## CHAPTER 13

# WATER SUPPLY AND SEWERAGE

1. Water Supply and treatment capacity is being increased in Delhi in almost in each five year plan taking into account the requirement of drinking water for the population increasing at a very high rate, almost more than double to the rate of increase at national level. Inspite of best efforts made by the Government, water supply front remained a matter of concern due to various reasons like raw water scarcity and related problems, transmission and distribution losses, supply with less pressure, uneven distribution, depleting ground water level, non-recharge of ground water due to rapid urbanization, increasing cost of water treatment and increasing gap between water supply cost & tariff, etc.

2. The water treatment and supply capacity, which was 66 MGD in 1956, was raised to 240 MGD in 1979, 437 MGD in 1990 and 650 MGD in 2002. The target for Tenth Five Year Plan ( March, 2007) is 950 MGD water treatment and supply by DJB in Delhi. However, due to non receipt of 300 cusec of raw water from Tehri Dam through Upper Ganga Canal, Sonia Vihar Water Treatment Plant could not start functioning and as such water treatment and supply capacity remained at 650 MGD in March, 2006. (Table No.13.7)

3. Out of total 25.54 lakh households in Delhi in 2001, about 19.24 lakh households were provided piped water supply system. About 5.60 lakh households were provided water supply through tubewells/deep bore hand pumps /public hydrants. Thus, about 75.33% households met their water requirement through piped water supply system and about 21.91 % household through tubewells/deep bore hand pumps/public hydrants. Remaining 2.76% households depended on other sources like wells, river, tanks, canal, ponds etc. (Table No.13.9)

## 4. WATER REQUIREMENT

4.1 Based on a norm of 60 gallon per capita per day as per CPHEEO norms prescribed in MPD 2001, the water requirement for 2005-06 would be 963 MGD. As per CPHEEO manual, the per capita per day water requirement is 60 GPCD as per details given in the Statement No.13.1

## Statement No.13.1

## PER CAPITA PER DAY WATER REQUIREMENT - CPHEEO NORMS

| | | |
|---|---|---|
| 1. | Domestic | 172 lpcd |
| 2. | Industrial, Commercial and Community requirement based on 45000 litres per hect. per day | 47 lpcd |
| 3. | Fire protection based on 1% of the total demand | 3 lpcd |
| 3. | Floating population and special uses like hotels and Embassies | 52 lpcd |
| **4.** | **Total** | **274 lpcd (60gpcd)** |

4.2 Draft MPD –2021 propose water requirement with the norm of 80 GPCD as per details given in the Statement NO.13.2.

## Statement No. 13.2

## Break up of water requirement as proposed in MPD-2021

| Norm | Quantum (in gpcd) | | Source for non-potable water |
|---|---|---|---|
| | Potable | Non-potable | |
| Domestic @ 50 gpcd | 30 | 20 | – |
| Residential | 30 | 20 | Recycling and permissible GW extraction at community level |
| Non-domestic @ 30 gpcd | 5 | 25 | – |
| Irrigation, horticulture, recreational, construction, Fire @ 6.75 lpcd) | - | 10 | Recycling from STPs and permissible GW extraction. |
| Public-semi public, industrial, commercial | 5 | 15 | Recycling from CETPs |
| TOTAL @ 80 gpcd | 35 | 45 | – |

With the proposed norm of 80 gpcd, water supply requirement, for projected population of 23 million in 2021 in Delhi, will be 1840 MGD as per MPD-2021.

