

Application Type Renewal
 Facility Type Industrial
 Major / Minor Major

NPDES PERMIT FACT SHEET
INDIVIDUAL INDUSTRIAL WASTE (IW)

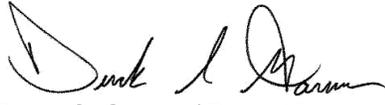
Application No. PA0232602
 APS ID 1116449
 Authorization IC 1489834

Applicant and Facility Information

Applicant Name	<u>Hummel Station LLC</u>	Facility Name	<u>Hummel Station LLC</u>
Applicant Address	<u>PO Box 518</u> <u>Shamokin Dam, PA 17876-0518</u>	Facility Address	<u>2386 N Old Trail</u> <u>Shamokin Dam, PA 17876</u>
Applicant Contact	<u>Kerry Colville</u>	Facility Contact	<u>Kerry Colville</u>
Applicant Phone	<u>(510) 372-6141</u>	Facility Phone	<u>(510) 372-6141</u>
Client ID	<u>314638</u>	Site ID	<u>786918</u>
SIC Code	<u>4911</u>	Municipality	<u>Shamokin Dam Borough</u>
SIC Description	<u>Trans. & Utilities - Electric Services</u>	County	<u>Snyder</u>
Date Application Received	<u>June 21, 2024</u>	EPA Waived?	<u>No</u>
Date Application Accepted	<u>September 8, 2024</u>	If No, Reason	<u>Major Facility</u>
Purpose of Application	<u>Renewal of an existing NPDES permit for the discharge of industrial waste.</u>		

Public Participation

DEP will publish notice of the receipt of the NPDES permit application and a tentative decision to issue the individual NPDES permit in the *Pennsylvania Bulletin* in accordance with 25 Pa. Code § 92a.82. Upon publication in the *Pennsylvania Bulletin*, DEP will accept written comments from interested persons for a 30-day period (which may be extended for one additional 15-day period at DEP's discretion), which will be considered in making a final decision on the application. Any person may request or petition for a public hearing with respect to the application. A public hearing may be held if DEP determines that there is significant public interest in holding a hearing. If a hearing is held, notice of the hearing will be published in the *Pennsylvania Bulletin* at least 30 days prior to the hearing and in at least one newspaper of general circulation within the geographical area of the discharge.

Approve	Deny	Signatures	Date
X		 Derek S. Garner / Project Manager	April 16, 2025
X		 Nicholas W. Hartranft, P.E. / Environmental Engineer Manager	April 17, 2025

Facility Summary

Hummel Station is a 1,122 MW natural gas-fired combined-cycle power plant converted from the retired Sunbury Generation 440 MW coal-fired power plant. Hummel Station consists of three gas turbines, one steam turbine, three air-cooled generators, one hydrogen-cooled generator, and three heat recovery steam generators (“HRSGs”). A closed-cycle recirculating cooling system withdraws water from a cooling water intake structure (“CWIS”) located in the Susquehanna River. Wastewater streams throughout the site are discharged into the cooling tower basin where it is concentrated up to five times before it is wasted as cooling tower blowdown to the onsite industrial wastewater treatment plant (“IWTP”). The on-site industrial wastewater treatment plant (“IWTP”) that consists of; one coagulation tank, one flocculation tank, two disc filters (1 duty, 1 standby), and appropriate chemical dosing before being discharged to the Susquehanna River. The construction/operation of the IWTP was/is covered under WQM Permit No. 5516201.

The natural-gas fired power plant began operation and discharge in March 2018.

Refer to Attachment A for a satellite overview of the facility.

Compliance History

The facility was most recently inspected by DEP on August 27, 2024. No violations were identified during the inspection.

One non-compliance during the existing permit’s term for a violation of permit schedule is noted for the June 2021 monitoring period. The permittee explained that the samples were submitted to the lab in a timely fashion, but due to COVID-related personnel issues the samples were returned. Samples were resubmitted and the June 2021 DMR was updated during the July 2021 monitoring period.

There are no open violations associated with the permittee.

Discharge, Receiving Waters and Water Supply Information

Outfall No.	<u>002</u>	Design Flow (MGD)	<u>1.553</u>
Latitude	<u>40° 50' 2.34"</u>	Longitude	<u>-76° 49' 28.22"</u>
Quad Name	<u>Sunbury</u>	Quad Code	<u>1231</u>
Wastewater Description: <u>Cooling tower blowdown and low volume wastes</u>			

Receiving Waters	<u>Susquehanna River</u>	Stream Code	<u>6685</u>
NHD Com ID	<u>54962831</u>	RMI	<u>122</u>
Drainage Area (mi ²)	<u>18,438</u>	Yield (cfs/mi ²)	<u>0.108</u>
Q ₇₋₁₀ Flow (cfs)	<u>1,990</u>	Q ₇₋₁₀ Basis	<u>Streamgage No. 01554000</u>
Elevation (ft)	<u>419</u>	Slope (ft/ft)	<u>n/a</u>
Watershed No.	<u>6-B</u>	Chapter 93 Class.	<u>WWF, MF</u>
Existing Use	<u>n/a</u>	Existing Use Qualifier	<u>n/a</u>
Exceptions to Use	<u>n/a</u>	Exceptions to Criteria	<u>n/a</u>
Assessment Status	<u>Impaired</u>		
Cause(s) of Impairment	<u>PCBs, Mercury; high pH</u>		
Source(s) of Impairment	<u>Source Unknown; Agriculture</u>		
TMDL Status	<u>n/a</u>	Name	<u>n/a</u>

Nearest Downstream Public Water Supply Intake	<u>SUEZ Water Pennsylvania Inc. – Harrisburg 6th St. WTP</u>		
PWS Waters	<u>Susquehanna River</u>	Flow at Intake (cfs)	<u>2,356</u>
PWS RMI	<u>76.7</u>	Distance from Outfall (mi)	<u>45.3</u>

Development of Effluent Limitations

Outfall No. 002 Design Flow (MGD) 1.553
 Latitude 40° 50' 15.00" Longitude -76° 49' 30.00"
 Wastewater Description: Cooling tower blowdown and low volume wastes.

Outfall 002 is the discharge point for the IWTP.

Technology-Based Effluent Limitations (TBELs)

Per the criterion for a new source determination at 40 CFR § 122.29(b)(1)(ii), by totally replacing the process or production equipment that causes the discharge of pollutants at an existing source after November 19, 1982, Hummel Station is designated as a new source. Consequently, the facility is subject to new source performance standards (“NSPS”) as well as; best practicable control technology currently available (“BPT”), best available technology economically achievable (“BAT”), and best conventional pollutant control technology (“BCT”) at 40 CFR Part 423 – Steam Electric Power Generating Point Source Category.

The following TBELs apply, subject to water quality analysis and BPJ where applicable:

Parameter	Limit (mg/l)	SBC	Federal Regulation	Waste Stream	State Regulation
pH	6.0	Minimum	423.12(b)(1), 423.15(b)(1)	All	95.2(1)
	9.0	IMAX	423.12(b)(1), 423.15(b)(1)	All	95.2(1)
Total PCBs (µg/L)	Non-detect	IMAX	423.12(b)(2), 423.13(a), 423.15(b)(2)	All	
Free Available Chlorine	0.2	Average Monthly	423.12(b)(7), 423.13(d)(1), 413.15(b)(10)(i)	Cooling tower blowdown	
	0.5	IMAX	423.12(b)(7), 423.13(d)(1), 413.15(b)(10)(i)	Cooling tower blowdown	
Priority Pollutants, Appendix A ⁽¹⁾	Non-detect	IMAX	423.13(d)(1), 423.15(b)(10)(i)	Cooling tower blowdown	
Total Chromium	0.2	Average Monthly	423.13(d)(1), 423.15(b)(10)(i)	Cooling tower blowdown	
	0.2	Daily Maximum	423.13(d)(1), 423.15(b)(10)(i)	Cooling tower blowdown	
Total Zinc	1.0	Average Monthly	423.13(d)(1), 423.15(b)(10)(i)	Cooling tower blowdown	
	1.0	Daily Maximum	423.13(d)(1), 423.15(b)(10)(i)	Cooling tower blowdown	
Oil and Grease ⁽²⁾	15	Daily Maximum		All	95.2(2)
	30	IMAX		All	95.2(2)
Dissolved Iron ⁽³⁾	7	IMAX		All	95.2(4)

⁽¹⁾ This requirement will be satisfied by establishing a Part C condition as follows, “Cooling tower blowdown discharges shall contain no detectable amounts of the 126 Priority Pollutants listed in 40 CFR Part 423, Appendix A, that are contained in chemicals added for cooling tower maintenance, except for Total Chromium and Total Zinc. On an annual basis, the permittee shall conduct monitoring or submit engineering calculations to demonstrate compliance with 40 CFR 423.15(b)(10)(i).”

⁽²⁾ Oil and grease is not present in the discharge at concentrations that approach the TBELs. Since there is no reasonable potential to approach the TBELs no limitations or monitoring requirements are proposed.

(3) Dissolved iron is not present in the discharge at detectable concentrations. Since there is no reasonable potential to approach the TBEL no limitations or monitoring requirements are proposed.

