EXECUTIVE SUMMARY

BACKGROUND

Indian Oil Corporation Limited (IOCL), the project proponent, is one of India's largest PSU Maharatna oil company. IOCL is involved in the refining and retailing of petroleum products. IOCL produces a diverse range of products, from petrochemicals and solvents to aircraft fuel (ATF) and specialty lubricants and markets them through its wide network of Oil Depots, Petrol Stations, Kerosene Dealers, etc. Indian Oil closed the year 2013-14 with a sales turnover of Rs. 4,73,210 crore and profits of 7,019 crore, as compared to 4,47,096 crores recorded in 2012-13 with profits of 5,005 crore.

Indian Oil Corporation Limited has been operating altogether 11 Depots and Terminals spread out across North East. The Present Ramnagar POL Storage Depot commissioned in the year 1987 with a product storage Tankage of 18664 KL was constructed in a land area of 8 acres and with two spur MG Railway siding. With the growth of demand and the 60 days demand coverage in the NE Depots/terminals (as set by the decision taken by the COS vide their Minutes dated 19/11/2010 and document no: 75/2010-CA IV), it has become imperative for building up the required infrastructural facilities complying with the latest OISD safety requirements. After a detailed study of the existing available land in and around the depot and Railways gauge conversion programme from MG to BG, it was decided to resite the existing Depot to Moinarband in the district of Cachar.

The input to the depot shall be obtained from Assam based Refineries namely Digboi Refinery, Guwahati Refinery, Numaligarh Rafinery, Bongaigaon Refinery and also from Outside as per monthly Production and demand plan.

The tankage requirements have been worked out based on the project thruput of 2016-17 for MS/SKO/HSD including the demand for the state of Mizoram considering days cover as projected. On commissioning of the proposed resettlement of existing vairengete depot to Sairang (Aizawl), likely in 2018-19, POL products supplies for Mizoram shall be shifted out an days cover ex- Moinarband depot shall increase. Additionally ATF facilities are proposed for rail input. Considering supplies to the existing AFSs at Kumbhigram, Aizawl and Agartala for avoiding road bridging cost reduction and supply security of ATF product during outage of production in North East refineries. Tankage capacity proposed is as under.

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Product</th>
<th>Thruput 2016-17 (KL)</th>
<th>Thruput 2021-22 (KL)</th>
<th>Proposed tankage (KL)</th>
<th>Type</th>
<th>Days cover 2016-17</th>
<th>Days cover 2021-22</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>MS</td>
<td>80064</td>
<td>47019</td>
<td>5430</td>
<td>IFR</td>
<td>19</td>
<td>32</td>
</tr>
<tr>
<td>2</td>
<td>SKO</td>
<td>85410</td>
<td>38001</td>
<td>7508</td>
<td>CR</td>
<td>27</td>
<td>61</td>
</tr>
<tr>
<td>3</td>
<td>HSD</td>
<td>235334</td>
<td>136457</td>
<td>15016</td>
<td>CR</td>
<td>20</td>
<td>34</td>
</tr>
<tr>
<td>4</td>
<td>ATF</td>
<td>22197</td>
<td>27010</td>
<td>1876</td>
<td>CR</td>
<td>39</td>
<td>32</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>423005</td>
<td>248478</td>
<td>30768</td>
<td></td>
<td>23</td>
<td>38</td>
</tr>
</tbody>
</table>

In view of the above, IOCL proposes for construction of a new Grassroot BG Railfed POL Storage Depot with a gross tankage capacity of 30,768 KL, which will take care of petroleum demands of NE regions.

As per EIA Notification, published in Gazette of India, Extraordinary Part-II, Section-3, sub-section (ii) of Ministry of Environment & Forest dated 14.09.2006 the proposed project falls in Activity 6(b), Category-B of “List of Projects or Activities Requiring Prior Environmental Clearance”. As per the above notification, the proposed project requires environmental clearance from State Environmental Impact Assessment Authority (SEIAA) or State Environmental Appraisal Committee (SEAC).
EXECUTIVE SUMMARY

IOCL has appointed Projects & Development India Limited (PDIL), a Government of India Undertaking, for preparation of EIA/RA Reports for proposed project in order to seek environment clearance from SEIAA, Assam. PDIL is a QCI-NABET accredited EIA consultancy organisation.

