



**Title:** Analytical Data of Water Analysis

<b>SOP No.:</b>		<b>Revision No.:</b>	00
<b>Effective Date:</b>		<b>Supersedes No.</b>	Nil
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**1.0 OBJECTIVE:**

To lay down a procedure for Analytical Data of Water Analysis.

**2.0 SCOPE:**

This SOP is applicable for Analytical Data of Water Analysis (pH, TDS, Conductivity, ORP, chlorine and Hardness) in water treatment plant.

**3.0 RESPONSIBILITY:**

Officer / Executive-Engineering

**4.0 ACCOUNTABILITY:**

Head-Engineering

**5.0 DEFINITION:**

**WATER:** Water a colourless, transparent, odourless, liquid which forms the seas, lakes, rivers, and rain and is the basis of the fluids of living organisms.

**6.0 PROCEDURE:**

**6.1 ANALYTICAL PARAMETERS:**

- 6.1.1 Total Dissolved Solids (TDS).
- 6.1.2 pH
- 6.1.3 Conductivity
- 6.1.4 Oxidation Reduction Potential (ORP).
- 6.1.5 Chlorine
- 6.1.6 Hardness

**6.2 ANALYSIS METHOD OF RAW WATER:**

- 6.2.1 **pH Testing Method:** Start the Pre treatment water plant in operation mode.
- 6.2.2 Take raw water in a beaker through sampling valve.
- 6.2.3 Rinse the beaker 2 to 3 times with water also clean the pen type pH meter sensing point.
- 6.2.4 Collect water 3/4th level in washed beaker.



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- 6.2.5 Switch "ON" the pH meter and insert into the water.
- 6.2.6 Observe the value and it should be between 5 to 8 pH, note down the reading in record.
- 6.2.7 **TDS Testing Method:** Clean the pen type TDS meter sensing point.
- 6.2.8 Collect fresh water 3/4th level in washed beaker.
- 6.2.9 Switch "ON" the TDS meter and insert into the water.
- 6.2.10 Observe the value and it should be NMT 500 ppm, note down the reading in record.

### 6.3 ANALYSIS METHOD OF SOFT WATER:

- 6.3.1 **pH Testing Method:** Take soft water in a beaker through sampling valve.
- 6.3.2 Rinse the beaker 2 to 3 times with water also clean the pen type pH meter sensing point.
- 6.3.3 Collect soft water 3/4th level in washed beaker.
- 6.3.4 Switch "ON" the pH meter and insert into the water.
- 6.3.5 Observe the value and it should be between 6.5 to 7.5 pH, note down the reading in record.
- 6.3.6 **TDS Testing Method:** Clean the pen type TDS meter sensing point.
- 6.3.7 Collect fresh water 3/4th level in washed beaker.
- 6.3.8 Switch "ON" the TDS meter and insert into the water.
- 6.3.9 Observe the value and it should be not more than 500 ppm, note down the reading in record.
- 6.3.10 Note down the reading of ORP (should be NMT200 mv) which is displayed in controlling panel ORP indicator.
- 6.3.11 **Chlorine Test Method:** Take soft water in a beaker through sampling valve.
- 6.3.11.1 **Method for Free Chlorine 0.1-2.0 ppm:**
  - i) Rinse the beaker/test tube/jar 2 to 3 times with soft water.
  - ii) Take 10ml. of water sample to be tested in the test jar.
  - iii) Add One spoonful (provided with kit) of FC-1.
  - iv) Mix contents well to dissolve.
  - v) If a pink colour does not develop, chlorine is not present.
  - vi) If a pink colour appears, free chlorine is present.
  - vii) Now drop wise add FC-2 with counting the number of drops while mixing, until the pink colour disappears.

6.3.11.1.1 **Results Interpretation:** Interpret the results by using following calculation for determination of Total Hardness.



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**6.3.11.1.2 Calculations:** Free chlorine as ppm chlorine =  $0.1 \times (\text{No. of drops of FC } 2)$

**NOTE:**

- a) Once the end point (colourless) has reached, ignore if the pink colour reappears after some time.
- b) Reagent FC-1 is highly sensitive to moisture, Close the lid of the bottle immediately after use.
- c) Ensure that only dry spoon is used to handle the FC 1 Reagent.
- d) If colour is observed from sample, adjust with SMBS until sample colourless.

