|
| 1. Monitoring and records | 6 NYCRR 750-2.5(a)(2), 2.5(a)(6), 2.5(c)(1), 2.5(c)(2), & 2.5(d) |
| 2. Signatory requirements | 6 NYCRR 750-1.8 & 2.5(b) |
- E. Reporting Requirements
- | | |
|---|-----------------------------|
| 1. Reporting requirements | 6 NYCRR 750-2.5, 2.7 & 1.17 |
| 2. Anticipated noncompliance | 6 NYCRR 750-2.7(a) |
| 3. Transfers | 6 NYCRR 750-1.17 |
| 4. Monitoring reports | 6 NYCRR 750-2.5(e) |
| 5. Compliance schedules | 6 NYCRR 750-1.14(d) |
| 6. 24-hour reporting | 6 NYCRR 750-2.7(c) & (d) |
| 7. Other noncompliance | 6 NYCRR 750-2.7(e) |
| 8. Other information | 6 NYCRR 750-2.1(f) |
| 9. Additional conditions applicable to a POTW | 6 NYCRR 750-2.9 |
- F. Planned Changes
1. In accordance with 6 NYCRR 750-2.7, the permittee shall give notice to the DEC at least 45 days prior to planned physical alterations or additions to the permitted facility when:
 - a. The alteration or addition to the permitted facility may meet any of the criteria for determining whether facility is a new source in 40 CFR §122.29(b); or
 - b. The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are subject either to effluent limitations in the permit, or to notification requirements under 40 CFR §122.42(a)(1); or
 - c. The alteration or addition results in a significant change in the permittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan.

In addition to the DEC, the permittee shall submit a copy of this notice to the United States Environmental Protection Agency at the following address: U.S. EPA Region 2, Clean Water Regulatory Branch, 290 Broadway, 24th Floor, New York, NY 10007-1866.

GENERAL REQUIREMENTS (continued)

2. Notification Requirement for POTWs

All POTWs shall provide adequate notice to the Department and the USEPA of the following:

- a. Any new introduction of pollutants into the POTW from an indirect discharger which would be subject to section 301 or 306 of CWA if it were directly discharging those pollutants; or
- b. Any substantial change in the volume or character of pollutants being introduced into that POTW by a source introducing pollutants into the POTW at the time of issuance of the permit.
- c. For the purposes of this paragraph, adequate notice shall include information on:
 - i. the quality and quantity of effluent introduced into the POTW, and
 - ii. any anticipated impact of the change on the quantity or quality of effluent to be discharged from the POTW.

POTWs shall submit a copy of this notice to the United States Environmental Protection Agency, at the following address:

U.S. EPA Region 2, Clean Water Regulatory Branch, 290 Broadway, 24th Floor, New York, NY 10007-1866

G. Sludge Management

The permittee shall comply with all applicable requirements of 6 NYCRR Part 360 series.

H. SPDES Permit Program Fee

The permittee shall pay to the Department an annual SPDES permit program fee within 30 days of the date of the first invoice, unless otherwise directed by the DEC, and shall comply with all applicable requirements of ECL 72-0602 and 6 NYCRR Parts 480, 481 and 485. Note that if there is inconsistency between the fees specified in ECL 72-0602 and 6 NYCRR Part 485, the ECL 72-0602 fees govern.

I. Water Treatment Chemicals (WTCs)

New or increased use and discharge of a WTC requires prior DEC review and authorization. At a minimum, the permittee must notify the DEC in writing of its intent to change WTC use by submitting a completed *WTC Notification Form* for each proposed WTC. The DEC will review that submittal and determine if a SPDES permit modification is necessary or whether WTC review and authorization may proceed under the current permit. The majority of WTC authorizations do not require SPDES permit modification. In any event, use and discharge of a WTC shall not proceed without prior authorization from the DEC. Examples of WTCs include biocides, coagulants, conditioners, corrosion inhibitors, defoamers, deposit control agents, flocculants, scale inhibitors, sequestrants, and settling aids.

1. WTC use shall not exceed the rate explicitly authorized by this permit or otherwise authorized in writing by the DEC.
2. The permittee shall maintain a logbook of all WTC use, noting for each WTC the date, time, exact location, and amount of each dosage, and, the name of the individual applying or measuring the chemical. The logbook must also document that adequate process controls are in place to ensure that excessive levels of WTCs are not used.
3. The permittee shall submit a completed WTC Annual Report Form each year that they use and discharge WTCs. This form shall be submitted in electronic format and attached to either the December DMR or the annual monitoring report required below. The *WTC Notification Form* and *WTC Annual Report Form* are available from the DEC's website at: <http://www.dec.ny.gov/permits/93245.html>

RECORDING, REPORTING AND ADDITIONAL MONITORING REQUIREMENTS

- A. The monitoring information required by this permit shall be retained for a period of at least five years from the date of the sampling for subsequent inspection by the DEC or its designated agent.
- B. Discharge Monitoring Reports (DMRs): Completed DMR forms shall be submitted for each one month reporting period in accordance with the DMR Manual available on DEC's website.

DMRs must be submitted electronically using the electronic reporting tool (NetDMR) specified by DEC. Instructions on the use of NetDMR can be found at: [How To Complete And Submit Discharge Monitoring Reports \(DMRs\) - NYSDEC](#). **Hardcopy paper DMRs will only be accepted if a waiver from the electronic submittal requirements has been granted by DEC to the facility.**

Attach the monthly "Wastewater Facility Operation Report" (form 92-15-7) and any required DMR attachments electronically to the DMR or with the hardcopy submittal.

The first monitoring period begins on the effective date of this permit, and, unless otherwise required, the reports are due no later than the 28th day of the month following the end of each monitoring period.

- C. Additional information required to be submitted by this permit shall be summarized and reported to the Regional Water Engineer and Bureau of Water Permits at the following addresses:

Department of Environmental Conservation
Division of Water, Bureau of Water Permits
625 Broadway, Albany, New York 12233-3505 Phone: (518) 402-8111

Department of Environmental Conservation
Regional Water Engineer, Region 7
5786 Widewaters Parkway, Syracuse, NY 13214-1867 Phone: (315) 426-7500

- D. Bypass and Sewage Pollutant Right to Know Reporting: In accordance with the Sewage Pollutant Right to Know Act (ECL § 17-0826-a), Publicly Owned Treatment Works (POTWs) are required to notify DEC and Department of Health within two hours of discovery of an untreated or partially treated sewage discharge and to notify the public and adjoining municipalities within four hours of discovery. Information regarding reporting and other requirements of this program may be found on the DEC's website. In addition, POTWs are required to provide a five-day incident report and supplemental information to the DEC in accordance with Part 750-2.7(d) by utilizing the Division of Water Report of Noncompliance Event form unless waived by DEC on a case-by-case basis.

- E. Schedule of Additional Submittals:

The permittee shall submit the following information to the Regional Water Engineer and to the Bureau of Water Permits, unless otherwise instructed:

SCHEDULE OF ADDITIONAL SUBMITTALS		
Outfall(s)	Required Action	Due Date
001	<u>EMERGING CONTAMINANT (EC) MINIMIZATION PROGRAM</u> The permittee shall initiate track down of potential sources by utilizing the “Emerging Contaminants Investigation Checklist for POTWs” available at Emerging Contaminants In NY's Waters - NYSDEChttps://dec.ny.gov/environmental-protection/water/emerging-contaminants. The permittee shall continue track down of potential sources and submit reports summarizing: - All EC monitoring results taken to date; - A list of likely EC sources; - All actions taken to reduce EC contaminants; and - Proposed next steps, including a monitoring plan to identify/confirm EC sources, and ensure continued progress towards minimization/eliminating contaminants. *Reports no longer required once effluent falls below action levels for at least 12 months or until further notified by the DEC.	Confirmation of initial Action Level exceedance 12 months after confirmation of initial Action Level exceedance, and every 6 months thereafter*
001	<u>WATER TREATMENT CHEMICAL (WTC) ANNUAL REPORT FORM</u> The permittee shall submit a completed WTC Annual Report Form each year that Water Treatment Chemicals are used. The form shall be attached to the December DMR.	December DMR (January 28 th)
001	<u>ANNUAL FLOW CERTIFICATION</u> The permittee shall submit an Annual Flow Certification form each year in accordance with 750-2.9(C)(4). The form shall be attached to the February DMR or submitted through nForm.	February DMR (March 28 th)
001	<u>BIENNIAL POLLUTANT SCAN</u> The permittee shall implement an ongoing monitoring program and perform effluent sampling every two years as specified in footnote of the permit limits table.	Retain and submit with next NY-2A Application
001	<u>WHOLE EFFLUENT TOXICITY (WET) TESTING</u> WET testing shall be performed as required in the footnote of the permit limits table. The toxicity test report including all information requested of this permit shall be attached to your WET DMRs and sent to the WET@dec.ny.gov email address.	Within 60 days following the end of each monitoring period
001	<u>STORMWATER NO EXPOSURE CERTIFICATION</u> Permittee must recertify every five years a condition of no exposure to stormwater in order to continue to qualify for the no exposure exclusion. The No Exposure Certification Form can be found on the DEC website.	06/09/2025 and every 5 years thereafter
001	<u>MERCURY MINIMIZATION PLAN</u> The permittee must complete and maintain onsite a mercury minimization plan and subsequent annual mercury minimization status reports in accordance with the requirements of this permit.	Maintained Onsite EDP + 12 months, annually thereafter

SCHEDULE OF ADDITIONAL SUBMITTALS		
Outfall(s)	Required Action	Due Date
001	<u>MINI INDUSTRIAL PRETREATMENT PROGRAM - FROSI</u> Submit completed Fast Report On Significant Industries forms (FROSI) for each SIU to the Department, or notification letter that no new significant industrial users have been added.	October 28 th of each year
001	<u>MINI INDUSTRIAL PRETREATMENT PROGRAM – Industrial Chemical Survey (ICS) Forms</u> Submit Industrial Chemical Survey forms completed by all SIUs to the DEC. Notify the DEC of any proposed significant changes to its implementing procedures or local sewer use law.	10/28/2026 and every three years thereafter

Unless noted otherwise, the above actions are one-time requirements.

- F. Monitoring and analysis shall be conducted using sufficiently sensitive test procedures approved under 40 CFR Part 136, unless other test procedures have been specified in this permit.
- G. More frequent monitoring of the discharge(s), monitoring point(s), or waters of the State than required by the permit, where analysis is performed by a certified laboratory or where such analysis is not required to be performed by a certified laboratory, shall be included in the calculations and recording of the data on the corresponding DMRs.
- H. Calculations which require averaging of measurements shall utilize an arithmetic mean unless otherwise specified in this permit.
- I. Unless otherwise specified, all information recorded on the DMRs shall be based upon measurements and sampling carried out during the most recently completed reporting period.
- J. Any laboratory test or sample analysis required by this permit for which the State Commissioner of Health issues certificates of approval pursuant to section 502 of the Public Health Law shall be conducted by a laboratory which has been issued a certificate of approval. Inquiries regarding laboratory certification should be directed to the New York State Department of Health, Environmental Laboratory Accreditation Program.

Permittee: Village of Cayuga Heights
Facility: Village of Cayuga Heights WWTP
SPDES Number: NY0020958
USEPA Major/Class 05 Municipal

Date: April 8, 2026 v.1.30
Permit Writer: Taylor Shanley/Madison Moore
Water Quality Reviewer: Taylor Shanley
Full Technical Review

SPDES Permit Fact Sheet Village of Cayuga Heights Wastewater Treatment Plant NY0020958



**Department of
Environmental
Conservation**

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Summary of Permit Changes

A State Pollutant Discharge Elimination System (SPDES) EBPS permit renewal has been drafted for the Village of Cayuga Heights Wastewater Treatment Plant. The changes to the permit are summarized below:

- Updated permit format, definitions, and general conditions
- Changed permit toxic class from non-toxic (N) to toxic (T)
- Changed temperature unit from degrees Fahrenheit to degrees Celsius
- Reduced limit for settleable solids from 0.3 mL/L to 0.1 mL/L
- Added two-year soluble reactive phosphorus monitoring
- Added total mercury daily max limit of 25 ng/L
- Updated Mercury Minimization Program (MMP) for Low Priority Publicly Owned Treatment Works (POTWs) to MMP Type I requirements
- Added 10 ng/L action level for both perfluorooctanoic acid (PFOA) and perfluorooctane sulfonic acid (PFOS) and monitoring for 38 per- and poly- fluoroalkyl substances (PFAS)
- Changed WET action levels to limits and decreased the acute from 15 to 7.2 TUa and kept the chronic at 100 TUC
- Increased WET sampling frequency from quarterly every five years to continuous quarterly
- Removed stormwater pollution prevention plan requirements

Added New Schedule of Additional Submittals

- Emerging Contaminant Minimization Program
- Water Treatment Chemical Annual Report
- Annual Flow Certification
- Biennial Pollutant Scan
- Whole Effluent Toxicity
- Stormwater No Exposure Certification
- Mercury Minimization Program Annual Status Report
- Mini Industrial Pretreatment Program

This fact sheet summarizes the information used to determine the effluent limitations (limits) and other conditions contained in the permit. General background information including the regulatory basis for the effluent limitations and other conditions are in the [Appendix](#) linked throughout this fact sheet.

Administrative History

6/1/2009	The last full technical review was performed as a modification to the 8/1/2005 SPDES permit with an expiration date of 7/31/2010. The 2009 permit, along with all subsequent modifications, has formed the basis of this permit. The permit was administratively renewed in 2010 and again in 2015. In 2020, the permit was allowed to stay in effect pursuant to SAPA¹.
1/12/2015	Permit was modified to decrease the phosphorus concentration limit from 0.5 mg/L to 0.35 mg/L.
9/23/2019	The Village of Cayuga Heights submitted a timely and sufficient renewal application.

8/1/2020 The current permit was allowed to stay in effect pursuant to SAPA¹.

1/16/2025 DEC issued a Request for Information (RFI) to modify and renew the SPDES permit due to the facility's EBPS score². At the time of the RFI, the facility had an EBPS score of 200.

6/12/2025 The Village of Cayuga Heights submitted a NY-2A permit application.

The Notice of Complete Application, published in the [Environmental Notice Bulletin](#) and newspapers, contains information on the public notice process.

Facility Information

This facility is a publicly owned treatment works that receives flow from domestic and industrial users, with effluent consisting of treated sanitary and industrial process water. The collection system consists of separate sewers.

The current 2.0 MGD treatment plant consists of:

- Screening/ Grit Removal
- Primary Settling
- Trickling Filter
- Rapid Mix Tank (phosphorus removal)
- Final Settling
- Tertiary Cloth Media Filters
- Chlorine Disinfection

Sludge is digested and dewatered via belt filter press before being sent for disposal at a landfill.

The primary outfall (Outfall 001) extends approximately 1,500 feet from the shoreline of Cayuga Lake (Class A) and consists of twenty-two (22) diffusers.

The facility accepts wastewater from the following municipalities:

Municipality	POSS # or SPDES #	Collection System
Village of Cayuga Heights	NY0020958	Separate
Town of Ithaca	NYS700041	Separate
Town of Lansing	NYS700077	Separate
Village of Lansing	NYS700042	Separate

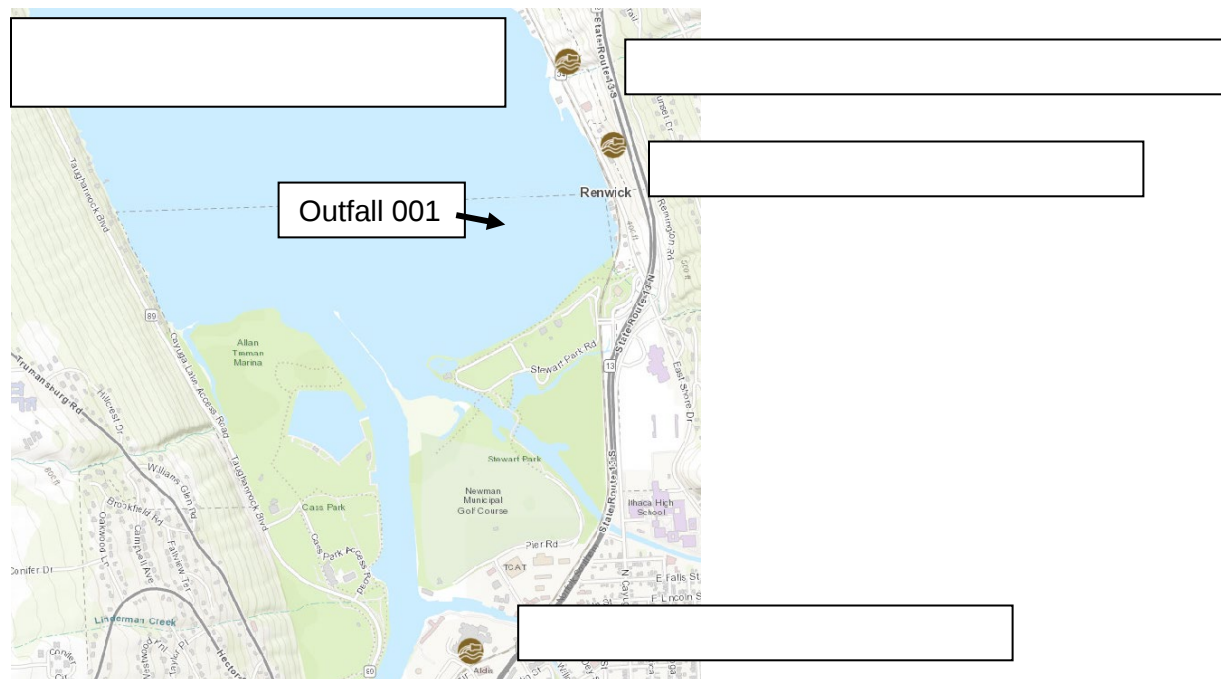
The facility accepts wastewater from the following significant industrial users (SIUs):

Significant Industrial User (SIU)	SIC Code	Categorical Reference (if applicable to 40 CFR)
Borg Warner Ithaca, LLC	3714	40 CFR Part 433
Odyssey Semiconductor, Inc.	3674	40 CFR Part 469

¹ State Administrative Procedures Act Section 401(2) and 6 NYCRR 621.11(f)

² Pursuant to 6 NYCRR 750-1.18 and NYS Environmental Benefit Permit Strategy (EBPS)

Site Overview



Enforcement History

Compliance and enforcement information can be found on the EPA's [Enforcement and Compliance History Online \(ECHO\)](#) website.

Existing Effluent Quality

The [Pollutant Summary Table](#) presents the existing effluent quality and effluent limitations. The existing effluent quality was determined from Discharge Monitoring Reports (DMRs) and the application submitted by the permittee for the period June 2020 to May 2025. [Appendix Link](#)

Interstate Water Pollution Control Agencies

Outfall(s) 001 is located within the Great Lakes watershed and International Joint Commission (IJC) compact area and is subject to 40 CFR Part 132. [Appendix Link](#)

Receiving Water Information

The facility discharges via the following outfalls:

Outfall No.	SIC Code	Wastewater Type	Receiving Water
001	4952	Treated Sanitary Sewage and Industrial Process Water	Cayuga Lake Southern End, Class A

See the [Outfall and Receiving Water Summary Table](#) and [Appendix](#) for additional information.

Impaired Waterbody Information

The Cayuga Lake, Southern End (PWL No. 0705-0040) is listed on the 2020/2022 [New York State Section 303\(d\) List](#) of Impaired/Total Maximum Daily Load (TMDL) Waters as impaired due to phosphorus. In July 2024, EPA approved DEC's Cayuga Lake TMDL for total phosphorus. As part of the TMDL, the discharge from Outfall 001 was given a wasteload allocation for phosphorus equal to the existing load limitation already established in the Cayuga Heights SPDES permit. Similarly, the existing concentration limit already established in the Cayuga Heights SPDES permit is equal to the load limit at the design flow of 2.0 MGD. As such, no changes are being proposed to the existing load or concentration limits for phosphorus. Two-year monitoring for soluble reactive phosphorus has been added consistent with the TMDL.

Outfall No.	Parameter	Wasteload Allocation
001	Phosphorus	5.84 lbs/d (concentration limit remains at 0.35 mg/L)

Critical Receiving Water Data & Mixing Zone

CORMIX Analysis

The facility was previously given the maximum dilution ratios (acute of 50:1 and chronic of 100:1) typically reserved for discharges to large flowing rivers (TOGS 1.3.1, page 8). This decision was made in the early 1980's and predates TOGS 1.3.1 guidance on establishing mixing zones. It also predates modern mixing zone practices and available modeling software.

As a result, it was necessary to develop a mixing zone model, consistent with TOGS 1.3.1, to confirm the dilution ratios remained appropriate or establish revised dilution ratios for use in the water quality analysis. Information submitted by the permittee, including the Outfall 001 as-built drawings, data from Discharge Monitoring Reports (DMRs), and ambient data from Cayuga Lake was used for the model. The model was run as a multiport discharge.

Effluent Inputs

Outfall 001 is a pipe that extends 1,495 feet (ft) from the eastern shore of Cayuga Lake into the lake's southern shelf. The diffuser makes up the last 105 ft of the pipe and consists of 22 discharge ports, which discharge at a 45° angle in an alternating direction. The model was developed around the design flow rate of 2.0 MGD and an average summer³ effluent temperature of 24.6°C, calculated from 25 data points collected from 2020 to 2024.

Ambient Inputs

An average depth of 10 ft and depth at discharge of 8.2 ft was used from the elevations indicated on the Outfall 001 as-built drawings.

The model was developed using temperature data from the southern shelf of Cayuga Lake collected as part of the Citizens Statewide Lake Assessment Program (CSLAP) at lake monitoring site CSL3 SS. The ambient temperature of 22.8°C was calculated as the median of the 23 available data points collected during the summer³ from 2018 to 2023. See Figure 2 below for Outfall 001 (end of diffuser) and lake monitoring locations.

Lake velocity was established from a nearby 1989 study done for the Ithaca Area Wastewater Treatment Plant that gave an average velocity of 0.0212 m/s. This is consistent with velocity outputs from the Cayuga Lake TMDL model as well as best professional judgment and recommended default lake velocities.

³ Summer is defined as June 1st to October 31st.

The same 1989 study also provided a summer average wind speed of 7.36 m/s.

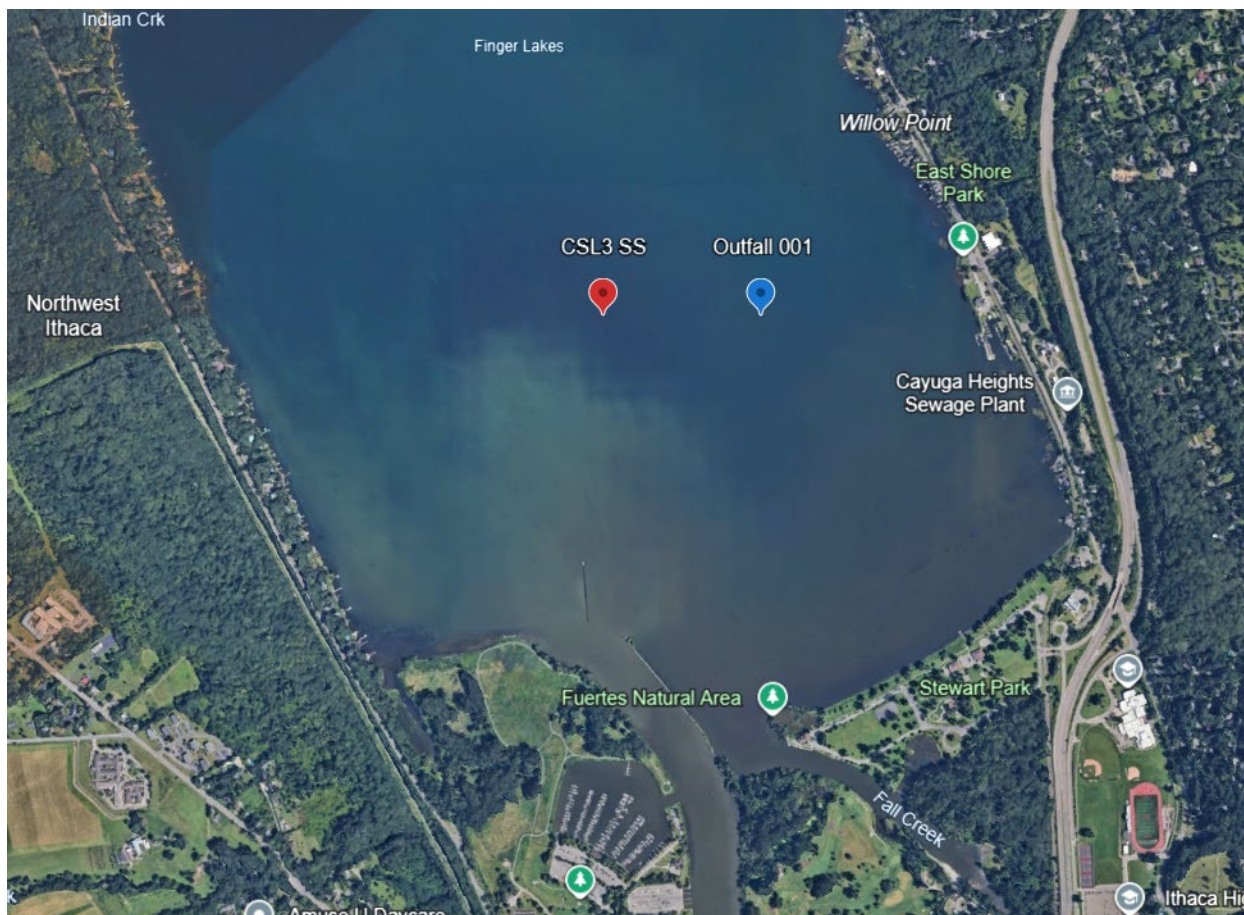


Figure 2. Outfall 001 and CSL3 SS locations.

