EXCELLENCE IN WATER MANAGEMENT AT UNIT-SHREE GOPAL

Presented by

Ballarpur Industries Ltd.

Unit- Shree Gopal

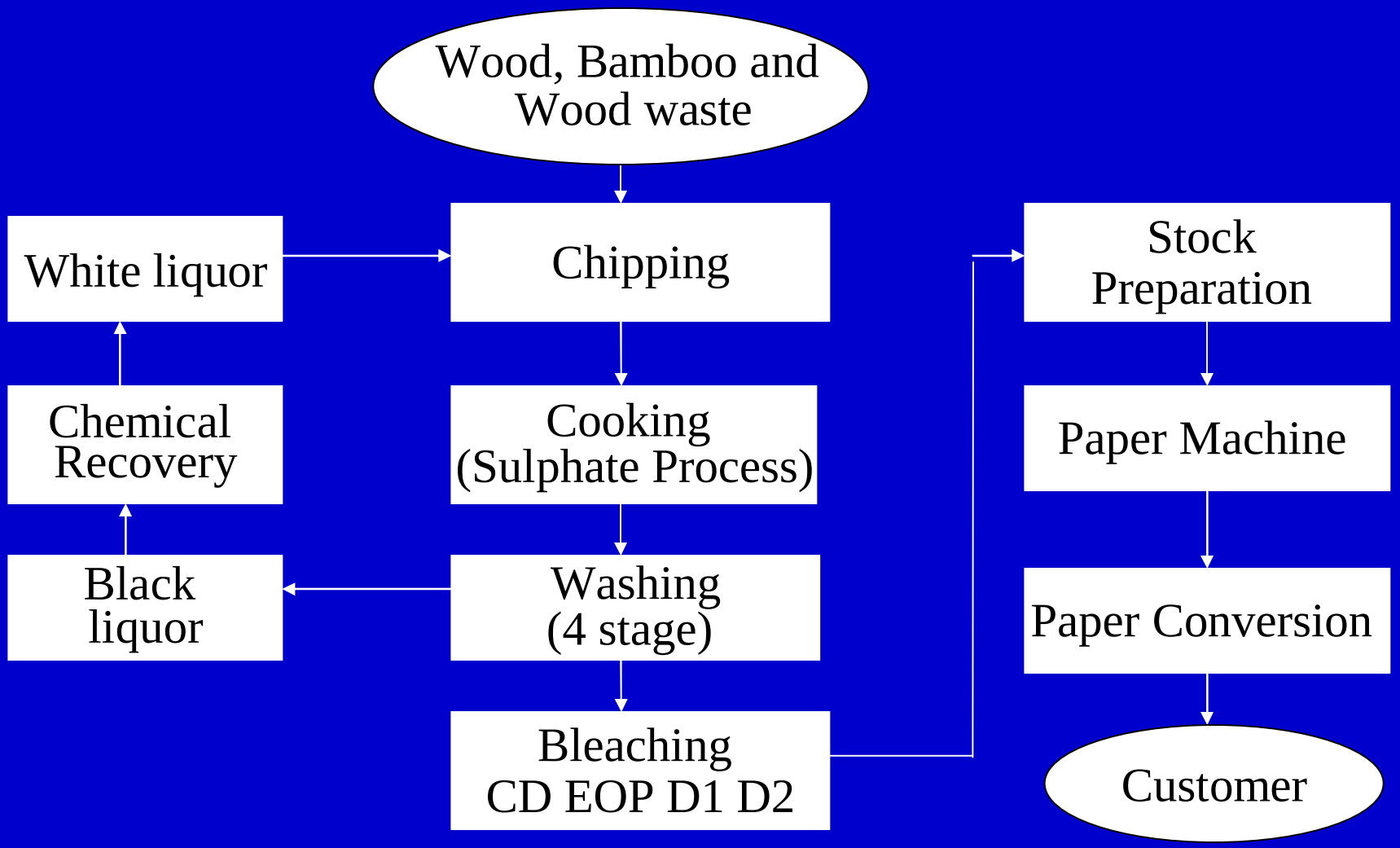
Yamuna Nagar

AN ISO 9001:2000 COMPANY

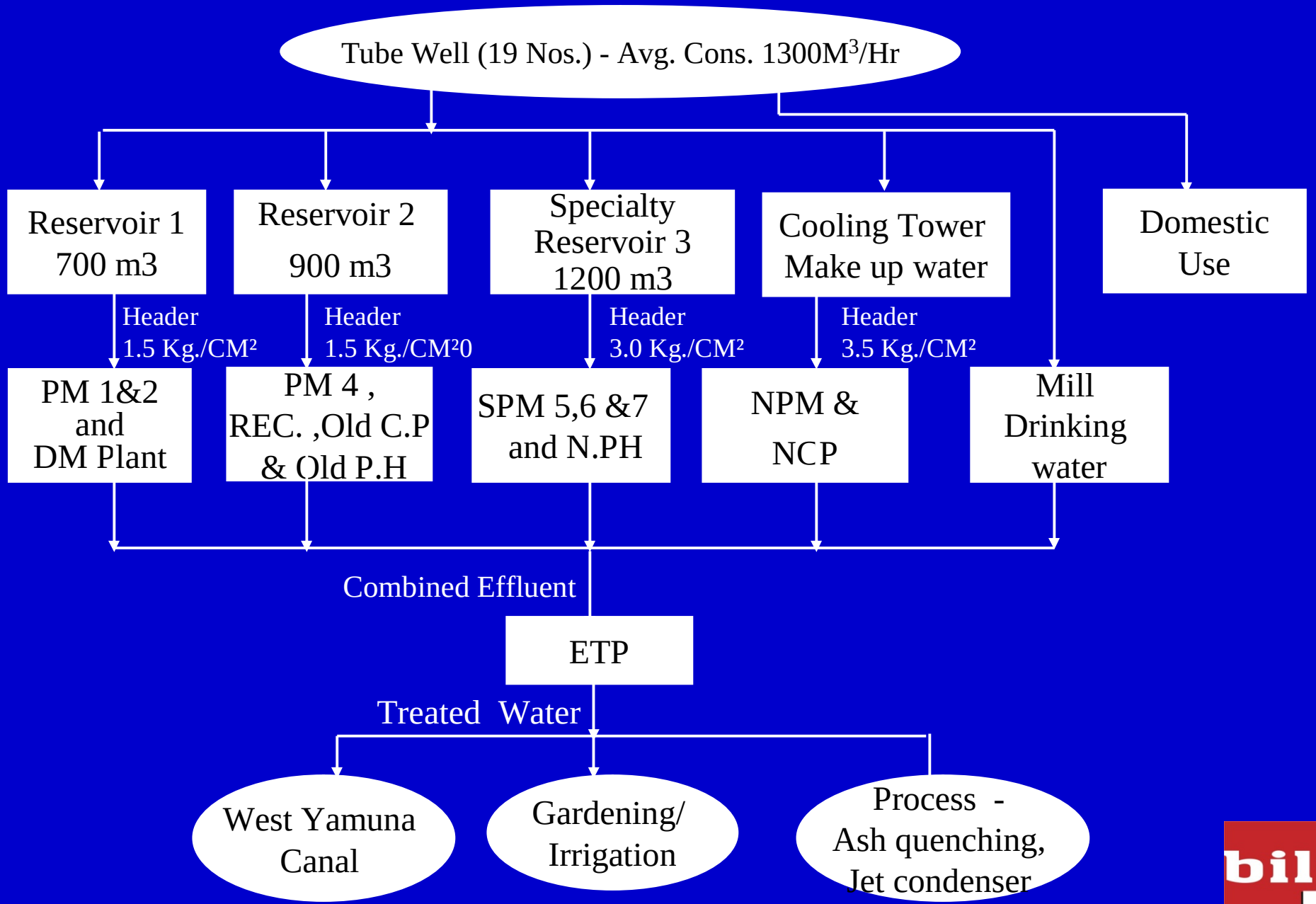
BILT–UNIT SHREE GOPAL AT GLANCE

- Production - 81,442 MT per annum (2006-07)
- Turnover - Rs. 392 crore
- Uncoated Writing/Printing Coated paper/Board & Industrial grade papers
- Matrix & Royal Executive Bond
- Customers-leading printers in the country

