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Water Quality

Parameter	Method	Container	Preservation	Holding Time
Acidity	EPA 305.1	250 mL, P or G	Cool, 4°C	14 Days
	2310B	"	"	"
Alkalinity	EPA 310.1	250 mL, P or G	Cool, 4°C	14 Days
	SM 2320 B	"	"	"
Ammonia	EPA 350.1	250 mL, P or G	Cool, 4°C, H ₂ SO ₄ to pH<2	28 Days
	SM 4500	"	"	"
Bacteria				
Coliform, E. Coli	SM 9222 G.	100 mL, P, sterile	Cool, 4°C	6 Hours
Coliform, Fecal	SM 9222 D.	100 mL, P, sterile	Cool, 4°C	6 Hours
Coliform, Total	SM 9223 B.	100 mL, P, sterile	Cool, 4°C	30 Hours
Biochemical Oxygen Demand (BOD)	EPA 405.1	1000 mL, P or G	Cool, 4°C	48 Hours
	SM 5210	"	"	"
Bromate	EPA 300.0	100 mL, P or G	None Required	28 Days
Bromide	EPA 300.0	100 mL, P or G	Cool, 4°C	28 Days
	SM 4500 Br-	"	"	"
Calcium	EPA 215.2	100 mL, P or G	Cool, 4°C	180 Days
	SM 3500	100 mL, P or G	HNO ₃ to pH <2	180 Days
	EPA 200.7	100 mL, P or G	HNO ₃ to pH <2	180 Days
Carbon, Total Organic (TOC)	EPA 415.1	2 x 40 mL, G	Cool, H ₂ SO ₄ to pH <2	28 Days
Chemical Oxygen Demand (COD)	EPA 410.4	250 mL, P or G	Cool, 4°C, H ₂ SO ₄ to pH<2	28 Days

Chloride	EPA 300.0 SM 4500-Cl D	100 mL, P or G "	None Required "	28 Days "
Chlorine, Residual	SM 4500-Cl H EPA 330	100 mL, P or G "	Cool, 4°C None Required	Analyze Immediately "

Color	EPA 110.3 SM 2120	100 mL, P or G "	Cool, 4°C "	48 Hour "
Conductance	EPA 120.1 SM 2510B	100 mL, P or G "	Cool, 4°C "	28 Days "
Cyanide				
Amenable	EPA 335.1	500 mL, P or G	NaOH to pH >12, Cool, 4°C	14 Days
Total	EPA 335.4	500 mL, P or G	NaOH to pH >12, Cool, 4°C	"
Weak Acid Dissociable (WAD)	EPA 335.4	500 mL, P or G	NaOH to pH >12, Cool, 4°C	"
Flouride	EPA 300.0/SM 4110 SM 4500-F C	100 mL, P or G "	Cool, 4°C "	28 Days "
Formaldehyde	NIOSH 3500	250 mL	Cool, 4°C	NA
Hardness				
	SM 2340 B	100 mL, P or G	HNO ₃ to pH <2	180 Days
	200.7 Calc.	"	HNO ₃ to pH <2	180 Days
Magnesium	EPA 200.7 / SM 3120 SM 3500	100 mL, P or G "	HNO ₃ to pH <2 "	180 Days "
Nitrogen				
Ammonia (NH₃)	EPA 350.1/SM 4500-NH ₃	100 mL, P or G	H ₂ SO ₄ to pH <2	28 Days
Nitrate (NO₃)	EPA 353.3 or EPA 300.0	"	Cool, 4°C	48 Hours
Nitrite (NO₂)	EPA 353.2 or EPA 300.0	"	Cool, 4°C	48 Hours
Nitrate + Nitrite	EPA 353.2 or EPA 300.0	"	H ₂ SO ₄ to pH <2	28 Days
Total Kjeldahl (TKN)	EPA 351.2	500 mL, P or G	H ₂ SO ₄ to pH <2	28 Days
Odor	EPA 140.1/SM 2150	500 mL, P or G	Cool, 4°C	ASAP
Oil & Grease				
	EPA 1664	1000 mL, Glass	HCl to ph <2, Cool	28 Days
	EPA 413.1/SM 5520	"	H ₂ SO ₄ to pH <2	"
Petroleum Hydrocarbons	see Organics			
pH	EPA 150.1/SM 4500-H ⁺	100 mL, P or G	Cool, 4°C	Analyze Immediately

