

## **ASSESSMENT OF POLLUTION / CASE STUDIES**

### **Review of the Status of Problem Area, Mandi Gobindgarh**

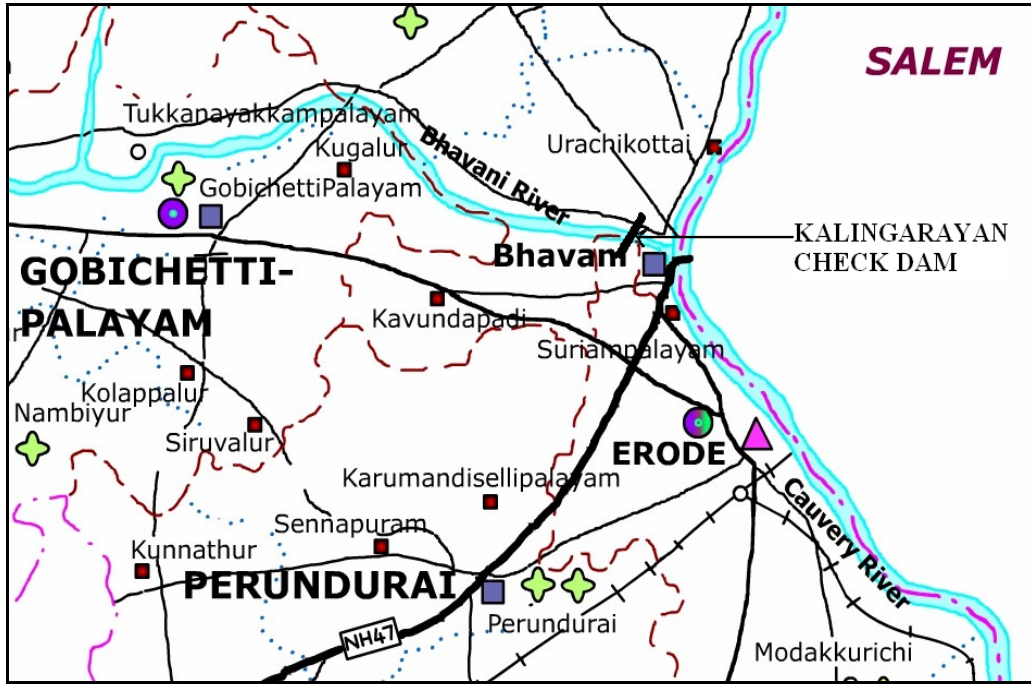
The first meeting of the 'Review Committee' for problem area was held at CPCB, Delhi on May 03, 2005 in which the 'Revised Action Plan' in respect of the problem area has been prepared in concurrence with Punjab Pollution Control Board. Follow up meetings were held at Patiala on 12.12.2005 and then at Mandi Gobindgarh on 07.02.2006 and the last meeting at Central Pollution Control Board Delhi to review the status and decide further course of action.

Intensive ambient air quality monitoring was conducted at seven locations including the reference, residential, industrial and mixed areas. Level of RSPM are exceeded the prescribed norms at all the places at all the times. The average 24 hourly RSPM concentration have varied from 95  $\mu\text{g}/\text{m}^3$  at the rural / reference point to 498  $\mu\text{g}/\text{m}^3$  in the industrial area. Major sources of RSPM contribution are burning of coal as fuel in the rolling mills without operation of APCDs / inadequate APCDs and use of substandard scraps of iron in the induction furnaces without operation of installed APCDs. Other sources are movement of vehicles on the unpaved roads in the industrial area and traffic on the adjacent GT road. Although 24 hourly average values of SO<sub>2</sub> and NO<sub>2</sub> are within the prescribed standards but the 4 hourly slot values of these parameters are sometimes as high as 182  $\mu\text{g}/\text{m}^3$  and 177  $\mu\text{g}/\text{m}^3$  respectively. This aspect needs some immediate (short term and long term) measures. The sources of these gases are use of high sulphur content fuels like furnace oil, Assam coal, non operation of installed APCDs and to some extent the vehicular traffic.

### **Kalingarayan Canal Water Quality Study, Tamil Nadu**

The Central Pollution Control Board carried out a study during August 2006 to evaluate the water quality status of Kalingarayan canal built during 13<sup>th</sup> century linking River Bhavani & River Noyyal, the two main tributaries of River Cauvery. The study was undertaken in view of the alleged severe pollution problem of the canal particularly due to textile and tanneries.

Map Showing the River Bhavani joining River Cauvery and Kalingarayan Check Dam, Erode District, Tamilnadu



About 150 dyeing units and 20 tanneries are in operation in the catchment area and discharge their trade effluent (both treated & untreated) either directly or indirectly into the canal, which contaminate the canal water and result in low crop yields. Also, the health of the people using this canal water for domestic purposes has been reported to be deteriorating. However significant affect in water quality was not observed during the study, except slight increase in the TDS values, because good flow in the canal provided substantial dilution at the time of monitoring.

### Analysis Results of Samples Collected at Various Points of Kalingarayan Canal

S. No	Parameter	Bhavani River	Kalingarayan Canal	
		On Bhavani River - 3 km upstream to Kalingarayan Check Dam	Konaivaikal Bridge upstream side	Karungalpalya m Bridge on Salem Road
1	pH	7.69	7.85	8.00
2	EC, $\mu\text{S}/\text{cm}$	350	390	500
3	Total Dissolved Solids, mg/l	208	242	272
4	Total Alkalinity, mg/l	136	138	157
5	Phenolphthalein Alkalinity,	Nil	Nil	Nil
6	Chloride, mg/l	21	27	57

S. No	Parameter	Bhavani River	Kalingarayan Canal	
		On Bhavani River - 3 km upstream to Kalingarayan Check Dam	Konaivaikal Bridge upstream side	Karungalpalya m Bridge on Salem Road
7	Sulphate, mg/l	10	14	18
8	Total Hardness as CaCO <sub>3</sub> ,	140	145	180
9	Calcium Hardness as	80	85	90
10	Sodium, mg/l	18	26	44
11	Potassium, mg/l	2	204	3

The industrial effluents of textile dyeing units and tanneries are the major sources of Kalingarayan canal water pollution. TNPCB has already issued notice to all the industries located in the bank of the canal to implement zero discharge system. Two tanneries that have adopted zero discharge system were also studied in depth. Treatment schemes in the two tannery units include physico-chemical primary and biological treatment before RO technology. Ground water qualities inside the industrial premise are also presented. Considerable increases in the dissolved solid contents of RO rejects are observed.

