Executive Summary

For

PROPOSED EXPANSION OF ISOLATED STORAGE TERMINAL WITH ADDITIONAL STORAGE TANKS FOR 90,070 KL HSD; 24,000 KL MS; 70 KL SKO; 140 KL Ethanol; 400 KL Biodiesel & 24,000 KL ATF

At

IOCL-SOLAPUR DEPOT, Nr. PAKNI RAILWAY STATION, VILLAGE PAKNI, TALUKA SOLAPUR (N), DISTRICT-SOLAPUR, MAHARASHTRA

Land/Plot Area: 372311 m^2 (92 Acres)

Storage Capacity: 160985 KL for 31 tanks (total; after Expansion)

[Unique No: 0000000451 Dated: 15-07-2017]
[Study Period: March 2017 to May 2017]

[Schedule 6 (b) Category–"B" as per EIA Notification 2006, amended till date]

APPLICANT

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1.1 INTRODUCTION

Indian Oil Corporation Limited (IOCL) proposes for an installation of new storage tanks thereby expanding fuel storage capacity of High Speed Diesel (HSD), Motor Spirit (MS), Superior Kerosene Oil (SKO), Ethanol, Biodiesel and Aviation Turbine Fuel (ATF) at Solapur Depot, Village:Pakni, Tehsil: North Solapur, District: Solapur, Maharashtra.

1.2 PROJECT DESCRIPTION

The project is classified as Category "B" project. The proposed project falls under Schedule Project activity Service Sector, "6 (b)-Isolated storage & handling of hazardous chemicals (as per threshold planning quantity indicated in column 3 of schedule 2 & 3 of MSIHC Rules 1989 amended 2000)" as per EIA Notification 2006, as amended till date.

1.2.1 Proposed Project

Currently, Solapur depot has cumulative storage capacity of on 22,305 KL for HSD, MS, SKO and Ethanol. Proposed expansion will increase storage capacity of Solapur depot by 1,38,680 KL i.e. total cumulative storage capacity will be 1,60,985 KL.

Out of total 14 existing tanks, 8 tanks will be converted and 6 tanks will remain same. Additional 17 tanks will be installed.

Existing Tanks Details

- High Speed Diesel (HSD) : 3 x 4011 KL & 2 x 2301 KL tanks
- Motor Spirit (MS) : 2 x 510 KL tanks & 1 x 350 KL tank
- Superior Kerosene Oil (SKO) : 2 x 2030 KL tanks
- Ethanol : 2 x 50 KL & 2 x 70 KL tanks

Proposed Tank Details

- High Speed Diesel (HSD) : 3 × 30000 KL tanks & 1 × 70 KL tank
- Motor Spirit (MS) : 4 × 6000 KL tanks
- Superior Kerosene Oil (SKO) : 1 × 70 KL tanks
- Ethanol : 2 × 70 KL tanks
- Biodiesel : 2 × 200 KL
- ATF : 4 × 6000 KL

After proposed expansion, total capacity will be **160985 KL** for **31 tanks**. The brief description of the project is given in ***Table 1.***

Table 1: Project Description

S. No.	Details	Description
General Description		
1	Nature	Isolated Storage and Handling of Hazardous Chemicals (as per threshold planning quantity indicated in column 3 of schedule

S. No.	Details	Description
		2 & 3 of MSIHC Rules 1989 amended 2000)
2	Product	Storage Tanks for HSD, MS, SKO, Ethanol, Biodiesel and ATF
3	Location	Survey No.: 292/1, 272, 266/1, 288/2/1, 276, 451/2, 451/1, 294, 452, 273, 274,291 & 275 Village Pakni, Tehsil: North Solapur, District: Solapur, Maharashtra
4	Coordinates	17°43'46.99"N/ 75°46'54.09"E (center of the site)
5	Total Plot Area	372311 m^2 (92 Acres)
6	Cost of the project	~INR 380 Cr
Utilities		
1	Power	1350 KW, sourced from MSEB for proposed Two DG set proposed of 750 KVA (emergency power on need basis)
2	HSD	~80 Liters/Hour for proposed DG set, only during emergency
3	Water	Water Requirement :3.25 KLD S Source: Bore well
4	Fire Fighting	57 Nos. Water Monitors, 53 Nos. Double Headed hydrants, no. of Trolley Mounted variable flow High Velocity Long Range (HVLR) Water-cum-Foam monitor, and 1 no. of Trolley mounted Water-cum-Foam are already provided