Phenols	EPA 420.4/SM 5530	100 mL, Amber G	H ₂ SO ₄ to pH <2, Cool, 4°C	28 Days
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Phosphorus				
Ortho	EPA 365.3	100 mL, P or G	Cool, 4°C	48 Hours (unpres.)
Total	EPA 365.3	500 mL, P or G	H ₂ SO ₄ to pH <2, Cool, 4°C	28 Days
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Solids				
Setteable	EPA 160.5/SM 2540 F	1000 mL, P or G	Cool, 4°C	48 Hours
Total Dissolved (TDS)	EPA 160.1/SM 2540 C	250 mL, P or G	"	7 Days
Total Solids	EPA 160.3/SM 2540 B	500 mL, P or G	"	"
Total Suspended (TSS)	EPA 160.2/SM 2540 D	500 mL, P or G	"	"
Volatile	EPA 160.4/SM 2540 E	250 mL, P or G	"	"
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Specific Gravity	ASTM D 854-92	100 mL, P or G	None	N/A
	Hydrometer	"	"	"
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Sulfur				
Sulfate	EPA 375.4/SM 4500-SO ₄	250 mL, P or G	Cool, 4°C	28 Days
	EPA 300.0/SM 4110	"	"	"
Sulfide	EPA 376.2/SM 4500-S	500 mL, P or G	ZnAc, Cool, 4°C, NaOH ph>9	7 Days
Sulfite	EPA 377.1/SM 4500-SO ₃	100 mL, P or G	Cool, 4°C	ASAP
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Surfactant (Foaming Agents)	SM 5540 C	500 mL, P or G	Cool, 4°C	48 Hours
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Total Petroleum Hydrocarbons (TPH)	EPA 418.1	1000 mL, G	HCl to pH <2, Cool, 4°C	7 Days
	EPA 1664	"	HCl to pH <2, Cool, 4°C	7 Days
	EPA 8015 (GRO)	(2) 40 mL VOA vials	HCl to pH <2, Cool, 4°C	14 Days
	EPA 8015 (DRO)	(2) 40 mL VOA vials	HCl to pH <2, Cool, 4°C	14 Days
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Turbidity	EPA 180.1	100 mL, P or G	Cool, 4°C	48 Hours
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Radiochemistry

Parameter	Method	Container	Preservation	Holding Time
Gross Alpha	E900.0	1/2 Gallon P or G	HNO ₃ to pH <2	6 months
	7110B	"	"	"
Gross Beta	E900.0	1/2 Gallon P or G	HNO ₃ to pH <2	6 months
	7110B	"	"	"
Lead	E905.0 Mod.	1000 mL P or G	HNO ₃ to pH <2	6 months
Polonium	RMO-3008	1000 mL P or G	HNO ₃ to pH <2	6 months
Radioactive Strontium	E905.0	1000 mL P or G	HNO ₃ to pH <2	6 months
Radium 226	SM 7500 Ra B	1/2 Gallon P or G	HNO ₃ to pH <2	6 months
Radium 228	SM 7500 Ra D	1/2 Gallon P or G	HNO ₃ to pH <2	6 months
Radon 222	ASTM D5072-92	(2) 40 mL VOA vials	Cool, 4°C	4 Days
Thorium	E907.0	1000 mL P or G	HNO ₃ to pH <2	6 months
Tritium	E906.9	1000 mL P or G	Unpreserved	6 months
Uranium	E907.0	1000 mL P or G	HNO ₃ to pH <2	6 months