### Quality of the industrial wastewater generated by some of the Tanneries in Erode

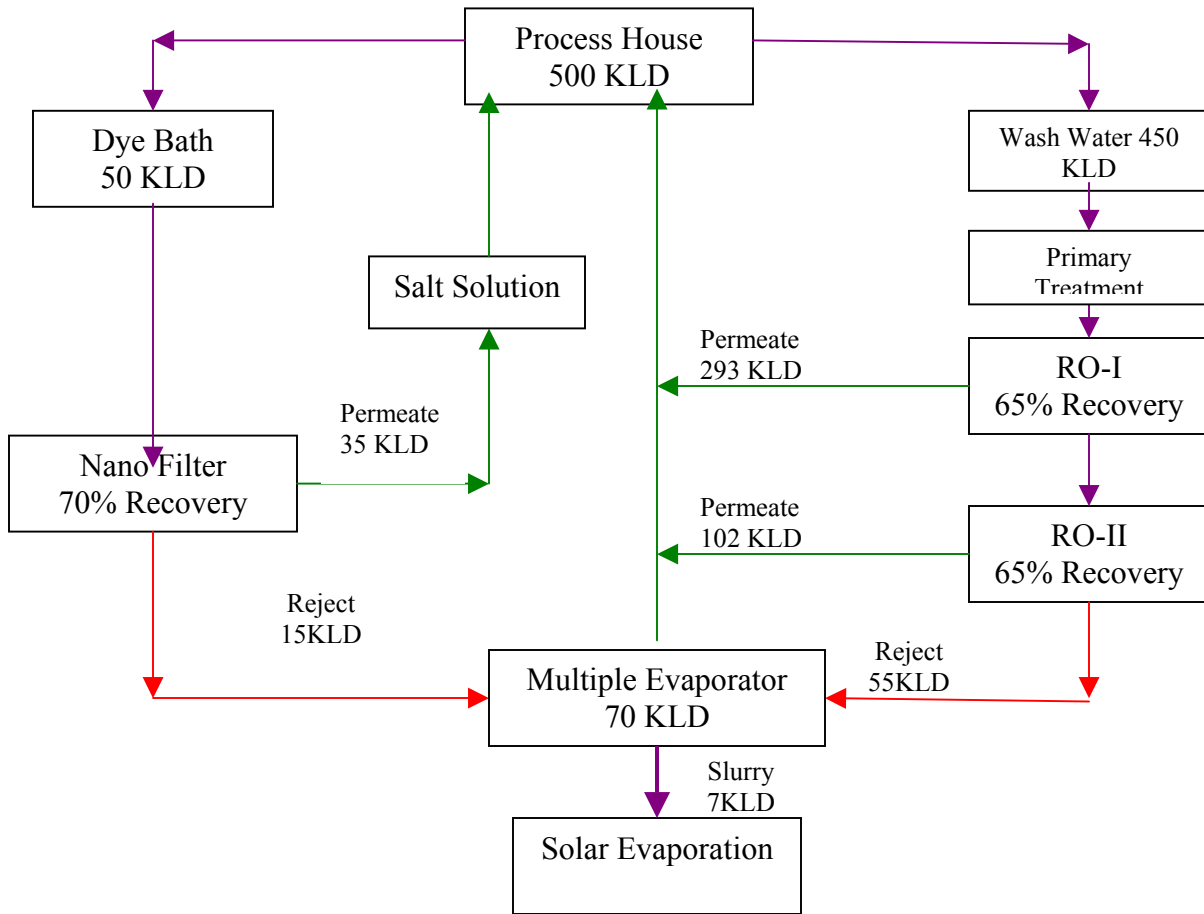
(Grab samples collected on 11/08/2006)

Parameters	EK Mohammed and Sons			KSK Tannery			
	Inlet to ETP	RO Reject	Ground water	Inlet to ETP	RO Feed	RO Reject	Ground Water
pH	8.12	4.87	7.61	6.60	5.85	5.70	8.50
EC, mS/cm	14200	18400	1040	19300	23000	32400	5000
TDS, mg/L	9130	13170	546	13885	18202	22888	3264
COD, mg/L	2682		-	1916	728	590	-
T. Alkalinity,	2700	14	299	1750	150	80	244
P. Alkalinity,	Nil	Nil	Nil	Nil	Nil	Nil	10
Chloride, mg/L	2760	4480	124	1405	4688	5887	1135
Sulphate, mg/l	1000	2500	92	7120	4750	8000	716
Total Harness, mg/L as CaCO <sub>3</sub>	400	750	320	1260	1870	2350	680
Ca-Hardness, mg/L as CaCO <sub>3</sub>	110	570	210	720	1240	1360	550
Na, mg/L	2600	3800	240	4040	4720	1200	840
K, mg/L	35	36	9	34	50	57	24

Some of the textile and tanneries implementing zero discharge by adopting RO and combined technologies were also studied. Treatment schemes in the two

textiles units include physico-chemical primary and biological treatment before RO.

**Flow diagram of zero discharge in textile dyeing unit using advanced treatment**



In order to make comprehensive assessment and suggest suitable means of handling the entire pollution problem in Tirupur and Erode, the project has been awarded to National Environmental Engineering Research Institute Nagpur during the year, which is expected to complete within 9 months.

**Monitoring of River Damanganga, Vapi**

River Damanganga is a perennial river flowing by on the South of Vapi industrial area in Gujarat, which accommodates a major chemical industrial estate. The river carries the industrial effluent generated from the GIDC Vapi after treatment in a CETP and finally meets the Arabian Sea at Daman after traveling around 9 km. On its way to Arabian Sea the river carries the effluent from CETP, Vapi and,

also, from two distilleries located at Daman, due to which the river water quality is deteriorated considerably. In order to assess the extent of deterioration of water quality in the river, particularly, due to the CETP at Vapi, the Central Pollution Control Board West Zonal Office carried out an in-depth monitoring of river Damanganga. Monitoring of around 34 industrial units producing organic chemicals and CETP has also been carried out. The results reveal that the river water quality is affected down stream of CETP discharge.

### **Monitoring of Amlakhadi, Ankleshwar**

Amlakhadi, an earthen storm water drain in Ankleshwar region, carries effluent generated from the industrial estates located at Ankleshwar, Panoli, and Jhagadia. The partially treated wastewater, discharged from all three estates is routed now through a Final ETP (called FETP) and further conveyed through a closed pipeline leading up to Gulf of Khambhat. The FETP and new conveyance system have been commissioned in November 2006. Following the commissioning of FETP and new conveyance system, the quality of Amlakhadi was monitored by CPCB in November 2006. This monitoring was carried out, along with an industrial pollution control compliance verification exercise at Ankleshwar & Panoli industrial estates. The quality of water in Amlakhadi was found not as per the norms.

The results reveals that the, organic load like COD, BOD in the drain was as high as 1854 mg/lit, 550 mg/lit. The levels of other parameters like  $\text{NH}_3\text{-N}$ , TDS were also found high. The ground water quality in the nearby area has been found contaminated at some locations, due to the persistent discharge of effluents into the drain for many years.

