

Issuance Date: February 12, 2021
Effective Date: March 1, 2021
Expiration Date: February 28, 2026

**National Pollutant Discharge Elimination System
Waste Discharge Permit No. WA0000281**

State of Washington
DEPARTMENT OF ECOLOGY

Industrial Section
PO Box 47600
Olympia, WA 98504-7600

In compliance with the provisions of
The State of Washington Water Pollution Control Law
Chapter 90.48 Revised Code of Washington
and
The Federal Water Pollution Control Act
(The Clean Water Act)
Title 33 United States Code, Section 1342 et seq.

Emerald Kalama Chemical, LLC
1296 Third Street NW
Kalama, Washington 98625

is authorized to discharge in accordance with the Special and General Conditions that follow.

<u>Facility Location:</u> 1296 Third Street NW Kalama, Washington 98625 <u>Treatment Type:</u> Activated Sludge, Anaerobic Treatment, Pre-Aeration	<u>Receiving Waters:</u> Columbia River at Mile 74 and Wetland <u>Industry Type:</u> Organic Chemicals, Plastics, and Synthetic Fibers <u>SIC Codes:</u> 2869, 2865 <u>NAICS Codes:</u> 325199, 325194
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Industrial Section Manager
Washington State Department of Ecology

Table of Contents

<i>Summary of Permit Report Submittals</i>	5
<i>Special Conditions</i>	8
S1. Discharge Limits	8
S1.A. Non-Contact Cooling Water and Treated Process Wastewater at Outfall 001	8
S1.B. Process Wastewater at Monitoring Point 002.....	8
S1.C. Mixing Zone Authorization for Outfall 001	11
S1.D. Stormwater Discharge at Outfall 003	12
S1.E. Filter Backwash Water Discharges at Outfalls 010 and 011.....	12
S2. Monitoring Requirements	13
S2.A. Monitoring Schedule.....	13
S2.B. Sampling and Analytical Procedures	19
S2.C. Flow Measurement, Field Measurement, and Continuous Monitoring Devices	20
S2.D. Laboratory Accreditation	21
S2.E. Request for Reduction in Monitoring	21
S3. Reporting and Recording Requirements	21
S3.A. Discharge Monitoring Reports.....	21
S3.B. Permit Submittals and Schedules.....	23
S3.C. Records Retention.....	23
S3.D. Recording of Results.....	23
S3.E. Additional Monitoring by the Permittee	24
S3.F. Reporting Permit Violations	24
S3.G. Other Reporting	25
S3.H. Maintaining a Copy of this Permit.....	26
S4. Operation and Maintenance	26
S4.A. O&M Manual.....	26
S4.B. Treatment System Operating Plan	27
S4.C. Bypass Procedures	28
S5. Solid Wastes	29
S5.A. Solid Waste Handling	29
S5.B. Leachate	29
S6. Application for Permit Renewal or Modification for Facility Changes	30
S7. Facility Loading Design Criteria	30
S8. Non-Routine and Unanticipated Discharges	30
S9. Outfall Evaluation	31
S10. Effluent Mixing Study	31
S10.A. General Requirements.....	31
S10.B. Reporting Requirements	32
S10.C. Protocols	34
S11. Pollution Prevention	34
S11.A. NPDES Pollution Prevention Plan Update and Implementation	35

S11.B. Specific Plan Update Requirements.....	35
S11.C. Stormwater Inspections.....	36
S11.D. Biennial Reporting.....	37
S11.E. Continuous Improvement	37
S12. Cooling Water Intake Structure (CWIS)	37
S12.A. Operations and Maintenance.....	37
S12.B. Information and Compliance Report	37
S12.C. Endangered Species Act	38
S13. Acute Toxicity.....	38
S13.A. Effluent Testing	38
S13.B. Effluent Limit for Acute Toxicity.....	38
S13.C. Compliance with the Effluent Limit for Acute Toxicity.....	39
S13.D. Compliance Testing for Acute Toxicity	39
S13.E. Response to Noncompliance with the Effluent Limit for Acute Toxicity	40
S13.F. Testing When There is no Permit Limit for Acute Toxicity.....	41
S13.G. Sampling and Reporting Requirements	41
S14. Chronic Toxicity.....	42
S14.A. Effluent Testing	42
S14.B. Effluent Limit for Chronic Toxicity	43
S14.C. Compliance with the Effluent Limit for Chronic Toxicity	43
S14.D. Compliance Testing for Chronic Toxicity	43
S14.E. Response to Noncompliance with the Effluent Limit for Chronic Toxicity.....	44
S14.F. Testing When There is no Permit Limit for Chronic Toxicity	45
S14.G. Sampling and Reporting Requirements	46
S15. Receiving Water Study	47
S16. Outfall 003 AKART Analysis and Engineering Report	48
S17. Filter Backwash Water AKART Analysis and Engineering Report.....	49
S17.A Filter Backwash Water Characterization Study.....	49
S17.B AKART Analysis.....	50
S17.C Water Quality Assessment.....	50
S17.D Engineering Report.....	50
S18. Dangerous Wastes – Permit by Rule Requirements.....	51
<i>General Conditions</i>	<i>52</i>
G1. Signatory Requirements.....	52
G2. Right of Inspection and Entry	53
G3. Permit Actions.....	53
G4. Reporting Planned Changes.....	54
G5. Plan Review Required	55
G6. Compliance with Other Laws and Statutes.....	55
G7. Transfer of this Permit	55
G8. Reduced Production for Compliance.....	56

G9.	Removed Substances.....	56
G10.	Duty to Provide Information.....	56
G11.	Other Requirements of 40 CFR.....	56
G12.	Additional Monitoring.....	56
G13.	Payment of Fees.....	56
G14.	Penalties for Violating Permit Conditions.....	56
G15.	Upset.....	57
G16.	Property Rights	57
G17.	Duty to Comply	57
G18.	Toxic Pollutants.....	58
G19.	Penalties for Tampering.....	58
G20.	Reporting Requirements Applicable to Existing Manufacturing, Commercial, Mining, and Silvicultural Dischargers	58
G21.	Compliance Schedules	59
<i>Appendix A</i>	60
	Table 1: Conventional Pollutants.....	60
	Table 2: Nonconventional Pollutants.....	61
	Table 3: Metals, Cyanide & Total Phenols.....	63
	Table 4: Acid Compounds	64
	Table 5: Volatile Compounds	65
	Table 6: Base/Neutral Compounds (Compounds in Bold are Ecology PBTS).....	66
	Table 7: Dioxin	69
	Table 8: Pesticides/PCBS	69
<i>Appendix B</i>	72
<i>Appendix C</i>	82

Summary of Permit Report Submittals

Refer to the Special and General Conditions of this permit for additional submittal requirements.

Permit Section	Submittal	Frequency	First Submittal Date
S3.A	Discharge Monitoring Report (DMR)	Monthly	April 15, 2021
S3.A	Discharge Monitoring Report (DMR)	Quarterly	July 15, 2021
S3.A	Discharge Monitoring Report (DMR)	Annually	January 15, 2022
S3.A	DMR - Priority Pollutant Data - Single Sample Data	1/2 years	January 15, 2022
S3.A.	Permit Renewal Application Monitoring Data	1/permit cycle	September 1, 2025
S3.F	Reporting Permit Violations	As necessary	
S4.A	Updated Operation and Maintenance Manual	1/permit cycle	September 1, 2022
S4.A	Operation and Maintenance Manual, Changes or Updates	As necessary	
S4.B	Updated Treatment System Operating Plan	1/permit cycle	September 1, 2025
S4.B	Treatment System Operating Plan, Changes or Updates	As necessary	
S4.C	Reporting Bypasses	As necessary	
S6	Application for Permit Renewal	1/permit cycle	September 1, 2025
S8	Non-Routine and Unanticipated Discharges	As necessary	
S9	Outfall Evaluation Report	1/permit cycle	March 1, 2023
S10.A	Effluent Mixing Study Plan	1/permit cycle	March 1, 2022
S10.A	Effluent Mixing Study Report	1/permit cycle	September 1, 2025
S11.A	Updated NPDES Pollution Prevention Plan	1/permit cycle	September 1, 2022
S11.D	NPDES Pollution Prevention Plan Biennial Progress Report	Every two years	September 1, 2024
S12.B	Cooling Water Intake Structure (CWIS) Information and Compliance Report	1/permit cycle	September 1, 2025
S13.A	Acute Toxicity: Effluent Test Results First Summer, First Winter Sampling	2/permit cycle	1 st summer - November 30, 2021 1 st winter – May 31, 2022

Permit Section	Submittal	Frequency	First Submittal Date
S13.D	Acute Toxicity: Compliance Monitoring Reports	As necessary	
S13.E	Acute Toxicity: Response to Noncompliance Reporting	As necessary	
S13.E	Acute Toxicity: TI/TRE Plan	As necessary	
S13.F	Acute Toxicity: Effluent Test Results Last Summer, Last Winter Sampling	1/permit cycle	September 1, 2025
S14.A	Chronic Toxicity: Effluent Test Results First Summer, First Winter Sampling	2/permit cycle	1 st summer - November 30, 2021 1 st winter – May 31, 2022
S14.D	Chronic Toxicity: Compliance Monitoring Reports	As necessary	
S14.E	Chronic Toxicity: Response to Noncompliance Reporting	As necessary	
S14.E	Chronic Toxicity: TI/TRE Plan	As necessary	
S14.F	Chronic Toxicity: Effluent Test Results Last Summer, Last Winter Sampling	1/permit cycle	September 1, 2025
S15	Receiving Water Study Sampling and Quality Assurance Plan	1/permit cycle	December 1, 2022
S15	Receiving Water Study Final Report	1/permit cycle	September 1, 2025
S16	Outfall 003 AKART Analysis and Engineering Report	As necessary	Prior to resuming discharge of stormwater at Outfall 003
S16	Outfall 003 Engineering Design Report	As necessary	
S17.A	Filter Backwash Water Characterization Sampling and Analysis Plan	1/permit cycle	March 1, 2022
S17.C and A.1. of App C	Filter Backwash Water Mixing Study Plan	1/permit cycle	March 1, 2022
S17.D	Filter Backwash Water AKART Analysis and Engineering Report	1/permit cycle	June 1, 2023
S17.D	Interim progress report of changes implemented for filter backwash water to meet AKART	As necessary	One year after Ecology approves Engineering Report

Permit Section	Submittal	Frequency	First Submittal Date
S17.D	Updated Operation and Maintenance Manual – to include changes implemented for filter backwash water	As necessary	Within 90 days of completing changes
G1	Notice of Change in Authorization	As necessary	
G4	Permit Application for Substantive Changes to the Discharge	As necessary	
G5	Engineering Report for Construction or Modification Activities	As necessary	
G7	Notice of Permit Transfer	As necessary	
G10	Duty to Provide Information	As necessary	
G21	Compliance Schedules	As necessary	

Special Conditions

S1. Discharge Limits

S1.A. Non-Contact Cooling Water and Treated Process Wastewater at Outfall 001

All discharges and activities authorized by this permit must be consistent with the terms and conditions of this permit.

The discharge of any of the following pollutants more frequently than, or at a level in excess of that identified and authorized by this permit violates the terms and conditions of this permit.

Outfall 001 is the direct discharge to the Columbia River of non-contact cooling water combined with effluent from Monitoring Point 002. Monitoring Point 002 is effluent from the wastewater treatment plant.

Beginning on the effective date of this permit, the Permittee is authorized to discharge non-contact cooling water, wastewater treatment plant effluent, and filter backwash water at the permitted location subject to complying with the following limits:

Effluent Limits: Outfall 001
Latitude 46.02182 - Longitude -122.86155

Parameter	Average Monthly ^a	Maximum Daily ^b
Temperature	-	40.7 degrees centigrade (°C)
Heat Load	1.97 x 10 ⁹ kilocalories per day (kcal/day) ^c	-

Footnote:

- a The average monthly heat load is calculated as the product of the average monthly temperature, average monthly flow, and a conversion factor of 3.77x10⁶. The average monthly temperature is calculated as the sum of average daily temperatures divided by the number of daily discharges measured in the month. The average monthly flow is calculated as the sum of average daily flows divided by the number of daily discharges measured in the month.
- b Maximum daily effluent limit is the highest allowable daily discharge. The daily discharge is the maximum temperature measured during a calendar day.
- c The average monthly heat load limit only applies from July through October.

S1.B. Process Wastewater at Monitoring Point 002

All discharges and activities authorized by this permit must be consistent with the terms and conditions of this permit.

The discharge of any of the following pollutants more frequently than, or at a level in excess of that identified and authorized by this permit violates the terms and conditions of this permit.

Beginning on the effective date of this permit, the Permittee is authorized to discharge treated process water which includes stormwater from industrial activities and remediation groundwater at the permitted location subject to complying with the following limits:

**Effluent Limits: Monitoring Point 002
 Latitude 46.02158 - Longitude -122.86045**

Parameter	Minimum Daily ^a	Maximum Daily ^b
pH ^c	6.0 standard units	9.0 standard units

Footnotes:

- a Minimum daily effluent limit is the lowest allowable daily discharge. The daily discharge is the minimum pH measured during a calendar day.
- b Maximum daily effluent limit is the highest allowable daily discharge. The daily discharge is the maximum pH measured during a calendar day.
- c When pH is continuously monitored, excursions between 5.0 and 6.0, or 9.0 and 10.0 are not considered violations if no single excursion exceeds 60 minutes in length and total excursions do not exceed 7 hours and 26 minutes per month. Any excursions below 5.0 and above 10.0 at any time are violations.

Parameter	Average Monthly ^a (pounds per day)	Maximum Daily ^b (pounds per day)
Biochemical Oxygen Demand (5-day)	114	304
Total Suspended Solids	139	453
Copper, Total	0.411	0.958
Nickel, Total	0.550	1.242
Zinc, Total	0.298	0.740
Acenaphthene	0.063	0.168
Acenaphthylene	0.063	0.168
Acrylonitrile	0.273	0.688
Anthracene	0.063	0.168
Benzene	0.105	0.387
Benzo(a)anthracene	0.063	0.168
3,4-Benzofluoranthene	0.065	0.173
Benzo(k)fluoranthene	0.063	0.168
Benzo(a)pyrene	0.065	0.173
Bis(2-ethylhexyl) phthalate	0.293	0.793
Carbon Tetrachloride	0.051	0.108
Chlorobenzene	0.043	0.080

Parameter	Average Monthly^a (pounds per day)	Maximum Daily^b (pounds per day)
Chloroethane	0.296	0.762
Chloroform	0.060	0.131
2-Chlorophenol	0.088	0.279
Chrysene	0.063	0.168
Di-n-butyl phthalate	0.077	0.162
1,2-Dichlorobenzene	0.219	0.464
1,3-Dichlorobenzene	0.088	0.125
1,4-Dichlorobenzene	0.043	0.080
1,1-Dichloroethane	0.063	0.168
1,2-Dichloroethane	0.193	0.600
1,1-Dichloroethylene	0.046	0.071
1,2-trans-Dichloroethylene	0.060	0.154
2,4-Dichlorophenol	0.111	0.319
1,2-Dichloropropane	0.435	0.654
1,3-Dichloropropylene	0.082	0.125
Diethyl phthalate	0.230	0.577
2,4-Dimethylphenol	0.051	0.102
Dimethyl phthalate	0.054	0.134
4,6-Dinitro-o-cresol	0.222	0.788
2,4-Dinitrophenol	0.202	0.350
2,4-Dinitrotoluene	0.321	0.811
2,6-Dinitrotoluene	0.725	1.823
Ethylbenzene	0.091	0.307
Fluoranthene	0.071	0.193
Fluorene	0.063	0.168
Hexachlorobenzene	0.043	0.080
Hexachlorobutadiene	0.057	0.139
Hexachloroethane	0.060	0.154
Methyl Chloride	0.245	0.540
Methylene Chloride	0.114	0.253
Naphthalene	0.063	0.168
Nitrobenzene	0.077	0.193
2-Nitrophenol	0.117	0.196

Parameter	Average Monthly^a (pounds per day)	Maximum Daily^b (pounds per day)
4-Nitrophenol	0.205	0.353
Phenanthrene	0.063	0.168
Phenol	0.043	0.074
Pyrene	0.071	0.191
Tetrachloroethylene	0.063	0.159
Toluene	0.074	0.228
1,2,4-Trichlorobenzene	0.193	0.398
1,1,1-Trichloroethane	0.060	0.154
1,1,2-Trichloroethane	0.060	0.154
Trichloroethylene	0.060	0.154
Vinyl Chloride	0.296	0.762

Footnotes:

- a Average monthly effluent limit means the highest allowable average of daily discharges over a calendar month. To calculate the discharge value to compare to the limit, add the value of each daily discharge measured during a calendar month and divide this sum by the total number of daily discharges measured. If only one sample is collected during a calendar month, the results of that sample are only compared to the maximum daily limits to determine compliance.
- b Maximum daily effluent limit is the highest allowable daily discharge. The daily discharge is the average discharge of a pollutant measured during a calendar day. For pollutants with limits expressed in units of mass, calculate the daily discharge as the total mass of the pollutant discharged over the day.

S1.C. Mixing Zone Authorization for Outfall 001

The following paragraphs define the Outfall 001 maximum boundaries of the mixing zones:

Chronic Mixing Zone

The length of the chronic mixing zone extends 100 feet upstream and 325 feet downstream of Outfall 001. The mixing zone extends from the bottom to the top of the water column. The concentration of pollutants at the edge of the chronic zone must meet chronic aquatic life criteria and human health criteria.

Acute Mixing Zone

The length of the acute mixing zone extends 10.0 feet upstream and 32.5 feet downstream of Outfall 001. The mixing zone extends from the bottom to the top of the water column. The concentration of pollutants at the edge of the acute zone must meet acute aquatic life criteria.

The Monitoring Point 002 process wastewater is authorized to mix with the Outfall 001 non-contact cooling water according to the following dilution factors:

Criteria	Dilution Factors for Outfall 001	Dilution Factors for Pollutants Discharged at Monitoring Point 002
Acute Aquatic Life Criteria	8.3	359
Chronic Aquatic Life Criteria	21.1	913
Human Health Criteria - Carcinogen	21.1	913
Human Health Criteria - Non-carcinogen	21.1	913

S1.D. Stormwater Discharge at Outfall 003

All discharges and activities authorized by this permit must be consistent with the terms and conditions of this permit.

The discharge of any of the following pollutants more frequently than, or at a level in excess of that identified and authorized by this permit violates the terms and conditions of this permit.

Beginning on the effective date of this permit, the Permittee is authorized to discharge stormwater from the secondary containment around tanks T-70 and T-71 to the adjacent wetland at the permitted location subject to the monitoring requirements in Special Condition S2. The results of this monitoring must be submitted to Ecology prior to discharge. The Permittee must receive approval from Ecology before discharging stormwater through Outfall 003.

Outfall 003

Latitude 46.02341 - Longitude -122.85466

There are no limits for Outfall 003. The permittee must comply with the monitoring requirements in Special Condition S2.

S1.E. Filter Backwash Water Discharges at Outfalls 010 and 011

All discharges and activities authorized by this permit must be consistent with the terms and conditions of this permit.

The discharge of any of the following pollutants more frequently than, or at a level in excess of that identified and authorized by this permit violates the terms and conditions of this permit.

