

## **Executive Summary Jamnagar Industrial Park Study**

### **Industrial Projects**

Jamnagar district has large industrial sector projects as Reliance Petroleum, Essar, Gujarat State Fertilizer Corporation & Gujarat Electricity Board. The district has 18 salt works producing 25 lakh tonnes of salt which is 33% of the state salt production. 1,377 industries in private sector deal with minerals, synthetic fibres, food processing, wood, chemicals, metals, machine tools and electrical etc.

### **Industrial Estates in Jamnagar District**

Gujarat Industrial Development Corporation (GIDC) have developed seven estates out of 10 Talukas in the District. They are located at Dhrol, Kalyanpur, Okha (Dwarka), Jamkhambholiya, Bhanwad and two estates in Jamnagar.

In the 9<sup>th</sup> Five Year Plan GIDC proposes to develop following additional estates.

- a) Jamnagar – II Expansion (78 ha)
- b) Jam Jodhpur and Jamkhambhalia (10 ha each)
- c) Positra (5000 ha), recently approved as SEZ by Govt of India
- d) Motikhavdi (4000 ha), the industrial park is under present feasibility study.

### **Minerals**

Jamnagar district has rich deposits of the following minerals

- Bauxite
- Bantonite
- Calcite
- Khandi Stone
- Lime Stone

Cultivation of coloured cultured pearls is done near Sikka

### **Fisheries**

The Jamnagar district has 355 km. long coastal line. There are number of fish processing units between Dwarka and Mithapur.

### **Water Supply**

Jamnagar Dist. does not have any perennial rivers. Water supply is arranged in GIDC estates through tube wells. Due to shortage of water, water intensive industries have not been possible but with availability of water through desalination.

## Site

The proposed site located in the North in the Saurashtra Region in the State of Gujarat. The site is on the state highway number 25 (coastal road), which goes through and bisects it. The physical area of the site, earmarked for the development of the Park, admeasures 4358 hectares.

Part of the area falls in Khambalia Taluka & part falls in Jamnagar taluka of Jamnagar District, with Gulf of Kuchchh on the North, Rajkot on the East as a major growth centre of Gujarat, Okha & Dwarka on the West has major salt pans areas. Site is located near the Sikka Port which is 7 km away.

## Linkages

The region is reasonably well connected with rail, road, air and water. The State highway No. 25 connects Okha to Rajkot. In the North East the state highway connects to NH 13 through coastal highway, which is having a proposal for upgradation to four laning. State highway no 25 also connects to NH no 8B at Rajkot which has a direct link to Gandhinagar, Ahmedabad, Baroda and Mumbai. On the other end State highway connects to Okha and Dwarka.

Efforts are already made by the Gujrat State Road Development Corporation (GSRDC) to develop and upgrade the section of the Coastal connection from Maliya, Dahisar, Jodhiya and Jamnagar and other coast road from Khambalia to Okha having a proposal of four laning. Also there is a need of development and upgradation of road to Sikka port which is currently having a heavy traffic and ranks second in the minor ports due to Relience and upcoming ESSAR Oils.

Broad Gauge rail connection is available connecting Okha to Mumbai through Jamnagar and Vadodara main line. Two of the rail stations are just situated near the site at the Southern end 'Pipli & Kanalus'. A railway siding from Kanalus to Sikka Port goes through from the South Western end of the site, which is presently being used by GNFC.

An airport is available at Jamnagar presently having flights to Mumbai and Bhuj needs upgradation and extension.

Presence of Sikka Port near the site offers excellent opportunity for water transport of goods for the proposed park and it ranks highest in the state for exports and imports as a medium port.

## Summary of Activity Mix Model of potential industries.

Activity Mix Model

Industry Sector	Industry Sector
1. Downstream Industry Petrochemicals	3-4 medium size Petrochemical/Chemical units-250 hectares.

