MARYLAND DEPARTMENT OF THE ENVIRONMENT
WATER & SCIENCE ADMINISTRATION

Toxic Pollutant Monitoring Protocol and Reporting Requirements for Toxic Chemical Testing Analytical Data

Revised 12/5/23: Deleted 4,6-Dinitro-O- Cresol (from Table 2) and revised footnote b, **Revised 10/4/23:** Parameters and RLs updated, **Revised 8/18/22:** RL Table updated, **Revised December 2, 2019:** RL Table Updated; **Revised September 10, 2019:** RLs Table Updated; **Revised August 14, 2018:** MDL revision 1.11 to revisions 2. 40 CFR link revised; **Revised September 18, 2017:** Added Nonylphenol and lowered LOQ for Cu and Acrolein; **Revised 5/18/2011:** Modified PP list to conform with 40 CFR. 423; **Revised April 12, 2011**: PCB by 1668 removed; **Revised November 11, 2010**: Clarify detection limit with the addition of LOQ, Added PCB by 1668 protocol, lowered LOQs for pollutants to WQ criteria; **Revised April 14, 2009:** Teflon and glass sampling req.'s added for semi-volatiles; **Revised March 17, 2009:** Removed HCA; **Revised July 2, 2007:** Asbestos added, and 2,3,7,8-TCDD footnote added.

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Executive Summary

Wastewater monitoring for toxic pollutants are fundamental tools in the assessment of Water quality. The purpose of toxic chemical testing is to obtain information about the chemical characteristics of discharges to the surface waters so that any environmental risks it poses can be adequately evaluated. The analytical data provided is used for the management of water resources and provide essential information characterizing the physical, chemical and biological status of Maryland's surface water. The data is essential for the evaluation of any developments and changes over time of the health of Maryland's water resources. Toxic chemical monitoring can help predict and identify developing water quality issues. The data helps in identifying toxic pollutants responsible for any toxicity detected with the concurrently run whole effluent toxicity (WET) testing. This data can help mitigate the expenses of a full-blown TRE if toxicity is observed during the WET testing.

Definitions:

1. **Level of Quantification (LOQ)*** is defined as the lowest concentration of an analyte that can be reliably measured within specified limits of precision and accuracy for a specific laboratory analytical method and that takes into account analytical adjustments made during sample preparation and analysis.

2. **Method detection limit (MDL)** is defined as the minimum measured concentration of a substance that can be reported with 99% confidence that the measured concentration is distinguishable from method blank results.

3. **Minimum level (ML)** * refers to the sample concentration. equivalent to the lowest calibration point in a method or a multiple of the. method detection limit (MDL). It is a quantitation **level** that corresponds to the lowest **level** at which the entire analytical system gives reliable signals and an acceptable calibration point or a multiple of the MDL

4. **Sufficiently sensitive method where:**
    A. The method minimum level is at or below the level of the applicable water quality criterion or permit limitation for the measured analyte or

    B. The method minimum level is above the applicable water quality criterion, but the amount of the pollutant or pollutant parameter in a facility's discharge is high enough that the method detects and quantifies the level of the pollutant or pollutant parameter in the discharge or

    C. The method has the lowest minimum level of the EPA-approved analytical methods

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*For the purpose of this protocol MDE considers the following terms related to analytical method sensitivity to be synonymous: ‘‘quantitation limit,’’ ‘‘reporting limit,’’ ‘‘level of quantitation,’’ “limit of Quantitation” and ‘‘minimum level.’’

A. Toxic Pollutant Monitoring Protocol and Reporting Requirements for Toxic Chemical Testing Analytical Data

- It is the responsibility of the permittee to assure that applicable sampling and analytical methodology is used to fulfill permit requirements. The Department strongly suggests that the permittee discuss these requirements with an environmental analytical laboratory familiar with wastewater methods as approved by EPA and listed in 40 CFR Part 136 or other methods approved by EPA for wastewater.

- All testing of wastewater must be performed using sampling and analytical methods for wastewater found in the most recent 40 CFR Part 136 (found at the following website: http://bit.ly/40CFR_Part136).

