

CHEMICAL & ENVIRONMENTAL TESTING

Item No.	Test	Method
1.0	Marine water/ Ground water	
1.01	pH value	SMWW 4500-H ⁺ B
1.02	Alkalinity as CaCO ₃	SMWW 2320B
1.03	Electrical Conductivity	SMWW 2510 B
1.04	Turbidity	SMWW 2130 B
1.05	Dissolved oxygen	SMWW 4500 O C
1.06	Total Suspended Solids (TSS)	SMWW 2540 D
1.07	Total Dissolved Solids (TDS)	SMWW 2540 C
1.08	Ammonia (NH ₄)	SMWW 4500 NH ₃ F
1.09	Ammonia as N (NH ₃ -N)	SMWW 4500 NH ₃ F
1.10	Nitrate (NO ₃)	SMWW 4110 B
1.11	Nitrate (NO ₃)	SMWW 4500 NO ₃ E
1.12	Nitrite (NO ₂)	SMWW 4500 NO ₂ B
1.13	Nitrite (NO ₂)	SMWW 4110 B
1.14	Total Nitrogen	SMWW 4500 (NO ₃ N+NO ₂ N+N _{org})
1.15	Total Nitrogen	ASTM D 5176-08
1.16	Total Kjeldhal Nitrogen (TKN)	SMWW 4500-N _{org} B/NH ₃ F
1.17	Orthophosphate (PO ₄)	SMWW 4500 PD
1.18	Phosphate	SMWW 4500-PB & D
1.19	Phosphate Phosphorous	SMWW 4500-PB & D
1.20	Sulphide	SMWW 4500 S ²⁻ F
1.21	Chlorine content	SMWW 4500 Cl-G
1.22	Chloride (Cl)	SMWW 4500-Cl-B

1.23	Salinity	SMWW 4500-Cl ^B
1.24	Cyanides	SMWW 4500 CN F
1.25	Cyanides	DIN 38405-07
1.26	Chemical Oxygen Demand (COD)	SMWW 5220 D
1.27	Biochemical Oxygen Demand (BOD)	SMWW -5210 B & 4500-OC
1.28	Fat, Oil & Grease	SMWW 1664B
1.29	Fat, Oil & Grease	SMWW 5220B
1.30	Chlorophyll a	SMWW 10200 H
1.31	BTEX	USEPA 5030/8260C
1.32	BTEX	SMWW 6200B
1.33	Chlorinated Hydrocarbons	USEPA 3510/5030/8270
1.34	Phenols	USEPA 3510/8041A/8270D
1.35	Phenols	SMWW 6410B/6420B

Item No.	Test	Method
1.36	Total Phenols	USEPA 9065
1.37	PCBs	USEPA 3510/8082A
1.38	PCBS	SMWW 6410B
1.39	Pesticides	USEPA 3510/8270D
1.40	Pesticides	SMWW 6410B
1.41	Polyaromatic hydrocarbon (PAH)	USEPA 3510C/8270D
1.42	Polyaromatic hydrocarbon (PAH)	SMWW 6410B
1.43	Semi volatile organic compounds (SVOC)	USEPA 3510/8270D
1.44	Semi volatile organic compounds (SVOC)	SMWW 6410B
1.45	Urea	GL-SOP-091
1.46	Anion Surfactants as MBAS	SMWW 5540C
1.47	Bromide	SMWW 4110 B
1.48	Total Organic Carbon (TOC)	SMWW 5310 B
1.49	Total petroleum hydrocarbons (TPH) GRH, DRH and Heavy Fractions	USEPA 5030B/8015C/3510C/8270D
1.50	Trihalo methane	USEPA 5030B/8260C
1.51	Trihalo methane	SMWW 6200B
1.52	Volatile organic compounds (VOC)	SMWW 6200B
1.53	Volatile organic compounds (VOC)	USEPA5030B/8260C
Marine water/ Ground water - Heavy Metals		
1.54	Aluminum (Al)	USEPA 3005A/3015A/6010C
1.55	Antimony (Sb)	USEPA 3005A/3015A/6010C
1.56	Arsenic (As)	USEPA 3005A/6010C -Hydride

