WEBINAR ON

‘SALIENT FEATURE OF CGWA NOTIFICATION ON GROUNDWATER REGULATION AND MANAGEMENT AND WATER AUDITING FOR INDUSTRIES’

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Applicability

- **Guidelines will come in force with immediate effect from issue of Notification with prospective effect.**
- **Guidelines will have pan-India applicability.**
- **CGWA guidelines shall prevail in case of inconsistency with State guidelines.**
- **If the State has more stringent provisions, the State provisions shall prevail.**

Salient features of Guidelines

▪Water Management Plans

- Water management plans to be prepared by State GW Authorities/ Organizations for all OCS blocks.
- Plans to be reviewed and updated periodically.
- Water management Plans, Data on water availability and policy for GW extraction to be uploaded on the web site of CGWA.

▪Registration of Drilling Rigs

- All drilling rigs operating in their jurisdiction to be registered by respective State / UT Governments.
- Database of wells drilled by rigs to be maintained.
- Link to be provided on CGWA web site to access the data.

Exemptions

Exempted from seeking NOC

- **Individual domestic consumers in both rural and urban areas for drinking water and domestic uses.**
- **Rural drinking water supply schemes.**
- **Armed Forces Establishments and Central Armed Police Forces establishments in both rural and urban areas.**
- **Agricultural activities.**
- **Micro and small Enterprises drawing ground water less than 10 cum/day.**

General Conditions for NOC

For Drinking & Domestic use for Residential apartments/ Group Housing Societies/ Government water supply agencies in urban areas

- Non-availability of water from local government water supply agency in cases requiring ground water in excess of 10 m3/ day for drinking/ domestic use.
- Installation of Sewage Treatment Plants shall be mandatory for all residential apartments where ground water requirement is more than 20 m3/day. The water from STP shall be utilized for toilet flushing, car washing, gardening etc.
- Ground water quality data monitoring
- Proposal for rainwater harvesting/ recharge within the premises as per Model Building Bye Laws issued by Ministry of Housing & Urban Affairs.

General Conditions for NOC

For Industry Projects

- NOC shall be granted only in such cases where local government water supply agencies are not able to supply the desired quantity of water.
- All industries shall be required to adopt latest water efficient technologies so as to reduce dependence on ground water resources.
- Construction of observation well(s) (piezometer)(s) within the premises and installation of appropriate water level monitoring mechanism shall be mandatory for industries drawing/ proposing to draw more than 10 m3/day of ground water
- **All industries abstracting ground water in excess of 100 m3/d shall be required to undertake annual water audit through CII/ FICCI/ NPC certified auditors and submit audit reports within three months of completion of the same to CGWA.**
- Adopt roof top rainwater harvesting/ recharge in the project premises. Industries that are likely to pollute GW to adopt Roof Top RWH with storage.

General Conditions for NOC

For Industries:

- All industries drawing more than 100 m3/day of GW required to reduce their ground water use by at least 20% over the next three years through appropriate means.
  - All industries drawing GW to the tune of 100 m^3/day or more in OCS areas to submit report on impact on GW withdrawal on GW regime including socio-economic aspect.
  - **NOC may be issued subject to the condition that the proponent will submit Impact Assessment Report prepared by Accredited Consultant (Critical & Semi-critical units) and Water Audit Report (Critical, Semi-critical & Safe units) prepared by certified auditors by 31/12/2020.**
  - **Over Exploited Assessment Units shall continue to be processed as per the notified guidelines dated 24/9/2020.**

Groundwater Charges

GW Restoration/ Abstraction charges

- Groundwater Restoration/ Abstraction Charges introduced.
- All residential apartments/ group housing societies/ Government water supply agencies in urban areas required to pay ground water abstraction charges.
- **All users seeking NOC in OE areas to pay Ground Water Restoration Charges**
- **All users seeking NOC in Safe, Semi-critical and Critical areas to pay Ground Water Abstraction Charges.**
- The revenue generated from the proposed water abstraction/ restoration charges to be kept in a separate fund for implementation of site-specific suitable demand/ supply side interventions.

GROUND WATER ABSTRACTION CHARGES

- **Drinking & Domestic use for residential apartments/ Group Housing Societies/ Government water supply agencies in Urban area.**

Quantum of Groundwater withdrawal (m^3/month)	Rate of ground water abstraction charges (Rs. per m^3)
0-25	No charge
26-50	Re 1/-
>50	Rs 2/-

- **Government water supply agencies/ Government infrastructure projects : Rs. 0.50 per m^3**

GROUND WATER ABSTRACTION CHARGES

Packaged Drinking Water units

S.No.	Category of area	Quantum of ground water withdrawal				
		Up to 50 m3/day	51 to <200 m3/day	200 to <1000 m3/day	1000 to <5000 m3/day	5000 m3/day and above
		Rates of GW abstraction charges (Rs. per m^3)				
1	Safe	1	3	5	8	10
2	Semi-critical	2	5	10	15	20
3	Critical	4	10	20	40	60

GROUND WATER RESTORATION CHARGES

Packaged Drinking Water units

S.No.	Category of area	Quantum of ground water withdrawal				
		Up to 50 m3/day	51 to <200 m3/day	200 to <1000 m3/day	1000 to <5000 m3/day	5000 m3/day and above
		Rates of GW restoration charges (Rs. per m^3)				
1	Over-exploited (existing industries only)	8	20	40	80	120

GROUND WATER ABSTRACTION CHARGES

Infrastructure Projects and Other Industries

S.No.	Category of area	Quantum of ground water withdrawal (m^3/day)			
		<200 m3/day	200 to <1000 m3/day	1000 to <5000 m3/day	5000 m3/day and above
		Rates of GW abstraction charges (Rs. per m^3)			
1	Safe	1	2	3	5
2	Semi-critical	2	3	5	8
3	Critical	4	6	8	10

GROUND WATER RESTORATION CHARGES

Infrastructure Projects and Other Industries

S.No.	Category of area	Quantum of ground water withdrawal			
		<200 m3/day	200 to <1000 m3/day	1000 to <5000 m3/day	5000 m3/day and above
		Rates of GW restoration charges (Rs. per m^3)			
1	Over-exploited (existing industries/ new Industries as per the present Guidelines)	6	10	16	20

GROUND WATER ABSTRACTION CHARGES

Mining projects

S.No.	Category of area	Quantum of ground water withdrawal			
		<200 m3/day	200 to <1000 m3/day	1000 to <5000 m3/day	5000 m3/day and above
		Rates of GW abstraction charges (Rs. per m^3)			
1	Safe	1	2	2.50	3
2	Semi-critical	2	2.50	3	4
3	Critical	3	4	5	6

GROUND WATER RESTORATION CHARGES

Mining projects

S.No.	Category of area	Quantum of ground water withdrawal			
		<200 m3/day	200 to <1000 m3/day	1000 to <5000 m3/day	5000 m3/day and above
		Rates of GW restoration charges (Rs. per m^3)			
1	Over-exploited	4	5	6	7

GROUND WATER ABSTRACTION/ RESTORATION CHARGES

Bulk/ Private Tanker water supplies

Category of area	Rate of GW abstraction charges (Rate per m^3) in Rs.
Safe	10
Semi-critical	20
Critical	25

Category of area	Rate of GW Restoration charges (Rs. per m^3)
Over-exploited	35

NOC for GW Abstraction – Restrictions and Permissions

Industrial Use

- NOC for Ground water abstraction by New Industries other than Public infrastructure/ Mining/ MSME not granted in OE units except for drinking, domestic & green belt use.
- Existing industries/ infrastructure/ mining projects in OE areas to be continued.
- Expansion of existing industries involving increase in quantum of ground water abstraction in over-exploited assessment units not permitted.
- No NOC to be granted to new packaged water industries in Over-exploited areas, even if they belong to MSME category.