## 5. WATER SUPPLY TARGETS 2005-06

5.1 Delhi Jal Board has proposed to increase the Water Supply capacity from 650 MGD as on 31.03.04 to 850 MGD as on 31.03.2006 as per details given below:

**Statement No.13.3**

**WATER SUPPLY CAPACITY**

| S.No. | Name of Plant | Existing Capacity as on 31.03.2004 (MGD ) | Proposed Capacity at the end of 31.03.06 (MGD) |
|---|---|---|---|
| 1. | Chandrawal Water House no. I & II | 90 | 90 |
| 2. | Wazirabad I,II & III | 120 | 120 |
| 3. | Haiderpur | 200 | 200 |
| 4. | North Shahadra (Bhagirathi) | 100 | 100 |
| 5. | Bawana | — | 20 |
| 6. | Nangloi | 40 | 40 |
| 7. | Sonia Vihar | — | 140 |
| 8. | Renney Wells and Tube Wells | 81 | 90 |
| 9. | Optimization of WTPs | 19 | 40 |
| 10. | Recycling of Waste water at Chandrawal, Bhagirathi, Haiderpur and Wazirabad | — | 10 |
| | **Total** | **650** | **850** |

5.2 Nangloi Water Treatment Plant could not function upto its full capacity of 40 MGD due to non-supply of raw water through WJC System by Haryana Government inspite of raw water supply available from BBMB. Haryana Government is constructing two Acua-ducts on WJ canal to enable the system to carry additional raw water. However, only one Acua-duct could be constructed so far against the target of completion of both by March, 2004. Further, non-release of 300 cusec of raw water for Sonia Vihar Plant by UP Government also adversely affected the achievement of water supply target in 2005-06.

5.3 Two new Water Treatment Plants are proposed to be constructed at Dwarka (40 MGD) and Okhla (20 MGD) during the 10th Five Year Plan. Raw water for the two plants will be available on construction of the pucca parallel channel from Munak to Haiderpur.

## 6. WATER CONSUMPTION

6.1 DJB supplies treated water in bulk to the NDMC (New Delhi Municipal Council) and to the DCB (Delhi cantonment Board), both of which are responsible for the distribution of water within their own territories. The water supply infrastructure in these territories is owned by them and, consequently, is not the responsibility of the DJB. MCD area is the responsibility of DJB.

6.2 The 2001-02 water production by the DJB was 2911 mld (640 MGD) with water obtained from a range of sources such as river Yamuna, Bhakra storage, Upper Ganga Canal and from underground water resources. The distribution of the produced water was as follows as reported by a study carried out for Reforms Plan of DJB.

**Statement 13.4**

<table>
<tr><td rowspan="10">System Input Volume</td><td rowspan="3">Authorized Consumption 58%</td><td rowspan="2">Billed Authorised Consumption</td><td>Billed Metered Consumption (including water exported in bulk)</td><td>13%</td><td rowspan="2">Revenue Water 50%</td></tr>
<tr><td>Billed Unmetered Consumption</td><td>37%</td></tr>
<tr><td rowspan="2">Unbilled Authorized Consumption</td><td>Unbilled Metered consumption</td><td>0%</td><td rowspan="8">Non-Revenue Water (NRW) 50%</td></tr>
<tr><td>Unbilled Unmetered Consumption</td><td>8%</td></tr>
<tr><td rowspan="5">Water Losses 42%</td><td rowspan="2">Apparent Losses 2%</td><td>Unauthorised Consumption</td><td>2%</td></tr>
<tr><td>Metering Inaccuracies</td><td>0%</td></tr>
<tr><td rowspan="3">Real Losses 40%</td><td>Leakage on Transmission Mains</td><td>16%</td></tr>
<tr><td>Leakage and Overflows at Utility's Storage Tanks</td><td>0%</td></tr>
<tr><td>Leakage on Distribution Mains and Service Connections upto Point of Customer Metering</td><td>24%</td></tr>
</table>

**Source:** Delhi Water Supply & Sewerage Project Preparation Study Report

6.3 The total number of private tube wells (domestic, commercial and industrial) in Delhi is estimated at around 200,000. In addition to private tube wells, there are supplies of bottled water as well as through numerous hand pumps. No consumption figures are available for hand pump and bottled water supplies. The willingness-to-pay survey carried out under a study project estimates that 23% of the households use such sources for at least part of their water requirement.