Model Output

The model showed near-field mixing of the effluent was influenced by the slightly buoyant conditions and orientation of the outfall structure and ability to entrain new freshwater. The acute dilution ratio is shown below and set at the end of the near-field reach, a distance of 25 meters from the outfall origin. The chronic and human, aesthetic, wildlife (HEW) dilution ratios were calculated at five times the distance of the acute mixing zone length and support maintaining the previous dilution of 100:1.

Outfall No.	Acute Dilution Ratio A(A)	Chronic Dilution Ratio A(C)	Human, Aesthetic, Wildlife Dilution Ratio (HEW)	Basis
001	24:1	100:1	100:1	CORMIX

Critical receiving water data are listed in the [Pollutant Summary Table](#) at the end of this fact sheet. [Appendix Link](#)

Appendix B contains the CORMIX session report and prediction file.

Permit Requirements

The technology based effluent limitations ([TBELs](#)), water quality-based effluent limitations ([WQBELs](#)), [Existing Effluent Quality](#) and a discussion of the selected effluent limitation for each pollutant present in the discharge are provided in the [Pollutant Summary Table](#).

Whole Effluent Toxicity (WET) Testing

The facility discharges greater than 1 MGD and chronic WET testing requirements will continue (see criteria #7 in [Appendix Link](#)). The facility performed WET testing in 2024 that failed the acute test and indicates reasonable potential for chronic toxicity. As such, the WET action levels have been changed to limits for each species, adjusted to reflect the reduced acute dilution ratio. Therefore, WET limits of 7.2 TUa and 100 TUc have been included. The acute limits represent the acute dilution ratio times a factor of 0.3. The chronic limits represent the chronic dilution ratio. WET testing has also been adjusted to continuous quarterly.

Table 1: Acute & Chronic Whole Effluent Toxicity (WET) test results for Cayuga Heights WWTP (NY0020958), including the required Reasonable Potential Determination (RPD) for comparison. This assessment is based on the previously permitted dilution factors of 50:1 Acute and 100:1 Chronic.

Test Date	¹ MSS 48H LC50 (%Effluent)	² MSS TUa	³ TUa Action Level	⁴ MSS Survival 100% Effluent	⁵ Acute Test Result	⁶ MSS RPD TUa	⁷ Acute WET Limit Required	⁸ MSS 7D NOEC/IC25 (%Effluent)	⁹ MSS NOEC/IC25 TUc	¹⁰ TUc Action Level	¹¹ Chronic Test Result NOEC/IC25	¹² MSS RPD IC25 TUc	¹³ Chronic WET Limit Required
02/24	35.4% (I)	2.8 (I)	15.0	0% (I)	Pass	7.3	No	6.25% (I) / 11.2% (I)	16.0 (I) / 8.9 (I)	100.0	Pass/Pass	23.1	No
06/24	>100% (FI)	<0.3 (FI)	15.0	100% (FI)	Pass	<0.8	No	>100% (FI)/>100% (FI)	<1.0 (FI)/<1.0 (FI)	100.0	Pass/Pass	<2.6	No
09/24	21.8% (I)	4.6 (I)	15.0	0% (FI)	Pass	12.0	No	6.25% (I) / 7.1% (I)	16.0 (I) / 14.0 (I)	100.0	Pass/Pass	36.4	No
12/24	6.25% (I)	16.0 (I)	15.0	0% (FI)	Fail	41.6	Yes	<6.25% (I) / 2.3% (I)	>16.0 (I) / 43.5 (I)	100.0	Pass/Pass	113.1	Yes

¹Most Sensitive Species 48-hour Lethal Concentration: (F=Fish; I=Invertebrate) is the percentage of effluent that is lethal to 50% of the exposed organisms over a 48-hour period, and often indicates one species is more sensitive than the other during effluent testing.

²Most Sensitive Species Toxic Units Acute: is calculated as $(100 / \text{MSS 48H LC50})$. However, because ≤ 0.3 TUa is defined as the acceptable amount of Acute toxicity at the edge of the Acute mixing zone, and mathematically $100 / 100 = 1.0$ (i.e. a failing result), non-toxic Acute test results are indicated as < 0.3 .

³Toxic Unit Acute Action Level/Limit: is calculated as $[\text{Acute Dilution Factor} \times 0.3 \text{ TUa}]$ representing the maximum allowable effluent TUa at the edge of the Acute mixing zone ensuring Acute protection of the receiving water. When the Acute Dilution Factor is < 3.3 , the default Acute Action Level/Limit of 0.3 TUa is used representing the maximum allowable effluent TUa at the end of pipe.

⁴Most Sensitive Species Survival in 100% Effluent: is the lowest percentage of surviving organisms in 100% effluent, providing additional evidence of unacceptable Acute toxicity when the necessary 50% or greater mortality required to generate an LC50 has not been attained. *Denotes statistically significant mortality in 100% effluent as compared to the control.

⁵Acute Test Result: MSS TUa $\leq$ TUa Action Level/Limit for passing effluent test result and MSS TUa $>$ TUa Action Level/Limit for a failing effluent test result. If unacceptable mortality (i.e. statistically significant as compared to the control) is noted in 100% effluent, this may also be considered a failing test result.

⁶Most Sensitive Species Reasonable Potential Determination Toxic Units Acute: is calculated as $(\text{MSS TUa} \times 2.6)$, the Reasonable Potential Multiplier when four tests have been completed, taking into account the statistical potential for effluent variability to occur causing an exceedance of the Acute Action Level, triggering the need for Acute Limits.

⁷Acute Whole Effluent Toxicity Limit Required: MSS RPD TUa $\leq$ TUa Action Level, then an Acute Limit is not required, and the Action Level remains in place. If MSS RPD TUa $>$ TUa Action Level, then an Acute Limit is required, and the Action Level becomes the Limit. **In low dilution situations, the application of the Reasonable Potential Multiplier to the Acute results often mathematically suggests the need for Acute Limits even when there is no toxicity evident in 100% effluent (i.e. a non-detect). Therefore, this data cannot be used to implement an Acute Limit.

⁸Most Sensitive Species 7-day No Observed Effect Concentration or 25% Inhibition Concentration: is the highest percentage of effluent tested that causes no statistically significant effect to the exposed test organisms as compared to the control over a 7-day period or the percentage of effluent that causes a 25% reduction in survival, growth, or reproduction for the test population.

⁹Most Sensitive Species Toxic Units Chronic: is calculated as $(100 / \text{MSS 7D NOEC})$ or $(100 / \text{MSS 7D IC25})$.

¹⁰Toxic Unit Chronic Action Level/Limit: is calculated as $[\text{Chronic Dilution Factor} \times 1.0 \text{ TUc}]$ representing the maximum allowable effluent TUc at the edge of the Chronic mixing zone ensuring Chronic protection of the receiving water.

¹¹Chronic Test Result: MSS NOEC/IC25 TUc $\leq$ TUc Action Level/Limit for passing effluent test result and MSS NOEC/IC25 TUc $>$ TUc Action Level/Limit for a failing effluent test result.

¹²Most Sensitive Species Reasonable Potential Determination Toxic Units Chronic: is calculated as $(\text{MSS IC25 TUc} \times 2.6)$, the Reasonable Potential Multiplier when four tests have been completed, taking into account the statistical potential for effluent variability to occur causing an exceedance of the toxicity-based Action Level, triggering the need for Chronic Limits.

¹³Chronic Whole Effluent Toxicity Limit Required: MSS RPD IC25 TUc $\leq$ TUc Action Level, then a Chronic Limit is not required, and the Action Level remains in place. If MSS RPD IC25 TUc $>$ TUc Action Level, then a Chronic Limit is required, and the Action Level becomes the Limit. ***In low dilution situations, the

application of the Reasonable Potential Multiplier the Chronic results often mathematically suggests the need for Chronic Limits even when there is no toxicity evident in 100% effluent (i.e. a non-detect). Therefore, this data cannot be used to implement a Chronic Limit.

Anti-backsliding

The limitations contained in the permit are at least as stringent as the previous permit limits and there are no instances of backsliding. [Appendix Link](#)

Antidegradation

The permit contains effluent limitations which ensure that the best usages of the receiving waters will be maintained. The Notice of Complete Application published in the Environmental Notice Bulletin contains information on the State Environmental Quality Review (SEQR)⁴ determination. [Appendix Link](#)

Discharge Notification Act Requirements

In accordance with the Discharge Notification Act (ECL 17-0815-a), the permittee is required to post a sign at each point of wastewater discharge to surface waters, unless a waiver is obtained. This requirement has been continued from the previous permit.

Additionally, the permit contains a requirement to make the DMR sampling data available to the public upon request. This requirement has been continued from the previous permit.

Stormwater Pollution Prevention Requirements

The facility is a publicly owned treatment works ≥ 1 MGD that requires SPDES permit coverage under 40 CFR 122.26 (b)(14)(ix).

On June 9th, 2025, the permittee submitted a Conditional Exclusion for No Exposure Form, certifying that all industrial activities and materials are completely sheltered from exposure. This condition must be maintained for the exclusion to remain applicable. The [Schedule of Additional Submittals](#) also includes a due date for re-certification every five years as required by 40 CFR 122.26(g)(iii). This requirement is new.

Mercury⁵

The DOW 1.3.10 Mercury – Multiple Discharge Variance (MDV), dated December 31, 2025, provides the framework for DEC to require mercury monitoring and mercury minimization programs (MMPs), through SPDES permitting. All of the following permit conditions are consistent with the MDV. [Appendix Link](#)

The facility is a class 05 major municipal facility located within the Great Lakes Basin and the permit includes requirements for the implementation of MMP Type I. This permit requirement is updated from the previous permit's MMP for Low Priority POTWs.

The new daily max limit of 25 ng/L represents the general level currently achievable (GLCA). Based on 3 data point(s) with a max of 0.6 ng/L, the facility is expected to meet the limit (with monthly sampling frequency). Once ten or more data points are collected, DEC will establish an additional 12-month rolling average effluent limit during the next permit review.

The MMP consists of the following:

- Additional monitoring of key locations, as defined in the MMP;
- Control strategy for implementation of the MMP; and,
- Annual status report (maintained onsite)

⁴ As prescribed by 6 NYCRR Part 617

⁵ In accordance with DOW 1.3.10 Mercury – SPDES Permitting & Multiple Discharge Variance (MDV), December 30, 2020.

Biennial Pollutant Scan

The permit includes a new requirement to perform biennial sampling (once every two years) of the WWTP effluent for the parameters in the NY-2A Application, Tables A – D. This sampling will provide the required three effluent samples from applicable parameters for submittal with the next NY-2A Application⁶. This requirement ensures the data is representative of effluent conditions over the permit term and will be available for the next application submittal and permit review.

Mini Industrial Pretreatment Program

The permittee is required to continue implementation of a Mini-Pretreatment Program because it serves Significant Industrial Users (SIUs). The program requires implementation of an industrial user compliance program, submission of user information, modification of local sewer use law (if necessary), and periodic reporting. [Appendix Link](#)

Emerging Contaminant Monitoring

The SPDES permit includes [Action Levels](#) for PFOA and PFOS, and minimization programs when exceedances of those Action Levels are confirmed, due to the emerging nature of PFOA and PFOS; the USEPA's addition of PFOA and PFOS to the hazardous substance list under CERCLA; the USEPA's addition of PFOA and PFOS to the recommended contaminant monitoring list for state fish advisory programs; and the need to protect the best usages of the receiving water and downstream waterbodies pursuant to 6 NYCRR 701.1. The use of minimization programs is also supported by 6 NYCRR 750-1.14(f). [Appendix Link](#)

Based on the available data at Outfall 001, the permit includes Action Levels for PFOA and PFOS. The Actions Levels are set at the NYS Department of Health (DOH) Maximum Contaminant Level (MCL) of 10 ng/L for drinking water as a proxy for background concentrations in the facility's influent. Discharges above the MCL indicate the potential presence of a controllable source beyond drinking water and the need to implement track down measures. Pursuant to 6 NYCRR 750-1.13(b), the SPDES permit also requires monitoring for the remaining 38 PFAS compounds. Those monitoring requirements are consistent with guidance released in EPA memos dated April 28, 2022, and December 5, 2022. Please see the [Pollutant Summary Table](#) below for more information.

Schedule of Additional Submittals

A Schedule of Additional Submittals has been included for the following ([Appendix Link](#)):

Emerging Contaminant Minimization Program

In accordance with 6 NYCRR 750-1.13(d) and 2.1(i), upon confirmation of action level exceedance, the permittee must submit reports to DEC, summarizing all emerging contaminant monitoring data; likely sources; actions taken to reduce emerging contaminants; and proposed next steps to minimize/eliminate emerging contaminants. This requirement is new.

WTC Annual Report

[Link to information on WTCs](#). In accordance with 6 NYCRR 750-2.1(i), the permittee must submit an annual report of the WTCs that the permittee discharged during the prior calendar year, January 1 through December 31. The permittee must attach the annual report either to the December DMR or annual monitoring report required by the permit. More information is located on the DEC's website under [SPDES Permitting of Water Treatment Chemicals](#). This requirement has been continued from the previous permit.

⁶ Pursuant to 40 CFR 122.21(j)(4)(vi).

Annual Flow Certification

In accordance with 6 NYCRR 750-2.9(c)(4), the chief fiscal officer of the municipality must submit an Annual Flow Certification form as an attachment to its February DMR. This requirement has been updated from the previous permit.

Biennial Pollutant Scan

In accordance with 40 CFR 122.21(j)(4)(vi) and 6 NYCRR 750-1.7(d), POTW applicants must submit data from a minimum of three samples taken within four and one-half years prior to the date of the permit application. This requirement is new.

Whole Effluent Toxicity (WET) Testing

The permittee must submit a report of all WET testing activity and results to the Department with the specific data outlined in TOGS 1.3.2, Appendix I. This requirement has been continued from the previous permit.

Stormwater No Exposure Certification

In accordance with 40 CFR 122.26(g)(iii), every five years, the permittee must submit the [form](#), signed in accordance with 6 NYCRR 750-1.8, certifying that the facility is eligible for the no exposure certification. Please see [Stormwater Pollution Prevention Requirements](#) above. This requirement is new.

Mercury Minimization Plan (MMP) Status Report

In accordance with 6 NYCRR 750-2.1(i), the permittee is required to submit an annual Status Report. This requirement is new.

Mini Industrial Pretreatment Program

Consistent with TOGS 1.3.3, as part of the mini industrial pre-treatment program, the permittee must submit on October 28th of each year completed Fast Report on Significant Industries forms (FROSIs) for each SIU to the DEC, or notification letter that no new significant industrial users have been added. The permittee must also submit completed Industrial Chemical Survey Forms completed by all SIUs to DEC every third year. At the same time, the permittee must notify the DEC of any proposed significant changes to its implementing procedures or local sewer use law. This requirement has been continued from the previous permit.

Please see [Mini Industrial Pretreatment Program](#) above.

Permittee: Village of Cayuga Heights
 Facility: Village of Cayuga Heights WWTP
 SPDES Number: NY0020958
 USEPA Major/Class 05 Municipal

Date: April 8, 2026 v.1.30
 Permit Writer: Taylor Shanley/Madison Moore
 Water Quality Reviewer: Taylor Shanley
 Full Technical Review

OUTFALL AND RECEIVING WATER SUMMARY TABLE

Outfall	Latitude	Longitude	Receiving Water Name	Water Class	Water Index No. / Priority Waterbody Listing (PWL) No.	Major / Sub Basin	Hardness (mg/L)	1Q10	7Q10	30Q10	Critical Effluent Flow (MGD)	Dilution Ratio		
												A(A)	A(C)	HEW
001	42° 28' 12" N	76° 30' 36" W	Cayuga Lake, Southern End	A	O-66-12-P296 PWL: 0705-0040	07/05	146 ⁷	-	-	-	2.0	24:1	100:1	100:1

POLLUTANT SUMMARY TABLE

Outfall 001

Outfall #	001	Description of Wastewater: Treated Sanitary Sewage and Industrial Process Water													
		Type of Treatment: Grit removal, primary settling, trickling filter, rapid mix tank, final settling, tertiary cloth media filters, chlorine disinfection													
Effluent Parameter	Units	Averaging Period	Existing Discharge Data			TBELs		Water Quality Data & WQBELs						ML	Basis for Permit Requirement
			Permit Limit	Existing Effluent Quality ⁸	# of Data Points Detects / Non-Detects	Limit	Basis	Ambient Bkgd. Conc.	Projected Instream Conc.	WQ Std. or GV	WQ Type	Calc. WQBEL	Basis		
General Notes: Existing discharge data from 2020 to 2025 was obtained from Discharge Monitoring Reports and the application provided by the permittee. All applicable water quality standards were reviewed for development of the WQBELs. The standard and WQBEL shown below represent the most stringent. In the additional pollutants section below, the number of detects/non-detects was not provided. Value listed in fact sheet is number of data points provided.															
Flow Rate	MGD	Monthly Avg	2.0	1.4 Actual Average	60/0	2.0	Design Flow	No alterations that will impair the waters for their best usages.				703.2	-	Design Flow	
	The flow limit will continue to be set at the design flow of the wastewater treatment facility.														
pH	SU	Minimum	6.0	6.4 Actual Min	60/0	6.0	40 CFR 133.102	Summer 8.6 ⁹	-	6.5 – 8.5	Range	No Reasonable Potential	703.3	-	TBEL
		Maximum	9.0	8.6 Actual Max	60/0	9.0		Winter 8.1							
Consistent with TOGS 1.3.3 for POTWs, TBELs reflect secondary treatment standards. Given the available dilution, an effluent limitation equal to the TBEL is protective of the WQS.															

⁷ Ambient hardness was calculated from lake monitoring site 0705CAY0296, located ~29 km north of the facility within the waterbody, using eight samples collected from June 2024 – September 2024.

⁸ Existing Effluent Quality: Unless otherwise stated, Daily Max = 99% lognormal; Monthly Avg = 95% lognormal (for datasets with ≤3 nondetects); Daily Max = 99% delta-lognormal; Monthly Avg = 95% delta-lognormal (for datasets with >3 nondetects)

⁹ Ambient pH was calculated as the median of 54 summer data points collected in 2024 and 2025, and the median of 65 winter data points collected from 2018-2023 at lake monitoring site 0705CAY0296.

Permittee: Village of Cayuga Heights
 Facility: Village of Cayuga Heights WWTP
 SPDES Number: NY0020958
 USEPA Major/Class 05 Municipal

Date: April 8, 2026 v.1.30
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 Water Quality Reviewer: Taylor Shanley
 Full Technical Review

Outfall #	001	Description of Wastewater: Treated Sanitary Sewage and Industrial Process Water													
		Type of Treatment: Grit removal, primary settling, trickling filter, rapid mix tank, final settling, tertiary cloth media filters, chlorine disinfection													
Effluent Parameter	Units	Averaging Period	Existing Discharge Data			TBELs		Water Quality Data & WQBELs						ML	Basis for Permit Requirement
			Permit Limit	Existing Effluent Quality ⁸	# of Data Points Detects / Non-Detects	Limit	Basis	Ambient Bkgd. Conc.	Projected Instream Conc.	WQ Std. or GV	WQ Type	Calc. WQBEL	Basis		
Temperature	°C	Daily Max	Monitor	28 Actual Max	60/0	-	-	22.8*	(Lake): The water temperature at the surface of a lake shall not be raised more than 3°F (1.7°C) over the temperature that existed before the addition			704.2	-	Monitor 750-1.13	
	Consistent with 6 NYCRR 750-1.13(a), monitoring is required to confirm compliance with the temperature criteria under 704.2. Given the available dilution, no effluent limitations are needed at this time. This requirement has been continued from the previous permit. The previous permit required reporting in degrees Fahrenheit; however, the permittee reported temperature in degrees Celsius on their DMRs. As such, the reporting requirement has been changed to degrees Celsius to remain consistent with facility reporting. *Ambient temperature is representative of the median of 23 data points from 2018-2023 at the Cayuga Lake CSL3 SS station.														
Dissolved Oxygen (DO)	mg/L	Daily Min	-	11*	3	-	-	-	-	(Non-Trout) 4.0 mg/L	-	703.3	-	No Limitation	
	Given the location of the Outfall and available dilution, existing limits for BOD ₅ are expected to be protective of dissolved oxygen water quality. *Data represents the maximum daily discharge as reported on NY-2A application. Average of the three samples was 10.6 mg/L.														
5-day Biochemical Oxygen Demand (BOD ₅)	mg/L	Monthly Avg	30	3.9	60/0	30	40 CFR 133.102	-	See Dissolved Oxygen for Surrogate Standard		-	703.3	-	TBEL	
		7 Day Avg	45	7.2	60/0	45	40 CFR 133.102				-				
	lbs/d	Monthly Avg	500	50	60/0	500	40 CFR 133.102				-				
		7 Day Avg	750	87	60/0	750	40 CFR 133.102				-				
	% Rem	Minimum	85	94 Actual Min	60/0	85	40 CFR 133.102				-				
											-				
Consistent with 40 CFR Part 133.102 and TOGS 1.3.3 for POTWs, TBELs reflect secondary treatment standards. See justification for Dissolved Oxygen.															