1.2.2 Process Description

Operation Philosophy, at present, can broadly divided into 3 parts viz.,

- Receipt of Material
- Storage of Material
- Dispatch of Material

These products are received through local dedicated Pipeline from Ex HPCL to Solapur Depot and through Railway Tank Wagons from Ex IOC's Gujarat Refinery, Koyali, EOL's Jamnagar Refinery, RIL's Jamnagar Refinery, HPCL Loni Terminal and distribution of these products are by road tankers to different consumers.

There are 8 bays in TLF which are used for dispatch of MS and HSD. There is also proposal for construction of two additional TLF with 8 bays each and hence loading and dispatch rate of material will considerably be increased

Present activities at Depot

- Tank Lorry Loading - MS, HSD
- Tank Lorry Unloading : MS, HSD, Ethanol
- Rail wagon loading: Nil
- Rail wagon unloading: MS, HSD
- Inter tank transfer
- Tank Water Draining Operation
- Sampling of Product from Tank after every receipt
- Emptying out of Tank at fixed interval for Maintenance/ Cleaning for Quality Control adherence
- Opening of Strainers for Cleaning of Strainer's Filters at fixed interval.

- Maintenance and Repair of various Equipments Viz. Pumps, Motors, Fire Engines, Air Compressors etc.

1.2.3 Infrastructure

The infrastructure includes Tank Farm areas, Dyke areas, Fire Fighting facilities, Weighbridges, TLF Bay, Rail tracks, Sheds, Administrative building, Canteen, Parking area Security cabin, utility area etc.

1.2.4 Air Emissions & Control

- It's being a storage facility there is no process stack in existing as well as proposed project.
- Flue gas stack includes stack attached to D. G set (2 Nos.) and Fire Water Engine stacks (7 Nos.). The flue gases will be predicted having pollutants like PM_{10}, SO_2 and NO_X.
- DG sets and fire water engines will be installed with stacks of adequate height, which will be operated during power failure and during emergency only.

1.2.5 Noise

Noise generation sources are: DG Sets and vehicular movement for transportation of product.

1.2.6 Wastewater treatment & Disposal

- The waste water will be generated from the domestic uses only which will be disposed off into Soak pit.

1.2.7 Hazardous & Other Solid Waste

- Hazardous Waste: Used Oil, Tank Cleaning Sludge and Diesel Filters will be generated. Used oil will be reused in lubrications of valve and Tank Cleaning Sludge will be Disposed through bio remediation process and Diesel Filters will be given to recyclers/Scrape vendors.
- Domestic Solid Waste: Paper waste will be handed over to scrap dealers and waste will be sent to nearest municipal waste collection site.
- Small amount of e-waste and scrap will be handed over to authorized scrap dealers.

1.3 DECRIPTION OF THE ENVIRONMENT

1.3.1 Study Period, Area & Monitoring/Sampling Locations

The baseline environmental study has been conducted for the study area of 10 Km radial distance from site for the period March to May – 2017.

Total eight ambient air samples, groundwater samples and four soil samples were collected. Noise monitoring was carried out at eight different locations. Surface water samples were not collected since water bodies falling in study area were dried up during study period.

1.3.2 Land Use and Land Cover

Land use of study area is classified as Fallow land (30.50%), Agricultural Land (2.25%), Barren Land (9.59%), Open Scrub (9.82%), Dry River with Channel (45.3%) & habitation (2.53%).

1.3.3 Air Monitoring Meteorology

Micrometeorological data were collected by using the weather station as per CPCB guideline which was installed near project site. Following are the observations:

- Minimum temperature was recorded 18.7°C in April, 2017 and maximum temperature was recorded as 43°C in May 2017.
- Hourly data for humidity were collected and humidity in the range of 12 % to 88%
- Minimum and maximum wind speed data varies in the range of 0.0 to 15.1 km/h during study period. Maximum wind velocity was in the month of May 2017.