Beginning on the effective date of this permit, the Permittee is authorized to discharge filter backwash water at the permitted locations subject to complying with the requirements of this permit.

Outfall 010
Latitude 46.02145 - Longitude -122.86088

There are no limits for Outfall 010. The permittee must comply with the requirements in Special Condition S17.

Outfall 011
Latitude 46.02143 - Longitude -122.86084

There are no limits for Outfall 011. The permittee must comply with the requirements in Special Condition S17.

S2. Monitoring Requirements

S2.A. Monitoring Schedule

The Permittee must monitor in accordance with the following schedule and the requirements specified in **Appendix A**.

(1) Wastewater Treatment Plant Influent

Parameter	Units & Speciation	Minimum Sampling Frequency ^a	Sample Type ^b
Flow	million gallons/day (MGD)	Continuous	Metered/recorded
Biochemical Oxygen Demand (5-day) (BOD ₅)	milligrams/liter (mg/L) and pounds/day (lbs/day)	Quarterly	Grab ^c

(2) Outfall 001 – Non-Contact Cooling Water and Treated Process Wastewater

Parameter	Units & Speciation	Minimum Sampling Frequency ^a	Sample Type ^b
Flow ^d	MGD	Continuous	Metered/recorded
Temperature ^e	degrees centigrade (°C)	Continuous	Metered/recorded
Toluene	micrograms/liter (µg/L)	Monthly	Grab
Turbidity	Nephelometric Turbidity Units (NTU)	Annually	Grab

(3) Monitoring Point 002 – Treated Process Wastewater

Parameter	Units & Speciation	Minimum Sampling Frequency^a	Sample Type^b
Flow	MGD	Continuous	Metered/recorded
pH ^f	standard units	Continuous	Metered/recorded
BOD ₅	mg/L and lbs/day	Weekly	Composite Sample (24 hour) and Calculated
Total Suspended Solids	mg/L and lbs/day	Weekly	Composite Sample (24 hour) and Calculated
Copper, Total	µg/L and lbs/day	Monthly	Composite Sample (24 hour) and Calculated
Nickel, Total	µg/L and lbs/day	Monthly	Composite Sample (24 hour) and Calculated
Zinc, Total	µg/L and lbs/day	Monthly	Composite Sample (24 hour) and Calculated
Acenaphthene	µg/L and lbs/day	Annually	Grab ^c and Calculated
Acenaphthylene	µg/L and lbs/day	Annually	Grab ^c and Calculated
Acrylonitrile	µg/L and lbs/day	Annually	Grab and Calculated
Anthracene	µg/L and lbs/day	Annually	Grab ^c and Calculated
Benzene	µg/L and lbs/day	Annually	Grab and Calculated
Benzo(a)anthracene	µg/L and lbs/day	Annually	Grab ^c and Calculated
3,4-Benzofluoranthene	µg/L and lbs/day	Annually	Grab ^c and Calculated
Benzo(k)fluoranthene	µg/L and lbs/day	Annually	Grab ^c and Calculated
Benzo(a)pyrene	µg/L and lbs/day	Annually	Grab ^c and Calculated
Bis(2-ethylhexyl) phthalate	µg/L and lbs/day	Annually	Grab ^c and Calculated
Carbon Tetrachloride	µg/L and lbs/day	Annually	Grab and Calculated
Chlorobenzene	µg/L and lbs/day	Annually	Grab and Calculated
Chloroethane	µg/L and lbs/day	Annually	Grab and Calculated
Chloroform	µg/L and lbs/day	Annually	Grab and Calculated
2-Chlorophenol	µg/L and lbs/day	Annually	Grab ^c and Calculated
Chrysene	µg/L and lbs/day	Annually	Grab ^c and Calculated
Di-n-butyl phthalate	µg/L and lbs/day	Annually	Grab ^c and Calculated
1,2-Dichlorobenzene	µg/L and lbs/day	Annually	Grab and Calculated
1,3-Dichlorobenzene	µg/L and lbs/day	Annually	Grab and Calculated

Parameter	Units & Speciation	Minimum Sampling Frequency ^a	Sample Type ^b
1,4-Dichlorobenzene	µg/L and lbs/day	Annually	Grab and Calculated
1,1-Dichloroethane	µg/L and lbs/day	Annually	Grab and Calculated
1,2-Dichloroethane	µg/L and lbs/day	Annually	Grab and Calculated
1,1-Dichloroethylene	µg/L and lbs/day	Annually	Grab and Calculated
1,2-trans-Dichloroethylene	µg/L and lbs/day	Annually	Grab and Calculated
2,4-Dichlorophenol	µg/L and lbs/day	Annually	Grab ^c and Calculated
1,2-Dichloropropane	µg/L and lbs/day	Annually	Grab and Calculated
1,3-Dichloropropylene	µg/L and lbs/day	Annually	Grab and Calculated
Diethyl phthalate	µg/L and lbs/day	Annually	Grab ^c and Calculated
2,4-Dimethylphenol	µg/L and lbs/day	Annually	Grab ^c and Calculated
Dimethyl phthalate	µg/L and lbs/day	Annually	Grab ^c and Calculated
4,6-Dinitro-o-cresol	µg/L and lbs/day	Annually	Grab ^c and Calculated
2,4-Dinitrophenol	µg/L and lbs/day	Annually	Grab ^c and Calculated
2,4-Dinitrotoluene	µg/L and lbs/day	Annually	Grab ^c and Calculated
2,6-Dinitrotoluene	µg/L and lbs/day	Annually	Grab ^c and Calculated
Ethylbenzene	µg/L and lbs/day	Annually	Grab and Calculated
Fluoranthene	µg/L and lbs/day	Annually	Grab ^c and Calculated
Fluorene	µg/L and lbs/day	Annually	Grab ^c and Calculated
Hexachlorobenzene	µg/L and lbs/day	Annually	Grab ^c and Calculated
Hexachlorobutadiene	µg/L and lbs/day	Annually	Grab ^c and Calculated
Hexachloroethane	µg/L and lbs/day	Annually	Grab ^c and Calculated
Methyl Chloride	µg/L and lbs/day	Annually	Grab and Calculated
Methylene Chloride	µg/L and lbs/day	Annually	Grab and Calculated
Naphthalene	µg/L and lbs/day	Annually	Grab ^c and Calculated
Nitrobenzene	µg/L and lbs/day	Annually	Grab ^c and Calculated
2-Nitrophenol	µg/L and lbs/day	Annually	Grab ^c and Calculated
4-Nitrophenol	µg/L and lbs/day	Annually	Grab ^c and Calculated
Phenanthrene	µg/L and lbs/day	Annually	Grab ^c and Calculated
Phenol	µg/L and lbs/day	Annually	Grab ^c and Calculated
Pyrene	µg/L and lbs/day	Annually	Grab ^c and Calculated
Tetrachloroethylene	µg/L and lbs/day	Annually	Grab and Calculated

Parameter	Units & Speciation	Minimum Sampling Frequency ^a	Sample Type ^b
Toluene	µg/L and lbs/day	Annually	Grab and Calculated
1,2,4-Trichlorobenzene	µg/L and lbs/day	Annually	Grab ^c and Calculated
1,1,1-Trichloroethane	µg/L and lbs/day	Annually	Grab and Calculated
1,1,2-Trichloroethane	µg/L and lbs/day	Annually	Grab and Calculated
Trichloroethylene	µg/L and lbs/day	Annually	Grab and Calculated
Vinyl Chloride	µg/L and lbs/day	Annually	Grab and Calculated

(4) Stormwater at Outfall 003

Parameter	Units & Speciation	Minimum Sampling Frequency ^a	Sample Type ^b
Copper, Total	µg/L	Once per defined event	Grab
Zinc, Total	µg/L	Once per defined event	Grab
Oil and Grease	mg/L	Once per defined event	Grab
pH	standard units	Once per defined event	Grab
Toluene	µg/L	Once per defined event	Grab
Turbidity	Nephelometric Turbidity Unit (NTU)	Once per defined event	Grab
Duration	Minutes	Once per defined event	Estimated
Flow	Gallons	Once per defined event	Estimated

(5) Filter Backwash Water at Outfalls 010 and 011

As specified in Special Condition S17.

(6) Priority Pollutant Monitoring – Treated Process Wastewater at Monitoring Point 002^g

See **Appendix A** to identify the specific pollutants in the priority pollutant groups listed below.

Parameter	Units & Speciation	Minimum Sampling Frequency ^a	Sample Type ^b
Total Cyanide	µg/L	1/2 years	Grab

Parameter	Units & Speciation	Minimum Sampling Frequency ^a	Sample Type ^b
Total Phenolic Compounds	µg/L	1/2 years	Grab
Priority Pollutants (PP) – Total Metals	µg/L; ng/L for mercury	1/2 years	Composite Sample (24 hour) Grab for mercury
PP – Acid-extractable Compounds	µg/L	1/2 years	Grab
PP – Volatile Organic Compounds	µg/L	1/2 years	Grab
PP – Base-neutral Compounds	µg/L	1/2 years	Grab
PP – Dioxin	picograms/liter (pg/L)	1/2 years	Composite Sample (24 hour)
PP – Pesticides/PCBs ^h	µg/L	1/2 years	Composite Sample (24 hour)

(7) Permit Renewal Application Requirements – Wastewater Effluent at Outfall 001

See parameters required by the permit application renewal forms available at <https://ecology.wa.gov/Water-Shorelines/Water-quality/Water-quality-permits/Water-Quality-individual-permits>.

(8) Permit Renewal Application Requirements – Wastewater Effluent at Monitoring Point 002

See parameters required by the permit application renewal forms available at <https://ecology.wa.gov/Water-Shorelines/Water-quality/Water-quality-permits/Water-Quality-individual-permits>.

(9) Permit Renewal Application Requirements – Stormwater at Outfall 003

See parameters required by the permit application renewal forms available at <https://ecology.wa.gov/Water-Shorelines/Water-quality/Water-quality-permits/Water-Quality-individual-permits>.

(10) Permit Renewal Application Requirements – Filter Backwash Water Outfall 010

See parameters required by the permit application renewal forms available at <https://ecology.wa.gov/Water-Shorelines/Water-quality/Water-quality-permits/Water-Quality-individual-permits>.

(11) Permit Renewal Application Requirements – Filter Backwash Water Outfall 011

See parameters required by the permit application renewal forms available at <https://ecology.wa.gov/Water-Shorelines/Water-quality/Water-quality-permits/Water-Quality-individual-permits>.

(12) Acute Whole Effluent Toxicity Testing – Outfall 001

As specified in Special Condition S13.

(13) Chronic Whole Effluent Toxicity Testing – Outfall 001

As specified in Special Condition S14.

(14) Receiving Water Study

As specified in Special Condition S15.

(15) Outfall 003 AKART Analysis and Engineering Report

As specified in Special Condition S16.

(16) Filter Backwash Water AKART Analysis and Engineering Report

As specified in Special Condition S17.

Footnotes:

- a Continuous means uninterrupted except for brief lengths of time for calibration, power failure, or unanticipated equipment repair or maintenance. The time interval for the associated data logger must be no greater than 30 minutes. The Permittee must sample one time per day when continuous monitoring is not possible.

Weekly means once per week.

Quarterly means once every three months. Quarterly sampling periods are January through March, April through June, July through September, and October through December. The Permittee must begin quarterly monitoring for the quarter beginning on 1/1/21 and submit results by 4/15/21.

Monthly means once per month.

Annually means once per calendar year.

Once per defined event means every time the Permittee discharges stormwater through Outfall 003. The Permittee must receive approval from Ecology before discharging stormwater through Outfall 003.

1/2 years means once every two years beginning in 2021.

- b Metered/recorded means recording meters such as for flow, temperature, and pH.

Composite Sample (24 hour) means a series of individual samples collected over a 24-hour period into a single container, and analyzed as one sample.

For sample types that include a loading calculation, use the following formulas:

Concentration (in mg/L) X Flow (in MGD) X Conversion Factor (8.34) = lbs/day

Concentration (in µg/L) X Flow (in MGD) X Conversion Factor (0.00834) = lbs/day.

Grab means an individual sample collected over a fifteen (15) minute, or less, period.

Estimated means an approximation of the duration and flow volume when the Permittee discharges stormwater at Outfall 003.

- c The Permittee may choose to use a composite sample (24 hour) instead of a grab sample.
- d Outfall 001 flow can be estimated by summing the continuous flows from the intake cooling water and treated process wastewater.
- e If continuous temperature monitoring is not possible, daily temperature grab sampling must occur when the effluent is at or near its daily maximum temperature, which usually occurs in the late afternoon. If measuring temperature continuously, the Permittee must determine and report a daily maximum from no less frequent than half-hour measurements in a 24-hour period. If measuring temperature continuously, the Permittee must also determine and report a daily average from no less frequent than half-hour measurements in a 24-hour period. Continuous monitoring instruments must achieve an accuracy of 0.2 degrees C and the Permittee must verify accuracy annually.
- f The Permittee must record and report the:
- Number of minutes the pH value measured between 5.0 and 6.0 and between 9.0 and 10.0 for each day.
 - Total minutes for the month that the pH value measured between 5.0 and 6.0 and between 9.0 and 10.0 for each day.
 - Monthly instantaneous maximum and minimum pH.
- If multiple excursions occur during the day, note the duration for each excursion in the notation field in the parameter notes. Do not average pH values.
- g The Permittee may collect priority pollutant samples in conjunction with the annual monitoring required for the treated process wastewater at Monitoring Point 002.
- h The Permittee must sample pesticides and PCBs only if the Permittee uses pesticides or there is a potential for PCBs onsite.

S2.B. Sampling and Analytical Procedures

Samples and measurements taken to meet the requirements of this permit must represent the volume and nature of the monitored parameters, including representative sampling of any unusual discharge or discharge condition, including bypasses, upsets, and maintenance-related conditions affecting effluent quality.

After a portion of the 24-hour composite samples are removed for the Permittee's analysis, the remainder, 3 gallons (minimum) must be retained until 3:00 pm on the following day. The composite samples must be kept refrigerated at or below 6 degrees Celsius in the dark during collection and storage. On days when the discharge occurs over a period of time too short to collect sufficient sample for testing and retainage, hourly grab samples composited together can be used to provide sufficient volume for testing and retainage.

Sampling and analytical methods used to meet the monitoring requirements specified in this permit must conform to the latest revision of the Guidelines Establishing Test Procedures for the Analysis of Pollutants contained in 40 CFR Part 136 (or as applicable in 40 CFR subchapters N [Parts 400–471] or O [Parts 501-503]) unless otherwise specified in this permit. Ecology may only specify alternative methods for parameters without limits and for those parameters without an EPA approved test method in 40 CFR Part 136.

S2.C. Flow Measurement, Field Measurement, and Continuous Monitoring Devices

The Permittee must:

1. Select and use appropriate flow measurement, field measurement, and continuous monitoring devices and methods consistent with accepted scientific practices.
2. Install, calibrate, and maintain these devices to ensure the accuracy of the measurements is consistent with the accepted industry standard, the manufacturer's recommendation, and approved O&M manual procedures for the device and the wastestream.
3. Calibrate continuous monitoring instruments weekly unless it can demonstrate a longer period is sufficient based on monitoring records. The Permittee:
 - a. May calibrate apparatus for continuous monitoring of dissolved oxygen by air calibration.
 - b. Must calibrate continuous pH measurement instruments using a grab sample analyzed in the lab with a pH meter calibrated with standard buffers and analyzed within 15 minutes of sampling.
 - c. Must calibrate continuous chlorine measurement instruments using a grab sample analyzed in the laboratory within 15 minutes of sampling.
4. Calibrate micro-recording temperature devices, known as thermistors, using protocols from Ecology's Quality Assurance Project Plan Development Tool (*Standard Operating Procedures for Continuous Temperature Monitoring of Fresh Water Rivers and Streams Version 1.0 10/26/2011*). This document is available online at:
<https://fortress.wa.gov/ecy/publications/summarypages/1803205.html>.
Calibration as specified in this document is not required if the Permittee uses recording devices certified by the manufacturer.
5. Use field measurement devices as directed by the manufacturer and do not use reagents beyond their expiration dates.
6. Establish a calibration frequency for each device or instrument in the O&M manual that conforms to the frequency recommended by the manufacturer.
7. Calibrate flow-monitoring devices at a minimum frequency of at least one calibration per year.
8. Maintain calibration records for at least three years.

S2.D. Laboratory Accreditation

The Permittee must ensure that all monitoring data required by Ecology for permit specified parameters is prepared by a laboratory registered or accredited under the provisions of chapter 173-50 WAC, *Accreditation of Environmental Laboratories*. Flow, temperature, settleable solids, conductivity, pH, and internal process control parameters are exempt from this requirement. The Permittee must obtain accreditation for conductivity and pH if it must receive accreditation or registration for other parameters.

S2.E. Request for Reduction in Monitoring

The Permittee may request a reduction of the sampling frequency after twelve (12) months of monitoring. Ecology will review each request and at its discretion grant the request when it reissues the permit or by a permit modification.

The Permittee must:

1. Provide a written request.
2. Clearly state the parameters for which it is requesting reduced monitoring.
3. Clearly state the justification for the reduction.

S3. Reporting and Recording Requirements

The Permittee must monitor and report in accordance with the following conditions. Falsification of information submitted to Ecology is a violation of the terms and conditions of this permit.

S3.A. Discharge Monitoring Reports

The first monitoring period begins on the effective date of the permit (unless otherwise specified). The Permittee must:

1. Summarize, report, and submit monitoring data obtained during each monitoring period on the electronic discharge monitoring report (DMR) form provided by Ecology within the Water Quality Permitting Portal. Include data for each of the parameters tabulated in Special Condition S2 and as required by the form. Report a value for each day sampling occurred (unless specifically exempted in the permit) and for the summary values (when applicable) included on the electronic form.

To find out more information and to sign up for the Water Quality Permitting Portal go to: <https://ecology.wa.gov/Regulations-Permits/Guidance-technical-assistance/Water-quality-permits-guidance/WQWebPortal-guidance>.

2. Ensure that DMRs are electronically submitted no later than the dates specified below, unless otherwise specified in this permit.
3. Submit DMRs for parameters with the monitoring frequencies specified in S2 (monthly and annual) at the reporting schedule identified below. The Permittee must:

- a. Submit **monthly DMRs** by the 15th day of the following month.
 - b. Submit **quarterly DMRs**, unless otherwise specified in the permit, by the 15th day of the month following the monitoring period. Quarterly sampling periods are January through March, April through June, July through September, and October through December. The Permittee must submit the first quarterly DMR on July 15, 2021 for the quarter beginning on April 1, 2021.
 - c. Submit **annual DMRs**, including priority pollutant sample results, unless otherwise specified in the permit, by January 15 for the previous calendar year. The annual sampling period is the calendar year. The Permittee must submit the first annual DMR on January 15, 2022 for the annual sampling period March 1, 2020 through December 31, 2020.
 - d. Submit permit renewal application monitoring data in WQWebDMR as required in Special Condition S2 by September 1, 2025.
4. Enter the “No Discharge” reporting code for an entire DMR, for a specific monitoring point, or for a specific parameter as appropriate, if the Permittee did not discharge wastewater or a specific pollutant during a given monitoring period.
 5. Report single analytical values below detection as “less than the detection level (DL)” by entering < followed by the numeric value of the detection level (e.g. < 2.0) on the DMR. If the method used did not meet the minimum DL and quantitation level (QL) identified in the permit, report the actual QL and DL in the comments or in the location provided.
 6. Report single analytical values between the detection level (DL) and the quantitation level (QL) by entering the estimated value, the code for estimated value/below quantitation limit (j) and any additional information in the comments. Submit a copy of the laboratory report as an attachment using WQWebDMR.
 7. Report the test method used for analysis in the comments if the laboratory used an alternative method not specified in the permit and as allowed in **Appendix A**.
 8. Calculate average values and calculated total values (unless otherwise specified in the permit) using:
 - a. The reported numeric value for all parameters measured between the detection value and the quantitation value for the sample analysis.
 - b. One-half the detection value (for values reported below detection) if the lab detected the parameter in another sample from the same monitoring point for the reporting period.
 - c. Zero (for values reported below detection) if the lab did not detect the parameter in another sample for the reporting period.

