

1. Prologue

The Indian paper industry is one of the important industrial sectors of the country which has shown tremendous growth potential in last few years. Indian paper industry is marked with diversity features. Production capacity varies in Indian paper industry from 50 tpd to 1000 tpd. Indian paper industry uses wide variety of raw materials which makes standardization of production process difficult. The industry uses wide spectrum of technology, which varies among industries as well as within the industry. The major challenge facing Indian pulp and paper industry are improvement in resource efficiency, sustaining in global competition, coping with fiber shortage and addressing the environment issues & challenges. Although in last decade Indian paper industry has implemented various projects on the augmentation of technology and cleaner production initiatives leading to improvement in various indicators such as specific energy consumption, specific water consumption and specific effluent generation. However, issues of technological obsolescence and lacks of standardization in production process are needed to be addressed urgently in mission mode for the sustainable growth of paper industry in the new order of environmental compliance and in global competition.

During 2012-2013, CPCB implemented a 'charter for water recycling & pollution prevention in Pulp & Paper industries in Ganga River Basin' in five identified clusters of Pulp & Paper industries located in Uttarakhand and Uttar Pradesh. Basic premise of industrial pollution abatement for river Ganga in charter is based on (i) participatory approach (ii) Benchmarking of the processes and waste-minimization/ cleaner production options (iii) Technology augmentation and process standardization (iv) Reduce, recycle and reuse of various streams in the industrial units without and with treatment (partial or full treatment) of various streams for different end-point uses i.e. cascade management of water utilization and wastewater management (v) End of Pipe Treatment for existing units with retrofitting of recycle and reuse options (vi) Effective and continuous monitoring programme. Impact assessment of the charter has shown tremendous improvement in the environmental status of pulp and paper industry in Ganga Basin. Now it is time to implement the charter for the whole pulp and paper sector in the country. The charter in Ganga basin, mainly addressed the water and wastewater issue, however air pollution and solid waste management are growing environmental concern for pulp and paper sector. Thus, the new charter is inclusive of wastewater, air pollution and solid waste management challenges and issues.

2. Problem Analysis

Focal Problems to be solved

Pulp and paper Industries have been categorised under the 17 categories of highly polluting industries. These industries have high water pollution potential. The major environmental issues related to Indian Paper Industry include high volume of fresh water consumption and waste water discharge, adverse impact on receiving stream due to high pollution load, high color in effluents due to recalcitrant compounds, black liquor management in agro based mills, odorous emissions from wood based mills, ETP sludge disposal and management, inadequate or low performance of ETPs, lack or low performance of air pollution control systems.

The effluent discharge standards implemented so far are based on the premise that the background river water quality is very good and at least 10 times dilution is available. However, these conditions are not met in most of the Indian rivers in which treated/partially treated/untreated industrial and domestic effluents are discharged. As such it is essential that treatment up to tertiary level is made mandatory.

Most of the ETPs perform much below the expected level and most of the times effluent discharge norms are violated. Number of reasons, including lack of knowledge and expertise to manage the ETPs, has been cited by the industry for poor performance.

At present there seems to be inadequate control on the quantity of water used and wastewater discharged from the pulp and paper industries due to obsolescence of process technology & practices and lack of implementation of polluter pays principle. These are the main de-motivating factors responsible for indiscriminate water uses in most of the industries.

Causes to the Focal Problems

Most of the Pulp and paper Industries have employed obsolete technologies with average age of equipments/ paper machine much higher. This has resulted in slow machine speed, high raw material, energy and water consumption and less efficient operations, causing high volume and concentration of waste streams.

Though most of the Paper Mills have enhanced their production capacity over a period of time, however, corresponding capacity augmentation of ETPs was not carried out. Moreover, most of ETPs have been set up by mills based on improper design without any proper performance assessment.

Presently, ETPs consist of two stages physical and biological treatment system and are not adequate to provide requisite effluent treatment to comply with the prescribed effluent norms and to meet the process water quality for waste water recycling within the process.

The operation and maintenance of ETPs are unsatisfactory. Mills do not operate regularly energy intensive ASP based aeration tanks of ETPs. Mills neither have trained man power for ETP operations nor have proper laboratory facility for analysis of performance parameters. Mills lack proper record keeping and sound system for monitoring of water consumption and effluent discharge.

SPCBs have inadequate resources for intensive performance monitoring and surveillance activities for compliance verification of these mills. There is a need for strengthening of institutional network to meet the technical requirements of Pulp & Paper industries such as technical knowhow for process and ETP up-gradation, training programmes and monitoring.

The upgradation in technology and process is therefore necessary for improved competitiveness through quantifiable increase in productivity, quality improvement with reduced cost, improvement in energy efficiency and environmental compliance, safeguards for eco-sustainability of products etc.

The high cost of energy (specially coal) and the reported environmental implications, makes it imperative for the paper industry to adopt energy efficient and eco – friendly technologies, increase automation and control, optimize process operations, increase reuse and recycling of back water and treated effluent, upgrade / modify ETPs , adopt Chemical Recovery System for black liquor management in agro based mills (individual / common) and promote biotechnological applications.

3. Objectives of the Charter Implementation Programme

Central Pollution Control Board (CPCB) has formulated the ‘Charter for Water Recycling and Pollution Prevention in Pulp & Paper Industries’ (hereinafter referred to as the ‘Charter’) in consultation with experts from Pulp & Paper industries, Central Pulp & Paper Research Institute (CPPRI), Saharanpur and Department of Paper Technology, IIT, Roorkee in brainstorming workshops held on July 23, 2014, August 5, 2014, August 6, 2014 and September 23, 2014. A detailed Implementation Programme (DIP) of the Charter has also been formulated.

The Charter prescribes action points for implementation by the Pulp & Paper industries operating in the country. The Charter takes a holistic approach for pollution prevention by emphasising on process technology up-gradation, adoption of best practices, besides quantum improvement in effluent treatment including tertiary treatment to reduce fresh water requirement, improve effluent quality and optimise water recycling. Compliance with the prescribed standards is mandatory. There will be no compromise with regard to the industry meeting the prescribed standards.

Various Pulp & Paper Mills Associations, representing the Pulp & Paper industries operating in the country have expressed their commitments for implementing the charter as per the prescribed plan of activities.

1. All time Compliance with Environmental Norms

The Charter envisages upgradation of the status of Pulp & Paper industries operating in the country in terms of process technology, practices and environmental performance to the prescribed level, besides substantial reduction of fresh water consumption, wastewater generation and compliance with the prescribed environmental norms on continuous basis.

Start-up/shut-down periods, normal boiler soot-blowing sequences and exceptional circumstances should not be considered while determining all-time compliance.

Water consumption, effluent generation and emission limits shall be reckoned per tonne of “product” and not just “paper”. Besides paper, paperboard and newsprint, “product” shall include air dry tonnes of surplus pulp produced for short term storage (as wet-lap) or for sale.

2. Improved Environmental Performance beyond Regulatory Norms

This will essentially be a voluntary effort by the mills with performance targets proposed in advance, properly documented, and then validated by third parties.

Achievement of such improved performance should receive appropriate recognition from MOEFCC/CPCB/SPCBs.

3. Increased Productivity

Freedom to install minimum impact technology will not only improve better environmental performance but also ensure stakeholder relations, increased productivity, cost savings and competitive market advantages.

Increased productivity could only amount to achieving the same production levels with lesser specific consumption of any or all of the resources involved in mill operations.

Objective hierarchy	Time frame, months from start of the Programme
Short Term Objectives	December 31, 2015
Medium Term Objectives	December 31, 2017
Long Term Objectives (Overall Goal)	December 31, 2019

4. Proposed Strategy

In order to improve the health of the surface water bodies and ambient environment, discharge of pollutants in the river channels needs to be minimised. The trade effluent, appropriately treated, could be viewed as a source of water that can be used for various processes. Management of water in the pulp and paper mills needs a two prong action plan.