1.57	Barium (Ba)	USEPA 3005A/3015A/6010C
1.58	Beryllium (Be)	USEPA 3005A/3015A/6010C
1.59	Boron (B)	USEPA 3005A/3015A/6010C
1.60	Cadmium (Cd)	USEPA 3005A/3015A/6010C
1.61	Calcium (Ca)	USEPA 3005A/3015A/6010C
1.62	Chromium (Cr)	USEPA 3005A/3015A/6010C
1.63	Chromium Hexavalent	USEPA 7196A
1.64	Cobalt (Co)	USEPA 3005A/3015A/6010C
1.65	Copper (Cu)	USEPA 3005A/3015A/6010C
1.66	Iron (Fe)	USEPA 3005A/3015A/6010C
1.67	Lead (Pb)	USEPA 3005A/3015A/6010C
1.68	Lithium (Li)	USEPA 3005A/3015A/6010C
1.69	Magnesium (Mg)	USEPA 3005A/3015A/6010C
1.70	Manganese (Mn)	USEPA 3005A/3015A/6010C

Item No.	Test	Method
1.71	Mercury (Hg)	USEPA 3005A/6010C -Hydride
1.72	Molybdenum (Mo)	USEPA 3005A/6010C
1.73	Nickel (Ni)	USEPA 3005A/6010C
1.74	Phosphorous (P)	USEPA 3005A/6010C
1.75	Potassium (K)	USEPA 3005A/6010C
1.76	Selenium (Se)	USEPA 3005A/6010C -Hydride
1.77	Silicon (Si)	USEPA 3005A/6010C
1.78	Silver (Ag)	USEPA 3005A/6010C
1.79	Sodium (Na)	USEPA 3005A/6010C
1.80	Sulphur (S)	USEPA 3005A/6010C
1.81	Thallium (Tl)	USEPA 3005A/6010C
1.82	Titanium (Ti)	USEPA 3005A/6010C
1.83	Vanadium (V)	USEPA 3005A/6010C
1.84	Zinc (Zn)	USEPA 3005A/6010C
1.85	Aluminum (Al)	SMWW 3120B
1.86	Antimony (Sb)	SMWW 3120B
1.87	Arsenic (As)	SMWW 3120B
1.88	Barium (Ba)	SMWW 3120B
1.89	Beryllium (Be)	SMWW 3120B
1.90	Boron (B)	SMWW 3120B
1.91	Cadmium (Cd)	SMWW 3120B
1.92	Calcium (Ca)	SMWW 3120B
1.93	Chromium (Cr)	SMWW 3120B
1.94	Cobalt (Co)	SMWW 3120B

1.95	Copper (Cu)	SMWW 3120B
1.96	Iron (Fe)	SMWW 3120B
1.97	Lead (Pb)	SMWW 3120B
1.98	Lithium (Li)	SMWW 3120B
1.99	Magnesium (Mg)	SMWW 3120B
2.00	Manganese (Mn)	SMWW 3120B
2.01	Molybdenum (Mo)	SMWW 3120B
2.02	Nickel (Ni)	SMWW 3120B
2.03	Potassium (K)	SMWW 3120B
2.04	Selenium (Se)	SMWW 3120B
2.05	Silicon (Si)	SMWW 3120B
2.06	Silver (Ag)	SMWW 3120B
2.07	Sodium (Na)	SMWW 3120B
2.08	Strontium (Sr)	SMWW 3120B
Item No.	Test	Method
2.09	Thallium (Tl)	SMWW 3120B
2.10	Vanadium (V)	SMWW 3120B
2.11	Zinc (Zn)	SMWW 3120B
2.0	Potable water	
2.01	Total Hardness (CaCO ₃)	SMWW 2340C
2.02	Total Alkalinity (CaCO ₃)	SMWW 2320 B
2.03	Total Dissolved Solids (TDS)	SMWW 2540 C
2.04	Calcium (Ca)	SMWW 3500 Ca ²⁺ B
2.05	Magnesium (Mg)	SMWW 3500 Mg ²⁺ B
2.06	Carbonate (CO ₃)	SMWW 2320 B
2.07	Bicarbonate (HCO ₃)	SMWW 2320 B

