

**Laboratory** GWEL Laboratory, GMR Warora Energy Limited, B-1, Mohbala, MIDC Warora Growth Centre, Post & Tehsil Warora, District Chandrapur, Maharashtra

**Accreditation Standard** ISO/IEC 17025: 2005

**Certificate Number** TC-7785 (in lieu of T-4140)

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**Validity** 22.09.2018 to 21.09.2020

**Last Amended on --**

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
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**CHEMICAL TESTING**

<b>I.</b>	<b>SOLID FUELS</b>			
<b>1.</b>	<b>Coal</b>	TM (Total Moisture)	IS 1350 (Part 1): 1984 (RA 2013)	5 % to 25 %
		Moisture (ADB) On dry basis	IS 1350 (Part 1): 1984 (RA 2013)	0.5 % to 20 %
		Ash (ADB)	IS 1350 (Part 1): 1984 (RA 2013)	2.0 % to 75 %
		VM (ADB)	IS 1350 (Part 1): 1984 (RA 2013)	10 % to 45 %
		FC (ADB)	IS 1350 (Part 1): 1984 (RA 2013)	By Calculation
		GCV Kcal/Kg (ADB)	IS 1350 (Part 2): 2017	500 kcal/kg to 8300 kcal/kg
<b>II.</b>	<b>WATER</b>			
<b>1.</b>	<b>Surface Water</b>	pH	IS 3025 (Part 2): 1983 (RA 2017) Electrometric method	2 to 13
		Conductivity	IS 3025 (Part 14): 2013 Electrometric method	1 µS/cm to 20 mS/cm
		Turbidity	IS 3025 (Part 10): 1984 (RA 2017) Nephelometric Method	0.1 NTU to 1000 NTU
		Suspended Solids	IS 3025 (Part 15): 1984 (RA 2014) Gravimetric method	10 mg/l to 1000 mg/l
		Total solids	IS 3025 (Part 15): 1984 (RA 2014) Gravimetric method	10 mg/l to 1000 mg/l

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		TDS	IS 3025 (Part 15): 1984 (RA 2014) Gravimetric method	5 mg/l to 1000 mg/l
		Total Hardness as CaCO <sub>3</sub>	IS 3025 (Part 21): 2009 (RA 2014) EDTA method	1 mg/l to 2000 mg/l
		Ca –Hardness as Ca CO <sub>3</sub>	IS 3025 (Part 21): 2009 (RA 2014) EDTA method	20 mg/l to 1500 mg/l
		Mg-hardness as CaCO <sub>3</sub>	IS 3025 (Part 21): 2009 (RA 2014) EDTA method	20 mg/l to 1500 mg/l
		Calcium as Ca	IS 3025 (Part 40): 1991 (RA 2014) EDTA method	0.5 mg/l to 1000 mg/l
		Magnesium as Mg	IS 3025 (Part 46): 1994 (RA 2014) EDTA method	0.5 mg/l to 1000 mg/l
		Chlorine Residual (FRC)	IS 3025 (Part 26): 1986 (RA 2014) Iodometric Method	0.1 mg/l to 2 mg/l
		Iron	IS 3025 (Part 53): 2003 (RA 2014) 1, 10 Phenanthroline method	0.01 mg/l to 5 mg/l
		Alkalinity as CaCO <sub>3</sub>	IS 3025 (Part 23): 1986 (RA 2014) Titrimetric method	2 mg/l to 1000 mg/l
		Chlorides as Cl	IS 3025 (Part 32): 1988 (RA 2014) Argentometric Method	2 mg/l to 1000 mg/l
		Sulphate as SO <sub>4</sub>	IS 3025 (Part 24): 1986 (RA 2014) Turbidity Method	2 mg/l to 2000 mg/l