FLOW CHART-PAPER MAKING PROCESS



WATER USAGES LAYOUT



STEPS FOR ENVIRONMENTAL IMPROVEMENTS

- Water conservation
- Waste water management
- Utilization of treated effluent
- Rain water harvesting
- Lime mud management
- Air pollution control measures
- Use of wood waste i.e. Veneer waste, Rolla, etc.
- CREP

WATER CONSERVATION

Major water conservation projects implemented (2003-04 to 2006-07)

S.No	Activity	Water saving $m^3/hr.$
1	Use of special type gland packing in 20 pumps/refiners	**10**
2	Re-use of pope reel and compressor water to water reservoir	**30**
3	Use of barometric condenser water of ClO2 in pulp mill	**15**
4	Use of disk save-all clear water on wire showers and wash roll edges at all the machines.	**75**
5	Use of treated effluent for gardening in mills & colony	**35**

WATER CONSERVATION

S.No	Activity	Water saving $m^3/hr.$
6	Use of D1 filtrate on E/O screw conveyor for pulp dilution.	**25**
7	Reuse of water on all machines vacuum pump by passing through cooling tower.	**115**
8	Use of machine back water in consistency controller and pulp dilution at pulp mill	**28**
9	Stopping of over flow of jet condenser pit and reduction of fresh water at chemical house by putting level controller & pump for circulation	**35**
10	Reduction in use of gland cooling water by providing Macstar packing (36 pumps)	**14**

WATER CONSERVATION

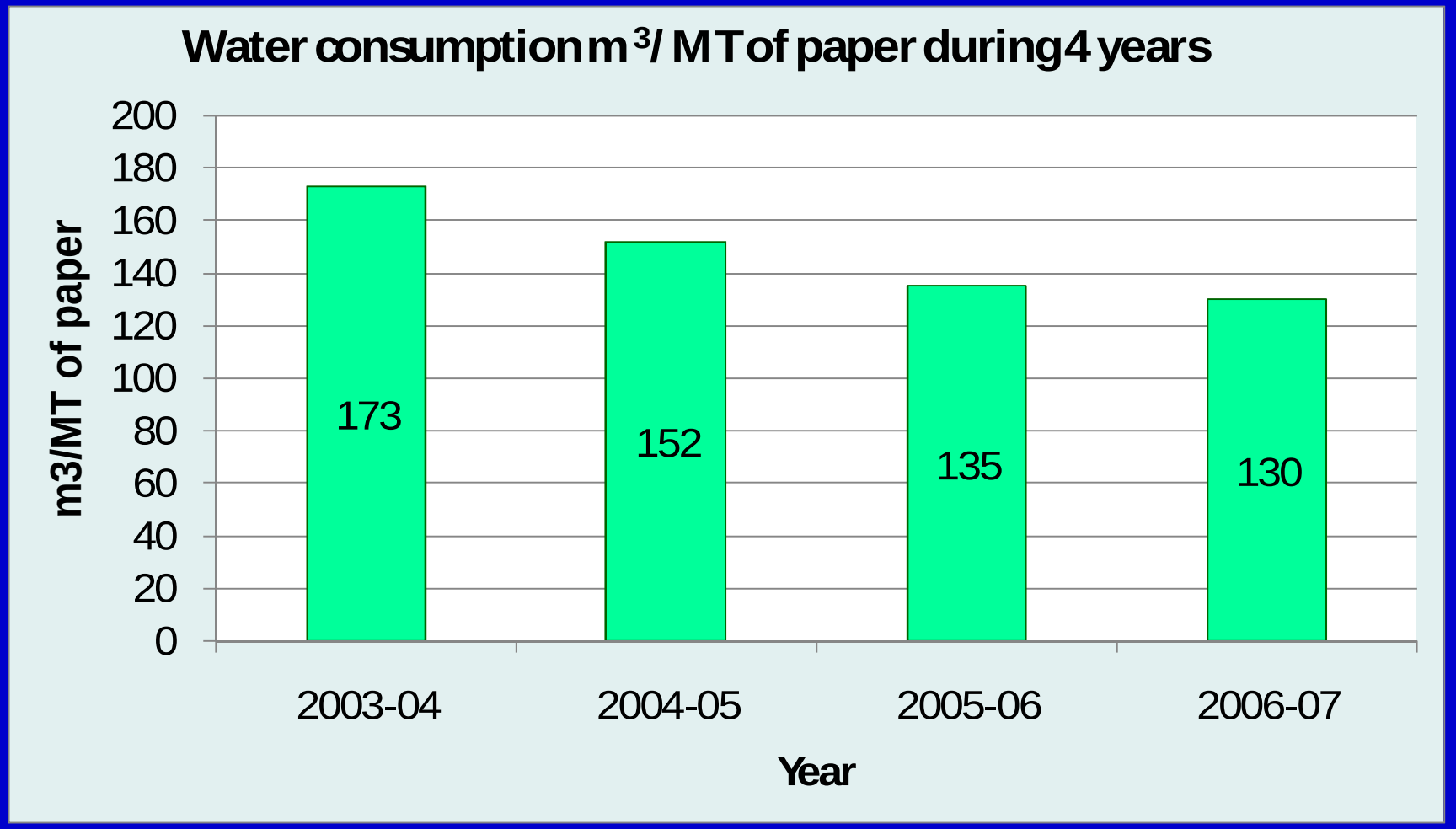
S.No	Activity	Water saving $m^3/hr.$
11	Push button type taps to be provided in Bathrooms/Toilets.	**1**
12	Installation of Duplex filter for spray showers at M/C 1&2.	**30**
13	Modification of feed pump to supply M/c 1,2&4 back water to brown stock washer	**15**
14	Thickener shower of m/c 1&2 replaced with new showers	**8**
15	Back water hose pipe provided near thickener for cleaning thickener of PM 1&2	**8**
16	Use of treated effluent in jet condenser , thus saving fresh water	**200**