Organics

Parameter	Method	Container	Preservation	Holding Time
EXTRACTIONS				
Separatory Funnel Liquid - Liquid	Method 3510C (SW-846)	1000 mL	Cool, 4°C	7 Days
Continuous Liquid - Liquid	Method 3520C (SW-846)	1000 mL	Cool, 4°C	7 Days
Solid Phase Extraction	Method 3535 (SW-846)	1000 mL	Cool, 4°C	7 Days
Soxhlet Extraction	Method 3540C (SW-846)	60 g	Cool, 4°C	14 Days
Ultrasonic Extraction	Method 3550B (SW-846)	60 g	Cool, 4°C	14 Days
Supercritical Fluid Extraction of TI	Method 3560 (SW-846)	60 g	Cool, 4°C	14 Days
Supercritical Fluid Extraction of P/	Method 3561 (SW-846)	60 g	Cool, 4°C	14 Days
Waste Dilution	Method 3580A (SW-846)	60 g	Cool, 4°C	14 Days
Waste Dilution for Volatile Organi	Method 3585 (SW-846)	60 g	Cool, 4°C	14 Days
VOC's in Solids Using Headspace	Method 5021 (SW-846)	60 g	Cool, 4°C	14 Days
Purge-and-Trap for Aqueous Sampl	Method 5030B (SW-846)	2 x 40 mL	Cool, 4°C, HCl to pH <2	14 Days
Purge-and-Trap for Soil and Wast	Method 5035 (SW-846)	60 g	Cool, 4°C	14 Days
BTEX / BTEX-MTBE*	EPA SW 846-8021B/water	2-40 mL VOA, G	Cool, 4°C, HCl to pH <2	14 Days
	"/soil	125 mL/ 4 oz w/m G	Cool, 4°C	"
	EPA SW 846-8260/ water	2-40 mL VOA, G	Cool, 4°C, HCl to pH <2	"
	"/soil	125 mL/ 4 oz w/m G	Cool, 4°C	"
	EPA 602/water	2-40 mL VOA, G	Cool, 4°C, HCl to pH <2	"
	EPA 524.2/water	2-40 mL VOA, G	Cool, 4°C, HCl to pH <2	"
Total Petroleum Hydrocarbons (TPH)	EPA SW 8015M/water	(2) 40 mL VOA	Cool, 4°C, HCl to pH <2	14 Days
	"/soil	125 mL/ 4 oz w/m G	Cool, 4°C	14 Days
	EPA 418.1/water	1000 mL Amber G	Cool, 4°C, HCl to pH <2	7 Days
	"/soil	125 mL/ 4 oz w/m G	Cool, 4°C	14 Days
	TX Method 1005/water	2) 40 mL VOA w/ HC	Cool, 4°C, HCl to pH <2	14 Days
	"/soil	125 mL/ 4 oz w/m G	Cool, 4°C	14 Days
Oil and Grease	EPA 413.1 water	1000 mL Amber G	Cool, 4°C, HCl to pH <2	28 Days
	EPA 1664A water	1000 mL Amber G	Cool, 4°C, HCl to pH <2	28 Days