9. Report single-sample grouped parameters (for example: priority pollutants, PAHs, pulp and paper chlorophenolics, TTOs) on the WQWebDMR form and include: sample date, concentration detected, detection limit (DL) (as necessary), and laboratory quantitation level (QL) (as necessary).

The Permittee must also submit an electronic copy of the contract laboratory report as an attachment using WQWebDMR. The contract laboratory reports must also include information on the chain of custody, quality assurance/quality control results, and documentation of accreditation for the parameter.

S3.B. Permit Submittals and Schedules

The Permittee must use the Water Quality Permitting Portal – Permit Submittals application (unless otherwise specified in the permit) to submit all other written permit-required reports by the date specified in the permit.

When another permit condition requires submittal of a paper (hard-copy) report, the Permittee must ensure that it is postmarked or received by Ecology no later than the dates specified by this permit. Send these paper reports to Ecology at:

Water Quality Permit Coordinator
Department of Ecology
Industrial Section
PO Box 47600
Olympia, WA 98504-7600

S3.C. Records Retention

The Permittee must retain records of all monitoring information for a minimum of three (3) years. Such information must include all calibration and maintenance records and all original recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit. The Permittee must extend this period of retention during the course of any unresolved litigation regarding the discharge of pollutants by the Permittee or when requested by Ecology.

S3.D. Recording of Results

For each measurement or sample taken, the Permittee must record the following information:

1. The date, exact place, method, and time of sampling or measurement.
2. The individual who performed the sampling or measurement.
3. The dates the analyses were performed.
4. The individual who performed the analyses.
5. The analytical techniques or methods used.
6. The results of all analyses.

S3.E. Additional Monitoring by the Permittee

If the Permittee monitors any pollutant more frequently than required by Special Condition S2 of this permit, then the Permittee must include the results of such monitoring in the calculation and reporting of the data submitted in the Permittee's DMR unless otherwise specified by Special Condition S2.

S3.F. Reporting Permit Violations

The Permittee must take the following actions when it violates or is unable to comply with any permit condition:

1. Immediately take action to stop, contain, and cleanup unauthorized discharges or otherwise stop the noncompliance and correct the problem.
2. If applicable, immediately repeat sampling and analysis. Submit the results of any repeat sampling to Ecology within thirty (30) days of sampling.

a. Immediate Reporting

The Permittee must immediately report to Ecology and the Department of Health, Shellfish Program (at the numbers listed below), all:

- Collection system overflows discharging to marine surface waters.
- Plant bypasses discharging to marine surface waters.

Southwest Regional Office	360-407-6300
Department of Health, Shellfish Program	360-236-3330 (business hours) 360-789-8962 (after business hours)

b. Twenty-Four-Hour Reporting

The Permittee must report the following occurrences of noncompliance by telephone, to Ecology at the telephone numbers listed above and the Ecology Industrial Section permit manager, within 24 hours from the time the Permittee becomes aware of any of the following circumstances:

1. Any noncompliance that may endanger health or the environment, unless previously reported under immediate reporting requirements.
2. Any unanticipated bypass that causes an exceedance of any effluent limit in the permit (see Special Condition S4.B., "Bypass Procedures").
3. Any upset that causes an exceedance of an effluent limit in the permit (see General Condition G.15, "Upset").
4. Any violation of a maximum daily or instantaneous maximum discharge limit for any of the pollutants in Special Conditions S1.A and S1.D of this permit.
5. Any overflow prior to the treatment works, whether or not such overflow endangers health or the environment or exceeds any effluent limit in the permit.

This requirement does not include industrial process wastewater overflows to impermeable surfaces which are collected and routed to the treatment works.

c. Report within Five Days

The Permittee must also submit a written report within five days of the time that the Permittee becomes aware of any reportable event under subparts a or b, above. The report must contain:

1. A description of the noncompliance and its cause.
2. The period of noncompliance, including exact dates and times.
3. The estimated time the Permittee expects the noncompliance to continue if not yet corrected.
4. Steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance.
5. If the noncompliance involves an overflow prior to the treatment works, an estimate of the quantity (in gallons) of untreated overflow.

d. Waiver of Written Reports

Ecology may waive the written report required in subpart c, above, on a case-by-case basis upon request if the Permittee has submitted a timely oral report.

e. All Other Permit Violation Reporting

The Permittee must report all permit violations, which do not require immediate or within 24 hours reporting, when it submits monitoring reports for S3.A ("Reporting"). The reports must contain the information listed in subpart c, above. Compliance with these requirements does not relieve the Permittee from responsibility to maintain continuous compliance with the terms and conditions of this permit or the resulting liability for failure to comply.

S3.G. Other Reporting

a. Spills of Oil or Hazardous Materials

The Permittee must report a spill of oil or hazardous materials in accordance with the requirements of RCW 90.56.280 and chapter 173-303-145. To find out more information on how to report a spill of oil or hazardous materials, go to <https://ecology.wa.gov/About-us/Get-involved/Report-an-environmental-issue/Report-a-spill>.

b. Failure to Submit Relevant or Correct Facts

Where the Permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application, or in any report to Ecology, it must submit such facts or information promptly.

S3.H. Maintaining a Copy of this Permit

The Permittee must keep a copy of this permit at the facility and make it available upon request to Ecology inspectors.

S4. Operation and Maintenance

The Permittee must, at all times, properly operate and maintain all facilities or systems of treatment and control (and related appurtenances), which are installed to achieve compliance with the terms and conditions of this permit. Proper operation and maintenance also includes keeping a daily operation logbook (paper or electronic), adequate laboratory controls, and appropriate quality assurance procedures. This provision of the permit requires the Permittee to operate backup or auxiliary facilities or similar systems only when the operation is necessary to achieve compliance with the conditions of this permit.

The Permittee must schedule any facility maintenance, which might require interruption of wastewater treatment and degrade effluent quality, during non-critical water quality periods and carry this maintenance out according to the approved operation and maintenance (O&M) manual or as otherwise approved by Ecology.

S4.A. O&M Manual

a. O&M Manual Submittal and Requirements

The Permittee must:

1. Update the O&M Manual that meets the requirements of 173-240-150 WAC and submit it to Ecology for review by September 1, 2022.
2. Review the O&M Manual at least annually.
3. Submit to Ecology for review and comment substantial changes or updates to the O&M Manual whenever it incorporates them into the manual.
4. Keep the approved O&M Manual at the permitted facility.
5. Follow the instructions and procedures of this manual.

b. O&M Manual Components

In addition to the requirements of WAC 173-240-150, the O&M Manual must be consistent with the guidance in Table G1-3 in the *Criteria for Sewage Works Design* (Orange Book) 2008. The O&M Manual must include:

1. Emergency procedures for plant shutdown and cleanup in the event of a wastewater system upset or failure.

2. A review of system components which if failed could pollute surface water or could impact human health. Provide a procedure for a routine schedule of checking the function of these components.
3. Wastewater system maintenance procedures that contribute to the generation of process wastewater.
4. Any directions to maintenance staff when cleaning, or maintaining other equipment or performing other tasks which are necessary to protect the operation of the wastewater system (for example, defining maximum allowable discharge rate for draining a tank, blocking all floor drains before beginning the overhaul of a stationary engine).
5. Wastewater sampling protocols and procedures for compliance with the sampling and reporting requirements in the wastewater discharge permit.
6. Minimum staffing adequate to operate and maintain the treatment processes and carry out compliance monitoring required by the permit.
7. Treatment plant process control monitoring schedule.

S4.B. Treatment System Operating Plan

The Permittee must summarize the following information in the initial chapter of the O&M Manual entitled the "Treatment System Operating Plan." For the purposes of this permit, a Treatment System Operating Plan (TSOP) is a concise summary of specifically defined elements of the O&M Manual.

The Permittee must submit an updated TSOP to Ecology September 1, 2025. The Permittee must update and submit this plan, as necessary, to include requirements for any major modifications of the treatment system.

The TSOP must not conflict with the O&M Manual and must include the following information:

1. A baseline operating condition, which describes the operating parameters and procedures, used to meet the effluent limits of Special Condition S1 at the production levels used in developing these limits.
2. In the event of production rates, which are below the baseline levels used to establish these limits, the plan must describe the operating procedures and conditions needed to maintain design treatment efficiency. The monitoring and reporting must be described in the plan.
3. In the event of an upset, due to plant maintenance activities, severe stormwater events, startups or shut downs, or other causes, the plan must describe the operating procedures and conditions employed to mitigate the upset. The monitoring and reporting must be described in the plan.

4. A description of any regularly scheduled maintenance or repair activities at the facility which would affect the volume or character of the wastes discharged to the wastewater treatment system and a plan for monitoring and treating/controlling the discharge of maintenance-related materials (such as cleaners, degreasers, solvents, etc.).

S4.C. Bypass Procedures

A bypass is the intentional diversion of waste streams from any portion of a treatment facility. This permit prohibits all bypasses except when the bypass is for essential maintenance, as authorized in special condition S4.B.1, or is approved by Ecology as an anticipated bypass following the procedures in S4.B.2.

1. Bypass for essential maintenance without the potential to cause violation of permit limits or conditions.

This permit allows bypasses for essential maintenance of the treatment system when necessary to ensure efficient operation of the system. The Permittee may bypass the treatment system for essential maintenance only if doing so does not cause violations of effluent limits. The Permittee is not required to notify Ecology when bypassing for essential maintenance. However the Permittee must comply with the monitoring requirements specified in special condition S2.B.

2. Anticipated bypasses for non-essential maintenance

Ecology may approve an anticipated bypass under the conditions listed below. This permit prohibits any anticipated bypass that is not approved through the following process.

- a. If a bypass is for non-essential maintenance, the Permittee must notify Ecology, if possible, at least ten (10) days before the planned date of bypass. The notice must contain:
 - A description of the bypass and the reason the bypass is necessary.
 - An analysis of all known alternatives which would eliminate, reduce, or mitigate the potential impacts from the proposed bypass.
 - A cost-effectiveness analysis of alternatives.
 - The minimum and maximum duration of bypass under each alternative.
 - A recommendation as to the preferred alternative for conducting the bypass.
 - The projected date of bypass initiation.
 - A statement of compliance with SEPA.
 - A request for modification of water quality standards as provided for in WAC 173-201A-410, if an exceedance of any water quality standard is anticipated.
 - Details of the steps taken or planned to reduce, eliminate, and prevent recurrence of the bypass.

- b. For probable construction bypasses, the Permittee must notify Ecology of the need to bypass as early in the planning process as possible. The Permittee must consider the analysis required above during the project planning and design process. The project-specific engineering report as well as the plans and specifications must include details of probable construction bypasses to the extent practical. In cases where the Permittee determines the probable need to bypass early, the Permittee must continue to analyze conditions up to and including the construction period in an effort to minimize or eliminate the bypass.
- c. Ecology will determine if the Permittee has met the conditions of Special Condition S4.B.2 a and b and consider the following prior to issuing a determination letter, an administrative order, or a permit modification as appropriate for an anticipated bypass:
 - If the Permittee planned and scheduled the bypass to minimize adverse effects on the public and the environment.
 - If the bypass is unavoidable to prevent loss of life, personal injury, or severe property damage. “Severe property damage” means substantial physical damage to property, damage to the treatment facilities which would cause them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.
 - If feasible alternatives to the bypass exist, such as:
 - The use of auxiliary treatment facilities.
 - Retention of untreated wastes.
 - Stopping production.
 - Maintenance during normal periods of equipment downtime, but not if the Permittee should have installed adequate backup equipment in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventative maintenance.
 - Transport of untreated wastes to another treatment facility.

S5. Solid Wastes

S5.A. Solid Waste Handling

The Permittee must handle and dispose of all solid waste material in such a manner as to prevent its entry into state ground or surface water.

S5.B. Leachate

The Permittee must not allow leachate from its solid waste material to enter state waters without providing all known, available, and reasonable methods of treatment, nor allow such leachate to cause violations of the State Surface Water Quality Standards, Chapter 173-201A WAC, or the State Ground Water Quality Standards, Chapter 173-200 WAC.

The Permittee must apply for a permit or permit modification as may be required for such discharges to state ground or surface waters.

S6. Application for Permit Renewal or Modification for Facility Changes

The Permittee must submit an application for renewal of this permit by September 1, 2025.

The Permittee must also submit a new application or addendum at least one hundred eighty (180) days prior to commencement of discharges, resulting from the activities listed below, which may result in permit violations. These activities include any facility expansions, production increases, or other planned changes, such as process modifications, in the permitted facility.

S7. Facility Loading Design Criteria

The flows or waste loads for the permitted facility must not exceed the following design criteria as measured at the influent to the biological wastewater treatment unit:

Design Criteria	Design Quantity
Peak Instantaneous Flow	400 gallons per minute
Maximum Daily Biochemical Oxygen Demand (5-day) Influent Loading	5,006 pounds per day

S8. Non-Routine and Unanticipated Discharges

1. Beginning on the effective date of this permit, the Permittee is authorized to discharge non-routine wastewater or unanticipated wastewater and therefore not listed on the permit application, on a case-by-case basis if approved by Ecology. Prior to any such discharge, the Permittee must contact Ecology and at a minimum provide the following information:
 - a. The proposed discharge location.
 - b. The nature of the activity that will generate the discharge.
 - c. Any alternatives to the discharge, such as reuse, storage, or recycling of the water.
 - d. The total volume of water it expects to discharge.
 - e. The results of the chemical analysis of the water.
 - f. The date of proposed discharge.
 - g. The expected rate of discharge, in gallons per minute.
2. The Permittee must analyze the water for all constituents limited for the discharge and report them as required by subpart 1.e above. The Permittee must also analyze for: total metals (antimony, arsenic, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, thallium, and zinc) and total residual chlorine. The analysis must also include any parameter deemed necessary by Ecology.

All discharges must comply with the effluent limits as established in Special Condition S1 of this permit, water quality standards, and any other limits imposed by Ecology.

3. The Permittee must limit the discharge rate, as referenced in subpart 1.g above, so it will not cause erosion of ditches or structural damage to culverts and their entrances or exits.
4. The discharge cannot proceed until Ecology has reviewed the information provided and has authorized the discharge by letter to the Permittee or by an Administrative Order. Once approved and if the proposed discharge is to a municipal storm drain, the Permittee must obtain prior approval from the municipality and notify it when it plans to discharge.

S9. Outfall Evaluation

The Permittee must inspect, within the second year of the permit, the submerged portion of the outfall line and diffuser to document its integrity and continued function. If conditions allow for a photographic verification, the Permittee must include such verification in the report. The Permittee must submit the inspection report to Ecology through the Water Quality Permitting Portal – Permit Submittals application by March 1, 2023. The Permittee must submit hard-copies of any video files to Ecology as required by Permit Condition S3.B. The Portal does not support submittal of video files.

The inspector must at minimum:

- Assess the physical condition of the outfall pipe, diffuser, and associated couplings.
- Determine the extent of sediment accumulation in the vicinity of the diffuser.
- Determine if diffuser ports are free of obstructions and are allowing uniform flow.
- Determine the number of diffuser ports that are working free of obstructions.
- Confirm physical location (latitude/longitude) and depths (at the seven-day-average low river flow with a recurrence interval of ten years – 7Q10) of the diffuser section of the outfall.
- Assess physical condition of the submarine line.
- Assess physical condition of anchors and structures used to secure the submarine line.

S10. Effluent Mixing Study

S10.A. General Requirements

The Permittee must:

1. Submit a draft Effluent Mixing Study Plan to Ecology for review and comment by March 1, 2022, prior to initiation of the effluent mixing study.
2. Follow the Guidance for Conducting Mixing Zone Analyses (Appendix C of Ecology's *Permit Writer's manual*, 2018) and the protocols identified in Special Condition S10.C.

3. Include the results of the effluent mixing study in the Effluent Mixing Study Report and submit it to Ecology by September 1, 2025.
4. If the results of the mixing study, toxicity tests, and chemical analysis indicate that the concentration of any pollutant(s) exceeds or has a reasonable potential to exceed the state water quality standards, chapter 173-201A WAC, Ecology may issue an administrative order to require a reduction of pollutants or modify this permit to impose effluent limits to meet the water quality standards.

S10.B. Reporting Requirements

The effluent mixing study must include:

1. A statement confirming that all known, available, and reasonable methods of prevention, control, and treatment (AKART) has been applied to the discharge.
2. A description of the size of the mixing zone allowed under chapter 173-201A WAC.
3. An analysis showing how mixing zones have been minimized using the lowest dilution from hydraulic limitations, width limitations, distance limitations and those predicted by the model.
4. A clear description of the critical conditions used to determine dilution factors:
 - a. For ambient freshwater (unidirectional flow) use 7Q10 flows for acute, chronic and non-carcinogenic pollutants, and harmonic flow for carcinogens.
 - b. For ambient marine waters (and reversing flows e.g., tidally-influenced rivers) use 10th or 90th percentile current velocity for acute and 50th percentile tidal current velocity for chronic, carcinogens and non-carcinogens.
 - c. Generally, use depth of outfall at 7Q10 flows (rivers) or at MLLW (marine environment).

For assessing human health in freshwater, depths of outfall should be established at the applicable flow (e.g. harmonic mean flow or 30Q5 flows). For tidally influenced rivers a combination of MLLW and critical river flows should be used to establish depth of outfall.

- d. Use a density profile that gives the lowest dilution. Evaluate both maximum and minimum stratification. For human health, use average density profiles to estimate dilution.
- e. For unidirectional flow use centerline dilution factor for acute and chronic conditions and flux average for human health dilution factors. For marine environment or rivers with reversing flows, use flux-average dilution factors for all conditions.