WATER CONSERVATION

Considerable reduction in water consumption from 173 m^3/MT of paper (2003-04) to 130 m^3/MT of paper (2006-07).

Year (April-March)	Annual Water Consumption m^3	Production MT	Specific water consumption m^3/MT
2003-04	12348760	71412	173
2004-05	11556900	75975	152
2005-06	10759770	79876	135
2006-07	10565900	81229	130

WATER CONSERVATION



- Present water consumption : 124m^3/MT of paper

WASTE WATER MANAGEMENT

Activated sludge process consisting of Primary clarifier, Aeration tank, Secondary & Tertiary clarifier.

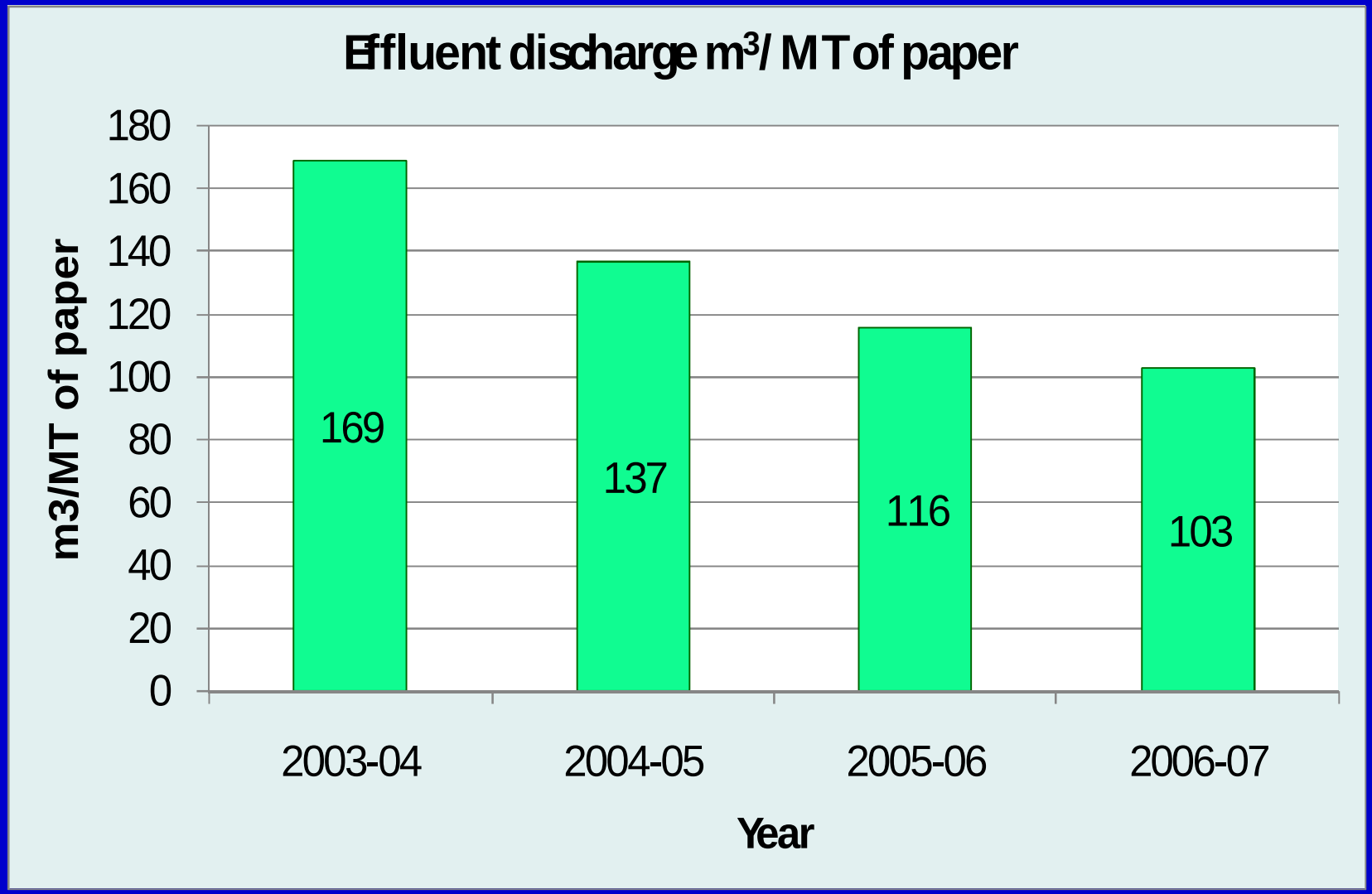
- Design Capacity : 53000 m^3/day
- Operating Capacity : 25000 m^3/day

Introduction of tertiary clarifier in the treatment facility has significant effect in reducing the SS, BOD and COD

Data showing the compliance to environmental norms

Particulars	Unit	HSPCB norms effluent	Treated water effluent
pH	-	7.0-8.5	7.2 – 7.8
BOD	ppm	30	10-14
COD	ppm	350	100-120
Suspended solids	ppm	50	15-30
AOX	Kg/MT Paper	<1.5	0.6-0.7

WASTE WATER MANAGEMENT



PER CAPITA WATER CONSUMPTION

Industrial

Consumption M^3	Average Employees per day	Per capita consumption (liters/person/day)
1000	2144	**466**

