AQUA®

WATER SUPPLY

Industrial Water Supply Scheme for Dahej SIR, SEZ & PCPIR - India's only PCPIR

GUJARAT INDUSTRIAL DEVELOPMENT CORPORATION

Gujarat Industrial Development Corporation ***(GIDC)*** established in 1962 develops Industrial Estates with State of the Art Infrastructure such as roads, drainage, electricity, water supply, street lights, and ready-to-occupy factory sheds.

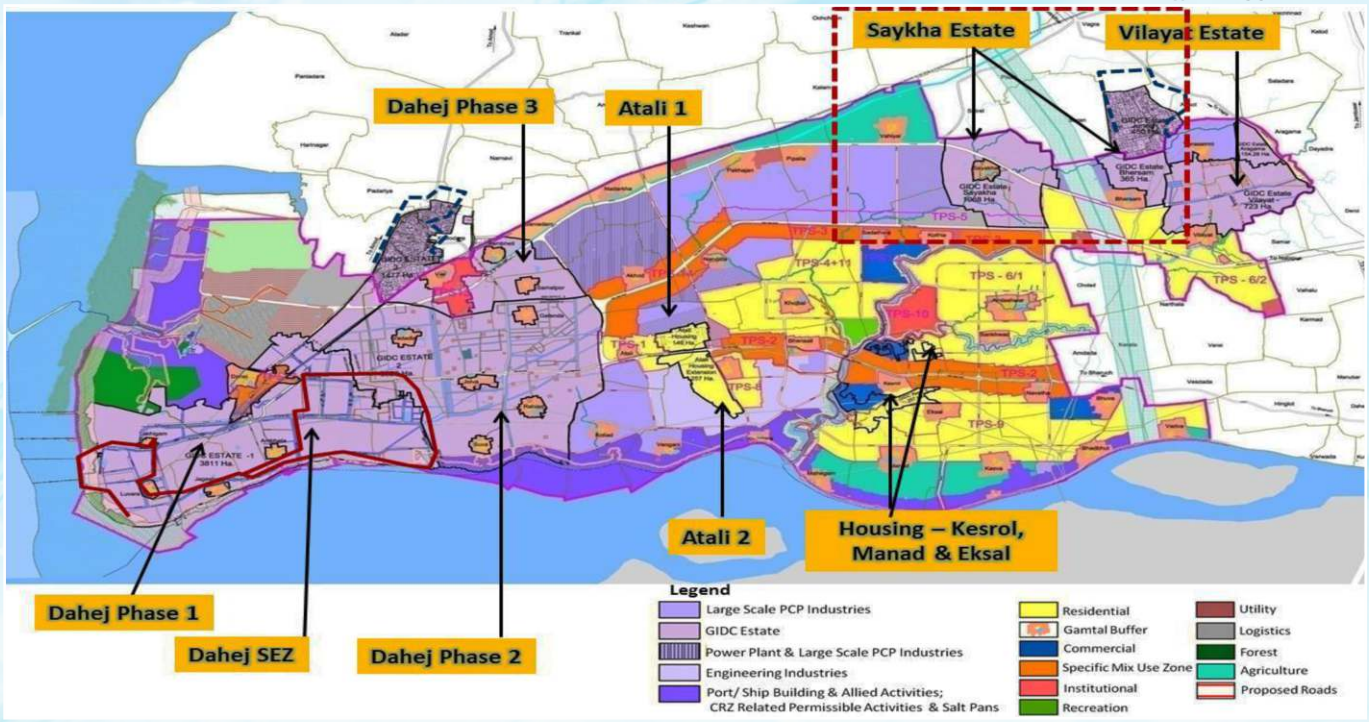
Gujarat is the only state to enact the **SIR Act** in 2009 with the objective of creating ultra large sized Investment & Industrial Areas to develop them as Global Hubs - a SIR has a minimum area of **10,000 hectare**.