Permittee: Village of Cayuga Heights
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Date: April 8, 2026 v.1.30
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 Water Quality Reviewer: Taylor Shanley
 Full Technical Review

Outfall #	001	Description of Wastewater: Treated Sanitary Sewage and Industrial Process Water													
		Type of Treatment: Grit removal, primary settling, trickling filter, rapid mix tank, final settling, tertiary cloth media filters, chlorine disinfection													
Effluent Parameter	Units	Averaging Period	Existing Discharge Data			TBELs		Water Quality Data & WQBELs						ML	Basis for Permit Requirement
			Permit Limit	Existing Effluent Quality ⁸	# of Data Points Detects / Non-Detects	Limit	Basis	Ambient Bkgd. Conc.	Projected Instream Conc.	WQ Std. or GV	WQ Type	Calc. WQBEL	Basis		
Total Suspended Solids (TSS)	mg/L	Monthly Avg	30	7.3	60/0	30	40 CFR 133.102	-	None from sewage, industrial wastes or other wastes that will cause deposition or impair the waters for their best usages.		703.2	-	TBEL		
		7 Day Avg	45	28	60/0	45	40 CFR 133.102								
	lbs/d	Monthly Avg	500	92	60/0	500	40 CFR 133.102								
		7 Day Avg	750	304	60/0	750	40 CFR 133.102								
	% Rem	Minimum	85	92 Actual Min	60/0	85	40 CFR 133.102								
Consistent with 40 CFR Part 133.102 and TOGS 1.3.3 for POTWs, TBELs reflect secondary treatment standards. Given the available dilution, an effluent limitation equal to the TBEL, and consistent with TOGS 1.3.3, is protective of water quality standards.															
Settleable Solids	mL/L	Daily Max	0.3	<0.1	0/60	0.1	TOGS 1.3.3	-	None from sewage, industrial wastes or other wastes that will cause deposition or impair the waters for their best usages			703.2	-	TBEL	
	Consistent with TOGS 1.3.3 the effluent limitation is being decreased to equal the TBEL of 0.1 mL/L for POTWs providing secondary treatment and filtration. Given the available dilution the TBEL is protective of the WQS. Based on existing performance, a schedule of compliance is not anticipated.														
Nitrogen, Ammonia (as N)	mg/L	Monthly Avg	Monitor	6.5 Actual Max 1.0 Actual Avg	60/0	-	-	0.027*	0.092	0.25	A(C)	No Reasonable Potential	703.5	-	Monitor 750-1.13
	Reporting for Ammonia has been changed from (as NH ₃) to (as N) for simpler data reporting, as this is consistent with the laboratory reporting units. All values shown are "as N". Values can be converted using the equation: Ammonia (as N) = Ammonia (as NH ₃) x 0.8224.														
	The WQS for Ammonia was determined from TOGS 1.1.1 and 703.5 from a pH of 8.6 and a summer temperature of 22.8°C. The summer pH was calculated as the 75 th percentile of 54 data points collected at lake monitoring site 0705CAY0296 in 2024 and 2025. The temperature was calculated as the median of 23 summer temperature data points collected at lake monitoring site 0705CAY0296 from 2018-2023.														
	The projected instream concentration was calculated using the maximum reported monthly average effluent concentration of 6.5 mg/L, a multiplier of 1.0, the HEW dilution ratio, and an ambient concentration*. The multiplier was selected from EPA's Technical Support Document Chapter 3.3 to account for the number of samples. The projected instream concentration is lower than the water quality standard and therefore no limitation is required at this time. Monitoring will continue to ensure facility performance and provide data for future reviews.														
	*Ambient concentration was calculated as the median of 364 data points collected at lake monitoring site 0705CAY0296 from 2002 to 2025.														

Permittee: Village of Cayuga Heights
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 USEPA Major/Class 05 Municipal

Date: April 8, 2026 v.1.30
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 Water Quality Reviewer: Taylor Shanley
 Full Technical Review

Outfall #	001	Description of Wastewater: Treated Sanitary Sewage and Industrial Process Water													
		Type of Treatment: Grit removal, primary settling, trickling filter, rapid mix tank, final settling, tertiary cloth media filters, chlorine disinfection													
Effluent Parameter	Units	Averaging Period	Existing Discharge Data			TBELs		Water Quality Data & WQBELs						ML	Basis for Permit Requirement
			Permit Limit	Existing Effluent Quality ⁸	# of Data Points Detects / Non-Detects	Limit	Basis	Ambient Bkgd. Conc.	Projected Instream Conc.	WQ Std. or GV	WQ Type	Calc. WQBEL	Basis		
Nitrogen, Ammonia (as N) Winter (November 1 st - May 31 st)	mg/L	Monthly Avg	Monitor	6.5 Actual Max 1.0 Actual Avg	60/0	-	-	0.027*	0.092	0.72	A(C)	No Reasonable Potential	703.5	-	Monitor 750-1.13
	Reporting for Ammonia has been changed from (as NH ₃) to (as N) for simpler data reporting, as this is consistent with the laboratory reporting units. All values shown are "as N". Values can be converted using the equation: Ammonia (as N) = Ammonia (as NH ₃) x 0.8224.														
	The WQS for Ammonia was determined from TOGS 1.1.1 and 703.5 from a pH of 8.2 and a winter temperature of 10°C. The winter pH was calculated as the 75 th percentile of 65 data points collected at lake monitoring site 0705CAY0296 from 2018-2023. The temperature is an assumed value and is consistent with TOGS 1.3.1.E.														
	The projected instream concentration was calculated using the maximum reported effluent concentration of 6.5 mg/L, a multiplier of 1.0, the HEW dilution ratio, and an ambient concentration*. The multiplier was selected from EPA's Technical Support Document Chapter 3.3 to account for the number of samples. The projected instream concentration is less than the water quality standard and therefore no limitation is required at this time. Monitoring will continue to ensure facility performance and provide data for future reviews.														
	*Ambient concentration was calculated as the median of 364 data points collected at lake monitoring site 0705CAY0296 from 2002 to 2025.														
Total Phosphorus	mg/L	Monthly Avg	0.35	0.22	60/0	-	-	-	None in amounts that will result in growths of algae, weeds and slimes that will impair the waters for their best usages.				703.2	-	TMDL
	lb/d	Monthly Avg	5.84	2.9	60/0	-	-								
	Consistent with the 2024 Cayuga Lake TMDL the load and concentration limitations will remain. See Impaired Waterbody Information section above.														
Coliform, Fecal	#/100 ml	30d Geo Mean	200	3.1	60/0	200	TOGS 1.3.3	-	The monthly geometric mean, from a minimum of five examinations, shall not exceed 200.				703.4	-	TBEL
		7d Geo Mean	400	43	60/0	400	TOGS 1.3.3	-							
	Consistent with TOGS 1.3.3, effluent disinfection will continue to be required year-round due to the class of the receiving waterbody.														
Total Residual Chlorine (TRC)	mg/L	Daily Max	2.0	2.0 Actual Max 1.8 Actual Avg 1.0 Actual Min	60/0	2.0	TOGS 1.3.3	-	-	0.005	A(C)	2.5	703.5	-	TBEL
	Effluent disinfection is currently required year-round and has been continued. Consistent with TOGS 1.3.1E, a rapid decay of residual chlorine upon discharge takes place and a five-fold reduction is assumed. The WQBEL was calculated by multiplying the WQS by the chronic dilution ratio and a decay factor of five. The calculated WQBEL is higher than the current limit and TBEL from TOGS 1.3.3. Therefore, the existing limit, equal to the TBEL, will remain.														

Permittee: Village of Cayuga Heights
 Facility: Village of Cayuga Heights WWTP
 SPDES Number: NY0020958
 USEPA Major/Class 05 Municipal

Date: April 8, 2026 v.1.30
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 Full Technical Review

Outfall #	001	Description of Wastewater: Treated Sanitary Sewage and Industrial Process Water													
		Type of Treatment: Grit removal, primary settling, trickling filter, rapid mix tank, final settling, tertiary cloth media filters, chlorine disinfection													
Effluent Parameter	Units	Averaging Period	Existing Discharge Data			TBELs		Water Quality Data & WQBELs						ML	Basis for Permit Requirement
			Permit Limit	Existing Effluent Quality ⁸	# of Data Points Detects / Non-Detects	Limit	Basis	Ambient Bkgd. Conc.	Projected Instream Conc.	WQ Std. or GV	WQ Type	Calc. WQBEL	Basis		
Additional Pollutants Detected															
Soluble Reactive Phosphorus	mg/L	Monthly Avg	-	-	-	Monitor	TMDL	-	Narrative: None in amounts that will result in growths of algae, weeds and slimes that will impair the waters for their best usages.				703.2	-	TMDL Monitor
		Daily Max	-	-	-	Monitor									
	lb/d	Monthly Avg	-	-	-	Monitor									
		Daily Max	-	-	-	Monitor									
		Consistent with the 2024 Cayuga Lake TMDL, soluble reactive phosphorus monitoring has been added for a period of two years. See Impaired Waterbody Information section above.													
Total Mercury	ng/L	Daily Max	-	0.59 Actual Max	3	-	-	-	-	0.7	H(FC)	25	GLCA	-	DOW 1.3.10
	See Mercury section of this fact sheet .														
Nitrite	mg/L	Daily Max	-	0.27 Actual Max	3	-	-	0.014*	0.022	0.1	A(C)	No Reasonable Potential	703.5	-	No Limitation or Monitoring
	The projected instream concentration was calculated using the maximum reported effluent concentration of 0.27 µg/L, a multiplier of 3.0, the chronic dilution ratio, and an ambient concentration*. The multiplier was selected from EPA's Technical Support Document Chapter 3.3 to account for the number of samples. A comparison of the projected instream concentration to the WQS indicates no reasonable potential to cause or contribute to a WQS violation. Therefore, no WQBEL has been specified.														
	*Ambient concentration was calculated as the median of nine data points collected at lake monitoring site 0705CAY0296 from 2007 and 2024.														
Nitrate	mg/L	Daily Max	-	38 Actual Max	3	-	-	0.86*	2.0	10	H(WS)	No Reasonable Potential	703.5	-	No Limitation or Monitoring
	The projected instream concentration was calculated using the maximum reported effluent concentration of 38 mg/L, a multiplier of 3.0, the HEW dilution ratio, and an upstream ambient concentration*. The multiplier was selected from EPA's Technical Support Document Chapter 3.3 to account for the number of samples. A comparison of the projected instream concentration to the WQS indicates no reasonable potential to cause or contribute to a WQS violation. Therefore, no WQBEL has been specified.														
	*Ambient concentration was calculated as the median of four data points collected at lake monitoring site 0705CAY0296 in 2024.														

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 Permit Writer: Taylor Shanley/Madison Moore
 Water Quality Reviewer: Taylor Shanley
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Outfall #	001	Description of Wastewater: Treated Sanitary Sewage and Industrial Process Water													
		Type of Treatment: Grit removal, primary settling, trickling filter, rapid mix tank, final settling, tertiary cloth media filters, chlorine disinfection													
Effluent Parameter	Units	Averaging Period	Existing Discharge Data			TBELs		Water Quality Data & WQBELs						ML	Basis for Permit Requirement
			Permit Limit	Existing Effluent Quality ⁸	# of Data Points Detects / Non-Detects	Limit	Basis	Ambient Bkgd. Conc.	Projected Instream Conc.	WQ Std. or GV	WQ Type	Calc. WQBEL	Basis		
Nitrate and Nitrite	mg/L	Daily Max	-	38	-	-	-	0.80*	1.9	10	H(WS)	No Reasonable Potential	703.5	-	No Limitation or Monitoring
	The projected instream concentration was calculated using the combined maximum reported effluent concentration of nitrite and nitrate of 38 µg/L, a multiplier of 3.0, the HEW dilution ratio, and an upstream ambient concentration*. The multiplier was selected from EPA's Technical Support Document Chapter 3.3 to account for the number of samples. A comparison of the projected instream concentration to the WQS indicates no reasonable potential to cause or contribute to a WQS violation. Therefore, no WQBEL has been specified. *Ambient concentration was calculated as the median of 351 data points collected at lake monitoring site 0705CAY0296 from 2002-2025.														
Total Kjeldahl Nitrogen (TKN)	mg/L	Daily Max	-	2.8	3	-	-	-	-	None in amounts that will result in growths of algae, weeds and slimes that will impair the waters for their best usages.		703.2	-	No Limitation or Monitoring	
	No numeric water quality standard for class A waterbodies, therefore no monitoring or limitation is needed.														
Hardness (as CaCO3)	mg/L	Daily Max	-	260	3	-	-	-	-	None in amounts that will adversely affect the taste, color or odor thereof, or impair the waters for their best usages.		703.2	-	No Limitation or Monitoring	
	No numeric water quality standard for class A waterbodies, therefore no monitoring or limitation is needed.														
Antimony	µg/L	Daily Max	-	2.2 Actual Max	3	-	-	-	0.07	3	H(WS)	No Reasonable Potential	703.5	-	No Limitation or Monitoring
	The projected instream concentration was calculated using the maximum reported effluent concentration of 2.2 µg/L, a multiplier of 3.0, the HEW dilution ratio, and an assumed negligible upstream ambient concentration. The multiplier was selected from EPA's Technical Support Document Chapter 3.3 to account for the number of samples. A comparison of the projected instream concentration to the WQS indicates no reasonable potential to cause or contribute to a WQS violation. Therefore, no WQBEL has been specified.														

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Outfall #	001	Description of Wastewater: Treated Sanitary Sewage and Industrial Process Water													
		Type of Treatment: Grit removal, primary settling, trickling filter, rapid mix tank, final settling, tertiary cloth media filters, chlorine disinfection													
Effluent Parameter	Units	Averaging Period	Existing Discharge Data			TBELs		Water Quality Data & WQBELs						ML	Basis for Permit Requirement
			Permit Limit	Existing Effluent Quality ⁸	# of Data Points Detects / Non-Detects	Limit	Basis	Ambient Bkgd. Conc.	Projected Instream Conc.	WQ Std. or GV	WQ Type	Calc. WQBEL	Basis		
Total Chromium	µg/L	Daily Max	-	22 Total	3	-	-	-	0.66 Dissolved	50 Dissolved	H(WS)	No Reasonable Potential	703.5	-	No Limitation or Monitoring
	The projected instream concentration was calculated using the maximum reported effluent concentration of 22 µg/L, a multiplier of 3.0, the HEW dilution ratio, and an assumed negligible upstream ambient concentration. The multiplier was selected from EPA's Technical Support Document Chapter 3.3 to account for the number of samples. A metals translator of 1.163 was also applied to convert between the total and dissolved form in accordance with the EPA Document 823-B-96-007. A comparison of the projected instream concentration to the WQS indicates no reasonable potential to cause or contribute to a WQS violation. Therefore, no WQBEL has been specified.														
Total Copper	µg/L	Daily Max	-	4.6	3	-	-	1.3* Dissolved	1.4 Dissolved	200 Dissolved	H(WS)	No Reasonable Potential	703.5	-	No Limitation or Monitoring
	The projected instream concentration was calculated using the maximum reported effluent concentration of 4.6 µg/L, a multiplier of 3.0, the HEW dilution ratio, and an upstream ambient concentration*. The multiplier was selected from EPA's Technical Support Document Chapter 3.3 to account for the number of samples. A comparison of the projected instream concentration to the WQS indicates no reasonable potential to cause or contribute to a WQS violation. Therefore, no WQBEL has been specified. *Ambient concentration was calculated as the median of four data points collected at lake monitoring site 0705CAY0296 in 2024.														
Total Nickel	µg/L	Daily Max	-	6.4	3	-	-	-	0.19 Dissolved	100 Dissolved	H(WS)	No Reasonable Potential	703.5	-	No Limitation or Monitoring
	The projected instream concentration was calculated using the maximum reported effluent concentration of 6.4 µg/L, a multiplier of 3.0, the HEW dilution ratio, and an assumed negligible upstream ambient concentration. The multiplier was selected from EPA's Technical Support Document Chapter 3.3 to account for the number of samples. A comparison of the projected instream concentration to the WQS indicates no reasonable potential to cause or contribute to a WQS violation. Therefore, no WQBEL has been specified.														
Cyanide, Free	µg/L	Daily Max	-	13	2	-	-	-	1.9	5.2	A(C)	No Reasonable Potential	703.5	-	No Limitation or Monitoring
	The projected instream concentration was calculated using the maximum reported effluent concentration of 13 µg/L, a multiplier of 3.8, the chronic dilution ratio, and an assumed negligible upstream ambient concentration. The multiplier was selected from EPA's Technical Support Document Chapter 3.3 to account for the number of samples. A comparison of the projected instream concentration to the WQS indicates no reasonable potential to cause or contribute to a WQS violation. Therefore, no WQBEL has been specified.														

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Outfall #	001	Description of Wastewater: Treated Sanitary Sewage and Industrial Process Water													
		Type of Treatment: Grit removal, primary settling, trickling filter, rapid mix tank, final settling, tertiary cloth media filters, chlorine disinfection													
Effluent Parameter	Units	Averaging Period	Existing Discharge Data			TBELs		Water Quality Data & WQBELs						ML	Basis for Permit Requirement
			Permit Limit	Existing Effluent Quality ⁸	# of Data Points Detects / Non-Detects	Limit	Basis	Ambient Bkgd. Conc.	Projected Instream Conc.	WQ Std. or GV	WQ Type	Calc. WQBEL	Basis		
Chlorodibromo methane	µg/L	Daily Max	-	1.9	3	-	-	-	0.22	50 (GV)	H(WS)	No Reasonable Potential	TOGS 1.1.1	-	No Limitation or Monitoring
	The projected instream concentration was calculated using the maximum reported effluent concentration of 1.9 µg/L, a multiplier of 3.0, the HEW dilution ratio, and an assumed negligible upstream ambient concentration. The multiplier was selected from EPA's Technical Support Document Chapter 3.3 to account for the number of samples. A comparison of the projected instream concentration to the WQS indicates no reasonable potential to cause or contribute to a WQS violation. Therefore, no WQBEL has been specified.														
Chloroform	µg/L	Daily Max	-	4.0	3	-	-	-	0.46	7	H(WS)	No Reasonable Potential	703.5	-	No Limitation or Monitoring
	The projected instream concentration was calculated using the maximum reported effluent concentration of 4.0 µg/L, a multiplier of 3.0, the HEW dilution ratio, and an assumed negligible upstream ambient concentration. The multiplier was selected from EPA's Technical Support Document Chapter 3.3 to account for the number of samples. A comparison of the projected instream concentration to the WQS indicates no reasonable potential to cause or contribute to a WQS violation. Therefore, no WQBEL has been specified.														
Dichlorobromo methane	µg/L	Daily Max	-	3.5	3	-	-	-	0.40	50 (GV)	H(WS)	No Reasonable Potential	TOGS 1.1.1	-	No Limitation or Monitoring
	The projected instream concentration was calculated using the maximum reported effluent concentration of 3.5 µg/L, a multiplier of 3.0, the HEW dilution ratio, and an assumed negligible upstream ambient concentration. The multiplier was selected from EPA's Technical Support Document Chapter 3.3 to account for the number of samples. A comparison of the projected instream concentration to the WQS indicates no reasonable potential to cause or contribute to a WQS violation. Therefore, no WQBEL has been specified.														

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Outfall 001 Emerging Contaminants

Emerging Contaminants: Outfall # 001															
Effluent Parameter	Units	Averaging Period	Existing Discharge Data			TBELs		Water Quality Data & WQBELs						ML	Basis for Permit Requirement
			Permit Limit	Existing Effluent Quality	# of Data Points Detects / Non-Detects	Limit	Basis	Ambient Bkgd. Conc.	Projected Instream Conc.	WQ Std. or GV	WQ Type	Calc. WQBEL	Basis		
Notes: See Emerging Contaminant Monitoring section above. Effluent samples were analyzed for the 40 PFAS compounds and 1,4-Dioxane.															
Perfluoro-butanoic Acid (PFBA)	ng/L	Daily Max	-	19	3	-	-	-	-	-	-	-	-	-	Monitor 750-1.13(b)
	Consistent with 6 NYCRR 750-1.13(b) and USEPA memos dated April 28, 2022, and December 5, 2022, the permit includes monitoring to support establishment of future standards or TBELs.														
Perfluoro-pentanoic Acid (PFPeA)	ng/L	Daily Max	-	19	3	-	-	-	-	-	-	-	-	-	Monitor 750-1.13(b)
	Consistent with 6 NYCRR 750-1.13(b) and USEPA memos dated April 28, 2022, and December 5, 2022, the permit includes monitoring to support establishment of future standards or TBELs.														
Perfluoro-hexanoic Acid (PFHxA)	ng/L	Daily Max	-	11	3	-	-	-	-	-	-	-	-	-	Monitor 750-1.13(b)
	Consistent with 6 NYCRR 750-1.13(b) and USEPA memos dated April 28, 2022, and December 5, 2022, the permit includes monitoring to support establishment of future standards or TBELs.														
Perfluoro-heptanoic Acid (PFHpA)	ng/L	Daily Max	-	2.8	3	-	-	-	-	-	-	-	-	-	Monitor 750-1.13(b)
	Consistent with 6 NYCRR 750-1.13(b) and USEPA memos dated April 28, 2022, and December 5, 2022, the permit includes monitoring to support establishment of future standards or TBELs.														
Perfluoro-octanoic Acid (PFOA)	ng/L	Daily Max	-	2.8 Actual Max	3	10 Action Level	BPJ MCL	-	0.32	6.7	H(WS)	No Reasonable Potential	TOGS 1.1.1	-	Action Level
	The projected instream concentration was calculated using the maximum reported effluent concentration of 0.0028 µg/L, a multiplier of 3, the HEW dilution ratio, and an assumed negligible upstream ambient concentration. The multiplier was selected from EPA's Technical Support Document Chapter 3.3 to account for the number of samples. A comparison of the projected instream concentration to the guidance value indicates no reasonable potential to cause or contribute to a water quality violation. However, due to the presence of PFOA, the permit includes an action level equal to the NYSDOH MCL of 10 ng/L. See the Emerging Contaminant Monitoring and Action Level sections for more information.														
Perfluoro-nonanoic Acid (PFNA)	ng/L	Daily Max	-	1.9	3	-	-	-	-	-	-	-	-	-	Monitor 750-1.13(b)
	Consistent with 6 NYCRR 750-1.13(b) and USEPA memos dated April 28, 2022, and December 5, 2022, the permit includes monitoring to support establishment of future standards or TBELs.														
Perfluoro-decanoic Acid (PFDA)	ng/L	Daily Max	-	1.9	3	-	-	-	-	-	-	-	-	-	Monitor 750-1.13(b)
	Consistent with 6 NYCRR 750-1.13(b) and USEPA memos dated April 28, 2022, and December 5, 2022, the permit includes monitoring to support establishment of future standards or TBELs.														

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Emerging Contaminants: Outfall # 001															
Effluent Parameter	Units	Averaging Period	Existing Discharge Data			TBELs		Water Quality Data & WQBELs						ML	Basis for Permit Requirement
			Permit Limit	Existing Effluent Quality	# of Data Points Detects / Non-Detects	Limit	Basis	Ambient Bkgd. Conc.	Projected Instream Conc.	WQ Std. or GV	WQ Type	Calc. WQBEL	Basis		
Perfluoro-undecanoic Acid (PFUnA)	ng/L	Daily Max	-	1.9	3	-	-	-	-	-	-	-	-	-	Monitor 750-1.13(b)
Consistent with 6 NYCRR 750-1.13(b) and USEPA memos dated April 28, 2022, and December 5, 2022, the permit includes monitoring to support establishment of future standards or TBELs.															
Perfluoro-dodecanoic Acid (PFDoA)	ng/L	Daily Max	-	1.9	3	-	-	-	-	-	-	-	-	-	Monitor 750-1.13(b)
Consistent with 6 NYCRR 750-1.13(b) and USEPA memos dated April 28, 2022, and December 5, 2022, the permit includes monitoring to support establishment of future standards or TBELs.															
Perfluoro-tridecanoic Acid (PFTriA)	ng/L	Daily Max	-	1.9	3	-	-	-	-	-	-	-	-	-	Monitor 750-1.13(b)
Consistent with 6 NYCRR 750-1.13(b) and USEPA memos dated April 28, 2022, and December 5, 2022, the permit includes monitoring to support establishment of future standards or TBELs.															
Perfluoro-tetradecanoic Acid (PFTeA)	ng/L	Daily Max	-	1.9	3	-	-	-	-	-	-	-	-	-	Monitor 750-1.13(b)
Consistent with 6 NYCRR 750-1.13(b) and USEPA memos dated April 28, 2022, and December 5, 2022, the permit includes monitoring to support establishment of future standards or TBELs.															
Perfluoro-butanesulfonic Acid (PFBS)	ng/L	Daily Max	-	1.9	3	-	-	-	-	-	-	-	-	-	Monitor 750-1.13(b)
Consistent with 6 NYCRR 750-1.13(b) and USEPA memos dated April 28, 2022, and December 5, 2022, the permit includes monitoring to support establishment of future standards or TBELs.															
Perfluoro-pentanesulfonic Acid (PFPeS)	ng/L	Daily Max	-	1.9	3	-	-	-	-	-	-	-	-	-	Monitor 750-1.13(b)
Consistent with 6 NYCRR 750-1.13(b) and USEPA memos dated April 28, 2022, and December 5, 2022, the permit includes monitoring to support establishment of future standards or TBELs.															
Perfluoro-hexanesulfonic Acid (PFHxS)	ng/L	Daily Max	-	2.1	3	-	-	-	-	-	-	-	-	-	Monitor 750-1.13(b)
Consistent with 6 NYCRR 750-1.13(b) and USEPA memos dated April 28, 2022, and December 5, 2022, the permit includes monitoring to support establishment of future standards or TBELs.															
Perfluoro-heptanesulfonic Acid (PFHpS)	ng/L	Daily Max	-	1.9	3	-	-	-	-	-	-	-	-	-	Monitor 750-1.13(b)
Consistent with 6 NYCRR 750-1.13(b) and USEPA memos dated April 28, 2022, and December 5, 2022, the permit includes monitoring to support establishment of future standards or TBELs.															