6.4 According to DJB data for 2001-02 and 2005-06, 1498 Thousand Cubic Meters Daily (TCMD) (330 MGD) water was distributed and charged to various categories of customers as follows:

**Statement 13.5**

| Category | No. of Connections 2005-06 | Sales | | | Percentage of Sales | |
|---|---|---|---|---|---|---|
| | | 2001-02 | | 2005-06 | 2001-02 | 2005-06 |
| | | TCMD | MGD | MGD | | |
| Domestic | 14,79,211 | 1124 | 247 | 214.67 | 75% | 76.81% |
| Commericial and institutional | 95,214 | 157 | 34 | 23.68 | 10.5% | 8.47% |
| Industrial | 24,482 | 59 | 13 | 7.45 | 4%` | 2.66% |
| Bulk supplies to DCB and NDMC | — | 158 | 36 | 33.70 | 10.5% | 12.06% |
| **Total** | **15,98,907** | **1498** | **330** | **279.50** | **100%** | **100%** |

In addition, the following free, non-metered supplies were given by DJB:
Standposts (11,533 no.); 221 TCMD (49MGD) (consultant's estimation)
Water tankers (493 no.); 10 TCMD (2 MGD) Consultant's estimation).

6.5 Inspite of increase in water treatment and supply capacity in each five year plan in Delhi, the average per capita availability of water remained at 38 GPCD in 2004-05. (Table No.13.1)

## 7. WATER RESOURCES

7.1 The water supply treatment plants of DJB treated 569 MGD surface water and 81 MGD ground water as on March, 2005. The water resources of DJB are indicated in Statement No.13.6.

## Statement No.13.6

## Water Resources of DJB

(March, 2005)

| SN | Source | Quantity (MGD) |
|---|---|---|
| 1 | Yamuna | 229 |
| 2 | Ganga | 100 |
| 3 | Bhakra Storage | 240 |
| | **SUB TOTAL** | **569** |
| 4. | Ranney Wells/Tube wells (Ground water) | 81 |
| | **TOTAL** | **650** |

## GROUND WATER

7.2 The decreasing ground water level in Delhi has become a matter of serious concern. At some places in south and south west Delhi, the water level has gone 20-30 meter mark below the land surface. The quality of underground water is deteriorating and in several places it has been found to be unfit for human consumption. The salinity of ground water is increasing in south-west and north-west Delhi. In some areas of Shahdara and Kanjhawala, nitrate content has been found to be more than 1000 mg/litre. Fluoride and chemical concentrations, more than prescribed limits, have also been found in ground water at various locations in Delhi (Table No.8.7). To tackle these problems, the Central Ground Water Board has taken steps to regulate the number of tube-wells being commissioned in Delhi.

7.3 As on March 2006, DJB has 2425 functional Tubewells and 21 Ranney Wells. The Flood prone area upstream of Wazirabad barrage is being exploited for commissioning of more tube wells by DJB. The deepening of the Najafgarh drain between Kakrola and Dhansa Regulator, preserving and developing old lakes and other water bodies, preserving and developing the forest area in Delhi, construction of check dams at Asola Wild Life Sanctuary and plantation of trees, are some of the steps being taken to improve ground water resources.

