Chapter 7

7 FINANCIAL FEASIBILITY OF CHEMICAL ESTATE

7.1 INTRODUCTION

The development of Chemical Estate in Kutch requires huge investments in facilities and infrastructure as well. This investment decision needs to be justified by the benefits that would accrue to the region in terms of revenue and regional development.

This chapter attempts to calculate the costs and benefits and also attempts to determine whether the investment in the chemical estate infrastructure and development of facilities is feasible.

7.2 APPROACH AND ASSUMPTIONS

Financial factors were analyzed to determine the feasibility of the estate infrastructure and facilities suggested by the industries as necessary. Financial analysis is done from the investor's (*Estate Developer*) point of view and determines all the financial costs and benefits to assess the net benefits accruing to the investor over time.

In the draft final report submitted by TCS, the financial viability analysis was based on non-discounting criterion. The underlying presumption is that the returns are reinvested into the business.

Since this is an infrastructure development project, the returns generated are not reinvested into the business. The debt, equity, interest and repayments have also been considered while analyzing cash flows. Cash flows in this case are discounted by the cost of capital. Thus discounting criterion has been used to assess the financial viability of the chemical estate. Thus the project is said to be viable when the NPV of the cash flows is positive at the said cost of capital.

a. Basic Assumptions

Following basic assumptions were made while assessing the entire project:

- The cut off year for financial analysis is 2026
- The interest rate is 13 percent per annum
- Unless otherwise mentioned the Debt to Equity ratio is 2
- Sale of land would be 20% in first year, 40% in next year and 40% in the subsequent year of the total available plots
- The total capital investment has been considered in the first year of operation
- Subsidies for infrastructure have not been considered for the calculation purposes, CETP is excluded from this assumption.
- Financial analysis is based on project returns for 13%, 15% and 20%. 13% has been taken as the prime lending rate and thus the minimum rate of return has been considered at 13%. For long term equity investment the risk is higher and the returns

expected are thus also high. Thus the expected return on equity is at about 20%. To consider an average risk-return scenario the financial analysis has also been done at 15% returns.

b. Financial Analysis: Assumptions

The following assumptions have been made for the analysis of financial feasibility of the estate:

Desalination plant

- The desalination plant capacity would be 17 MLD.
- The capital investment is in the range of Rs. 6 crores to Rs. 7 crores per MLD output of water.
- When a desalination plant is run in isolation i.e. without integration with a power plant, the operating cost of plant is Rs. 100 per KL; whereas in case of integration with power plant the operating cost is Rs. 24 to Rs. 25 per KL.
- The water supply pipeline from the sea to the desalination plant has been considered at Rs. 20 lacs per KM.
- The cost of brine discharge pipeline from the desalination plant has been considered at Rs. 15 lacs per KM.

Substation and Electrification

- A 66KV/11KV Substation costing around Rs. 250 lacs will be required for the estate.
- The transmission lines have been assumed to cost Rs. 6 lacs per Km.
- Street lighting and other general lighting have been assumed to cost Rs. 5 lacs per Km of street lighting amounting to Rs. 100 Lacs.

Effluent Treatment Plant

- The capital investment in an effluent treatment plant is around Rs. 75 lacs to Rs. 100 lacs per MLD of effluent.
- The effluent discharge has been assumed to be 80% of the water requirement.
- The Government would give 25% subsidy on the capital investment.

Cleaner Production Center

- The cleaner production center would cost approximately Rs. 15 Lacs.

Testing Laboratories

- The testing laboratories would cost approximately Rs. 200 Lacs.

Approach Roads

- Approach road for highway cost about Rs. 180 Lacs per km. The approach road would be approximately 8 km in length.
- Internal four lane roads measuring 8 km at around Rs. 120 Lacs/km.
- Other internal roads measuring 16 km would cost around Rs 80 Lacs per km.

Water Supply

- Internal supply network measuring 30 km would cost around Rs. 4 Lacs per km.
- One storage reservoir would be required, costing approx. Rs. 40 Lacs.
- Pumping station would cost approx. Rs 15 Lacs.

Effluent Disposal

- Internal supply network measuring 24 km would cost around Rs. 35 Lacs per km.
- Over the land disposal pipeline measuring about 9 km would cost around Rs. 100 Lacs per km.
- Undersea disposal pipeline measuring about 10 km would cost around Rs. 500 Lacs per km.

Fire Fighting.

- Fire-fighting arrangements would be required, this has been assumed to cost about Rs. 100 Lacs

Hazardous Waste Disposal

- Four Hectares of land would be developed for hazardous waste disposal at cost of Rs. 30 Lacs per hectare.

Green Belt

- Fifty-meter green belt would be required on the perimeter of the estate; the assumed cost for the same is Rs 100 per 10 sq. mt.

Fencing

- Fencing would be required for the security of the estate and this costs around Rs. 600 per meter.

Other Assumptions

- The Government land that amounts to 250 Ha, shall be transferred to the estate developer at the rate of Rs. 24 per Sq. mt.
- The land acquisition and subsequent transfer price to the estate developer has been taken at Rs. 24 per Sq. mt.
- The water requirement has been calculated on the basis of Pollution Prevention and Abatement Handbook of the World Bank and in-house database of TCS.
- The turnover of the industry has been considered to be twice the investment.
- The loan repayment period has been considered 20 years unless otherwise mentioned.
- The annual expenditure on electricity for street lighting and pumping etc. has been considered to be Rs. 50 lacs initially going up to Rs. 75 lacs.
- Other maintenance and contingency expenses in the estate are considered to be Rs. 15 lacs.
- Nominal expenditure on road maintenance has been considered.
- Industrial investment is assumed to be around 2.75 crores per hectare.
- Estate would charge the units a maintenance charge at the rate of Rs. 5 per Sq. Mt of land held.
- Depreciation has been considered for financial calculations. Depreciation for the Estate infrastructure 15% WDV.
- Annual expenditure on fire fighting would be approx. Rs. 5 lacs.
- An average benefit of 8% for sales tax incentive has been considered, and it has been assumed that the sales in Gujarat would be around 35% of the total production.
- An average 14% of benefit from excise has been considered for calculation of the benefits to the industry.
- Administration cost has been considered to be Rs. 18 lacs.
- The income tax holiday to the estate developers has also been considered. Section 80-IA of Income Tax Act, permits the benefits of tax holiday in any 10 consecutive years out of 15 years from beginning from the year the enterprise or

undertaking begins to develop an infrastructure facility or start providing telecommunication services or develop industrial park or generate power.

