

Sewerage and Sanitation Schemes including Yamuna Action Plan

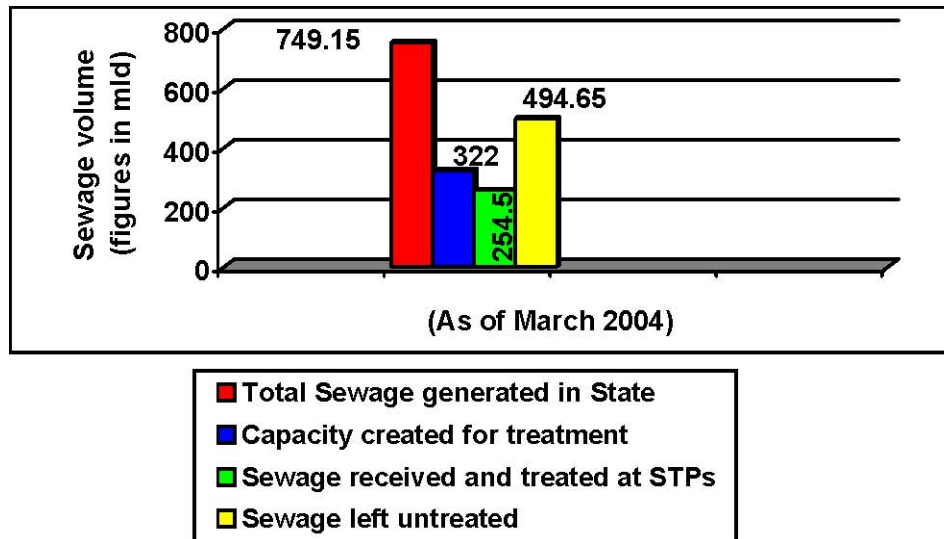
Introduction

3.2.1 Safe water supply and hygienic sanitation facilities are basic essential amenities required for a community for healthy living. About 80 per cent of water used by the community comes out of houses in the form of waste water which, unless properly collected, conveyed, treated and safely disposed off, may eventually pollute the precious water resources and cause environmental degradation. Out of 68 towns in Haryana, 22 towns did not have any sewerage facility; and even in the remaining 46 towns, the percentage area covered with sewerage systems ranged from 15 to 60. With the augmentation of drinking water supply schemes in rural areas, the generation of waste water had increased manifold which created insanitary conditions resulting thereby in growth of diseases. State Government had approved rural drainage/sewerage programme in selected villages. In order to reduce pollution load in river Yamuna, six towns in the State, which were directly or indirectly discharging their effluents into river Yamuna, were covered under Yamuna Action Plan (YAP) as a part of Phase-II (started from May 1994) of Ganga Action Plan for sewage treatment facilities. Six more towns were included from February 1996 in the scheme as per the direction of the Supreme Court.

To provide hygienic sanitation facilities, the State Government had sanctioned 60 new sewerage schemes during 1999-2004 at an estimated cost of Rs 107.69 crore in addition to 25 ongoing schemes. None of these 85 schemes had been completed so far (March 2004).

To reduce pollution load in Yamuna river, a project at an estimated cost of Rs 232.20 crore was under execution for providing 18 sewage treatment plants (STPs) in 12 towns identified under the scheme. As of March 2004 of the 749.15 mld sewage generated in 83 towns of the State, 494.65 mld sewage was left untreated. Capacity of 17 STPs for treating 322 mld sewage was not fully utilized as only 254.5 mld sewage could be treated as indicated in the graph below:

Generation and treatment of sewage in the State



Mld: Million litres per day.

Programme objectives

3.2.2 Objective of Sewerage and Sanitation Schemes was to provide hygienic sanitation facilities to the public by providing sewerage system in various towns.

Yamuna Action Plan was a Centrally sponsored scheme, aimed at reducing pollution load in Yamuna river, which is the main source of water supply in Delhi and some parts of Haryana, by providing sewage treatment plants in twelve towns identified under the scheme.

Organizational set up

1. **3.2.3** For the formulation of policies/schemes relating to sewerage and sanitation and for monitoring their implementation, the State Government constituted (1967) Haryana State Sanitary Board (HSSB), which was comprised of 19 members with the Public Health Minister as its President. Financial Commissioner and Secretary to Government of Haryana, Public Health Department was administrative head at Government level and was responsible for implementation of policy decisions, programmes and schemes, etc. The Engineer-in-Chief (EIC), Public Works Department, Public Health Branch, Panchkula was over all incharge of the schemes and was assisted by 12 Superintending Engineers (SEs) and 43 Executive Engineers (EEs) in the field for execution of works. One SE and four EEs were exclusively dealing with the works relating to YAP.