2. Downstream Industry- Petroleum	LPG bottling unit/Calcined Petroleum Coke unit. 50 hectares.
SEZ for petroleum & petrochemicals, converting units, Brass units. (Optional)*	Recommended area as per scheme, 1600 hectares Break up of area Small 2000 sqm units for brass & 10,000 sqm units for Petrochemical converting industry plus – 325 ha. (net) 1 Container loading & unloading terminal, 100 hectares. 3-4 medium size Petrochemical/Chemical units –250 hectares. 2 large Petrochemical units of 250 hectares each / 5-10 Oil Tankage & Storage Facilities. Roads and social infrastructure – 425 ha.
3. Power	2*250 MW Power unit based on Petroleum Coke 75 hectares 2000 MW Based on LNG. 150 hectares
4. Bauxite based industries	Alumina Refining Unit / Bauxite Calcination Unit 50 hectares Smelter not considered due competition from Middle east and perceived high power cost for aluminium smelting.
5. Fertilizers	Not considered on LNG due focus of investments in Middle east & investments based on domestic gas maybe more feasible.
6. Others	Cement potentially based on LNG, 50 hectares
Subtotal Total for Industry	625 hectares
7. Social Infrastructure including major roads	700 hectares
Subtotal	1325 hectares
SEZ/Petroleum & Petrochemicals, converting units, Brass (Optional)*	1600 hectares
Total	2925 hectares

\* Recommend as an option that an SEZ to create a Petroleum & Petrochemicals Hub such as Jurong island Singapore, Yanbu or Rotterdam, be established at Jamnagar. The SEZ will also house brass units, which rely on imports for raw material & have good export potential. The existing refineries may also be integrated into the SEZ as discussed in the ensuing chapter.

## Marketing Schedule

Optimistic Basis

### Sale pattern for optimistic model

Total Salable Area's of the Park	2001	2002	2003	2004	2005	Total
1. Downstream Industry- Petrochemicals (3-4)			250			
2. Downstream Industry - Petroleum LPG/Calcined Pet coke			50			
3. SEZ						
Small units			325			
Petrochemical Units (3-4)			250			
Petrochemical Units (2)/ Oil Tankage & Storage Facilities					500	
Central Business Area			25			
Railway Siding & Cargo Handling					60	
4. Power based on Pet Coke			75			
Based on LNG					150	
5. Alumina Smelting on Bauxite Calcination unit					50	
6. Cement					50	
<b>Sub-total (1 to 6)</b>			<b>975</b>		<b>810</b>	<b>1785</b>
7. Industrial & Social Infrastructure						311
Business & Convention & Recreation Center			65			
Hotel Complex			25			
Transportation Hub			25			
Township			98		98	
<b>Sub-total (7)</b>			<b>213</b>		<b>98</b>	<b>311</b>
<b>Grand Total (1 to 7)</b>			<b>1188</b>		<b>908</b>	<b>2096</b>

### Conservative Basis

If the modeling were to be done on a conservative basis it could be taken up in two parts based on cyclical recovery by the year 2004. The development can take place in a period of eight years.

### Sale Pattern of Conservative Model

Total Salable Area's of the Park	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
1. Downstream Industry – Petrochemicals (3-4)				25%	25%	25%	25%				
2. Downstream Industry - Petroleum											
LPG/Calcined Pet Coke				100%							



Business & Convention & Recreation Center				100%						
Hotel Complex				100%						
Transportation Hub				100%						
Township				50%					50%	

### **Activity Mix as Input to the Conceptual Plan**

Based on the project sizing & activity mix done by the sub-consultant (E&Y), basic zoning and conceptual plan for the industrial park has been prepared on an area of 2925 ha. Land use zoning has been done for 4358 ha i.e. the total area under consideration. According to activity mix, the industrial park comprises of large industrial units, the Special Economic Zone (SEZ), Business centre and the Township. The large industrial units consists of downstream petrochemical and petroleum industries, regasification & power plant, LPG bottling unit and cement industry. The SEZ consists of downstream petrochemical and chemical units, brass industries large petrochemical industries and cargo handling facilities.