2.08	Sulphate (SO ₄)	SMWW 4110B
2.09	Chloride (Cl)	SMWW 4500-Cl-B
2.10	Nitrate (NO ₃)	SMWW 4500-NO ₃ D
2.11	Iron (Fe)	SMWW 3500 Fe B
2.12	Turbidity	SMWW 2130 B
2.13	pH Value @ 25°C	SMWW 4500-H ⁺ B
2.14	Electrical Conductivity	SMWW 2510 B
2.15	Bacteria - Total Coliforms & E-Coli	SMWW 9223 B
2.16	Bacteria - Faecal Coliforms	SMWW 9222 D
2.17	Total Bacteria count	SMWW 9215 D
2.18	Heterotrophic plate count	SMWW 9215 D
2.19	Pseudomonas Aeruginosa	BS EN ISO 16266
2.20	Tri halo methane	USEPA 5021/826C
2.21	Bromate	SMWW 4110D
2.22	Chlorite	SMWW 4110B
2.23	Chlorine Dioxide	SMWW 4500 ClO ₂ -B
2.24	Sulphide- Methylene Blue Method	SMWW 4110S ² D
2.25	Monochloramine & Dichloramine	SMWW 4500 Cl-G
2.26	Chlorate	SMWW 4110B
2.27	Langlier Saturation Index	GL-SOP-088

Item No.	Test	Method
3	Waste water/Sewage water/Treated Effluent	
3.01	pH value	SMWW 4500-H ⁺ B
3.02	Ammonia Nitrogen	SMWW 4500 NH ₃ C
3.03	Nitrate Nitrogen	SMWW 4500 NO ₃ E
3.04	Nitrite Nitrogen	SMWW 4500 NO ₂ B
3.05	Total Nitrogen	SMWW 4500 NO ₃ , 4500 NO ₂ , 4500 N _{org}
3.06	Total Nitrogen	SMWW 4500NC
3.07	Total Nitrogen	ASTM D5176-08.TN Analyzer
3.08	Total Kjeldhal Nitrogen (TKN)	SMWW 4500. N _{org}
3.09	Chemical Oxygen Demand (COD)	SMWW 5220 D
3.10	Biochemical Oxygen Demand (BOD)	SMWW 5210 B
3.11	Dissolved oxygen	SMWW 4500 O C
3.12	Phosphate	SMWW 4500-PC
3.13	Sulphide	SMWW 4500 S ²⁻ F
3.14	Total Suspended Solids	SMWW 2540 D
3.15	Total Dissolved Solids (TDS)	SMWW 2540 C
3.16	Total Solids	SMWW 2540 B
3.17	Turbidity	SMWW 2130 B
3.18	Sludge Volume Index	SMWW 2710 D
3.19	MLSS	SMWW 2540 D
3.20	MLVSS	SMWW 2540 E
3.21	Chlorine content	SMWW 4500 Cl
3.22	Cyanides	SMWW 4500 CN·F

3.24	Fat, Oil & Grease	SMWW 5520 B
3.25	Fat, Oil & Grease	USEPA 1664B/USEPA7196A
3.26	Hexavalent Chromium (Cr ⁺⁶)	SMWW 3500 Cr B
3.27	BTEX	USEPA 5021/8260C
3.28	BTEX	SMWW 6200B
3.29	Chlorinated Hydrocarbons	USEPA 3510/8021
3.30	PCBs	USEPA 3510/8082A
3.31	PCBs	SMWW 6410B
3.32	Pesticides	USEPA 3510/8081B
3.33	Pesticides	SMWW 6410B
3.34	Total Phenols	USEPA 9065
3.35	Polyaromatic hydrocarbon (PAH)	USEPA 3510/8270D

