

Laboratory	Richardson & Cruddas (1972) Ltd., Environmental Engineering Laboratory Chennai Division, 69-D, SIDCO Industrial Estate, Ambattur, Chennai, Tamil Nadu		
Accreditation Standard	ISO/IEC 17025: 2005		
Discipline	Chemical Testing	Issue Date	24.04.2015
Certificate Number	T-2422	Valid Until	23.04.2017
Last Amended on	-	Page	1 of 7

S.No.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
I.	AIR, GASES & ATMOSPHERE			
1.	Stack Emission Monitoring	Particulate Matter	IS 11255 (Part 1): 1985 (RA2003)	5 mg/Nm ³ to 1000 mg/Nm ³
		Sulphur Dioxide as SO ₂	IS 11255 (Part 2): 1985 (RA2003)	5 mg/Nm ³ to 1000 mg/Nm ³
		Velocity	IS 11255 (Part 3): 1985 (RA2003)	1 to 40 m/s
		Volume of flue gas discharge	IS 11255 (Part 3): 1985 (RA 2003)	500-5,00,000 Nm ³ /hr
		Oxides of Nitrogen as NO _x	IS 11255 (Part 7): 2005	4 mg/Nm ³ to 1000 mg/Nm ³
		Temperature	IS 11255 (Part 3): 1985 (RA2003)	30 °C to 1200 °C
2.	Ambient Air Quality Monitoring	Suspended Particulate Matter (SPM)	IS 5182 (Part 4): (RA 2005)	4 µg/m ³ to 5000 µg/m ³
		Respirable Suspended Particulate Matter (RSPM), PM10	IS 5182 (Part 23): 2006	4 µg/m ³ to 1000 µg/m ³
		Particulate Matter, PM2.5	Validated Laboratory method No. R&C/SOP/48 dt. 30.11.2013	10 µg/m ³ to 100 µg/m ³
		Sulphur Dioxide as SO ₂	IS 5182 (Part 2): 2001 (RA 2006)	4 µg/m ³ to 1000 µg/m ³
		Nitrogen Oxides as NO _x	IS 5182 (Part 6): 2006	4 µg/m ³ to 1000 µg/m ³
		Noise	IS 15575 (Part 1 & Part 2): (2005)	30 dB to 130 dB

Laboratory Richardson & Cruddas (1972) Ltd., Environmental Engineering
 Laboratory Chennai Division, 69-D, SIDCO Industrial Estate, Ambattur,
 Chennai, Tamil Nadu

Accreditation Standard ISO/IEC 17025: 2005

Discipline Chemical Testing **Issue Date** 24.04.2015

Certificate Number T-2422 **Valid Until** 23.04.2017

Last Amended on - **Page** 2 of 7

S.No.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
II. WATER				
1.	Water for Construction Purpose	Inorganic Solids	IS 3025 (Part 18): 1984 (RA 2006)	10 mg/l to 20000 mg/l
		Sulphate as SO ₄	IS 3025 (Part 24): 1986 (RA 2009)	1 mg/l to 20000 mg/l
		Chloride as Cl	IS 3025 (Part 32): 1988 (RA 2009)	10 mg/l to 5000 mg/l
		pH @ 25 °C	IS 3025 (Part 11): 1983 (RA 2006)	1 to 13
		Water Neutralization – To neutralize 100 ml of sample water using Phenolphthalein as an indicator using 0.02 N NaOH	IS 3025 (Part 22): 1986 (RA 2009)	0.1 ml to 50 ml
		Water Neutralization – To neutralize 100 ml of sample water using Mixed indicator using 0.02 N H ₂ SO ₄	IS 3025 (Part 23): 1986 (RA 2009)	0.1 ml to 50 ml
2.	Potable and Domestic (Raw Water/ Treated Water/ RO Water/ Process Water/ Bore Well Water/ Product Water, Ground Water, Surface Water)	Colour	IS 3025 (Part 4): 1983 (RA 2006) APHA 22 nd Edn. 2120 B, 2012	1 Hazen to 100 Hazen
		Odour	IS 3025 (Part 5): 1983 (RA 2006) APHA 22 nd Edn. 2150 B, 2012	Qualitative (Objectionable / Unobjectionable)
		Turbidity	IS 3025 (Part 10): 1984 (RA 2006) APHA 22 nd Edn. 2130 B, 2012	1.0 NTU to 500 NTU
		Taste	IS 3025 (Part 8): 1984 (RA 2006)	Qualitative (Agreeable/ Disagreeable)