1.3.4 Ambient Air Quality

The broad findings of the ambient air quality monitoring are:

- The maximum concentration of PM_{10} is found within the standard at all locations and the values are in the range of 75.1 - 89.3 µg/m^3. Whereas, the average concentration values are found in the range between 67.6 – 82.5 µg/m^3.
- The maximum concentration of $PM_{2.5}$ is found in the range of 36.0-49.0 µg/m^3 and the concentration values are found within the standard. The concentration of $PM_{2.5}$ is higher at Chincholikati village than the project site and other 6 monitoring stations. The average concentration is found in the range of 32.2 – 46.0 µg/m^3.
- The maximum concentration for SO_2 is observed in the range of 11.9-15.8 µg/m^3.
- CO concentration values in ambient air are found within the standard.

1.3.5 Noise Level

- Maximum noise level was recorded 83.5 dB during day time at near road (N5) while maximum noise level was recorded 75 dB during night time at near road (N5) which is well within the limit for Industrial zone.
- Equivalent noise level taken from all the villages also meet with the norms for residential area as per the Noise criteria given by the MoEF & CC, 2009.

1.3.6 Traffic Survey

Based on LOS value; the current scenario on National Highway - 204 is good. The available assimilative capacity of National Highways is 20% for more PCU to be added in the existing traffic scenario.

1.3.7 Soil Quality

Based on soil analysis data it is concluded that soils are normal from salinity view point, but sodic as ESP is > 15 at the project site. The soils are low in nitrogen, phosphorus and potassium. The levels of total Fe, Cu, Cr, B and Zn are within the limits. However, for

successful greenbelt development liberal quantity of organic manure (50 tons/ha) and double the quantity of recommended doses of N, P and K fertilizers should be applied. The soil at the project site requires amelioration. Apply acid forming amendments like Sulphur/Iron pyrite for removal of excess sodium from the exchange complex with provision of adequate drainage. The soil should be periodically monitored for EC, pH and ESP.

1.3.8 Groundwater Quality

The test results were compared with the Drinking Water Specification: IS: 10500, 1992 (Reaffirmed 2012) and it is summarized as under:

- The TDS is above permissible limit in the Village Chincholikati (GW4), while it is above desirable limit in all other samples.
- Total Hardness is above permissible limit in Chincholikati (GW4), Hiraj (GW5), Kondi (GW6), Pophali (GW7) and Drfal (GW8) and above desirable limit in all other samples.
- Total Alklinity is above permissible limit in Chincholikati (GW4), Hiraj (GW5), Kondi (GW6) and Pophali (GW7) and above desirable limit in all other villages.
- Magnesium is above permissible limit in Chincholikati (GW4) village sample.
- Total Nitrogen is found to be very high above permissible limit in all the samples
- The higher value of Total Hardness and Total Alkalinity found into study area may be due to the hydrogeological setup of the study area and inherent salinity of aquifer.

1.3.9 Surface water

Surface water samples were not collected since all the surface water bodies were dried up during study period.

1.3.10 Ecology and Biodiversity

Project Site / Core Zone:

The proposed project site is located within the existing premises. The flora reported at project site includes Limb, Morpankh, Pimpad, Ashoka, Amba, Badam and Jangle.

Buffer Zone/Study area:

- Floral diversity:

Trees: Dhawada, Dhupali, Bahawa, Apta, Amla, Hirda, Moho, Nimb, Khair, Maharuk, Badam, Umbar, AMrood, Nilgiri, Jambhul etc.

Shrubs: Amboni, Henkal, Tantani, Tarwad, Palsvel, Chillar, Vikankar, Bor, Nirgundi, Karen etc.

Herbs: Darudi, Karadia, Anghedi, Barmasi, Marchi, Bhrami, Tali, Methi etc.

- Faunal Diversity:

Mammals: Noria, Khiskoli, Rat, Mouse and Blue Bull

*Bird*s: Red-wattled lapwing, Yellow-wattled lapwing, Little ringed plover, Indian Treepie, Blue rock pigeon, Indian ring dove, Spotted dove, Black winged kite etc.

Reptiles: Common garden lizard, Roux's fores lizard, Fan-throated lizard, Indian chameleon, Indian cobra, Russell viper.

1.3.11 Socio Economy

The summary of the social survey, as per 2011 census, for the study area is provided as below:

Population Structure

- Total population of the study area was 73518 out of which male population was 38449 (52%) and female population was 35069 (48%).
- Total number of households was 14937 with average occupancy of 4.92 persons per household and overall population density was 250 persons/ Km^2.
- Sex ratio (number of females per 1000 males) of total population was 912. Among child population, sex ratio was 823.