- The permittee shall collect 24-hr flow proportioned samples unless the Department has given prior approval for an alternate sample type.

- To determine compliance with numerical permit limitations, unless otherwise specified in the permit, the analytical methods shall include:

  a. Any approved method with a Method Detection Level (MDL) adequate to detect concentrations of at least one-tenth the level of the permit limitation and the laboratory’s limit of quantitation (LOQ) or Minimum Level must be below the permit limitation or

  b. If there is no approved method sensitive to at least one-tenth of the permit limitation, then the most sensitive method approved in 40 CFR Part 136 or other method approved by EPA for wastewater is required with an appropriate Minimum Level.

  c. For parameters without a permit limitation, permittees should choose a method that can quantify down to the sensitivity of the water quality criterion and follow USEPA’s Sufficiently Sensitive Method Rule (See https://www.govinfo.gov/content/pkg/FR-2014-08-19/pdf/2014-19265.pdf)

- To fulfill monitoring only requirements or for special studies, the method with the lowest achievable detection level and minimum level must be used unless the Department determines an alternate detection level and minimum level is adequate for the particular purpose of the monitoring event. If it is known that the concentration of the target analyte present is above the most sensitive method, then less sensitive methods that can quantify below the critical value or permit limitation can be utilized. These methods must be approved by 40 CFR Part 136 or are other methods approved by EPA for wastewater analysis. However, if after analysis, the target analyte is not detected, the sample must be reanalyzed using more sensitive 40 CFR Part 136 or

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other methods approved by EPA for wastewater. The testing laboratory's level of Quantitation (LOQ) must also be low.

- If the desired LOQ using the above protocol cannot be attained due to matrix interference, current QA/QC protocols to verify that claim will still be in effect.

- The MDL is defined as the minimum concentration that can be measured and reported with 99 percent confidence that the concentration is greater than zero, but the exact concentration cannot be reliably quantified.

- Quantitation Limit or LOQ is defined as the lowest concentration of an analyte that can be reliably measured within specified limits of precision and accuracy for a specific laboratory analytical method and that takes into account analytical adjustments made during sample preparation and analysis.

B. Reporting Requirements For Toxic Chemical Testing Analytical Data

- **Background:** The Maryland Department of the Environment (MDE), Water & Science Administration (WSA) has compiled the following guidelines for reporting analytical data from priority pollutant analyses. These guidelines were formulated in an effort to standardize evaluations of priority pollutant data submitted to the Department. The following reporting requirements were compiled directly from quality control procedures required in the individual analytical methods, information obtained from EPA, and best professional judgment by MDE staff.

- **Toxic Chemical Testing Reporting Requirements:** The results from toxic chemical testing shall be reported in a concise easily understood manner. The report shall include a simple table of contents, sample collection/preservation documentation, a tabular summary of analytical data, and quality assurance data. The information to be included in the report as described below.

I. Sample Collection & Preservation Documentation

1. Chain of custody forms, which shall include the following information:

    - The sample source (e.g. name of facility)
    - The sample collection location (e.g. Outfall 001A), date & time (start and finish)
    - The sampling method (e.g. composite or grab)
    - The sampler's signature and date and time
    - The signatures of every person receiving custody of the sample prior to use in testing, dates and times of receipt (no broken chains allowed)
    - A description of sample condition upon arrival at the laboratory
    - Comments (as appropriate)

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2. A description of sample preservation and treatment techniques (i.e., All samples must be refrigerated during holding and transport to the testing laboratory and chemical preservation must be performed at the time of collection. To ensure that preservation required under 40 CFR is followed, the collector and the laboratory must track and document the temperature and chemical preservation of the samples. The laboratory must verify and document all chemical preservation such as pH adjustment and the temperature of the samples upon arrival at the lab).

3. All composite samples for organic compounds must be collected using Teflon tubing and composited into glass containers.