□ **3.2.4** Main objective of the audit review was to evaluate the performance in providing hygienic sanitation facilities through the schemes implemented. Audit also assessed the achievement in reduction of water pollution levels in river Yamuna, a source of irrigation/drinking water for large population. For this purpose, following parameters were adopted in audit:

- . • Achievement of targets for completion of works relating to sewerage;
- . • Execution of works within a time frame;
- . • Proper functioning of sewerage system laid under various schemes;
- . • Reduction in pollution level in Yamuna river caused through domestic waste and industrial effluents; and
- . • Functioning of sewage treatment plants under YAP.

Audit objectives

Audit coverage

3.2.5 Records relating to sewerage and sanitation schemes and YAP works for the period from 1999-2004 in the offices of the HSSB, EIC, Public Works Department, Public Health Branch and 13² Public Health Divisions (out of 43) were test checked during October 2003 to May 2004..

Sewerage and sanitation schemes

3.2.10 For providing hygienic sanitation facilities and ensuring safe supply of drinking water, the State Government and HSSB took up several sewerage and sanitation schemes. During 1999-2004, 60 new schemes were taken up besides 25 ongoing schemes, which were already under implementation prior to April 1999. None of these schemes had been completed till date

(March 2004). Rupees 12.92 crore had been spent on 25 schemes, which were more than 5 years old.

A review in audit revealed absence of any time limit for completion of each scheme in the administrative approvals and non-release of funds by the Government; this resulted in non-completion of schemes. The review also brought out improper planning, non-completion of sewerage schemes, avoidable/extra expenditure, spread of unhygienic conditions due to discharge of untreated sewage water in open, non-functioning/under utilization of sewerage schemes, non-providing of sewage facilities in Ambala City and execution of works without obtaining technical sanctions to cost estimates. Such irregularities were being repeated time and again by the department. These points are discussed in the following paragraphs:

Improper planning

Non-completion of sewerage schemes

3.2.11 The HSSB approved four schemes for providing sewerage facilities in Narnaund, Bawani Khera, Loharu and Siwani towns during August 1997 to July 1999. The schemes provided laying of sewer line, construction of screening chamber, collection tanks, pump chamber, etc. for disposal works. As provided in GOI's Sewage and Sewerage Manual, the sewerage work should begin from the final disposal points going backwards. Contrary to this, in several cases, the works relating to sewer lines were being completed first and the works for disposal of sewage were being either completed later or left incomplete. Almost all the divisions were repeating this practice. Details of four such schemes where sewer lines were laid but disposal works were not completed were as under:

Sr. No.	Name of scheme	Estimated cost/date of sanction (Rs in lakh)	Date of start	Date of completion of sewer lines	Quantum of sewage (MLD)	Upto date expenditure on completion (Rs in lakh)	Remarks
1.	Sewerage scheme at Narnaund	65.00 July 1999	May 2000	December 2002	1.13	39.41	Due to non-availability of land.
2.	Sewerage scheme at Bawani Khera	85.00 January 1998	June 1998	December 2002	1.35	35.94	Due to change in the site of disposal works.
3.	Surface drain with intercepting outfall sewer at Loharu	60.50 August 1997	July 1999	March 2001	1.36	32.57	Due to non-availability of funds.
4.	Surface drain with intercepting outfall sewer at Siwani.	70.00 January 1999	March 1999	December 2002	1.31	58.97	Due to non-availability of funds.
	Total	280.50			5.15	166.89	

Thus taking up of works of sewer lines without ensuring availability of land and funds for disposal works, Rs 1.67 crore spent on laying of surface drains and sewer lines were rendered unfruitful.

Avoidable expenditure due to injudicious planning

3.2.12 At Hisar, RCC sewer pipeline of 24" dia laid in Patel Nagar area along Kaimri Road was damaged during 1989. For pumping of sewer water, the Public Health Division set up a temporary pumping station in October 1989. In

November 1998, another 16”dia RCC pipe was also damaged at different stretches and therefore another temporary pumping station was set up for pumping the water. To replace the existing damaged sewer of 16” dia with 24”dia, HSSB approved (May 2000) an estimate for Rs 1.18 crore, which included Rs 72.45 lakh for laying new parallel pipeline of 24” dia in the damaged portion. The work for replacing only damaged sewer was awarded as late as in December 2002 to an agency at an estimated cost of Rs 4.65 lakh i.e after 2 years and 7 months of Board’s approval. Balance work for laying new parallel pipeline of 24” dia had not yet been awarded.

However, the division incurred an expenditure of Rs.65.60 lakh from October 1989 and November 1998 to October 2003 on running of temporary pump houses whereas approximately Rs 6 lakh only were required to repair the damaged portion.

Thus due to injudicious planning in fixing priorities for execution of works, the division had incurred an avoidable expenditure of Rs 65.60 lakh on running temporary pump houses. The concerned EE stated (November 2003) that due to tight position of funds it was not possible to take up the project. The reply was not tenable, as Rupees six lakh approximately were required to replace the damaged RCC pipeline.