Literacy

- Overall literate population was 48761 (66%) and illiterate population was 24757 (34%)
- Out of total literates, male literates were 28101 (58%) and female literates were 20660 (42%)
- Out of total illiterates, male illiterates were 10348 (42%) and female illiterates were 14409 (58%)
- Literacy rate were very low in the study area. Female illiterate were mostly found.

Occupational Pattern

- Total worker population in the study area was 32134 (44%).
- Main workers were 29854 (41%) and marginal workers were 2280 (3%).Total non-working population was 41384 (56%).
- Out of total 29854 main workers in the study area, there were total 9937 cultivators (33%), 11203 agricultural workers (38%), 541 household industry workers (2%) and other workers 8173 (27%).

1.4 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

1.4.1 Air Environment

Dispersion modelling (using “AERMOD” modelling software) was carried out for point source.

This indicates:

- The highest values of incremental increase in pollutants PM_{10}, SO_2, NO_X are 0.78, 3.93 & 3.93 $\mu g/m^3$ at project site respectively.

- While at rest of monitoring stations, PM_{10}, SO_2,NO_X incremental concentration values are found in the range of 0.01-0.27, 0.03-1.35, 0.03-1.35 µg/m^3 respectively.
- The highest resultant concentration values of PM_{10}, SO_2, NO_X are 87.28, 17.93, 36.43 µg/m^3 respectively at project site compared to rest of monitoring stations.
- All values are well within the prescribed NAAQ standards, 2009.

1.4.2 Noise Environment

Due to the proposed activities the noise will be generated from Vehicular movement and heavy fabrication work during construction phase, running of DG set and vehicular movement for products transportation during operation phase. This noise will be very negligible.

Control measures will be provided. These include passive and active controls such as noise barriers (hollow blocks) or acoustic enclosure. Where this is not possible, control measures in the form of use of suitable PPE (ear muffs or ear plugs) will be provided.

1.4.3 Water Environment

Surface Water: The proposed unit does not involve any process and hence generation of industrial effluent is nil. Only domestic wastewater will be generated and will be disposed off into soak pits / septic tanks.

Ground Water: Impact on groundwater environment is envisaged due to project activities like groundwater withdrawal and due leakage or spillage of petroleum products. Mitigation measures suggested are:

- The tank farm area, pump house, loading/unloading areas of plant will be paved, therefore the likelihood of contaminants entering groundwater and harming the same is improbable (i.e. unlikely).
- Separate drains for storm water and will be connected to Oil Water Separator to remove Oil/Grease from storm water if any.
- Rainwater Harvesting and Groundwater Recharge practice is/ will be carried out.
- Flow meters will be provided for raw water consumption.

1.4.4 Land Environment

Proposed project only for an additional storage tank within the existing facility, so there is no additional land requirement. Land clearance will be done leading to removal of top soil which will be used for greenbelt management.

1.4.5 Solid and Hazardous Waste

The debris generated from the excavation and paving of site during construction phase will be used for filling low lying area, while the scraps generated during heavy fabrication will be given to scrap vendors.

During operation phase the hazardous waste generated includes Tank Cleaning Sludge, Diesel Filters and Used Oil. Tank cleaning sludge is Disposed through bio remediation

process, Used oil is reused for valve lubrication and Diesel Filters is send to recycler/ scrap vendors.

1.4.6 Biological Environment

Removal of common site specific floral species from project site will not have significant or permanent impact on the habitat structure of associated faunal diversity.

As there are no process emissions from the Depot and flue gas emission is/ will be regulated and minimal with respect to the specified norms, and with a very healthy greenbelt proposed at the site in the form of several species, it then follows that the biological environment will be protected.

Green Belt Development

The unit is having existing well developed greenbelt area of 122862 square meters (33% of total plot area) within existing site boundary. The number of tees at present is ~800 which includes local tress lile Limb, Morpankhe, Panpad, Ashoka, Amba, Badam and Jangle.

1.4.7 Socio-Economic Environment

While assessing the socio-economic and sociological impact including health impacts to surrounding population, the upcoming project will bring job opportunities for the local people.

