

EXECUTIVE SUMMARY

Introduction

Bharat Petroleum Corporation limited (BPCL), the project proponent, is one of the highest ranked Indian Public sector under taking company, under Govt. of India (Ministry of Petroleum & Natural Gas). In the prestigious Fortune 'Global 500' listing, BPCL is having 358th position in year 2016. BPCL is one of the Navratna Company of India. Company is engaged in refining and marketing of petroleum products across pan India with two major Refineries i.e. Mumbai Refinery and Kochi Refinery and one joint venture Bina Refinery & one subsidiary Numaligarh refinery. BPCL is India's one of the largest commercial enterprises in Oil and Gas sector.

Pune City, being the 9th most populated city in the country, is also one of the fastest growing Hub in the country; having agricultural, industries, education, housing and sound cultural base. Pune is fast emerging as a prominent Hub for Information Technology, automotive and manufacturing activities having very high energy needs.

As per the industry estimate & as per directive of the Ministry of Petroleum and Natural Gas, Government of India, different Oil companies are required to augment / construct new facilities to meet the growing demand of different markets .

The projected demands of POL products in Pune are likely to increase substantially over the years to come. Hence in order to meet the future high energy demand of Pune Territory BPCL proposed a new POL terminal at Pune.

Project Description

BPCL has proposed to set up a new Rail-fed Petroleum, Oils and Lubricants (POL) Terminal at Village Tarde, District – Pune, Maharashtra. This Terminal shall handle products like MS, HSD, SKO, Bio-Diesel & Ethanol. These products will be distributed to all BPCL Retail Outlets through Tank Lorries of different capacities. The installation is planned as per OISD 117, 118 & 244, PESO standards, Govt. regulations & conforming to the relevant BIS/API standards. Proponents have proposed to construct within the area of ~ 27.17.20 hectare (67.93 Acres). Details of product wise tankage at Tarde Terminal are given in **Table 1**.

Table 1: Proposed Schedule of Tanks

Tank	Dia. (m)	Ht. (m)	Capacity (KL)	Total Tanks	Class	Type	Total storage (KL)
Phase - I							
MS	24	13.5	5429	3	A	EFR	16286
HSD	24	16	7148	3	B	CR	21443
Ethanol	11	14.38	1348	2	A	CR	2695

Bio-Diesel	11	14.38	1348	2	-	CR	2695
SKO	9	13.5	846	2	B	CR	1692
HSD	3.2	12.6	100	1	B	UG	100
SKO	3.2	12.6	100	1	B	UG	100
MS	3.2	12.6	100	1	A	UG	100
SLOP	3.2	12.6	100	1	A/B	UG	100
HSD	2	6.3	20	1	B	UG	20
Phase - I Total							45231
Phase - II							
MS	24	13.5	5429	5	A	EFR	27143
HSD	24	16	7148	5	B	CR	35738
ATF	17	15	3359	4	B	CR	13437
Phase - II Total							76318
Total							121549

CR – Cone Roof Vertical Tank

EFR – External Floating Roof Vertical Tank

UG – Underground Horizontal Tank

Phase I tanks – Immediate

Phase II tanks – Later Stage

Technology and Process Description

There is no manufacturing process involved in the Terminal. The Rail Fed POL Terminal shall be receiving, storing, loading and distributing various finished petroleum products. The brief process description is as follows:

- Receiving the Product through Railway Wagons, primarily from Manmad Installation, Maharashtra and proposed Rasayani POL Terminal, Maharashtra.
- Storing the product in storage tanks, maintaining the quality in line with IS specifications.
- Loading & Dispatching quality petroleum products through Tank Trucks to Retail Outlets (ROs).

The entire operation of RECEIPT, STORAGE AND DISPATCH of petroleum products is carried out in a closed system thereby eliminating risk of spillage of products and to achieve enhanced safety standards. The process flow chart is as shown in **Figure 1**.