## SURFACE WATER

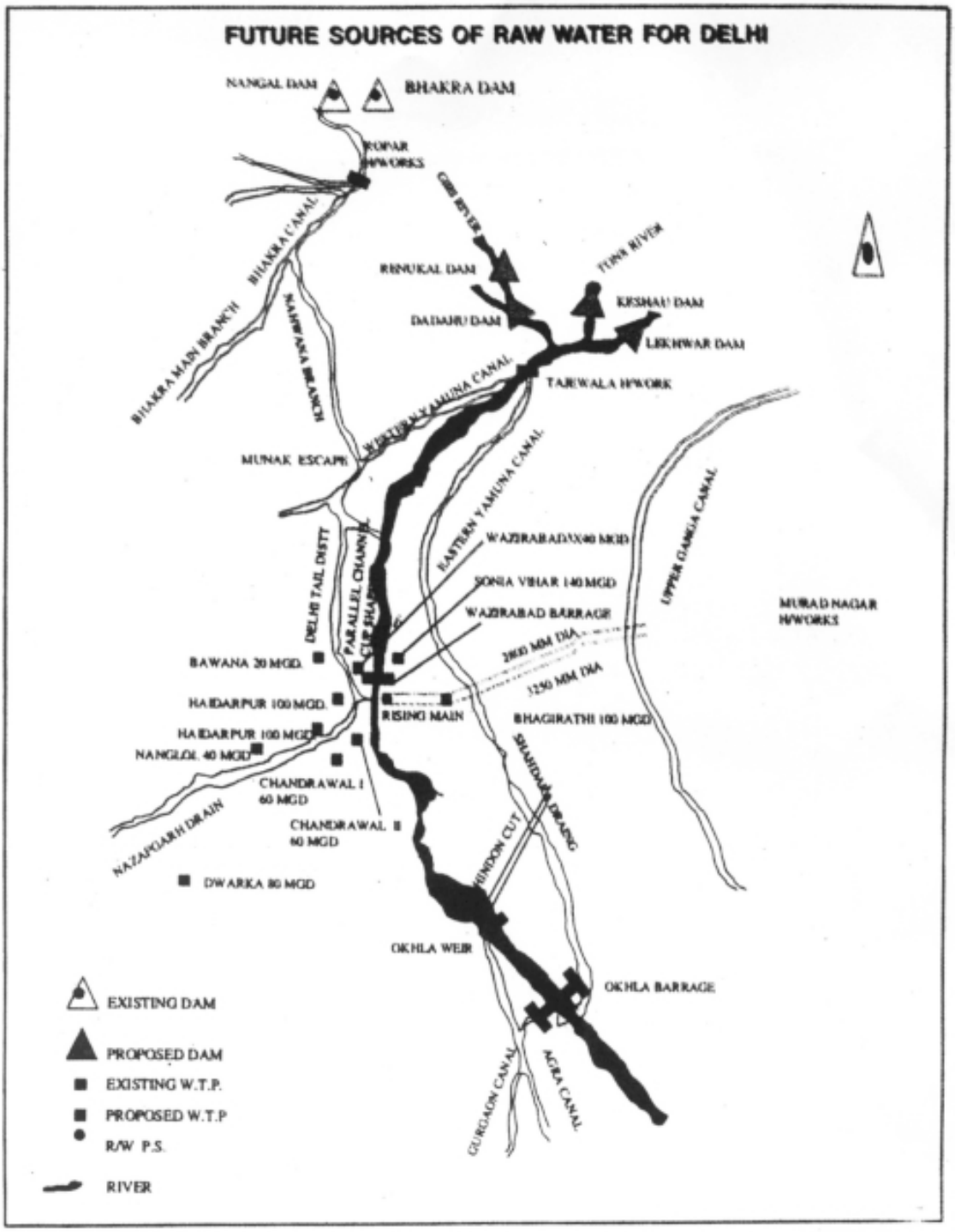
## PARALLEL CHANNEL FROM MUNAK TO HAIDERPUR

7.4 About 30% of the raw water discharged from Tajewala headworks is lost in the present water carrier system through the Yamuna river and the Western Yamnua Canal system. To prevent this loss, a parallel pucca channel is under construction from Munak to Haiderpur. This channel of 102 kms. length is being constructed by the Haryana Government. The estimated cost is Rs. 314.15 crores and it is targetted to be completed in 2006. The entire cost of the project will be financed by Delhi Govt. Water availability will increase by 80 MGD on construction of this channel.

