EXECUTIVE SUMMARY

I. Executive Summary

The Executive Summary covers the following topics in brief:

1. Project Description
2. Baseline data collection
3. Anticipated Environmental Impacts and Mitigation measures
4. Environmental Monitoring Programme
5. Environment Management Plan
6. Additional studies
7. Project Benefits

II. Project Description

M/s HPCL intends to decongest Mumbai Refinery and accordingly plans to move/shift some of its product storage facilities to newly acquired Calico Plot located North East of the existing refinery. The project includes construction of storage tank for 6 different types of white oils at Calico Plot apart from storage for Naphtha and Slop. Six different types of White Oils are MS-I, MS-II, HSD-I, HSD-II, SKO and ATF. The gross storage capacity of White Oils is 458145 KL.

Proposed Storage Tank and Associated Facilities at Calico, HPCL

The proposed project comprises of the following major facilities as part of it:

- Storage facility for six different types of White Oils (MS grade-I, MS grade-II, HSD grade- I, HSD grade- II, SKO and ATF), Naphtha and Slop.
  - MS I/MS II Storage Tanks – 8 Numbers (4 Numbers of 29620 Kl gross capacity each + 4 Numbers of 14535 Kl gross capacity each)
  - HSD I/ HSD II Storage Tanks – 6 Numbers (4 Numbers of 29620 Kl gross capacity each + 2 Numbers of 14535 Kl gross capacity each)
  - SKO Storage Tanks – 5 Numbers of 14535 Kl gross capacity each
  - ATF Storage Tanks – 5 Numbers (4 Numbers of 14929 Kl gross capacity each + 1 Numbers of 1584 Kl gross capacity each)
  - Naphtha Storage Tanks – 2 Numbers of 4964 Kl gross capacity each
  - Slop Storage Tanks – 2 Numbers of 4964 Kl gross capacity each
- Pipelines to receive all eight types of oils from the refinery.
  - 2 numbers of 12” Pipe for MS-I & MS-II
  - 2 numbers of 14” Pipe for HSD-I & HSD-II
  - 2 numbers of 8” Pipe for SKO
  - 1 number of 10” Pipe for ATF
  - 1 number of 6” Pipe for SCN
- Providing 2 nos. 24” diameter underground/ aboveground pipelines for dispatch of four different types of White oils to Pirpou Jetty. New pumps will be installed at Calico Plot for transfer of Oils to Jetty.
  - 24” new pipeline to Jetty for MS-I/ MS-II
  - 24” new pipeline to Jetty for HSD-I/ HSD-II
  - ATF will be transferred through existing 10” pipeline to Mumbai Airport
  - Slop will be transferred to refinery through 3” pipeline from MR-II
  - SCN will be transferred to refinery through 6” pipeline.
- One 8” diameter pipeline from SKO (Sales) for receipt and one 14” diameter pipeline for SKO (Sales) for dispatch are also provided other than regular SKO pipeline.
  - 1 number of 8” SKO line inside Mumbai Refinery near TK-370
  - 14” new pipeline for SKO to Refinery.
- For transfer of ATF through pipeline new pumps will be installed.

- For pipeline despatch of five different types of white oils through existing Mumbai Pune Solapur pipeline new booster Pumps will be installed.
- Re-circulation of MS in storage tanks will be carried out through pumps. Re-circulation of all other products in those storage tanks will be carried out through Propeller Mixers.
- Inter tank transfer of MS will also be carried out through MS recirculation Pumps. Inter tank transfer of HSD and SKO will be carried out through Jetty Transfer Pumps. For ATF it will be carried out through ATF transfer Pumps.
- MFA, DYE and Antioxidant Dosing system are provided for MS. Filter separator is provided for ATF transfer.
- New pipe rack inside the refinery for new pipelines. Laying of pipelines through the existing pipe rack inside the refinery wherever possible.
- Pipe culverts inside Calico Plot for all pipelines and underground pipe crossing culverts between Refinery and Calico plot.
- Above ground access road way between Refinery and Calico plot for movement of vehicles.
- Effluent collection pits for OWS inside Calico plot. Effluent transfer pump will transfer effluent from Calico to Refinery treatment plant.
- New pig launchers are provided for following pipelines
  - One number for ATF pipeline.
  - One number for Jetty transfer from Calico
- Dedicated sub station shall be provided at Calico Plot. Power supply to the sub-stations will be provided from the refinery power supply.
- Similarly dedicated control room shall be provided at Calico Plot. DCS based operation is provided for Calico plot facilities. Local operation is also considered from calico plot control room.
- Dedicated administrative buildings and vehicle sheds for Calico plot.
- Independent fire fighting facilities inside the Calico Plot for all above ground installation.
- Booster pumps for pumping white oil to existing Mumbai Pune Solapur Pipeline operation.
- LEL detector inside Calico White Oil Pump Houses.