First to reduce water consumption through process improvements and implementation of recycle and reuse of water. Several technological and process improvements are available to reduce net water consumption and thereby reducing the amounts of effluents generated. Suggested technological up-gradation/measures for reduction in water consumption for achieving the benchmark/ overall goal are mentioned in the Charter. Second is to have quantum improvement on the individual ETPs by adding tertiary treatment units. This would result in producing industry grade water from excess back water discharged from various processes reusable within the industry. A strict metering of the water used and wastewater generation is recommended. Extensive and regular monitoring protocol is to be followed by regulatory authorities for improved environmental performance.

Third party involvement is recommended for planning, assessment, design and monitoring of implementation of measures as prescribed in the Charter for process technologies as well as ETP up-gradation. CPPRI and Paper Mills Associations will play pivotal role in facilitating the individual Pulp & Paper Mills, concerned SPCBs and CPCB in implementing the Charter in a time bound and efficient manner.

5. Stakeholders

Various Stakeholders of the programme are as under:

- Pulp & Paper Mills (about 766 Mills)
- Pulp & paper Mills Associations
- Experts & Resource Institutes (IITs/ NEERI/ other consulting organisations)
- Central Pulp & Paper Research Institute (CPPRI), Saharanpur
- State Pollution Control Boards (SPCBs)/ PCCs
- Central Pollution Control Board (CPCB)
- Ministry of Environment & Forests (MoEF)
- National Mission Clean Ganga (NMCG)

6. Plan of Activities

Plan of Activities 1: Facilitation of Charter

Activities	Action By	Time
Formation of experts group / selection of experts	Third Party	3 months
Joining all mills to Industry association to facilitate the charter implementation and coordination	Third Party	3 months

Plan of Activities 2: Technological & Process Improvements

Activities	Action By	Time
<u>Self Assessment:</u> Inventory of existing process technologies & practices, identification of upgradation requirement and preparation of action plan for upgradation with supporting document & pert chart	Mills / consultants	3 months
<u>Third Party Evaluation & Validation:</u> Evaluation/ validation of the reports on inventory, up-gradation requirements and action plan	Third Party	4 months
Implementation of action plan envisaged as per document of individual mills	Mills	As per schedule
Submission of monthly progress reports to Third Party/ SPCB	Mills	monthly
Verification of progress	Third Party/ SPCBs	Quarterly
<u>Regulatory review:</u> Verification of the progress	SPCBs	Periodic

Plan of Activities 3: Water Conservation & Water Recycling

Activities	Action By	Time
Installation of sealed flow meter and running hours meter on bore wells and inlet pipe line of different process section i.e. pulp mill, paper machine, boiler etc	Mills	Three Month
Installation of online flow meter/ V notch to monitor final effluent discharge	Mills	Three Month
Colour coding of pipe lines carrying recycled process water and fresh process water	Mills	One year
Provision of water reservoir and supply of process water from reservoir only	Mills	Six Month
Maintenance of log book to record daily water drawl from borewell and water consumption unit wise after installation of meter	Mills	Daily basis
<u>Self Assessment</u> : Preparation of report of existing water consumption- section wise, reuse/ recycle practices; Preparation of work plan to achieve fresh water requirement targets	Mill/ Consultant	Three Months
<u>Third party Evaluation & Validation</u> : Evaluation/ validation of the work plan for implementation of water consumption standards	Third Party/ SPCBs	4 months
Implementation of action plan	Mills	As per schedule
Submission of progress reports	Mills	Monthly
Verification of the progress	Third Party/ SPCBs	Quarterly
<u>Regulatory review</u> : Verification of the progress	SPCBs	Periodic

Plan of Activities 4: Assessment, augmentation and up-gradation of ETPs for improved environmental performance

Activities	Action By	Time
Self Assessment: Preparation of ETP adequacy assessment report; and proposed augmentation and up-gradation plan, design/ drawing, along with monthly PERT Chart	Expert / Mill	3 months
Third Party Evaluation & Validation: Evaluation/ validation of adequacy, and proposed augmentation/ up-gradation plan, design/ drawings	Third Party/ SPCBs	4 months
Implementation of action plan	Mills	As per time schedule
Submission of monthly progress report to Third Party/ SPCBs	Mills	Monthly
Verification of the progress	Third Party	Quarterly
Regulatory review: Verification of the progress	SPCBs	Periodic

Plan of Activities 5: Monitoring & Surveillance of Environmental Compliance

Activities	Action By	Time
Self Monitoring & Reporting: ETP performance monitoring by individual Mills and maintenance of Log Book as per the prescribed format	Mills	Daily
Submission of the performance report of individual mill to third party/ SPCBs	Mills	Monthly
Review meetings of Mills/ third party & SPCBs to help mills to improve ETP performance & sample analysis quality	Third Party/ SPCB	Quarterly
Regulatory Monitoring: Periodic/ Surprise monitoring and review meetings	SPCBs	Periodically/ Quarterly
Dismantling/ removal of digesters/ pulp washing lines, etc. in agro based mills operating in Ganga River Basin (UP/UK) not having operational CRPs/ CCRPs	SPCBs	Immediate

Organisation of training programmes on process technology, best practices, ETP operation & maintenance, Sample analysis etc	Third Parties/ SPCBs / CPCB	Periodically
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Plan of Activities 6: Strengthening of Environmental Cell and Laboratory in Industry to ensure improved Environmental Compliance

Setting up of lab facility at Paper Mills for Effluent Analysis

- (a) Minimum Analysis Facilities for pH, DO, TSS, TDS, BOD, COD, Colour, AOx and SAR
- (b) Appointment of scientific and technical staff
- (c) Training of the Staff
- (d) Frequency of the Analysis

Parameters	Frequency of sampling
pH	Daily
TSS, mg/l	Daily
BOD, mg/l	Weekly
COD, mg/l	Daily
TDS, mg/l	Daily
Colour, PCU	Daily
AOx, mg/l	Monthly
SAR	Monthly

Operation & Maintenance of ETP

To achieve the designed performance from ETP, it is necessary to operate it under optimum conditions so as to meet the environmental discharge standards for which regular maintenance and analysis of performance parameters is necessary. For proper and optimum operation of ETPs, the mills should ensure:

(a) Key guidelines for Operation & Maintenance

- Ensure proper and optimum conditions as per the designed specification and manufacturer's instruction.
- Avoid fluctuation in effluent flow and pollution load so as to reduce the shock load to biomass and the system as a whole.
- Ensure proper addition of nutrients
- Maintain required level of MLSS/MLVSS concentration during biological treatment.
- Maintain desired level of DO in the aeration tank (1-2 mg/l).
- Ensure periodic & timely withdrawal of sludge from the clarifiers.
- Proper maintenance of electric motors and pumps etc.
- Documentation
- Fresh water consumption, effluent discharge, effluent analysis , and ETP chemical & utility (like steam and power) consumption to be properly recorded

(b) Documentation

The fresh water consumption, effluent discharge, effluent analysis & ETP chemical consumption shall be recorded in prescribed formats.

CREATION OF ENVIRONMENTAL MAANGEMENT CELL (EMC)

Every mill will compulsorily set up an Environmental Cell to effectively monitor the environmental compliance. The Environmental Cell will constitute of:

- Unit / Business Head
- ETP In-charge
- Process Operations Heads

Duties of Environmental Management Cell

- The Environmental Cell shall review the water consumption , measures taken and identify the areas for water conservation , resource recovery & pollution reduction every week.
- A detailed minutes of the decisions taken will be recorded and circulated to all members of Environmental Cell and follow up of the decisions will be monitored by the Unit Head & ETP Incharge.
- Review to be made in case of non compliance by any department
- Internal Audit to be done by the EMC on quarterly basis
- External Environmental audit on annual basis.