Mining Use

- Mining projects allowed in all category areas in the national interest

NOC for GW Abstraction – Restrictions and Permissions

Agriculture Sector: Agriculture sector is exempted from obtaining NOC for GW extraction.

- Adopting Participatory approach for sustainable GW management
- Review free/ subsidized electricity policy to farmers
- Bringing suitable water pricing policy
- Working towards crop rotation/ diversification/ other initiatives to reduce over-dependence on groundwater.

Infrastructure Projects

- Existing/ New public infrastructure projects permitted in all areas.
- No NOC for new Water Park/ Theme Park/ Amusement Park in OE units
- In OE assessment units, use of ground water for construction activity for infrastructure projects to be permitted only if no treated sewage water is available within 10 km radius of the site.

NOC for GW Abstraction – Restrictions and Permissions

Bulk/Tanker supplies

- All private tankers / bulk water suppliers abstracting ground water to be regulated and mandatorily obtain NOC for ground water abstraction
- The bulk/ water tanker suppliers drawing ground water to pay ground water abstraction charges as per the category of the area
- Municipal bodies to be roped in for this purpose

Saline GW

- Industries using saline ground water to be encouraged
- Such industries to be exempted from paying ground water abstraction/ restoration charges

Salient features of Guidelines- Monitoring Mechanism

Robust Monitoring Mechanism of NOC

- Comprehensive MIS utilizing the latest ICT tools for centralized monitoring of compliance
- Online monitoring of GW extraction and water levels through installation of digital flow meters with telemetry
- Designating all technical officers of CGWB/ State Ground Water organization as authorized officers for periodic field inspection and monitoring of compliance.
- District Industry/ Revenue Officers/ Agriculture Officer to act as Authorized Officers.
- Independent agencies to be engaged for monitoring compliance of NOC conditions.
- Steep hike in penalties proposed for violation of NOC conditions

Protection of Wet Land

- Project proponent to obtain consent from Wet Land Authority before seeking NOC from CGWA.
- Projects located within 500 meter from the periphery of demarcated wetland areas to mandatorily submit detailed study report to ensure that ground water abstraction by the project proponent is not likely to have any adverse impact on the protected wetland areas.

Environmental Compensation

Environmental Compensation

- Environmental compensation for any illegal abstraction of ground water to be levied as per CPCB report
- Categories for which EC shall be levied and corresponding rates specified.

ECGW = Ground water consumption per day x Environmental Compensation rate (ECRGW) x No. of days x Deterrence factor

where ground water consumption is in m3/day and ECRGW in Rs./ cum

Environmental Compensation Rates

ECRgw for Drinking & Domestic use (For institutional activity, commercial complexes, townships etc)

S.No.	Area Category	Water Consumption (m^3/day)			
		<2	2 to <5	5 to <25	25 & above
		Environmental Compensation Rate (ECR_{GW}) in Rs./m^3			
1	Safe	4	6	8	10
2	Semi Critical	12	14	16	20
3	Critical	22	24	26	30
4	Over- Exploited	32	34	36	40

Note: -Minimum EC_{GW} shall not be less than Rs. 50,000/- [for institutional activity, commercial complexes, townships etc)

ECRgw for Packaged Drinking Water Units

S.No.	Area Category	Water Consumption (m^3/day)			
		<200	200 to <1000	1000 to <5000	5000 & above
		Environmental Compensation Rate (ECRGW) in Rs./m^3			
1	Safe	12	18	24	30
2	Semi critical	24	36	48	60
3	Critical	36	48	66	90
4	Over-exploited	48	72	96	120

Note :-Minimum ECGW shall not be less than Rs 1,00,000/-

ECRgw for Mining, Infrastructure and Dewatering Projects

S.No.	Area Category	Water Consumption (m^3/day)			
		<200	200 to <1000	1000 to <5000	5000 & above
		Environmental Compensation Rate (ECRGW) in Rs./m^3			
1	Safe	15	21	30	40
2	Semi critical	30	45	60	75
3	Critical	45	60	85	115
4	Over-exploited	60	90	120	150
Note :-Minimum ECcw shall not be less than Rs 1,00,000/-					

ECRgw for Industrial Units

S.No.	Area Category	Water Consumption (m^3/day)			
		<200	200 to <1000	1000 to <5000	5000 & above
		Environmental Compensation Rate (ECRGW) in Rs./m^3			
1	Safe	20	30	40	50
2	Semi critical	40	60	80	100
3	Critical	60	80	110	150
4	Over- exploited	80	120	160	200
Note :-Minimum ECcw =Rs 1,00,000/-					

DETERRENT FACTORS TO COMPENSATE LOSSES AND ENVIRONMENTAL DAMAGE

- For packaged drinking water units, mining, industries and infrastructural dewatering projects

Table: Deterrent factor based on quantum of ground water withdrawal and number of years of illegal withdrawal

S.No.	Water Consumption	Deterrence Factor		
		< 2 years	2-5 years	>5 years
1	<1000 KLD	1.00	1.00	1.25
2	1000-5000 KLD	1.00	1.00	1.50
3	>5000 KLD	1.00	1.25	2.00

Penalty Provisions

Provision of Penalty & Charges for modification in the existing issued NOC

- Provision of penalty for each type of violation of NOC conditions
- Provision of charges for correction /modification in the existing issued NOC.
- Penalty for injection of contaminated water into the aquifer enhanced to Rs. 10 lakh from Rs. 2 lakh.

Processing Fee

- Processing fee enhanced from Rs. 1000/- to Rs. 10000/- for grant of new NOC and from Rs. 500/- to Rs. 5000/- for renewal/ expansion of NOC

PENALTY FOR NON-COMPLIANCE OF NOC CONDITIONS

S. No.	Condition of NOC	Penalty (Rs.)
1	Non Installation/Defunct Digital water Flow meter with telemetry	2,00,000
2	Non disclosure/ construction of additional groundwater abstraction structures a) Functional (per structure) b) Defunct/Abandoned (per structure)	 2,00,000 1,00,000
3	Reporting of fresh water zones as Brackish / Saline zones in application	2,00,000
4	Non Installation of Piezometer	2,00,000
5	Non Installation /faulty DWLR/Telemetry	1,00,000
6	Non Construction /Inadequate Recharge Structure	5,00,000
7	Non maintenance of Recharge structure	2,00,000

PENALTY FOR NON-COMPLIANCE OF NOC CONDITIONS

S. No.	Condition of NOC	Penalty (Rs.)
8	Injection of treated/untreated water into the aquifer system. Note: In addition to penalty, the proponent shall bear the cost of aquifer remediation as per the provisions of Environment (Protection) Act, 1986.	1000000
9	Non Submission of Water level/Water quality Data.	50000
10	Non-maintenance of log book of daily withdrawal/non submission of Groundwater abstraction data.	50000
11	Non submission of photograph of recharge structure(s).	50000
12	Non Submission of Self Compliance report.	100000
13	Construction of groundwater abstraction structures by un authorized/unregistered Drilling Rigs (per structures).	100000
14	Non registration of water supply tankers.	500000
15	Submission of false information/ undertaking.	100000

PROPOSED CHARGES FOR CORRECTION/MODIFICATION IN THE EXISTING ISSUED NOC

Table: Proposed Charges for correction/Modification in the existing issued No Objection Certificate

S. No.	Items	Charges in Rs.
1	Change in recharge quantum	10000
2	Change in User ID.	5000
3	Change in firm Name	5000
4	Extension of No Objection Certificate	5000
5	Issuance of duplicate No Objection Certificate	5000
6	Issuance of corrigendum to No Objection Certificate	5000
7	Any other items/corrections etc	5000

Renewal of NOC

- The applicant to apply for renewal of NOC at least 90 days prior to expiry of its validity.
- Before granting renewal, Central Ground Water Authority or State/ UT Authority to satisfy itself that the conditions of NOC have been complied with.
- If the proponent fails to apply for renewal within 3 months from the date of expiry of NOC, the proponent to pay Environmental Compensation for the period starting from the date of expiry of NOC till NOC is renewed by the competent authority.