- SIR
(Special Investment Regions)

- SEZ
(Special Economic Zone)

- PCPIR
(Petroleum, Chemical & Petro Chemical Investment Region)

Dahej PCPIR falls within the proposed Delhi Mumbai Industrial Corridor *(DMIC)*, within 150 km distance on both sides of the **Dedicated Freight Corridor *(DFC)***



GIDC has developed SEZ & PCPIR in Dahej Region looking to the availability of ports *(& existing big industries like GACL, RIL (IPCL), Birla Copper, Welspun, GFL, Meghmani, etc)* through Central and State Government aid.

Situation :

"One one side there is rapid growth & increasing demand of water while on other hand existing units are **facing severe water scarcity** *(especially between January to July)* due to Low Water Flow & Salinity Ingress in River Narmada.

Hence, an 25 MGD Intake was planned well Upstream of Dahej - at Nand & was awarded on Engineering, Procurement & Construction *(EPC)* basis to **M/s. L&T ECC Wet BU** *(Industrial Water).*

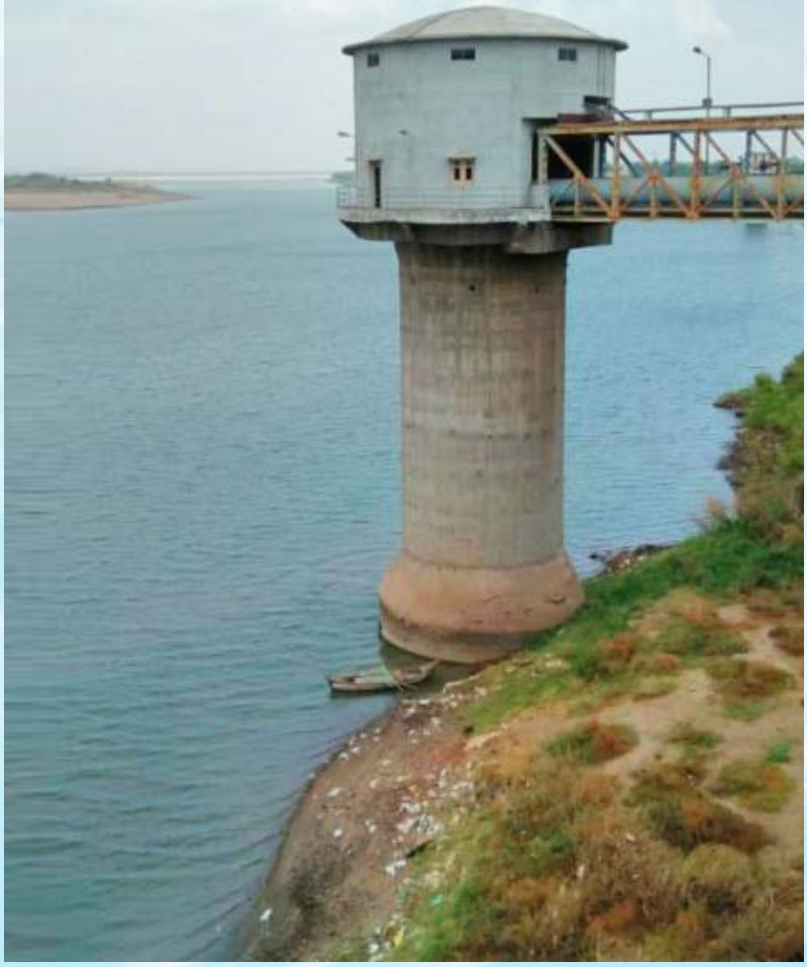
Additionally at the Raw Water Reservoirs in Dahej-II, III & Saykha; New Distribution Pumping Stations were planed to distribute these water further to the industries - the E&M contracts were awarded to M/s. **H. M. Engineering** & M/s. **Asiatic Traders**.

Some End Clients like M/s. **Deepak Phenolics** & M/s. **GNFC** lift their own water directly from the RWR's.

Source : 25 MGD Intake Well

WATER SUPPLY

The Intake well is almost 34m deep..!



L&T Construction

The project was awarded on EPC basis to M/s. **L&T ECC** *(Industrial Water).*

The salient features of the contract are :

- Construction of Intake well along with SITC of P/M.
- 70km Ø1400mm M.S. pipeline.
- Comprehensive O&M of 5 years.