STRUCTURE OF EIA REPORT
The EIA report has been prepared as per approved TOR (Terms of Reference) in addition to “Generic Structure of EIA/EMP/RA Report” required by the Ministry of Environment & Forest, Government of India as per the general condition stipulated in the EIA notification dt 14.9.2006 & subsequent amendments.

PROJECT PROPOSAL
The proposal relates to setting up of a new Grassroot BG Railfed POL Storage Depot on 45.74 acres of land falling under Silchar Town of Udharbond tehsil of Cachar district. The total cost as well as operating cost of the above proposed project has been estimated as Rs. 202 Crores (approx.) and it is expected to be completed 36 months for mechanical completion from the date of Environmental Clearance

PROJECT LOCATION
POL Depot is located near Bahadurpur & Gosainpur Village at a distance of about 6 Km from Silchar town under Cachar district in the state of Assam. The depot is spread over an area of 45.74 acres of land shall be provided by Govt. of Assam. The entire area of 45.74 acres has been declared as prohibited area for storage of hazardous chemicals by State Government. Geographically, the depot is located at 24° 52’ 22.21" N latitude and 92° 53’ 07.10" E Longitude at an altitude of about 29 m from mean sea level (MSL). The depot is well connected with road and rail network. The National Highway, NH-54 is passing at a distance of about 1.5 km, nearest Railway station at Silchar is at a distance of about 5.0 Km and the nearest Bus Depot is at a distance of 5 Km from the project site. The nearest airport is Kumbhirgram (Silchar) at a distance of about 13 Km.

BENEFITS OF PROPOSED PROJECT
One of the major benefits of proposed Moinarband POL depot is that it would be meet petroleum product requirements of not only Assam but also NE regions. The proposed depot is relocation of existing Ramanagar Depot considering various safety aspects. The proposed project for establishment of POL depot for receipt, storage & despatch of MS, SKO, HSD, ATF etc. shall yield following benefits:
- Maintain continuity of supply of petroleum products in the Barak Valley, the state of Mizoram and North Tripura,
- Ease in availability of MS, SKO & HSD to the consumers / industries.
- Ease in availability of ATF to Airport Authorities
- Provide adequate coverage to avoid dry outs and tank maintenance requirements.
- Increased safety measures for hazard detection and prevention system.

OBJECTIVE OF EIA STUDY
The objective of the EIA study is to identify and evaluate the potential impacts (beneficial and adverse), and preparation of impact statement in accordance with existing guidelines of MoEF. The study would provide information on the environmental implications, which could be used for environmental safeguards. The EIA report shall be a document for getting environmental clearances from State Level Environment Impact Assessment Authority, Assam and other relevant statutory agencies. The EIA report will also present the existing environmental setting vis-à-vis contribution of pollutants and other factors from the proposed facilities.
EXECUTIVE SUMMARY

SCOPE OF EIA STUDY
The scope of this EIA study includes detailed characterization of pre-project status of environment in an area of 5 Km radius including TOR approved by SEIAA, Assam with the following important considerations:

- To assess the existing status of air, noise, water, land, biological and socio-economic components of the existing environment.
- To identify and quantify significant impacts of various operations on environmental components during construction & operation phases with respect to pre-project status.
- To evaluate proposed pollution control measures.
- To prepare Environmental Impact statement outlining additional control technologies to be adopted for mitigation of adverse impacts, if any.

PROJECT DESCRIPTION
Proposed Storage Facilities
POL depot shall be provided with a total tankage/storage capacity of about 30,768 KL of petroleum products namely MS, HSD, SKO and ATF. The depot comprises 12 nos. of above ground (A/G) tanks (Gross Capacity – 30,768 KL). The details are given below in Table – E.2