Total Dissolved Solids (TDS) Treatment Requirements

This facility is classified as Unaffected in regard to the TDS treatment requirements of 25 Pa. Code § 95.10. As stated in the preamble to the final rulemaking, Section 95.10 applies only to net loadings. Since the primary source of TDS in the waste streams are naturally occurring (i.e., ambient stream concentration), and the closed-cycle cooling system will only concentrate the natural concentration, effluent limits or monitoring requirements are not necessary.

Water Quality-Based Limitations

The Toxics Management Spreadsheet (TMS) is a single discharge model that is used to determine NPDES effluent limits for toxics, if applicable.

Effluent concentration data was entered into TMS. Input concentration data was taken from eDMR data, when available, or the analysis results tables completed for the renewal application. When eDMR data was available, the daily maximum concentrations were entered into the TOXCONC spreadsheet to develop average monthly limits and daily coefficient of variations for input into TMS. Only sample results taken post-completion of the IWTP modifications in November 2021 were used so that the data is representative of current treatment. The TMS recommends the following:

Pollutants	Mass Limits		Concentration Limits				Governing WQBEL	WQBEL Basis
	AML (lbs/day)	MDL (lbs/day)	AML	MDL	IMAX	Units		
Total Aluminum ⁽¹⁾⁽²⁾	Report	Report	Report	Report	Report	µg/L	4,234	AFC
Total Mercury ⁽¹⁾	Report	Report	Report	Report	Report	µg/L	3.0	THH

(1) Discharge concentration > 10% WQBEL (no RP)

(2) Since the TBEL for total aluminum is more stringent than the report-only recommendation from TMS, the TBEL is considered the governing limit.

A thermal discharge analysis was conducted using DEP’s Thermal Limits spreadsheet. The spreadsheet indicates the existing public safety-based maximum temperature limit of 110 °F is protective of the Susquehanna River.

The technology-based free available chlorine limit was evaluated using DEP’s TRC Evaluation spreadsheet. Since free available chlorine is one component of total residual chlorine, using the spreadsheet provides a conservative analysis. The spreadsheet indicates the abovementioned FAC TBELs will not negatively impact the Susquehanna River.

See Attachment B for documents associated with the water quality analysis.

Best Professional Judgment

Waste streams throughout the site are combined in the cooling tower basin and recirculated through the cooling system. Since the cooling tower blowdown is composed of various waste streams throughout the facility, many of which are considered low volume waste streams, DEP has historically established low volume waste effluent limit guidelines at Outfall 002. Below are the applicable effluent limit guidelines for low volume waste:

Parameter	Limit (mg/l)	SBC	Federal Regulation	Waste Stream
Total Suspended Solids	30.0	Average Monthly	423.15(b)(3)	Low volume waste
	100.0	Daily Maximum	423.15(b)(3)	Low volume waste
Oil and Grease ⁽¹⁾	15	Average Monthly	423.15(b)(3)	Low volume waste
	20	Daily Maximum	423.15(b)(3)	Low volume waste

(1) Oil and grease is not present in the discharge at concentrations that approach the TBELs. Since there is no reasonable potential to approach the TBELs no limitations or monitoring requirements are proposed.

To help further characterize the wastewater, DEP has proposed to establish quarterly sampling for four PFAS parameters; PFOA, PFOS, HFPO-DA, and PFBS. The permittee may discontinue monitoring for PFOA, PFOS, HFPO-DA, and PFBS

if the results in four consecutive monitoring periods indicate non-detect results at or below Quantitation Limits of 4.0 ng/L for PFOA, 3.7 ng/L for PFOS, 3.5 ng/L for PFBS and 6.4 ng/L for HFPO-DA. When monitoring is discontinued, permittees must enter a No Discharge Indicator (NODI) Code of "GG" on the discharge monitoring reports.

Chesapeake Bay TMDL Considerations

As with TDS, the Chesapeake Bay TMDL is concerned with net loadings. Since the primary source of total nitrogen (TN) and phosphorus (TP) in cooling tower blown is natural, and the closed-cycle cooling system will only concentrate the natural concentrations, a net increase in TN or TP is not expected.

Anti-Backsliding

No limits are proposed to be made less stringent than existing requirements. Anti-backsliding should not impact the development of effluent limits.

Clean Water Act § 316(b)

Part C V.D. of the permit required the permittee to submit the applicable information in 40 CFR §§ 122.21(r)(2) – (r)(8) with the subsequent permit application. The following information was included in the application to satisfy these requirements:

Source water physical data. A Water Baseline Biological Characterization, along with the Susquehanna River Basin Commission's Susquehanna River Fact Sheet, is attached to Module 5 of the application. Data included in these two reports satisfies requirements at §§ 122.21(r)(2)(i) – (iii).

Cooling water intake structure data. A detailed narrative of the cooling water intake structure was included in the application's cover letter. Additionally, latitude and longitude of the physical intake structure, description of the intake flows and operation, a water balance diagram, and engineering drawings have all been included with the application. The provided cooling water intake structure data satisfies requirements at §§ 122.21(r)(3)(i) – (v).

Source water baseline biological characterization data. As mentioned in the source water physical data, a Water Baseline Biological Characterization report was included with Module 5 of the permit. The report satisfies requirements at §§ 122.21(r)(4)(i) – (xii).

Cooling water system data. All cooling water system data relevant to §§ 122.21(r)(5)(i) –(iii) was included with Module 5 of the application.

Chosen method of compliance with impingement mortality standard. The facility uses a closed-cycle recirculating system to meet BTA standards.

Entrainment performance studies. No entrainment performance studies were included with the application. However, the closed-cycle recirculating system satisfies BTA requirements for entrainment.

Operational status. A description of the facility's operational status that satisfies §§ 122.21(r)(8)(i) –(v) has been included in Module 5 of the application.

Existing Effluent Limitations and Monitoring Requirements

The existing effluent limitations and monitoring requirements are as follows:

Outfall 002, Effective Period: December 1, 2021 through Permit Expiration Date

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day)		Concentrations (mg/L)				Minimum Measurement Frequency	Required Sample Type
	Average Monthly	Daily Maximum	Minimum	Average Monthly	Daily Maximum	Instant. Maximum		
Flow (MGD)	Report	Report	XXX	XXX	XXX	XXX	Continuous	Metered
pH (S.U.)	XXX	XXX	6.0 Inst Min	XXX	XXX	9.0	1/day	Grab
Free Available Chlorine	XXX	XXX	XXX	0.2	XXX	0.5	1/day	Grab
Temperature (deg F) (°F)	XXX	XXX	XXX	XXX	110	XXX	Continuous	Metered
Total Suspended Solids	385	1295	XXX	30.0	100.0	125	1/week	24-Hr Composite
Aluminum, Total	28.88	44.42	XXX	2.23	3.43	5.57	1/week	24-Hr Composite
Chromium, Total	2.59	2.59	XXX	0.20	0.20	0.5	1/week	24-Hr Composite
Zinc, Total	12.95	12.95	XXX	1.00	1.00	2.5	1/week	24-Hr Composite
PCBs, Total (ug/L)	XXX	XXX	XXX	XXX	XXX	Report	1/month	Grab
Priority Pollutants, Total	XXX	Report	XXX	XXX	XXX	Report	1/year	See Permit

Compliance Sampling Location: Outfall 002

Proposed Effluent Limitations and Monitoring Requirements

The limitations and monitoring requirements specified below are proposed for the draft permit, and reflect the most stringent limitations amongst technology, water quality and BPJ. Instantaneous Maximum (IMAX) limits are determined using multipliers of 2 (conventional pollutants) or 2.5 (toxic pollutants). Sample frequencies and types are derived from the "NPDES Permit Writer's Manual" (386-0400-001), SOPs and/or BPJ.

Outfall 002, Effective Period: Permit Effective Date through Permit Expiration Date.