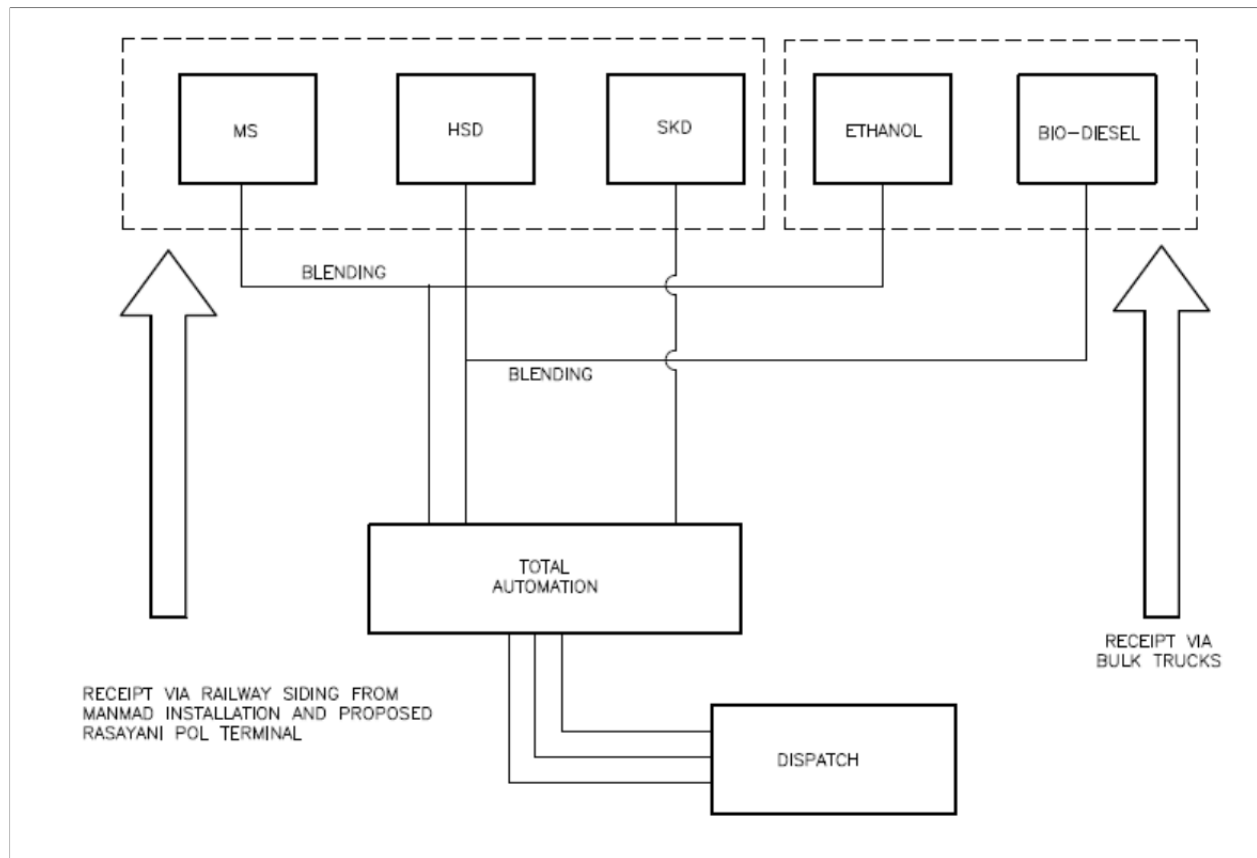


Figure 1: Process Flow Chart

TLF Sheds

There will be twenty-four (24) nos. of TLF bays (8+4 bays in Phase I and 4+8 bays in Phase II) for Tank Trucks loading. The loading facilities will be bottom loading for all products considered in phase I and II.

Product Pump House

Proposed project will have 1 TLF Pump House: 40 m X 6 m and TWD pump house of 40m X 6m size.