5. Diffuser information:
 - a. Location, orientation, description and dimension of diffusers and ports.
 - b. Depth of the diffuser/ports below water surface based on either 7Q10 flow (for rivers) or MLLW (for marine or tidally-influenced river reaches).
 - c. Plan view maps showing the mixing zone size and dimensions in relation to the diffuser.
 - d. Schematic of waterbody cross-section, showing channel width, depth, and diffuser location in relation to shoreline and bottom.
 - e. Report on the integrity of the diffuser and the ports being modeled.
 - f. Results of the Outfall Inspection from Special Condition S9.
6. Discharge characteristics:
 - a. Existing and projected maximum daily, maximum monthly average, and annual average flows.
 - b. Discharge density (temperature and salinity).
7. Ambient water characteristics:
 - a. Critical stream flow statistics (7Q10, 30Q5, harmonic flow) or marine current velocities (10th, 90th and 50th percentiles over a neap and spring tide and directions).
 - b. Velocity profile in the vicinity of the diffuser.
 - c. Temporal density (temperature and salinity) profiles near the diffuser. May need to consider both seasonal and tidal variability.
 - d. Manning's roughness coefficient, if used.
 - e. Available information regarding background concentrations of chemical substances in the receiving water for which there are criteria in chapter 173-201A WAC.
8. Model selection and results:
 - a. Model selection and application discussion. Consider model applicability to single or multiport diffuser, opposing port configuration, submerged, surface or above-surface discharge, buoyant or non-buoyant discharge, and potential plume attachment to boundaries.
 - b. Description of mixing and plume dynamics (nearfield, farfield, tidal buildup/reflux).
 - c. Sensitivity analysis.
 - d. Calibration to empirical data (tracer studies), if applicable.
 - e. Provide model output and summary table of results.

S10.C. Protocols

The Permittee must determine dilution ratios using protocols outlined in the following references, approved modifications thereof, or by another method approved by Ecology:

1. Doneker, R.L. and G.H. Jirka, *CORMIX User Manual: A Hydrodynamic Mixing Zone Model and Decision Support System for Pollutant Discharges into Surface Waters*, EPA-823-K-07-001, Dec. 2007.
<http://www.mixzon.com/downloads/>.

A complete list of general references for CORMIX is at:
<http://www.cormix.info/references.php>.

2. Frick, W.E., Roberts, P.J.W., Davis, L.R., Keyes, D.J., Baumgartner, George, K.P. 2003. *Dilution Models for Effluent Discharges, 4th Edition (Visual Plumes)*. Ecosystems Research Div., USEPA, Athens, GA, USA.
3. Ecology, Water Quality Program, *Permit Writer's Manual*. 2018. Washington State Department of Ecology. Publication No. 92-109, Revised January 2015.
<https://fortress.wa.gov/ecy/publications/documents/92109.pdf>.
4. Ecology, Guidance for conducting mixing zone analysis (Appendix C, Water Quality Program *Permit Writer's Manual*. 2018).
<https://fortress.wa.gov/ecy/publications/parts/92109part1.pdf>.
5. Kilpatrick, F.A., and E.D. Cobb, *Measurement of Discharge Using Tracers, Chapter A16, Techniques of Water-Resources Investigations of the USGS*, Book 3, Application of Hydraulics, USGS, U.S. Department of the Interior, Reston, VA, 1985.
6. Wilson, J.F., E.D. Cobb, and F.A. Kilpatrick, *Fluorometric Procedures for Dye Tracing, Chapter A12. Techniques of Water-Resources Investigations of the USGS*, Book 3, Application of Hydraulics, USGS, U.S. Department of the Interior, Reston, VA, 1986.

S11. Pollution Prevention

Pollution prevention planning and activities at the facility include the:

- New pollution prevention projects identified for the upcoming permit cycle in the plan update.
- Standard Operating Procedures (SOPs), Best Management Practices (BMPs), and work practices developed and updated from previous permit pollution plans, stormwater pollution prevention plans (SWPPPs), solid waste control plans, and spill plans.

The Permittee must continue to ensure proper operation and maintenance of the facility process units and wastewater treatment system by following existing SOPs, BMPs, and work practices. The Permittee must continue to maintain these procedures and other measures and/or facilities currently employed at the facility to prevent or minimize the

potential for release of pollutants to the wastewater treatment system, stormwater, and/or waters of the state unless modified by the pollution prevention plan updated required below.

Stormwater

Stormwater BMPs must:

- Provide all known, available, and reasonable methods of prevention, control, and treatment (AKART) of stormwater pollution from industrial and construction activities at the site.
- Ensure the discharges do not cause or contribute to a violation of the Water Quality Standards.
- Comply with applicable federal technology-based treatment requirements under 40 CFR 125.3.
- Be consistent with the Stormwater Management Manual for Western Washington (2019 edition) or provide an equivalent level of pollution prevention approved by Ecology.

Storage Tank Wastewater

The Permittee must remove wastewater from oil, product, and intermediate distillate storage tanks in a manner and with facilities as required to prevent the wastewater from draining or spilling onto the ground.

S11.A. NPDES Pollution Prevention Plan Update and Implementation

The Permittee must update its NPDES Pollution Prevention Plan and submit it to Ecology for review and approval by September 1, 2022. The Permittee must implement the approved pollution prevention plan update and any approved modifications to the plan and abide by the timeframes identified throughout the term of the permit.

The objective of this update is to identify any new sources of pollutants, to reevaluate previously identified pollution prevention opportunities, and to identify any new opportunities and implement those that are technically and economically achievable.

The update must also include an evaluation of the existing SOPs, BMPs, and work practices developed under previous pollution prevention planning/activities. The update must also evaluate pollution prevention opportunities for reducing or eliminating arsenic in the discharge at Monitoring Point 002.

S11.B. Specific Plan Update Requirements

The Permittee must update the following plan elements as necessary to address changes: the policy statement and signature, employee involvement, training and awareness, descriptions of current pollution prevention activities, and the description of potential pollutants and sources. **Appendix B** includes references to guidance documents, specific items to be included in the plan, and procedures for identifying, evaluating, and prioritizing pollution prevention opportunities. Other information available to the Permittee may also be used in preparing the plan.

The updated plan must include a schedule for implementation of each newly selected opportunity. If a detailed analysis of technical and economic feasibility for any pollution prevention opportunity will extend beyond the deadline for submitting the updated plan, the Permittee must include a schedule for completing the analysis in the plan submittal. The timeframe for implementing any opportunities scheduled for further evaluation and then selected must be provided in the biennial report.

The Permittee must modify the plan if the Permittee or Ecology determine during inspections or investigations, that existing BMPs are, or would be, ineffective in eliminating or significantly minimizing pollutants in stormwater discharges from the site. The Permittee must modify the plan as necessary to include additional or modified BMPs designed to correct problems identified.

The Permittee must modify the plan whenever there is a change in design, construction, operation, or maintenance at the facility that significantly changes the nature of pollutants in wastewater or stormwater from the facility; significantly increases the quantity of pollutants discharged; or causes the pollution prevention plan, existing SOPs, BMPs, or work practices to be less effective in controlling pollutants. The Permittee must provide for implementation of any modifications to the pollution prevention plan in a timely manner.

The Permittee must include the following information in the updated plan:

- A discussion of the dry wells in the employee parking lot and finished product storage lot including:
 - The locations of the dry wells, associated piping, and associated catch basins,
 - Drawings showing the typical dry well designs at the facility,
 - The potential pollutant sources to the stormwater, and
 - How the dry wells protect groundwater;
- How the Permittee operates the dry wells to maintain their functionality; and
- How the Permittee eliminates, reduces, and manages spills in the employee parking lot and finished product storage lot to prevent contaminated stormwater from being discharged to the dry wells.

S11.C. Stormwater Inspections

The Permittee must conduct two stormwater inspections per year; one during the wet season (October 1st through April 30th) and the other during the dry season (May 1st through September 30th).

The Permittee must conduct the wet season inspection during a rainfall event and must include observations of the presence of any floating materials, suspended solids, oil and grease, discolorations, turbidity, odor, etc. in stormwater runoff throughout the facility that could contribute to a discharge off-site.

The Permittee must conduct the dry season inspection at least ten days after a rainfall event and must determine the presence of unpermitted non-stormwater discharges such as sanitary wastewater, non-contact cooling water, process wastewater, and drainage from raw material/product/waste storage to the stormwater drainage system. If an unpermitted, non-stormwater discharge is discovered, the Permittee must immediately notify Ecology.

Inspections must be conducted by personnel who are knowledgeable and trained in the application of BMPs and pollution prevention activities at the facility. Results from the stormwater visual inspections must be reported in the pollution prevention plan biennial update reports.

S11.D. Biennial Reporting

The Permittee must periodically evaluate and modify, as necessary, the pollution prevention plan and existing SOPs, BMPs, and work practices to ensure that it has been updated or otherwise modified to reflect current conditions, that measures to reduce or eliminate pollutant loadings selected in the plan are adequate and are being properly implemented in accordance with the terms of the permit, and whether any additional controls are needed.

The Permittee must submit a pollution prevention plan biennial progress report by September 1, 2024 and every two years thereafter. The report must identify the implementation status of each pollution prevention opportunity selected, and any modification or updates to the plan. The report must also include a summary of the results of stormwater inspections.

S11.E. Continuous Improvement

In maintaining, implementing, and updating the pollution prevention plan, the Permittee should employ continuous improvement principles, including the systematic and ongoing identification, evaluation, and implementation of pollution prevention opportunities in all decisions having environmental consequences.

S12. Cooling Water Intake Structure (CWIS)

S12.A. Operations and Maintenance

The Permittee must, at all time, properly operate and maintain the CWIS including any existing technologies used to minimize impingement and entrainment.

The Permittee must report any significant impingement or entrainment events to Ecology within 24 hours consistent with the requirements in Special Condition S3.F.

S12.B. Information and Compliance Report

The Permittee must prepare an information and compliance report for the CWIS and submit it to Ecology for review and approval by September 1, 2025.

The information and compliance report must address the submittal requirements of 40 CFR 122.21(r)(2) and (3) and applicable provisions of paragraphs (4), (5), (6), (7), and (8).

S12.C. Endangered Species Act

Nothing in this permit authorizes take for the purposes of a facility’s compliance with the Endangered Species Act.

S13. Acute Toxicity

S13.A. Effluent Testing

The Permittee must:

1. Conduct acute toxicity testing on the final effluent Outfall 001 twice; once in the first summer and once in the first winter after the permit effective date.
2. Submit a written report to Ecology within 45 days of sampling. The Permittee must submit the first report by November 30, 2021 and the second report by May 31, 2022. Further instructions on testing conditions and test report content are in Special Condition S13.G.
3. Use a dilution series consisting of a minimum of five concentrations and a control. The five concentrations should include the acute critical effluent concentration (ACEC) of 12.0% effluent.
4. Conduct the following two acute toxicity tests on each sample:

Acute Toxicity Tests	Species	Method
Fathead minnow 96-hour static-renewal test	<i>Pimephales promelas</i>	EPA-821-R-02-012
Daphnid 48-hour static test	<i>Ceriodaphnia dubia</i> , <i>Daphnia pulex</i> , or <i>Daphnia magna</i>	EPA-821-R-02-012

5. The effluent limit for acute toxicity listed in Special Condition S13.B applies if the effluent testing required in S13.A.1. shows:
 - The median survival of any species in 100% effluent is below 80%.
 - Any one test of any species exhibits less than 65% survival in 100% effluent.

If the limit applies, then the Permittee must follow the instructions in Special Conditions S13.B, S13.C, S13.D, S13.E, S13.F, and S13.G. If the limit does not apply, then the Permittee must follow the instructions in Special Conditions S13.F and S13.G.

S13.B. Effluent Limit for Acute Toxicity

The effluent limit for acute toxicity is:

No acute toxicity detected in a test concentration representing the ACEC.

The ACEC means the maximum concentration of effluent during critical conditions at the boundary of the acute mixing zone, defined in Special Condition S1.C of this permit. The ACEC equals 12.0% effluent.

S13.C. Compliance with the Effluent Limit for Acute Toxicity

Compliance with the effluent limit for acute toxicity means the results of the testing specified in Special Condition S13.D show no statistically significant difference in survival between the control and the ACEC.

If the test results show a statistically significant difference in survival between the control and the ACEC, and Ecology has not determined the test result to be anomalous under Special Condition S13.E, and the test is otherwise valid, the result is a violation of the effluent limit for acute toxicity. The Permittee must immediately conduct the additional testing described in Special Condition S13.E.

The Permittee must determine the statistical significance by conducting a hypothesis test at the 0.05 level of significance (Appendix H, EPA/600/4-89/001). If the difference in survival between the control and the ACEC is less than 10%, the Permittee must conduct the hypothesis test at the 0.01 level of significance.

S13.D. Compliance Testing for Acute Toxicity

The Permittee must:

1. Perform the acute toxicity tests with 100% effluent, the ACEC, and a control, or with a full dilution series.
2. Conduct quarterly acute toxicity testing on the final effluent if testing determines that the effluent limit for acute toxicity applies. Testing must begin in the second quarter of 2022.

Quarters means January through March, April through June, July through September, and October through December.

3. Submit a quarterly written report to Ecology within 45 days of sampling and starting no later than August 15, 2022. Each subsequent report is due on April 30th, July 30th, October 30th, and January 30th of each year. Further instructions on testing conditions and test report content are in Special Condition S13.G.
4. The Permittee must perform compliance tests using each of the species and protocols listed below on a rotating basis:

Acute Toxicity Tests	Species	Method
Fathead minnow 96-hour static-renewal test	<i>Pimephales promelas</i>	EPA-821-R-02-012
Daphnid 48-hour static test	<i>Ceriodaphnia dubia</i> , <i>Daphnia pulex</i> , or <i>Daphnia magna</i>	EPA-821-R-02-012

S13.E. Response to Noncompliance with the Effluent Limit for Acute Toxicity

If a toxicity test conducted under Special Condition S13.D determines a statistically significant difference in response between the ACEC and the control, using the statistical test described in Special Condition S13.C, the Permittee must begin additional testing within one week from the time of receiving the test results. The Permittee must:

1. Conduct one additional test each week for four consecutive weeks, using the same test and species as the failed compliance test.
2. Test at least five effluent concentrations and a control to determine appropriate point estimates. One of these effluent concentrations must equal the ACEC. The results of the test at the ACEC will determine compliance with the effluent limit for acute toxicity as described in Special Condition S13.B.
3. Return to the original monitoring frequency in Special Condition S13.D after completion of the additional compliance monitoring.

Anomalous test results: If a toxicity test conducted under Special Condition S13.D indicates noncompliance with the acute toxicity limit and the Permittee believes that the test result is anomalous, the Permittee may notify Ecology that the compliance test result may be anomalous. The Permittee may take one additional sample for toxicity testing and wait for notification from Ecology before completing the additional testing. The Permittee must submit the notification with the report of the compliance test result and identify the reason for considering the compliance test result to be anomalous.

If Ecology determines that the test result was not anomalous, the Permittee must complete all of the additional monitoring required in this section. Or,

If the one additional sample fails to comply with the effluent limit for acute toxicity, then the Permittee must complete all of the additional monitoring required in this section. Or,

If Ecology determines that the test result was anomalous, the one additional test result will replace the anomalous test result for the purpose of determining compliance with the acute toxicity limit.

If all of the additional testing in Special Condition S13.E.1 complies with the permit limit, the Permittee must submit a report to Ecology on possible causes and preventive measures for the transient toxicity event, which triggered the additional compliance monitoring. This report must include a search of all pertinent and recent facility records, including:

- Operating records
- Monitoring results
- Inspection records
- Spill reports
- Weather records
- Production records

- Raw material purchases
- Pretreatment records, etc.

If the additional testing in this section shows another violation of the acute toxicity limit, the Permittee must submit a Toxicity Identification/Reduction Evaluation (TI/RE) plan to Ecology within sixty (60) days after the sample date (WAC 173-205-100(2)).

S13.F. Testing When There is no Permit Limit for Acute Toxicity

The Permittee must:

1. Conduct acute toxicity testing on final effluent at Outfall 001 once in the last summer and once in the last winter prior to submission of the application for permit renewal.
2. Conduct acute toxicity testing on a series of at least five concentrations of effluent, including 100% effluent and a control. The five concentrations should include a new acute critical effluent concentration (ACEC) which will be determined from the approved mixing study in Special Condition S10.
3. Use each of the following species and protocols for each acute toxicity test:

Acute Toxicity Tests	Species	Method
Fathead minnow 96-hour static-renewal test	<i>Pimephales promelas</i>	EPA-821-R-02-012
Daphnid 48-hour static test	<i>Ceriodaphnia dubia</i> , <i>Daphnia pulex</i> , or <i>Daphnia magna</i>	EPA-821-R-02-012

4. Submit the results to Ecology by September 1, 2025. Further instructions on testing conditions and test report content are in Special Condition S13.G.

S13.G. Sampling and Reporting Requirements

1. The Permittee must submit all reports for toxicity testing in accordance with the most recent version of Ecology Publication No. WQ-R-95-80, *Laboratory Guidance and Whole Effluent Toxicity Test Review Criteria*. Reports must contain toxicity data, bench sheets, and reference toxicant results for test methods. In addition, the Permittee must submit toxicity test data in electronic format (CETIS export file preferred) for entry into Ecology’s database.
2. The Permittee must collect grab samples for toxicity testing. The Permittee must cool the samples to 0 - 6 degrees Celsius during collection and send them to the lab immediately upon completion. The laboratory must begin the toxicity testing as soon as possible but no later than 36 hours after sampling was completed.

3. The laboratory must conduct water quality measurements on all samples and test solutions for toxicity testing, as specified in the most recent version of Ecology Publication No. WQ-R-95-80, *Laboratory Guidance and Whole Effluent Toxicity Test Review Criteria*.
4. All toxicity tests must meet quality assurance criteria and test conditions specified in the most recent versions of the EPA methods listed in Special Condition S13.C and the Ecology Publication No. WQ-R-95-80, *Laboratory Guidance and Whole Effluent Toxicity Test Review Criteria*. If Ecology determines any test results to be invalid or anomalous, the Permittee must repeat the testing with freshly collected effluent.
5. The laboratory must use control water and dilution water meeting the requirements of the EPA methods listed in Special Condition S13.A or pristine natural water of sufficient quality for good control performance.
6. The Permittee must conduct whole effluent toxicity tests on an unmodified sample of final effluent.
7. The Permittee may choose to conduct a full dilution series test during compliance testing in order to determine dose response. In this case, the series must have a minimum of five effluent concentrations and a control. The series of concentrations must include the acute critical effluent concentration (ACEC). The ACEC equals 12.0% effluent, except as described in Special Condition S13.F.2.
8. All whole effluent toxicity tests, effluent screening tests, and rapid screening tests that involve hypothesis testing must comply with the acute statistical power standard of 29% as defined in WAC 173-205-020. If the test does not meet the power standard, the Permittee must repeat the test on a fresh sample with an increased number of replicates to increase the power.

S14. Chronic Toxicity

S14.A. Effluent Testing

The Permittee must:

1. Conduct chronic toxicity testing on the final effluent at Outfall 001 twice; once in the first summer and once in the first winter after the permit effective date.
2. Submit a written report to Ecology within 45 days of sampling. The Permittee must submit the first report by November 30, 2021 and the second report by May 31, 2022. Further instructions on testing conditions and test report content are in Special Condition S14.G.
3. Conduct chronic toxicity testing during effluent testing on a series of at least five concentrations of effluent and a control. This series of dilutions must include the acute critical effluent concentration (ACEC). The ACEC equals 12.0% effluent. The series of dilutions should also contain the chronic critical effluent concentration (CCEC) of 4.7% effluent.