## RESERVOIRS

7.5 Renuka Dam, Kishau Dam and Lakhwar Vyasi Dam are proposed to be constructed so that Delhi gets its share in Yamuna water as per Yamuna Water Sharing Agreement signed in May, 1994. The approved allocation of Yamuna Water to each State may be seen at Statement No. 13.7. About 275 MGD of water will be available to Delhi from Renuka Dam. Delhi will also get 372 MGD water from Kishau reservoir and 135 MGD from Lakhwar Vyasi reservoir (Map 13.1).

## MAP. 13.1




Source : NCR Fact sheet

## Statement No. 13.7

## Allocation of Yamuna Water

| SN | States | Allocation (BCM) | | | TOTAL (BCM) |
|---|---|---|---|---|---|
| | | July to October | Nov. to Feb. | March to June | |
| 1 | Haryana | 4.107 | 0.686 | 0.937 | 5.730 |
| 2 | Uttar Pradesh | 4c.3.216 | 0.343 | 0.473 | 4c.4.032 |
| 3 | Rajasthan | 0.963 | 0.070 | 0.086 | 1.119 |
| 4 | Himachal Pradesh | 0.190 | 0.108 | 0.080 | 0.378 |
| 5 | Delhi | 0.580 (Consumptive) (1926+495 return flow) or 2421cusec | 0.068 (Consumptive) (231+495 return flow) or 726 cusec | 0.076 (Consumptive) (255 +495 return flow) or 750 cusec | 0.728 (Consumptive) (806 +495 return flow) or 2350 cusec |

7.6 Uttranchal Government entered into an agreement with NHPC for implementation of Lakhwar Vyasi Project. NHPC prepared project report and estimated its cost of about Rs.10,000 crores. The cost of electricity generation was found very high and non-saleable. NHPC proposed to transfer part of electricity generation cost to water component cost. This approach is not acceptable to Government of Delhi and CWC has been requested to take care of water component cost.

7.7 Renuka Project approval is held up for want of clearance from Ministry of Environment and Forest, Government of India. An area of about 50 Hects of a wild life sanctuary falling within the area of proposed Renuka Project has delayed the clearance process.

7.8 Uttranchal Government has signed an MOU with THDC for construction of Kisau Dam Project. As such THDC will now prepare a fresh Detailed Project Report for Kisau Dam and will also obtain environmental clearance from M/o Environment and Forest and project approval from CWC, Government of India.

## 8. WATER ACCOUNTING AND AUDITING

8.1 Till now DJB was using old system for measuring the quantity of raw water available at water treatment plants and the quantity of treated water supplied by treatment plants for distribution. Similar was the position at under ground water tanks, reservoirs and booster pumping stations. Due to this system, DJB was not able to assess exact amount of water distribution losses. To overcome this situation, DJB has started a comprehensive programme for installation of bulk meters at all water

treatment plants. About 66 bulk meters have already been installed and remaining 20 bulk meters will be installed by June, 2006.

8.2 DJB has also decided to install bulk meters on all distribution mains, underground reservoirs and booster pumping stations for correct measurement of water supply from these points upto different localities,/consumer points. Under this project 231 sophisticated bulk meters will be installed by March, 2007.

8.3 Complete and correct water supply accounting could not be maintained by DJB due to the following facts :-

a) Out of total 15.48 lakh water connections in March,2005 more than 3.35 lakh connections were without meters.

b) And even out of 12.13 lakh metered connections, more than 5 lakh meters were defective or non-functional.

8.4 DJB has streamlined its system for obtaining water connections along with installation of water meter. The existing system of supply of water meters along with water connections approval has been amended and now consumer can purchase water meters of the selected companies from the market. Authorized Meter Testing Laboratories have also been notified. This revised system may help DJB in converting all non-metered connections to metered connections.