7. Resource Planning

(a) Distribution of Pulp & Paper Mills in the Country

State	No. of Mills
Gujarat	123
Maharashtra	112
Tamil Nadu	108
Uttar Pradesh	99
Punjab	61
Andhra Pradesh	53
West Bengal	36
Uttarakhand	31
Karnataka	29
Haryana	21
Madhya Pradesh	19
Rajasthan	16
Kerala	15
Others	43
Total	766

Source: Directory published by IARPMA

Table: Structure of Indian Paper Industry

	No. of Mills	Production, Mtpa	Production Share (%)
Wood based (Large Integrated)	30	3.40	31
Agro based (Medium Scale)	150	2.42	22
Recycle Fibre based (Medium and Small Scale)	579	5.10	47
Total	759	10.92	100

Source: Working Group report of 12th FYP

Implementation of the Charter and to comply with the prescribed norms/ standards shall be the sole responsibility of the Pulp & Paper Mills. The entire cost towards implementation of the Charter as per the Plan of Activities shall be borne by the individual Pulp & Paper Mills. Pulp & Paper Mills shall carry out all the activities related to self assessment, preparation of action plan, including PERT Chart, implementation of the Charter and self compliance reporting. Participating mills may take technical/ logistic assistance of experts or their Associations for carrying out various activities as per the Plan of Activities. Some of the activities to be carried out by the individual mills on their own or through their experts/ associations are as under:

1. Preparation of inventory of existing process technologies and practices.
2. Identification of process technological up-gradation requirement w.r.t. the Charter.
3. Preparation of Action Plan, including monthly PERT Chart for implementation of the Charter for technological and process up-gradation.
4. Implementation of technological up-gradation action plan and submission of monthly progress report.
5. Preparation of ETP adequacy assessment report w.r.t. environmental compliance, actual production, pollution load generation and targeted water consumption; and design, drawing and preparation of proposed augmentation and up-gradation plan, including monthly PERT Chart in accordance with the Charter
6. Implementation of ETP up-gradation action plan and submission of monthly progress report.
7. Installation of sealed flow meter along with running hours meter on bore wells
8. Installation of flow meters at individual inlet pipe line of different process operation.
9. Provision of water reservoir and supply of process water from reservoir only; and provision for collection tank / reservoir for backwater for reuse into the process.
10. Setting up of online flow meter/ V notch (@ 60° or 90° angle) to monitor final effluent discharge.
11. Colour coding of pipe lines carrying recycled process water and fresh process water.
12. Maintenance of log book to record daily water drawl from bore wells.
13. Maintenance of log book by individual process unit for recording daily water consumption.
14. Setting up of maximum water consumption targets for individual unit operation.
15. Report preparation of existing water consumption- section wise, reuse/ recycle practices, strategies/ work plan to achieve fresh water consumption targets.

16. Implementation of water recycling action plan and submission of monthly progress report.
17. Self monitoring and reporting: Daily ETP performance monitoring and maintain Log Book as per the prescribed format.
18. Participation in periodic review meeting to be held by Third Party (association/ CPPRI)/ SPCB/ CPCB.
19. Strengthening of Environmental Cell and Laboratory facilities
20. Organising training programme for their personnel.

(b) Empanelled Experts

Third Parties (Pulp & Paper Mills Associations/ CPPRI) may empanel experts for preparation of assessment reports, action plans for process & ETP up-gradation, effluent sample analysis, etc. The empanelled expert(s) will provide technical support to individual mills or Associations in implementation of the Charter as delineated under Plan of Activities.

(c) Third Party: Pulp & Paper Mills Associations/ Central Pulp & Paper Research Institute (CPPRI)

Each of the participating mills have to join either any one of the identified Third Parties or their respective SPCBs/ PCCs for evaluation & validation of their technical reports (self assessment and planning reports: Preparation of inventory, ETP Adequacy & upgradation, and Action plans to implement the Charter), and physical verification of their progress reports under the Charter implementation programme.

Third Party shall play pivotal role in encouraging their member mills in implementation of the Charter and shall facilitate individual mills by arranging technical and logistic supports. Pulp & Paper Mills Associations/ Central Pulp & Paper Research Institute (CPPRI) have been identified as Third Party to facilitate the industry in implementation of the Charter and monitoring.

CPPRI is an expert organisation on Pulp & Paper Technology under aegis of Ministry of Commerce & Industry, Government of India, whereas Pulp & Paper Associations shall engage Expert Institutions like IITs/ NEERI/ NPC/ EPTRI /any other reputed environmental consultants/ organisations or set up Expert Committee(s) for evaluation & Validation of technical reports Submitted by the participating Mills and physical verification of the progress reports.

Third Parties:

1. Central Pulp & Paper Research Institute (CPPRI)
2. Indian Paper Manufacturers Association (IPMA)
3. Indian Agro & Recycled Paper Mills Association (IARPMA)
4. South India Kraft Paper Manufacturer Association, Chennai
5. Paper Unit Chapter, Kumaun Garhwal Chamber of Commerce and Industry (KGCCI)
6. Paper Manufacturer Association (PMA), Uttar Pradesh
7. Gujarat Paper Mills Association, Vapi
8. Andhra Pradesh Paper Mills association, Rajahmundry
9. Aurangabad Paper Mills Association
10. Indian Recycle Paper Association

11. Indian Newsprint Manufacturers Association
12. Indian Agro & Recycled Paper Mills Association (IARPMA) / Gujarat Chapter Ahmadabad
13. Any other local/ state/ national level industry associations registered as per the established norms, and having at least 15 Pulp & Paper Mills as member units.

Participating Mills will have option to select and join any one as the Third Party from the list of third parties. Once joined the selected Third Party, the participating mills shall not be allowed to change their selected Third Party for a period of at least one year and change of third party will be allowed only after written permission from their respective SPCB/ PCC.

The Third Party shall perform following activities as per the Plan of Activities:

Preparation of list of experts/ Institutions to facilitate Mills in preparation of self assessment & planning reports

Engagement of Expert Institutions like IITs/ NEERI/ NPC/ EPTRI /any other reputed environmental consultants/ organisations or setting up of Expert Committee for Evaluation & Validation of following reports Submitted by the participating Mills

- ✓ ETP adequacy assessment report , design / drawings and proposed augmentation/ upgradation plan as per Charter
- ✓ Inventory, upgradation requirements and action plan for process upgradation
- ✓ Work plan by mills for reduction in water consumption/ effluent generation

Initial Phase

1. Evaluation & validation of individual mills Action Plan, including PERT Chart for implementation of the Charter for technological and process up-gradation.
2. Evaluation & validation of individual mills ETP adequacy assessment report w.r.t. environmental compliance, actual production, pollution load generation and targeted water consumption; and design, drawing and proposed augmentation and up-gradation plan, including PERT Chart in accordance with the Charter
3. Evaluation & validation of individual mills assessment report of existing water consumption- section wise, reuse/ recycle practices; and their strategies/ work plans to achieve fresh water consumption targets.