II. Analytical Results

- Analytical results and quantitation levels achieved, not method detection levels for each parameter or analyte. The reporting limit shall not be lower that the lowest calibration standard analyzed with the run. If the target analyte is detected at a concentration or level between the MDL and the LOQ/ Reporting limit, the estimated results must be reported with a qualifier.
- Report date and time of extraction of primary sample, QC samples and other samples associated with primary sample analytical run.
- Report date and time of initial sample preparation prior to final analysis.
- Report date and time of sample analysis
- Report analytical methods used (the method number and text reference including edition is sufficient)
- Report any deviations taken from analytical methods
- Report all steps and target sample manipulations taken to overcome matrix interferences e.g. dilution, and amount, chemical additions, manual integrations

III. Quality Assurance Data:

- Quality assurance data is collected to document the accuracy and precision of the analytical method. Quality assurance data, which are required by the analytical methods, are collected by the analytical laboratory at method or regulatory specified frequencies, whichever is more frequent. (e.g. usually with each set of samples analyzed or every 10% of samples analyzed (See 40 CFR Part 136.7 https://www.ecfr.gov/cgi-bin/text-idx?SID=e8f8542494abd894111c1d28ce7e58f4&mc=true&node=se40.25.136_17&rgn=div8)
- Annual method detection limit (MDL) studies must be conducted to establish the laboratory's ability to detect analytes at low levels. The laboratory must determine the MDL in accordance with the procedure in 40 CFR 136, Appendix B Revision 2 using the apparatus, reagents, and

standards that will be used in the practice of this method (See https://www.ecfr.gov/cgi-bin/text-idx?SID=e8f8542494abd894111c1d28ce7e58f4&mc=true&node=ap40.25.136_17.b&rgn=div9)

- The laboratory must have documents verifying an initial demonstration of capability for each reported analyte and records documenting the proficiency of each analyst conducting the testing.
- The analysis of duplicates, matrix spikes (MS) and matrix spike duplicates (MSD) are required to demonstrate accuracy and precision and to monitor matrix interferences.
- The analyses of blanks are required to demonstrate acceptable levels of contamination.
- The laboratory must demonstrate on an ongoing basis that the analytical system is in control through the analysis of reagent blanks (LRB), laboratory fortified blanks (LFB) and quality control samples (QCS). The laboratory must analyze at least one LFB with each batch of samples and calculate accuracy as percent recovery. The laboratory must use LFB analyses data to assess the performance of the laboratory against established control limits of preferably 90-110%. The control limits will vary by analyte and test method but should fall within the acceptance range specified in the specific test method and or assigned value of the QCS. QCS show the ability of the laboratory to report analytical results of known documented quality. QCS and LFB results falling outside of the acceptance criteria is sufficient reason to reject sample results from that run. Samples must then be reanalyzed.

IV. Organic Tests

The following information is required for each organic analysis (e.g. volatiles, semi-volatiles, pesticides / Aroclors and PCBs)

Trip, Field, Equipment and Method blank[1] results (i.e. Method blank: An aliquot of reagent water that is treated exactly as a sample including exposure to all glassware, equipment, solvents, reagents, internal standards, and surrogates that are used with samples. The method blank is used to determine if target analytes or interferences are present in the laboratory environment, the reagents, or the apparatus. Method Blanks must the analyzed at the original concentration with no dilution factors. If method blanks show detectable results of the target analyte, then the sample values from the runs should be flagged or qualified. Field blank is an aliquot of reagent water or other reference matrix that is placed in a sample container in the field, and treated as a sample in all respects, including exposure to sampling site conditions, storage, preservation, and all analytical procedures. The purpose of the field blank is to determine if the field or sample transporting procedures and environments have contaminated the sample. A trip blank is a sample of analyte- free reagent water or media collected in the same type of container that is required for the analytical testing of volatile organic compounds and taken from the laboratory or the beginning of the sampler's route to the sampling site and returned to the laboratory unopened.) Rinsate blanks are blanks that are utilized to assess analyte contamination of the sampling apparatus used

for the collection of samples. These blanks consist of analyte-free water that is used to rinse the sampling equipment and collected after the sampling equipment has been thoroughly cleaned or decontaminated prior to sampling.