### **Studies of Ground Water Quality around Common Secured Land Fill Sites in Gujarat & Maharashtra:**

The states of Gujarat and Maharashtra have pioneered in commissioning the secured land fill sites at many industrial estates. A total of 10 common TSDF sites (6 in Gujarat & 4 in Maharashtra) have come up in west zone. CPCB carried out the ground water quality monitoring around some of these TSDF sites located in Gujarat & Maharashtra, in order to assess the possibility of contamination in the ground water due to the disposal of hazardous waste at the landfill sites. The monitoring results reveal contamination of ground water, in respect of parameters TDS, COD, BOD, & Total Hardness at a few places as compared to the prescribed drinking water standards. The exact reason for the contamination, whether due to TSDF or other nearby natural or anthropogenic activities, could not be ascertained.

### **Inventorization and Assessment of Pollution Load in Bhiwadi Industrial Area, Bhiwadi, Rajasthan**

Bhiwadi is located close to the National Capital Region and has attracted large number of industries due to the infrastructure made available by the Rajasthan Government. There are around 800 industries including the lead battery recyclers, which have come up in the area in large number.

### Industries in Bhiwadi Region

Category	Set-up	Working	Closed
Small scale	1025	583	442
Medium scale	200	170	30
Large scale	55	45	10
<b>Total</b>	1280	798	482

CPCB carried out a study to assess the overall environmental status of the industrial area including observations on water quality, ambient air quality, status of effluent treatment facilities in major industries and status of source emissions in major industries. Industries for detailed studies were selected randomly based upon the category, pollution potential etc. in consultation with RSPCB.

All the pucca drains in Bhiwadi Industrial Area lead to a common channel near Alupur, which flows by the side of CETP. As the effluent generation is more than the designed capacity of CETP, only a part of the effluent is diverted to CETP and the rest continue to flow into low lying areas.

### Pollution Load in kg/day in the Drains of Bhiwadi

Location	Flow	pH	TS, mg/L	TS load, kg/d	COD, mg/L	COD load, kg/d	BOD, mg/L	BOD load, kg/d
Near Satalakha Village <sup>1</sup>	7.77MLD	2.5-6.5	5942	46197	788	6126	120	933
Near UIT Police Chouki <sup>2</sup>	6.53MLD	5.5-7.0	2054	18464	486	4369	150	1348
Near UIT Sector No. III <sup>3</sup>	9.07 MLD	3.0-7.0	3322	49229	604	8951	142	2104
Near Alupura Village <sup>4</sup>	9.56MLD	4.0-7.0	2508	29773	526	6244	120	1425
Near Bhiwadi Mode <sup>5</sup>	3.53MLD	6.0 –7.0	2578	9110	986	3484	314	1110
CETP Inlet <sup>6</sup>	4.69 MLD	4.5-7.0	2768	12983	724	3396	190	891

#### Remarks:

<sup>1</sup> The pH is low mainly due to patta patti and rolling mills

<sup>2</sup> Some flow is diverted into the nearby land

<sup>3</sup> The pH is very low mainly during the night and early morning hours

<sup>4</sup> The pH is very low mainly during the night and early morning hours

<sup>5</sup> The drain comprise mainly of domestic waste from Bhiwadi

<sup>6</sup> The total waste before the CETP is 13.0MLD

Fourteen large water polluting industries were monitored to assess the operation of ETP provided by them. Most of the major industries have provided effluent treatment facilities and operation and maintenance is also satisfactory. The industries, which are engaged in saria making (re-rolling mills), have not provided any effluent treatment facilities. There is a requirement of effluent collection and settling tank facilities to reduce the suspended solids before discharging into common drains.

Rolling mills & Saria Industries are engaged in melting of iron scrap and making saria. In most of these industries there were no arrangement for monitoring of stacks. In M/s Ashiana Ispat the particulate matter values exceeded the consented value of 150mg/Nm<sup>3</sup>. Source emission was monitored in three lead recycler units and all the units exceeded the standards for particulate matter of 50mg/Nm<sup>3</sup> mainly due to improper maintenance of stack. At present, there are 07 registered recyclers whereas during the study two more units were noticed which have not registered themselves with CPCB. Also, there may be more number of illegal recyclers of battery scrap.

It can be concluded from the studies that most of the industries are not carrying out source monitoring regularly as it was noticed that either the stack platforms were not proper or monitoring ports were jammed.

Lead concentration in ambient air was found in the range of 0.99ug/m<sup>3</sup> to 13.21 ug/m<sup>3</sup> may be because of recycling of lead battery scrap by the lead recycling units.

Bhiwadi industrial area is having large number of forging units, rolling mills and textile processing units and therefore generating solid waste like char, ash and other type of solid wastes. This solid waste can be seen dumped in open plots in the industrial estate. Although RIICO has identified a low-lying area near Rampur, which is surrounded by hillock, industries are reluctant to dump over there. Most of the solid waste is sent to the outskirts of Bhiwadi region to Haryana state. In this region the waste like discarded containers, char, textile wastes are sold to recyclers. During the survey it was observed that the information of hazardous waste generation, storage quantities etc are either removed or not displayed by various units.

Most of the industries in Bhiwadi region have taken membership of common disposal facilities coming up at Udaipur and some have already started sending the hazardous waste stored in their premises. Rajasthan State Pollution Control Board while issuing authorization as per amended rules 2003 imposed the condition stating that the industry have to take membership of TSDF. Most of the industries are complying with Supreme Court directions and not storing the hazardous waste for more than 90 days at their premises.

The equivalent noise levels in commercial area were found in the range of 72.7-78.7dB (A) during day hours and 63.4-71.2 dB (A) during night hours while in residential area it was recorded in the range of 59.0-69.2dB(A) during day hours and 56.2-59.7dB(A) during night hours. Leq values in commercial and residential zones are exceeding the prescribed standards.

### **Study of Environmental Problems of Aravali Hills & Preparation of Action Plan for Restoration of Environmental Quality in Chittorgarh and Udaipur Districts of Rajasthan**

The Central Pollution Control Board has undertaken a study to prepare status report of the pollution problems in the Aravali Hills (Chittorgarh and Udaipur districts of Rajasthan) and to prepare environmental management plan and action plan for restoration of environmental quality. Draft report of the project has been prepared. Meetings with all stakeholders including State Pollution Control Board, Forest Department, Department of Mines and Geology, Central Ground Water Boards etc. have been held at Delhi, Udaipur and Chittorgarh.

### **Air Pollution due to Burning of Agriculture Residue**

About 253 million tones per year bio-fuels are used in the rural areas in the domestic sector, out of which 181 MT, is estimated as fuel wood, 32 MT dung cake and 40 MT crop residue (the fuel potential per year of crop residue is estimated to be 52 MT, out of which 40 MT per year of crop residue is used as fuel). Other major components of biomass burning are forest fires and wasteful field burning of agricultural residue.