Quarterly Activities

1. Verification of progress made by individual mills on process technology / ETP upgradation as per their action plans
2. Verification of individual mills fresh water consumption, effluent generation and water recycling achievement, etc. .
3. Verification of progress reports submitted by participating mills
4. Compilation of Implementation Status Report for Submission to SPCBs/ CPCB
5. Compilation of ETPs performance report for submission to SPCBs/ CPCB
6. Organising Quarterly review meetings with participating mills/ SPCBs/ CPCB

Periodical: Organise training/ workshop programmes on process technology & best practice, ETP operation & maintenance, sampling & analysis, etc for mill personnel

Cost of engaging third party/expert will be borne by the member mills. Participating Mills shall pay/ reimburse fee to their selected Third Party towards meeting the expenditure for carrying out various activities/ responsibilities assigned/ to be assigned from time to time to the Third Party under the Charter. Each of the identified Third Parties shall provide the estimated project cost as per the scope of work to member mills willing to join them, who shall also be responsible for ensuring the payment of the services to third party.

(d) SPCBs/ PCCs

SPCBs/ PCCs shall ensure proper implementation of the Charter by the individual mills. They shall be responsible for monitoring and surveillance activities to ensure environmental compliance. Participating Pulp & Paper Mills will not be allowed, under any circumstances, for bypassing of ETP systems and discharge of partially/ untreated effluent or episodic discharge. In case of any serious/ significant violation of the prescribed norms, concerned SPCBs will take appropriate actions, including issuance of closure directions under the Water/ Air Acts/ E(P)Act.

Each of the participating mills shall have option to join either any one of the identified Third Parties or their respective SPCBs/ PCCs for evaluation & validation of their technical reports (self assessment and planning reports: Preparation of inventory, ETP Adequacy & upgradation, and Action plans to implement the Charter), and physical verification of their progress reports under the Charter implementation programme.

SPCBs/ PCCs shall constitute Expert Committee(s) for Evaluation & Validation of following reports directly submitted by the participating Mills (if any) to SPCBs/ PCCs

- ✓ ETP adequacy assessment report , design / drawings and proposed augmentation/ upgradation plan as per Charter
- ✓ Inventory, upgradation requirements and action plan for process upgradation
- ✓ Work plan for reduction in water consumption/ effluent generation

Some of the activities identified for UEPCB/ UPPCB are as under:

- To ensure proper implementation of the Charter by the individual mills
- Responsible for monitoring and surveillance activities to ensure environmental compliance
- To take appropriate actions under the Water/ Air Acts/ E(P)Act in case of any serious/ significant violation of prescribed norms
- Participation in evaluation /validation of the status assessment reports, action plan for Charter implementation/ process/ ETP upgradation
- Quarterly review meetings of Mills, Third Parties & CPCB to facilitate mills in timely implementation of the Charter
- Constitution of Expert Committee for Evaluation & Validation of following reports directly submitted by the participating Mills (if any) to SPCBs (Mill has to decide where to submit the report, either to association or to SPCB).
 - ✓ ETP adequacy assessment report , design / drawings and proposed augmentation/ upgradation plan as per Charter
 - ✓ Inventory, upgradation requirements and action plan for process upgradation
 - ✓ Work plan for reduction in water consumption/ effluent generation

- Surveillance Activities
 - ✓ Verification of progress reports
(on quarterly basis in case directly submitted by participating mills, and on random basis in case of submission through Third Party)
 - ✓ Compilation of Implementation Status Report for Submission to CPCB on Quarterly basis
 - ✓ Surprise monitoring

- Organising Quarterly Review meetings of participating Mills, Third Parties & CPCB to assess status of implementation of Charter and environmental compliance by mills.

(e) CPCB

CPCB shall supervise and co-ordinate with stake holders namely participating Pulp & Paper Mills, Third Parties (Associations/ CPPRI), Expert Institutions, and SPCBs/ PCCs. CPCB shall periodically review the progress of implementation of the Charter and carry out environmental compliance assessments. Based on findings of the review meetings, CPCB shall take necessary actions namely modification in the Charter/ Action Plan/ roles & responsibilities of participating agencies.

Some of the activities identified for CPCB are as under:

1. Participation in review meetings organised by third parties/ SPCBs
2. Organising quarterly/ half-yearly review meetings of participating mills/ third parties/ SPCBs to review the progress of the Charter implementation programme
3. To supervise, co-ordinate and support to stake holders
4. To take necessary actions namely modification in the Charter/ Action Plan/ roles & responsibilities of participating agencies, interpretation of the provisions prescribed under the Charter, approval for any state of the art technology, etc.

8. Conditions Necessary for Timely Implementation of the Charter

1. CPCB shall issue appropriate directions/ guidelines to SPCBs/ PCCs for issuance of directions/ instructions to Pulp & Paper Mills operating in their respective States/ UTs for implementation the Charter as per the Plan of Activities.
2. SPCBs/ PCCs shall issue appropriate directions/ guidelines to Pulp & Paper industries operating in their respective States/ UTs to implement the Charter as per the Plan of Activities.
3. The implementation of the Charter will be considered to be commenced on the date of issuance of directions/ instructions from SPCBs/ PCCs and the entire action plan will be implemented before December 31, 2019.
4. Participating Pulp & Paper Mills may submit Affidavit to their respective SPCBs/ PCCs for implementation of the Charter as per the Plan of Activities and other Terms & Conditions.
5. Pulp & Paper Mills shall sign MoUs/ Agreements with their selected Third Parties (Associations/ CPPRI) to participate in the programme as per the Plan of Activities

and to reimburse the third party expenditure and shall sanction the project as per their mutual agreed ToR.

6. Pulp & Paper Mill Associations, which have agreed to implement the Charter as per CPCB/ SPCBs directives/ guidelines, will be allowed to achieve short term, medium term and long term objectives as prescribed by the Charter within the agreed implementation period. Participating Pulp & Paper Mills will not be allowed, under any circumstances, for bypassing of ETP systems and discharge of partially/ untreated effluent or episodic discharge. In case of any violation on continuous basis or serious/ significant violations, SPCBs/ PCCs will take appropriate actions, including issuance of appropriate directions under the provisions of Water/ Air Acts/ Environment (Protection) Act.
7. No regulatory impediments: Any process modification, construction activity or any other action required to be undertaken by a mill in pursuit of the objectives of this Charter should receive necessary clearances from SPCBs with utmost speed. Concerned authorities should set in place a fast-track, single-window clearance mechanism.
8. Any order/ direction prescribed by any court of law/ tribunal in respect of individual industrial unit or in general, shall overrule the provisions/ norms prescribed under this Charter, and shall be complied by the industry.
9. SPCBs/ PCCs may prescribe conditions/ norms, etc. stringent than those prescribed under this Charter, and shall be complied by the industry.
10. MOEFCC/ CPCB/ SPCBs/ PCCs may issues directions/ instructions and/ or take up programmes for implementation of advanced technological and managerial tools to achieve further higher technological and compliance status in future for prevention, control and abatement of environmental pollution and to meet the objectives of National Mission for Clean Ganga (NMCG);

9. Industry Specific Standards Notified under the Environment (Protection) Rules, 1986

Existing Treated Effluent Quality Standards for Pulp & Paper Mills

Parameters	Large Pulp & Paper Mills (Capacity above 24000 MT/Annum)	Small Pulp & Paper Mills (Capacity upto 24000 MT/Annum)
pH	7.0-8.5	5.5 – 9.0
TSS, mg/l	100	100
BOD, mg/l	30	30
COD, mg/l	350	--

Total Wastewater Discharge Standards for Pulp & Paper Mills

Large Pulp & Paper mills	200 cum/ton of paper produced 100 cum/ton for mills established after 1992
Large Pulp & Paper mills (Rayon Grade)	150 cum/ton of paper produced
Agro based Small Pulp & Paper mills	200 cum/ton of paper produced 150 cum/ton for mills established after 1992
Waste paper based Pulp & Paper mills	75 cum/ton of paper produced 50 cum/ton for mills established after 1992

10. Charter on Water Recycling & Pollution Prevention in Pulp & Paper Industry

10.1 Categories of Indian Pulp & Paper Mills

Proposed Categorization under the Charter

- A1:** Wood Based Pulp & Paper Mills producing bleached grades of chemical pulps, papers, paperboards & newsprint
- A2:** Wood Based Pulp & Paper Mills producing unbleached grades of chemical pulps, papers and paperboards
- B1:** Agro Based Pulp & Paper Mills producing bleached grades of chemical pulps, papers, paperboards & newsprint
- B2:** Agro Based Pulp & Paper Mills producing unbleached grades of papers and paperboards
- C1:** RCF and Market Pulp Based Paper Mills producing bleached grades of papers, paperboards & newsprint
- C2:** RCF and Market Pulp Based Paper Mills producing unbleached grades of papers and paperboards
- D:** RCF and Market Pulp Based Specialty Paper Mills

Mills that attract classification in more than one category will be deemed to be in the "highest" among those categories. For example, a mill that is both wood and agro based (A1 & B1) will be classified as A1. The only exception will be mills that also manufacture specialty paper on a daily basis as described elsewhere in this proposed Charter.