Extra expenditure due to improper planning

3.2.13 To provide storm water sewer in Sirsa Town, State Government approved an estimate for Rs 3 crore in February 1996. The work was started in 1996 and after incurring an expenditure of Rs 1.34 crore upto 1998-99, it came to notice that the newly designed sewer and the existing sewer crossed each other at two places because of which, it was not possible to lay the sewer any further as the levels did not permit. It was proposed to change the alignment of the new sewer by constructing an additional 2050 ft. 54” dia brick circular storm water sewer, to make the already laid/being laid sewer functional. The additional storm water sewer was got constructed (May 2003) by spending Rs 51.21 lakh.

During audit it was noticed that position/location of existing sewer already laid was on record of the department but the same was not taken into account while obtaining approval of the storm water sewer scheme.

Thus, due to non-assessing the levels and position of existing sewer, an extra expenditure of Rs 51.21 lakh had to be incurred.

Spread of unhygienic conditions due to discharge of untreated sewage in open

3.2.14 Design standards to be adopted for drainage/sewerage systems issued by Chief Engineer, PWD, Public Health Branch provided *inter-alia* that method of treatment or disposal of sewage should be decided at the stage of preparing the project instead of after the completion of the scheme and the sullage carrier should be so designed as to command sufficient area of land required for broad irrigation. In Bhiwani, the untreated sewage of the town was discharged into Halluwas Minor from where it flows into open fields of the village causing extensive damage to the standing crops over 265 acre land besides contaminating the drinking water and death of livestock. The EE, Bhiwani intimated (August 2004) that farmers had submitted simple application for compensation (no amount indicated) to Deputy Commissioner, Bhiwani. The Department, however, sent a case (May 2004) to the State Government for a claim of Rs 1.07 lakh to which decision was awaited (August 2004).



Agricultural land at village Halluwas rendered uncultivable as a result of sewage discharge in open fields



Polluted drinking water of a well unfit for human consumption due to mixing of sewage water in village Halluwas

The EE further stated (August 2004) that a proposal for acquiring 101 acres land for discharging sewage water was sent to the Government which was not approved due to paucity of funds.

Thus failure of the department in making proper arrangements for disposal of untreated sewage had resulted in damage of crops, pollution of drinking water and death of livestock in the village.

Non-functional sewerage scheme

3.2.15 Public Health Division-1, Hisar completed (March 1997 to March 1998) schemes for providing sewerage facilities in 3 villages (Sadul Pur, Siswal and Arya Nagar) in Hisar district at a cost of Rs 1.09 crore. The scheme envisaged that water supply level in these villages would be raised to 110 LPCD⁴ for proper working of sewerage system.

However, no villager had come forward to obtain sewerage connection till date (October 2003) because of pre-condition of security deposit of Rs 1,000 and thereafter recurring charges of Rs 5 per month per connection. The village *Sarpanch*, Sadalpur also pointed out (July 2002) to the concerned division that sewerage lines had got damaged or choked. Further, water supply level in these villages had not been raised to 110 LPCD, as projected in the schemes.

Thus, sewerage schemes had been non-functional, as the sewerage lines had got damaged. The failure of the department to carry out survey to identify the prospective beneficiaries, motivating the villagers to derive the benefits of the scheme and in raising water supply level had resulted in unfruitful expenditure of Rs 1.09 crore.

Underutilisation of sewerage scheme

3.2.16 An underground sewerage system in Rania town (District Sirsa) was completed in March 2003 at a cost of Rs 77.07 lakh. The scheme was designed for population of 37,000, projected upto 2020. The population of the town was 20,938 as per 2001 census.

It was noticed that only 14 sewer connections were released up to December 2003 and target of releasing one more connection was fixed for the year 200304. Thus the benefit of the scheme was derived by about 98⁵ persons only, resulting in under utilization of the facility for which the department had not intimated the reasons.

Non-providing of sewerage facilities in Ambala City

3.2.17 To provide sewerage facilities to about 1.69 lakh population of Ambala City, HSSB approved (June 1984) a scheme for laying of sewer lines, intercepting sewer, construction of disposal works, rising main and pumping machinery with cost estimate for Rs 3.43 crore, which was revised to Rs 5.26 crore in May 1987 due to cost escalation.

However, Public Health Division, Ambala Cantt. after spending Rs 28.12 lakh stopped the work in March 1998 because of considerable rise in water table in the area causing slushy conditions. The sewer lines could not be laid so far (March 2004).

Though this situation came to the notice of the department in December 1989, no alternate strategy was adopted to provide sewerage facilities. However, in September 2002, EE, PH Division, Ambala submitted a different detailed project report to EIC, Public Health, for providing sewerage facilities, which included provision for dewatering, plugging, pumping, etc. which had not yet been approved (April 2004).

The Department could provide sewerage facilities to only about ten *per cent* of population of the city and for the remaining population, these facilities had not been provided even after 20 years of approval of initial estimates.