Volatile Organics (VOCs)*	EPA SW 8260B/water	2-40 mL VOA, G	Cool, 4°C, HCl to pH <2	14 Days
	"/soil	125 mL/ 4 oz w/m G	Cool, 4°C	14 Days
	EPA 524.2	2-40 mL VOA, G	Cool, 4°C, HCl to pH <2	14 Days
	EPA 624	2-40 mL VOA, G	Cool, 4°C, HCl to pH <2	14 Days
Semivolatile Organics (SOCs)	EPA SW 8270C/water**	1000 mL, Amber G	Cool, 4°C	7 Days
	"/soil	125 mL/ 4 oz w/m G	Cool, 4°C	14 Days
	EPA 625/water**	1000 mL, Amber G	Cool, 4°C	7 Days
	EPA 525.2***	1000 mL, Amber G	Cool, 4°C, HCl to pH <2	7 Days
Polynuclear Aromatic Hydrocarbons:	EPA SW 8270C/water**	1000 mL, Amber G	Cool, 4°C	7 Days
	"/soil	125 mL/ 4 oz w/m G	Cool, 4°C	14 Days
	EPA 625/water**	1000 mL, Amber G	Cool, 4°C	7 Days
Base/Neutral/Acid Extractables**	EPA SW 8270C/water**	1000 mL, Amber G	Cool, 4°C	7 Days
	"/soil	125 mL/ 4 oz w/m G	Cool, 4°C	14 Days
	EPA 625/water**	1000 mL, Amber G	Cool, 4°C	7 Days
Organohalide Pesticides and PCBs**	EPA 505	2-40 mL VOA, G	Cool, 4°C	7 Days
Organochlorine Pesticides**	EPA 608 / water	1000 mL, Amber G	Cool, 4°C	7 Days
	EPA SW 8081A / water	1000 mL, Amber G	"	7 Days
	EPA SW 8081A / soil	125 mL/ 4 oz w/m G	"	14 Days
Polychlorinated Biphenyles (PCBs)**	EPA SW 8082/water	1000 ml, Amber G	Cool, 4°C	7 Days
	EPA SW 8082/soil	125 mL/ 4 oz w/m G	"	14 Days
Herbicides*	EPA 8151 A/water	1000 mL, Amber G	Cool, 4°C	7 Days
	EPA 8151 A/soil	125 mL/ 4 oz w/m G	Cool, 4°C	14 Days
	EPA 615/water	1000 mL, Amber G	Cool, 4°C	7 Days
	EPA 515.1/water	1000 mL, Amber G	Cool, 4°C	14 Days
Phenols	EPA SW 8270C/water**	1000 mL, Amber G	Cool, 4°C	7 Days
	"/soil	125 mL/ 4 oz w/m G	Cool, 4°C	14 Days
	EPA 625/water**	1000 mL, Amber G	Cool, 4°C	7 Days
	EPA 604/water	1000 mL, Amber G	Cool, 4°C	7 Days
	EPA 8041/water	1000 mL, Amber G	Cool, 4°C	7 Days
	EPA 8041/soil	125 mL/ 4 oz w/m G	Cool, 4°C	14 Days
Phthalate Esters	EPA SW 8270C/water	1000 mL, Amber G	Cool, 4°C	7 Days
	"/soil	125 mL/ 4 oz w/m G	Cool, 4°C	14 Days
	EPA 625/water	1000 mL, Amber G	Cool, 4°C	7 Days
Carbamates**	EPA 531.1/water	2-40 mL VOA, G	4°C, monochloro-acetic	28 Days

Diquat**	EPA 549.1	2) 1000 mL, P or PVI	Cool, 4°C	7 Days
EDB and DBCP**	EPA 504.1	-40 mL VOA, G/teflo	Cool, 4°C, add Sodium Th.	14 Days
Endothall**	EPA 548.1	1000 mL, G	Cool, 4°C	7 Days
Glyphosate**	E 547	50 mL VOA, Amber C	Cool, 4°C	14 Days
Haloacetic Acids (HAAs)	EPA 552.2	(3) 60 mL VOA, AG	4°C, Dark, NH ₄ Cl	28 Days
Trihalomethanes (THMs)*	EPA 524.2 EPA 502.2	2) 40 mL VOA, G/tef "	Cool, 4°C, HCl to pH <2 "	14 Days "