Colony

Consumption M^3	No of persons	Per capita consumption (liters/person/day)
2600	5350	**485**

The figure is based on the average of 2006-07 . This includes water consumption at Temple, Gurudwara and Community centre

UTILIZATION OF TREATED EFFLUENT

A – PROCESS :

Ø Raw Material Wetting
: 80 m³/day

Ø Coal Ash Quenching
: 1000 m³/day

Ø Ejector Cooler at soda recovery evaporators
: 400 m³/day

UTILIZATION OF TREATED EFFLUENT

Ø Jet condenser of the evaporators
: 4800 m³/day.

Ø Broke chest pump for gland cooling at 8 pumps
: 100m³/day

Ø Chemical house pumps for gland cooling at 6 pumps
: 80m³/day

Ø Gland cooling of all refiners
: 200m³/day

UTILIZATION OF TREATED EFFLUENT

B – GARDENING :

The excess treated effluent is utilized for gardening in mills, colony and wetting play grounds. :180 m^3/day.

UTILIZATION OF TREATED EFFLUENT

C – IRRIGATION :

- Ø Cultivation of paddy crops.
- Ø One acre land for sugarcane crops.

Motivation of formers to use treated effluent for irrigation/ plantation.

RAIN WATER HARVESTING

Ø Two completed (one inside the mill and one in colony)

Ø Five more are in line at different locations in side the mill and colony.