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day)		Concentrations (mg/L)				Minimum Measurement Frequency	Required Sample Type
	Average Monthly	Daily Maximum	Minimum	Average Monthly	Daily Maximum	Instant. Maximum		
Flow (MGD)	Report	Report	XXX	XXX	XXX	XXX	Continuous	Metered
pH (S.U.)	XXX	XXX	6.0 Inst Min	XXX	XXX	9.0	1/day	Grab
Free Available Chlorine	XXX	XXX	XXX	0.2	XXX	0.5	1/day	Grab
Temperature (°F)	XXX	XXX	XXX	XXX	110	XXX	Continuous	Metered
TSS	385	1295	XXX	30.0	100.0	125	1/week	24-Hr Composite
Total Aluminum	28.88	44.42	XXX	2.23	3.43	5.57	1/week	24-Hr Composite
Total Chromium	2.59	2.59	XXX	0.20	0.20	0.5	1/week	24-Hr Composite
Total Mercury	Report	Report	XXX	Report	Report	XXX	1/week	24-Hr Composite
Total Zinc	12.95	12.95	XXX	1.00	1.00	2.5	1/week	24-Hr Composite
Total Priority Pollutants	XXX	Report IMAX	XXX	XXX	XXX	Report	1/year	See Permit
Total PCBs (ug/L)	XXX	XXX	XXX	XXX	XXX	Report	1/month	Grab
PFOA (ng/L)	XXX	XXX	XXX	XXX	XXX	Report	1/quarter	Grab
PFOS (ng/L)	XXX	XXX	XXX	XXX	XXX	Report	1/quarter	Grab
PFBS (ng/L)	XXX	XXX	XXX	XXX	XXX	Report	1/quarter	Grab
HFPO-DA (ng/L)	XXX	XXX	XXX	XXX	XXX	Report	1/quarter	Grab

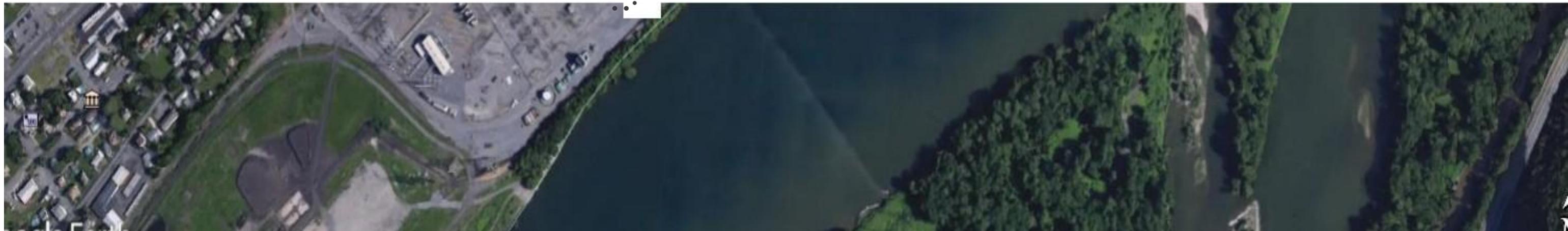
Compliance Sampling Location: Outfall 002

**ATTACHMENT A
LOCATION MAP**

Facility Location

Panda Hummel Station
Intake
Outfall 002

Map



**ATTACHMENT B
WATER QUALITY MODELING**

**ATTACHMENT B.1
TOXCONC SPREADSHEET**

**ATTACHMENT B.2
TOXICS MANAGEMENT SPREADSHEET**

Discharge Information

Instructions **Discharge** Stream

Facility: Hummel Station LLC NPDES Permit No.: PA0232602 Outfall No.: 002

Evaluation Type Major Sewage / Industrial Waste Wastewater Description: Cooling Tower Blowdown

Discharge Characteristics								
Design Flow (MGD)*	Hardness (mg/l)*	pH (SU)*	Partial Mix Factors (PMFs)				Complete Mix Times (min)	
			AFC	CFC	THH	CRL	Q ₇₋₁₀	Q _h
1.553	401	7						

Discharge Pollutant	Units	Max Discharge Conc	0 if left blank		0.5 if left blank		0 if left blank			1 if left blank	
			Trib Conc	Stream Conc	Daily CV	Hourly CV	Stream CV	Fate Coeff	FOS	Criteria Mod	Chem Transl
Group 1	Total Dissolved Solids (PWS)	mg/L	756								
	Chloride (PWS)	mg/L	87.7								
	Bromide	mg/L	2.1								
	Sulfate (PWS)	mg/L	339								
	Fluoride (PWS)	mg/L	0.3								
Group 2	Total Aluminum	µg/L	1725			0.4233					
	Total Antimony	µg/L	< 1								
	Total Arsenic	µg/L	< 1.5								
	Total Barium	µg/L	120								
	Total Beryllium	µg/L	< 0.5								
	Total Boron	µg/L	59								
	Total Cadmium	µg/L	< 0.2								
	Total Chromium (III)	µg/L	1.2			0.3743					
	Hexavalent Chromium	µg/L	0.49								
	Total Cobalt	µg/L	< 1								
	Total Copper	µg/L	2.5								
	Free Cyanide	µg/L									
	Total Cyanide	µg/L	< 10								
	Dissolved Iron	µg/L	< 20								
	Total Iron	µg/L	26								
	Total Lead	µg/L	< 1								
	Total Manganese	µg/L	20								
	Total Mercury	µg/L	0.33								
	Total Nickel	µg/L	< 2.5								
	Total Phenols (Phenolics) (PWS)	µg/L	< 5								
Total Selenium	µg/L	< 2									
Total Silver	µg/L	< 0.4									
Total Thallium	µg/L	< 0.5									
Total Zinc	µg/L	55			0.9982						
Total Molybdenum	µg/L	2.3									
Acrolein	µg/L	< 2									
Acrylamide	µg/L	<									
Acrylonitrile	µg/L	< 5									
Benzene	µg/L	< 0.5									
Bromoform	µg/L	< 0.5									
Discharge Information	µg/L	< 0.5		4/16/2	25						

Stream / Surface Water Information

Hummel Station LLC, NPDES Permit No. PA0232602, Outfall 002

Instructions Discharge **Stream**

Receiving Surface Water Name: Susquehanna River

No. Reaches to Model: 1

- Statewide Criteria
 Great Lakes Criteria
 ORSANCO Criteria

Location	Stream Code*	RMI*	Elevation (ft)*	DA (mi ²)*	Slope (ft/ft)	PWS Withdrawal (MGD)	Apply Fish Criteria*
Point of Discharge	006685	122.73	420	18438.57			Yes
End of Reach 1	006685	76.54	350	25636.81		17	Yes

Q₇₋₁₀

Location	RMI	LFY (cfs/mi ²)*	Flow (cfs)		W/D Ratio	Width (ft)	Depth (ft)	Velocity (fps)	Travel Time (days)	Tributary		Stream		Analysis	
			Stream	Tributary						Hardness	pH	Hardness*	pH*	Hardness	pH
Point of Discharge	122.73	0.108										74.8	7		
End of Reach 1	76.54	0.108										74.8	7		

Q_h

Location	RMI	LFY (cfs/mi ²)*	Flow (cfs)		W/D Ratio	Width (ft)	Depth (ft)	Velocity (fps)	Travel Time (days)	Tributary		Stream		Analysis	
			Stream	Tributary						Hardness	pH	Hardness	pH	Hardness	pH
Point of Discharge	122.73														
End of Reach 1	76.54														

Model Results

Hummel Station LLC, NPDES Permit No. PA0232602, Outfall 002

Instructions

Results

RETURN TO INPUTS

SAVE AS PDF

PRINT

All

Inputs

Results

Limits

Hydrodynamics

Q₇₋₁₀

RMI	Stream Flow (cfs)	PWS Withdrawal (cfs)	Net Stream Flow (cfs)	Discharge Analysis Flow (cfs)	Slope (ft/ft)	Depth (ft)	Width (ft)	W/D Ratio	Velocity (fps)	Travel Time (days)	Complete Mix Time (min)
122.73	1991.37		1991.37	2.402	0.00029	0.946	1272.883	1345.105	1.655	1.705	142053.118
76.54	2768.78	26.299	2742.47648								

Q_h

RMI	Stream Flow (cfs)	PWS Withdrawal (cfs)	Net Stream Flow (cfs)	Discharge Analysis Flow (cfs)	Slope (ft/ft)	Depth (ft)	Width (ft)	W/D Ratio	Velocity (fps)	Travel Time (days)	Complete Mix Time (min)
122.73	5681.29		5681.29	2.402	0.00029	1.5	1272.883	848.351	2.976	0.949	71262.33
76.54	7577.89	26.299	7551.59								

Wasteload Allocations

AFC

CCT (min):

PMF:

Analysis Hardness (mg/l):

Analysis pH:

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Dissolved Solids (PWS)	0	0		0	N/A	N/A	N/A	
Chloride (PWS)	0	0		0	N/A	N/A	N/A	
Sulfate (PWS)	0	0		0	N/A	N/A	N/A	
Fluoride (PWS)	0	0		0	N/A	N/A	N/A	
Total Aluminum	0	0		0	750	750	7,138	
Total Antimony	0	0		0	1,100	1,100	10,469	
Total Arsenic	0	0		0	340	340	3,236	Chem Translator of 1 applied
Total Barium	0	0		0	21,000	21,000	199,866	
Total Boron	0	0		0	8,100	8,100	77,091	
Total Cadmium	0	0		0	2.191	2.33	22.2	Chem Translator of 0.94 applied
Total Chromium (III)	0	0		0	611.770	1,936	18,426	Chem Translator of 0.316 applied
Hexavalent Chromium	0	0		0	16	16.3	155	Chem Translator of 0.982 applied
Total Cobalt	0	0		0	95	95.0	904	
Total Copper	0	0		0	14.585	15.2	145	Chem Translator of 0.96 applied
Dissolved Iron	0	0		0	N/A	N/A	N/A	
Total Iron	0	0		0	N/A	N/A	N/A	