Laboratory	Richardson & Cruddas (1972) Ltd., Environmental Engineering Laboratory Chennai Division, 69-D, SIDCO Industrial Estate, Ambattur, Chennai, Tamil Nadu		
Accreditation Standard	ISO/IEC 17025: 2005		
Discipline	Chemical Testing	Issue Date	24.04.2015
Certificate Number	T-2422	Valid Until	23.04.2017
Last Amended on	-	Page	3 of 7

S.No.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
	Potable and Domestic (Raw Water/ Treated Water/ RO Water/ Process Water/ Bore Well Water/ Product Water, Ground Water, Surface Water)	pH @ 25°C	IS 3025 (Part 11): 1983 (RA 2006) APHA 22 nd Edn. 4500 H+ B, 2012	1.5 to 12
		Temperature	IS 3025 (Part 9): 1984 (RA 2006) APHA 22 nd Edn. 2550 B, 2012	Ambient to 50°C
		Conductivity @ 25 °C	IS 3025 (Part 14): 1984 (RA2006) APHA 22 nd Edn. 2510, 2012	1 to 200000 µmhos/cm
		Total Solids	IS 3025 (Part 15): 1984 (RA 2009) APHA 22 nd Edn. 2540 B, 2012	10 mg/l to 10000 mg/l
		Total Dissolved Solids	IS 3025 (Part 16): 1984 (RA 2006) APHA 22 nd Edn 2540 D	10 mg/l to 10000 mg/l
		Total Suspended Solids	IS 3025 (Part 17): 1984 (RA 2006) APHA 22 nd Edn. 2540 D, 2012	10 mg/l to 10000 mg/l
		Total Hardness as CaCO ₃	IS 3025 (Part 21): 1983 (RA 2006) APHA 22 nd Edn. 2340 A, 2012	1 mg/l to 1000 mg/l
		Non-Carbonate Hardness as CaCO ₃	IS 3025 (Part 21): 1983 (RA 2006) APHA 22 nd Edn. 2340 C, 2012	1 mg/l to 1000 mg/l
		Calcium as Ca	IS 3025 (Part 40): 1991 (RA 2009) APHA 22 nd Edn. 3500 Ca B, 2012	1 mg/l to 2000 mg/l
		Magnesium as Mg	IS 3025 (Part 46): 1994 (RA 2009) APHA 22 nd Edn. 3500 Mg, B, 2012	1 mg/l to 2000 mg/l
	Phenolphthalein Alkalinity as CaCO ₃	IS 3025 (Part 23): 1986 (RA 2009) APHA 22 nd Edn. 2320 B, 2012	1 mg/l to 5000 mg/l	

Laboratory	Richardson & Cruddas (1972) Ltd., Environmental Engineering Laboratory Chennai Division, 69-D, SIDCO Industrial Estate, Ambattur, Chennai, Tamil Nadu		
Accreditation Standard	ISO/IEC 17025: 2005		
Discipline	Chemical Testing	Issue Date	24.04.2015
Certificate Number	T-2422	Valid Until	23.04.2017
Last Amended on	-	Page	4 of 7

S.No.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
	Potable and Domestic (Raw Water/ Treated Water/ RO Water/ Process Water/ Bore Well Water/ Product Water, Ground Water, Surface Water)	Total Alkalinity as CaCO ₃	IS 3025 (Part 23): 1986 (RA 2009) APHA 22 nd Edn. 2320 B, 2012	1 mg/l to 5000 mg/l
		Chloride as Cl	IS 3025 Part 32:1988 (RA 2009) APHA 22 nd Edn. 4500 CI-B, 2012	1 mg/l to 30000 mg/l
		Total Iron as Fe	IS 3025 (Part 53): 2003 (RA 2009) APHA 22 nd Edn.4500 NO3 B, 2012	0.05 mg/l to 100 mg/l
		Nitrate as NO ₃	IS 3025 (Part 34): 1988 (RA 2009) APHA 22 nd Edn.3500-Fe, B, 2012	0.5 mg/l to 100 mg/l
		Fluoride as F	IS 3025 (Part 60): 2008 APHA 22 nd Edn. 4500 F, D, 2012	0.5 mg/l to 100 mg/l
		Total Residual Chlorine	IS 3025 (Part 26): 1986 (RA 2009) APHA 22 nd Edn. 4500 CI G, 2012	0.1 mg/l to 10 mg/l
		Dissolved Phosphate as PO ₄	IS 3025 (Part 31): 1988 (RA 2009) APHA 22 nd Edn. 4500 P-B,D, 2012	0.01 mg/l to 100 mg/l
		Reactive Silica as SiO ₂	IS 3025 (Part 35): 1988 (RA 2009)	0.02 mg/l to 100 mg/l
		Sulphate as SO ₄	IS 3025 (Part 24): 1986 (RA 2009) APHA 22 nd Edn.4500 SO4 B, 2012	1.0 mg/l to 5000 mg/l
		Sodium as Na	IS 3025 (Part 45): 1993 (RA 2009) APHA 22 nd Edn. 3111 B, 2012	1.0 mg/l to 10000 mg/l
	Potassium as K	IS 3025 (Part 45): 1993 (RA 2009) APHA 22 nd Edn. 3111 B, 2012	1.0 mg/l to 10000 mg/l	