7.3 VARIABLES AFFECTING PROJECT VIABILITY

There are various factors that would affect the feasibility of the industrial estate. The quantifiable factors are as follows:

1. Industrial investment
2. Land Price
3. Power availability and price
4. Water availability and price
5. Effluent treatment and disposal price
6. Maintenance charges
7. Subsidies and Incentives

7.4 QUALITATIVE FACTORS AFFECTING THE ESTATE VIABILITY

- ***Industrial Scenario***

Today, the markets world over are not doing well. The biggest economies Worldwide are facing a situation of turmoil and the Chemical Industrial segment of the Indian Economy is no exception. The industry is growing at a rate of 8-12% in India. Most of the segments are incurring losses either due to the excess capacities and fall in the market demand or aggressive international pricing owing to the high volumes. In such times when the question is that of sustainability, not many industries can be presumed to be making newer investments. The government therefore needs to take some concrete steps towards building up the confidence and reinstating the entrepreneurial spirit of the industrialists.

- ***Time Frame:***

The time frame in which the infrastructure is setup for facilitating the industry is very important. An industry is eligible for the excise exemption if it starts production in Kutch before July 31st, 2003. Similarly, the deadline for availing the Sales Tax exemption is July 31st, 2004. These dates actually leave the industries with a very tight schedule. The kind of investments that will undergo in this project and the minimum infrastructure that needs to be developed before any industry can occupy the estate, both are phenomenal and require substantial time for set up. The Government thus requires to follow a Fast-Track Program wherein a time deadline is set up for the basic infrastructure to be set up by the Government itself and in light of such a deadline, it should invite the industries to start their infrastructure development. If such a regimen is not followed, then industries would not remain eligible to avail the Sales Tax and Excise incentives as a result of which the investors' number may go down.

- ***Time Frame for Land Acquisition***

The proposed site at Kidana Barapar has approximately 50% - 55% of land that is privately owned. The approximate time frame required to acquire this land from the private parties is of the tune of six months. Now, the zoning plan has been carried out in

such a manner that the first phase of development falls entirely on the Government owned land. This predominantly comprises setting up the common utilities like CPP, CETP, desalination plant and all. This infrastructure too would take its own toll of time to be set up and assuming that the industries do not come to the estate from day one, the remaining piece of land needs to be acquired before completion of the Phase I of development. The Government has no choice other than following a time bound development plan and the land acquisition program which goes hand in hand with it.

- ***Quality of Infrastructure***

The past experience of the industries of working in the GIDC estates has not been very good in general. The success of an estate depends upon the kind of facilities provided within the estate and how they are maintained over a period of time. In case of couple of GIDC estates viz. Jhagadia and Ankleshwar, the industries were assured of several basic amenities like continuous water and power, proper effluent treatment and disposal, good roads etc. But according to the industry, often, these basic facilities were not maintained and some of them not provided. The outcome is that today industries would like to see at least the basic infrastructure like water, power and effluent disposal in place before they actually venture with a project into a Government Estate. The Government should thus aim at providing a state of the art infrastructure within the estate.

- ***A Single Window Clearance System :***

Any new industrial set up at the proposed estate would require a number of clearances to be taken from various Government departments. The time frame for the industries to set up and start production is short in order to avail the tax and excise exemptions. So it is imperative that a single window clearance system prevails with regard to the estate for quick, smooth and hassle-free functioning. The Government should additionally put a deadline for this clearance window before the expiry of which it should grant clearances to all the applicant industries.

- ***A Disciplinary Regime in terms of Maintenance:***

One of the major factors contributing to the success of the SEZs across the world is the stringent order in which the laws are framed and followed within them. A recommended feature for the proposed estate is that they should follow a strict disciplinary regime on the lines of the SEZs. Regulations should be formed for the appropriate and righteous usage of various common utilities within the estate, misuse of which should be heavily penalized. Besides, some of the major industries should be made stakeholders within these common utilities so that they may take corrective actions to avert any damages to their stakes.

7.5 COSTING

a. Capital Costs

Capital costs are non-recurring costs incurred during the initial stages of a project. The costs incurred in developing the infrastructure and facilities in Chemical Estate have been considered as capital costs. Since the time available is very less, most of the investments would have to be made in first year. For calculation purposes the total investment has been considered in the first year. The details regarding the capital cost have been mentioned in the previous section on assumptions for financial analysis.

Table 7- 1 Capital Costs

FACTORS	RATE	UNIT	MEASUREMENT	COST in Rs. LACS
DESALINATION PLANT				
DESALINATION PLANT	650.00	lacs/MLD	17.00	11,050
WATER -IN PIPELINE	20.00	Lacs /KM	11.00	220
SLUDGE-OUT PIPELINE	15.00	Lacs /KM	2.00	30
ELECTRICITY TRANSMISSION				
SUBSTATIONS 66KV/11KV SS	250.00	Lacs /NO	2.00	
TRANSMISSION LINES	6.00	Lacs /KM	24.00	144
STREET LIGHTING/GENERAL LIGHTING	5.00	Lacs /KM	20.00	100
CAPTIVE POWER PLANT (gas based)	350.00	Lacs/MW	50.00	17,500
EFFLUENT TREATMENT PLANT	110.00	Lacs/MLD	12.00	1,320
CLEAN PRODUCTION CENTER	15.00	Lacs		15
TESTING LABORATORIES	200.00	Lacs		200
APPROACH ROADS				
APPROACH TO HIGHWAY	180.00	Lacs /KM	8.00	1,440
INTERNAL ROADS - FOUR LANE	120.00	Lacs /KM	8.00	960
INTERNAL ROADS	80.00	Lacs /KM	16.00	1,280
WATER SUPPLY LINES				
INTERNAL NETWORK	4.00	Lacs /KM	30.00	120
STORAGE RESERVOIRS/OHTS/	40.00	/NO	1.00	40
PUMPING STATIONS	15.00	/NO	1.00	15
FENCING	5.00	Lacs /KM	12.00	60
GREEN BELT 50 MT	1.00	/HA	35.00	35
EFFLUENT DISPOSAL				
INTERNAL NETWORK	35.00	Lacs /KM	24.00	840
DISPOSAL PIPELINE ONLAND	100.00	Lacs /KM	9.00	900
DISPOSAL PIPELINE UNDERSEA	500.00	Lacs /KM	10.00	5,000
STEAM NETWORK	12.00	Lacs /KM	10.00	120
FIRE FIGHTING	150.00			150
LAND - GOVERNMENT	2.40	Lacs/ha	200.00	480
LAND - PRIVATE	2.40	Lacs/ha	250.00	600
LAND - KPT	2.40	Lacs/ha	50.00	120
LAND - FOR EXPANSION (IF ANY)	3.60	Lacs/ha	0.00	
HAZARDOUS WASTE SITE DEVELOPMENT	30.00	Lacs/ha	4.00	120
LAND DEVELOPMENT(FILLING/CUTTING ETC)	0.25	Lacs /ha	500.00	125
OTHERS				
TOTAL DEVELOPMENT COST				**42,984**

b. Costing for Estate Development

The financial analysis for the different units of the estate has been taken separately to obtain a clear picture of the overall profitability of the estate. The analysis has been considered on IRR of 13%, 15% and 20% returns. 20% return is expected return from investment point of view, 13% is minimum cost of capital in current market scenario and 15% has been considered as medium average rate of return.