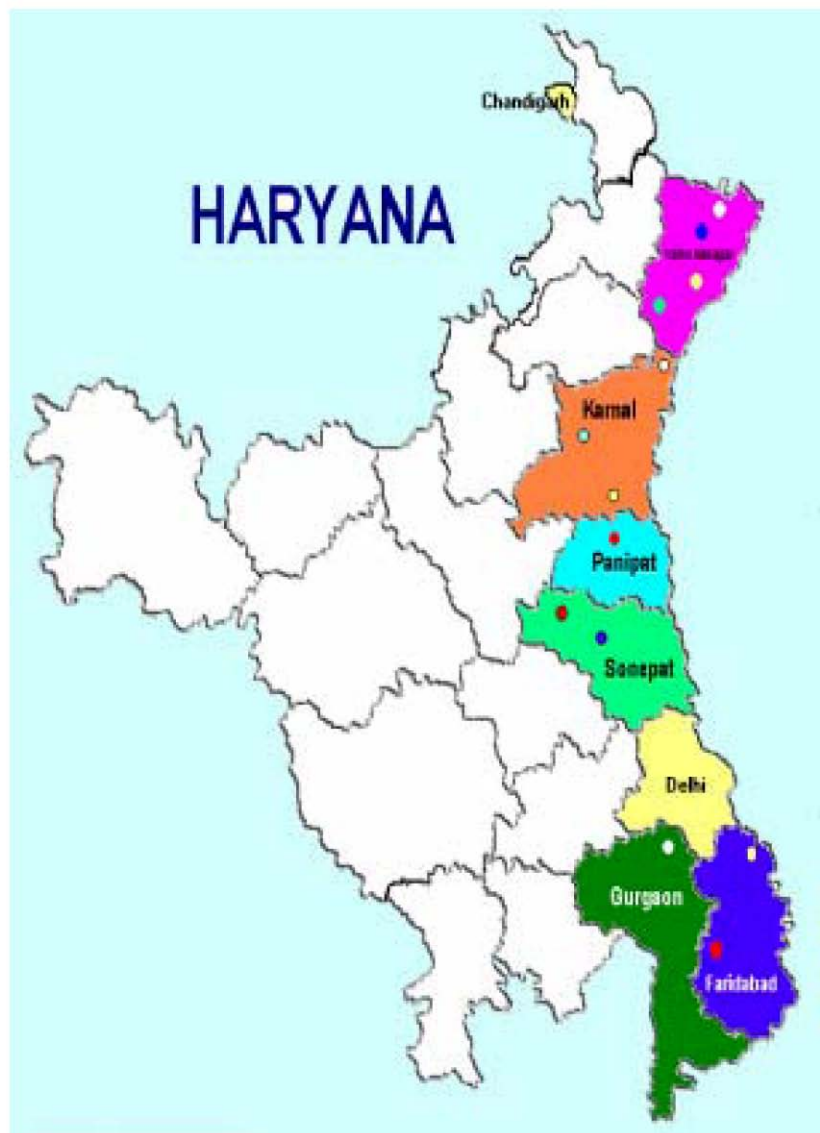
3.2.18 Public Works Department Code lays down that no work shall commence unless a properly detailed design and estimate is sanctioned by the competent authority. The department undertook execution of 28 works in 10 (out of 13) test checked divisions involving an expenditure of Rs 11.51 crore during 1999-2004 after these were administratively approved by the State Sanitary Board. However, technical sanctions to the detailed cost estimates for these works were not obtained from EIC/SE.

Yamuna Action Plan

3.2.19 To reduce pollution load in Yamuna river, which is the main source of water supply to Delhi and some parts in Haryana, Yamuna Action Plan (YAP) was started as part of Phase II of Centrally sponsored Ganga Action Plan started from May 1994. The scheme covered 12 towns of the State as shown in the map below:

Location of 12 towns under YAP

❖	<u>Yamunanagar District</u>
•	Chhachhrauli
•	Jagadhri
•	Yamunanagar
•	Radaur
❖	<u>Karnal District</u>
•	Indri
•	Karnal
•	Gharaunda
❖	<u>Panipat District</u>
•	Panipat
❖	<u>Sonapat District</u>
•	Sonapat
•	Gohana
❖	<u>Gurgaon District</u>
•	Gurgaon
❖	<u>Faridabad District</u>
•	Faridabad
•	Palwal



A project at an estimated cost of Rs 232.20 crore was under execution for providing 18 Sewage Treatment Plants (STPs) in 12 towns in Haryana, besides works of laying internal and trunk sewer

to enable disposal of sewage and waste water, interception and diversion of sewage water, low cost sanitation, construction of electric crematorium and river-front development.