1.5 ENVIRONMENTAL MONITORING PLAN

The following will be monitored on a regular basis during operation phase to ensure that a high level of environmental performance is maintained:

- Ambient air monitoring of PM_{10}, $PM_{2.5}$, SO_2, NO_x, HC and CO will be carried out during the operational phase within site premises and nearby villages, location of downwind direction, once every season.
- Groundwater sample from site or nearby location once every season.
- Post project sampling and effect on baseline data generated during construction and operation.
- The general effectiveness of pollution control measures shall also be monitored.

1.6 ADDITIONAL STUDIES

1.6.1 Socio Economic Development Activities

Socio-economic development activities towards community welfare in the field of education, health care services, sanitation, & infrastructure development programs in the study area will be based on the need of the community.

1.6.2 Risk Assessment

Risk Assessment has been analysed using methodology called HIRA-Hazards Identification & Risk Assessment carried out for Storage and Handling of petroleum products like HSD,

MS, SKO and Ethanol. Major hazards identified and related risk involved (impact) during construction phase are mainly related to injuries, fall, burn, accidents etc. of workers. Mitigation measures suggested are by providing proper PPEs and adequate safety measures.

1.6.3 Fire and Hazard

Hazard identified for operation phase is mainly related to storage and handling of petroleum products which involved hazards like fire, blast or both. Proper safety measures will be taken to ensure no spillage will take place during each stage i.e. receipt of material, Storage of material and dispatch of material. Proper handling and storage procedures will be followed to avoid any kind of accidents. Fire fighting facilities like fire hydrant line and fire extinguishers are provided. In addition, HVLR system will be installed for proposed tanks also.

Safety training and mock drills for all workers will be carried out periodically.

Occupational health and Safety

The project does not envisage any activity leading to high noise level still It will be ensured that all workers will wear ear plugs, muffs etc. The project does not envisage conditions that could lead to excess heating. However, it will be ensured that proper ventilation of air will be provided for heat evacuation, drinking water availability at several locations and providing suitable PPEs for handing of heated equipment.

1.7 PROJECT BENEFITS

Due to establishment of the proposed project following benefits are envisaged for the locals and country:

- Impacts due to current mode of transportation (i.e. through Rail Wagons) will be reduced as material transfer will be done through pipeline
- This expansion is also important cater future load to Retail Outlets & Consumers across Solapur, Osmanabad, Nanded, Beed, Latur districts and Government Parties like BSF, Railways & MSRTC‘s and to interstate consumers in Karnataka.
- Additional job creations, temporary and permanent, during construction and operation phase.

1.8 ENVIRONMENTAL MANAGEMENT PLAN

Environmental Management Plan for suggested mitigation measures and monitoring plan will include:

- Review of Compliance of EMP, EC & statutory conditions in the management meeting
- Preparation and timely submission of required statutory reports & Cess
- Proper hazardous waste inventory accounting by HSE department
- Monitoring for reduction in air emissions generation of hazardous waste quantity by concerned department heads as per QMS developed by IOCL

- Reviewing time bound action plan for imparting training to drivers and availability of TREM cards
- Reviewing annual performance of EHS in board meeting.
- An Environmental Management Cell with adequate professional expertise and resources shall be established to discharge responsibilities related to environmental management including statutory compliance, pollution prevention, environmental monitoring, etc.

IOCL-Solapur Depot is/ will have Environmental Management Cell headed by General Manager of MSO and supported by Chief Depot Manager and Depot Safety Officer.

1.9 CONCLUSION

Based on the EIA study conducted in Summer Season of 2017 and as per terms of reference given by SEAC, the following highlights emerge

- There are no Protected Areas, Critically polluted areas, Eco-sensitive areas, Interstate boundaries and international boundaries located in 10 km of study area from the proposed project site.
- There will be negligible pollution potential on air, water and noise environment, which, with the implementation of the mitigation measures and EMP, can be reduced considerably.
- The proposed project activities will have positive beneficial effect on the local population, economic output and other related facilities *viz.* employment, development of business, transportation *etc.*
- Rapid risk assessment including emergency response plan and DMP has been prepared to handle any sort of emergencies.

Looking to the overall project justification, process, pollution potential and pollution prevention measures /technologies installed by proponent, environmental management activities of proponent; the proposed project would be environmentally acceptable, in compliance with environmental legislation and standards.