10.2 Proposed Norms

Fresh Water Consumption Norms in the Revised Charter (m³/t of product)

Category	Short Term Objectives	Medium Term Objectives	Long Term Objectives
A1: Wood Based Pulp & Paper Mills	80	60	50
A2: Wood Based Pulp & Paper Mills	70	50	40
B1: Agro Based Pulp & Paper Mills	80	60	50
B2: Agro Based Pulp & Paper Mills	70	50	40
C1: RCF & Market Pulp Based Paper Mills	25	25	20
C2: RCF & Market Pulp Based Paper Mills	25	20	15
D: RCF & Market Pulp Based Specialty Paper Mills [#]	80	60	50

Notes:

1. Short, Medium and Long Term norms become applicable 1yr, 3yrs and 5 yrs respectively, from the date of notification of Charter. Long Term norms will be reviewed 6 months before the expiry of the Medium Term duration.
2. “#” applies to mills that manufacture **only** specialty papers
3. "tpd" refers to Air-Dry (ADt) for pulp; Saleable weight for paper.

Proposed Effluent Generation Norms in the Revised Charter (m³/t of product)

Category	Short Term Objectives	Medium Term Objectives	Long Term Objectives
A1: Wood Based Pulp & Paper Mills	70	50	40
A2: Wood Based Pulp & Paper Mills	60	40	30
B1: Agro Based Pulp & Paper Mills	70	50	40
B2: Agro Based Pulp & Paper Mills	60	40	30
C1: RCF Based Paper Mills	20	20	15
C2: RCF Based Paper Mills	20	20	10
D : RCF & Market Pulp Based Specialty Paper Mills#	70	50	40

Notes:

1. Short, Medium and Long Term norms become applicable 1yr, 3yrs and 5 yrs respectively, from the date of notification of Charter. Long Term norms will be reviewed 6 months before the expiry of the Medium Term duration.
2. “#” applies to mills that manufacture only specialty papers
3. "tpd" refers to Air-Dry (ADt) for pulp; Saleable weight for paper
4. Effluent "Discharge" means effluent leaving the outlet of final wastewater treatment stage and includes volumes applied on land within the mill or other mill-owned land. Such application on land is not be drawn from any point before the outlet of the final wastewater treatment stage.

**Proposed Norms for Treated Effluent Quality for Integrated Pulp & Paper Mills
manufacturing Chemical pulp**

Parameters	Goals
pH	6.5 – 8.5
TSS, mg/l	50
BOD, mg/l	< 30
COD, mg/l	250
TDS, mg/l	2100
Colour, PCU	500
AOx, mg/l	10
SAR	12 (Short/Medium Term) 10 (Long Term)

**Proposed Norms for Treated Effluent Quality for RCF and Market Pulp Based Pulp &
Paper Mills**

Parameters	Goals
pH	6.5 – 8.5
TSS, mg/l	50
BOD, mg/l	< 30
COD, mg/l	225
TDS, mg/l	2100
SAR	12 (Short/Medium Term) 10 (Long Term)

Proposed Norms for Odorous Emissions

Odorous gases	Existing Emission Norms mg/Nm ³	Proposed Emission Norms mg/Nm ³	Measurement Method	Control technology*
H ₂ S	10	10	Gastec Tube Sampling	Alkaline Absorption, Biological Methods, Adsorption, or Incineration
Total Mercaptans (Methyl Mercaptan, DMS & DMDS)	Not Specified	50	Gastec Tube Sampling	

These emissions shall be measured twice a year, as an odour control assessment protocol, to identify and evaluate point source emissions of odorous gases. Mills that operate with a Soda Process and with mill-wide sulphur-free operations shall be exempt from this section of the Charter.

Proposed Stack Emission Norms

Boiler Capacity	Control Equipment	Existing Norms (mg/Nm ³)	Proposed Norms (mg/Nm ³)	Remarks
15tph & above	ESP / Multi Cyclone dust collector with wet scrubber/ Bag filter	SPM : 150 H ₂ S : 10	SPM : 150 (Boilers set up before 2008) SPM : 100 (Boilers set up after 2008) H ₂ S : 10	Norms for a Chemical Recovery Boiler & lime kiln will be same as that for power Boiler with capacity >15 tph
For boilers <15 tph	Multi Cyclone	SPM : 600 (10- 15tph) SPM : 800 (<10 tph) H ₂ S : Not Defined	SPM : 600 H ₂ S : 10	

H₂S norms will be applicable only to stacks attached to Chemical Recovery Boilers.

10.3 Action Points of “Charter for Water Recycling & Pollution Prevention in Pulp & Paper Industries”

S No	Action	Time Frame
I.	Process improvement and Water use Benchmarks	
	Achieving the Benchmark	December 31, 2015
a)	Short-term standards	
	Category A1: Wood based – Bleached Grades of Papers, Paperboards & Newsprint	80m ³ /T
	Category A1: Wood based -Unbleached Grades of Papers and Paperboards	70m ³ /T
	Category B1: Agro based- Bleached Grades of Papers, Paperboards & Newsprint	80 m ³ /T
	Category B2: Agro based- Unbleached Grades of Papers and Paperboards	70 m ³ /T
	Category C1: RCF based- Bleached Grades of Papers, Paperboards & Newsprint	25 m ³ /T
	Category C2: RCF based- Unbleached Grades of Papers and Paperboards	25 m ³ /T
	Category D: RCF & Market Pulp Based Specialty Paper Mills	80 m ³ /T
	Medium-term standards	
	Category A1: Wood based – Bleached Grades of Papers, Paperboards & Newsprint	60m ³ /T
	Category A1: Wood based -Unbleached Grades of Papers and Paperboards	50m ³ /T
	Category B1: Agro based- Bleached Grades of Papers, Paperboards & Newsprint	60 m ³ /T
	Category B2: Agro based- Unbleached Grades of Papers and Paperboards	50 m ³ /T
	Category C1: RCF based- Bleached Grades of Papers, Paperboards & Newsprint	25 m ³ /T
	Category C2: RCF based- Unbleached Grades of Papers and Paperboards	20 m ³ /T
	Category D: RCF & Market Pulp Based Specialty Paper Mills	60 m ³ /T
		December 31, 2017