Challenge : This 34m depth is substantially higher than the safe limit of Extended Shaft Vertical Turbine pumps - hence, Clients decided to go for a Combination of Vertical Turbine & Submerged Bowl Centrifugal *(SubVT)* pumpsets – i.e. a mix of Old & New technologies.

Challenge : Also the huge head variation necessitated the use of VFD's.

WATER SUPPLY

► **Submerged Turbine pumpsets,** Combines the Robustness of Centrifugal pumps, Efficiency of VT & Reliability of Induction Motors in a Ultra Low Maintenance, Portable Monoblock; Submergible enclosure.

Discharge Head of SubVT Pump

Pumpsets Details :

Flow : **1440 m^3/hr**
Head : **70 m**
Power : **500hp**
Quantity : 4 Nos. Submerged VT Pumpsets *(partially driven by VFD's / Soft Starters)*

With Compelling Advantages like,

- Unsurpassed Reliability
- Zero Consumables
- Simple to Operate
- Minimal Routine Maintenance & Competitive Wire to Water Pumping Machinery Efficiency

"We have used both - i.e. Vertical Extended Shaft Turbine as well as Submerged Bowl Turbine pumpsets, in same well for the same duty. Over the years, we have experienced that the latter have Lower Maintenance Costs, Lesser O&M Hassles & are more compatatible with VFD's"

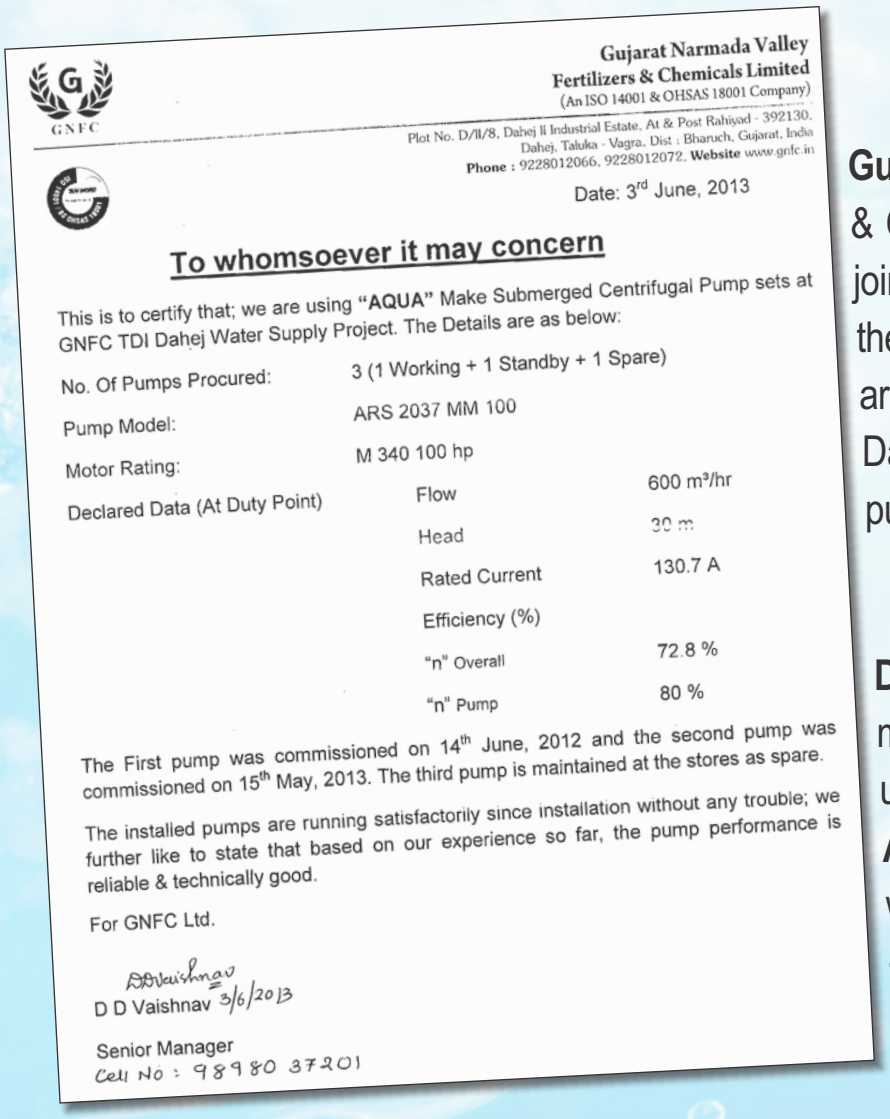
- Sayan Mukherjee
E&M Engineer (O&M Dept.), L&T