The following section describes the analysis of each unit of operation.

Desalination plant

The operating cost of the desalination when the desalination plant is integrated with a power plant comes to around Rs 24 / kl of water output. The fixed cost (at 80% utilization and 13% cost of capital) for the same comes to Rs. 31.50 per kl. At 20% return to investor the price that the industry would be required to pay comes to around Rs. 67 per kl. As per the survey the industry would be willing to pay about Rs. 25 per kl.

Captive Power Plant for Estate

The operating cost of the power plant comes to around Rs 2.50 / unit of power output. The fixed cost (at 80% capacity utilization) for the same comes to Rs. 0.70 per unit. This power plant would be for the captive use of the industries in the estate. The power price comes to Rs. 3.75 for 20% return to the power plant. The power price is higher due to lower cash flows in initial three years and higher cost of capital. Electricity connection charges at the rate of Rs. 2000 per KVA could be charged separately.

Common Effluent Treatment Plant

The operating cost of the CETP comes to around Rs 18 / kl of effluent discharge. The fixed cost for the same comes to Rs. 3.13 /kl. The price that the industry would therefore be required to pay comes to about Rs. 21 /kl. This cost includes the cost of capital at 13%. The units in the estate can also become the shareholder of the CETP and thus reduce the cost to around Rs. 20 per kl. As per the survey and pricing at other estates, maximum price of Rs. 20 /kl can be charged to the industry. The cost here does not include the cost of the disposal pipelines to be laid in estate and to carry effluents to the deep sea. These costs do take into account that 25% subsidy would be given by the Government.

Operations and Maintenance

The operating and maintenance cost of the estate comes to around Rs 1.2 crores per annum. The initial investment for the same is shown in the analysis sheet. A maintenance charge of Rs. 5 per sq. mt. could be charged to the industry on annual basis.

Site development

Site development includes basic infrastructure like transmission lines, disposal pipelines, approach and internal roads, land development, green belt, hazardous waste site etc. To cover the capital cost incurred on the land and other services as mentioned in the analysis sheet, the land price would need to be atleast Rs. 584 per sq. mt. (Based on saleable plots of 300 Ha and total capital investment of Rs. 127.53 crores).

Keeping in view that the proposed chemical industrial estate would provide better utilities to the industries setting up their unit; logically, the estate can be priced at comparative prices to these estates. But the survey results and the inertia that the industry has shown in coming to Kutch leads to a conclusion that the industry would invest if the land prices are

lower. This is also based on industry perception that huge barren lands are easily available in Kutch.

For the project implementation, the typical scenario that is recommended is discussed in the following section.

7.6 PROJECT IMPLEMENTATION FOR ESTATE DEVELOPMENT

As mentioned earlier the estate development constitutes of various components. Each component could be developed separately by different entities or by single entity. The debt to equity ratio has been considered to be 2. The expected return on equity is assumed to be 20%. The following are the five major parts of the estate:

- Desalination plant
- Captive power plant
- Common Effluent Treatment Plant
- Operations and Maintenance (O & M)
- Land development and other infrastructure

a. Scenario Analysis

Following scenarios have been analyzed for the project implementation:

1. Development of the above mentioned infrastructure components by different agencies
2. Development of all the infrastructure components by a single entity
3. Development of infrastructure by a few different agencies

The following additional scenarios have also been analyzed:

4. Long term phasing of capital costs and land sale
5. Supply of water from GWIL
6. Supply of water by GWIL and phasing of investment and land sale

Please refer the annex for the detailed cash flow and financial statements.

- ***Scenario 1: Development of different infrastructure components by different agencies***

Each unit has been taken separately in the following analysis

Entity 1: Water Supply Agency (Desalination Plant)

The project feasibility at different water prices and 80% utilization is shown in the table below. The desalination pant is not viable below water price of Rs. 59/kl.

Water price Rs./kl	IRR
59	13%
61	15%
67	20%

Debt	Rs. 7533 Lacs	66.67%
Equity	Rs. 3767 Lacs	33.33%

The desalination plant as a single entity is not viable, because the price that the industry

would be willing to pay is far less than the actual price.

Entity 2: Power Supplier (Captive Power Plant)

The project financials at different power prices and 80% utilization is as follows:

Power price Rs./Unit	IRR
3.45	13%
3.52	15%
3.73	20%

Debt	Rs. 11747 Lacs	66.67%
Equity	Rs. 5873 Lacs	33.33%

The captive power plant is viable as a single entity.

Entity 3: Effluent Treatment Agency (CETP)

Strategically, CETPs are operated by the user industries and thus, 100% of the equity of CETP could be held by the industry.

The project NPV (at 13% cost of capital) at different treatment prices and 80% utilization is as follows:

Treatment price Rs./kl	NPV of the project in Rs. Lacs
17	(1819)
20	668
22	2326

The analysis shows that the CETP is viable at the treatment price of around Rs. 21/kl. As mentioned earlier this can be reduced by full equity participation by the member of the estate. The NPV in such a scenario are as follows:

Debt	Rs. 0 Lacs	0
Equity	Rs. 1000 Lacs	100%

The CETP is viable at the rate of Rs. 20 / kl. This price is also likely to be acceptable to the industry.

Entity 4: O & M

The O & M can be given to separate party who would deal with erection of lighting, fire fighting and maintain the these utilities along with other utilities like roads etc. The IRR of the project at Rs. 5 per Sq. mt. annual charges is 29%. This project is viable as a stand-alone entity.

Debt	Rs. 167 Lacs	66.67%
Equity	Rs. 83 Lacs	33.33%

These investments are for fire-fighting, street lighting. The maintenance would also include road maintenance, administration.

Entity 5: Site Development Agency

The site development entity would develop the whole estate, which includes basic infrastructure like approach roads, internal roads, disposal pipelines, drainage, green belt, water supply network etc. The services have been mentioned in the analysis sheet. The

project financials at different land prices is as follows:

Land price Rs./Unit	IRR
554	13%
562	15%
584	20%

Debt	Rs. 8502 Lacs	66.67%
Equity	Rs. 4251 Lacs	33.33%

The site development entity alone can be viable only if the land is sold at the rate Rs. 584 /Sq. Mt. or more. The government, to the extent of land price of the transferred land would also contribute the equity in this entity. This comes to around Rs. 12 crores in case the estate size is limited to 500 Ha. If estate expansion takes place then the Government equity would be correspondingly increased.