S No	Action	Time Frame
I.	Process improvement and Water use Benchmarks	
	<i>Long-term standards- Ultimate Goal</i>	December 31, 2019
	Category A1: Wood based – Bleached Grades of Papers, Paperboards & Newsprint	50 m ³ /T
	Category A1: Wood based -Unbleached Grades of Papers and Paperboards	40 m ³ /T
	Category B1: Agro based- Bleached Grades of Papers, Paperboards & Newsprint	50 m ³ /T
	Category B2: Agro based- Unbleached Grades of Papers and Paperboards	40 m ³ /T
	Category C1: RCF based- Bleached Grades of Papers, Paperboards & Newsprint	20 m ³ /T
	Category C2: RCF based- Unbleached Grades of Papers and Paperboards	15 m ³ /T
	Category D: RCF & Market Pulp Based Specialty Paper Mills	50 m ³ /T
II.	<i>Improved ETP with tertiary treatment</i> <u>Primary Treatment</u> comprising coarse & fine screening, stabilization/equalisation, sedimentation and primary sludge dewatering after pre-thickening. <u>Secondary Treatment</u> comprising anaerobic pre-treatment wherever necessary (COD >3500 mg/l), aerobic treatment (like activated sludge process), secondary sedimentation, thickening (centrifuging/decanting), sun-drying (sludge drying beds) and co-combustion in Power boilers in admixture with chip dust/pith/primary sludge or any combustible non-hazardous waste. <u>Tertiary Treatment</u> will be site-specific, and can cover a wide range of processes starting from a simple Polishing Pond (to even out discharge variations), Coagulation & Flocculation and/ or micro filtration (to achieve low TSS levels), and/ or activated carbon filtration and/ or ozonisation (for reducing odour and colour), etc.	December 31, 2015
III.	Commissioning of CRP/ CCRP in Agro based chemical pulp making Mills in NGRBA covered States (Uttar Pradesh & Uttarakhand)	Immediate
IV.	Dismantling & Removal of chemical pulping facilities namely digester, blown tank, pulp washers (brown stock washer/ pressure washer, etc.) from the premises of all Agro/ RCF based Mills located in NGRBA covered States (Uttar Pradesh & Uttarakhand) and not having CRP/ CCRP	One Month (October 31, 2014)

S No	Action	Time Frame
V.	Agro based Kraft Pulp & Paper Mills located in States not covered under NGRBA, and having LRP facilities to shift to CRP/ CCRP; to submit to SPCBs/ PCCs, supporting documents such as work orders, pay orders, photographs, etc. towards their commitments for installation of CRP/ common CRP based on either conventional or fluidised bed processes, to the satisfaction of SPCBs/ CPCB within three months, failing which such pulp & paper Mills to dismantle and remove chemical pulping facilities from the Unit's premises and shift to RCF based production within three months	Three Months
VI.	Commissioning of CRP/ CCRP in Agro based Kraft Paper Mills in States not covered under NGRBA	June 30, 2016
VII.	Continuous online effluent/ emission monitoring system	March 31, 2015

10.4 Bare Minimum Technology (BMT)

BMT is indicative of the systems, equipment, processes and practices that are generally considered essential to achievement of the objectives of this Charter.

Technology actually required, or implemented, by individual mills to achieve the same documented level of environmental protection, may differ on account of their unique set of circumstances like scale of operations, equipment & system configuration, product portfolio, raw material mix, etc.

Bare Minimum Technologies (BMT)			
Sl. No.	Functional Area	Facility Required	
		BMT/Optional	Type of Facility (Generic)
1	Chemical Pulping		
1.1	Wood Based Kraft (Sulphate) Pulping		
1.1.1	Raw Material Preparation	Optional	Dry De-barking system
		BMT	Log washing using treated wastewater
		BMT	Dust extraction system equipped with bag filters for chipper dust collection
1.1.2	Cooking	BMT for 250 tpd & above	Extended delignification/Modified Cooking plants, either batch or continuous.
		BMT for <250 tpd	Conventional batch digester systems with efficient blow heat recovery systems and capture/disposal of NCG
1.1.3	Brownstock Washing, Screening & Cleaning	BMT	3 or 4 stage washing using presses or high-efficiency washers with discharge at medium to high consistencies
		BMT	All washers & Presses to be equipped with hoods and extraction fans for capture & disposal of NCG
1.1.4	Oxygen Delignification	BMT	Single or two-stage oxygen delignification with an efficient post-OD (pre-bleach) washer/press
1.1.5	Bleaching	BMT for 250 tpd & above	Elemental chlorine-free bleaching with an oxygen reinforced peroxide extraction stage Maximum recirculation of process filterates to the extent limited by scale formation
		Optional (now); BMT for >25% capacity expansion	Partial replacement of chlorine dioxide with an Ozone stage (ECF - Lite)
1.2.6	Spillage Monitoring & Control	BMT	Spill pits/tanks, and drainage system for containment/recovery, with conductivity-based alarm anunciation for spill notification.
1.2	Agro Based Soda or Kraft Pulping		
1.2.1	Raw Material Preparation	BMT	Drum de-dusting for straw/ Swing-hammer type Depithers for bagasse
			Straw washing using treated wastewater
			Wet washing & cleaning with sand and pith removal arrangements
1.2.2	Cooking	Optional (now) for Pulp mills<50 tpd brown pulp	Continuous digester(s) with cold-blow arrangements

		BMT for Pulp mills < 50 tpd brown pulp for capacity expansion	Continuous digester(s) with cold-blow arrangements
		BMT for Pulp mills > 50 tpd brown pulp	Continuous digester(s) with cold-blow arrangements
1.2.3	Brownstock Washing, Screening & Cleaning	BMT	3 or 4 stage washing using presses or high-efficiency washers with discharge at medium to high consistencies
		BMT	All washers & Presses to be equipped with hoods and extraction fans
1.2.4	Oxygen Delignification	Optional	Single stage oxygen delignification with an efficient post-OD (pre-bleach) washer/press
1.2.5	Bleaching	BMT for < 200 tpd	Partial replacement of elemental chlorine with peroxide
		Optional (now); for < 200 tpd	3 stage Elemental chlorine-free bleaching with oxygen reinforced peroxide extraction stage
		BMT for < 200 tpd mill for capacity expansion	3 stage Elemental chlorine-free bleaching with oxygen reinforced peroxide extraction stage
		BMT for 200 tpd & above	3 stage Elemental chlorine-free bleaching with oxygen reinforced peroxide extraction stage
1.2.6	Spillage Monitoring & Control	BMT	Spill pits/tanks, and drainage system for containment/recovery, with conductivity-based alarm announcement for spill notification.
2	Chemical Recovery		
2.1	Chemical Recovery for Kraft Pulping		
2.1.1	Black Liquor Evaporation	BMT	Multiple-effect, falling film evaporation plants (with surface condensers) capable of concentrating black liquor to a concentration not less than 70%, in excess of 70%
		Optional (now) & BMT for > 25% capacity expansion	Foul condensate stripping & stripped gas capture/disposal
2.1.2	Black Liquor Combustion	BMT	High pressure recovery boiler, directly fired at 65-75% bls dryness without any secondary direct-contact evaporation, a 3 or 4-level combustion air distribution arrangement and adequately sized Electrostatic Precipitator (ESP).
2.1.3	Causticising Plant	BMT	Causticising plant comprising green liquor normalisation, green liquor clarification, dregs washing/filtration, drum/stationary slaker, single or 2-stage causticising, white liquor clarification and lime mud washing followed by efficient pre-coat lime mud filtration. White liquor clarification/mud washing can be through sedimentation type clarifiers/washers or pressurised disk filters or a combination of the two.
		BMT	Dust extraction and scrubbing systems
2.1.4	Lime Mud Re-	BMT	Rotary Lime Kiln with Electrostatic Precipitator