The pipeline from calico plot to jetty is envisaged to be routed to Pirpou jetty through HPCL Mumbai Refinery in the existing pipeline corridor up to the jetty.

III. Baseline data collection

The baseline data for the study area had been collected around refinery site during the period of January- April, 2013 by M/s Netel (INDIA) Ltd, Thane, Mumbai which is MoEF approved environmental laboratory. The baseline data for various environmental components related to Ambient Air Quality, Water Quality, Noise Level, Traffic Density, Soil, Meteorology and Socio-Economic Data were monitored and collected in an area of 10 km radius from the plant site. The analysis of environmental parameters for all components is described below.

Air Environment

A network of five ambient air-sampling locations has been selected for assessment of the existing status of air environment within the study zone. Measurement of the actual Sulphur Dioxide (SO_2), Oxides of Nitrogen (NO_X), Carbon Monoxide (CO), Particulate Matter (PM_{10}), Particulate Matter ($PM_{2.5}$), Total Hydrocarbons (Methane & Non-methane), ozone, benzene and benzo (a) pyrine were carried out and analyzed.

It has been observed that the average values of PM_{10} for all the monitoring stations ranging from 52.3 to 60.5 µg/ m^3. The PM_{10} lowest and highest values of 45.2 and 75.1 µg/m^3 were observed at IOCL Colony Govandi and Mysore Colony respectively.

The average values of $PM_{2.5}$ for all the monitoring stations ranged from 19.1 to 21.9 µg/m^3. The $PM_{2.5}$ lowest and highest values of 15.9 and 27.0 µg/m^3 were recorded both at Mysore Colony.

The average concentration of SO_2 is ranging from 9.7 to 11.7 µg/ m^3. The lowest value SO_2 recorded was 8.0 µg/ m^3 at IOCL Colony Govandi and the highest value was 14.0 µg/ m^3 at Mysore Colony.

During the monitoring period, the average NOx concentration was within the range of from 15.4 to18.2 µg/m^3. The lowest and highest NOx values were observed 12.9 and 22.0 µg/m^3 at Bhakti Park and Gawangaon respectively.

The average concentrations of CO were in the range of 0.728 to 0.0.814 mg/m^3. The lowest and highest CO values were observed 0.355 and 1.2 mg/m^3 at Bhakti Park and Mysore Colony respectively.
The average concentration of MHC is ranging from 603 to 716 µg/ m^3. The lowest value of MHC recorded was 502 µg/ m^3 at Estate Office (at BPCL Colony) and the highest value was 849 µg/ m^3 at Bhakti Park.

The average concentration of Benzene is ranging from 1.77 to 2.1 µg/ m^3. The lowest value of Benzene recorded was 1.41 µg/ m^3 at Estate Office (at BPCL Colony) & IOCL Colony Govandi and the highest value was 2.81 µg/ m^3 at Estate Office (at BPCL Colony).

The average concentration of Ozone is ranging from 7.5 to 7.9 µg/ m^3. The lowest value of Ozone recorded was 3.7 µg/ m^3 at Bhakti Park and the highest value was 12.6 µg/ m^3 at IOCL Colony Govandi.

The concentrations of NMHC and Benzo (a) Pyrine in all the locations are below detectable limit of 100 µg/ m^3 and 0.5 ng/ m^3 respectively.