Extension of NOC

- Extension of NOC to be granted for a maximum period of two years.
- No further extension to be granted after the expiry of the extended period. In such case, the applicant to apply afresh for grant of NOC.

Validity period of NOC

Validity period of NOC (Renewal)

Category	Use	Term of renewal
Critical, Semi-critical and Safe	Infrastructure projects for drinking & domestic use and Urban Water Supply Agencies	5 Years
	Industries	3 Years
	Mines	2 Years
Over-Exploited	All users in 'Over-exploited areas'	2 Years

Salient features of Guidelines

General Compliance Conditions of NOC

- Installation of digital water flow meter (conforming to BIS/ IS standards) having telemetry system in the abstraction structure(s)
- Calibration of digital flow meters once in a year through authorized agency
- Roof top rainwater harvesting & recharge systems in the project area
- Payment of applicable Ground Water Abstraction/ Restoration Charges
- Monitoring of quality of ground water from the abstraction structure(s) once in a year
- Wherever feasible, requirement of water for greenbelt (horticulture) shall be met from recycled / treated wastewater
- Construction of purpose-built observation wells (piezometers) for ground water level monitoring is mandatory

GROUND WATER LEVEL MONITORING

All the project proponents (drawing ground water more than 10 cum/d) have to mandatorily construct Piezometers (observation wells) within their premises for monitoring of the ground water levels.

Table: No. of Piezometers to be constructed & Type of Water Level Monitoring Mechanism

S.No.	Quantum of Ground water withdrawal (cum/d)	No. of piezometer required	Monitoring mechanism		
			Manual	DWLR	DWLR with Telemetry
1	<10	0	0	0	0
2	11-50	1	1	0	0
3	51-500	1	0	1	0
4	>500	2	0	1	1

Salient features of Guidelines

Other General Compliance Conditions of NOC

- Conduction of Annual water Audits, report to be uploaded on CGWA website
- Conduction of Impact Assessment Study by industries located in OCS area
- Sale of ground water by a person/ agency not having valid NOC not permitted
- In infrastructure projects, paved/ parking area to be covered with interlocking/ perforated tiles or other appropriate measures to facilitate ground water recharge
- In case of Infrastructure projects, firm to ensure implementation of dual water supply system for use of fresh and STP treated water
- Non-compliance of conditions mentioned in the NOC sufficient reason for cancellation of NOC / non-renewal of NOC
- Abstraction structure(s) to be located inside the premises of project only

Salient features of Guidelines

Important Decisions:

- Processing of the existing cases submitted in NOCAP between 30/6/2020 and 24/9/2020 - In all such penalty of Rs 1 lakh will be imposed.
- Processing of the existing cases submitted in NOCAP after 24/9/2020 - In all such environmental compensation as per guidelines will be imposed.
- Applicants withdrawing water for drinking and domestic purposes for industry or mining have to apply under industry or mining category.

Salient features of Guidelines

Time limit for Compliance:

- **Electromagnetic flow meter with telemetry for all users seeking/ have sought NOC for ground water abstraction irrespective of quantum of ground water withdrawal – within 30 days.**

- **Construction of piezometer and installation of AWLR with telemetry – 90 days**

Salient features of Guidelines

Eligibility Checks

Projects	Stage	Area Type/ Assessment Units			
		Safe	Semi-critical	Critical	O.E.
Industries	Existing	Yes	Yes	Yes	Yes
	New	Yes	Yes	Yes	No
	Expansion	Yes	Yes	Yes	No
	Drinking & Green Belt	Yes	Yes	Yes	Yes

Salient features of Guidelines

Eligibility Checks

Projects	Stage	Area Type/ Assessment Units			
		Safe	Semi-critical	Critical	O.E.
Packaged Water Industries	Existing	Yes	Yes	Yes	Yes
	New	Yes	Yes	Yes	No
	Expansion	Yes	Yes	Yes	No

Salient features of Guidelines

Eligibility Checks

Projects	Stage	Area Type/ Assessment Units			
		Safe	Semi-critical	Critical	O.E.
MSME (> 10 KLD)	Existing	Yes	Yes	Yes	Yes
	New	Yes	Yes	Yes	Yes
	Expansion	Yes	Yes	Yes	Yes
	Packaged Water Industries	Yes	Yes	Yes	No

Salient features of Guidelines

Other Measures

- CGWA be restructured as an independent organisation, de-linked from CGWB having separate manpower exclusively dedicated to regulation of ground water extraction
- District Industry/ Revenue Officers be designated as Authorized Officers for ensuring that no project proponent abstracts illegal ground water without obtaining NOC from CGWA
- Given the large number of stakeholders associated with agriculture, appropriate levels of Agriculture / Revenue Officers be designated as Authorized Officers in consultation with the State Governments for implementation of the initiatives mentioned

‘WATER AUDIT & CONSERVATION IN INDUSTRIES’

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Resource Conservation Management (RCM) Division of FICCI, Services Offered to Industries

Energy Efficiency and Demand Side Management

Water & Wastewater Audits

Environment Management

Occupational Health & Safety Management

National Level Studies For Policy Development

Training & Capacity Building

FICCI WATER AUDIT STUDIES

We have done water audit studies for more than 200 industrial units including CAIRN, SAIL, ITC, IOCL, BPCL, BALCO, Essar Steel Ltd, JK Lakshmi Cement, UltraTech Cement, UB Group, Coca Cola India Inc, HZL, ACC Ltd, NTPC etc. covering following sectors

- Cement
- Iron & Steel
- Beverage
- Pulp & Paper
- Pharmaceuticals
- Zinc
- Power
- Textiles
- Chemical
- Oil & Refinery
- Aluminium
- Sugar
- Building Complex etc.

PARTIAL LIST OF OUR INDIAN CLIENTS – FOR WATER MANAGEMENT AUDIT

- ***Water Management Audits– List of Industries***
- Cairn India, Surat and Rajasthan
- IISCO-SAIL, Burnpur (Iron & Steel)
- CPM, JK Paper, Surat (Pulp & Paper)
- Indian Oil Corporation Ltd., Bongaigaon (Oil Refinery)
- Birla Century, Jagadia (Textiles)
- Hindustan Zinc Ltd, Bhilwara (Zinc)
- ITC Limited, Munger (Cigarette Manufacturing)
- ACC Limited, Barmana, HP (Cement)
- RBI, Chennai (Government Office & Staff Quarters)
- NTPC Limited, Kayamkulam (Power Plant)
- NTPC Limited, Faridabad (Power Plant)
- Essar Steel Limited, Visakhapatnam (Iron & Steel)
- Bharat Petroleum Corporation Ltd., Mahul (Oil Refinery)
- Bharat Aluminium Company Ltd. (BALCO), Korba (Aluminium)
- JK Lakshmi Cement Limited, Sirohi (Cement)
- Century Cement Ltd, Raipur (Cement) etc……..

RCM, FICCI IS :

- An Empanelled Accredited Energy Auditing Organization with Bureau of Energy Efficiency (BEE) for Conducting Mandatory Energy Audits and M&V Audits under Energy Conservation Act 2001

- Recognized Water Auditing Agency by Central Ground Water Authority, GoI

FICCI WATER AUDIT - ESTIMATED SAVING POTENTIAL

It is estimated that by implementing FICCI suggestions, the studied units improved their water use efficiency by 10-50 % with a discounted payback period < 2 years.

In addition to water savings, the unit also saved associated water & wastewater management costs (like energy, chemical consumption) by 5-20%.

WHAT IS WATER AUDIT?