Total Lead	0	0		0	70.978	91.2	868	Chem Translator of 0.778 applied
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Mercury	0	0		0	1.400	1.65	15.7	Chem Translator of 0.85 applied
Total Nickel	0	0		0	503.937	505	4,806	Chem Translator of 0.998 applied
Total Phenols (Phenolics) (PWS)	0	0		0	N/A	N/A	N/A	
Total Selenium	0	0		0	N/A	N/A	N/A	Chem Translator of 0.922 applied
Total Silver	0	0		0	3.735	4.39	41.8	Chem Translator of 0.85 applied
Total Thallium	0	0		0	65	65.0	619	
Total Zinc	0	0		0	126.129	129	1,227	Chem Translator of 0.978 applied
Acrolein	0	0		0	3	3.0	28.6	
Acrylonitrile	0	0		0	650	650	6,186	
Benzene	0	0		0	640	640	6,091	
Bromoform	0	0		0	1,800	1,800	17,131	
Carbon Tetrachloride	0	0		0	2,800	2,800	26,649	
Chlorobenzene	0	0		0	1,200	1,200	11,421	
Chlorodibromomethane	0	0		0	N/A	N/A	N/A	
2-Chloroethyl Vinyl Ether	0	0		0	18,000	18,000	171,314	
Chloroform	0	0		0	1,900	1,900	18,083	
Dichlorobromomethane	0	0		0	N/A	N/A	N/A	
1,2-Dichloroethane	0	0		0	15,000	15,000	142,762	
1,1-Dichloroethylene	0	0		0	7,500	7,500	71,381	
1,2-Dichloropropane	0	0		0	11,000	11,000	104,692	
1,3-Dichloropropylene	0	0		0	310	310	2,950	
Ethylbenzene	0	0		0	2,900	2,900	27,601	
Methyl Bromide	0	0		0	550	550	5,235	
Methyl Chloride	0	0		0	28,000	28,000	266,489	
Methylene Chloride	0	0		0	12,000	12,000	114,209	
1,1,2,2-Tetrachloroethane	0	0		0	1,000	1,000	9,517	
Tetrachloroethylene	0	0		0	700	700	6,662	
Toluene	0	0		0	1,700	1,700	16,180	
1,2-trans-Dichloroethylene	0	0		0	6,800	6,800	64,719	
1,1,1-Trichloroethane	0	0		0	3,000	3,000	28,552	
1,1,2-Trichloroethane	0	0		0	3,400	3,400	32,359	
Trichloroethylene	0	0		0	2,300	2,300	21,890	
Vinyl Chloride	0	0		0	N/A	N/A	N/A	
2-Chlorophenol	0	0		0	560	560	5,330	
2,4-Dichlorophenol	0	0		0	1,700	1,700	16,180	
2,4-Dimethylphenol	0	0		0	660	660	6,282	
4,6-Dinitro-o-Cresol	0	0		0	80	80.0	761	
2,4-Dinitrophenol	0	0		0	660	660	6,282	
2-Nitrophenol	0	0		0	8,000	8,000	76,140	
4-Nitrophenol	0	0		0	2,300	2,300	21,890	
p-Chloro-m-Cresol	0	0		0	160	160	1,523	
Pentachlorophenol	0	0		0	8.723	8.72	83.0	
Phenol	0	0		0	N/A	N/A	N/A	
2,4,6-Trichlorophenol	0	0		0	460	460	4,378	
Acenaphthene	0	0		0	83	83.0	790	
Anthracene	0	0		0	N/A	N/A	N/A	
Benzidine	0	0		0	300	300	2,855	
Benzo(a)Anthracene	0	0		0	0.5	0.5	4.76	

Benzo(a)Pyrene	0	0		0	N/A	N/A	N/A	
3,4-Benzofluoranthene	0	0		0	N/A	N/A	N/A	
Benzo(k)Fluoranthene	0	0		0	N/A	N/A	N/A	
Bis(2-Chloroethyl)Ether	0	0		0	30,000	30,000	285,523	
Bis(2-Chloroisopropyl)Ether	0	0		0	N/A	N/A	N/A	
Bis(2-Ethylhexyl)Phthalate	0	0		0	4,500	4,500	42,829	
4-Bromophenyl Phenyl Ether	0	0		0	270	270	2,570	
Butyl Benzyl Phthalate	0	0		0	140	140	1,332	
2-Chloronaphthalene	0	0		0	N/A	N/A	N/A	
Chrysene	0	0		0	N/A	N/A	N/A	
Dibenzo(a,h)Anthracene	0	0		0	N/A	N/A	N/A	
1,2-Dichlorobenzene	0	0		0	820	820	7,804	
1,3-Dichlorobenzene	0	0		0	350	350	3,331	
1,4-Dichlorobenzene	0	0		0	730	730	6,948	
3,3-Dichlorobenzidine	0	0		0	N/A	N/A	N/A	
Diethyl Phthalate	0	0		0	4,000	4,000	38,070	
Dimethyl Phthalate	0	0		0	2,500	2,500	23,794	
Di-n-Butyl Phthalate	0	0		0	110	110	1,047	
2,4-Dinitrotoluene	0	0		0	1,600	1,600	15,228	
2,6-Dinitrotoluene	0	0		0	990	990	9,422	
1,2-Diphenylhydrazine	0	0		0	15	15.0	143	
Fluoranthene	0	0		0	200	200	1,903	
Fluorene	0	0		0	N/A	N/A	N/A	
Hexachlorobenzene	0	0		0	N/A	N/A	N/A	
Hexachlorobutadiene	0	0		0	10	10.0	95.2	
Hexachlorocyclopentadiene	0	0		0	5	5.0	47.6	
Hexachloroethane	0	0		0	60	60.0	571	
Indeno(1,2,3-cd)Pyrene	0	0		0	N/A	N/A	N/A	
Isophorone	0	0		0	10,000	10,000	95,174	
Naphthalene	0	0		0	140	140	1,332	
Nitrobenzene	0	0		0	4,000	4,000	38,070	
n-Nitrosodimethylamine	0	0		0	17,000	17,000	161,797	
n-Nitrosodi-n-Propylamine	0	0		0	N/A	N/A	N/A	
n-Nitrosodiphenylamine	0	0		0	300	300	2,855	
Phenanthrene	0	0		0	5	5.0	47.6	
Pyrene	0	0		0	N/A	N/A	N/A	
1,2,4-Trichlorobenzene	0	0		0	130	130	1,237	

 CFC

 CCT (min):

 PMF:

 Analysis Hardness (mg/l):

 Analysis pH:

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Dissolved Solids (PWS)	0	0		0	N/A	N/A	N/A	
Chloride (PWS)	0	0		0	N/A	N/A	N/A	
Sulfate (PWS)	0	0		0	N/A	N/A	N/A	
Fluoride (PWS)	0	0		0	N/A	N/A	N/A	
Total Aluminum	0	0		0	N/A	N/A	N/A	
Total Antimony	0	0		0	220	220	13,202	
Total Arsenic	0	0		0	150	150	9,002	Chem Translator of 1 applied

Total Barium	0	0		0	4,100	4,100	246,043	
Total Boron	0	0		0	1,600	1,600	96,017	
Total Cadmium	0	0		0	0.211	0.23	13.8	Chem Translator of 0.918 applied
Total Chromium (III)	0	0		0	61.884	72.0	4,318	Chem Translator of 0.86 applied
Hexavalent Chromium	0	0		0	10	10.4	624	Chem Translator of 0.962 applied
Total Cobalt	0	0		0	19	19.0	1,140	
Total Copper	0	0		0	7.420	7.73	464	Chem Translator of 0.96 applied
Dissolved Iron	0	0		0	N/A	N/A	N/A	
Total Iron	0	0		0	1,500	1,500	1,244,813	WQC = 30 day average; PMF = 1
Total Lead	0	0		0	1.979	2.4	144	Chem Translator of 0.823 applied
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Mercury	0	0		0	0.770	0.91	54.4	Chem Translator of 0.85 applied
Total Nickel	0	0		0	43.167	43.3	2,598	Chem Translator of 0.997 applied
Total Phenols (Phenolics) (PWS)	0	0		0	N/A	N/A	N/A	
Total Selenium	0	0		0	4.600	4.99	299	Chem Translator of 0.922 applied
Total Silver	0	0		0	N/A	N/A	N/A	Chem Translator of 1 applied
Total Thallium	0	0		0	13	13.0	780	
Total Zinc	0	0		0	98.031	99.4	5,966	Chem Translator of 0.986 applied
Acrolein	0	0		0	3	3.0	180	
Acrylonitrile	0	0		0	130	130	7,801	
Benzene	0	0		0	130	130	7,801	
Bromoform	0	0		0	370	370	22,204	
Carbon Tetrachloride	0	0		0	560	560	33,606	
Chlorobenzene	0	0		0	240	240	14,403	
Chlorodibromomethane	0	0		0	N/A	N/A	N/A	
2-Chloroethyl Vinyl Ether	0	0		0	3,500	3,500	210,037	
Chloroform	0	0		0	390	390	23,404	
Dichlorobromomethane	0	0		0	N/A	N/A	N/A	
1,2-Dichloroethane	0	0		0	3,100	3,100	186,033	
1,1-Dichloroethylene	0	0		0	1,500	1,500	90,016	
1,2-Dichloropropane	0	0		0	2,200	2,200	132,023	
1,3-Dichloropropylene	0	0		0	61	61.0	3,661	
Ethylbenzene	0	0		0	580	580	34,806	
Methyl Bromide	0	0		0	110	110	6,601	
Methyl Chloride	0	0		0	5,500	5,500	330,058	
Methylene Chloride	0	0		0	2,400	2,400	144,025	
1,1,2,2-Tetrachloroethane	0	0		0	210	210	12,602	
Tetrachloroethylene	0	0		0	140	140	8,401	
Toluene	0	0		0	330	330	19,804	
1,2-trans-Dichloroethylene	0	0		0	1,400	1,400	84,015	
1,1,1-Trichloroethane	0	0		0	610	610	36,606	
1,1,2-Trichloroethane	0	0		0	680	680	40,807	
Trichloroethylene	0	0		0	450	450	27,005	
Vinyl Chloride	0	0		0	N/A	N/A	N/A	
2-Chlorophenol	0	0		0	110	110	6,601	
2,4-Dichlorophenol	0	0		0	340	340	20,404	
2,4-Dimethylphenol	0	0		0	130	130	7,801	