At mill

At residential garden

WORLD BENCHMARK

	National Benchmark	International Benchmark	CPCB Benchmark 120 m^3/MT of paper as per CREP after March'07.
Waste Water Discharge (m^3/MT)	*	**	120 m^3/MT of paper as per CREP after March'07.

*Mills are different based on the raw materials used, products manufactured, no. of machines used etc. There is no authentic national bench mark figures.

**Since we have multimachines, it is not possible to achieve the world benchmark.

STRATEGIES ROADMAP

Ultimate Target/Objective – 100 m3 (within 3 years) and
– 80 m3 (within 5 years)

Strategies :

Ø Optimizing the pressure of process water line wherever possible.

Ø Installing of better efficient washing equipment.

Ø Segregation of vacuum sealing water and re-using it while passing through cooling tower at PM-5 & 7.

Ø Installation of fiber recovery system (Disk filters) so as to re-use the clean filtrate in place of fresh water wherever possible at PM-5.

Ø Recycling of sectional waste waters within the process itself.

Ø Use of treated effluent for wood and bamboo washing.

Ø Use of treated effluent in fire hydrant, gardening and plantation activity.

SUSTAINABILITY

- Ø Water consumption review – Daily
- Ø Water consumption project review – Weekly
- Ø Communication through e-mail to all process/concerned heads – Daily
- Ø Installation of water flow meters on PM- 1,4, 5, 6 & 7 respectively to monitor water consumption on daily basis.
- Ø Further addition of meters at PM-2

Review meeting

- By Functional Head

DGM(PERC) 12.11.07

Tube-well No.	Tube-well Initial Reading	Tube-well Final Reading	Raw Water	SHUT HRS
1	57717	57855	1380	
2	29054	29193	1390	
3	629159	629490	3310	
4	46480	46802	3220	
6	612152	612152	0	24
7(N)	806656	808281	1625	
8	86985	87102	1170	
9	124969	127124	2155	
10	5342	5482	1400	
12	73055	73404	3490	
14	608281	609482	1201	
15	339	462	1230	
16	43532	45968	2436	
17	818290	819581	1291	
18	77199	77327	1280	7
19	23950	23980	300	21
20	788253	789261	1008	
21	6079	6297	2180	
22	231367	232712	1345	4
			31411	56
			1308.79	343314
Total Raw Water		31411	TODATE	374725
Average Raw water(M3/Day)		31227		

INNOVATIVE PROJECTS

Ø Use of treated effluent in the Jet Condenser in the Chemical House for vacuum generation and re-circulation of used treated effluent back to ETP. The requirement of treated effluent for Jet Condenser is 4800 m^3/day.

Vacuum Pump

Vacuum generation : 625 mm of Hg
Designed - Fresh water requirement : 240 m^3/hr.
Actual - Fresh water consumption : 200 m^3/hr.

Since, fresh water has been replaced with treated effluent

Therefore, Saving in terms of money : Rs.28.0 lac/annum

By the use of treated effluent, there is a scaling inside the pump and it is being cleaned mechanically after every four months during the planned shut.

INNOVATIVE PROJECTS

Ø Use of disc save-all clear water on wire showers & wash roll edges at all m/cs. Fresh water saving of 1450 m^3/day at PM#1&2.

Quality of Clear water :

pH of lean water	: 6.7
Suspended solids	: 50-60 mg/l
Filler in lean water	: 0.002 MT/hr
Fiber in lean water	: 0.001 MT/hr

Use of back water in wire shower on PM#1&2 : 60 M^3/hr

Saving of Filler	: Rs.30.0 lac/annum
Saving of Fiber	: Rs.63.8 lac/annum
Saving of water	: Rs. 8.0 lac/annum
Total saving	**: Rs. 102 lac/**annum
Saving due to Krofta	: Rs. 70 lac/annum
Net additional saving	: Rs. 32 lac/annum

INNOVATIVE PROJECTS

Use of barometric condenser water of ClO_2 plant in pulp mill.

- Fresh cooling water is being used in barometric condenser and was drained after use due to high temp 50-55°C and traces of ClO_2 in water.

