



IndianOil

INDIAN OIL CORPORATION LIMITED



EXECUTIVE SUMMARY

FOR

**Proposed additional tankages and
Associated facility in IOCL's Oil Terminal
At
Morur village, Sankari Taluk, Salem District,
Tamilnadu- 637302**

SCHEDULE 6(b)

ABC Techno Labs India Private Limited

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(Accredited by NABL, NABET, MoEF)



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I. PROJECT DESCRIPTION

Indian Oil Corporation Limited (IOCL) has a terminal at Sankari for the purpose of receipt, storage and dispatch of petroleum products such as Motor Spirit (MS), High-Speed Diesel (HSD), Superior Kerosene (SKO), Aviation Turbine Fuel (ATF), Ethanol and Biodiesel. The Sankari terminal receives petroleum products (MS, HSD, SKO) through CTMPL pipelines from CPCL refinery, Manali and receives ATF through tank wagon from CPCL & other IOCL refineries. The Ethanol and Biodiesel are received through Road Tankers. The existing storage units consist of different types of aboveground and underground tanks. Dispatch from the installation is done by tank Lorries. Oil receiving terminal with an existing capacity of 65065 KL and now proposes expansion of oil terminal envisages an expansion of storage capacity by the installation of four aboveground storage tanks (1x10592 KL) & (1x12284 KL) for HSD, (1x2301 KL) for Biodiesel, (1x2301 KL) for Ethanol and Conversion of (1x70 KL) makeup sump tank for Ethanol storage. After expansion, the storage capacity will increase to 92638 KL.

NEED FOR THE PROJECT AND ITS IMPORTANCE

Petroleum Industry plays a crucial role in meeting the daily needs of the common man but also contributes significantly towards Industrial and Economic Growth of the Nation. The demand for petroleum products has increased with the urbanization of the places in Tamil Nadu. In order to meet the demand and to meet ministry guideline in 10% ethanol doping criteria, IOCL proposes to increase the storage capacity and associated facility of their existing Sankari terminal.

The proposed project is meant for improving supply position of POL products in the villages and small towns around Salem.

PROJECT LOCATION

The terminal is an area of 63.7803 Acres at Survey Nos. 167, 168, 396, 356, 384, 385, 386, 397, 387 & 169, Morur village, Sankari Taluk, Salem District and Tamilnadu-637302. The latitude-longitude of the terminal is 11°26'19.33"N, 77°52'17.88"E. The Environmental setting of the project site is shown in **Table 1**. The location map of the project is shown in **Figure 1**.

TABLE 1 - ENVIRONMENTAL SETTINGS OF THE PROJECT SITE

S. No.	Particulars	Details
1	Latitude	11°26'19.33"N
2	Longitude	77°52'17.88"E
3	Site Elevation above MSL	263 m
4	Topography	Plain
5	Present land use at the site	Industrial
6	Nearest highway	State Highway - SH-86 (Sankari-Tiruchengodu Road)
7	Nearest railway station	Sankari Durg Railway Station – 0.5 km (N)
8	Nearest airport	Coimbatore International Airport – 101 km (WSW)
9	Nearest town/city	Sankari – 4.5 km (N) Salem – 39 km (NE)
10	Waterbody	Puttala Kuttai Aeri – 4.8 km (NE) Veppadai Lake – 9.7 km (WSW)
11	Nearest Port	Nagapattinam Port – 228.65 km (ESE)
12	Hills / valleys	Sankari hill – 5.1 km towards NNW Tiruchengode hills – 7.92 km towards SSE
13	Archaeologically important places	Tippu Sultan hill fort – 5.1 km towards NNW
14	National Parks / Wildlife Sanctuaries/ Eco-sensitive zones as per Wild Life Protection Act, 1972	Nil in 10km radius
15	Reserved / Protected Forests	Suriyamalai Reserve Forest – 8.5 km (NW)
16	Seismicity	Seismic Zone - III (moderate sensitive seismic Zone) as per IS:1893 (Part 1): 2002
17	Defense Installations	Nil in 10 km radius