Dahej RWR

WATER SUPPLY

Water intake from Narmada River is stored at Dahej 2 & 3 Reservoirs from where it is lifted/ distributed to around 400 units using various Aqua make Sub CF pumpsets.

Site	HP	Qty.	Head	Flow
Dahej II to Chemical Zone HW 5 & 6 Line1 and HW 3 Line 2	100 hp	8 No.	28 mtr	549 m^3/hr
Dahej II to HW 1 Engineering Zone	45 hp	3 No.	39 mtr	195 m^3/hr
Dahej II to HW 7 Engineering	80 hp	3 No.	44 mtr	306 m^3/hr
Dahej III to Zone A	40 hp	4 No.	19 mtr	372 m^3/hr
Dahej III to Zone B,C and D	75 hp	4 No.	21 mtr	611 m^3/hr



Gujarat Narmada Valley Fertilizers & Chemicals Limited
(An ISO 14001 & OHSAS 18001 Company)
GNFC
Plot No. D/II/8, Dahej II Industrial Estate, At & Post Rahiyad - 392130. Dahej, Taluka - Vagra, Dist : Bharuch, Gujarat, India
Phone : 9228012066, 9228012072, Website www.gnfc.in

Date: 3rd June, 2013

To whomsoever it may concern

This is to certify that; we are using **"AQUA"** Make Submerged Centrifugal Pump sets at GNFC TDI Dahej Water Supply Project. The Details are as below:

No. Of Pumps Procured:	3 (1 Working + 1 Standby + 1 Spare)	
Pump Model:	ARS 2037 MM 100	
Motor Rating:	M 340 100 hp	
Declared Data (At Duty Point)	Flow	600 m^3/hr
	Head	30 m
	Rated Current	130.7 A
	Efficiency (%)	
	"n" Overall	72.8 %
	"n" Pump	80 %

The First pump was commissioned on 14th June, 2012 and the second pump was commissioned on 15th May, 2013. The third pump is maintained at the stores as spare.

The installed pumps are running satisfactorily since installation without any trouble; we further like to state that based on our experience so far, the pump performance is reliable & technically good.

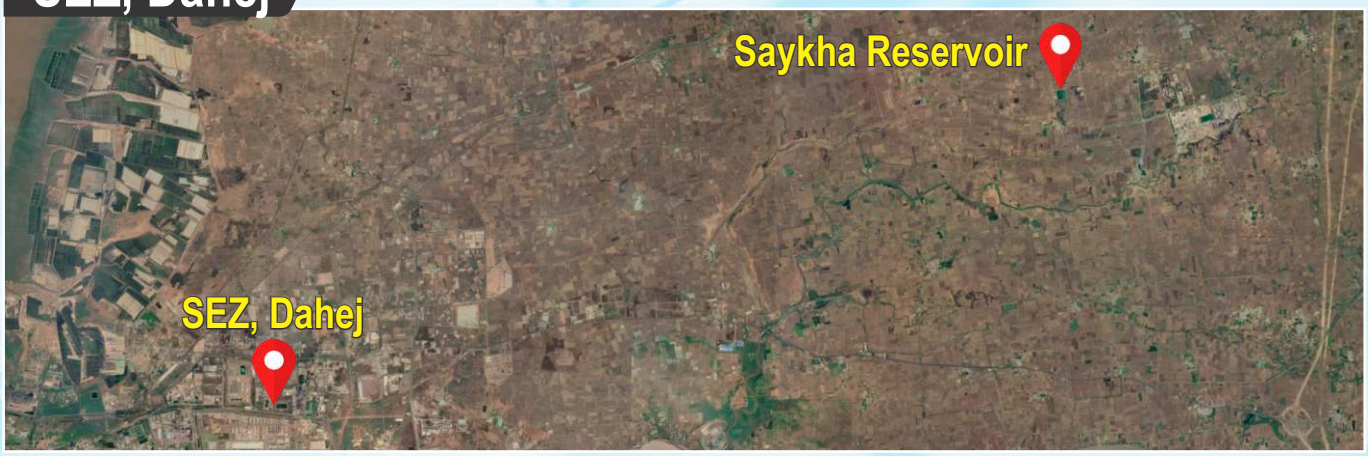
For GNFC Ltd.