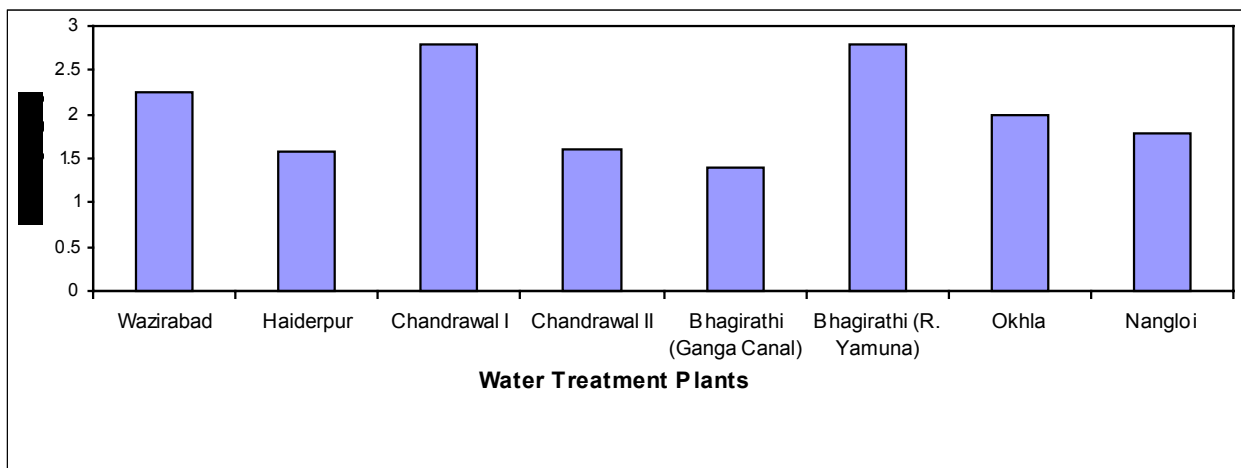
A workshop was held at the Punjab Agriculture University Ludhiana on 29<sup>th</sup> July, 2006 to discuss all aspects of “ Field – Burning of Agricultural Residues”, particularly of wheat and paddy stalks. Besides agriculture and environment experts a sizeable number (over 50) of progressive farmers participated. The proceedings and the recommendations of the workshop are reported in detail in

Indian Journal of Air Pollution Control, Vol VII, No.2 of September 2006, pages 81-87. A study was sponsored by Central Pollution Control Board, Delhi in pursuance of the workshop to generate data on the pollution caused by Field-Burning of Agricultural Residues. M/s Envirotech Instruments Pvt. Ltd., New Delhi was commissioned to carry out the field work. Scientists of CPCB and SPCB Punjab participated through out the field study.

### Quality of Raw and Treated Water at Water Treatment Plants in NCT Delhi

The public supply of drinking water in NCT-Delhi is maintained through seven Water Treatment Plants (WTPs). The raw and treated water at various water treatment plants such as Chandrawal I and II, Wazirabad, Haiderpur, Bhagirathi, Okhla and Nangloi are being monitored on Bimonthly basis. The raw as well as treated water quality has been assessed chemically and micro-biologically for the year 2006. The raw water quality at treatment plant intake confirms to the Primary Water Quality Criteria Class `C` (except in the case of Total Coliforms). Annual average of BOD observed at various raw water intake points of water treatment plant have been within the designated use quality criteria. The levels of core drinking water parameters viz. pH (6.58-7.85), Total Alkalinity (38-247 mg/l), Total Hardness (82-292 mg/l), Chloride (9-161 mg/l), Fluoride (<0.1-0.50 mg/l), Boron (0.19-0.38 mg/l) and Nitrate (0.34-2.82 mg/l) were observed complying with BIS standard's desirable drinking water limits (1991). The treated water has not depicted any coliform contamination.

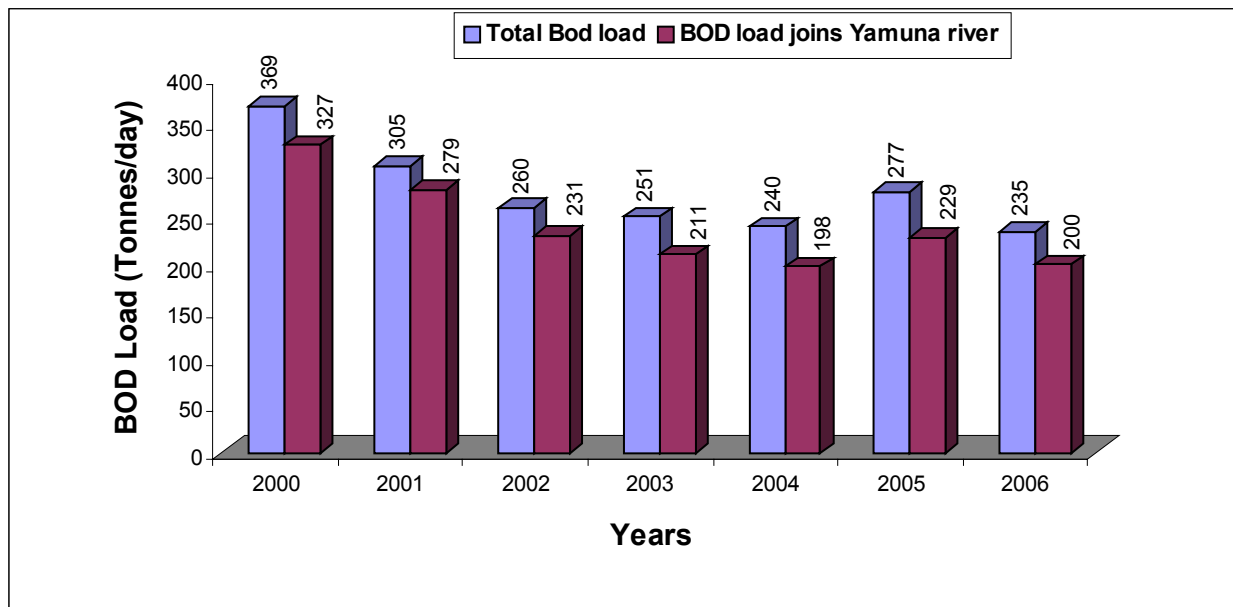
#### Annual average BOD at intake point of water treatment plants in NCT Delhi during Year 2006



## Wastewater Discharges into Water Bodies from Delhi

Central Pollution Control Board is regularly monitoring major wastewater outfalls at NCT – Delhi on monthly basis. Though, originally there was 22 major drains in the city but during the year 2006 water flow had not been observed in two drains i.e. Moat Drain and Drain No. 12A. Out of remaining 20 drains, 16 drains join Yamuna River and 4 join 2 canals i.e. Agra and Gurgaon. The total pollution load in terms of Bio-chemical oxygen demand, transported alongwith the discharge and BOD load contribution of these drains during the year 2006 is presented in Figure below:

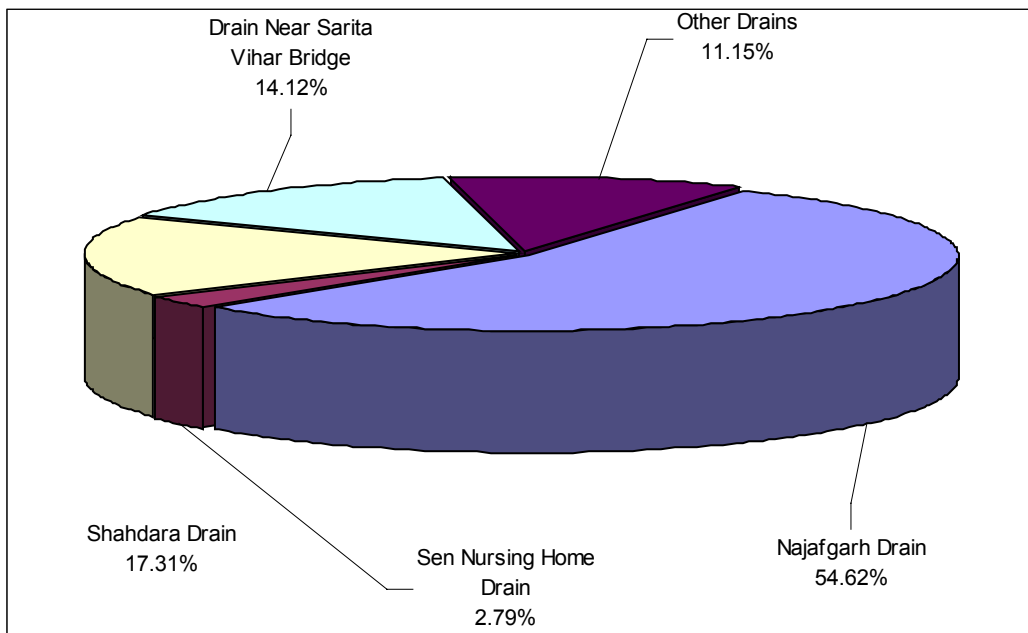
### Trend in Total BOD load of major drains joining Yamuna River at Delhi



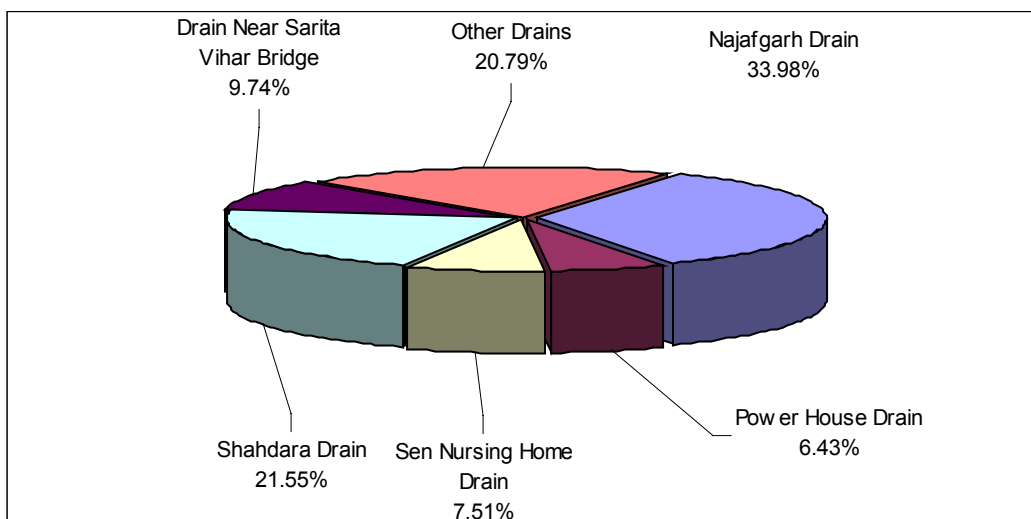
It is evident that five major drains i.e. Najafgarh, Shahdara, Sarita Vihar Bridge, Sen Nursing Home & Power House Drain contribute significant pollution load. The diversion of wastewater alongwith wastewater treatment of these drains may reduce the total pollution load of all the drain by around 80%. The wastewater flow quantity of wastewater transported by these 20 drains has been quantified as approx. 44 cubic m<sup>3</sup>/sec, which also include about 7 m<sup>3</sup>/sec of water released by Haryana State into Yamuna river through Najafgarh drain for its supply into down stream of the state. The total pollution load contributed by these drain into

river Yamuna Delhi stretch and the Agra and Gurgaon canals during the year 2006 was approx. 235 tonnes per day which is about 15% less than the previous year. The pollution load received by the River Yamuna during the year 2006 was about 200 tonnes/day and rest was received by Agra and Gurgaon canals. The Najafgarh drain ranking at top in terms of discharge (about 55% contribution) and pollution load (about 34% contribution) into River Yamuna.

**Discharge contribution of various drains at Delhi (Year 2006)**



**BOD load contribution of various drains at Delhi (Year 2006)**



## Survey of Polluting Sources of the River Yamuna Between Delhi (Okhla) and Agra

Agra Water Works and other authorities frequently complains about water quality degradation in the Yamuna River at the intake points of Agra Water Works. The wastewater discharges from Delhi, U.P. and Haryana are responsible for the above problem. In order to assess the nature and magnitude pollution and identify the polluting sources, a detailed survey of the Yamuna River and drains / outfalls joining River Yamuna downstream of Delhi to Agra was carried out during November 20-24, 2006. The detailed survey included industrial and sewage drains in Delhi, U.P. and Haryana. It was observed that the major contributor of pollution load in the Yamuna River on the right bank are Faridabad (Haryana) and Vrindavan, Mathura, Agra (U.P.) and on the left bank Delhi, Noida (U.P.) and Hindon River that includes wastewater from Ghaziabad, Saharanpur, Muzfarnagar (U. P.). A summary of wastewater discharges into the River Yamuna is given in below.

### Point Polluting Sources in River Yamuna Between Delhi (Okhla) and Agra (280 km)

City / Town	State	Estimated Wastewater Discharge and Pollution Loads		
		Wastewater discharge (mld)	Pollution load in terms of BOD (tpd)	Pollution load in terms of NH <sub>3</sub> -N (tpd)
Delhi	Delhi	699*	46.98*	24.3
Faridabad	Haryana	132	5.94	3.56
Saharanpur Muzafarnagar Ghaziabad	UP	150**	21.46	18.45
NOIDA Ghaziabad		271	11.1	8.9
Vrindavan		7.23	0.96	0.22
Mathura		119	2.78	2.33
Agra (upstream water works)		53.84	8.81	1.62
Grand Total		1432	98.03	59.38