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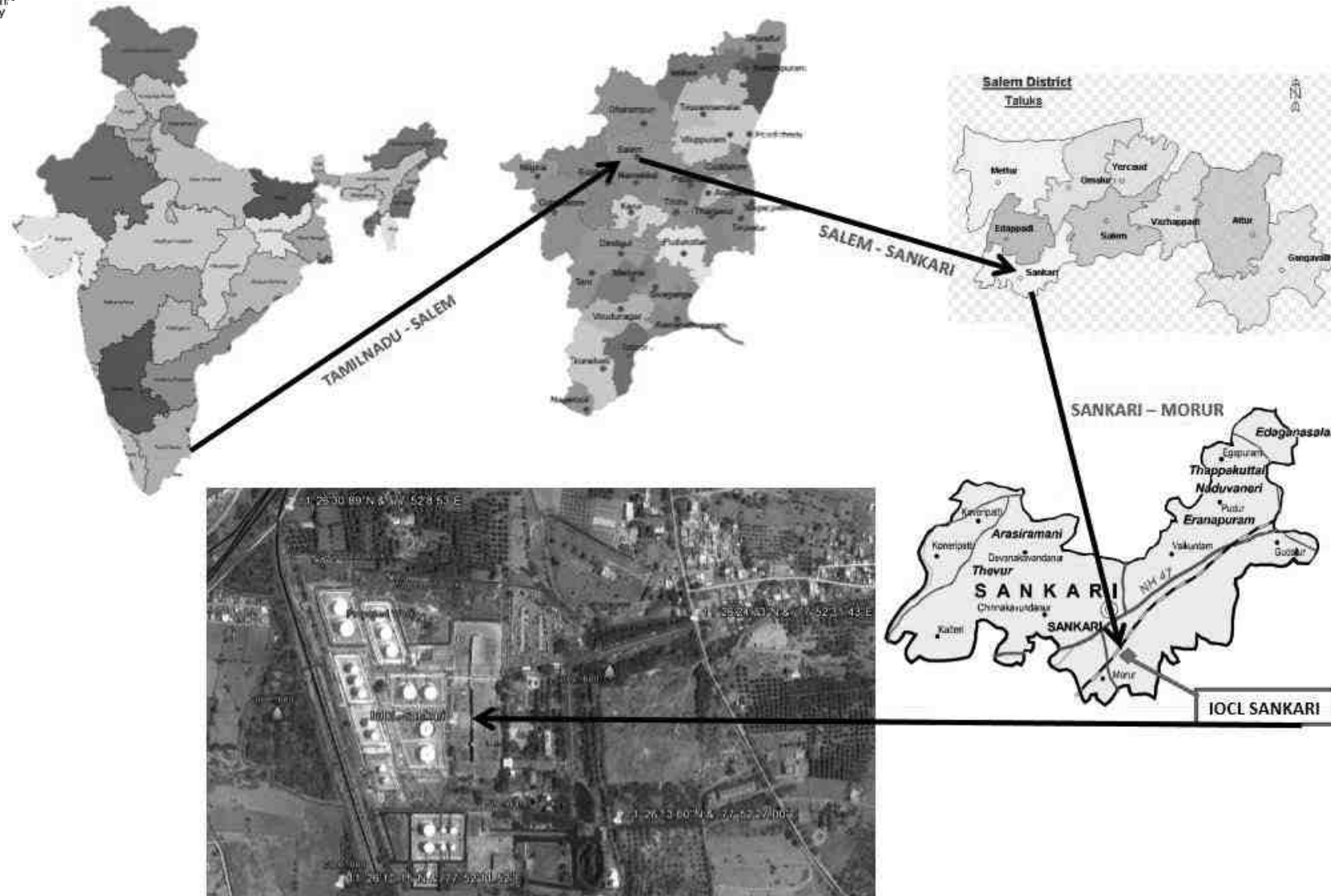