4,6-Dinitro-o-Cresol	0	0		0	16	16.0	960
2,4-Dinitrophenol	0	0		0	130	130	7,801
2-Nitrophenol	0	0		0	1,600	1,600	96,017
4-Nitrophenol	0	0		0	470	470	28,205
p-Chloro-m-Cresol	0	0		0	500	500	30,005
Pentachlorophenol	0	0		0	6.693	6.69	402
Phenol	0	0		0	N/A	N/A	N/A
2,4,6-Trichlorophenol	0	0		0	91	91.0	5,461
Acenaphthene	0	0		0	17	17.0	1,020
Anthracene	0	0		0	N/A	N/A	N/A
Benzdine	0	0		0	59	59.0	3,541
Benzo(a)Anthracene	0	0		0	0.1	0.1	6.0
Benzo(a)Pyrene	0	0		0	N/A	N/A	N/A
3,4-Benzofluoranthene	0	0		0	N/A	N/A	N/A
Benzo(k)Fluoranthene	0	0		0	N/A	N/A	N/A
Bis(2-Chloroethyl)Ether	0	0		0	6,000	6,000	360,064
Bis(2-Chloroisopropyl)Ether	0	0		0	N/A	N/A	N/A
Bis(2-Ethylhexyl)Phthalate	0	0		0	910	910	54,610
4-Bromophenyl Phenyl Ether	0	0		0	54	54.0	3,241
Butyl Benzyl Phthalate	0	0		0	35	35.0	2,100
2-Chloronaphthalene	0	0		0	N/A	N/A	N/A
Chrysene	0	0		0	N/A	N/A	N/A
Dibenzo(a,h)Anthracene	0	0		0	N/A	N/A	N/A
1,2-Dichlorobenzene	0	0		0	160	160	9,602
1,3-Dichlorobenzene	0	0		0	69	69.0	4,141
1,4-Dichlorobenzene	0	0		0	150	150	9,002
3,3-Dichlorobenzidine	0	0		0	N/A	N/A	N/A
Diethyl Phthalate	0	0		0	800	800	48,008
Dimethyl Phthalate	0	0		0	500	500	30,005
Di-n-Butyl Phthalate	0	0		0	21	21.0	1,260
2,4-Dinitrotoluene	0	0		0	320	320	19,203
2,6-Dinitrotoluene	0	0		0	200	200	12,002
1,2-Diphenylhydrazine	0	0		0	3	3.0	180
Fluoranthene	0	0		0	40	40.0	2,400
Fluorene	0	0		0	N/A	N/A	N/A
Hexachlorobenzene	0	0		0	N/A	N/A	N/A
Hexachlorobutadiene	0	0		0	2	2.0	120
Hexachlorocyclopentadiene	0	0		0	1	1.0	60.0
Hexachloroethane	0	0		0	12	12.0	720
Indeno(1,2,3-cd)Pyrene	0	0		0	N/A	N/A	N/A
Isophorone	0	0		0	2,100	2,100	126,022
Naphthalene	0	0		0	43	43.0	2,580
Nitrobenzene	0	0		0	810	810	48,609
n-Nitrosodimethylamine	0	0		0	3,400	3,400	204,036
n-Nitrosodi-n-Propylamine	0	0		0	N/A	N/A	N/A
n-Nitrosodiphenylamine	0	0		0	59	59.0	3,541
Phenanthrene	0	0		0	1	1.0	60.0

Pyrene	0	0		0	N/A	N/A	N/A	
1,2,4-Trichlorobenzene	0	0		0	26	26.0	1,560	

 THH

 CCT (min):

 THH PMF:

 Analysis Hardness (mg/l):

 Analysis pH:

 PWS PMF:

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Dissolved Solids (PWS)	0	0		0	500,000	500,000	76,263,308	WQC applied at RM1 76.54 with a design stream flow of 2768.77548 cfs
Chloride (PWS)	0	0		0	250,000	250,000	38,131,654	WQC applied at RM2 768.5747w54th8ad design stream flow of 2768.77548 cfs
Sulfate (PWS)	0	0		0	250,000	250,000	38,131,654	WQC applied at RM2 768.5747w54th8ad design stream flow of 2768.77548 cfs
Fluoride (PWS)	0	0		0	2,000	2,000	305,053	
Total Aluminum	0	0		0	N/A	N/A	N/A	
Total Antimony	0	0		0	5.6	5.6	336	
Total Arsenic	0	0		0	10	10.0	600	
Total Barium	0	0		0	2,400	2,400	144,025	
Total Boron	0	0		0	3,100	3,100	186,033	
Total Cadmium	0	0		0	N/A	N/A	N/A	
Total Chromium (III)	0	0		0	N/A	N/A	N/A	
Hexavalent Chromium	0	0		0	N/A	N/A	N/A	
Total Cobalt	0	0		0	N/A	N/A	N/A	
Total Copper	0	0		0	N/A	N/A	N/A	
Dissolved Iron	0	0		0	300	300	18,003	
Total Iron	0	0		0	N/A	N/A	N/A	
Total Lead	0	0		0	N/A	N/A	N/A	
Total Manganese	0	0		0	1,000	1,000	60,011	
Total Mercury	0	0		0	0.050	0.05	3.0	
Total Nickel	0	0		0	610	610	36,606	
Total Phenols (Phenolics) (PWS)	0	0		0	5	5.0	763	WQC applied at RM1 76.54 with a design stream flow of 2768.77548 cfs
Total Selenium	0	0		0	N/A	N/A	N/A	
Total Silver	0	0		0	N/A	N/A	N/A	
Total Thallium	0	0		0	0.24	0.24	14.4	
Total Zinc	0	0		0	N/A	N/A	N/A	
Acrolein	0	0		0	3	3.0	180	
Acrylonitrile	0	0		0	N/A	N/A	N/A	
Benzene	0	0		0	N/A	N/A	N/A	
Bromoform	0	0		0	N/A	N/A	N/A	
Carbon Tetrachloride	0	0		0	N/A	N/A	N/A	
Chlorobenzene	0	0		0	100	100.0	6,001	
Chlorodibromomethane	0	0		0	N/A	N/A	N/A	
2-Chloroethyl Vinyl Ether	0	0		0	N/A	N/A	N/A	
Chloroform	0	0		0	5.7	5.7	342	
Dichlorobromomethane	0	0		0	N/A	N/A	N/A	
1,2-Dichloroethane	0	0		0	N/A	N/A	N/A	
1,1-Dichloroethylene	0	0		0	33	33.0	1,980	
1,2-Dichloropropane	0	0		0	N/A	N/A	N/A	
1,3-Dichloropropylene	0	0		0	N/A	N/A	N/A	
Ethylbenzene	0	0		0	68	68.0	4,081	