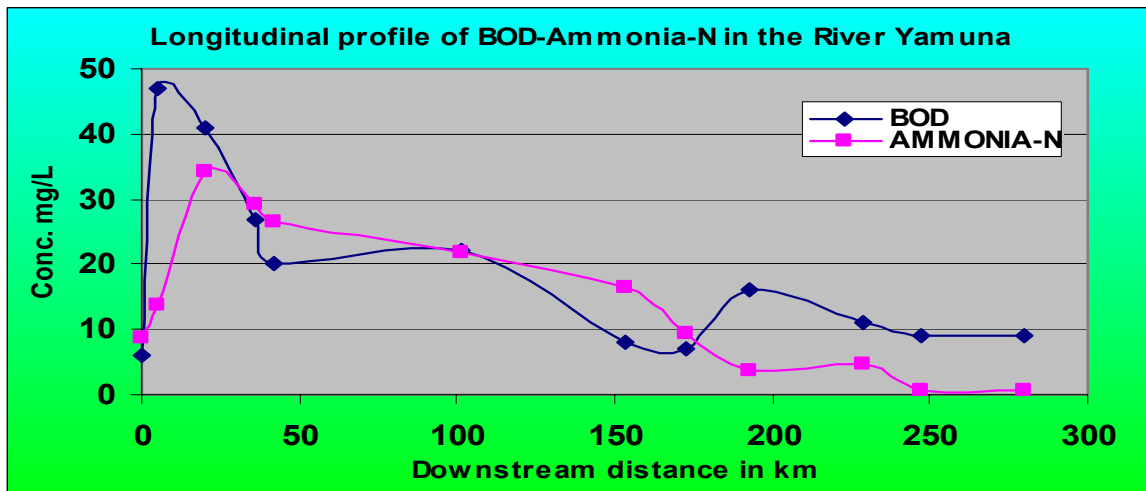
\* Including 236 mld flow/36 tpd BOD load from UP (Indrapuri & Sahibabad drain join Shahdara drain of Delhi)

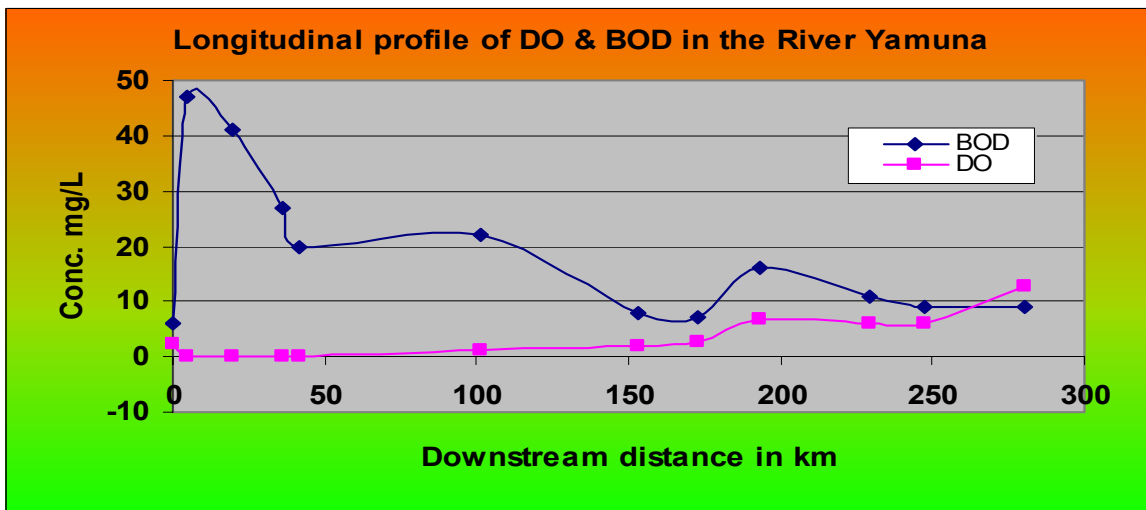
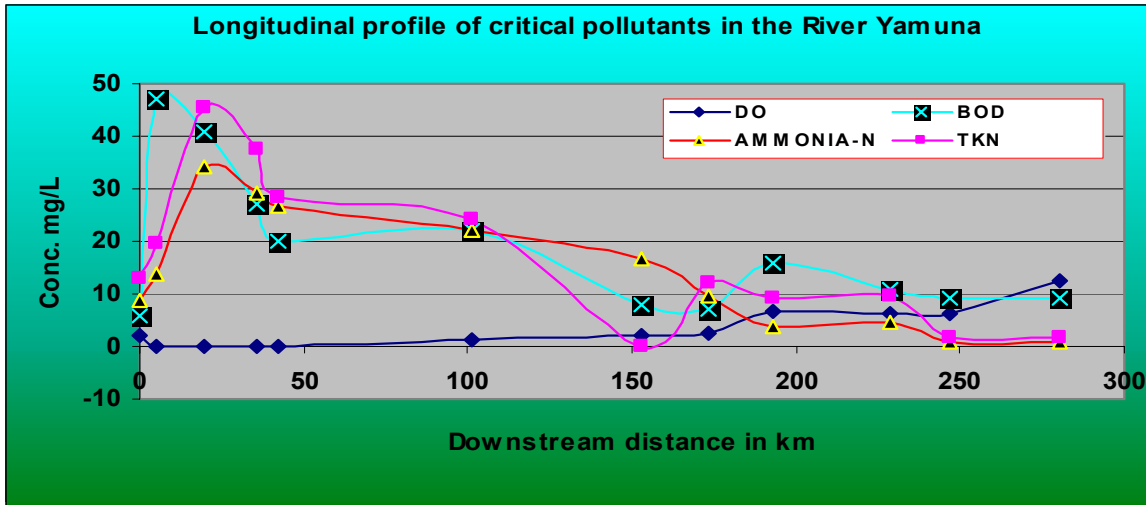
\*\* Total flow in River Hindon before confluence is 1073 mld which is inclusive of freshwater & GW accrual

There is a barrage at the end of 180 km stretch at Gokul that provides extended retention time. During this retention the BOD and ammonia loads are assimilated to some extent by the river.

In order to contain the pollution load and improve the quality of water of the river it is important that STPs constructed under YAP in Delhi, Noida, Ghaziabad, Faridabad, Vrindavan, Mathura and Agra should be optimally operated and also the efficiency and also the sewage treatment capacity is augmented in all the cities located along the Yamuna. Maintenance of minimum flow in Yamuna River in order to sustain its assimilation capacity throughout the stretch between Delhi and Agra is also important. This will require contributions from the States using Yamuna water for irrigation. It is necessary to utilize entire sewage of Noida, Ghaziabad, Faridabad, Vrindavan, Mathura, and Agra for irrigation. Delhi sewage should also be diverted for irrigation to maximum extent possible. Shahdara drain being one of the main sources of pollution in this stretch requires special attention. It may be considered to divert its outfall, through pumping, directly into the Agra Canal and equivalent volume of cleaner water may be released into River Yamuna. Providing Ganga water for Agra drinking water supply through dedicated pipeline should also be considered.