- Surrogate spike results and acceptable surrogate spike recovery range[2] (i.e. analysis of surrogate compounds added to each environmental sample for documentation of instrument response and extraction efficiency).
- Matrix spike & matrix spike duplicate results[2] to access acceptable recovery range[3] (i.e. Matrix spike/matrix spike duplicate (MS/MSD))—An aliquot of an environmental sample to which a known quantity of the method analyte is added in the laboratory and then analyzed in the same manner as the sample. The spiking concentration must be high enough to be detected above the original sample and should not be less than four times the MDL. In addition, the spiking concentration should be at the same concentration as the laboratory fortified blank. The purpose of the MS/MSD is to determine whether the sample matrix contributes bias to the analytical results.).
- Duplicate analysis of the environmental sample to access the precision of the analytical system.
- Quality control check standard results[3] (i.e. EPA/NELAC approved or QCS traceable to NIST standards obtained from a source that is different from the instrument calibration standards).
- Laboratories must minimize manual integration by properly maintaining the instrument, updating retention times, and configuring peak integration parameters, etc., On occasion manual integration may be necessary due to a variety of matrix effects so each laboratory must have a documented policy or guidelines, which **defines proper methods for performing manual integrations when they are necessary**. The policy must follow analytically and **scientifically sound manual integration practices and detail or specify proper methods for performing manual integrations when they are necessary.**

V. Inorganic Tests

The following information is required for each separate inorganic analysis:

- Equipment, Field and Method blank results[1]
- MS and MSD results[2] and acceptable recovery range[3] (i.e. Matrix spike/matrix spike duplicate (MS/MSD) — An aliquot of an environmental sample to which a known quantity of the method analyte is added in the laboratory and then analyzed in the same manner as the sample. The purpose of the MS/MSD is to determine whether the sample matrix contributes bias to the analytical results).
- Duplicate analysis of the environmental sample to access the precision of the analytical system.

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- Quality control check standard results[3] (i.e. EPA/NELAC approved or QCS traceable to NIST standards obtained from a source that is different from the instrument calibration standards).

Note:

In recognition of the ongoing advances occurring in analytical technology, and allowable modifications under 40 CFR Part 136.6. The laboratory or analyst is permitted certain options or modifications to improve analysis or lower the costs of testing or allow the analyst to overcome sample matrix interferences. These modifications include alternate extraction, concentration, cleanup procedures, and changes in columns, instrumentation and detectors. However, alternate analytical or determinative techniques and method procedural changes that degrade method performance are **not** allowed.

If method modifications are used, those techniques must have an analytical accuracy equal to or better than the accuracy of the techniques in the established methods for the target analytes of interest. If the underlying chemistry and determinative technique in a modified method are essentially the same as an approved Part 136 method, then the modified method is an equivalent and acceptable alternative to the approved method provided the requirements of 40 CFR Part 136.6 are successfully met (See https://www.ecfr.gov/cgi-bin/text-idx?SID=e8f8542494abd894111c1d28ce7e58f4&mc=true&node=se40.25.136_16&rgn=div8) Documentation of the equivalency of the modifications as specified by 40 CFR Part 136.6 must be kept on file by the laboratory for review by MDE auditors or inspectors.

Footnotes to Sections IV and V:

[1] *Method blanks, duplicates, matrix spikes (MS), and matrix spike duplicates (MSD) shall be performed at or above the minimum frequency specified in the test method (e.g. usually 5% -10% of samples analyzed or once per each batch of samples analyzed, whichever is more frequent). If matrix interferences are suspected, it is recommended that recovery rates for the target analytes of these samples are determined with the use of MS and MSD (Sample results shall be qualified by the laboratory based upon these results or reanalysis may be necessary).*

[2] *The source of acceptable matrix spike and surrogate spike recovery ranges shall also be stated (e.g. from EPA method specifications or from laboratory control charts).*

[3] *Frequency of analysis of QCS will vary depending on recoveries of matrix and surrogate spikes. The results of QCS that fall outside of the acceptance range may indicate that the laboratory's analytical system is out of control or that the target analytes have been estimated (Sample results shall be qualified by the laboratory based upon these results or reanalysis may be necessary).*

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Table: Required Toxic Chemical Analytes