Water environment

Water samples were collected at 6 locations for ground water, 5 locations for surface water sources and 1 location for sea water. The pH of the ground water samples varies from 6.8 to 7.85. Total dissolve solids (TDS) were found to be in the range of 232 to 1600 mg/l. It indicates that the TDS of water samples are within the permissible limits of 2000 mg/l as per IS 10500. Hardness concentration was ranging from 106 to 706 mg/l. which is indicating that hardness in the Gawan Village Well Water sample collected is exceeding the permissible limit of 600 mg/l as per IS 10500.

The pH of the surface water samples varying from 7.07 to 8.01, which is well within the IS 2296 limits 6.5 to 9.0. Total dissolve solids (TDS) were found to be in the range of 45 to 5120 mg/l. it is to be noted that the TDS values are exceeding the IS 2296 limits (1500 mg/l). The TDS variation is found to be 1876 to 2091, 3682 to 3991, 2118 to 2291, 4830 – 5120 at Ashish Talav, Teen Talav, Ghatala Lake and Chedda Nagar Talav respectively. DO was observed in the range of 3.7 to 5.31 mg/l. Chloride concentration were found to be in the range of 10.91 to 2675.0 mg/l. Sulphates concentration at Teen Talav was found to be exceeding the IS 2296 limit of 400 mg/l. it was observed as 928.4 to 953.6

For sea water sample, the pH range was found to be 7.13 to 8.03, whereas the TDS value was found to be varying between 36896 to 39497.

Noise environment

Noise levels have been monitored at four different points within the study zone. It can be seen that the noise levels (Leq) are ranging between 70.1 and 83.6 dB (A) during daytime and 54.3 and 65.9 dB (A) during night time.

The night time noises Leq (Ln) level in Industrial areas are within the Industrial zone noise standard. Whereas the day time noise Leq (Ld) level in Industrial areas are more than the Industrial zone noise standard.

For residential area, day time noise Leq (Ld) level and night time noise Leq (Ln) are more than the residential zone noise standard. This may be due to the movement of goods carriers and public transportation because of Eastern Express Highway as well as due to the location of the refinery (Adjoining HPCL refineries are some of the vital industries such as Bharat Petroleum Corporation, Tata Thermal Power Plant, Rashtriya Chemicals and Fertilisers, Aegis Chemicals.etc.).

Soil environment

For establishing the baseline status of soil within the probable impact zone, Soil Samples were collected at BPCL South Gate, BPCL North Gate, Mysore Colony, BPCL Colony, BhaktiPark, IOC Nagar, Gawan Village, Mahul Village, Aziz Baug and Near Teen Talav.

Sodium Adsorption Ratio of the soil samples ranges from 0.02-0.72. Total Nitrogen of the soil samples ranges from 111.29-338.61 mg/kg. Organic Matter of the soil samples ranges from 7.82-12.24 %.

Land environment

Land use pattern in study area and its buffer zones covered within a radius of 10 km from the proposed plant has been established through interpretation of satellite imageries and by means of preparation of land use/land cover map.

Table - Distribution of Land Use Land Cover in the Study Area

Sr. No.	Description	Area (sq.km.)	Area (Ha.)
1.	Agricultural Land-Kharif Crop	0.62	61.93
2.	Agricultural Land-More than two crop	0.06	6.34
3.	Agricultural Land-Two crop area	0.05	5.40
4.	Agricultural Land-Current Fallow	0.01	0.85
5.	Agricultural Land-Agro Horticulture Plnt.	0.31	30.78
6.	Built Up-(Rural)-Built Up area (Rural)	0.23	23.16
7.	Built Up-(Urban)-Commercial	0.53	53.44
8.	Built Up-(Urban)-Recreational	1.03	103.17
9.	Built Up-(Urban)-Residential	97.99	9798.77
10.	Built Up-(Urban)-Transportation	4.97	497.49
11.	Built Up-(Urban)-Vegetated Area	19.06	1905.54
12.	Built Up-Mining / Industrial area	10.33	1032.76
13.	Sea	70.12	7012.50
14.	Wastelands-Barren Rocky/Stony waste	0.59	58.80
15.	Wastelands-Sandy area-Coastal	0.08	7.68