DDVaishnav 3/6/2013
D D Vaishnav
Senior Manager
Cell No : 98980 37201

Gujarat Narmada Valley Fertilizers & Chemicals Limited *(GNFC)*, is a joint sector enterprise promoted by the **Govt. of Gujarat** & **GSFC Ltd.**; are taking water to their Plant from Dahej II reservoirs through SubCF pumps **since 2013.**

Deepak Nitrite Ltd. is a chemical manufacturing company having set up **India's largest Phenol Acetone Plant** at Dahej PCPIR with capacity of about 200,000 TPA - it uses Aqua SubCF for Raw Water Intake from the RWR.

SEZ, Dahej



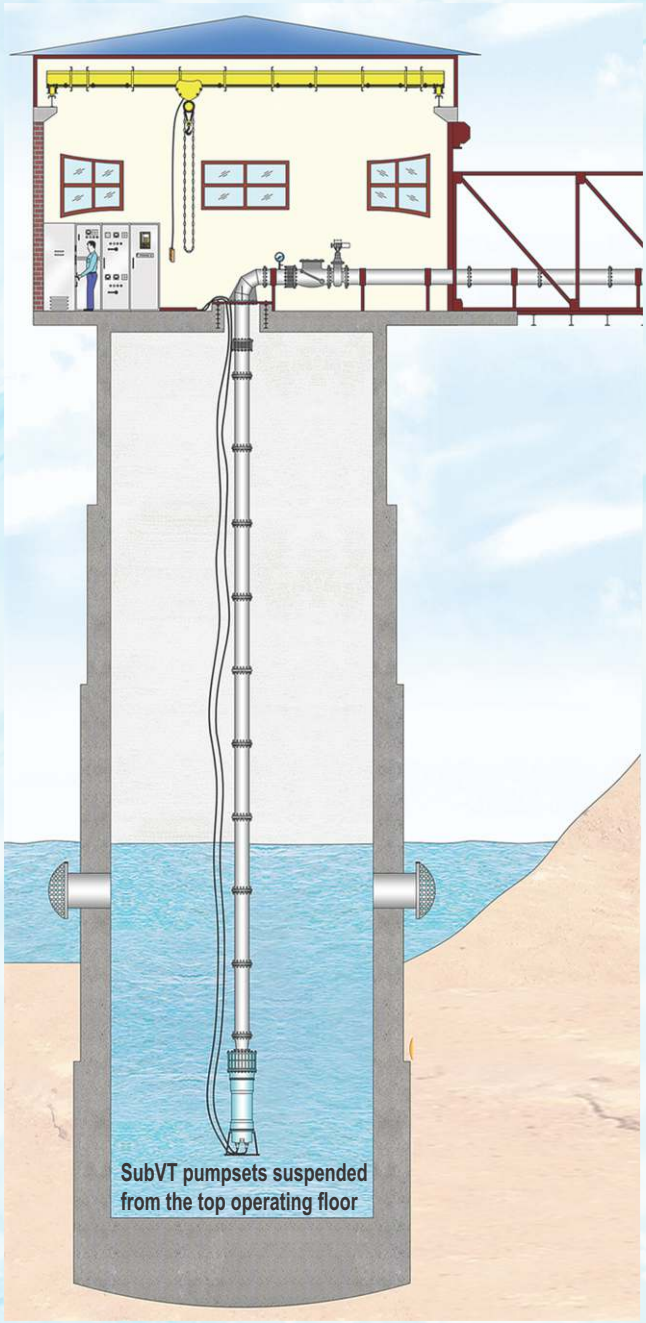
Since 2013, GIDC SEZ is using Aqua SubCF pumps for their 57 MLD Water Supply Scheme.