Besides the industrial park would include residential housing for workers, transportation hub, business and recreation centre and utility areas.

### **Amenities & facilities for a proposed industrial park**

The industrial park besides the industrial units in the large industrial units area and SEZ would accommodate the required amenities, facilities, business and recreational and other areas.

The SEZ shall include, it's specific business area, railway siding and cargo handling facility. The central business & convention centre complex shall include the administrative building, Business complex and area for social amenities.

- Govt. Institutions related to growth centres
- Police Station
- Bank and Financial Institution
- ESI clinic and P.F. Office
- Post Office (main)
- Health Care facilities (General Hospitals & primary health centre)

### **Industrial Infrastructure**

- Other industrial infrastructure for the industrial area & SEZ would include :
- Plotted area including road network within the growth centre area and linkage to the nearby highway.
- Drainage and CETP
- Tele-communication
- Waterhouse and container depot.
- Transport facilities including road, rail etc. for cargo and passengers.

- Market, exhibition, conference centre
- Demonstration project and product development centre
- Quality testing and training centre
- Fire safety
- Power, street lighting
- Water supply
- Sewerage

### **Residential Infrastructure**

The township area besides housing shall including the related amenities and housing area facilities such as :

- Provision for water, power, street light and sewerage in residential area
- Health services
- Sports and recreation
- Education facilities
- Parks
- Community centre and shopping centres
- Religious and cultural facilities
- Banks and other financial institutions – PCOs for telecommunication

### **Financial Feasibility**

#### **Alternative 1**

The details of the project cost are indicated as under :

Sl No.		Total Cost (in Rs. million)	Phase I (in Rs. million)	Phase II (in Rs. million)
A)	Land Acquisition	585.00	278.00	307.00
B)	Site Development	14.04	6.68	7.36
C)	Construction of Transport Infrastructure	1463.00	941.10	521.90
D)	Power	4250.00	2200.00	2050.00
E1)	Water Supply	3843.86	2717.54	1126.32
E2)	Sewerage	1309.17	574.87	734.30
E3)	Solid Waste	138.10	63.30	74.80
A-E3)	Total External Cost (A to E3) including L A	11603.17	6781.49	4821.68
F)	Internal Development	751.50	526.50	225.00
G)	Construction of Amenities (Built Space)	28.40	14.10	14.30
	<b>Total Project Cost (Rs. million)</b>	12383.07	7322.09	5060.98

Various demand models were developed as shown earlier. The corresponding cost of land is worked out for different IRR's and different scenario's as follows:

	16% IRR	NPV set at zero to satisfy IRR equation	21% IRR	NPV in Rs. cr's
1a. Conservative	795	0	838	164.48
1b. Optimistic	752	0	969	286.82
1c. Most Conservative	875	0	1165	296.37

The detailed project development analysis is worked out as follows

- Cost & expenditure schedule
- Sale pattern & price indexing
- Revenue & Project IRR calculation & Debt Repayment Schedule

Rate Sensitivity Analysis – Alt 1a	IRR - Swing	IRR + Swing
+/- 10%	13.3%	18.5%
+/- 20%	10.25%	20.6%
+/- 30%	6.7%	22.7%

The impact of lowering the Debt equity ratio & cost build up of different heads is studied:

Debt equity Ratio	Alt1	Alt 3 b
70 : 30	795	594
60 : 40	763	570
50 : 50	731	545
30 : 70	666	499
100% Equity	569	429

## Alternative – II

In this alternative the project cost is brought down by removing the cost of water desalination equipment of 330.88 cr's. The impact on project cost is as follows :

Phase I	Total Cost (in Rs. million)	Phase I (in Rs. million)	Phase II (in Rs. million)
Land Acquisition	585.00	278.00	307.00
Site Development	14.04	6.68	7.36
Construction of Transport Infrastructure	1463.00	941.10	521.90
Power	4250.00	2200.00	2050.00
Water Supply	535.06	271.14	263.92
Sewerage	1309.17	574.87	734.30
Solid Waste	138.10	63.30	74.80
Total External Cost (A to E3) including L A	8294.37	4335.09	3959.28

Internal Development	751.50	526.50	225.00
Construction of Amenities (Built Space)	28.40	14.10	14.30
<b>Total Project Cost (Rs. million)</b>	<b>9074.27</b>	<b>4875.69</b>	<b>4198.58</b>

It can be observed that the rate falls from Rs. 795 per square meter to Rs. 575 per sq. meter for a similar of 16%.