This scenario is not viable, as the desalination plant can not be sustained on a standalone basis.

- ***SCENARIO 2: Development of all the infrastructure by single entity***

In this scenario, a single entity develops the entire infrastructure Except the CETP. The project viability details at different prices are as follows

The land price in this scenario would be higher because it would have to account for the reduced water price. Increasing the power price would reduce the land price. 50% of average demand of power would be from industry. The industry would be required to pay Rs. 5.50 per unit. The unutilized power could be sold to GEB. It is assumed that the GEB would pay Rs. 2.5 per unit purchased from the power plant. Therefore, the effective selling price for the power plant comes to Rs. 4.00 per unit.

The project cost at different rate of returns is as follows:

Land Price*	IRR
421	13%
537	15%
761	20%

*Water Price: Rs. 30/ kl, Power Price: Rs. 4.00 / Unit

The funding requirement would be like as follows:

Debt	Rs. 27949 Lacs	66.7%
Equity	Rs. 13974 Lacs	33.3%

- ***SCENARIO 3: Development of infrastructure by a few different agencies***

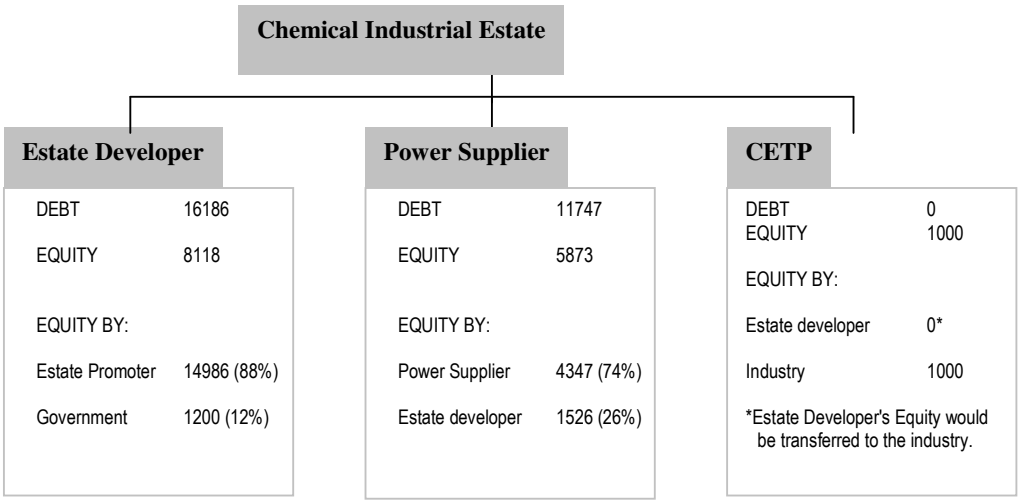
The approach adopted here is the optimized approach where the profit making entities have been taken as separate business units.

Strategically, CETPs are operated by the user industries and thus, 100% of the equity of CETP could be held by the industry. The estate development agency would be the owner of 100% equity of CETP during the starting phase of the project. When the industry starts

setting up the units, the equity can be transferred from the estate development agency to the user industries.

In the end, there would be three entities, which would be operating in the estate. The following are the financial details of the three entities viz.

1. Power Supplier (Power Plant)
2. CETP
3. Estate Development Agency



Entity 1: Power Supplier (Captive Power Plant)

The power connection charges would be Rs. 2000 per KVA of connection requirement. The project financials at different power prices and 80% utilization is as follows:

Table 7- 2 Project Financials at different Power Prices

Power price Rs./Unit	IRR
3.45	13%
3.52	15%
3.73	20%

Debt	Rs. 11747 Lacs	66.67%
Equity	Rs. 5873 Lacs	33.33%

The captive power plant is viable and provides good return in comparison to other infrastructure projects.

Entity 2: CETP

CETP with full equity participation from the industry can be setup as a stand-alone entity. As mentioned earlier, this can be reduced by full equity participation by the member of the estate. The project financials in such a scenario is as follows:

Table 7- 3 IRR for CETP at different treatment price

Treatment price Rs./kl	IRR
20	4%

Debt	Rs. 0 Lacs	0%
Equity	Rs. 990 Lacs	100%

The CETP is viable at the rate of Rs. 20 / kl. The equity participation conversion comes to around Rs. 34/ sq. mt.

Entity 3: Estate Development Agency

The estate developer would develop all other infrastructure and utilities including desalination plant. The capital cost of the infrastructure is as follows:

Table 7- 4 Estate Development Costs

Cost Component	**Rs. Lacs**
Desalination	11300
Site development	12753
O & M	250
Total Capital Cost	**24303**

Debt (Rs. Lacs)	16186	66.67%
Equity (Rs. Lacs)	8118	33.33%

The Estate Development Agency would primarily be responsible for:

- Desalination Plant
- Land and Site Development
- Road Network and Maintenance
- Effluent Collection and Disposal
- Clean Production Center
- Transmission Lines
- Testing Laboratories
- Fencing, 50 mt. Green Belt
- Hazardous Waste Site Development
- Water Supply Lines, OHT, Pumping Stations
- Fire Fighting, Street Lighting
- O & M, Administration
- Other activities

The project financials at various land prices are as follows:

Land Price Rs./ Sq. Mt. *	**IRR**
943	13%
943	15%
953	20%

* Water Price: Rs. 30 /KL

The land would be transferred from Government to the Estate Development Agency. The developer would be responsible for the timely completion of the infrastructure setup in the estate. The development includes the items as mentioned in the tables above. The same agency would be responsible for the Operation and Maintenance (O & M) of the estate. The land price would have to be Rs. 953 per Sq. mt. for 20% return.

The estate development agency would be responsible for the initial investment in the CETP. The equity invested in the CETP would be sold to the industry at a margin of 10%. The estate development agency would also have dividend income from the stake in Power Supply Agency.

b. Comparative Statement of the Scenarios

At Debt equity ratio of 1.5:1

Scenario	All Separate Entities 1			Single Entity 2			Multiple Entities 3		
IRR	13%	15%	20%	13%	15%	20%	13%	15%	20%
Land Price	554	564	588	942	948	979	943	948	969
Water Price	59	62	68	30	30	30	30	30	30
Power Price	3.45	3.53	3.75	3.45	3.53	3.73	3.45	3.53	3.73

The above table shows the land prices in different scenarios at different rate of return.

Scenario	All Separate Entities 1			Single Entity 2			Multiple Entities 3		
	13%	15%	20%	13%	15%	20%	13%	15%	20%
Land Price	554	564	588	421	548	795	943	948	969
Water Price	59	62	68	30	30	30	30	30	30
Power Price	3.45	3.53	3.75	4.00	4.00	4.00	4.00	4.00	4.00

The above table shows the land prices in different scenarios at different rate of return and higher power price.