FIGURE 1 - LOCATION MAP OF THE PROJECT SITE

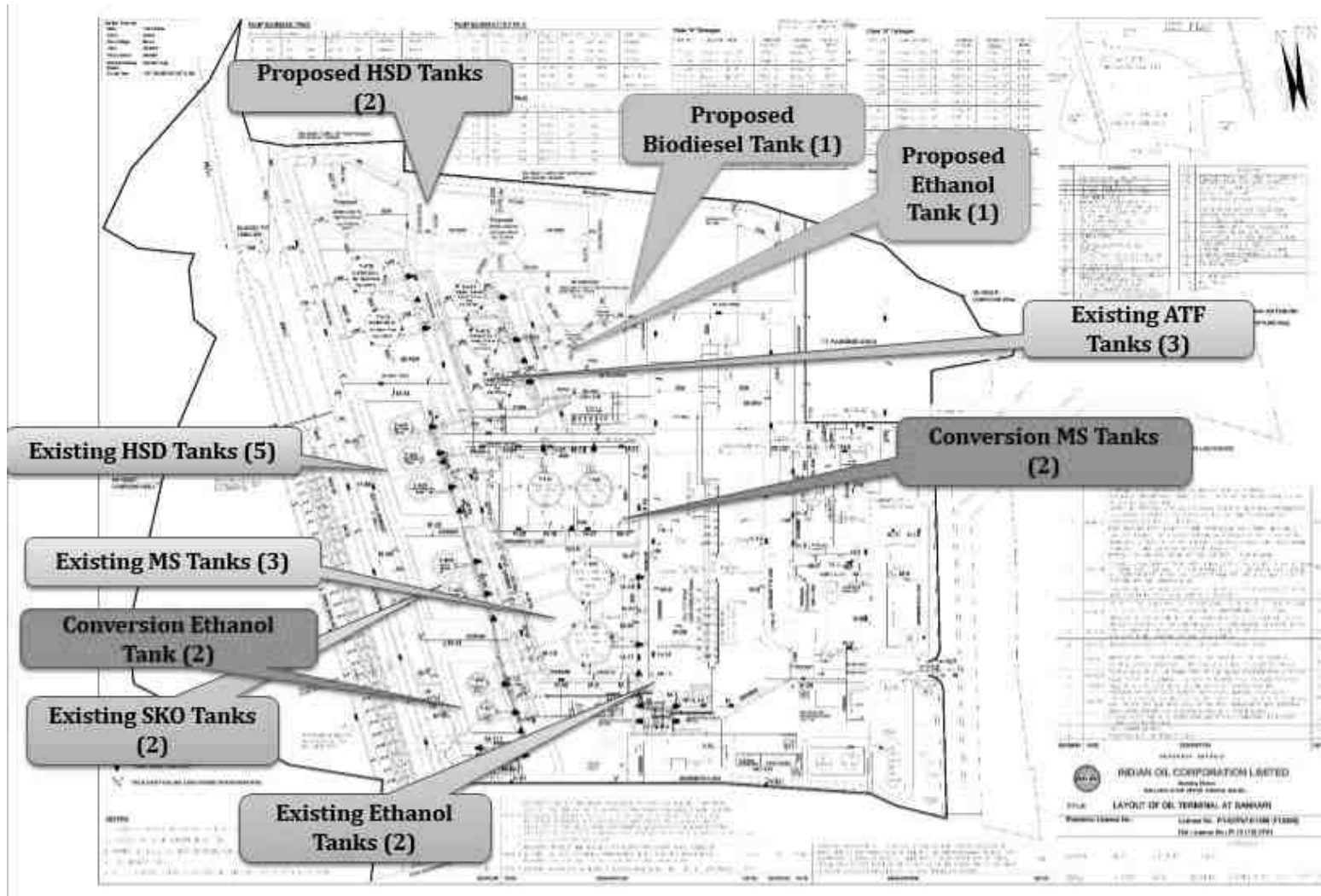


FIG 2 - SITE LAYOUT

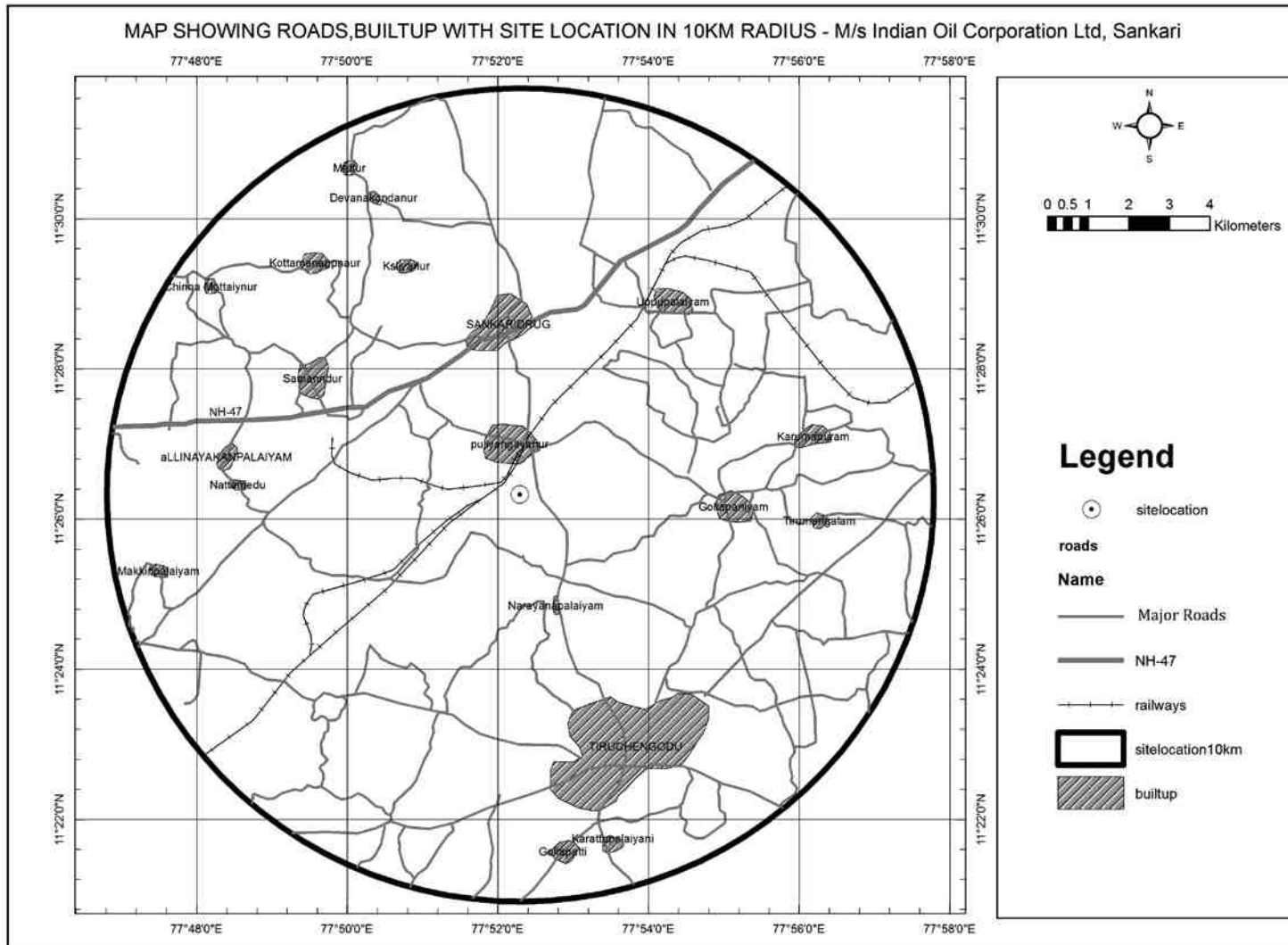


FIGURE 3 - ROAD CONNECTIVITY MAP

MAGNITUDE OF OPERATION

The present storage capacity of Terminal is total 65065 KL. After expansion, the storage capacity will increase by 27573 KL. Aggregate capacity after expansion will be 92638 KL.

Tank Details are given below in **Table 2**.

TABLE 2 - DETAILS OF EXISTING AND PROPOSED TANKS

Tank Sr. No.	Type	Capacity (KL)	Existing	Proposed	Remarks
1	FRVT	7389	MS	-	NO CHANGE (Above Ground Tanks) & P/L Div Transmix tank
2	FRVT	7389	MS	-	
3	FRVT	320	MS	-	
4	HORIZONTAL TANK	70	ETHANOL	-	NO CHANGE (Under Ground Tanks)
5	HORIZONTAL TANK	70			
6	CRVT	3055	SKO	-	NO CHANGE (Above Ground Tanks)
7	CRVT	3055	SKO	-	
8	CRVT	3055	HSD	-	
9	CRVT	3055	HSD	-	
10	CRVT	3055	HSD	-	
11	CRVT	3754	ATF JET-A1	-	
12	CRVT	3754	ATF JET-A1	-	
13	CRVT	3754	ATF JET-A1	-	
14	CRVT	5406	HSD	-	
15	CRVT	5406	HSD	-	
16	IFRVT	936	MS	ETHANOL	IFRVT-MS tank to RETROFITTING OF ALUMINIUM GEODESIC ROOF-ETHANOL TANK
17	IFRVT	936	MS	ETHANOL	
18	CRVT	5303	HSD	MS	CRVT-HSD TANK TO IFRVT-MS TANK