Scrutiny of records revealed lack of planning for sewage treatment, partial completion/under-utilisation of STPs, non-maintenance of prescribed standards in treatment of effluent, non-laying of internal sewer lines/drains to link interception and diversion sewers, construction of oxidation ponds without ensuring disposal of treated effluent, under-utilisation of mechanical structures, construction of toilet units in unidentified areas, etc. as brought out in the following paragraphs:

3.2.20 Sewage Treatment Plants of 322 MLD capacity were constructed under YAP in 12 towns against which quantum of sewage received was 254.50 MLD, whereas the level of sewage in these towns was 419 MLD as of 2002-03. Thus, 164.50 MLD sewage was going untreated into the Yamuna river as shown below:

Sr. No.	Name of town	Present level of sewage generated	Capacity created	Sewage received in the STPs	Quantum of untreated sewage
(MLD)					
1	Yamunanagar/Jagadhari (2)	40	35	29	11
2	Karnal (2)	50	48	38	12
3	Faridabad (3)	205	115	76	129
4	Panipat (2)	45	45	45	-
5	Sonipat	30	30	30	-
6	Gurgaon	30	30	30	-
7	Chhachhrauli	1	1	-	1
8	Radaur	1	1	-	1
9	Indri	1.50	1.50	-	1.50
10	Gharaunda	3	3	3	-
11	Palwal	9	9	-	9
12	Gohana (2)	3.50	3.50	3.50	-
	Total	419	322	254.50	164.50

Note:- Figures within bracket indicate the number of STPs in the town.

Besides this, 91.50 MLD sewage of 10 other towns (not covered under YAP) was going untreated into Yamuna system for which no remedial measures were initiated by the department except in two towns (where STPs were under construction) as shown under:

Sr.No.	Name of towns	Sewage generated (MLD)	Remarks
1	Samalkha	4.00	
2	Shahbad	6.00	
3	Hodel	4.50	
4	Jhajjar	5.00	STP under construction
5	Ganaur	3.50	
6	Ladwa	4.00	
7	Nilokheri	3.00	
8	Taravari	3.00	
9	Bahadurgarh	8.50	STP under construction
10	Rohtak	50.00	
	Total	91.50	

Besides, Haryana Urban Development Authority (HUDA) at Panchkula was maintaining a sewage treatment plant. Panchkula town generated 54 MLD sewage but the details of treated sewage were

not intimidated by HUDA.

The department replied that pre-feasibility reports of these 10 towns were submitted to NRCD for approval, which was awaited.

In the remaining 59 towns in the State, 184.65 MLD sewage was generated but no sewage treatment system existed as no scheme had been approved for the purpose so far. Untreated sewage of these towns was being disposed off into fields/open drains causing environmental hazards.

Thus, in the State, of 749.15 MLD sewage generated as of March 2004, 494.65 MLD of sewage had been going untreated in open areas/drains.

Underutilisation of Sewage Treatment Plants

3.2.21 In Haryana, Yamuna Action Plan covers various towns including Faridabad. The waste water from Faridabad town was discharged into *nalas*, drains, (which ultimately reach river Yamuna) becoming the main cause of water pollution in the river. In order to prevent pollution of river in Faridabad area, GOI administratively approved (November 1993) a scheme, estimating the quantum of total sewage as 108.5 MLD, for construction of three STPs of 20 MLD, 45 MLD and 50 MLD capacity. The work of these STPs was completed between August 1998 and March 1999 at a cost of Rs 51.27 crore. However, 50 to 65 MLD sewage going untreated into Yamuna River through Movai Drain, Buria Nala and storm drains escaped the estimates and were not included while preparing detailed project reports.



Effluent treated in STPs was not within prescribed standards



Movai drain meeting points of Box and RCC Circular Sewer carrying raw sewage which remained to be diverted to STP

It was noticed that all the three STPs never ran to their installed capacity due to less flow of sewage. Zone wise position of inflow of sewage as on December 2003 was as under:

Sr. No.	Installed capacity	Sewage received	Shortage	Percentage of capacity
Zone I	20 MLD	16 MLD	4 MLD	80
Zone II	45 MLD	25 MLD	20 MLD	56
Zone III	50 MLD	35 MLD	15 MLD	70
Total	115 MLD	76 MLD	39	66

Thus, the STPs were running below their installed capacity. The reasons for receipt of less sewage were large number of sewers getting choked and outfall sewer of many colonies and HUDA not being connected with the main system. Thus STPs remained underutilized and defeated the very purpose of the scheme as the raw sewage was still being discharged into drains, which ultimately polluted river Yamuna. It was also noticed that no sewage from the initially planned area was going to STP for Zone – I. To utilise the STP of Zone – I, the discharge from Buria Nala and Movai Drain was temporarily diverted to STP – I and thus the STP – I was receiving 16 MLD sewage.

The EE stated (March 2004) that Municipal Corporation, Faridabad had connected the blocked sewers with these drains. The fact remained that the department failed to get the choked sewers cleared/repared for running the system successfully.

Discharge standards in Sewage Treatment Plants not maintained

3.2.22 The discharge standards for the treated effluent were biochemical oxygen demand (BOD) 30 mg/l and Total Suspended Solids (TSS) 50 mg/l as per YAP standards. Test

reports of Central Pollution Control Board revealed that the working of 50 MLD, STP, Zone III at Faridabad and 30 MLD, STP at Gurgaon was not upto the YAP standards as BOD and TSS levels exceeded the desirable limit as depicted below:

Name of STP		Levels of treated effluent				
		January 2003	June 2003	November 2003	December 2003	January 2004
		(Mg/l)				
50 MLD Faridabad	BOD	128	28	58	88	87
	TSS	168	80	71	222	51
30MLD Gurgaon	BOD	114	48	62	73	114
	TSS	53	140	59	62	62

The concerned division, however, had not devised any system to check the BOD and TSS level by testing samples of treated effluents.