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Product</th>
<th>Dimension (m)</th>
<th>Capacity (KL)</th>
<th>No. of Tanks</th>
<th>Total Cap. (KL)</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>01.</td>
<td>MS</td>
<td>10 ø x 12 (Ht.)</td>
<td>1810</td>
<td>3</td>
<td>5430</td>
<td>IFR</td>
</tr>
<tr>
<td>02.</td>
<td>SKO</td>
<td>20 ø x 12 (Ht.)</td>
<td>3754</td>
<td>2</td>
<td>7508</td>
<td>CR</td>
</tr>
<tr>
<td>03.</td>
<td>HSD</td>
<td>20 ø x 12 (Ht.)</td>
<td>3754</td>
<td>4</td>
<td>15016</td>
<td>CR</td>
</tr>
<tr>
<td>04.</td>
<td>ATF</td>
<td>10 ø x 12 (Ht.)</td>
<td>938</td>
<td>3</td>
<td>2814</td>
<td>CR</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>30768</td>
<td></td>
</tr>
</tbody>
</table>

The material of construction of all the FR & CR tanks is mild steel and shall be constructed as per IS:803. The fire water storage tanks and fire hydrants shall be designed / constructed as per OISD-117.

PROCESS DESCRIPTION
Product Receipt
All the products like MS, HSD, SKO, & ATF shall be received from Assam based Refineries namely Digboi Refinery, Guwahati Refinery, Numaligarh Refinery, Bongaigaon Refinery of IOCL through BTPN Rail Wagons. The Depot shall be located adjacent to railway track and is connected to it for receipt of products through wagons.

Storage Facilities
The proposed POL depot shall be provided with 12 nos. of above ground (A/G) tanks (Gross Capacity – 30,768 KL). Details of storage tanks have been presented above in Tables E.2.

Despatch
From Storage tanks, MS, SKO, HSD & ATF shall be pumped to 12 nos. of TLF Bays which are provided with flow governor and flow meter and then to the loading arm for filling the tank trucks by PD meters. Sufficient space has been provided for parking of tank trucks. Tank trucks shall be properly earthed before starting the filling operation in TLF bays.
DESCRIPTION OF ENVIRONMENT & IDENTIFICATION OF ANTICIPATED IMPACT

Description of baseline environmental status and the impact on the existing environment after construction and operation of the proposed depot have been discussed with respect to the following components of the environment. Baseline environmental data generation has been carried out for a period of three months (post-monsoon) from March, 2014 to May, 2014. The status of important components of the environment and impact of project activities on them has been summarized below:

Land Environment

The proposed new grass-root BG railfed depot shall be installed on an area of 45.74 acres of waste barren land allotted by Government of Assam. There is no solid and hazardous waste generation during project activities and consequently any adverse impact on a land is not envisaged. Thus, there will be no change in the soil characteristics and landscape due to the construction & operation of the proposed facilities.

In order to evaluate the physico-chemical characteristics of soils, six sampling locations were selected to represent various land use conditions in the study area. Out of six locations, one was selected within project site and remaining five locations were identified from the villages located around the proposed depot site. Highlights of some important parameters are as under:

The texture of soil was Clay Loam.
The percentage of sand content ranged between 41.63 to 45.27%.
The percentage of silt content ranged between 21.56 to 25.74%.
The percentage of clay content ranged between 30.55 to 35.12%.
The pH of the soil ranged between 6.1 and 6.6.
The bulk density of the soil ranged between 1.27 to 1.32 g/cm3.
The infiltration rate ranged between 7.94 to 9.45 cm/hr.
The electrical conductivity ranged between 0.24 to 0.31 dS/cm.
Organic carbon was found in the range of 1.21 to 1.37%.
Level of Nitrogen as N ranged between 115.6 and 132.5 Kg/ha.
Level of Phosphorous as $P_2O_5$ ranged between 5.26 & 6.89 Kg/ha.
Level of Potash as $K_2O$ ranged between 31.24 & 40.35 Kg/ha.

CLIMATE & METEOROLOGY

Climate
The study area has tropical climate influenced by the atmospheric conditions in Bay of Bengal. During monsoon period from May to September and occasionally during rest period of the year in the wake of western disturbances humidity, cloudiness and rainfall activities increase. The year is broadly divided into four seasons namely the winter season starts from mid November to mid March, summer or hot weather season from April, monsoon season spread from end of May to mid September, and October and November are known as transit period or post monsoon period. The summer in Silchar is not very hot while winters are extremely cold.