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Effluent Parameter	Units	Averaging Period	Existing Discharge Data			TBELs		Water Quality Data & WQBELs						ML	Basis for Permit Requirement
			Permit Limit	Existing Effluent Quality	# of Data Points Detects / Non-Detects	Limit	Basis	Ambient Bkgd. Conc.	Projected Instream Conc.	WQ Std. or GV	WQ Type	Calc. WQBEL	Basis		
Perfluoro-octanesulfonic Acid (PFOS)	ng/L	Daily Max	-	2.8 Actual Max	3	10 Action Level	BPJ MCL	-	0.32	2.7	H(WS)	No Reasonable Potential	TOGS 1.1.1	-	Action Level
	The projected instream concentration was calculated using the maximum reported effluent concentration of 0.0028 µg/L, a multiplier of 3, the HEW dilution ratio, and an assumed negligible upstream ambient concentration. The multiplier was selected from EPA's Technical Support Document Chapter 3.3 to account for the number of samples. A comparison of the projected instream concentration to the guidance value indicates no reasonable potential to cause or contribute to a water quality violation. However, due to the presence of PFOS, the permit includes an action level equal to the NYSDOH MCL of 10 ng/L. See the Emerging Contaminant Monitoring and Action Level sections for more information.														
Perfluoro-nonanesulfonic Acid (PFNS)	ng/L	Daily Max	-	1.9	3	-	-	-	-	-	-	-	-	-	Monitor 750-1.13(b)
	Consistent with 6 NYCRR 750-1.13(b) and USEPA memos dated April 28, 2022, and December 5, 2022, the permit includes monitoring to support establishment of future standards or TBELs.														
Perfluoro-decanesulfonic Acid (PFDS)	ng/L	Daily Max	-	1.9	3	-	-	-	-	-	-	-	-	-	Monitor 750-1.13(b)
	Consistent with 6 NYCRR 750-1.13(b) and USEPA memos dated April 28, 2022, and December 5, 2022, the permit includes monitoring to support establishment of future standards or TBELs.														
Perfluoro-dodecane-sulfonic Acid (PFDoS)	ng/L	Daily Max	-	1.9	3	-	-	-	-	-	-	-	-	-	Monitor 750-1.13(b)
	Consistent with 6 NYCRR 750-1.13(b) and USEPA memos dated April 28, 2022, and December 5, 2022, the permit includes monitoring to support establishment of future standards or TBELs.														
Perfluoro-octane-sulfonamide (FOSA)	ng/L	Daily Max	-	1.9	3	-	-	-	-	-	-	-	-	-	Monitor 750-1.13(b)
	Consistent with 6 NYCRR 750-1.13(b) and USEPA memos dated April 28, 2022, and December 5, 2022, the permit includes monitoring to support establishment of future standards or TBELs.														
N-methyl Perfluoro-octanesulfon-amidoacetic Acid (NMeFOSAA)	ng/L	Daily Max	-	19	3	-	-	-	-	-	-	-	-	-	Monitor 750-1.13(b)
	Consistent with 6 NYCRR 750-1.13(b) and USEPA memos dated April 28, 2022, and December 5, 2022, the permit includes monitoring to support establishment of future standards or TBELs.														
N-ethyl Perfluoro-octanesulfon-amidoacetic Acid (NEtFOSAA)	ng/L	Daily Max	-	19	3	-	-	-	-	-	-	-	-	-	Monitor 750-1.13(b)
	Consistent with 6 NYCRR 750-1.13(b) and USEPA memos dated April 28, 2022, and December 5, 2022, the permit includes monitoring to support establishment of future standards or TBELs.														

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Effluent Parameter	Units	Averaging Period	Existing Discharge Data			TBELs		Water Quality Data & WQBELs						ML	Basis for Permit Requirement
			Permit Limit	Existing Effluent Quality	# of Data Points Detects / Non-Detects	Limit	Basis	Ambient Bkgd. Conc.	Projected Instream Conc.	WQ Std. or GV	WQ Type	Calc. WQBEL	Basis		
4:2 Fluorotelomer Sulfonic Acid (FTS)	ng/L	Daily Max	-	19	3	-	-	-	-	-	-	-	-	-	Monitor 750-1.13(b)
Consistent with 6 NYCRR 750-1.13(b) and USEPA memos dated April 28, 2022, and December 5, 2022, the permit includes monitoring to support establishment of future standards or TBELs.															
6:2 Fluorotelomer Sulfonic Acid (FTS)	ng/L	Daily Max	-	22	3	-	-	-	-	-	-	-	-	-	Monitor 750-1.13(b)
Consistent with 6 NYCRR 750-1.13(b) and USEPA memos dated April 28, 2022, and December 5, 2022, the permit includes monitoring to support establishment of future standards or TBELs.															
8:2 Fluorotelomer Sulfonic Acid (FTS)	ng/L	Daily Max	-	19	3	-	-	-	-	-	-	-	-	-	Monitor 750-1.13(b)
Consistent with 6 NYCRR 750-1.13(b) and USEPA memos dated April 28, 2022, and December 5, 2022, the permit includes monitoring to support establishment of future standards or TBELs.															
N-ethyl Perfluoro-octanesulfonamide (NEtFOSA)	ng/L	Daily Max	-	19	3	-	-	-	-	-	-	-	-	-	Monitor 750-1.13(b)
Consistent with 6 NYCRR 750-1.13(b) and USEPA memos dated April 28, 2022, and December 5, 2022, the permit includes monitoring to support establishment of future standards or TBELs.															
N-methyl Perfluoro-octanesulfonamide (NMeFOSA)	ng/L	Daily Max	-	19	3	-	-	-	-	-	-	-	-	-	Monitor 750-1.13(b)
Consistent with 6 NYCRR 750-1.13(b) and USEPA memos dated April 28, 2022, and December 5, 2022, the permit includes monitoring to support establishment of future standards or TBELs.															
N-methyl Perfluoro-octanesulfonamidoethanol (NMeFOSE)	ng/L	Daily Max	-	19	3	-	-	-	-	-	-	-	-	-	Monitor 750-1.13(b)
Consistent with 6 NYCRR 750-1.13(b) and USEPA memos dated April 28, 2022, and December 5, 2022, the permit includes monitoring to support establishment of future standards or TBELs.															
N-ethyl Perfluoro-octanesulfonamidoethanol (NEtFOSE)	ng/L	Daily Max	-	19	3	-	-	-	-	-	-	-	-	-	Monitor 750-1.13(b)
Consistent with 6 NYCRR 750-1.13(b) and USEPA memos dated April 28, 2022, and December 5, 2022, the permit includes monitoring to support establishment of future standards or TBELs.															
9-Chlorohexadeca-fluoro-3-oxanonane-1-sulfonic Acid (9CI-PF3ONS)	ng/L	Daily Max	-	1.9	3	-	-	-	-	-	-	-	-	-	Monitor 750-1.13(b)
Consistent with 6 NYCRR 750-1.13(b) and USEPA memos dated April 28, 2022, and December 5, 2022, the permit includes monitoring to support establishment of future standards or TBELs.															

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Effluent Parameter	Units	Averaging Period	Existing Discharge Data			TBELs		Water Quality Data & WQBELs						ML	Basis for Permit Requirement
			Permit Limit	Existing Effluent Quality	# of Data Points Detects / Non-Detects	Limit	Basis	Ambient Bkgd. Conc.	Projected Instream Conc.	WQ Std. or GV	WQ Type	Calc. WQBEL	Basis		
Hexafluoro-propylene Oxide Dimer Acid (HFPO-DA or GenX)	ng/L	Daily Max	-	19	3	-	-	-	-	-	-	-	-	-	Monitor 750-1.13(b)
	Consistent with 6 NYCRR 750-1.13(b) and USEPA memos dated April 28, 2022, and December 5, 2022, the permit includes monitoring to support establishment of future standards or TBELs.														
11-Chloroeicosafuoro-3-oxaundecane-1-sulfonic Acid (11Cl-PF3OUdS)	ng/L	Daily Max	-	1.9	3	-	-	-	-	-	-	-	-	-	Monitor 750-1.13(b)
	Consistent with 6 NYCRR 750-1.13(b) and USEPA memos dated April 28, 2022, and December 5, 2022, the permit includes monitoring to support establishment of future standards or TBELs.														
4,8-Dioxa-3H-perfluorononanoic Acid (ADONA)	ng/L	Daily Max	-	1.9	3	-	-	-	-	-	-	-	-	-	Monitor 750-1.13(b)
	Consistent with 6 NYCRR 750-1.13(b) and USEPA memos dated April 28, 2022, and December 5, 2022, the permit includes monitoring to support establishment of future standards or TBELs.														
3-Perfluoropropyl Propanoic Acid (3:3 FTCA)	ng/L	Daily Max	-	19	3	-	-	-	-	-	-	-	-	-	Monitor 750-1.13(b)
	Consistent with 6 NYCRR 750-1.13(b) and USEPA memos dated April 28, 2022, and December 5, 2022, the permit includes monitoring to support establishment of future standards or TBELs.														
2H,2H,3H,3H-Perfluoro-octanoic Acid (5:3 FTCA)	ng/L	Daily Max	-	19	3	-	-	-	-	-	-	-	-	-	Monitor 750-1.13(b)
	Consistent with 6 NYCRR 750-1.13(b) and USEPA memos dated April 28, 2022, and December 5, 2022, the permit includes monitoring to support establishment of future standards or TBELs.														
3-Perfluoroheptyl Propanoic Acid (7:3 FTCA)	ng/L	Daily Max	-	19	3	-	-	-	-	-	-	-	-	-	Monitor 750-1.13(b)
	Consistent with 6 NYCRR 750-1.13(b) and USEPA memos dated April 28, 2022, and December 5, 2022, the permit includes monitoring to support establishment of future standards or TBELs.														
Nonafluoro-3,6-dioxaheptanoic Acid (NFDHA)	ng/L	Daily Max	-	19	3	-	-	-	-	-	-	-	-	-	Monitor 750-1.13(b)
	Consistent with 6 NYCRR 750-1.13(b) and USEPA memos dated April 28, 2022, and December 5, 2022, the permit includes monitoring to support establishment of future standards or TBELs.														
Perfluoro-4-methoxy-butanoic Acid (PFMBA)	ng/L	Daily Max	-	19	3	-	-	-	-	-	-	-	-	-	Monitor 750-1.13(b)
	Consistent with 6 NYCRR 750-1.13(b) and USEPA memos dated April 28, 2022, and December 5, 2022, the permit includes monitoring to support establishment of future standards or TBELs.														

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Emerging Contaminants: Outfall # 001															
Effluent Parameter	Units	Averaging Period	Existing Discharge Data			TBELs		Water Quality Data & WQBELs						ML	Basis for Permit Requirement
			Permit Limit	Existing Effluent Quality	# of Data Points Detects / Non-Detects	Limit	Basis	Ambient Bkgd. Conc.	Projected Instream Conc.	WQ Std. or GV	WQ Type	Calc. WQBEL	Basis		
Perfluoro-3-methoxy-propanoic Acid (PFMPA)	ng/L	Daily Max	-	19	3	-	-	-	-	-	-	-	-	-	Monitor 750-1.13(b)
	Consistent with 6 NYCRR 750-1.13(b) and USEPA memos dated April 28, 2022, and December 5, 2022, the permit includes monitoring to support establishment of future standards or TBELs.														
Perfluoro(2-ethoxyethane)sulfonic Acid (PFEEA)	ng/L	Daily Max	-	19	3	-	-	-	-	-	-	-	-	-	Monitor 750-1.13(b)
	Consistent with 6 NYCRR 750-1.13(b) and USEPA memos dated April 28, 2022, and December 5, 2022, the permit includes monitoring to support establishment of future standards or TBELs.														
1,4-Dioxane	µg/L	Daily Max	-	1.2	2	-	-	-	0.17	0.35	H(WS)	No Reasonable Potential	TOGS 1.1.1	-	No Limitation
	The projected instream concentration was calculated using the maximum reported effluent concentration of 1.2 µg/L, a multiplier of 3.8, the HEW dilution ratio, and an assumed negligible upstream ambient concentration. The multiplier was selected from EPA's Technical Support Document Chapter 3.3 to account for the number of samples. A comparison of the projected instream concentration to the WQS indicates no reasonable potential to cause or contribute to a WQS violation. Therefore, no WQBEL has been specified.														

Appendix A: Regulatory and Technical Basis of Permit Authorizations

The Appendix is meant to supplement the fact sheet for multiple types of SPDES permits. Portions of this Appendix may not be applicable to this specific permit.

Regulatory References

The provisions of the permit are based largely upon 40 CFR 122 subpart C and 6 NYCRR Part 750 and include monitoring, recording, reporting, and compliance requirements, as well as general conditions applicable to all SPDES permits. Below are the most common citations for the requirements included in SPDES permits:

- Clean Water Act (CWA) 33 section USC 1251 to 1387
- Environmental Conservation Law (ECL) Articles 17 and 70
- Federal Regulations
 - o 40 CFR, Chapter I, subchapters D, N, and O
- State environmental regulations
 - o 6 NYCRR Part 621
 - o 6 NYCRR Part 750
 - o 6 NYCRR Parts 700 - 704 – Best use and other requirements applicable to water classes
 - o 6 NYCRR Parts 800 – 941 - Classification of individual surface waters
- NYSDEC water program policy, referred to as Technical and Operational Guidance Series (TOGS)
- USEPA Office of Water Technical Support Document for Water Quality-based Toxics Control, March 1991, Appendix E

The following is a quick guide to the references used within the fact sheet:

SPDES Permit Requirements	Regulatory Reference
Anti-backsliding	6 NYCRR 750-1.10(c)
Best Management Practices (BMPS) for CSOs	6 NYCRR 750-2.8(a)(2)
Environmental Benefits Permit Strategy (EBPS)	6 NYCRR 750-1.18, NYS ECL 17-0817(4), TOGS 1.2.2 (revised January 25,2012)
Exceptions for Type I SSO Outfalls (bypass)	6 NYCRR 750-2.8(b)(2), 40 CFR 122.41
Mercury Multiple Discharge Variance	Division of Water Program Policy 1.3.10 (DOW 1.3.10)
Mixing Zone and Critical Water Information	TOGS 1.3.1 & Amendments
PCB Minimization Program	40 CFR Part 132 Appendix F Procedure 8, 6 NYCRR 750-1.13(a) and 750-1.14(f), and TOGS 1.2.1
Pollutant Minimization Program (PMP)	6 NYCRR 750-1.13(a), 750-1.14(f), TOGS 1.2.1
Schedules of Compliance	6 NYCRR 750-1.14
Sewage Pollution Right to Know (SPRTK)	NYS ECL 17-0826-a, 6 NYCRR 750-2.7
State Administrative Procedure Act (SAPA)	State Administrative Procedure Act Section 401(2), 6 NYCRR 621.11(l)
State Environmental Quality Review (SEQR)	6 NYCRR Part 617
USEPA Effluent Limitation Guidelines (ELGs)	40 CFR Parts 405-471
USEPA National CSO Policy	33 USC Section 1342(q)
Whole Effluent Toxicity (WET) Testing	TOGS 1.3.2
General Provisions of a SPDES Permit Department Request for Additional Information	NYCRR 750-2.1(i)

Outfall and Receiving Water Information

Impaired Waters

The [NYS 303\(d\) List of Impaired/TMDL Waters](#) identifies waters where specific best usages are not fully supported. The state must consider the development of a Total Maximum Daily Load (TMDL) or other strategy to reduce the input of the specific pollutant(s) that restrict waterbody uses, in order to restore and protect such uses. SPDES permits must include effluent limitations necessary to implement a waste load allocation (WLA) of an EPA-approved TMDL (6 NYCRR 750-1.11(a)(5)(ii)), if applicable. In accordance with 6 NYCRR 750-1.13(a), permittees discharging to waters which are on the list but do not yet have a TMDL developed may be required to perform additional monitoring for the parameters causing the impairment. Accurate monitoring data is needed

to determine the existing capabilities of the wastewater treatment plants and to assure that WLAs are allocated equitably.

Interstate Water Pollution Control Agencies

Some POTWs may be subject to regulations of interstate basin/compact agencies including: Interstate Sanitation Commission (ISC), International Joint Commission (IJC), Delaware River Basin Commission (DRBC), Ohio River Valley Water Sanitation Commission (ORSANCO), and the Susquehanna River Basin Commission (SRBC). Generally, basin commission requirements focus principally on water quality and not treatment technology. However, interstate/compact agency regulations for the ISC, IJC, DRBC and NYC Watershed contain explicit effluent limits which must be addressed during permit drafting. 6 NYCRR 750-2.1(d) requires SPDES permits for discharges that originate within the jurisdiction of an interstate water pollution control agency, to include any applicable effluent standards or water quality standards (WQS) promulgated by that interstate agency.

Existing Effluent Quality

The existing effluent quality is determined from a statistical evaluation of effluent data in accordance with TOGS 1.2.1 and the USEPA Office of Water, Technical Support Document for Water Quality-based Toxics Control, March 1991, Appendix E (TSD). The existing effluent quality is equal to the 95th (monthly average) and 99th (daily maximum) percentiles of the lognormal distribution of existing effluent data. When there are greater than three non-detects, a delta-lognormal distribution is assumed, and delta-lognormal calculations are used to determine the monthly average and daily maximum pollutant concentrations. Statistical calculations are not performed for parameters where there are less than ten data points. If additional data is needed, a monitoring requirement may be specified either through routine monitoring or a short-term high intensity monitoring program. The [Pollutant Summary Table](#) identifies the number of sample data points available.

Permit Requirements

Basis for Effluent Limitations

Sections 101, 301, 304, 308, 401, 402, and 405 of the CWA and Titles 5, 7, and 8 of Article 17 ECL, as well as their implementing federal and state regulations, and related guidance, provide the basis for the effluent limitations and other conditions in the permit.

When conducting a full technical review of an existing permit, the previous effluent limitations form the basis for the next permit. Existing effluent quality is evaluated against the existing effluent limitations to determine if these should be continued, revised, or deleted. Generally, existing limitations are continued unless there are changed conditions at the facility, the facility demonstrates an ability to meet more stringent limitations, or in response to updated regulatory requirements. Pollutant monitoring data is also reviewed to determine the presence of additional contaminants that should be included in the permit based on a reasonable potential analysis to cause or contribute to a water quality standards violation.

Anti-backsliding

Anti-backsliding requirements are specified in the CWA sections 402(o) and 303(d)(4), ECL 17-0809, and regulations at 40 CFR 122.44(l) and 6 NYCRR 750-1.10(c) and (d). Generally, the relaxation of effluent limitations in permits is prohibited unless one of the specified exceptions applies, which will be cited on a case-by-case basis in this fact sheet. Consistent with current case law¹⁰ and USEPA interpretation¹¹ anti-backsliding requirements do not apply should a revision to the final effluent limitation take effect before the scheduled date of compliance for that final effluent limitation.

¹⁰ American Iron and Steel Institute v. Environmental Protection Agency, 115 F.3d 979, 993 n.6 (D.C. Cir. 1997)

¹¹ U.S. EPA, Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; 65 Fed. Reg. 31682, 31704 (May 18, 2000); Proposed Water Quality Guidance for the Great Lakes System, 58 Fed. Reg. 20802, 20837 & 20981 (April 16, 1993)

Antidegradation Policy

New York State implements the antidegradation portion of the CWA based upon two documents: (1) Organization and Delegation Memorandum #85-40, "Water Quality Antidegradation Policy" (September 9, 1985); and, (2) TOGS 1.3.9, "Implementation of the NYSDEC Antidegradation Policy – Great Lakes Basin (Supplement to Antidegradation Policy dated September 9, 1985) (undated)." The permit for the facility contains effluent limitations which ensure that the existing best usage of the receiving waters will be maintained. To further support the antidegradation policy, SPDES applications have been reviewed in accordance with the State Environmental Quality Review Act (SEQR) as prescribed by 6 NYCRR Part 617.

Effluent Limitations

In developing a permit, the DEC determines the technology-based effluent limitations (TBELs) and then evaluates the water quality expected to result from technology controls to determine if any exceedances of water quality criteria in the receiving water might result. If there is a reasonable potential for exceedances of water quality criteria to occur, water quality-based effluent limitations (WQBELs) are developed. A WQBEL is designed to ensure that the water quality standards of receiving waters are met. In general, the CWA requires that the effluent limitations for a particular pollutant are the more stringent of either the TBEL or WQBEL.

Technology-based Effluent Limitations (TBELs)

CWA sections 301(b)(1)(B) and 304(d)(1), 40 CFR 133.102, ECL section 17-0509, and 6 NYCRR 750-1.11 require technology-based controls, known as secondary treatment. These and other requirements are summarized in TOGS 1.3.3. Where the TBEL is more stringent than the WQBEL, the TBEL is applied as a limit in accordance with TOGS 1.3.3. Equivalent secondary treatment, as defined in 40 CFR 133.105, allow for effluent limitations of the more stringent of the consistently achievable concentrations or monthly/weekly averages of 45/65 mg/L, and the minimum monthly average of at least 65% removal. Consistently achievable concentrations are defined in 40 CFR 133.101(f) as the 95th percentile value for the 30-day (monthly) average effluent quality achieved by the facility in a period of two years. The achievable 7-day (weekly) average value is equal to 1.5 times the 30-day average value calculated above. Equivalent secondary treatment applies to those facilities where the principal treatment process is either a trickling filter or a waste stabilization pond; the treatment works provides significant biological treatment of municipal wastewater; and, the effluent concentrations consistently achievable through proper operation and maintenance of the facility cannot meet traditional secondary treatment requirements. There are no federal technology-based standards for toxic pollutants from POTWs. A statistical analysis of existing effluent data, as described in TOGS 1.2.1, may be used to establish other performance-based TBELs.

Water Quality-Based Effluent Limitations (WQBELs)

In addition to the TBELs, permits must include additional or more stringent effluent limitations and conditions, including those necessary to protect water quality. CWA sections 101 and 301(b)(1)(C), 40 CFR 122.44(d)(1), and 6 NYCRR Parts 750-1.11 require that permits include limitations for all pollutants or parameters which are or may be discharged at a level which may cause or contribute to an exceedance of any State water quality standard adopted pursuant to NYS ECL 17-0301. Additionally, 6 NYCRR Part 701.1 prohibits the discharge of pollutants that will cause impairment of the best usages of the receiving water as specified by the water classifications at the location of discharge and at other locations that may be affected by such discharge. Water quality standards can be found under 6 NYCRR Parts 700-704. The limitations must be stringent enough to ensure that water quality standards are met at the point of discharge and in downstream waters and must be consistent with any applicable WLA which may be in effect through a TMDL for the receiving water. These and other requirements are summarized in TOGS 1.1.1, 1.3.1, 1.3.2, 1.3.5 and 1.3.6. The DEC considers a mixing zone analysis, critical flows, and reasonable potential analysis when developing a WQBEL.

Mixing Zone Analyses

In accordance with TOGS 1.3.1., the DEC may perform additional analysis of the mixing condition between the effluent and the receiving waterbody. Mixing zone analyses using plume dispersion modeling are conducted in accordance with the following:

"EPA Technical Support Document for Water Quality-Based Toxics Control" (March 1991); EPA Region VIII's "Mixing Zones and Dilution Policy" (December 1994); NYSDEC TOGS 1.3.1, "Total Maximum Daily Loads and Water Quality-Based Effluent Limitations" (July 1996); "CORMIX v11.0" (2019).