Sr. No.	Description	Area (sq.km.)	Area (Ha.)
16.	Wastelands-Dense scrub	11.14	1113.55
17.	Wastelands-Open scrub	0.46	46.24
18.	Waterbodies-Reservoir/Tanks-Dry	0.39	39.09
19.	Waterbodies-River/Stream	0.09	8.51
20.	Wetlands-Coastal Manmade	0.03	2.99
21.	Wetlands-Coastal Manmade(Salt pans)	2.65	265.32
22.	Wetlands-Coastal Natural(Creek)	64.78	6478.41
23.	Wetlands-Coastal Natural(Mangrove-Dense)	22.65	2265.34
24.	Wetlands-Coastal Natural(Mangrove-Open)	0.06	6.41
25.	Wetlands-Coastal Natural(Mudflats)	0.40	39.84
26.	Wetlands-Coastal Natural(Salt Marsh)	1.10	110.09
27.	Wetlands-Coastal Natural(Tidal Area)	4.41	441.12
	TOTAL	**314.16**	**31415.51**

Biological environment

The study was aimed at enumeration of the available flora and fauna resources and obtaining a broad representation of the existing floristic variations in and around the proposed project site.

A total of 134 species of plants (including wild, ornamental and cultivated plants) belonging to 108 genera and spreading over 53 plant families were documented and identified in the 10 km radial distance from the proposed project site of the study area.

A total of 30 bird species belonging to 18 families are recorded in the study area. The common birds recorded were Indian Pond Heron *Ardeola grayii*, Little Egret *Egretta garzetta,* Black-winged Stilt *Himantopus himantopus,* Common Sandpiper *Actitis hypoleucos,* House Crow *Corvus splendens,* Red-wattled Lapwing *Vanellus indicus* etc. Oriental White Ibis *Threskiornis malanocephalus* is a near threatened bird which sighted in the mangrove areas.

There are 14 butterfly species belonging to 5 families which were identified in a random survey around the study area. Grey Pansy *Junonia atlites* is sighted in mangrove areas. Several species of fishes are available in the mangrove water and collected by local fisherman. Some of them are Indian Tarpon *Megalops* sp., Guppy *Guppy poecila*, Catfish *Clarius* sp., Tilapia *Oreochronis mossambicus*, Mullet *Mugil cephulus*, Mud-skipper *Periophthalmus* sp., and Eel *Anguilla* sp. are common in the mangrove areas. They come along tidal water and also live in puddles in mangroves.

The survey of HPCL surrounding area was done by Bombay Natural History Society. They have recorded 5 species of snakes, one species of lizards and 2 types of skinks. Snake species recorded were Common Kukri *Oligodon arnensis*, Dog faced water snake *Cerberus rhyncops*, Common Indian Cobra *Naja Naja*, Russel's Viper *Daboia russelii* and Common Rat Snake *Ptyas mucosus*. Only one species of lizard is found i.e. Common Garden Lizard *Calotes versicolor*. Two species of skinks recorded were Forest Skink *Mabuya macularia* and Common Skink *Mabuya carinata*.

The Jackal *Canis aureus*, Common Mongoose *Herpestes edwardsi*, Bandicoot Rat *Bandicota indica* and Indian Mole-Rat *Bandicota bengalensis* are recorded species in the surrounding areas which was mentioned in literature.

Socio-economic environment

Effect of employment generation and additional transport requirements on local infrastructural facilities are adequately addressed for the project construction activities. Operational phase of the plant covers the entire life span of the plant. Hence the impacts of the operational phase extend over a long period of time. The policy of HPCL towards social welfare & community development aims at strengthening the bond between project authorities and local population in the vicinity of the project area. In line with this policy, the positive impacts include opportunities for employment, etc.

IV. Anticipated Environmental Impacts

Summary of potential impacts of the proposed project is as given in the following table.

Table - Summary of Potential Impacts

Environmental Area	Environmental Impact									
	No Effect	Positive Effect	Negative Effect	Beneficial	Adverse	Problematic	Short-term	Long-term	Reversible	Irreversible
Soil characteristics	√									
Natural drainage	√									
Air quality			√				√		√	
Ground water	√									
Surface water	√									
Noise			√				√		√	
Wildlife	√									
Endangered Species	√									
Natural Vegetation		√						√		
Demography	√									
Recreation	√									
Health & Safety		√		√				√		
Regional Economy		√						√		
National Economy		√						√		
Public facilities				√						
Public services		√						√		
Transportation			√				√		√	
Pipeline to Jetty	√									

V. Environmental Monitoring Program

The proposed environmental monitoring program of the proposed project during construction and operation phases is mentioned below tables.