Methyl Bromide	0	0		0	100	100.0	6,001
Methyl Chloride	0	0		0	N/A	N/A	N/A
Methylene Chloride	0	0		0	N/A	N/A	N/A
1,1,2,2-Tetrachloroethane	0	0		0	N/A	N/A	N/A
Tetrachloroethylene	0	0		0	N/A	N/A	N/A
Toluene	0	0		0	57	57.0	3,421
1,2-trans-Dichloroethylene	0	0		0	100	100.0	6,001
1,1,1-Trichloroethane	0	0		0	10,000	10,000	600,106
1,1,2-Trichloroethane	0	0		0	N/A	N/A	N/A
Trichloroethylene	0	0		0	N/A	N/A	N/A
Vinyl Chloride	0	0		0	N/A	N/A	N/A
2-Chlorophenol	0	0		0	30	30.0	1,800
2,4-Dichlorophenol	0	0		0	10	10.0	600
2,4-Dimethylphenol	0	0		0	100	100.0	6,001
4,6-Dinitro-o-Cresol	0	0		0	2	2.0	120
2,4-Dinitrophenol	0	0		0	10	10.0	600
2-Nitrophenol	0	0		0	N/A	N/A	N/A
4-Nitrophenol	0	0		0	N/A	N/A	N/A
p-Chloro-m-Cresol	0	0		0	N/A	N/A	N/A
Pentachlorophenol	0	0		0	N/A	N/A	N/A
Phenol	0	0		0	4,000	4,000	240,042
2,4,6-Trichlorophenol	0	0		0	N/A	N/A	N/A
Acenaphthene	0	0		0	70	70.0	4,201
Anthracene	0	0		0	300	300	18,003
Benidine	0	0		0	N/A	N/A	N/A
Benzo(a)Anthracene	0	0		0	N/A	N/A	N/A
Benzo(a)Pyrene	0	0		0	N/A	N/A	N/A
3,4-Benzofluoranthene	0	0		0	N/A	N/A	N/A
Benzo(k)Fluoranthene	0	0		0	N/A	N/A	N/A
Bis(2-Chloroethyl)Ether	0	0		0	N/A	N/A	N/A
Bis(2-Chloroisopropyl)Ether	0	0		0	200	200	12,002
Bis(2-Ethylhexyl)Phthalate	0	0		0	N/A	N/A	N/A
4-Bromophenyl Phenyl Ether	0	0		0	N/A	N/A	N/A
Butyl Benzyl Phthalate	0	0		0	0.1	0.1	6.0
2-Chloronaphthalene	0	0		0	800	800	48,008
Chrysene	0	0		0	N/A	N/A	N/A
Dibenzo(a,h)Anthracene	0	0		0	N/A	N/A	N/A
1,2-Dichlorobenzene	0	0		0	1,000	1,000	60,011
1,3-Dichlorobenzene	0	0		0	7	7.0	420
1,4-Dichlorobenzene	0	0		0	300	300	18,003
3,3-Dichlorobenzidine	0	0		0	N/A	N/A	N/A
Diethyl Phthalate	0	0		0	600	600	36,006
Dimethyl Phthalate	0	0		0	2,000	2,000	120,021
Di-n-Butyl Phthalate	0	0		0	20	20.0	1,200
2,4-Dinitrotoluene	0	0		0	N/A	N/A	N/A
2,6-Dinitrotoluene	0	0		0	N/A	N/A	N/A
1,2-Diphenylhydrazine	0	0		0	N/A	N/A	N/A

Fluoranthene	0	0		0	20	20.0	1,200	
Fluorene	0	0		0	50	50.0	3,001	
Hexachlorobenzene	0	0		0	N/A	N/A	N/A	
Hexachlorobutadiene	0	0		0	N/A	N/A	N/A	
Hexachlorocyclopentadiene	0	0		0	4	4.0	240	
Hexachloroethane	0	0		0	N/A	N/A	N/A	
Indeno(1,2,3-cd)Pyrene	0	0		0	N/A	N/A	N/A	
Isophorone	0	0		0	34	34.0	2,040	
Naphthalene	0	0		0	N/A	N/A	N/A	
Nitrobenzene	0	0		0	10	10.0	600	
n-Nitrosodimethylamine	0	0		0	N/A	N/A	N/A	
n-Nitrosodi-n-Propylamine	0	0		0	N/A	N/A	N/A	
n-Nitrosodiphenylamine	0	0		0	N/A	N/A	N/A	
Phenanthrene	0	0		0	N/A	N/A	N/A	
Pyrene	0	0		0	20	20.0	1,200	
1,2,4-Trichlorobenzene	0	0		0	0.07	0.07	4.2	

 CRL

 CCT (min):

 PMF:

 Analysis Hardness (mg/l):

 Analysis pH:

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Dissolved Solids (PWS)	0	0		0	N/A	N/A	N/A	
Chloride (PWS)	0	0		0	N/A	N/A	N/A	
Sulfate (PWS)	0	0		0	N/A	N/A	N/A	
Fluoride (PWS)	0	0		0	N/A	N/A	N/A	
Total Aluminum	0	0		0	N/A	N/A	N/A	
Total Antimony	0	0		0	N/A	N/A	N/A	
Total Arsenic	0	0		0	N/A	N/A	N/A	
Total Barium	0	0		0	N/A	N/A	N/A	
Total Boron	0	0		0	N/A	N/A	N/A	
Total Cadmium	0	0		0	N/A	N/A	N/A	
Total Chromium (III)	0	0		0	N/A	N/A	N/A	
Hexavalent Chromium	0	0		0	N/A	N/A	N/A	
Total Cobalt	0	0		0	N/A	N/A	N/A	
Total Copper	0	0		0	N/A	N/A	N/A	
Dissolved Iron	0	0		0	N/A	N/A	N/A	
Total Iron	0	0		0	N/A	N/A	N/A	
Total Lead	0	0		0	N/A	N/A	N/A	
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Mercury	0	0		0	N/A	N/A	N/A	
Total Nickel	0	0		0	N/A	N/A	N/A	
Total Phenols (Phenolics) (PWS)	0	0		0	N/A	N/A	N/A	
Total Selenium	0	0		0	N/A	N/A	N/A	
Total Silver	0	0		0	N/A	N/A	N/A	
Total Thallium	0	0		0	N/A	N/A	N/A	
Total Zinc	0	0		0	N/A	N/A	N/A	
Acrolein	0	0		0	N/A	N/A	N/A	

Acrylonitrile	0	0		0	0.06	0.06	14.3
Benzene	0	0		0	0.58	0.58	138
Bromoform	0	0		0	7	7.0	1,671
Carbon Tetrachloride	0	0		0	0.4	0.4	95.5
Chlorobenzene	0	0		0	N/A	N/A	N/A
Chlorodibromomethane	0	0		0	0.8	0.8	191
2-Chloroethyl Vinyl Ether	0	0		0	N/A	N/A	N/A
Chloroform	0	0		0	N/A	N/A	N/A
Dichlorobromomethane	0	0		0	0.95	0.95	227
1,2-Dichloroethane	0	0		0	9.9	9.9	2,363
1,1-Dichloroethylene	0	0		0	N/A	N/A	N/A
1,2-Dichloropropane	0	0		0	0.9	0.9	215
1,3-Dichloropropylene	0	0		0	0.27	0.27	64.4
Ethylbenzene	0	0		0	N/A	N/A	N/A
Methyl Bromide	0	0		0	N/A	N/A	N/A
Methyl Chloride	0	0		0	N/A	N/A	N/A
Methylene Chloride	0	0		0	20	20.0	4,774
1,1,2,2-Tetrachloroethane	0	0		0	0.2	0.2	47.7
Tetrachloroethylene	0	0		0	10	10.0	2,387
Toluene	0	0		0	N/A	N/A	N/A
1,2-trans-Dichloroethylene	0	0		0	N/A	N/A	N/A
1,1,1-Trichloroethane	0	0		0	N/A	N/A	N/A
1,1,2-Trichloroethane	0	0		0	0.55	0.55	131
Trichloroethylene	0	0		0	0.6	0.6	143
Vinyl Chloride	0	0		0	0.02	0.02	4.77
2-Chlorophenol	0	0		0	N/A	N/A	N/A
2,4-Dichlorophenol	0	0		0	N/A	N/A	N/A
2,4-Dimethylphenol	0	0		0	N/A	N/A	N/A
4,6-Dinitro-o-Cresol	0	0		0	N/A	N/A	N/A
2,4-Dinitrophenol	0	0		0	N/A	N/A	N/A
2-Nitrophenol	0	0		0	N/A	N/A	N/A
4-Nitrophenol	0	0		0	N/A	N/A	N/A
p-Chloro-m-Cresol	0	0		0	N/A	N/A	N/A
Pentachlorophenol	0	0		0	0.030	0.03	7.16
Phenol	0	0		0	N/A	N/A	N/A
2,4,6-Trichlorophenol	0	0		0	1.5	1.5	358
Acenaphthene	0	0		0	N/A	N/A	N/A
Anthracene	0	0		0	N/A	N/A	N/A
Benidine	0	0		0	0.0001	0.0001	0.024
Benzo(a)Anthracene	0	0		0	0.001	0.001	0.24
Benzo(a)Pyrene	0	0		0	0.0001	0.0001	0.024
3,4-Benzofluoranthene	0	0		0	0.001	0.001	0.24
Benzo(k)Fluoranthene	0	0		0	0.01	0.01	2.39
Bis(2-Chloroethyl)Ether	0	0		0	0.03	0.03	7.16
Bis(2-Chloroisopropyl)Ether	0	0		0	N/A	N/A	N/A
Bis(2-Ethylhexyl)Phthalate	0	0		0	0.32	0.32	76.4
4-Bromophenyl Phenyl Ether	0	0		0	N/A	N/A	N/A