- Water Audit study is a **qualitative** and **quantitative** analysis of water consumption which helps **efficient water utilization & conservation and wastewater management**.
- *Water Audit determines the amount of water lost from a distribution system and the cost of this loss to the utility.*
- *Comprehensive water audit envisages a detailed profile of the distribution system and water users, thereby facilitating easier and effective management of water resources and improved reliability.*

WATER AUDIT – CORE ELEMENT OF WATER & WASTEWATER MANAGEMENT PROGRAM

A Water Audit is a "Systematic Approach of Identifying, Measuring, Monitoring and Reducing the Water Consumption and Wastewater Generation by various activities in an Industry or any Organization"

WHY TO CONDUCT WATER AUDIT?

- Poor Availability or Non-Availability of Fresh Water
- Higher Specific Water Consumption
- High Water Bills
- Inconsistent Product Quality
- High Effluent Discharge
- Restriction on effluent Disposal to any Recipient Media
- Breakdowns, Leakages & Spillages
- Plan for future expansion
- Compliance Requirement
- Corporate Image etc.

WATER AUDIT-SCOPE OF WORK

• Development of **Water Circuit Flow Diagram** for the entire complex showing locations of reservoir tanks and pumps etc.

•Collection & compilation of **basic data of pumps** rated details, operating hours of pumps, reservoirs/tanks capacities etc.

•**Measurements of Flow**, Pressure and Power at major operating pumps

•Performance Assessment of Pumps in terms of actual v/s rated efficiency & Identification of inefficient pumps

•Preparation of **Water Balance Diagram**

•Study of existing **Water Distribution system** & Estimation of associated losses

WATER AUDIT-SCOPE OF WORK (CONTD.)

- Study for **optimization of freshwater usage** at various consumption points and recommend cost effective schemes
- Evolving **value added "cost of water"** at various locations
- Assessment of **water usage for Utilities**
- Assessment of **water quality** of water at use location
- Evolving recommendations on **water conservation & cost reductions**
- Suggestions for **reduction, reuse, recycling, regeneration & recharging** options for water conservation With cost benefit analysis and the required investment.

WATER AUDIT-SCOPE OF WORK (CONTD.)

- Assessing the **logistics of existing water management** practices & suggesting appropriate changes for reducing overall costs & improved water management.
- Incorporating **latest water conserving equipment/ technologies** in recommendations.
- Provide details on **Rainwater Harvesting (RWH) potential** for the given site and suggest possible RWH schemes.
- Evolving WATCON (Water Conservation) options with its **techno-economic feasibility** aspects & Cost Benefit Analysis.

SCOPE OF WORK AS PER CGWA NOTIFICATION

- On site training and discussion with facility manager and personnel
- Water system analysis
- Quantification of baseline water map
- Monitoring and measurements using pressure and flow meters and various other devices
- Quantification of inefficiencies and leaks
- Quantification of water quality loads and discharges
- Quantification of variability in flows and quality parameters
- Strategies for water treatment and reuse or direct use
- Complete water balance of the facility
- Developing ‘recycle’ and ‘reuse’ opportunities.
- Water consumption and wastewater generation pattern
- Specific water use and conservation
- Water saving opportunities
- Method of implementing the proposals with Full description and figures and Investment required

INITIATIVES BY INDUSTRY TO IMPROVE WATER USE EFFICIENCY

Supported by FICCI Water Audit Studies

PULP & PAPER UNIT

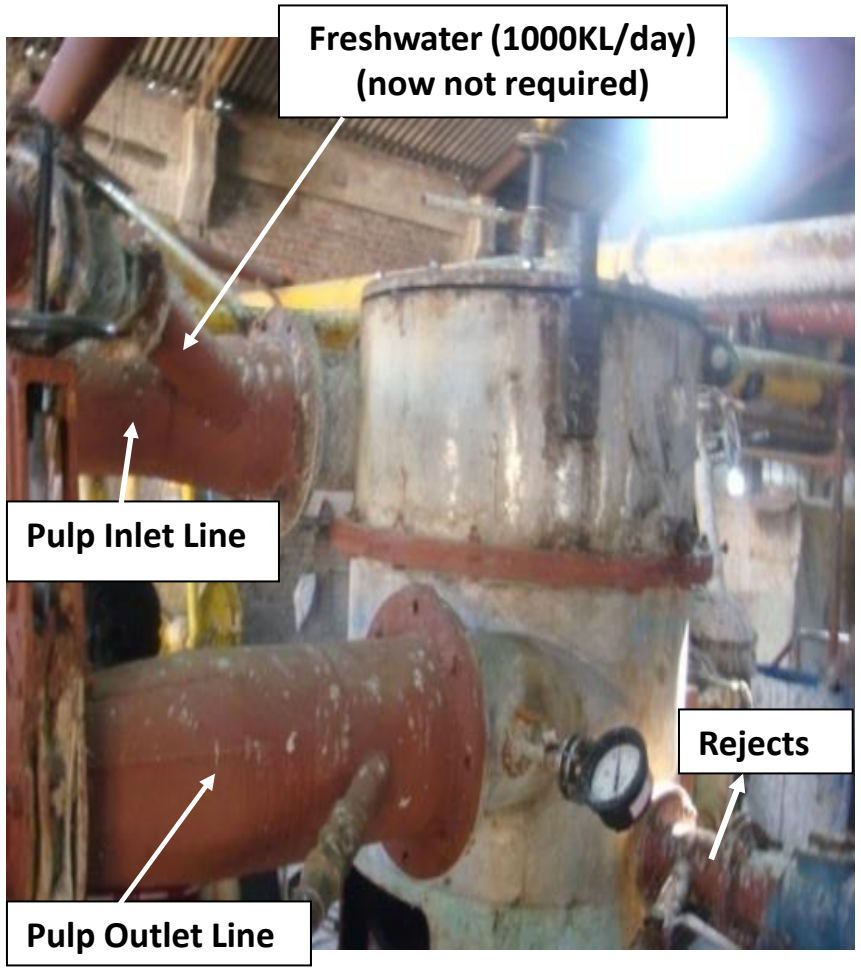
50% reduction in freshwater Consumption in one of the Pulp & Paper unit and reduction in effluent generation by 22% with discounted pay-back period of <2 years

Key Water saving opportunities implemented by RCM-FICCI:

- *Replacing low consistency screening technology (1%) with medium consistency (2.5%) pulp screening technology*
- *Installation of Water Efficient Showers at Paper Machines*
- *Implementation of Scheme for Segregation & Treatment of Colored Effluent for reuse in pulping*
- *Training and awareness generation*