4. Conduct the following two chronic toxicity tests on each sample:

Freshwater Chronic Test	Species	Method
Fathead minnow survival and growth	<i>Pimephales promelas</i>	EPA-821-R-02-013
Water flea survival and reproduction	<i>Ceriodaphnia dubia</i>	EPA-821-R-02-013

5. The effluent limit for chronic toxicity listed in Special Condition S14.B below applies if any test in the effluent testing required in S14.A.1 shows a significant difference between the control and the ACEC at the 0.05 level of significance using hypothesis testing (Appendix H, EPA/600/4-89/001).

If the limit applies, then the Permittee must follow the instructions in Special Conditions S14.B, S14.C, S14.D, S14.E, S14.F, and S14.G. If the limit does not apply, then the Permittee must follow the instructions in Special Conditions S14.F and S14.G.

S14.B. Effluent Limit for Chronic Toxicity

The effluent limit for chronic toxicity is:

No toxicity detected in a test concentration representing the CCEC.

The CCEC means the maximum concentration of effluent during critical conditions at the boundary of the mixing zone, defined in Special Condition S1.C of this permit. The CCEC equals 4.7% effluent.

S14.C. Compliance with the Effluent Limit for Chronic Toxicity

Compliance with the effluent limit for chronic toxicity means the results of the testing specified in Special Condition S14.D show no statistically significant difference in response between the control and the CCEC.

If the test results show a statistically significant difference in survival between the control and the CCEC, and Ecology has not determined the test result to be anomalous under Special Condition S14.E, and the test is otherwise valid, the result is a violation of the effluent limit for chronic toxicity. The Permittee must immediately conduct the additional testing described in Special Condition S14.E.

The Permittee must determine the statistical significance by conducting a hypothesis test at the 0.05 level of significance (Appendix H, EPA/600/4-89/001). If the difference in response between the control and the CCEC is less than 20%, the Permittee must conduct the hypothesis test at the 0.01 level of significance.

Ecology will reevaluate the need for the chronic toxicity limit in future permits. Therefore, the Permittee must also conduct this same hypothesis test (Appendix H, EPA/600/4-89/001) to determine whether a statistically significant difference in response exists between the acute critical effluent concentration (ACEC) and the control.

S14.D. Compliance Testing for Chronic Toxicity

The Permittee must:

1. Perform the chronic toxicity tests using the CCEC, the ACEC, and a control, or with a full dilution series.
2. Conduct quarterly chronic toxicity testing on the final effluent if testing determines that the effluent limit for chronic toxicity applies. Testing must begin in the second quarter of 2022. Quarters means January through March, April through June, July through September, and October through December.
3. Submit a quarterly written report to Ecology within 45 days of sampling and starting no later than August 15, 2022. Each subsequent report is due on April 30th, July 30th, October 30th, and January 30th of each year. Further instructions on testing conditions and test report content are in Special Condition S14.G.
4. Perform compliance tests using the following species on a rotating basis and the most recent version of the following protocols:

Freshwater Chronic Test	Species	Method
Fathead minnow survival and growth	<i>Pimephales promelas</i>	EPA-821-R-02-013
Water flea survival and reproduction	<i>Ceriodaphnia dubia</i>	EPA-821-R-02-013

S14.E. Response to Noncompliance with the Effluent Limit for Chronic Toxicity

If a toxicity test conducted under Special Condition S14.D determines a statistically significant difference in response between the CCEC and the control using the statistical test described in Special Condition S14.C, the Permittee must begin additional testing within one week from the time of receiving the test results. The Permittee must:

1. Conduct additional testing each month for three consecutive months using the same test and species as the failed compliance test.
2. Use a series of at least five effluent concentrations and a control to determine appropriate point estimates. One of these effluent concentrations must equal the CCEC. The results of the test at the CCEC will determine compliance with the effluent limit for chronic toxicity as described in Special Condition S14.B.
3. Return to the original monitoring frequency in Special Condition S14.D after completion of the additional compliance monitoring.

Anomalous test results: If a toxicity test conducted under Special Condition S14.D indicates noncompliance with the chronic toxicity limit and the Permittee believes that the test result is anomalous, the Permittee may notify Ecology that the compliance test result may be anomalous. The Permittee may take one additional sample for toxicity testing and wait for notification from Ecology before completing the additional testing. The Permittee must submit the notification with the report of the compliance test result and identify the reason for considering the compliance test result to be anomalous.

If Ecology determines that the test result was not anomalous, the Permittee must complete all of the additional monitoring required in this section. Or,

If the one additional sample fails to comply with the effluent limit for chronic toxicity, then the Permittee must complete all of the additional monitoring required in this section. Or,

If Ecology determines that the test result was anomalous, the one additional test result will replace the anomalous test result for the purpose of determining compliance with the chronic toxicity limit.

If all of the additional testing required in Special Condition S14.E.1 complies with the permit limit, the Permittee must submit a report to Ecology on possible causes and preventive measures for the transient toxicity event, which triggered the additional compliance monitoring. This report must include a search of all pertinent and recent facility records, including:

- Operating records
- Monitoring results
- Inspection records
- Spill reports
- Weather records
- Production records
- Raw material purchases
- Pretreatment records, etc.

If the additional testing required by this section shows another violation of the chronic toxicity limit, the Permittee must submit a Toxicity Identification/Reduction Evaluation (TI/RE) plan to Ecology within 60 days after the sample date (WAC 173-205-100(2)).

S14.F. Testing When There is no Permit Limit for Chronic Toxicity

The Permittee must:

1. Conduct chronic toxicity testing on final effluent at Outfall 001 once in the last winter and once in the last summer prior to submission of the application for permit renewal.
2. Conduct chronic toxicity testing on a series of at least five concentrations of effluent and a control. This series of dilutions must include a new ACEC which will be determined from the approved mixing study in Special Condition S10. The series of dilutions should also contain a new CCEC which will be determined from the approved mixing study in Special Condition S10.
3. Compare the new ACEC to the control using hypothesis testing at the 0.05 level of significance as described in Appendix H, EPA/600/4-89/001.
4. Submit the results to Ecology by September 1, 2025. Further instructions on testing conditions and test report content are in Special Condition S14.G.
5. Perform chronic toxicity tests with all of the following species and the most recent version of the following protocols:

Freshwater Chronic Test	Species	Method
Fathead minnow survival and growth	<i>Pimephales promelas</i>	EPA-821-R-02-013
Water flea survival and reproduction	<i>Ceriodaphnia dubia</i>	EPA-821-R-02-013

S14.G. Sampling and Reporting Requirements

1. The Permittee must submit all reports for toxicity testing in accordance with the most recent version of Ecology Publication No. WQ-R-95-80, *Laboratory Guidance and Whole Effluent Toxicity Test Review Criteria*. Reports must contain toxicity data, bench sheets, and reference toxicant results for test methods. In addition, the Permittee must submit toxicity test data in electronic format (CETIS export file preferred) for entry into Ecology’s database.
2. The Permittee must collect grab samples for toxicity testing. The Permittee must cool the samples to 0 - 6 degrees Celsius during collection and send them to the lab immediately upon completion. The laboratory must begin the toxicity testing as soon as possible but no later than 36 hours after sampling was completed.
3. The laboratory must conduct water quality measurements on all samples and test solutions for toxicity testing, as specified in the most recent version of Ecology Publication No. WQ-R-95-80, *Laboratory Guidance and Whole Effluent Toxicity Test Review Criteria*.
4. All toxicity tests must meet quality assurance criteria and test conditions specified in the most recent versions of the EPA methods listed in Special Condition S14.C and the Ecology Publication no. WQ-R-95-80, *Laboratory Guidance and Whole Effluent Toxicity Test Review Criteria*.

If Ecology determines any test results to be invalid or anomalous, the Permittee must repeat the testing with freshly collected effluent.

5. The laboratory must use control water and dilution water meeting the requirements of the EPA methods listed in Special Condition S14.A. or pristine natural water of sufficient quality for good control performance.
6. The Permittee must conduct whole effluent toxicity tests on an unmodified sample of final effluent.
7. The Permittee may choose to conduct a full dilution series test during compliance testing in order to determine dose response. In this case, the series must have a minimum of five effluent concentrations and a control. The series of concentrations must include the CCEC and the ACEC. The CCEC and the ACEC may either substitute for the effluent concentrations that are closest to them in the dilution series or be extra effluent concentrations. The CCEC equals 4.7% effluent, except as described in Special Condition S14.F.2. The ACEC equals 12.0% effluent, except as described in Special Condition S14.F.2.

8. All whole effluent toxicity tests that involve hypothesis testing must comply with the chronic statistical power standard of 39% as defined in WAC 173-205-020. If the test does not meet the power standard, the Permittee must repeat the test on a fresh sample with an increased number of replicates to increase the power.

S15. Receiving Water Study

The Permittee must collect receiving water information necessary to determine if the effluent has a reasonable potential to cause a violation of the water quality standards. If reasonable potential exists, Ecology will use the study information to calculate effluent limits.

The Permittee must:

1. Submit a sampling and quality assurance plan for Ecology review and approval by December 1, 2022. Prepare all quality assurance plans in accordance with the guidelines given in *Guidelines for Preparing Quality Assurance Project Plans for Environmental Studies, Ecology Publication 04-03-030*. This document is available at: <https://fortress.wa.gov/ecy/publications/documents/0403030.pdf>.
2. Conduct all sampling and analysis in accordance with the approved quality assurance project plan.
 - a. Locate the receiving water sampling locations outside the zone of influence of the effluent.
 - b. Use sampling station accuracy requirements of ± 20 meters.
 - c. Time the sampling as close as possible to the critical period.
 - d. Follow the clean sampling techniques (Method 1669: *Sampling Ambient Water for Trace Metals at EPA Water Quality Criteria Levels*, EPA Publication No. 821-R-95-034, April 1995).
 - e. Collect at least ten receiving water samples from the Columbia River and analyze the samples for ammonia, pH, temperature, turbidity, and for both the total and dissolved fractions of the 13 priority pollutant metals (antimony, arsenic, beryllium, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, thallium, and zinc).
 - f. Conduct all chemical analysis using the methods and the detection levels identified in **Appendix A**.
3. Submit sediment, chemical, and biological data to Ecology's Environmental Information Management System (EIM) (linked below). Data must be submitted to EIM according to the instructions on the EIM website. The data submittal portion of EIM website (linked below) provides information and help on formats and requirements for submitting tabular data. Specific questions about data submittal may be directed to the EIM Data Coordinator.
 - Environmental Information Management System (EIM)
<https://fortress.wa.gov/ecy/eimreporting/default.aspx>

- Data submittal portion of EIM website <https://ecology.wa.gov/Research-Data/Data-resources/Environmental-Information-Management-database/EIM-submit-data>
4. Submit the final report, summarizing the results of the study to Ecology by September 1, 2025. The final report must document when the data was successfully loaded into EIM.

Any subsequent sampling and analysis must also meet these requirements. The Permittee may conduct a cooperative receiving water study with other NPDES Permittees discharging in the same vicinity.

S16. Outfall 003 AKART Analysis and Engineering Report

The Permittee must determine if all applicable Best Management Practices (BMPs) employed at Outfall 003 provide all known, available, and reasonable methods of prevention, control, and treatment (AKART) for stormwater, prior to resuming discharge of stormwater at Outfall 003. If the evaluation demonstrates that the Permittee is not providing AKART for stormwater, the Permittee must propose new BMPs to meet the AKART standard and a schedule for implementing the proposed changes.

The Outfall 003 AKART Analysis and Engineering Report must consist of a site assessment that identifies sources of pollutants in the stormwater discharges. The AKART analysis must also include an economic analysis, environmental analysis, and industry analysis of stormwater BMPs.

The AKART analysis must be conducted by an engineer who has experience and/or training in pollutant sources in stormwater and stormwater BMPs.

The engineering report must be prepared by or under the supervision of a licensed professional engineer. The engineering report must include:

1. A site map identifying significant features including, but not limited to, stormwater drainage areas, stormwater drainage/conveyance infrastructure, tanks, sampling locations, pervious and impervious areas, buildings, and surface waters.
2. A description of the stormwater discharges at Outfall 003.
3. An assessment and description of existing and potential sources of pollutants in stormwater.
4. An identification of the range of management options for prevention, control, and treatment of pollutants in the stormwater discharges including operational source controls, structural source controls, and treatment measures. At a minimum, the Permittee must evaluate applicable BMPs in the *Stormwater Management Manual for Western Washington* (2019 edition).
5. An engineering economic analysis addressing the cost for the management options identified above. The economic analysis must address the cost of implementation including installation, operation and maintenance, housekeeping, and regulatory compliance costs and evaluate the overall cost per amount of pollutant prevented, treated, or otherwise controlled.

6. An environmental analysis addressing the benefit to the receiving water of the pollutant prevented, treated, or controlled for each option. This analysis must include the ability for each option to meet applicable water quality standards in the receiving water.
7. An analysis of practices of comparable industrial facilities for similar sources of stormwater.
8. Recommendations and implementation schedules for new operational, structural, or treatment BMPs.

Any proposed new BMPs identified by the Outfall 003 AKART Analysis and Engineering Report must be implemented on a schedule approved by Ecology. After Ecology reviews the Outfall 003 AKART Analysis and Engineering Report and agrees with any proposed recommendations that include new structural or treatment BMPs, the Permittee will be required to submit an engineering design report per WAC 173-240-110 and -130. The engineering design report must be prepared in accordance with WAC 173-240 and the *State Requirements for Submission of Engineering Reports and Plans for Industrial Wastewater Treatment Facilities*, Publication No. 05-10-014, January 2005. Any proposed new BMPs identified by the Outfall 003 AKART Analysis and Engineering Report must be implemented on a schedule approved by Ecology.

The Permittee must also update the Pollution Prevention Plan to incorporate any new BMPs recommended in the approved Outfall 003 AKART Analysis and Engineering Report. The Permittee must modify the Pollution Prevention Plan within sixty (60) days of implementing new BMPs.

S17. Filter Backwash Water AKART Analysis and Engineering Report

The Permittee must conduct a study to determine the characteristics of the filter backwash water from the water supply plant located at the facility.

The Permittee must determine if all known, available, and reasonable methods of prevention, control, and treatment (AKART) are being applied to the filter backwash water. The Permittee must assess whether after applying AKART, the filter backwash water meets state water quality criteria. The Permittee must submit an engineering report detailing the findings of the characterization study, AKART analysis, and water quality assessment.

S17.A Filter Backwash Water Characterization Study

The Permittee must submit a sampling and analysis plan to Ecology for review and approval by March 1, 2022. The Permittee must conduct the filter backwash water characterization study within 90 days of Ecology's approval of the plan.

1. The study plan must include:
 - a. A description of the filter backwash water (how it is generated, how it is currently managed, any process or activity that contributes to the wastewater stream, any raw materials used in the process/activity, known pollutants in the wastewater stream, estimated flow or volume of the wastewater stream, and any commingling with other wastewater streams).

- b. A description of any existing treatment of the filter backwash water.
 - c. A minimum of four (4) samples collected from each of the filter backwash water discharges (at least one week apart).
 - d. The sampling point locations identified on a diagram or map.
 - e. A plan for monitoring and recording the flow rate of the filter backwash water discharges at the time of sampling.
2. Samples must be collected during normal operations (i.e., no upsets or maintenance turnarounds). Each sample must be analyzed for BOD₅, dissolved oxygen, TSS, total dissolved solids, turbidity, cyanide, the 13 priority pollutant metals (antimony, arsenic, beryllium, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, thallium, and zinc), and any treatment chemicals added to the source water.
 3. Sampling must be collected and analyzed in accordance with the requirements specified in **Appendix A** and Special Conditions S2.B, S2.C, and S2.D.

S17.B AKART Analysis

Once the pollutants and volume of the filter backwash water have been identified, the Permittee must research and evaluate known and available treatment technologies that can be used to treat the pollutants in the waste stream. The Permittee must conduct a literature search, consult vendor information, and review Ecology and EPA guidance including *Ecology's 2018 Water Quality Program's Permit Writer's Manual*, *Ecology's 2014 Water Treatment Plant General Permit and Fact Sheet*, and *EPA's 2011 Drinking Water Treatment Plant Residuals Management Technical Report*, EPA 820-R-11-003.

The Permittee must consider treatment technologies for filter backwash water employed by other large industrial water users that withdraw and treat water from the Columbia River as well as other discharges with pollutants similar in nature and concentration.

The Permittee must evaluate treatment technologies for technical feasibility, effectiveness in removing or reducing pollutants, and cost.

S17.C Water Quality Assessment

The Permittee must assess whether the AKART treatment technologies analyzed will ensure that the filter backwash discharge will meet state water quality criteria at the end-of-pipe. To factor dilution with the receiving water into this assessment, the Permittee must conduct a mixing study of the filter backwash water in accordance with **Appendix C**.

S17.D Engineering Report

The Permittee must prepare an engineering report in accordance with WAC 173-240. The engineering report must be prepared by a licensed professional engineer trained and experienced in wastewater treatment. The Permittee must submit the engineering report to Ecology for review and approval by June 1, 2023.

The engineering report must include:

1. The results of the filter backwash water characterization study.
2. An evaluation of any existing treatment of the filter backwash water to determine if it meets AKART.
3. The results of the AKART analysis of other treatment technologies for the filter backwash water.
4. Design criteria for the existing and analyzed treatment technologies.
5. The results of the water quality assessment of the existing and analyzed AKART treatment technologies.

If the existing treatment technology for the filter backwash water does not meet AKART, the engineering report must include a recommended alternative. The Permittee must implement all changes necessary to meet AKART within two (2) years of receiving Ecology's written approval of the engineering report.

The Permittee must submit an interim progress report to Ecology at the end of one year describing the status of the changes.

The Permittee must update the O&M manual required by Special Condition S4.A. to include the changes implemented to achieve AKART for the filter backwash water, within 90 days of completing the changes.

S18. Dangerous Wastes – Permit by Rule Requirements

The Permittee is authorized to treat dangerous wastes, generated on or off-site, at the wastewater treatment facility under the permit by rule provisions of Chapter WAC 173-303-802(5). This authorization is limited to the onsite and off-site waste streams identified on the permit application and application amendments as approved by Ecology.

The Permittee must maintain records of the off-site waste streams treated at the wastewater facility. The origin, volume, known waste constituents, any analytical data, and date of addition must be recorded. This information must be available to an authorized representative of Ecology per General Condition G2.

General Conditions

G1. Signatory Requirements

1. All applications submitted to Ecology must be signed and certified.
 - a. In the case of corporations, by a responsible corporate officer. For the purpose of this section, a responsible corporate officer means:
 - A president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision making functions for the corporation, or
 - The manager of one or more manufacturing, production, or operating facilities, provided, the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long-term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.
 - b. In the case of a partnership, by a general partner.
 - c. In the case of sole proprietorship, by the proprietor.
 - d. In the case of a municipal, state, or other public facility, by either a principal executive officer or ranking elected official.

Applications for permits for domestic wastewater facilities that are either owned or operated by, or under contract to, a public entity shall be submitted by the public entity.

2. All reports required by this permit and other information requested by Ecology must be signed by a person described above or by a duly authorized representative of that person. A person is a duly authorized representative only if:
 - a. The authorization is made in writing by a person described above and submitted to Ecology.
 - b. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility, such as the position of plant manager, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters. (A duly authorized representative may thus be either a named individual or any individual occupying a named position.)

