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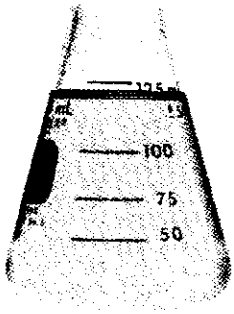
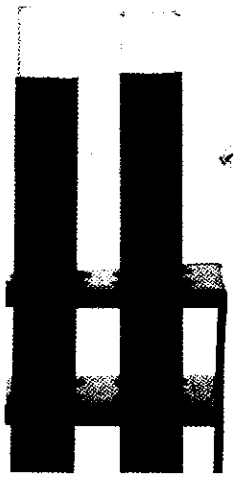
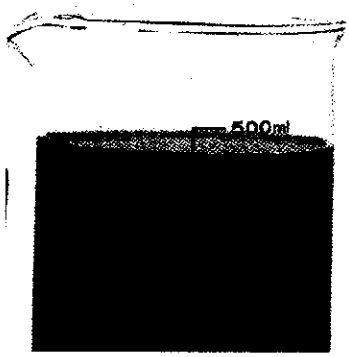
EPA
United States
Environmental Protection
Agency

Stage 1 Disinfectants and Disinfection Byproducts Rule: Laboratory Quick Reference Guide







Overview of the Rule

Title	Stage 1 Disinfectants and Disinfection Byproducts Rule (Stage 1 DBPR) 63 FR 69390 - 69476, December 16, 1998, Vol. 63, No. 241 Revisions to the Interim Enhanced Surface Water Treatment Rule (IESWTR), the Stage 1 Disinfectants and Disinfection Byproducts Rule (Stage 1 DBPR), and Revisions to State Primacy Requirements to Implement the Safe Drinking Water Act (SDWA) Amendments 66 FR 3770, January 16, 2001, Vol. 66, No. 29
Purpose	Improve public health protection by reducing exposure to disinfection byproducts. Some disinfectants and disinfection byproducts (DBPs) have been shown to cause cancer and reproductive effects in lab animals and are suspected to cause bladder cancer and reproductive effects in humans.
General Description	The Stage 1 DBPR is the first of a staged set of rules that will reduce the allowable levels of DBPs in drinking water. The new rule establishes seven new standards and a treatment technique of enhanced coagulation or enhanced softening to further reduce DBP exposure. The rule is designed to limit capital investments and avoid major shifts in disinfection technologies until additional information is available on the occurrence and health effects of DBPs.

Critical Deadlines and Requirements

January 1, 2002	Surface water systems and ground water systems under the direct influence of surface water (GWUDI) serving ≥ 10,000 people must comply with the Stage 1 DBPR requirements.
January 1, 2004	Surface water systems and GWUDI serving < 10,000, and all ground water systems must comply with the Stage 1 DBPR requirements.

Routine Monitoring Requirements

Regulated Contaminants/ Disinfectants	Coverage	Monitoring Frequency
TTHM/HAA5	Surface and GWUDI serving ≥ 10,000	4/plant/quarter
	Surface and GWUDI serving 500 - 9,999	1/plant/quarter
	Surface and GWUDI serving < 500	1/plant/year in month of warmest water temperature*
	Ground water serving ≥ 10,000	1/plant/quarter
	Ground water serving < 10,000	1/plant/year in month of warmest water temperature*
Bromate†	Ozone plants	Monthly at entrance to distribution system
Chlorite	Chlorine dioxide plants	Daily at entrance to distribution system; monthly in distribution system
Chlorine/Chloramines	All systems	Same location and frequency as Total Coliform Rule sampling
Chlorine dioxide	Chlorine dioxide plants	Daily at entrance to distribution system
DBP precursors (TOC/Alkalinty/SUVA)	Conventional filtration systems	Monthly for total organic carbon and alkalinity or the SUVA alternative

* System must increase monitoring to 1 sample per plant per quarter if an MCL is exceeded.
† Reduced Bromate monitoring may be available based on results of optional Bromide monitoring - See Stage 1 DBPR.

Laboratory Considerations

- Obtain certification (or state approval) to perform new analyses.
- Become familiar with new monitoring requirements.
- Prepare for increased number of samples (e.g., storage, supplies, staff).
- Schedule to accommodate large number of samples, holding times, and demands on instrumentation.