19	CRVT	5303	HSD	MS	
New					
20	CRVT	10592	-	HSD	-
21	CRVT	12284	-	HSD	-
22	CRVT	2301	-	BIODIESEL	-
23	IFRVT	2301	-	ETHANOL	-

Other Tanks					
Tank Sr. No.	Type	Capacity (KL)	Existing	Proposed	Remarks
1	CRVT	2x655 2x2030	Fire water storage Tank	-	Total capacity 5370 KL
2	CRVT	1x2030 1x3517	-	Water Storage Tank	Total capacity 5547 KL
3	Spare / Testing Tanks	70	Makeup sump	ETHANOL	U/G tank will be converted as Ethanol storage Tank
		5	Fast Flush Slop Tank	-	For daily QC Checks of ATF
		20	Trans mix Sump Tank	-	To manage emergency leaks during TT loading / enroute

FRVT - Floating Roof Vertical Tank

CRVT - Cone Roof Vertical Tank

UG - Underground Tank

IFRVT - Internal Floating Roof Vertical Tank

PROCESS DESCRIPTION

The Sankari Terminal at Morur is operated by IOCL. The terminal functions primarily as Petroleum products storage and distribution facility. The terminal operations are categorized as,

1. The Product is received through pipeline/ railway wagons/ tank lorry.
2. Unloading of different products in their designated tanks through TWD Pumps.
3. Storage in Aboveground & Underground Tanks.
4. Loading in Tank Trucks through TLF Pumps.