3. Changes to authorization. If an authorization under paragraph G1.2, above, is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of paragraph G1.2, above, must be submitted to Ecology prior to or together with any reports, information, or applications to be signed by an authorized representative.
4. Certification. Any person signing a document under this section must make the following certification:

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

G2. Right of Inspection and Entry

The Permittee must allow an authorized representative of Ecology, upon the presentation of credentials and such other documents as may be required by law:

1. To enter upon the premises where a discharge is located or where any records must be kept under the terms and conditions of this permit.
2. To have access to and copy, at reasonable times and at reasonable cost, any records required to be kept under the terms and conditions of this permit.
3. To inspect, at reasonable times, any facilities, equipment (including monitoring and control equipment), practices, methods, or operations regulated or required under this permit.
4. To sample or monitor, at reasonable times, any substances or parameters at any location for purposes of assuring permit compliance or as otherwise authorized by the Clean Water Act.

G3. Permit Actions

This permit may be modified, revoked and reissued, or terminated either at the request of any interested person (including the permittee) or upon Ecology’s initiative. However, the permit may only be modified, revoked and reissued, or terminated for the reasons specified in 40 CFR 122.62, 122.64 or WAC 173-220-150 according to the procedures of 40 CFR 124.5.

1. The following are causes for terminating this permit during its term, or for denying a permit renewal application:
 - a. Violation of any permit term or condition.
 - b. Obtaining a permit by misrepresentation or failure to disclose all relevant facts.
 - c. A material change in quantity or type of waste disposal.

- d. A determination that the permitted activity endangers human health or the environment, or contributes to water quality standards violations and can only be regulated to acceptable levels by permit modification or termination.
 - e. A change in any condition that requires either a temporary or permanent reduction, or elimination of any discharge or sludge use or disposal practice controlled by the permit.
 - f. Nonpayment of fees assessed pursuant to RCW 90.48.465.
 - g. Failure or refusal of the Permittee to allow entry as required in RCW 90.48.090.
2. The following are causes for modification but not revocation and reissuance except when the Permittee requests or agrees:
- a. A material change in the condition of the waters of the state.
 - b. New information not available at the time of permit issuance that would have justified the application of different permit conditions.
 - c. Material and substantial alterations or additions to the permitted facility or activities which occurred after this permit issuance.
 - d. Promulgation of new or amended standards or regulations having a direct bearing upon permit conditions, or requiring permit revision.
 - e. The Permittee has requested a modification based on other rationale meeting the criteria of 40 CFR Part 122.62.
 - f. Ecology has determined that good cause exists for modification of a compliance schedule, and the modification will not violate statutory deadlines.
 - g. Incorporation of an approved local pretreatment program into a municipality's permit.
3. The following are causes for modification or alternatively revocation and reissuance:
- a. When cause exists for termination for reasons listed in 1.a through 1.g of this section, and Ecology determines that modification or revocation and reissuance is appropriate.
 - b. When Ecology has received notification of a proposed transfer of the permit. A permit may also be modified to reflect a transfer after the effective date of an automatic transfer (General Condition G7) but will not be revoked and reissued after the effective date of the transfer except upon the request of the new Permittee.

G4. Reporting Planned Changes

The Permittee must, as soon as possible, but no later than one hundred eighty (180) days prior to the proposed changes, give notice to Ecology of planned physical alterations or additions to the permitted facility, production increases, or process modification which will result in:

1. The permitted facility being determined to be a new source pursuant to 40 CFR 122.29(b).
2. A significant change in the nature or an increase in quantity of pollutants discharged.
3. A significant change in the Permittee's sludge use or disposal practices. Following such notice, and the submittal of a new application or supplement to the existing application, along with required engineering plans and reports, this permit may be modified, or revoked and reissued pursuant to 40 CFR 122.62(a) to specify and limit any pollutants not previously limited. Until such modification is effective, any new or increased discharge in excess of permit limits or not specifically authorized by this permit constitutes a violation.

G5. Plan Review Required

Prior to constructing or modifying any wastewater control facilities, an engineering report and detailed plans and specifications must be submitted to Ecology for approval in accordance with chapter 173-240 WAC. Engineering reports, plans, and specifications must be submitted at least one hundred eighty (180) days prior to the planned start of construction unless a shorter time is approved by Ecology. Facilities must be constructed and operated in accordance with the approved plans.

G6. Compliance with Other Laws and Statutes

Nothing in this permit excuses the Permittee from compliance with any applicable federal, state, or local statutes, ordinances, or regulations.

G7. Transfer of this Permit

In the event of any change in control or ownership of facilities from which the authorized discharge emanate, the Permittee must notify the succeeding owner or controller of the existence of this permit by letter, a copy of which must be forwarded to Ecology.

1. Transfers by Modification

Except as provided in paragraph (2) below, this permit may be transferred by the Permittee to a new owner or operator only if this permit has been modified or revoked and reissued under 40 CFR 122.62(b)(2), or a minor modification made under 40 CFR 122.63(d), to identify the new Permittee and incorporate such other requirements as may be necessary under the Clean Water Act.

2. Automatic Transfers

This permit may be automatically transferred to a new Permittee if:

- a. The Permittee notifies Ecology at least thirty (30) days in advance of the proposed transfer date.
- b. The notice includes a written agreement between the existing and new Permittees containing a specific date transfer of permit responsibility, coverage, and liability between them.

- c. Ecology does not notify the existing Permittee and the proposed new Permittee of its intent to modify or revoke and reissue this permit. A modification under this subparagraph may also be minor modification under 40 CFR 122.63. If this notice is not received, the transfer is effective on the date specified in the written agreement.

G8. Reduced Production for Compliance

The Permittee, in order to maintain compliance with its permit, must control production and/or all discharges upon reduction, loss, failure, or bypass of the treatment facility until the facility is restored or an alternative method of treatment is provided. This requirement applies in the situation where, among other things, the primary source of power of the treatment facility is reduced, lost, or fails.

G9. Removed Substances

Collected screenings, grit, solids, sludges, filter backwash, or other pollutants removed in the course of treatment or control of wastewaters must not be resuspended or reintroduced to the final effluent stream for discharge to state waters unless the Permittee has provided all known, available, and reasonable methods of prevention, control, and treatment of the pollutants and the discharge complies with the requirements of Chapter 173-201A WAC.

G10. Duty to Provide Information

The Permittee must submit to Ecology, within a reasonable time, all information which Ecology may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The Permittee must also submit to Ecology upon request, copies of records required to be kept by this permit.

G11. Other Requirements of 40 CFR

All other requirements of 40 CFR 122.41 and 122.42 are incorporated in this permit by reference.

G12. Additional Monitoring

Ecology may establish specific monitoring requirements in addition to those contained in this permit by administrative order or permit modification.

G13. Payment of Fees

The Permittee must submit payment of fees associated with this permit as assessed by Ecology.

G14. Penalties for Violating Permit Conditions

Any person who is found guilty of willfully violating the terms and conditions of this permit is deemed guilty of a crime, and upon conviction thereof shall be punished by a

fine of up to ten thousand dollars (\$10,000) and costs of prosecution, or by imprisonment in the discretion of the court. Each day upon which a willful violation occurs may be deemed a separate and additional violation.

Any person who violates the terms and conditions of a waste discharge permit may incur, in addition to any other penalty as provided by law, a civil penalty in the amount of up to ten thousand dollars (\$10,000) for every such violation. Each and every such violation is a separate and distinct offense, and in case of a continuing violation, every day's continuance is deemed to be a separate and distinct violation.

G15. Upset

Definition – “Upset” means an exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limits because of factors beyond the reasonable control of the Permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

An upset constitutes an affirmative defense to an action brought for noncompliance with such technology-based permit effluent limits if the requirements of the following paragraph are met.

A Permittee who wishes to establish the affirmative defense of upset must demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:

1. An upset occurred and that the Permittee can identify the cause(s) of the upset.
2. The permitted facility was being properly operated at the time of the upset.
3. The Permittee submitted notice of the upset as required in Special Condition S3.F.
4. The Permittee complied with any remedial measures required under S3.F of this permit.

In any enforcement action the Permittee seeking to establish the occurrence of an upset has the burden of proof.

G16. Property Rights

This permit does not convey any property rights of any sort, or any exclusive privilege.

G17. Duty to Comply

The Permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.

G18. Toxic Pollutants

The Permittee must comply with effluent standards or prohibitions established under Section 307(a) of the Clean Water Act for toxic pollutants within the time provided in the regulations that establish those standards or prohibitions, even if this permit has not yet been modified to incorporate the requirement.

G19. Penalties for Tampering

The Clean Water Act provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than \$10,000 per violation, or by imprisonment for not more than two (2) years per violation, or by both. If a conviction of a person is for a violation committed after a first conviction of such person under this condition, punishment shall be a fine of not more than \$20,000 per day of violation, or by imprisonment of not more than four (4) years, or by both.

G20. Reporting Requirements Applicable to Existing Manufacturing, Commercial, Mining, and Silvicultural Dischargers

The Permittee belonging to the categories of existing manufacturing, commercial, mining, or silviculture must notify Ecology as soon as they know or have reason to believe:

1. That any activity has occurred or will occur which would result in the discharge, on a routine or frequent basis, of any toxic pollutant which is not limited in this permit, if that discharge will exceed the highest of the following “notification levels:”
 - a. One hundred micrograms per liter (100 µg/L).
 - b. Two hundred micrograms per liter (200 µg/L) for acrolein and acrylonitrile; five hundred micrograms per liter (500 µg/L) for 2,4-dinitrophenol and for 2-methyl-4,6-dinitrophenol; and one milligram per liter (1 mg/L) for antimony.
 - c. Five (5) times the maximum concentration value reported for that pollutant in the permit application in accordance with 40 CFR 122.21(g)(7).
 - d. The level established by the Director in accordance with 40 CFR 122.44(f).
2. That any activity has occurred or will occur which would result in any discharge, on a non-routine or infrequent basis, of a toxic pollutant which is not limited in this permit, if that discharge will exceed the highest of the following “notification levels:”
 - a. Five hundred micrograms per liter (500µg/L).
 - b. One milligram per liter (1 mg/L) for antimony.
 - c. Ten (10) times the maximum concentration value reported for that pollutant in the permit application in accordance with 40 CFR 122.21(g)(7).
 - d. The level established by the Director in accordance with 40 CFR 122.44(f).

G21. Compliance Schedules

Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit must be submitted no later than fourteen (14) days following each schedule date.

Appendix A

List of Pollutants with Analytical Methods, Detection Limits and Quantitation Levels

The Permittee must use the specified analytical methods, detection limits (DLs) and quantitation levels (QLs) in the following table for permit and application required monitoring unless:

- Another permit condition specifies other methods, detection levels, or quantitation levels.
- The method used produces measurable results in the sample and EPA has listed it as an EPA-approved method in 40 CFR Part 136. If the Permittee uses an alternative method, not specified in the permit and as allowed above, it must report the test method, DL, and QL on the discharge monitoring report or in the required report.

If the Permittee is unable to obtain the required DL and QL in its effluent due to matrix effects, the Permittee must submit a matrix-specific detection limit (MDL) and a quantitation limit (QL) to Ecology with appropriate laboratory documentation.

When the permit requires the Permittee to measure the base neutral compounds in the list of priority pollutants, it must measure all of the base neutral pollutants listed in the table below. The list includes EPA required base neutral priority pollutants and several additional polynuclear aromatic hydrocarbons (PAHs). The Water Quality Program added several PAHs to the list of base neutrals below from Ecology’s Persistent Bioaccumulative Toxics (PBT) List. It only added those PBT parameters of interest to Appendix A that did not increase the overall cost of analysis unreasonably.

Ecology added this appendix to the permit in order to reduce the number of analytical “non-detects” in permit-required monitoring and to measure effluent concentrations near or below criteria values where possible at a reasonable cost.

The lists below include conventional pollutants (as defined in CWA section 502(6) and 40 CFR Part 122.), toxic or priority pollutants as defined in CWA section 307(a)(1) and listed in 40 CFR Part 122 Appendix D, 40 CFR Part 401.15 and 40 CFR Part 423 Appendix A), and nonconventionals. 40 CFR Part 122 Appendix D (Table V) also identifies toxic pollutants and hazardous substances which are required to be reported by dischargers if expected to be present. This permit Appendix A list does not include those parameters.

Table 1: Conventional Pollutants

Pollutant	CAS Number (if available)	Recommended Analytical Protocol	Detection Level (DL) ¹ <i>µg/L Unless specified</i>	Quantitation Level (QL) ² <i>µg/L Unless specified</i>
Biochemical Oxygen Demand		SM5210-B		2 mg/L

Pollutant	CAS Number (if available)	Recommended Analytical Protocol	Detection Level (DL) ¹ <i>µg/L Unless specified</i>	Quantitation Level (QL) ² <i>µg/L Unless specified</i>
Biochemical Oxygen Demand, Soluble		SM5210-B ³		2 mg/L
Fecal Coliform		SM 9221E,9222	N/A	Specified in method sample aliquot dependent
Oil and Grease (HEM) (Hexane Extractable Material)		1664 A or B	1,400	5,000
pH		SM4500-H ⁺ B	N/A	N/A
Total Suspended Solids		SM2540-D		5 mg/L

Table 2: Nonconventional Pollutants

Pollutant	CAS Number (if available)	Recommended Analytical Protocol	Detection Level (DL) ¹ <i>µg/L Unless specified</i>	Quantitation Level (QL) ² <i>µg/L Unless specified</i>
Alkalinity, Total		SM2320-B		5 mg/L as CaCO ₃
Aluminum, Total	7429-90-5	200.8	2.0	10
Ammonia, Total (as N)		SM4500-NH ₃ -B and C/D/E/G/H		20
Barium, Total	7440-39-3	200.8	0.5	2.0
BTEX (benzene +toluene + ethylbenzene + m,o,p xylenes)		EPA SW 846 8021/8260	1	2
Boron, Total	7440-42-8	200.8	2.0	10.0
Chemical Oxygen Demand		SM5220-D		10 mg/L
Chloride		SM4500-Cl B/C/D/E and SM4110 B		Sample and limit dependent
Chlorine, Total Residual		SM4500 Cl G		50.0
Cobalt, Total	7440-48-4	200.8	0.05	0.25
Color		SM2120 B/C/E		10 color units

Pollutant	CAS Number (if available)	Recommended Analytical Protocol	Detection Level (DL) ¹ μg/L Unless specified	Quantitation Level (QL) ² μg/L Unless specified
Dissolved oxygen		SM4500-OC/OG		0.2 mg/L
E.coli		SM 9221B, 9221F, 9223B	N/A	Specified in method - sample aliquot dependent
Enterococci		SM 9230B, 9230C, 9230D	N/A	Specified in method - sample aliquot dependent
Flow		Calibrated device		
Fluoride	16984-48-8	SM4500-F E	25	100
Hardness, Total		SM2340B		200 as CaCO ₃
Iron, Total	7439-89-6	200.7	12.5	50
Magnesium, Total	7439-95-4	200.7	10	50
Manganese, Total	7439-96-5	200.8	0.1	0.5
Molybdenum, Total	7439-98-7	200.8	0.1	0.5
Nitrate + Nitrite Nitrogen (as N)		SM4500-NO ₃ -E/F/H		100
Nitrogen, Total Kjeldahl (as N)		SM4500-N _{org} B/C and SM4500NH ₃ -B/C/D/EF/G/H		300
NWTPH Dx ⁴		Ecology NWTPH Dx	250	250
NWTPH Gx ⁵		Ecology NWTPH Gx	250	250
Phosphorus, Total (as P)		SM 4500 PB followed by SM4500-PE/PF	3	10
Salinity		SM2520-B		3 practical salinity units or scale (PSU or PSS)

Pollutant	CAS Number (if available)	Recommended Analytical Protocol	Detection Level (DL) ¹ <i>µg/L Unless specified</i>	Quantitation Level (QL) ² <i>µg/L Unless specified</i>
Settleable Solids		SM2540 -F		Sample and limit dependent
Soluble Reactive Phosphorus (as P)		SM4500-P E/F/G	3	10
Sulfate (as mg/L SO ₄)		SM4110-B		0.2 mg/L
Sulfide (as mg/L S)		SM4500-S ² F/D/E/G		0.2 mg/L
Sulfite (as mg/L SO ₃)		SM4500-SO3B		2 mg/L
Temperature (max. 7-day avg.)		Analog recorder or Use micro-recording devices known as thermistors		0.2° C
Tin, Total	7440-31-5	200.8	0.3	1.5
Titanium, Total	7440-32-6	200.8	0.5	2.5
Total Coliform		SM 9221B, 9222B, 9223B	N/A	Specified in method - sample aliquot dependent
Total Organic Carbon		SM5310-B/C/D		1 mg/L
Total Dissolved Solids		SM2540 C		20 mg/L

Table 3: Metals, Cyanide & Total Phenols

Priority Pollutants	PP #	CAS Number (if available)	Recommended Analytical Protocol	Detection Level (DL) ¹ <i>µg/L Unless specified</i>	Quantitation Level (QL) ² <i>µg/L Unless specified</i>
Antimony, Total	114	7440-36-0	200.8	0.3	1.0
Arsenic, Total	115	7440-38-2	200.8	0.1	0.5
Beryllium, Total	117	7440-41-7	200.8	0.1	0.5
Cadmium, Total	118	7440-43-9	200.8	0.05	0.25

Priority Pollutants	PP #	CAS Number (if available)	Recommended Analytical Protocol	Detection Level (DL) ¹ <i>µg/L Unless specified</i>	Quantitation Level (QL) ² <i>µg/L Unless specified</i>
Chromium (hex) dissolved	119	18540-29-9	SM3500-Cr C	0.3	1.2
Chromium, Total	119	7440-47-3	200.8	0.2	1.0
Copper, Total	120	7440-50-8	200.8	0.4	2.0
Lead, Total	122	7439-92-1	200.8	0.1	0.5
Mercury, Total	123	7439-97-6	1631E	0.0002	0.0005
Nickel, Total	124	7440-02-0	200.8	0.1	0.5
Selenium, Total	125	7782-49-2	200.8	1.0	1.0
Silver, Total	126	7440-22-4	200.8	0.04	0.2
Thallium, Total	127	7440-28-0	200.8	0.09	0.36
Zinc, Total	128	7440-66-6	200.8	0.5	2.5
Cyanide, Total	121	57-12-5	335.4	5	10
Cyanide, Weak Acid Dissociable	121		SM4500-CN I	5	10
Cyanide, Free Amenable to Chlorination (Available Cyanide)	121		SM4500-CN G	5	10
Phenols, Total	65		EPA 420.1		50

Table 4: Acid Compounds

Priority Pollutants	PP #	CAS Number (if available)	Recommended Analytical Protocol	Detection Level (DL) ¹ <i>µg/L Unless specified</i>	Quantitation Level (QL) ² <i>µg/L Unless specified</i>
2-Chlorophenol	24	95-57-8	625.1	3.3	9.9
2,4-Dichlorophenol	31	120-83-2	625.1	2.7	8.1
2,4-Dimethylphenol	34	105-67-9	625.1	2.7	8.1
4,6-dinitro-o-cresol (2-methyl-4,6,-dinitrophenol)	60	534-52-1	625.1/1625B	24	72
2,4 dinitrophenol	59	51-28-5	625.1	42	126
2-Nitrophenol	57	88-75-5	625.1	3.6	10.8