Meteorology
A meteorological station was installed for recording hourly wind speed, wind direction, temperature, relative humidity and rainfall measurements within the project site. No deviation has been recorded with the secondary data related to meteorology and micro-climatic conditions. Besides this, the proposed project is a non-polluting developmental project and no adverse impact on the existing climate is envisaged.
AIR ENVIRONMENT
Existing Ambient Air Quality
To evaluate the baseline ambient air quality, one season data generation was conducted at six locations around project site including residential & rural area for a period of three months from March 2014 to May 2014. During the survey period, the concentrations of air pollutants namely PM\textsubscript{10}, PM\textsubscript{2.5}, SO\textsubscript{2}, NO\textsubscript{x}, CO, VOC, Methane & Non-methane Hydrocarbon in ambient air were measured.

The highlights of the results are as below:

<table>
<thead>
<tr>
<th></th>
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<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>PM\textsubscript{10}</td>
<td>µg/m\textsuperscript{3}</td>
<td>47</td>
<td>67</td>
<td>44</td>
<td>58</td>
<td>47</td>
<td>56</td>
<td>45</td>
<td>60</td>
<td>43</td>
<td>57</td>
<td>48</td>
<td>63</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PM\textsubscript{2.5}</td>
<td>µg/m\textsuperscript{3}</td>
<td>25</td>
<td>36</td>
<td>23</td>
<td>30</td>
<td>24</td>
<td>30</td>
<td>21</td>
<td>31</td>
<td>21</td>
<td>30</td>
<td>23</td>
<td>34</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SO\textsubscript{2}</td>
<td>µg/m\textsuperscript{3}</td>
<td>5.4</td>
<td>7.2</td>
<td>5.3</td>
<td>6.9</td>
<td>5.6</td>
<td>7.2</td>
<td>5.2</td>
<td>7.3</td>
<td>5.4</td>
<td>7.6</td>
<td>5.9</td>
<td>7.7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NO\textsubscript{x}</td>
<td>µg/m\textsuperscript{3}</td>
<td>10.1</td>
<td>12.4</td>
<td>10.4</td>
<td>12.3</td>
<td>10.8</td>
<td>12.2</td>
<td>10.4</td>
<td>12.5</td>
<td>9.8</td>
<td>12.3</td>
<td>10.5</td>
<td>12.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CO</td>
<td>mg/m\textsuperscript{3}</td>
<td>0.2</td>
<td>0.7</td>
<td>0.2</td>
<td>0.8</td>
<td>0.2</td>
<td>0.6</td>
<td>0.1</td>
<td>0.6</td>
<td>0.2</td>
<td>0.6</td>
<td>0.3</td>
<td>0.6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>THC</td>
<td>ppm</td>
<td>2.02</td>
<td>2.40</td>
<td>1.91</td>
<td>2.46</td>
<td>2.0</td>
<td>1.94</td>
<td>2.37</td>
<td>1.86</td>
<td>1.95</td>
<td>2.46</td>
<td>1.98</td>
<td>2.44</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VOC</td>
<td>mg/m\textsuperscript{3}</td>
<td>2.06</td>
<td>2.34</td>
<td>2.04</td>
<td>2.34</td>
<td>2.09</td>
<td>2.32</td>
<td>2.04</td>
<td>2.28</td>
<td>2.08</td>
<td>2.31</td>
<td>2.11</td>
<td>2.35</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

From the above, it is concluded that the measured values of the air pollutants, as stated above, are well within the limits specified under NATIONAL AMBIENT AIR QUALITY STANDARD for rural and residential areas.

Source of Air Pollution
Operation of the depot usually does not involve any chemical or manufacturing process, which may lead to process specific emission of air pollutants into atmosphere. The entire operation of receipt, storage, filling of products in tank lorries is carried out under leak proof system. The intermittent sources of air emission are limited to DG Sets. DG sets shall be operated only in case of power failure during working hours. Hence, adverse impact on existing air environment is not envisaged.