	burning	BMT	Dust extraction and scrubbing systems at Feed and Discharge-ends of the Kiln, and transfer points of conveying systems.
2.1.5	Spillage Monitoring & Control	BMT	Spill pits/tanks, and drainage system for containment/recovery, with conductivity-based alarm annunciation for spill notification.
2.2	Chemical Recovery for Soda Pulping		
2.2.1	Black Liquor Evaporation	BMT for Pulp mills >200 tpd brown pulp	Multiple-effect evaporation plants (with surface condensers) capable of concentrating black liquor to a concentration not less than 65%
		BMT for Pulp mills <200 tpd brown pulp	Multiple-effect evaporation plants (with surface condensers) capable of concentrating black liquor to the desired concentration, preferably not less than 25%
2.2.2	Black Liquor Combustion	BMT for Pulp mills >200 tpd brown pulp	High pressure recovery boiler, directly fired at 65-70% bls dryness without any secondary direct-contact evaporation, a 3 or 4-level combustion air distribution arrangement and adequately sized Electrostatic Precipitator (ESP).
		BMT for Pulp mills <200 tpd brown pulp	Unconventional, low-temperature, fluidised-bed black liquor processing systems ensuring complete combustion of black liquor and producing saleable sodium carbonate (soda ash) pellets.
2.2.3	Causticising Plant	BMT for Pulp mills >200 tpd brown pulp	Causticising plant comprising green liquor normalisation, green liquor clarification, dregs washing/filtration, drum/stationary slaker, 2-stage causticising, white liquor clarification and lime mud washing followed by efficient pre-coat lime mud filtration. White liquor clarification/mud washing can be performed through sedimentation type clarifiers/washers or pressurised disk filters or a combination of the two. Dust extraction and scrubbing systems
		BMT for Pulp mills <200 tpd brown pulp using unconventional recovery system (FBR technology)	No causticising required as long as all the sodium carbonate produced is sold and not used as landfill. Mills shall have to install a Causticising Plant in event that the product does not find a ready market and constitutes a solid waste.
2.2.4	Lime Mud Re-burning	BMT for Pulp mills >200 tpd brown pulp	Rotary Lime Kiln with Electrostatic Precipitator or alternate system duly approved by CPCB
			Dust extraction and scrubbing systems at Feed and Discharge-ends of the Kiln, and transfer points of conveying systems.

		BMT for Pulp mills <200 tpd brown pulp using unconventional recovery system (FBR technology)	No Lime Kiln is required as long as all the sodium carbonate produced is sold and not used as landfill. Mills shall undertake to install a Lime Kiln (in additiona to a causticising plant) in event that the product does not find a ready market and constitutes a solid waste.
2.2.5	Spillage Monitoring & Control	BMT	Spill pits/tanks, and drainage system for containment/recovery, with conductivity-based alarm annunciation for spill notification.
3	Wastepaper Recycling		
3.1	Fibre Preparation for Paperboards & Brown Grades	BMT	<p>Pulping performed by low or high consistency pulper or Drum pulper followed by coarse cleaning & screening, fractionation (optional for testliner), refining, and final screening. The process water loops will be closed and recycled through DAF cells.</p> <p>Two rejects handling systems, one for pulper and coarse screen reject (plastic & meteaallic) and one for the subsequent fine screening and cleaning (fibre sludge). The fibre sludge will be dewatered and pressed to a dryness >55%.</p>
3.2	Fibre Preparation including Deinking for White Grades	BMT	<p>Pulping performed by high consistenct pulper or Drum pulper followed by coarse screeing. Two loop deinking with two flotation stages, intermediate fine screening and cleaning and one disperging stage. The process water loops will be closed and recycled through DAF cells. Bleaching will be performed with Peroxide bleaching for whitening/brightening and Hydrosulphite/Formamidine sulphinic Acid (FAS) for colour removal.</p> <p>Two rejects handling systems, one for pulper and coarse screen reject (plastic & meteaallic) and one for the subsequent fine screening, cleaning and flotation stages (deinking sludge). The deinking sludge will be dewatered and pressed to a dryness >55%.</p>
4	Paper Making		
4.1	Paper Machines & Stock Preparation	BMT	<p>Closed loop fibre recovery and backwater system using Polydisc filters or DAF (Dissolved Air Flootation) Units and adequately sized broke & clarified backwater storage towers/chests</p> <p>Use of clarified back water or recycled water in high-volume, low-pressure showers and sheet knock-offs</p> <p>Use of optimum size and type of nozzles in wire cleaning showers</p> <p>Collection, cooling & reuse of vacuum pump sealing water</p>

5	Handling of Discharges		
5.1	Wastewater Discharges		
5.1.1	Wastewater Treatment	BMT	<u>Primary Treatment</u> comprising coarse & fine screening, stabilization/equalisation, sedimentation and primary sludge dewatering after pre-thickening.
		BMT	<u>Secondary Treatment</u> comprising anaerobic pre-treatment wherever necessary (COD >3500 mg/l), aerobic treatment (like activated sludge process), secondary sedimentation, thickening (centrifuging/decanting), sun-drying (sludge drying beds) and co-combustion in Power boilers in admixture with chip dust/pith/primary sludge or any combustible non-hazardous waste.
		BMT	<u>Tertiary Treatment</u> will be site-specific, and can cover a wide range of processes starting from a simple Polishing Pond (to even out discharge variations), Coagulation & Flocculation and/ or micro filtration (to achieve low TSS levels), and/ or activated carbon filtration and/ or ozonisation (for reducing odour and colour), etc.
5.1.2	Treated Wastewater Disposal		Site specific; to be prescribed by SPCBs based on condition of receiving waters
5.2	Solid Waste Discharges		
5.2.1	Chipper Dust, Straw Dust, Pith		Co-combustion in mill's main boilers
5.2.2	Boiler Ash		Supply to Cement Mills/ filling of low lying land
5.2.3	Lime Sludge Bleeds and Causticising Rejects		Supply to Cement Mills
5.2.4	Primary Sludge from		Supply to secondary manufacture of cardboards, moulded fibre packing material (like Egg Trays)
5.2.5	Wastewater Treatment		Co-combustion in mill's main boilers
5.2.6	Secondary Sludge from Wastewater Treatment		Co-combustion in mill's main boilers after decanting, sun-drying and admixture with chipper dust/bagasse pith and/or primary sludge
5.2.7	Waste paper Pulper & Coarse Screen Rejects		Plastic/Metallic Office consumables to be supplied to authorised recyclers/resellers
5.2.8	Fine Screening/Cleaning Rejects & Deinking Sludge		Dewatering to >50% dryness and co-combustion in mill's main boilers

5.3	Atmospheric Discharges		
5.3.1	Stacks		All stacks to be preceded by ESPs or Bag Filters or multi cyclone with wet scrubber as appropriate
5.3.2	Atmospheric Reaction Vessels		Reaction vessels like Smelt Dissolvers, causticisers, slakers, etc to be equipped with Demisters/Scrubbers
5.3.3	Dust Extraction Systems		Dust extraction systems to be equipped with bagfilters or wet scrubbers as appropriate
6	General Pollution Abatement Measures		
6.1	Resource Management		Optimum use of all material resources through input-output analysis and establishment of moving targets for specific consumption of inputs. Cost audits to be moderated by environmental considerations.
6.2	Good Housekeeping		Containment and management of material spillages to prevent contamination of soil, ambient air, and groundwater, besides increasing pollution loads and vitiating workplace environment.
6.3	Monitoring & Control		Mill-wide fresh water distribution networks to be colour coded (as per BIS) to identify process, utility and domestic supplies
7	Environmental Management Systems		
7.1	General & Mill-wide		
7.1.1	Environmental Control Laboratory		Establishment of testing facilities, manned by trained and dedicated staff, for routine monitoring of emissions and performance measurement of pollution control systems, equipment and devices. The staff will also be responsible for <u>maintaining proper records</u> and initiating non-compliance warnings.
7.1.2	Environmental Audits		Annual Comprehensive Water Audit Annual Performance Audit of Wastewater Treatment Facilities Assessment of Odourous Emissions Control twice a year
8	Compliance Monitoring		
8.1	Off-line Routine Monitoring		pH, TSS, BOD, COD, TDS, Colour, AOX, SAR for wastewater; SPM, SO ₂ , NO _x for mill boilers; SPM, SO ₂ , NO _x , H ₂ S for recovery boilers and lime kilns AOX & SAR monthly, BOD weekly and pH/TSS/COD/TDS/Colour daily. Air quality measurements as prescribed by SPCBs
8.2	Flow Measurement		Magnetic Flowmeter with remote mounted transmitter and totaliser feature and with connectivity to a remote PC through an RTU. Installation Guidelines of maintaining straight lengths, upstream and downstream of flow tube, shall be adhered to. Open channel Parshall Flume with ultrasonic level measurement to infer flow, and with connectivity to a remote PC through an RTU.