## 9. WATER TARIFFS

9.1 Prior to January, 2005,on an average DJB was charging only Rs.1 per k.ltr. as against the estimated cost of treated water supply of Rs.7 per kilo ltr. DJB has revised water tariffs in Delhi w.e.f. 29.01.2005.

9.2 The revised water tariffs are in two parts as against the single rate under the 1998 plan. The revised plan consists of a fixed access charge in one part and water use charges on the basis of actual consumption in other part. Fixed access charges are payable by all registered consumers towards the cost of accessing the network and for its operation and maintenance.

9.3 The water usage charges have been fixed in different categories for different slabs of consumption on a sliding scale. Under CI, there are four slabs, namely upto 6 Kl/month, above 6 to 20 Kl and above 20 to 40 Kl. and above 40 Kl./months. The new tariffs per Kl.for these slabs are nil, Rs. 2,Rs.5 and Rs.10 respectively. For a family size of say 4 persons consuming 30 Kl/month, the revised tariff is calculated as indicated in Statement No.13.8.

Statement No.13.8

| Consumption Slab (In kl/per Month) | Rate (Rs. Kl) | Total Usage Charges (Rs./Month) |
|---|---|---|
| Upto 6 | Nil | Nil |
| Above 6 and up to 20 | 2.00 | 28 |
| Above 20 and up to 30 | 5.00 | 50 |
| **Total** | | **78** |

The water bill will be calculated as under:
Fixed Access Charges + 1.5 X Usage Charges or
Rs.75 + 1.5 X Rs.78 or Rs.192 per month.

9.4 The factor 1.5 to the usage charge is towards maintenance of sewerage system, which means that 50% of the total usage charge of Rs.78/- in this case goes for sewerage. Therefore, out of total monthly bill of Rs.192/-, the amounts for water and sewerage are Rs.153/- and Rs.39/- respectively.

9.5 The impact of the establishment cost of DJB on the cost of production of water can be very well realized from the fact that as against the production cost of Rs.7/Kl in DJB, this cost is only Rs.2.40/ Kl. in Mumbai, which has a lot of similarity with Delhi in terms of water supply operations and treatment capacity. The present manpower strength of DJB makes it a highly oversized organization as compared to the similar organizations in the other mega-cities of Mumbai, Chennai, Bangalore, Kolkata and Hyderabad. The annual establishment cost of water supply set up of DJB is estimated at Rs.260 crore

## 10. RAIN WATER HARVESTING

10.1 All Government Departments, Local Bodies and Public Sector Undertakings have been directed to install rain water harvesting system in their buildings/complexes. Buildings norms have also been modified and now all new buildings with 100 sq.meters and above area will have to provide rain water harvesting system in their lay out plan for approval to Local Bodies. PWD, MCD, DJB have installed rain water harvesting system in the buildings/complexes being maintained by them.

10.2 A plan scheme to promote rain water harvesting is being implemented by DJB. Technical know-how is being provided to all willing individuals, RWAs, institutions, Housing Societies, etc. Financial incentive of Rs.50,000/- or 50% of cost, whichever is less, is also being provided under the Scheme. A number of RWAs have found very encouraging results from rain water harvesting system introduced in their respective areas.

## 11. WATER CONSERVATION

11.1 Delhi has a network of about 9,000 Kms. of water supply mains of which, a significant portion is as old as 40 to 50 years and prone to higher leakage losses. Normally water losses are calculated by water billed or consumed subtracted from the water produced. In the case of Delhi, water billed or consumed and leakage losses there from can not be calculated exactly as a majority of houses do not have working meters. According to the estimates of DJB, the total distribution losses are of the order of 40% of the total water supplied. These are quite high as compared to 10-20% in the developing countries. The distribution losses include losses due to (a) leaking pipes and (b) theft of water through unauthorized connections.