Toxic Substances Criteria for Inorganic Substances

Number	Parameter	Cas Number	Minimum Reporting Limit (MRL) µg/L, except as noted [a]			
			Discharges to Fresh Water	Discharges to Estuarine Water	Discharges to Salt Water	Discharges to Meet Human Health Criteria
1	Aluminum*	7429-90-5	5.4**		5.4**	
2	Antimony*	7440360	0.12**		0.12**	5.6
3	Arsenic*	7440382	(0.5)**		(0.5)**	0.18
4	Arsenic $^{+3}$ (inorganic Arsenic)					1.4 Organism only
5	Asbestos [b]	1332214	0.2 MFL (million fibers per liter)		0.2 MFL (million fibers per liter)	7 MFL (million fibers per liter)
6	Barium*	7440393	0.12**		0.12**	1,000
7	Beryllium*	7440417	0.064**		0.064**	4
8	Cadmium*	7440439	0.096**		0.096**	5
9	Chromium (total)*	7440473	0.26**		0.26**	100
10	Chromium VI	18540299	0.96**		0.96**	0.1
11	Cobalt*	7440-48-4	0.013**		0.013**	
12	Copper*	7440508	0.064**	6.1	0.064**	1,300
13	Cyanide (total)	57125	5***		5***	
14	Cyanide (free or available) [c]	57125	2****		2****	140
15	Iron*	7439-89-6	0.1**		0.1**	
16	Lead*	7439921	0.15**		0.15**	15
17	Mercury*	7439976	0.0005*****		0.0005*****	2

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Table: Required Toxic Chemical Analytes

Toxic Substances Criteria for Inorganic Substances

Number	Parameter	Cas Number	Minimum Reporting Limit (MRL) µg/L, except as noted[a]			
			Discharges to Fresh Water	Discharges to Estuarine Water	Discharges to Salt Water	Discharges to Meet Human Health Criteria
18	Nickel*	7440020	0.20**		0.20**	610
19	Selenium*	7782492	2.0**		2.0**	50
20	Silver*	7440224	0.12**		0.12**	100
21	Thallium*	7440280	0.064**		0.064**	0.24
22	Zinc*	7440666	0.32**		0.32**	7,400

***Measured as Total Recoverable Metals.*

***Reporting limit is the calculated minimum level (ML)[d] using the analyte specified MDLs in EPA Method 200.8 Rev. 5.34*

**** Reporting limit is the calculated minimum level (ML)[d] using the analyte specified MDLs in* Kelada-01.

***** Reporting limit is the calculated minimum level (ML)[d] using the analyte specified MDLs in EPA Method* OIA–1677–09,

****** Reporting limit is the calculated minimum level (ML)[d] using the analyte specified MDL in EPA Method 1631 Rev. E*

[a] *In those cases where numerical toxic substance criteria for aquatic life protection and protection of human health* both apply, the most restrictive of the criteria shall be used.

[b] *Analysis by EPA Method 100.2 - Only asbestos structures greater than 10 µm are counted in this method. Therefore, analytical laboratories testing wastewater from facilities that discharge to surface waters that are used for public drinking water supply must use a 0.1 µm pore size polycarbonate or MCE filter membrane to prevent loss of small asbestos fibers during filtration at the time of analysis or use* ***EPA Method 100.1***.

[c] *Cyanide (free or available) shall be measured as either free cyanide or cyanide amenable to chlorination.*

[d] *Minimum Level (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 all method-specified sample weights, volumes, and cleanup procedures have been employed. The ML is calculated by multiplying the MDL by 3.18 and rounding the result.*

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Table 2: Required Toxic Chemical Analytes: Organic Compounds