Item No.	Test	Method
3.36	Polyaromatic hydrocarbon (PAH)	SMWW 6410B
3.37	Semi volatile organic compounds (SVOC)	USEPA 3510/8270D
3.38	Semi volatile organic compounds (SVOC)	SMWW 6410B
3.39	Total Organic Carbon (TOC)	USEPA 9060 A
3.40	Volatile organic compounds (VOC)	USEPA 5021/8260C
3.41	Total petroleum hydrocarbons (TPH)	
	Gasoline Hydrocarbons (GRH)	USEPA 5030B/8015C
	Diesel Range Hydrocarbons (DRH)	USEPA 8015C/3510C/8270D
	Heavy Fractions	USEPA 1664B
3.42	Lonelier Saturation Index (LSI)	GL-SOP-088
3.43	% Dry Solids	GL-SOP-092
3.44	Density & Specific Gravity	GI-SOP-090
3.45	Sodium Absorption Ratio (SAR)	GL-SOP-089
3.46	Settleable Solids	SMWW 2540F
3.47	Urea	GL-SOP-091
3.48	Floating Particles	SMWW 2530 B
3.49	Volatile Suspended Solids (VSS)	SMWW 2540G
3.50	Volatile Solids	SMWW 2540E
3.51	Total Chlorine	SMWW 4500 CI-B
Waste water/Sewage water/Treated Effluent - Heavy Metals		
3.52	Aluminum (Al)	USEPA 3010A/3015A/6010C
3.53	Antimony (Sb)	USEPA 3010A/3015A/6010C
3.54	Arsenic (As)	USEPA 3010/Hydride/6010C-
3.55	Barium (Ba)	USEPA 3010A/3015A/6010C

3.56	Beryllium (Be)	USEPA 3010A/3015A/6010C
3.57	Boron (B)	USEPA 3010A/3015A/6010C
3.58	Cadmium (Cd)	USEPA 3010A/3015A/6010C
3.59	Calcium (Ca)	USEPA 3010A/3015A/6010C
3.60	Chromium (Cr)	USEPA 3010A/3015A/6010C
3.61	Cobalt (Co)	USEPA 3010A/3015A/6010C
3.62	Copper (Cu)	USEPA 3010A/3015A/6010C
3.63	Iron (Fe)	USEPA 3010A/3015A/6010C
3.64	Lead (Pb)	USEPA 3010A/3015A/6010C
3.65	Lithium (Li)	USEPA 3010A/3015A/6010C
3.66	Magnesium (Mg)	USEPA 3010A/3015A/6010C
3.67	Manganese (Mn)	USEPA 3010A/3015A/6010C
3.68	Mercury (Hg)	USEPA 3010/Hydride/6010C-

Item No.	Test	Method
3.69	Molybdenum (Mo)	USEPA 3010A/3015A/6010C
3.70	Nickel (Ni)	USEPA 3010A/3015A/6010C
3.71	Phosphorous (P)	USEPA 3010A/3015A/6010C
3.72	Potassium (K)	USEPA 3010A/3015A/6010C
3.73	Selenium (Se)	USEPA 3010/Hydride/6010C-
3.74	Silicon (Si)	USEPA 3010A/3015A/6010C
3.75	Silver (Ag)	USEPA 3010A/3015A/6010C
3.76	Sodium (Na)	USEPA 3010A/3015A/6010C
3.77	Sulphur (S)	USEPA 3010A/3015A/6010C
3.78	Thallium (Tl)	USEPA 3010A/3015A/6010C
3.79	Titanium (Ti)	USEPA 3010A/3015A/6010C
3.80	Vanadium (V)	USEPA 3010A/3015A/6010C
3.81	Zinc (Zn)	USEPA 3010A/3015A/6010C
4	Marine sediment/Soil/Sludge/Solid Waste	
4.01	Total petroleum hydrocarbons (TPH)	GRH-USEPA 8015/HS Trap
		DRH-USEPA 8015/3540/8270
		Heavy Fraction- USEPA 9071B
4.02	BTEX	USEPA 5021/8260C
4.03	Chlorinated Hydrocarbons	USEPA 3540/8021
4.04	Flammability test	USEPA 1050
4.05	Oil & Grease	USEPA 9071 B
4.06	PCBs	USEPA 3540/8082A
4.07	Pesticides	USEPA 3550/8081B GCMS
4.08	Polycyclic aromatic hydrocarbon (PAH)	USEPA 3540/8270D