Critical Flows

In accordance with TOGS 1.2.1 and 1.3.1, WQBELs are developed using dilution ratios that relate the critical low flow condition of the receiving waterbody to the critical effluent flow. The critical low flow condition used in the dilution ratio will be different depending on whether the limitations are for aquatic or human health protection. For chronic aquatic protection, the critical low flow condition of the waterbody is typically represented by the 7Q10 flow and is calculated as the lowest average flow over a 7-day consecutive period within 10 years. For acute aquatic protection, the critical low flow condition is typically represented by the 1Q10 and is calculated as the lowest 1-day flow within 10 years. However, NYSDEC considers using 50% of the 7Q10 to be equivalent to the 1Q10 flow. For the protection of human health, the critical low flow condition is typically represented by the 30Q10 flow and is calculated as the lowest average flow over a 30-day consecutive period within 10 years. However, NYSDEC considers using $1.2 \times 7Q10$ to be equivalent to the 30Q10. The 7Q10 or 30Q10 flow is used with the critical effluent flow to calculate the dilution ratio. The critical effluent flow can be the maximum daily flow reported on the permit application, the maximum of the monthly average flows from discharge monitoring reports for the past three years, or the facility design flow. When more than one applicable standard exists for aquatic or human health protection for a specific pollutant, a reasonable potential analysis is conducted for each applicable standard and corresponding critical flow to ensure effluent limitations are sufficiently stringent to ensure all applicable water quality standards are met as required by 40 CFR 122.44(d)(1)(i). For brevity, the pollutant summary table reports the results of the most conservative scenario.

Reasonable Potential Analysis (RPA)

The Reasonable Potential Analysis (RPA) is a statistical estimation process, outlined in the 1991 USEPA Technical Support Document for Water Quality-based Toxics Control (TSD), Appendix E. This process uses existing effluent quality data and statistical variation methodology to project the maximum amounts of pollutants that could be discharged by the facility. This projected instream concentration (PIC) is calculated using the appropriate ratio and compared to the water quality standard (WQS). When the RPA process determines the WQS may be exceeded, a WQBEL is required. The procedure for developing WQBELs includes the following steps:

- 1) identify the pollutants present in the discharge(s) based upon existing data, sampling data collected by the permittee as part of the permit application or a short-term high intensity monitoring program, or data gathered by the DEC;
- 2) identify water quality criteria applicable to these pollutants;
- 3) determine if WQBELs are necessary (i.e. reasonable potential analysis (RPA)). The RPA will utilize the procedure outlined in Chapter 3.3.2 of EPA's Technical Support Document (TSD). As outlined in the TSD, for parameters with limited effluent data the RPA may include multipliers to account for effluent variability; and,
- 4) calculate WQBELs (if necessary). Factors considered in calculating WQBELs include available dilution of effluent in the receiving water, receiving water chemistry, and other pollutant sources.

The DEC uses modeling tools to estimate the expected concentrations of the pollutant in the receiving water and develop WQBELs. These tools were developed in part using the methodology referenced above. If the estimated concentration of the pollutant in the receiving water is expected to exceed the ambient water quality standard or guidance value (i.e. numeric interpretation of a narrative water quality standard), then there is a reasonable potential that the discharge may cause or contribute to an exceedance of any State water quality standard adopted pursuant to

NYS ECL 17-0301. If a TMDL is in place, the facility's WLA for that pollutant is applied as the WQBEL.

For carbonaceous and nitrogenous oxygen demanding pollutants, the DEC uses a model which incorporates the Streeter-Phelps equation. The equation relates the decomposition of inorganic and organic materials along with oxygen reaeration rates to compute the downstream dissolved oxygen concentration for comparison to water quality standards.

The Division of Water has been using the TMDL approach in permit limit development for the control of toxic substances. Since the early 1980's, the loading capacity for specific pollutants has been determined for each drainage basin. Water quality-limiting segments and pollutants have been identified, TMDLs, wasteload allocations and load allocations have been developed, and permits with water quality-based effluent limits have been issued. In accordance with TOGS 1.3.1, the Division of Water implements a Toxics Reduction Strategy which is committed to the application of the TMDL process using numeric, pollutant-specific water quality standards through the Watershed Approach. The Watershed Approach accounts for the cumulative effect of multiple discharges of conservative toxic pollutants to ensure water quality standards are met in downstream segments.

Whole Effluent Toxicity (WET) Testing:

WET tests use small vertebrate and invertebrate species to measure the aggregate toxicity of an effluent. There are two different durations of toxicity tests: acute and chronic. Acute toxicity tests measure survival over a 96-hour test exposure period. Chronic toxicity tests measure reductions in survival, growth, and reproduction over a 7-day exposure. TOGS 1.3.1 includes guidance for determining when aquatic toxicity testing should be included in SPDES permits. The authority to require toxicity testing is in 6NYCRR 702.9. TOGS 1.3.2 describes the procedures which should be followed when determining whether to include toxicity testing in a SPDES permit and how to implement a toxicity testing program. Per TOGS 1.3.2, WET testing may be required when any one of the following seven criteria are applicable:

1. There is the presence of substances in the effluent for which ambient water quality criteria do not exist.
2. There are uncertainties in the development of TMDLs, WLAs, and WQBELs, caused by inadequate ambient and/or discharge data, high natural background concentrations of pollutants, available treatment technology, and other such factors.
3. There is the presence of substances for which WQBELs are below analytical detectability.
4. There is the possibility of complex synergistic or additive effects of chemicals, typically when the number of metals or organic compounds discharged by the permittee equals or exceeds five.
5. There are observed detrimental effects on the receiving water biota.
6. Previous WET testing indicated a problem.
7. POTWs which exceed a discharge of 1 MGD. Facilities of less than 1 MGD may be required to test, e.g., POTWs <1 MGD which are managing industrial pretreatment programs.

Minimum Level of Detection

Pursuant to 40 CFR 122.44(i)(1)(iv) and 6 NYCRR 750-2.5(d), SPDES permits must contain monitoring requirements using sufficiently sensitive test procedures approved under 40 CFR Part 136. A method is "sufficiently sensitive" when the method's minimum level (ML) is at or below the level of the effluent limitation established in the permit for the measured pollutant parameter; or the lowest ML of the analytical methods approved under 40 CFR Part 136. The ML represents the lowest level that can be measured within specified limitations of precision and accuracy during routine laboratory operations on most effluent matrices. When establishing effluent limitations for a specific parameter (based on technology or water quality requirements), it is possible that the calculated limitation will fall below the ML established by the approved analytical method(s). In these instances, the calculated limitation is included in the permit with a compliance level set equal to the ML of the most sensitive method.

Monitoring Requirements

CWA section 308, 40 CFR 122.44(i), 6 NYCRR 750-1.13, and 750-2.5 require that monitoring be included in permits to determine compliance with effluent limitations. Additional effluent monitoring may also be required to gather data to determine if effluent limitations may be required. The permittee is responsible for conducting the monitoring and reporting results on Discharge Monitoring Reports (DMRs). The permit contains the monitoring requirements for the facility. Monitoring frequency is based on the minimum sampling necessary to adequately monitor the facility's performance and characterize the nature of the discharge of the monitored flow or pollutant. Variable effluent flows and pollutant levels may be required to be monitored at more frequent intervals than relatively constant effluent flow and pollutant levels (6 NYCRR 750-1.13). For industrial facilities, sampling frequency is based on guidance provided in TOGS 1.2.1. For municipal facilities, sampling frequency is based on guidance provided in TOGS 1.3.3.

Action Levels

As defined in 6 NYCRR 750-1.2(a)(2), when used in a SPDES permit, an Action Level means a monitoring requirement characterized by a numerical value that, when exceeded, triggers additional permittee monitoring and DEC review to determine if numerical effluent limitations should be imposed.

The application of an Action Level is provided in TOGS 1.2.1. If the Action Level is exceeded, the permittee is required to conduct confirmatory monitoring. If Action Levels are routinely or excessively exceeded, they will be reconsidered and adjusted or replaced by limits in accordance with the Environmental Benefit Permit Strategy (EBPS). An Action Level is not a limit, and an exceedance does not constitute a permit violation unless the confirmatory sampling is not performed in accordance with the permit requirements.

Other Conditions

Mercury

Mercury is widespread in New York State (NYS) waters at levels above the most stringent dissolved mercury water quality standard (WQS) of 0.7 ng/L. SPDES permittees cannot comply with a Water Quality-Based Effluent Limitation (WQBEL) for mercury. Therefore, an MDV is appropriate, in accordance with 6 NYCRR 702.17(h), "to address widespread standard or guidance value attainment issues including the presence of a ubiquitous pollutant or naturally high levels of a pollutant in a watershed." The first MDV was issued in October 2010 and subsequently revised and reissued in 2015 and 2020. Each iteration of the MDV builds off the previous version supporting the State's effort to reduce mercury pollution and make reasonable progress toward achieving the WQBEL for mercury. This iteration of the MDV refines the content and application of the MDV for mercury.

The MDV does not change the WQS of 0.7 ng/L; it establishes a variance of the WQBEL which is based on the WQS. SPDES permits which include this variance comply with 40 CFR 122.44.

DOW 1.3.10 explains which surface water permittees are eligible for the MDV.

Schedules of Compliance

Schedules of compliance are included in accordance with 40 CFR Part 132 Attachment F, Procedure 9, 40 CFR 122.47 and 6 NYCRR 750-1.14. Schedules of compliance are intended to, in the shortest reasonable time, achieve compliance with applicable effluent standards and limitations, water quality standards, and other applicable requirements. Where the time for compliance is more than nine months, the schedule of compliance must include interim requirements and dates for their achievement. If the time necessary to complete the interim milestones is more than nine months, and not readily divisible into stages for completion, progress reports must be required.

Emerging Contaminants

Emerging Contaminants, such as Perfluorooctanoic acid (PFOA), Perfluorooctanesulfonic acid (PFOS), and 1,4-Dioxane (1,4-D), have been used in a wide variety of consumer and industrial products as well as in manufacturing processes for decades. Based on available research, water quality assessments for 1,4-D will follow existing WQBEL development. PFOA and PFOS do not break down easily; therefore, their presence in wastewater can remain a concern for years following their discontinued use. As the science surrounding these contaminants is still evolving, additional monitoring is needed to better understand potential sources and

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background levels. For more information on emerging contaminants, please see the DEC Division of Water web page: [Emerging Contaminants In NY's Waters - NYSDEC](#).

Schedule(s) of Additional Submittals

Schedules of Additional Submittals are used to summarize the deliverables required by the permit not identified in a separate Schedule of Compliance.

Mini Industrial Pretreatment Program

Pretreatment requirements are intended to protect a WWTP from receiving pollutants that cause pass through or interference to the operations of the POTW receiving such wastes. When necessary, the DEC, in accordance with TOGS 1.3.3. and through issued SPDES permits, requires WWTPs to develop and implement mini or partial pretreatment programs. These requirements are consistent with regulations in 6 NYCRR §750-2.9(b)(1), ECL 17-0811, ECL 17-0825, and 40 CFR §403.5.

As part of the mini pretreatment program, a WWTP must identify industrial users; determine whether legal authority controls (e.g. sewer use laws) are adequate; require, issue, and enforce industrial user permits; and, implement the program.

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Appendix B: CORMIX Session Report and Prediction File

[illegible]

Subsystem CORMIX2: Multiport Diffuser Discharges

HYDRO2 Version 12.0.1.0 August 2021

Time stamp: 12/26/2025--12:46:43

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HA      =      3.05  HD      =      2.49
UA      =      0.021 F      =      0.049  USTAR =0.1654E-02
UW      =      7.360 UWSTAR=0.9101E-02
Uniform density environment
STRCND=  U          RHOAM = 997.5865

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BANK = LEFT DISTB = 439.67 YB1 = 423.67 YB2 = 455.68
LD = 32.00 NOPEN = 22 NRISER= 22 SPAC = 1.52 NPPERR = 1
D0 = 0.089 A0 = 0.006 H0 = 0.61 SUB0 = 1.88
DOINP = 0.089 CR0 = 1.000 B0 =0.4071E-02
Nozzle/port arrangement: alternating without fanning
GAMMA = 90.00 THETA = 45.00 SIGMA = 0.00 BETA = 90.00
U0 = 0.642 Q0 = 0.088 Q0A =0.8763E-01
RHO0 = 997.1575 DRHO0 =0.4290E+00 GPO =0.4217E-02
C0 =0.1000E+03 CUNITs= %
IPOLL = 1 KS =0.0000E+00 KD =0.0000E+00

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q0      =0.2738E-02      SIGNJ0=      1.0
m0 =U0*2*B0 =0.1678E-02      j0 =U0*GP0*B0 =0.1102E-04      (based on slot width B0)
m0 =U0*q0      =0.1758E-02      j0 =q0*GP0      =0.1155E-04      (based on volume flux q0)
Associated 2-d length scales (meters)
lq=B      =      0.004 lm      =      3.38 lm      =      3.91
lmp      = 99999.00 lbp      = 99999.00 la      = 99999.00

```

Q0 =0.8763E-01 M0 =0.5370E-01 J0 =0.3528E-03
 Associated 3-d length scales (meters)
 LQ = 0.08 LM = 5.94 Lm = 11.19 Lb = 38.78
 Lmp = 9999.00 Lbp = 9999.00

FR0 = 154.93 FRD0 = 33.16 R = 30.28 PL = 17.35
(slot) (port/nozzle)

```

Momentum fluxes:  m0      =0.1186E-02  M0      =0.3797E-01
LQ=B      =      0.006 LM      =      2.39  lm      =      2.77  lmp      = 99999.00
LQ=L      =      0.311 LM      =      4.58  lm      =      9.41  lmp      = 99999.00
Properties of riser group with 1 ports/nozzles each:
U0      =      0.454 D0      =      0.106 A0      =      0.009 THETA =      90.00
FR0      = 92.12  FRD0      = 21.50 R      =      21.41
      (slot)              (riser group)

```

[illegible]