☐ Terminal Operation Process

1. Receipt of product

The Bulk petroleum products (MS, HSD, & SKO) are received through pipelines from CPCL Refinery, Manali and receives ATF through tank wagon from CPCL & other IOCL refineries. The Ethanol and Biodiesel are received through Road Tankers.

2. Unloading and Storage

Products will be stored in designated above ground and Underground tanks.

3. Loading & Dispatch

Empty Tank Lorries which report to the Terminal are sent to tank lorry filling Gantries. They are filled with loading arms fitted in the gantries. Products come to the loading arm from the products tank through pump provided in the pump house. The quantity filled in the tank lorry is measured by flow meters fitted in the gantry. After Checking the right quantity the tank lorry is sent to retail outlets.

The process flowchart for is shown in **Figure 2**.

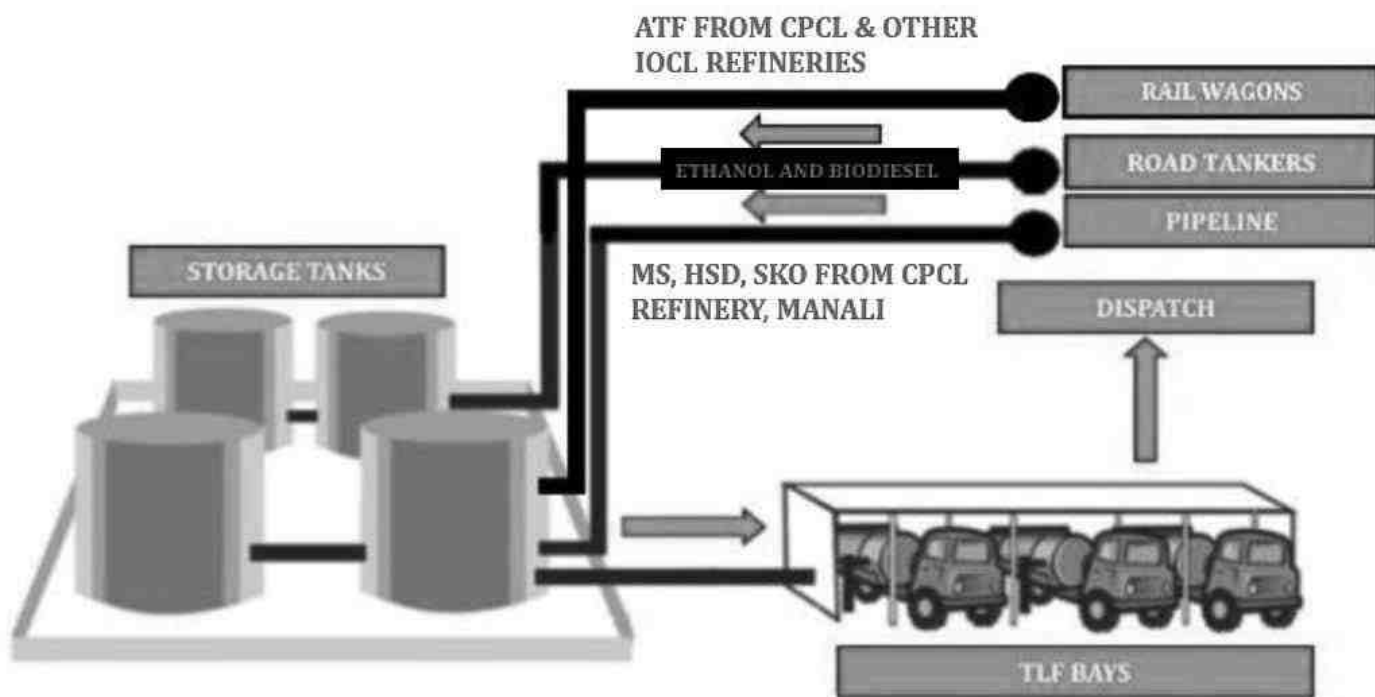


FIGURE 2 - PROCESS FLOW CHART

INFRASTRUCTURE AT THE FACILITY

The lists of equipments and other facilities available at the Terminal are as given in **Table 3**.