11.2 DJB has taken several steps to minimize leakage losses. To address this problem, a leak detection and investigation (LDI) cell was set up. Initially, the leak detection cell started functioning with the help of a very few conventional equipments viz. sounding rods, micro-correlates and pipe/ cable locators. More sophisticated sonic and electronic equipments were subsequently acquired and are now being used regularly. The Board has replaced about 1200-Km length of the old, damaged and leaking water mains during the last five years. As a result of these initiatives, the Board expects to bring down the distribution losses to 20 % level in the near future.

11.3 DJB has formulated a programme for recycling of backwash water in three major water treatment plants at Haiderpur, Bhagirathi and Wazirabad. The work for commissioning of Recycling Plant at Bhagirathi and Haiderpur has been started. On completion of programme of all 3 Water Treatment Plants, about 46 MGD water supply will be available without any additional raw water.

## 12. SEWAGE TREATMENT CAPACITY

12.1 The sewage treatment capacity of DJB has been increased from 402.4 MGD as on 31.3.2001 to 512.40 MGD by March, 2006 as per details given below:

## Statement No.13.9

## SEWAGE TREATMENT CAPACITY

| SN | Name of STP | Capacity (MGD) As on 31.3.2001 | Capacity (MGD) By 31.3.2006 | Actual treatment in MGD as on 31.3.2006 |
|---|---|---|---|---|
| 1. | Okhla | 140 | 140 | 119 |
| 2 | Keshopur | 72 | 72 | 68.6 |
| 3 | Coronation Pillar with Oxidation ponds at Timaarpur | 46 | 46 | 26.0 |
| 4 | Rithala | 40 | 80 | 42.0 |
| 5 | Kondli I,II,III,IV | 45 | 45 | 43.50 |
| 6 | Yamuna Vihar I,II | 10 | 20 | 7.6 |
| 7 | Vasant Kunj | 5 | 5 | 4.10 |
| 8 | Ghitorni | 5 | 5 | - |
| 9 | Pappankalan | 20 | 20 | 8.2 |
| 10 | Narela | 10 | 10 | 2.3 |
| 11 | Najafgarh | 5 | 5 | 0.2 |
| 12 | Delhi Gate | 2.2 | 2.2 | 2.4 |
| 13 | Sen Nursing Home | 2.2 | 2.2 | 2.5 |
| 14 | Rohini | - | 15 | - |
| 15 | Nilothi | - | 40 | 5.10 |
| 16 | Mehrauli | - | 5 | 1.50 |
| | **Total** | **402.4** | **512.40** | **333.00** |

12.2 These STPs are not functioning up to their full installed capacity due to various reasons such as low flow of sewage to STPs, trunk and peripheral sewer lines still to be connected to STPs, etc. The sewage generation at present is estimated to be around 640 MGD = [675 (water production) x 0.8) + 100 (Pvt. Ground water entroction)] and treatment is around 333 MGD only. This untreated sewage (307 MGD) falling in river Yamuna is the major cause of river pollution.

12.3 DJB has a network of branch, peripheral sewers of about 6000 kms. Also there is network of 147 kms of trunk sewers. About 91 kms of trunk sewers was settled and silted. The status of trunk sewers may be seen at table No. 13.5.

12.4 The Consultant for World Bank funded "Delhi Water Supply & Sewerage Project" estimated 5259 MLD water supply requirement for Delhi in 2021 and waste water generation from this level of water supply will be about 3760 MLD as per statement No.13.10.

Statement 13.10

## PROJECTED SEWAGE FLOWS

| Sources of wastewater | Volumes, mld | | | | |
|---|---|---|---|---|---|
| | 2004 | 2005 | 2006 | 2011 | 2021 |
| Total water demand | 2685 | 3763 | 4090 | 5181 | 6272 |
| Total net water supply | 2265 | 2362 | 2461 | 3573 | 5259 |
| Wastewater generated | 1812 | 3010 | 3272 | 4144 | 5017 |
| Treated at CETP | 200 | 217 | 234 | 346 | 755 |
| Proportion not sewered | 14% | 13% | 13% | 10% | 5% |
| Outside sewered area | 254 | 302 | 302 | 294 | 210 |
| Net generated wastewater | 1358 | 1722 | 1798 | 2218 | 3242 |
| Infiltration | 518 | 518 | 518 | 518 | 518 |
| Gross wastewater to treatment | 1876 | 2240 | 2316 | 2736 | 3760 |