Fire Fighting Facilities

Fire Fighting Facilities will be provided as per prevailing safety guidelines issued by OISD 117, 118 and 244.

1. Full fledge auto-pressurized Fire Hydrant System to cover all facilities in the Terminal as per OISD-117/118/244 norms including Tank Truck Parking Area, as per latest Safety Norms.
2. Two no's of Fire Water Storage tanks each of 50% of water storage requirement (Total Capacity 100% of requirement as per OISD standard).
3. Fire Fighting Pumps with diesel engines including stand by units.
4. Jockey Pumps.
5. Fire Hydrant network system with monitors and hydrant valves
6. Provision of Fire hydrant piping network for all the new product tank farms.
7. Water Sprinkler system on A/G storage tanks in line with OISD 117/118/244.
8. Foam compound storage and delivery system.
9. Foam system on proposed A/G storage tanks.
10. Remote operated HVLV variable flow water cum foam monitors fixed type or portable type as per requirement,
11. Medium Expansion Foam Generators for Dyke Area.
12. Portable fire fighting equipment as per OISD standards.

The Fire Water tanks have been provided as shown in **Table 2**. Additionally, Fire Pump House shall be provided of 35 m x10 m.

Table 2: Details of Fire Water Tanks

SN	Product	Type of Tank	Proposed Tanks and Capacities	Total Tankages	Diameter (m)	Height (m)
1	Fire Tank Water	Above ground Vertical tank	2 x 4500 KL	9,000 KL	20	16

Dyke Wall Facility

Dyke wall shall be provided surrounding the POL tanks (above ground type). The Capacity of each tank and total maximum Capacity is highlighted below in **Table 3**.

Table 3: Dyke Wall Details

Sr. No.	Dyke Wall Containing Tanks	Enclosure Capacity m ³	Overall Dimension
Dyke – I	MS (3x5429) Ethanol (2x1348)	8757	156 m x 44 m x 1.8m
Dyke – II	HSD (3x7148)	8433	116 m x 55 m x 1.8m

Dyke – III	SKO (2x846) Bio-Diesel (2x1348)	4047	90 m x 31 m x 1.8m
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Dyke I, II and III shall be provided for MS & Ethanol, HSD and SKO & Bio-Diesel respectively. For future expansion of MS, HSD and ATF, Dyke IV, V and VI shall be provided respectively. Impervious dyke wall surrounding the above ground product tanks can accommodate spilled oil. The dyke capacity is more than the maximum capacity of the largest product tank inside the dyke. Dykes are provided with adequate wall height of 1.8m as per OISD norms. Tank foundations are also provided with impervious membrane to avoid seepage of product into the soil below. The tank farm flooring and dyke wall also are made impervious to prevent oil from seeping into ground/ surrounding area.

Instrumentation and Automation

Automation / Instrumentation system will be as per BPCL's latest Terminal Automation System (TAS) philosophy, which includes the following, as applicable:

- Terminal Automation System, Tank farm management system including Radar Gauges, Multi-Point Temperature Sensors, Pressure Transmitters, Overspill detection and audio, visual alarm system etc.
- Tank Truck loading system including, Flow meters, Batch Controller, DCV etc.
- Ethanol Blending and Multi-Functional Additives (MFA) dosing systems.
- Other field equipment such as online density and temperature sensors, Field Automation and Integration of Sub system Remote Operated Shut off Valves (ROSOV's), Motor Operated Valves (MOV's), Double block and bleed valves (DBBV's), Electrical sub systems, product delivery pumps, fire fighting systems. Tank Truck Entry system, bay queue display etc.
- Control Room equipment such as LRC, OIC's, Servers, PLC's, UPS etc. and necessary TAS software.
- Position sensors for tank dyke valves etc.
- Safety Shutdown System covering Automated Overfill Prevention System, ESD system.
- Meters proving and Calibration facilities.
- ROSOV's, MOV's, DBBV's master station, Push Button Stations etc.
- Necessary cabling, control panel, earthing etc.
- Air Compressor/Air Dryer/Air receiver and piping for pneumatic systems.
- Access control, zoning and multi zoning systems, security features like Door Frame Metal Detectors (DFMD's), Hand Held Metal Detectors (HHMD's) etc.
- CCTV system to cover total Terminal facilities including perimeter wall.
- Hydrocarbon detectors and flow sensors etc. near all potential leak sources of class ' A ' petroleum product,
- Other automation systems and its interface of SAP system with TAS, and to ensure that engineering and design addresses the need for standardization.