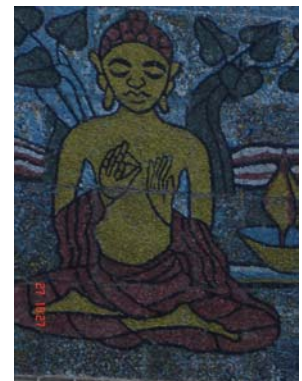
### Longitudinal profile of critical pollutants in 280 km stretch of the River Yamuna





## Environmental Status of Gaya and Bodh Gaya

Gaya is historical and religious town in Bihar while Bodh Gaya, a reverent Buddhist pilgrimage centers in India is at 17 Km from Gaya. Tourists and pilgrims come to Gaya to visit Bodh Gaya. Thus, Gaya is a major tourist destination attracting lakhs of visitors every year from India and abroad. Recently, United Nation has recognized it as one of the World Heritage Centers. The study has been undertaken to assess the environmental conditions of Gaya. Seasonal variation in ambient air, wastewater and solid waste generation is being assessed to ascertain the impact of tourists and pilgrims on the environmental status of Gaya and Bodh Gaya.



## Environmental Status of Howrah Railway Station

The study is being carried out by Central Pollution Control Board to assess overall environmental and sanitation conditions at Railway station premises, Railway loco-shed, and other service areas. Howrah station which is one of the busiest and very important railway stations in eastern India is selected for the study. Howrah station receives about 7 lakhs passenger daily and manages about 400 local trains and 147 inter-city (long distance) trains. About 4MLD of wastewater is generated from station premises, which is collected through underground drainage system and treated in an Effluent Treatment Plant. The existing ETP is being operated round the clock however there is scope for improving performance of ETP. Treated effluent was found close to prescribed norms but occasionally exceeding the limits marginally. The final treated wastewater is discharged into river Hugli.

### Wastewater Discharged from Howrah Railway Station

Parameter	Before treatment	Treated Effluent	Limit
pH	6.86	7.5	5.5 to 9.0
BOD, mg/l	40 - 96	21 - 39	30
Suspended Solids, mg/l	56	36	100
COD, mg/l	107	71	250

The respirable dust was found significantly high (370 - 460 ug/m<sup>3</sup>) at platforms receiving local trains (platforms 1 & 12). Dust concentration is relatively low (150 - 200 ug/m<sup>3</sup>) in common waiting lobbies of old and new platforms. Rail aprons are cleaned regularly but littering of waste papers, tea cups and other packaging materials on rail tracks and spills from platforms add to deposition on aprons. There is an immediate need to improve the sanitary conditions of platform aprons, which are highly unhygienic for the commuters. It is necessary to convert all the old-ballast tracks into washable cement aprons to improve hygiene and sanitation. Significant quantity of oily waste is generated near engine parking area, which needs proper collection and disposal as HW Management and Disposal guidelines.

## Assessment of River Narmada Water Quality at Omkareshwar

The Narmada is the longest (1,312 km) West flowing river in the Central India. It originates from eastern M.P. at Amarkantak, flows towards West and joins Arabian Sea at Baruach in Gujarat. Narmada flows through three states namely

Madhya Pradesh (MP), Maharashtra and Gujarat. Out of which major part of river 88% (1079 km.) is situated in M.P. Narmada receives water from forty-one principal tributaries. Most of these tributaries have catchment area of 500 km<sup>2</sup> and above. Twenty two of them join the river from left bank and nineteen join from right bank in MP. Only two of them, the Karjan and the Orsang lie out side MP. Under the project “ River water Quality of Narmada at Omkareshwar“ Central Pollution Control Board Zonal Office Bhopal has monitored the Narmada river stretch at Omkareshwar for a total distance of about 30 km.

The river receives the entire sewage without any treatment of the Omkareshwar because slope of the city towards river. Further downstream at Mortakka and Murllah and small –small village also discharged the sewage in Narmada.

Several annual festivals and fair are held throughout the year. Two major ghats at Omkareshwar namely Gowghat and Nagarghat were newly constructed. Main festivals that are celebrated at these ghats are Makar Sankranti, Guru Purnima, Shiv Ratri, Panchkosi Yatra and occasion of Solar Eclipse. These types of pilgrimage activity and fair increase the pollution load in the river proportionate the number of visitor. There is no industrial drain and effluent mixed with the river at Omkareshwar region at the time of study. Based on the water quality assessment study, various recommendations have been made in order to improve the situation.

### **Pollution Assessment at Vapi and Daman**

River Damanganga, flowing through Vapi-Daman region before merging in to Arabian Sea, is highly polluted due to heavy industrialization in the region. There are two major sources of water pollution, viz, discharge from Vapi CETP, and distilleries at Daman. There was, also, a complaint from the Administrator, UT of Daman & Diu, and Dadra Nagar Haveli regarding the pollution in River Damanganga potentially causing occasional Fish kill. The matter was discussed in the meeting with officials from GPCB, DPCC, Industrial Association. In pursuance to decision taken in the said Meeting, an assessment exercise was carried out covering surprise inspections of 34 industries (mainly organic intermediates) of Vapi, apart from monitoring of River water quality at various locations and CETP discharge. 9 pharmaceuticals units at Daman were also inspected to review environmental management. Directions were issued to the Chairman, GPCB under Section 18 (1) (b) of Water/Air Act for further directions to the erring industrial units, and also to the M/s Vapi Waste & Effluent Management Company Ltd., (CETP), Vapi under Section 5 of E (P) Act.

### **Pollution Assessment in Bharuch Region**

As a follow up of reference received from Hon'ble Member of Parliament Sh. Ahmed Patel and also local NGOs, regarding the pollution problems in Ankleshwar area; a Committee has been constituted by CPCB, comprising the

officials from MoEF, CPCB, NPC and GPCB to look into the pollution problems at Ankleshwar. The Committee had its first meeting and also visited few major industries and CETP at Panoli. The Committee is further reviewing the contents of the complaint under reference. Apart from this, a detailed pollution control compliance verification exercise was taken up by CPCB, covering inspection/monitoring in 96 industrial units including CETPs at Ankleshwar & Panoli. The Final Effluent Treatment Plant (FETP), provided for the purpose of the final treatment to the effluents generated from all three industrial estates viz: Ankleshwar, Panoli and Jhagadia before disposal through a closed pipeline, was also monitored along with ambient air/water quality monitoring and ground water quality monitoring in the area.

Based on the pollution assessment, necessary Directions were issued to 12 units under Section 5 of E (P) Act, and to the Chairman, GPCB under Section 18 (1) (b) of Water/Air Act for further directions to 45 industrial units. In addition, communication was also sent to the Dept. of Environment, Govt. of Gujarat and GPCB, in this regard, for improvement in the situation.

### **Monitoring of Fluoride in Ground Water**

Fluoride monitoring was conducted in Raiberilly and Unnao district of Uttar Pradesh during November & December-2006. The samples were collected from India Mark Hand Pumps drawing water from about 120 to 150 feet and Hand Pumps drawing water from about 40 feet depth. Some samples were also collected from open wells. In both the district these hand pumps are extensively used for drinking water purpose. 80% of development blocks of both districts were covered for the purpose and 2 samples from each block were collected to monitor the fluoride content in the ground water. Samples were collected from 40 locations in Raiberilly District and 44 locations in Unnao district.