4.09	Pyrophoric test	USEPA 1050
4.10	Semi volatile organic compounds	USEPA 3540/8270D
4.11	Sulphide	USEPA 9030 B /9034
4.12	TCLP	USEPA 1311/6010C
4.13	Volatile organic compounds (VOC)	USEPA5021/8260C
4.14	Ammonia as N (High Range)	SMWW 4500 NH ₃ B&C
4.15	Ammonia as N (Low Range)	SMWW 4500 NH ₃ B&F
4.16	Available Nitrate (NO ₃)	Laboratory manual for the analysis of water, waste water & soil/water extract and Colorimetric (SMWW 4500NO3-E)
4.17	Available Nitrite (NO ₂)	Laboratory manual for the analysis of water, waste water & soil/water extract and Colorimetric (SMWW 4500NO2-B)
4.18	Total Nitrogen	SMWW 4500 (N _{org} +NO ₃ -E+NO ₂ -B)
4.19	Total Phosphorous	ICP OES
4.20	Phosphate	ICP OES
Item No.	Test	Method
4.21	Total Phenols	USEPA 9065
4.22	Total Nitrogen	SMWW 4500NC
4.23	Total Nitrogen	ASTM D 5176-08-TN analyzer
4.24	Total Petroleum Hydrocarbons (TPH) C ₆ – C ₄₀	USEPA 8015C
4.25	Total Organic Carbon (TOC)	MOOPAM
Marine sediment/Soil/Sludge/Solid Waste - Heavy Metals		
4.26	Aluminum (Al)	USEPA 3050B/3051A/6010 C
4.27	Antimony (Sb)	USEPA 3050B/3051A/6010 C
4.28	Arsenic (As)	USEPA 3050B/Hydride/6010C

4.29	Barium (Ba)	USEPA 3050B/3051A/6010 C
4.30	Beryllium (Be)	USEPA 3050B/3051A/6010 C
4.31	Boron (B)	USEPA 3050B/3051A/6010 C
4.32	Cadmium (Cd)	USEPA 3050B/3051A/6010 C
4.33	Calcium (Ca)	USEPA 3050B/3051A/6010 C
4.34	Chromium (Cr)	USEPA 3050B/3051A/6010 C
4.35	Cobalt (Co)	USEPA 3050B/3051A/6010 C
4.36	Copper (Cu)	USEPA 3050B/3051A/6010 C
4.37	Iron (Fe)	USEPA 3050B/3051A/6010 C
4.38	Lead (Pb)	USEPA 3050B/3051A/6010 C
4.39	Magnesium (Mg)	USEPA 3050B/3051A/6010 C
4.40	Manganese (Mn)	USEPA 3050B/3051A/6010 C
4.41	Mercury (Hg)	USEPA 3050B/Hydride/6010C
4.42	Molybdenum (Mo)	USEPA 3050B/3051A/6010 C
4.43	Nickel (Ni)	USEPA 3050B/3051A/6010 C
4.44	Phosphorous (P)	USEPA 3050B/3051A/6010 C
4.45	Potassium (K)	USEPA 3050B/3051A/6010 C
4.46	Selenium (Se)	USEPA 3050B/3051A/6010 C
4.47	Silicon (Si)	USEPA 3050B/3051A/6010 C
4.48	Silver (Ag)	USEPA 3050B/3051A/6010 C
4.49	Sodium (Na)	USEPA 3050B/3051A/6010 C
4.50	Sulphur (S)	USEPA 3050B/3051A/6010 C
4.51	Thallium (Tl)	USEPA 3050B/3051A/6010 C
4.52	Titanium (Ti)	USEPA 3050B/3051A/6010 C
4.53	Vanadium (V)	USEPA 3050B/3051A/6010 C
4.54	Zinc (Zn)	USEPA 3050B/3051A/6010 C

4.55	Potassium (K)	USEPA 3050B/3051A/6010 C
4.56	Selenium (Se)	USEPA 3050B/3051A/6010 C
4.5.7	Silicon (Si)	USEPA 3050B/3051A/6010 C
4.58	Silver (Ag)	USEPA 3050B/3051A/6010 C
Item No.	Test	Method
4.59	Sodium (Na)	USEPA 3050B/3051A/6010 C
4.60	Sulphur (S)	USEPA 3050B/3051A/6010 C
4.61	Thallium (Tl)	USEPA 3050B/3051A/6010 C
4.62	Titanium (Ti)	USEPA 3050B/3051A/6010 C
4.63	Vanadium (V)	USEPA 3050B/3051A/6010 C
4.64	Uranium (U)	USEPA 3050B/3051A/6010 C
4.65	Zirconium (Zr)	USEPA 3050B/3051A/6010 C
4.66	Zinc (Zn)	USEPA 3050B/3051A/6010 C
5	Microbiological Analysis	
5.01	Fecal Coliforms	SMWW 9222 D
5.02	Fecal Coliforms	SMWW 9221 E
5.03	Total Coliforms/E.Coli	SMWW 9223B- MPN IDEXX Method
5.04	Total Coliforms/E.Coli	SMWW 9223B&D- Membrane Filter Method
5.05	Total Coliforms/E.Coli	SMWW 9223B&F- MPN Method
5.06	Helminth Ova	Lab Manual of Parasitological & Bacteriological Techniques
5.07	Legionella	BS EN ISO 11731-2
5.08	Pseudomonas aeruginosa	BS EN ISO 16266
5.09	Pseudomonas aeruginosa	SMWW 9213E
5.10	Streptococcus	SMWW 9230D