	16% IRR	NPV set at zero to satisfy IRR equation	21% IRR	NPV in Rs. cr's
Alternative II	575	0	699	204.88
Ia. Conservative	795	0	838	164.48

### Alternative III

In the case of Alternative 3a only the first phase of the project is considered. In alternative 3b, the desalination cost is excluded & in alternative 3c both the cost of the desalination and power is further excluded. The corresponding cost of land is worked out for different IRR's & different scenario's as follows :

	Project Cost in Rs. Cr's.	16% IRR, NPV 0	21% IRR	NPV in Rs. cr's
3a. Phase I only	732.21	890	1037	147.12
3b. excluding Desalination	487.57	594	693	99.42
3c. excluding Power & desalination	267.57	327	382	54.88

### Broad Observations & Recommended Actions:

1. Small industry for which the park was originally conceived would be driven by markets & no longer by raw materials. It is suggested that the project may thus be pursued with a vision to create a Mega Chemical Industrial park in the Indian Subcontinent.
2. Thus the Govt. of Gujarat should support the Ministry of Commerce, Govt. of India proposal by offering Jamnagar as an alternative for planning a Mega chemical Industrial Park with an SEZ. Jamnagar will have to compete with other states such as Orissa, Kerala, West Bengal, Maharashtra, Andhra Pradesh and Tamil Nadu but strengths on account of existing petrochemical and chemical industry & the Gulf of Kutch will hold Jamnagar in good stead. This concept will help bring in FDI investment and will also potentially benefit small industry such as converting & brass units.
3. The Refinery Stakeholder participation may be invited in the project . This may be not only in the form of equity participation or offering common infrastructure facilities but also by helping to anchor the project by locating downstream petrochemical units in the industrial park such as Ethylene & Proplene. The SEZ structure may catalyze partnerships for these project's estimated announcements

- of which is around \$ 6 billion dollars. This is subject to the condition that benefits emerge as realistic, i.e. as per global norms and the policy thrust remains not only for exports but also FDI.
4. While the refineries may not need to physically integrate into the SEZ at present, they may wish to do so in the future once they go ahead with their expansions in order to avail duty benefits for capital goods & for free movement of goods. Jamnagar has the potential to position itself as a major global refining centre in the subcontinent. The refinery product offered to the park will be the manner of integration. Commercially this will also enjoy deemed exports and thus globally competitive prices of feedstock.
  5. Another important national objective is strategic stock creation on account of our huge dependence on imports of crude at present and in the future. The site is suitable for the creation of oil tankage & storage facilities (provided the environmental issues are addressed) to be included.
  6. In view of sending a clear policy signal, synergies with the Positra SEZ may be considered. This shall ensure efficient resource utilization over come environmental hurdles and also offer a Unique Selling Proposition of Chemicals to prospective investment.
  7. The govt. may consider land acquisition for the first phase of the project. The investment for land will be Rs. 27.8 cr's. The minimum cost of development can be less than Rs. 500 cr. As per Alternative 3b.
  8. Synergies in development of industrial parks, power projects and ports must be brought out for improving the bank ability of such projects.
  9. Strategic investors may be searched via a bidding process.
  10. As a proactive measure to ensure the development of the Gulf of Kutch is to have reputed agencies like the ADB, World Bank of KfW to assist in the preparation of Master Regional Plan for development of the region, which shall take into account the environmental considerations for sustainable development