```

C0      =0.1000E+03  CUNITS= %
NTOX   =  0
NSTD   =  0
REGMZ  =  0
XINT   =  2000.00  XMAX =  2000.00

```

NSTEP = 200 display intervals per module

Profile definitions:

- BV = Gaussian 1/e (37%) width, in vertical plane normal to trajectory
- BH = top-hat half-width, in horizontal plane normal to trajectory
- S = hydrodynamic centerline dilution

C = centerline concentration (includes reaction effects, if any)
 Uc = Local centerline excess velocity (above ambient)
 TT = Cumulative travel time

X	Y	Z	S	C	BV	BH	Uc	TT
0.00	0.00	0.61	1.0	0.100E+03	0.00	16.00	0.642	.000000E+00

END OF MOD201: DIFFUSER DISCHARGE MODULE

BEGIN MOD234: UNSTABLE RECIRCULATION REGION OVER LAYER DEPTH

INITIAL LOCAL VERTICAL INSTABILITY REGION:

Bulk dilution (S = 21.89) occurs in a limited region (horizontal extent
 = 13.74 m) surrounding the discharge location.

Control volume inflow:

X	Y	Z	S	C	BV	BH	TT
0.00	0.00	0.61	1.0	0.100E+03	0.00	16.00	.000000E+00

Control volume outflow:

X	Y	Z	S	C	BV	BH	TT
13.74	0.00	1.25	21.9	0.457E+01	2.49	22.23	.20717E+02

END OF MOD234: UNSTABLE RECIRCULATION REGION OVER LAYER DEPTH

BEGIN MOD234a: UPSTREAM SPREADING AFTER NEAR-FIELD INSTABILITY

UPSTREAM INTRUSION PROPERTIES:

Upstream intrusion length	=	3.68 m
X-position of upstream stagnation point	=	10.05 m
Thickness in intrusion region	=	2.49 m
Half-width at downstream end	=	21.51 m
Thickness at downstream end	=	2.28 m

Control volume inflow:

X	Y	Z	S	C	BV	BH	TT
13.74	0.00	1.25	21.9	0.457E+01	2.49	22.23	.20717E+02

Profile definitions:

BV = top-hat thickness, measured vertically
 BH = top-hat half-width, measured horizontally in y-direction
 ZU = upper plume boundary (Z-coordinate)
 ZL = lower plume boundary (Z-coordinate)
 S = hydrodynamic average (bulk) dilution
 C = average (bulk) concentration (includes reaction effects, if any)
 TT = Cumulative travel time

X	Y	Z	S	C	BV	BH	ZU	ZL	TT
10.05	0.00	2.49	9999.9	0.000E+00	0.00	0.00	2.49	2.49	.19450E+03
10.34	0.00	2.49	62.5	0.160E+01	1.25	6.22	2.49	1.24	.18088E+03
11.76	0.00	2.49	26.9	0.372E+01	2.49	15.12	2.49	0.00	.11414E+03
13.17	0.00	2.49	22.2	0.450E+01	2.49	20.45	2.49	0.00	.47397E+02
14.59	0.00	2.49	21.9	0.456E+01	2.28	21.82	2.49	0.21	.60779E+02
16.00	0.00	2.49	22.2	0.451E+01	2.28	21.77	2.49	0.21	.12752E+03
17.42	0.00	2.49	22.6	0.443E+01	2.28	21.71	2.49	0.21	.19426E+03
18.83	0.00	2.49	23.0	0.435E+01	2.28	21.67	2.49	0.21	.26101E+03
20.25	0.00	2.49	23.3	0.429E+01	2.28	21.62	2.49	0.21	.32775E+03
21.66	0.00	2.49	23.5	0.425E+01	2.43	21.58	2.49	0.06	.39449E+03
23.08	0.00	2.49	23.6	0.423E+01	2.34	21.54	2.49	0.15	.46123E+03
24.49	0.00	2.49	23.7	0.422E+01	2.28	21.51	2.49	0.21	.52797E+03

Cumulative travel time = 527.9727 sec (0.15 hrs)

END OF MOD234a: UPSTREAM SPREADING AFTER NEAR-FIELD INSTABILITY

** End of NEAR-FIELD REGION (NFR) **

BEGIN MOD241: BUOYANT AMBIENT SPREADING

Profile definitions:

BV = top-hat thickness, measured vertically
 BH = top-hat half-width, measured horizontally in y-direction
 ZU = upper plume boundary (Z-coordinate)
 ZL = lower plume boundary (Z-coordinate)
 S = hydrodynamic average (bulk) dilution
 C = average (bulk) concentration (includes reaction effects, if any)
 TT = Cumulative travel time

Plume Stage 1 (not bank attached):

X	Y	Z	S	C	BV	BH	ZU	ZL	TT
24.49	0.00	2.49	23.7	0.422E+01	2.28	21.51	2.49	0.21	.52797E+03
24.71	0.00	2.49	23.8	0.420E+01	2.27	21.66	2.49	0.22	.53839E+03
24.93	0.00	2.49	23.9	0.418E+01	2.27	21.80	2.49	0.23	.54882E+03
25.16	0.00	2.49	24.0	0.417E+01	2.26	21.95	2.49	0.23	.55924E+03
25.38	0.00	2.49	24.1	0.415E+01	2.25	22.10	2.49	0.24	.56966E+03
25.60	0.00	2.49	24.2	0.414E+01	2.25	22.24	2.49	0.25	.58008E+03
25.82	0.00	2.49	24.3	0.412E+01	2.24	22.39	2.49	0.25	.59050E+03
26.04	0.00	2.49	24.3	0.411E+01	2.23	22.53	2.49	0.26	.60093E+03
26.26	0.00	2.49	24.4	0.409E+01	2.23	22.67	2.49	0.26	.61135E+03

26.48	0.00	2.49	24.5	0.408E+01	2.22	22.82	2.49	0.27	.62177E+03
26.70	0.00	2.49	24.6	0.406E+01	2.22	22.96	2.49	0.27	.63219E+03
26.92	0.00	2.49	24.7	0.405E+01	2.21	23.10	2.49	0.28	.64261E+03
27.14	0.00	2.49	24.8	0.403E+01	2.20	23.25	2.49	0.29	.65304E+03
27.37	0.00	2.49	24.9	0.402E+01	2.20	23.39	2.49	0.29	.66346E+03
27.59	0.00	2.49	25.0	0.400E+01	2.19	23.53	2.49	0.30	.67388E+03
27.81	0.00	2.49	25.1	0.399E+01	2.19	23.67	2.49	0.30	.68430E+03
28.03	0.00	2.49	25.2	0.397E+01	2.18	23.81	2.49	0.31	.69472E+03
28.25	0.00	2.49	25.3	0.396E+01	2.18	23.95	2.49	0.31	.70515E+03
28.47	0.00	2.49	25.4	0.394E+01	2.18	24.09	2.49	0.31	.71557E+03
28.69	0.00	2.49	25.5	0.393E+01	2.17	24.23	2.49	0.32	.72599E+03
28.91	0.00	2.49	25.6	0.391E+01	2.17	24.37	2.49	0.32	.73641E+03
29.13	0.00	2.49	25.7	0.390E+01	2.16	24.51	2.49	0.33	.74683E+03
29.35	0.00	2.49	25.8	0.388E+01	2.16	24.65	2.49	0.33	.75726E+03
29.57	0.00	2.49	25.8	0.387E+01	2.16	24.79	2.49	0.33	.76768E+03
29.80	0.00	2.49	25.9	0.385E+01	2.15	24.92	2.49	0.34	.77810E+03
30.02	0.00	2.49	26.0	0.384E+01	2.15	25.06	2.49	0.34	.78852E+03
30.24	0.00	2.49	26.1	0.382E+01	2.14	25.20	2.49	0.35	.79894E+03
30.46	0.00	2.49	26.2	0.381E+01	2.14	25.33	2.49	0.35	.80937E+03
30.68	0.00	2.49	26.3	0.380E+01	2.14	25.47	2.49	0.35	.81979E+03
30.90	0.00	2.49	26.4	0.378E+01	2.13	25.61	2.49	0.36	.83021E+03
31.12	0.00	2.49	26.5	0.377E+01	2.13	25.74	2.49	0.36	.84063E+03
31.34	0.00	2.49	26.7	0.375E+01	2.13	25.88	2.49	0.36	.85105E+03
31.56	0.00	2.49	26.8	0.374E+01	2.13	26.01	2.49	0.36	.86148E+03
31.78	0.00	2.49	26.9	0.372E+01	2.12	26.14	2.49	0.37	.87190E+03
32.01	0.00	2.49	27.0	0.371E+01	2.12	26.28	2.49	0.37	.88232E+03
32.23	0.00	2.49	27.1	0.369E+01	2.12	26.41	2.49	0.37	.89274E+03
32.45	0.00	2.49	27.2	0.368E+01	2.12	26.54	2.49	0.37	.90316E+03
32.67	0.00	2.49	27.3	0.367E+01	2.11	26.68	2.49	0.38	.91358E+03
32.89	0.00	2.49	27.4	0.365E+01	2.11	26.81	2.49	0.38	.92401E+03
33.11	0.00	2.49	27.5	0.364E+01	2.11	26.94	2.49	0.38	.93443E+03
33.33	0.00	2.49	27.6	0.362E+01	2.11	27.07	2.49	0.38	.94485E+03
33.55	0.00	2.49	27.7	0.361E+01	2.10	27.21	2.49	0.39	.95527E+03
33.77	0.00	2.49	27.8	0.360E+01	2.10	27.34	2.49	0.39	.96569E+03
33.99	0.00	2.49	27.9	0.358E+01	2.10	27.47	2.49	0.39	.97612E+03
34.21	0.00	2.49	28.0	0.357E+01	2.10	27.60	2.49	0.39	.98654E+03
34.44	0.00	2.49	28.1	0.355E+01	2.10	27.73	2.49	0.39	.99696E+03
34.66	0.00	2.49	28.3	0.354E+01	2.10	27.86	2.49	0.39	.10074E+04
34.88	0.00	2.49	28.4	0.353E+01	2.09	27.99	2.49	0.40	.10178E+04
35.10	0.00	2.49	28.5	0.351E+01	2.09	28.12	2.49	0.40	.10282E+04
35.32	0.00	2.49	28.6	0.350E+01	2.09	28.25	2.49	0.40	.10386E+04
35.54	0.00	2.49	28.7	0.348E+01	2.09	28.37	2.49	0.40	.10491E+04
35.76	0.00	2.49	28.8	0.347E+01	2.09	28.50	2.49	0.40	.10595E+04
35.98	0.00	2.49	28.9	0.346E+01	2.09	28.63	2.49	0.40	.10699E+04
36.20	0.00	2.49	29.0	0.344E+01	2.09	28.76	2.49	0.40	.10803E+04
36.42	0.00	2.49	29.2	0.343E+01	2.09	28.89	2.49	0.40	.10908E+04
36.64	0.00	2.49	29.3	0.342E+01	2.09	29.01	2.49	0.40	.11012E+04
36.87	0.00	2.49	29.4	0.340E+01	2.09	29.14	2.49	0.41	.11116E+04
37.09	0.00	2.49	29.5	0.339E+01	2.08	29.27	2.49	0.41	.11220E+04
37.31	0.00	2.49	29.6	0.337E+01	2.08	29.39	2.49	0.41	.11324E+04
37.53	0.00	2.49	29.8	0.336E+01	2.08	29.52	2.49	0.41	.11429E+04
37.75	0.00	2.49	29.9	0.335E+01	2.08	29.65	2.49	0.41	.11533E+04
37.97	0.00	2.49	30.0	0.333E+01	2.08	29.77	2.49	0.41	.11637E+04
38.19	0.00	2.49	30.1	0.332E+01	2.08	29.90	2.49	0.41	.11741E+04
38.41	0.00	2.49	30.2	0.331E+01	2.08	30.02	2.49	0.41	.11846E+04
38.63	0.00	2.49	30.4	0.329E+01	2.08	30.15	2.49	0.41	.11950E+04
38.85	0.00	2.49	30.5	0.328E+01	2.08	30.27	2.49	0.41	.12054E+04
39.08	0.00	2.49	30.6	0.327E+01	2.08	30.40	2.49	0.41	.12158E+04
39.30	0.00	2.49	30.7	0.325E+01	2.08	30.52	2.49	0.41	.12262E+04
39.52	0.00	2.49	30.9	0.324E+01	2.08	30.64	2.49	0.41	.12367E+04
39.74	0.00	2.49	31.0	0.323E+01	2.08	30.77	2.49	0.41	.12471E+04
39.96	0.00	2.49	31.1	0.321E+01	2.08	30.89	2.49	0.41	.12575E+04
40.18	0.00	2.49	31.2	0.320E+01	2.08	31.01	2.49	0.41	.12679E+04
40.40	0.00	2.49	31.4	0.319E+01	2.08	31.14	2.49	0.41	.12783E+04
40.62	0.00	2.49	31.5	0.317E+01	2.08	31.26	2.49	0.41	.12888E+04
40.84	0.00	2.49	31.6	0.316E+01	2.08	31.38	2.49	0.41	.12992E+04
41.06	0.00	2.49	31.8	0.315E+01	2.08	31.50	2.49	0.41	.13096E+04
41.28	0.00	2.49	31.9	0.314E+01	2.08	31.63	2.49	0.41	.13200E+04
41.51	0.00	2.49	32.0	0.312E+01	2.08	31.75	2.49	0.41	.13305E+04
41.73	0.00	2.49	32.2	0.311E+01	2.09	31.87	2.49	0.40	.13409E+04
41.95	0.00	2.49	32.3	0.310E+01	2.09	31.99	2.49	0.40	.13513E+04
42.17	0.00	2.49	32.4	0.308E+01	2.09	32.11	2.49	0.40	.13617E+04
42.39	0.00	2.49	32.6	0.307E+01	2.09	32.23	2.49	0.40	.13721E+04
42.61	0.00	2.49	32.7	0.306E+01	2.09	32.35	2.49	0.40	.13826E+04
42.83	0.00	2.49	32.8	0.305E+01	2.09	32.47	2.49	0.40	.13930E+04
43.05	0.00	2.49	33.0	0.303E+01	2.09	32.59	2.49	0.40	.14034E+04
43.27	0.00	2.49	33.1	0.302E+01	2.09	32.71	2.49	0.40	.14138E+04
43.49	0.00	2.49	33.3	0.301E+01	2.09	32.83	2.49	0.40	.14243E+04
43.72	0.00	2.49	33.4	0.299E+01	2.09	32.95	2.49	0.40	.14347E+04
43.94	0.00	2.49	33.5	0.298E+01	2.10	33.07	2.49	0.39	.14451E+04
44.16	0.00	2.49	33.7	0.297E+01	2.10	33.19	2.49	0.39	.14555E+04
44.38	0.00	2.49	33.8	0.296E+01	2.10	33.31	2.49	0.39	.14659E+04
44.60	0.00	2.49	34.0	0.294E+01	2.10	33.43	2.49	0.39	.14764E+04
44.82	0.00	2.49	34.1	0.293E+01	2.10	33.54	2.49	0.39	.14868E+04
45.04	0.00	2.49	34.2	0.292E+01	2.10	33.66	2.49	0.39	.14972E+04
45.26	0.00	2.49	34.4	0.291E+01	2.10	33.78	2.49	0.39	.15076E+04
45.48	0.00	2.49	34.5	0.290E+01	2.11	33.90	2.49	0.38	.15181E+04
45.70	0.00	2.49	34.7	0.288E+01	2.11	34.01	2.49	0.38	.15285E+04
45.92	0.00	2.49	34.8	0.287E+01	2.11	34.13	2.49	0.38	.15389E+04
46.15	0.00	2.49	35.0	0.286E+01	2.11	34.25	2.49	0.38	.15493E+04

46.37	0.00	2.49	35.1	0.285E+01	2.11	34.37	2.49	0.38	.15597E+04
46.59	0.00	2.49	35.3	0.283E+01	2.11	34.48	2.49	0.38	.15702E+04
46.81	0.00	2.49	35.4	0.282E+01	2.12	34.60	2.49	0.37	.15806E+04
47.03	0.00	2.49	35.6	0.281E+01	2.12	34.72	2.49	0.37	.15910E+04
47.25	0.00	2.49	35.7	0.280E+01	2.12	34.83	2.49	0.37	.16014E+04
47.47	0.00	2.49	35.9	0.279E+01	2.12	34.95	2.49	0.37	.16118E+04
47.69	0.00	2.49	36.0	0.277E+01	2.12	35.06	2.49	0.37	.16223E+04
47.91	0.00	2.49	36.2	0.276E+01	2.13	35.18	2.49	0.36	.16327E+04
48.13	0.00	2.49	36.3	0.275E+01	2.13	35.29	2.49	0.36	.16431E+04
48.35	0.00	2.49	36.5	0.274E+01	2.13	35.41	2.49	0.36	.16535E+04
48.58	0.00	2.49	36.7	0.273E+01	2.13	35.52	2.49	0.36	.16640E+04
48.80	0.00	2.49	36.8	0.272E+01	2.14	35.64	2.49	0.36	.16744E+04
49.02	0.00	2.49	37.0	0.270E+01	2.14	35.75	2.49	0.35	.16848E+04
49.24	0.00	2.49	37.1	0.269E+01	2.14	35.87	2.49	0.35	.16952E+04
49.46	0.00	2.49	37.3	0.268E+01	2.14	35.98	2.49	0.35	.17056E+04
49.68	0.00	2.49	37.5	0.267E+01	2.14	36.10	2.49	0.35	.17161E+04
49.90	0.00	2.49	37.6	0.266E+01	2.15	36.21	2.49	0.34	.17265E+04
50.12	0.00	2.49	37.8	0.265E+01	2.15	36.32	2.49	0.34	.17369E+04
50.34	0.00	2.49	37.9	0.264E+01	2.15	36.44	2.49	0.34	.17473E+04
50.56	0.00	2.49	38.1	0.262E+01	2.15	36.55	2.49	0.34	.17578E+04
50.79	0.00	2.49	38.3	0.261E+01	2.16	36.66	2.49	0.33	.17682E+04
51.01	0.00	2.49	38.4	0.260E+01	2.16	36.78	2.49	0.33	.17786E+04
51.23	0.00	2.49	38.6	0.259E+01	2.16	36.89	2.49	0.33	.17890E+04
51.45	0.00	2.49	38.8	0.258E+01	2.17	37.00	2.49	0.32	.17994E+04
51.67	0.00	2.49	38.9	0.257E+01	2.17	37.11	2.49	0.32	.18099E+04
51.89	0.00	2.49	39.1	0.256E+01	2.17	37.23	2.49	0.32	.18203E+04
52.11	0.00	2.49	39.3	0.255E+01	2.17	37.34	2.49	0.32	.18307E+04
52.33	0.00	2.49	39.5	0.253E+01	2.18	37.45	2.49	0.31	.18411E+04
52.55	0.00	2.49	39.6	0.252E+01	2.18	37.56	2.49	0.31	.18516E+04
52.77	0.00	2.49	39.8	0.251E+01	2.18	37.67	2.49	0.31	.18620E+04
52.99	0.00	2.49	40.0	0.250E+01	2.19	37.78	2.49	0.30	.18724E+04
53.22	0.00	2.49	40.1	0.249E+01	2.19	37.89	2.49	0.30	.18828E+04
53.44	0.00	2.49	40.3	0.248E+01	2.19	38.01	2.49	0.30	.18932E+04
53.66	0.00	2.49	40.5	0.247E+01	2.20	38.12	2.49	0.29	.19037E+04
53.88	0.00	2.49	40.7	0.246E+01	2.20	38.23	2.49	0.29	.19141E+04
54.10	0.00	2.49	40.8	0.245E+01	2.20	38.34	2.49	0.29	.19245E+04
54.32	0.00	2.49	41.0	0.244E+01	2.21	38.45	2.49	0.28	.19349E+04
54.54	0.00	2.49	41.2	0.243E+01	2.21	38.56	2.49	0.28	.19453E+04
54.76	0.00	2.49	41.4	0.242E+01	2.21	38.67	2.49	0.28	.19558E+04
54.98	0.00	2.49	41.6	0.241E+01	2.22	38.78	2.49	0.27	.19662E+04
55.20	0.00	2.49	41.8	0.240E+01	2.22	38.89	2.49	0.27	.19766E+04
55.43	0.00	2.49	41.9	0.238E+01	2.22	39.00	2.49	0.27	.19870E+04
55.65	0.00	2.49	42.1	0.237E+01	2.23	39.11	2.49	0.26	.19975E+04
55.87	0.00	2.49	42.3	0.236E+01	2.23	39.22	2.49	0.26	.20079E+04
56.09	0.00	2.49	42.5	0.235E+01	2.23	39.33	2.49	0.26	.20183E+04
56.31	0.00	2.49	42.7	0.234E+01	2.24	39.43	2.49	0.25	.20287E+04
56.53	0.00	2.49	42.9	0.233E+01	2.24	39.54	2.49	0.25	.20391E+04
56.75	0.00	2.49	43.0	0.232E+01	2.24	39.65	2.49	0.25	.20496E+04
56.97	0.00	2.49	43.2	0.231E+01	2.25	39.76	2.49	0.24	.20600E+04
57.19	0.00	2.49	43.4	0.230E+01	2.25	39.87	2.49	0.24	.20704E+04
57.41	0.00	2.49	43.6	0.229E+01	2.25	39.98	2.49	0.24	.20808E+04
57.63	0.00	2.49	43.8	0.228E+01	2.26	40.09	2.49	0.23	.20913E+04
57.86	0.00	2.49	44.0	0.227E+01	2.26	40.19	2.49	0.23	.21017E+04
58.08	0.00	2.49	44.2	0.226E+01	2.27	40.30	2.49	0.22	.21121E+04
58.30	0.00	2.49	44.4	0.225E+01	2.27	40.41	2.49	0.22	.21225E+04
58.52	0.00	2.49	44.6	0.224E+01	2.27	40.52	2.49	0.22	.21329E+04
58.74	0.00	2.49	44.8	0.223E+01	2.28	40.62	2.49	0.21	.21434E+04
58.96	0.00	2.49	45.0	0.222E+01	2.28	40.73	2.49	0.21	.21538E+04
59.18	0.00	2.49	45.2	0.221E+01	2.29	40.84	2.49	0.20	.21642E+04
59.40	0.00	2.49	45.4	0.220E+01	2.29	40.95	2.49	0.20	.21746E+04
59.62	0.00	2.49	45.6	0.219E+01	2.29	41.05	2.49	0.20	.21851E+04
59.84	0.00	2.49	45.8	0.218E+01	2.30	41.16	2.49	0.19	.21955E+04
60.06	0.00	2.49	46.0	0.218E+01	2.30	41.27	2.49	0.19	.22059E+04
60.29	0.00	2.49	46.2	0.217E+01	2.31	41.37	2.49	0.18	.22163E+04
60.51	0.00	2.49	46.4	0.216E+01	2.31	41.48	2.49	0.18	.22267E+04
60.73	0.00	2.49	46.6	0.215E+01	2.32	41.58	2.49	0.17	.22372E+04
60.95	0.00	2.49	46.8	0.214E+01	2.32	41.69	2.49	0.17	.22476E+04
61.17	0.00	2.49	47.0	0.213E+01	2.32	41.80	2.49	0.17	.22580E+04
61.39	0.00	2.49	47.2	0.212E+01	2.33	41.90	2.49	0.16	.22684E+04
61.61	0.00	2.49	47.4	0.211E+01	2.33	42.01	2.49	0.16	.22788E+04
61.83	0.00	2.49	47.6	0.210E+01	2.34	42.11	2.49	0.15	.22893E+04
62.05	0.00	2.49	47.8	0.209E+01	2.34	42.22	2.49	0.15	.22997E+04
62.27	0.00	2.49	48.0	0.208E+01	2.35	42.32	2.49	0.14	.23101E+04
62.50	0.00	2.49	48.3	0.207E+01	2.35	42.43	2.49	0.14	.23205E+04
62.72	0.00	2.49	48.5	0.206E+01	2.35	42.53	2.49	0.14	.23310E+04
62.94	0.00	2.49	48.7	0.205E+01	2.36	42.64	2.49	0.13	.23414E+04
63.16	0.00	2.49	48.9	0.205E+01	2.36	42.74	2.49	0.13	.23518E+04
63.38	0.00	2.49	49.1	0.204E+01	2.37	42.85	2.49	0.12	.23622E+04
63.60	0.00	2.49	49.3	0.203E+01	2.37	42.95	2.49	0.12	.23726E+04
63.82	0.00	2.49	49.5	0.202E+01	2.38	43.06	2.49	0.11	.23831E+04
64.04	0.00	2.49	49.8	0.201E+01	2.38	43.16	2.49	0.11	.23935E+04
64.26	0.00	2.49	50.0	0.200E+01	2.39	43.26	2.49	0.10	.24039E+04
64.48	0.00	2.49	50.2	0.199E+01	2.39	43.37	2.49	0.10	.24143E+04
64.70	0.00	2.49	50.4	0.198E+01	2.40	43.47	2.49	0.09	.24248E+04
64.93	0.00	2.49	50.6	0.197E+01	2.40	43.58	2.49	0.09	.24352E+04
65.15	0.00	2.49	50.9	0.197E+01	2.41	43.68	2.49	0.08	.24456E+04
65.37	0.00	2.49	51.1	0.196E+01	2.41	43.78	2.49	0.08	.24560E+04
65.59	0.00	2.49	51.3	0.195E+01	2.42	43.89	2.49	0.07	.24664E+04
65.81	0.00	2.49	51.5	0.194E+01	2.42	43.99	2.49	0.07	.24769E+04
66.03	0.00	2.49	51.8	0.193E+01	2.43	44.09	2.49	0.06	.24873E+04

66.25	0.00	2.49	52.0	0.192E+01	2.43	44.19	2.49	0.06	.24977E+04
66.47	0.00	2.49	52.2	0.192E+01	2.44	44.30	2.49	0.05	.25081E+04
66.69	0.00	2.49	52.4	0.191E+01	2.44	44.40	2.49	0.05	.25186E+04
66.91	0.00	2.49	52.7	0.190E+01	2.45	44.50	2.49	0.04	.25290E+04
67.14	0.00	2.49	52.9	0.189E+01	2.45	44.61	2.49	0.04	.25394E+04
67.36	0.00	2.49	53.1	0.188E+01	2.46	44.71	2.49	0.03	.25498E+04
67.58	0.00	2.49	53.4	0.187E+01	2.46	44.81	2.49	0.03	.25602E+04
67.80	0.00	2.49	53.6	0.187E+01	2.47	44.91	2.49	0.02	.25707E+04
68.02	0.00	2.49	53.8	0.186E+01	2.47	45.01	2.49	0.02	.25811E+04
68.24	0.00	2.49	54.1	0.185E+01	2.48	45.12	2.49	0.01	.25915E+04
68.46	0.00	2.49	54.3	0.184E+01	2.48	45.22	2.49	0.01	.26019E+04
68.68	0.00	2.49	54.6	0.183E+01	2.49	45.32	2.49	0.00	.26124E+04

Cumulative travel time = 2612.3611 sec (0.73 hrs)

END OF MOD241: BUOYANT AMBIENT SPREADING

Bottom coordinate for FAR-FIELD is determined by average depth, ZFB = -0.56m

BEGIN MOD261: PASSIVE AMBIENT MIXING IN UNIFORM AMBIENT

Vertical diffusivity (initial value) = 0.454E-02 m²/s
Horizontal diffusivity (initial value) = 0.242E+00 m²/s

Profile definitions:

BV = Gaussian s.d.*sqrt(pi/2) (4%) thickness, measured vertically
= or equal to layer depth, if fully mixed
BH = Gaussian s.d.*sqrt(pi/2) (4%) half-width,
measured horizontally in Y-direction
ZU = upper plume boundary (Z-coordinate)
ZL = lower plume boundary (Z-coordinate)
S = hydrodynamic centerline dilution
C = centerline concentration (includes reaction effects, if any)
TT = Cumulative travel time

Plume Stage 1 (not bank attached):

X	Y	Z	S	C	BV	BH	ZU	ZL	TT
68.68	0.00	2.49	54.6	0.183E+01	2.49	45.32	2.49	0.00	.26124E+04
71.73	0.00	2.49	58.0	0.172E+01	2.57	46.53	2.49	0.00	.27560E+04
74.77	0.00	2.49	61.6	0.162E+01	2.66	47.75	2.49	0.00	.28996E+04
77.81	0.00	2.49	65.4	0.153E+01	2.76	48.99	2.49	0.00	.30432E+04