Priority Pollutants	PP #	CAS Number (if available)	Recommended Analytical Protocol	Detection Level (DL) ¹ <i>µg/L Unless specified</i>	Quantitation Level (QL) ² <i>µg/L Unless specified</i>
4-Nitrophenol	58	100-02-7	625.1	2.4	7.2
Parachlorometa cresol (4-chloro-3-methylphenol)	22	59-50-7	625.1	3.0	9.0
Pentachlorophenol	64	87-86-5	625.1	3.6	10.8
Phenol	65	108-95-2	625.1	1.5	4.5
2,4,6-Trichlorophenol	21	88-06-2	625.1	2.7	8.1

Table 5: Volatile Compounds

Priority Pollutants	PP #	CAS Number (if available)	Recommended Analytical Protocol	Detection Level (DL) ¹ <i>µg/L Unless specified</i>	Quantitation Level (QL) ² <i>µg/L Unless specified</i>
Acrolein	2	107-02-8	624.1	5	10
Acrylonitrile	3	107-13-1	624.1	1.0	2.0
Benzene	4	71-43-2	624.1	4.4	13.2
Bromoform	47	75-25-2	624.1	4.7	14.1
Carbon tetrachloride	6	56-23-5	624.1/601 or SM6230B	2.8	8.4
Chlorobenzene	7	108-90-7	624.1	6.0	18.0
Chloroethane	16	75-00-3	624/601	1.0	2.0
2-Chloroethylvinyl Ether	19	110-75-8	624.1	1.0	2.0
Chloroform	23	67-66-3	624.1 or SM6210B	1.6	4.8
Dibromochloromethane (chlordibromomethane)	51	124-48-1	624.1	3.1	9.3
1,2-Dichlorobenzene	25	95-50-1	624.1	1.9	7.6
1,3-Dichlorobenzene	26	541-73-1	624.1	1.9	7.6
1,4-Dichlorobenzene	27	106-46-7	624.1	4.4	17.6
Dichlorobromomethane	48	75-27-4	624.1	2.2	6.6
1,1-Dichloroethane	13	75-34-3	624.1	4.7	14.1
1,2-Dichloroethane	10	107-06-2	624.1	2.8	8.4

Priority Pollutants	PP #	CAS Number (if available)	Recommended Analytical Protocol	Detection Level (DL) ¹ <i>µg/L Unless specified</i>	Quantitation Level (QL) ² <i>µg/L Unless specified</i>
1,1-Dichloroethylene	29	75-35-4	624.1	2.8	8.4
1,2-Dichloropropane	32	78-87-5	624.1	6.0	18.0
1,3-dichloropropene (mixed isomers) (1,2-dichloropropylene) ⁶	33	542-75-6	624.1	5.0	15.0
Ethylbenzene	38	100-41-4	624.1	7.2	21.6
Methyl bromide (Bromomethane)	46	74-83-9	624/601	5.0	10.0
Methyl chloride (Chloromethane)	45	74-87-3	624.1	1.0	2.0
Methylene chloride	44	75-09-2	624.1	2.8	8.4
1,1,2,2-Tetrachloroethane	15	79-34-5	624.1	6.9	20.7
Tetrachloroethylene	85	127-18-4	624.1	4.1	12.3
Toluene	86	108-88-3	624.1	6.0	18.0
1,2-Trans-Dichloroethylene (Ethylene dichloride)	30	156-60-5	624.1	1.6	4.8
1,1,1-Trichloroethane	11	71-55-6	624.1	3.8	11.4
1,1,2-Trichloroethane	14	79-00-5	624.1	5.0	15.0
Trichloroethylene	87	79-01-6	624.1	1.9	5.7
Vinyl chloride	88	75-01-4	624/SM6200B	1.0	2.0

Table 6: Base/Neutral Compounds (Compounds in **Bold** are Ecology PBTS)

Priority Pollutants	PP #	CAS Number (if available)	Recommended Analytical Protocol	Detection Level (DL) ¹ <i>µg/L Unless specified</i>	Quantitation Level (QL) ² <i>µg/L Unless specified</i>
Acenaphthene	1	83-32-9	625.1	1.9	5.7
Acenaphthylene	77	208-96-8	625.1	3.5	10.5
Anthracene	78	120-12-7	625.1	1.9	5.7
Benzidine	5	92-87-5	625.1	44	132

Priority Pollutants	PP #	CAS Number (if available)	Recommended Analytical Protocol	Detection Level (DL) ¹ <i>µg/L Unless specified</i>	Quantitation Level (QL) ² <i>µg/L Unless specified</i>
Benzyl butyl phthalate	67	85-68-7	625.1	2.5	7.5
Benzo(a)anthracene	72	56-55-3	625.1	7.8	23.4
Benzo(b)fluoranthene (3,4-benzofluoranthene) ⁷	74	205-99-2	610/625.1	4.8	14.4
Benzo(j)fluoranthene ⁷		205-82-3	625	0.5	1.0
Benzo(k)fluoranthene (11,12-benzofluoranthene) ⁷	75	207-08-9	610/625.1	2.5	7.5
Benzo(r,s,t)pentaphene		189-55-9	625	1.3	5.0
Benzo(a)pyrene	73	50-32-8	610/625.1	2.5	7.5
Benzo(ghi)Perylene	79	191-24-2	610/625.1	4.1	12.3
Bis(2-chloroethoxy)methane	43	111-91-1	625.1	5.3	15.9
Bis(2-chloroethyl)ether	18	111-44-4	611/625.1	5.7	17.1
Bis(2-chloro-1-methylethyl)Ether (Bis(2-chloroisopropyl)ether) ¹⁰	42	108-60-1	625.1	5.7	17.1
Bis(2-ethylhexyl)phthalate	66	117-81-7	625.1	2.5	7.5
4-Bromophenyl phenyl ether	41	101-55-3	625.1	1.9	5.7
2-Chloronaphthalene	20	91-58-7	625.1	1.9	5.7
4-Chlorophenyl phenyl ether	40	7005-72-3	625.1	4.2	12.6
Chrysene	76	218-01-9	610/625.1	2.5	7.5
Dibenzo (a,h)acridine		226-36-8	610M/625M	2.5	10.0
Dibenzo (a,j)acridine		224-42-0	610M/625M	2.5	10.0
Dibenzo(a-h)anthracene (1,2,5,6-dibenzanthracene)	82	53-70-3	625.1	2.5	7.5
Dibenzo(a,e)pyrene		192-65-4	610M/625M	2.5	10.0
Dibenzo(a,h)pyrene		189-64-0	625M	2.5	10.0

Priority Pollutants	PP #	CAS Number (if available)	Recommended Analytical Protocol	Detection Level (DL) ¹ <i>µg/L Unless specified</i>	Quantitation Level (QL) ² <i>µg/L Unless specified</i>
3,3-Dichlorobenzidine	28	91-94-1	605/625.1	16.5	49.5
Diethyl phthalate	70	84-66-2	625.1	1.9	5.7
Dimethyl phthalate	71	131-11-3	625.1	1.6	4.8
Di-n-butyl phthalate	68	84-74-2	625.1	2.5	7.5
2,4-dinitrotoluene	35	121-14-2	609/625.1	5.7	17.1
2,6-dinitrotoluene	36	606-20-2	609/625.1	1.9	5.7
Di-n-octyl phthalate	69	117-84-0	625.1	2.5	7.5
1,2-Diphenylhydrazine (as Azobenzene)	37	122-66-7	1625B/625.1	5.0	20
Fluoranthene	39	206-44-0	625.1	2.2	6.6
Fluorene	80	86-73-7	625.1	1.9	5.7
Hexachlorobenzene	9	118-74-1	612/625.1	1.9	5.7
Hexachlorobutadiene	52	87-68-3	625.1	0.9	2.7
Hexachlorocyclopentadiene	53	77-47-4	1625B/625.1	2.0	4.0
Hexachloroethane	12	67-72-1	625.1	1.6	4.8
Indeno(1,2,3-cd)Pyrene	83	193-39-5	610/625.1	3.7	11.1
Isophorone	54	78-59-1	625.1	2.2	6.6
3-Methyl cholanthrene		56-49-5	625	2.0	8.0
Naphthalene	55	91-20-3	625.1	1.6	4.8
Nitrobenzene	56	98-95-3	625.1	1.9	5.7
N-Nitrosodimethylamine	61	62-75-9	607/625.1	2.0	4.0
N-Nitrosodi-n-propylamine	63	621-64-7	607/625.1	0.5	1.0
N-Nitrosodiphenylamine	62	86-30-6	625.1	1.0	2.0
Perylene		198-55-0	625	1.9	7.6
Phenanthrene	81	85-01-8	625.1	5.4	16.2
Pyrene	84	129-00-0	625.1	1.9	5.7
1,2,4-Trichlorobenzene	8	120-82-1	625.1	1.9	5.7

Table 7: Dioxin

Priority Pollutant	PP #	CAS Number (if available)	Recommended Analytical Protocol	Detection Level (DL) ¹ <i>µg/L Unless specified</i>	Quantitation Level (QL) ² <i>µg/L Unless specified</i>
2,3,7,8-Tetra-Chlorodibenzo-P-Dioxin (2,3,7,8 TCDD)	129	1746-01-6	1613B	1.3 pg/L	5 pg/L

Table 8: Pesticides/PCBS

Priority Pollutants	PP #	CAS Number (if available)	Recommended Analytical Protocol	Detection Level (DL) ¹ <i>µg/L Unless specified</i>	Quantitation Level (QL) ² <i>µg/L Unless specified</i>
Aldrin	89	309-00-2	608.3	4.0 ng/L	12 ng/L
alpha-BHC	102	319-84-6	608.3	3.0 ng/L	9.0 ng/L
beta-BHC	103	319-85-7	608.3	6.0 ng/L	18 ng/L
gamma-BHC (Lindane)	104	58-89-9	608.3	4.0 ng/L	12 ng/L
delta-BHC	105	319-86-8	608.3	9.0 ng/L	27 ng/L
Chlordane ⁸	91	57-74-9	608.3	14 ng/L	42 ng/L
4,4'-DDT	92	50-29-3	608.3	12 ng/L	36 ng/L
4,4'-DDE	93	72-55-9	608.3	4.0 ng/L	12 ng/L
4,4' DDD	94	72-54-8	608.3	11ng/L	33 ng/L
Dieldrin	90	60-57-1	608.3	2.0 ng/L	6.0 ng/L
alpha-Endosulfan	95	959-98-8	608.3	14 ng/L	42 ng/L
beta-Endosulfan	96	33213-65-9	608.3	4.0 ng/L	12 ng/L
Endosulfan Sulfate	97	1031-07-8	608.3	66 ng/L	198 ng/L
Endrin	98	72-20-8	608.3	6.0 ng/L	18 ng/L
Endrin Aldehyde	99	7421-93-4	608.3	23 ng/L	70 ng/L
Heptachlor	100	76-44-8	608.3	3.0 ng/L	9.0 ng/L
Heptachlor Epoxide	101	1024-57-3	608.3	83 ng/L	249 ng/L

Priority Pollutants	PP #	CAS Number (if available)	Recommended Analytical Protocol	Detection Level (DL) ¹ <i>µg/L Unless specified</i>	Quantitation Level (QL) ² <i>µg/L Unless specified</i>
PCB-1242 ⁹	106	53469-21-9	608.3	0.065	0.195
PCB-1254	107	11097-69-1	608.3	0.065	0.195
PCB-1221	108	11104-28-2	608.3	0.065	0.195
PCB-1232	109	11141-16-5	608.3	0.065	0.195
PCB-1248	110	12672-29-6	608.3	0.065	0.195
PCB-1260	111	11096-82-5	608.3	0.065	0.195
PCB-1016 ⁹	112	12674-11-2	608.3	0.065	0.195
Toxaphene	113	8001-35-2	608.3	240 ng/L	720 ng/L

Footnotes

1. **Detection level (DL)** – or detection limit means the minimum concentration of an analyte (substance) that can be measured and reported with a 99% confidence that the analyte concentration is greater than zero as determined by the procedure given in 40 CFR part 136, Appendix B.
2. **Quantitation Level (QL)** – also known as Minimum Level of Quantitation (ML) – The lowest level at which the entire analytical system must give a recognizable signal and acceptable calibration point for the analyte. It is equivalent to the concentration of the lowest calibration standard, assuming that the lab has used all method-specified sample weights, volumes, and cleanup procedures. The QL is calculated by multiplying the MDL by 3.18 and rounding the result to the number nearest to (1, 2, or 5) x 10ⁿ, where n is an integer. (64 FR 30417).

Also Given As: The smallest detectable concentration of analyte greater than the Detection Limit (DL) where the accuracy (precision & bias) achieves the objectives of the intended purpose. (Report of the Federal Advisory Committee on Detection and Quantitation Approaches and Uses in Clean Water Act Programs Submitted to the US Environmental Protection Agency December 2007).

3. **Soluble Biochemical Oxygen Demand** – method note: First, filter the sample through a Millipore Nylon filter (or equivalent) - pore size of 0.45-0.50 um (prep all filters by filtering 250 ml of laboratory grade deionized water through the filter and discard). Then, analyze sample as per method 5210-B.
4. **Northwest Total Petroleum Hydrocarbons Diesel Extended Range OR NWTPH Dx**
– Analytical Methods for Petroleum Hydrocarbons
<https://fortress.wa.gov/ecy/publications/documents/97602.pdf>.
5. **Northwest Total Petroleum Hydrocarbons Gasoline Extended Range OR NWTPH Gx**
– Analytical Methods for Petroleum Hydrocarbons
<https://fortress.wa.gov/ecy/publications/documents/97602.pdf>
6. **1, 3-dichloroproylene (mixed isomers)** – You may report this parameter as two separate parameters: cis-1, 3-dichloropropene (10061-01-5) and trans-1, 3-dichloropropene (10061-02-6).
7. **Total Benzofluoranthenes** – Because Benzo(b)fluoranthene, Benzo(j)fluoranthene and Benzo(k)fluoranthene co-elute you may report these three isomers as total benzofluoranthenes.
8. **Chlordane** – You may report alpha-chlordane (5103-71-9) and gamma-chlordane (5103-74-2) in place of chlordane (57-74-9). If you report alpha and gamma-chlordane, the DL/PQLs that apply are 14/42 ng/L.
9. **PCB 1016 & PCB 1242** – You may report these two PCB compounds as one parameter called PCB 1016/1242.
10. **Bis(2-Chloro-1-Methylethyl) Ether** – This compound was previously listed as Bis(2-Chloroisopropyl) Ether (39638-32-9).

Appendix B

NPDES Pollution Prevention Plan – General and Specific Requirements

Guidance Documents

Guidance documents that must be used when developing or updating a pollution prevention plan include the *Stormwater Management Manual for Western Washington* published July 2019 by Ecology (Publication number 19-10-021), the ‘Pollution Prevention and Best Management Practices’ section of the *Ecology Permit Writer’s Manual*, Chapter XII (Publication number 92-109), EPA’s *An Organizational Guide to Pollution Prevention*, 2001 available at <https://www.epa.gov/sites/production/files/2014-01/documents/organizationalguide.pdf>, and other information provided by the Ecology Permit Manager.

Plan Requirements

A. General Requirements

1. Policy Statement and Signature

The pollution prevention plan must include a policy statement articulating management and corporate support for the plan and a commitment to implement the plan and to continued pursuit of pollution prevention opportunities. The plan, plan updates, and modifications must be signed in accordance with General Condition G1.

2. Employee Involvement, Training, and Awareness

The pollution prevention plan must include a description of personnel training and employee involvement programs that emphasize pollution prevention and solicit employee ideas about pollution prevention opportunities and other environmental issues. Staff training records must be maintained onsite and be available for inspection.

3. Other Pollution Prevention Plans

The Permittee may incorporate applicable portions of plans prepared for their facility for other purposes. Plans or portions of plans incorporated into the Pollution Prevention Plan become enforceable requirements of this permit.

B. Specific Requirements

The Pollution Prevention Plan must contain a site map, detailed assessment of the facility, detailed description of BMPs, spill prevention and emergency cleanup procedures, and sampling requirements.

1. The site map must identify:

- a. The scale or include relative distances between significant structures and drainage systems.
- b. Significant features.
- c. The stormwater drainage and discharge structures.

- d. The stormwater drainage areas for each stormwater discharge point off-site (including discharges to groundwater) and identifying number for each discharge point.
 - e. Each sampling location by identifying number.
 - f. Paved areas and buildings.
 - g. Areas of pollutant contact (actual and potential) associated with specific industrial activities.
 - h. Surface water locations (including wetlands and drainage ditches)
 - i. Areas of existing and potential soil erosion (in a significant amount).
 - j. Vehicle maintenance areas.
 - k. Lands and waters adjacent to the site that may be helpful in identifying discharge points or drainage routes.
2. The facility assessment must include a description of the facility; an inventory of facility activities and equipment that contribute to or have the potential to contribute any pollutants to the wastewater treatment system, stormwater, and/or waters of the state; and an inventory of materials that contribute to or have the potential to contribute pollutants to the wastewater treatment system, stormwater, and/or waters of the state.
- a. The facility description must describe:
 - i. The industrial and construction activities conducted at the site.
 - ii. Regular business hours and seasonal variations in business hours or industrial activities.
 - iii. The general layout of the facility including buildings and storage of raw materials, and the flow of goods and materials through the facility.
 - b. The inventory of industrial activities must identify all areas associated with industrial activities that have been or may potentially be sources of pollutants, including, but not limited to, the following:
 - i. Loading and unloading of dry bulk materials or liquids.
 - ii. Outdoor storage of materials or products.
 - iii. Outdoor manufacturing and processing.
 - iv. On-site dust or particulate generating processes.
 - v. On-site waste treatment, storage, or disposal.
 - vi. Vehicle and equipment fueling, maintenance, and/or cleaning (includes washing).
 - vii. Roofs or other surfaces exposed to air emissions from a manufacturing building or a process area.