Out of the total 40 locations in Raiberilly District, 67.5 % locations indicated fluoride levels above permissible limit of 1.0 mg/l as per BIS standard. In Unnao district out of 44 surveyed locations 36% locations indicated higher values than the permitted level for drinking water. During present survey it was found that blocks adjoining river Ganga at Unnao –Raiberilly district boundary have relatively higher concentration of Fluoride in ground water.

### **Fluoride Concentration in Ground Water of Raiberilly District (U.P)**

(Locations with Fluoride conc. more than 1.0 mg/l)

Sl. No.	Location	Fluoride in mg/l	Source Type
1	Gaura Block, Kamla Bhawan (about 200 m from block office), Gorakh Singh	1.15	India M
2	Jiledar Ka Purwa/ Pure Hulas Singh Ka	2.44	Open well ,12'

Sl. No.	Location	Fluoride in mg/l	Source Type
	Purwa , Gaura Block		
3	MatinGunj (Jahgatpur Block), Near Bank of Baroda	2.25	India M
4	Near NTPC Gate, Unchahar	1.09	H.P.40
5	Vill. Dhaurahara (Rauhania)	1.02	India M
6	Parsadepur Chauraha (Dih)	2.12	India M
7	Parsadepur Bazar (Dih)	2.85	Open Well 30'
8	Dharai Chauraha (Chatoh Block)	1.05	HP40,
9	PNB, Jayas (Bahadurpur Block)	1.10	India M
10	Phursatganj Bazar (Bahadurpur)	1.22	HP,40
11	Industrial Area, Near Bhawani P	3.08	India M
12	Civil Lines , Infront of Awadh Diesel	1.16	India M
13	Katghar (Dalmau BI) Near Primary School	3.08	India M
14	Bahai (Kamla Nehru School) Lalganj	1.49	India M
15	Dhannipur (Lalganj)	1.30	India M
16	Behtakalan (lalganj) Market PCO	1.12	India M
17	Behtakalan (lalganj) Pandeji	1.84	India M
18	Hasnapur (Sarini) Amarnath Verma	1.26	India M
19	Saraini Block office	3.14	India M
20	Hathnasa Public school (South)	4.13	India M
21	Hathnasa Mid Kailash Singh	1.37	India M

Sl. No.	Location	Fluoride in mg/l	Source Type
22	Hathnasa east Sukhdev Singh	3.08	India M
23	Ghuremau (Saraini)	1.38	India M
24	Sabji (saraini)	3.40	India M
25	Maharani Ganj (Khero)	3.55	HP-40
26	Semri chauraha (Khero)	1.25	India M
27	Kanpur Road, Rana Nagar (Raiberilly) S.K.Electrical	1.14	India M

H.P-40 (Hand Pump with water level of about 40 feet), IM: India mark (water level 120-150 ft)

#### **Fuoride Concentration in Ground Water of Unnao District (U.P)**

(Locations with Fluoride conc. more than 1.0 mg/l)

Sl. No	Location	Fluoride mg/l	Source
1	Lakhanapur (Hasanganj)	1.02	HP-40
2	Maholia (dasarath House)	1.11	IM
3	Maholia (Kaniha Lal House)	1.11	Open Well
4	Maholia ( primary school)	1.12	IM
5	Pariar	1.07	IM
6	Rau	1.13	IM
7	Kabba Kheda (Ganga Oil)	1.38	IM
8	Unnao Treasury campus	1.19	IM
9	Jagganni Hotel, Nawabganj	1.87	HP-40
10	Hasana (Nawabjanj)	1.3	IM
11	Pathakpur (Asoha)	2.9	IM
12	Purwa	3.1	HP-40

Sl. No	Location	Fluoride mg/l	Source
13	Takia (Patan)	2.3	IM
14	Sumerpur Tel Ex.	3.3	IM
15	Chota Chauraha, Dhani Khera (Bighapur)	1.2	IM
16	Mudkari Chauraha, Ghatampur (Bighapur)	1.1	IM

H.P-40 (Hand Pump with water level of about 40 feet), IM: India mark (water level 120-150 ft)

### Studies on Marine Debris

Marine debris is now recognised internationally a major hazard to marine life. Many marine organisms from the largest whales to small fish including turtles and seals choke or starve to deaths with guts blocked by plastic debris. The fishermen report about the entangling of their fishing nets with polybags and plastic materials. Similarly beaches polluted with rubbish are unsightly and unpleasant for both local residents as well as visiting tourists, which may affect the tourism industry and ultimately the economy of the country. No study on marine debris has been conducted and documented. Considering the environmental and economic importance, the Central Pollution Control Board has initiated the study on marine debris along Orissa and West Bengal coasts. More than 50 items have been identified in the marine debris collected during the study. Many factors influence the amount of debris on the shoreline. These include increasing urban and industrial areas, national and international transports, tourism, recreational activities, use of packagings and packed eatables, storm water discharge and natural phenomena like wind, monsoon etc.

### Status of fish processing industries in Orissa

There are about 20 fish processing industries located in Orissa, the effluent quality of 14 were monitored. These are located in Bhubaneswar, Puri and Paradip. Ground water is the main source of water for processing. Almost 25000 to 30000 litres of water per day is being utilized for processing by each industry and is being discharged as wastewater after treatment in ETP of 50000 litres. The solid waste generated is varied from few kgs to 1000 kg / day depending on the processing technology, which is being sold for preparation of fish meal or manure.

The BOD of final effluent varied between 15 mg/l to 1520 mg/l. This wide variation in quality of effluents is due to the type of process technology and

products prepared as well as improper operation of the ETP. Similarly, there is also a wide variation in the nutrient (nitrate & phosphate) contents in the effluents.

### **Environmental Status of Aquaculture in West Bengal**

The coastal aquaculture in West Bengal mostly employs traditional organic farming. 15 aquaculture ponds located in North 24 Parganas were monitored. The ponds were of various dimensions. It was seen that in certain cases the intake water of one pond mixes with the outlet water of the another. The maximum BOD recorded in the outlet water during harvesting is 13 mg/l and the minimum is 2 mg/l. The TSS content ranged between 61 mg/l and 285 mg/l in the harvest water. Among nutrients, total phosphorous ranged between 0.14 mg/l and 0.46 mg/l, while nitrate-N varied between 0.02 mg/l and 1.06 mg/l. This wide variation may be due to mixing of outlet water of one pond with intake water of another pond.

### **Inspection of Authorized Pollution Checking Centers in Delhi**

Inspection of Pollution Checking Centres (PCCs), authorized by Directorate of Transport (Govt. of NCT-Delhi) was conducted from March 20 to 24, 2006 to check the operation, methodology and calibration of the instruments. 41 PCCs covering all five zones, i.e. South, West, North, Central and East Delhi were inspected during the programme. It was observed that the staff, deputed at PCCs need regular training to improve their skills and appraise them of the steps, being taken for reducing vehicular pollution.