Number	Parameter	CAS Registry Number	Minimum Reporting Limit (RL) µg/L, except as noted [c]		
			Discharges to Fresh Water	Discharges to Salt Water	Discharges to Meet Human Health Criteria [e]
1	1,1 Dichloroethene (DCE)	75354	0.5	0.5	7
2	1,1,1-Trichloroethane (TCA)	71556	0.5	0.5	200
3	1,1,2,2-Tetrachloroethane	79345	0.5	0.5	1.7
4	1,1,2-Trichloroethane	79005	0.5	0.5	5
5	1,2,4-Trichlorobenzene	120821	0.5	0.5	35
6	1,2,4,5-Tetrachlorobenzene	95943	1	1	0.03
7	1,2-Dichlorobenzene	95501	1	1	600
8	1,2-Dichloroethane	107062	0.5	0.5	5
9	1,2-Dichloropropane	78875	0.5	0.5	5
10	1,2-Diphenylhydrazine	122667	1.4	1.4	0.3
11	1,2-Trans-Dichloroethylene	156605	0.3	0.3	100
12	1,3-Dichlorobenzene	541731	1	1	320
13	1,3-Dichloropropene	542756	1	1	3.4
14	1,4-Dichlorobenzene	106467	1	1	75
15	2,4,5-Trichlorophenol	95954	2	2	300
16	2,4,6-Trichlorophenol	88062	2.0	2.0	14
17	2,4-Dichlorophenol	120832	1.5	1.5	77
18	2,4-Dimethylphenol	105679	1.5	1.5	100
19	2,4-Dinitrotoluene	121142	0.5	0.5	1.1
20	2-Chloronapthalene	91587	2.8	2.8	800
21	2-Chlorophenol	95578	3	3	81
22	2-Methyl-4,6-Dinitrophenol	534521	6	6	2
23	3,3-Dichlorobenzidine	91941	1.5	1.5	0.49

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Table 2: Required Toxic Chemical Analytes: Organic Compounds

Number	Parameter	CAS Registry Number	Minimum Reporting Limit (RL) µg/L, except as noted [c]		
			Discharges to Fresh Water	Discharges to Salt Water	Discharges to Meet Human Health Criteria [e]
24	3-Methyl-4-Chlorophenol (Parachlorometa Cresol)	59507	3.5	3.5	500
25	Acrolein	107028	2.5	2.5	6
26	Acrylonitrile	107131	1.6	1.6	0.61
27	Benzene	71432	0.6	0.6	5
28	Benzidine	92875	1	1	0.0014
29	Bis(2-Chloroethyl) Ether	111444	1	1	0.3
30	Bis2(Chloroisopropyl) Ether	108601	2.5	2.5	200
31	Bromoform[b]	75252	0.6	0.6	See Trihalomethanes
32	Carbon tetrachloride	56235	0.4	0.4	4
33	Chlorobenzene	108907	0.8	0.8	130
34	Chlorodibromomethane[b]	124481	0.3	0.3	8
35	Chloroform[b]	67663	0.2	0.2	60
36	Chlorophenoxy Herbicide (2,4-D)	94757	0.35	0.35	1300
37	Chlorophenoxy Herbicide (2,4,5-TP)	93721	0.13	0.13	100
38	Dichlorobromomethane[b]	75274	0.35	0.35	See Trihalomethanes
39	Dinitrophenols	25550587	4	4	10
40	Ethylbenzene	100414	0.7	0.7	530
41	Hexachlorobenzene	118741	0.2	0.2	0.00079
42	Hexachlorobutadiene	87683	1.1	1.1	4.4

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Table 2: Required Toxic Chemical Analytes: Organic Compounds

Number	Parameter	CAS Registry Number	Minimum Reporting Limit (RL) µg/L, except as noted [c]		
			Discharges to Fresh Water	Discharges to Salt Water	Discharges to Meet Human Health Criteria [e]
43	Hexachlorocyclopenta-diene	77474	1.3	1.3	4
44	Hexachloroethane	67721	0.2	0.2	14
45	Hexachlorocyclohexane (HCH)-Technical Mixture	608731	0.1	0.1	0.066
46	Isophorone	78591	2.5	2.5	340
47	Methoxychlor	72435	0.6	0.6	0.02
48	Methyl bromide	74839	1.6	1.6	100
49	Methylene chloride AKA Dichloromethane, (DCM)	75092	0.8	0.8	5
50	Nitrobenzene	98953	2.5	2.5	10
51	N-Nitrosodimethylamine	62759	0.5	0.5	0.0069
52	N-Nitrosodi-n-Propylamine	621647	1.3	1.3	0.05
53	N-Nitrosodiphenylamine	86306	2.5	2.5	33
54	Nonylphenol	84852153	6.6	1.7	NA
55	Phenol	108952	0.5	0.5	4000
56	Tetrachloroethylene	127184	0.2	0.2	5
57	Toluene	108883	0.7	0.7	1000
58	Trichloroethylene (TCE)	79016	0.4	0.4	5
59	Trihalomethanes[b]				80
60	Vinyl chloride (Chloroethylene)	75014	0.3	0.3	0.22
61	Acenaphthene	83329	1.3	1.3	*70*
62	Anthracene	120127	1.3	1.3	*300*