Mixing of treated and untreated effluent

3.2.23 The treated effluent from STPs was discharged into various drains, which also carried untreated domestic and industrial waste at Yamunanagar and Panipat to river Yamuna and Western Jamuna Canal (WJC). As the treated effluent got mixed with the untreated one, the pollution level increased which ultimately polluted river Yamuna/WJC as detailed below:

Sr. No.	Name of towns	Capacity (MLD)	Pollution level after treatment		Pollution level after mixing with untreated effluent	
			BOD	TSS	BOD	TSS
1.	Yamunanagar	25	28	45	94	61
		10	29	55	74	76
2.	Panipat	35	27	50	148	74



Treated effluent from 25 MLD, STP at Camp area Yamunanagar coming out through effluent channel and falling into a Nallah running near the STP which flows into WJC



Treated effluent from 35 MLD, STP at Panipat coming out through effluent channel and falling into Panipat drain STP which flows into Yamuna River

Thus, appropriate planning was not done to save river Yamuna /WJC water from pollution.

Lack of planning

Unfruitful expenditure due to improper planning

3.2.24 To check pollution caused by sewage of some colonies in Gurgaon flowing into drain number 8 and river Yamuna, GOI approved a scheme to provide 'Interception and Diversion (I&D)' sewer in Avadhपुरi, Rajinder park and adjoining colonies across railway line for Rs 2.65 crore after an assurance from the EE, PH Division, Gurgaon that open drains would be constructed in the area to carry the discharge of streets into the main I&D sewer. This work was to be completed by December 2001. Though the work of main I&D sewer was completed in February 2002 at a cost of Rs 2.64 crore, drains/internal sewer were not constructed to link with I&D sewer. Thus, laying of I & D sewer without constructing the internal sewer had rendered the huge expenditure of Rs 2.64 crore as unfruitful as the I & D sewer was underutilized.

Executive Engineer stated (February 2004) that the work for laying branch sewer was in progress and considerable discharge of the area was going into the I&D sewer through branch line/open drains. The reply was not tenable as revised technical approval for laying sewer in the town was sanctioned only in February 2004 and funds were not allotted as of March 2004.

Construction of oxidation ponds without ensuring disposal of treated effluent

3.2.25 To treat the sewage water of Karnal, 8 MLD oxidation pond was constructed (completed in December 1999) under YAP at a cost of Rs 1.06 crore. As there was no appropriate arrangement for discharge of effluent, the low lying area near the plant was filled. The Forest Department as well as the farmers objected to the water being released on their land. The proposal for construction of effluent channel from sewage treatment plant to Barota Drain was not accepted by Engineer-in-Chief, as the scope of work was not covered in the detailed project report of the scheme and also in view of GOI's instructions that arrangements for conveying the treated effluent from STPs to final disposal were to be made by State Government. Another proposal for discharging the treated effluent into the irrigation channel was also not accepted by the Irrigation Department.

Executive Engineer stated (April 2004) that permission to construct the effluent channel had been received from Irrigation Department and the work had been started. The reply was not tenable, as Irrigation Department had asked for a certificate that there would be no death of any human and cattle by drinking effluent discharged from the STP. Also, permission of Forest Department on whose land effluent channel was to be constructed had not been obtained. Moreover, due to absence of tackling the colliform load of sewage water in oxidation ponds, the chances of contamination of potable water and occurrence of diseases could not be ruled out.

Thus, the oxidation ponds were constructed without making arrangement for disposal of treated effluent.

Non-completion of pollution abatement scheme

3.2.26 With the growing emphasis on abatement of pollution in river Yamuna, GOI (August 1997) approved a scheme for I&D sewers at Palwal, to be completed by August 1998. The work was partially completed in April 2001 at a cost of Rs 1.69 crore. Thereafter, no action to complete the sewer lines in the remaining areas and also to link the already laid sewer lines was taken.

Government of India separately sanctioned (August, 2001) the construction of STP and Main Pumping Station at Palwal at an estimated cost of Rs 3.64 crore with the condition to complete the same by June 2003. The work was still (January 2004) incomplete after spending Rs 1.67 crore. Thus delay in construction of I&D sewer and STP had resulted in nugatory expenditure of Rs 1.69 crore incurred on laying of partial sewer lines besides delay in controlling the pollution level in Yamuna. EE, YAP, PH Division, Faridabad stated (March 2004) that revised proposal for laying of I&D sewer in Palwal town was submitted to GOI in 1998, approval to which was still awaited (May 2004).