Butyl Benzyl Phthalate	0	0		0	N/A	N/A	N/A	
2-Chloronaphthalene	0	0		0	N/A	N/A	N/A	
Chrysene	0	0		0	0.12	0.12	28.6	
Dibenzo(a,h)Anthracene	0	0		0	0.0001	0.0001	0.024	
1,2-Dichlorobenzene	0	0		0	N/A	N/A	N/A	
1,3-Dichlorobenzene	0	0		0	N/A	N/A	N/A	
1,4-Dichlorobenzene	0	0		0	N/A	N/A	N/A	
3,3-Dichlorobenzidine	0	0		0	0.05	0.05	11.9	
Diethyl Phthalate	0	0		0	N/A	N/A	N/A	
Dimethyl Phthalate	0	0		0	N/A	N/A	N/A	
Di-n-Butyl Phthalate	0	0		0	N/A	N/A	N/A	
2,4-Dinitrotoluene	0	0		0	0.05	0.05	11.9	
2,6-Dinitrotoluene	0	0		0	0.05	0.05	11.9	
1,2-Diphenylhydrazine	0	0		0	0.03	0.03	7.16	
Fluoranthene	0	0		0	N/A	N/A	N/A	
Fluorene	0	0		0	N/A	N/A	N/A	
Hexachlorobenzene	0	0		0	0.00008	0.00008	0.019	
Hexachlorobutadiene	0	0		0	0.01	0.01	2.39	
Hexachlorocyclopentadiene	0	0		0	N/A	N/A	N/A	
Hexachloroethane	0	0		0	0.1	0.1	23.9	
Indeno(1,2,3-cd)Pyrene	0	0		0	0.001	0.001	0.24	
Isophorone	0	0		0	N/A	N/A	N/A	
Naphthalene	0	0		0	N/A	N/A	N/A	
Nitrobenzene	0	0		0	N/A	N/A	N/A	
n-Nitrosodimethylamine	0	0		0	0.0007	0.0007	0.17	
n-Nitrosodi-n-Propylamine	0	0		0	0.005	0.005	1.19	
n-Nitrosodiphenylamine	0	0		0	3.3	3.3	788	
Phenanthrene	0	0		0	N/A	N/A	N/A	
Pyrene	0	0		0	N/A	N/A	N/A	
1,2,4-Trichlorobenzene	0	0		0	N/A	N/A	N/A	

Recommended WQBELs & Monitoring Requirements

No. Samples/Month: 4

Pollutants	Mass Limits		Concentration Limits				Governing WQBEL	WQBEL Basis	Comments
	AML (lbs/day)	MDL (lbs/day)	AML	MDL	IMAX	Units			
Total Aluminum	Report	Report	Report	Report	Report	µg/L	4,234	AFC	Discharge Conc > 10% WQBEL (no RP)
Total Mercury	Report	Report	Report	Report	Report	µg/L	3.0	THH	Discharge Conc > 10% WQBEL (no RP)

Other Pollutants without Limits or Monitoring

The following pollutants do not require effluent limits or monitoring based on water quality because reasonable potential to exceed water quality criteria was not determined and the discharge concentration was less than thresholds for monitoring, or the pollutant was not detected and a sufficiently sensitive analytical method was used (e.g., <= Target QL).

Pollutants	Governing WQBEL	Units	Comments
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Total Dissolved Solids (PWS)	76,263	mg/L	Discharge Conc ≤ 10% WQBEL
Chloride (PWS)	38,132	mg/L	Discharge Conc ≤ 10% WQBEL
Bromide	N/A	N/A	No WQS
Sulfate (PWS)	38,132	mg/L	Discharge Conc ≤ 10% WQBEL
Fluoride (PWS)	305	mg/L	Discharge Conc ≤ 10% WQBEL
Total Antimony	N/A	N/A	Discharge Conc < TQL
Total Arsenic	N/A	N/A	Discharge Conc < TQL
Total Barium	128,106	µg/L	Discharge Conc ≤ 10% WQBEL
Total Beryllium	N/A	N/A	No WQS
Total Boron	49,412	µg/L	Discharge Conc ≤ 10% WQBEL
Total Cadmium	13.8	µg/L	Discharge Conc < TQL
Total Chromium (III)	4,318	µg/L	Discharge Conc ≤ 10% WQBEL
Hexavalent Chromium	99.4	µg/L	Discharge Conc ≤ 10% WQBEL
Total Cobalt	580	µg/L	Discharge Conc < TQL
Total Copper	92.7	µg/L	Discharge Conc ≤ 10% WQBEL
Total Cyanide	N/A	N/A	No WQS
Dissolved Iron	18,003	µg/L	Discharge Conc < TQL
Total Iron	1,244,813	µg/L	Discharge Conc ≤ 10% WQBEL
Total Lead	144	µg/L	Discharge Conc < TQL
Total Manganese	60,011	µg/L	Discharge Conc ≤ 10% WQBEL
Total Nickel	2,598	µg/L	Discharge Conc < TQL
Total Phenols (Phenolics) (PWS)	763	µg/L	Discharge Conc < TQL
Total Selenium	299	µg/L	Discharge Conc < TQL
Total Silver	26.8	µg/L	Discharge Conc < TQL
Total Thallium	14.4	µg/L	Discharge Conc < TQL
Total Zinc	1,226	µg/L	Discharge Conc ≤ 10% WQBEL
Total Molybdenum	N/A	N/A	No WQS
Acrolein	18.3	µg/L	Discharge Conc < TQL
Acrylonitrile	14.3	µg/L	Discharge Conc < TQL
Benzene	138	µg/L	Discharge Conc < TQL
Bromoform	1,671	µg/L	Discharge Conc < TQL
Carbon Tetrachloride	95.5	µg/L	Discharge Conc < TQL
Chlorobenzene	6,001	µg/L	Discharge Conc ≤ 25% WQBEL
Chlorodibromomethane	191	µg/L	Discharge Conc < TQL
Chloroethane	N/A	N/A	No WQS
2-Chloroethyl Vinyl Ether	109,805	µg/L	Discharge Conc < TQL
Chloroform	342	µg/L	Discharge Conc ≤ 25% WQBEL
Dichlorobromomethane	227	µg/L	Discharge Conc < TQL
1,1-Dichloroethane	N/A	N/A	No WQS
1,2-Dichloroethane	2,363	µg/L	Discharge Conc < TQL
1,1-Dichloroethylene	1,980	µg/L	Discharge Conc < TQL
1,2-Dichloropropane	215	µg/L	Discharge Conc < TQL
1,3-Dichloropropylene	64.4	µg/L	Discharge Conc < TQL
1,4-Dioxane	N/A	N/A	No WQS
Ethylbenzene	4,081	µg/L	Discharge Conc < TQL
Methyl Bromide	3,355	µg/L	Discharge Conc < TQL
Methyl Chloride	170,808	µg/L	Discharge Conc < TQL

Methylene Chloride	4,774	µg/L	Discharge Conc < TQL
1,1,2,2-Tetrachloroethane	47.7	µg/L	Discharge Conc < TQL
Tetrachloroethylene	2,387	µg/L	Discharge Conc < TQL
Toluene	3,421	µg/L	Discharge Conc < TQL
1,2-trans-Dichloroethylene	6,001	µg/L	Discharge Conc < TQL
1,1,1-Trichloroethane	18,301	µg/L	Discharge Conc < TQL
1,1,2-Trichloroethane	131	µg/L	Discharge Conc < TQL
Trichloroethylene	143	µg/L	Discharge Conc < TQL
Vinyl Chloride	4.77	µg/L	Discharge Conc < TQL
2-Chlorophenol	1,800	µg/L	Discharge Conc < TQL
2,4-Dichlorophenol	600	µg/L	Discharge Conc < TQL
2,4-Dimethylphenol	4,026	µg/L	Discharge Conc < TQL
4,6-Dinitro-o-Cresol	120	µg/L	Discharge Conc < TQL
2,4-Dinitrophenol	600	µg/L	Discharge Conc < TQL
2-Nitrophenol	48,802	µg/L	Discharge Conc < TQL
4-Nitrophenol	14,031	µg/L	Discharge Conc < TQL
p-Chloro-m-Cresol	976	µg/L	Discharge Conc < TQL
Pentachlorophenol	7.16	µg/L	Discharge Conc < TQL
Phenol	240,042	µg/L	Discharge Conc < TQL
2,4,6-Trichlorophenol	358	µg/L	Discharge Conc < TQL
Acenaphthene	506	µg/L	Discharge Conc < TQL
Acenaphthylene	N/A	N/A	No WQS
Anthracene	18,003	µg/L	Discharge Conc < TQL
Benidine	0.024	µg/L	Discharge Conc < TQL
Benzo(a)Anthracene	0.24	µg/L	Discharge Conc < TQL
Benzo(a)Pyrene	0.024	µg/L	Discharge Conc < TQL
3,4-Benzofluoranthene	0.24	µg/L	Discharge Conc < TQL
Benzo(ghi)Perylene	N/A	N/A	No WQS
Benzo(k)Fluoranthene	2.39	µg/L	Discharge Conc < TQL
Bis(2-Chloroethoxy)Methane	N/A	N/A	No WQS
Bis(2-Chloroethyl)Ether	7.16	µg/L	Discharge Conc < TQL
Bis(2-Chloroisopropyl)Ether	12,002	µg/L	Discharge Conc < TQL
Bis(2-Ethylhexyl)Phthalate	76.4	µg/L	Discharge Conc < TQL
4-Bromophenyl Phenyl Ether	1,647	µg/L	Discharge Conc < TQL
Butyl Benzyl Phthalate	6.0	µg/L	Discharge Conc < TQL
2-Chloronaphthalene	48,008	µg/L	Discharge Conc < TQL
4-Chlorophenyl Phenyl Ether	N/A	N/A	No WQS
Chrysene	28.6	µg/L	Discharge Conc < TQL
Dibenzo(a,h)Anthracene	0.024	µg/L	Discharge Conc < TQL
1,2-Dichlorobenzene	5,002	µg/L	Discharge Conc < TQL
1,3-Dichlorobenzene	420	µg/L	Discharge Conc < TQL
1,4-Dichlorobenzene	4,453	µg/L	Discharge Conc < TQL
3,3-Dichlorobenzidine	11.9	µg/L	Discharge Conc < TQL
Diethyl Phthalate	24,401	µg/L	Discharge Conc < TQL
Dimethyl Phthalate	15,251	µg/L	Discharge Conc < TQL
Di-n-Butyl Phthalate	671	µg/L	Discharge Conc < TQL
2,4-Dinitrotoluene	11.9	µg/L	Discharge Conc < TQL