TABLE 3 - LIST OF EQUIPMENTS / FACILITIES & NUMBER

Sl.No.	Description	Size (m)
1	TWD PUMP HOUSE	14 X 5 X 5



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Sl.No.	Description	Size (m)
2	TWD MANIFOLD	14 X 12
3	TLF PUMP HOUSE	14 X 5 X 5
4	TLF SHED 10 BAYS	54.15 X 7.88
5	DRAIN MARKED AS BUILT	
6,7 & 23	ADMINISTRATIVE OFFICE, AMENITY & WASH & CHANGE ROOM	42.92 X 9.2
8	FIRE WATER PUMP HOUSE	8 X 7
9	DG. SET.	9 X 7
10	SWITCH ROOM (MCC)	12 X 4
11	DP STRUCTURE	10 X 6
12	FIRE EQUIPMENT STORES	
13 A	GENERAL STORES	
13 B	LAB	
14	OIL WATER SEPARATORS (4NOS.)	
15	DEEP WELL	
16	DEEP WELL PUMP SHED	2 X 1.5 X 3
17 & 19	SCOOTER / CYCLE SHED	2.5 X 33
18	CAR SHED	10 X 5
20	WATCHMAN'S CABIN	5 X 4
21	OBSERVATION TOWERS (4 NOS.)	1.23 SQ
24	OFFICE NEAR SIDING	6.3 X 4
25	S & D BLOCK	10.20 X 5.0
26	P.C. / BILL COUNTER ROOM	8 X 5
27	FIRE WATER TANKS	12 X 18 - 2030 KL
28	FIRE WATER TANK	12 X 18 - 2030 KL
29	BOREWELL PUMPHOUSE	2.35 X 1.8
30	DRIVERS RESTROOM	14.16 X 3.0
31	CAR SHED	20 X 5
32	FIRE PUMPHOUSE (612 KL/HR X 3)	8 X 5.22
34	CHANGE ROOM FOR CWM	6.66 X 5.06
35	BOREWELL PUMP HOUSE	2.35 X 1.80
36	W.C.	1.65 X 1.65
37	LPG CYLINDER BANK ROOM	2.35 X 2.35
38	LADIES TOILET BLOCK	5.78 X 3.98
39	EXTENSION OF VCB ROOM	6 X 4.10
40	TRANSFORMER YARD - 1250 KVA	
41	ELECTRICAL METER ROOM	3.54 X 3.54
42	SURPRISE CHECK PLATFORM	1.5 X 4.0
43	OIL WATER SEPARATOR	
44	CONTROL BUILDING	
46	DG FOR LIGHTING	
47A	DG SETS	
47B	PMCC	

PROJECT COST

The total project cost for the proposed expansion is around **Rs. 2811 Lakhs**.

II. DESCRIPTION OF THE ENVIRONMENT

Primary baseline environmental monitoring studies were conducted during March 2018 to May 2018 and details are as follows:

Meteorology - The predominant wind direction during the study period was from Southeast to Northwest direction with average wind speed of 2.16 m/s. Maximum relative humidity is around 75%. The minimum temperature recorded is 19°C while maximum temperature is 37.8°C.

Air Environment- The maximum and minimum concentrations of PM₁₀ were recorded as 72.5 µg/m³ and 48.2 µg/m³ respectively. The maximum concentration was recorded at the Project Site and the minimum concentration was recorded at Kumaresapuram. The maximum and minimum concentrations for PM_{2.5} were recorded as 36.9 µg/m³ and 21.8 µg/m³ respectively. The maximum concentration was recorded at the Project site and the minimum concentration was recorded at Project site and Varapalayam. The maximum and minimum SO₂ concentrations were recorded as 14.1 µg/m³ and 7.11. The maximum and minimum concentration was recorded at Project Site. The maximum and minimum NO_x concentrations were recorded as 21.8 µg/m³ and 12.9 µg/m³. The maximum and minimum CO concentrations were recorded as 0.52 mg/m³ and BDL (<0.1) mg/m³. The concentrations of PM₁₀, PM_{2.5}, SO₂, NO_x, CO, Lead & Total Hydrocarbon are observed to be well within the standards prescribed by Central Pollution Control Board (CPCB) for Industrial, Rural, Residential and Other area.

Noise Environment - Noise levels during day time were found to be in the range 48.3 to 54.1 dB (A). Noise levels observed to be in the range 41.6 to 47.6 dB (A) during the night time. Measured noise levels are observed to be in compliance with prescribed standards for ambient noise for the respective applicable categories.