Thus, the fact remained that the activities were taken up without any proper synchronisation and planning, as I&D sewers were partially laid and revised proposal for laying complete I&D sewer in Palwal town was not yet approved by GOI despite its submission six years back.

Absence of disposal system for treated effluent

3.2.27 According to DPRs for construction of 25 MLD Upflow Anaerobic Sludge Blanket (UASB) sewage treatment plant at Yamunanagar (Camp area), the treated effluent from the STP was to fall into adjoining drain, which, ultimately was to join WJC. However, PH Department did not obtain prior permission of the Irrigation Department for discharging the treated effluent into WJC. PH Division 1, Yamunanagar took up the work in May 1996 and completed the construction in January 2003 at a cost of Rs 9.02 crore. The plant was, however, partially commissioned in September 2000 as only one of the two reactors could be completed by that time. Thus the work was completed without ensuring the method and location of release of the treated effluent.

In 1996, the irrigation authorities did not allow the discharge of treated effluent into WJC, because the canal water was utilized for drinking purposes also. The Chairman, Delhi Jal Board also stressed upon the Irrigation Department time and again to stop discharge of treated/untreated sewage in WJC as the water was utilised for drinking purpose in Delhi also.

For discharge of treated effluent the department submitted (December 1997) a proposal to GOI for construction of effluent channel at an estimated cost of Rs 3.83 crore. GOI refused to finance the project and asked the State Government to arrange funds from their own resources. The matter remained undecided till May 2003 when, Haryana State Pollution Control Board (HSPCB) took a decision to construct a ditch drain along WJC at a cost of Rs 7.94 crore of which Rs 3.08 crore and Rs 4.86 crore were to be borne by the Public Health Department and by the industries (who were discharging their effluent into WJC) respectively. No action in the matter had been taken so far (May 2004). Thus, the plant was conceived ignoring the provisions of the Haryana Canal and Drainage Act, 1974, (as amended in July 2001), which did not permit the discharge of treated/untreated sewage into canals. No action had been taken so far though the discharged effluent was being released in WJC against the codal provisions and against the instruction of Irrigation Department.

Unutilised sewerage structures

3.2.28 Government of India approved (June 1996) a pollution abatement scheme under YAPs phase II in Indri, Chhachhrauli and Radaur towns at a cost of Rs 4.30 crore. The works included laying of I&D sewer, construction of STPs and other ancillary works. As no sewerage facilities existed in these towns, it was proposed to complete sewerage works by 2001. Work on laying of I&D sewer was started in 1998 and completed during 2001 at a cost of Rs 1.47 crore. Work on construction of STPs was under progress and a total expenditure of Rs 3.83 crore had been incurred upto March 2004.

No provision for internal sewer lines was made and thus no internal sewer had been laid in any of these towns due to which I&D sewer laid at a cost of Rs 1.47 crore in these towns remained non-functional thereby defeating the very purpose of the pollution abatement.

Under utilization of structures resulting in recurring expenditure on running of Sewage Treatment Plant

3.2.29 Under YAP, the department constructed, 10 upflow anaerobic sludge blanket (UASB) plants in six⁸ towns. The domestic waste water treated in a UASB reactor was suitable for discharging in river water; and the biogas generated through process could also be utilized for generating electricity for running the plant. In order to utilize the energy generated from biogas, various structures and equipments were provided and electricity generating system installed at all the UASB Plants at a cost of Rs.2.27 crore.

It was noticed that against capacity of generating electricity for 6-8 hours daily, electricity was generated for 2 hours per day on an average in all the STPs (except STP at Faridabad). This was much less than what was projected during the preparation of detailed project report on the basis of the design of UASB technology. For the remaining time electricity was arranged from external sources to run the STPs and its auxiliary pumps. Had the electricity been fully produced from the biogas as envisaged in the detailed project reports and design of UASB

technology, the department would have saved Rs 77,000 per month as energy charges (at the rate of Rs 11,000 per month per STP).

Failure of the department in not generating enough energy sufficient to run the plant had resulted in unfruitful expenditure of Rs 2.27 crore incurred on infrastructures raised for generating electricity.

The EE, Panipat stated (November 2003) that cost of electricity produced from the biogas was equal to the electricity used from external source. The fact remains that since the equipments have been installed for generation of electricity, the same should have been utilized to optimum capacity to save upon electricity that had to be sourced externally particularly in view of electricity being a scarce resource.

Unjustified expenditure due to deviation from scheme norms

3.2.30 In several towns of the State, there were large number of dry latrines, which were environmentally/aesthetically unsuitable and created unhygienic conditions. In these towns, there were certain identified slum areas where people did not have latrines in their houses or nearby. So in order to have better sanitation facilities, it was decided to construct community toilets/complexes in six towns. However, instead of constructing the community toilets in identified slum areas, the department constructed 33 units at a cost of Rs. 2.95 crore at places like bus stands, administrative complexes, etc. where such facilities were already existing.