Site	HP	Qty.	Head	Flow
SEZ	335 hp	6 No.	48 mtr	1180 m^3/hr

GIDC, Saykha

Water is supplied through SubCF Pumpsets.

Site	HP	Qty.	Head	Flow
Saykha to Zone 1,2,3,4 and 5	150 hp	4 No.	21 mtr	1134 m^3/hr
Saykha to Zone 6,7	100 hp	3 No.	23 mtr	648 m^3/hr
Saykha to Zone 8	50 hp	2 No.	30 mtr	267 m^3/hr



Robust & Reliable

- Minimum breakdown even in High Silt levels.
- No breakdown for Deeper Column Lengths even upto 120m due to the Elimination of Couplings, Fragile Line Shafts & its Water Lubricated Line Shaft Bearings, Spiders, etc.
- Over-safe Design & Smart Protection Systems result in high Reliability.

Ultra Low Maintenance

Requires neither Consumables nor Routine Maintenance (like Priming, Oiling, Greasing, Gland Tightening, Shaft Alignment, Dry Run prevention, Forced Water Lubrication systems, etc.)

Low Life Cycle Costs *(LCC)*

Zero Consumables, Minimal Maintenance & Competitive Power Consumption.

VFD compatible*

As compared to VT pumps + Air Cooled motors; SubVT pumps are much more VFD compatible *(with minor modifications)*

Competitive Energy Costs

Based on VT Bowl/ Diffuser type hydraulics, the Bowl Efficiency is nearly the same as that of VT pumps However the Elimination of Line Shaft, Coupling,Thrust Bearing, Spider, Shaft Enclosing Tube, Forced Water Lubrication system, etc. causes a Reduction in Mechanical Power Consumption *(kW)* as well as in Hydraulic Losses *(m)* thereby resulting in Pumping Machinery power consumption being slightly lower than VT pumps *(the savings growing larger & larger with deeper column depths)*

Simple & Quick to Commission

Due to mono block design; No need to align shafts, couplings, thrust bearing, spiders; set up forced water lubrication, oiling, thrust bearing cooling system; etc.

Minimal Noise, Vibration & Heat Emission

Due to elimination of Auxiliary & Ancillary systems like Forced Water Lubrication, Thrust Bearing Cooling system, Motor Heat Exchanger.

GUJARAT INDUSTRIAL DEVELOPMENT CORPORATION

[A Govt. of Gujarat Undertaking]

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No: GIDC: SE: ME: HO/ 378 Date: 13 /07/2016

TO WHOM SO EVER IT MAY CONCERN

This is to certify that, for 25MGD Dahej Water Supply Project at Nand Intake well, we are drawing 25 MGD water through a combination of VT & Submerged Centrifugal pump sets (Bowl type) (both of the same rating – i.e. 1440 m3/hr x 70 mtr head x 500 HP) from intake well-constructed on Narmada River & conveyed to Bharuch RW Reservoir for Industrial Water Supply.

After our substantial use of both types of pump sets (installed at same intake, commissioned at same time & operating into same system); we feel that Submerged Centrifugal pump sets (Bowl type) are much more simple & easy to operate, energy efficient, noise free & require much lesser maintenance.

We have found the performance of Submerged Centrifugal pump sets (Bowl type) satisfactory & recommend the use of such type of pump sets at Intake well.

Superintending Engineer (M&E)
GIDC, Gandhinagar

"We have been using Aqua make SubCF & Sub VT pumpsets at many sites for many years now. We are highly satisfied with their reliability & recommend their usage for Low Maintenance."

- Ketan N Doshi
M.D. Asiatic Traders

Aqua Machineries Private Limited

www.aquapumps.com

Registered Office & Manufacturing Plant

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