NOISE ENVIRONMENT
Noise monitoring survey was conducted at six locations within the study area, four locations inside the project site representing industrial, rural and residential areas. The noise monitoring results reveals that the noise levels vary from 39.8 dB(A) to 51.2 dB(A) during night and day time. A little increase in the noise level during construction and operation has been envisaged. The duration of construction activities shall be 8 to 12 hours with maximum incremental noise level equivalent to 10 dB(A) which will correspond to 3 to 4 dB(A) on day and night levels. The incremental increase in the noise level during operation phase shall be 8 hours (one shift). Hence, impact due to noise shall be practically insignificant during construction and operation phase also.

WATER ENVIRONMENT
Existing Water Quality
To evaluate the baseline water quality, one season data generation was conducted at six locations around Moinarband Depot for a period of three months from March 2014 to May 2014. Two nos. of surface water, four nos. of ground water samples were collected and characterized for relevant parameters.
Table - E.4
Summary of Observations of Water Quality

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Ground Water</th>
<th>Surface Water</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Min.</td>
<td>Max.</td>
</tr>
<tr>
<td>Total Dissolved Solids</td>
<td>100</td>
<td>136</td>
</tr>
<tr>
<td>Alkalinity total as CaCO₃</td>
<td>46</td>
<td>64</td>
</tr>
<tr>
<td>Hardness total as CaCO₃</td>
<td>32</td>
<td>48</td>
</tr>
<tr>
<td>Chloride as Cl</td>
<td>10</td>
<td>14</td>
</tr>
<tr>
<td>Iron as Fe</td>
<td>0.14</td>
<td>0.26</td>
</tr>
</tbody>
</table>

The surface and ground water characteristics of the samples collected within the study area have been found well within the permissible limits laid down in Drinking Water Standards (IS: 10500-1991).

**Water Consumption**

Existing water consumption of proposed terminal is 5.0 m³/day. The details are as under:

Table - E.5
Water Consumption

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Particulars</th>
<th>Quantity (m³/day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>a)</td>
<td>Domestic Water (Drinking &amp; Sanitary)</td>
<td>1.5</td>
</tr>
<tr>
<td>b)</td>
<td>Floor Washings</td>
<td>2.0</td>
</tr>
<tr>
<td>c)</td>
<td>Mock drill (once in a month)</td>
<td>1.0</td>
</tr>
<tr>
<td>d)</td>
<td>Green Belt Development</td>
<td>0.5</td>
</tr>
<tr>
<td></td>
<td><strong>TOTAL</strong></td>
<td><strong>5.0</strong></td>
</tr>
</tbody>
</table>

**Wastewater Generation**

The details of wastewater generation are as under:

Table - E.6
Wastewater Generation

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Particulars</th>
<th>Quantity (m³/day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>a)</td>
<td>Mock drills</td>
<td>0.5</td>
</tr>
<tr>
<td>b)</td>
<td>Floor washings</td>
<td>1.5</td>
</tr>
<tr>
<td>c)</td>
<td>Sanitary waste water</td>
<td>1.0</td>
</tr>
<tr>
<td></td>
<td><strong>TOTAL</strong></td>
<td><strong>2.5</strong></td>
</tr>
</tbody>
</table>

Presently, about 2.5 m³/day of wastewater is generated from the proposed depot. No wastewater shall be discharged outside the premises of proposed terminal. Sanitary wastewater from toilets, canteen and wash room shall be treated in Septic Tanks and disposed off in soak pits. The non-sanitary wastewater such as wastewater generating due to floor washings, mock drills etc. shall be passed through Oil Water Separator (OWS) for arresting the oil content. The oil free wastewater shall be used quantitatively in gardening / afforestation. Hence, no adverse impact is envisaged from the proposed depot on existing water environment.
EXECUTIVE SUMMARY

BIOLOGICAL ENVIRONMENT
The proposed Moinarband POL depot shall be established on 45.74 acres of barren waste land provided by Government of Assam. There shall be no point and non-point source of emission or discharge of pollutants and hence, no adverse impact on the biological environment is envisaged due to the proposed project activities and operation.

SOCIO-ECONOMIC ENVIRONMENT
The proposed project activity is limited to receipt, storage and despatch of petroleum products like MS, SKO, HSD and ATF etc. Construction of proposed depot shall generate direct/indirect employment in local area. During the construction phase, local people shall be employed temporarily for construction works. Thus, significant positive impact on the socio-economic environment for the proposed project is foreseen. Moreover, the proposed project, during its operational phase would be able to meet the demand of petroleum products in and around NE regions.