Table - Proposed environmental monitoring program during construction phase

Sl. No.	Potential impact	Action to be Followed	Parameters for Monitoring	Frequency of Monitoring
1	Air Emissions	All equipment is operated within specified design parameters.	Random checks of equipment logs/ manuals	Periodic
		Vehicle trips to be minimized to the extent possible.	Vehicle logs	Periodic during site clearance & construction activities
		Any dry, dusty materials stored in sealed containers or prevented from blowing.	Absence of stock piles or open containers of dusty materials.	Periodic during construction activities
2	Noise	Night working is to be minimized.	Working hour records	Daily records
		Generation of vehicular noise	Maintenance of records of vehicles	Daily records
		Acoustic mufflers / enclosures to be provided in large noise generated engines	Mufflers / enclosures in place	Prior to use of equipment
3	Soil Erosion	Protect topsoil stockpile wherever possible	Effective cover in place	Periodic during construction activities
4	Health	Employees and migrant labor health check ups	All relevant parameters including audiometry	Regular check ups
5	Construction camps	Away from settlements and ensure disciplinary procedures. Avoid use of public infrastructural facilities such as power, gas and water and maintain hygienic conditions	Regular monitoring	Pre-construction
6	Waste Management	Identification & characterization of every waste arising from proposed activities as per prevalent waste management plan and which also identifies the procedures for collection, handling & disposal of each waste arising from	Comprehensive Waste Management Plan in place and available for inspection on-site. Compliance with Hazardous Wastes (Management and	Periodic check during construction activities

Sl. No.	Potential impact	Action to be Followed	Parameters for Monitoring	Frequency of Monitoring
		the project site.	Handling Rules), 2008	
7	Non-routine events and accidental releases	Plan to be drawn up, considering likely emergencies and steps required to prevent/limit consequences.	Mock drills and records of the same	Periodic during construction activities
8	Public and animal safety	Erection of warning barriers	Routine monitoring and checks	Throughout construction period
9	Water and waste water	Take care in disposal of Waste water generated such that soil and groundwater resources are protected.	Discharge norms for effluents as given in permits	Periodic during construction activities

Table - Proposed environmental monitoring program during Operation phase

S. No.	Potential impact	Action to be Followed	Parameters for Monitoring	Frequency of Monitoring
1.	Air quality	Cold venting any from storage tanks	Quantity and cold venting if any.	Continuous
		Ambient air quality within the project site and nearby habitations to be monitored.	SO_2, NO_x, VOCs	As per CPCB/ MPCB requirement or on monthly basis whichever is earlier
2	Noise	Noise generated from operation of pumps to be optimized and monitored. DG sets are to be provided at basement with acoustic enclosures	Spot Noise Level recording; Leq(night), Leq(day), Leq(dn)	Periodic during operation phase
3	Water Quality and Water Levels	Monitoring groundwater quality	Comprehensive monitoring as per IS 10500	Once in a season
4	Wastewater Discharge	No untreated discharge to be made to surface water, groundwater or soil. The cleaning water shall also be disposed to refinery ETP.	No discharge hoses in vicinity of water courses.	Periodic during operation phase
		Take care in disposal of wastewater generated such that soil and Groundwater resources are protected.	Discharge norms for effluents as per ETP norms	Periodic during operation phase
5	Maintenance of flora and fauna	Vegetation and greenbelt / green cover development.	No. of plants species	Periodic during operation phase

S. No.	Potential impact	Action to be Followed	Parameters for Monitoring	Frequency of Monitoring
6	Health	Employees health check-ups.	All relevant parameters including audiometry	Regular check-ups

VI. Environmental Management Plan

The Environmental Management Plan in the design stage endeavors to mitigate the problems related to health, safety and environment at the process technology selection stage and at the design stage. The project facilities have been designed taking into account all applicable standards/ norms both for regulatory and safety purpose. A summary of impacts, mitigation measures and proper environmental management plan for proposed project facilities are given in following tables.