* Add ascorbic acid to chlorinated water samples

** Add sodium thiosulfate to chlorinated water samples

***Add sodium sulfite to chlorinated water samples before adding acid

Metals

Parameter	Method	Container	Preservation	Holding Time
DIGESTIONS				
Water Digestion	EPA 200.2	250-1000 mL	Cool, 4°C, HNO ₃ to pH <2	180 Days
	EPA SW 3005	"	"	"
Water Digestion	SM 3030F	"	"	"
	EPA SW 3010	"	"	"
Water Digestion	EPA SW 3020	"	"	"
Oil Digestion	EPA SW 3031	100 g, P	N/A	180 Days
Soil/Sludge Digestion	EPA SW 3050	100 g, P	Cool, 4°C, HNO ₃ to pH <2	180 Days
Dissolved Metals	EPA 200.7	500 mL, P or G	Filter (0.45 micron), then HNO ₃ to pH <2	180 Days
	EPA 200.8	"	"	"
Total Metals*	EPA 200.7 /water	500 mL, P or G	Cool, 4°C, HNO ₃ to pH <2	180 Days
	6010B/soil	4 oz, G	Cool, 4°C	"
	EPA 200.8/water	500 mL, P or G	Cool, 4°C, HNO ₃ to pH <2	180 Days
	6020B/soil	4 oz, G	Cool, 4°C	"
Total Recoverable Metals*	EPA 200.7 /water	500 mL, P or G	Cool, 4°C, HNO ₃ to pH <2	180 Days
	6010B/soil	4 oz, G	Cool, 4°C	"
	EPA 200.8/water	500 mL, P or G	Cool, 4°C, HNO ₃ to pH <2	180 Days
	6020B/soil	4 oz, G	Cool, 4°C	"
Chromium VI	SM 3500-Cr D/water	500 mL, P or G	Cool, 4°C	24 Hours
	SM 3500-Cr D/soil*	4 oz, G	"	ASAP
Ferrous Iron	EPA 200.7/water	500 mL, P or G	Filter (0.45 micron), then HNO ₃ to pH <2	6 months
Mercury*	EPA 245.1/water	500 mL, P or G	per total or dissolved	28 Days
	EPA 7471/soil	4 oz, G	Cool, 4°C	28 Days

*Requires Digestion

Wastes

Parameter	Method	Container	Preservation	Holding Time
Toxicity Characteristic Leaching Procedure (TCLP) Prior to Analysis				
Volatile Organics (VOCs)	SW 1311	1method/Matrix Spec.	Cool, 4°C	14 Days
Extractable Organics	SW 1311	1method/Matrix Spec.	Cool, 4°C	14 Days
Metals (other than Mercury)	SW 1311	1method/Matrix Spec.	Cool, 4°C	180 Days
Mercury	SW 1311	1method/Matrix Spec.	Cool, 4°C	28 Days
* Specific				
Reactivity, Corrosivity, Ignitability (RCI)				
Cyanide, Reactive, water	SW Section 7.3.3.2	250 mL P or G	NaOH to pH>12	14 Days
Cyanide, Reactive, non-aqueous	SW Section 7.3.3.2	50g P or G	None	NA
Sulfide, Reactive, water	SW Section 7.3.4.2	250 mL P or G	Zinc Acetate, NaOH ph>9	7 Days
Sulfide, Reactive, non-aqueous	SW Section 7.3.4.2	50g P or G	None	NA
Corrosivity, PH	SW 9045 C/ 9040 B	25 mL or 50 g	None	ASAP
Ignitability, flashpoint	ASTM D-93-80	100 mL P or G	None	NA
Semi-volatiles (see Organics)				
Volatiles (see Organics)				
Pesticides (see Organics)				
Herbicides (see Organics)				
Metals (see Metals)				
Mercury (see Metals)				