Rozina  
Convenor

Anuja Anand  
Program Manager

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		Silica as SiO <sub>2</sub>	IS 3025 (Part 35): 1988 (RA 2014) Heteropoly blue method	0.005 mg/l to 300 mg/l
		COD	IS 3025 (Part 58): 2006 (RA 2017)	10 mg/l to 1000 mg/l
<b>2.</b>	<b>Process Water</b>	pH	IS 3025 (Part 2): 1983 (RA 2017) Electrometric method	2 to 13
		Conductivity	IS 3025 (Part 14): 2013 Electrometric method	1 µS/cm to 20 mS/cm
		Turbidity	IS 3025 (Part 10): 1984 (RA 2017) Nephelometric Method	0.1 NTU to 1000 NTU
		Suspended Solids	IS 3025 (Part 15): 1984 (RA 2014) Gravimetric method	10 mg/l to 1000 mg/l
		Total solids	IS 3025 (Part 15): 1984 (RA 2014) Gravimetric method	10 mg/l to 1000 mg/l
		TDS	IS 3025 (Part 15): 1984 (RA 2014) Gravimetric method	5 mg/l to 1000 mg/l
		Total Hardness as CaCO <sub>3</sub>	IS 3025 (Part 21): 2009 (RA 2014) EDTA method	1 mg/l to 2000 mg/l
		Ca –Hardness as Ca CO <sub>3</sub>	IS 3025 (Part 21): 2009 (RA 2014) EDTA method	20 mg/l to 1500 mg/l
		Mg-hardness as CaCO <sub>3</sub>	IS 3025 (Part 21): 2009 (RA 2014) EDTA method	20 mg/l to 1500 mg/l
		Calcium as Ca	IS 3025 (Part 40): 1991 (RA 2014) EDTA method	0.5 mg/l to 1000 mg/l

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		Magnesium as Mg	IS 3025 (Part 46): 1994 (RA 2014) EDTA method	0.5 mg/l to 1000 mg/l
3.	<b>Water &amp; Process Water</b>	Chlorine Residual (FRC)	IS 3025 (Part 26): 1986 (RA 2014) Iodometric Method	0.1 mg/l to 2 mg/l
		Iron	IS 3025 (Part 53): 2003 (RA 2014) 1, 10 Phenanthroline method	0.01 mg/l to 5 mg/l
		Copper	IS 3025 (Part 42): 1992 (RA 2014) Neocuproin method	20 µg/l to 1000 µg/l
		Alkalinity as CaCO <sub>3</sub>	IS 3025 (Part 23): 1986 (RA 2014) Titrimetric method	2 mg/l to 1000 mg/l
		Chlorides as Cl	IS 3025 (Part 32): 1988 (RA 2014) Argentometric Method	2 mg/l to 1000 mg/l
		Sulphate as SO <sub>4</sub>	IS 3025 (Part 24): 1986 (RA 2014) Turbidity Method	2 mg/l to 2000 mg/l
		Silica as SiO <sub>2</sub>	IS 3025 (Part 35): 1988 (RA 2014) Heteropoly blue method	0.005 mg/l to 300 mg/l
		Oil & Grease	IS 3025 (Part 39): 1991 (RA 2014) Partition gravimetric method	2 mg/l to 100 mg/l
		COD	IS 3025 (Part 58): 2006 (RA 2017)	10 mg/l to 1000 mg/l
		Phosphate	IS 3025 (Part 31): 1988 (RA 2014) Vanadomolybdo-Phosphoric method	0.1 mg/l to 10 mg/l

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		Hydrazine	IS 3550:1965 (RA 2009) p-aminobenzeldehyde method	0.02 mg/l to 3 mg/l
		Acidity	IS 3025 (Part 22) Titrimetric method	2 mg/l to 2000 mg/l
		Ammonia	IS 3025 (Part 34): 1988 (RA 2003) Ammoniacal Nitrogen method	0.1 mg/l to 10 mg/l
<b>III.</b>	<b>POLLUTION AND ENVIRONMENT</b>			
<b>1.</b>	<b>Water &amp; Waste Water</b>	pH	IS 3025 (Part 2): 1983 (RA 2017) Electrometric method	2 to 13
		Conductivity	IS 3025 (Part 14): 2013 Electrometric method	1 µS/cm to 20 mS/cm
		Suspended Solids	IS 3025 (Part 15): 1984 (RA 2014) Gravimetric method	10 mg/l to 1000 mg/l
		Total solids	IS 3025 (Part 15): 1984 (RA 2014) Gravimetric method	10 mg/l to 1000 mg/l
		TDS	IS 3025 (Part 15): 1984 (RA 2014) Gravimetric method	5 mg/l to 1000 mg/l
		BOD	IS 3025 (Part 44): 1993 (RA 2013) Oxygen depletion method	5 mg/l to 250 mg/l
		COD	IS 3025 (Part 58): 2006 (RA 2017)	10 mg/l to 1000 mg/l