Executive Engineers, YAP Division, Yamunanagar and Panipat stated (November 2003) that as per allotment letter, the site was to be selected in consultation with the Non-Government Organisations (NGOs) keeping in view the viability of these units. The reply was not tenable as the purpose of construction of these toilets was to reduce pollution level in slum areas where no such facilities existed. Besides, the reply was silent about the diversion of funds for sites other than slum areas. Thus, the expenditure was not justified under the scheme.

Industrial pollution

3.2.31 A large number of industries are located in the catchments of WJC at Yamunanagar/Jagadhari and Yamuna river at Panipat, some of which were generating heavy organic pollution. At Jagadhari/Yamunanagar, 96.13 MLD of treated, untreated or partially treated industrial and domestic effluent was discharged into the WJC. Central Pollution Control Board in a survey conducted during February 2003 measured high concentration of Total Suspended Solids (TSS) (158mg/l), Bio-chemical Oxygen Demand (BOD) (190 mg/l) and Ammonia Nitrogen (30.5 mg/l). Similarly, 92.81 MLD untreated or partially treated industrial and domestic effluent including treated effluent from Panipat town was discharged into Yamuna river through drain number 2. Details of major industries discharging heavy pollution load in these towns were as under:

Sr.No.	Name of town	Name of industries	BOD	TSS
1	Yamunanagar	Haryana Distillery	292	661
2	Sonipat	Sterling Agro	68	59
3	Kundli	Industrial area of Kundli town	2407	1272
4	Sonipat	Bharat leather	393	223
5	Sonipat	Sugra leather Akbarpur	61	566
6	Samalkha	Haryana organics	139	127

Haryana State Pollution Control Board had not initiated any action against these polluting units to take remedial measures.

Monitoring

3.2.32 SPCB was required to inspect sewage/trade effluents works, plants for the treatment of sewage and trade effluents and review plans, specifications or other data relating to these activities. However, except in six towns, which were covered under YAP, the Board did not monitor the quality of water and pollution load in the towns/cities where 349.15 MLD untreated sewage was being discharged into open fields/drains.

Besides, the execution/completion of works was required to be effectively monitored by the EIC, with a view to ensure that for each work, targets relating to time, cost, services, etc. were achieved. However, no monitoring cell was created to watch the progress of works. The periodical progress reports (physical & financial) received by the EIC from the field officers were neither scrutinized properly nor effective follow up action taken. The reports did not indicate time frame fixed for completion of schemes. As a result 60 sewerage schemes undertaken by the divisions during 1999-2004 and 25 schemes more than five year old remained incomplete. Funds were not earmarked for completing the left out works resulting in non-commissioning of schemes.

The works under YAP were monitored in YAP wing functioning in the office of the EIC, Public Health and the quality of water was monitored by the HSPCB. The State Government was to constitute Citizen Monitoring Committee (CMC) for each town, as per directive of the National River Conservation Directorate, Ministry of Environment and forest, GOI issued in March 1995, to monitor the progress of execution and timely completion of schemes, their operation and maintenance and to facilitate public awareness / participation. The CMCs were to meet once in a month. However, CMCs were constituted in only 6 out of 12 towns and in these towns also no meeting was held. Thus, CMCs were not functional.

Conclusions

3.2.33 The department had not completed any of the 85 sewerage and sanitation schemes (25 ongoing schemes prior to March 1999). Sewerage schemes were non-functional because treated

effluents disposal works were not completed as was required according to the procedure laid by GOI. Due to non-consideration of already laid sewer, Rs 51.21 lakh were spent on additional work at Sirsa town. Sewerage facilities were provided to only 10 *per cent* of the population of Ambala City even after 20 years of the approval of sewerage scheme. Under YAP, treated effluent was being discharged in a drain carrying untreated effluent in Yamuna System. STPs constructed at Faridabad at a cost of Rs 51.27 crore remained underutilised. STPs failed to maintain prescribed level of pollutants in treated effluents in Faridabad and Gurgaon. Main Interception and Diversion sewers in five towns could not be made functional due to non-construction of internal sewer lines for carrying the sewage into main I&D sewer. Pollution Control Board failed to take effective action against large number of industrial units, which discharged untreated effluents into Yamuna system. All these factors led to non-achievement of goals of reducing water pollution and improving sanitary conditions.

Recommendations

3.2.34 Government should ensure that sewerage schemes are formulated in such a way that sewerage works are started from the final disposal points going backwards as laid down in the GOI's Sewage and Sewerage Manual;

Works should be completed within prescribed time frame to make the sewerage system effective;

Sewerage system should be provided for towns where this facility does not exist to achieve the objective of providing hygienic sanitary conditions;

Government should ensure that capacity of STPs is utilised to the optimum level in order to treat the maximum sewage of concerned towns;

Effective controls should be put in place to ensure that industrial units treat the effluents before releasing into drains; and

It should be ensured that pollutants in treated effluents are brought down to the level of YAP standards.

These points were referred to the Government (June 2004); reply had not been received (August 2004).