2,6-Dinitrotoluene	11.9	µg/L	Discharge Conc < TQL
Di-n-Octyl Phthalate	N/A	N/A	No WQS
1,2-Diphenylhydrazine	7.16	µg/L	Discharge Conc < TQL
Fluoranthene	1,200	µg/L	Discharge Conc < TQL
Fluorene	3,001	µg/L	Discharge Conc < TQL
Hexachlorobenzene	0.019	µg/L	Discharge Conc < TQL
Hexachlorobutadiene	2.39	µg/L	Discharge Conc < TQL
Hexachlorocyclopentadiene	30.5	µg/L	Discharge Conc < TQL
Hexachloroethane	23.9	µg/L	Discharge Conc < TQL
Indeno(1,2,3-cd)Pyrene	0.24	µg/L	Discharge Conc < TQL
Isophorone	2,040	µg/L	Discharge Conc < TQL
Naphthalene	854	µg/L	Discharge Conc < TQL
Nitrobenzene	600	µg/L	Discharge Conc < TQL
n-Nitrosodimethylamine	0.17	µg/L	Discharge Conc < TQL
n-Nitrosodi-n-Propylamine	1.19	µg/L	Discharge Conc < TQL
n-Nitrosodiphenylamine	788	µg/L	Discharge Conc < TQL
Phenanthrene	30.5	µg/L	Discharge Conc < TQL
Pyrene	1,200	µg/L	Discharge Conc < TQL
1,2,4-Trichlorobenzene	4.2	µg/L	Discharge Conc < TQL
PCB-1016	N/A	N/A	No WQS
PCB-1221	N/A	N/A	No WQS
PCB-1232	N/A	N/A	No WQS
PCB-1242	N/A	N/A	No WQS
PCB-1248	N/A	N/A	No WQS
PCB-1254	N/A	N/A	No WQS
PCB-1260	N/A	N/A	No WQS

**ATTACHMENT B.3
THERMAL ANALYSIS**

Instructions

Inputs

Facility: Hummel Station LLC

Permit No.: PA0232602

Stream Name: Susquehanna River

Analyst/Engineer: Derek Garner

Stream Q7-10 (cfs)*: 1,990.0

Outfall No.: 002

Analysis Type*: WWF

Facility Flows

Semi-Monthly Increment	Intake (Stream) (MGD)*	Intake (External) (MGD)*	Consumptive Loss (MGD)*	Discharge Flow (MGD)
Jan 1-31	8.88	0	7.327	1.553
Feb 1-29	8.88	0	7.327	1.553
Mar 1-31	8.88	0	7.327	1.553
Apr 1-15	8.88	0	7.327	1.553
Apr 16-30	8.88	0	7.327	1.553
May 1-15	8.88	0	7.327	1.553
May 16-31	8.88	0	7.327	1.553
Jun 1-15	8.88	0	7.327	1.553
Jun 16-30	8.88	0	7.327	1.553
Jul 1-31	8.88	0	7.327	1.553
Aug 1-15	8.88	0	7.327	1.553
Aug 16-31	8.88	0	7.327	1.553
Sep 1-15	8.88	0	7.327	1.553
Sep 16-30	8.88	0	7.327	1.553
Oct 1-15	8.88	0	7.327	1.553
Oct 16-31	8.88	0	7.327	1.553
Nov 1-15	8.88	0	7.327	1.553
Nov 16-30	8.88	0	7.327	1.553
Dec 1-31	8.88	0	7.327	1.553

Stream Flows

Q7-10 Multipliers (Default Shown)	PMF	Seasonal Stream Flow (cfs)	Downstream Stream Flow (cfs)
3.2	0.61	6368.00	3878.50
3.5	0.61	6965.00	4242.67
7	0.61	13930.00	8491.32
9.3	0.61	18507.00	11283.29
9.3	0.61	18507.00	11283.29
5.1	0.61	10149.00	6184.91
5.1	0.61	10149.00	6184.91
3	0.61	5970.00	3635.72
3	0.61	5970.00	3635.72
1.7	0.61	3383.00	2057.65
1.4	0.61	2786.00	1693.48
1.4	0.61	2786.00	1693.48
1.1	0.61	2189.00	1329.31
1.1	0.61	2189.00	1329.31
1.2	0.61	2388.00	1450.70
1.2	0.61	2388.00	1450.70
1.6	0.61	3184.00	1936.26
1.6	0.61	3184.00	1936.26
2.4	0.61	4776.00	2907.38

Instructions

WWF Results

Recommended Limits for Case 1 or Case 2

Semi-Monthly Increment	WWF Target Maximum Stream Temp. (°F)	Case 1 Daily WLA (Million BTUs/day)	Case 2 Daily WLA (°F)
Jan 1-31	40	104,526	110.0
Feb 1-29	40	114,340	110.0
Mar 1-31	46	274,609	110.0
Apr 1-15	52	304,085	110.0
Apr 16-30	58	304,085	110.0
May 1-15	64	200,020	110.0
May 16-31	72	333,367	110.0
Jun 1-15	80	254,755	110.0
Jun 16-30	84	254,755	110.0
Jul 1-31	87	133,089	110.0
Aug 1-15	87	118,662	110.0
Aug 16-31	87	118,662	110.0
Sep 1-15	84	93,145	110.0
Sep 16-30	78	93,145	110.0
Oct 1-15	72	93,831	110.0
Oct 16-31	66	93,831	110.0
Nov 1-15	58	104,365	110.0
Nov 16-30	50	83,492	110.0
Dec 1-31	42	78,354	110.0

**ATTACHMENT B.4
TRC EVALUATION**

1A	B	C	D	E	F	G
2	TRC EVALUATION					
3	Input appropriate values in B4:B8 and E4:E7					
4	1990	= Q stream (cfs)		0.5	= CV Daily	
5	1.553	= Q discharge (MGD)		0.5	= CV Hourly	
6	30	= no. samples		0.004	= AFC_Partial Mix Factor	
7	0.3	= Chlorine Demand of Stream		0.031	= CFC_Partial Mix Factor	
8	0	= Chlorine Demand of Discharge		15	= AFC_Criteria Compliance Time (min)	
9	0.2	= BAT/BPJ Value		720	= CFC_Criteria Compliance Time (min)	
	0	= % Factor of Safety (FOS)		0	=Decay Coefficient (K)	
10	Source	Reference	AFC Calculations	Reference	CFC Calculations	
11	TRC	1.3.2.iii	WLA afc = 1.076	1.3.2.iii	WLA cfc = 7.997	
12	PENTOXSD TRG	5.1a	LTAMULT afc = 0.373	5.1c	LTAMULT cfc = 0.581	
13	PENTOXSD TRG	5.1b	LTA_afc= 0.401	5.1d	LTA_cfc = 4.649	
14						
15	Source	Effluent Limit Calculations				
16	PENTOXSD TRG	5.1f	AML MULT = 1.231			
17	PENTOXSD TRG	5.1g	AVG MON LIMIT (mg/l) = 0.200	BAT/BPJ		
18			INST MAX LIMIT (mg/l) = 0.654			
	WLA afc	(.019/e(-k*AFC_tc)) + [(AFC_Yc*Qs*.019/Qd*e(-k*AFC_tc))... ...+ Xd + (AFC_Yc*Qs*Xs/Qd)]*(1-FOS/100)				
	LTAMULT afc	EXP((0.5*LN(cvh^2+1))-2.326*LN(cvh^2+1)^0.5)				
	LTA_afc	wla_afc*LTAMULT_afc				
	WLA_cfc	(.011/e(-k*CFC_tc) + [(CFC_Yc*Qs*.011/Qd*e(-k*CFC_tc))... ...+ Xd + (CFC_Yc*Qs*Xs/Qd)]*(1-FOS/100)				
	LTAMULT_cfc	EXP((0.5*LN(cvd^2/no_samples+1))-2.326*LN(cvd^2/no_samples+1)^0.5)				
	LTA_cfc	wla_cfc*LTAMULT_cfc				
	AML MULT	EXP(2.326*LN((cvd^2/no_samples+1)^0.5)-0.5*LN(cvd^2/no_samples+1))				
	AVG MON LIMIT	MIN(BAT_BPJ,MIN(LTA_afc,LTA_cfc)*AML_MULT)				
	INST MAX LIMIT	1.5*(av_mon_limit/AML_MULT)/LTAMULT_afc				