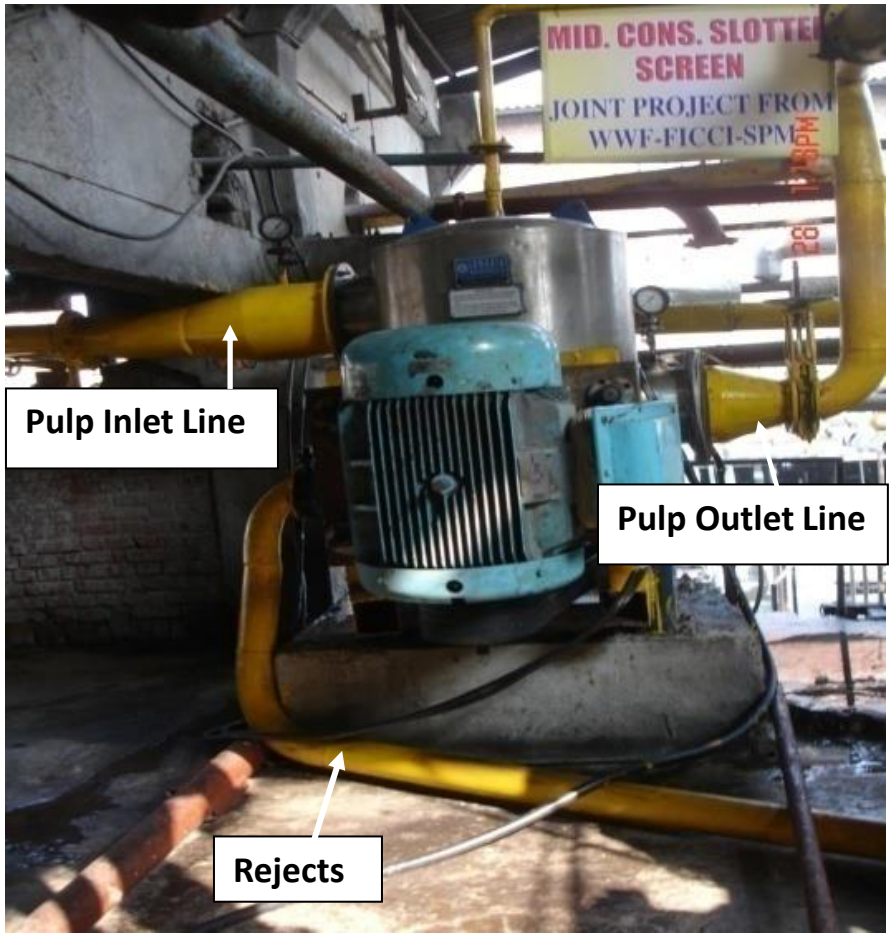
INSTALLATION OF MODERN MEDIUM CONSISTENCY PULP SCREENING EQUIPMENT

Before Implementation



Low Consistency Pulp Screen consuming more water

After Implementation



Medium Consistency Pulp Screen consuming less water.

WATER & ENERGY SAVINGS BY MODERN PULP SCREEN

Water & Energy Savings by Modern Pulp Screen Installation			
	Water Consumption (KL/day)	**Energy Consumption**	
Details		**Borewell (H.P./day)**	**Modern Pulping Screen KWh/day**
Before Installation	3000	720	990 (60 HP)
After Installation	2000	480	490 (32.8 HP)
Savings	**1000**	**240**	**500 (33.5 HP)**

INSTALLATION OF WATER EFFICIENT SHOWERS AT PAPER MACHINES

Before Implementation

Fig 3: Inefficient Hole Showers consuming more water

After Implementation

Fig 4: Water Efficient Wide Angle Spray Showers

WATER SAVINGS & REDUCTION IN EFFLUENT GENERATION BY MODERN WATER EFFICIENT SHOWERS

Water Savings & Reduction in Effluent Generation by Modern Water Efficient Showers		
Details	**Water Consumption (KL/day)**	**Effluent Generation (KL/day)**
Before Installation	1200	600
After Installation	720	360
Savings	**480**	**240**