For additional information on the Stage 1 DBPR

Call the Safe Drinking Water Hotline at 1-800-426-4791; visit the EPA web site at www.epa.gov/safewater; or contact your State drinking water representative.

Additional material is available at www.epa.gov/safewater/mdbp/implement.html.

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Routine Monitoring Requirements

Regulated Contaminants/ Disinfectants	MCL (mg/L)	MRDL (mg/L)	Analytical Method	Preservative/Quenching Agent	Holding Time Sample/Extract	Sample Container Size & Type
TTHM * (Sum of: chloroform bromodichloromethane dibromochloromethane bromoform)	0.080		EPA 502.2	Sodium thiosulfate (immediately acidify to pH<2 with HCl, if VOCs are included in analysis), OR ascorbic acid and immediate acidification to pH<2 with HCl. Samples must be dechlorinated prior to acidification.	14 days at 4ºC	40 - 120 mL glass w/Teflon-lined septum
			EPA 524.2			
			EPA 551.1	Sodium sulfite or ammonium chloride with a phosphate buffer (pH = 4.5 - 5.5).	14 days at 4ºC/14 days at <-10ºC	60 mL glass vial w/Teflon-lined septum
HAA5 * (Sum of: monochloroacetic acid dichloroacetic acid trichloroacetic acid monobromoacetic acid dibromoacetic acid)	0.060		EPA 552.1	Ammonium chloride	28 days at 4ºC away from light/48 hours	>100 mL amber glass w/Teflon-lined septum
			EPA 552.2	Ammonium chloride	14 days at 4ºC away from light/7 days at 4ºC or 14 days at ≤ -10ºC	>50 mL amber glass w/Teflon-lined septum
			SM 6251B	Ammonium chloride	9 days at 4ºC/21 days at -11ºC	40 - 60 mL glass vial w/Teflon-lined septum
Bromate *	0.010		EPA 300.1	Ethylenediamine	28 days	> 30 mL plastic or glass
Bromide +			EPA 300.0 EPA 300.1	Ethylenediamine	28 days	> 30 mL plastic or glass
Chlorite + (Daily at entrance to distribution system)	1.0		SM 4500-ClO_2 E	None	Immediately	>500 mL plastic or glass
			EPA 300.0 EPA 300.1	Ethylenediamine	14 days at 4ºC protected from light	> 30 mL opaque plastic or glass
Chlorite * (Monthly in distribution system)	1.0		EPA 300.0 EPA 300.1	Ethylenediamine	14 days at 4ºC protected from light	> 30 mL opaque plastic or glass
Chlorine +		4.0 as Cl_2	Free - 4500-Cl D, F, G, H	None	Immediately	> 500 mL plastic or glass
			Combined - 4500-Cl D, F, G			
			Total - 4500-Cl D, E, F, G, I			
Chloramines +		4.0 as Cl_2	4500-Cl D, E, F, G, I	None	Immediately	> 500 mL plastic or glass
Chlorine Dioxide +		0.8 as ClO_2	4500-ClO_2 D, E	None	Immediately	> 500 mL plastic or glass
pH +			EPA 150.1, 150.2, 4500 H+ B, or ASTM D1293-95	None	Immediately	> 500 mL plastic or glass
DBP Precursors + (TOC/Alkalinity/SUVA)	Treatment Technique: Enhanced coagulation/ enhanced softening to improve removal of DBP precursors for suface water systems using conventional filtration treatment or lime softening.		SM 5310 B, C and D for TOC or DOC portion of SUVA	Acidify TOC samples to pH < 2. Filter DOC sample through 0.45 µm pore diameter filter as soon as possible after collection (≤ 48 hours) and then acidify same as TOC.	28 days stored at 4ºC and protected from light	>100 mL amber glass w/Teflon-lined septum
			SM 5910 B for UV_{254} portion of SUVA	Filter through 0.45 µm pore diameter filter as soon as possible after collection (≤ 48 hours).	≤ 48 hours stored at 4ºC and protected from light	> 100 mL amber glass w/Teflon-lined septum
			ASTM D1067-92B or SM 2320 B or I-1030-85 for alkalinity	None	14 days stored at 4ºC and protected from light	> 200 mL plastic or glass

1 - Note the sample volumes specified in this table are estimates. The actual sample container volumes should be specified by the laboratory(s) performing the analyses.
+ - Indicates the analysis must be performed by a party approved by the state.
* - Indicates the laboratory must be certified to analyze the sample.