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Table 2: Required Toxic Chemical Analytes: Organic Compounds

Number	Parameter	CAS Registry Number	Minimum Reporting Limit (RL) µg/L, except as noted [c]		
			Discharges to Fresh Water	Discharges to Salt Water	Discharges to Meet Human Health Criteria [e]
63	Benzo(a)Anthracene	56553	0.03	0.03	*0.012*
64	Benzo(a)Pyrene	50328	0.06	0.06	*0.0012*
65	Benzo(b)Fluoranthene	205992	0.057	0.057	*0.012*
66	Benzo(k)Fluoranthene	207089	0.05	0.05	*0.12*
67	Chrysene	218019	0.47	0.47	*0.038*
68	Dibenzo(a,h)Anthracene	53703	0.09	0.09	*0.0012*
69	Fluoranthene	206440	0.6	0.6	*20*
70	Fluorene	86737	0.6	0.6	
71	Ideno(1,2,3-cd)Pyrene	193395	0.1	0.1	0.012
72	Pyrene	129000	0.85	0.85	20
73	Bis(2-Ethylhexyl) Phthalate	117817	3	3	3.2
74	Butylbenzyl Phthalate	85687	0.9	0.9	1
75	Diethyl Phthalate	84662	1.5	1.5	600
76	Dimethyl Phthalate	131113	0.9	0.9	2000
77	Di-n-Butyl Phthalate	84742	1	1	20
78	2, 3, 7, 8-TCDD (Dioxin)	1746016	1.5	1.5	0.00000005
79	4,4'-DDD	72548	0.0013	0.0013	0.0012
80	4,4'-DDE	72559	0.0013	0.0013	0.00018
81	4,4'-DDT	50293	0.001	0.001	0.0003
82	Aldrin	309002	0.0013	0.0013	0.0000077
83	Alpha-BHC	319846	0.0013	0.0013	0.0036

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Table 2: Required Toxic Chemical Analytes: Organic Compounds					
			Minimum Reporting Limit (RL) µg/L, except as noted [c]		
Number	**Parameter**	**CAS Registry Number**	**Discharges to Fresh Water**	**Discharges to Salt Water**	**Discharges to Meet Human Health Criteria** [e]
84	Alpha-Endosulfan	959988	0.056	0.0087	20
85	Atrazine	1912249	0.046	0.046	3
86	Beta-BHC	319857	0.0013	0.0013	0.08
87	Beta-Endosulfan	33213659	0.056	0.0087	20
88	Carbaryl	63252	2.1	1.6	
89	Chlordane (Technical Mixture)	57749	0.0043	0.004	0.0031
90	Chlorpyrifos	2921882	0.041	0.0056	
91	Diazinon	333415	0.17	0.82	
92	Dieldrin	60571	0.056	0.0019	0.000012
93	Endosulfan Sulfate	1031078	0.0013	0.0013	20
94	Endrin	72208	0.036	0.0023	0.059
95	Endrin Aldehyde	7421934	0.0013	0.0013	1
96	gamma-BHC (Lindane)	58899	0.95	0.16	4.2
97	Heptachlor	76448	0.0038	0.0036	0.000059
98	Heptachlor Epoxide	1024573	0.0038	0.0036	0.00032
99	Total Polychlorinated Biphenyls (PCBs)[d]		0.014	0.03	0.00064
100	Toxaphene	8001352	0.002	0.002	0.007
101	Tributyltin (TBT, total)		0.072	0.0074	
102	Pentachlorobenzene	608935	1.2	1.2	0.1
103	Pentachlorophenol (PCP)	87865	15	7.9	2.7
Priority Pollutants from 40 CFR Part 423 Appendix A					
104	2,6-Dinitrotoluene	606202	0.5	0.5	
105	Bromophenyl Phenyl Ether	*101553*	3	3	