Analysis of condensate water :

pH	: 7.1
Color, Pt-Co unit	: 4.0
P. Alkalinity, as $CaCO_3$	: Nil
M Alkalinity, as $CaCO_3$	: 235 mg/l
Iron content	: 0.2 mg/l
ClO_2 content	: Traces

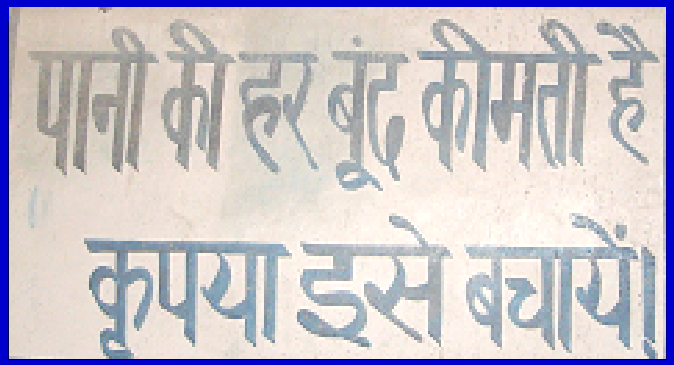
This water is suitable for the use of pulp mill and being used in pulp mill to generate hot water.

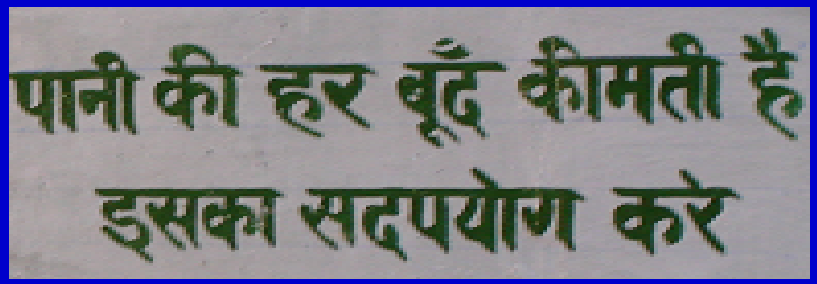
- Fresh water feed in condenser : 15 m^3/hr.
- Running hours of plant : 14.5 hrs.
- Fresh water saving : 220 m^3/day

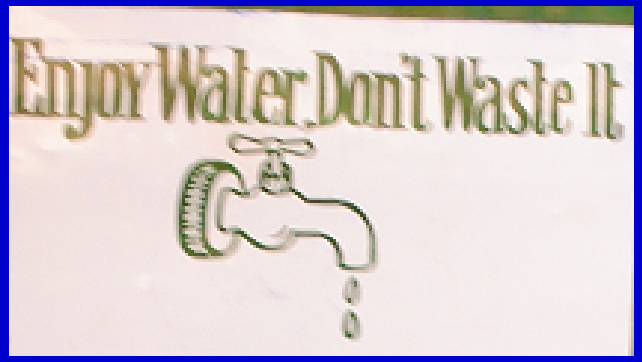
AWARENESS: WATER CONSERVATION

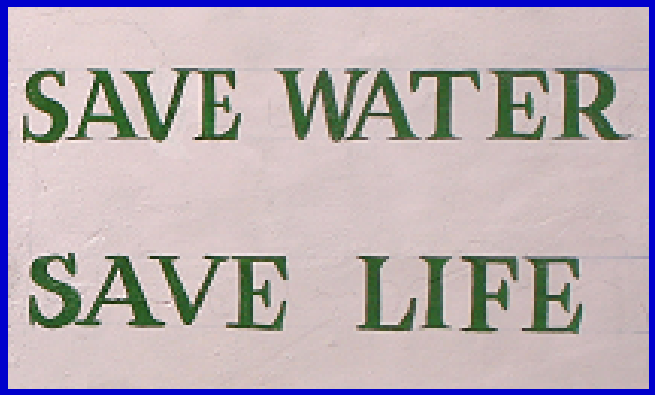
Painting competitions at Colony

AWARENESS : WATER CONSERVATION









Slogans displaced at various locations in mills

AWARENESS : WATER CONSERVATION

Inside the mill – Chemical House

Inside the mill – Filler unloading site

Inside the mill – Pulp Mill

Mill Gate - Local community

Outside the mill – Temple

Inside the mill – Blade coating

Slogans displayed at various locations inside the mills /public places