For pipeline activity, there shall be short term impacts during construction phase, which are insignificant and reversible in nature. The pipeline is proposed to be laid in the existing corridor for which access to ROW is already acquired. The ROW shall be restored to its original state after completion of construction activities. During operation phase, No significant environmental impact is envisaged as a result of the pipeline operation except for the noise levels at feed pumping stations. The pumps/motors selected for pipeline operation will meet OSHA norms.

Table - Environmental Monitoring Plan during Construction Phase

S. No	Environmental Component	Activity/Aspect	Impacts	Mitigation Measures	Element of Environmental Management Plan
1	Air Environment	• Foundation work • Digging, leveling work • Structural works	Very less conventional pollutants will be released during this phase due to construction works,	• Dust pollution will be suppressed using water sprinklers	Regular monitoring of levels of conventional pollutants as per MPCB guidelines
2	Water Environment	Maintenance of drainage and water supply network for sanitation and waste water generation	Limited impact on surrounding water bodies/aquatic ecosystems/ground water due to soil erosion, leaching, waste water generation	• Water requirement through existing raw water source • Proper sanitation • Waste water treatment through existing treatment plant located at Mumbai Refinery	• Provision for appropriate sanitary facility for construction workers
3	Land Environment	Land use change due to drilling, excavating	• Land pollution of small magnitude due to solid waste generation • Overburden and construction waste will also be produced	• Management of solid waste • Management of excavated solid and construction waste	• Composting bio-degradable waste and disposal of non bio-degradable waste in land fills • Construction waste will be used for back filling
4	Noise Environment	Noise from construction, heavy vehicle movements	Noise level will be more but within the permissible limits	• Noise protection measures • Using ear muffs for workers while construction	• Rules & regulations of Noise Standards will be followed • Greenbelt development for attenuating the noise levels
5	Socio-economic Environment	Migration of labourers	More benefits to the local people	• Employment opportunities to local skilled and unskilled people • Social and cultural development	• Regular health camp surrounding the plant • Implementation of HPCL CSR Policy
6	Biological Environment	Land use change	• Impact on flora and fauna will be minimal • Less impact on marine ecosystem	• Creation of landscape with plantation • Conservation of	• Biological diversity Act and MoEF guidelines for conservation of species will

S. No	Environmental Component	Activity/Aspect	Impacts	Mitigation Measures	Element of Environmental Management Plan
				biodiversity through greenbelt development	be followed • Greenbelt development with more fruit bearing trees, avenue plantation etc. will be made

Table - Environmental Monitoring Plan during Operation Phase

Sl. No	Environmental Component	Activity/Aspect	Impacts	Mitigation Measures	Element of Environmental Management Plan
1	Air Environment	• Air emissions (Fugitive)	• Insignificant impact as fugitive emission will be within the permissible limits.	•Compliance to standards •Continuous monitoring	• Control air emissions at source • Treatment to reduce air emissions • Regular monitoring of the levels of conventional pollutants as per MPCB requirements
2	Water Environment	Operation of new storage tanks and utilities	No impact on surrounding water bodies/aquatic ecosystems/ground water	• Proper management of Oily, sanitary and domestic waste water	• Treatment of domestic waste and reuse of water for irrigation of plantation/green belt • Regular monitoring of the levels of conventional pollutants as per MPCB norms
3	Land Environment	Disposal of solid waste	Land pollution of small magnitude due to solid waste generation	• Management solid waste • Development of green belt	• Treatment and disposal of solid waste as per CPCB/MPCB norms • Development of green belt in the plant area
4	Noise Environment	Noise from compressors, DG sets etc.	Insignificant noise levels in public domain	• Control of noise levels within permissible limits • Development of barriers to control noise • Follow occupational health and safety measures	• Noise levels due to plant activities will be controlled within permissible limits • Noise generating units will be housed in acoustic enclosures • Development of green belt will act as a barrier • Noise standards of CPCB will be