Manpower

During construction phase approximately 100-400 local labour will be employed and 50 during operational phase including contract labour and security personnel.

Water Supply

Water requirement for the Project will be around 15-20 KL/day for construction phase (i.e. during the major civil work) and about 20-22KL/day for operational phase. The water requirement is proposed to be met from local/ from outside agencies.

Power Requirement

Power Requirement of the project will be fulfilled by MSEDCL, which will be around 1000KVA; 3 DG sets of 1x750, 1x400 and 1x150 kVA capacity are envisaged to be used only during power failures and emergencies. The DG sets will each have a stack height as per CPCB guidelines.

Description of Environment

The area around the proposed POL Terminal has been surveyed for physical features and existing environmental scenario. The field survey and baseline monitoring has been done from the period of **March to May 2017**.

Air Environment:

The ambient air quality is determined at 9 locations. The PM₁₀ varied from 39 to 67 µg/m³, PM_{2.5} varied from 18 to 33 µg/m³, SO₂ varied from 11 to 20 µg/m³, NO_x varied from 27 to 33 µg/m³. Other parameters like VOCs, Heavy metals, Benzene etc. were found Below Detectable Limit (BDL). All values are within prescribed NAAQS 2009.

Noise Environment:

Noise can be defined as an unwanted sound. A total of 10 locations were identified for ambient noise monitoring in the study area. The daytime varied from 49.5 dB (A) Leq to 53.3 dB (A) Leq and night time noise varied of 37.9 dB (A) Leq to 44.6 dB (A) Leq. Both daytime noise and night time noise was within the limit.

Water Environment:

In order to establish the baseline water quality, 3 ground water and 4 surface water samples were collected and analyzed in the study area. The analysis result for ground water samples were within drinking water limit as per IS 10500: 2012. Details of analysis result are given in the EIA report.

Soil Quality:

Soil samples were collected from 6 locations in the study area and analyzed for physico-chemical characteristics. Soil quality was found to be normal. Details of analysis result are given in the EIA report.

Land Use/Land Cover of the Study Area:

Land use pattern of the study area covering 10 km radius includes water bodies, agricultural land, Fallow land, Barren Land, Open Land and Built-up Land. Details of land use /land cover classification are given in the EIA report.

Biological Environment:

The ecological study of the area has been conducted within 10 km radius of the project site in order to understand the existing status of flora and fauna to generate baseline information.

Flora: 82 plant species from 42 genera of 15 families were identified.

Fauna: 13 species of mammals, 4 species of Ambhhibians, 11 species of Reptiles, 14 species of Butterflies, 6 species of Dragonflies and Damselies were identified.

Avifauna: 56 species were identified within the Study Area.

Socio-economic Environment:

Analysis of the demographical statistics, based on Primary Census Abstract, 2011 & field survey reveals that the study area has a total population of 1,41,039 in the study area. Average scheduled castes constitute about 13.4% of the total population of villages in the study area. Scheduled tribes constitute about 1.7% of the total population of villages in the study area. Average literacy rate of the study area in 2011 was 71.34% to total population. Villages in the study area have fairly good infrastructure facilities.

Anticipated Environment Impacts and Environment Management Plan

Impact on Air Environment:

No emission is envisaged during the receipt, storage & handling of petroleum products. There would be no fugitive emission during unloading and hence, no impact is envisaged. The air environment may have minimal impact due to truck movement for receipt and dispatch.

