

WATER SUPPLY PROJECT FOR PITHAMPUR INDUSTRIAL AREA (PIA) FROM MAHI DAM

EXECUTIVE SUMMARY

INTRODUCTION

1. As per the concept and objective of DMIC Project, Pithampur-Dhar-Mhow region is conceived as an Investment Region spread over an area of about 372.4 sq. km. The Investment Region shall constitute of new industrial infrastructure along with augmentation of existing industrial precincts in Pithampur Industrial area (PIA). The PIA is located near Indore in Dhar District and is spread over an area of about 3172 hectares (Ha). This large industrial growth centre consists of Sectors 1, 2, 3, Kheda & SEZ (I&II). Sector 3 occupies the largest area (36% of the total area) followed by SEZs (over one-third of the area).
2. The areas in PIA, although plotted, are not fully occupied and show uneven industrial development at present. The industries presently in PIA are a mixed bag of large, medium and small scale units with prominent production categories being textiles, automotive, pharmaceuticals, chemicals, engineering and the agro-products.
3. Adequate arrangement for water supply is one of the major yard stick for development of the region. This note illustrates the extract from the feasibility study for Water Supply Project from Mahi dam. The report envisages assessment of phase wise demand of water in the region, existing source, potential of ground water in the region, possible source in nearby area, their evaluation on techno-economical consideration, study of available options for carrying the water to project area with recommendations, cost estimates and the study for viability of the project for execution on PPP model along with financial analysis.

PRESENT WATER SUPPLY SYSTEM WITH ADEQUACY ASSESSMENT

4. Presently the raw water supply is sourced from two small reservoirs situated in the south of project area. One is Karam Reservoir, located about 20kms away on Karam River (a tributary of Narmada). Water from this source is pumped to treatment plant at Chanderpura and then distributed through overhead tanks to Sector – 3 (PIA), Kheda and SEZ I with an intermediate booster pumping station at Sagor village. The other is Sanjay Sagar Reservoir, located about 4km. away, on the southern side of PIA, from where the water is pumped to Tarpura Water Treatment Plant and then distributed by gravity to Sector-1 and by pumping to Sector-2.
5. Thus presently there are two Water treatment plants each of 9 mld capacity one at Chanderpura & the other one in Tarpura. Though an additional WTP (9 mld) is under construction in SEZ II, but since the existing Tarpura Treatment plant is not working satisfactorily and needs major repairs, the total treatment capacity after

commissioning of new plant shall remain 18 mld only until major repairs and rehabilitation of the damaged treatment plant is not undertaken.

6. The water distribution network was initially laid in the year 1987 and has been expanded over the years using a mix of CI, GI and AC pipes. The existing pipe sizes vary from 50mm to 400 mm, having a cumulative length of about 72 km, out of which about 62 kms is AC pipe line. Since the distribution system is very old and small size pipe lines are mainly of AC pipes, the distribution losses are comparatively high. Similarly the losses in existing rising main from Karam reservoir are also very high due to worn out pipe line.

7. The present demand of water for the existing industrial area at consumer end is about 17 mld, and the actual water supply is hardly 10.65 mld.

8. Detailed adequacy assessment for the raw water source, existing rising mains, treatment plants, service reservoirs, pumping sets and distribution system was carried out and necessary provision is included for alteration/ replacement. Similarly energy audit was carried out for the pumping sets and provision for replacement of inefficient pumping sets has also been included in the feasibility report.

DEMAND ASSESSMENT

9. Though demand for complete Investment Region has been worked out, But in the initial phase, following areas have been considered for improvement of water supply:

- Pithampur Industrial Area
- Investment Region Phase –I, including Betma cluster.
- Augmenting 7.5 mld of water to Pithampur Municipal Area.
- Supply of 1.00 mld Raw Water to en-route villages from Mahi dam to PIA as a social responsibility.

10. The plan horizon year is kept as 2041, assuming 30 years design period. While calculating demand of water for the region, due care has been taken for the development scenario and likely pace of development for the target year. The criterion for calculating demand of water is mainly based on manual of water supply & treatment issued by CPHEEO, Ministry of Urban Development, Government of India. The major criteria are being listed as below:

- Domestic population : 135 litres per capita per day
- Floating population : 45 litres per capita per day
- For Industries : Existing as per actual survey,
New 45000 litres/ ha as per DDA guide lines
- Fire Fighting Demand : 1 percent of total demand.