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Number	Parameter	CAS Registry Number	Minimum Reporting Limit (RL) µg/L, except as noted [c]		
			Discharges to Fresh Water	Discharges to Salt Water	Discharges to Meet Human Health Criteria [e]
106	4-Chlorophenyl Phenyl Ether	*7005723*	3	3	
107	Chloroethane	*75003*	0.25	0.25	
108	2-Chloroethyl Vinyl Ether	*110758*	4.8	4.8	
109	Bis(2-chloroethoxy) methane	*111911*	1.5	1.5	
110	*Methyl Chloride* (Chloromethane)	*74873*	0.25	0.25	
111	Naphthalene	*91203*	1.5	1.5	
112	*2, 4-Dinitrophenol*	*51285*	1	1	
113	*2-Nitrophenol*	*88755*	1	1	
114	*4-Nitrophenol*	*100027*	1	1	
115	Di-n-octyl phthalate	*117840*	3	3	
116	Acenaphthylene	*208968*	3	3	
117	Benzo(ghi)perylene	*191242*	0.24	0.24	
118	Phenanthrene	*85018*	2	2	
119	Delta-BHC	*319868*	0.0013	0.0013	
120	PCB-1242 (Aroclor 1242)	53469219	0.2	0.2	
121	PCB-1254 (Aroclor 1254)	11097691	0.2	0.2	
122	PCB-1221 (Aroclor 1221)	*11104282.*	0.2	0.2	
123	PCB-1232 (Aroclor 1232)	11141165	0.2	0.2	
124	PCB-1248 (Aroclor 1248)	12672296	0.2	0.2	
125	PCB-1260 (Aroclor 1260)	11096825	0.2	0.2	
126	PCB-1016 (Aroclor 1016)	12674112	0.2	0.2	
127	Total Phenolic Compounds	various	2.5	2.5	

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Table 2: Required Toxic Chemical Analytes: Organic Compounds

Number	Parameter	CAS Registry Number	Minimum Reporting Limit (RL) µg/L, except as noted [c]		
			Discharges to Fresh Water	Discharges to Salt Water	Discharges to Meet Human Health Criteria [e]

[a] *Analysis by EPA Method 100.2 - Only asbestos structures greater than 10 µm are counted in this method. Therefore, analytical laboratories testing wastewater from facilities that discharge to surface waters that are used for public drinking water supply must use a 0.1 µm pore size polycarbonate or MCE filter membrane to prevent loss of small asbestos fibers during filtration at the time of analysis or use* ***EPA Method 100.1***.

[b] *Four compounds (bromoform, chlorodibromomethane, chloroform, and dichlorobromomethane) are found in combination and comprise a category of contaminants called "trihalomethanes". The concentration results of these compounds should be summed, and the individual concentrations reported.* The concentration of any of these compounds individually, or all of them in sum, may not exceed 80 ug/L.

[c] *In some instances the Water Quality Criteria may be lower than the most sensitive methodology or practically achievable limits using any of the available approved methods. In such instances, the Department will accept qualified estimate values (J qualified values) where possible. The approval for the use of an estimated value for each contaminant should be requested with the Toxic Chemical Testing Study Plan. There may also be instances where the Water Quality Criteria may be lower than the method detection limit (MDL) for the contaminant using the most sensitive approved analytical method. In this case, explain in the Toxic Chemical Testing Study Plan and provide the name of the contaminant, test method, MDL and RL and the Department will determine how to proceed.*

[d] *Total PCBs is defined as the sum of all congeners or all isomer or homolog or Aroclor analyses. Testing for PCB Congeners must follow the MDE guidance document titled* REPORTING *REQUIREMENTS FOR TOTAL PCBs (PCB CONGENERS) BY EPA METHOD 1668 C rev 11/9/2021*

[e] *In those cases where numerical toxic substance criteria for aquatic life protection and protection of human health both apply, the most restrictive of the criteria shall be used.*

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