## 13. WASTE WATER REUSE

13.1 The main opportunities for reuse of treated wastewater in and around the city are considered to be irrigation and horticulture. There is also some demand for use as cooling water in the power stations. Other options include groundwater recharge, return to the raw water source, and the treatment and reuse of sullage water, i.e. water that does not contain human excreta, for flushing toilets, etc.

13.2 Presently DJB supplies about 138 MGD of treated wastewater to the Irrigation Deptt. This is discharged directly to the irrigation channels from the sewage treatment plants.

13.3 A number of small effluent reuse projects are in the planning or implementation stages. They comprise horticultural, irrigation and industrial uses, and will use up to 46 MGD (210 Mld).

13.4 DDA is responsible for 4,451 hectt. of open spaces, all of which are irrigated via tubewells. There is also irrigation of MCD open spaces, central government properties, private parks and properties, road verges, sports stadiums, etc. The details of the green areas being maintained by the various agencies is indicated in Statement No.13.11.

## Statement 13.11

## AGENCY-WISE GREEN AREA

| Agencies | Green Areas(in Hectare) |
|---|---|
| NDMC | 445 |
| MCD | 2,428 |
| DDA | 4,451 |
| CPWD | 2,200 |
| FOREST Department | 11,000 |
| Total | 20,524 |

**Source :** DUEIIP-2021

## 13.5 WASTER WATER UTILISATION STATUS

## Statement No. 13.12

| | | |
|---|---|---|
| 1 | Treated effluent supplied to CPWD for horticulture purposes in Lutyen Delhi from Okhla STP | 20.00 MGD |
| 2. | Treated effluent supplied to Pragati Power Plant form Dr.Sen Nursing Home Nalla and Delhi Gate Nalla STPs | 4.00 MGD |
| 3. | Treated effluent supplied to DDA for Japanese Park in Rohini form Rithala STP | 5.00 MGD |
| 4. | Treated effluent supplied to Minor Irrigation Deptt., Govt. of National Capital Territory of Delhi from Okhla STP-42 cusecs Keshavpur STP – 37 cusec Coronation Pillar STP 70 cusec for irrigation purposes. | 80.5 MGD |
| | **TOTAL** | **109.5 MGD** |

## 14. WASTE WATER MANAGEMENT

14.1 Due to the continuous inflow of migrants and the mushrooming growth of unauthorized colonies and JJ clusters, the landscape of Delhi is spotted with different types of settlements. More than 45% population is residing in such unplanned settlements where sewerage system is not provided. The estimated waste water generation in Delhi in January, 2000 and the population served with sewerage system may be seen at Table No.13.2. Now, plan schemes to provide sewerage systems in regularised-unauthorised colonies, JJ resettlement colonies, and urbanised villages, are being implemented and the present status of these colonies may be seen at Table 13.4. DUEIIP-2021 projections for waste water generation in Delhi in 2021 are indicated in Statement No.13.13.

## Statement No.13.13

## WASTE WATER GENERATION IN DELHI IN 2021

| | | |
|---|---|---|
| • Predicted population in 2021 | = | 220 lakh |
| • Total water demand (excluding losses) | = | 4370 mld |
| • Total wastewater generation (assumed at 80% of demand) | = | 3600 mld |
| • Wastewater going to STPs* | = | 3600 mld |
| • Wastewater going to CETPs* | = | 350 mld |

* ignores any local recycling and reuse of wastewater, etc., but allows for future transfer of some existing industries in non-conforming areas to conforming areas