80.86	0.00	2.49	69.4	0.144E+01	2.85	50.23	2.49	0.00	.31868E+04
83.90	0.00	2.49	73.5	0.136E+01	2.95	51.48	2.49	0.00	.33304E+04
86.95	0.00	2.49	77.8	0.129E+01	3.05	52.75	2.49	0.00	.34740E+04
89.99	0.00	2.49	79.7	0.126E+01	3.05	54.02	2.49	0.00	.36176E+04
93.04	0.00	2.49	81.6	0.123E+01	3.05	55.30	2.49	0.00	.37612E+04
96.08	0.00	2.49	83.5	0.120E+01	3.05	56.60	2.49	0.00	.39048E+04
99.13	0.00	2.49	85.4	0.117E+01	3.05	57.90	2.49	0.00	.40484E+04
102.17	0.00	2.49	87.3	0.114E+01	3.05	59.22	2.49	0.00	.41920E+04
105.21	0.00	2.49	89.3	0.112E+01	3.05	60.54	2.49	0.00	.43356E+04
108.26	0.00	2.49	91.3	0.110E+01	3.05	61.87	2.49	0.00	.44792E+04
111.30	0.00	2.49	93.2	0.107E+01	3.05	63.22	2.49	0.00	.46228E+04
114.35	0.00	2.49	95.2	0.105E+01	3.05	64.57	2.49	0.00	.47664E+04
117.39	0.00	2.49	97.2	0.103E+01	3.05	65.93	2.49	0.00	.49100E+04
120.44	0.00	2.49	99.3	0.101E+01	3.05	67.30	2.49	0.00	.50536E+04
123.48	0.00	2.49	101.3	0.987E+00	3.05	68.68	2.49	0.00	.51972E+04
126.53	0.00	2.49	103.4	0.968E+00	3.05	70.08	2.49	0.00	.53408E+04
129.57	0.00	2.49	105.4	0.949E+00	3.05	71.47	2.49	0.00	.54844E+04
132.61	0.00	2.49	107.5	0.930E+00	3.05	72.88	2.49	0.00	.56280E+04
135.66	0.00	2.49	109.6	0.913E+00	3.05	74.30	2.49	0.00	.57716E+04
138.70	0.00	2.49	111.7	0.895E+00	3.05	75.73	2.49	0.00	.59152E+04
141.75	0.00	2.49	113.8	0.879E+00	3.05	77.16	2.49	0.00	.60588E+04
144.79	0.00	2.49	115.9	0.863E+00	3.05	78.61	2.49	0.00	.62024E+04
147.84	0.00	2.49	118.1	0.847E+00	3.05	80.06	2.49	0.00	.63460E+04
150.88	0.00	2.49	120.2	0.832E+00	3.05	81.53	2.49	0.00	.64896E+04
153.92	0.00	2.49	122.4	0.817E+00	3.05	83.00	2.49	0.00	.66332E+04
156.97	0.00	2.49	124.6	0.803E+00	3.05	84.48	2.49	0.00	.67768E+04
160.01	0.00	2.49	126.8	0.789E+00	3.05	85.97	2.49	0.00	.69204E+04
163.06	0.00	2.49	129.0	0.775E+00	3.05	87.46	2.49	0.00	.70641E+04
166.10	0.00	2.49	131.2	0.762E+00	3.05	88.97	2.49	0.00	.72077E+04
169.15	0.00	2.49	133.5	0.749E+00	3.05	90.49	2.49	0.00	.73513E+04
172.19	0.00	2.49	135.7	0.737E+00	3.05	92.01	2.49	0.00	.74949E+04
175.24	0.00	2.49	138.0	0.725E+00	3.05	93.54	2.49	0.00	.76385E+04
178.28	0.00	2.49	140.2	0.713E+00	3.05	95.08	2.49	0.00	.77821E+04
181.32	0.00	2.49	142.5	0.702E+00	3.05	96.63	2.49	0.00	.79257E+04
184.37	0.00	2.49	144.8	0.691E+00	3.05	98.19	2.49	0.00	.80693E+04
187.41	0.00	2.49	147.1	0.680E+00	3.05	99.75	2.49	0.00	.82129E+04
190.46	0.00	2.49	149.4	0.669E+00	3.05	101.32	2.49	0.00	.83565E+04
193.50	0.00	2.49	151.8	0.659E+00	3.05	102.91	2.49	0.00	.85001E+04
196.55	0.00	2.49	154.1	0.649E+00	3.05	104.50	2.49	0.00	.86437E+04
199.59	0.00	2.49	156.5	0.639E+00	3.05	106.09	2.49	0.00	.87873E+04
202.63	0.00	2.49	158.8	0.630E+00	3.05	107.70	2.49	0.00	.89309E+04
205.68	0.00	2.49	161.2	0.620E+00	3.05	109.31	2.49	0.00	.90745E+04
208.72	0.00	2.49	163.6	0.611E+00	3.05	110.93	2.49	0.00	.92181E+04
211.77	0.00	2.49	166.0	0.602E+00	3.05	112.56	2.49	0.00	.93617E+04
214.81	0.00	2.49	168.4	0.594E+00	3.05	114.20	2.49	0.00	.95053E+04
217.86	0.00	2.49	170.9	0.585E+00	3.05	115.85	2.49	0.00	.96489E+04
220.90	0.00	2.49	173.3	0.577E+00	3.05	117.50	2.49	0.00	.97925E+04
223.95	0.00	2.49	175.7	0.569E+00	3.05	119.16	2.49	0.00	.99361E+04
226.99	0.00	2.49	178.2	0.561E+00	3.05	120.83	2.49	0.00	.10080E+05
230.03	0.00	2.49	180.7	0.553E+00	3.05	122.51	2.49	0.00	.10223E+05

233.08	0.00	2.49	183.2	0.546E+00	3.05	124.19	2.49	0.00	.10367E+05
236.12	0.00	2.49	185.7	0.539E+00	3.05	125.88	2.49	0.00	.10511E+05
239.17	0.00	2.49	188.2	0.531E+00	3.05	127.58	2.49	0.00	.10654E+05
242.21	0.00	2.49	190.7	0.524E+00	3.05	129.29	2.49	0.00	.10798E+05
245.26	0.00	2.49	193.2	0.518E+00	3.05	131.01	2.49	0.00	.10941E+05
248.30	0.00	2.49	195.8	0.511E+00	3.05	132.73	2.49	0.00	.11085E+05
251.35	0.00	2.49	198.3	0.504E+00	3.05	134.46	2.49	0.00	.11229E+05
254.39	0.00	2.49	200.9	0.498E+00	3.05	136.19	2.49	0.00	.11372E+05
257.43	0.00	2.49	203.4	0.492E+00	3.05	137.94	2.49	0.00	.11516E+05
260.48	0.00	2.49	206.0	0.485E+00	3.05	139.69	2.49	0.00	.11659E+05
263.52	0.00	2.49	208.6	0.479E+00	3.05	141.45	2.49	0.00	.11803E+05
266.57	0.00	2.49	211.2	0.473E+00	3.05	143.22	2.49	0.00	.11947E+05
269.61	0.00	2.49	213.8	0.468E+00	3.05	144.99	2.49	0.00	.12090E+05
272.66	0.00	2.49	216.5	0.462E+00	3.05	146.77	2.49	0.00	.12234E+05
275.70	0.00	2.49	219.1	0.456E+00	3.05	148.56	2.49	0.00	.12377E+05
278.74	0.00	2.49	221.8	0.451E+00	3.05	150.36	2.49	0.00	.12521E+05
281.79	0.00	2.49	224.4	0.446E+00	3.05	152.16	2.49	0.00	.12665E+05
284.83	0.00	2.49	227.1	0.440E+00	3.05	153.97	2.49	0.00	.12808E+05
287.88	0.00	2.49	229.8	0.435E+00	3.05	155.79	2.49	0.00	.12952E+05
290.92	0.00	2.49	232.5	0.430E+00	3.05	157.61	2.49	0.00	.13095E+05
293.97	0.00	2.49	235.2	0.425E+00	3.05	159.44	2.49	0.00	.13239E+05
297.01	0.00	2.49	237.9	0.420E+00	3.05	161.28	2.49	0.00	.13383E+05
300.06	0.00	2.49	240.6	0.416E+00	3.05	163.12	2.49	0.00	.13526E+05
303.10	0.00	2.49	243.3	0.411E+00	3.05	164.98	2.49	0.00	.13670E+05
306.14	0.00	2.49	246.1	0.406E+00	3.05	166.84	2.49	0.00	.13813E+05
309.19	0.00	2.49	248.8	0.402E+00	3.05	168.70	2.49	0.00	.13957E+05
312.23	0.00	2.49	251.6	0.397E+00	3.05	170.58	2.49	0.00	.14101E+05
315.28	0.00	2.49	254.3	0.393E+00	3.05	172.46	2.49	0.00	.14244E+05
318.32	0.00	2.49	257.1	0.389E+00	3.05	174.34	2.49	0.00	.14388E+05
321.37	0.00	2.49	259.9	0.385E+00	3.05	176.24	2.49	0.00	.14531E+05
324.41	0.00	2.49	262.7	0.381E+00	3.05	178.14	2.49	0.00	.14675E+05
327.46	0.00	2.49	265.5	0.377E+00	3.05	180.04	2.49	0.00	.14819E+05
330.50	0.00	2.49	268.4	0.373E+00	3.05	181.96	2.49	0.00	.14962E+05
333.54	0.00	2.49	271.2	0.369E+00	3.05	183.88	2.49	0.00	.15106E+05
336.59	0.00	2.49	274.0	0.365E+00	3.05	185.81	2.49	0.00	.15249E+05
339.63	0.00	2.49	276.9	0.361E+00	3.05	187.74	2.49	0.00	.15393E+05
342.68	0.00	2.49	279.8	0.357E+00	3.05	189.68	2.49	0.00	.15537E+05
345.72	0.00	2.49	282.6	0.354E+00	3.05	191.63	2.49	0.00	.15680E+05
348.77	0.00	2.49	285.5	0.350E+00	3.05	193.58	2.49	0.00	.15824E+05
351.81	0.00	2.49	288.4	0.347E+00	3.05	195.54	2.49	0.00	.15967E+05
354.85	0.00	2.49	291.3	0.343E+00	3.05	197.51	2.49	0.00	.16111E+05
357.90	0.00	2.49	294.2	0.340E+00	3.05	199.48	2.49	0.00	.16255E+05
360.94	0.00	2.49	297.1	0.337E+00	3.05	201.46	2.49	0.00	.16398E+05
363.99	0.00	2.49	300.1	0.333E+00	3.05	203.45	2.49	0.00	.16542E+05
367.03	0.00	2.49	303.0	0.330E+00	3.05	205.44	2.49	0.00	.16685E+05
370.08	0.00	2.49	306.0	0.327E+00	3.05	207.44	2.49	0.00	.16829E+05
373.12	0.00	2.49	308.9	0.324E+00	3.05	209.45	2.49	0.00	.16973E+05
376.17	0.00	2.49	311.9	0.321E+00	3.05	211.46	2.49	0.00	.17116E+05
379.21	0.00	2.49	314.9	0.318E+00	3.05	213.48	2.49	0.00	.17260E+05
382.25	0.00	2.49	317.8	0.315E+00	3.05	215.51	2.49	0.00	.17404E+05
385.30	0.00	2.49	320.8	0.312E+00	3.05	217.54	2.49	0.00	.17547E+05
388.34	0.00	2.49	323.8	0.309E+00	3.05	219.58	2.49	0.00	.17691E+05
391.39	0.00	2.49	326.9	0.306E+00	3.05	221.62	2.49	0.00	.17834E+05
394.43	0.00	2.49	329.9	0.303E+00	3.05	223.67	2.49	0.00	.17978E+05
397.48	0.00	2.49	332.9	0.300E+00	3.05	225.73	2.49	0.00	.18122E+05
400.52	0.00	2.49	336.0	0.298E+00	3.05	227.79	2.49	0.00	.18265E+05
403.57	0.00	2.49	339.0	0.295E+00	3.05	229.86	2.49	0.00	.18409E+05
406.61	0.00	2.49	342.1	0.292E+00	3.05	231.94	2.49	0.00	.18552E+05
409.65	0.00	2.49	345.1	0.290E+00	3.05	234.02	2.49	0.00	.18696E+05
412.70	0.00	2.49	348.2	0.287E+00	3.05	236.11	2.49	0.00	.18840E+05
415.74	0.00	2.49	351.3	0.285E+00	3.05	238.20	2.49	0.00	.18983E+05
418.79	0.00	2.49	354.4	0.282E+00	3.05	240.30	2.49	0.00	.19127E+05
421.83	0.00	2.49	357.5	0.280E+00	3.05	242.41	2.49	0.00	.19270E+05
424.88	0.00	2.49	360.6	0.277E+00	3.05	244.52	2.49	0.00	.19414E+05
427.92	0.00	2.49	363.8	0.275E+00	3.05	246.64	2.49	0.00	.19558E+05
430.96	0.00	2.49	366.9	0.273E+00	3.05	248.77	2.49	0.00	.19701E+05
434.01	0.00	2.49	370.0	0.270E+00	3.05	250.90	2.49	0.00	.19845E+05
437.05	0.00	2.49	373.2	0.268E+00	3.05	253.03	2.49	0.00	.19988E+05
440.10	0.00	2.49	376.4	0.266E+00	3.05	255.18	2.49	0.00	.20132E+05
443.14	0.00	2.49	379.5	0.263E+00	3.05	257.33	2.49	0.00	.20276E+05
446.19	0.00	2.49	382.7	0.261E+00	3.05	259.48	2.49	0.00	.20419E+05
449.23	0.00	2.49	385.9	0.259E+00	3.05	261.64	2.49	0.00	.20563E+05
452.28	0.00	2.49	389.1	0.257E+00	3.05	263.81	2.49	0.00	.20706E+05
455.32	0.00	2.49	392.3	0.255E+00	3.05	265.98	2.49	0.00	.20850E+05
458.36	0.00	2.49	395.5	0.253E+00	3.05	268.16	2.49	0.00	.20994E+05
461.41	0.00	2.49	398.7	0.251E+00	3.05	270.35	2.49	0.00	.21137E+05
464.45	0.00	2.49	402.0	0.249E+00	3.05	272.54	2.49	0.00	.21281E+05
467.50	0.00	2.49	405.2	0.247E+00	3.05	274.73	2.49	0.00	.21424E+05
470.54	0.00	2.49	408.4	0.245E+00	3.05	276.94	2.49	0.00	.21568E+05
473.59	0.00	2.49	411.7	0.243E+00	3.05	279.15	2.49	0.00	.21712E+05
476.63	0.00	2.49	415.0	0.241E+00	3.05	281.36	2.49	0.00	.21855E+05
479.68	0.00	2.49	418.2	0.239E+00	3.05	283.58	2.49	0.00	.21999E+05
482.72	0.00	2.49	421.5	0.237E+00	3.05	285.81	2.49	0.00	.22142E+05
485.76	0.00	2.49	424.8	0.235E+00	3.05	288.04	2.49	0.00	.22286E+05
488.81	0.00	2.49	428.1	0.234E+00	3.05	290.27	2.49	0.00	.22430E+05
491.85	0.00	2.49	431.4	0.232E+00	3.05	292.52	2.49	0.00	.22573E+05
494.90	0.00	2.49	434.7	0.230E+00	3.05	294.77	2.49	0.00	.22717E+05
497.94	0.00	2.49	438.1	0.228E+00	3.05	297.02	2.49	0.00	.22860E+05
500.99	0.00	2.49	441.4	0.227E+00	3.05	299.28	2.49	0.00	.23004E+05
504.03	0.00	2.49	444.7	0.225E+00	3.05	301.55	2.49	0.00	.23148E+05

507.07	0.00	2.49	448.1	0.223E+00	3.05	303.82	2.49	0.00	.23291E+05
510.12	0.00	2.49	451.5	0.222E+00	3.05	306.10	2.49	0.00	.23435E+05
513.16	0.00	2.49	454.8	0.220E+00	3.05	308.38	2.49	0.00	.23578E+05
516.21	0.00	2.49	458.2	0.218E+00	3.05	310.67	2.49	0.00	.23722E+05
519.25	0.00	2.49	461.6	0.217E+00	3.05	312.96	2.49	0.00	.23866E+05
522.30	0.00	2.49	465.0	0.215E+00	3.05	315.26	2.49	0.00	.24009E+05
525.34	0.00	2.49	468.4	0.214E+00	3.05	317.57	2.49	0.00	.24153E+05
528.39	0.00	2.49	471.8	0.212E+00	3.05	319.88	2.49	0.00	.24296E+05
531.43	0.00	2.49	475.2	0.210E+00	3.05	322.20	2.49	0.00	.24440E+05
534.47	0.00	2.49	478.6	0.209E+00	3.05	324.52	2.49	0.00	.24584E+05
537.52	0.00	2.49	482.1	0.207E+00	3.05	326.85	2.49	0.00	.24727E+05
540.56	0.00	2.49	485.5	0.206E+00	3.05	329.18	2.49	0.00	.24871E+05
543.61	0.00	2.49	488.9	0.205E+00	3.05	331.52	2.49	0.00	.25015E+05
546.65	0.00	2.49	492.4	0.203E+00	3.05	333.86	2.49	0.00	.25158E+05
549.70	0.00	2.49	495.9	0.202E+00	3.05	336.21	2.49	0.00	.25302E+05
552.74	0.00	2.49	499.3	0.200E+00	3.05	338.57	2.49	0.00	.25445E+05
555.78	0.00	2.49	502.8	0.199E+00	3.05	340.93	2.49	0.00	.25589E+05
558.83	0.00	2.49	506.3	0.198E+00	3.05	343.30	2.49	0.00	.25733E+05
561.87	0.00	2.49	509.8	0.196E+00	3.05	345.67	2.49	0.00	.25876E+05
564.92	0.00	2.49	513.3	0.195E+00	3.05	348.05	2.49	0.00	.26020E+05
567.96	0.00	2.49	516.8	0.193E+00	3.05	350.43	2.49	0.00	.26163E+05
571.01	0.00	2.49	520.4	0.192E+00	3.05	352.82	2.49	0.00	.26307E+05
574.05	0.00	2.49	523.9	0.191E+00	3.05	355.21	2.49	0.00	.26451E+05
577.10	0.00	2.49	527.4	0.190E+00	3.05	357.61	2.49	0.00	.26594E+05
580.14	0.00	2.49	531.0	0.188E+00	3.05	360.01	2.49	0.00	.26738E+05
583.18	0.00	2.49	534.5	0.187E+00	3.05	362.42	2.49	0.00	.26881E+05
586.23	0.00	2.49	538.1	0.186E+00	3.05	364.84	2.49	0.00	.27025E+05
589.27	0.00	2.49	541.7	0.185E+00	3.05	367.26	2.49	0.00	.27169E+05
592.32	0.00	2.49	545.2	0.183E+00	3.05	369.69	2.49	0.00	.27312E+05
595.36	0.00	2.49	548.8	0.182E+00	3.05	372.12	2.49	0.00	.27456E+05
598.41	0.00	2.49	552.4	0.181E+00	3.05	374.55	2.49	0.00	.27599E+05
601.45	0.00	2.49	556.0	0.180E+00	3.05	376.99	2.49	0.00	.27743E+05
604.49	0.00	2.49	559.6	0.179E+00	3.05	379.44	2.49	0.00	.27887E+05
607.54	0.00	2.49	563.2	0.178E+00	3.05	381.89	2.49	0.00	.28030E+05
610.58	0.00	2.49	566.9	0.176E+00	3.05	384.35	2.49	0.00	.28174E+05
613.63	0.00	2.49	570.5	0.175E+00	3.05	386.81	2.49	0.00	.28317E+05
616.67	0.00	2.49	574.1	0.174E+00	3.05	389.28	2.49	0.00	.28461E+05
619.72	0.00	2.49	577.8	0.173E+00	3.05	391.75	2.49	0.00	.28605E+05
622.76	0.00	2.49	581.4	0.172E+00	3.05	394.23	2.49	0.00	.28748E+05
625.81	0.00	2.49	585.1	0.171E+00	3.05	396.72	2.49	0.00	.28892E+05
628.85	0.00	2.49	588.8	0.170E+00	3.05	399.21	2.49	0.00	.29035E+05
631.89	0.00	2.49	592.5	0.169E+00	3.05	401.70	2.49	0.00	.29179E+05
634.94	0.00	2.49	596.1	0.168E+00	3.05	404.20	2.49	0.00	.29323E+05
637.98	0.00	2.49	599.8	0.167E+00	3.05	406.70	2.49	0.00	.29466E+05
641.03	0.00	2.49	603.5	0.166E+00	3.05	409.21	2.49	0.00	.29610E+05
644.07	0.00	2.49	607.2	0.165E+00	3.05	411.73	2.49	0.00	.29753E+05
647.12	0.00	2.49	611.0	0.164E+00	3.05	414.25	2.49	0.00	.29897E+05
650.16	0.00	2.49	614.7	0.163E+00	3.05	416.77	2.49	0.00	.30041E+05
653.20	0.00	2.49	618.4	0.162E+00	3.05	419.30	2.49	0.00	.30184E+05
656.25	0.00	2.49	622.2	0.161E+00	3.05	421.84	2.49	0.00	.30328E+05
659.29	0.00	2.49	625.9	0.160E+00	3.05	424.38	2.49	0.00	.30471E+05
662.34	0.00	2.49	629.7	0.159E+00	3.05	426.92	2.49	0.00	.30615E+05
665.38	0.00	2.49	633.4	0.158E+00	3.05	429.47	2.49	0.00	.30759E+05
668.43	0.00	2.49	637.2	0.157E+00	3.05	432.03	2.49	0.00	.30902E+05
671.47	0.00	2.49	641.0	0.156E+00	3.05	434.59	2.49	0.00	.31046E+05
674.52	0.00	2.49	644.7	0.155E+00	3.05	437.15	2.49	0.00	.31189E+05
677.56	0.00	2.49	648.5	0.154E+00	3.05	439.72	2.49	0.00	.31333E+05
Cumulative travel time =			31333.0176 sec (		8.70 hrs)				

Plume Stage 2 (bank attached):

X	Y	Z	S	C	BV	BH	ZU	ZL	TT
677.56	439.67	2.49	648.5	0.154E+00	3.05	879.45	2.49	0.00	.31333E+05
684.17	439.67	2.49	653.7	0.153E+00	3.05	886.50	2.49	0.00	.31645E+05
690.78	439.67	2.49	658.9	0.152E+00	3.05	893.57	2.49	0.00	.31957E+05
697.40	439.67	2.49	664.2	0.151E+00	3.05	900.65	2.49	0.00	.32269E+05
704.01	439.67	2.49	669.4	0.149E+00	3.05	907.76	2.49	0.00	.32581E+05
710.62	439.67	2.49	674.7	0.148E+00	3.05	914.89	2.49	0.00	.32892E+05
717.23	439.67	2.49	679.9	0.147E+00	3.05	922.03	2.49	0.00	.33204E+05
723.85	439.67	2.49	685.2	0.146E+00	3.05	929.19	2.49	0.00	.33516E+05
730.46	439.67	2.49	690.5	0.145E+00	3.05	936.37	2.49	0.00	.33828E+05
737.07	439.67	2.49	695.8	0.144E+00	3.05	943.57	2.49	0.00	.34140E+05
743.68	439.67	2.49	701.1	0.143E+00	3.05	950.79	2.49	0.00	.34452E+05
750.29	439.67	2.49	706.5	0.142E+00	3.05	958.02	2.49	0.00	.34764E+05
756.91	439.67	2.49	711.8	0.140E+00	3.05	965.28	2.49	0.00	.35076E+05
763.52	439.67	2.49	717.2	0.139E+00	3.05	972.55	2.49	0.00	.35388E+05
770.13	439.67	2.49	722.6	0.138E+00	3.05	979.84	2.49	0.00	.35700E+05
776.74	439.67	2.49	728.0	0.137E+00	3.05	987.15	2.49	0.00	.36011E+05
783.35	439.67	2.49	733.4	0.136E+00	3.05	994.47	2.49	0.00	.36323E+05
789.97	439.67	2.49	738.8	0.135E+00	3.05	1001.82	2.49	0.00	.36635E+05
796.58	439.67	2.49	744.2	0.134E+00	3.05	1009.18	2.49	0.00	.36947E+05
803.19	439.67	2.49	749.6	0.133E+00	3.05	1016.56	2.49	0.00	.37259E+05
809.80	439.67	2.49	755.1	0.132E+00	3.05	1023.96	2.49	0.00	.37571E+05
816.42	439.67	2.49	760.6	0.131E+00	3.05	1031.37	2.49	0.00	.37883E+05
823.03	439.67	2.49	766.0	0.131E+00	3.05	1038.81	2.49	0.00	.38195E+05
829.64	439.67	2.49	771.5	0.130E+00	3.05	1046.26	2.49	0.00	.38507E+05
836.25	439.67	2.49	777.1	0.129E+00	3.05	1053.73	2.49	0.00	.38818E+05
842.86	439.67	2.49	782.6	0.128E+00	3.05	1061.22	2.49	0.00	.39130E+05
849.48	439.67	2.49	788.1	0.127E+00	3.05	1068.72	2.49	0.00	.39442E+05
856.09	439.67	2.49	793.7	0.126E+00	3.05	1076.24	2.49	0.00	.39754E+05

862.70	439.67	2.49	799.2	0.125E+00	3.05	1083.78	2.49	0.00	.40066E+05
869.31	439.67	2.49	804.8	0.124E+00	3.05	1091.34	2.49	0.00	.40378E+05
875.93	439.67	2.49	810.4	0.123E+00	3.05	1098.91	2.49	0.00	.40690E+05
882.54	439.67	2.49	816.0	0.123E+00	3.05	1106.51	2.49	0.00	.41002E+05
889.15	439.67	2.49	821.6	0.122E+00	3.05	1114.12	2.49	0.00	.41314E+05
895.76	439.67	2.49	827.2	0.121E+00	3.05	1121.74	2.49	0.00	.41626E+05
902.37	439.67	2.49	832.8	0.120E+00	3.05	1129.39	2.49	0.00	.41937E+05
908.99	439.67	2.49	838.5	0.119E+00	3.05	1137.05	2.49	0.00	.42249E+05
915.60	439.67	2.49	844.2	0.118E+00	3.05	1144.73	2.49	0.00	.42561E+05
922.21	439.67	2.49	849.8	0.118E+00	3.05	1152.43	2.49	0.00	.42873E+05
928.82	439.67	2.49	855.5	0.117E+00	3.05	1160.14	2.49	0.00	.43185E+05
935.43	439.67	2.49	861.2	0.116E+00	3.05	1167.87	2.49	0.00	.43497E+05
942.05	439.67	2.49	866.9	0.115E+00	3.05	1175.62	2.49	0.00	.43809E+05
948.66	439.67	2.49	872.7	0.115E+00	3.05	1183.38	2.49	0.00	.44121E+05
955.27	439.67	2.49	878.4	0.114E+00	3.05	1191.16	2.49	0.00	.44433E+05
961.88	439.67	2.49	884.2	0.113E+00	3.05	1198.96	2.49	0.00	.44745E+05
968.50	439.67	2.49	889.9	0.112E+00	3.05	1206.78	2.49	0.00	.45056E+05
975.11	439.67	2.49	895.7	0.112E+00	3.05	1214.61	2.49	0.00	.45368E+05
981.72	439.67	2.49	901.5	0.111E+00	3.05	1222.46	2.49	0.00	.45680E+05
988.33	439.67	2.49	907.3	0.110E+00	3.05	1230.32	2.49	0.00	.45992E+05
994.94	439.67	2.49	913.1	0.110E+00	3.05	1238.21	2.49	0.00	.46304E+05
1001.56	439.67	2.49	918.9	0.109E+00	3.05	1246.11	2.49	0.00	.46616E+05
1008.17	439.67	2.49	924.8	0.108E+00	3.05	1254.02	2.49	0.00	.46928E+05
1014.78	439.67	2.49	930.6	0.107E+00	3.05	1261.96	2.49	0.00	.47240E+05
1021.39	439.67	2.49	936.5	0.107E+00	3.05	1269.91	2.49	0.00	.47552E+05
1028.01	439.67	2.49	942.3	0.106E+00	3.05	1277.87	2.49	0.00	.47863E+05
1034.62	439.67	2.49	948.2	0.105E+00	3.05	1285.86	2.49	0.00	.48175E+05
1041.23	439.67	2.49	954.1	0.105E+00	3.05	1293.86	2.49	0.00	.48487E+05
1047.84	439.67	2.49	960.0	0.104E+00	3.05	1301.87	2.49	0.00	.48799E+05