At Debt equity ratio of 2:1

Scenario	All Separate Entities 1			Single Entity 2			Multiple Entities 3		
IRR	13%	15%	20%	13%	15%	20%	13%	15%	20%
Land Price	554	562	584	421	537	761	943	943	953
Water Price	59	61	67	30	30	30	30	30	30
Power Price	3.45	3.52	3.72	4.00	4.00	4.00	4.00	4.00	4.00

Best Scenario

The price which seem to be most favorable under the under different scenarios is Rs. 761 at a debt equity ratio of 2:1, power price of Rs. 4 per unit, and water price at Rs. 30 /kl.

c. Additional Scenarios

- ***SCENARIO 4: Phasing of investment and land sale***

As per the suggestion of GIDB, the investment would be spread over a period of three years. The land sale would complete in three years subsequent to the completion of the estate development. *Such a scenario would not entitle the industries to avail the excise benefits because of short time frame available to start the production.*

When infrastructure except CETP is developed by a single entity, the project financials for a phased implementation are as follows:

IRR	13%	15%	20%
Land Price	496	723	1208
Water Price	30	30	30
Power Price	4.00	4.00	4.00

The above table is based on the Scenario 2. The phased approach results in land being dearer (at Rs. 1208) due to cash inflows at much later stage as compared to the capital investments.

- ***SCENARIO 5: Supply of water by GWIL***

An economical alternative for the estate could be derived if water supply is done through the water supply network to be setup in Kutch. As mentioned earlier GWIL would be able to supply 5 MLD water by the year 2005. If Government takes up this as a priority project and pursues GWIL, a profit making organization, to make available 17 MLD of water by July 2003, then the desalination plant would not be required.

In such a scenario the following are changes to the costing of the estate:

- The desalination plant capital investment would not be there
- The sludge out pipeline would not be required
- Cost of the distribution channel that would be required to carry water from water source (the cost has been assumed to be about Rs. 1 Crore per Km, the total length has been assumed to be 18 km)
- No subsidy on the above mentioned distribution channel has been considered
- The reduction in capital investment is Rs. 113 crores, while additional capital investment is Rs. 18 crores. The total savings in this scenario are Rs. 95 crores.

Land Price	GWIL Rate	Water Price	Power Price	IRR
444	30	30	4.00	20%
210	30	30	4.00	15%
86	30	30	4.00	13%

The above analysis is based on the Scenario 2.

But this scenario is feasible only if the following factors are taken care of:

- The water supply project for the Gandhidham region is taken on top priority and infrastructure for water supply near Gandhidham is made available
- The planned GWIL distribution network passing through Gandhidham is created on time so that further connecting network to the estate can be built.
- This infrastructure is made available in very short time frame.
- Water is supplied through the water supply canals so that region gets water and in turn the estate would get the supply of water
- Reserved supply of water for the industry is kept in the distribution system
- Water reaches the estate by July 2003.

- ***SCENARIO 6: Supply of water by GWIL and phasing of investment and land sale***

  A more realistic and practical alternative for the estate could be derived if water supply is done through GWIL and phasing of investments and land sale is done.

  The project financials on the basis of Scenario 4 and Scenario 5 are as follows:

Land Price	GWIL Rate	Water Price	Power Price	IRR
790	30	30	4.00	20%
365	30	30	4.00	15%
164	30	30	4.00	13%

d. Recommended Scenario

Comparing the above-mentioned scenario, it can be concluded that the first scenario of having different unit for each component is not viable because of non-feasibility of the desalination plant. The best scenario is the second scenario where infrastructure is developed by a single entity. The alternate scenario that could be considered is the 6th scenario where water supply is through GWIL and capital investments are in phased manner.

7.7 PROJECT IMPLEMENTATION STRUCTURE

The following table summarizes the financials of the industrial estate under the recommended scenario

Debt	Rs. 27949 Lacs	66.7%
Equity	Rs. 13974 Lacs	33.3%

The total equity investment by the promoters would required to be about Rs. 140 crores.

Revenue for *Estate Development Agency*

Land Price	*Rs. 761 / Sq. mt.*
Water price	Rs. 30 / kl
Power Price	Rs. 4.00 / Unit
Annual Maintenance charge	Rs. 5 / Sq. mt.

Revenue for *CETP*

Equity participation	*Rs. 34 / Sq. mt.*
Effluent Treatment Price	Rs. 20 / kl

The land price may seem to be higher as compared to the GIDC estate viz. Ankleshwar and Jhagadia but it compares well with the GIDC Naroda and Nandesari Estate Prices.

Government Stake in the Project

The government would hold equity in the Estate Development Agency. The equity would be in lieu of the land that the government transfers to the Developer.

The government stake in the estate developer comes to Rs. 12 crores out of the total equity of about Rs. 80 crores. This implies that the government equity stake in the Estate development agency would be about 15%. The following table summarizes the government stake in the estate.

Table 7- 5 Government stake in the Estate

All figures in Rs. Lacs

Development agency shareholder capital	13974
Government owned land cost	600
Private land purchased by government	600
Cash outflow from government	600
Equity participation in the Estate	1200
Percentage equity participation in Estate	**8.6%**

Comparison with other Estates

The prices in other GIDC industrial estates are as follows:

Table 7- 6 Comparison of Estate Price with GIDC Estates

Estate	Price in Rs. / Sq. mt.
Ankleshwar	360
Gandhidham	1800
Jhagadia	250
Panoli	300
Naroda, Ahmedabad	700
Nandesari, Vadodara	600

- ***Jhagadia Chemical Estate***
  - Communication: Reliable telephone, telex and fax services.
  - Road Network: 30 Kms four lane and 45 Kms double lane within the estate.
  - Water Supply: Filtered water supply system based on river Narmada (Planned: 78 MLD, Commissioned: 45 MLD).
  - Power Supply: One 220/66 KV and Two 66/11 KV Sub stations.
  - Effluent Disposal: 78 MLD effluent collection and disposal system (primary treatment to be done at the individual units' end).
  - Housing: A 400 Hectares housing complex (planned) near the estate.
- ***Vilayat Estate***
  - Communication: Reliable telephone, telex and fax services.
  - Road Network: 15 Kms four lane roads within the estate.
  - Water Supply: Filtered water supply system based on river Narmada (Capacity 36 MLD).
  - Power Supply: One 220/66 KV and One 66/11 KV Sub stations.
  - Effluent Disposal: 36 MLD effluent collection and disposal system (primary and secondary treatments to be done at the individual units' end).
  - Housing: Nil