Water Environment :

Ground Water: The analysis of groundwater results indicate that the average pH ranges in between 6.93 to 8.17, TDS ranges from 401 mg/l - 658 mg/l and GW3, GW5, GW6, GW8 where found to be beyond acceptable limits. Total Hardness ranges from 196 mg/l - 359 mg/l and GW1 and GW2 are found to be within acceptable limit, iron content ranges from

BDL(<0.05) – 0.27 mg/l, nitrate content ranges from 7 mg /l – 35 mg/l was observed.

Surface Water: The analysis of Surface water results indicate that the average pH ranges in between 8.03 – 8.22, TDS ranges from 92 mg/l - 126 mg/l, Total Hardness ranges from 58 mg/l – 74 mg/l, DO ranges from 6.2 mg/l – 6.4 mg/l was observed.

Soil Environment: The soil results were compared with soil standards. It has been observed that the pH of the soil was ranging from 7.55 to 8.29 indicating the soils are basic in nature. The conductivity of the soil ranges from 0.077 to 0.217 mS/cm. Since the EC value is less than 2000 μ S/cm, the soil is said to be Nonsaline in nature. The texture of the soil sample is predominantly clayey. Soil organic content varied from 0.78 to 1.24 % which indicates the very low level of organic matter. The available nitrogen content ranges between 299 to 483 mg/kg in the locality and the value of phosphorus content varies between 26.9 to 49.6 mg/kg. This indicates that the soil has very high quantities of Nitrogen and Phosphorus. The potassium content varies from 198 to 385 mg/kg which indicates that the soils have high quantities of potassium. From the above observations, it was found that the soil in the Study area shows moderate fertility.

Ecological Environment: There is no Wildlife Sanctuary / National Park found in the study area. There are no endemic and endangered species of flora and fauna within the study region.

Socio-Economic Environment: As per 2011 census, the study area had a population of 3,482,056. The literacy level of the study area is 72.86%. As per 2011 census records, altogether the main workers works out to be 44.83% of the total population. The marginal workers constitute to 3.82% of the total population respectively.

III. ANTICIPATED ENVIRONMENTAL IMPACTS & MITIGATION MEASURES

Ambient Air Environment - Industry operation involves receipt, storage and distribution of petroleum products only. No Manufacturing is involved and hence, no significant emissions will be there from the proposed expansion project except DG sets, which are used during power failure only. The adequate height of stacks and acoustic enclosure will be provided to DG sets as per guidelines of CPCB to facilitate the dispersion of flue gases into the atmosphere.

Impact on Water Environment - No effluent shall be generated because no industrial process is involved, as it is a receipt, storage and dispatch of petroleum products



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terminal. Domestic sewage will be treated through septic tank followed with soak pits. Oily wastewater will be treated in the Oil Water Separator (OWS). Oil water separator shall be in place and to be connected to tank-farm, TLF Gantry and Pump house. No wastewater will be discharged outside the premises.

Impact on Ambient Noise Environment - The source of noise generation within the terminal are DG sets operation and vehicular traffic. DG sets are fitted with acoustic enclosures and will be operated during power shutdown. Greenbelt has been developed around the terminal, which works as a noise barrier for noise.

Solid and Hazardous Waste Generation - Municipal solid waste and canteen waste generated from IOCL terminal will be treated through the proposed Organic Waste Converter (OWC). Oily Sludge generated during tank cleaning in every five years will be treated through Bioremediation method. Other hazardous wastes like spent batteries, waste oil, empty drums of oil/chemicals, fluorescent tubing etc. are disposed of in accordance with approved safe procedures.

Details on Fire Protection System and Safety Measures - Fire Fighting Facilities provided in the plant are based on the accepted requirements stipulated in OISD-STD-117.

Fire Fighting Facilities

- 1) Fire Water Tanks 6 Nos. with storage capacity (2 X 2030KL, 2 X 655KL, 1 X 2030 & 1 X 3517 KL) 10917 KL (For 4 Hour Firefighting) for handling Double Contingency.
- 2) Fire Engines 3 Nos. each having capacity of 616 m³/hour (Diesel driven- 3).
- 3) Jockey pumps 2 Nos. each having capacity of 180 m³/hr (Electrical driven).
- 4) Fire Hydrant System
- 5) Hydrant monitor / double headed hydrant point are located at the Terminal covered by hydrant system with alternate monitor and double headed hydrant point. (Total: 66 nos)
- 6) Sprinkler system on each tank 401, 402, 403, 404, 405, 406, 407, 408, 409 & 410.
- 7) Medium Expansion Foam Generator is provided for MS tanks 401, 402, 409, 410 (front & back).