Before Segregation and Treatment of Colored Effluent

COLORED DRAIN SAMPLES TESTED FOR HYPO-DOSING

Colored Wastewater Samples from different drains

Bleaching with addition of Hypo Solution

AFTER SEGREGATION AND TREATMENT OF COLORED EFFLUENT

Newly Constructed Channels & Pits for segregation & treatment

Hypo-dosing for colour removal

Treated Colored Effluent after Hypo-dosing

AFTER SEGREGATION AND TREATMENT OF COLORED EFFLUENT

New Storage Tank to provide Retention Time to treated colored effluent

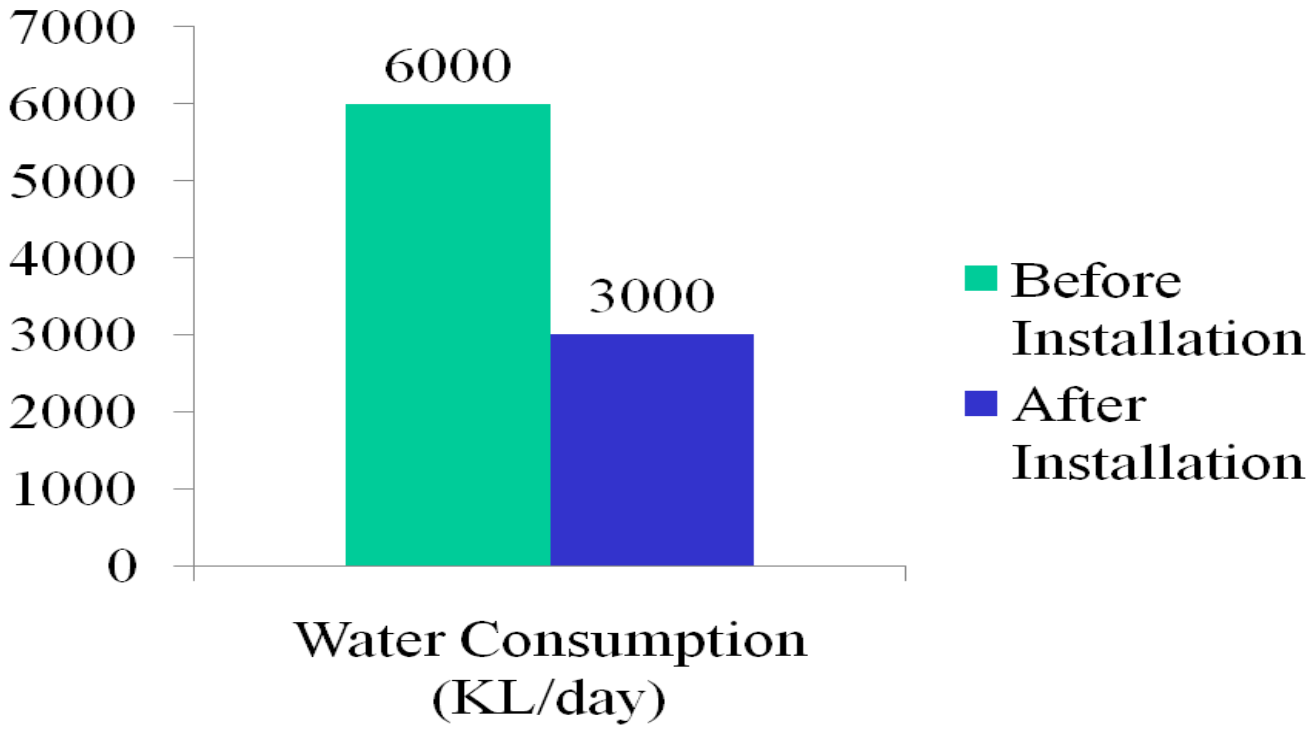
Effluent Discharged to common pit

Training to Middle Management at Pulp and Paper Unit

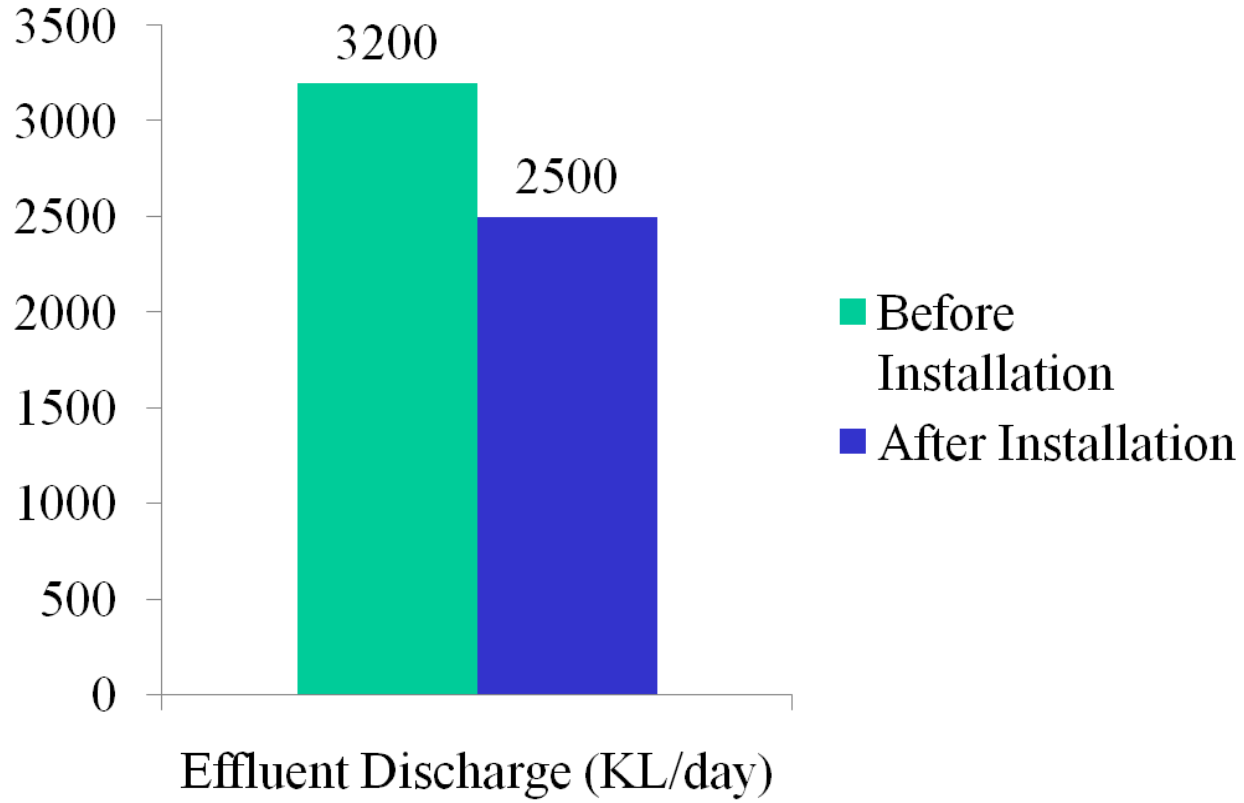
S.No.	Best Management Practices	Operational & Environmental benefits	Annual Resource Savings	Investment (Rs. In lakhs)	Annual Monetary Savings (Rs. In lakhs)	Simple Payback Period (Years)
1	Replacement of Conventional Pulp Screen with Modern Pulp Screening Equipment having consistency 2.5%	Uses less fresh water and energy and also, less energy would be required to pump the fresh water from the borewells	-Water Savings 3,000,00 KL	9.5	12	0.8
			-Energy Savings 226050 HP			
2	Replacement of conventional hole showers with modern wide angle & fan jet spray Showers at Paper Machines	Uses less water and enable backwater recycling leading to less effluent generation & savings in effluent treatment	-Water Saving	1.4	1.7	0.8
			1,440,00 KL			
			-Reduction in backwater generation			
			720,00 KL			
SUB-TOTAL				15.4	18.9	0.8
3	Segregation of colored effluents for colour removal before treatment & reuse	Increased efficiency of existing ETP and improved quality of final Effluent.		4.1	Operating Cost	--
					(-7.5)	
			TOTAL	**19.5**	**11.4**	**1.7**

COST BENEFIT ANALYSIS OF IMPLEMENTED BEST PRACTICES

REDUCTION IN FRESHWATER CONSUMPTION UPTO 50%

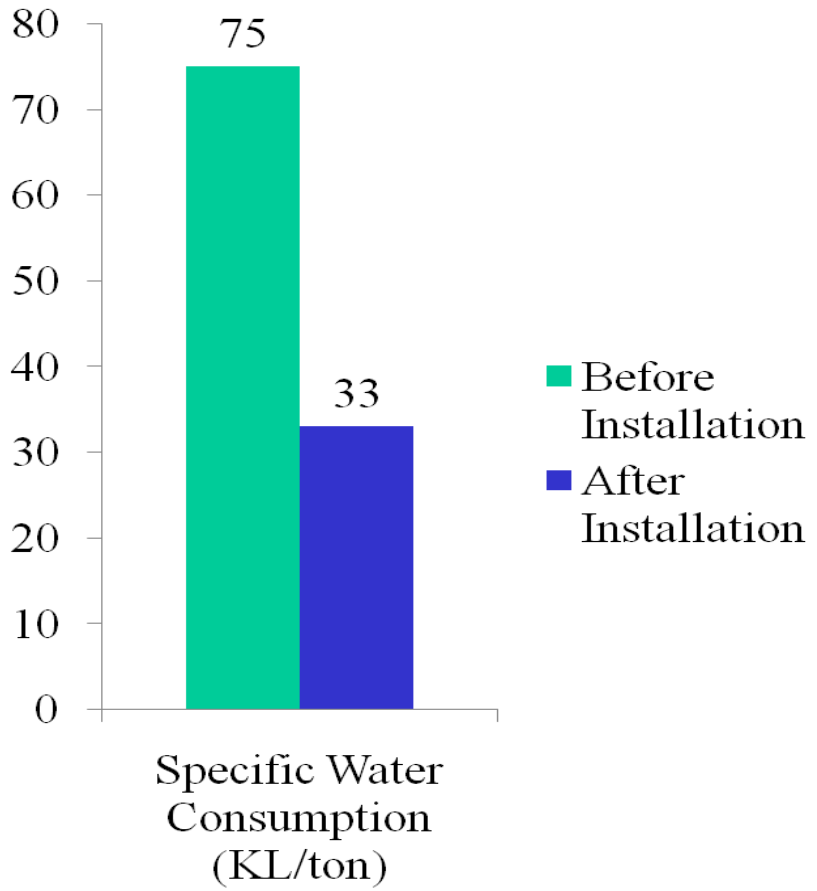


REDUCTION IN EFFLUENT GENERATION UPTO 22%



REDUCTION IN SPECIFIC WATER CONSUMPTION UPTO 56%

- The mill was consuming around 6000 KL/day of Freshwater and was producing 80 TPD of paper.
- SWC of the mill was 75 KL/Ton before FICCI Intervention.
- After intervention SWC is 33 KL/Ton (Mill consuming around 3000 KL/day of Freshwater and has also increased its production capacity to around 90 TPD).



DAIRY UNIT

16% Water Saving in one of the Largest Dairy with discounted pay-back period of <1.5 years

Key Water saving opportunities identified by RCM-FICCI:

- Immediate repairing of Faulty valves in Sterilizers leading to chilled water leakages
- Recovering Caustic final Rinse water for reuse in Pre-rinsing during CIP in Fresh Milk Processing Section
- Install Water Efficient Nozzles in the hose pipes used for cleaning & washing
- *Optimizing CIP water for small & Large Tankers of 6000 & 30,000 litres capacity*

IRON & STEEL UNIT

15% Water Saving in one of the Iron & Steel Plant with pay-back period of <1 years, it accounted to saving of water management and associated Energy management costs by 17%

Key Water saving opportunities identified by RCM-FICCI:

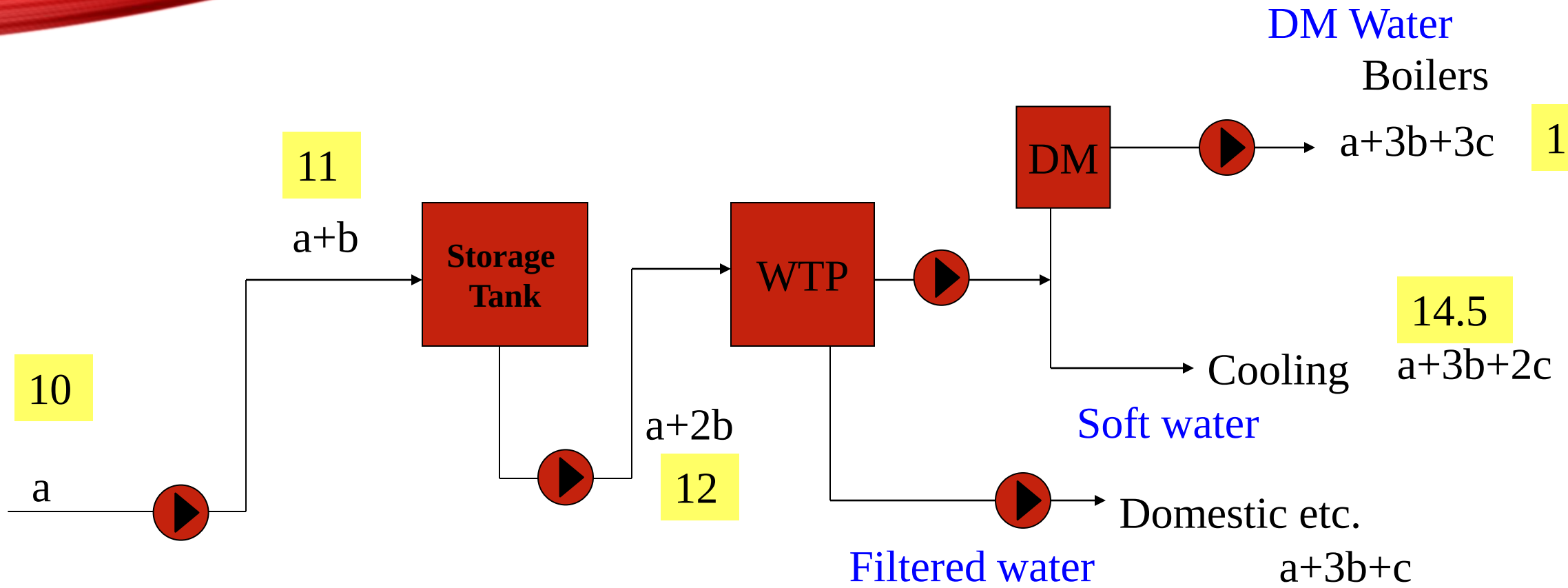
- Optimization of Cooling Tower Blowdown by Maintaining Desired COC and Improve in Practices for Chemical Treatment of Circulating water
- Reduce Evaporation losses from the open Water Reservoirs
- Operation and Maintenance of non-working RO plant/ZLD plant and other wastewater recovery plants in the various shops
- Stop leakages and water losses in the settling tanks at WTP
- Rainwater Harvesting

VALUE ADDED COST OF WATER

- **Value added cost of a water are the costs which are directly associated with water to improve its quality and availability.**
- It includes the costs associated with water from 'sourcing till its disposal from the plant premises'. For example:
  - Water Sourcing cost
  - Pumping (Energy Cost)
  - Treatment (Chemical & Energy Cost)
  - Maintenance (spare parts, consumables/replacement cost), labour costs etc.

As water travels in our system, its cost keeps on increasing; therefore it is important to know the cost of water at use location.

Value Added Cost



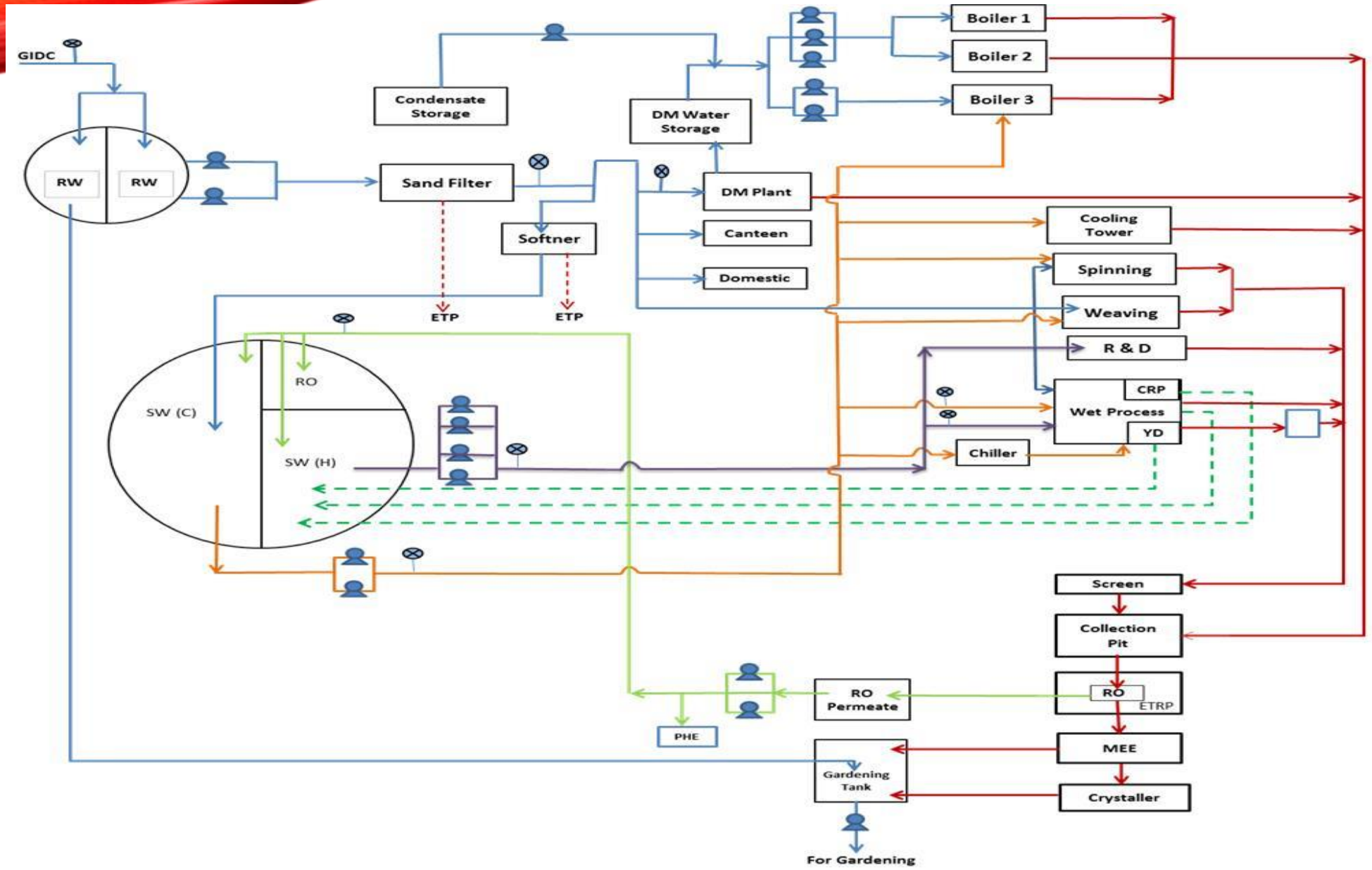
For Example:

a – cost of raw water (Rs 10/m3)