Comparison with other Estates in India

State	Estate	Price in Rs. / Sq. mt.
Tamilnadu	Perundurai	150
Maharashtra	Nandangaon	100
Maharashtra	Ranjangaon	450
Tamilnadu	Sriperumbudur	320

- ***Perundurai Industrial Park***
  - Total Allotable Area: 2450 Acres (lands alloted: 494.32 Acres).
  - Type of Industries: Engineering, Textile, Tanning, Light Engineering Foundary and allied manufacturing units.
  - Salient features of the Industrial Park: well laid roads, water, power, telecommunication exchange, street lighting, sewerage system, com treatment plant for textiles, processing industries etc.
  - **Cost of Land: Rs. 150/ Sq. m**

- ***Nandgaon Peth-The Industrial Park***
  - Objective: a five star industrial area.
  - Total Allotable Area: 2809.78 Hectares (Chemical Zone: 500 Hectares).
  - Zoning: it is proposed to develop various zones viz. Engineering Zone, Chemical Zone, Commercial Institutional and Garment Zone, Food Products & Pharmaceutical Zone.
  - Water: water supply scheme is already completed and potable standard water 25000m3 is available.
  - Roads: main roads of 60 m land width with 4 lanes, internal roads with land width 30m; all roads are asphalted for approaches to plots.
  - Power Supply: MSEB is ready to give power connections on demand by the plot holders.
  - Telephones: plot demarcated for telephone exchange; telephone deptt. Shall commission the exchange with a minimum application of 50 nos.
  - Street Lights: all main and internal roads are provided with 150 W HPSV.
  - Common Facility Center (C.F.C.): this will accommodate post office, bank, dispensary, MIDC office, MSEB office, canteen, STD-PCO, hotels, weigh bridges and other commercial establishments.
  - Single Window Scheme: provides point assistance for all clearances related to Govt. departments (MSEB, MSFC, MIDC, SICOM, MPCB, etc.).
  - **Cost of Land: Rs. 100/ Sq. mt (Rs. 50/ Sq. m for rest of the area).**

- ***Ranjangaon Park***
  - Objective: promotion of industrial growth and foreign direct investment.
  - MIDC Investment: Rs. 130 Crores.
  - Water: 24 hrs. water supply supplying 13.8 msd. Water in first phase; MIDC investment: Rs. 15 Crores.
  - Roads: main roads of 60 m land width, internal roads with land width 30m; all roads are built by international standards.
  - Power Supply: a 100 MW, 220 KV substation provides uninterrupted power supply.

- Communication: a dedicated electronic telephone exchange with 360 lines and 512 PC-DOT with ISDN facility.
- Street Lights: the entire area is lit up by 2,000 street lights, which are fully operational.
- CETP: is under construction, an underground drainage collection and disposal system has already been installed.
- Residential Facilities: a 160 Hectares residential area is reserved.
- Support Facilities: this will accommodate post office, bank, dispensary, fire station, truck terminus, hotels, executive hostels and a single window office.
- **Cost of Land: Rs. 450/ sq. mt.**
  The land price in Ranjangaon Park is high and industries are investment in this estate because of the location advantage of Pune and Proximity of Mumbai. The kind of social and physical infrastructure that is in place in these areas is an advantage enough for the industries to pay the higher price.

Facilities at Proposed Estate

- Assured water and power supply
- Well-developed infrastructure with connectivity to the Kandla Port.
- Communication, Internet, logistics management etc. available
- Social infrastructure available in Gandhidham
- Industry owned CETP with tertiary treatment and disposal into deep sea.
- A limited Steam network depending upon steam availability from power plant (the main user of the steam is the desalination plant)
- Cleaner Production center
- State-of-the-art testing laboratories
- Fire-fighting facilities for estate.
- Industrial symbiosis can also be achieved with mutual co-operation of the industries

7.8 SENSITIVITY ANALYSIS

The sensitivity of land price to changes in the capital cost is shown in the following table. The analysis has been on assumption that the water price is Rs. 30 /KL and power price is Rs. 4 per unit.

Table 7- 7 Sensitivity of Estate Land Prices to change in Capital Cost

Original Land Price	Change in Capital Cost	Land Price	% change
761	-5%	675	-11%
761	-10%	588	-23%
761	-15%	502	-34%
761	5%	848	11%
761	10%	934	23%
761	15%	1021	34%

The rate of change in the land price is approximately two times the rate of change of capital investment.

7.9 IMPLICATION OF ESTATE PRICING ON FEASIBILITY OF INDUSTRY

It is very important to analyze the feasibility of the industry at the above mentioned prices. There are various factors that affect the feasibility of the industry in any market situation. All the factors cannot be considered while analyzing the industry feasibility in the chemical estate.

The factors that have been given prime importance are:

- Land price
- Water price
- Power price
- Additional/ lower cost of transportation because of proximity to port
- Increased capital investment due to cleaner production
- Decreased cost of production due to cleaner production
- Excise duty exemption
- Sales tax incentive

The factors that are also of prime importance but cannot be easily quantified are:

Constraints

- Earthquake prone area
    - Kutch is a level 5 seismic zone and this may increase the cost of the construction
- Proximity to Port
    - Availability of the port at very short distance, this reduces the cost of shipping and inventory cost. This also does away with high cost transportation (on road) of hazardous chemicals. Time sensitive material can be handled very effectively
- Remoteness from major markets
    - Compared to other estates like *Ankleshwar* and *Vapi*, Kutch is perceived to be far off from the major markets in the country.
- Low demand from Industry
    - As the survey results and market condition of the chemical industry shows the industry is not in a growth phase. Most of industries are trying to sustain rather than going for expansion.
- Time availability
    - If the requirements of infrastructure are not met in right time frame then it would be very difficult for the industries to be able to setup their plant and start production. This would result in the estate not being utilized to its optimum capacity and in turn the estate management would not be able to

provide better services. The estate agency could also run into losses, which may result in shutdown of various services.

Positive Factors

- Private Participation
    - The proposed estate would be made available to the industry by the government through private participation. It can be anticipated that the services and infrastructure provided would be better than other estates in Gujarat.
- Specialized Chemical Estate
    - The fully equipped specialized chemical estate would help in efficient operations of chemical industries.

Industry IRR Analysis

The analysis for the industry has been on for 15-year time frame. This has been done to take all incentives into account for the analysis.

According to cash flow analysis the industry can achieve IRR of 16%. When the excise and sales tax benefits are considered, the IRR comes to around 28%. The industry IRR is lower than expectation because of the high prices of land, water and power. However, the industry IRR is better when the effect of sales tax and excise incentives is considered.

7.10 SOCIO-ECONOMIC ANALYSIS

In view of the huge investment and the objective of economic revival of Kutch, an analysis of the socio- economic impacts of setting the Chemical Estate is done.