Laboratory	Richardson & Cruddas (1972) Ltd., Environmental Engineering Laboratory Chennai Division, 69-D, SIDCO Industrial Estate, Ambattur, Chennai, Tamil Nadu		
Accreditation Standard	ISO/IEC 17025: 2005		
Discipline	Chemical Testing	Issue Date	24.04.2015
Certificate Number	T-2422	Valid Until	23.04.2017
Last Amended on	-	Page	5 of 7

S.No.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
III. POLLUTION & ENVIRONMENT				
1.	Liquid Effluent (Effluent Water, STP Water, Waste Water & Treated Water)	Turbidity	IS 3025 (Part 10): 1984 (RA 2006) APHA 22 nd Edn. 2130 B, 2012	1.0 NTU to 500 NTU
		pH @ 25°C	IS 3025 (Part 11): 1983 (RA 2006) APHA 22 nd Edn. 4500 H+ B, 2012	1.5 to 13
		Temperature	IS 3025 (Part 9): 1984 (RA 2006) APHA 22 nd Edn. 2550 B, 2012	1 °C to 50 °C
		Conductivity @ 25°C	IS 3025 (Part 14): 1984 (RA 2006) APHA 22 nd Edn. 2510, 2012	1 to 200000 µmhos/cm
		Total Solids	IS 3025 (Part 15): 1984 (RA 2009) APHA 22 nd Edn. 2540 B, 2012	10 mg/l to 20000 mg/l
		Total Dissolved Solids	IS 3025 (Part 16): 1984 (RA 2006) APHA 22 nd Edn 2540 C, 2012	10 mg/l to 20000 mg/l
		Total Suspended Solids	IS 3025 (Part 17): 1984 (RA 2006) APHA 22 nd Edn. 2540 D, 2012	10 mg/l to 20000 mg/l
		Total Hardness as CaCO ₃	IS 3025 (Part 21): 1983 (RA 2006) APHA 22 nd Edn. 2340 C, 2012	1 mg/l to 10000 mg/l
		Calcium as Ca	IS 3025 (Part 40): 1991 (RA 2009) APHA 22 nd Edn. 3500 Ca B, 2012	1 mg/l to 2000 mg/l
		Magnesium as Mg	IS 3025 (Part 46): 1994 (RA 2009) APHA 22 nd Edn. 3500 Mg, B, 2012	1 mg/l to 2000 mg/l
	Acidity as CaCO ₃	IS 3025 (Part 22): 1986 (RA 2009) APHA 22 nd Edn. 2310 B, 2012	1 mg/l to 5000 mg/l	

Laboratory	Richardson & Cruddas (1972) Ltd., Environmental Engineering Laboratory Chennai Division, 69-D, SIDCO Industrial Estate, Ambattur, Chennai, Tamil Nadu		
Accreditation Standard	ISO/IEC 17025: 2005		
Discipline	Chemical Testing	Issue Date	24.04.2015
Certificate Number	T-2422	Valid Until	23.04.2017
Last Amended on	-	Page	6 of 7