Impact on Noise Environment:

The project site is likely to have increased noise level up to 80-90 dB(A) due to the construction activity but it is likely to be insignificant, reversible and localized in nature and mainly confined to the day hours. As the proposed Terminal shall be operated in closed circuit, it is envisaged that noise environment would remain unaffected during operation of the proposed facilities.

Impact on Water Environment:

Water requirement will meet from local/outside agencies. The overall impact on water environment due to construction of proposed project is likely to be temporary, short term and

insignificant. Total water requirement for the proposed project during operation phase will be around 540 KL/Month.

Impact on Land Environment:

The project area is vacant land, there are no settlements and hence the question of rehabilitation and resettlement does not arise. As the complete system shall be closed loop, no impact is envisaged on the topography during operation phase.

Impact on Biological Environment:

The probability and consequences of significant ecological impacts occurring as a result of the operation of the POL Terminal are considered to be almost negligible. The risk of any leakage is almost negligible owing to stringent leak prevention technologies.

Municipal solid waste will be disposed through local bodies. Spent lube oil from D.G. set will be sold to MPCB Authorized recyclers. Hence no impact on flora and fauna is envisaged. Moreover there are no reserve forest and protected areas within 10 km radius. Greenbelt will be developed which will serve as ecosystem. There will be no effluent discharge in the water body. Thus there is no impact on the aquatic biota present in vicinity of proposed project.

Impact on Socio-economic Environment:

The construction of the proposed project is expected to provide temporary indirect employment to a good number of skilled and unskilled workers. The project will contribute to the socio-economic development of the area at the local level in turn reducing migration for employment. Hence the proposed project will have positive impact on the socio-economic environment.

Environmental Monitoring Programme

It is imperative that BPCL should engage domain expert to collect sample data at prescribed intervals as suggested by PCB guidelines to assess the environmental health in the post period. A post study monitoring programme is important as it provides useful information on the following aspects.

- It helps to verify the predictions on environmental impacts presented in this study.
- It helps to indicate warnings of the development of any alarming environmental situations, and thus, provides opportunities for adopting appropriate control measures in advance.

Additional Studies

Hazard Identification and Consequence Assessment

Quantitative Risk Study has been done to determine the potential risks of major disasters having damage potential to life and property and provide a scientific basis using PHAST RISK (Version 6.7) software developed by DNV GL. Disaster Management Plan is prepared for identification of various hazards addressed qualitatively and included in onsite- emergency plan. Details of risk assessment are given in the EIA report.

Hazards we identified for release of MS, HSD, SKO, Bio-Diesel and Ethanol for scenarios of catastrophic rupture of storage tank at proposed site. Consequence analysis of all possible containment scenarios was carried out. **No domino effect envisaged as all tanks are adequately spaced and heat or pressure wave is limited to dyke area.**

Project Benefits

- The project will improve supply of the High Speed Diesel (HSD), Motor Spirit (MS), and Superior Kerosene Oil (SKO) in Pune region and overall benefit the state of Maharashtra which is vital for economic growth as well as improving the quality of life.
- The project shall provide indirect employment to potential under unskilled, semi-skilled and skilled categories. The employment potential shall increase with the start of construction activities, reach a peak during construction phase and then reduce with completion of construction activities. During operation phase also there will be indirect employment opportunities, mainly in service sector, although its magnitude will be much less.
- The employment opportunities exist mainly with the indirect employment like contractors and sub-contractors. These agencies will be persuaded to provide the jobs to local persons on a preferential basis wherever feasible.

Capital Investment

The expected cost of the proposed project will be around Rs. 267 Crores. The cost breakup is as provided in **Table 4**.

Table 4: Cost Breakup

S.N	Components	Cost INR (in Crores)
1	Basic Engineering	1.3
2	Civil facilities	147.0
3	Railway Sliding	47.0
4	Electrical	17.0
5	Miscellaneous	2.7
6	Fire Fighting	17.0
7	Contingency	35.0
Total		267.0