11. This way the demand of the planning area in different phases till horizon year works out as follows:

Year----->	2012 (mld)	2020 (mld)	2031(mld)	2041(mld)
Pithampur Industrial Area	27.28	42.51	53.97	53.97
Pithampur Municipal Area (Supply)	7.31	7.31	7.31	7.31
Industrial Demand IR Phase-I	0.00	0.00	29.30	29.30
Dom. Com & other IR Phase-I	0.00	14.37	14.37	14.37
Betama Industrial Cluster	1.64	25.24	25.24	25.24
Total demand at consumer end	36.20	89.40	130.20	130.20
Demand including 15% dist. losses	42.59	105.18	153.18	153.18
Raw water demand at source	44.83	110.72	161.24	161.24

AVAILABLE WATER SOURCE

12. As already stated, 18 mld of water is available from Karam and Sanjaya reservoirs through existing treatment plants. In addition to it 90 mld of water is reserved in nearby Mahi (Labriya) dam for Pithampur Industrial Area. The availability from this source after accounting for conveyance and treatment losses works out to 86 mld. This way a total of 104 mld treated water shall be available for the area. After accounting for distribution losses (15%), the total water available at consumer end shall be around 88.40 mld, which will suffice for the area up to the year 2019, as is clear from above table. As such to meet the balance demand of the area onwards from 2019 and that of remaining Investment Region water from river Narmada is proposed to be tapped for which pre- feasibility study has already been done.

PROPOSED PROJECT

Intake Arrangement

13. It is proposed to construct wet intake well with a channel from lowest level in dam along with a foot over bridge from TBL of the dam. The lowest level of drawl from dam is 430 m above msl and TBL of dam is 454 m. Therefore the total height of Intake is taken as 26 meters. The water from the intake well shall be pumped to intermediate boosting station at 41 kms from intake. The Intake pumping station shall be installed with 6 number 33 KV Vertical Turbine Pumping sets capable to discharge 284 lps, coupled with 750 kw electric motor each, four as working and two numbers as standby.

Carrying Main

14. Selection of pipe material and design of pipe diameter for carrying main to be laid from Intake well to Intermediate boosting station and from boosting station to

treatment plant in PIA has been designed as per CPHEEO manual, considering the capital cost and the capitalised cost on power charges for possible five nearby sizes. Accordingly it is proposed to provide 1000 mm diameter Pipe line, 41 kms long from Intake well to Boosting station and 51 kms long from Boosting station to site of Treatment Plant in PIA.

Intermediate Pumping Stations and Express Power Feeder

15. The intermediate boosting station is proposed at RL 526. It shall have a raw water reservoir of two hours pumping capacity (8 ml) and shall be installed with 6 number Vertical Turbine Pumping Sets, coupled with 33 KV electric motors of 840 kw each, out of which 4 shall be working and 2 shall be standby.

16. For uninterrupted power supply to both the pumping stations it is proposed to provide 33 KV Express Power Feeder for both the pumping stations. The 132 KV Grid sub-station for drawing power for these pumping stations have also been identified in consultation with MP Electricity Board. Accordingly provision has been included in the estimate for the required length of power feeder and Grid Sub Station.

Water Treatment Plant

17. The Water Treatment Plant is proposed to be constructed near existing treatment plant at Tarpura in PIA. The capacity of treatment plant is proposed as 77 ml. Provision has also been kept to rehabilitate the existing damaged plant of 9 mld capacity, so as to create a total addition of 86 mld sufficient to cater the augmented supply of 90 mld from Mahi dam. This way the total treatment capacity including 18 mld existing shall be 104 mld. It is proposed to construct Rapid Gravity Sand Filters with conventional Clariflocculators. The concessionaire may go for modular design of the plant as per demand. The hydraulic design and unit sizing of the plant has been done as per provisions given in the manual of Water Supply and Treatment issued by CPHEEO.

Storage Reservoirs

18. As per mass demand curve of CPHEEO manual, with 22 hours pumping and 2.5 to 3 peak factor, capacity of Service Reservoirs comes nearly 30% of the total demand. Accordingly one master reservoir of 6.4 ml capacity is proposed at Tarpura, and one 3 ml capacity at SEZ-II (at hillock). In addition 7 number OHTs of 9.75 ml capacity and one GLSR of 9 ml capacity is proposed to be constructed in addition to existing 3 numbers of 1.00 ml capacity each.

Distribution system

19. Provision has been kept for laying and jointing distribution system in newly developed area and improvement in existing system, including laying of major feeder mains. The feeder mains and trunk distribution lines are proposed to be laid with DI Pipes class K-7, while smaller size pipe lines may be in uPVC or HDPE pipes, but use of AC pipes shall not be permitted. Total length of proposed distribution net work is 128 kms.