ANALYSIS OF ALTERNATIVE (TECHNOLOGY & SITE)
IOCL has acquired enough experience in installation of receipt, storage and dispatch facilities in the POL Depot with inception of new technologies. The Engineering & Project Division of IOCL has been involved in successful installation and execution of many POL Depots all over the country. All these expertises of IOCL are well proven and working efficiently at different locations of the country without fail.

ENVIRONMENTAL MONITORING PROGRAMME
A monitoring schedule with respect to Ambient Air Quality, Water Quality, Noise Quality, prepared in consultation with Assam State Pollution Control Board, shall be maintained. The measurements shall be carried out by MoEF/ASPCB/NABL accredited laboratory and the test reports shall be regularly forwarded to the State Pollution Control Board.

ADDITIONAL STUDIES
No additional study is envisaged due to following reasons:

Impact on local infrastructure such as road network etc.
Presently, about 100 trucks are plying every hour on NH-54. After establishment of proposed Moinarband POL depot, it is envisaged that the traffic load would increase from 100 to 110/115 per hour. The existing road network around the proposed depot is sufficient enough to sustain the increased traffic load. Hence, no impact is envisaged due to movement of TTs from Moinarband POL depot to other areas.

Compensation package for the people affected by the proposed project
Construction of grass-root Moinarband POL depot shall be incorporated in the vacant barren waste land, which is spread over an area of 45.74 acres of land provided by Govt. of Assam to IOCL. Hence, the proposed project does not involve any RR policy violation.

Proposed Plan to handle the socio-economic influence on local community
The proposed project shall require about 25 nos. of manpower for receipt, storage and delivery of petroleum products in the proposed terminal. Existing man-power of Ramnagar Depot is sufficient to handle the extra load. Hence, the proposed project shall not impart any socio-economic influence on local community. Most of the workmen shall be engaged from local population. Very few experts shall be engaged from other places. Hence, no negative influence is envisaged from the proposed terminal on local community.
EXECUTIVE SUMMARY

Risk Analysis Study

Quantitative risk analysis has been carried for the said project with the help of Phast Risk Software (DNV Technica, UK). A number of credible and incredible scenarios have been considered. It has been found that Risk arises out due to proposed facilities is well within the acceptable limit.

ENVIRONMENTAL MANAGEMENT PLAN DURING CONSTRUCTION PHASE

Following factors shall require due consideration during construction phase:

**Site Preparation**
It is envisaged that minor levelling of land will be required for the proposed project. Stock piling of earthen material would be required during foundation works of the proposed project. The earth work will generate dust which will be controlled by periodical sprinkling of water during working period.

**Sanitation**
The site shall be provided with adequate and suitable sanitary facilities to maintain proper standard of hygiene for construction workers. These facilities shall include water supply, bath toilets, rest room, etc. as per standard practice of IOCL.

**Construction Equipment & Waste**
Care shall be taken to prevent accidental spillage of any oil from construction equipment. Combustible waste and other wastes shall be disposed-off by adopting environmentally compatible methodology.

**Storage of Hazardous Materials**
The hazardous materials used during the construction period may include diesel, welding gas and paints. These materials would be stored, handled and disposed off as per Solid Waste (Management, Handling & Trans-boundary Movement) Rules 2008.

MANAGEMENT PLAN DURING OPERATION PHASE

**AIR ENVIRONMENT**
There is no continuous source of air pollution. The sources of air pollution are limited to the DG Sets only. This source of air pollution is intermittent. The minimum required heights and the heights actually provided to the DG Sets (height of the shed 3 metres above the ground level) are as follows:

<table>
<thead>
<tr>
<th>DG Set Capacity</th>
<th>Height Required, m</th>
</tr>
</thead>
<tbody>
<tr>
<td>250 KVA</td>
<td>3.0 + 3.16 = 6.16 m</td>
</tr>
</tbody>
</table>

For computing the minimum height of DG Set ducts, the following formula, specified by the Central Pollution Control Board, has been used.

\[ H = h + 0.2 \times (\text{KVA})^{0.5} \]

Where,

- \( H \) = Total height of stack, m
- \( h \) = Height of the building where the DG Set is installed, m, and
- \( \text{KVA} \) = Total generation capacity of the DG Set, KVA.