**6.3.12 Hardness Test Method:**

Take soft water in a beaker through sampling valve.

**6.3.12.1.1 Method (A) for (2-40 ppm)**

- i) Rinse the beaker 2 to 3 times with soft water.
- ii) Take 25 ml of water sample to be tested in the test jar /beaker/test tube
- iii) Add One spoonful (provided with kit) of TH 1.
- iv) Mix contents well to dissolve.
- v) Add 10-12 drops of TH 2 and mix content well.
- vi) If colour turns blue, it indicates there is 'No Hardness' in the water.
- vii) If colour turns red, it indicates there is 'Hardness'.
- viii) Now add TH 3 drop wise with counting the number of drops while mixing, until the colour changes from red to blue.
- ix) If the colour does not changes to blue after adding 20 drops it means that the hardness of the sample is more than 40 PPM, in this case follow Method (B) as below.

**6.3.12.1.2 Method (A) for (25-500 ppm)**

- i) Take 10 ml of water sample to be tested in the beaker/test jar/test tube.
- ii) Add one spoonful (provided in Kit) of TH 1.
- iii) Mix contents well to dissolve.
- iv) Then add 10-12 drops of TH 2, and mix contents well.
- v) Now add TH 5 drop wise with counting the number of drops while mixing, until the colour changes from red to blue.



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#### 6.3.12.1.3 Results Interpretation:

Interpret the results by using following calculation for determination of Total Hardness.

#### 6.3.12.1.4 Calculations:

- Total Hardness as ppm CaCO<sub>3</sub> = 2 X (Number of drops of TH 3)
- Total Hardness as ppm CaCO<sub>3</sub> = 25 X (Number of drops of TH 5)

### 6.4 ANALYSIS METHOD OF RO-I PERMEATE:

- 6.4.1 pH Testing Method:** Take RO-I permeate water in a beaker through sampling valve.
- 6.4.2** Rinse the beaker 2 to 3 times with water also clean the pen type pH meter sensing point.
- 6.4.3** Collect RO-I permeate 3/4<sup>th</sup> level in washed beaker.
- 6.4.4** Switch "ON" the pH meter and insert into the water.
- 6.4.5** Observe the value and it should be between 7.5 to 8.0 pH, note down the reading in record.
- 6.4.6 TDS Testing Method:** Clean the pen type TDS meter sensing point.
- 6.4.7** Collect fresh water 3/4<sup>th</sup> level in washed beaker.
- 6.4.8** Switch "ON" the TDS meter and insert into the water.
- 6.4.9** Observe the value and it should not more than 75 ppm, note down the reading in record.
- 6.4.10** Note down the reading of conductivity (should be NMT 50 Micro Siemens per cm<sup>2</sup>) which is displayed in controlling panel conductivity indicator.

### 7.0 ABBREVIATIONS:

SOP	Standard Operating Procedure
No.	Number
QA	Quality Assurance
ID No.	Identification Number
Ltd	Limited
EN	Engineering
TDS	Total Dissolved Solids
ORP	Oxidation Reduction Potential
NMT	Not More Than
RO	Reverse Osmosis
TH	Total Hardness



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FC Free Chlorine  
SMBS Sodium Meta Bisulphite  
cm centimeter  
COND Conductivity

### 8.0 ANNEXURES:

ANNEXURE No.	TITLE OF ANNEXURE	FORMAT No.
Annexure-I	Analytical Data of Water Analysis	
Annexure-II	Soft Water ORP and RO Water Conductivity Record	
Annexure-III	Soft Water Chlorine, Hardness and pH of ultra filtration test record	

### 9.0 DISTRIBUTION:

- Controlled Copy No. 01 Head-Engineering
- Master Copy Quality Assurance Department

### 10.0 REFERENCES:

Not Applicable

### 11.0 REVISION HISTORY:

Revision No.	Change Control No.	Details of Changes	Reason of Changes	Effective Date	Done By