A main issue is to distinguish between direct and indirect implications. Analysis of direct implications attempts to quantify any measurable result from the project. Programme activities are seen globally. Concerning the indirect implications, proposals pay due attention on the conditions under which Chemical Estate activities can foster their socio-economic impact.

- ***The Development Scenario***

The increased accessibility of the area, influx of laborers from other regions, and shifts from agriculture to industry and from self-employment or unemployment to wage labor, would affect the livelihoods, lifestyles and the quality of life of the local people. At the local level, the different development scenarios would result in similar changes, and are therefore addressed collectively below.

- ***Land Readjustment and Acquisition***

As the proposed site is devoid of any habitation, resettlement would not be required. An important aspect affecting the Estate development would be time taken for Land Acquisition, Compensation and Readjustment if any. It is critical to involve the landowners in the acquisition from the beginning itself to minimize the time taken for the same.

Consultations with the concerned *Talatis* and representatives showed that people are willing to sell the land since the land is mostly barren and wherever cultivation is done, it is un-irrigated and irregular. The land where seasonal agriculture is practices using the sewage water from Gandhidham is not taken as part of the Estate anticipating possible delay in acquisition and high land prices.

Land Readjustment was beyond the scope of the study. It is expected that monetary compensation be given for acquired land.

- ***Demographics and social structure***

Aside from land readjustment and acquisition, the most significant and long-term social implications of the project are likely to involve the influx of people from other regions into the local communities that will result as a consequence of the new employment opportunities generated on and around the Estate. The new members of the communities are likely to increase diversity. But since the residential settlement is expected to be based in Gandhidham, which is already diverse in culture, the new estate and influx of people is not expected to raise many changes in the social structure.

- ***Economic Activity***

The greatest anticipated long-term implications of implementing a development project of the scale of the proposed Estate are associated with indirect employment and income created as the incomes of the labor force and profits from the endeavor are spent and invested on goods, services and activities within the project area. The development of a road infrastructure would improve access to and from the project area and would also be expected to stimulate the development of income generating activities both within and outside the project area.

Quantifying such indirect impacts is beyond the scope of this study. With the new industrial and allied activities, anticipated direct economic impacts would include considerable increases in local incomes. Short-term employment opportunities would be generated for constructing roads, desalination and power plant, industrial and other buildings, landscaping, other facilities etc.

- ***Long-term Employment***

Other than the direct employment created in the industries in various classes, a lot of long term employment would be generated in the service sector. This would be more in logistics management, refreshment sector and Estate servicing. An opportunity exists to strive for gender balances when filling the almost 1,500 skilled and unskilled positions. Women could fill a wide range of the required positions in the industrial and managerial components.

- ***Health Impacts***

The most significant short-term health impacts would involve effects of noise and dust that would directly affect workers involved in land preparation activities. The project developer needs to provide noise and dust protection equipment to the workers to reduce the health effects of this activity. Major Air and Water Pollution impacts are dealt with in detail in IEE.

- ***Contribution to improvements in quality of life addressed***

Employment created in industrial, ancillary and service sector would improve the economic status of the people. Also the facilities created in the Estate would have a multiplier effect opening up new opportunities for the local population. Coming up of townships with better residential and housing facilities along with increase in income and employment would improve the quality of life of the people.

7.11 OTHER BENEFITS EXPECTED FROM THE ESTATE

- ***Industrial Investments:***

  The industries getting good infrastructure and incentives would invest in the chemical estate in Kutch, which implies a direct inflow of finances and thus the vested interests of the industrialists in the Kutch region. The region would thus be rehabilitated by the industries which would become the harbinger of the overall development of the earthquake devastated region.

- ***Impetus to the Local Trade and Commerce:***

  As new industries set up their units in Kutch there will be an increased influx of the industry related people. This would have a positive impact on the local trade and industry viz. new ancillary units, which derive their raw material from these units or some basic chemical manufacturing units. The service industry like hotels and hospitals would also get a boost.

- ***Best Practices:***

  A good setup of infrastructure facilities in the estate in Kutch would attract major industries, which would bring along with the best practices in terms of experience and technology. The new technology would enhance the production facilities bringing thereby the establishment of an efficient industrial estate.

- ***Role Model:***

  With state of the art infrastructure the estate would thus not only be housing some of the prominent industries but would also prove to be a benchmark for other estates. This would set a competitive spirit amongst other estates, which might improve their standards in order to emulate this estate.

- ***Sufficient Water and Power for the industry would equip the region with some basic infrastructure facilities which the region is actually scarce of:***

  An initiative of setting up a CPP and a desalination plant is recommended for the estate. The excess production of both power and water can be utilized to cater to the needs of the local population once the needs of the industries are met.

- ***Impetus to the Import/Export through the ports along the vast coastline:***

  A large number of export oriented units are expected to come up in Kutch. Patronizing one of the ports specifically for the chemical estate can actually boost the imports and exports from it.

- ***Opportunities to Decrease Waste Disposal and Increase Byproduct Reuse and Enhance Pollution Prevention***