Sl. No	Environmental Component	Activity/Aspect	Impacts	Mitigation Measures	Element of Environmental Management Plan
					adhered with
5	Socio-economic Environment	Quality of life	More benefits to the local people	• Employment generation • Awareness camps • Medical camps	• Implementation of social welfare schemes for the local people • Preference will be given to local people • Ensure participation of local people in cultural events to create social harmony and goodwill
6	Biological Environment	Discharge/ releases to air & water	Impact on terrestrial flora and fauna	• Adequate protection measures should be ensured in design for conservation of flora and fauna	• Development of green belt with indigenous tree species • Regular monitoring of biodiversity and listing the same
7	Health, Safety & Environment	Conventional emissions	Health effects of pollutants	• Occupational health & safety • Safety in tank design • Monitoring & compliance to OSHA standards	• Safety in tank design as per OSHA norms • Regular monitoring of the pollutant levels in different components of surrounding environment • Regular health check-up of the workers • Hazard analysis and safety measures in work place to reduce the undue risk to employees, members of public & environment as per OSHA requirements

Capital Cost for Environmental Protection

The capital cost for environmental measures related to proposed expansion project is worked out for implementation of environmental management plan and is given as follows:

Table - Total estimated budget for implementation of EMP

S. No.	Capital Cost for EMP	Rs (Lakhs)
1	Air Pollution Control (A)	200
2	Water Pollution Control (B)	50
2.1	Rain water harvesting	50
3	Land Pollution Control (C)	40
3.1	Green Belt Development	10
4	Noise Pollution Control (D)	1
	Total (A+B+C+D)	**351**

Recurring Cost for Environmental Protection

The recurring cost for environmental measures related to proposed project is worked out for implementation of environmental management plan and is given as follows:

Table - Annual Budget of Environmental Management Plan (Operation Phase)

Activities	Rs. (Lakhs)
Air Monitoring Activities	
Ambient Air Monitoring	10
VOC monitoring	10
Other recurring cost (consents)	20
Total	**40**
Noise Monitoring Activities	
Ear Plugs, Ear Muff, Soft Sponge	0.2
Land Monitoring Activities	
Soil testing	NA
Ground Water Quality	1
Rain Water Harvesting	5
Tree Plantation-Green belt	1
Total (E)	**7**
Grand Total	**47.2**

VII. Additional Studies

Emergency Response and Disaster Management Plan

This chapter outlines the role and responsibility (and their initial actions) of identified personnel in case of emergency break out in the plant.

Emergency/disaster is an undesirable occurrence of events of such magnitude and nature that adversely affect production, cause loss of human lives and property as well as damage to the environment. Industrial installations are vulnerable to various kinds of natural and manmade disasters. Examples of natural disaster are flood, cyclone, earthquake, lightning etc. and manmade disasters are like major fire, explosion, sudden heavy leakage of toxic/poisonous gases, civil war, nuclear attacks, terrorist activities,

sabotage etc. It is impossible to forecast the time and nature of disaster, which might strike an undertaking.

However, an effective disaster management plan helps to minimize the losses in terms of human lives, plant assets and environmental damage and resumes working condition as soon as possible.

It is to be understood that the first few minutes after the start of an incident are most vital in prevention of escalation. Therefore the personnel available at the site on round the clock basis play an important role. Some of them are the “KEY PERSONS”. Since the proposed storage tank facility is operated by trained operators and contract personnel M/s HPCL has envisaged that emergency in the proposed plant will be handled by operation in-charge i.e., Plant manager with the help of other officers & workers of Plant. Plant Manager will nominate different Emergency Coordinators to control emergency situation.

The role of various coordinators is to assess the situation form time to time, take appropriate decisions in consultation with the CHIEF CONTROLLER and to provide timely resources and instructions to the Key Persons to fight the emergency. Key Persons as far as possible are available on a round the clock basis.

The senior most officer in the plant is Plant manager, who will be the Chief Emergency Controller. In pre Emergency period he will delegate responsibility to other officers as other Coordinators as per suitability and the job to be done by them. During emergency, if Plant Manager is not present at site, the senior most officers in the plant will assume the responsibility of Chief Emergency Controller and inform Plant Manager to be present at site at shortest possible time.

Risk Assessment Study

Engineers India Limited (EIL), New Delhi, has been appointed by M/s Hindustan Petroleum Corporation Limited (HPCL) to carry out Risk Analysis for proposed storage tankages and its associated facilities.