1054.45	439.67	2.49	966.0	0.104E+00	3.05	1309.90	2.49	0.00	.49111E+05
1061.07	439.67	2.49	971.9	0.103E+00	3.05	1317.95	2.49	0.00	.49423E+05
1067.68	439.67	2.49	977.8	0.102E+00	3.05	1326.02	2.49	0.00	.49735E+05
1074.29	439.67	2.49	983.8	0.102E+00	3.05	1334.10	2.49	0.00	.50047E+05
1080.90	439.67	2.49	989.8	0.101E+00	3.05	1342.20	2.49	0.00	.50359E+05
1087.52	439.67	2.49	995.8	0.100E+00	3.05	1350.31	2.49	0.00	.50671E+05
1094.13	439.67	2.49	1001.8	0.998E-01	3.05	1358.44	2.49	0.00	.50982E+05
1100.74	439.67	2.49	1007.8	0.992E-01	3.05	1366.59	2.49	0.00	.51294E+05
1107.35	439.67	2.49	1013.8	0.986E-01	3.05	1374.75	2.49	0.00	.51606E+05
1113.96	439.67	2.49	1019.8	0.981E-01	3.05	1382.93	2.49	0.00	.51918E+05
1120.58	439.67	2.49	1025.9	0.975E-01	3.05	1391.13	2.49	0.00	.52230E+05
1127.19	439.67	2.49	1031.9	0.969E-01	3.05	1399.34	2.49	0.00	.52542E+05
1133.80	439.67	2.49	1038.0	0.963E-01	3.05	1407.57	2.49	0.00	.52854E+05
1140.41	439.67	2.49	1044.1	0.958E-01	3.05	1415.81	2.49	0.00	.53166E+05
1147.02	439.67	2.49	1050.2	0.952E-01	3.05	1424.07	2.49	0.00	.53478E+05
1153.64	439.67	2.49	1056.3	0.947E-01	3.05	1432.35	2.49	0.00	.53789E+05
1160.25	439.67	2.49	1062.4	0.941E-01	3.05	1440.64	2.49	0.00	.54101E+05
1166.86	439.67	2.49	1068.5	0.936E-01	3.05	1448.95	2.49	0.00	.54413E+05
1173.47	439.67	2.49	1074.6	0.931E-01	3.05	1457.27	2.49	0.00	.54725E+05
1180.09	439.67	2.49	1080.8	0.925E-01	3.05	1465.61	2.49	0.00	.55037E+05
1186.70	439.67	2.49	1086.9	0.920E-01	3.05	1473.97	2.49	0.00	.55349E+05
1193.31	439.67	2.49	1093.1	0.915E-01	3.05	1482.34	2.49	0.00	.55661E+05
1199.92	439.67	2.49	1099.3	0.910E-01	3.05	1490.73	2.49	0.00	.55973E+05
1206.53	439.67	2.49	1105.5	0.905E-01	3.05	1499.13	2.49	0.00	.56285E+05
1213.15	439.67	2.49	1111.7	0.900E-01	3.05	1507.55	2.49	0.00	.56597E+05
1219.76	439.67	2.49	1117.9	0.895E-01	3.05	1515.98	2.49	0.00	.56908E+05
1226.37	439.67	2.49	1124.2	0.890E-01	3.05	1524.43	2.49	0.00	.57220E+05
1232.98	439.67	2.49	1130.4	0.885E-01	3.05	1532.90	2.49	0.00	.57532E+05
1239.60	439.67	2.49	1136.7	0.880E-01	3.05	1541.38	2.49	0.00	.57844E+05
1246.21	439.67	2.49	1142.9	0.875E-01	3.05	1549.88	2.49	0.00	.58156E+05
1252.82	439.67	2.49	1149.2	0.870E-01	3.05	1558.39	2.49	0.00	.58468E+05
1259.43	439.67	2.49	1155.5	0.865E-01	3.05	1566.92	2.49	0.00	.58780E+05
1266.04	439.67	2.49	1161.8	0.861E-01	3.05	1575.46	2.49	0.00	.59092E+05
1272.66	439.67	2.49	1168.1	0.856E-01	3.05	1584.02	2.49	0.00	.59404E+05
1279.27	439.67	2.49	1174.4	0.851E-01	3.05	1592.59	2.49	0.00	.59716E+05
1285.88	439.67	2.49	1180.8	0.847E-01	3.05	1601.18	2.49	0.00	.60027E+05
1292.49	439.67	2.49	1187.1	0.842E-01	3.05	1609.79	2.49	0.00	.60339E+05
1299.10	439.67	2.49	1193.5	0.838E-01	3.05	1618.41	2.49	0.00	.60651E+05
1305.72	439.67	2.49	1199.8	0.833E-01	3.05	1627.04	2.49	0.00	.60963E+05
1312.33	439.67	2.49	1206.2	0.829E-01	3.05	1635.69	2.49	0.00	.61275E+05
1318.94	439.67	2.49	1212.6	0.825E-01	3.05	1644.36	2.49	0.00	.61587E+05
1325.55	439.67	2.49	1219.0	0.820E-01	3.05	1653.04	2.49	0.00	.61899E+05
1332.17	439.67	2.49	1225.4	0.816E-01	3.05	1661.74	2.49	0.00	.62211E+05
1338.78	439.67	2.49	1231.8	0.812E-01	3.05	1670.45	2.49	0.00	.62523E+05
1345.39	439.67	2.49	1238.3	0.808E-01	3.05	1679.18	2.49	0.00	.62834E+05
1352.00	439.67	2.49	1244.7	0.803E-01	3.05	1687.92	2.49	0.00	.63146E+05
1358.61	439.67	2.49	1251.2	0.799E-01	3.05	1696.68	2.49	0.00	.63458E+05
1365.23	439.67	2.49	1257.7	0.795E-01	3.05	1705.45	2.49	0.00	.63770E+05
1371.84	439.67	2.49	1264.1	0.791E-01	3.05	1714.24	2.49	0.00	.64082E+05
1378.45	439.67	2.49	1270.6	0.787E-01	3.05	1723.04	2.49	0.00	.64394E+05
1385.06	439.67	2.49	1277.1	0.783E-01	3.05	1731.86	2.49	0.00	.64706E+05
1391.68	439.67	2.49	1283.6	0.779E-01	3.05	1740.69	2.49	0.00	.65018E+05
1398.29	439.67	2.49	1290.2	0.775E-01	3.05	1749.54	2.49	0.00	.65330E+05
1404.90	439.67	2.49	1296.7	0.771E-01	3.05	1758.40	2.49	0.00	.65642E+05
1411.51	439.67	2.49	1303.2	0.767E-01	3.05	1767.28	2.49	0.00	.65953E+05
1418.12	439.67	2.49	1309.8	0.763E-01	3.05	1776.17	2.49	0.00	.66265E+05
1424.74	439.67	2.49	1316.4	0.760E-01	3.05	1785.08	2.49	0.00	.66577E+05
1431.35	439.67	2.49	1323.0	0.756E-01	3.05	1794.00	2.49	0.00	.66889E+05
1437.96	439.67	2.49	1329.5	0.752E-01	3.05	1802.94	2.49	0.00	.67201E+05
1444.57	439.67	2.49	1336.1	0.748E-01	3.05	1811.89	2.49	0.00	.67513E+05
1451.19	439.67	2.49	1342.8	0.745E-01	3.05	1820.86	2.49	0.00	.67825E+05

1457.80	439.67	2.49	1349.4	0.741E-01	3.05	1829.84	2.49	0.00	.68137E+05
1464.41	439.67	2.49	1356.0	0.737E-01	3.05	1838.83	2.49	0.00	.68449E+05
1471.02	439.67	2.49	1362.7	0.734E-01	3.05	1847.84	2.49	0.00	.68760E+05
1477.63	439.67	2.49	1369.3	0.730E-01	3.05	1856.87	2.49	0.00	.69072E+05
1484.25	439.67	2.49	1376.0	0.727E-01	3.05	1865.91	2.49	0.00	.69384E+05
1490.86	439.67	2.49	1382.7	0.723E-01	3.05	1874.96	2.49	0.00	.69696E+05
1497.47	439.67	2.49	1389.3	0.720E-01	3.05	1884.03	2.49	0.00	.70008E+05
1504.08	439.67	2.49	1396.0	0.716E-01	3.05	1893.12	2.49	0.00	.70320E+05
1510.69	439.67	2.49	1402.8	0.713E-01	3.05	1902.21	2.49	0.00	.70632E+05
1517.31	439.67	2.49	1409.5	0.709E-01	3.05	1911.33	2.49	0.00	.70944E+05
1523.92	439.67	2.49	1416.2	0.706E-01	3.05	1920.46	2.49	0.00	.71256E+05
1530.53	439.67	2.49	1422.9	0.703E-01	3.05	1929.60	2.49	0.00	.71568E+05
1537.14	439.67	2.49	1429.7	0.699E-01	3.05	1938.75	2.49	0.00	.71879E+05
1543.76	439.67	2.49	1436.5	0.696E-01	3.05	1947.92	2.49	0.00	.72191E+05
1550.37	439.67	2.49	1443.2	0.693E-01	3.05	1957.11	2.49	0.00	.72503E+05
1556.98	439.67	2.49	1450.0	0.690E-01	3.05	1966.31	2.49	0.00	.72815E+05
1563.59	439.67	2.49	1456.8	0.686E-01	3.05	1975.52	2.49	0.00	.73127E+05
1570.20	439.67	2.49	1463.6	0.683E-01	3.05	1984.75	2.49	0.00	.73439E+05
1576.82	439.67	2.49	1470.4	0.680E-01	3.05	1993.99	2.49	0.00	.73751E+05
1583.43	439.67	2.49	1477.3	0.677E-01	3.05	2003.25	2.49	0.00	.74063E+05
1590.04	439.67	2.49	1484.1	0.674E-01	3.05	2012.52	2.49	0.00	.74375E+05
1596.65	439.67	2.49	1490.9	0.671E-01	3.05	2021.81	2.49	0.00	.74686E+05
1603.27	439.67	2.49	1497.8	0.668E-01	3.05	2031.11	2.49	0.00	.74998E+05
1609.88	439.67	2.49	1504.7	0.665E-01	3.05	2040.42	2.49	0.00	.75310E+05
1616.49	439.67	2.49	1511.5	0.662E-01	3.05	2049.75	2.49	0.00	.75622E+05
1623.10	439.67	2.49	1518.4	0.659E-01	3.05	2059.09	2.49	0.00	.75934E+05
1629.71	439.67	2.49	1525.3	0.656E-01	3.05	2068.45	2.49	0.00	.76246E+05
1636.33	439.67	2.49	1532.2	0.653E-01	3.05	2077.82	2.49	0.00	.76558E+05
1642.94	439.67	2.49	1539.2	0.650E-01	3.05	2087.20	2.49	0.00	.76870E+05
1649.55	439.67	2.49	1546.1	0.647E-01	3.05	2096.60	2.49	0.00	.77182E+05
1656.16	439.67	2.49	1553.0	0.644E-01	3.05	2106.01	2.49	0.00	.77494E+05
1662.78	439.67	2.49	1560.0	0.641E-01	3.05	2115.44	2.49	0.00	.77805E+05
1669.39	439.67	2.49	1567.0	0.638E-01	3.05	2124.88	2.49	0.00	.78117E+05
1676.00	439.67	2.49	1573.9	0.635E-01	3.05	2134.34	2.49	0.00	.78429E+05
1682.61	439.67	2.49	1580.9	0.633E-01	3.05	2143.80	2.49	0.00	.78741E+05
1689.22	439.67	2.49	1587.9	0.630E-01	3.05	2153.29	2.49	0.00	.79053E+05
1695.84	439.67	2.49	1594.9	0.627E-01	3.05	2162.78	2.49	0.00	.79365E+05
1702.45	439.67	2.49	1601.9	0.624E-01	3.05	2172.29	2.49	0.00	.79677E+05
1709.06	439.67	2.49	1608.9	0.622E-01	3.05	2181.82	2.49	0.00	.79989E+05
1715.67	439.67	2.49	1616.0	0.619E-01	3.05	2191.36	2.49	0.00	.80301E+05
1722.28	439.67	2.49	1623.0	0.616E-01	3.05	2200.91	2.49	0.00	.80612E+05
1728.90	439.67	2.49	1630.1	0.613E-01	3.05	2210.48	2.49	0.00	.80924E+05
1735.51	439.67	2.49	1637.1	0.611E-01	3.05	2220.06	2.49	0.00	.81236E+05
1742.12	439.67	2.49	1644.2	0.608E-01	3.05	2229.65	2.49	0.00	.81548E+05
1748.73	439.67	2.49	1651.3	0.606E-01	3.05	2239.26	2.49	0.00	.81860E+05
1755.35	439.67	2.49	1658.4	0.603E-01	3.05	2248.88	2.49	0.00	.82172E+05
1761.96	439.67	2.49	1665.5	0.600E-01	3.05	2258.51	2.49	0.00	.82484E+05
1768.57	439.67	2.49	1672.6	0.598E-01	3.05	2268.16	2.49	0.00	.82796E+05
1775.18	439.67	2.49	1679.7	0.595E-01	3.05	2277.82	2.49	0.00	.83108E+05
1781.79	439.67	2.49	1686.9	0.593E-01	3.05	2287.50	2.49	0.00	.83420E+05
1788.41	439.67	2.49	1694.0	0.590E-01	3.05	2297.19	2.49	0.00	.83731E+05
1795.02	439.67	2.49	1701.2	0.588E-01	3.05	2306.89	2.49	0.00	.84043E+05
1801.63	439.67	2.49	1708.3	0.585E-01	3.05	2316.61	2.49	0.00	.84355E+05
1808.24	439.67	2.49	1715.5	0.583E-01	3.05	2326.34	2.49	0.00	.84667E+05
1814.86	439.67	2.49	1722.7	0.580E-01	3.05	2336.09	2.49	0.00	.84979E+05
1821.47	439.67	2.49	1729.9	0.578E-01	3.05	2345.84	2.49	0.00	.85291E+05
1828.08	439.67	2.49	1737.1	0.576E-01	3.05	2355.61	2.49	0.00	.85603E+05
1834.69	439.67	2.49	1744.3	0.573E-01	3.05	2365.40	2.49	0.00	.85915E+05
1841.30	439.67	2.49	1751.5	0.571E-01	3.05	2375.20	2.49	0.00	.86227E+05
1847.92	439.67	2.49	1758.8	0.569E-01	3.05	2385.01	2.49	0.00	.86539E+05
1854.53	439.67	2.49	1766.0	0.566E-01	3.05	2394.83	2.49	0.00	.86850E+05
1861.14	439.67	2.49	1773.3	0.564E-01	3.05	2404.67	2.49	0.00	.87162E+05
1867.75	439.67	2.49	1780.5	0.562E-01	3.05	2414.53	2.49	0.00	.87474E+05
1874.36	439.67	2.49	1787.8	0.559E-01	3.05	2424.39	2.49	0.00	.87786E+05
1880.98	439.67	2.49	1795.1	0.557E-01	3.05	2434.27	2.49	0.00	.88098E+05
1887.59	439.67	2.49	1802.4	0.555E-01	3.05	2444.16	2.49	0.00	.88410E+05
1894.20	439.67	2.49	1809.7	0.553E-01	3.05	2454.07	2.49	0.00	.88722E+05
1900.81	439.67	2.49	1817.0	0.550E-01	3.05	2463.99	2.49	0.00	.89034E+05
1907.43	439.67	2.49	1824.3	0.548E-01	3.05	2473.92	2.49	0.00	.89346E+05
1914.04	439.67	2.49	1831.7	0.546E-01	3.05	2483.87	2.49	0.00	.89657E+05
1920.65	439.67	2.49	1839.0	0.544E-01	3.05	2493.83	2.49	0.00	.89969E+05
1927.26	439.67	2.49	1846.4	0.542E-01	3.05	2503.80	2.49	0.00	.90281E+05
1933.87	439.67	2.49	1853.7	0.539E-01	3.05	2513.78	2.49	0.00	.90593E+05
1940.49	439.67	2.49	1861.1	0.537E-01	3.05	2523.78	2.49	0.00	.90905E+05
1947.10	439.67	2.49	1868.5	0.535E-01	3.05	2533.79	2.49	0.00	.91217E+05
1953.71	439.67	2.49	1875.9	0.533E-01	3.05	2543.82	2.49	0.00	.91529E+05
1960.32	439.67	2.49	1883.3	0.531E-01	3.05	2553.86	2.49	0.00	.91841E+05
1966.94	439.67	2.49	1890.7	0.529E-01	3.05	2563.91	2.49	0.00	.92153E+05
1973.55	439.67	2.49	1898.1	0.527E-01	3.05	2573.97	2.49	0.00	.92465E+05
1980.16	439.67	2.49	1905.6	0.525E-01	3.05	2584.05	2.49	0.00	.92776E+05
1986.77	439.67	2.49	1913.0	0.523E-01	3.05	2594.14	2.49	0.00	.93088E+05
1993.38	439.67	2.49	1920.5	0.521E-01	3.05	2604.25	2.49	0.00	.93400E+05
2000.00	439.67	2.49	1927.9	0.519E-01	3.05	2614.36	2.49	0.00	.93712E+05
Cumulative travel time = 93712.2656 sec (26.03 hrs)									

Simulation limit based on maximum specified distance = 2000.00 m.
This is the REGION OF INTEREST limitation.

END OF MOD261: PASSIVE AMBIENT MIXING IN UNIFORM AMBIENT

[illegible]

CORMIX SESSION REPORT:

XX

CORMIX MIXING ZONE EXPERT SYSTEM

CORMIX Version 12.0GTD

HYDRO2:Version-12.0.1.0 August,2021

SITE NAME/LABEL:**DESIGN CASE:****FILE NAME:**

C:\Users\mbmoss\OneDrive - New York State Office of Information Technology

Services\Desktop\Cayuga Heights CORMIX.prd

Using subsystem CORMIX2: Multiport Diffuser Discharges

Start of session: 12/26/2025--12:46:43

SUMMARY OF INPUT DATA:**AMBIENT PARAMETERS:**

Cross-section	=	unbounded
Average depth	HA	= 3.05 m
Depth at discharge	HD	= 2.49 m
Ambient velocity	UA	= 0.0212 m/s
Darcy-Weisbach friction factor	F	= 0.0487
Calculated from Manning's n		= 0.03
Wind velocity	UW	= 7.36 m/s
Stratification Type	STRCND	= U
Surface temperature		= 22.80 degC
Bottom temperature		= 22.80 degC
Calculated FRESH-WATER DENSITY values:		
Surface density	RHOAS	= 997.5865 kg/m^3
Bottom density	RHOAB	= 997.5865 kg/m^3

DISCHARGE PARAMETERS:

Submerged Multiport Diffuser Discharge

Diffuser type	DITYPE	= alternating perpendicular
Diffuser length	LD	= 32.00 m
Nearest bank		= left
Diffuser endpoints	YB1	= 423.67 m; YB2 = 455.68 m
Number of openings	NOPE	= 22
Number of Risers	NRISER	= 22
Ports/Nozzles per Riser	NPPERR	= 1
Spacing between risers/openings	SPAC	= 1.52 m
Port/Nozzle diameter	D0	= 0.0889 m
with contraction ratio		= 1
Equivalent slot width	B0	= 0.004071 m
Total area of openings	TA0	= 0.1365 m^2
Discharge velocity	U0	= 0.64 m/s
Total discharge flowrate	Q0	= 0.087625 m^3/s
Discharge port height	H0	= 0.61 m
Nozzle arrangement	BETYPE	= alternating without fanning
Diffuser alignment angle	GAMMA	= 90 deg
Vertical discharge angle	THETA	= 90 deg
Actual Vertical discharge angle	THEAC	= 45 deg
Horizontal discharge angle	SIGMA	= 0 deg
Relative orientation angle	BETA	= 90 deg
Discharge temperature (freshwater)		= 24.56 degC
Corresponding density	RHO0	= 997.1575 kg/m^3
Density difference	DRHO	= 0.4290 kg/m^3
Buoyant acceleration	GP0	= 0.0042 m/s^2
Discharge concentration	C0	= 100 %
Surface heat exchange coeff.	KS	= 0 m/s
Coefficient of decay	KD	= 0 /s

FLUX VARIABLES PER UNIT DIFFUSER LENGTH:

Discharge (volume flux)	q0	= 0.002738 m^2/s
Momentum flux		
(based on slot width B0)	m0 = U0^2*B0	= 0.001678 m^3/s^2
(based on volume flux q0)	m0 = U0*q0	= 0.001758 m^3/s^2
Buoyancy flux		
(based on slot width B0)	j0 = U0*GP0*B0	= 0.000011 m^3/s^3
(based on volume flux q0)	j0 = q0*GP0	= 0.000012 m^3/s^3

DISCHARGE/ENVIRONMENT LENGTH SCALES:

LQ = 0.00 m	Lm = 3.91 m	LM = 3.38 m
lm' = 99999 m	Lb' = 99999 m	La = 99999 m

(These refer to the actual discharge/environment length scales.)

NON-DIMENSIONAL PARAMETERS:

Slot Froude number	FR0	= 154.93
Port/nozzle Froude number	FRD0	= 33.16
Velocity ratio	R	= 30.28

MIXING ZONE / TOXIC DILUTION ZONE / AREA OF INTEREST PARAMETERS:

Toxic discharge	=	no
Water quality standard specified	=	no
Regulatory mixing zone	=	no
Region of interest	=	2000 m downstream

HYDRODYNAMIC CLASSIFICATION:

| FLOW CLASS = MU8 |

This flow configuration applies to a layer corresponding to the full water depth at the discharge site.

Applicable layer depth = water depth = 2.49 m

MIXING ZONE EVALUATION (hydrodynamic and regulatory summary):

X-Y-Z Coordinate system:
Origin is located at the BOTTOM below the port/diffuser center:
439.67 m from the left bank/shore.
Number of display steps NSTEP = 200 per module.

NEAR-FIELD REGION (NFR) CONDITIONS :
Note: The NFR is the zone of strong initial mixing. It has no regulatory
implication. However, this information may be useful for the discharge
designer because the mixing in the NFR is usually sensitive to the
discharge design conditions.
Pollutant concentration at NFR edge c = 4.2159 %
Dilution at edge of NFR s = 23.7
NFR Location: x = 24.49 m
(centerline coordinates) y = 0 m
z = 2.49 m
NFR plume dimensions: half-width (bh) = 21.51 m
thickness (bv) = 2.28 m
Cumulative travel time: 527.9727 sec.

Buoyancy assessment:
The effluent density is less than the surrounding ambient water
density at the discharge level.
Therefore, the effluent is POSITIVELY BUOYANT and will tend to rise towards
the surface.

Near-field instability behavior:
The diffuser flow will experience instabilities with full vertical mixing
in the near-field.
There may be benthic impact of high pollutant concentrations.

UPSTREAM INTRUSION SUMMARY:
Plume exhibits upstream intrusion due to low ambient velocity or strong
discharge buoyancy.
Intrusion length = 3.68 m
Intrusion stagnation point = 10.05 m
Intrusion thickness = 3.57 m
Intrusion half width at impingement = 21.51 m
Intrusion half thickness at impingement = 2.28 m

FAR-FIELD MIXING SUMMARY:
Plume is vertically fully mixed WITHIN NEAR-FIELD (or a fraction thereof),
but RE-STRATIFIES LATER.
Plume becomes vertically fully mixed again at 0 m downstream.

PLUME BANK CONTACT SUMMARY:
Plume in unbounded section contacts nearest bank at 677.56 m downstream.
***** TOXIC DILUTION ZONE SUMMARY *****
No TDZ was specified for this simulation.
***** REGULATORY MIXING ZONE SUMMARY *****
No RMZ and no ambient water quality standard have been specified.
***** FINAL DESIGN ADVICE AND COMMENTS *****
CORMIX2 uses the TWO-DIMENSIONAL SLOT DIFFUSER CONCEPT to represent
the actual three-dimensional diffuser geometry. Thus, it approximates
the details of the merging process of the individual jets from each
port/nozzle.
In the present design, the spacing between adjacent ports/nozzles
(or riser assemblies) is of the order of, or less than, the local
water depth so that the slot diffuser approximation holds well.

Nevertheless, if this is a final design, the user is advised to use a
final CORMIX1 (single port discharge) analysis, with discharge data
for an individual diffuser jet/plume, in order to compare to
the present near-field prediction.

DIFFUSER DESIGN DETAILS: Because of the alternating arrangement
of the opposing nozzles/ports, the AVERAGE VERTICAL ANGLE (THETA)
has been set to 90 deg. This represents a ZERO NET HORIZONTAL
MOMENTUM FLUX for the entire diffuser.

REMINDER: The user must take note that HYDRODYNAMIC MODELING by any known
technique is NOT AN EXACT SCIENCE.
Extensive comparison with field and laboratory data has shown that the
CORMIX predictions on dilutions and concentrations (with associated
plume geometries) are reliable for the majority of cases and are accurate
to within about +-50% (standard deviation).
As a further safeguard, CORMIX will not give predictions whenever it judges
the design configuration as highly complex and uncertain for prediction.