S.No.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
	Liquid Effluent (Effluent Water, STP Water, Waste Water & Treated Water)	Phenolphthalein Alkalinity as CaCO ₃	IS 3025 (Part 23): 1986 (RA 2009) APHA 22 nd Edn. 2320 B, 2012	1 mg/l to 5000 mg/l
		Total Alkalinity as CaCO ₃	IS 3025 (Part 23): 1986 (RA 2009) APHA 22 nd Edn. 2320 B, 2012	1 mg/l to 5000 mg/l
		Chloride as Cl	IS 3025 (Part 32): 1988 (RA 2009) APHA 22 nd Edn. 4500 Cl-B, 2012	1 mg/l to 30000 mg/l
		Total Iron as Fe	IS 3025 (Part 53): 2003 (RA 2009) APHA 22 nd Edn.3500-Fe, B, 2012	0.05 mg/l to 100 mg/l
		COD	IS 3025 (Part 58): 2006 APHA 22 nd Edn. 5220 B, 2012	4 mg/l to 40000 mg/l
		BOD @ 27 °C for 3 days	IS 3025 (Part 44): 1993 (RA 2009) APHA 22 nd Edn.5210 B, 2012	5 mg/l to 5000 mg/l
		Dissolved Oxygen	IS 3025 (Part 38): 1989 (RA 2009) APHA 22 nd Edn.4500 O-B, 2012	0.2 mg/l to 10 mg/l
		Total Kjeldahl Nitrogen & Organic Nitrogen	IS 3025 (Part 34): 1988 (RA 2009) APHA 22 nd Edn.4500 N-C, 2012	1 mg/l to 500 mg/l
		Nitrate as NO ₃	IS 3025 (Part 34): 1988 (RA 2009) APHA 22 nd Edn.4500 NO ₃ ,B,2012	0.5 mg/l to 100 mg/l
		Free Ammonia as NH ₃	IS 3025 (Part 34): 1988 (RA 2009) APHA 22 nd Edn.4500 NH ₃ ,C,2012	0.1 mg/l to 20 mg/l
	Ammoniacal Nitrogen as NH ₃	IS 3025 (Part 34): 1988 (RA 2009) APHA 22 nd Edn.4500 NH ₃ B,C,2012	1 mg/l to 500 mg/l	

Laboratory Richardson & Cruddas (1972) Ltd., Environmental Engineering
**Laboratory Chennai Division, 69-D, SIDCO Industrial Estate, Ambattur,
Chennai, Tamil Nadu**

Accreditation Standard ISO/IEC 17025: 2005

Discipline Chemical Testing **Issue Date** 24.04.2015

Certificate Number T-2422 **Valid Until** 23.04.2017

Last Amended on - **Page** 7 of 7

S.No.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
	Liquid Effluent (Effluent Water, STP Water, Waste Water & Treated Water)	Oil & Grease	IS 3025 (Part 39): 1991 (RA 2009) APHA 22 nd Edn.5520 O&G-B,2012	1 mg/l to 1000 mg/l
		Fluoride as F	IS 3025 (Part 60): 2008 APHA 22 nd Edn.4500 F,D, 2012	0.1 mg/l to 20 mg/l
		Total Residual Chlorine	IS 3025 (Part 26): 1986 (RA 2009) APHA 22 nd Edn.4500 CI G, 2012	0.1 – 10 mg/l
		Dissolved Phosphate as PO ₄	IS 3025 (Part 31): 1988 (RA 2009) APHA 22 nd Edn.4500 P-B,D, 2012	0.01 mg/l to 100 mg/l
		Total Phosphate as PO ₄ ,	IS 3025 (Part 31): 1988 (RA 2009) APHA 22 nd Edn.4500 P-B,D, 2012	0.01 mg/l to 100 mg/l
		Reactive Silica as SiO ₂	APHA 22 nd Edn.4500-SiO ₂ C,2012	0.02 mg/l to 100 mg/l
		Sulphate as SO ₄	IS 3025 (Part 24): 1986 (RA 2009) APHA 22 nd Edn.4500 SO ₄ B, 2012	1 mg/l to 5000 mg/l
		Sulphide as S ₂	IS 3025 (Part 29): 1986 (RA 2009) APHA 22 nd Edn. 4500 S F, 2012	0.5 mg/l to 100 mg/l
		Sodium as Na	IS 3025 (Part 45): 1993 (RA 2009) APHA 22 nd Edn. 3111 B, 2012	1.0 mg/l to 10000 mg/l
		Potassium as K	IS 3025 (Part 45): 1993 (RA 2009) APHA 22 nd Edn. 3111 B, 2012	1.0 mg/l to 10000 mg/l
	Percent Sodium,	Validated Laboratory method No. R&C/SOP/49 dt. 30.11.2013 (Ref. EPA methods)	10 % to 80 %	

~~-X-X-X-X-X-X-X-X-X-X-X-X-X-X-X-~~

Ruchi Guntuku
Convenor

N. Venkateswaran
Program Manager