- viii. Roofs or other surfaces composed of materials that may be mobilized by stormwater (e.g., galvanized roofs, galvanized fences, etc.).
- c. The inventory of materials must list:
 - i. The types of materials handled at the site that potentially may be exposed to precipitation or runoff and could result in stormwater pollution.
 - ii. A short narrative for each material describing the potential of the pollutant to be present in stormwater discharges. The Permittee must update this narrative when data become available to verify the presence or absence of these pollutants.
 - iii. A narrative description of any potential sources of pollutants from past activities, materials and spills that were previously handled, treated, stored, or disposed of in a manner to allow ongoing exposure to stormwater. Include the method and location of on-site storage or disposal. List significant spills and significant leaks of toxic or hazardous pollutants.
- 3. The Pollution Prevention Plan must identify specific individuals by name or title within the organization (pollution prevention team) whose responsibilities include: Pollution Prevention Plan development, implementation, maintenance, and modification.
- 4. Best Management Practices (BMPs)
 - a. The Permittee must describe each BMP selected to eliminate or reduce the potential to contaminate stormwater and/or waters of the state and prevent violations of water quality standards.
 - b. The Permittee must include each of the following mandatory BMPs in the Pollution Prevention Plan and implement the BMPs. The Permittee may omit individual BMPs if site conditions render the BMP unnecessary, infeasible, or the Permittee provides alternative and equally effective BMPs, if the Permittee clearly justifies each BMP omission in the Pollution Prevention Plan. The Permittee must document in the Pollution Prevention Plan that the BMPs selected are demonstrably equivalent to practices contained in stormwater technical manuals approved by Ecology.
 - i. Operational Source Control BMPs
 - 1) The Pollution Prevention Plan must include Operational Source Control BMPs listed as “applicable” in the *Stormwater Management Manual for Western Washington* (2019) or other guidance documents or manuals approved by Ecology.
 - 2) Good Housekeeping: The Pollution Prevention Plan must include BMPs that define ongoing maintenance and cleanup, as appropriate, of areas which may contribute pollutants to stormwater discharges. The Pollution Prevention Plan must include the schedule/frequency for completing each housekeeping task, based upon industrial activity, sampling results, and observations made during inspections. The Permittee must:

- a) Vacuum paved surfaces with a vacuum sweeper (or a sweeper with a vacuum attachment) to remove accumulated pollutants a minimum of once per quarter.
 - b) Identify and control all on-site sources of dust to minimize stormwater contamination from the deposition of dust on areas exposed to precipitation.
 - c) Inspect and maintain baghouses monthly to prevent the escape of dust from the system. Immediately remove any accumulated dust at the base of exterior baghouses.
 - d) Keep all dumpsters under cover or fit with a lid that must remain closed when not in use.
- 3) **Preventive Maintenance:** The Pollution Prevention Plan must include BMPs to inspect and maintain the stormwater drainage, source controls, treatment systems (if any), and plant equipment and systems that could fail and result in contamination of stormwater. The Pollution Prevention Plan must include the schedule/frequency for completing each maintenance task. The Permittee must:
- a) Clean catch basins when the depth of debris reaches 60% of the sump depth. In addition, the Permittee must keep the debris surface at least 6 inches below the outlet pipe.
 - b) Inspect all equipment and vehicles monthly for leaking fluids such as oil, antifreeze, etc. Take leaking equipment and vehicles out of service or prevent leaks from spilling on the ground until repaired.
 - c) Immediately clean up spills and leaks (e.g., using absorbents, vacuuming, etc.) to prevent the discharge of pollutants.
- 4) **Spill Prevention and Emergency Cleanup:** The Pollution Prevention Plan must include BMPs to prevent spills that can contaminate stormwater. The Pollution Prevention Plan must specify BMPs for material handling procedures, storage requirements, cleanup equipment and procedures, and spill logs, as appropriate. The Permittee must:
- a) Store all chemical liquids, fluids, and petroleum products, on an impervious surface that is surrounded with a containment berm or dike that is capable of containing 10% of the total enclosed tank volume or 110% of the volume contained in the largest tank, whichever is greater.
 - b) Prevent precipitation from accumulating in containment areas with a roof or equivalent structure or include a plan on how it will manage and dispose of accumulated water if a containment cover is not practical.
 - c) Locate spill kits within 25 feet of all stationary fueling stations, fuel transfer stations, and mobile fueling units. At a minimum, spill kits must include:

- i) Oil absorbents capable of absorbing 15 gallons of fuel.
 - ii) A storm drain plug or cover kit.
 - iii) A non-water containment boom, a minimum of 10 feet in length with a 12-gallon absorbent capacity.
 - iv) A non-metallic shovel.
 - v) Two five-gallon buckets with lids.
- d) Not lock shut-off fueling nozzles in the open position. Do not “top off” tanks being refueled.
- e) Block, plug, or cover storm drains that receive runoff from areas where fueling, during fueling.
- f) Use drip pans or equivalent containment measures during all petroleum transfer operations.
- g) Locate materials, equipment, and activities so that leaks are contained in existing containment and diversion systems (confine the storage of leaky or leak-prone vehicles and equipment awaiting maintenance to protected areas).
- h) Use drip pans and absorbents under or around leaky vehicles and equipment or store indoors where feasible. Drain fluids from equipment and vehicles prior to on-site storage or disposal.
- i) Maintain a spill log that includes the following information for chemical and petroleum spills: date, time, amount, location, and reason for spill; and date/time cleanup completed, notifications made, and staff involved.
- 5) Employee Training: The Pollution Prevention Plan must include BMPs to provide pollution prevention plan training for employees. At a minimum, the training plan must include:
- a) The content of the training:
 - i) An overview of what is in the Pollution Prevention Plan.
 - ii) How employees make a difference in complying with the Pollution Prevention Plan and preventing contamination of stormwater and/or waters of the state.
 - iii) Spill response procedures, good housekeeping, maintenance requirements, and material management practices.
 - b) How the Permittee will conduct the training.
 - c) The frequency/schedule of training. The Permittee must train employees annually, at a minimum.
 - d) A log of the dates on which specific employees received training.

- 6) Inspections and Recordkeeping: The Pollution Prevention Plan must include documentation of procedures to ensure compliance with permit requirements for inspections and recordkeeping. At a minimum, the Pollution Prevention Plan must:
- a) Identify facility personnel who will inspect designated equipment and facility areas as required by Condition S12.
 - b) Contain a visual inspection report or checklist that includes all items required by Condition S12.
 - c) Provide a tracking or follow-up procedure to ensure that a report is prepared and any appropriate action taken in response to visual inspections.
- 7) Illicit Discharges: The Pollution Prevention Plan must include measures to identify and eliminate the discharges of process wastewater, domestic wastewater, non-contact cooling water, and other illicit discharges, to stormwater sewers, or to surface waters, or ground waters of the state. The Permittee can find BMPs to identify and eliminate illicit discharges in Volume IV of the *Stormwater Management Manual for Western Washington* (2019).

Water from washing vehicles or equipment, steam cleaning and/or pressure washing is considered process wastewater. The Permittee must not allow this process wastewater to commingle with stormwater or enter storm drains.

ii. Structural Source Control BMPs

- 1) The Pollution Prevention Plan must include Operational Source Control BMPs listed as “applicable” in the *Stormwater Management Manual for Western Washington* (2019) or other guidance documents or manuals approved by Ecology.
- 2) The Pollution Prevention Plan must include BMPs to minimize the exposure of manufacturing, processing, and material storage areas (including loading and unloading, storage, disposal, cleaning, maintenance, and fueling operations) to rain, snow, snowmelt, and runoff by either locating these industrial materials and activities inside or protecting them with storm resistant coverings.

The Permittee must:

- a) Use grading, berming, or curbing to prevent runoff of contaminated flows and divert run-on away from these areas.
- b) Perform all cleaning operations indoors, under cover, or in bermed areas that prevent stormwater runoff and run-on and also that capture any overspray.

- c) Ensure that all wash water drains to a collection system that directs wash water to further treatment or storage and not to the stormwater drainage system.

iii. Treatment BMPs

The Permittee must:

- 1) Use Treatment BMPS consistent with the *Stormwater Management Manual for Western Washington* (2019) or other guidance documents or manuals approved by Ecology.
- 2) Employ oil/water separators, booms, skimmers, or other methods to eliminate or minimize oil and grease contamination of stormwater discharges.
- 3) Obtain Ecology approval before beginning construction/installation of all treatment BMPs that include the addition of chemicals to provide treatment.

iv. Stormwater Peak Runoff Rate and Volume Control BMPs

- 1) Facilities with new development or redevelopment must evaluate whether flow control BMPs are necessary to satisfy the state's AKART requirements and prevent violations of water quality standards. If flow control BMPs are required, they must be consistent with the *Stormwater Management Manual for Western Washington* (2019) or other guidance documents or manuals approved by Ecology.

v. Erosion and Sediment Control BMPs

The Pollution Prevention Plan must describe BMPs necessary to prevent erosion of soils and other earthen materials (crushed rock/gravel, etc.) and prevent off-site sedimentation and violations of water quality standards. The Permittee must implement and maintain:

- 1) Sediment control BMPs such as detention or retention ponds or traps, vegetated filter strips, bioswales, or other permanent sediment control BMPs to minimize sediment loads in stormwater discharges.
- 2) Filtration BMPs to remove solids from catch basins, sumps, or other stormwater collection and conveyance system components (filter socks, modular canisters, sand filtration, centrifugal separators, etc.).

5. Sampling Plan

The Pollution Prevention Plan must include a stormwater sampling plan. The plan must:

- a. Identify points of discharge to surface water, storm sewers, or discrete ground water infiltration locations such as dry wells or detention ponds.
- b. Include documentation on why each discharge point is not sampled (if applicable):

- i. Location of which discharge points the Permittee does not sample because pollutant concentrations are substantially identical to a discharge point being sampled.
 - ii. Reasons why the Permittee expects the discharge points to discharge substantially identical effluents.
 - iii. General industrial activities conducted in the drainage areas of each discharge point.
 - iv. Best Management Practices conducted in the drainage area of each outfall.
 - v. Exposed materials located in the drainage area of each discharge point that are likely to be significant contributors of pollutants to stormwater discharges.
 - vi. Impervious surfaces in the drainage area that could affect the percolation stormwater runoff into the ground (e.g., asphalt, crushed rock, grass, etc.).
- c. Identify each sampling location by its unique identifying number.
 - d. Identify staff responsible for conducting stormwater sampling.
 - e. Specify procedures for sample collection and handling.
 - f. Specify procedures for sending samples to a laboratory.
 - g. Identify parameters for analysis, holding times and preservative, laboratory quantitation levels, and analytical methods.
 - h. Specify the procedure for submitting results to Ecology.

C. Identifying and Evaluating Pollution Prevention Opportunities

1. Description of Current Pollution Prevention Activities

The plan must include a description of preventive measures and facilities already employed at the refinery to prevent, reduce, eliminate, or control releases of pollutants to influent wastewater streams, storm water, and/or waters of the state.

2. Description of Potential Pollutants and Sources

The pollution prevention plan must include a detailed description of the processes or activities that contribute or potentially contribute pollutants to the treatment plant influent, stormwater, groundwater, and wetlands. Influent wastewater streams must include those having daily average flow rates equal to or greater than 30 gallons per minute at the point where the wastewater stream enters the collection system, the catalytic wash water, spent caustic, and wash water waste streams. Minor incidental waste streams to stormwater, such as landscaping fertilizers, do not have to be included. The plan must identify the materials used, processed, stored, treated, or disposed of at the facility and the pollutants that are generated or potentially generated or released.

The level of detail provided in the plan should be sufficient to help identify and understand how and why materials are used and pollutants generated or released. Process flow diagrams and/or material input/output information must be included on a process unit basis.

The Permittee must include in the plan all materials which may become pollutants or cause pollution upon reaching state waters, including, but not limited to:

- Persistent bioaccumulative and toxic chemicals (PBTs),
- Oil and petroleum products, and
- Materials which, when spilled or otherwise released into the environment, would be designated Dangerous Waste (DW) or Extremely Hazardous Waste (EHW) by the procedures set forth in WAC 173-303-070.

In determining which sources and pollutants to address in the plan, the Permittee must use available sampling data, as well as knowledge of processes and materials, and available information on the relative toxicity or hazard of materials. Sources of PBTs must be included in the analysis. The Permittee must not be required to sample each stream analytically and may use engineering judgment to assess and quantify material inputs and outputs on a process unit basis.

3. Identification & Preliminary Evaluation of Pollution Prevention Opportunities

The plan must identify pollution prevention opportunities and provide a detailed analysis of each opportunity's technical (including safety considerations) and economic feasibility. Opportunities determined to be technically and economically feasible will be considered as known, available, and reasonable and therefore are required to be selected and scheduled for implementation. For each pollution prevention opportunity selected, the plan must identify the process(es) or activities it affects, an estimate of the amount of pollutants reduced, and the environmental or other benefits that will be achieved.

The Permittee must concentrate on opportunities that reduce or eliminate PBTs, priority pollutant metals, and methyldiethanolamine (MDEA) to influent and upstream flows to the oily water sewer. Solids and hydrocarbon loadings to the oily water sewer must also be evaluated. Stormwater must be evaluated for oil and grease and solids loading as well as toxics.

In identifying and evaluating pollution prevention opportunities, the Permittee must consider the following:

- All reasonably expected activities and conditions, such as normal operations, maintenance, and other ancillary activities; equipment failure; improper operation; upsets, accidents, spills, leaks; and natural events such as rainfall, snowfall, etc.
- All areas of the refinery with potential to generate water pollutants including process units, raw material and product storage, handling and transfer facilities, material handling areas, maintenance areas, solid and hazardous waste storage, treatment, and disposal, and stormwater systems.

The following are examples of pollution prevention strategies that may warrant evaluation:

- Improving and/or establishing new management practices and standard operating procedures addressing: increased training or supervision; improvements in inventory control, materials and waste handling, general operations, and housekeeping; preventive maintenance; and remedial measures
- Process or equipment modifications, including re-engineering processes to use less toxic input materials or to utilize by-products
- Material substitution
- Reducing material inputs
- Recycle/reuse of refinery waste, by-products, or process materials and fluids
- Application of water conservation methods, including water reuse
- Waste segregation and separation
- Alternative and/or enhanced treatment technology, including upstream treatment of pollutants

Cross-media shift of pollutants should be avoided, unless a clear net environmental benefit results and compliance with standards applicable to other media or management programs would be maintained.

4. Prioritization & Selection of Pollution Prevention Opportunities

The plan must prioritize pollution prevention opportunities. The Permittee must provide their rationale for how the pollution prevention opportunities are prioritized. In addition to technical and economic feasibility, other factors may influence ranking of opportunities and should be included in the discussion. These factors may include capital projects planned or ongoing at the refinery that will provide a benefit to environmental media other than water, corresponding reduction in safety risks, etc.

Projects that achieve the highest environmental benefit must have greater priority. In prioritizing and selecting pollution prevention opportunities, the Permittee must give preference first to those that eliminate, avoid, or reduce the generation of water pollutants at the source, second to those that recycle or reuse the pollutants, and third to those that provide at-source or near-source treatment to remove pollutants or render them less toxic or harmful. In ranking opportunities, the Permittee must also consider pollutant loading and toxicity and the potential to achieve the greatest reduction with respect to time and costs.

The Permittee is expected to establish reasonable priorities and schedules for implementation to achieve the greatest reduction in pollutant quantity and toxicity, as well as for management and fiscal necessity.

Appendix C

Filter Backwash Water Mixing Study

A. General requirements

The Permittee must:

1. Submit a Filter Backwash Mixing Study Plan to Ecology for review and comment by March 1, 2022, prior to initiation of the filter backwash water mixing study.
2. Follow the Guidance for Conducting Mixing Zone Analyses (Appendix C of Ecology's *Permit Writer's Manual*, 2018) and the protocols identified in Subsection C below.
3. Include the results of the mixing study in a Filter Backwash Water Mixing Report and submit it to Ecology for approval with the Engineering Report required in Special Condition S17.D of this permit.
4. If the results of the mixing study and chemical analysis required in Special Condition S17. indicate that the concentration of any pollutant exceeds or has a reasonable potential to exceed the state water quality standards, Chapter 173-201A WAC, Ecology may issue an administrative order to require a reduction of pollutants or modify this permit to impose effluent limits to meet the water quality standards.

B. Reporting requirements

The mixing zone study must include:

1. A statement confirming that AKART has been applied to the discharge.
2. A description of the size of the mixing zone allowed under Chapter 173-201A WAC.
3. An analysis showing how mixing zones have been minimized using the lowest dilution from hydraulic limitations, width limitations, distance limitations and those predicted by the model.
4. A clear description of the critical conditions used for dilution factors:
 - a. For ambient freshwater (unidirectional flow) use 7Q10 flows for acute, chronic and non-carcinogenic pollutants, and harmonic flow for carcinogens.
 - b. For ambient marine waters (and reversing flows e.g., tidally-influenced rivers) use 10th or 90th percentile current velocity for acute and 50th percentile tidal current velocity for chronic, carcinogens and non-carcinogens.
 - c. Generally, use depth of outfall at 7Q10 flows (rivers) or at MLLW (marine environment). For assessing human health in freshwater, depths of outfall should be established at the applicable flow (e.g. harmonic mean flow or 30Q5 flows). For tidally influenced rivers a combination of MLLW and critical river flows should be used to establish depth of outfall.
 - d. Use a density profile that gives the lowest dilution. Evaluate both maximum and minimum stratification. For human health, use average density profiles to estimate dilution.

- e. For unidirectional flow use centerline dilution factor for acute and chronic conditions and flux average for human health dilution factors. For marine environment or rivers with reversing flows, use flux-average dilution factors for all conditions.
5. Discharge characteristics:
 - a. Existing and projected maximum daily, maximum monthly average, and annual average flows.
 - b. Discharge density (temperature and salinity).
6. Ambient water characteristics:
 - a. Critical stream flow statistics (7Q10, 30Q5, harmonic flow).
 - b. Velocity profile in the vicinity of the diffuser.
 - c. Temporal density (temperature and salinity) profiles near the diffuser. May need to consider both seasonal and tidal variability.
 - d. Manning's roughness coefficient, if used.
 - e. Available information regarding background concentrations of chemical substances in the receiving water for which there are criteria in Chapter 173-201A WAC.
7. Model selection and results:
 - a. Model selection and application discussion. Consider model applicability to submerged, surface or above-surface discharge, buoyant or non-buoyant discharge, and potential plume attachment to boundaries.
 - b. Description of mixing and plume dynamics (nearfield, farfield, tidal buildup/reflux).
 - c. Sensitivity analysis.
 - d. Calibration to empirical data (tracer studies), if applicable.
 - e. Provide model output and summary table of results.

C. Protocols

The Permittee must determine the dilution ratio using protocols outlined in the following references, approved modifications thereof, or by another method approved by Ecology:

1. Doneker, R.L. and G.H. Jirka, *CORMIX User Manual: A Hydrodynamic Mixing Zone Model and Decision Support System for Pollutant Discharges into Surface Waters*, EPA-823-K-07-001, Dec. 2007. <http://www.mixzon.com/downloads/>.

A complete list of general reference for CORMIX is at:
<http://www.cormix.info/references.php>

2. Frick, W.E., Roberts, P.J.W., Davis, L.R., Keyes, D.J., Baumgartner, George, K.P. 2003. *Dilution Models for Effluent Discharges, 4th Edition (Visual Plumes)*. Ecosystems Research Div., USEPA, Athens, GA, USA.

3. Ecology, Water Quality Program, *Permit Writer's Manual*. 2015. Washington State Department of Ecology. Publication No. 92-109, Revised January 2015.
<https://fortress.wa.gov/ecy/publications/documents/92109.pdf>.
4. Ecology, Guidance for conducting mixing zone analysis (Appendix C, Water Quality Program, *Permit Writer's Manual*. 2015)
<https://fortress.wa.gov/ecy/publications/parts/92109part1.pdf>.
5. Kilpatrick, F.A., and E.D. Cobb, *Measurement of Discharge Using Tracers, Chapter A16, Techniques of Water-Resources Investigations of the USGS*, Book 3, Application of Hydraulics, USGS, U.S. Department of the Interior, Reston, VA, 1985.
6. Wilson, J.F., E.D. Cobb, and F.A. Kilpatrick, *Fluorometric Procedures for Dye Tracing, Chapter A12. Techniques of Water-Resources Investigations of the USGS*, Book 3, Application of Hydraulics, USGS, U.S. Department of the Interior, Reston, VA, 1986.