Fire Protection System

- 1) Tank sprinkler system.

- 2) Manual Call Point MCP (26 nos.) installed in all Strategic locations.
- 3) Foam pourer system.
- 4) Fire Fighting Trolley and Emergency Kit trolley available.

Impact on Socioeconomic Environment - Existing IOCL Terminal after expansion shall meet increased demand for Petroleum products in nearby districts in Tamil Nadu. It will have a positive impact on the socio-economic conditions of the area.

IV. ENVIRONMENTAL MONITORING PROGRAMME

Environmental monitoring plan for operation phases of the proposed expansion of Sankari terminal has been prepared to ensure efficiency of implemented mitigation measures. In order to implement the proposed environmental management program efficiently within the organization, periodical monitoring as per statutory guidelines and mid-course corrections/actions, the environmental cell is established for successful implementation of the monitoring plan.

V. BENEFITS OF PROPOSED EXPANSION

The project will improve supply position of the Petroleum products in Tamil Nadu, which is vital for economic growth as well as improving the quality of life. The improved petroleum supply will have strong logistical support for delivering the products to customers at better quality and better price. Availability of product in the vicinity of demand location will be reduced price. Delivery distance by tankers which in turn will reduce trucks on the road reducing the vehicular load on the already strained public roads, thereby reducing the noise pollution as well as air pollution at local levels and also reduced the probability of accidents on the roads due to less movement of tank trucks. Establishment of large developmental projects improves the availability of the physical infrastructures like approach roads, drainage, communication and transportation facilities etc.

VI. ENVIRONMENT MANAGEMENT PLAN

Air Environment Management - Adequate greenbelt has been developed within the existing terminal to mitigate the air and noise pollution arising due to movement of

vehicles at the existing terminal. Regular monitoring of DG stack and ambient air quality monitoring will be carried out.

Water Environment Management - Domestic sewage generated from the terminal will be treated through septic tank and soak pits. Oily wastewater will be treated in the Oil Water Separator (OWS). No wastewater will be discharged outside the premises.

Noise Environment Management - The source of noise generation within the terminal are DG sets operation and vehicular traffic. DG sets are fitted with acoustic enclosures. Greenbelt has been developed around the terminal, which works as a noise barrier.

Solid & Hazardous Waste Management - Municipal solid waste generated at the terminal will be treated through Organic Waste Converter. Oily Sludge is generated during tank cleaning in every five years. It is disposed of through bioremediation method. Other hazardous wastes like spent batteries, waste oil, empty drums of oil/chemicals, fluorescent tubing etc. are disposed of in accordance with approved safe procedures.

GREENBELT DEVELOPMENT

The terminal has a well-developed greenbelt area of about 33% in the total plot area.

RISK ASSESSMENT AND DISASTER MANAGEMENT PLAN

Hazard Identification, Risk Assessment and Disaster Management Plan of existing terminal at Sankari have been carried to ensure acceptability of the on-site and off-site risk exposures as per Petroleum & Natural Gas Regulatory Board (PNGRB) guidelines.

ENVIRONMENTAL MANAGEMENT PLAN BUDGET - The budget for implementation of mitigation measures and environmental management plan to mitigate the potential adverse environmental impacts during operation phase has been estimated as capital cost Rs. 64 Lakhs and recurring expenditure as Rs. 7 Lakhs.

CORPORATE ENVIRONMENTAL RESPONSIBILITY - As per OM F.No.22-65/2017-**IA.III**, IOCL will follow the Corporate Environmental Responsibility (CER) and spend 1.0% of Investment which is 28.11 Lacs.

The proposed activities under CER are

1. Furniture for student desk 126 numbers and benches 126 for the class room
(Govt. hr. sec school, Verllariveli, idappadi -TK Salem)
2. Renovation of old toilet block 2 no's
 - Overhead sintex tank of 1000 liters capacity
 - Replacement of cement floor and side walls with tiles

VII. CONCLUSION

The Proposed expansion project has a certain level of marginal impacts on the local environment. However, the proposed expansion project has significant beneficial impact/effects in terms of providing temporary employment opportunity and various CSR activities. The conclusions of EIA are: The proposed expansion project meets the compliance requirements of various environmental regulations; Adoption of environmental friendly best management practices results minimizing the impacts on the environment; and Community impacts of the project will be beneficial, as the project will generate significant economic benefits for the region. Thus, it can be concluded that with the judicious and proper implementation of the pollution control and mitigation measures, the proposed expansion project will be beneficial to the society and will contribute to the economic development of the region in particular and country in general.