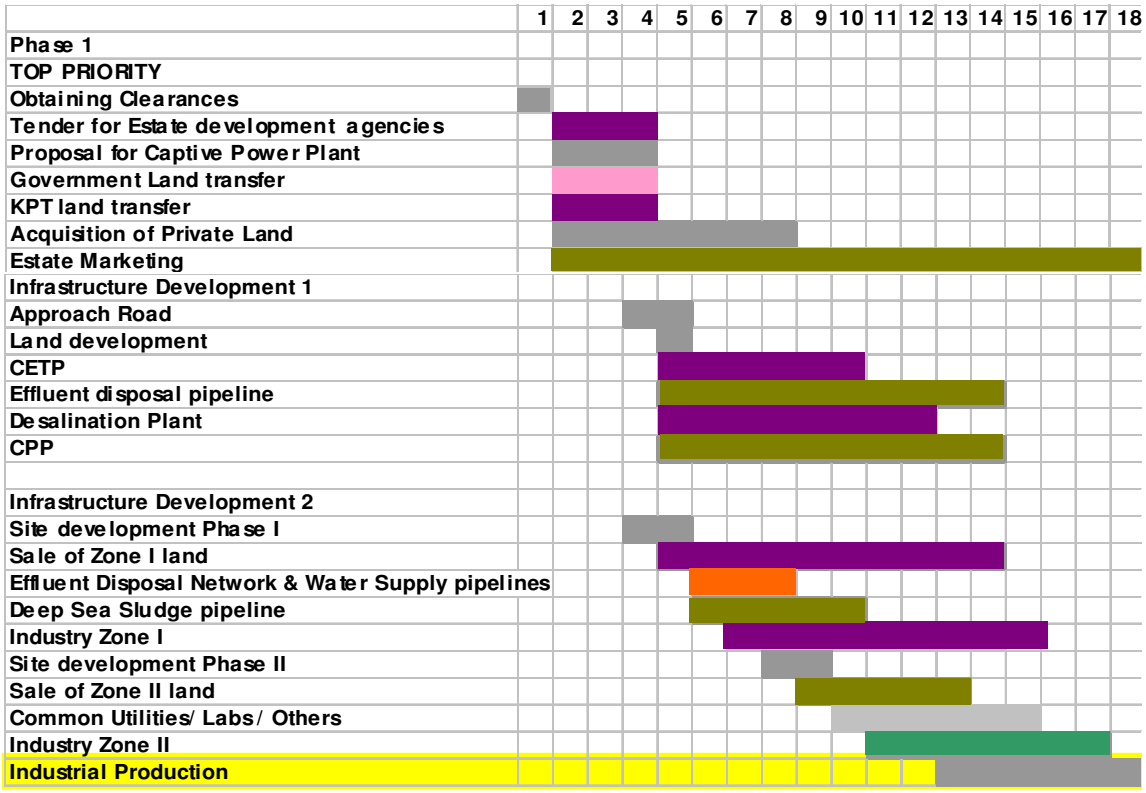
  A recommended methodology of industrial operations within the chemical estate is that of a Chemical Symbiosis wherein using organizational and networking processes, businesses cooperating in an Eco-industrial development project are encouraged to reduce releases of pollution. According to this phenomenon, similar product segment industries would form a cluster and the by-products of one industry may be utilized by the other industry. For example, a pollution prevention strategy, process, or technology for a firm might be made available by a collaborating partner. As another example, Firm A discovers that Firm B's manufacturing process could potentially use one by-product of Firm A, thus closing the loop for that particular waste material.

- ***Impetus to the Salt Industry-***

  The unutilized land for the CRZ can be used for developing salt pans. Further, sludge out of the desalination plant (approx. 5 MLD and 80,000 TDS) can be provided free to poor farmers who in turn can monitor the salt manufacturing. The faster salt recovery from the sludge can double the salt manufacturing causing thereby efficient salt industry set up, providing new employment opportunities and eventually catering to the social benefit accruing to the local inhabitants.

7.12 PROJECT IMPLEMENTATION PLAN

The estate development is bound by several constraints. One of the major constraints is time. Keeping in view the tight time frame availability for various activities, a project implementation has been prepared. The plan takes into the key priority activities that have to be done on urgent basis and then subsequent activities can take place.



The industrial production shall start before the July 31st 2003 deadline to be eligible for the excise exemption.

7.13 SUMMARY AND CONCLUSION

The following section summarizes the scenarios at 20% IRR and Debt equity ratio of 2:1.

Scenario 1: All Different Entities		
Land Price in Rs./Sq. mt.	Water Price in Rs/KL	Power Price in Rs./ Unit
584	67	3.73
Pro		
• Low equity investments for different units • Separate services as separate entities		
Cons		
• Very high water price		
Scenario 2: Single Entity		
Land Price in Rs./Sq. mt.	Water Price in Rs/KL	Power Price in Rs./ Unit
761	30	4.00
Pro		
• Only a single entity to manage all the services • Easy to manage synergy between the power plant and desalination plant		
Cons		
• High equity investment • Very short time frame availability • Power and land price subsidizes the water price		
Scenario 3: Multiple Entities		
Land Price in Rs./Sq. mt.	Water Price in Rs/KL	Power Price in Rs./ Unit
953	30	3.73
Pro		
• No cross subsidizing between the services • Captive Power plant runs as separate business entity		
Cons		
• High equity investment • High land price		
Scenario 4: Phasing of Investment and Land Sale		
Land Price in Rs./Sq. mt.	Water Price in Rs/KL	Power Price in Rs./ Unit
1208	30	4.00
Pro		
• More practical setup time frame		
Cons		
• High land price • Excise benefit to the industry may not be available by the time the estate is setup.		
Scenario 5: Water Supply through GWIL		
Land Price in Rs./Sq. mt.	Water Price in Rs/KL	Power Price in Rs./ Unit
444	30	4.00
Pro		
• Comparatively low land price • Desalination plant not required		
Cons		

• The project would depend upon the GWIL pipeline setup		
Scenario 6: Water Supply through GWIL and Phasing of Investment and Land Sale		
Land Price in Rs./Sq. mt.	Water Price in Rs/KL	Power Price in Rs./ Unit
790	30	4.00
Pro		
• More practical setup time frame • Desalination plant not required		
Cons		
• Excise benefit to the industry may not be available by the time the estate is setup.		

a. Conclusion

- The feasibility of the estate depends upon whether a private developer would be interested in developing the proposed estate. The primary factor that governs the returns to the estate developer is the price at which the land is sold to the industry.

- For a private estate developer, the least cost scenario which meets the deadline for availing incentives is Scenario 2 (Single Entity). The Estate Development Agency would make the following equity investments:

	Rs. Lacs
Estate Development	13974
Equity in CETP	1000
Total	14974

Under this scenario, at 20% return on equity the land price comes to Rs. 761 per sq. mt. and at 15% return (the minimum return expected by an investor) the land price comes to Rs. 537 per sq. mt.

The industry view is that the land price shall be around Rs. 250 / sq. mt. Though only a few respondents are willing to pay in range of Rs. 600 - 800 per sq. mt.

- Scenario 6 (GWIL Water Supply and Phasing) is also relatively low cost scenario. In the interest of Government, this scenario is also better than Scenario 2. Under this scenario, at 20% return on equity the land price comes to Rs. 790 per sq. mt. and at 15% return the land price comes to Rs. 365 per sq. mt.

From investor perspective this scenario would be preferable because of relatively lower investment. However, the major disadvantage under this scenario is that the industry will not be able to avail excise incentives.

The following investments would be required:

	Rs. Lacs
Estate Development	10824
Equity in CETP	1000
Total	11824

- The indicative financial analysis for the industry shows that the returns to the industry are above the average market returns at unit land price of Rs. 761. Therefore no incentives would be required to make the industrial estate proposition more attractive for the industry.

- The scenario 5 (water supply through GWIL) is the least cost scenario from the industry point of view, while maintaining the returns to the investor.

  The following investments would be required:

	Rs. Lacs
Estate Development	10824
Equity in CETP	1000
Total	11824

  However, the major assumption here is that all investment would be made almost immediately and GWIL also supplies in the next one year, both of which seems to be practically impossible to implement.

In view of the above, it seems unlikely that this estate can be developed through private participation at commercial consideration, while also optimizing the benefits of excise and sales tax incentives to the industry.