Project phasing and Cost estimates

20. The cost estimates are primarily based on the Madhya Pradesh PHED Schedule of Rates, with suitable price escalation added to it. The rates have also been compared with market rates, and suitable corrections applied wherever necessary. Accordingly the estimated costs for capital works and Operation and Maintenance (O&M) works out as follows:

All costs are in INR Crores

Particulars	Phase I by year 2011-12	Phase II by year 2025-26	Total
Capital cost	329.00	21.91	350.91
Operation and Maintenance cost / year	13.79	26.04	

PROPOSED PPP MODEL, WATER TARIFF AND FINANCIAL ANALYSIS

21. The project is proposed to be executed on DBFOT (Design Built Finance Operate and Transfer) basis in PPP (Public Private Partnership) mode. Financial Analysis based on capital investment & operation and maintenance cost worked out as above, has been carried out to explore the viability of the project for executing in PPP mode. The salient feature of the projects are as follows:

- The concessionaire shall execute the proposed project from Mahi dam, and shall augment, repair and rehabilitate the existing system including distribution system in Pithampur Industrial Area as per provisions in above project.
- The concessionaire shall Shall supply water to consumers of PIA and collect revenue from them.
- The concessionaire shall Shall supply 7.31 mld of water to PMA as bulk supply at Master reservoir, the revenue for which shall be paid to concessionaire by PMA.
- The concessionaire shall Shall provide water supply to the consumers of Investment Region Phase-I and Betma Industrial Cluster and collect revenue from them. But the trunk infrastructure for this part from the Master reservoir of the project shall be provided and executed by DMICDC and the internal distribution by developer of the said land. No investment shall be made by the concessionaire for infrastructure development in this area.
- Narmada project will be required to be operational by the year 2019, when the demand of above areas shall be in excess to the available water.
- The concessionaire shall provide 1 mld of raw water at desired take off points on route from Mahi to PIA for the rural population of en-route villages as its social liability. The infrastructure for its treatment and supply shall be done by state government.
- Concession Period : 30 years, including 2 years construction period.
- Viability Gap Funding : 35 % (20% Central + 15% state)
- D : E Ratio : 2.33
- Equity Contribution : Rs. 79.41 Crores
- Debt : Rs. 185.28 Crores
- Interest rate : 14 %

- Inflation Rate : 3 %
- Water Tariff assumed for
 - Domestic Consumers : Rs. 16.32 per kl (Year 2013)
 - Industrial Consumers : Rs. 33.54 per kl (Year 2013)
- Project IRR : 12.50 %
- Equity IRR : 17.33 %

RFQ, RFP AND CONCESSION AGREEMENT

22. Based on above assumptions the RFQ, RFP and Concession agreement has been prepared. All these documents are based on the model document prescribed and guide lines issued by Planning Commission Government of India, leaving aside some project specific changes.
23. The application fee for RFQ is kept Rs. 35000.00, as prescribed @ Rs. 10000.00 per 100 crores of project cost.
24. The RFP Bid document fee is kept as Rs. 1.00 lacs as prescribed.
25. The validity period of bid is kept as 120 days.
26. A bid security of Rs. 3.51 crores at prescribed rate of 1% of project cost shall have to be deposited along with the financial bid.
27. The eligibility criteria is also as per above guide lines, which includes a threshold technical capability of more than Rs. 700.00 crores (Two times the project cost) in past five years, and financial capacity i.e net worth of the firm at the close of preceding financial year as Rs. 88.00 crores. (25% of project cost).
28. The technical capability for the purpose of evaluation shall include the following categories of experience, which would qualify as Technical Capacity and eligible experience
- Category 1: Project experience on Eligible Projects in **Water Supply Sector**.
 - Category 2: Project experience on Eligible Projects in **Core sector**.
 - Category 3: Construction experience on Eligible Projects in **Water Supply Sector**
 - Category 4: Construction experience on Eligible Projects in **Core sector**
- (i) *Water Supply Sector would be deemed to include Drinking Water Supply Projects with Pumping stations, Pumping mains, Treatment plants, Distribution system ; and*
 - (ii) *core sector would be deemed to include highways, bridges, tunnels, power, telecom, ports, airports, railways, metro rail, industrial parks/ estates, logistic parks, irrigation, sewerage and real estate development (excluding residential flats unless they form part of a Real Estate complex or town ship which has been built by the Applicant)*
29. Applicant's experience shall be measured and stated in terms of a score (the "Experience Score"). The Experience Score for an Eligible Project in a given category would be the eligible payments and/or receipts, divided by one crore and then multiplied by the applicable factor in Table below. In case the Applicant has experience

across different categories, the score for each category would be computed as above and then aggregated to arrive at its Experience Score.

Factors for Experience across categories

Category	Factor
Category 1	1.25
Category 2	1.00
Category 3	0.85
Category 4	0.45