The Risk Analysis study has been performed with PHAST 6.7 (Software by DNV) and this report documents the consequence results with hazard contours superimposed on the layouts/ maps to create awareness about the extent of impact.

The Storage tanks are located in the dykes and have been considered based on the required inter-tank separation distances as per OISD. The detailed Risk Assessment report is attached as Annexure-XI.

VIII. Project Benefits

M/s HPCL Mumbai Refinery had taken many initiatives for the welfare of the society in the vicinity in addition to its contribution towards fulfilling nations energy requirements over the years.

The proposed project aims at de congestion of Mumbai Refinery for creation of space in the refinery for Mumbai Refinery expansion project (MRMP). The Mumbai Refinery expansion project aims at maximizing the production of eco-friendly products and shall prepare the refinery to meet stringent fuel specificatinos in future. In addition, the proposed project shall yield following benefits:

- Maintain continuity of petroleum products (through Mumbai Refinery expansion project) supply to the consumers nationwide.
- Increased safety measures for reconstructed storage tanks at Calico Plot with respect to hazard detection and prevention system.

Employment Potential

The project shall also provide employment 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 employment opportunities, mainly in service sector, although its magnitude will be much less. The direct employment opportunities with M/s HPCL are extremely limited and the opportunities exist mainly with the contractors and sub-contractors. These agencies will be persuaded to provide the jobs to local persons on a preferential basis wherever feasible.

Corporate Social Responsibility

HPCL has always worked towards being a model of excellence in meeting commitment to society as RESPONSIBLE CORPORATE CITIZEN with which HPCL engage and interact, and beyond. HPCL has been consciously striving towards this commitment.

In the last few years, aligning ourselves with the world trend, HPCL too has been moving away from a philanthropic charity mode of engagement to a more pro-active and participative engagement with our beneficiaries.

Initiatives of our corporation are broadly classified under Focus Areas: Child-Care, Education, Health Care, Skill Development and Community Development. Interventions in these areas make a meaningful and long-term impact on the community. In the above areas the following are the Major Projects that were undertaken by HPCL.

Our CSR initiatives and activities were also recognized by the following awards that we won during the year 2012-13:

- CSR Excellence Award honored by ASSOCHAM and received from Dr. APJ Abdul Kalam
- PSE Excellence Award honored by ICC&DPE
- CRY Child Rights Champion Award
- 3 Awards: a) Best Overall CSR Performance, b) Support for Quality Education and c) Community Development from Subir Raha Centre for Corporate Governance
- 3 Awards: a) Most Caring Company, b) Best CSR Practices and C) Improvement in Education from World CSR Congress & Blue Dart Global CSR Excellence
- 2 Awards: a) HR Practices in CSR and b) Outstanding Contribution to the Cause of Education honored by Asia Pacific HRM Congress

Accordingly in line with the corporate policy of CSR, Mumbai Refinery HR is also actively participating in the community development initiative. Few of the activities undertaken by Mumbai Refinery in the last year are:

FY 2013-14

- 8th successive year of Annual Inter School Athletic Championship 2014 was conducted by HPCL on 1st February 2014 at H.P. Nagar West Ground, Mahul,

Chembur. This perhaps is the only such corporate initiative as a corporate citizen in the city of Mumbai at such a large scale.

- Mumbai Refinery collected the relief material from the desirous employees for flood affected people of Uttarakhand and Himachal Pradesh. Accordingly, employees of Mumbai Refinery have generously donated relief material.

- Organizing Health talk on a regular basis by reputed Doctors on different Specializations such as “Be safer or suffer” on Monsoon Diseases, “Harm of Tobacco” and Cardiac care.

- Garden/Park right in front of our Mahul Terminal Main Gate in the periphery of Mumbai Refinery.

- Various free medical camps are conducted in the vicinity areas by providing free medicine and consultation to the poor.

- Mangroves Plantation - HPCL MR celebrated International Mangroves Action Day on Saturday July 26, 2014 for the first time.

- Food and Medicine distribution **-** On the occasion of Death anniversary of Dr Ambedekar from December 5th to 7th at Dadar.

- Blood donation camp - Various blood donation camps are arranged periodically.

- Tree Plantation - in collaboration with TATA Power.

- Rapid assessment survey in the surrounding villages to understand their requirements.