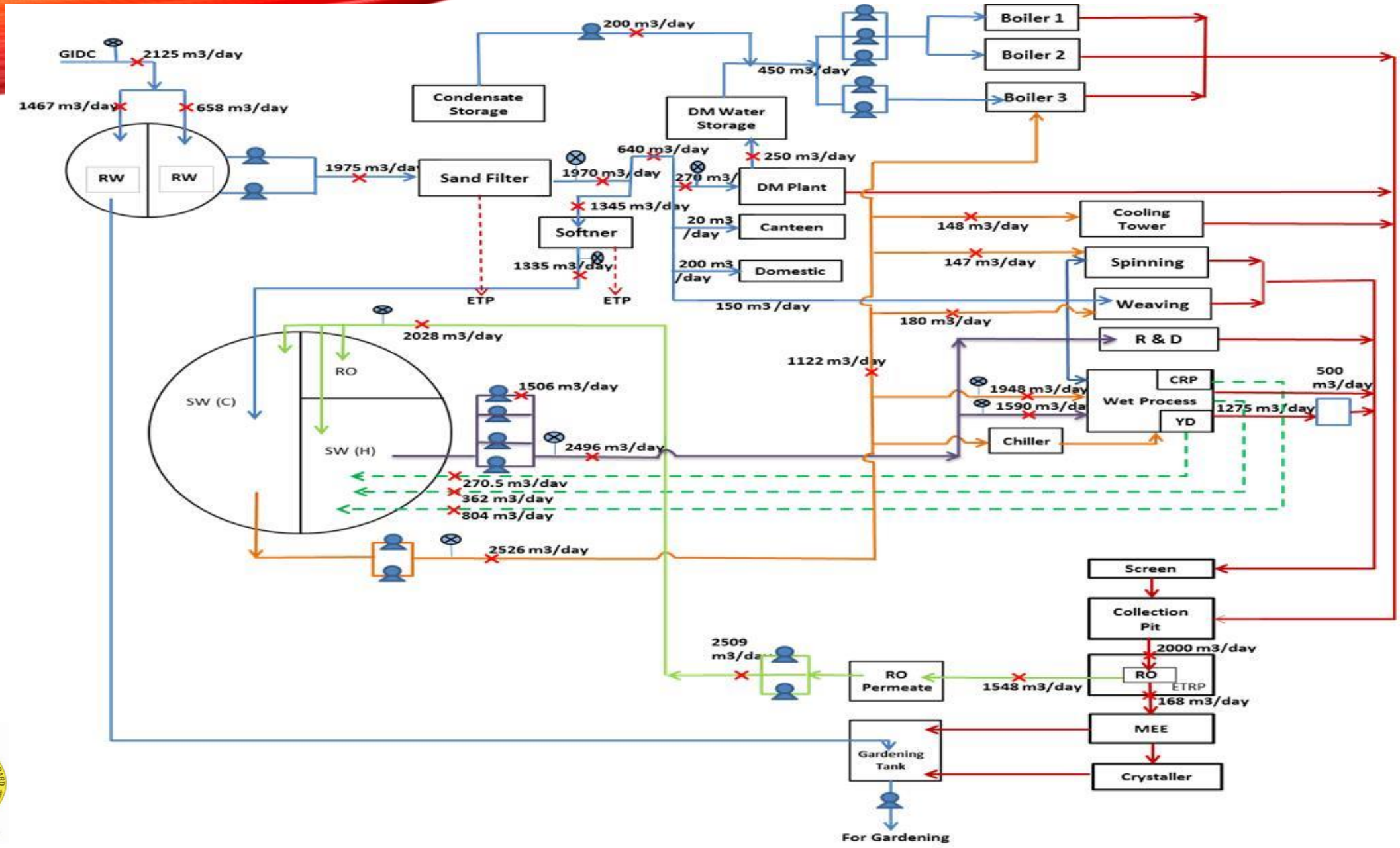
b- pumping cost (Rs 1/m3)

c- treatment cost (Rs/m3)- Filtration 0.5; Softening 1; DM 5

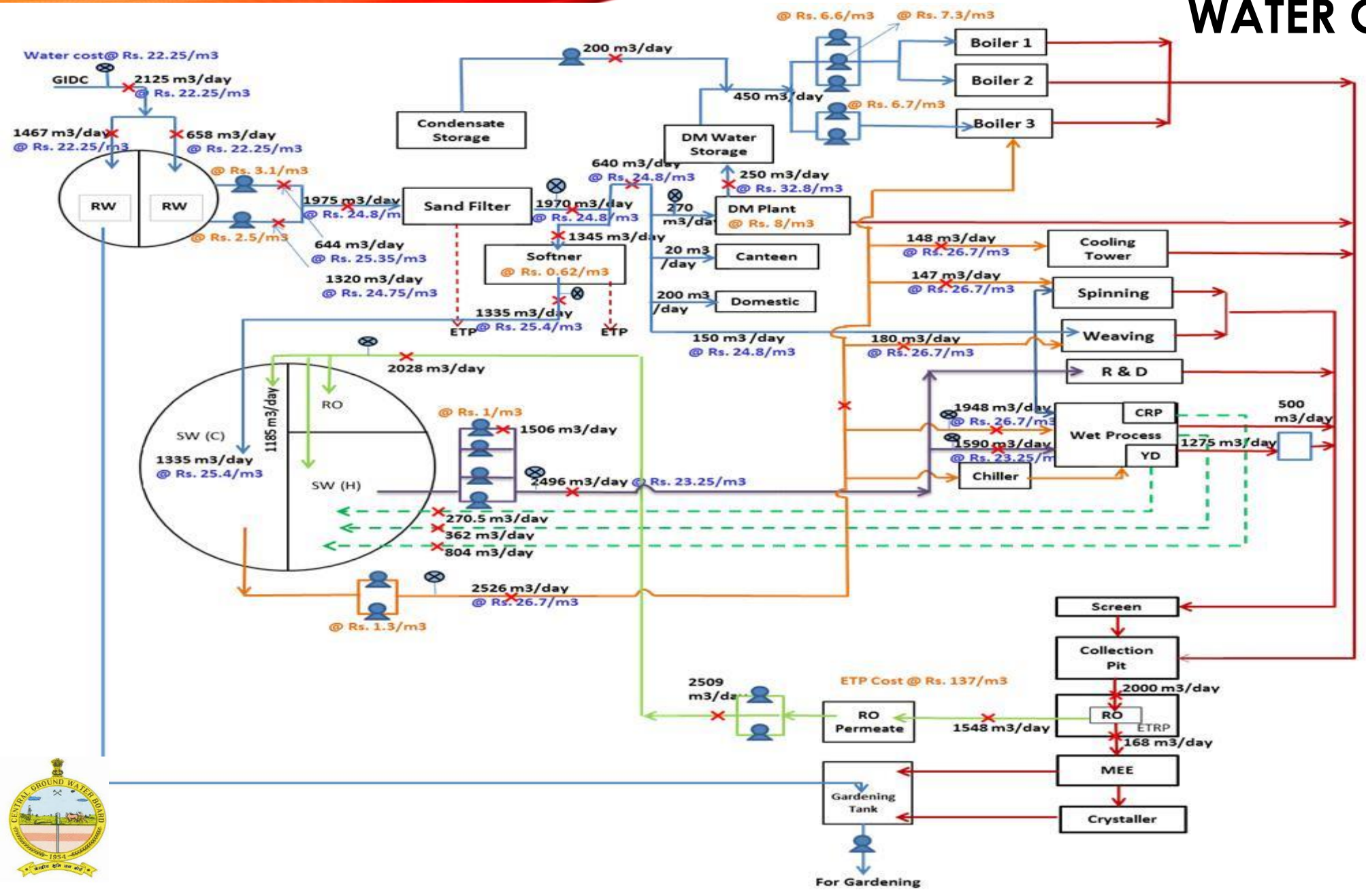
WATER CIRCUIT – L1



WATER BALANCE – L2



VALUE ADDED WATER COSTING – L3



EXCESS WATER IN A 'SYSTEM' IS A 'BURDEN'

- Excess water pumping-increased energy Cost
- Excess water for treatment – increased energy and chemical cost
- Excess water discharge – increased wastewater treatment cost
- Excess wastewater disposal – increased disposal costs

RCM SERVICES HELPS YOU IN

Reducing Production Costs, by reducing energy & water bills, saving resources

Reduced water footprint, by conserving water, increased recycling of water, achieving ZLD

Achieving Sustainable growth through optimum use of resources and waste minimisation

Reduced green house gas emissions by improving energy, water & resource use efficiency

Improvement in Occupational Health & Safety

TRAINING & CAPACITY BUILDING SERVICES

- More Than 15,000 Professionals Across Industry Sectors, Government & Regulatory Authorities Trained in Energy, Water, Environment, Occupational Health & Industrial Safety since 1999

RCM SERVICES - INTERNATIONAL

Global Footprint for Resource Conservation & Management Services

- Senegal
- Luxembourg
- Czech Republic
- Kenya
- France
- Italy
- Zambia
- India

Thank You

We are here to serve you

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