Soil and Overburden

Parameter	Method	Container	Preservation	Holding Time
SAMPLE PREPARATION				
Acid Digestion	EPA SW 3050	1 gallon resealable, P		
Acid Digestion	Perchloric, HF & HCl	"		
AB-DTPA Extract	ASA Mono #9	"		
Coarse Fragments	USDA 60	"		
Compositing				
Grinding				
Coarse, 10 Mesh, Hammer Mill	USDA No. 18	"		
Fine, 60 Mesh, Pulverizer	USDA No. 18	"		
Hot Water Extract	ASA Mono #9	"		
Mixing & Splitting				
Saturated Paste Extract	USDA 60 / ASA Mono 9	"		
1:1 Paste	USDA 60	"		
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AB-DTPA Metals				
Selenium		"		
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Acid Potential (AP)	Calculation			
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Acid-Base Accounting	EPA-600/2-78-054	"		
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Acid-Base Potential	Calculation			
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Alkalinity	EPA 310.1	"		
	SM 2320 B	"		
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Ammonia	EPA 350.1	"		
	SM 4500	"		
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Available Cations

Calcium	EPA 6010B	"
Magnesium	"	"
Potassium	"	"
Sodium	"	"
Base Saturation Percentage	Calculation	
Bicarbonate	ASA 62-3.4.2.3	"
Bulk Density	EPA-600/2-78-054	"
Calcium Carbonate	USDA 60, Method 230	"
	ASA Mono #9	"
Carbonate	ASA 62-3.4.2.3	"
	USDA 60	"
Carbon		
Total	ASA Mono #9	"
Total Organic	ASA Mono #9	"
Cation Exchange Capacity (CEC)	USDA No. 60 (19)	"
Chloride	EPA 300.0	"
	SM 4500-Cl D	"
Chromium, Hexavalent	EPA M3060A	"
Cyanide		
Total	EPA 335.4	"
WAD	SM 4500 CN-I	"
Electrical Conductivity	USDA 60	"
	ASA Mono #9	"
Exchangeable Acidity	ASA Mono #9	"
Exchangeable Sodium Percentage	USDA No. 60	"
Flouride	EPA 340.2	"

Lime Requirement (SMP Buffer)	EPA-600/2-78-054	"
Loss on Ignition		
Moisture Percent	USDA 60	"
Net Acid Generating Potential	Titration	"
Neutralization Potential (Calcium Carbonates)	USDA 60	"
NDEP Profile I		
NDEP Profile II		
Nitrogen		
Ammonia (NH₃)	EPA 350.1/SM 4500-NH ₃	"
Nitrate (NO₃)	EPA 353.3 or EPA 300.0	"
Nitrite (NO₂)	EPA 353.3 or EPA 300.0	"
Nitrate + Nitrite	EPA 353.3 or EPA 300.0	"
Total Kjeldahl (TKN)	EPA 350.2	"
Organic Nitrogen	Calculation	"
Particle Density	USDA 60	"
pH	ASA Mono #9	"
	USDA No. 60	"
Particle Size Analysis	ASA Mono #9	"
	Hydrometer	"
Phosphorus		
Olsen	EPA 365.1	"
Total	EPA 365.1	"
Potassium	ASA Mono #9, EPA 6010B	"

Saturation Percent	USDA 60	"
	ASA Mono #9	"
Sieve Analysis	ASA Mono #9	"
Sodium		
Available	USDA 60	"
	ASA Mono #9	"
	EPA 6010B	"
Extractable	ASA Mono #9	"
	EPA 6010B	"
Soluable	ASA Mono #9	"
	EPA 6010B	"
Sodium Adsorption Ratio	USDA 60	"
Sulfate		
	EPA 375.4/SM 4500-SO ₄	"
	EPA 300.0/SM 4110	"
Sulfur Fractionation		
Sulfur Forms		
Sulfur, Organic	EPA-600/2-78-054	"
Sulfur, Pyritic	EPA-600/2-78-054	"
Sulfur, Sulfate	EPA-600/2-78-054	"
Sulfur, Total	EPA-600/2-78-054	"
Texture + USDA Class ID	ASA Mono #9	"
Total Organic Carbon	ASA Mono #9	"
Total Organic Matter	ASA Mono #9	"
Very Fine Sands	ASA Mono #9	"