8.2	On-line Continuous Monitoring		
8.2.1	-- of Wastewater		Online monitoring for flow (water consumption & wastewater discharge from treatment plant), pH, Dissolved Oxygen (DO), BOD, COD, TSS of treated wastewater/ as required by SPCBs.
8.2.2	-- of Air Emissions		As required by SPCBs
Notes:			
1	"tpd" refers to Air-Dry (ADt) for pulp; Saleable weight for paper.		
2	Effluent "Discharge" shall mean the effluent leaving the outlet of the final wastewater treatment stage and will include any volumes applied on land within the mill premises or any other mill-owned lands. Such application on land shall not be drawn from any other point before the outlet of the final wastewater treatment stage.		

11. Protocol for Operating Chemical Recovery Plants (CRPs) (Individual/ Common)

1.0 Measurement of Black Liquor

- i. Flow measurement of Weak Black Liquor (WBL) by installing Mass Flow meter at Pulp Mill & Evaporation plant both for flow and solids (Recording daily, to-date monthly and to-date yearly flow of WBL).
- ii. Measurement of Strong Black Liquor (SBL) production by installing Mass Flow meter at Pulp Mill both for flow and solids (Recording daily, to-date monthly and to-date yearly flow of SBL).
- iii. Measurement of Heavy Black Liquor (HBL) production by installing Mass Flow meter at Pulp Mill both for flow and solids (Recording daily, to-date monthly and to-date yearly flow of HBL).
- iv. All these Flow measurement shall be connected to PLC based logic or DCS with required password.

2.0 Production data of soda ash

- i. Recording of daily production of Soda Ash (in MT).
- ii. Recording of to-date monthly production of Soda Ash (in MT).
- iii. Recording of to-date yearly production of Soda Ash (in MT) .

3.0 Steam and power consumption

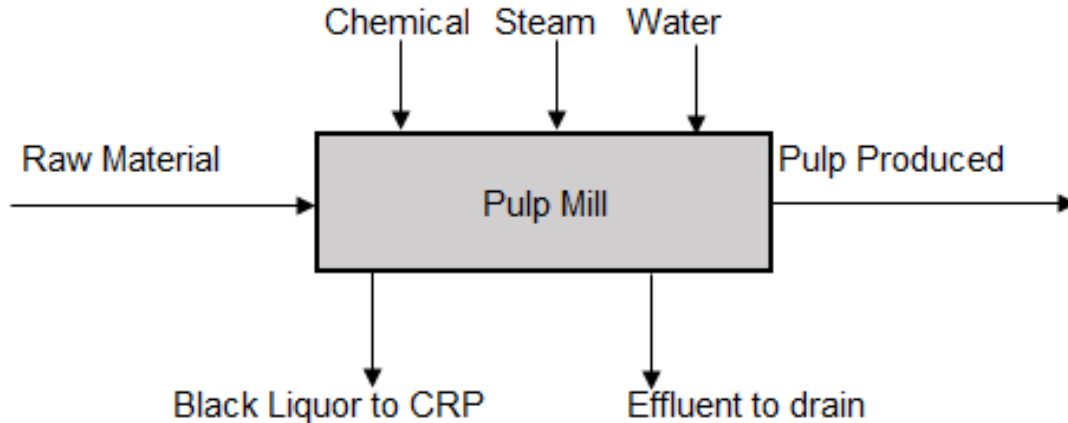
- i. Separate steam mass flow meter in CRP should be installed.
- ii. Consumption of steam in evaporators in MT/Day (Recording daily, to-date monthly and to-date yearly steam consumption in MT).
- iii. Recording of Steam Economy of evaporators (on daily, to-date monthly and to-date yearly basis).
- iv. Consumption of power in the total CRP in Units/Day (Recording daily, to-date monthly and to-date yearly power).
- v. Separate power meter (with totalizer) connected to PLC based logic or DCS with required password for the CRP should be installed.

4.0 Caustic Consumption

- i. Caustic (lye or soda) consumption figures should be noted on daily basis.
- ii. Agro-based kraft paper mill should keep the record of caustic consumption in cooking (digester).
- iii. Agro-based writing-printing paper mill should keep record of caustic consumption in cooking and alkali extraction separately.
- iv. Normally, the production of Soda Ash is between 1 to 1.2 times the consumption of caustic in cooking.
- v. The mills should give the declaration of total caustic purchased and total Soda Ash produced in a month.

5.0 Measurement and Reporting Points

- i. All the input raw materials utility (like steam, power, chemicals etc) effluent flow and pulp production data in Pulp Mill shall be recorded on daily / monthly / yearly basis
- ii. Pulp Mills effluent flow drain should be separate and flow should be measured and recorded



6.0 Submission of reports to State Pollution Control Boards (SPCBs)/ Pollution Control Committees (PCCs)

Monthly reports shall be submitted based on the measuring points by the mills as follows:

- i. Daily, monthly and yearly raw material consumption, pulp production, steam consumption in Cooking, Fresh Water / Condensate consumption in Washing, Caustic consumption, Weak Black Liquor Flow to evaporation Plant, SBL & HBL flow, effluent flow and power consumption per ton of pulp, Soda Ash production.
- ii. Daily, monthly and yearly running hours of Pulp Mill separately.
- iii. Daily, monthly and yearly running hours of Evaporator section and FBR section separately.
- iv. Logging of running hours of evaporators and FBR separately.
- v. Monthly purchase of Caustic (Lye/Soda) by the mill.

7.0 Information to SPCBs/ PCCs

Monthly schedule of running of CRP in the coming month shall be submitted by every mill in the last week of current month to SPCB/ PCC. The schedule shall contain the following:

- i. Expected total running hours of evaporators and FBR separately.
- ii. Expected production of WBL, SBL and HBL
- iii. Expected production of Soda Ash
- iv. Whenever there will be a shut down or break down of the FBR, the same shall be reported to SPCB. The reporting to SPCB should be through email followed by letter.

The SPCBs will also inspect mills, which are running CRPs and will verify that the concerned mill has operated its CRPs as per its monthly declaration for that month.

8.0 On Line Monitoring of CRP

- i. The confirmation of running FBR for an outsider is only through the chimney of the CRP. If thick white vapors are coming from the chimney, FBR is in operation.
- ii. A camera (facing chimney) should be installed to online monitor the running of the FBR. This camera should be connected to SPCBs/ PCCs server
- iii. All the Flow measurement & Power meter shall be connected to PLC based logic or DCS with required password

9.0 Miscellaneous points

- i. For Common CRP (CCRP), the black liquor has to be transported only through pipe lines. Any other mode of transportation, like tankers, shall not be permitted.
- ii. All the Pulp Mill effluents shall be separate and cameras should be installed at the discharge points
- iii. There should be no permission to run digesters for pulping of imported waste paper/ agro or wood based raw material or pulp by any Paper Mill without having CRP facility or membership of a common CRP.