5.11	Streptococcus (Membrane Filtration Method)	SMWW 9230C
5.12	Nematode Eggs	WHO- lab Manual of Parasitological & Bacteriological Techniques
5.13	Total Bacteria count	CCFRA 1.1.4:2003- Pour Plate Method.
5.14	Total Bacteria count- Anaerobic & Aerobic for Soils	CCFRA 1.1.4:2007- Pour Plate method
5.15	Mesophilic spore count	CCFRA 1.2.1:2003
5.16	Heterotrophic plate Count	SMWW 9215D- Membrane Filtration method
5.17	Yeast and Mould	CCFRA 1.1.4:2007- Spread Plate method
5.18	Salmonella	CCFRA 1.1.4:2007- cultural method
5.19	Sulphate Reducing Bacteria (SRB)	ASTM D 4412-84 (MPN Method)
5.20	Sulphate Reducing Bacteria (SRB)	SMWW 9240D/HACH-BART
5.21	Iron Related bacteria(IRB)	SMWW 9240D/HACH-BART
5.22	Slime Forming Bacteria	HACH-BART
5.23	Microscopic Examination (All Microbes)	SMWW 10200 E

Item No.	Test	Method
6.0	Chemical Analysis of Concrete	
6.01	Sulphate content	BS 1881:Part:124, Test 10.3
6.02	Chloride content	BS 1881:Part:124, Test 10.2
6.03	Water Soluble Chloride in Mortar and Concrete	ASTM C1218/C1218M
6.04	Acid Soluble Chloride in Mortar and Concrete	ASTM C 1152/C1152M
6.05	Water Soluble Chloride Ion content in Concrete	AASHTO T 260,Test 5.3
7.0	Chemical Analysis of Aggregate	
7.01	Acid soluble Sulphate content	BS EN 1744-1
7.02	Acid Soluble Chloride content	BS EN 1744-5
7.03	Organic impurities	ASTM C 40
7.04	Potential Alkali Silica reactivity	ASTM C 289
7.05	Light weight particles	ASTM C 123
8.0	Chemical Analysis of Soil	
8.01	pH Value	BS 1377:Part:3 Test - 9
8.02	Water Soluble Sulphate content	BS 1377:Part:3 Test -5.3
8.03	Water Soluble Chloride content	BS 1377:Part:3 Test -7.2
8.04	Acid Soluble Sulphate content	BS 1377:Part:3 Test -5.2
8.05	Acid Soluble Chloride content	BS 1377:Part:3 Test -7.3
8.06	Organic matter content	BS 1377:Part:3 Test -4
8.07	Carbonate content	BS 1377:Part:3 Test -6
8.08	Redox Potential	BS 1377:Part:3 Test -11
8.09	Organics in Soil by Loss on ignition	AASHTO T267-86(2013)

8.10	Water Soluble Chloride ion content	AASHTO T 291-94
8.11	Water Soluble Sulphate ion content	AASHTO T 290-95

Item No.	Test	Method
9	Soil For Agricultural Purpose	
9.01	Sodium Absorption Ratio (SAR)	Laboratory Manual for the Examination of Water, Wastewater and Soil
9.02	Boron	
9.03	Cat ion Exchange capacity	
9.04	Exchangeable Sodium	
9.05	Salinity	
9.06	Chloride	
9.07	Sulphate	
9.08	Phosphate	
9.09	Total Kjeldhal Nitrogen (TKN)	
9.10	Total Nitrogen	
9.11	Carbonates	
9.12	Particle size distribution	BS 1377 Part:2