**WATER ENVIRONMENT**

Projects & Development India Limited, Sindri
Waste Water Consumption/Generation
The total water requirement for proposed project has been worked out to be 5 m$^3$/day and generation of wastewater has been envisaged to be about 2.5 m$^3$/day. Out of total waste water generation of 2.50 m$^3$/day, 1.5 m$^3$/day shall be industrial waste and 1.0 m$^3$/day shall be sanitary waste.

Waste Water Treatment & Disposal
Sanitary Waste Water from toilets, canteen and wash rooms will be treated in septic tanks and disposed-off in soak pits. Waste Water generated during mock fire drills and precipitation, will be passed through Oil Water Separators. The treated wastewater will be utilized quantitatively for dust suppression, irrigation of afforested areas and rain water harvesting, for which a rain water harvesting system shall be provided in the storm water drain.

Oil Water Separator / Oil Trap
Oil water separators shall be provided for Tank Farm, TLF Gantry & Pump House, and the Main Drain. The storage tanks, the pump house and the TLF areas shall be provided with enclosure walls to contain any spillage, washing, fire water or rain water within the walls. Waste Water from these areas will be fed to Oil-water separators.

NOISE ENVIRONMENT
The sources of noise in the proposed terminal shall be limited to the DG Sets, Pumps & Compressors and movement of tank Lorries. Latest generation of DG Sets, Pumps, etc, which generates very low noise shall be procured. During installation of above equipments, instruction of manufactures shall be strictly followed in order to meet the specified limits of noise.

Control of Noise
The following measures are also proposed for control and abatement of noise & vibration.
- Regular condition monitoring e.g. speed, vibration and regular preventive maintenance including schedule lubrication will be done for the moving machines to keep them in good condition and also to reduce vibration.
- Trees grown in the green belt around the facilities would also facilitate reduction of noise level beyond the boundary walls.

SOLID WASTE MANAGEMENT
Environmental Management with respect to solid waste management may be summarized as under:
- No Solid Waste shall be generated from the proposed POL depot. The oil collected in the oil water separator will be collected in storage containers and returned to the refinery for reprocessing.
- Used oil, grease and empty drums shall be disposed of through registered vendors as per Solid Waste (Management, Handling & Trans-boundary Movement) Rules 2008.

AFFORESTATION
Green belt area will be provided along the boundary wall. Evergreen trees having thick foliage will be planted within the green belt.

Preventive Maintenance / Planned Inspection
Preventive maintenance and planned inspection of the facilities will be done in accordance with OISD and as per schedule. Record keeping for jobs done would be maintained. The intermittent inspection and maintenance schedule would be prepared as per directive and procedures laid down by OISD.

In addition to above management plan, the project will emphasize the following programs to catalyze the green economy of the nation:

Green Light Program
EXECUTIVE SUMMARY

It involves installation of energy efficient lighting system which reduces indirectly generation of oxides of Carbon, Nitrogen and Sulphur. However, there shall not be any compromise with required illumination at working places.

Energy Star Program
Use of energy efficient electrical appliances including computer etc shall be encouraged. IOCL shall pay proper attention to improve the working environment by adopting the principle of Ergonomics in the following line of action:

“In order to maximise the working and skill capability of the work-men, the Environmental Management Plan considers the strategy and goal of Ergonomics. The application of ergonomics will reduce the Muscular Skeletal Disorder (MSD). Attempts shall be made to make the Working Environment to fit the Workmen instead of forcing a workman to adopt the Working Environment.”

CONCLUSION

Any adverse impact due to the proposed project on air, noise, water, land and ecological environment is insignificant and the socio-economic benefits are predominantly positive. It is also evident from the risk analysis study that acceptable individual risk level of $1.0 \times 10^{-6}$/ year is mainly confined within the plant boundary. All the relevant safety norms with latest technology shall be incorporated to ensure safe operation of the depot. In view of the above, it may be opined that the proposed project in totality may be considered environmentally safe.